



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

### VIA ELECTRONIC MAIL

November 21, 2019

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

RE: **EM-VER-155-191010** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 139 North Main Street, West Hartford, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your correspondence of November 15, 2019 submitted in response to the Council's October 21, 2019 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification 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,

Melanie A. Bachman  
Executive Director

MAB/IN/emr



## Robidoux, Evan

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**From:** Dandeneau, Kathleen <KDANDENEAU@RC.com>  
**Sent:** Friday, November 15, 2019 2:04 PM  
**To:** Bachman, Melanie; CSC-DL Siting Council  
**Cc:** Baldwin, Kenneth; Mayo, Rachel  
**Subject:** EM-VER-155-191010 - West Hartford - Additional Information  
**Attachments:** West Hartford.pdf

The original has been mailed to the Siting Council.

**Kathleen M. Dandeneau**  
Legal Administrative Assistant

Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103  
Direct 860.541.2689 | Fax 860.275.8299  
[kdandeneau@rc.com](mailto:kdandeneau@rc.com) | [www.rc.com](http://www.rc.com)

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November 15, 2019

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

Re: **EM-VER-155-191010 – Cellco Partnership d/b/a Verizon Wireless Notice of Intent to Modify an Existing Telecommunications Facility Located at 139 North Main Street, West Hartford, Connecticut**


Dear Ms. Bachman:

In response to your October 21, 2019 letter regarding the above-referenced notice of exempt modification, I offer the following additional information.

1. An updated Structural Report with the final equipment configuration for the tower and the percentage stress capacity of the antenna support structure and the host building.
2. A set of Construction Drawings for the proposed antenna swap project prepared by Dewberry Engineers Inc.
3. Documentation that the original facility was approved by the Siting Council in Docket No. 434.

If you have any questions or need any additional information please do not hesitate to contact me.

Sincerely,



Kenneth C. Baldwin

Enclosures

20031237-v1

# **ATTACHMENT 1**



November 13, 2019

Verizon Wireless  
99 East River Drive  
East Hartford, CT 06108

**Re: West Hartford Relo CT  
Site ID: 472708  
Fuze #: 15626601  
139 North Main Street  
West Hartford, CT 06107**

To Whom It May Concern:

Verizon Wireless (VZW) has proposed to install new equipment within the VZW equipment levels within the existing clock tower at the site referenced above. The final equipment configuration according to the antenna design sheets (dated 07/31/19) is as follows:

Final (VZW) Equipment Configuration

Rad Center 78'-0"

- (6) SBNHH-1D65B antennas – 40.6 lbs ea. (2 per sector)
  - (3) BSAMNT-SBS-1-2 side by side mounting brackets -25.4 lbs ea.(1 per sector)
- (3) B2/B66A RRH-BR049 – 97.5 lbs ea. (1 per sector)
- (3) B5/B13 RRH BR04C – 82.0 lbs ea. (1 per sector)
- (2) OVP junction boxes – 32 lbs ea. (2 total)

Rad Center 68'-6"

- (6) LPA-80063/6CF antennas – 27.0 lbs ea. (2 per sector)
  - (6) Mounting brackets – 15 lbs ea. (2 per sector)
- (3) BXA-70063-6CF antennas – 17.0 lbs ea. (1 per sector)
  - (3) Mounting brackets – 15.2 lbs ea. (1 per sector)

Cabling

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

The proposed configuration as shown above represents a total increase in load of 272 lbs which is negligible in comparison to the overall structure loading. The analysis concludes the existing clock tower, as described in the permit drawings provided, has sufficient structural capacity to support the proposed equipment configuration. Under the proposed conditions and existing design loads, the maximum utilization of a single structural member is 63.8%.

Our assessment is based on the assumption that the existing structure is in good condition, constructed according to the drawings provided and were constructed in conformance with all applicable state and local building codes. If, during construction, any damage, deterioration, and/or discrepancies are noticed, Dewberry is to be notified to assess any deviation from the assumed condition. Any alteration in equipment



Dewberry Engineers Inc. | 617.695.3400  
99 Summer Street, Suite 700 | 617.695.3310 fax  
Boston, MA 02110-1200 | www.dewberry.com

loading described above and on the associated plans will void any conclusions expressed herein and will require further analysis and design.

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

Sincerely,  
**Dewberry Engineers Inc.**



Ben Revette, P.E.  
Senior Associate

**Dewberry Engineers, Inc.**  
**Structural Analysis Summary Sheet**

**Job No.:** 50002925/50114615 **By:** SMS **Date:** 11/06/19  
**Job Name:** West Hartford Relo CT **Checked:** SA **Date:** 11/13/19

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

**Scope of Work:**

- Proposed replacement of (6) existing RRH units with (3) B2/B66A RRH BR049 and (3) B5/B13 RRH BR04C RRH units on existing interior mounts.
- Proposed installation of (3) BSAMNT-SBS-1-2 side-by-side mounting brackets and relocation of (6) existing SBNHH-1D65B antennas to the proposed brackets.
- Analysis of the existing clock tower building.

**Codes / Standards / References:**

- IBC 2015
- 2018 Connecticut State Building Code – Amendments to IBC 2015
- TIA-222-G
- AISC 14<sup>th</sup>Ed.
- RFDS dated 07/31/19
- Existing drawings by CENTEK Engineering dated 10/21/13
- Site visit by Dewberry Engineers on 11/01/19

**Design & Analysis Assumptions:**

- Assume antennas are mounted inside the existing clock tower.
- Analysis is limited to the existing clock tower only.
- Design and analysis are based on dead, wind, live, seismic and snow loads. The analysis checks for normal bending and shear stresses.
- Assumes minimum concrete compressive strength of 3000 psi and density of 115 lb/ft<sup>3</sup> and reinforcement strength of 60 ksi for the composite decks
- Assumes minimum concrete compressive strength of 3000 psi and density of 150 lb/ft<sup>3</sup> and reinforcement strength of 60 ksi for the lower level and foundation.
- Assumes composite concrete decks modeled with equivalent shear studs 1/2" dia.
- Assumes FRP panel thickness of 1/4".
- Assumed exterior foundation walls to take all soil pressure loads and are designed according to soil parameters of the site.
- Assumed minimum allowable soil bearing capacity of 2500 psf

**Conclusion / Recommendations:**

- The existing structure has sufficient capacity to support the proposed installation.



Job Number 50114615  
Made by: SMS  
Date: 10/31/19  
Checked by: SA  
Date: 11/11/19

## (West Hartford Relo CT) - Structure Loading

\\CAPECOD\Projects\50002925\50114615 - West Hartford Relo CT\Tech\Clock Tower\50114615 - Clock Tower.xlsx

Site Name: West Hartford Relo CT

### Existing Building Information

- Existing Clock Tower drawings by CENTEK Engineering dated 10/21/13
- 2018 Connecticut State Building Code (IBC 2015 , ASCE 7-10)
- Assumed 3000 psi concrete
- Assumed equivalent shear studs 1/2" dia. for composite action

### Existing Dead Load

- Estimated building dead load:

Roof Dead Load =	18.5 psf	(existing building drawings - slab weight- structural steel)
Floor Dead Load =	14 psf	(existing building drawings - slab weight- structural steel)
Grating Platform Dead Load =	20 psf	(estimated)
Ext. Stud Walls w/ Brick Veneer =	48 psf	(ASCE 7-10, Table C3-1)
Exterior FRP Reinforced Walls =	7.5 psf	(0.25" panel with 4x4 tube reinforcements)

### Existing Live Load

- Design building live load:

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

### Snow Load (ASCE 7-10)

#### General Design Criteria

Exposure Factor, $C_e$ =	1.0	(ASCE 7-10, Table 7-2)
Thermal Factor, $C_t$ =	1.0	(ASCE 7-10, Table 7-3)
Importance Factor, $I_s$ =	1.0	(ASCE 7-10, Table 1.5-2)
Min. Flat Roof Load, $p_{f min}$ =	30 psf	(Connecticut State Building Code 2018)
Ground Snow Load, $p_g$ =	30 psf	(ASCE 7-10, Hazard Tool)
Design Snow Load, $p_f = 0.7 C_e C_t I_s p_g$		(ASCE 7-10, Eqn. 7.3-1)
	= 21.0 psf	<b>(Use 30 psf)</b>





Job Number 50114615  
 Made by: SMS  
 Date: 10/31/19  
 Checked by: SA  
 Date: 11/11/19

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

\\CAPECOD\Projects\50002925\50114615 - West Hartford Relo CT\Tech\Clock Tower\50114615 - Clock Tower.xlsx

Site Name: West Hartford Relo CT

**Wind Load per ASCE 7-10, Chapter 27**

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

Design Criteria

Height, h = 90.00 ft (Mean roof height)  
 Risk Category = II (Table 1.5-1, ASCE 7-10)  
 Basic Wind Speed, V = 125 mph (Connecticut State Building Code 2018, Appendix V)  
 K<sub>d</sub> = 0.85 (Table 26.6-1, ASCE 7-10)  
 Exposure Category = B (Sect. 26.7.3, ASCE 7-10)  
 K<sub>z1</sub> = 1 (Sect. 26.8.2, ASCE 7-10)  
 G = 0.85 (Sect. 26.9.4, ASCE 7-10)  
 K<sub>h</sub> = 0.960 (Table 27.3-1, ASCE 7-10)

Velocity Pressure

$$q_h = 0.00256 * K_h * K_{z1} * K_d * V^2 \quad (\text{Eqn. 27.3-1, ASCE 7-10})$$

$$= 32.64 \text{ lb/ft}^2$$

Design Wind Force

- Conservatively using q<sub>h</sub> for all sides

$$p_w = q_h GC_p - q_h(GC_{pi}) \quad (\text{Eqn. 27.4-1, ASCE 7-10})$$

p <sub>w(+)</sub> windward = 16.3 psf	(+ Internal Pressure)
p <sub>w(+)</sub> leeward = -19.7 psf	
p <sub>w(+)</sub> side = -25.3 psf	
p <sub>w(-)</sub> windward = 28.1 psf	(- Internal Pressure)
p <sub>w(-)</sub> leeward = -8.0 psf	
p <sub>w(-)</sub> side = -13.5 psf	

where: (+) GC<sub>pi</sub> = 0.18 (Table 26.11-1, ASCE 7-10)  
 (-) GC<sub>pi</sub> = -0.18 (Table 26.11-1, ASCE 7-10)  
 C<sub>p</sub> windward = 0.80 (Fig. 27.4-1, ASCE 7-10)  
 C<sub>p</sub> leeward = -0.50 (Fig. 27.4-1, ASCE 7-10)  
 C<sub>p</sub> side = -0.70 (Fig. 27.4-1, ASCE 7-10)



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Job No  
**50114615**Sheet No  
**1**

Rev

Part

Job Title **West Hartford Relo CT**

Ref

By **SMS**Date **31-Oct-19**Chd **SA**Client **Verizon**File **Clock Tower (Composite)**Date/Time **08-Nov-2019 11:54**

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	SMS	SA	
<b>Date:</b>	31-Oct-19	11-Nov-19	

<b>Project ID</b>	
Project Name	

<b>Structure Type</b>	SPACE FRAME
-----------------------	-------------

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

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

Included in this printout are data for:

<b>All</b>	The Whole Structure
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Included in this printout are results for load cases:

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



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Job No  
**50114615**

Sheet No  
**2**

Rev

Part

Job Title West Hartford Relo CT

Ref

By SMS

Date 31-Oct-19

Chd SA

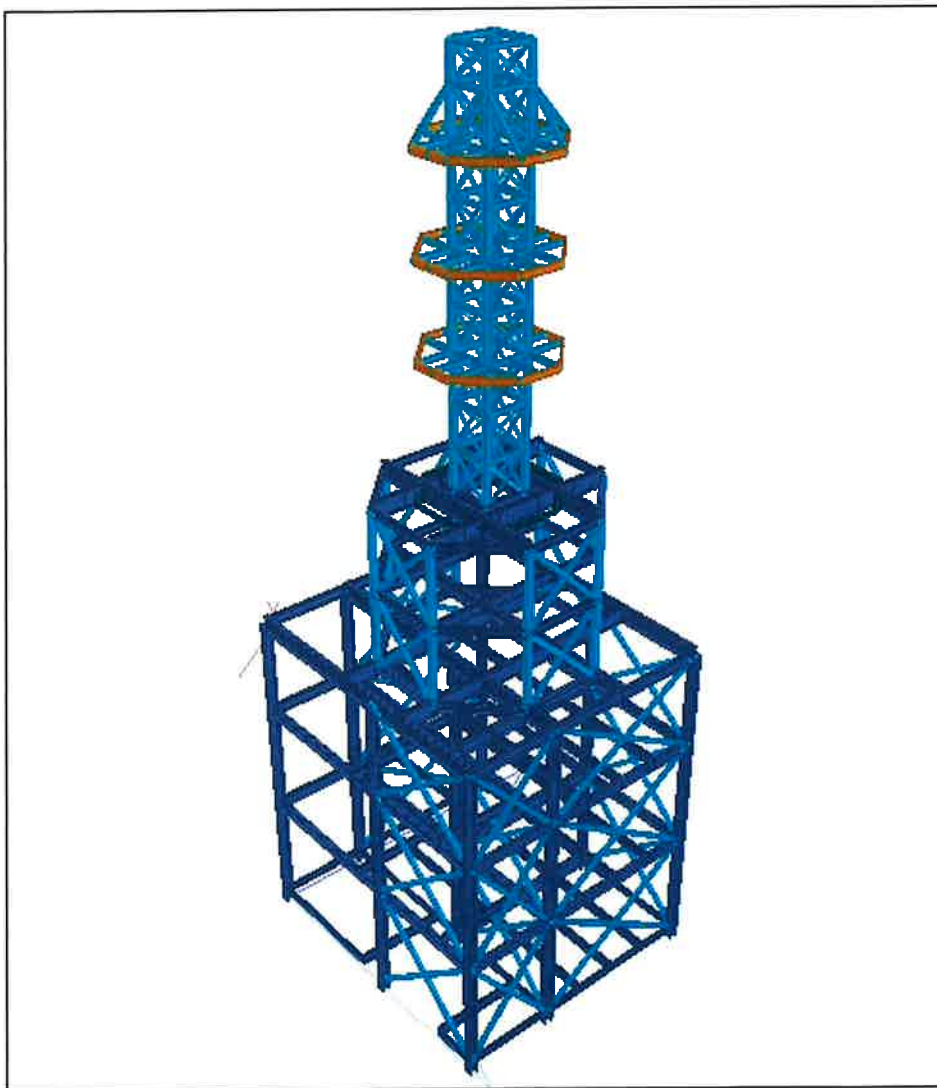
Client Verizon

File Clock Tower (Composite I

Date/Time 08-Nov-2019 11:54

### Job Information Cont...

Type	L/C	Name
Combination	34	0.9D+1.0E(X)
Combination	35	0.9D+1.0E(Z)
Combination	36	0.9D-1.0E(X)
Combination	37	0.9D-1.0E(Z)



3D Rendered View



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Job No  
**50114615**

Sheet No  
**3**

Rev

Job Title **West Hartford Relo CT**

Part

Ref

By **SMS**

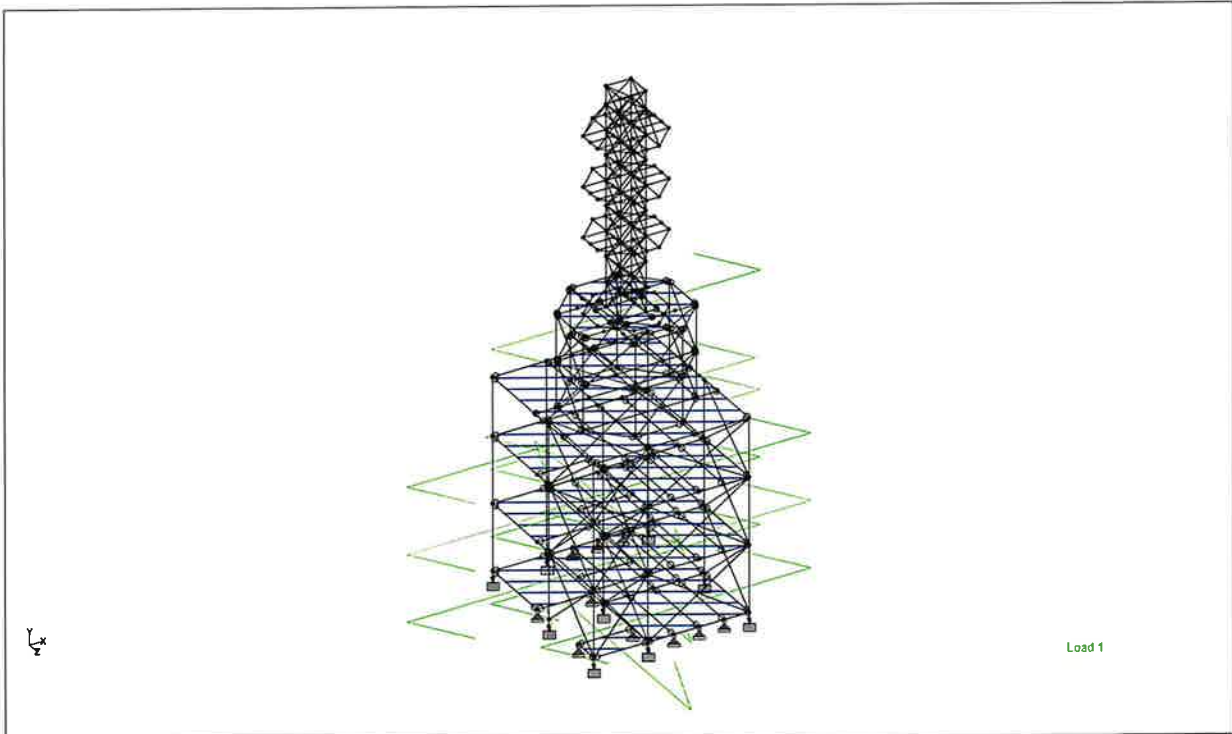
Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite I**

Date/Time **08-Nov-2019 11:54**



Composite Slabs

### Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.000	0.000
2	9.667	0.000	0.000
3	27.667	0.000	0.000
4	0.000	0.000	17.333
5	9.667	0.000	17.333
6	27.667	0.000	17.333
7	0.000	0.000	31.167
8	9.667	0.000	31.167
9	27.667	0.000	31.167
10	0.000	1.250	0.000
11	9.667	1.250	0.000
12	27.667	1.250	0.000
13	0.000	1.250	17.333
14	9.667	1.250	17.333
15	27.667	1.250	17.333
16	0.000	1.250	31.167
17	9.667	1.250	31.167
18	27.667	1.250	31.167
19	0.000	13.250	0.000



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Job No  
**50114615**

Sheet No  
**4**

Rev

Part

Job Title **West Hartford Relo CT**

Ref

By **SMS**

Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite)**

Date/Time **08-Nov-2019 11:54**

### Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
20	9.667	13.250	0.000
21	27.667	13.250	0.000
22	0.000	13.250	17.333
23	9.667	13.250	17.333
24	27.667	13.250	17.333
25	0.000	13.250	31.167
26	9.667	13.250	31.167
27	27.667	13.250	31.167
28	0.000	25.250	0.000
29	9.667	25.250	0.000
30	27.667	25.250	0.000
31	0.000	25.250	17.333
32	9.667	25.250	17.333
33	27.667	25.250	17.333
34	0.000	25.250	31.167
35	9.667	25.250	31.167
36	27.667	25.250	31.167
37	0.000	35.750	0.000
38	9.667	35.750	0.000
39	27.667	35.750	0.000
40	0.000	35.750	17.333
41	9.667	35.750	17.333
42	27.667	35.750	17.333
43	0.000	35.750	31.167
44	9.667	35.750	31.167
45	27.667	35.750	31.167
46	9.667	13.250	13.833
47	0.000	13.250	13.833
48	14.167	13.250	17.333
49	18.667	13.250	17.333
50	23.167	13.250	17.333
51	14.167	13.250	0.000
52	18.667	13.250	0.000
53	23.167	13.250	0.000
54	14.167	13.250	31.167
55	18.667	13.250	31.167
56	23.167	13.250	31.167
57	0.000	13.250	26.500
58	9.667	13.250	26.500
59	0.000	25.250	13.833
60	0.000	25.250	26.500
61	14.167	25.250	31.167
62	23.167	25.250	0.000
63	14.167	25.250	17.333
64	9.667	25.250	13.833



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Job No  
**50114615**

Sheet No  
**5**

Rev

Part

Job Title **West Hartford Relo CT**

Ref

By **SMS**

Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite I**

Date/Time **08-Nov-2019 11:54**

### Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
65	9.667	25.250	26.500
66	18.667	25.250	17.333
67	23.167	25.250	17.333
68	14.167	25.250	0.000
69	18.667	25.250	0.000
70	18.667	25.250	31.167
71	23.167	25.250	31.167
72	18.000	35.750	0.000
74	18.000	35.750	31.167
75	0.000	35.750	13.167
76	9.667	35.750	13.167
77	27.667	35.750	13.167
78	18.000	35.750	13.167
79	0.000	35.750	21.500
80	9.667	35.750	21.500
81	27.667	35.750	21.500
82	18.000	35.750	21.500
83	3.771	35.750	13.167
84	3.771	35.750	21.500
85	23.896	35.750	13.167
86	23.896	35.750	21.500
87	9.667	35.750	7.271
88	18.000	35.750	7.271
89	9.667	35.750	27.396
90	18.000	35.750	27.396
91	3.771	44.000	13.167
92	3.771	44.000	21.500
93	23.896	44.000	13.167
94	23.896	44.000	21.500
95	9.667	44.000	7.271
96	18.000	44.000	7.271
97	9.667	44.000	27.396
98	18.000	44.000	27.396
99	3.771	52.250	13.167
100	3.771	52.250	21.500
101	23.896	52.250	13.167
102	23.896	52.250	21.500
103	9.667	52.250	7.271
104	18.000	52.250	7.271
105	9.667	52.250	27.396
106	18.000	52.250	27.396
107	18.000	44.000	13.167
108	9.667	44.000	13.167
109	18.000	44.000	21.500
110	9.667	44.000	21.500



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Job No  
**50114615**

Sheet No  
**6**

Rev

Part

Job Title West Hartford Relo CT

Ref

By SMS

Date 31-Oct-19

Chd SA

Cient Verizon

File Clock Tower (Composite |

Date/Time 08-Nov-2019 11:54

### Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
111	9.667	52.250	13.167
112	9.667	52.250	21.500
113	18.000	52.250	13.167
114	18.000	52.250	21.500
115	11.583	52.250	13.167
116	11.583	52.250	21.500
117	16.083	52.250	13.167
118	16.083	52.250	21.500
119	9.667	52.250	19.583
120	11.583	52.250	19.583
121	16.083	52.250	19.583
122	18.000	52.250	19.583
123	9.667	52.250	15.083
124	11.583	52.250	15.083
125	16.083	52.250	15.083
126	18.000	52.250	15.083
127	11.583	65.750	19.583
128	16.083	65.750	19.583
129	11.583	65.750	15.083
130	16.083	65.750	15.083
131	11.583	74.750	19.583
132	16.083	74.750	19.583
133	11.583	74.750	15.083
134	16.083	74.750	15.083
135	11.583	83.750	19.583
136	16.083	83.750	19.583
137	11.583	83.750	15.083
138	16.083	83.750	15.083
139	11.583	91.500	19.583
140	16.083	91.500	19.583
141	11.583	91.500	15.083
142	16.083	91.500	15.083
167	7.500	83.750	19.583
168	7.500	83.750	15.083
169	20.167	83.750	19.583
170	20.167	83.750	15.083
171	11.583	83.750	11.000
172	16.083	83.750	11.000
173	11.583	83.750	23.667
174	16.083	83.750	23.667
175	7.500	65.750	15.083
176	7.500	65.750	19.583
177	11.583	65.750	23.667
178	16.083	65.750	23.667
179	20.167	65.750	19.583



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Job No  
**50114615**

Sheet No  
**7**

Rev

Part

Job Title **West Hartford Relo CT**

Ref

By **SMS**

Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite I**

Date/Time **08-Nov-2019 11:54**

### Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
180	20.167	65.750	15.083
181	16.083	65.750	11.000
182	11.583	65.750	11.000
183	16.083	74.750	11.000
184	11.583	74.750	11.000
185	7.500	74.750	15.083
186	7.500	74.750	19.583
187	11.583	74.750	23.667
188	16.083	74.750	23.667
189	20.167	74.750	19.583
190	20.167	74.750	15.083
191	11.583	56.750	15.083
192	11.583	61.250	15.083
193	16.083	56.750	15.083
194	16.083	61.250	15.083
195	16.083	56.750	19.583
196	16.083	61.250	19.583
197	11.583	56.750	19.583
198	11.583	61.250	19.583
199	11.583	70.250	15.083
200	11.583	79.250	15.083
201	16.083	70.250	15.083
202	16.083	79.250	15.083
203	16.083	70.250	19.583
204	16.083	79.250	19.583
205	11.583	70.250	19.583
206	11.583	79.250	19.583
207	11.583	88.250	15.083
208	16.083	88.250	15.083
209	16.083	88.250	19.583
210	11.583	88.250	19.583
211	16.083	65.750	17.333
212	13.833	65.750	15.083
213	11.583	65.750	17.333
214	13.833	65.750	19.583
215	13.833	65.750	23.667
216	13.833	65.750	11.000
217	7.500	65.750	17.333
218	20.167	65.750	17.333
219	13.833	74.750	19.583
220	13.833	74.750	23.667
221	13.833	74.750	15.083
222	13.833	74.750	11.000
223	11.583	74.750	17.333
224	7.500	74.750	17.333





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Part

Job Title **West Hartford Relo CT**

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By **SMS**

Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite I**

Date/Time **08-Nov-2019 11:54**

### Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
225	16.083	74.750	17.333
226	20.167	74.750	17.333
227	13.833	83.750	19.583
228	13.833	83.750	23.667
229	13.833	83.750	15.083
230	13.833	83.750	11.000
231	11.583	83.750	17.333
232	7.500	83.750	17.333
233	16.083	83.750	17.333
234	20.167	83.750	17.333
235	7.500	52.250	19.583
237	16.083	52.250	23.667
239	20.167	52.250	15.083
241	11.583	52.250	11.000
243	7.500	52.250	15.083
244	16.083	52.250	11.000
245	20.167	52.250	19.583
246	11.583	52.250	23.667
247	9.417	52.250	13.167
248	9.417	52.250	21.500
249	9.667	52.250	12.917
250	18.000	52.250	12.917
251	18.250	52.250	13.167
252	18.250	52.250	21.500
253	9.667	52.250	21.750
254	18.000	52.250	21.750
255	14.167	1.250	17.333
256	18.667	1.250	17.333
257	23.167	1.250	17.333
258	14.167	1.250	31.167
259	14.167	1.250	0.000
260	18.667	1.250	31.167
261	18.667	1.250	0.000
262	23.167	1.250	31.167
263	23.167	1.250	0.000
264	7.500	52.250	13.167
265	7.500	52.250	21.500
266	9.667	52.250	11.000
267	18.000	52.250	11.000
268	20.167	52.250	13.167
269	20.167	52.250	21.500
270	9.667	52.250	23.667
271	18.000	52.250	23.667
272	9.667	1.250	13.833
273	0.000	1.250	13.833



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Job No  
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Rev

Part

Job Title **West Hartford Relo CT**

Ref

By **SMS**

Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite I**

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## Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
274	9.667	1.250	26.333
275	0.000	1.250	26.333

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	10	1.250	2	0
2	10	19	12.000	2	0
3	19	28	12.000	2	0
4	28	37	10.500	2	0
5	2	11	1.250	2	0
6	11	20	12.000	2	0
7	20	29	12.000	2	0
8	29	38	10.500	2	0
9	3	12	1.250	2	0
10	12	21	12.000	2	0
11	21	30	12.000	2	0
12	30	39	10.500	2	0
13	6	15	1.250	2	0
14	15	24	12.000	2	0
15	24	33	12.000	2	0
16	33	42	10.500	2	0
17	9	18	1.250	2	0
18	18	27	12.000	2	0
19	27	36	12.000	2	0
20	36	45	10.500	2	0
21	8	17	1.250	2	0
22	17	26	12.000	2	0
23	26	35	12.000	2	0
24	35	44	10.500	2	0
25	7	16	1.250	2	0
26	16	25	12.000	2	0
27	25	34	12.000	2	0
28	34	43	10.500	2	0
29	4	13	1.250	2	0
30	13	22	12.000	2	0
31	22	31	12.000	2	0
32	31	40	10.500	2	0
33	5	14	1.250	2	0
34	14	23	12.000	2	0
35	23	32	12.000	2	0
36	32	41	10.500	2	0
37	19	47	13.833	5	0



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Client Verizon

File Clock Tower (Composite)

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### Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
38	22	57	9.167	5	0
39	25	26	9.667	6	0
40	26	54	4.500	5	0
41	27	24	13.833	5	0
42	24	21	17.333	5	0
43	21	53	4.500	5	0
44	20	19	9.667	6	0
45	23	48	4.500	4	0
46	20	46	13.833	5	0
47	23	58	9.167	5	0
48	47	46	9.667	3	0
49	46	23	3.500	5	0
50	47	22	3.500	5	0
51	48	49	4.500	4	0
52	49	50	4.500	4	0
53	50	24	4.500	4	0
54	51	20	4.500	5	0
55	52	51	4.500	5	0
56	53	52	4.500	5	0
57	54	55	4.500	5	0
58	55	56	4.500	5	0
59	56	27	4.500	5	0
60	54	48	13.833	3	0
61	48	51	17.333	3	0
62	55	49	13.833	3	0
63	49	52	17.333	3	0
64	56	50	13.833	3	0
65	50	53	17.333	3	0
66	57	25	4.667	5	0
67	58	26	4.667	5	0
68	57	58	9.667	3	0
69	28	59	13.833	5	0
70	31	60	9.167	5	0
71	34	35	9.667	6	0
72	35	61	4.500	6	0
73	36	33	13.833	5	0
74	33	30	17.333	5	0
75	30	62	4.500	6	0
76	29	28	9.667	6	0
77	32	63	4.500	4	0
78	29	64	13.833	5	0
79	32	65	9.167	5	0
80	59	64	9.667	3	0
81	64	32	3.500	5	0
82	59	31	3.500	5	0



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By <b>SMS</b>	Date <b>31-Oct-19</b>	Chd <b>SA</b>
Client <b>Verizon</b>	File <b>Clock Tower (Composite I</b>	Date/Time <b>08-Nov-2019 11:54</b>

Job Title **West Hartford Relo CT**

### Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
83	63	66	4.500	4	0
84	66	67	4.500	4	0
85	67	33	4.500	4	0
86	68	29	4.500	6	0
87	69	68	4.500	6	0
88	62	69	4.500	6	0
89	61	70	4.500	6	0
90	70	71	4.500	6	0
91	71	36	4.500	6	0
92	61	63	13.833	3	0
93	63	68	17.333	3	0
94	70	66	13.833	3	0
95	66	69	17.333	3	0
96	71	67	13.833	3	0
97	67	62	17.333	3	0
98	60	34	4.667	5	0
99	65	35	4.667	5	0
100	60	65	9.667	3	0
101	37	38	9.667	6	0
102	38	72	8.333	6	0
103	39	77	13.167	7	0
104	42	81	4.167	7	0
105	37	75	13.167	7	0
106	40	79	4.167	7	0
107	43	44	9.667	6	0
108	44	74	8.333	6	0
109	38	87	7.271	7	0
110	41	80	4.167	7	0
111	72	39	9.667	6	0
112	72	88	7.271	7	0
113	74	45	9.667	6	0
114	82	78	8.333	7	0
115	75	40	4.167	7	0
116	76	41	4.167	7	0
117	77	42	4.167	7	0
119	79	43	9.667	7	0
120	80	89	5.896	7	0
121	81	45	9.667	7	0
122	82	90	5.896	7	0
123	75	83	3.771	7	0
124	76	78	8.333	7	0
125	78	85	5.896	7	0
126	79	84	3.771	7	0
127	80	82	8.333	7	0
128	82	86	5.896	7	0



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### Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
129	83	76	5.896	7	0
130	84	80	5.896	7	0
131	85	77	3.771	7	0
132	86	81	3.771	7	0
133	87	76	5.896	7	0
134	88	78	5.896	7	0
135	89	44	3.771	7	0
136	90	74	3.771	7	0
137	83	84	8.333	8	0
138	85	86	8.333	8	0
139	89	90	8.333	8	0
140	87	88	8.333	8	0
141	83	87	8.338	8	0
142	88	85	8.338	8	0
143	86	90	8.338	8	0
144	89	84	8.338	8	0
145	83	91	8.250	9	0
146	91	99	8.250	9	0
147	87	95	8.250	9	0
148	95	103	8.250	9	0
149	88	96	8.250	9	0
150	96	104	8.250	9	0
151	85	93	8.250	9	0
152	93	101	8.250	9	0
153	86	94	8.250	9	0
154	94	102	8.250	9	0
155	90	98	8.250	9	0
156	98	106	8.250	9	0
157	89	97	8.250	9	0
158	97	105	8.250	9	0
159	84	92	8.250	9	0
160	92	100	8.250	9	0
161	91	108	5.896	5	0
162	92	110	5.896	5	0
163	95	108	5.896	5	0
164	96	107	5.896	5	0
165	95	96	8.333	10	0
166	96	93	8.338	10	0
167	93	94	8.333	10	0
168	94	98	8.338	10	0
169	98	97	8.333	10	0
170	97	92	8.338	10	0
171	92	91	8.333	10	0
172	91	95	8.338	10	0
173	107	93	5.896	5	0



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Client Verizon

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### Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
174	108	107	8.333	5	0
175	109	94	5.896	5	0
176	110	109	8.333	5	0
177	110	97	5.896	5	0
178	108	110	8.333	5	0
179	109	98	5.896	5	0
180	107	109	8.333	5	0
181	99	264	3.729	7	0
182	100	265	3.729	7	0
183	103	266	3.729	7	0
184	104	267	3.729	7	0
185	103	104	8.333	10	0
186	104	101	8.338	10	0
187	101	102	8.333	10	0
188	102	106	8.338	10	0
189	106	105	8.333	10	0
190	105	100	8.338	10	0
191	100	99	8.333	10	0
192	99	103	8.338	10	0
193	113	251	0.250	7	0
194	111	115	1.917	7	0
195	114	252	0.250	7	0
196	112	116	1.917	7	0
197	112	253	0.250	7	0
198	111	123	1.917	7	0
199	114	254	0.250	7	0
200	113	126	1.917	7	0
201	89	98	11.726	14	0
202	97	90	11.726	14	0
203	105	98	11.726	14	0
204	97	106	11.726	14	0
205	91	100	11.726	14	0
206	83	92	11.726	14	0
207	84	91	11.726	14	0
208	92	99	11.726	14	0
209	95	104	11.726	14	0
210	103	96	11.726	14	0
212	88	95	11.726	14	0
213	94	101	11.726	14	0
214	102	93	11.726	14	0
215	86	93	11.726	14	0
216	94	85	11.726	14	0
217	87	96	11.726	14	0
218	115	117	4.500	7	0
219	116	118	4.500	7	0



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Chd **SA**

Client **Verizon**

File **Clock Tower (Composite)**

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## Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
220	115	124	1.917	5	0
221	117	113	1.917	7	0
222	118	114	1.917	7	0
223	117	125	1.917	5	0
224	119	112	1.917	7	0
225	120	116	1.917	5	0
226	119	120	1.917	5	0
227	121	118	1.917	5	0
228	120	121	4.500	5	0
229	122	114	1.917	7	0
230	121	122	1.917	5	0
231	123	119	4.500	7	0
232	124	120	4.500	5	0
233	123	124	1.917	5	0
234	125	121	4.500	5	0
235	124	125	4.500	5	0
236	126	122	4.500	7	0
237	125	126	1.917	5	0
238	124	191	4.500	9	0
239	129	199	4.500	9	0
240	133	200	4.500	9	0
241	137	207	4.500	9	0
242	125	193	4.500	9	0
243	130	201	4.500	9	0
244	134	202	4.500	9	0
245	138	208	4.500	9	0
246	121	195	4.500	9	0
247	128	203	4.500	9	0
248	132	204	4.500	9	0
249	136	209	4.500	9	0
250	120	197	4.500	9	0
251	127	205	4.500	9	0
252	131	206	4.500	9	0
253	135	210	4.500	9	0
267	137	168	4.083	12	0
269	138	172	4.083	12	0
271	136	169	4.083	12	0
273	135	173	4.083	12	0
275	167	232	2.250	11	0
279	135	167	4.083	12	0
280	171	230	2.250	11	0
281	170	234	2.250	11	0
282	174	228	2.250	11	0
283	137	171	4.083	12	0
284	138	170	4.083	12	0



