CG ENGINEERING | civil & structural engineering & planning

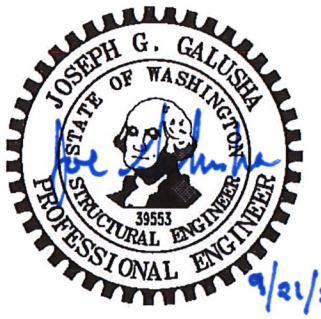
T-Mobile

STRUCTURAL ANALYSIS REPORT

SE06033A – Burke

Water Tank Site

6563 Sunset Ave NE
Bremerton, WA 98310



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CG Project No.: 20070.667

Permit Number: 20-04364

TABLE OF CONTENTS

INTRODUCTION

CG Engineering was retained by B.J. Thomas, PE (Client) to provide structural analysis of the existing structure for the site modifications proposed by T-Mobile.

The structural analysis completed by CG Engineering was inclusive of the structural elements that were affected by the addition of equipment and antennas associated with the proposed T-Mobile site modifications. Where applicable, this includes the antenna and equipment support structure and affected portions of the existing main structure.

SITE DESCRIPTION

The appurtenances are mounted to an existing steel antenna braced frame located on the top of a cylindrical, 90' tall steel water tank. The existing steel braced frame is anchored to the roof with (6) 1/2" threaded rods, (2) per sector, and (3) L3x3x1/4 steel angle kicker braces, (1) per sector.

The Client provided us with structural calculations for a previous antenna upgrade dated 07/18/19. CG Engineering also had access to structural calculations for previous antenna upgrades by CG Engineering dated 06/23/2015 and by Cornerstone Engineering dated 10/17/12. Photos of the site and architectural plans were also provided for the proposed revisions. All geometry, member sizes, and material strengths used in our analysis were based on this information. If anything differs from the information contained in these documents, CG Engineering should be notified to revise our analysis.

APPURTENANCE CONFIGURATION

The structure was analyzed using the appurtenance configuration specified in the following table. All loading was provided to us from the Client. This table includes all known existing and future antennas for this site.

Sector	Existing Appurtenance Configuration	Proposed Appurtenance Configuration (Bold=New)	Mount Type
A	(2) Commscope Panel Antennas Model No. TMBXX-6516-R2M (1) Commscope Panel Antenna Model No. FFHH-65C-R3 (1) AHLOA (1) COVP (1) AHFIB (1) FXFB (2) DUAL PCS/AWS TMA	(1) Commscope Panel Antennas Model No. TMBXX-6516-R2M (1) Commscope Panel Antenna Model No. FFHH-65C-R3 **(1) Nokia Radio Antenna** **Model No. AEHC** (1) AHLOA (1) COVP **(1) AHFIG** (1) FXFB **(1) FRIA**	Mount appurtenances to existing 2-1/2" pipe mounts
B	(2) Commscope Panel Antennas Model No. TMBXX-6516-R2M (1) Commscope Panel Antenna Model No. FFHH-65C-R3 (1) AHLOA (1) COVP (1) AHFIB (1) FXFB (2) DUAL PCS/AWS TMA	(1) Commscope Panel Antennas Model No. TMBXX-6516-R2M (1) Commscope Panel Antenna Model No. FFHH-65C-R3 **(1) Nokia Radio Antenna** **Model No. AEHC** (1) AHLOA **(1) AHFIG** (1) FXFB **(1) FRIA** (2) HCS 2.0 Pendants	Mount appurtenances to existing 2-1/2" pipe mounts

Table continued on following page…

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…table continued from previous page.

G	(2) Commscope Panel Antennas Model No. TMBXX-6516-R2M (1) Commscope Panel Antenna Model No. FFHH-65C-R3 (1) AHLOA (1) COVP (1) AHFIB (1) FXFB (2) DUAL PCS/AWS TMA	(1) Commscope Panel Antennas Model No. TMBXX-6516-R2M (1) Commscope Panel Antenna Model No. FFHH-65C-R3 **(1) Nokia Radio Antenna** **Model No. AEHC** (1) AHLOA **(1) AHFIG** (1) FXFB **(1) FRIA**	Mount appurtenances to existing 2-1/2" pipe mounts

The coax cables that serve the antennas weigh less than 5 lb/ft and are therefore exempt from the requirements of Chapter 13 of ASCE 7.

LEASE AREA EQUIPMENT

All loading for the equipment was provided to us from the client. The client is proposing the following modifications at the equipment cabinets: remove (1) Purcell cabinet, add **(1) HPL3 600A Support Cabinet,** and add **(1) LB3 Battery Cabinet**.

ANALYSIS CRITERIA

The parameters in the following table were used in our analysis of the structure based on its location.

City of Seattle, WA					
Wind Criteria				**Seismic Criteria**	
Basic Wind Speed w/o Ice (3-s Gust):	110 mph	Risk Category:	IV	Sds:	0.975
Exposure:	B	Kzt (ASCE 7-10):	1.30	Sd1:	0.579
Notes: 1. Refer to the attached topographic maps used to determine the topographic factor. 2. Parameters based on the 2012 International Building Code (IBC) and referenced standards.					

APPURTENANCE MOUNT/MAIN STRUCTURE ANALYSIS RESULTS

Individual appurtenance mounts have been determined to be sufficient to support the proposed loads. Additionally, the existing structure has been determined to be sufficient to support the proposed appurtenance configuration.

CONCLUSIONS/RECOMMENDATIONS

We have determined that no upgrades to the existing structure are required for the proposed T-Mobile installation as described above in the appurtenance configuration tables.

- Appurtenance Anchorage:
  The appurtenances shall attach to the existing 2-1/2" standard pipe mounts on the existing steel braced frame. Attach the appurtenances to the pipe mounts with the mounting hardware provided by the manufacturer and in accordance with their installation instructions.
- Equipment Anchorage:
  The new equipment cabinet shall mount to the existing concrete slab with (4) 3/8" ϕ HILTI Kwik Bolt TZ wedge anchors with a 2" embedment into the concrete, (1) each corner.

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CONDITIONS OF ANALYSIS

This structural analysis is based on the documentation that was available to us. CG Engineering did not perform an observation of this site to verify the accuracy of the provided structure and appurtenance data, and we should be contacted immediately if there are any discrepancies with the information stated within this report.

Our analysis is based on the assumption that the structure has been properly installed and is maintained to the minimum standards required by code. We assume the structure has no known deterioration or damage that would adversely affect its capacity.

REFERENCE DOCUMENTS

The following documents were provided to us by the Client for our analysis:

1. "*STRUCTURAL ANALYSIS REPORT SE06033A Burke*", by CG Engineering, dated 07/18/2019
2. *"SE06033A Burke Structural Calculations"* by Cornerstone Engineering, dated 10/17/2012
3. *"Structural Calculations for Burke Water Tank SE6033A"* by EISI Ltd., dated 10/23/1998

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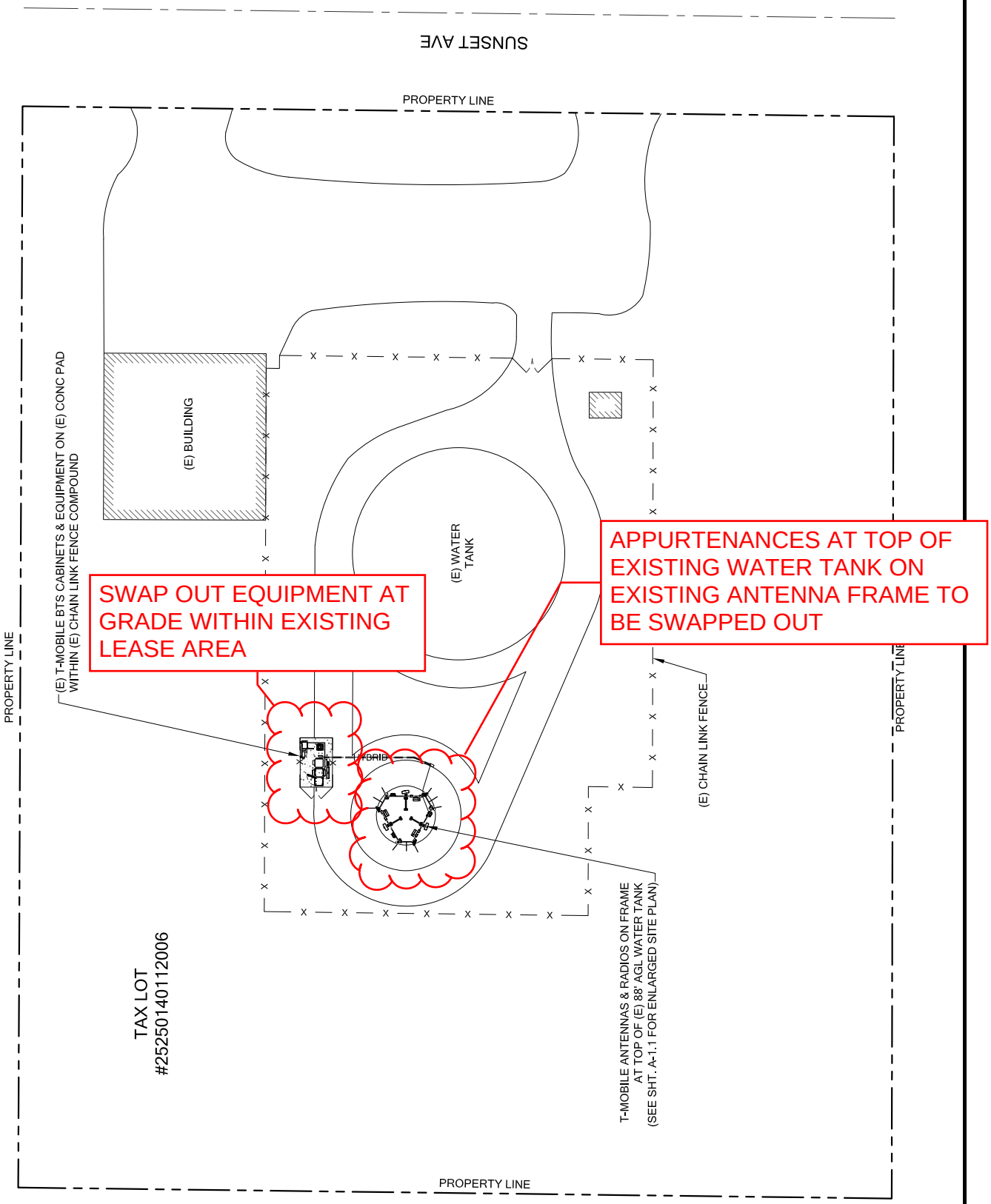


CG ENGINEERING 250 4th Ave. South Suite 200 Edmonds, WA 98020	Description	By CGP	Date 09/15/20
	SITE PLAN	Checked	Date
		Scale	Sheet No.
	Project SE06033A - Burke	Job No. 20070.667	4

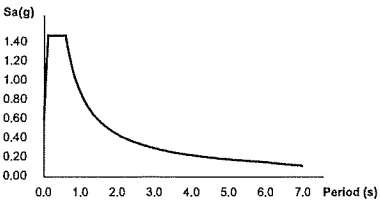
Permit Number: 20-04364

ATC Hazards by Location

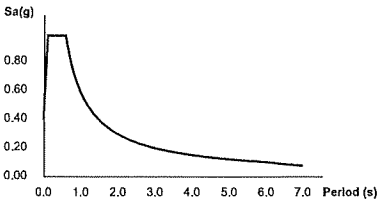
Search Information

Coordinates:	47.622706, -122.608525
Elevation:	402 ft
Timestamp:	2020-09-14T21:45:19.716Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	1.465	MCE_R ground motion (period=0.2s)
S_1	0.58	MCE_R ground motion (period=1.0s)
S_{MS}	1.465	Site-modified spectral acceleration value
S_{M1}	0.87	Site-modified spectral acceleration value
S_{DS}	0.977	Numeric seismic design value at 0.2s SA
S_{D1}	0.58	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	D	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.961	Coefficient of risk (0.2s)
CR_1	0.932	Coefficient of risk (1.0s)
PGA	0.608	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.608	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	1.465	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.524	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.961	Factored deterministic acceleration value (0.2s)
S1RT	0.58	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.622	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.238	Factored deterministic acceleration value (1.0s)
PGAd	1.138	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

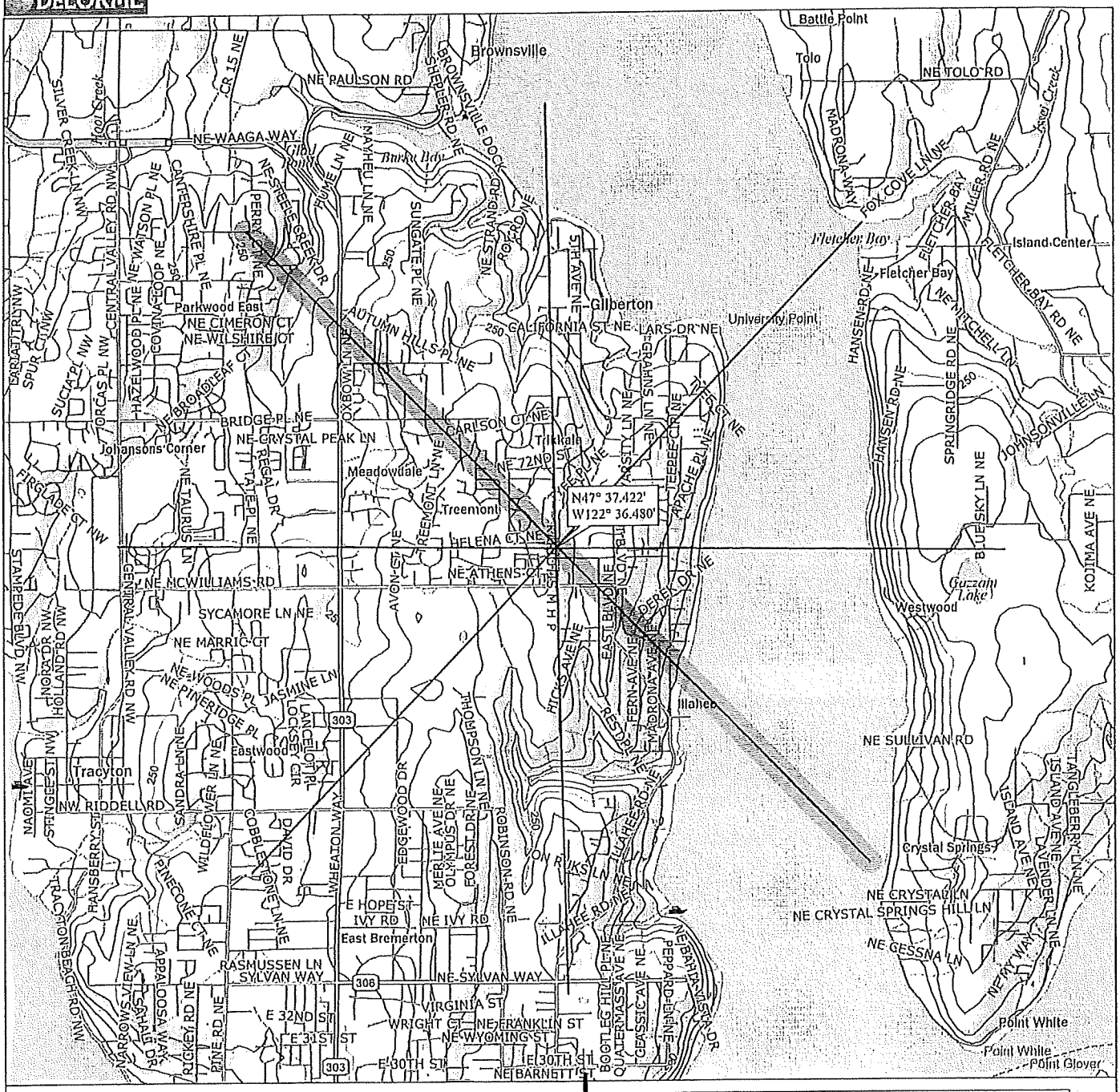
Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

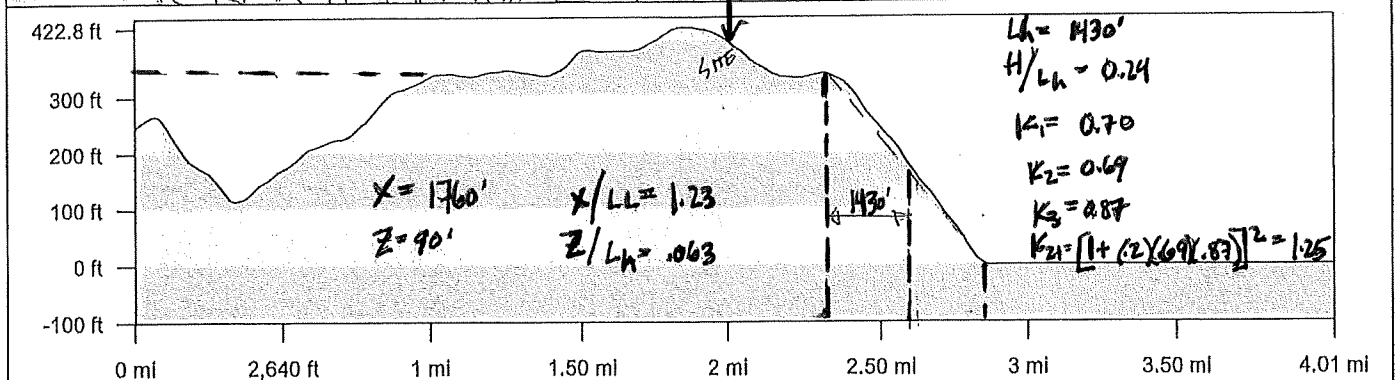
5

Permit Number: 20-04364

DELORME

Topo North America™ 10





Lin Dist: 4.0 mi	Terr Dist: 4.0 mi	Elev Gain: -245.6 ft	Avg Grade: 4
Climb Elev: 358.9 ft	Desc Elev: 604.5 ft	Max. Elev: 422.8 ft	Min. Elev: -0.9 ft
Climb Dist: 1.4 mi	Desc Dist: 1.5 mi		

TN
MN (16.1°E)

Scale 1 : 43,750

1" = 3,645.8 ft Data Zoom 12-2

Permit Number: 20-04364

6

DELORME

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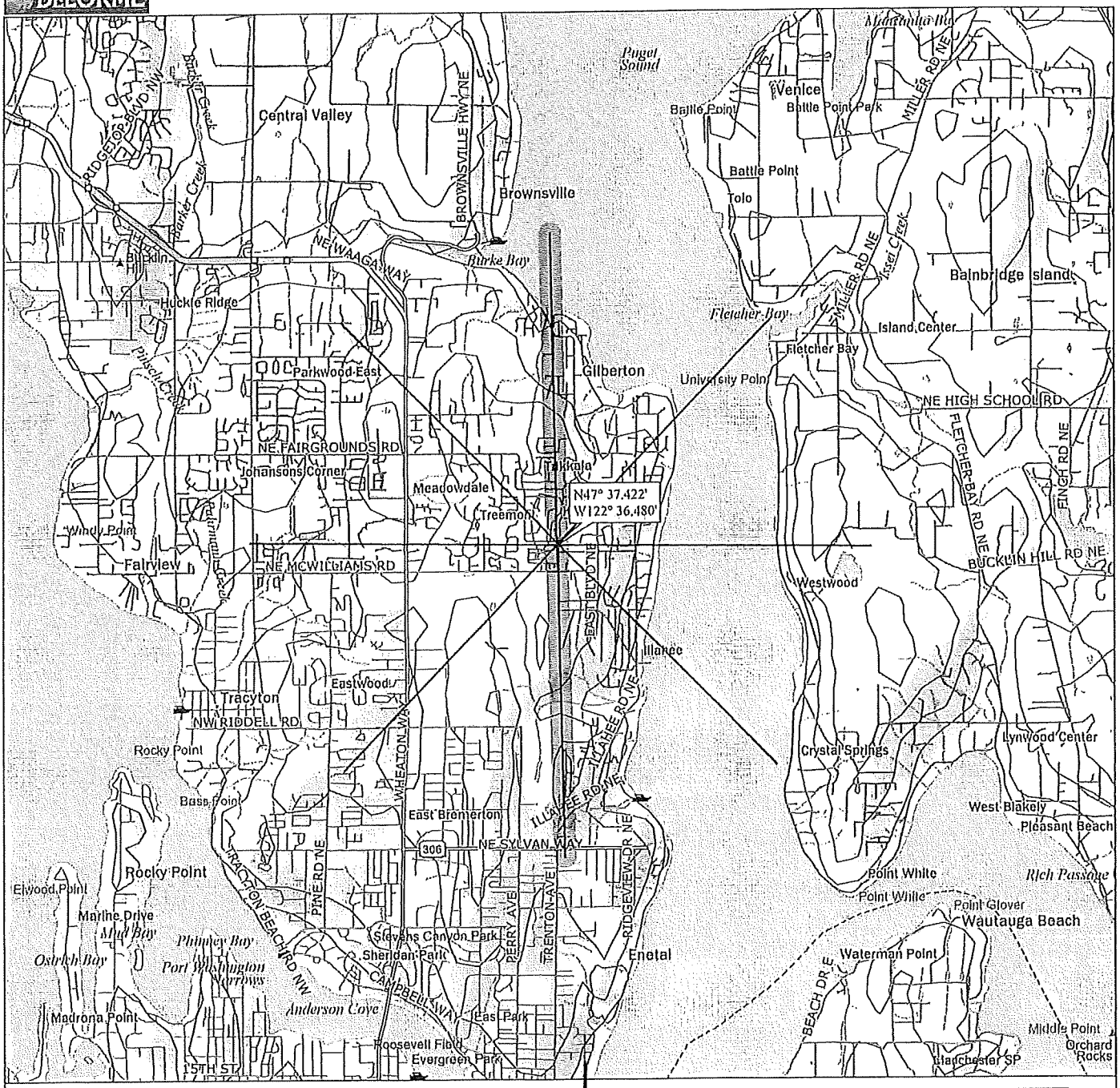

Lin Dist: 4.0 mi	Terr Dist: 4.0 mi	Elev Gain: 329.1 ft	Avg Grade: 5
Climb Elev: 729.0 ft	Desc Elev: 399.9 ft	Max. Elev: 406.5 ft	Min. Elev: -0.1 ft
Climb Dist: 2.0 mi	Desc Dist: 1.6 mi		

TN
MN (18.1°E)