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### Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
285	136	174	4.083	12	0
286	137	231	2.250	12	0
287	135	227	2.250	12	0
288	136	233	2.250	12	0
289	138	229	2.250	12	0
290	133	223	2.250	12	0
291	131	219	2.250	12	0
292	132	225	2.250	12	0
293	134	221	2.250	12	0
294	128	211	2.250	12	0
295	130	212	2.250	12	0
296	129	213	2.250	12	0
297	127	214	2.250	12	0
299	129	175	4.083	12	0
300	176	217	2.250	11	0
301	127	176	4.083	12	0
303	127	177	4.083	12	0
304	178	215	2.250	11	0
305	128	178	4.083	12	0
307	128	179	4.083	12	0
308	180	218	2.250	11	0
309	130	180	4.083	12	0
311	130	181	4.083	12	0
312	182	216	2.250	11	0
313	129	182	4.083	12	0
315	134	183	4.083	12	0
316	184	222	2.250	11	0
317	133	184	4.083	12	0
319	133	185	4.083	12	0
320	186	224	2.250	11	0
321	131	186	4.083	12	0
323	131	187	4.083	12	0
324	188	220	2.250	11	0
325	132	188	4.083	12	0
327	132	189	4.083	12	0
328	190	226	2.250	11	0
329	134	190	4.083	12	0
330	191	192	4.500	9	0
331	192	129	4.500	9	0
332	193	194	4.500	9	0
333	194	130	4.500	9	0
334	195	196	4.500	9	0
335	196	128	4.500	9	0
336	197	198	4.500	9	0
337	198	127	4.500	9	0





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### Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
338	191	197	4.500	12	0
339	197	195	4.500	12	0
340	195	193	4.500	12	0
341	193	191	4.500	12	0
342	192	198	4.500	12	0
343	198	196	4.500	12	0
344	196	194	4.500	12	0
345	194	192	4.500	12	0
346	198	191	6.364	13	0
347	192	197	6.364	13	0
348	192	193	6.364	13	0
349	191	194	6.364	13	0
350	193	196	6.364	13	0
351	194	195	6.364	13	0
352	195	198	6.364	13	0
353	196	197	6.364	13	0
354	197	124	6.364	13	0
355	191	120	6.364	13	0
356	191	125	6.364	13	0
357	124	193	6.364	13	0
358	120	195	6.364	13	0
359	197	121	6.364	13	0
360	195	125	6.364	13	0
361	193	121	6.364	13	0
362	127	196	6.364	13	0
363	128	198	6.364	13	0
364	127	192	6.364	13	0
365	198	129	6.364	13	0
366	129	194	6.364	13	0
367	130	192	6.364	13	0
368	130	196	6.364	13	0
369	128	194	6.364	13	0
370	199	133	4.500	9	0
371	200	137	4.500	9	0
372	201	134	4.500	9	0
373	202	138	4.500	9	0
374	203	132	4.500	9	0
375	204	136	4.500	9	0
376	205	131	4.500	9	0
377	206	135	4.500	9	0
378	199	205	4.500	12	0
379	205	203	4.500	12	0
380	203	201	4.500	12	0
381	201	199	4.500	12	0
382	205	129	6.364	13	0



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### Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
383	199	127	6.364	13	0
384	199	130	6.364	13	0
385	129	201	6.364	13	0
386	127	203	6.364	13	0
387	205	128	6.364	13	0
388	203	130	6.364	13	0
389	201	128	6.364	13	0
390	131	203	6.364	13	0
391	132	205	6.364	13	0
392	203	134	6.364	13	0
393	201	132	6.364	13	0
394	134	199	6.364	13	0
395	201	133	6.364	13	0
396	133	205	6.364	13	0
397	199	131	6.364	13	0
398	200	202	4.500	12	0
399	202	204	4.500	12	0
400	204	206	4.500	12	0
401	206	200	4.500	12	0
402	200	131	6.364	13	0
403	206	133	6.364	13	0
404	206	132	6.364	13	0
405	131	204	6.364	13	0
406	204	134	6.364	13	0
407	202	132	6.364	13	0
408	202	133	6.364	13	0
409	200	134	6.364	13	0
410	200	138	6.364	13	0
411	137	202	6.364	13	0
412	202	136	6.364	13	0
413	138	204	6.364	13	0
414	204	135	6.364	13	0
415	136	206	6.364	13	0
416	206	137	6.364	13	0
418	135	200	6.364	13	0
419	207	141	3.250	9	0
421	208	142	3.250	9	0
423	209	140	3.250	9	0
425	210	139	3.250	9	0
427	207	208	4.500	12	0
428	208	209	4.500	12	0
429	209	210	4.500	12	0
430	210	207	4.500	12	0
431	207	135	6.364	13	0
432	210	137	6.364	13	0



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File **Clock Tower (Composite)**

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### Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
433	210	136	6.364	13	0
434	135	209	6.364	13	0
435	209	138	6.364	13	0
436	208	136	6.364	13	0
437	208	137	6.364	13	0
438	207	138	6.364	13	0
439	207	168	6.076	14	0
440	210	167	6.076	14	0
441	208	170	6.076	14	0
442	209	169	6.076	14	0
443	208	172	6.076	14	0
444	207	171	6.076	14	0
445	210	173	6.076	14	0
446	209	174	6.076	14	0
447	141	142	4.500	12	0
448	142	140	4.500	12	0
449	139	141	4.500	12	0
450	140	139	4.500	12	0
451	141	208	5.551	13	0
452	142	207	5.551	13	0
453	139	209	5.551	13	0
454	140	210	5.551	13	0
455	142	209	5.551	13	0
456	140	208	5.551	13	0
457	141	210	5.551	13	0
458	207	139	5.551	13	0
459	26	36	21.633	14	0
460	27	35	21.633	14	0
461	35	25	15.409	14	0
462	26	34	15.409	14	0
463	22	34	18.313	14	0
464	25	31	18.313	14	0
465	26	32	18.313	14	0
466	23	35	18.313	14	0
467	29	21	21.633	14	0
468	30	20	21.633	14	0
469	29	39	20.839	14	0
470	38	30	20.839	14	0
471	43	31	17.367	14	0
472	40	34	17.367	14	0
473	43	35	14.272	14	0
474	44	34	14.272	14	0
475	35	45	20.839	14	0
476	36	44	20.839	14	0
477	27	33	18.313	14	0



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### Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
478	36	24	18.313	14	0
479	36	42	17.367	14	0
480	45	33	17.367	14	0
483	175	182	5.775	11	0
484	181	180	5.775	11	0
485	179	178	5.775	11	0
486	177	176	5.775	11	0
487	211	130	2.250	12	0
488	212	129	2.250	12	0
489	213	127	2.250	12	0
490	214	128	2.250	12	0
491	215	177	2.250	11	0
492	214	215	4.083	12	0
493	216	181	2.250	11	0
494	212	216	4.083	12	0
495	217	175	2.250	11	0
496	213	217	4.083	12	0
497	218	179	2.250	11	0
498	211	218	4.083	12	0
499	185	184	5.775	11	0
500	183	190	5.775	11	0
501	189	188	5.775	11	0
502	187	186	5.775	11	0
503	219	132	2.250	12	0
504	220	187	2.250	11	0
505	219	220	4.083	12	0
506	221	133	2.250	12	0
507	222	183	2.250	11	0
508	221	222	4.083	12	0
509	223	131	2.250	12	0
510	224	185	2.250	11	0
511	223	224	4.083	12	0
512	225	134	2.250	12	0
513	226	189	2.250	11	0
514	225	226	4.083	12	0
515	168	171	5.775	11	0
516	172	170	5.775	11	0
517	169	174	5.775	11	0
518	173	167	5.775	11	0
519	227	136	2.250	12	0
520	228	173	2.250	11	0
521	227	228	4.083	12	0
522	229	137	2.250	12	0
523	230	172	2.250	11	0
524	229	230	4.083	12	0



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**Beams Cont...**

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
525	231	135	2.250	12	0
526	232	168	2.250	11	0
527	231	232	4.083	12	0
528	233	138	2.250	12	0
529	234	169	2.250	11	0
530	233	234	4.083	12	0
531	26	18	21.633	14	0
532	27	17	21.633	14	0
533	26	16	15.409	14	0
534	25	17	15.409	14	0
535	25	13	18.313	14	0
536	22	16	18.313	14	0
537	18	24	18.313	14	0
538	15	27	18.313	14	0
539	21	11	21.633	14	0
540	20	12	21.633	14	0
541	14	26	18.313	14	0
542	17	23	18.313	14	0
583	235	243	4.500	15	45
584	237	246	4.500	15	45
585	239	245	4.500	15	45
586	241	244	4.500	15	45
587	243	247	2.711	15	45
588	244	250	2.711	15	45
589	245	252	2.711	15	45
590	246	253	2.711	15	45
591	247	111	0.250	7	0
592	248	112	0.250	7	0
593	249	111	0.250	7	0
594	250	113	0.250	7	0
595	251	268	1.917	7	0
596	252	269	1.917	7	0
597	253	270	1.917	7	0
598	254	271	1.917	7	0
599	249	241	2.711	15	45
600	247	249	0.353	15	45
601	251	239	2.711	15	45
602	250	251	0.353	15	45
603	254	237	2.711	15	45
604	252	254	0.353	15	45
605	248	235	2.711	15	45
606	253	248	0.353	15	45
631	14	255	4.500	4	0
632	255	256	4.500	4	0
633	256	257	4.500	4	0



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### Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
634	257	15	4.500	4	0
635	258	255	13.833	3	0
636	255	259	17.333	3	0
637	260	256	13.833	3	0
638	256	261	17.333	3	0
639	262	257	13.833	3	0
640	257	263	17.333	3	0
641	264	247	1.917	7	0
642	265	248	1.917	7	0
643	266	249	1.917	7	0
644	267	250	1.917	7	0
645	268	101	3.729	7	0
646	269	102	3.729	7	0
647	270	105	3.729	7	0
648	271	106	3.729	7	0
653	10	11	9.667	16	0
654	11	259	4.500	16	0
655	259	261	4.500	16	0
656	261	263	4.500	16	0
657	263	12	4.500	16	0
658	12	15	17.333	16	0
659	15	18	13.833	16	0
660	18	262	4.500	16	0
661	262	260	4.500	16	0
662	260	258	4.500	16	0
663	258	17	4.500	16	0
664	17	16	9.667	16	0
665	10	273	13.833	16	0
667	273	272	9.667	3	0
668	17	274	4.833	16	0
669	14	272	3.500	16	0
670	272	11	13.833	16	0
672	274	14	9.000	16	0
673	275	16	4.833	16	0
674	274	275	9.667	3	0



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## Plates

Plate	Node A	Node B	Node C	Node D	Property
543	19	22	13	10	1
544	22	25	16	13	1
545	25	26	17	16	1
546	26	27	18	17	1
547	27	24	15	18	1
548	24	21	12	15	1
549	21	20	11	12	1
550	20	19	10	11	1
551	30	29	20	21	1
552	29	28	19	20	1
553	39	38	29	30	1
554	38	37	28	29	1
555	37	40	31	28	1
556	28	31	22	19	1
557	40	43	34	31	1
558	31	34	25	22	1
559	43	44	35	34	1
560	34	35	26	25	1
561	44	45	36	35	1
562	35	36	27	26	1
563	45	42	33	36	1
564	36	33	24	27	1
565	33	30	21	24	1
566	42	39	30	33	1
567	92	97	89	84	1
568	97	98	90	89	1
569	98	94	86	90	1
570	94	93	85	86	1
571	93	96	88	85	1
572	96	95	87	88	1
573	95	91	83	87	1
574	91	92	84	83	1
575	103	99	91	95	1
576	99	100	92	91	1
577	100	105	97	92	1
578	105	106	98	97	1
579	106	102	94	98	1
580	102	101	93	94	1
581	101	104	96	93	1
582	104	103	95	96	1
607	175	176	235	243	1
608	176	177	246	235	1
609	177	178	237	246	1
610	178	179	245	237	1
611	179	180	239	245	1



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## Plates Cont...

Plate	Node A	Node B	Node C	Node D	Property
612	180	181	244	239	1
613	181	182	241	244	1
614	182	175	243	241	1
615	184	185	175	182	1
616	185	186	176	175	1
617	186	187	177	176	1
618	187	188	178	177	1
619	188	189	179	178	1
620	189	190	180	179	1
621	190	183	181	180	1
622	183	184	182	181	1
623	172	171	184	183	1
624	171	168	185	184	1
625	168	167	186	185	1
626	167	173	187	186	1
627	173	174	188	187	1
628	174	169	189	188	1
629	169	170	190	189	1
630	170	172	183	190	1
649	141	139	167	168	1
650	139	140	174	173	1
651	140	142	170	169	1
652	142	141	171	172	1

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
2	W10X54	15.800	103.000	303.000	1.711	STEEL
3	W12X22	6.480	4.660	156.000	0.276	STEEL
4	W18X50	14.700	40.100	800.000	1.186	STEEL
5	W12X30	8.790	20.300	238.000	0.440	STEEL
6	W12X26	7.650	17.300	204.000	0.285	STEEL
7	W21X50	14.700	24.900	984.000	1.037	STEEL
8	W8X35	10.300	42.600	127.000	0.724	STEEL
9	HSST6X6X0.25	5.240	28.600	28.600	44.690	STEEL
10	W8X18	5.260	7.970	61.900	0.157	STEEL
11	C8X11	3.370	1.310	32.500	0.116	STEEL
12	HSST6X3X0.25	3.840	5.700	17.000	13.904	STEEL
13	HSST2X2X0.125	0.840	0.486	0.486	0.776	STEEL
14	HSST4X4X0.25	3.370	7.800	7.800	12.455	STEEL
15	L60606	4.380	24.518	6.256	0.208	STEEL
16	W8X10	2.960	2.090	30.800	0.035	STEEL





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## Plate Thickness

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

## Materials

Mat	Name	E (kip/in <sup>2</sup> )	v	Density (kip/in <sup>3</sup> )	$\alpha$ (°F)
1	STEEL	29 E+3	0.300	0.000	6 E-6
2	STAINLESSSTEEL	28 E+3	0.300	0.000	10 E-6
3	ALUMINUM	10 E+3	0.330	0.000	13 E-6
4	CONCRETE	3.15 E+3	0.170	0.000	5 E-6

## Supports

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

## Releases

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

Beam	Node	x	y	z	rx	ry	rz
37	19	Fixed	Fixed	Fixed	Fixed	Pin	Pin
38	22	Fixed	Fixed	Fixed	Fixed	Pin	Pin
39	25	Fixed	Fixed	Fixed	Fixed	Pin	Pin
39	26	Fixed	Fixed	Fixed	Fixed	Pin	Pin
40	26	Fixed	Fixed	Fixed	Fixed	Pin	Pin
41	27	Fixed	Fixed	Fixed	Fixed	Pin	Pin
41	24	Fixed	Fixed	Fixed	Fixed	Pin	Pin
42	24	Fixed	Fixed	Fixed	Fixed	Pin	Pin
42	21	Fixed	Fixed	Fixed	Fixed	Pin	Pin
43	21	Fixed	Fixed	Fixed	Fixed	Pin	Pin
44	20	Fixed	Fixed	Fixed	Fixed	Pin	Pin
44	19	Fixed	Fixed	Fixed	Fixed	Pin	Pin
45	23	Fixed	Fixed	Fixed	Fixed	Pin	Pin



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### Releases Cont...

Beam	Node	x	y	z	rx	ry	rz
46	20	Fixed	Fixed	Fixed	Fixed	Pin	Pin
47	23	Fixed	Fixed	Fixed	Fixed	Pin	Pin
48	47	Fixed	Fixed	Fixed	Fixed	Pin	Pin
48	46	Fixed	Fixed	Fixed	Fixed	Pin	Pin
49	23	Fixed	Fixed	Fixed	Fixed	Pin	Pin
50	22	Fixed	Fixed	Fixed	Fixed	Pin	Pin
53	24	Fixed	Fixed	Fixed	Fixed	Pin	Pin
54	20	Fixed	Fixed	Fixed	Fixed	Pin	Pin
59	27	Fixed	Fixed	Fixed	Fixed	Pin	Pin
60	54	Fixed	Fixed	Fixed	Fixed	Pin	Pin
60	48	Fixed	Fixed	Fixed	Fixed	Pin	Pin
61	48	Fixed	Fixed	Fixed	Fixed	Pin	Pin
61	51	Fixed	Fixed	Fixed	Fixed	Pin	Pin
62	55	Fixed	Fixed	Fixed	Fixed	Pin	Pin
62	49	Fixed	Fixed	Fixed	Fixed	Pin	Pin
63	49	Fixed	Fixed	Fixed	Fixed	Pin	Pin
63	52	Fixed	Fixed	Fixed	Fixed	Pin	Pin
64	56	Fixed	Fixed	Fixed	Fixed	Pin	Pin
64	50	Fixed	Fixed	Fixed	Fixed	Pin	Pin
65	50	Fixed	Fixed	Fixed	Fixed	Pin	Pin
65	53	Fixed	Fixed	Fixed	Fixed	Pin	Pin
66	25	Fixed	Fixed	Fixed	Fixed	Pin	Pin
67	26	Fixed	Fixed	Fixed	Fixed	Pin	Pin
68	57	Fixed	Fixed	Fixed	Fixed	Pin	Pin
68	58	Fixed	Fixed	Fixed	Fixed	Pin	Pin
69	28	Fixed	Fixed	Fixed	Fixed	Pin	Pin
70	31	Fixed	Fixed	Fixed	Fixed	Pin	Pin
71	34	Fixed	Fixed	Fixed	Fixed	Pin	Pin
71	35	Fixed	Fixed	Fixed	Fixed	Pin	Pin
72	35	Fixed	Fixed	Fixed	Fixed	Pin	Pin
73	36	Fixed	Fixed	Fixed	Fixed	Pin	Pin
73	33	Fixed	Fixed	Fixed	Fixed	Pin	Pin
74	33	Fixed	Fixed	Fixed	Fixed	Pin	Pin
74	30	Fixed	Fixed	Fixed	Fixed	Pin	Pin
75	30	Fixed	Fixed	Fixed	Fixed	Pin	Pin
76	29	Fixed	Fixed	Fixed	Fixed	Pin	Pin
76	28	Fixed	Fixed	Fixed	Fixed	Pin	Pin
77	32	Fixed	Fixed	Fixed	Fixed	Pin	Pin
78	29	Fixed	Fixed	Fixed	Fixed	Pin	Pin
79	32	Fixed	Fixed	Fixed	Fixed	Pin	Pin
80	59	Fixed	Fixed	Fixed	Fixed	Pin	Pin
80	64	Fixed	Fixed	Fixed	Fixed	Pin	Pin
81	32	Fixed	Fixed	Fixed	Fixed	Pin	Pin
82	31	Fixed	Fixed	Fixed	Fixed	Pin	Pin
85	33	Fixed	Fixed	Fixed	Fixed	Pin	Pin



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### Releases Cont...

Beam	Node	x	y	z	rx	ry	rz
86	29	Fixed	Fixed	Fixed	Fixed	Pin	Pin
91	36	Fixed	Fixed	Fixed	Fixed	Pin	Pin
92	61	Fixed	Fixed	Fixed	Fixed	Pin	Pin
92	63	Fixed	Fixed	Fixed	Fixed	Pin	Pin
93	63	Fixed	Fixed	Fixed	Fixed	Pin	Pin
93	68	Fixed	Fixed	Fixed	Fixed	Pin	Pin
94	70	Fixed	Fixed	Fixed	Fixed	Pin	Pin
94	66	Fixed	Fixed	Fixed	Fixed	Pin	Pin
95	66	Fixed	Fixed	Fixed	Fixed	Pin	Pin
95	69	Fixed	Fixed	Fixed	Fixed	Pin	Pin
96	71	Fixed	Fixed	Fixed	Fixed	Pin	Pin
96	67	Fixed	Fixed	Fixed	Fixed	Pin	Pin
97	67	Fixed	Fixed	Fixed	Fixed	Pin	Pin
97	62	Fixed	Fixed	Fixed	Fixed	Pin	Pin
98	34	Fixed	Fixed	Fixed	Fixed	Pin	Pin
99	35	Fixed	Fixed	Fixed	Fixed	Pin	Pin
100	60	Fixed	Fixed	Fixed	Fixed	Pin	Pin
100	65	Fixed	Fixed	Fixed	Fixed	Pin	Pin
101	37	Fixed	Fixed	Fixed	Fixed	Pin	Pin
103	39	Fixed	Fixed	Fixed	Fixed	Pin	Pin
105	37	Fixed	Fixed	Fixed	Fixed	Pin	Pin
107	43	Fixed	Fixed	Fixed	Fixed	Pin	Pin
109	38	Fixed	Fixed	Fixed	Fixed	Pin	Pin
111	39	Fixed	Fixed	Fixed	Fixed	Pin	Pin
112	72	Fixed	Fixed	Fixed	Fixed	Pin	Pin
113	45	Fixed	Fixed	Fixed	Fixed	Pin	Pin
119	43	Fixed	Fixed	Fixed	Fixed	Pin	Pin
121	45	Fixed	Fixed	Fixed	Fixed	Pin	Pin
123	75	Fixed	Fixed	Fixed	Fixed	Pin	Pin
126	79	Fixed	Fixed	Fixed	Fixed	Pin	Pin
131	77	Fixed	Fixed	Fixed	Fixed	Pin	Pin
132	81	Fixed	Fixed	Fixed	Fixed	Pin	Pin
135	44	Fixed	Fixed	Fixed	Fixed	Pin	Pin
136	74	Fixed	Fixed	Fixed	Fixed	Pin	Pin
137	83	Fixed	Fixed	Fixed	Fixed	Pin	Pin
137	84	Fixed	Fixed	Fixed	Fixed	Pin	Pin
138	85	Fixed	Fixed	Fixed	Fixed	Pin	Pin
138	86	Fixed	Fixed	Fixed	Fixed	Pin	Pin
139	89	Fixed	Fixed	Fixed	Fixed	Pin	Pin
139	90	Fixed	Fixed	Fixed	Fixed	Pin	Pin
140	87	Fixed	Fixed	Fixed	Fixed	Pin	Pin
140	88	Fixed	Fixed	Fixed	Fixed	Pin	Pin
141	83	Fixed	Fixed	Fixed	Fixed	Pin	Pin
141	87	Fixed	Fixed	Fixed	Fixed	Pin	Pin
142	88	Fixed	Fixed	Fixed	Fixed	Pin	Pin



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### Releases Cont...

Beam	Node	x	y	z	rx	ry	rz
142	85	Fixed	Fixed	Fixed	Fixed	Pin	Pin
143	86	Fixed	Fixed	Fixed	Fixed	Pin	Pin
143	90	Fixed	Fixed	Fixed	Fixed	Pin	Pin
144	89	Fixed	Fixed	Fixed	Fixed	Pin	Pin
144	84	Fixed	Fixed	Fixed	Fixed	Pin	Pin
161	91	Fixed	Fixed	Fixed	Fixed	Pin	Pin
162	92	Fixed	Fixed	Fixed	Fixed	Pin	Pin
163	95	Fixed	Fixed	Fixed	Fixed	Pin	Pin
164	96	Fixed	Fixed	Fixed	Fixed	Pin	Pin
165	95	Fixed	Fixed	Fixed	Fixed	Pin	Pin
165	96	Fixed	Fixed	Fixed	Fixed	Pin	Pin
166	96	Fixed	Fixed	Fixed	Fixed	Pin	Pin
166	93	Fixed	Fixed	Fixed	Fixed	Pin	Pin
167	93	Fixed	Fixed	Fixed	Fixed	Pin	Pin
167	94	Fixed	Fixed	Fixed	Fixed	Pin	Pin
168	94	Fixed	Fixed	Fixed	Fixed	Pin	Pin
168	98	Fixed	Fixed	Fixed	Fixed	Pin	Pin
169	98	Fixed	Fixed	Fixed	Fixed	Pin	Pin
169	97	Fixed	Fixed	Fixed	Fixed	Pin	Pin
170	97	Fixed	Fixed	Fixed	Fixed	Pin	Pin
170	92	Fixed	Fixed	Fixed	Fixed	Pin	Pin
171	92	Fixed	Fixed	Fixed	Fixed	Pin	Pin
171	91	Fixed	Fixed	Fixed	Fixed	Pin	Pin
172	91	Fixed	Fixed	Fixed	Fixed	Pin	Pin
172	95	Fixed	Fixed	Fixed	Fixed	Pin	Pin
173	93	Fixed	Fixed	Fixed	Fixed	Pin	Pin
175	94	Fixed	Fixed	Fixed	Fixed	Pin	Pin
177	97	Fixed	Fixed	Fixed	Fixed	Pin	Pin
179	98	Fixed	Fixed	Fixed	Fixed	Pin	Pin
181	99	Fixed	Fixed	Fixed	Fixed	Pin	Pin
182	100	Fixed	Fixed	Fixed	Fixed	Pin	Pin
183	103	Fixed	Fixed	Fixed	Fixed	Pin	Pin
184	104	Fixed	Fixed	Fixed	Fixed	Pin	Pin
185	103	Fixed	Fixed	Fixed	Fixed	Pin	Pin
185	104	Fixed	Fixed	Fixed	Fixed	Pin	Pin
186	104	Fixed	Fixed	Fixed	Fixed	Pin	Pin
186	101	Fixed	Fixed	Fixed	Fixed	Pin	Pin
187	101	Fixed	Fixed	Fixed	Fixed	Pin	Pin
187	102	Fixed	Fixed	Fixed	Fixed	Pin	Pin
188	102	Fixed	Fixed	Fixed	Fixed	Pin	Pin
188	106	Fixed	Fixed	Fixed	Fixed	Pin	Pin
189	106	Fixed	Fixed	Fixed	Fixed	Pin	Pin
189	105	Fixed	Fixed	Fixed	Fixed	Pin	Pin
190	105	Fixed	Fixed	Fixed	Fixed	Pin	Pin
190	100	Fixed	Fixed	Fixed	Fixed	Pin	Pin



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Job No  
**50114615**

Sheet No  
**28**

Rev

Job Title **West Hartford Relo CT**

Part

Ref

By **SMS**

Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite I**

Date/Time **08-Nov-2019 11:54**

### Releases Cont...

Beam	Node	x	y	z	rx	ry	rz
191	100	Fixed	Fixed	Fixed	Fixed	Pin	Pin
191	99	Fixed	Fixed	Fixed	Fixed	Pin	Pin
192	99	Fixed	Fixed	Fixed	Fixed	Pin	Pin
192	103	Fixed	Fixed	Fixed	Fixed	Pin	Pin
220	115	Fixed	Fixed	Fixed	Fixed	Pin	Pin
223	117	Fixed	Fixed	Fixed	Fixed	Pin	Pin
225	116	Fixed	Fixed	Fixed	Fixed	Pin	Pin
226	119	Fixed	Fixed	Fixed	Fixed	Pin	Pin
227	118	Fixed	Fixed	Fixed	Fixed	Pin	Pin
230	122	Fixed	Fixed	Fixed	Fixed	Pin	Pin
233	123	Fixed	Fixed	Fixed	Fixed	Pin	Pin
237	126	Fixed	Fixed	Fixed	Fixed	Pin	Pin
631	14	Fixed	Fixed	Fixed	Fixed	Pin	Pin
634	15	Fixed	Fixed	Fixed	Fixed	Pin	Pin
635	258	Fixed	Fixed	Fixed	Fixed	Pin	Pin
635	255	Fixed	Fixed	Fixed	Fixed	Pin	Pin
636	255	Fixed	Fixed	Fixed	Fixed	Pin	Pin
636	259	Fixed	Fixed	Fixed	Fixed	Pin	Pin
637	260	Fixed	Fixed	Fixed	Fixed	Pin	Pin
637	256	Fixed	Fixed	Fixed	Fixed	Pin	Pin
638	256	Fixed	Fixed	Fixed	Fixed	Pin	Pin
638	261	Fixed	Fixed	Fixed	Fixed	Pin	Pin
639	262	Fixed	Fixed	Fixed	Fixed	Pin	Pin
639	257	Fixed	Fixed	Fixed	Fixed	Pin	Pin
640	257	Fixed	Fixed	Fixed	Fixed	Pin	Pin
640	263	Fixed	Fixed	Fixed	Fixed	Pin	Pin
645	101	Fixed	Fixed	Fixed	Fixed	Pin	Pin
646	102	Fixed	Fixed	Fixed	Fixed	Pin	Pin
647	105	Fixed	Fixed	Fixed	Fixed	Pin	Pin
648	106	Fixed	Fixed	Fixed	Fixed	Pin	Pin
653	10	Fixed	Fixed	Fixed	Fixed	Pin	Pin
653	11	Fixed	Fixed	Fixed	Fixed	Pin	Pin
654	11	Fixed	Fixed	Fixed	Fixed	Pin	Pin
657	12	Fixed	Fixed	Fixed	Fixed	Pin	Pin
658	12	Fixed	Fixed	Fixed	Fixed	Pin	Pin
658	15	Fixed	Fixed	Fixed	Fixed	Pin	Pin
659	15	Fixed	Fixed	Fixed	Fixed	Pin	Pin
659	18	Fixed	Fixed	Fixed	Fixed	Pin	Pin
660	18	Fixed	Fixed	Fixed	Fixed	Pin	Pin
663	17	Fixed	Fixed	Fixed	Fixed	Pin	Pin
664	17	Fixed	Fixed	Fixed	Fixed	Pin	Pin
664	16	Fixed	Fixed	Fixed	Fixed	Pin	Pin
665	10	Fixed	Fixed	Fixed	Fixed	Pin	Pin
665	273	Fixed	Fixed	Fixed	Fixed	Pin	Pin
667	273	Fixed	Fixed	Fixed	Fixed	Pin	Pin



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Job No  
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Sheet No  
**29**

Rev

Part

Job Title West Hartford Relo CT

Ref

By SMS

Date 31-Oct-19

Chd SA

Client Verizon

File Clock Tower (Composite I

Date/Time 08-Nov-2019 11:54

### Releases Cont...

Beam	Node	x	y	z	rx	ry	rz
667	272	Fixed	Fixed	Fixed	Fixed	Pin	Pin
668	17	Fixed	Fixed	Fixed	Fixed	Pin	Pin
669	14	Fixed	Fixed	Fixed	Fixed	Pin	Pin
670	11	Fixed	Fixed	Fixed	Fixed	Pin	Pin
672	14	Fixed	Fixed	Fixed	Fixed	Pin	Pin
673	275	Fixed	Fixed	Fixed	Fixed	Pin	Pin
673	16	Fixed	Fixed	Fixed	Fixed	Pin	Pin
674	274	Fixed	Fixed	Fixed	Fixed	Pin	Pin
674	275	Fixed	Fixed	Fixed	Fixed	Pin	Pin

### Reference Load Cases

Number	Name	Type
R1	REF DEAD	Mass

### Primary Load Cases

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



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By SMS	Date 31-Oct-19	Chd SA
Client Verizon	File Clock Tower (Composite I)	Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

### Combination Load Cases

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



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Client Verizon	File Clock Tower (Composite I	Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

### Combination Load Cases Cont...

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

### 3 DEAD : Plate Loads

Plate	Type	Direction	Fa	Fb	X1 (ft)	Y1 (ft)	X2 (ft)	Y2 (ft)
543	PRE	psi	GY	-0.333	-	-	-	-
544	PRE	psi	GY	-0.333	-	-	-	-
545	PRE	psi	GY	-0.333	-	-	-	-
546	PRE	psi	GY	-0.333	-	-	-	-
547	PRE	psi	GY	-0.333	-	-	-	-
548	PRE	psi	GY	-0.333	-	-	-	-
549	PRE	psi	GY	-0.333	-	-	-	-
550	PRE	psi	GY	-0.333	-	-	-	-
551	PRE	psi	GY	-0.333	-	-	-	-
552	PRE	psi	GY	-0.333	-	-	-	-
553	PRE	psi	GY	-0.333	-	-	-	-
554	PRE	psi	GY	-0.333	-	-	-	-
555	PRE	psi	GY	-0.333	-	-	-	-
556	PRE	psi	GY	-0.333	-	-	-	-
557	PRE	psi	GY	-0.333	-	-	-	-





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Part

Job Title West Hartford Relo CT

Ref

By SMS

Date 31-Oct-19

Chd SA

Client Verizon

File Clock Tower (Composite I) Date/Time 08-Nov-2019 11:54

### 3 DEAD : Plate Loads Cont...

Plate	Type	Direction	Fa	Fb	X1 (ft)	Y1 (ft)	X2 (ft)	Y2 (ft)
558	PRE psi	GY	-0.333	-	-	-	-	-
559	PRE psi	GY	-0.333	-	-	-	-	-
560	PRE psi	GY	-0.333	-	-	-	-	-
561	PRE psi	GY	-0.333	-	-	-	-	-
562	PRE psi	GY	-0.333	-	-	-	-	-
563	PRE psi	GY	-0.333	-	-	-	-	-
564	PRE psi	GY	-0.333	-	-	-	-	-
565	PRE psi	GY	-0.333	-	-	-	-	-
566	PRE psi	GY	-0.333	-	-	-	-	-
567	PRE psi	GY	-0.052	-	-	-	-	-
568	PRE psi	GY	-0.052	-	-	-	-	-
569	PRE psi	GY	-0.052	-	-	-	-	-
570	PRE psi	GY	-0.052	-	-	-	-	-
571	PRE psi	GY	-0.052	-	-	-	-	-
572	PRE psi	GY	-0.052	-	-	-	-	-
573	PRE psi	GY	-0.052	-	-	-	-	-
574	PRE psi	GY	-0.052	-	-	-	-	-
575	PRE psi	GY	-0.052	-	-	-	-	-
576	PRE psi	GY	-0.052	-	-	-	-	-
577	PRE psi	GY	-0.052	-	-	-	-	-
578	PRE psi	GY	-0.052	-	-	-	-	-
579	PRE psi	GY	-0.052	-	-	-	-	-
580	PRE psi	GY	-0.052	-	-	-	-	-
581	PRE psi	GY	-0.052	-	-	-	-	-
582	PRE psi	GY	-0.052	-	-	-	-	-
607	PRE psi	GY	-0.052	-	-	-	-	-
608	PRE psi	GY	-0.052	-	-	-	-	-
609	PRE psi	GY	-0.052	-	-	-	-	-
610	PRE psi	GY	-0.052	-	-	-	-	-
611	PRE psi	GY	-0.052	-	-	-	-	-
612	PRE psi	GY	-0.052	-	-	-	-	-
613	PRE psi	GY	-0.052	-	-	-	-	-
614	PRE psi	GY	-0.052	-	-	-	-	-
615	PRE psi	GY	-0.052	-	-	-	-	-
616	PRE psi	GY	-0.052	-	-	-	-	-
617	PRE psi	GY	-0.052	-	-	-	-	-
618	PRE psi	GY	-0.052	-	-	-	-	-
619	PRE psi	GY	-0.052	-	-	-	-	-
620	PRE psi	GY	-0.052	-	-	-	-	-
621	PRE psi	GY	-0.052	-	-	-	-	-
622	PRE psi	GY	-0.052	-	-	-	-	-
623	PRE psi	GY	-0.052	-	-	-	-	-
624	PRE psi	GY	-0.052	-	-	-	-	-
625	PRE psi	GY	-0.052	-	-	-	-	-
626	PRE psi	GY	-0.052	-	-	-	-	-



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Job No  
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Job Title West Hartford Relo CT

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By SMS

Date 31-Oct-19

Chd SA

Client Verizon

File Clock Tower (Composite I

Date/Time 08-Nov-2019 11:54

### 3 DEAD : Plate Loads Cont...

Plate	Type	Direction	Fa	Fb	X1 (ft)	Y1 (ft)	X2 (ft)	Y2 (ft)
627	PRE	psi	GY	-0.052	-	-	-	-
628	PRE	psi	GY	-0.052	-	-	-	-
629	PRE	psi	GY	-0.052	-	-	-	-
630	PRE	psi	GY	-0.052	-	-	-	-
649	PRE	psi	GY	-0.139	-	-	-	-
650	PRE	psi	GY	-0.139	-	-	-	-
651	PRE	psi	GY	-0.139	-	-	-	-
652	PRE	psi	GY	-0.139	-	-	-	-

### 3 DEAD : Selfweight

Direction	Factor	Assigned Geometry
Y	-1.000	1 - 117, 119 - 210, 212 - 253, 267, 269, 271, 273, 275, ...