Scale 1 : 62,500

1" = 5,208.3 ft Data Zoom 11-6

Permit Number: 20-04364

7

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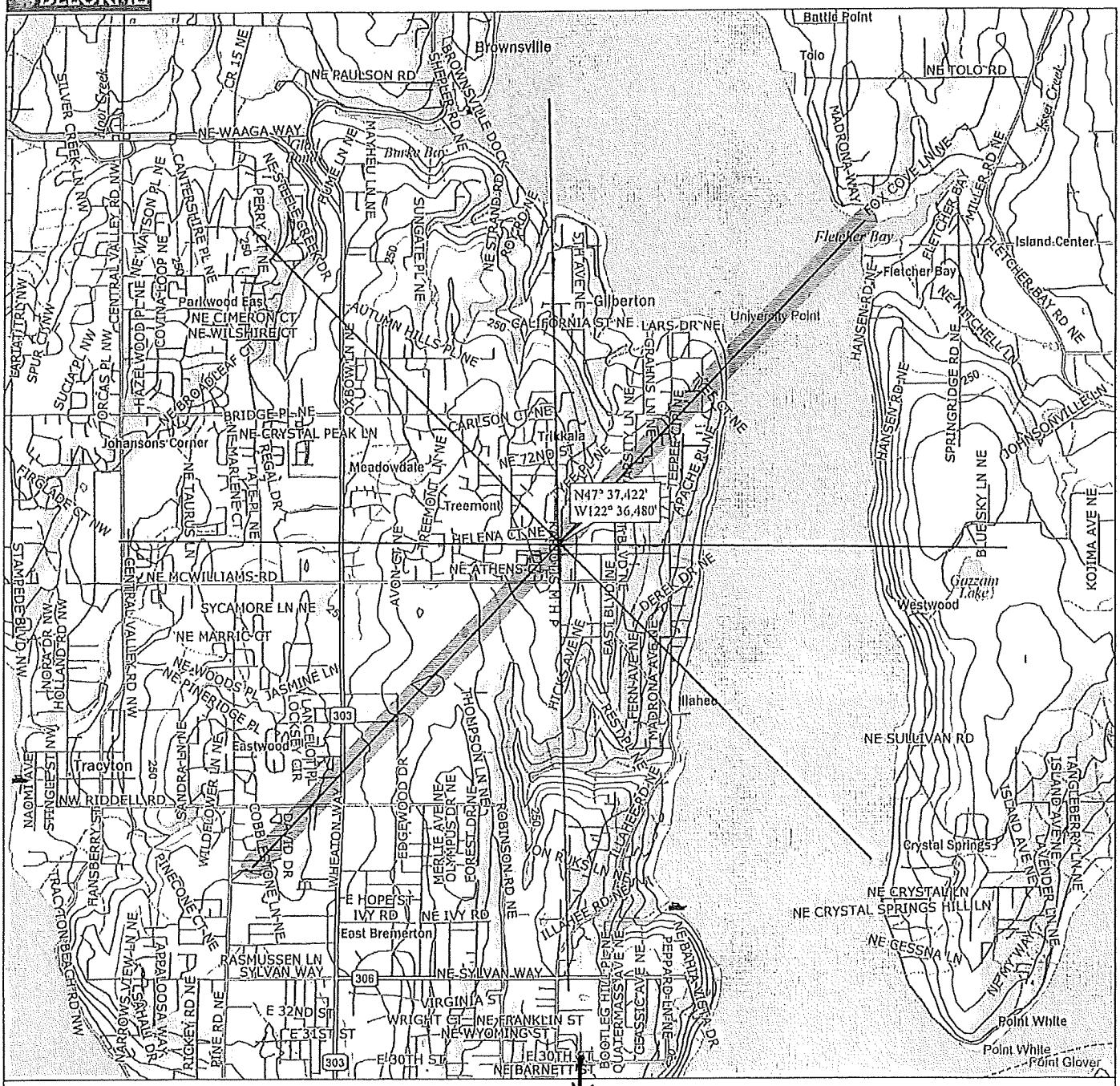
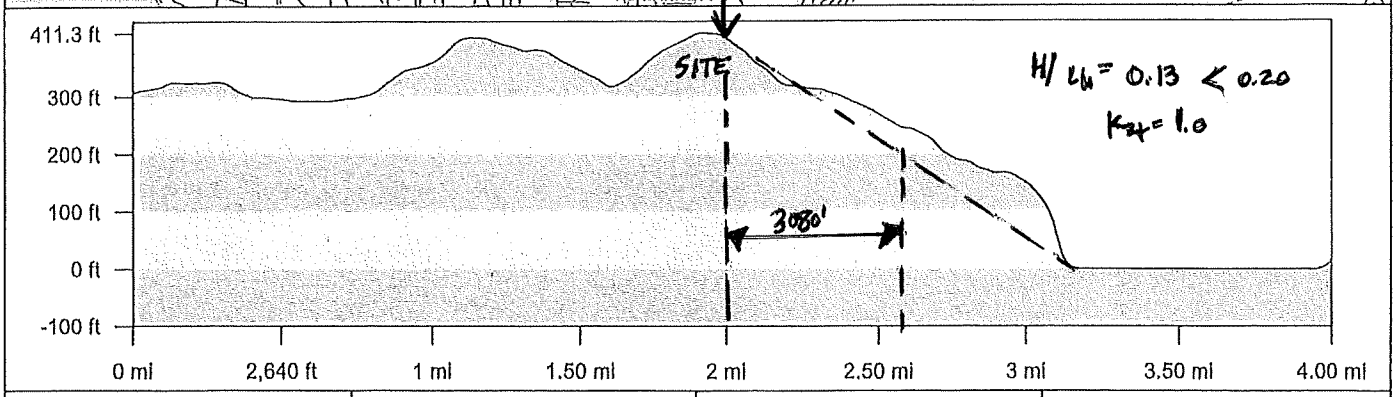




Lin Dist: 4.0 mi	Terr Dist: 4.0 mi	Elev Gain: -293.5 ft	Avg Grade: 3
Climb Elev: 245.0 ft	Desc Elev: 538.5 ft	Max. Elev: 411.3 ft	Min. Elev: -0.6 ft
Climb Dist: 1.2 mi	Desc Dist: 2.1 mi		

TN
MN (16.1°E)

Scale 1 : 43,750

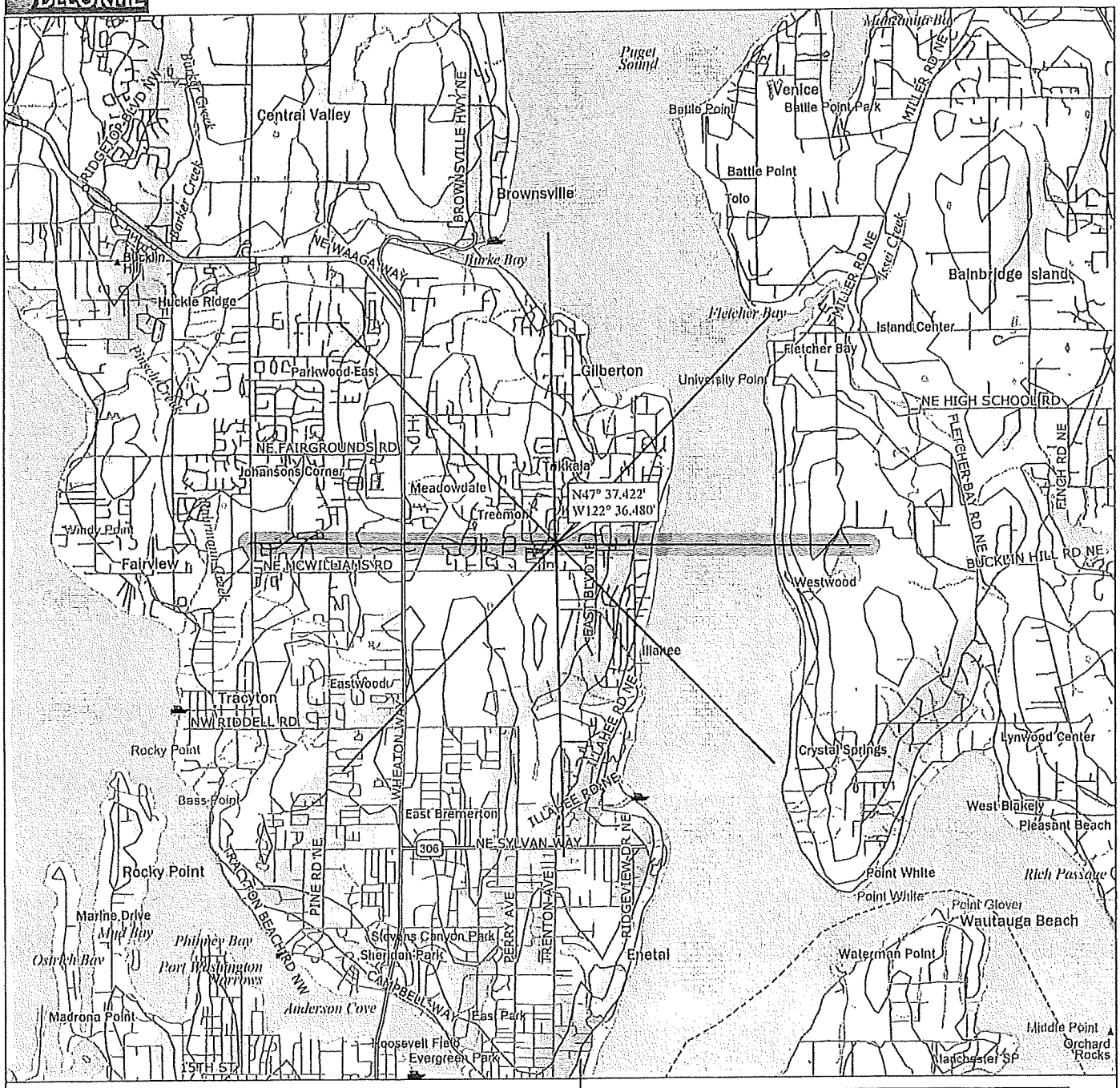
1" = 3,645.8 ft Data Zoom 12-2

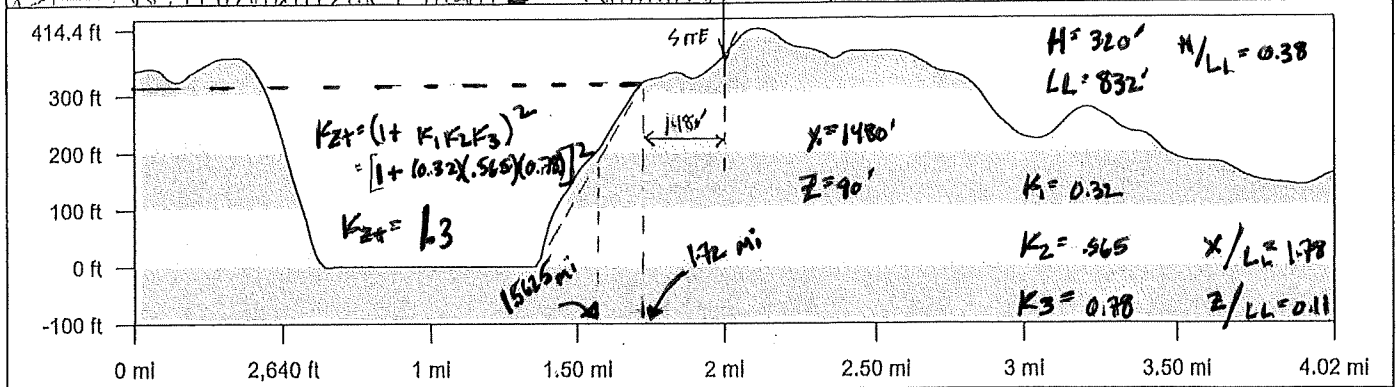
Permit Number: 20-04364

6

DELORME

Topo North America™ 10





Lin Dist: 4.0 mi	Terr Dist: 4.0 mi	Elev Gain: -181.8 ft	Avg Grade: 6
Climb Elev: 566.3 ft	Desc Elev: 748.1 ft	Max. Elev: 414.4 ft	Min. Elev: -2.0 ft
Climb Dist: 1.4 mi	Desc Dist: 2.0 mi		

TN
MN (16.1°E)

Scale 1 : 62,500

1" = 5,208.3 ft Data Zoom 11-6

Permit Number: 20-04364

Seismic Load Calculation for Components and System

(Reference: IBC 2015 Section 1613 & ASCE 7-10 Section 13.3)

Seismic Force:

0.2s Spectral Response Acceleration, Site Class B, S_s	=	**1.465**	(ASCE 7, Figure 22-1 thru 22-6)
1.0s Spectral Response Acceleration, Site Class B, S_1	=	**0.580**	(ASCE 7, Figure 22-1 thru 22-6)
Site Class	=	**D**	(ASCE 7, Section 11.4.2)
Seismic Design Category	=	**D**	(ASCE 7, Tables 11.6-1 & 11.6-2)
Site Coefficient per S_s & Site Class, F_a	=	**1.00**	(ASCE 7, Table 11.4-1)
Site Coefficient per S_1 & Site Class, F_v	=	**1.50**	(ASCE 7, Table 11.4-2)
$S_{MS} = F_a S_s$	=	**1.465**	(ASCE 7, Section 11.4.3)
$S_{M1} = F_v S_1$	=	**0.870**	(ASCE 7, Section 11.4.3)
$S_{DS} = 2/3\ S_{MS}$	=	**0.977**	(ASCE 7, Section 11.4.4)
$S_{D1} = 2/3\ S_{M1}$	=	**0.580**	(ASCE 7, Section 11.4.4)
(Per ASCE 7-10, 13.3)			
Component Amplification Factor, a_p	=	**1.0**	(ASCE 7, Table 13.6-1)
Component Response Modification Factor, R_p	=	**2.5**	(ASCE 7, Table 13.6-1)
Component Importance Factor, I_p	=	**1.0**	(ASCE 7, Table 1.5-2)
Component Operating Weight, W_p	=	W_p	(lb)
Height in structure at lowest point of attachment of component, z_1	=	**87.25**	(ft)
Height in structure at highest point of attachment of component, z_2	=	**95.25**	(ft)
Average Roof Height of Structure, h	=	**88**	(ft)

Seismic design force, $F_p = \dfrac{0.4 a_p S_{DS} W_p}{R_p/I_p}(1+2z/h)$ (Eq. 13.3-1)

Max. seismic design force, $F_{pmax} = 1.6 S_{DS} I_p W_p$ (Eq. 13.3-2)

Min. seismic design force, $F_{pmin} = 0.3 S_{DS} I_p W_p$ (Eq. 13.3-3)

Seismic design force at lowest point, F_{P1}	=	**0.466** W_p	$F_{p\,(AVG)}$= **0.480**
Seismic design force at highest point, F_{P2}	=	**0.495** W_p	
Min. seismic design force, F_{pmin}	=	**0.293** W_p	
Max. seismic design force, F_{pmax}	=	**1.563** W_p	

Seismic design force, F_p **(ASD)**	=	**0.343** W_p

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Description: Seismic Loads For Components & Systems		By: CGP	Date: 9/16/2020
		Checked:	Date:
Project: SE06033A Burke		Scale: N.T.S.	Sheet No.: 10
		Job No.: 20070.611	

Wind Load Calculation for Other Structures

(Reference: 2015 IBC Section 1609 & ASCE 7-10 Chapter 29)

Wind Velocity Pressure:

Average Roof Height of Building, h (ft)	=	**88**	(Per Architectural Drawings)
Height of Other Structure, z (ft)	=	**95.25**	(Per Architectural Drawings)
Basic Wind Speed, V_{3s} (mph)	=	**115**	(ASCE Figure 26.5-1)
Exposure Category	=	**B**	(ASCE Section 26.7.3)
Risk Category	=	**IV**	(IBC Table 1.5-1)
Velocity Pressure Exposure Coefficient, Kz	=	**0.98**	(ASCE Section 29.3.1 & Table 29.3-1)
Topographic Factor, K_{zt}	=	**1.30**	(ASCE Section 26.8.2 & Figure 26.8-1)
Wind Directionality Factor, K_d	=	**0.85**	(ASCE Section 26.6 & Table 26.6-1)
Velocity Pressure, qz (psf)	=	**0.00256KzKztKdV^2**	(ASCE Eq. 29.3-1)
	qz =	**36.50**	psf

Design Wind Load on Other Structures

Gust Effect Factor, G	=	**0.85**	(ASCE Section 26.9)
Net Force Coefficient, Cf	=	**1.4**	(ASCE Figure 29.4-1 to 29.5-3)
Projected Area Normal to the Wind, A_f or A_r (ft^2)	=	**A_f or A_r**	(Projected Wind Area)
Design Lateral Wind Load, F (lbs)	=	**qzGCfAf**	(ASCE Eq. 29.5-1)

LRFD	**F** =	**43.4**	psf x A_f
ASD	**F** =	**26.1**	psf x A_f

K_z or K_h (ASCE Table 29.3-1)

Height Z (ft)	Exposure B	Exposure C	Exposure D
0	0.57	0.85	1.03
15	0.57	0.85	1.03
20	0.62	0.90	1.08
25	0.66	0.94	1.12
30	0.70	0.98	1.16
40	0.76	1.04	1.22
50	0.81	1.09	1.27
60	0.85	1.13	1.31
70	0.89	1.17	1.34
80	0.93	1.21	1.38
90	0.96	1.24	1.40
100	0.99	1.26	1.43
120	1.04	1.31	1.48
140	1.09	1.36	1.52
160	1.13	1.39	1.55
180	1.17	1.43	1.58
200	1.20	1.46	1.61

ANTENNA COMPARISON

Existing (Alpha/Gamma)						
Model	Height (in)	Width (in)	Depth (in)	Weight (LBS)	Area1 (ft^2)	Area2 (ft^2)
TMBXX-6516-R2M	59.9	12	6.5	36.2	4.99	2.70
TMBXX-6516-R2M	59.9	12	6.5	36.2	4.99	2.70
FFHH-65C-R3	95.9	25.2	9.3	127.6	16.78	6.19
AHFIB	22	12.1	5.9	66.1	1.85	0.90
COVP	20.0	16.0	8.0	25	2.22	1.11
AHLOA	22.1	12.2	7.5	83.9	1.87	1.15
FXFB	16.6	17.6	5.2	55.1	0.34	0.27
PCS/AWS TMA	6.3	7.7	6.2	22	0.34	0.27
PCS/AWS TMA	6.3	7.7	6.2	22	0.34	0.27
			Total	474.10	33.72	15.58

Proposed (Alpha/Gamma)						
Model	Height (in)	Width (in)	Depth (in)	Weight (LBS)	Area1 (ft^2)	Area2 (ft^2)
TMBXX-6516-R2M	59.9	12	6.5	36.2	4.99	2.70
AEHC	38.2	21.5	5.9	108	5.70	1.57
FFHH-65C-R3	95.9	25.2	9.3	127.6	16.78	6.19
AHFIG	28.7	12.87	5.59	70.5	2.57	1.12
COVP	20.0	16.0	8.0	25.0	2.22	1.11
AHLOA	22.1	12.2	7.5	83.9	1.87	1.15
FXFB	16.6	17.6	5.2	55.1	2.03	0.27
FRIA	15.6	17.6	5.2	55.1	1.91	0.27
PCS/AWS TMA	6.3	7.7	6.2	22	0.34	0.27
PCS/AWS TMA	6.3	7.7	6.2	22	0.34	0.27
			Total	605.40	38.75	14.93

Existing (Beta)						
Model	Height (in)	Width (in)	Depth (in)	Weight (LBS)	Area1 (ft^2)	Area2 (ft^2)
TMBXX-6516-R2M	59.9	12	6.5	36.2	4.99	2.70
TMBXX-6516-R2M	59.9	12	6.5	36.2	4.99	2.70
FFHH-65C-R3	95.9	25.2	9.3	127.6	16.78	6.19
AHFIB	22	12.1	5.9	66.1	1.85	0.90
COVP	20.0	16.0	8.0	25	2.22	1.11
AHLOA	22.1	12.2	7.5	83.9	1.87	1.15
FXFB	16.6	17.6	5.2	55.1	0.34	0.27
PCS/AWS TMA	6.3	7.7	6.2	22	0.34	0.27
PCS/AWS TMA	6.3	7.7	6.2	22	0.34	0.27
			Total	474.10	33.72	15.58

Proposed (Beta)						
Model	Height (in)	Width (in)	Depth (in)	Weight (LBS)	Area1 (ft^2)	Area2 (ft^2)
TMBXX-6516-R2M	59.9	12	6.5	36.2	4.99	2.70
AEHC	38.2	21.5	5.9	108	5.70	1.57
FFHH-65C-R3	95.9	25.2	9.3	127.6	16.78	6.19
AHFIG	28.7	12.87	5.59	70.5	2.57	1.12
COVP	20.0	16.0	8.0	25.0	2.22	1.11
AHLOA	22.1	12.2	7.5	83.9	1.87	1.15
FXFB	16.6	17.6	5.2	55.1	2.03	0.27
FRIA	15.6	17.6	5.2	55.1	1.91	0.27
PCS/AWS TMA	6.3	7.7	6.2	22	0.34	0.27
PCS/AWS TMA	6.3	7.7	6.2	22	0.34	0.27
HCS 2.0 Pendant	14.9	9.3	5.8	8.76	0.96	0.60
HCS 2.0 Pendant	14.9	9.3	5.8	8.76	0.96	0.60
			Total	622.92	40.67	16.13

CG ENGINEERING

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Description	By	Date
Antenna Comparison	CGP	9/16/2020
	Checked	Date
Project	Scale	Sheet No.
SE06033A Burke WT	Job No. 20070.667	2

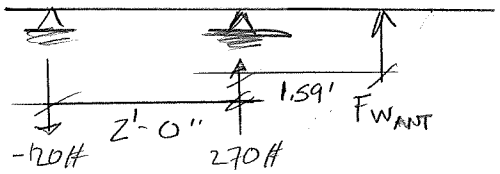
SE06033A BURKE

ANTENNA MOUNTS

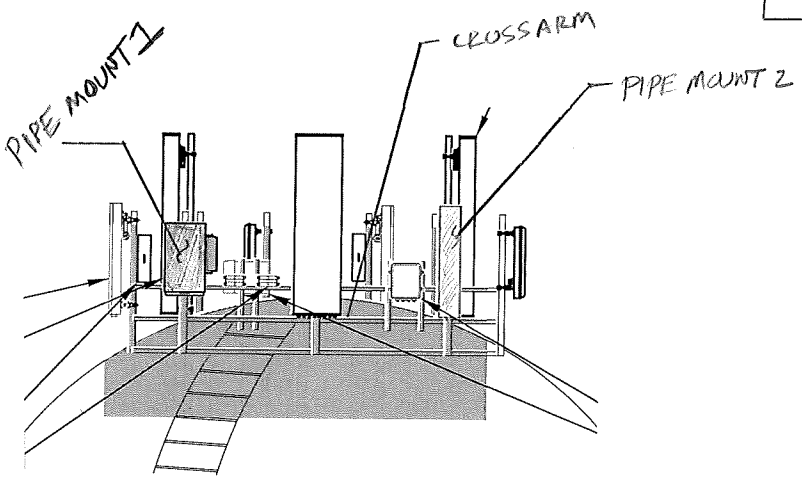
PIPE MOUNT 1 (AEHC ANT)

$F_{WANT} = \underbrace{(5.70FT^2)(26.1PSF)}_{AEHC} = 149\#$

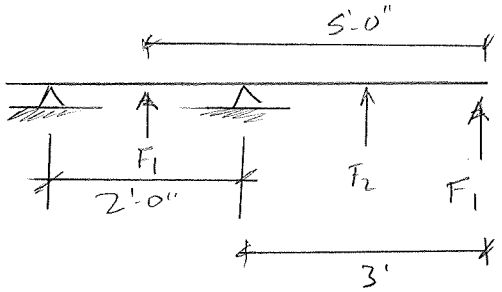
$M_A / M_n / \Omega = 0.099 << 1.0$



EXISTING 2½" Ø PIPE ADEQUATE
*SEE ENERCALC



PIPE MOUNT 2



$F_1 = \underbrace{(4.99ft^2)(26.1PSF)}_{TMBXX-6516-122M}/2 = 66\#$

$F_2 = \underbrace{(2.57ft^2)(26.1PSF)}_{AHFIG\ RRU} = 67\#$

$M_A / M_n / \Omega = 0.124$

EXISTING 2½" Ø PIPE ADEQUATE
*SEE ENERCALC

CG ENGINEERING 250 4th Ave. South Suite 200 Edmonds, WA 98020 425.778.8500 www.cgengineering.com	Description: ANTENNA MOUNTS	By: CGP	Date: 9/16/20
		Checked	Date
		Scale	Sheet No.: 13
	Project: SE06033A BURKE	Job No.: 20070.667	

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Project Title:
Engineer:
Project ID:
Project Descr:

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Steel Beam

File: Burke.ec6

Lic. # : KW-06005155

CG ENGINEERING

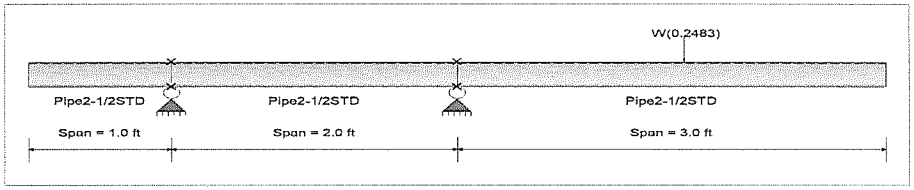
DESCRIPTION: Pipe Mount 1

CODE REFERENCES

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combination Set : IBC 2018

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	35.0 ksi
Beam Bracing :	Completely Unbraced	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Load(s) for Span Number 3
Point Load : W = 0.2483 k @ 1.590 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.099 : 1	Maximum Shear Stress Ratio =	0.015 : 1
Section used for this span	Pipe2-1/2STD	Section used for this span	Pipe2-1/2STD
Ma : Applied	0.237 k-ft	Va : Applied	0.1490 k
Mn / Omega : Allowable	2.393 k-ft	Vn/Omega : Allowable	10.123 k
Load Combination	+D+0.60W+H	Load Combination	+D+0.60W+H
Location of maximum on span	2.000 ft	Location of maximum on span	2.000 ft
Span # where maximum occurs	Span # 2	Span # where maximum occurs	Span # 2

Maximum Deflection

Max Downward Transient Deflection	0.064 in	Ratio =	1,121 >=100
Max Upward Transient Deflection	-0.004 in	Ratio =	5,715 >=100
Max Downward Total Deflection	0.039 in	Ratio =	1870 >=100
Max Upward Total Deflection	-0.003 in	Ratio =	9526 >=100

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
+D+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+L+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+Lr+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+S+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+0.750Lr+0.750L+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+0.750L+0.750S+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12