### 7 WIND(X-) : Plate Loads

Plate	Type	Direction	Fa	Fb	X1 (ft)	Y1 (ft)	X2 (ft)	Y2 (ft)
543	PRE	psi	GX	0.195	-	-	-	-
544	PRE	psi	GX	0.195	-	-	-	-
545	PRE	psi	Z	-0.094	-	-	-	-
546	PRE	psi	Z	-0.094	-	-	-	-
547	PRE	psi	Z	-0.056	-	-	-	-
548	PRE	psi	Z	-0.056	-	-	-	-
549	PRE	psi	Z	-0.094	-	-	-	-
550	PRE	psi	Z	-0.094	-	-	-	-
551	PRE	psi	Z	-0.094	-	-	-	-
552	PRE	psi	Z	-0.094	-	-	-	-
553	PRE	psi	Z	-0.094	-	-	-	-
554	PRE	psi	Z	-0.094	-	-	-	-
555	PRE	psi	GX	0.195	-	-	-	-
556	PRE	psi	GX	0.195	-	-	-	-
557	PRE	psi	GX	0.195	-	-	-	-
558	PRE	psi	GX	0.195	-	-	-	-
559	PRE	psi	Z	-0.094	-	-	-	-
560	PRE	psi	Z	-0.094	-	-	-	-
561	PRE	psi	Z	-0.056	-	-	-	-
	PRE	psi	Z	-0.094	-	-	-	-
562	PRE	psi	Z	-0.094	-	-	-	-
563	PRE	psi	Z	-0.056	-	-	-	-
564	PRE	psi	Z	-0.056	-	-	-	-
565	PRE	psi	Z	-0.056	-	-	-	-
566	PRE	psi	Z	-0.056	-	-	-	-



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Job No  
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Job Title **West Hartford Relo CT**

Part

Ref

By **SMS**

Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite)**

Date/Time **08-Nov-2019 11:54**

### 7 WIND(X-) : Plate Loads Cont...

Plate	Type	Direction	Fa	Fb	X1 (ft)	Y1 (ft)	X2 (ft)	Y2 (ft)
567	PRE	psi	GX	0.195	-	-	-	-
568	PRE	psi	Z	-0.094	-	-	-	-
569	PRE	psi	Z	-0.056	-	-	-	-
570	PRE	psi	Z	-0.056	-	-	-	-
571	PRE	psi	Z	-0.056	-	-	-	-
572	PRE	psi	Z	-0.094	-	-	-	-
573	PRE	psi	GX	0.195	-	-	-	-
574	PRE	psi	GX	0.195	-	-	-	-
575	PRE	psi	GX	0.195	-	-	-	-
576	PRE	psi	GX	0.195	-	-	-	-
577	PRE	psi	GX	0.195	-	-	-	-
578	PRE	psi	Z	-0.094	-	-	-	-
579	PRE	psi	Z	-0.056	-	-	-	-
580	PRE	psi	Z	-0.056	-	-	-	-
581	PRE	psi	Z	-0.056	-	-	-	-
582	PRE	psi	Z	-0.094	-	-	-	-
607	PRE	psi	GX	0.195	-	-	-	-
608	PRE	psi	GX	0.195	-	-	-	-
609	PRE	psi	Z	-0.094	-	-	-	-
610	PRE	psi	Z	-0.056	-	-	-	-
611	PRE	psi	Z	-0.056	-	-	-	-
612	PRE	psi	Z	-0.056	-	-	-	-
613	PRE	psi	Z	-0.094	-	-	-	-
614	PRE	psi	GX	0.195	-	-	-	-
615	PRE	psi	GX	0.195	-	-	-	-
616	PRE	psi	GX	0.195	-	-	-	-
617	PRE	psi	GX	0.195	-	-	-	-
618	PRE	psi	Z	-0.094	-	-	-	-
619	PRE	psi	Z	-0.056	-	-	-	-
620	PRE	psi	Z	-0.056	-	-	-	-
621	PRE	psi	Z	-0.056	-	-	-	-
622	PRE	psi	Z	-0.094	-	-	-	-
623	PRE	psi	Z	-0.094	-	-	-	-
624	PRE	psi	GX	0.195	-	-	-	-
625	PRE	psi	GX	0.195	-	-	-	-
626	PRE	psi	GX	0.195	-	-	-	-
627	PRE	psi	Z	-0.094	-	-	-	-
628	PRE	psi	Z	-0.056	-	-	-	-
629	PRE	psi	Z	-0.056	-	-	-	-
630	PRE	psi	Z	-0.056	-	-	-	-
649	PRE	psi	GX	0.195	-	-	-	-
650	PRE	psi	Z	-0.094	-	-	-	-
651	PRE	psi	Z	-0.056	-	-	-	-
652	PRE	psi	Z	-0.094	-	-	-	-



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Part		
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By SMS	Date 31-Oct-19	Chd SA
Client Verizon	File Clock Tower (Composite I)	Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

### 8 WIND(Z-) : Plate Loads

Plate	Type	Direction	Fa	Fb	X1 (ft)	Y1 (ft)	X2 (ft)	Y2 (ft)
543	PRE psi	Z	-0.094	-	-	-	-	-
544	PRE psi	Z	-0.094	-	-	-	-	-
545	PRE psi	Z	-0.056	-	-	-	-	-
546	PRE psi	Z	-0.056	-	-	-	-	-
547	PRE psi	Z	-0.094	-	-	-	-	-
548	PRE psi	Z	-0.094	-	-	-	-	-
549	PRE psi	GZ	0.195	-	-	-	-	-
550	PRE psi	GZ	0.195	-	-	-	-	-
551	PRE psi	GZ	0.195	-	-	-	-	-
552	PRE psi	GZ	0.195	-	-	-	-	-
553	PRE psi	GZ	0.195	-	-	-	-	-
554	PRE psi	GZ	0.195	-	-	-	-	-
555	PRE psi	Z	-0.094	-	-	-	-	-
556	PRE psi	Z	-0.094	-	-	-	-	-
557	PRE psi	Z	-0.094	-	-	-	-	-
558	PRE psi	Z	-0.094	-	-	-	-	-
559	PRE psi	Z	-0.056	-	-	-	-	-
560	PRE psi	Z	-0.056	-	-	-	-	-
561	PRE psi	Z	-0.056	-	-	-	-	-
562	PRE psi	Z	-0.056	-	-	-	-	-
563	PRE psi	Z	-0.094	-	-	-	-	-
564	PRE psi	Z	-0.094	-	-	-	-	-
565	PRE psi	Z	-0.094	-	-	-	-	-
566	PRE psi	Z	-0.094	-	-	-	-	-
567	PRE psi	Z	-0.056	-	-	-	-	-
568	PRE psi	Z	-0.056	-	-	-	-	-
569	PRE psi	Z	-0.056	-	-	-	-	-
570	PRE psi	Z	-0.094	-	-	-	-	-
571	PRE psi	GZ	0.195	-	-	-	-	-
572	PRE psi	GZ	0.195	-	-	-	-	-
573	PRE psi	GZ	0.195	-	-	-	-	-
574	PRE psi	Z	-0.094	-	-	-	-	-
575	PRE psi	GZ	0.195	-	-	-	-	-
576	PRE psi	Z	-0.094	-	-	-	-	-
577	PRE psi	Z	-0.056	-	-	-	-	-
578	PRE psi	Z	-0.056	-	-	-	-	-
579	PRE psi	Z	-0.056	-	-	-	-	-
580	PRE psi	Z	-0.094	-	-	-	-	-
581	PRE psi	GZ	0.195	-	-	-	-	-
582	PRE psi	GZ	0.195	-	-	-	-	-
607	PRE psi	Z	-0.094	-	-	-	-	-
608	PRE psi	Z	-0.056	-	-	-	-	-
609	PRE psi	Z	-0.056	-	-	-	-	-
610	PRE psi	Z	-0.056	-	-	-	-	-
611	PRE psi	Z	-0.094	-	-	-	-	-



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Job No

50114615

Sheet No

36

Rev

Part

Ref

By SMS

Date 31-Oct-19

Chd SA

Job Title West Hartford Relo CT

Client Verizon

File Clock Tower (Composite I

Date/Time 08-Nov-2019 11:54

### 8 WIND(Z-) : Plate Loads Cont...

Plate	Type	Direction	Fa	Fb	X1 (ft)	Y1 (ft)	X2 (ft)	Y2 (ft)
612	PRE	psi	GZ	0.195	-	-	-	-
613	PRE	psi	GZ	0.195	-	-	-	-
614	PRE	psi	GZ	0.195	-	-	-	-
615	PRE	psi	GZ	0.195	-	-	-	-
616	PRE	psi	Z	-0.094	-	-	-	-
617	PRE	psi	Z	-0.056	-	-	-	-
618	PRE	psi	Z	-0.056	-	-	-	-
619	PRE	psi	Z	-0.056	-	-	-	-
620	PRE	psi	Z	-0.094	-	-	-	-
621	PRE	psi	GZ	0.195	-	-	-	-
622	PRE	psi	GZ	0.195	-	-	-	-
623	PRE	psi	GZ	0.195	-	-	-	-
624	PRE	psi	GZ	0.195	-	-	-	-
625	PRE	psi	Z	-0.094	-	-	-	-
626	PRE	psi	Z	-0.056	-	-	-	-
627	PRE	psi	Z	-0.056	-	-	-	-
628	PRE	psi	Z	-0.056	-	-	-	-
629	PRE	psi	Z	-0.094	-	-	-	-
630	PRE	psi	GZ	0.195	-	-	-	-
649	PRE	psi	Z	-0.094	-	-	-	-
650	PRE	psi	Z	-0.056	-	-	-	-
651	PRE	psi	Z	-0.094	-	-	-	-
652	PRE	psi	GZ	0.195	-	-	-	-



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Part

Ref

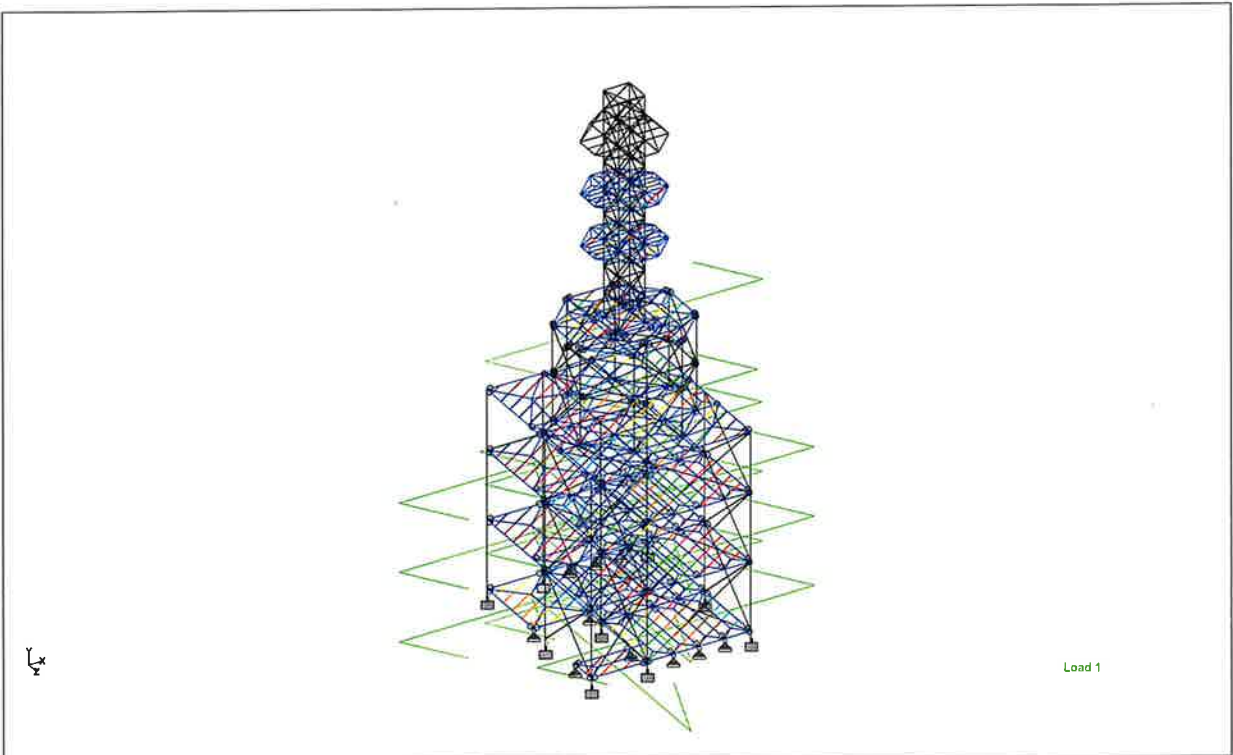
By **SMS**

Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite)** | Date/Time **08-Nov-2019 11:54**



*Dead Loads*



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Job No  
**50114615**

Sheet No  
**38**

Rev

Part

Job Title **West Hartford Relo CT**

Ref

By **SMS**

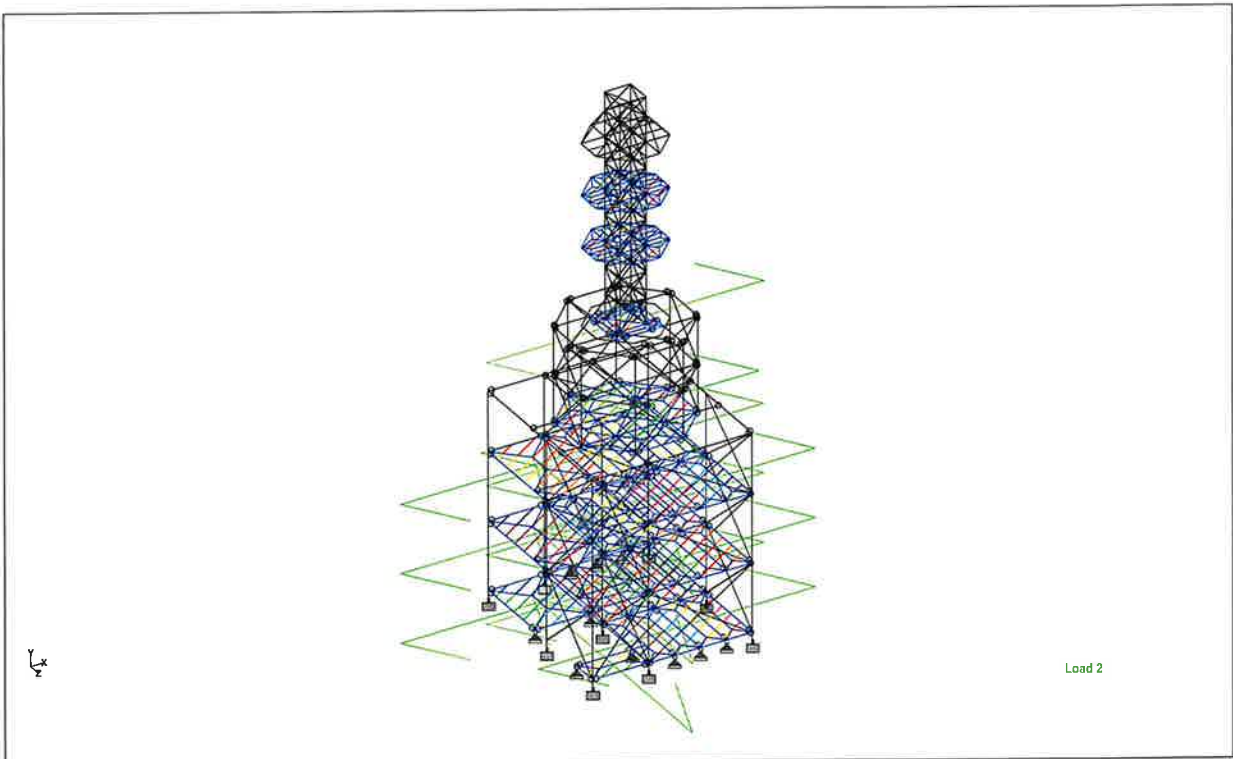
Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite)**

Date/Time **08-Nov-2019 11:54**



*Live Loads*



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Job No  
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Job Title **West Hartford Relo CT**

Ref

By **SMS**

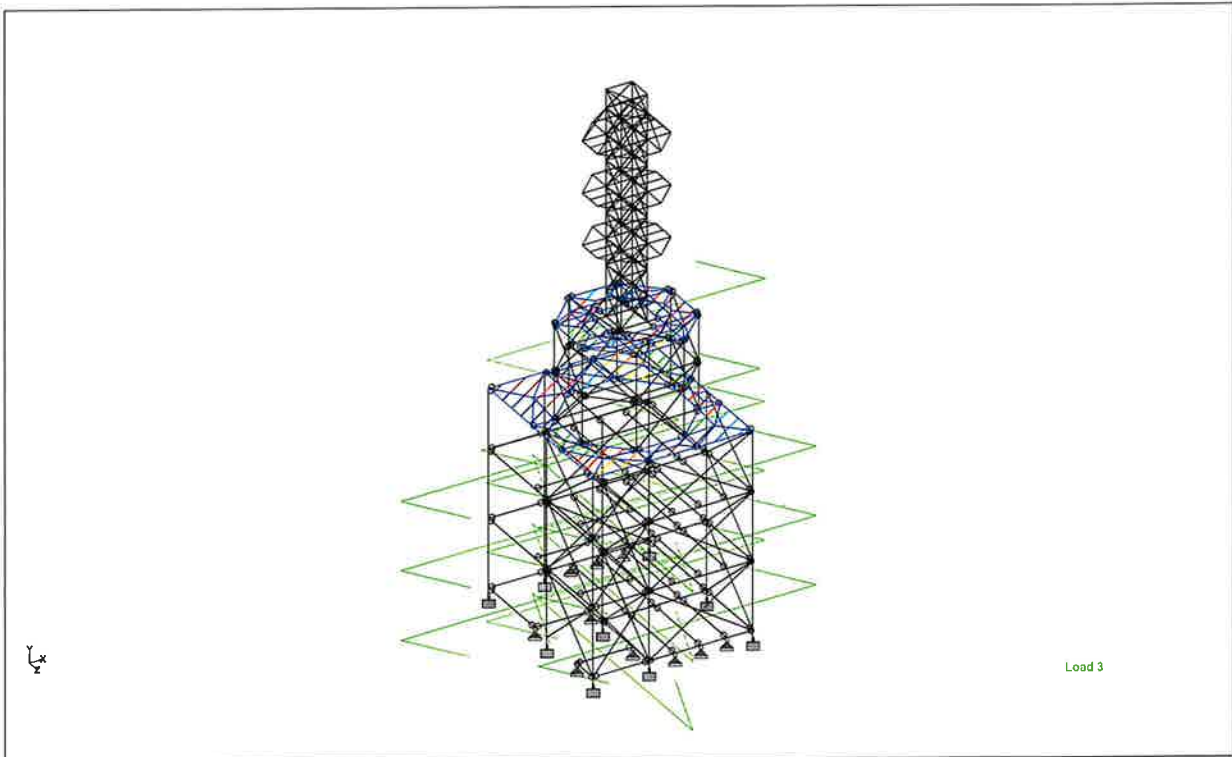
Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite I**

Date/Time **08-Nov-2019 11:54**



*Snow Loads*





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**40**

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Job Title **West Hartford Relo CT**

Ref

By **SMS**

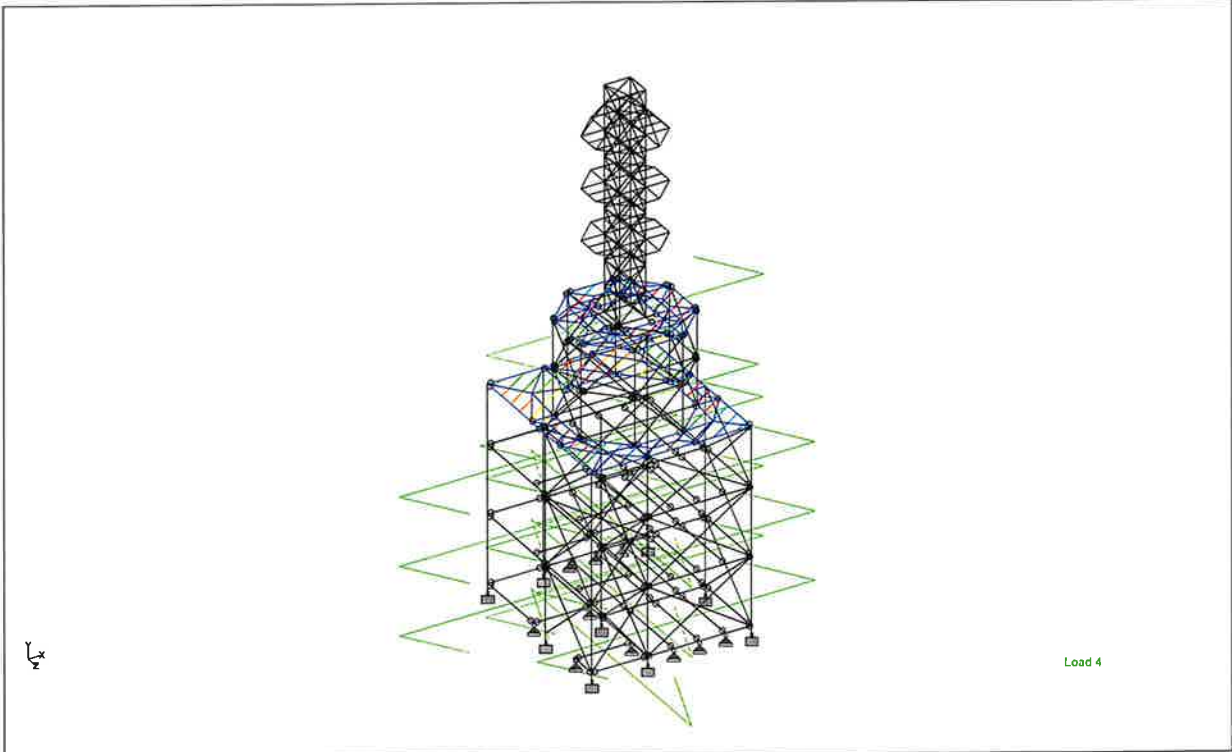
Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite I**

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Roof Live Load



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**41**

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Job Title **West Hartford Relo CT**

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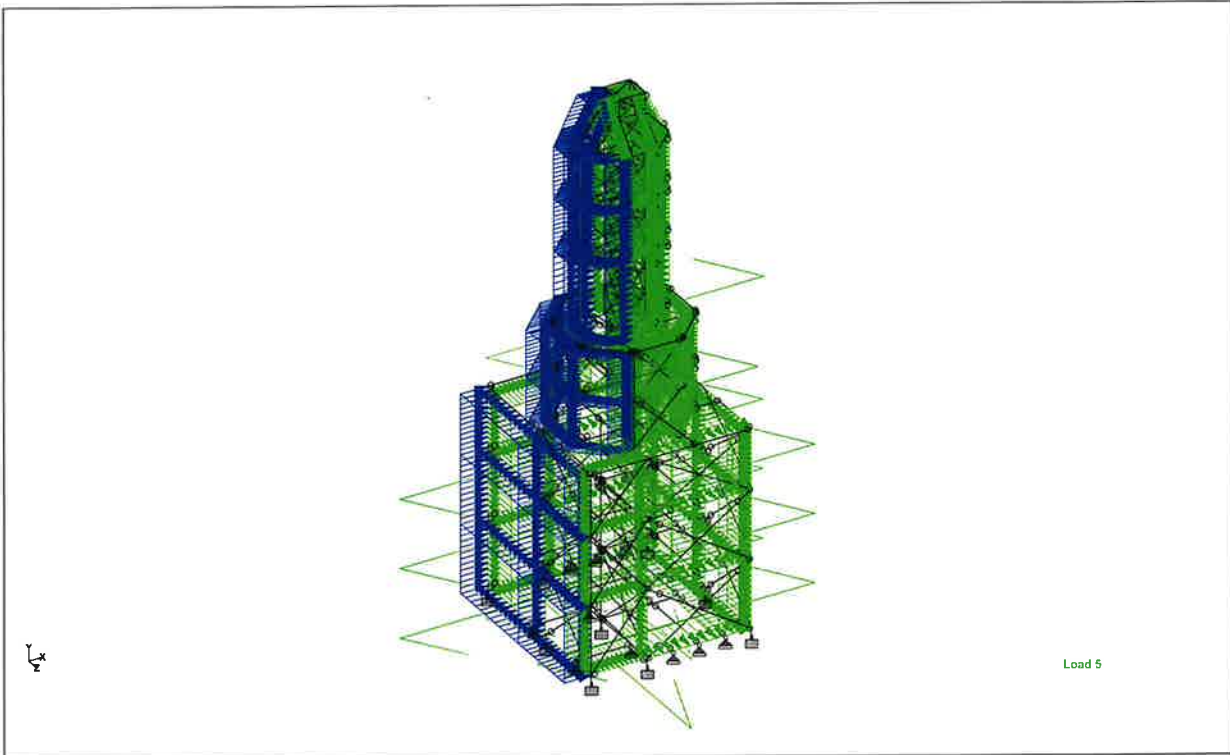
By **SMS**

Date **31-Oct-19**

Chd **SA**

Client **Verizon**

File **Clock Tower (Composite** | Date/Time **08-Nov-2019 11:54**



Typical Wind Loads

### Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
1	W10X54	W10X54	0.304	1.000	0.304	Eq. H1-1b	12	15.800	303.000	103.000	1.820
2	W10X54	W10X54	0.089	1.000	0.089	Sec. E1	12	15.800	303.000	103.000	1.820
3	W10X54	W10X54	0.061	1.000	0.061	Sec. E1	12	15.800	303.000	103.000	1.820
4	W10X54	W10X54	0.036	1.000	0.036	Eq. H1-1b	26	15.800	303.000	103.000	1.820
5	W10X54	W10X54	0.160	1.000	0.160	Sec. E4	12	15.800	303.000	103.000	1.820
6	W10X54	W10X54	0.129	1.000	0.129	Sec. E1	12	15.800	303.000	103.000	1.820
7	W10X54	W10X54	0.097	1.000	0.097	Sec. E1	12	15.800	303.000	103.000	1.820
8	W10X54	W10X54	0.068	1.000	0.068	Eq. H1-2	19	15.800	303.000	103.000	1.820
9	W10X54	W10X54	0.480	1.000	0.480	Eq. H1-1a	26	15.800	303.000	103.000	1.820
10	W10X54	W10X54	0.167	1.000	0.167	Sec. E1	12	15.800	303.000	103.000	1.820
11	W10X54	W10X54	0.116	1.000	0.116	Sec. E1	12	15.800	303.000	103.000	1.820
12	W10X54	W10X54	0.053	1.000	0.053	Sec. E1	26	15.800	303.000	103.000	1.820
13	W10X54	W10X54	0.280	1.000	0.280	Eq. H1-1a	26	15.800	303.000	103.000	1.820
14	W10X54	W10X54	0.173	1.000	0.173	Sec. E1	12	15.800	303.000	103.000	1.820
15	W10X54	W10X54	0.150	1.000	0.150	Sec. E1	26	15.800	303.000	103.000	1.820
16	W10X54	W10X54	0.108	1.000	0.108	Sec. E1	26	15.800	303.000	103.000	1.820
17	W10X54	W10X54	0.530	1.000	0.530	Eq. H1-1a	26	15.800	303.000	103.000	1.820
18	W10X54	W10X54	0.159	1.000	0.159	Sec. E1	26	15.800	303.000	103.000	1.820



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By SMS	Date 31-Oct-19	Chd SA
File Clock Tower (Composite I)		Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

Client Verizon

### Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
			Ratio	Ratio							
19	W10X54	W10X54	0.113	1.000	0.113	Sec. E1	26	15.800	303.000	103.000	1.820
20	W10X54	W10X54	0.050	1.000	0.050	Sec. E1	26	15.800	303.000	103.000	1.820
21	W10X54	W10X54	0.184	1.000	0.184	Eq. H1-1b	27	15.800	303.000	103.000	1.820
22	W10X54	W10X54	0.113	1.000	0.113	Sec. E1	27	15.800	303.000	103.000	1.820
23	W10X54	W10X54	0.093	1.000	0.093	Sec. E1	27	15.800	303.000	103.000	1.820
24	W10X54	W10X54	0.085	1.000	0.085	Eq. H1-1b	27	15.800	303.000	103.000	1.820
25	W10X54	W10X54	0.345	1.000	0.345	Eq. H1-1b	27	15.800	303.000	103.000	1.820
26	W10X54	W10X54	0.085	1.000	0.085	Sec. E1	27	15.800	303.000	103.000	1.820
27	W10X54	W10X54	0.060	1.000	0.060	Sec. E1	27	15.800	303.000	103.000	1.820
28	W10X54	W10X54	0.041	1.000	0.041	Eq. H1-1b	26	15.800	303.000	103.000	1.820
29	W10X54	W10X54	0.148	1.000	0.148	Eq. H1-1b	26	15.800	303.000	103.000	1.820
30	W10X54	W10X54	0.115	1.000	0.115	Eq. H1-1b	26	15.800	303.000	103.000	1.820
31	W10X54	W10X54	0.076	1.000	0.076	Sec. E1	12	15.800	303.000	103.000	1.820
32	W10X54	W10X54	0.067	1.000	0.067	Eq. H1-1b	26	15.800	303.000	103.000	1.820
33	W10X54	W10X54	0.344	1.000	0.344	Eq. H1-1a	12	15.800	303.000	103.000	1.820
34	W10X54	W10X54	0.401	1.000	0.401	Eq. H1-1a	12	15.800	303.000	103.000	1.820
35	W10X54	W10X54	0.327	1.000	0.327	Eq. H1-1a	12	15.800	303.000	103.000	1.820
36	W10X54	W10X54	0.223	1.000	0.223	Eq. H1-1b	26	15.800	303.000	103.000	1.820
37	W12X30	W12X30	0.107	1.000	0.107			27.522	930.617	5.27 E+3	1.75 E+3
38	W12X30	W12X30	0.171	1.000	0.171	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
39	W12X26	W12X26	0.023	1.000	0.023			16.693	676.427	608.128	815.956
40	W12X30	W12X30	0.419	1.000	0.419	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
41	W12X30	W12X30	0.060	1.000	0.060			17.510	741.043	550.048	796.981
42	W12X30	W12X30	0.095	1.000	0.095			17.510	741.043	550.048	796.981
43	W12X30	W12X30	0.513	1.000	0.513	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
44	W12X26	W12X26	0.096	1.000	0.096	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
45	W18X50	W18X50	0.370	1.000	0.370	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
46	W12X30	W12X30	0.240	1.000	0.240			46.254	1.07 E+3	42 E+3	3.74 E+3
47	W12X30	W12X30	0.138	1.000	0.138			17.510	741.044	550.058	796.986
48	W12X22	W12X22	0.222	1.000	0.222	LRFD-H1-1B-	10	6.480	156.000	4.660	0.293
49	W12X30	W12X30	0.166	1.000	0.166			17.510	741.044	550.058	796.986
50	W12X30	W12X30	0.365	1.000	0.365	LRFD-H1-1B-	26	8.790	238.000	20.300	0.457
51	W18X50	W18X50	0.557	1.000	0.557	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
52	W18X50	W18X50	0.564	1.000	0.564	LRFD-H1-1B-	12	14.700	800.000	40.100	1.240
53	W18X50	W18X50	0.381	1.000	0.381	LRFD-H1-1B-	12	14.700	800.000	40.100	1.240
54	W12X30	W12X30	0.516	1.000	0.516	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
55	W12X30	W12X30	0.586	1.000	0.586	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
56	W12X30	W12X30	0.578	1.000	0.578	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
57	W12X30	W12X30	0.494	1.000	0.494	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
58	W12X30	W12X30	0.485	1.000	0.485	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
59	W12X30	W12X30	0.411	1.000	0.411	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
60	W12X22	W12X22	0.117	1.000	0.117			23.920	704.953	4.24 E+3	1.66 E+3
61	W12X22	W12X22	0.186	1.000	0.186			23.920	704.953	4.24 E+3	1.66 E+3
62	W12X22	W12X22	0.117	1.000	0.117			23.920	704.952	4.24 E+3	1.66 E+3
63	W12X22	W12X22	0.186	1.000	0.186			23.920	704.952	4.24 E+3	1.66 E+3



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Part		
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By SMS	Date 31-Oct-19	Chd SA
Client Verizon	File Clock Tower (Composite)	Date/Time 08-Nov-2019 11:54

### Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
64	W12X22	W12X22	0.117	1.000	0.117			23.920	704.952	4.24 E+3	1.66 E+3
65	W12X22	W12X22	0.186	1.000	0.186			23.920	704.952	4.24 E+3	1.66 E+3
66	W12X30	W12X30	0.157	1.000	0.157	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
67	W12X30	W12X30	0.131	1.000	0.131			17.510	741.044	550.058	796.986
68	W12X22	W12X22	0.056	1.000	0.056			15.523	590.950	595.488	824.526
69	W12X30	W12X30	0.107	1.000	0.107			27.522	930.617	5.27 E+3	1.75 E+3
70	W12X30	W12X30	0.167	1.000	0.167	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
71	W12X26	W12X26	0.023	1.000	0.023			16.693	676.427	608.128	815.956
72	W12X26	W12X26	0.478	1.000	0.478	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
73	W12X30	W12X30	0.060	1.000	0.060			17.510	741.043	550.048	796.981
74	W12X30	W12X30	0.095	1.000	0.095			17.510	741.043	550.048	796.981
75	W12X26	W12X26	0.572	1.000	0.572	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
76	W12X26	W12X26	0.082	1.000	0.082	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
77	W18X50	W18X50	0.366	1.000	0.366	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
78	W12X30	W12X30	0.184	1.000	0.184			46.254	1.07 E+3	42 E+3	3.74 E+3
79	W12X30	W12X30	0.136	1.000	0.136			17.510	741.044	550.058	796.986
80	W12X22	W12X22	0.223	1.000	0.223	LRFD-H1-1B-	10	6.480	156.000	4.660	0.293
81	W12X30	W12X30	0.166	1.000	0.166			17.510	741.044	550.058	796.986
82	W12X30	W12X30	0.384	1.000	0.384	LRFD-H1-1B-	26	8.790	238.000	20.300	0.457
83	W18X50	W18X50	0.576	1.000	0.576	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
84	W18X50	W18X50	0.587	1.000	0.587	LRFD-H1-1B-	12	14.700	800.000	40.100	1.240
85	W18X50	W18X50	0.384	1.000	0.384	LRFD-H1-1B-	12	14.700	800.000	40.100	1.240
86	W12X26	W12X26	0.588	1.000	0.588	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
87	W12X26	W12X26	0.638	1.000	0.638	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
88	W12X26	W12X26	0.624	1.000	0.624	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
89	W12X26	W12X26	0.537	1.000	0.537	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
90	W12X26	W12X26	0.521	1.000	0.521	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
91	W12X26	W12X26	0.456	1.000	0.456	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
92	W12X22	W12X22	0.117	1.000	0.117			23.920	704.953	4.24 E+3	1.66 E+3
93	W12X22	W12X22	0.186	1.000	0.186			23.920	704.953	4.24 E+3	1.66 E+3
94	W12X22	W12X22	0.117	1.000	0.117			23.920	704.952	4.24 E+3	1.66 E+3
95	W12X22	W12X22	0.186	1.000	0.186			23.920	704.952	4.24 E+3	1.66 E+3
96	W12X22	W12X22	0.117	1.000	0.117			23.920	704.952	4.24 E+3	1.66 E+3
97	W12X22	W12X22	0.186	1.000	0.186			23.920	704.952	4.24 E+3	1.66 E+3
98	W12X30	W12X30	0.146	1.000	0.146	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
99	W12X30	W12X30	0.132	1.000	0.132			17.510	741.044	550.058	796.986
100	W12X22	W12X22	0.056	1.000	0.056			15.523	590.950	595.488	824.526
101	W12X26	W12X26	0.033	1.000	0.033			25.249	816.318	4.37 E+3	1.64 E+3
102	W12X26	W12X26	0.151	1.000	0.151			25.249	816.318	4.37 E+3	1.64 E+3
103	W21X50	W21X50	0.121	1.000	0.121			32.311	2.78 E+3	4.39 E+3	3.09 E+3
104	W21X50	W21X50	0.136	1.000	0.136			22.007	2.07 E+3	336.621	1.37 E+3
105	W21X50	W21X50	0.071	1.000	0.071			32.311	2.78 E+3	4.39 E+3	3.09 E+3
106	W21X50	W21X50	0.054	1.000	0.054			22.007	2.07 E+3	336.607	1.37 E+3
107	W12X26	W12X26	0.001	1.000	0.001			25.249	816.318	4.37 E+3	1.64 E+3
108	W12X26	W12X26	0.185	1.000	0.185			25.249	816.318	4.37 E+3	1.64 E+3