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CG ENGINEERING

DESCRIPTION: Pipe Mount 1

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+0.60W+H													
Dsgn. L = 1.00 ft	1		0.012				4.00	2.39	1.00	1.00	0.12	16.91	10.12
Dsgn. L = 2.00 ft	2	0.099	0.015		-0.24	0.24	4.00	2.39	1.67	1.00	0.15	16.91	10.12
Dsgn. L = 3.00 ft	3	0.099	0.015		-0.24	0.24	4.00	2.39	1.00	1.00	0.15	16.91	10.12
+D+0.70E+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+0.750Lr+0.750L+0.450W+H													
Dsgn. L = 1.00 ft	1		0.009				4.00	2.39	1.00	1.00	0.09	16.91	10.12
Dsgn. L = 2.00 ft	2	0.074	0.011		-0.18	0.18	4.00	2.39	1.67	1.00	0.11	16.91	10.12
Dsgn. L = 3.00 ft	3	0.074	0.011		-0.18	0.18	4.00	2.39	1.00	1.00	0.11	16.91	10.12
+D+0.750L+0.750S+0.450W+H													
Dsgn. L = 1.00 ft	1		0.009				4.00	2.39	1.00	1.00	0.09	16.91	10.12
Dsgn. L = 2.00 ft	2	0.074	0.011		-0.18	0.18	4.00	2.39	1.67	1.00	0.11	16.91	10.12
Dsgn. L = 3.00 ft	3	0.074	0.011		-0.18	0.18	4.00	2.39	1.00	1.00	0.11	16.91	10.12
+D+0.750L+0.750S+0.5250E+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+0.60D+0.60W+0.60H													
Dsgn. L = 1.00 ft	1		0.012				4.00	2.39	1.00	1.00	0.12	16.91	10.12
Dsgn. L = 2.00 ft	2	0.099	0.015		-0.24	0.24	4.00	2.39	1.67	1.00	0.15	16.91	10.12
Dsgn. L = 3.00 ft	3	0.099	0.015		-0.24	0.24	4.00	2.39	1.00	1.00	0.15	16.91	10.12
+0.60D+0.70E+0.60H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.0054	0.000		0.0000	0.000
	2	0.0000	0.000	W Only	-0.0042	1.160
W Only	3	0.0642	3.000		0.0000	1.160

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Overall MAXimum		-0.197	0.446	
Overall MINimum		-0.089	0.201	
+D+0.60W+H		-0.118	0.267	
+D+0.750Lr+0.750L+0.450W+H		-0.089	0.201	
+D+0.750L+0.750S+0.450W+H		-0.089	0.201	
+0.60D+0.60W+0.60H		-0.118	0.267	
W Only		-0.197	0.446	
H Only				

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Steel Beam

Lic. # : KW-06005155 CG ENGINEERING

DESCRIPTION: Pipe Mount 2

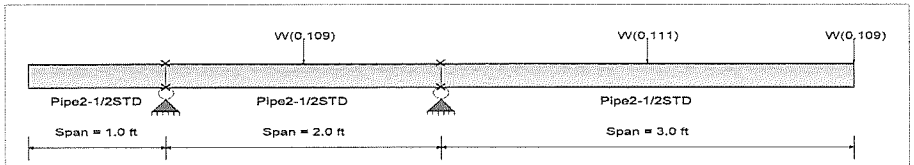
CODE REFERENCES

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combination Set : IBC 2018

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Completely Unbraced
Bending Axis : Major Axis Bending

Fy : Steel Yield : 35.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Load(s) for Span Number 2
Point Load : W = 0.1090 k @ 1.0 ft, (TMBXX)

Load(s) for Span Number 3
Point Load : W = 0.1090 k @ 3.0 ft, (TMBXX)

Point Load : W = 0.1110 k @ 1.50 ft, (AHFIG)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.124 : 1	Maximum Shear Stress Ratio =	0.018 : 1
Section used for this span	Pipe2-1/2STD	Section used for this span	Pipe2-1/2STD
Ma : Applied	0.296 k-ft	Va : Applied	0.1808 k
Mn / Omega : Allowable	2.393 k-ft	Vn/Omega : Allowable	10.123 k
Load Combination	+D+0.60W+H	Load Combination	+D+0.60W+H
Location of maximum on span	2.000 ft	Location of maximum on span	1.000 ft
Span # where maximum occurs	Span # 2	Span # where maximum occurs	Span # 2

Maximum Deflection

Max Downward Transient Deflection	0.090 in	Ratio =	799 >=100
Max Upward Transient Deflection	-0.005 in	Ratio =	5,303 >=100
Max Downward Total Deflection	0.054 in	Ratio =	1332 >=100
Max Upward Total Deflection	-0.003 in	Ratio =	8839 >=100

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
+D+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+L+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+Lr+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+S+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12

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Steel Beam

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DESCRIPTION: Pipe Mount 2

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
+D+0.750Lr+0.750L+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+0.750L+0.750S+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+0.60W+H													
Dsgn. L = 1.00 ft	1		0.011				4.00	2.39	1.00	1.00	0.12	16.91	10.12
Dsgn. L = 2.00 ft	2	0.124	0.018		-0.30	0.30	4.00	2.39	1.86	1.00	0.18	16.91	10.12
Dsgn. L = 3.00 ft	3	0.124	0.013		-0.30	0.30	4.00	2.39	1.00	1.00	0.13	16.91	10.12
+D+0.70E+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+D+0.750Lr+0.750L+0.450W+H													
Dsgn. L = 1.00 ft	1		0.009				4.00	2.39	1.00	1.00	0.09	16.91	10.12
Dsgn. L = 2.00 ft	2	0.093	0.013		-0.22	0.22	4.00	2.39	1.86	1.00	0.14	16.91	10.12
Dsgn. L = 3.00 ft	3	0.093	0.010		-0.22	0.22	4.00	2.39	1.00	1.00	0.10	16.91	10.12
+D+0.750L+0.750S+0.450W+H													
Dsgn. L = 1.00 ft	1		0.009				4.00	2.39	1.00	1.00	0.09	16.91	10.12
Dsgn. L = 2.00 ft	2	0.093	0.013		-0.22	0.22	4.00	2.39	1.86	1.00	0.14	16.91	10.12
Dsgn. L = 3.00 ft	3	0.093	0.010		-0.22	0.22	4.00	2.39	1.00	1.00	0.10	16.91	10.12
+D+0.750L+0.750S+0.5250E+H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
+0.60D+0.60W+0.60H													
Dsgn. L = 1.00 ft	1		0.011				4.00	2.39	1.00	1.00	0.12	16.91	10.12
Dsgn. L = 2.00 ft	2	0.124	0.018		-0.30	0.30	4.00	2.39	1.86	1.00	0.18	16.91	10.12
Dsgn. L = 3.00 ft	3	0.124	0.013		-0.30	0.30	4.00	2.39	1.00	1.00	0.13	16.91	10.12
+0.60D+0.70E+0.60H													
Dsgn. L = 1.00 ft	1		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 2.00 ft	2		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12
Dsgn. L = 3.00 ft	3		0.000				4.00	2.39	1.00	1.00	-0.00	16.91	10.12

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.0056	0.000		0.0000	0.000
	2	0.0000	0.000	W Only	-0.0045	1.187
W Only	3	0.0901	3.000		0.0000	1.187

Vertical Reactions

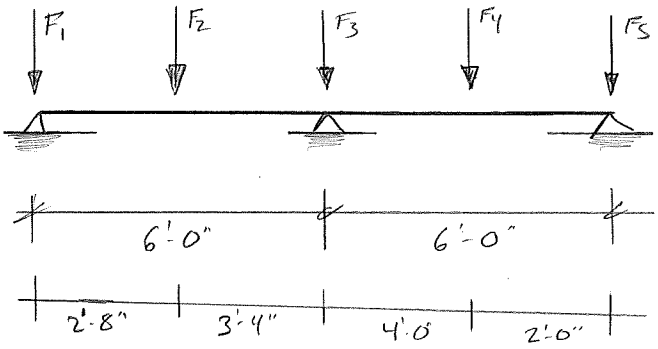
Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Overall MAXimum		-0.192	0.521	
Overall MINimum		-0.087	0.235	
+D+0.60W+H		-0.115	0.313	
+D+0.750Lr+0.750L+0.450W+H		-0.087	0.235	
+D+0.750L+0.750S+0.450W+H		-0.087	0.235	
+0.60D+0.60W+0.60H		-0.115	0.313	
W Only		-0.192	0.521	
H Only				

SE06033A TBURKE

ANTENNA MOUNTS

CROSSARM * ASSUME ALL LOAD INTO TOP CROSSARM



[AEHC] (PIPE)

$F_{1\,DL}$ = 108# (DL) + 50# = 158# DL

$F_{1\,WL}$ = (5.70 FT²)(43.4 PSF) = 248# WL

(TMA) (FRIA/FXFB)

$F_{2\,DL}$ = (2) 22# DL + (2) 55.1# DL

$F_{2\,WL}$ = (2)(0.27 FT²)(43.4 PSF) + (1)(2.03 FT²)(43.4 PSF)

SIDE AREA / (1) SHIELDED

$F_{2\,WL}$ = 112# (WL)

[FFHH-65C-R3] [AHLOA]

F_{3DL} = 123# + 83.9# + 50# = 257#

F_{3WL} = (16.78 FT²)(43.4 PSF) = 729 # WL

[COVP]

F_{4DL} = 25# (DL)

F_{4WL} = (2.22 FT²)(43.4 PSF) = 97 # WL

[TMBXX] [AHFIG]

F_{5DL} = 36.2# + 70.5# + 50# = 156.7#

F_{5WL} = [(4.99 FT²) + (2.57 FT²)](43.4 PSF)

= 328 # WL

EXISTING L3X3 X 1/4" ANGLE IS ADEQUATE

SEE ENERCALC

CG ENGINEERING 250 4th Ave. South Suite 200 Edmonds, WA 98020 425.778.8500 www.cgengineering.com	Description: ANTENNA MOUNTS	By: CGP	Date: 9/16/20
		Checked	Date
		Scale	Sheet No.: 16
	Project: SE06033A BURKE	Job No.: 20090.667	

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Steel Beam

Lic. # : KW-06005155 CG ENGINEERING

DESCRIPTION: Crossarm

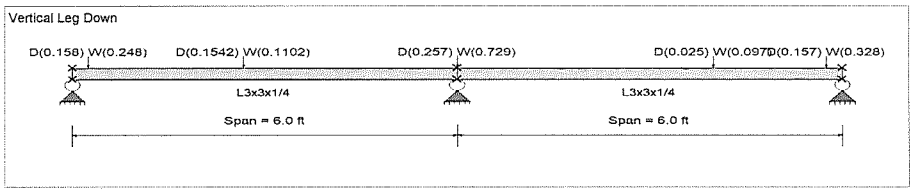
CODE REFERENCES

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combination Set : IBC 2018

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Completely Unbraced
Bending Axis : Major Axis Bending

Fy : Steel Yield : 36.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Load(s) for Span Number 1
Point Load : D = 0.1580, W = 0.2480 k @ 0.250 ft
Point Load : D = 0.1542, W = 0.1102 k @ 2.667 ft
Point Load : D = 0.2570, W = 0.7290 k @ 6.0 ft
Load(s) for Span Number 2
Point Load : D = 0.0250, W = 0.0970 k @ 4.0 ft
Point Load : D = 0.1570, W = 0.3280 k @ 5.750 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.243 : 1	Maximum Shear Stress Ratio =	0.041 : 1
Section used for this span	L3x3x1/4	Section used for this span	L3x3x1/4
Ma : Applied	0.294 k-ft	Va : Applied	0.3948 k
Mn / Omega : Allowable	1.208 k-ft	Vn/Omega : Allowable	9.701 k
Load Combination	+D+0.60W+H	Load Combination	+D+0.60W+H
Location of maximum on span	2.664 ft	Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.016 in	Ratio =	4,423 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.037 in	Ratio =	1945 >=180
Max Upward Total Deflection	-0.004 in	Ratio =	16108 >=180

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
+D+H													
Dsgn. L = 6.00 ft	1	0.176	0.024	0.21	-0.14	0.21	2.01	1.20	1.52	1.00	0.23	16.20	9.70
Dsgn. L = 6.00 ft	2	0.110	0.016	0.04	-0.14	0.14	2.05	1.23	2.63	1.00	0.16	16.20	9.70
+D+L+H													
Dsgn. L = 6.00 ft	1	0.176	0.024	0.21	-0.14	0.21	2.01	1.20	1.52	1.00	0.23	16.20	9.70
Dsgn. L = 6.00 ft	2	0.110	0.016	0.04	-0.14	0.14	2.05	1.23	2.63	1.00	0.16	16.20	9.70
+D+Lr+H													
Dsgn. L = 6.00 ft	1	0.176	0.024	0.21	-0.14	0.21	2.01	1.20	1.52	1.00	0.23	16.20	9.70
Dsgn. L = 6.00 ft	2	0.110	0.016	0.04	-0.14	0.14	2.05	1.23	2.63	1.00	0.16	16.20	9.70
+D+S+H													

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Steel Beam

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Lic. # : KW-06005155 CG ENGINEERING