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By SMS	Date 31-Oct-19	Chd SA
File Clock Tower (Composite I)		Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

Client Verizon

### Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
109	W21X50	W21X50	0.194	1.000	0.194			30.848	2.7 E+3	3.39 E+3	2.83 E+3
110	W21X50	W21X50	0.127	1.000	0.127			42.273	3.13 E+3	16.8 E+3	4.91 E+3
111	W12X26	W12X26	0.130	1.000	0.130			25.249	816.318	4.37 E+3	1.64 E+3
112	W21X50	W21X50	0.079	1.000	0.079			30.848	2.7 E+3	3.39 E+3	2.83 E+3
113	W12X26	W12X26	0.156	1.000	0.156			25.249	816.318	4.37 E+3	1.64 E+3
114	W21X50	W21X50	0.082	1.000	0.082			42.273	3.13 E+3	16.8 E+3	4.91 E+3
115	W21X50	W21X50	0.078	1.000	0.078			22.007	2.07 E+3	336.607	1.37 E+3
116	W21X50	W21X50	0.130	1.000	0.130			42.273	3.13 E+3	16.8 E+3	4.91 E+3
117	W21X50	W21X50	0.155	1.000	0.155			22.007	2.07 E+3	336.621	1.37 E+3
119	W21X50	W21X50	0.055	1.000	0.055			32.311	2.78 E+3	4.39 E+3	3.09 E+3
120	W21X50	W21X50	0.240	1.000	0.240			30.848	2.7 E+3	3.39 E+3	2.83 E+3
121	W21X50	W21X50	0.107	1.000	0.107			32.311	2.78 E+3	4.39 E+3	3.09 E+3
122	W21X50	W21X50	0.105	1.000	0.105			30.848	2.7 E+3	3.39 E+3	2.83 E+3
123	W21X50	W21X50	0.192	1.000	0.192			32.311	2.78 E+3	4.39 E+3	3.09 E+3
124	W21X50	W21X50	0.194	1.000	0.194			32.311	2.78 E+3	4.39 E+3	3.09 E+3
125	W21X50	W21X50	0.358	1.000	0.358			32.311	2.78 E+3	4.39 E+3	3.09 E+3
126	W21X50	W21X50	0.156	1.000	0.156			32.311	2.78 E+3	4.39 E+3	3.09 E+3
127	W21X50	W21X50	0.191	1.000	0.191			32.311	2.78 E+3	4.39 E+3	3.09 E+3
128	W21X50	W21X50	0.350	1.000	0.350			32.311	2.78 E+3	4.39 E+3	3.09 E+3
129	W21X50	W21X50	0.174	1.000	0.174			32.311	2.78 E+3	4.39 E+3	3.09 E+3
130	W21X50	W21X50	0.147	1.000	0.147			32.311	2.78 E+3	4.39 E+3	3.09 E+3
131	W21X50	W21X50	0.407	1.000	0.407			32.311	2.78 E+3	4.39 E+3	3.09 E+3
132	W21X50	W21X50	0.395	1.000	0.395			32.311	2.78 E+3	4.39 E+3	3.09 E+3
133	W21X50	W21X50	0.187	1.000	0.187			30.848	2.7 E+3	3.39 E+3	2.83 E+3
134	W21X50	W21X50	0.121	1.000	0.121			30.848	2.7 E+3	3.39 E+3	2.83 E+3
135	W21X50	W21X50	0.255	1.000	0.255			30.848	2.7 E+3	3.39 E+3	2.83 E+3
136	W21X50	W21X50	0.057	1.000	0.057			30.848	2.7 E+3	3.39 E+3	2.83 E+3
137	W8X35	W8X35	0.026	1.000	0.026			29.032	628.009	5.29 E+3	1.14 E+3
138	W8X35	W8X35	0.026	1.000	0.026			29.032	628.009	5.29 E+3	1.14 E+3
139	W8X35	W8X35	0.037	1.000	0.037			28.393	621.499	4.77 E+3	1.1 E+3
140	W8X35	W8X35	0.038	1.000	0.038			28.393	621.499	4.77 E+3	1.1 E+3
141	W8X35	W8X35	0.023	1.000	0.023			28.393	621.499	4.77 E+3	1.1 E+3
142	W8X35	W8X35	0.023	1.000	0.023			28.393	621.499	4.77 E+3	1.1 E+3
143	W8X35	W8X35	0.021	1.000	0.021			28.393	621.499	4.77 E+3	1.1 E+3
144	W8X35	W8X35	0.021	1.000	0.021			28.393	621.499	4.77 E+3	1.1 E+3
145	HSST6X6X0	HSST6X6X0	0.084	1.000	0.084	Eq. H1-2	12	5.240	28.600	28.600	45.600
146	HSST6X6X0	HSST6X6X0	0.077	1.000	0.077	Eq. H1-1b	12	5.240	28.600	28.600	45.600
147	HSST6X6X0	HSST6X6X0	0.091	1.000	0.091	Eq. H1-1b	12	5.240	28.600	28.600	45.600
148	HSST6X6X0	HSST6X6X0	0.057	1.000	0.057	Eq. H1-1b	12	5.240	28.600	28.600	45.600
149	HSST6X6X0	HSST6X6X0	0.083	1.000	0.083	Eq. H1-1b	12	5.240	28.600	28.600	45.600
150	HSST6X6X0	HSST6X6X0	0.053	1.000	0.053	Eq. H1-1b	12	5.240	28.600	28.600	45.600
151	HSST6X6X0	HSST6X6X0	0.163	1.000	0.163	Eq. H1-1b	26	5.240	28.600	28.600	45.600
152	HSST6X6X0	HSST6X6X0	0.100	1.000	0.100	Eq. H1-1b	26	5.240	28.600	28.600	45.600
153	HSST6X6X0	HSST6X6X0	0.158	1.000	0.158	Eq. H1-1b	26	5.240	28.600	28.600	45.600
154	HSST6X6X0	HSST6X6X0	0.099	1.000	0.099	Eq. H1-1b	26	5.240	28.600	28.600	45.600



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Job No <b>50114615</b>	Sheet No <b>45</b>	Rev
Part		
Ref		
By SMS	Date 31-Oct-19	Chd SA
Client Verizon	File Clock Tower (Composite)	Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

**Utilization Ratio Cont...**

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
155	HSST6X6X0	HSST6X6X0	0.075	1.000	0.075	Eq. H1-1b	12	5.240	28.600	28.600	45.600
156	HSST6X6X0	HSST6X6X0	0.063	1.000	0.063	Eq. H1-1b	27	5.240	28.600	28.600	45.600
157	HSST6X6X0	HSST6X6X0	0.126	1.000	0.126	Eq. H1-1b	27	5.240	28.600	28.600	45.600
158	HSST6X6X0	HSST6X6X0	0.082	1.000	0.082	Eq. H1-2	27	5.240	28.600	28.600	45.600
159	HSST6X6X0	HSST6X6X0	0.074	1.000	0.074	Eq. H1-2	30	5.240	28.600	28.600	45.600
160	HSST6X6X0	HSST6X6X0	0.077	1.000	0.077	Eq. H1-1b	12	5.240	28.600	28.600	45.600
161	W12X30	W12X30	0.017	1.000	0.017	Eq. H1-1b	9	8.790	238.000	20.300	0.457
162	W12X30	W12X30	0.018	1.000	0.018	Eq. H1-1b	9	8.790	238.000	20.300	0.457
163	W12X30	W12X30	0.018	1.000	0.018	Eq. H1-1b	9	8.790	238.000	20.300	0.457
164	W12X30	W12X30	0.026	1.000	0.026	Eq. Sec. D2	26	8.790	238.000	20.300	0.457
165	W8X18	W8X18	0.030	1.000	0.030	Sec. E1	8	5.260	61.900	7.970	0.172
166	W8X18	W8X18	0.020	1.000	0.020	Eq. Sec. D2	26	5.260	61.900	7.970	0.172
167	W8X18	W8X18	0.059	1.000	0.059	Eq. Sec. D2	26	5.260	61.900	7.970	0.172
168	W8X18	W8X18	0.018	1.000	0.018	Eq. Sec. D2	26	5.260	61.900	7.970	0.172
169	W8X18	W8X18	0.028	1.000	0.028	Eq. Sec. D2	33	5.260	61.900	7.970	0.172
170	W8X18	W8X18	0.034	1.000	0.034	Eq. Sec. D2	27	5.260	61.900	7.970	0.172
171	W8X18	W8X18	0.037	1.000	0.037	Sec. E1	7	5.260	61.900	7.970	0.172
172	W8X18	W8X18	0.023	1.000	0.023	Sec. E1	8	5.260	61.900	7.970	0.172
173	W12X30	W12X30	0.020	1.000	0.020	Eq. H1-1b	27	8.790	238.000	20.300	0.457
174	W12X30	W12X30	0.021	1.000	0.021	Eq. H1-1b	9	8.790	238.000	20.300	0.457
175	W12X30	W12X30	0.020	1.000	0.020	Eq. H1-1b	27	8.790	238.000	20.300	0.457
176	W12X30	W12X30	0.022	1.000	0.022	Eq. H1-1b	27	8.790	238.000	20.300	0.457
177	W12X30	W12X30	0.019	1.000	0.019	Eq. H1-1b	9	8.790	238.000	20.300	0.457
178	W12X30	W12X30	0.021	1.000	0.021	Eq. H1-1b	9	8.790	238.000	20.300	0.457
179	W12X30	W12X30	0.026	1.000	0.026	Eq. Sec. D2	26	8.790	238.000	20.300	0.457
180	W12X30	W12X30	0.026	1.000	0.026	Eq. Sec. D2	26	8.790	238.000	20.300	0.457
181	W21X50	W21X50	0.138	1.000	0.138			32.311	2.78 E+3	4.39 E+3	3.09 E+3
182	W21X50	W21X50	0.138	1.000	0.138			32.311	2.78 E+3	4.39 E+3	3.09 E+3
183	W21X50	W21X50	0.078	1.000	0.078			23.121	2.18 E+3	501.996	1.55 E+3
184	W21X50	W21X50	0.079	1.000	0.079			23.121	2.18 E+3	501.994	1.55 E+3
185	W8X18	W8X18	0.029	1.000	0.029			22.458	370.637	4.07 E+3	1.1 E+3
186	W8X18	W8X18	0.017	1.000	0.017			22.458	370.637	4.07 E+3	1.1 E+3
187	W8X18	W8X18	0.029	1.000	0.029			22.458	370.637	4.07 E+3	1.1 E+3
188	W8X18	W8X18	0.017	1.000	0.017			22.458	370.637	4.07 E+3	1.1 E+3
189	W8X18	W8X18	0.029	1.000	0.029			22.458	370.637	4.07 E+3	1.1 E+3
190	W8X18	W8X18	0.017	1.000	0.017			22.458	370.637	4.07 E+3	1.1 E+3
191	W8X18	W8X18	0.029	1.000	0.029			22.458	370.637	4.07 E+3	1.1 E+3
192	W8X18	W8X18	0.017	1.000	0.017			22.458	370.637	4.07 E+3	1.1 E+3
193	W21X50	W21X50	0.313	1.000	0.313			32.311	2.78 E+3	4.39 E+3	3.09 E+3
194	W21X50	W21X50	0.277	1.000	0.277			32.311	2.78 E+3	4.39 E+3	3.09 E+3
195	W21X50	W21X50	0.312	1.000	0.312			32.311	2.78 E+3	4.39 E+3	3.09 E+3
196	W21X50	W21X50	0.309	1.000	0.309			32.311	2.78 E+3	4.39 E+3	3.09 E+3
197	W21X50	W21X50	0.225	1.000	0.225			32.311	2.78 E+3	4.39 E+3	3.09 E+3
198	W21X50	W21X50	0.169	1.000	0.169			18.414	1.65 E+3	65.837	761.699
199	W21X50	W21X50	0.229	1.000	0.229			32.311	2.78 E+3	4.39 E+3	3.09 E+3



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Part		
Ref		
By SMS	Date 31-Oct-19	Chd SA
Client Verizon	File Clock Tower (Composite)	Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

### Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
200	W21X50	W21X50	0.181	1.000	0.181			18.414	1.65 E+3	65.835	761.689
201	HSST4X4X0	HSST4X4X0	0.039	1.000	0.039	Sec. E1	27	3.370	7.800	7.800	12.800
202	HSST4X4X0	HSST4X4X0	0.010	1.000	0.010	Sec. E1	7	3.370	7.800	7.800	12.800
203	HSST4X4X0	HSST4X4X0	0.017	1.000	0.017	Sec. E1	26	3.370	7.800	7.800	12.800
204	HSST4X4X0	HSST4X4X0	0.028	1.000	0.028	Sec. E1	27	3.370	7.800	7.800	12.800
205	HSST4X4X0	HSST4X4X0	0.018	1.000	0.018	Sec. E1	31	3.370	7.800	7.800	12.800
206	HSST4X4X0	HSST4X4X0	0.025	1.000	0.025	Sec. E1	31	3.370	7.800	7.800	12.800
207	HSST4X4X0	HSST4X4X0	0.029	1.000	0.029	Sec. E1	27	3.370	7.800	7.800	12.800
208	HSST4X4X0	HSST4X4X0	0.027	1.000	0.027	Sec. E1	27	3.370	7.800	7.800	12.800
209	HSST4X4X0	HSST4X4X0	0.017	1.000	0.017	Sec. E1	30	3.370	7.800	7.800	12.800
210	HSST4X4X0	HSST4X4X0	0.019	1.000	0.019	Sec. E1	26	3.370	7.800	7.800	12.800
212	HSST4X4X0	HSST4X4X0	0.010	1.000	0.010	Sec. E1	32	3.370	7.800	7.800	12.800
213	HSST4X4X0	HSST4X4X0	0.022	1.000	0.022	Sec. E1	27	3.370	7.800	7.800	12.800
214	HSST4X4X0	HSST4X4X0	0.018	1.000	0.018	Sec. E1	26	3.370	7.800	7.800	12.800
215	HSST4X4X0	HSST4X4X0	0.036	1.000	0.036	Sec. E1	26	3.370	7.800	7.800	12.800
216	HSST4X4X0	HSST4X4X0	0.038	1.000	0.038	Sec. E1	26	3.370	7.800	7.800	12.800
217	HSST4X4X0	HSST4X4X0	0.018	1.000	0.018	Sec. E1	30	3.370	7.800	7.800	12.800
218	W21X50	W21X50	0.256	1.000	0.256			32.311	2.78 E+3	4.39 E+3	3.09 E+3
219	W21X50	W21X50	0.260	1.000	0.260			32.311	2.78 E+3	4.39 E+3	3.09 E+3
220	W12X30	W12X30	0.069	1.000	0.069			21.224	831.408	1.56 E+3	1.13 E+3
221	W21X50	W21X50	0.318	1.000	0.318			32.311	2.78 E+3	4.39 E+3	3.09 E+3
222	W21X50	W21X50	0.318	1.000	0.318			32.311	2.78 E+3	4.39 E+3	3.09 E+3
223	W12X30	W12X30	0.099	1.000	0.099			21.224	831.407	1.56 E+3	1.13 E+3
224	W21X50	W21X50	0.211	1.000	0.211			18.414	1.65 E+3	65.837	761.699
225	W12X30	W12X30	0.116	1.000	0.116			21.224	831.408	1.56 E+3	1.13 E+3
226	W12X30	W12X30	0.123	1.000	0.123			26.398	916.217	4.38 E+3	1.64 E+3
227	W12X30	W12X30	0.116	1.000	0.116			21.224	831.407	1.56 E+3	1.13 E+3
228	W12X30	W12X30	0.181	1.000	0.181			26.398	916.217	4.38 E+3	1.64 E+3
229	W21X50	W21X50	0.212	1.000	0.212			18.414	1.65 E+3	65.835	761.689
230	W12X30	W12X30	0.163	1.000	0.163			26.398	916.217	4.38 E+3	1.64 E+3
231	W21X50	W21X50	0.177	1.000	0.177			18.414	1.65 E+3	65.837	761.699
232	W12X30	W12X30	0.158	1.000	0.158			21.224	831.408	1.56 E+3	1.13 E+3
233	W12X30	W12X30	0.090	1.000	0.090			26.398	916.217	4.38 E+3	1.64 E+3
234	W12X30	W12X30	0.159	1.000	0.159			21.224	831.407	1.56 E+3	1.13 E+3
235	W12X30	W12X30	0.181	1.000	0.181			26.398	916.217	4.38 E+3	1.64 E+3
236	W21X50	W21X50	0.178	1.000	0.178			18.414	1.65 E+3	65.835	761.689
237	W12X30	W12X30	0.163	1.000	0.163			26.398	916.217	4.38 E+3	1.64 E+3
238	HSST6X6X0	HSST6X6X0	0.136	1.000	0.136	Eq. H1-1b	8	5.240	28.600	28.600	45.600
239	HSST6X6X0	HSST6X6X0	0.045	1.000	0.045	Sec. E1	30	5.240	28.600	28.600	45.600
240	HSST6X6X0	HSST6X6X0	0.034	1.000	0.034	Sec. E1	9	5.240	28.600	28.600	45.600
241	HSST6X6X0	HSST6X6X0	0.030	1.000	0.030	Sec. E1	9	5.240	28.600	28.600	45.600
242	HSST6X6X0	HSST6X6X0	0.224	1.000	0.224	Eq. H1-1b	26	5.240	28.600	28.600	45.600
243	HSST6X6X0	HSST6X6X0	0.060	1.000	0.060	Sec. E1	22	5.240	28.600	28.600	45.600
244	HSST6X6X0	HSST6X6X0	0.037	1.000	0.037	Sec. E1	22	5.240	28.600	28.600	45.600
245	HSST6X6X0	HSST6X6X0	0.030	1.000	0.030	Sec. E1	9	5.240	28.600	28.600	45.600



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Job No <b>50114615</b>	Sheet No <b>47</b>	Rev
Part		
Ref		
By SMS	Date 31-Oct-19	Chd SA
Client Verizon	File Clock Tower (Composite I)	Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

**Utilization Ratio Cont...**

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
			Ratio	Ratio							
246	HSST6X6X0	HSST6X6X0	0.226	1.000	0.226	Eq. H1-1b	27	5.240	28.600	28.600	45.600
247	HSST6X6X0	HSST6X6X0	0.060	1.000	0.060	Sec. E1	22	5.240	28.600	28.600	45.600
248	HSST6X6X0	HSST6X6X0	0.037	1.000	0.037	Sec. E1	22	5.240	28.600	28.600	45.600
249	HSST6X6X0	HSST6X6X0	0.030	1.000	0.030	Sec. E1	9	5.240	28.600	28.600	45.600
250	HSST6X6X0	HSST6X6X0	0.227	1.000	0.227	Eq. H1-1b	27	5.240	28.600	28.600	45.600
251	HSST6X6X0	HSST6X6X0	0.060	1.000	0.060	Sec. E1	23	5.240	28.600	28.600	45.600
252	HSST6X6X0	HSST6X6X0	0.037	1.000	0.037	Sec. E1	23	5.240	28.600	28.600	45.600
253	HSST6X6X0	HSST6X6X0	0.030	1.000	0.030	Sec. E1	9	5.240	28.600	28.600	45.600
267	HSST6X3X0	HSST6X3X0	0.016	1.000	0.016	Eq. H1-1b	22	3.840	17.000	5.700	14.200
269	HSST6X3X0	HSST6X3X0	0.016	1.000	0.016	Eq. H1-1b	23	3.840	17.000	5.700	14.200
271	HSST6X3X0	HSST6X3X0	0.016	1.000	0.016	Eq. H1-1b	9	3.840	17.000	5.700	14.200
273	HSST6X3X0	HSST6X3X0	0.016	1.000	0.016	Eq. H1-1b	9	3.840	17.000	5.700	14.200
275	C8X11	C8X11	0.013	1.000	0.013	Eq. H1-1b	22	3.370	32.500	1.310	0.121
279	HSST6X3X0	HSST6X3X0	0.016	1.000	0.016	Eq. H1-1b	22	3.840	17.000	5.700	14.200
280	C8X11	C8X11	0.013	1.000	0.013	Eq. H1-1b	23	3.370	32.500	1.310	0.121
281	C8X11	C8X11	0.012	1.000	0.012	Eq. H1-1b	9	3.370	32.500	1.310	0.121
282	C8X11	C8X11	0.012	1.000	0.012	Eq. H1-1b	9	3.370	32.500	1.310	0.121
283	HSST6X3X0	HSST6X3X0	0.016	1.000	0.016	Eq. H1-1b	23	3.840	17.000	5.700	14.200
284	HSST6X3X0	HSST6X3X0	0.016	1.000	0.016	Eq. H1-1b	9	3.840	17.000	5.700	14.200
285	HSST6X3X0	HSST6X3X0	0.016	1.000	0.016	Eq. H1-1b	9	3.840	17.000	5.700	14.200
286	HSST6X3X0	HSST6X3X0	0.006	1.000	0.006	Eq. H1-2	9	3.840	17.000	5.700	14.200
287	HSST6X3X0	HSST6X3X0	0.006	1.000	0.006	Eq. H1-2	9	3.840	17.000	5.700	14.200
288	HSST6X3X0	HSST6X3X0	0.009	1.000	0.009	Eq. H1-1b	23	3.840	17.000	5.700	14.200
289	HSST6X3X0	HSST6X3X0	0.009	1.000	0.009	Eq. H1-1b	22	3.840	17.000	5.700	14.200
290	HSST6X3X0	HSST6X3X0	0.025	1.000	0.025	Eq. H1-1b	10	3.840	17.000	5.700	14.200
291	HSST6X3X0	HSST6X3X0	0.025	1.000	0.025	Eq. H1-1b	10	3.840	17.000	5.700	14.200
292	HSST6X3X0	HSST6X3X0	0.028	1.000	0.028	Eq. H1-1b	23	3.840	17.000	5.700	14.200
293	HSST6X3X0	HSST6X3X0	0.029	1.000	0.029	Eq. H1-1b	22	3.840	17.000	5.700	14.200
294	HSST6X3X0	HSST6X3X0	0.057	1.000	0.057	Eq. H1-1b	23	3.840	17.000	5.700	14.200
295	HSST6X3X0	HSST6X3X0	0.057	1.000	0.057	Eq. H1-1b	22	3.840	17.000	5.700	14.200
296	HSST6X3X0	HSST6X3X0	0.034	1.000	0.034	Eq. H1-1b	8	3.840	17.000	5.700	14.200
297	HSST6X3X0	HSST6X3X0	0.035	1.000	0.035	Eq. H1-1b	7	3.840	17.000	5.700	14.200
299	HSST6X3X0	HSST6X3X0	0.049	1.000	0.049	Eq. H1-1b	22	3.840	17.000	5.700	14.200
300	C8X11	C8X11	0.028	1.000	0.028	Eq. H1-1b	23	3.370	32.500	1.310	0.121
301	HSST6X3X0	HSST6X3X0	0.056	1.000	0.056	Eq. H1-1b	23	3.840	17.000	5.700	14.200
303	HSST6X3X0	HSST6X3X0	0.049	1.000	0.049	Eq. H1-1b	23	3.840	17.000	5.700	14.200
304	C8X11	C8X11	0.029	1.000	0.029	Eq. H1-1b	22	3.370	32.500	1.310	0.121
305	HSST6X3X0	HSST6X3X0	0.056	1.000	0.056	Eq. H1-1b	22	3.840	17.000	5.700	14.200
307	HSST6X3X0	HSST6X3X0	0.056	1.000	0.056	Eq. H1-1b	23	3.840	17.000	5.700	14.200
308	C8X11	C8X11	0.020	1.000	0.020	Eq. H1-1b	23	3.370	32.500	1.310	0.121
309	HSST6X3X0	HSST6X3X0	0.050	1.000	0.050	Eq. H1-1b	22	3.840	17.000	5.700	14.200
311	HSST6X3X0	HSST6X3X0	0.056	1.000	0.056	Eq. H1-1b	22	3.840	17.000	5.700	14.200
312	C8X11	C8X11	0.020	1.000	0.020	Eq. H1-1b	22	3.370	32.500	1.310	0.121
313	HSST6X3X0	HSST6X3X0	0.049	1.000	0.049	Eq. H1-1b	23	3.840	17.000	5.700	14.200
315	HSST6X3X0	HSST6X3X0	0.036	1.000	0.036	Eq. H1-1b	10	3.840	17.000	5.700	14.200





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Job No <b>50114615</b>	Sheet No <b>48</b>	Rev
Part		
Ref		
By SMS	Date 31-Oct-19	Chd SA
Client Verizon	File Clock Tower (Composite I)	Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

**Utilization Ratio Cont...**

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
			Ratio	Ratio							
316	C8X11	C8X11	0.015	1.000	0.015	Eq. H1-1b	23	3.370	32.500	1.310	0.121
317	HSST6X3X0	HSST6X3X0	0.036	1.000	0.036	Eq. H1-1b	10	3.840	17.000	5.700	14.200
319	HSST6X3X0	HSST6X3X0	0.036	1.000	0.036	Eq. H1-1b	10	3.840	17.000	5.700	14.200
320	C8X11	C8X11	0.015	1.000	0.015	Eq. H1-1b	22	3.370	32.500	1.310	0.121
321	HSST6X3X0	HSST6X3X0	0.036	1.000	0.036	Eq. H1-1b	10	3.840	17.000	5.700	14.200
323	HSST6X3X0	HSST6X3X0	0.036	1.000	0.036	Eq. H1-1b	10	3.840	17.000	5.700	14.200
324	C8X11	C8X11	0.013	1.000	0.013	Eq. H1-1b	22	3.370	32.500	1.310	0.121
325	HSST6X3X0	HSST6X3X0	0.036	1.000	0.036	Eq. H1-1b	10	3.840	17.000	5.700	14.200
327	HSST6X3X0	HSST6X3X0	0.036	1.000	0.036	Eq. H1-1b	10	3.840	17.000	5.700	14.200
328	C8X11	C8X11	0.012	1.000	0.012	Eq. H1-1b	10	3.370	32.500	1.310	0.121
329	HSST6X3X0	HSST6X3X0	0.036	1.000	0.036	Eq. H1-1b	10	3.840	17.000	5.700	14.200
330	HSST6X6X0	HSST6X6X0	0.073	1.000	0.073	Eq. Sec. D2	7	5.240	28.600	28.600	45.600
331	HSST6X6X0	HSST6X6X0	0.059	1.000	0.059	Sec. E1	30	5.240	28.600	28.600	45.600
332	HSST6X6X0	HSST6X6X0	0.125	1.000	0.125	Sec. E1	22	5.240	28.600	28.600	45.600
333	HSST6X6X0	HSST6X6X0	0.091	1.000	0.091	Sec. E1	22	5.240	28.600	28.600	45.600
334	HSST6X6X0	HSST6X6X0	0.124	1.000	0.124	Sec. E1	22	5.240	28.600	28.600	45.600
335	HSST6X6X0	HSST6X6X0	0.091	1.000	0.091	Sec. E1	22	5.240	28.600	28.600	45.600
336	HSST6X6X0	HSST6X6X0	0.124	1.000	0.124	Sec. E1	23	5.240	28.600	28.600	45.600
337	HSST6X6X0	HSST6X6X0	0.090	1.000	0.090	Sec. E1	23	5.240	28.600	28.600	45.600
338	HSST6X3X0	HSST6X3X0	0.066	1.000	0.066	Eq. H1-1b	27	3.840	17.000	5.700	14.200
339	HSST6X3X0	HSST6X3X0	0.065	1.000	0.065	Eq. H1-1b	26	3.840	17.000	5.700	14.200
340	HSST6X3X0	HSST6X3X0	0.067	1.000	0.067	Eq. H1-1b	27	3.840	17.000	5.700	14.200
341	HSST6X3X0	HSST6X3X0	0.065	1.000	0.065	Eq. H1-1b	26	3.840	17.000	5.700	14.200
342	HSST6X3X0	HSST6X3X0	0.055	1.000	0.055	Eq. H1-1b	27	3.840	17.000	5.700	14.200
343	HSST6X3X0	HSST6X3X0	0.056	1.000	0.056	Eq. H1-1b	22	3.840	17.000	5.700	14.200
344	HSST6X3X0	HSST6X3X0	0.056	1.000	0.056	Eq. H1-1b	27	3.840	17.000	5.700	14.200
345	HSST6X3X0	HSST6X3X0	0.056	1.000	0.056	Eq. H1-1b	22	3.840	17.000	5.700	14.200
346	HSST2X2X0	HSST2X2X0	0.139	1.000	0.139	Eq. Sec. D2	8	0.840	0.486	0.486	0.796
347	HSST2X2X0	HSST2X2X0	0.328	1.000	0.328	Eq. H1-1a	23	0.840	0.486	0.486	0.796
348	HSST2X2X0	HSST2X2X0	0.328	1.000	0.328	Eq. H1-1a	22	0.840	0.486	0.486	0.796
349	HSST2X2X0	HSST2X2X0	0.140	1.000	0.140	Eq. Sec. D2	7	0.840	0.486	0.486	0.796
350	HSST2X2X0	HSST2X2X0	0.139	1.000	0.139	Eq. Sec. D2	8	0.840	0.486	0.486	0.796
351	HSST2X2X0	HSST2X2X0	0.328	1.000	0.328	Eq. H1-1a	23	0.840	0.486	0.486	0.796
352	HSST2X2X0	HSST2X2X0	0.328	1.000	0.328	Eq. H1-1a	22	0.840	0.486	0.486	0.796
353	HSST2X2X0	HSST2X2X0	0.139	1.000	0.139	Eq. Sec. D2	7	0.840	0.486	0.486	0.796
354	HSST2X2X0	HSST2X2X0	0.117	1.000	0.117	Eq. Sec. D2	8	0.840	0.486	0.486	0.796
355	HSST2X2X0	HSST2X2X0	0.296	1.000	0.296	Eq. H1-1a	27	0.840	0.486	0.486	0.796
356	HSST2X2X0	HSST2X2X0	0.332	1.000	0.332	Eq. H1-1a	26	0.840	0.486	0.486	0.796
357	HSST2X2X0	HSST2X2X0	0.119	1.000	0.119	Eq. Sec. D2	7	0.840	0.486	0.486	0.796
358	HSST2X2X0	HSST2X2X0	0.141	1.000	0.141	Sec. E1	23	0.840	0.486	0.486	0.796
359	HSST2X2X0	HSST2X2X0	0.297	1.000	0.297	Eq. H1-1a	26	0.840	0.486	0.486	0.796
360	HSST2X2X0	HSST2X2X0	0.141	1.000	0.141	Sec. E1	22	0.840	0.486	0.486	0.796
361	HSST2X2X0	HSST2X2X0	0.294	1.000	0.294	Eq. H1-1a	27	0.840	0.486	0.486	0.796
362	HSST2X2X0	HSST2X2X0	0.308	1.000	0.308	Eq. H1-1a	22	0.840	0.486	0.486	0.796
363	HSST2X2X0	HSST2X2X0	0.132	1.000	0.132	Eq. Sec. D2	7	0.840	0.486	0.486	0.796



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Job No

50114615

Sheet No

49

Rev

Part

Job Title West Hartford Relo CT

Ref

By SMS

Date 31-Oct-19

Chd SA

Client Verizon

File Clock Tower (Composite I

Date/Time 08-Nov-2019 11:54

**Utilization Ratio Cont...**

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
			Ratio	Ratio							
364	HSST2X2X0	HSST2X2X0	0.131	1.000	0.131	Eq. Sec. D2	8	0.840	0.486	0.486	0.796
365	HSST2X2X0	HSST2X2X0	0.307	1.000	0.307	Eq. H1-1a	23	0.840	0.486	0.486	0.796
366	HSST2X2X0	HSST2X2X0	0.308	1.000	0.308	Eq. H1-1a	22	0.840	0.486	0.486	0.796
367	HSST2X2X0	HSST2X2X0	0.132	1.000	0.132	Eq. Sec. D2	7	0.840	0.486	0.486	0.796
368	HSST2X2X0	HSST2X2X0	0.307	1.000	0.307	Eq. H1-1a	23	0.840	0.486	0.486	0.796
369	HSST2X2X0	HSST2X2X0	0.131	1.000	0.131	Eq. Sec. D2	8	0.840	0.486	0.486	0.796
370	HSST6X6X0	HSST6X6X0	0.042	1.000	0.042	Sec. E1	30	5.240	28.600	28.600	45.600
371	HSST6X6X0	HSST6X6X0	0.033	1.000	0.033	Sec. E1	9	5.240	28.600	28.600	45.600
372	HSST6X6X0	HSST6X6X0	0.051	1.000	0.051	Sec. E1	22	5.240	28.600	28.600	45.600
373	HSST6X6X0	HSST6X6X0	0.033	1.000	0.033	Sec. E1	22	5.240	28.600	28.600	45.600
374	HSST6X6X0	HSST6X6X0	0.051	1.000	0.051	Sec. E1	22	5.240	28.600	28.600	45.600
375	HSST6X6X0	HSST6X6X0	0.033	1.000	0.033	Sec. E1	22	5.240	28.600	28.600	45.600
376	HSST6X6X0	HSST6X6X0	0.050	1.000	0.050	Sec. E1	23	5.240	28.600	28.600	45.600
377	HSST6X6X0	HSST6X6X0	0.033	1.000	0.033	Sec. E1	23	5.240	28.600	28.600	45.600
378	HSST6X3X0	HSST6X3X0	0.014	1.000	0.014	Eq. H1-1b	23	3.840	17.000	5.700	14.200
379	HSST6X3X0	HSST6X3X0	0.014	1.000	0.014	Eq. H1-1b	22	3.840	17.000	5.700	14.200
380	HSST6X3X0	HSST6X3X0	0.014	1.000	0.014	Eq. H1-1b	23	3.840	17.000	5.700	14.200
381	HSST6X3X0	HSST6X3X0	0.014	1.000	0.014	Eq. H1-1b	22	3.840	17.000	5.700	14.200
382	HSST2X2X0	HSST2X2X0	0.051	1.000	0.051	Sec. E1	31	0.840	0.486	0.486	0.796
383	HSST2X2X0	HSST2X2X0	0.109	1.000	0.109	Sec. E1	23	0.840	0.486	0.486	0.796
384	HSST2X2X0	HSST2X2X0	0.121	1.000	0.121	Sec. E1	22	0.840	0.486	0.486	0.796
385	HSST2X2X0	HSST2X2X0	0.051	1.000	0.051	Sec. E1	30	0.840	0.486	0.486	0.796
386	HSST2X2X0	HSST2X2X0	0.051	1.000	0.051	Sec. E1	30	0.840	0.486	0.486	0.796
387	HSST2X2X0	HSST2X2X0	0.110	1.000	0.110	Sec. E1	22	0.840	0.486	0.486	0.796
388	HSST2X2X0	HSST2X2X0	0.051	1.000	0.051	Sec. E1	31	0.840	0.486	0.486	0.796
389	HSST2X2X0	HSST2X2X0	0.108	1.000	0.108	Sec. E1	23	0.840	0.486	0.486	0.796
390	HSST2X2X0	HSST2X2X0	0.098	1.000	0.098	Sec. E1	22	0.840	0.486	0.486	0.796
391	HSST2X2X0	HSST2X2X0	0.049	1.000	0.049	Sec. E1	30	0.840	0.486	0.486	0.796
392	HSST2X2X0	HSST2X2X0	0.097	1.000	0.097	Sec. E1	23	0.840	0.486	0.486	0.796
393	HSST2X2X0	HSST2X2X0	0.048	1.000	0.048	Sec. E1	31	0.840	0.486	0.486	0.796
394	HSST2X2X0	HSST2X2X0	0.048	1.000	0.048	Sec. E1	30	0.840	0.486	0.486	0.796
395	HSST2X2X0	HSST2X2X0	0.098	1.000	0.098	Sec. E1	22	0.840	0.486	0.486	0.796
396	HSST2X2X0	HSST2X2X0	0.097	1.000	0.097	Sec. E1	23	0.840	0.486	0.486	0.796
397	HSST2X2X0	HSST2X2X0	0.048	1.000	0.048	Sec. E1	31	0.840	0.486	0.486	0.796
398	HSST6X3X0	HSST6X3X0	0.006	1.000	0.006	Eq. H1-1b	22	3.840	17.000	5.700	14.200
399	HSST6X3X0	HSST6X3X0	0.005	1.000	0.005	Eq. H1-1b	23	3.840	17.000	5.700	14.200
400	HSST6X3X0	HSST6X3X0	0.006	1.000	0.006	Eq. H1-1b	22	3.840	17.000	5.700	14.200
401	HSST6X3X0	HSST6X3X0	0.006	1.000	0.006	Eq. H1-1b	23	3.840	17.000	5.700	14.200
402	HSST2X2X0	HSST2X2X0	0.049	1.000	0.049	Sec. E1	23	0.840	0.486	0.486	0.796
403	HSST2X2X0	HSST2X2X0	0.032	1.000	0.032	Sec. E1	31	0.840	0.486	0.486	0.796
404	HSST2X2X0	HSST2X2X0	0.049	1.000	0.049	Sec. E1	22	0.840	0.486	0.486	0.796
405	HSST2X2X0	HSST2X2X0	0.032	1.000	0.032	Sec. E1	30	0.840	0.486	0.486	0.796
406	HSST2X2X0	HSST2X2X0	0.032	1.000	0.032	Sec. E1	31	0.840	0.486	0.486	0.796
407	HSST2X2X0	HSST2X2X0	0.049	1.000	0.049	Sec. E1	23	0.840	0.486	0.486	0.796
408	HSST2X2X0	HSST2X2X0	0.032	1.000	0.032	Sec. E1	30	0.840	0.486	0.486	0.796



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Job No <b>50114615</b>	Sheet No <b>50</b>	Rev
Part		
Ref		
By SMS	Date 31-Oct-19	Chd SA
Client Verizon	File Clock Tower (Composite)	Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

**Utilization Ratio Cont...**

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
			Ratio	Ratio							
409	HSST2X2X0	HSST2X2X0	0.049	1.000	0.049	Sec. E1	22	0.840	0.486	0.486	0.796
410	HSST2X2X0	HSST2X2X0	0.032	1.000	0.032	Sec. E1	30	0.840	0.486	0.486	0.796
411	HSST2X2X0	HSST2X2X0	0.047	1.000	0.047	Sec. E1	22	0.840	0.486	0.486	0.796
412	HSST2X2X0	HSST2X2X0	0.032	1.000	0.032	Sec. E1	31	0.840	0.486	0.486	0.796
413	HSST2X2X0	HSST2X2X0	0.047	1.000	0.047	Sec. E1	23	0.840	0.486	0.486	0.796
414	HSST2X2X0	HSST2X2X0	0.047	1.000	0.047	Sec. E1	22	0.840	0.486	0.486	0.796
415	HSST2X2X0	HSST2X2X0	0.032	1.000	0.032	Sec. E1	30	0.840	0.486	0.486	0.796
416	HSST2X2X0	HSST2X2X0	0.047	1.000	0.047	Sec. E1	23	0.840	0.486	0.486	0.796
418	HSST2X2X0	HSST2X2X0	0.032	1.000	0.032	Sec. E1	31	0.840	0.486	0.486	0.796
419	HSST6X6X0	HSST6X6X0	0.019	1.000	0.019	Sec. E1	9	5.240	28.600	28.600	45.600
421	HSST6X6X0	HSST6X6X0	0.019	1.000	0.019	Sec. E1	9	5.240	28.600	28.600	45.600
423	HSST6X6X0	HSST6X6X0	0.019	1.000	0.019	Sec. E1	9	5.240	28.600	28.600	45.600
425	HSST6X6X0	HSST6X6X0	0.019	1.000	0.019	Sec. E1	9	5.240	28.600	28.600	45.600
427	HSST6X3X0	HSST6X3X0	0.010	1.000	0.010	Eq. Sec. D2	9	3.840	17.000	5.700	14.200
428	HSST6X3X0	HSST6X3X0	0.010	1.000	0.010	Eq. Sec. D2	22	3.840	17.000	5.700	14.200
429	HSST6X3X0	HSST6X3X0	0.010	1.000	0.010	Eq. Sec. D2	23	3.840	17.000	5.700	14.200
430	HSST6X3X0	HSST6X3X0	0.010	1.000	0.010	Eq. Sec. D2	9	3.840	17.000	5.700	14.200
431	HSST2X2X0	HSST2X2X0	0.030	1.000	0.030	Sec. E1	23	0.840	0.486	0.486	0.796
432	HSST2X2X0	HSST2X2X0	0.026	1.000	0.026	Sec. E1	9	0.840	0.486	0.486	0.796
433	HSST2X2X0	HSST2X2X0	0.031	1.000	0.031	Sec. E1	22	0.840	0.486	0.486	0.796
434	HSST2X2X0	HSST2X2X0	0.026	1.000	0.026	Sec. E1	9	0.840	0.486	0.486	0.796
435	HSST2X2X0	HSST2X2X0	0.026	1.000	0.026	Sec. E1	9	0.840	0.486	0.486	0.796
436	HSST2X2X0	HSST2X2X0	0.030	1.000	0.030	Sec. E1	23	0.840	0.486	0.486	0.796
437	HSST2X2X0	HSST2X2X0	0.026	1.000	0.026	Sec. E1	9	0.840	0.486	0.486	0.796
438	HSST2X2X0	HSST2X2X0	0.031	1.000	0.031	Sec. E1	22	0.840	0.486	0.486	0.796
439	HSST4X4X0	HSST4X4X0	0.012	1.000	0.012	Eq. Sec. D2	9	3.370	7.800	7.800	12.800
440	HSST4X4X0	HSST4X4X0	0.012	1.000	0.012	Eq. Sec. D2	23	3.370	7.800	7.800	12.800
441	HSST4X4X0	HSST4X4X0	0.012	1.000	0.012	Eq. Sec. D2	9	3.370	7.800	7.800	12.800
442	HSST4X4X0	HSST4X4X0	0.012	1.000	0.012	Eq. Sec. D2	23	3.370	7.800	7.800	12.800
443	HSST4X4X0	HSST4X4X0	0.012	1.000	0.012	Eq. Sec. D2	22	3.370	7.800	7.800	12.800
444	HSST4X4X0	HSST4X4X0	0.012	1.000	0.012	Eq. Sec. D2	9	3.370	7.800	7.800	12.800
445	HSST4X4X0	HSST4X4X0	0.012	1.000	0.012	Eq. Sec. D2	9	3.370	7.800	7.800	12.800
446	HSST4X4X0	HSST4X4X0	0.012	1.000	0.012	Eq. Sec. D2	22	3.370	7.800	7.800	12.800
447	HSST6X3X0	HSST6X3X0	0.004	1.000	0.004	Sec. E1	23	3.840	17.000	5.700	14.200
448	HSST6X3X0	HSST6X3X0	0.003	1.000	0.003	Sec. E1	23	3.840	17.000	5.700	14.200
449	HSST6X3X0	HSST6X3X0	0.004	1.000	0.004	Sec. E1	22	3.840	17.000	5.700	14.200
450	HSST6X3X0	HSST6X3X0	0.003	1.000	0.003	Sec. E1	22	3.840	17.000	5.700	14.200
451	HSST2X2X0	HSST2X2X0	0.009	1.000	0.009	Eq. H1-1b	22	0.840	0.486	0.486	0.796
452	HSST2X2X0	HSST2X2X0	0.009	1.000	0.009	Eq. H1-1b	9	0.840	0.486	0.486	0.796
453	HSST2X2X0	HSST2X2X0	0.009	1.000	0.009	Eq. H1-1b	22	0.840	0.486	0.486	0.796
454	HSST2X2X0	HSST2X2X0	0.009	1.000	0.009	Eq. H1-1b	9	0.840	0.486	0.486	0.796
455	HSST2X2X0	HSST2X2X0	0.009	1.000	0.009	Eq. H1-1b	23	0.840	0.486	0.486	0.796
456	HSST2X2X0	HSST2X2X0	0.009	1.000	0.009	Eq. H1-1b	9	0.840	0.486	0.486	0.796
457	HSST2X2X0	HSST2X2X0	0.009	1.000	0.009	Eq. H1-1b	23	0.840	0.486	0.486	0.796
458	HSST2X2X0	HSST2X2X0	0.009	1.000	0.009	Eq. H1-1b	9	0.840	0.486	0.486	0.796



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Job No <b>50114615</b>	Sheet No <b>51</b>	Rev
Part		
Ref		
By SMS	Date 31-Oct-19	Chd SA
File Clock Tower (Composite)		Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

Client Verizon

**Utilization Ratio Cont...**

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
			Ratio	Ratio							
459	HSST4X4X0	HSST4X4X0	0.030	1.000	0.030	Sec. E1	30	3.370	7.800	7.800	12.800
460	HSST4X4X0	HSST4X4X0	0.080	1.000	0.080	Sec. E1	26	3.370	7.800	7.800	12.800
461	HSST4X4X0	HSST4X4X0	0.065	1.000	0.065	Sec. E1	27	3.370	7.800	7.800	12.800
462	HSST4X4X0	HSST4X4X0	0.053	1.000	0.053	Sec. E1	26	3.370	7.800	7.800	12.800
463	HSST4X4X0	HSST4X4X0	0.008	1.000	0.008	Sec. E1	31	3.370	7.800	7.800	12.800
464	HSST4X4X0	HSST4X4X0	0.051	1.000	0.051	Sec. E1	27	3.370	7.800	7.800	12.800
465	HSST4X4X0	HSST4X4X0	0.339	1.000	0.339	Eq. H1-1a	27	3.370	7.800	7.800	12.800
466	HSST4X4X0	HSST4X4X0	0.164	1.000	0.164	Sec. E1	12	3.370	7.800	7.800	12.800
467	HSST4X4X0	HSST4X4X0	0.066	1.000	0.066	Sec. E1	26	3.370	7.800	7.800	12.800
468	HSST4X4X0	HSST4X4X0	0.032	1.000	0.032	Sec. E1	30	3.370	7.800	7.800	12.800
469	HSST4X4X0	HSST4X4X0	0.011	1.000	0.011	Sec. E1	36	3.370	7.800	7.800	12.800
470	HSST4X4X0	HSST4X4X0	0.049	1.000	0.049	Sec. E1	26	3.370	7.800	7.800	12.800
471	HSST4X4X0	HSST4X4X0	0.009	1.000	0.009	Eq. Sec. D2	27	3.370	7.800	7.800	12.800
472	HSST4X4X0	HSST4X4X0	0.047	1.000	0.047	Sec. E1	27	3.370	7.800	7.800	12.800
473	HSST4X4X0	HSST4X4X0	0.018	1.000	0.018	Sec. E1	26	3.370	7.800	7.800	12.800
474	HSST4X4X0	HSST4X4X0	0.045	1.000	0.045	Sec. E1	27	3.370	7.800	7.800	12.800
475	HSST4X4X0	HSST4X4X0	0.013	1.000	0.013	Sec. E1	36	3.370	7.800	7.800	12.800
476	HSST4X4X0	HSST4X4X0	0.070	1.000	0.070	Sec. E1	26	3.370	7.800	7.800	12.800
477	HSST4X4X0	HSST4X4X0	0.094	1.000	0.094	Sec. E1	27	3.370	7.800	7.800	12.800
478	HSST4X4X0	HSST4X4X0	0.041	1.000	0.041	Sec. E1	26	3.370	7.800	7.800	12.800
479	HSST4X4X0	HSST4X4X0	0.075	1.000	0.075	Sec. E1	27	3.370	7.800	7.800	12.800
480	HSST4X4X0	HSST4X4X0	0.007	1.000	0.007	Eq. Sec. D2	23	3.370	7.800	7.800	12.800
483	C8X11	C8X11	0.026	1.000	0.026	Eq. H1-1b	10	3.370	32.500	1.310	0.121
484	C8X11	C8X11	0.028	1.000	0.028	Eq. H1-1b	22	3.370	32.500	1.310	0.121
485	C8X11	C8X11	0.028	1.000	0.028	Eq. H1-1b	23	3.370	32.500	1.310	0.121
486	C8X11	C8X11	0.028	1.000	0.028	Eq. H1-1b	23	3.370	32.500	1.310	0.121
487	HSST6X3X0	HSST6X3X0	0.035	1.000	0.035	Eq. H1-1b	8	3.840	17.000	5.700	14.200
488	HSST6X3X0	HSST6X3X0	0.035	1.000	0.035	Eq. H1-1b	7	3.840	17.000	5.700	14.200
489	HSST6X3X0	HSST6X3X0	0.056	1.000	0.056	Eq. H1-1b	23	3.840	17.000	5.700	14.200
490	HSST6X3X0	HSST6X3X0	0.057	1.000	0.057	Eq. H1-1b	22	3.840	17.000	5.700	14.200
491	C8X11	C8X11	0.020	1.000	0.020	Eq. H1-1b	22	3.370	32.500	1.310	0.121
492	HSST6X3X0	HSST6X3X0	0.014	1.000	0.014	Eq. H1-1b	22	3.840	17.000	5.700	14.200
493	C8X11	C8X11	0.029	1.000	0.029	Eq. H1-1b	22	3.370	32.500	1.310	0.121
494	HSST6X3X0	HSST6X3X0	0.014	1.000	0.014	Eq. H1-1b	22	3.840	17.000	5.700	14.200
495	C8X11	C8X11	0.019	1.000	0.019	Eq. H1-1b	23	3.370	32.500	1.310	0.121
496	HSST6X3X0	HSST6X3X0	0.014	1.000	0.014	Eq. H1-1b	23	3.840	17.000	5.700	14.200
497	C8X11	C8X11	0.029	1.000	0.029	Eq. H1-1b	23	3.370	32.500	1.310	0.121
498	HSST6X3X0	HSST6X3X0	0.014	1.000	0.014	Eq. H1-1b	23	3.840	17.000	5.700	14.200
499	C8X11	C8X11	0.020	1.000	0.020	Eq. H1-1b	23	3.370	32.500	1.310	0.121
500	C8X11	C8X11	0.020	1.000	0.020	Eq. H1-1b	23	3.370	32.500	1.310	0.121
501	C8X11	C8X11	0.018	1.000	0.018	Eq. H1-1b	10	3.370	32.500	1.310	0.121
502	C8X11	C8X11	0.020	1.000	0.020	Eq. H1-1b	22	3.370	32.500	1.310	0.121
503	HSST6X3X0	HSST6X3X0	0.029	1.000	0.029	Eq. H1-1b	22	3.840	17.000	5.700	14.200
504	C8X11	C8X11	0.013	1.000	0.013	Eq. H1-1b	23	3.370	32.500	1.310	0.121
505	HSST6X3X0	HSST6X3X0	0.012	1.000	0.012	Eq. H1-1b	12	3.840	17.000	5.700	14.200



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Part		
Ref		
By SMS	Date 31-Oct-19	Chd SA
File Clock Tower (Composite I	Date/Time 08-Nov-2019 11:54	

Job Title West Hartford Relo CT

Client Verizon

### Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
506	HSST6X3X0	HSST6X3X0	0.026	1.000	0.026	Eq. H1-1b	10	3.840	17.000	5.700	14.200
507	C8X11	C8X11	0.015	1.000	0.015	Eq. H1-1b	23	3.370	32.500	1.310	0.121
508	HSST6X3X0	HSST6X3X0	0.012	1.000	0.012	Eq. H1-1b	12	3.840	17.000	5.700	14.200
509	HSST6X3X0	HSST6X3X0	0.028	1.000	0.028	Eq. H1-1b	23	3.840	17.000	5.700	14.200
510	C8X11	C8X11	0.015	1.000	0.015	Eq. H1-1b	22	3.370	32.500	1.310	0.121
511	HSST6X3X0	HSST6X3X0	0.012	1.000	0.012	Eq. H1-1b	12	3.840	17.000	5.700	14.200
512	HSST6X3X0	HSST6X3X0	0.025	1.000	0.025	Eq. H1-1b	10	3.840	17.000	5.700	14.200
513	C8X11	C8X11	0.013	1.000	0.013	Eq. H1-1b	23	3.370	32.500	1.310	0.121
514	HSST6X3X0	HSST6X3X0	0.012	1.000	0.012	Eq. H1-1b	12	3.840	17.000	5.700	14.200
515	C8X11	C8X11	0.020	1.000	0.020	Sec. E1	22	3.370	32.500	1.310	0.121
516	C8X11	C8X11	0.020	1.000	0.020	Sec. E1	23	3.370	32.500	1.310	0.121
517	C8X11	C8X11	0.016	1.000	0.016	Sec. E1	9	3.370	32.500	1.310	0.121
518	C8X11	C8X11	0.020	1.000	0.020	Sec. E1	22	3.370	32.500	1.310	0.121
519	HSST6X3X0	HSST6X3X0	0.009	1.000	0.009	Eq. H1-1b	22	3.840	17.000	5.700	14.200
520	C8X11	C8X11	0.012	1.000	0.012	Eq. H1-1b	9	3.370	32.500	1.310	0.121
521	HSST6X3X0	HSST6X3X0	0.003	1.000	0.003	Eq. H1-1b	9	3.840	17.000	5.700	14.200
522	HSST6X3X0	HSST6X3X0	0.006	1.000	0.006	Eq. H1-2	9	3.840	17.000	5.700	14.200
523	C8X11	C8X11	0.013	1.000	0.013	Eq. H1-1b	23	3.370	32.500	1.310	0.121
524	HSST6X3X0	HSST6X3X0	0.003	1.000	0.003	Eq. H1-1b	9	3.840	17.000	5.700	14.200
525	HSST6X3X0	HSST6X3X0	0.009	1.000	0.009	Eq. H1-1b	23	3.840	17.000	5.700	14.200
526	C8X11	C8X11	0.013	1.000	0.013	Eq. H1-1b	22	3.370	32.500	1.310	0.121
527	HSST6X3X0	HSST6X3X0	0.003	1.000	0.003	Eq. H1-1b	9	3.840	17.000	5.700	14.200
528	HSST6X3X0	HSST6X3X0	0.006	1.000	0.006	Eq. H1-2	9	3.840	17.000	5.700	14.200
529	C8X11	C8X11	0.012	1.000	0.012	Eq. H1-1b	9	3.370	32.500	1.310	0.121
530	HSST6X3X0	HSST6X3X0	0.003	1.000	0.003	Eq. H1-1b	9	3.840	17.000	5.700	14.200
531	HSST4X4X0	HSST4X4X0	0.134	1.000	0.134	Sec. E1	26	3.370	7.800	7.800	12.800
532	HSST4X4X0	HSST4X4X0	0.050	1.000	0.050	Sec. E1	30	3.370	7.800	7.800	12.800
533	HSST4X4X0	HSST4X4X0	0.108	1.000	0.108	Sec. E1	27	3.370	7.800	7.800	12.800
534	HSST4X4X0	HSST4X4X0	0.071	1.000	0.071	Sec. E1	27	3.370	7.800	7.800	12.800
535	HSST4X4X0	HSST4X4X0	0.030	1.000	0.030	Sec. E1	31	3.370	7.800	7.800	12.800
536	HSST4X4X0	HSST4X4X0	0.080	1.000	0.080	Sec. E1	27	3.370	7.800	7.800	12.800
537	HSST4X4X0	HSST4X4X0	0.156	1.000	0.156	Sec. E1	27	3.370	7.800	7.800	12.800
538	HSST4X4X0	HSST4X4X0	0.077	1.000	0.077	Sec. E1	26	3.370	7.800	7.800	12.800
539	HSST4X4X0	HSST4X4X0	0.058	1.000	0.058	Sec. E1	30	3.370	7.800	7.800	12.800
540	HSST4X4X0	HSST4X4X0	0.132	1.000	0.132	Sec. E1	26	3.370	7.800	7.800	12.800
541	HSST4X4X0	HSST4X4X0	0.273	1.000	0.273	Eq. H1-1a	12	3.370	7.800	7.800	12.800
542	HSST4X4X0	HSST4X4X0	0.477	1.000	0.477	Eq. H1-1a	27	3.370	7.800	7.800	12.800
583	L60606	N/A						4.380	6.203	24.571	0.205
584	L60606	N/A						4.380	6.203	24.571	0.205
585	L60606	N/A						4.380	6.203	24.571	0.205
586	L60606	N/A						4.380	6.203	24.571	0.205
587	L60606	N/A						4.380	6.203	24.571	0.205
588	L60606	N/A						4.380	6.203	24.571	0.205
589	L60606	N/A						4.380	6.203	24.571	0.205
590	L60606	N/A						4.380	6.203	24.571	0.205



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Job No <b>50114615</b>	Sheet No <b>53</b>	Rev
Part		
Ref		
By SMS	Date 31-Oct-19	Chd SA
File Clock Tower (Composite)	Date/Time 08-Nov-2019 11:54	

Job Title West Hartford Relo CT

Client Verizon

### Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (in <sup>2</sup> )	Iz (in <sup>4</sup> )	Iy (in <sup>4</sup> )	Ix (in <sup>4</sup> )
			Ratio	Ratio							
591	W21X50	W21X50	0.242	1.000	0.242			32.311	2.78 E+3	4.39 E+3	3.09 E+3
592	W21X50	W21X50	0.243	1.000	0.243			32.311	2.78 E+3	4.39 E+3	3.09 E+3
593	W21X50	W21X50	0.157	1.000	0.157			32.311	2.78 E+3	4.39 E+3	3.09 E+3
594	W21X50	W21X50	0.158	1.000	0.158			32.311	2.78 E+3	4.39 E+3	3.09 E+3
595	W21X50	W21X50	0.295	1.000	0.295			32.311	2.78 E+3	4.39 E+3	3.09 E+3
596	W21X50	W21X50	0.294	1.000	0.294			32.311	2.78 E+3	4.39 E+3	3.09 E+3
597	W21X50	W21X50	0.168	1.000	0.168			23.121	2.18 E+3	501.993	1.55 E+3
598	W21X50	W21X50	0.170	1.000	0.170			23.121	2.18 E+3	501.990	1.55 E+3
599	L60606	N/A						4.380	6.203	24.571	0.205
600	L60606	N/A						4.380	6.203	24.571	0.205
601	L60606	N/A						4.380	6.203	24.571	0.205
602	L60606	N/A						4.380	6.203	24.571	0.205
603	L60606	N/A						4.380	6.203	24.571	0.205
604	L60606	N/A						4.380	6.203	24.571	0.205
605	L60606	N/A						4.380	6.203	24.571	0.205
606	L60606	N/A						4.380	6.203	24.571	0.205
631	W18X50	W18X50	0.104	1.000	0.104	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
632	W18X50	W18X50	0.225	1.000	0.225	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
633	W18X50	W18X50	0.225	1.000	0.225	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
634	W18X50	W18X50	0.105	1.000	0.105	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
635	W12X22	W12X22	0.032	1.000	0.032			23.920	704.953	4.24 E+3	1.66 E+3
636	W12X22	W12X22	0.050	1.000	0.050			23.920	704.953	4.24 E+3	1.66 E+3
637	W12X22	W12X22	0.032	1.000	0.032			23.920	704.952	4.24 E+3	1.66 E+3
638	W12X22	W12X22	0.050	1.000	0.050			23.920	704.952	4.24 E+3	1.66 E+3
639	W12X22	W12X22	0.032	1.000	0.032			23.920	704.952	4.24 E+3	1.66 E+3
640	W12X22	W12X22	0.050	1.000	0.050			23.920	704.952	4.24 E+3	1.66 E+3
641	W21X50	W21X50	0.221	1.000	0.221			32.311	2.78 E+3	4.39 E+3	3.09 E+3
642	W21X50	W21X50	0.222	1.000	0.222			32.311	2.78 E+3	4.39 E+3	3.09 E+3
643	W21X50	W21X50	0.115	1.000	0.115			23.121	2.18 E+3	501.996	1.55 E+3
644	W21X50	W21X50	0.116	1.000	0.116			23.121	2.18 E+3	501.994	1.55 E+3
645	W21X50	W21X50	0.182	1.000	0.182			32.311	2.78 E+3	4.39 E+3	3.09 E+3
646	W21X50	W21X50	0.182	1.000	0.182			32.311	2.78 E+3	4.39 E+3	3.09 E+3
647	W21X50	W21X50	0.114	1.000	0.114			23.121	2.18 E+3	501.993	1.55 E+3
648	W21X50	W21X50	0.115	1.000	0.115			23.121	2.18 E+3	501.990	1.55 E+3
653	W8X10	N/A						2.960	30.800	2.090	0.043
654	W8X10	N/A						2.960	30.800	2.090	0.043
655	W8X10	N/A						2.960	30.800	2.090	0.043
656	W8X10	N/A						2.960	30.800	2.090	0.043
657	W8X10	N/A						2.960	30.800	2.090	0.043
658	W8X10	N/A						11.680	194.944	531.838	535.752
659	W8X10	N/A						11.680	194.944	531.838	535.752
660	W8X10	N/A						2.960	30.800	2.090	0.043
661	W8X10	N/A						2.960	30.800	2.090	0.043
662	W8X10	N/A						2.960	30.800	2.090	0.043
663	W8X10	N/A						2.960	30.800	2.090	0.043



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Job No  
**50114615**Sheet No  
**54**

Rev

Part

Job Title West Hartford Relo CT

Ref

By SMS

Date 31-Oct-19

Chd SA

Client Verizon

File Clock Tower (Composite I)

Date/Time 08-Nov-2019 11:54

### Utilization Ratio Cont...

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

### Failed Members

There is no data of this type.

### Statics Check Results

L/C		FX (kip)	FY (kip)	FZ (kip)	MX (kip'in)	MY (kip'in)	MZ (kip'in)
1:EQ(X)	Loads	17.859	0.000	0.000	0.000	3.54 E+3	-8.97E+3
1:EQ(X)	Reactions	-17.859	-0.000	0.000	-0.000	-3.54E+3	8.97 E+3
	Difference	-0.000	-0.000	0.000	-0.000	0.000	0.000
2:EQ(Z)	Loads	0.000	0.000	17.859	8.97 E+3	-2.98E+3	0.000
2:EQ(Z)	Reactions	0.000	0.000	-17.859	-8.97E+3	2.98 E+3	0.000
	Difference	0.000	0.000	-0.000	0.000	0.000	0.000
3:DEAD	Loads	0.000	-552.871	0.000	106 E+3	0.000	-93.2E+3
3:DEAD	Reactions	-0.000	551.705	0.000	-106E+3	-0.000	93.2 E+3
	Difference	-0.000	-1.165	0.000	282.137	-0.000	-0.003
4:LIVE	Loads	0.000	-309.683	0.000	59.3 E+3	0.000	-55E+3
4:LIVE	Reactions	-0.000	309.232	0.000	-59.2E+3	-0.000	55 E+3
	Difference	-0.000	-0.451	0.000	92.405	-0.000	-0.003
5:SNOW	Loads	0.000	-23.785	0.000	4.41 E+3	0.000	-3.95E+3
5:SNOW	Reactions	-0.000	23.785	0.000	-4.41E+3	-0.000	3.95 E+3
	Difference	-0.000	0.000	0.000	0.000	-0.000	-0.000
6:LIVE ROOF	Loads	0.000	-15.857	0.000	2.94 E+3	0.000	-2.63E+3
6:LIVE ROOF	Reactions	-0.000	15.857	0.000	-2.94E+3	-0.000	2.63 E+3
	Difference	-0.000	0.000	0.000	0.000	-0.000	-0.000
7:WIND(X-)	Loads	71.853	0.643	1.512	419.627	13.8 E+3	-31.7E+3
7:WIND(X-)	Reactions	-71.853	-0.643	-1.512	-419.627	-13.8E+3	31.7 E+3
	Difference	-0.000	-0.000	0.000	-0.000	0.000	0.001
8:WIND(Z-)	Loads	0.000	0.643	67.494	30.7 E+3	-11.2E+3	106.758
8:WIND(Z-)	Reactions	0.000	-0.643	-67.494	-30.7E+3	11.2 E+3	-106.757
	Difference	0.000	0.000	-0.000	0.000	0.001	0.000



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Job No <b>50114615</b>	Sheet No <b>55</b>	Rev
Part		
Ref		
By SMS	Date 31-Oct-19	Chd SA
Client Verizon	File Clock Tower (Composite)	Date/Time 08-Nov-2019 11:54

Job Title West Hartford Relo CT

### Reaction Summary

	Node	L/C	Horizontal	Vertical	Horizontal	Moment		
			FX (kip)	FY (kip)	FZ (kip)	MX (kip'in)	MY (kip'in)	MZ (kip'in)
Max FX	1	12:1.2D+1.6L+1	<b>21.062</b>	96.605	15.364	201.464	-0.000	-279.567
Min FX	3	26:1.2D+1.0W(	<b>-26.690</b>	153.111	19.046	250.537	-0.000	358.696
Max FY	5	12:1.2D+1.6L+1	0.012	<b>236.101</b>	1.103	13.829	0.000	-6.639
Min FY	7	32:0.9D+1.0W(	-5.091	<b>7.449</b>	-2.666	-34.427	0.000	75.729
Max FZ	3	12:1.2D+1.6L+1	-19.965	149.869	<b>20.320</b>	267.565	0.000	265.752
Min FZ	9	27:1.2D+1.0W(	-16.306	148.554	<b>-27.153</b>	-357.361	0.000	216.707
Max MX	3	12:1.2D+1.6L+1	-19.965	149.869	20.320	<b>267.565</b>	0.000	265.752
Min MX	9	27:1.2D+1.0W(	-16.306	148.554	-27.153	<b>-357.361</b>	0.000	216.707
Max MY	4	26:1.2D+1.0W(	-5.443	49.767	1.376	18.320	<b>0.004</b>	338.257
Min MY	8	31:1.2D-1.0E(Z	1.247	85.821	-2.488	-36.192	<b>-0.001</b>	-15.351
Max MZ	3	26:1.2D+1.0W(	-26.690	153.111	19.046	250.537	-0.000	<b>358.696</b>
Min MZ	1	12:1.2D+1.6L+1	21.062	96.605	15.364	201.464	-0.000	<b>-279.567</b>





# Dewberry®

Dewberry Engineers Inc.