DESCRIPTION: Crossarm

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
Dsgn. L = 6.00 ft	1	0.176	0.024	0.21	-0.14	0.21	2.01	1.20	1.52	1.00	0.23	16.20	9.70
Dsgn. L = 6.00 ft	2	0.110	0.016	0.04	-0.14	0.14	2.05	1.23	2.63	1.00	0.16	16.20	9.70
+D+0.750Lr+0.750L+H													
Dsgn. L = 6.00 ft	1	0.176	0.024	0.21	-0.14	0.21	2.01	1.20	1.52	1.00	0.23	16.20	9.70
Dsgn. L = 6.00 ft	2	0.110	0.016	0.04	-0.14	0.14	2.05	1.23	2.63	1.00	0.16	16.20	9.70
+D+0.750L+0.750S+H													
Dsgn. L = 6.00 ft	1	0.176	0.024	0.21	-0.14	0.21	2.01	1.20	1.52	1.00	0.23	16.20	9.70
Dsgn. L = 6.00 ft	2	0.110	0.016	0.04	-0.14	0.14	2.05	1.23	2.63	1.00	0.16	16.20	9.70
+D+0.60W+H													
Dsgn. L = 6.00 ft	1	0.243	0.041	0.29	-0.22	0.29	2.02	1.21	1.55	1.00	0.39	16.20	9.70
Dsgn. L = 6.00 ft	2	0.178	0.038	0.12	-0.22	0.22	2.05	1.23	2.11	1.00	0.37	16.20	9.70
+D+0.70E+H													
Dsgn. L = 6.00 ft	1	0.176	0.024	0.21	-0.14	0.21	2.01	1.20	1.52	1.00	0.23	16.20	9.70
Dsgn. L = 6.00 ft	2	0.110	0.016	0.04	-0.14	0.14	2.05	1.23	2.63	1.00	0.16	16.20	9.70
+D+0.750Lr+0.750L+0.450W+H													
Dsgn. L = 6.00 ft	1	0.226	0.036	0.27	-0.20	0.27	2.02	1.21	1.54	1.00	0.35	16.20	9.70
Dsgn. L = 6.00 ft	2	0.161	0.033	0.10	-0.20	0.20	2.05	1.23	2.18	1.00	0.32	16.20	9.70
+D+0.750L+0.750S+0.450W+H													
Dsgn. L = 6.00 ft	1	0.226	0.036	0.27	-0.20	0.27	2.02	1.21	1.54	1.00	0.35	16.20	9.70
Dsgn. L = 6.00 ft	2	0.161	0.033	0.10	-0.20	0.20	2.05	1.23	2.18	1.00	0.32	16.20	9.70
+D+0.750L+0.750S+0.5250E+H													
Dsgn. L = 6.00 ft	1	0.176	0.024	0.21	-0.14	0.21	2.01	1.20	1.52	1.00	0.23	16.20	9.70
Dsgn. L = 6.00 ft	2	0.110	0.016	0.04	-0.14	0.14	2.05	1.23	2.63	1.00	0.16	16.20	9.70
+0.60D+0.60W+0.60H													
Dsgn. L = 6.00 ft	1	0.173	0.031	0.21	-0.16	0.21	2.02	1.21	1.56	1.00	0.30	16.20	9.70
Dsgn. L = 6.00 ft	2	0.134	0.032	0.10	-0.16	0.16	2.05	1.23	1.97	1.00	0.31	16.20	9.70
+0.60D+0.70E+0.60H													
Dsgn. L = 6.00 ft	1	0.106	0.014	0.13	-0.08	0.13	2.01	1.20	1.52	1.00	0.14	16.20	9.70
Dsgn. L = 6.00 ft	2	0.066	0.010	0.02	-0.08	0.08	2.05	1.23	2.63	1.00	0.10	16.20	9.70

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.60W+H	1	0.0370	2.640		0.0000	0.000
W Only	2	0.0137	3.840	D Only	-0.0045	1.440

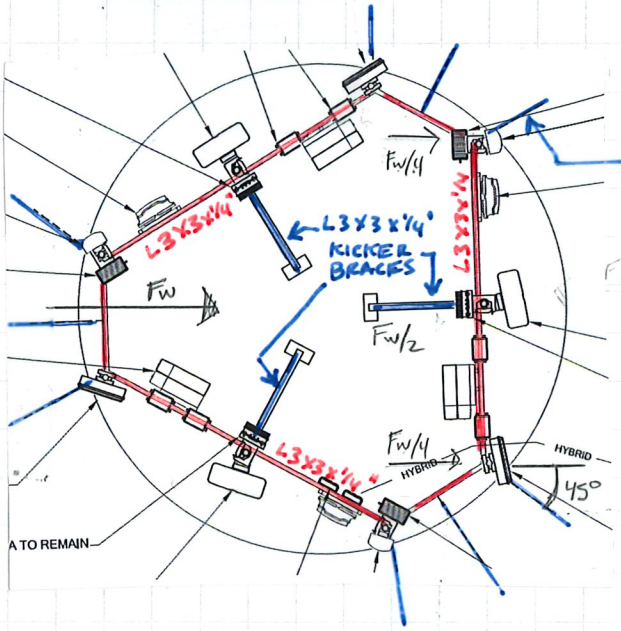
Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	0.395	0.950	0.373
Overall MINimum	0.138	0.253	0.096
+D+H	0.229	0.422	0.159
+D+L+H	0.229	0.422	0.159
+D+Lr+H	0.229	0.422	0.159
+D+S+H	0.229	0.422	0.159
+D+0.750Lr+0.750L+H	0.229	0.422	0.159
+D+0.750L+0.750S+H	0.229	0.422	0.159
+D+0.60W+H	0.395	0.950	0.373
+D+0.70E+H	0.229	0.422	0.159
+D+0.750Lr+0.750L+0.450W+H	0.353	0.818	0.319
+D+0.750L+0.750S+0.450W+H	0.353	0.818	0.319
+D+0.750L+0.750S+0.5250E+H	0.229	0.422	0.159
+0.60D+0.60W+0.60H	0.303	0.781	0.309
+0.60D+0.70E+0.60H	0.138	0.253	0.096
D Only	0.229	0.422	0.159
W Only	0.276	0.880	0.356
H Only			

SE06033A BURKE

ANTENNA FRAME



½"Ø THREADED ROD TIES, TYP

$F_{WIND} = (40.67\,ft^2)(43.4\,PSF)$

$= 1796\,\#/SIDE$

$F_{TOTAL} = (3)(1796\,\#)(0.8)$ ← SHIELDING FACTOR

$= 4310\,\#(ULT)$; $2586\,\#(ASD)$

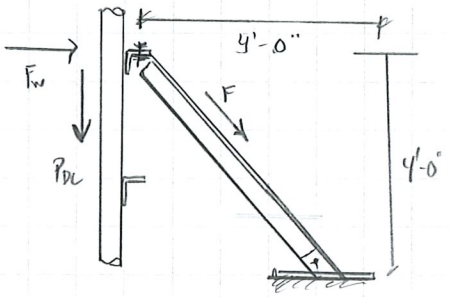
½" Ø THREADED ROD BRACES

LOAD PER CABLE $= \sqrt{\left(\frac{4310\,\#}{4}\right)^2 + \left(\frac{4310\,\#}{4}\right)^2} = 1524\,\#(ULT)$; $914\,\#(ASD)$

$914\,\# < 1130\,\#$ CAPACITY (PER ORIGINAL CALCS)

$M_R/\Sigma M = 0.81$ STRESSED

L3X3X¼" KICKER



$F_W = 4310\,\#/2 = 2155\,\#$ $F_{DL} = 623\,\#$

$F_{KICKER} = \frac{2155\,\#}{\cos 45^\circ}(WL) + \frac{623\,\#}{\cos 45^\circ}(DL) = 3929\,\#$

EXISTING L3X3X¼" KICKER IS ADEQUATE

CG ENGINEERING 250 4th Ave. South Suite 200 Edmonds, WA 98020 425.778.8500 www.cgengineering.com	Description: ANTENNA FRAME	By: CGP	Date: 9/16/20
		Checked	Date
		Scale	Sheet No.: 18
	Project: SE06033A BURKE	Job No.: 20070.667	

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Steel Column

Lic. # : KW-06005155 CG ENGINEERING

DESCRIPTION: Kicker

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : IBC 2018

General Information

Steel Section Name : **L3x3x1/4**
Analysis Method : Allowable Strength
Steel Stress Grade
Fy : Steel Yield 36.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 5.670 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Unbraced Length for buckling ABOUT Y-Y Axis = 5.670 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 5.670 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 27.783 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 5.670 ft, D = 0.8810, W = 3.048 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.2064** : 1
Load Combination +D+0.60W+H
Location of max.above base 0.0 ft
At maximum location values are . . .
Pa : Axial 2.738 k
Pn / Omega : Allowable 13.261 k
Ma-x : Applied 0.0 k-ft
Mn-x / Omega : Allowable 1.135 k-ft
Ma-y : Applied 0.0 k-ft
Mn-y / Omega : Allowable 1.135 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
Load Combination 0.0
Location of max.above base 0.0 ft
At maximum location values are . . .
Va : Applied 0.0 k
Vn / Omega : Allowable 0.0 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 0.0 k
Bottom along Y-Y 0.0 k

Maximum Load Deflections . . .
Along Y-Y 0.0 in at 0.0 ft above base
for load combination :
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Max. Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Max. Shear Ratios: Stress Ratio	Status	Location
+D+H	0.069	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+D+L+H	0.069	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+D+Lr+H	0.069	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+D+S+H	0.069	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+D+0.750Lr+0.750L+H	0.069	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+D+0.750L+0.750S+H	0.069	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+D+0.60W+H	0.206	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+D+0.70E+H	0.069	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+D+0.750Lr+0.750L+0.450W+H	0.172	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+D+0.750L+0.750S+0.450W+H	0.172	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+D+0.750L+0.750S+0.5250E+H	0.069	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+0.60D+0.60W+0.60H	0.179	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft
+0.60D+0.70E+0.60H	0.041	PASS	0.00 ft	1.00	1.00	127.11	127.11	0.000	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments @ Base	@ Top	k-ft	My - End Moments @ Base	@ Top
+D+H	0.909										
+D+L+H	0.909										

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Steel Column

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Lic. # : KW-06005155 CG ENGINEERING

DESCRIPTION: Kicker

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments @ Base	@ Top	k-ft	My - End Moments @ Base	@ Top
+D+H	0.909										
+D+L+H	0.909										
+D+Lr+H	0.909										
+D+S+H	0.909										
+D+0.750Lr+0.750L+H	0.909										
+D+0.750L+0.750S+H	0.909										
+D+0.60W+H	2.738										
+D+0.70E+H	0.909										
+D+0.750Lr+0.750L+0.450W+H	2.280										
+D+0.750L+0.750S+0.450W+H	2.280										
+D+0.750L+0.750S+0.5250E+H	0.909										
+0.60D+0.60W+0.60H	2.374										
+0.60D+0.70E+0.60H	0.545										
D Only	0.909										
Lr Only											
L Only											
S Only											
W Only	3.048										
E Only											
H Only											

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments @ Base	@ Top	k-ft	My - End Moments @ Base	@ Top
Axial @ Base	Maximum	3.048										
"	Minimum											
Reaction, X-X Axis Base	Maximum	0.909										
"	Minimum	0.909										
Reaction, Y-Y Axis Base	Maximum	0.909										
"	Minimum	0.909										
Reaction, X-X Axis Top	Maximum	0.909										
"	Minimum	0.909										
Reaction, Y-Y Axis Top	Maximum	0.909										
"	Minimum	0.909										
Moment, X-X Axis Base	Maximum	0.909										
"	Minimum	0.909										
Moment, Y-Y Axis Base	Maximum	0.909										
"	Minimum	0.909										
Moment, X-X Axis Top	Maximum	0.909										
"	Minimum	0.909										
Moment, Y-Y Axis Top	Maximum	0.909										
"	Minimum	0.909										

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
+D+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+L+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+Lr+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+S+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750Lr+0.750L+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750L+0.750S+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.60W+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.70E+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750Lr+0.750L+0.450W+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750L+0.750S+0.450W+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750L+0.750S+0.5250E+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+0.60D+0.60W+0.60H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+0.60D+0.70E+0.60H	0.0000	in	0.000	ft	0.000	in	0.000	ft
D Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
Lr Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
L Only	0.0000	in	0.000	ft	0.000	in	0.000	ft