99 Summer St.  
Boston, MA 02110

Project  
West Hartford Relo CT

Section  
Concrete Column

Calc. by  
SMS

Date  
11/8/2019

Chk'd by  
SA

Date  
11/11/19

Job Ref.  
50114615

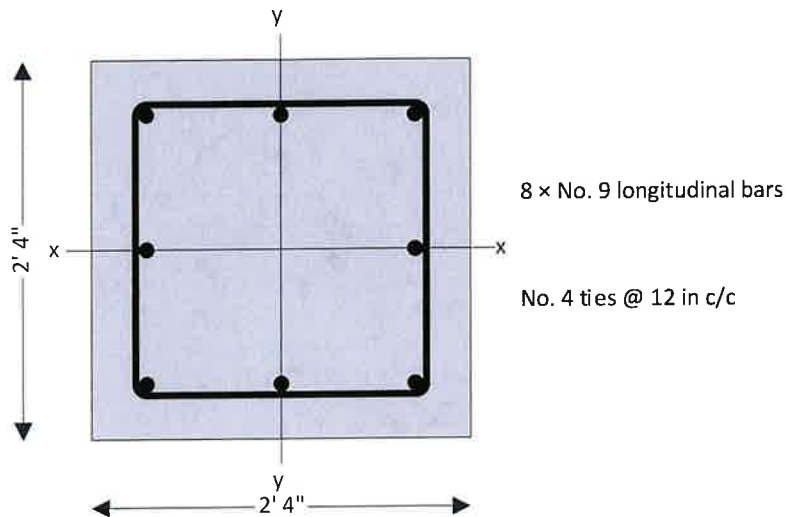
Sheet no./rev.  
1

App'd by

Date

## RC RECTANGULAR COLUMN DESIGN (ACI318-14)

Tedds calculation version 2.2.02



### Applied loads

Ultimate axial force acting on column	$P_{u\_aci} = 236.101$ kips
Ultimate moment about major (X) axis	$M_{ux\_aci} = 29.8$ kips_ft
Ultimate moment about minor (Y) axis	$M_{uy\_aci} = 29.89$ kips_ft
Contour beta factor	$\beta = 0.650$

### Geometry of column

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

### Check on overall column dimensions

**Column dimensions are OK -  $h < 4b$**

### Reinforcement of column

Numbers of bars of longitudinal steel	$N = 8$
Longitudinal steel bar diameter number	$D_{bar\_num} = 9$
Diameter of longitudinal bar	$D_{long} = 1.128$ in
Stirrup bar diameter number	$D_{stir\_num} = 4$
Diameter of stirrup bar	$D_{stir} = 0.500$ in
Specified yield strength of reinforcement	$f_y = 60000$ psi
Specified compressive strength of concrete	$f'_c = 3000$ psi
Modulus of elasticity of bar reinforcement	$E_s = 29 \times 10^6$ psi



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Modulus of elasticity of concrete

$$E_c = 57000 \times f'_c{}^{1/2} \times (1 \text{ psi})^{1/2} = \mathbf{3122019 \text{ psi}}$$

Yield strain

$$\epsilon_y = f_y / E_s = \mathbf{0.00207}$$

Ultimate design strain

$$\epsilon_c = \mathbf{0.003 \text{ in/in}}$$

### Check for minimum area of steel - 10.6.1.1

Gross area of column

$$A_g = h \times b = \mathbf{784.000 \text{ in}^2}$$

Area of steel

$$A_{st} = N \times (\pi \times D_{long}^2) / 4 = \mathbf{7.995 \text{ in}^2}$$

Minimum area of steel required

$$A_{st\_min} = 0.01 \times A_g = \mathbf{7.840 \text{ in}^2}$$

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

### Check for maximum area of steel - 10.6.1.1

Permissible maximum area of steel

$$A_{st\_max} = 0.08 \times A_g = \mathbf{62.720 \text{ in}^2}$$

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

### Slenderness check about x axis

Radius of gyration

$$r_x = 0.3 \times h = \mathbf{8.4 \text{ in}}$$

Actual slenderness ratio

$$S_{rx\_act} = k_x \times l_{ux} / r_x = \mathbf{9.75}$$

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

### Slenderness check about y axis

Radius of gyration

$$r_y = 0.3 \times b = \mathbf{8.4 \text{ in}}$$

Actual slenderness ratio

$$S_{ry\_act} = k_y \times l_{uy} / r_y = \mathbf{18}$$

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

### Axial load capacity of axially loaded column

Strength reduction factor

$$\phi = \mathbf{0.65}$$

Area of steel on compression face

$$A'_s = A_{st} / 2 = \mathbf{3.997 \text{ in}^2}$$

Area of steel on tension face

$$A_s = A_{st} / 2 = \mathbf{3.997 \text{ in}^2}$$

Net axial load capacity of column

$$P_n = 0.8 \times (0.85 \times f'_c \times (A_g - A_{st}) + f_y \times A_{st}) = \mathbf{1966.793 \text{ kips}}$$

Ultimate axial load capacity of column

$$P_u = \phi \times P_n = \mathbf{1278.415 \text{ kips}}$$

**PASS : Column is safe in axial loading**

### Net moments for biaxial column

Assuming strength reduction factor

$$\phi = \mathbf{0.65}$$

Net moment about major (X) axis

$$M_{nx} = M_{ux\_act} / \phi = \mathbf{45.85 \text{ kips\_ft}}$$

Net moment about minor (Y) axis

$$M_{ny} = M_{uy\_act} / \phi = \mathbf{45.98 \text{ kips\_ft}}$$

### Axial load capacity with zero moment

Nominal axial load capacity

$$P_{n0} = 0.85 \times f'_c \times (A_g - A_{st}) + A_{st} \times f_y = \mathbf{2458 \text{ kips}}$$

Strength reduction factor

$$\phi = \mathbf{0.650}$$

Ultimate axial load capacity

$$P_{u0} = \phi \times P_{n0} = \mathbf{1598 \text{ kips}}$$

Maximum nominal axial load capacity

$$P_{n,max} = 0.8 \times P_{n0} = \mathbf{1967 \text{ kips}}$$

Maximum ultimate axial load capacity

$$P_{u,max} = 0.8 \times P_{u0} = \mathbf{1278 \text{ kips}}$$

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


#### Moment of resistance of concrete

Depth to neutral axis

$$c_{x0} = \mathbf{27.7 \text{ in}}$$

Depth of equivalent rectangular stress block

$$a_{x0} = \min((\beta_1 \times c_{x0}), h) = \mathbf{24 \text{ in}}$$

 <b>Dewberry</b> Dewberry Engineers Inc. 99 Summer St. Boston, MA 02110	Project West Hartford Relo CT			Job Ref. 50114615	
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Concrete compression force	$P_{xcon0} = 0.85 \times f'_c \times b \times a_{x0} = 1678.7 \text{ kips}$
Concrete moment of resistance	$M_{xcon0} = P_{xcon0} \times (h / 2 - (a_{x0} / 2)) = 314.0 \text{ kip\_ft}$
<b>Moment of resistance of reinforcement</b>	
Strain in layer 1	$\epsilon_{x10} = \epsilon_c \times (1 - X_{x1} / C_{x0}) = 0.00256$
Stress in layer 1	$\sigma_{x10} = \min(f_y, E_s \times \epsilon_{x10}) - 0.85 \times f'_c = 57450.00 \text{ psi}$
Force carried by layer 1	$P_{x10} = N_x \times A_{bar} \times \sigma_{x10} = 172.234 \text{ kips}$
Moment carried by steel layer 1	$M_{x10} = P_{x10} \times ((h / 2) - X_{x1}) = 142.610 \text{ kip\_ft}$
Strain in layer 2	$\epsilon_{x20} = \epsilon_c \times (1 - X_{x2} / C_{x0}) = 0.00148$
Stress in layer 2	$\sigma_{x20} = \min(f_y, E_s \times \epsilon_{x20}) - 0.85 \times f'_c = 40414.96 \text{ psi}$
Force carried by layer 2	$P_{x20} = 2 \times A_{bar} \times \sigma_{x20} = 80.776 \text{ kips}$
Moment carried by steel layer 2	$M_{x20} = P_{x20} \times ((h / 2) - X_{x2}) = 0.000 \text{ kip\_ft}$
Strain in layer 3	$\epsilon_{x30} = \epsilon_c \times (1 - X_{x3} / C_{x0}) = 0.00040$
Stress in layer 3	$\sigma_{x30} = \min(f_y, E_s \times \epsilon_{x30}) = 11712.67 \text{ psi}$
Force carried by layer 3	$P_{x30} = N_x \times A_{bar} \times \sigma_{x30} = 35.114 \text{ kips}$
Moment carried by steel layer 3	$M_{x30} = P_{x30} \times ((h / 2) - X_{x3}) = -29.075 \text{ kip\_ft}$
<b>Combined axial load and moment resistance</b>	
Sum of forces	$P_{nx0} = 1966.8 \text{ kips}$
Sum of moments	$M_{ox0} = 427.5 \text{ kip\_ft}$
Strength reduction factor	$\phi_x = 0.650$
Ultimate axial load capacity	$P_{ux0} = \phi_x \times P_{nx0} = 1278.4 \text{ kips}$
Ultimate moment load capacity	$M_{uox0} = \phi_x \times M_{ox0} = 277.9 \text{ kip\_ft}$

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

<b>Moment of resistance of concrete</b>	
Depth to neutral axis	$C_{x1} = 23.9 \text{ in}$
Depth of equivalent rectangular stress block	$a_{x1} = \min((\beta_1 \times c_{x1}), h) = 20 \text{ in}$
Concrete compression force	$P_{xcon1} = 0.85 \times f'_c \times b \times a_{x1} = 1452.7 \text{ kips}$
Concrete moment of resistance	$M_{xcon1} = P_{xcon1} \times (h / 2 - (a_{x1} / 2)) = 463.3 \text{ kip\_ft}$
<b>Moment of resistance of reinforcement</b>	
Strain in layer 1	$\epsilon_{x11} = \epsilon_c \times (1 - X_{x1} / C_{x1}) = 0.00249$
Stress in layer 1	$\sigma_{x11} = \min(f_y, E_s \times \epsilon_{x11}) - 0.85 \times f'_c = 57450.00 \text{ psi}$
Force carried by layer 1	$P_{x11} = N_x \times A_{bar} \times \sigma_{x11} = 172.234 \text{ kips}$
Moment carried by steel layer 1	$M_{x11} = P_{x11} \times ((h / 2) - X_{x1}) = 142.610 \text{ kip\_ft}$
Strain in layer 2	$\epsilon_{x21} = \epsilon_c \times (1 - X_{x2} / C_{x1}) = 0.00125$
Stress in layer 2	$\sigma_{x21} = \min(f_y, E_s \times \epsilon_{x21}) - 0.85 \times f'_c = 33564.30 \text{ psi}$
Force carried by layer 2	$P_{x21} = 2 \times A_{bar} \times \sigma_{x21} = 67.084 \text{ kips}$
Moment carried by steel layer 2	$M_{x21} = P_{x21} \times ((h / 2) - X_{x2}) = 0.000 \text{ kip\_ft}$
Strain in layer 3	$\epsilon_{x31} = \epsilon_c \times (1 - X_{x3} / C_{x1}) = 0.00000$
Stress in layer 3	$\sigma_{x31} = \min(f_y, E_s \times \epsilon_{x31}) = 0.00 \text{ psi}$
Force carried by layer 3	$P_{x31} = N_x \times A_{bar} \times \sigma_{x31} = 0.000 \text{ kips}$
Moment carried by steel layer 3	$M_{x31} = P_{x31} \times ((h / 2) - X_{x3}) = 0.000 \text{ kip\_ft}$



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### Combined axial load and moment resistance

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

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

#### Moment of resistance of concrete

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

#### Moment of resistance of reinforcement

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

### Combined axial load and moment resistance

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

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

#### Moment of resistance of concrete

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

#### Moment of resistance of reinforcement

Strain in layer 1  $\epsilon_{x13} = \epsilon_c \times (1 - X_{x1} / C_{x3}) = 0.00214$   
 Stress in layer 1  $\sigma_{x13} = \min(f_y, E_s \times \epsilon_{x13}) - 0.85 \times f'_c = 57450.00$  psi  
 Force carried by layer 1  $P_{x13} = N_x \times A_{bar} \times \sigma_{x13} = 172.234$  kips



# Dewberry

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Project West Hartford Relo CT				Job Ref. 50114615	
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Moment carried by steel layer 1  $M_{x13} = P_{x13} \times ((h / 2) - x_{x1}) = 142.610 \text{kip\_ft}$   
 Strain in layer 2  $\epsilon_{x23} = \epsilon_c \times (1 - x_{x2} / c_{x3}) = 0.00004$   
 Stress in layer 2  $\sigma_{x23} = \min(f_y, E_s \times \epsilon_{x23}) = 1020.72 \text{psi}$   
 Force carried by layer 2  $P_{x23} = 2 \times A_{\text{bar}} \times \sigma_{x23} = 2.040 \text{kips}$   
 Moment carried by steel layer 2  $M_{x23} = P_{x23} \times ((h / 2) - x_{x2}) = 0.000 \text{kip\_ft}$   
 Strain in layer 3  $\epsilon_{x33} = \epsilon_c \times (1 - x_{x3} / c_{x3}) = -0.00207$   
 Stress in layer 3  $\sigma_{x33} = \max(-1 \times f_y, E_s \times \epsilon_{x33}) = -60000.00 \text{psi}$   
 Force carried by layer 3  $P_{x33} = N_x \times A_{\text{bar}} \times \sigma_{x33} = -179.879 \text{kips}$   
 Moment carried by steel layer 3  $M_{x33} = P_{x33} \times ((h / 2) - x_{x3}) = 148.940 \text{kip\_ft}$

### Combined axial load and moment resistance

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

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

#### Moment of resistance of concrete

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

#### Moment of resistance of reinforcement

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

### Combined axial load and moment resistance

Sum of forces  $P_{nx4} = 402.6 \text{kips}$   
 Sum of moments  $M_{ox4} = 723.2 \text{kip\_ft}$   
 Strength reduction factor  $\phi_x = 0.900$   
 Utilmate axial load capacity  $P_{ux4} = \phi_x \times P_{nx4} = 362.4 \text{kips}$   
 Utilmate moment load capacity  $M_{uox4} = \phi_x \times M_{ox4} = 650.8 \text{kip\_ft}$



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

#### Moment of resistance of concrete

Depth to neutral axis  $c_{x5} = 4.5\text{in}$   
 Depth of equivalent rectangular stress block  $a_{x5} = \min((\beta_1 \times c_{x5}), h) = 4\text{in}$   
 Concrete compression force  $P_{xcon5} = 0.85 \times f'_c \times b \times a_{x5} = 273.9\text{kips}$   
 Concrete moment of resistance  $M_{xcon5} = P_{xcon5} \times (h / 2 - (a_{x5} / 2)) = 275.7\text{kip\_ft}$

#### Moment of resistance of reinforcement

Strain in layer 1  $\epsilon_{x15} = \epsilon_c \times (1 - x_{x1} / c_{x5}) = 0.00030$   
 Stress in layer 1  $\sigma_{x15} = \min(f_y, E_s \times \epsilon_{x15}) = 8649.87\text{psi}$   
 Force carried by layer 1  $P_{x15} = N_x \times A_{bar} \times \sigma_{x15} = 25.932\text{kips}$   
 Moment carried by steel layer 1  $M_{x15} = P_{x15} \times ((h / 2) - x_{x1}) = 21.472\text{kip\_ft}$   
 Strain in layer 2  $\epsilon_{x25} = \epsilon_c \times (1 - x_{x2} / c_{x5}) = -0.00631$   
 Stress in layer 2  $\sigma_{x25} = \max(-1 \times f_y, E_s \times \epsilon_{x25}) = -60000.00\text{psi}$   
 Force carried by layer 2  $P_{x25} = 2 \times A_{bar} \times \sigma_{x25} = -119.919\text{kips}$   
 Moment carried by steel layer 2  $M_{x25} = P_{x25} \times ((h / 2) - x_{x2}) = 0.000\text{kip\_ft}$   
 Strain in layer 3  $\epsilon_{x35} = \epsilon_c \times (1 - x_{x3} / c_{x5}) = -0.01291$   
 Stress in layer 3  $\sigma_{x35} = \max(-1 \times f_y, E_s \times \epsilon_{x35}) = -60000.00\text{psi}$   
 Force carried by layer 3  $P_{x35} = N_x \times A_{bar} \times \sigma_{x35} = -179.879\text{kips}$   
 Moment carried by steel layer 3  $M_{x35} = P_{x35} \times ((h / 2) - x_{x3}) = 148.940\text{kip\_ft}$

#### Combined axial load and moment resistance

Sum of forces  $P_{nx5} = 0.0\text{kips}$   
 Sum of moments  $M_{ox5} = 446.2\text{kip\_ft}$   
 Strength reduction factor  $\phi_x = 0.900$   
 Ultimate axial load capacity  $P_{uox5} = \phi_x \times P_{nx5} = 0.0\text{kips}$   
 Ultimate moment load capacity  $M_{uox5} = \phi_x \times M_{ox5} = 401.5\text{kip\_ft}$

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

#### Moment of resistance of concrete

Depth to neutral axis  $c_{y0} = 27.7\text{in}$   
 Depth of equivalent rectangular stress block  $a_{y0} = \min((\beta_1 \times c_{y0}), b) = 24\text{in}$   
 Concrete compression force  $P_{ycon0} = 0.85 \times f'_c \times h \times a_{y0} = 1678.7\text{kips}$   
 Concrete moment of resistance  $M_{ycon0} = P_{ycon0} \times (b / 2 - (a_{y0} / 2)) = 314.0\text{kip\_ft}$

#### Moment of resistance of reinforcement

Strain in layer 1  $\epsilon_{y10} = \epsilon_c \times (1 - x_{y1} / c_{y0}) = 0.00256$   
 Stress in layer 1  $\sigma_{y10} = \min(f_y, E_s \times \epsilon_{y10}) - 0.85 \times f'_c = 57450.00\text{psi}$   
 Force carried by layer 1  $P_{y10} = N_y \times A_{bar} \times \sigma_{y10} = 172.234\text{kips}$   
 Moment carried by steel layer 1  $M_{y10} = P_{y10} \times ((b / 2) - x_{y1}) = 142.610\text{kip\_ft}$   
 Strain in layer 2  $\epsilon_{y20} = \epsilon_c \times (1 - x_{y2} / c_{y0}) = 0.00148$   
 Stress in layer 2  $\sigma_{y20} = \min(f_y, E_s \times \epsilon_{y20}) - 0.85 \times f'_c = 40414.96\text{psi}$   
 Force carried by layer 2  $P_{y20} = 2 \times A_{bar} \times \sigma_{y20} = 80.776\text{kips}$   
 Moment carried by steel layer 2  $M_{y20} = P_{y20} \times ((b / 2) - x_{y2}) = 0.000\text{kip\_ft}$   
 Strain in layer 3  $\epsilon_{y30} = \epsilon_c \times (1 - x_{y3} / c_{y0}) = 0.00040$



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Stress in layer 3

$$\sigma_{y30} = \min(f_y, E_s \times \epsilon_{y30}) = 11712.67 \text{psi}$$

Force carried by layer 3

$$P_{y30} = N_y \times A_{\text{bar}} \times \sigma_{y30} = 35.114 \text{kips}$$

Moment carried by steel layer 3

$$M_{y30} = P_{y30} \times ((b / 2) - x_{y3}) = -29.075 \text{kip\_ft}$$

### Combined axial load and moment resistance

Sum of forces

$$P_{ny0} = 1966.8 \text{kips}$$

Sum of moments

$$M_{oy0} = 427.5 \text{kip\_ft}$$

Strength reduction factor

$$\phi_y = 0.650$$

Ultimate axial load capacity

$$P_{uy0} = \phi_y \times P_{ny0} = 1278.4 \text{kips}$$

Ultimate moment load capacity

$$M_{uoy0} = \phi_y \times M_{oy0} = 277.9 \text{kip\_ft}$$

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

#### Moment of resistance of concrete

Depth to neutral axis

$$c_{y1} = 23.9 \text{in}$$

Depth of equivalent rectangular stress block

$$a_{y1} = \min((\beta_1 \times c_{y1}), b) = 20 \text{in}$$

Concrete compression force

$$P_{ycon1} = 0.85 \times f'_c \times h \times a_{y1} = 1452.7 \text{kips}$$

Concrete moment of resistance

$$M_{ycon1} = P_{ycon1} \times (b / 2 - (a_{y1} / 2)) = 463.3 \text{kip\_ft}$$

#### Moment of resistance of reinforcement

Strain in layer 1

$$\epsilon_{y11} = \epsilon_c \times (1 - x_{y1} / c_{y1}) = 0.00249$$

Stress in layer 1

$$\sigma_{y11} = \min(f_y, E_s \times \epsilon_{y11}) - 0.85 \times f'_c = 57450.00 \text{psi}$$

Force carried by layer 1

$$P_{y11} = N_y \times A_{\text{bar}} \times \sigma_{y11} = 172.234 \text{kips}$$

Moment carried by steel layer 1

$$M_{y11} = P_{y11} \times ((b / 2) - x_{y1}) = 142.610 \text{kip\_ft}$$

Strain in layer 2

$$\epsilon_{y21} = \epsilon_c \times (1 - x_{y2} / c_{y1}) = 0.00125$$

Stress in layer 2

$$\sigma_{y21} = \min(f_y, E_s \times \epsilon_{y21}) - 0.85 \times f'_c = 33564.30 \text{psi}$$

Force carried by layer 2

$$P_{y21} = 2 \times A_{\text{bar}} \times \sigma_{y21} = 67.084 \text{kips}$$

Moment carried by steel layer 2

$$M_{y21} = P_{y21} \times ((b / 2) - x_{y2}) = 0.000 \text{kip\_ft}$$

Strain in layer 3

$$\epsilon_{y31} = \epsilon_c \times (1 - x_{y3} / c_{y1}) = 0.00000$$

Stress in layer 3

$$\sigma_{y31} = \min(f_y, E_s \times \epsilon_{y31}) = 0.00 \text{psi}$$

Force carried by layer 3

$$P_{y31} = N_y \times A_{\text{bar}} \times \sigma_{y31} = 0.000 \text{kips}$$

Moment carried by steel layer 3

$$M_{y31} = P_{y31} \times ((b / 2) - x_{y3}) = 0.000 \text{kip\_ft}$$

### Combined axial load and moment resistance

Sum of forces

$$P_{ny1} = 1692.0 \text{kips}$$

Sum of moments

$$M_{oy1} = 605.9 \text{kip\_ft}$$

Strength reduction factor

$$\phi_y = 0.650$$

Ultimate axial load capacity

$$P_{uy1} = \phi_y \times P_{ny1} = 1099.8 \text{kips}$$

Ultimate moment load capacity

$$M_{uoy1} = \phi_y \times M_{oy1} = 393.8 \text{kip\_ft}$$

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

#### Moment of resistance of concrete

Depth to neutral axis

$$c_{y2} = 17.8 \text{in}$$

Depth of equivalent rectangular stress block

$$a_{y2} = \min((\beta_1 \times c_{y2}), b) = 15 \text{in}$$

Concrete compression force

$$P_{ycon2} = 0.85 \times f'_c \times h \times a_{y2} = 1080.2 \text{kips}$$

Concrete moment of resistance

$$M_{ycon2} = P_{ycon2} \times (b / 2 - (a_{y2} / 2)) = 579.3 \text{kip\_ft}$$



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### Moment of resistance of reinforcement

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

### Combined axial load and moment resistance

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

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

#### Moment of resistance of concrete

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

#### Moment of resistance of reinforcement

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

### Combined axial load and moment resistance

Sum of forces	$P_{ny3} = \mathbf{854.1kips}$
Sum of moments	$M_{oy3} = \mathbf{863.2kip\_ft}$





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Strength reduction factor  $\phi_y = 0.650$   
 Ultimate axial load capacity  $P_{uy3} = \phi_y \times P_{ny3} = 555.2 \text{ kips}$   
 Ultimate moment load capacity  $M_{uoy3} = \phi_y \times M_{oy3} = 561.1 \text{ kip\_ft}$

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

#### Moment of resistance of concrete

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

#### Moment of resistance of reinforcement

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

#### Combined axial load and moment resistance

Sum of forces  $P_{ny4} = 402.6 \text{ kips}$   
 Sum of moments  $M_{oy4} = 723.2 \text{ kip\_ft}$   
 Strength reduction factor  $\phi_y = 0.900$   
 Ultimate axial load capacity  $P_{uy4} = \phi_y \times P_{ny4} = 362.4 \text{ kips}$   
 Ultimate moment load capacity  $M_{uoy4} = \phi_y \times M_{oy4} = 650.8 \text{ kip\_ft}$

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

#### Moment of resistance of concrete

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

#### Moment of resistance of reinforcement

Strain in layer 1  $\epsilon_{y15} = \epsilon_c \times (1 - x_{y1} / c_{y5}) = 0.00030$   
 Stress in layer 1  $\sigma_{y15} = \min(f_y, E_s \times \epsilon_{y15}) = 8649.87 \text{ psi}$   
 Force carried by layer 1  $P_{y15} = N_y \times A_{bar} \times \sigma_{y15} = 25.932 \text{ kips}$   
 Moment carried by steel layer 1  $M_{y15} = P_{y15} \times ((b / 2) - x_{y1}) = 21.472 \text{ kip\_ft}$   
 Strain in layer 2  $\epsilon_{y25} = \epsilon_c \times (1 - x_{y2} / c_{y5}) = -0.00631$   
 Stress in layer 2  $\sigma_{y25} = \max(-1 \times f_y, E_s \times \epsilon_{y25}) = -60000.00 \text{ psi}$



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Force carried by layer 2

$$P_{y25} = 2 \times A_{bar} \times \sigma_{y25} = -119.919 \text{ kips}$$

Moment carried by steel layer 2

$$M_{y25} = P_{y25} \times ((b / 2) - x_{y2}) = 0.000 \text{ kip\_ft}$$

Strain in layer 3

$$\epsilon_{y35} = \epsilon_c \times (1 - x_{y3} / c_{y5}) = -0.01291$$

Stress in layer 3

$$\sigma_{y35} = \max(-1 \times f_y, E_s \times \epsilon_{y35}) = -60000.00 \text{ psi}$$

Force carried by layer 3

$$P_{y35} = N_y \times A_{bar} \times \sigma_{y35} = -179.879 \text{ kips}$$

Moment carried by steel layer 3

$$M_{y35} = P_{y35} \times ((b / 2) - x_{y3}) = 148.940 \text{ kip\_ft}$$

### Combined axial load and moment resistance

Sum of forces

$$P_{ny5} = 0.0 \text{ kips}$$

Sum of moments

$$M_{oy5} = 446.2 \text{ kip\_ft}$$

Strength reduction factor

$$\phi_y = 0.900$$

Ultimate axial load capacity

$$P_{uy5} = \phi_y \times P_{ny5} = 0.0 \text{ kips}$$

Ultimate moment load capacity

$$M_{uoy5} = \phi_y \times M_{oy5} = 401.5 \text{ kip\_ft}$$



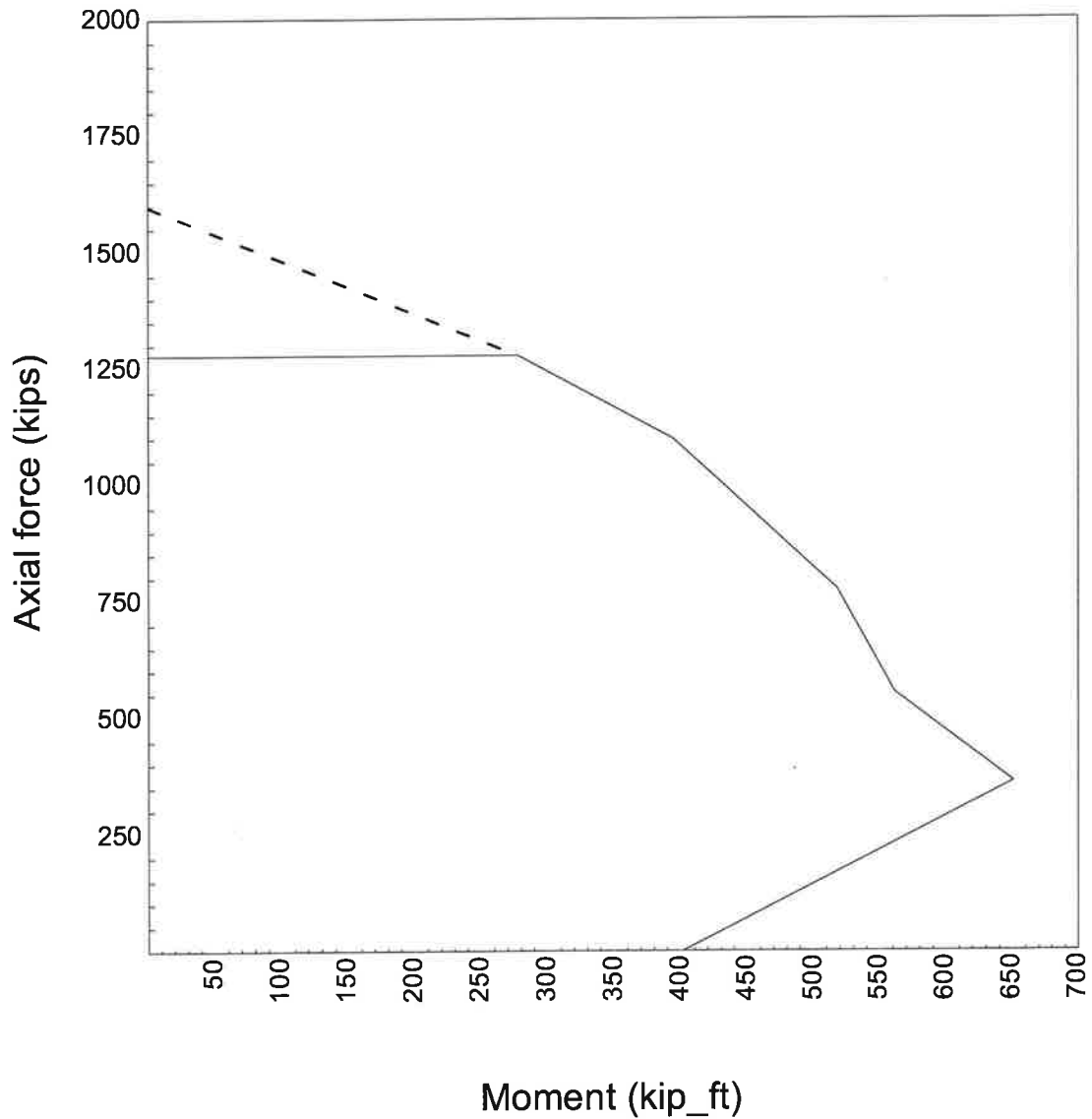
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Boston, MA 02110

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### Interaction diagram for bending about x axis

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





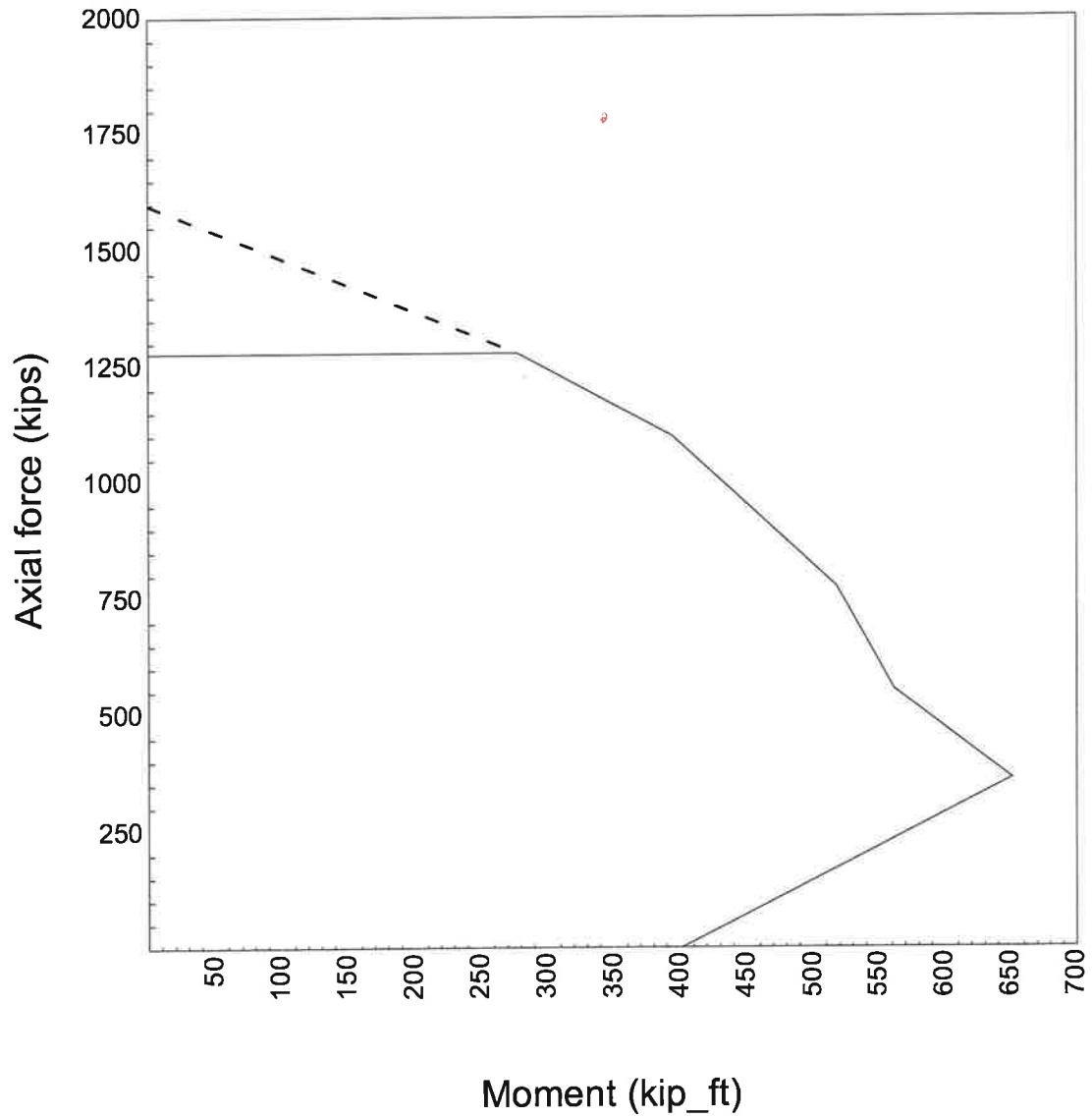
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### Interaction diagram for bending about y axis

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



matslab

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00      00  00  00  00  00  00  000000  000000  00
    00000  00  00  00      00  00  00  00  00      00000
          00  000000  00      00  00  00  00  00      00
0  00  00      00      00  00  00  00  00  0  0  00
    00000  00      00      00  00  00000  0  000  00000

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(TM)

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spMats v8.50 (TM)

A Computer Program for Analysis and Design of Foundation Mats, Combined Footings, and Slabs on Grade

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matslab

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A1 - GENERAL INFORMATION:

=====

Project : West Hartford Relo CT  
File : \\CAPECOD\Projects\50002925\50114615 - West Hartford Relo  
CT\Tech\Clock Tower\Additional Calcs\matslab.ma8  
Units : English Date : 11/8/2019  
Code : ACI 318-14 Time : 11:16:05 AM

Maximum number of iterations = 10  
Maximum allowed service displacement = 11 in  
Minimum ratio of soil contact area w.r.t. initial soil-supported area = 50.00  
%  
Minimum ratio of active spring/piles w.r.t. total number of spring/piles =  
0.00 %  
Displacement limit for uplift = 0 in  
Reinforcement is based on maximum moment within an element.

Number of nodes = 49  
Number of elements = 36

A2 - THICKNESS DEFINITIONS:

=====

Label	t (in)	Assigned
Mat30	30.00	Yes

A3 - SOIL DEFINITIONS:

matslab

```

=====
Label  Ks (kcf)    Qa (ksf)    Assigned
-----
Assumed      100        2.5        Yes
  
```

A4 - CONCRETE DEFINITIONS:

```

=====
Label  f'c (ksi)    Wc (pcf)    Ec (ksi)    v    Assigned
-----
C3      3            150        3320.6    0.200    Yes
  
```

A5 - REINFORCING STEEL DEFINITIONS:

```

=====
Label  Fy (ksi)    Es (ksi)    Assigned
-----
Gr60      60        29000        Yes
  
```

A6 - DESIGN PARAMETERS DEFINITIONS:

```

=====
Label  Top-X (in) Top-Y (in) Bot-X (in) Bot-Y (in) Min Reinf  Assigned
-----
Gr60#8  3.2500    3.7500    3.2500    3.7500    0.0900%    Yes
  
```

A7 - COLUMN DEFINITIONS:

```

=====
Label  Type        Dim X (in) Dim Y (in) Assigned
-----
C28X28 Rectangle  28.0000    28.0000    Yes
  
```

A10 - PILE DEFINITIONS:

```

=====
Label  Type        Kp (klf)    Material    E (ksi)    Soil        Assigned
-----
R36      Round        2738.7    Concrete    4286.8    Error: N/A    No
S30X30   Square        2570.1    Precast     4286.8    Error: N/A    No
1H8X36   H-Type1      273.29    Steel       29000     Error: N/A    No
2H8X36   H-Type2      273.29    Steel       29000     Error: N/A    No

Label  Length (ft) Embed.(in) Dim a (in) Dim b (in) Dim c (in) Dim d (in)
-----
R36      50.000    6.0000    36.0000
S30X30   50.000    6.0000    30.0000
1H8X36   50.000    6.0000    8.1550    0.4450    7.1300    0.4450
2H8X36   50.000    6.0000    8.1550    0.4450    7.1300    0.4450
  
```

A11 - CONCENTRATED LOAD DEFINITIONS:

```

=====
Label  Case        Pz (kips)    Mx (k-ft)    My (k-ft)
  
```

matslab

Assigned

	1	A - DEAD	-51.4510	8.7290	-11.0650
Yes	2	A - DEAD	-56.4540	0.2550	0.7480
Yes	3	A - DEAD	-71.2570	9.8090	10.1690
Yes	4	A - DEAD	-43.6160	0.9380	-0.0330
Yes	5	A - DEAD	-83.4610	0.4160	-0.1720
Yes	6	A - DEAD	-72.4080	0.8050	0.1130
Yes	7	A - DEAD	-48.6880	-8.5950	-7.3750
Yes	8	A - DEAD	-55.5840	-1.9580	-0.6660
Yes	9	A - DEAD	-68.7870	-10.4080	8.1800
Yes	1	B - LIVE	-21.0260	3.8100	-6.0790
Yes	2	B - LIVE	-27.9140	0.2520	-0.0210
Yes	3	B - LIVE	-39.2360	6.4270	6.0550
Yes	4	B - LIVE	-15.7960	0.4910	-0.1150
Yes	5	B - LIVE	-83.4380	0.4030	-0.2130
Yes	6	B - LIVE	-41.9190	0.4710	-0.0230
Yes	7	B - LIVE	-17.6650	-3.3870	-3.7330
Yes	8	B - LIVE	-25.7700	-1.6670	-0.6060
Yes	9	B - LIVE	-36.4610	-6.6670	4.6440
Yes	1	C - SNOW	-2.4440	0.4350	-0.5860
Yes	2	C - SNOW	-2.2570	0.0100	0.0440
Yes	3	C - SNOW	-3.1660	0.4870	0.5110
Yes	4	C - SNOW	-1.6390	0.0350	-0.0020
Yes	5	C - SNOW	-4.8950	0.0160	-0.0120



			matslab		
Yes	6	C - SNOW	-2.7760	0.0270	0.0040
Yes	7	C - SNOW	-1.8620	-0.3880	-0.3150
Yes	8	C - SNOW	-1.9870	-0.1180	-0.0240
Yes	9	C - SNOW	-2.7580	-0.5070	0.3580
Yes	1	D - WIND	22.3650	-2.6500	10.5410
Yes	2	D - WIND	6.4760	0.4460	9.5860
Yes	3	D - WIND	-26.7840	2.4370	11.3780
Yes	4	D - WIND	19.1880	-0.1070	28.3440
Yes	5	D - WIND	5.2510	0.0020	14.5560
Yes	6	D - WIND	-25.2190	-0.5730	15.0950
Yes	7	D - WIND	36.3710	4.8760	12.9480
Yes	8	D - WIND	9.0020	-0.3800	11.7980
Yes	9	D - WIND	-46.0060	-5.7280	14.7830
Yes	1	E - EQ	6.4410	-0.7730	2.6980
Yes	2	E - EQ	1.9510	0.0170	2.5790
Yes	3	E - EQ	-8.0390	0.7170	3.1490
Yes	4	E - EQ	5.3300	-0.0040	2.3300
Yes	5	E - EQ	1.1710	0.0240	2.5240
Yes	6	E - EQ	-7.2960	-0.0660	2.5680
Yes	7	E - EQ	10.4350	1.4420	3.5320
Yes	8	E - EQ	2.7950	0.0850	3.2850
Yes	9	E - EQ	-12.7880	-1.4370	4.1030

A12 - SURFACE LOAD DEFINITIONS:  
 =====

Label	Case	matslab Wz (psf)	Assigned
soil load	F - SOIL	-1207.0000	Yes
basement floor	A - DEAD	-77.0000	Yes
basement live	B - LIVE	-150.0000	Yes
wall	A - DEAD	-1575.0000	Yes

A13 - LOAD COMBINATIONS:

=====

Self weight is included under Case A.

Load Cases

	Case	A	B	C	D	E	F
	G						
	Case label	DEAD	LIVE	SNOW	WIND	EQ	
SOIL	N/A						
	Load defined	Yes	Yes	Yes	Yes	Yes	
Yes	No						
	Case	H	I	J	K	L	M
	N						
	Case label	N/A	N/A	N/A	N/A	N/A	
N/A	N/A						
	Load defined	No	No	No	No	No	
No	No						
	Case	O	P	Q	R	S	T
	U						
	Case label	N/A	N/A	N/A	N/A	N/A	
N/A	N/A						
	Load defined	No	No	No	No	No	
No	No						
	Case	V	W	X	Y	Z	
	Case label	N/A	N/A	N/A	N/A	N/A	
	Load defined	No	No	No	No	No	

Service Load Combinations (factors listed only for cases with defined loads)

	S1	1.0000 A	0.0000 B	0.0000 C	0.0000 D	0.0000 E
1.0000 F	-	-	-	-	-	-

matslab

-	-	-	-	-	-	-
0.6000 F	S2	1.0000 A	0.0000 B	0.0000 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S3	1.0000 A	1.0000 B	0.0000 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S4	1.0000 A	1.0000 B	0.0000 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S5	1.0000 A	0.0000 B	1.0000 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S6	1.0000 A	0.0000 B	1.0000 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S7	1.0000 A	0.7500 B	0.7500 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S8	1.0000 A	0.7500 B	0.7500 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-

matslab

-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S9	1.0000 A	0.0000 B	0.0000 C	0.6000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S10	1.0000 A	0.0000 B	0.0000 C	0.6000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S11	1.0000 A	0.0000 B	0.0000 C	-0.6000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S12	1.0000 A	0.0000 B	0.0000 C	-0.6000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S13	1.0000 A	0.0000 B	0.0000 C	0.0000 D	0.7000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S14	1.0000 A	0.0000 B	0.0000 C	0.0000 D	0.7000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S15	1.0000 A	0.0000 B	0.0000 C	0.0000 D	-0.7000 E

matslab

-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S16	1.0000 A	0.0000 B	0.0000 C	0.0000 D	-0.7000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S17	1.0000 A	0.7500 B	0.7500 C	0.4500 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S18	1.0000 A	0.7500 B	0.7500 C	0.4500 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S19	1.0000 A	0.7500 B	0.7500 C	-0.4500 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S20	1.0000 A	0.7500 B	0.7500 C	-0.4500 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S21	1.0000 A	0.7500 B	0.7500 C	0.0000 D	0.5250 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
	S22	1.0000 A	0.7500 B	0.7500 C	0.0000 D	0.5250 E

matslab

0.6000 F	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S23	1.0000 A	0.7500 B	0.7500 C	0.0000 D	-0.5250 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S24	1.0000 A	0.7500 B	0.7500 C	0.0000 D	-0.5250 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S25	0.6000 A	0.0000 B	0.0000 C	0.6000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S26	0.6000 A	0.0000 B	0.0000 C	0.6000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S27	0.6000 A	0.0000 B	0.0000 C	-0.6000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S28	0.6000 A	0.0000 B	0.0000 C	-0.6000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-

		matslab				
1.0000 F	S29	0.6000 A	0.0000 B	0.0000 C	0.0000 D	0.7000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S30	0.6000 A	0.0000 B	0.0000 C	0.0000 D	0.7000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.0000 F	S31	0.6000 A	0.0000 B	0.0000 C	0.0000 D	-0.7000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.6000 F	S32	0.6000 A	0.0000 B	0.0000 C	0.0000 D	-0.7000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Ultimate Load Combinations (factors listed only for cases with defined loads)

---

1.6000 F	U1	1.4000 A	0.0000 B	0.0000 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.9000 F	U2	1.4000 A	0.0000 B	0.0000 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
	U3	1.2000 A	1.6000 B	0.5000 C	0.0000 D	0.0000 E

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1.6000 F	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.9000 F	U4	1.2000 A	1.6000 B	0.5000 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.6000 F	U5	1.2000 A	1.0000 B	1.6000 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.9000 F	U6	1.2000 A	1.0000 B	1.6000 C	0.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.6000 F	U7	1.2000 A	0.0000 B	1.6000 C	0.5000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.9000 F	U8	1.2000 A	0.0000 B	1.6000 C	0.5000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.6000 F	U9	1.2000 A	0.0000 B	1.6000 C	-0.5000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-



		matslab				
0.9000 F	U10	1.2000 A	0.0000 B	1.6000 C	-0.5000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.6000 F	U11	1.2000 A	1.0000 B	0.5000 C	1.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.9000 F	U12	1.2000 A	1.0000 B	0.5000 C	1.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.6000 F	U13	1.2000 A	1.0000 B	0.5000 C	-1.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.9000 F	U14	1.2000 A	1.0000 B	0.5000 C	-1.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.6000 F	U15	0.9000 A	0.0000 B	0.0000 C	1.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.9000 F	U16	0.9000 A	0.0000 B	0.0000 C	1.0000 D	0.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

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		-	-	-	-	-
	U17	0.9000 A	0.0000 B	0.0000 C	-1.0000 D	0.0000 E
1.6000 F	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
	U18	0.9000 A	0.0000 B	0.0000 C	-1.0000 D	0.0000 E
0.9000 F	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
	U19	1.2000 A	1.0000 B	0.2000 C	0.0000 D	1.0000 E
1.6000 F	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
	U20	1.2000 A	1.0000 B	0.2000 C	0.0000 D	1.0000 E
0.9000 F	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
	U21	1.2000 A	1.0000 B	0.2000 C	0.0000 D	-1.0000 E
1.6000 F	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
	U22	1.2000 A	1.0000 B	0.2000 C	0.0000 D	-1.0000 E
0.9000 F	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
	U23	0.9000 A	0.0000 B	0.0000 C	0.0000 D	1.0000 E
1.6000 F	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

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0.9000 F	U24	0.9000 A	0.0000 B	0.0000 C	0.0000 D	1.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
1.6000 F	U25	0.9000 A	0.0000 B	0.0000 C	0.0000 D	-1.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
0.9000 F	U26	0.9000 A	0.0000 B	0.0000 C	0.0000 D	-1.0000 E
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

A14 - X-GRID LINE DEFINITIONS:

=====

No.	Coord. (ft)	No.	Coord. (ft)	No.	Coord. (ft)
1	0	2	1	3	2.167
4	12	5	30	6	31.167
7	32.167				

A15 - Y-GRID LINE DEFINITIONS:

=====

No.	Coord. (ft)	No.	Coord. (ft)	No.	Coord. (ft)
1	0	2	1	3	2.167
4	14.667	5	30	6	31.167
7	32.167				

A16 - NODAL DATA:

=====

Node	X (ft)	Y (ft)	Fixity	Spring	Column	Pile	Loaded?
1	0.000	0.000	-	-			

			matslab			
2	1.000	0.000	-	-		
3	2.167	0.000	-	-		
4	12.000	0.000	-	-		
5	30.000	0.000	-	-		
6	31.167	0.000	-	-		
7	32.167	0.000	-	-		
8	0.000	1.000	-	-		
9	1.000	1.000	-	-		
10	2.167	1.000	-	-		
11	12.000	1.000	-	-		
12	30.000	1.000	-	-		
13	31.167	1.000	-	-		
14	32.167	1.000	-	-		
15	0.000	2.167	-	-		
16	1.000	2.167	-	-		
17	2.167	2.167	-	-	C28X28	Yes
18	12.000	2.167	-	-	C28X28	Yes
19	30.000	2.167	-	-	C28X28	Yes
20	31.167	2.167	-	-		
21	32.167	2.167	-	-		
22	0.000	14.667	-	-		
23	1.000	14.667	-	-		
24	2.167	14.667	-	-	C28X28	Yes
25	12.000	14.667	-	-	C28X28	Yes

				matslab		
26	30.000	14.667	-	-	C28X28	Yes
27	31.167	14.667	-	-		
28	32.167	14.667	-	-		
29	0.000	30.000	-	-		
30	1.000	30.000	-	-		
31	2.167	30.000	-	-	C28X28	Yes
32	12.000	30.000	-	-	C28X28	Yes
33	30.000	30.000	-	-	C28X28	Yes
34	31.167	30.000	-	-		
35	32.167	30.000	-	-		
36	0.000	31.167	-	-		
37	1.000	31.167	-	-		
38	2.167	31.167	-	-		
39	12.000	31.167	-	-		
40	30.000	31.167	-	-		
41	31.167	31.167	-	-		
42	32.167	31.167	-	-		
43	0.000	32.167	-	-		
44	1.000	32.167	-	-		
45	2.167	32.167	-	-		
46	12.000	32.167	-	-		
47	30.000	32.167	-	-		
48	31.167	32.167	-	-		
49	32.167	32.167	-	-		

matslab

A17 - LOADED NODES:

```

=====
Node      Case A      Case B      Case C      Case D      Case E
Case F    Case G
-----
17        7          7          7          7          7
18        8          8          8          8          8
19        9          9          9          9          9
24        4          4          4          4          4
25        5          5          5          5          5
26        6          6          6          6          6
31        1          1          1          1          1
32        2          2          2          2          2
33        3          3          3          3          3

Node      Case H      Case I      Case J      Case K      Case L
Case M    Case N
-----

Node      Case O      Case P      Case Q      Case R      Case S
Case T    Case U
-----

Node      Case V      Case W      Case X      Case Y      Case Z
-----

```

A18 - SLAVED NODES ASSIGNMENTS:

```

=====
Node  Dz-Group  Rx-Group  Ry-Group
-----

```

A19 - ELEMENT GEOMETRY:

```

=====
Elem  i    j    k    l  X-Dim (ft)  Y-Dim (ft)  Thick.(in)

```

matslab

1	1	8	2	9	1.000	1.000	30.00
2	2	9	3	10	1.167	1.000	30.00
3	3	10	4	11	9.833	1.000	30.00
4	4	11	5	12	18.000	1.000	30.00
5	5	12	6	13	1.167	1.000	30.00
6	6	13	7	14	1.000	1.000	30.00
7	8	15	9	16	1.000	1.167	30.00
8	9	16	10	17	1.167	1.167	30.00
9	10	17	11	18	9.833	1.167	30.00
10	11	18	12	19	18.000	1.167	30.00
11	12	19	13	20	1.167	1.167	30.00
12	13	20	14	21	1.000	1.167	30.00
13	15	22	16	23	1.000	12.500	30.00
14	16	23	17	24	1.167	12.500	30.00
15	17	24	18	25	9.833	12.500	30.00
16	18	25	19	26	18.000	12.500	30.00
17	19	26	20	27	1.167	12.500	30.00
18	20	27	21	28	1.000	12.500	30.00
19	22	29	23	30	1.000	15.333	30.00
20	23	30	24	31	1.167	15.333	30.00
21	24	31	25	32	9.833	15.333	30.00
22	25	32	26	33	18.000	15.333	30.00
23	26	33	27	34	1.167	15.333	30.00
24	27	34	28	35	1.000	15.333	30.00
25	29	36	30	37	1.000	1.167	30.00
26	30	37	31	38	1.167	1.167	30.00
27	31	38	32	39	9.833	1.167	30.00
28	32	39	33	40	18.000	1.167	30.00
29	33	40	34	41	1.167	1.167	30.00
30	34	41	35	42	1.000	1.167	30.00
31	36	43	37	44	1.000	1.000	30.00
32	37	44	38	45	1.167	1.000	30.00
33	38	45	39	46	9.833	1.000	30.00
34	39	46	40	47	18.000	1.000	30.00
35	40	47	41	48	1.167	1.000	30.00
36	41	48	42	49	1.000	1.000	30.00

A20 - ELEMENT ASSIGNMENTS:

=====

Elem	Thick.	Concrete	Soil	Steel	DesParam	Loaded?
1	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
2	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
3	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
4	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
5	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
6	Mat30	C3	Assumed	Gr60	Gr60#8	Yes

matslab						
7	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
8	Mat30	C3	Assumed	Gr60	Gr60#8	
9	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
10	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
11	Mat30	C3	Assumed	Gr60	Gr60#8	
12	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
13	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
14	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
15	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
16	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
17	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
18	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
19	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
20	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
21	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
22	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
23	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
24	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
25	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
26	Mat30	C3	Assumed	Gr60	Gr60#8	
27	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
28	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
29	Mat30	C3	Assumed	Gr60	Gr60#8	
30	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
31	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
32	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
33	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
34	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
35	Mat30	C3	Assumed	Gr60	Gr60#8	Yes
36	Mat30	C3	Assumed	Gr60	Gr60#8	Yes

A21 - LOADED ELEMENTS:

=====						
Element	Case A	Case B	Case C	Case D	Case E	
Case F	Case G					
-----						
	1					
soil load						
	2					
soil load						
	3					
soil load						
	4					
soil load						
	5					
soil load						



matslab

6  
soil load  
7  
soil load  
9 wall  
10 wall  
12  
soil load  
13  
soil load  
14 wall  
15 basement flo basement liv  
16 basement flo basement liv  
17 wall  
18  
soil load  
19  
soil load  
20 wall  
21 basement flo basement liv  
22 basement flo basement liv  
23 wall  
24  
soil load  
25  
soil load  
27 wall  
28 wall  
30  
soil load  
31  
soil load  
32  
soil load  
33  
soil load

matslab

34  
soil load  
35  
soil load  
36  
soil load

Element	Case H	Case I	Case J	Case K	Case L
Case M	Case N				
Element	Case O	Case P	Case Q	Case R	Case S
Case T	Case U				
Element	Case V	Case W	Case X	Case Y	Case Z

C5a - ELEMENT TOP DESIGN MOMENT AND REINFORCEMENT:

Units --> Moment (kip-ft/ft), As (in<sup>2</sup>/ft)

Flags --> [m] Minimum controls. [x] Exceeds maximum. [\*] Cannot compute.

Elem	Node	Ld Comb.	Max. M(ux)	As(xx)	Node	Ld Comb.	Max. M(uy)	As(yy)
1	9	U15	8.17	0.324m	8	U15	7.86	0.324m
2	3	U15	17.17	0.324m	10	U15	8.64	0.324m
3	11	U1	30.23	0.324m	11	U11	8.98	0.324m
4	11	U17	7.57	0.324m	11	U11	3.97	0.324m
5	12	U17	20.69	0.324m	5	U13	12.89	0.324m
6	6	U17	11.76	0.324m	13	U17	12.67	0.324m
7	16	U15	7.97	0.324m	16	U15	14.64	0.324m
8	10	U15	15.09	0.324m	16	U15	16.08	0.324m
9	11	U1	32.96	0.324m	18	U11	13.45	0.324m
10	18	U9	10.83	0.324m	18	U11	8.87	0.324m
11	12	U17	24.04	0.324m	20	U17	20.45	0.324m
12	20	U17	10.62	0.324m	21	U17	19.20	0.324m
13	23	U11	5.44	0.324m	22	U13	24.68	0.324m
14	24	U3	10.06	0.324m	23	U13	24.48	0.324m
15	18	U1	30.90	0.324m	24	U13	22.38	0.324m
16	25	U17	13.82	0.324m	26	U11	21.30	0.324m
17	19	U17	13.28	0.324m	27	U11	25.09	0.324m
18	20	U17	6.85	0.324m	28	U11	25.42	0.324m
19	23	U11	3.78	0.324m	23	U17	16.22	0.324m
20	24	U3	8.85	0.324m	24	U9	16.39	0.324m
21	32	U1	31.56	0.324m	24	U17	16.82	0.324m

matslab									
22	25	U17	16.69	0.324m	25	U17	16.99	0.324m	
23	33	U17	6.62	0.324m	26	U11	17.20	0.324m	
24	28	U13	1.95	0.324m	27	U11	17.20	0.324m	
25	29	U17	8.76	0.324m	30	U17	11.41	0.324m	
26	38	U1	16.16	0.324m	30	U1	14.53	0.324m	
27	39	U13	34.25	0.324m	32	U3	9.78	0.324m	
28	32	U17	13.65	0.324m	32	U13	5.21	0.324m	
29	40	U1	24.93	0.324m	34	U1	20.38	0.324m	
30	41	U1	9.78	0.324m	34	U1	16.63	0.324m	
31	37	U1	8.64	0.324m	36	U1	6.84	0.324m	
32	45	U1	14.79	0.324m	38	U1	7.01	0.324m	
33	39	U13	31.96	0.324m	39	U3	6.27	0.324m	
34	39	U17	10.14	0.324m	46	U17	1.51	0.324m	
35	40	U1	19.27	0.324m	47	U1	11.39	0.324m	
36	41	U1	11.43	0.324m	41	U1	12.61	0.324m	

C5b - ELEMENT BOTTOM DESIGN MOMENT AND REINFORCEMENT:

=====

Units --> Moment (kip-ft/ft), As (in<sup>2</sup>/ft)

Flags --> [m] Minimum controls. [x] Exceeds maximum. [\*] Cannot compute.

Elem	Node	Ld	Comb.	Max. M(ux)	As(xx)	Node	Ld	Comb.	Max. M(uy)	As(yy)
1	1		U15	-2.03	0.324m	1		U15	-2.15	0.324m
2	9		U14	-0.95	0.324m	2		U15	-2.54	0.324m
3	3		U3	-14.06	0.324m	3		U11	-7.12	0.324m
4	12		U3	-32.95	0.324m	4		U11	-6.64	0.324m
5	5		U12	-5.94	0.324m	6		U13	-6.07	0.324m
6	7		U17	-3.16	0.324m	6		U13	-3.51	0.324m
7	8		U11	-3.58	0.324m	15		U14	-5.30	0.324m
8	17		U13	-11.08	0.324m	17		U13	-9.39	0.324m
9	10		U3	-16.15	0.324m	17		U13	-9.00	0.324m
10	12		U3	-37.78	0.324m	19		U11	-12.03	0.324m
11	19		U11	-11.71	0.324m	19		U11	-8.65	0.324m
12	14		U13	-3.42	0.324m	21		U12	-1.35	0.324m
13	16		U11	-5.66	0.324m	15		U13	-24.83	0.324m
14	17		U13	-12.16	0.324m	16		U13	-26.49	0.324m
15	17		U3	-15.89	0.324m	17		U13	-24.99	0.324m
16	19		U3	-35.84	0.324m	19		U3	-25.21	0.324m
17	19		U11	-11.85	0.324m	20		U11	-23.31	0.324m
18	21		U17	-6.86	0.324m	20		U11	-20.85	0.324m
19	30		U17	-5.28	0.324m	30		U13	-29.90	0.324m
20	31		U13	-13.01	0.324m	30		U13	-33.29	0.324m
21	31		U3	-15.14	0.324m	31		U3	-31.34	0.324m
22	33		U3	-34.66	0.324m	33		U3	-30.86	0.324m
23	33		U11	-12.75	0.324m	34		U3	-30.25	0.324m
24	34		U11	-5.67	0.324m	34		U3	-26.84	0.324m
25	36		U13	-4.76	0.324m	29		U4	-6.19	0.324m
26	31		U13	-10.67	0.324m	31		U13	-9.45	0.324m

matslab							
27	38	U1	-14.38	0.324m	31	U13	-8.61 0.324m
28	40	U3	-36.43	0.324m	33	U11	-12.09 0.324m
29	33	U11	-11.48	0.324m	33	U11	-9.17 0.324m
30	42	U11	-4.30	0.324m	35	U4	-1.46 0.324m
31	36	U1	-2.66	0.324m	43	U1	-2.10 0.324m
32	0	-	0.00	0.324m	44	U17	-1.91 0.324m
33	38	U3	-12.07	0.324m	45	U1	-6.17 0.324m
34	40	U3	-31.61	0.324m	40	U7	-4.95 0.324m
35	47	U4	-1.67	0.324m	48	U1	-5.27 0.324m
36	49	U1	-2.99	0.324m	48	U1	-3.35 0.324m

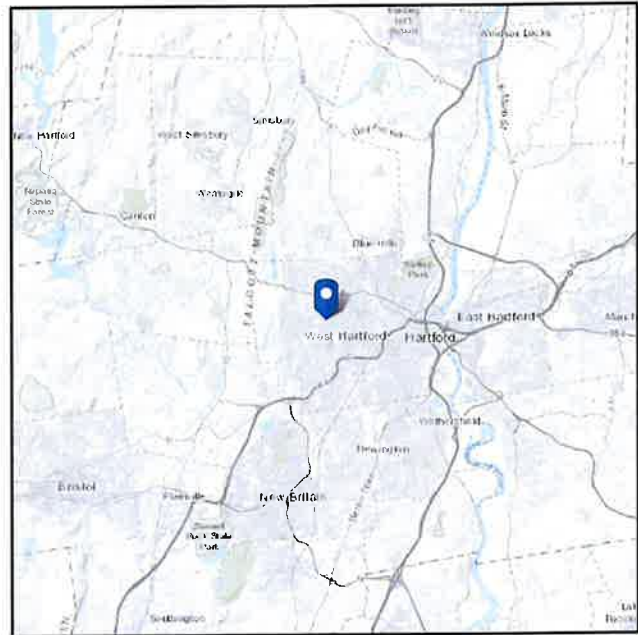
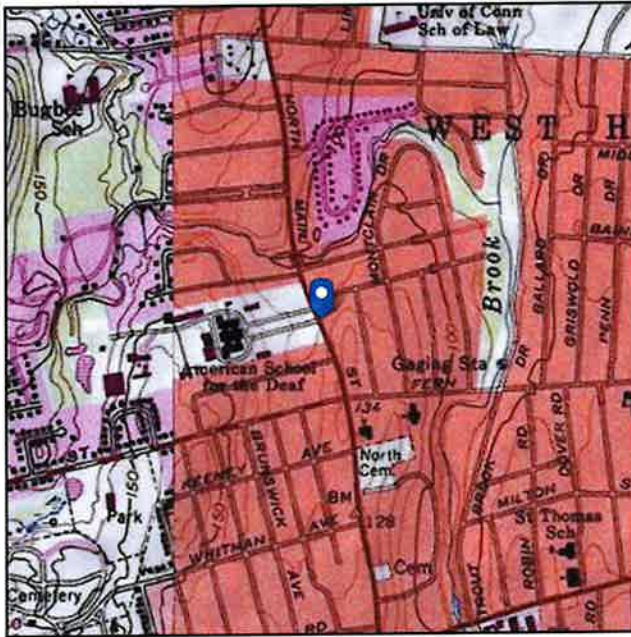


# ASCE 7 Hazards Report

**Address:**  
139 N Main St  
West Hartford, Connecticut  
06107

**Standard:** ASCE/SEI 7-10  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 107.29 ft (NAVD 88)  
**Latitude:** 41.771318  
**Longitude:** -72.743939

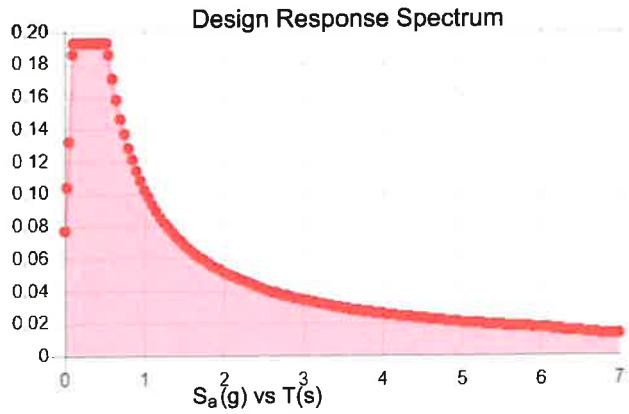
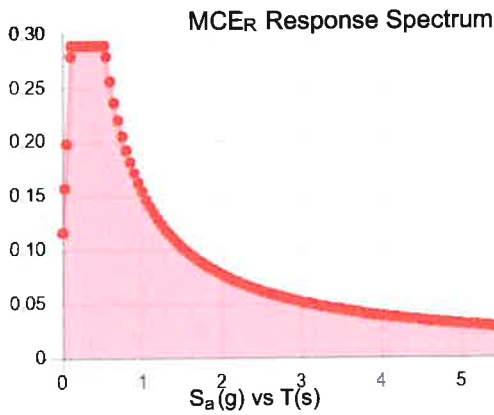


**Site Soil Class:** D - Stiff Soil

**Results:**

$S_S$ :	0.181	$S_{DS}$ :	0.193
$S_1$ :	0.064	$S_{D1}$ :	0.102
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.091
$S_{MS}$ :	0.289	PGA <sub>M</sub> :	0.146
$S_{M1}$ :	0.154	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Fri Nov 08 2019

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

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

- Brauer, Mark - mark.brauer2@verizonwireless.com - 07/31/2019 15:35:27

<b>Project Detail</b>		<b>Location Information</b>	
<b>Site Type</b>		<b>Siterra Site ID#</b>	W HARTFORD W CT RELO
<b>Carrier Aggregation</b>	false	<b>Site Name</b>	
<b>MPT Id</b>		<b>Siterra SR#</b>	
<b>eCIP-0</b>	false	<b>E-NodeB ID#</b>	068846
<b>Project Name</b>	MANUAL Modification ENTRY -	<b>PSLC#</b>	472708
<b>RFDS Project ID</b>	1499183	<b>Switch Name</b>	
<b>Project ID</b>	15626601	<b>Tower Owner</b>	
<b>Site Traker Project ID</b>		<b>Tower Type</b>	Other
<b>RFDS Project Scope</b>	PCS and 850 LTE add Keeping SBNHH antennas adding side by side brackets for 4Tx/Rx Samsung dual band RRHs  Updated 07/31/2019 per A&E for center lines and place holder antenna.	<b>Street Address</b>	139 North Main Street
		<b>City</b>	West Hartford
		<b>State</b>	CT
		<b>Zip Code</b>	06107
		<b>County</b>	Hartford
		<b>Latitude</b>	41.770621 / 41° 46' 14.2356" " N
		<b>Longitude</b>	-72.749599 / 72° 44' 58.5564" " W



## Antenna Summary

Added Antennas														
700 LTE	850 CDM A	850 LTE	1900 CDM A	1900 LTE	2100 LTE	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	QTY
Removed Antennas														
700 LTE	850 CDM A	850 LTE	1900 CDM A	1900 LTE	2100 LTE	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	QTY
Retained Antennas														
YES		YES		YES		ANDREW	SBNHH-1D65B_PORT 1 - 45 03DT_0725 (354020)	78	81	270(D3)	true	true	PHYSICA L	1
YES		YES		YES		ANDREW	SBNHH-1D65B_PORT 1 - 45 07DT_0725 (354028)	78	81	140(D2),40 (D1)	true	true	PHYSICA L	2
YES		YES			YES	ANDREW	SBNHH-1D65B_PORT 2 - 45 02DT_2130 (329416)	78	81	270(D3)	true	true	PHYSICA L	1
YES		YES			YES	ANDREW	SBNHH-1D65B_PORT 2 - 45 03DT_2130 (329418)	78	81	140(D2),40 (D1)	true	true	PHYSICA L	2
	YES					ANTEL	LPA-80063/6CF 2 (178374)	68.7	71.7	270(D3),14 0(D2),40(D 1)	false	false	PHYSICA L	6
						ANTEL	BXA-70063-6CF	68.7	71.7	270(D3),14 0(D2),40(D 1)	false	false	PHYSICA L	3

## Equipment Summary

Added Non Antennas													
Equipment Type	700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Location	Make	Model	Cable Length	Cable Size	Inst. Type	Quantity
Mount							Tower	Comscope	BSAMNT-SBS-1-2			PHYSICAL	3
RRU				YES	YES	YES	Tower	Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)			PHYSICAL	3
RRU	YES		YES				Tower	Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)			PHYSICAL	3
Removed Non Antennas													
Equipment Type	700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Location	Make	Model	Cable Length	Cable Size	Inst. Type	Quantity
RRU	YES						Tower	Nokia	UHBA B13 RRH 4x30			PHYSICAL	3
RRU						YES	Tower	Nokia	UHIE B66A RRH 4x45			PHYSICAL	3
Retained Non Antennas													
Equipment Type	700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Location	Make	Model	Cable Length	Cable Size	Inst. Type	Quantity
Coaxial Cables							Tower					PHYSICAL	6
Hybrid Cable							Tower					PHYSICAL	1
OVP Box							Tower					PHYSICAL	1

## Services

		700 MHZ LTE		
		Proposed Version:		
		0002		
Sector	D1	D2	D3	D3
Azimuth	40	140	270	270
Cell/ENode B ID	068846	068846	068846	068846
Antenna Model	SBNHH-1D65B_PORT 1 - 45 07DT 0725 (354028)	SBNHH-1D65B_PORT 1 - 45 07DT 0725 (354028)	SBNHH-1D65B_PORT 1 - 45 03DT 0725 (354020)	SBNHH-1D65B_PORT 1 - 45 03DT 0725 (354020)
Antenna Make	ANDREW	ANDREW	ANDREW	ANDREW
Centerline(Ft)	78	78	78	78
Mechanical DT(Deg.)	0	0	0	0
Electrical DT	7	7	3	3
Tip Height	81	81	81	81
TMA make				
TMA model				
RRU make	Nokia	Nokia	Nokia	Samsung
RRU model	UHBA B13 RRH 4x30	UHBA B13 RRH 4x30	UHBA B13 RRH 4x30	B5/B13 RRH-BR04C (RFV01U-D2A)
# of Tx, Rx Lines	2,4	2,4	2,4	4,4
Position				4,4

**2100 MHZ LTE**

		<b>Current Version:</b>			<b>Proposed Version:</b>		
		0000			0002		
Sector	D1	D2	D3	D1	D2	D3	
Azimuth	40	140	270	40	140	270	
Cell/ENode B ID	068846	068846	068846	068846	068846	068846	
Antenna Model	SBNHH-1D65B_PORT 2 - 45-03DT-2130 (329418)	SBNHH-1D65B_PORT 2 - 45-03DT-2130 (329418)	SBNHH-1D65B_PORT 2 - 45-02DT-2130 (329416)	SBNHH-1D65B_PORT 2 - 45-03DT-2130 (329418)	SBNHH-1D65B_PORT 2 - 45-03DT-2130 (329418)	SBNHH-1D65B_PORT 2 - 45-02DT-2130 (329416)	
Antenna Make	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	
Centerline(Ft)	78	78	78	78	78	78	
Mechanical DT(Deg.)	0	0	0	0	0	0	
Electrical DT	3	3	2	3	3	2	
Tip Height	81	81	81	81	81	81	
TMA make							
TMA model							
RRU make	Nokia	Nokia	Nokia	Samsung	Samsung	Samsung	
RRU model	UHIE B66A RRH 4x45	UHIE B66A RRH 4x45	UHIE B66A RRH 4x45	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	
# of Tx, Rx Lines	4,4	4,4	4,4	4,4	4,4	4,4	
Position							

		Proposed Version:		
		0002		
		D1	D2	D3
Sector		40	140	270
Azimuth		068846	068846	068846
Cell/ENode B ID		SBNHH-ID65B_PORT 2 - 45 03DT 1950 (329417)	SBNHH-ID65B_PORT 2 - 45 03DT 1950 (329417)	SBNHH-ID65B_PORT 2 - 45 02DT 1950 (329415)
Antenna Model		ANDREW	ANDREW	ANDREW
Antenna Make		78	78	78
Centerline(Ft)		0	0	0
Mechanical DT(Deg.)		3	3	2
Electrical DT		81	81	81
Tip Height				
TMA make				
TMA model				
RRU make		Samsung	Samsung	Samsung
RRU model		B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
# of Tx, Rx Lines		4,4	4,4	4,4
Position				

Current Version:

--

850 MHZ CDMA

		Current Version:			Proposed Version:		
		0000			0002		
Sector	D1	D2	D3	D1	D2	D3	
Azimuth	40	140	270	40	140	270	
Cell/ENode B ID							
Antenna Model	LPA-80063/6CF 2 (178374)	LPA-80063/6CF 2 (178374)	LPA-80063/6CF 2 (178374)	LPA-80063/6CF 2 (178374)	LPA-80063/6CF 2 (178374)	LPA-80063/6CF 2 (178374)	
Antenna Make	ANTEL	ANTEL	ANTEL	ANTEL	ANTEL	ANTEL	
Centerline(Ft)	68.7	68.7	68.7	68.7	68.7	68.7	
Mechanical DT(Deg.)	4	4	0	4	4	0	
Electrical DT	2	2	2	2	2	2	
Tip Height	71.7	71.7	71.7	71.7	71.7	71.7	
TMA make							
TMA model							
RRU make							
RRU model							
# of Tx, Rx Lines							
Position							

Current Version:

Proposed Version:

	0002		
	D1	D2	D3
Sector	40	140	270
Azimuth	068846	068846	068846
Cell/ENode B ID	SBNHH-ID65B PORT 1 - 45 07DT 0850 (354029)	SBNHH-ID65B PORT 1 - 45 07DT 0850 (354029)	SBNHH-ID65B PORT 1 - 45 03DT 0850 (354021)
Antenna Model	ANDREW	ANDREW	ANDREW
Antenna Make	78	78	78
Centerline(Ft)	0	0	0
Mechanical DT(Deg.)	7	7	3
Electrical DT	81	81	81
Tip Height			
TMA make			
TMA model			
RRU make	Samsung	Samsung	Samsung
RRU model	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
# of Tx, Rx Lines	4,4	4,4	4,4
Position			

**Service Comments**





D1	ANDRE W	SBNHH- 1D65B_PORT 1- 45_07DT_0725 (354028)	78ft/23.77 m	81ft/24.69 m	40	7	0	12.5 9	69.2 5	76.69	WQJQ689						
D2	ANDRE W	SBNHH- 1D65B_PORT 1- 45_07DT_0725 (354028)	78ft/23.77 m	81ft/24.69 m	140	7	0	12.5 9	69.2 5	76.69	WQJQ689						
D1	ANTEL	LPA- 80063/6CF 2 (178374)	68.7ft/20. 94m	71.7ft/21. 85m	40	2	4	14.5	65	349.95		KNKA40 4					
D1	ANTEL	LPA- 80063/6CF 2 (178374)	68.7ft/20. 94m	71.7ft/21. 85m	40	2	4	14.5	65	497.74		KNKA40 4					
D2	ANTEL	LPA- 80063/6CF 2 (178374)	68.7ft/20. 94m	71.7ft/21. 85m	140	2	4	14.5	65	497.74		KNKA40 4					
D2	ANTEL	LPA- 80063/6CF 2 (178374)	68.7ft/20. 94m	71.7ft/21. 85m	140	2	4	14.5	65	349.95		KNKA40 4					
D1	ANDRE W	SBNHH- 1D65B_PORT 1- 45_07DT_0850 (354029)	78ft/23.77 m	81ft/24.69 m	40	7	0	13.3 67	64.7 5	486.07		KNKA40 4					
D2	ANDRE W	SBNHH- 1D65B_PORT 1- 45_07DT_0850 (354029)	78ft/23.77 m	81ft/24.69 m	140	7	0	13.3 67	64.7 5	486.07		KNKA40 4					
D3	ANDRE W	SBNHH- 1D65B_PORT 1- 45_03DT_0850 (354021)	78ft/23.77 m	81ft/24.69 m	270	3	0	13.3 35	66	482.5		KNKA40 4					
D3	ANDRE W	SBNHH- 1D65B_PORT 2- 45_02DT_1950 (329415)	78ft/23.77 m	81ft/24.69 m	270	2	0	16.2 210 01	53	290.31			KNLH251 ,WPOJ73 0				