6

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Steel Column

File: Burke.ec6

Lic. # : KW-06005155

CG ENGINEERING

DESCRIPTION: Kicker

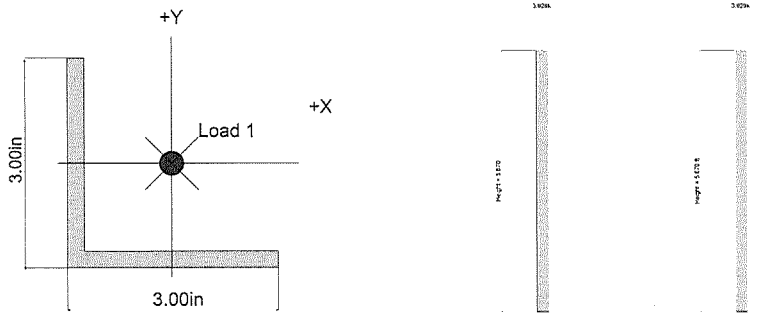
Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
S Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
W Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
E Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
H Only	0.0000	in	0.000	ft	0.000	in	0.000	ft

Steel Section Properties : L3x3x1/4

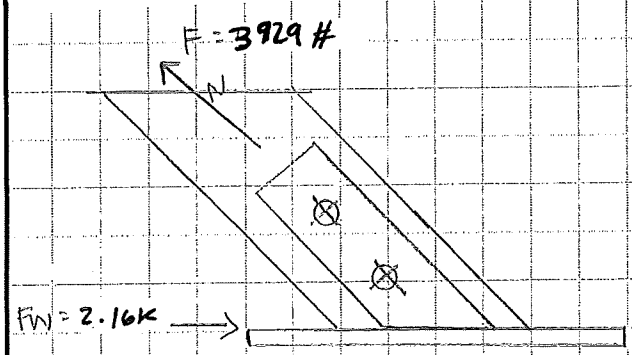
Depth	=	3.000 in	I xx	=	1.23 in^4		J	=	0.031 in^4
			S xx	=	0.57 in^3		Cw	=	0.02 in^6
Leg Width	=	3.000 in	R xx	=	0.926 in		Ro	=	1.650 in
Thickness	=	0.250 in	Zx	=	1.020 in^3				
Area	=	1.440 in^2	I yy	=	1.230 in^4				
Weight	=	4.900 plf	S yy	=	0.569 in^3				
Kdesign	=	0.625 in	R yy	=	0.926 in				
Ycg	=	0.836 in	Qs	=	0.000				
			Iz	=	0.490 in^4				
			Sz	=	0.415 in^3				
Yp	=	0.240 in	Rz	=	0.585 in				
			Tan_{Iz}	=	1.00 deg				
Eo	=	0.000 in							

Sketches



SEOG033A BURKE

KICKER CONNECTIONS



Check Bolt

* assume 3/4" Ø

$$R_{nv} = \frac{(27\,ksi)(\pi)(\frac{3/4}{2})^2)(2\,bolts)}{\Omega} = \frac{}{1.67}$$

$$= 14.28\,K > 3.93\,K \quad (OK)$$

(2) 3/4" Ø bolts are adequate

Check Weld

* assume 3" long 3/16" weld

$$R_n = \frac{0.6(70\,ksi)(0.707)(3/16")(3")}{2} = 8.35\,K > 2.16\,K \quad (OK)$$

3" long 3/16" fillet weld is adequate

Check Epoxy

* assume 4" x 4" SQ plate, minimum

Allowable T = 2790 psi (4")(4")

T = 44.6 K >> F = 2.16 K (OK)

4" x 4" Belzona 1111 is adequate

CG ENGINEERING 250 4th Ave. South Suite 200 Edmonds, WA 98020 425.778.8500 www.cgengineering.com	Description: Kicker Connection	By: MBB	Date: 9/16/20
		Checked	Date
		Scale: NTS	Sheet No.: 21
	Project: SEOG033A Burke	Job No.: 20070.667	

PRODUCT SPECIFICATION SHEET
BELZONA 1111
FN10132

BELZONA
Repair • Protect • Improve

ABRASION

Taber
The Taber abrasion resistance determined in accordance with ASTM D4060 with 1 kg load is typically:

H10 Wheels (Wet)	852 mm^3 loss per 1000 cycles
CS17 Wheels (Dry)	24 mm^3 loss per 1000 cycles

ADHESION

Tensile Shear
When tested in accordance with ASTM D1002, using degreased strips, grit blasted to a 3-4 mil profile, typical values will be:

Mild steel	2,790 psi (19.2 MPa)
Brass	1,650 psi (11.4 MPa)
Copper	2,060 psi (14.2 MPa)
Stainless steel	2,960 psi (20.4 MPa)
Aluminium	1,950 psi (13.4 MPa)

Tensile fatigue
The Tensile fatigue in accordance with ASTM D3166 at ambient temperature and 653 psi (4.5MPa) applied static tensile stress is >1,000,000 cycles.

Pull Off Adhesion
When tested in accordance with ASTM D 4541/ ISO 4624, the pull off strength from grit blasted steel will be typically:

3240 psi (22.3 MPa)	68°F (20°C) cure
2980 psi (20.5 MPa)	212°F (100°C) cure

Cleavage strength
When tested in accordance with ASTM D 1062, the cleavage strength to grit blasted steel will be typically:

1199 pli	68°F (20°C) cure

CHEMICAL ANALYSIS

The mixed **Belzona 1111** has been independently analyzed for halogens, heavy metals, and other corrosion-causing impurities, with the following typical results:

Analyte	Total Concentration (ppm)
Fluoride	224
Chloride	398
Bromide	ND (<12)
Sulfur	1019
Nitrite	ND (<6)
Nitrate	4
Zinc	3.4
Antimony, Arsenic, Bismuth, Cadmium, Lead, Tin, Silver, Mercury, Gallium and Indium	ND (<3.0)

ND : Not Detected

CHEMICAL RESISTANCE

Once fully cured, the material will demonstrate excellent resistance to most commonly found inorganic acids and alkalis at concentrations up to 20%.
The material is also resistant to hydro-carbons, mineral oils, lubricating oils and many other commonly found chemicals.

* *For a more detailed description of chemical resistance properties, refer to relevant Chemical Resistance chart.*

COMPRESSIVE PROPERTIES

When determined in accordance with ASTM D695 (1.0in/25.4mm thick test pieces), typical values will be:

	Cure temperature
Compressive Strength (Maximum)	
12525 psi (86.4 MPa)	68°F (20°C)
16645 psi (114.8 MPa)	212°F (100°C)
Compressive Strength (Yield)	
9620 psi (66.3 MPa)	68°F (20°C)
10955 psi (75.6 MPa)	212°F (100°C)
Compressive Modulus	
1.77 x 10^5 psi (1217 MPa)	68°F (20°C)
1.75 x 10^5 psi (1205 MPa)	212°F (100°C)

When determined using a modified version of ASTM D695, at thickness more representative of in service application, typical values will be:

Thickness	Compressive Strength (Yield)	Cure Temperature
0.24 in (6.0 mm)	13095 psi (90.3 MPa) 16450 psi (113.4 MPa)	68°F (20°C) 212°F (100°C)
0.12 in (3.0 mm)	14855 psi (102.5 MPa) 18980 psi (130.9 MPa)	68°F (20°C) 212°F (100°C)

Bonded to grit blasted mild steel (single side)

Thickness	Compressive Strength (Yield)	Cure Temperature
0.12 in (3.0 mm)	19910 psi (137.3 MPa) 23840 psi (164.4 MPa)	68°F (20°C) 212°F (100°C)

CORROSION PROTECTION

Corrosion Resistance
Will show no visible signs of corrosion after 5,000 hours exposure in the ASTM B117 salt spray cabinet.

22

CABINET ANCHORAGE DESIGN

Input Values

B =	31.6	in	(Least out-out dimension of equipment footprint)
L =	30	in	(Equipment Length)
d =	23.27	in	(Distance between anchors/Smallest moment arm)
H =	60.4	in	(Equipment height)
Wt =	2206	lbs	(Equipment weight)
S_{ds} =	0.977		

Applied Forces (LRFD; see previous EQ & Wind calcs)

F_{Eh} = Seismic Coefficient * Wt =	1060	lbs
$F_{Ev} = \pm 0.2S_{ds}Wt$ =	431	lbs
F_{Wh} = Horiz Pressure * [(B or L)*H] =	576	lbs
F_{Wv} = Vert Pressure * (B*L) =	0	N/A when H>60'

Load Combinations for Max Uplift

	LRFD	ASD
EQ	0.9D + 1.0E	0.6D + 0.7E
Wind	0.9D + 1.0W	0.6D + 0.6W

Overturning Moment

$M_{OTE} = F_{Eh}H/2$ =	32,001	in-lbs
$M_{OTW} = F_{Wh}H/2$ =	17,388	in-lbs

Resisting Moment

$M_R = (Wt)d/2$ =	25,667	in-lbs

Max Uplift

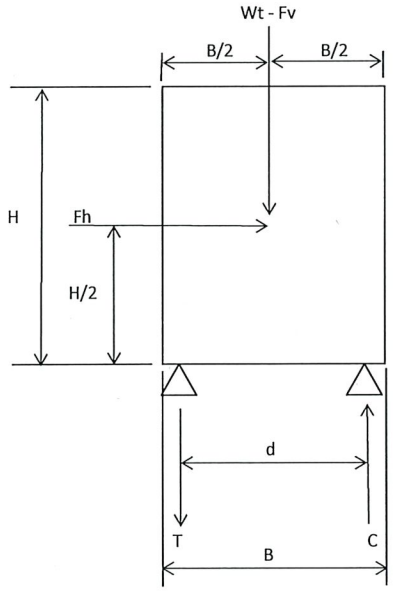
LRFD (lbs/side)		ASD (lbs/side)	
$T_E = (1.0M_{OTE}-0.9M_R)/d + F_{Ev}/2$ =	598	$T_E = (0.7M_{OTE}-0.6M_R)/d + 0.7F_{Ev}/2$ =	452
$T_W = (1.0M_{OTW}-0.9M_R)/d + F_{Wv}/2$ =	-245	$T_W = (0.6M_{OTW}-0.6M_R)/d + 0.6F_{Wv}/2$ =	-213

Max Shear

LRFD (lbs/side)		ASD (lbs/side)	
$V_E = 1.0F_E/2$ =	530	$V_E = 0.7F_E/2$ =	371
$V_W = 1.0F_W/2$=	288	$V_W = 0.6F_W/2$ =	173

Summary of Anchorage Forces

LRFD		
Tension, T =	**598**	**lbs/side**
Shear, V =	**530**	**lbs/side**
ASD		
Tension, T =	**452**	**lbs/side**
Shear, V =	**371**	**lbs/side**



Summary of Anchorage

Use (4) 3/8"Hilti Kwik Bolt TZ wedge anchors with 2" embedment into concrete slab, (1) at each corner of the unit, Min.

C&G ENGINEERING

250 4th Ave. South
Suite 200
Edmonds, WA 98020

Description: Equipment Anchorage		By: CGP	Date: 9/18/2020
HPL3 Battery Cabinet		Checked	Date
Project: SE06033A Burke		Scale: N.T.S.	Sheet No.: 23
		Job No.: 20070.667	

Company:
Specifier:
Address:
Phone I Fax: |
E-Mail:

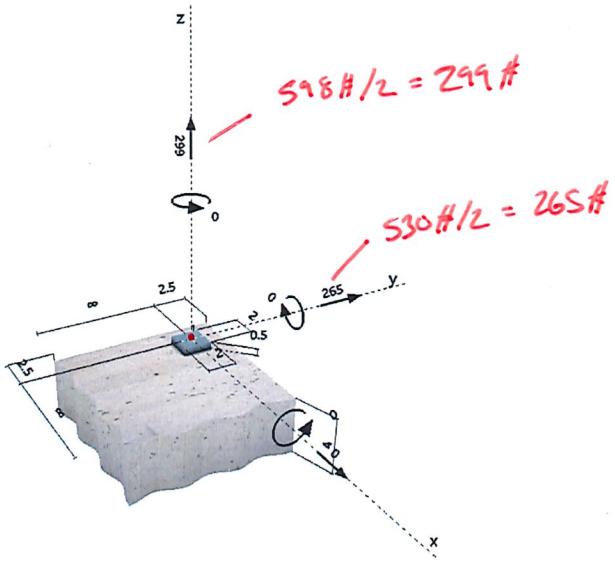
Page: 1
Project:
Sub-Project I Pos. No.:
Date: 9/18/2020

Specifier's comments:

1 Input data

Anchor type and diameter:	**Kwik Bolt TZ - CS 3/8 (2)**
Effective embedment depth:	$h_{ef,act}$ = 2.000 in., h_{nom} = 2.313 in.
Material:	Carbon Steel
Evaluation Service Report:	ESR-1917
Issued I Valid:	2/22/2016 | 5/1/2017
Proof:	Design method ACI 318-14 / Mech.
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.500 in.
Anchor plate:	l_x x l_y x t = 2.000 in. x 2.000 in. x 0.500 in.; (Recommended plate thickness: not calculated
Profile:	no profile
Base material:	cracked concrete, 2500, f_c' = 2500 psi; h = 4.000 in.
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present edge reinforcement: none or < No. 4 bar
Seismic loads (cat. C, D, E, or F)	Tension load: yes (17.2.3.4.3 (d)) Shear load: yes (17.2.3.5.3 (a))

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



598#/2 = 299#

530#/2 = 265#

42

Company:
Specifier:
Address:
Phone I Fax: |
E-Mail:

Page: 2
Project:
Sub-Project I Pos. No.:
Date: 9/18/2020

2 Proof I Utilization (Governing Cases)

		Design values [lb]		Utilization	
Loading	**Proof**	**Load**	**Capacity**	**β_N / β_V [%]**	**Status**
Tension	Concrete Breakout Strength	299	936	32 / -	OK
Shear	Concrete edge failure in direction y+	265	622	- / 43	OK

Loading	**β_N**	**β_V**	**ζ**	**Utilization $\beta_{N,V}$ [%]**	**Status**
Combined tension and shear loads	0.320	0.426	5/3	40	OK

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!