## Callsigns

Callsigns	Market	Radio Code	Market Number	Block	State	County	Licensee Name	Wholly Owned	Total MHz	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs/Sq Mi	Status	Project Action
<b>KNKA404</b>	<b>Hartford-New Britain-Bristol, CT</b>	<b>CL</b>	<b>CMA032</b>	<b>A</b>	<b>CT</b>	<b>Hartford</b>	<b>Cellco Partnership</b>	<b>Yes</b>	<b>25.000</b>	<b>824.000-835.000</b>	<b>869.000-880.000</b>	<b>845.000-846.500</b>	<b>890.000-891.500</b>	<b>349.95</b>	<b>500</b>	<b>1216.2</b>	<b>Active</b>	<b>Added</b>
<b>KNLH251</b>	<b>Hartford, CT</b>	<b>CW</b>	<b>BTA184</b>	<b>F</b>	<b>CT</b>	<b>Hartford</b>	<b>Cellco Partnership</b>	<b>Yes</b>	<b>10.000</b>	<b>1890.000-1895.000</b>	<b>1970.000-1975.000</b>	<b>.000-.000</b>	<b>.000-.000</b>	<b>290.31</b>	<b>1640</b>	<b>1216.2</b>	<b>Active</b>	<b>Added</b>
<b>WPLM398</b>	<b>Hartford, CT</b>	<b>LD</b>	<b>BTA184</b>	<b>B</b>	<b>CT</b>	<b>Hartford</b>	<b>Cellco Partnership</b>	<b>Yes</b>	<b>150.000</b>	<b>31000.000-31075.000</b>	<b>31225.000-31300.000</b>	<b>.000-.000</b>	<b>.000-.000</b>			<b>1216.2</b>	<b>Active</b>	
<b>WPOH943</b>	<b>Hartford, CT</b>	<b>LD</b>	<b>BTA184</b>	<b>A</b>	<b>CT</b>	<b>Hartford</b>	<b>Cellco Partnership</b>	<b>Yes</b>	<b>300.000</b>	<b>29100.000-29250.000</b>	<b>31075.000-31225.000</b>	<b>.000-.000</b>	<b>.000-.000</b>			<b>1216.2</b>	<b>Active</b>	
<b>WPOJ730</b>	<b>Hartford, CT</b>	<b>CW</b>	<b>BTA184</b>	<b>C</b>	<b>CT</b>	<b>Hartford</b>	<b>Cellco Partnership</b>	<b>Yes</b>	<b>15.000</b>	<b>1895.000-1902.500</b>	<b>1975.000-1982.500</b>	<b>.000-.000</b>	<b>.000-.000</b>	<b>290.31</b>	<b>1640</b>	<b>1216.2</b>	<b>Active</b>	<b>Added</b>
<b>WQGA906</b>	<b>New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-</b>	<b>AW</b>	<b>BEA010</b>	<b>B</b>	<b>CT</b>	<b>Hartford</b>	<b>Cellco Partnership</b>	<b>Yes</b>	<b>20.000</b>	<b>1720.000-1730.000</b>	<b>2120.000-2130.000</b>	<b>.000-.000</b>	<b>.000-.000</b>	<b>142.44</b>	<b>1640</b>	<b>1216.2</b>	<b>Active</b>	<b>Retained</b>
<b>WQGB276</b>	<b>Hartford-New Britain-Bristol, CT</b>	<b>AW</b>	<b>CMA032</b>	<b>A</b>	<b>CT</b>	<b>Hartford</b>	<b>Cellco Partnership</b>	<b>Yes</b>	<b>20.000</b>	<b>1710.000-1720.000</b>	<b>2110.000-2120.000</b>	<b>.000-.000</b>	<b>.000-.000</b>	<b>142.44</b>	<b>1640</b>	<b>1216.2</b>	<b>Active</b>	<b>Retained</b>
<b>WQJQ689</b>	<b>Northeast</b>	<b>WU</b>	<b>REA001</b>	<b>C</b>	<b>CT</b>	<b>Hartford</b>	<b>Cellco Partnership</b>	<b>Yes</b>	<b>22.000</b>	<b>746.000-757.000</b>	<b>776.000-787.000</b>	<b>.000-.000</b>	<b>.000-.000</b>	<b>76.99</b>	<b>1000</b>	<b>1216.2</b>	<b>Active</b>	<b>Retained</b>
<b>WRBA708</b>	<b>Hartford, CT</b>	<b>UU</b>	<b>BTA184</b>	<b>L1</b>	<b>CT</b>	<b>Hartford</b>	<b>Cellco Partnership</b>	<b>Yes</b>	<b>325.000</b>	<b>27500.000-27600.000</b>	<b>27700.000-27925.000</b>	<b>.000-.000</b>	<b>.000-.000</b>			<b>1216.2</b>	<b>Active</b>	

WRBA709	Hartford, CT	UU	BTA18 4	CT	Hartford	Cellico Partnership	Yes	325.000	27925.000- 28050.000	28150.000- 28350.000	.000- .000	.000- .000			1216.2	Active
WRBD571	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	.000	.000- .000	.000- .000	.000- .000	.000- .000			.0	Active
WRBD572	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	.000	.000- .000	.000- .000	.000- .000	.000- .000			.0	Active
WRBE444	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	50.000	38800.000- 38850.000	.000- .000	.000- .000	.000- .000			.0	Active
WRBE445	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	50.000	39500.000- 39550.000	.000- .000	.000- .000	.000- .000			.0	Active
WRBE704	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	.000	.000- .000	.000- .000	.000- .000	.000- .000			.0	Active
WRBE705	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	.000	.000- .000	.000- .000	.000- .000	.000- .000			.0	Active
WRBE864	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	50.000	38900.000- 38950.000	.000- .000	.000- .000	.000- .000			.0	Active
WRBE865	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	50.000	39600.000- 39650.000	.000- .000	.000- .000	.000- .000			.0	Active
WRBF500	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	50.000	39000.000- 39050.000	.000- .000	.000- .000	.000- .000			.0	Active
WRBF501	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	50.000	39700.000- 39750.000	.000- .000	.000- .000	.000- .000			.0	Active
WRBF792	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	50.000	39050.000- 39100.000	.000- .000	.000- .000	.000- .000			.0	Active
WRBF793	New York, NY	UU	PEA00 1	CT	Hartford	Straight Path Spectrum, LLC	Yes	50.000	39750.000- 39800.000	.000- .000	.000- .000	.000- .000			.0	Active

WRBF968	New York, NY	UU	PEA001	11-A	CT	Hartford	Straight Path Spectrum, LLC	Yes	50.000	39100.000-39150.000	.000-.000	.000-.000	.000-.000	.0	Active
WRBF969	New York, NY	UU	PEA001	11-B	CT	Hartford	Straight Path Spectrum, LLC	Yes	50.000	39800.000-39850.000	.000-.000	.000-.000	.000-.000	.0	Active
WRDG500	New York, NY	UU	PEA001	S2	CT	Hartford	Cellco Partnership	Yes	400.000	37800.000-38200.000	.000-.000	.000-.000	.000-.000	.0	Active

# **ATTACHMENT 2**



**WEST HARTFORD  
WEST RELO CT**

CONSTRUCTION DRAWINGS

0	08/09/19	FOR SUBMITTAL
A	08/07/19	FOR COMMENT



Dewberry Engineers Inc.  
89 SUMMER STREET  
SUITE 700  
BOSTON, MA 02110  
PHONE: 617.696.3400  
FAX: 617.696.3310



DRAWN BY: MR

REVIEWED BY: CDH

CHECKED BY: BBR

PROJECT NUMBER: 50002925

JOB NUMBER: 50114615

SITE ADDRESS

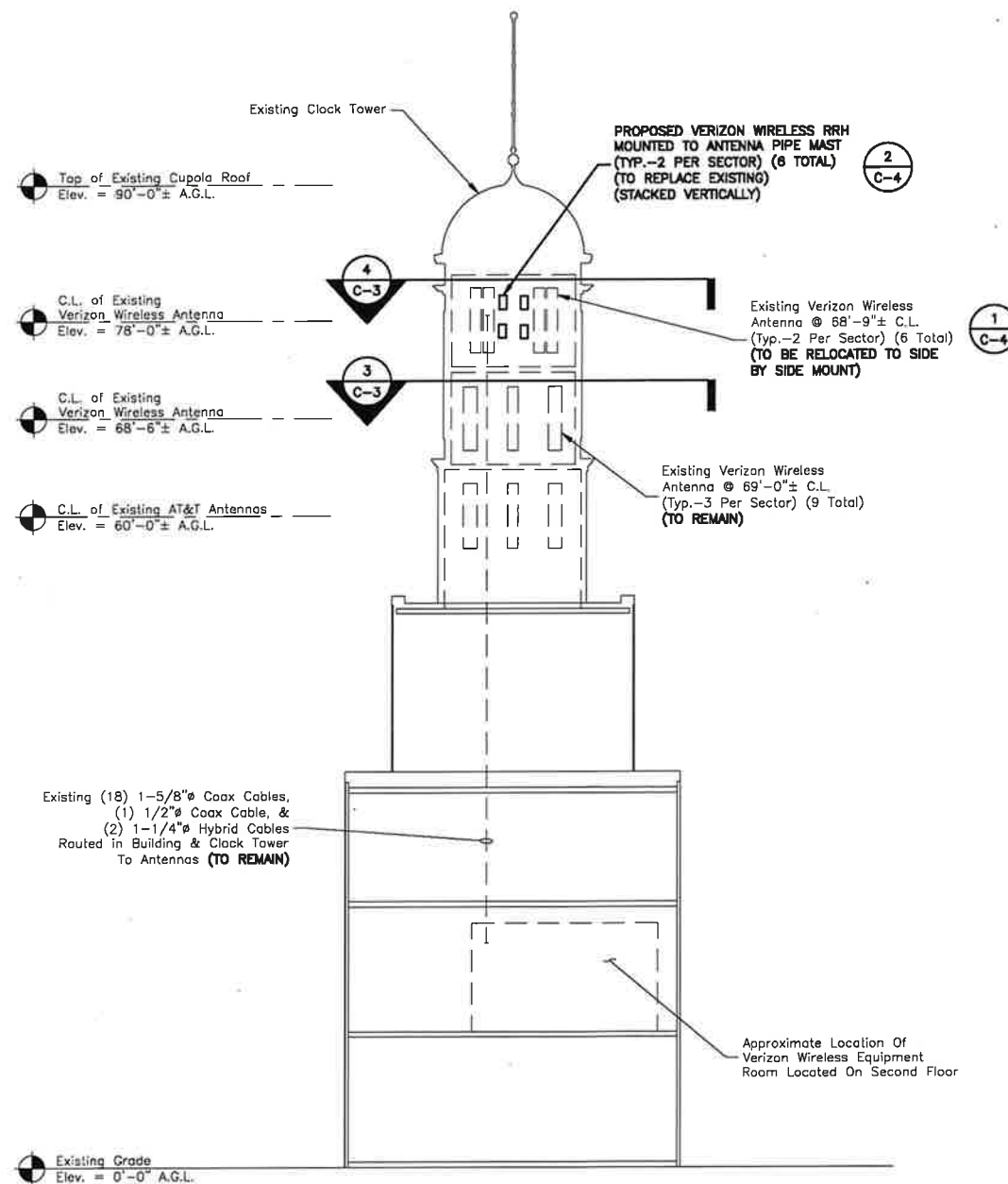
139 NORTH MAIN STREET  
WEST HARTFORD, CT 06107

SHEET TITLE

ELEVATION

SHEET NUMBER

C-2

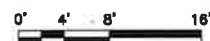


**NOTES:**

- ELEVATION SHOWN AS APPROXIMATE.
- SOME EXISTING AND PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
- SITE PLAN & ELEVATION BASED ON A SITE VISIT BY DEWBERRY ENGINEERS INC. ON 07/28/19.
- EXISTING ANTENNAS SHOWN AS APPROXIMATE. ELEVATION BASED ON EXISTING INFORMATION AND VISUAL INSPECTION AND HAVE NOT BEEN VERIFIED THROUGH AN ANTENNA MAPPING.
- MOUNT ALL ANTENNAS, COAX, RRH'S, OVP BOXES, ETC. IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS STRUCTURAL ASSESSMENT COMPLETED BY DEWBERRY ENGINEERS INC. DATED 08/07/19.
- REUSE EXISTING MOUNTS AND COAX. INSPECT FOR DAMAGE OR DECAY AND REPLACE AS NEEDED PER STRUCTURAL ANALYSIS.
- THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAINS. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

**ELEVATION**

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



1



**WEST HARTFORD  
WEST RELO CT**

CONSTRUCTION DRAWINGS

0	08/09/19	FOR SUBMITTAL
A	08/07/19	FOR COMMENT



Dewberry Engineers Inc.  
99 SUMMER STREET  
SUITE 700  
BOSTON, MA 02110  
PHONE: 617.686.3400  
FAX: 617.686.3310



DRAWN BY:	MR
REVIEWED BY:	CDH
CHECKED BY:	BBR
PROJECT NUMBER:	50002925
JOB NUMBER:	50114815

SITE ADDRESS

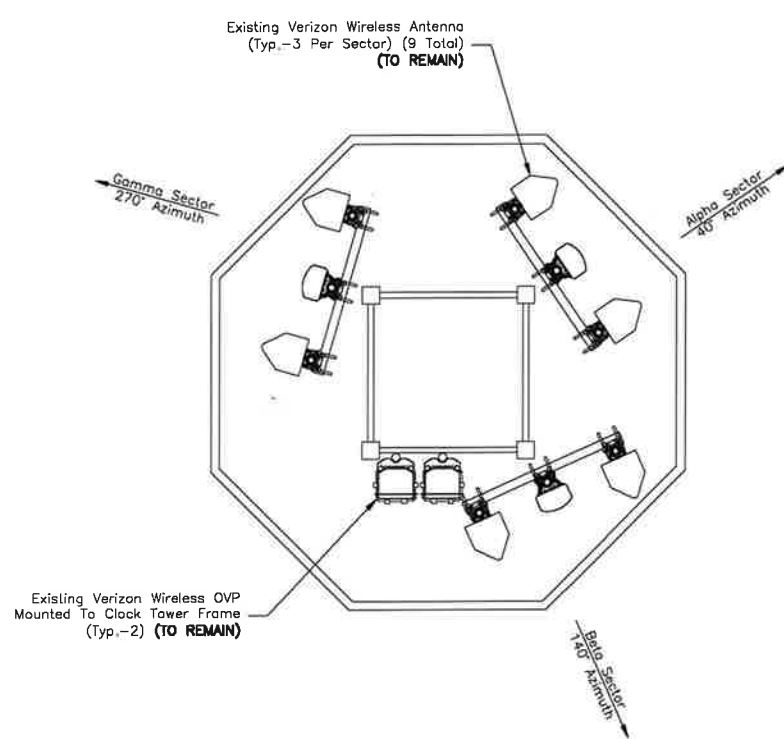
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WEST HARTFORD, CT 06107

SHEET TITLE

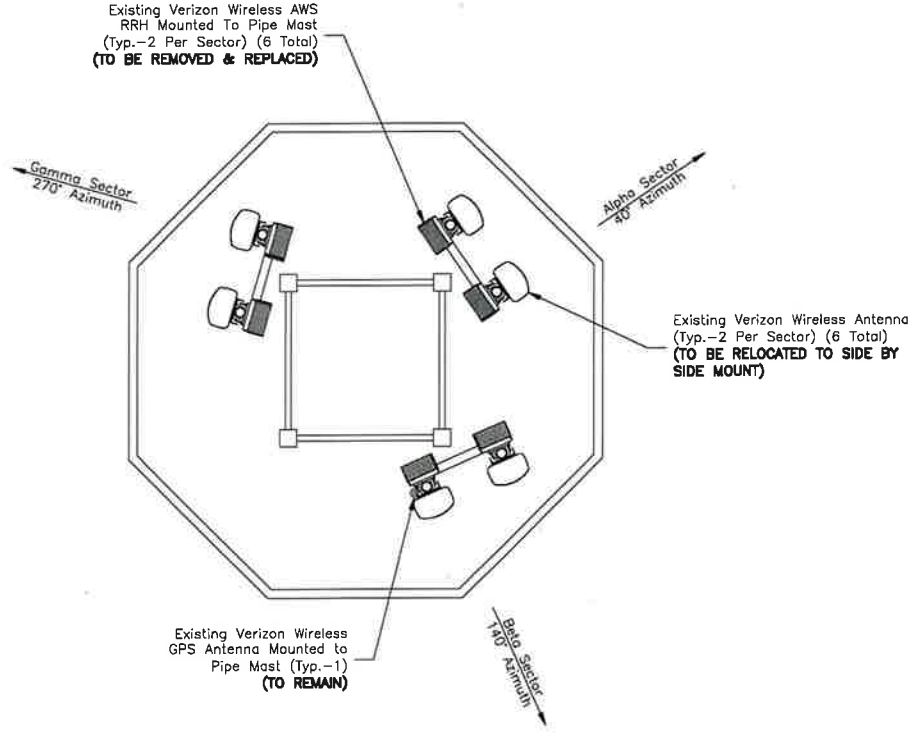
EXISTING & PROPOSED  
ANTENNA PLANS

SHEET NUMBER

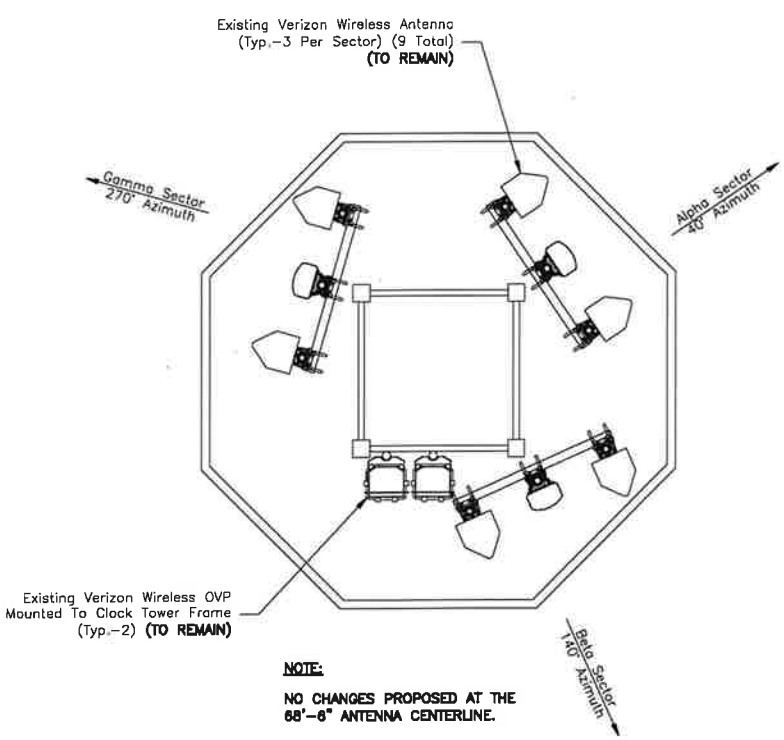
C-3



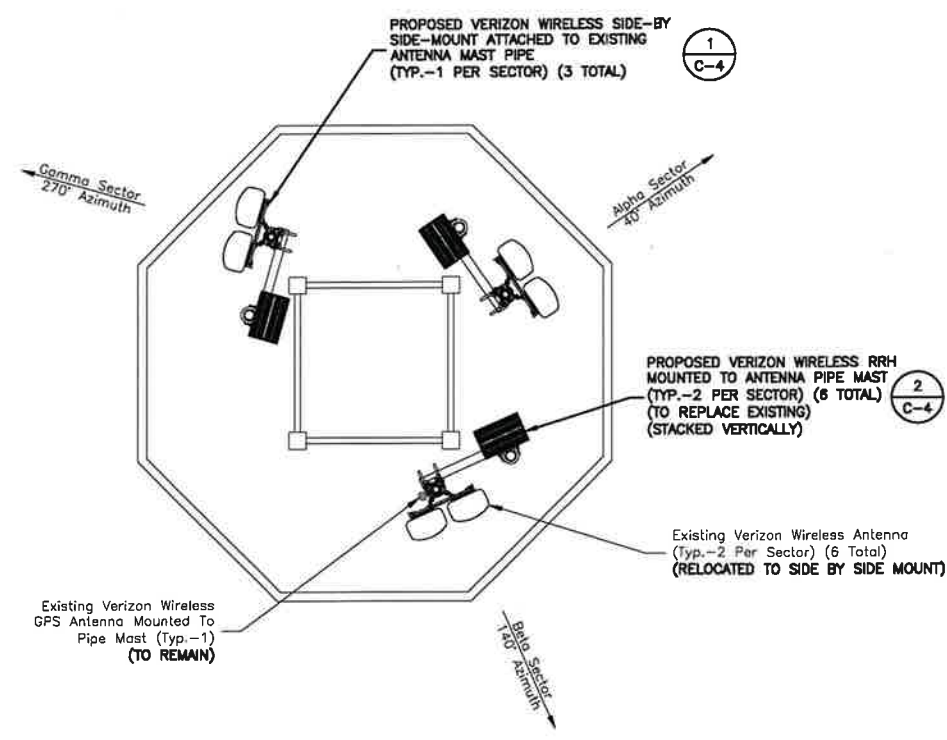
**EXISTING ANTENNA PLAN @ 68'-6"± C.L.** 1  
SCALE: N.T.S.



**EXISTING ANTENNA PLAN @ 78'-0"± C.L.** 2  
SCALE: N.T.S.



**PROPOSED ANTENNA PLAN @ 68'-6"± C.L.** 3  
SCALE: N.T.S.



**PROPOSED ANTENNA PLAN @ 78'-0"± C.L.** 4  
SCALE: N.T.S.

- NOTES:**
1. NORTH SHOWN AS APPROXIMATE.
  2. SOME EXISTING AND PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
  3. ANTENNA PLANS BASED ON A SITE VISIT BY DEWBERRY ENGINEERS INC. ON 07/28/19.
  4. EXISTING ANTENNAS SHOWN AS APPROXIMATE. ELEVATION BASED ON EXISTING INFORMATION AND VISUAL INSPECTION AND HAVE NOT BEEN VERIFIED THROUGH AN ANTENNA MAPPING.
  5. MOUNT ALL ANTENNAS, COAX, RRH'S, OVP BOXES, ETC. IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS STRUCTURAL ASSESSMENT COMPLETED BY DEWBERRY ENGINEERS INC. DATED 08/07/19.
  6. REUSE EXISTING ANTENNA MOUNTS AND COAX. INSPECT FOR DAMAGE OR DECAY AND REPLACE AS NEEDED PER STRUCTURAL ANALYSIS.
  7. THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAINS. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

**WEST HARTFORD  
WEST RELO CT**

**CONSTRUCTION DRAWINGS**

0	08/09/19	FOR SUBMITTAL
A	08/07/19	FOR COMMENT



Dewberry Engineers Inc.  
99 SUMMER STREET  
SUITE 700  
BOSTON, MA 02110  
PHONE: 617.696.3400  
FAX: 617.696.3310

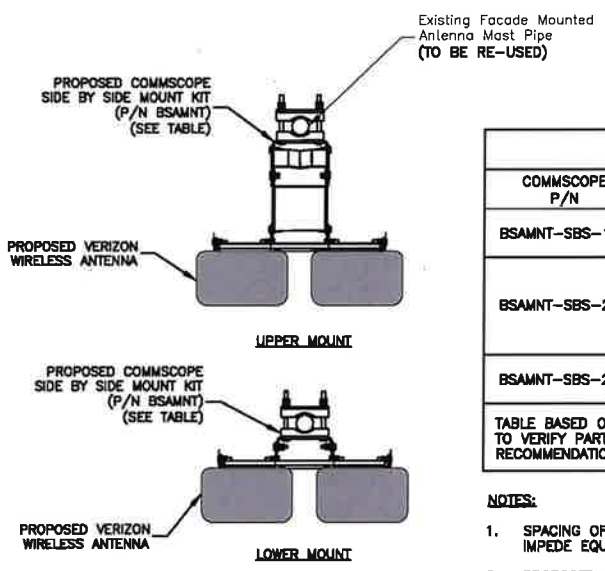


DRAWN BY:	MR
REVIEWED BY:	CDH
CHECKED BY:	BBR
PROJECT NUMBER:	60002925
JOB NUMBER:	50114815

SITE ADDRESS

139 NORTH MAIN STREET  
WEST HARTFORD, CT 06107

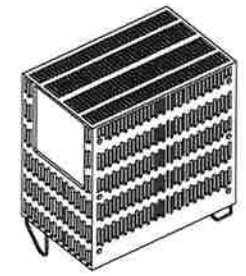
SHEET TITLE	CONSTRUCTION DETAILS
SHEET NUMBER	C-4



COMMSCOPE P/N: BSAMNT MOUNT TABLE				
COMMSCOPE P/N	SUPPORTED ANTENNAS	QUANTITY REQUIRED PER (2) ANTENNAS	NUMBER OF MOUNTING POINTS	GAP BETWEEN ANTENNAS
BSAMNT-SBS-1-2	SBNHH-1D85A/B/C NHH-85A/B/C-R2B	1	2	3-3/8"
BSAMNT-SBS-2-2	JAHH-85A/B/C-R3B JAHH-45A-R3B NHH-45A-R2B SBNHH-1D45A/B	1	2	2"
BSAMNT-SBS-2-3	JAHH-45B/C-R3B SBNHH-1D45C	1	3	2"

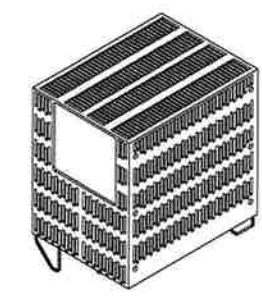
- NOTES:**
- SPACING OF PROPOSED EQUIPMENT SHALL BE CONFIRMED AND PROPOSED MOUNTS SHALL NOT IMPEDE EQUIPMENT CLEARANCES. ACCESS TO EQUIPMENT SHALL BE MAINTAINED.
  - PROPOSED ANTENNA MOUNT SHALL BE INSTALLED ACCORDING TO MANUFACTURER SPECIFICATIONS.

**SIDE BY SIDE ANTENNA MOUNT** 1  
SCALE: N.T.S.



MANUFACTURER: SAMSUNG  
MODEL: 700/850 RRH  
DIMENSIONS: 15.0"H X 15.0"W X 8.1"D  
WEIGHT: 82.0 LBS

LTE 700/850



MANUFACTURER: SAMSUNG  
MODEL: AWS/PCS RRH  
DIMENSIONS: 15.0"H X 15.9"W X 10.0"D  
WEIGHT: 97.5 LBS

LTE PCS/AWS

**REMOTE UNIT DETAILS** 2  
SCALE: N.T.S.

**WEST HARTFORD  
WEST RELO CT**

**CONSTRUCTION DRAWINGS**

0 08/09/19 FOR SUBMITTAL  
A 08/07/19 FOR COMMENT



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



DRAWN BY: MR

REVIEWED BY: CDH

CHECKED BY: BBR

PROJECT NUMBER: 50002925

JOB NUMBER: 50114615

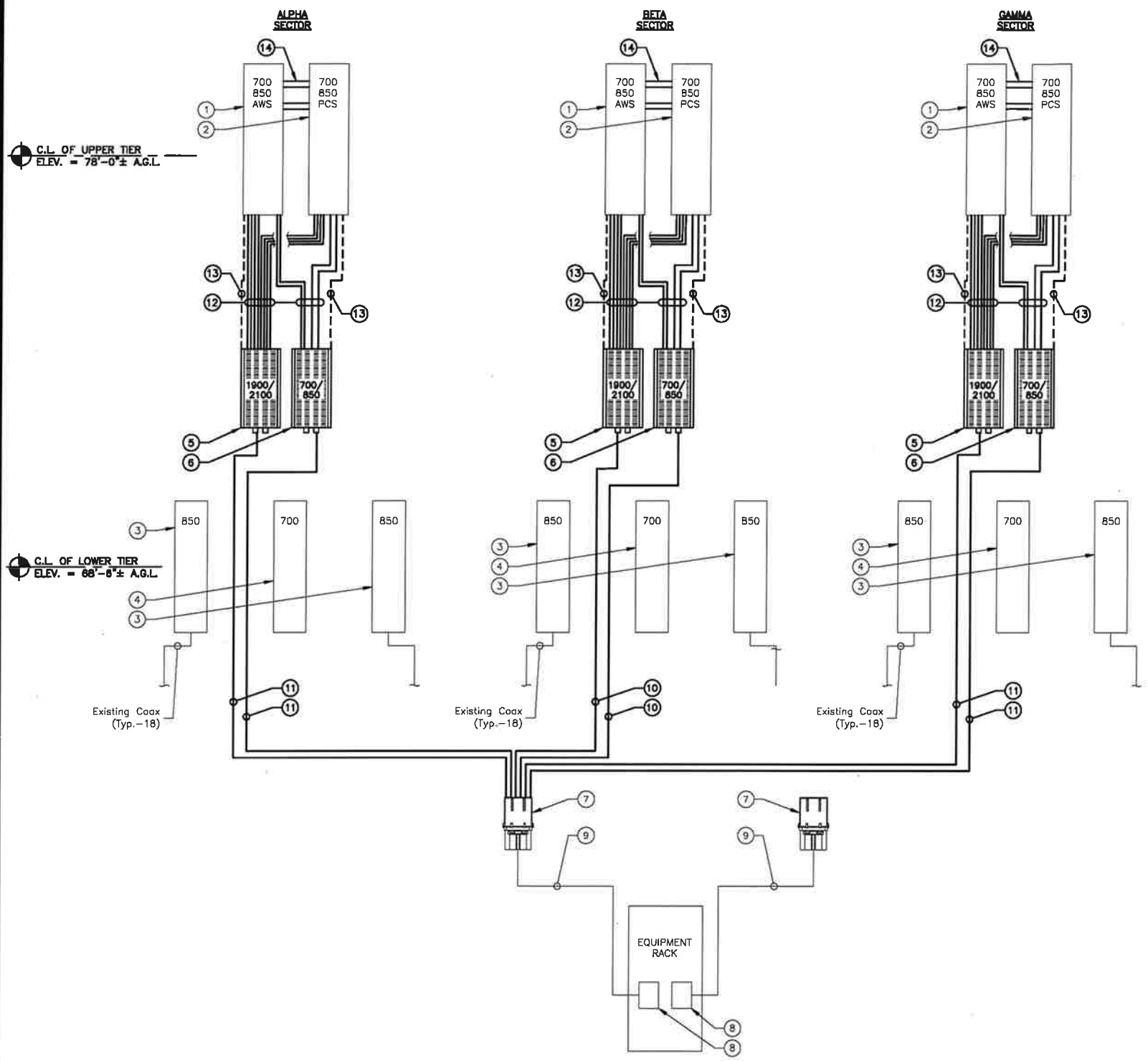
SITE ADDRESS

139 NORTH MAIN STREET  
WEST HARTFORD, CT 06107

SHEET TITLE

**BILL OF MATERIALS &  
PLUMBING RISER DIAGRAM**

SHEET NUMBER



**BILL OF MATERIALS**

ITEM	DESCRIPTION	QTY.	LENGTH	COMMENTS
SITE NAME: WEST HARTFORD WEST RELO CT				
1	ANTENNA 1900 MHz (PCS)	3		MOUNTED TO ANTENNA FRAME (SBNHH-1D65B) (EXISTING) (RELOCATED TO SIDE-BY-SIDE MOUNT)
2	ANTENNA 2100 MHz (AWS)	3		MOUNTED TO ANTENNA FRAME (SBNHH-1D65B) (EXISTING) (RELOCATED TO SIDE-BY-SIDE MOUNT)
3	ANTENNA 850 MHz (CELLULAR)	6		MOUNTED TO ANTENNA FRAME (LPA-80063-6CF) (EXISTING)
4	ANTENNA 700 MHz (LTE)	3		MOUNTED TO ANTENNA FRAME (BXA-70063-6CF) (EXISTING)
5	SAMSUNG B2/B66 RRH_BR049	3		MOUNTED TO ANTENNA PIPE MAST
6	SAMSUNG B5/B13 RRH_BR04C	3		MOUNTED TO ANTENNA PIPE MAST
7	MAIN OVP (UPPER)	2		MOUNTED TO CLOCK TOWER FRAME (EXISTING)
8	MAIN OVP (LOWER)	2		MOUNTED INSIDE SHELTER (EXISTING)
9	6x12 MAIN LINE (HYBRIFLEX)	2	60 FT	ROUTED FROM LOWER OVP TO UPPER OVP (EXISTING)
10	1X1 HYBRID CABLE	2	15 FT	ROUTED FROM UPPER OVP TO RRH
11	1X1 HYBRID CABLE	4	20 FT	ROUTED FROM UPPER OVP TO RRH
12	TOP JUMPER	24	5 FT	ROUTED FROM RRH TO ANTENNA
13	RET CONTROL CABLE	6	3 M	ROUTED FROM RRH TO ANTENNA
14	SIDE-BY-SIDE MOUNT	3		MOUNTED TO EXISTING ANTENNA MAST PIPE (COMMSCOPE BSAMNT-SBS-1-2)

**LEGEND**

- LIGHT LINE DENOTES EXISTING
- DARK LINE DENOTES PROPOSED
- - - DASHED LINE DENOTES FUTURE
- - - DARK DASHED LINE DENOTES RET CABLE

**NOTE:**

1. MEASUREMENTS OF CABLE LENGTHS DO NOT INCLUDE ADDITIONAL LENGTH FOR SLACK.

- NOTE:**
- VIEW FROM LOOKING FROM BEHIND OF ANTENNAS.
  - SCOPE OF WORK BASED ON ANTENNA REC FOR W HARTFORD W CT RELO DATED 07/31/18. VERIFY SCOPE OF WORK WITH FINAL RFDS PRIOR TO CONSTRUCTION.

**PLUMBING DIAGRAM**  
SCALE: N.T.S.

1

# **ATTACHMENT 3**

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

Connecticut

Siting

Council

June 27, 2013

**Decision and Order**

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

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

1. The tower shall be constructed as a stealth clock tower, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of the Certificate Holder and other entities, both public and private, but such tower shall not exceed a height of 90 feet above ground level at the top of the cupola dome.
2. All wireless telecommunications carriers’ equipment and antennas shall be located inside the tower structure.
3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of (West Hartford) for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
  - a. a final site plan(s) of site development to include specifications for the clock tower, tower foundation, antennas, equipment room configuration, backup generator, radio equipment, access/parking area, garden wall, utility line, and landscaping; and
  - b. construction plans for site clearing, grading, landscaping, water drainage, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.
4. The Eastern Box Turtle Protection Program shall be implemented to mitigate any possible impacts to Eastern Box Turtles in the event any are found in the vicinity of the site.

5. Prior to the commencement of operation, the Certificate Holder shall provide the Council worst-case modeling of the electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.
6. Upon the establishment of any new state or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
7. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
8. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed with at least one fully operational wireless telecommunications carrier providing wireless service within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The Certificate Holder shall provide written notice to the Executive Director of any schedule changes as soon as is practicable.
9. Any request for extension of the time period referred to in Condition 8 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of West Hartford. Any proposed modifications to this Decision and Order shall likewise be so served.
10. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
11. Any nonfunctioning antenna, and associated antenna mounting equipment, on this facility shall be removed within 60 days of the date the antenna ceased to function.
12. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction, and the commencement of site operation.
13. The Certificate Holder shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v.



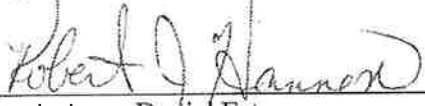

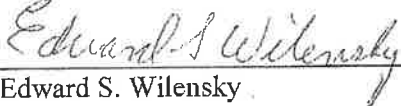
14. This Certificate may be transferred in accordance with Conn. Gen. Stat. §16-50k(b), provided both the Certificate Holder/transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. In addition, both the Certificate Holder/transferor and the transferee shall provide the Council a written agreement as to the entity responsible for any quarterly assessment charges under Conn. Gen. Stat. §16-50v(b)(2) that may be associated with this facility.
15. The Certificate Holder shall maintain the facility and associated equipment, including but not limited to, the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line and landscaping in a reasonable physical and operational condition that is consistent with this Decision and Order and a Development and Management Plan to be approved by the Council.
16. If the Certificate Holder is a wholly-owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the Certificate Holder within 30 days of the sale and/or transfer.

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

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

CERTIFICATION

The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, in **DOCKET NO. 434** – Cellco Partnership d/b/a Verizon Wireless Application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a relocated telecommunications facility at 139 North Main Street, West Hartford, Connecticut, and voted as follows to approve the proposed facility:

<u>Council Members</u>	<u>Vote Cast</u>
_____ Robert Stein, Chairman	Absent
 _____ James J. Murphy, Jr., Vice Chairman	Yes
 _____ Chairman Arthur House Designee: Michael Caron	Yes
 _____ Commissioner Daniel Esty Designee: Robert Hannon	Yes
_____ Philip T. Ashton	Absent
_____ Daniel P. Lynch, Jr.	Absent
 _____ Dr. Barbara Currier Bell	Yes
 _____ Edward S. Wilensky	Yes

Dated at New Britain, Connecticut, June 27, 2013.