4 Remarks; Your Cooperation Duties

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

Permit Number: 20-04364

RYKA CONSULTING

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BURKE

6563 SUNSET AVE NE
BREMERTON, WA 98310

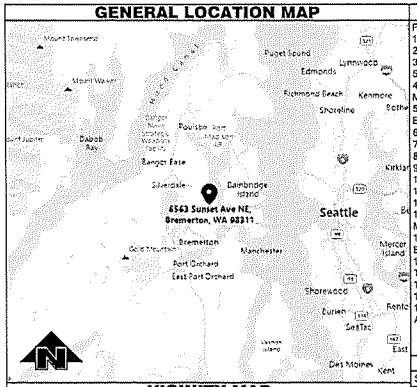
RFDS: VER: 6
PROJECT: ANCHOR

SITE NUMBER: SE06033A

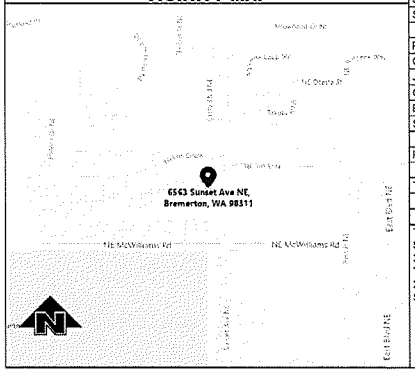
LATITUDE 47° 37' 21.74" N (47.622706) **LONGITUDE 122° 36' 30.69" W (-122.608525)**

PROJECT: ANCHOR/L600

GENERAL LOCATION MAP



VICINITY MAP



DRIVING DIRECTIONS

FROM T-MOBILE BOTHELL 4 OFFICE:
1. DEPART SOUTH ON N CREEK PKWY 0.3 MI
2. TURN RIGHT ONTO NE 195TH ST 0.2 MI
3. TAKE RAMP RIGHT FOR I-405 NORTH TOWARD EVERETT 5.8 MI
4. TAKE RAMP RIGHT FOR I-5 SOUTH TOWARD SEATTLE 4.6 MI
5. AT EXIT 177, TAKE RAMP RIGHT FOR WA-104 TOWARD EDMONDS / LAKE FOREST PARK 0.6 MI
6. TURN RIGHT ONTO WA-104 / 244TH ST SW 0.8 MI
7. KEEP RIGHT TO STAY ON WA-104 / EDMONDS WAY 3.3 MI
8. KEEP RIGHT TO STAY ON WA-104 / EDMONDS WAY 0.5 MI
9. KEEP STRAIGHT TO STAY ON WA-104 / MAIN ST 479 FT
10. TAKE WA-104 / EDMONDS - KINGSTON 5.5 MI
11. TAKE WA-104 / NE STATE HIGHWAY 104 4.1 MI
12. KEEP STRAIGHT ONTO WA-307 / BOND RD NE 5.2 MI
13. TURN RIGHT ONTO WA-305 / STATE HIGHWAY 305 NE 0.7 MI
14. TAKE RAMP RIGHT FOR WA-3 SOUTH TOWARD BREMERTON 7.1 MI
15. AT EXIT 45, TAKE RAMP RIGHT FOR WA-303 SOUTH TOWARD E BREMERTON / SILVERDALE 0.2 MI
16. TURN LEFT ONTO WA-303 S / NE WAAGA WAY S 5.0 MI
16. TURN LEFT ONTO NE MCWILLIAMS RD 1.0 MI
17. TURN LEFT ONTO SUNSET AVE NE 482 FT
ARRIVE 6563 SUNSET AVE NE, BREMERTON, WA 98311

ZONING INFORMATION

SITE NUMBER:	SE06033A
SITE NAME:	BURKE
SITE ADDRESS:	6563 SUNSET AVE NE BREMERTON, WA 98310
PARCEL #:	252501401120O6
CURRENT ZONING:	UH (URBAN HIGH RESIDENTIAL)
JURISDICTION:	KITSAP COUNTY
GOV CODE:	2015 IBC, STANDARDS & AMENDMENTS, WAC 51-50
BUILDING TYPE:	–
SITE TYPE:	UNSTAFFED TELECOMM FACILITY

UTILITY PURVEYOR

POWER COMPANY:	N/A
TELCO COMPANY:	N/A

LEGAL DESCRIPTION

TH PT OF S1/2 SE1/4 SE1/4 SEC 25 DESC AS BEG AT SE COR OF SD SEC 25 TH NLY ALG E LN OF SD SEC 25 361.24FT TO POB TH CONT NLY ALG SD SEC LN 270FT TO A PT 30FT S OF N LN OF S1/2 SE1/4 SE1/4 SD SEC 25 TH WLY ALG SD N LN 330FT TH SLY PLW E LN OF SD SEC 25 270FT TH ELY TO POB

PROJECT TEAM

PROPERTY OWNER:	NORTH PERRY WATER DISTRICT PO BOX 2183 BREMERTON, WA 98310
PROJECT MANAGER:	RYKA CONSULTING JESSICA PIERCE 5628 AIRPORT WAY S, STE 112 SEATTLE, WA 98108 PHONE #: 206-523-1941
CONSTRUCTION MANAGER:	RYKA CONSULTING CHRIS DEVOIST 5628 AIRPORT WAY S, STE 112 SEATTLE, WA 98108 PHONE #: 206-949-3321
SITE ACQUISITION:	RYKA CONSULTING KELLER HIGBEE 5628 AIRPORT WAY S, STE 112 SEATTLE, WA 98108
ZONING:	RYKA CONSULTING KELLER HIGBEE 5628 AIRPORT WAY S, STE 112 SEATTLE, WA 98108
RF ENGINEER:	T-MOBILE JOMELL ABARCAR 19807 NORTH CREEK PKWY N BOTHELL, WA 98011
CONSULTING ENGINEER:	B.J. THOMAS, P.E. 7607 80TH AVE NE MARYSVILLE, WA 98270 PHONE: 206-851-1106 bjthomas@bjthomaspe.comcastbiz.net

PROJECT DESCRIPTION

T-MOBILE PROPOSES TO MODIFY AN EXISTING WIRELESS FACILITY WITH THE FOLLOWING SCOPE OF WORK:

WATER TANK CONFIGURATION SCOPE:
ANTENNAS: REMOVE (3) TMBXX-6516-A2M QUAD ANTENNAS. ADD (3) AEHC. KEEP (3) FFHH-65C-R3 OCTO ANTENNA [(1) OF EACH PER SECTOR].
RADIOS: REMOVE (3) AHFIB. ADD (3) AHFIG. KEEP (3) AHLOA AND (3) FXFB [(1) OF EACH PER SECTOR]. DAISY CHAIN FXFB GSM RETS THROUGH AHFIG.
HCS TRUNK: REMOVE (2) 25-FT 1.0 MID-CAP HCS. KEEP (1) 175-FT 1.0 HIGH-CAP HCS (FOR FXFB). ADD (2) 200-FT TOWER TOP STYLE 2.0 HCS (1 FOR ANCHOR, 1 FOR LTE).
HCS JUMPERS: ADD 15-FT 2.0 JUMPERS FOR AHLOA, AHFIG, AND AEHC. ADD 30-FT 1.0 JUMPERS FOR FXFB TO DAISY CHAIN.
TMAS/DIPLEXERS: KEEP (6) TMAS [(2) PER SECTOR].
COAX: KEEP (6) 7/8" COAX.

GROUND SCOPE:
REMOVE (1) PURCELL RAC72. KEEP (1) 19-INCH RACK. ADD (1) PURCELL LB3 BATTERY CABINET AND (1) PURCELL HPL3 600A DC POWER CABINET. ADD (2) HCS 2.0 TOWER TOP STYLE JUNCTION BOXES. REMOVE EVERGOOD CABINET. ADD 200A EMERSON PANEL WITH 200A AC BREAKERS ON NEW I-FRAME. ADD CUBE. ADD LED WORK LIGHT. ADD ATS. UPGRADE 7210 SAS-MXP TO IXRE. ADD NEW FSMF (VERSION 1.03 OR HIGHER). ADD VOLTAGE BOOSTER FOR LTE 2.0 HCS.

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING ON THESE PLANS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES:
2015 IBC, STANDARDS & AMENDMENTS, WAC 51-50
2015 IMC, STANDARDS & AMENDMENTS, WAC 51-52
2015 IFC, STANDARDS & AMENDMENTS, WAC 51-54
2015 NFPA 54 - NATIONAL FUEL GAS CODE (PROPANE INSTALLATIONS ONLY)
2014 NFPA 58 - LIQUEFIED PETROLEUM GAS CODE (PROPANE INSTALLATIONS ONLY)
2015 INTERNATIONAL FIRE CODE
2015 UPC, STANDARDS & AMENDMENTS, WAC 51-56, 51-57
2017 NATIONAL ELECTRICAL CODE
2012 NATIONAL ELECTRIC SAFETY CODE
LOCAL BUILDING CODE ORDINANCES
ANSI / TIA / EIA - 222 - G
NFPA-101 - LIFE SAFETY CODE

DRAWING INDEX

PROJECT INFORMATION

THIS IS UNSTAFFED AND RESTRICTED EQUIPMENT AND WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
T-MOBILE CERTIFIES THAT THIS TELEPHONE EQUIPMENT FACILITY WILL BE SERVICED ONLY BY T-MOBILE EMPLOYEES AND THE WORK ASSOCIATED WITH ANY EQUIPMENT CANNOT BE PERFORMED BY HANDICAPPED PERSONS. THIS FACILITY WILL BE FREQUENTED ONLY BY SERVICE PERSONNEL FOR REPAIR PURPOSES. PURSUANT TO THE AMERICANS WITH DISABILITIES ACT (ADA), APPENDIX B SECTION 4.11. (5)(b), THIS FACILITY IS EXEMPT FROM THAT ACT.
NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.
NO WASTE WATER OR SOLID WASTE WILL BE GENERATED AT THIS LOCATION.
T-MOBILE MAINTENANCE CREW (ONE PERSON) WILL MAKE AN AVERAGE OF ONE TRIP PER MONTH AT ONE HOUR PER TRIP.

APPROVAL/SIGN OFF OF CONST DRAWINGS

REVIEWERS SHALL CLEARLY PLACE INITIALS ADJACENT TO EACH REDLINE NOTE AS DRAWINGS ARE BEING REVIEWED.

CONSULTANT GROUP SIGN OFF

LANDLORD'S REPRESENTATIVE:	DATE:
CONSTRUCTION MANAGER:	DATE:
CONSTRUCTION PROJECT MANAGER:	DATE:
PROJECT MANAGER:	DATE:
SITE ACQUISITION:	DATE:
ZONING:	DATE:
RF ENGINEER:	DATE:

T··Mobile·

PROJECT INFORMATION:
BURKE
SE06033A
6563 SUNSET AVE NE
BREMERTON, WA 98310

ISSUED FOR:
BUILDING PERMIT

REVISION HISTORY:

NO.	DATE:	DESCRIPTION:	CHK. BY:
1	9/4/2020	ISSUED DESIGN REVIEW	BJT

PLANS PREPARED BY:
B. J. THOMAS, P.E.
7607 80TH AVE NE
MARYSVILLE, WA 98270
206-851-1106

DRAWN BY:	CHK. BY:
JL	BJ

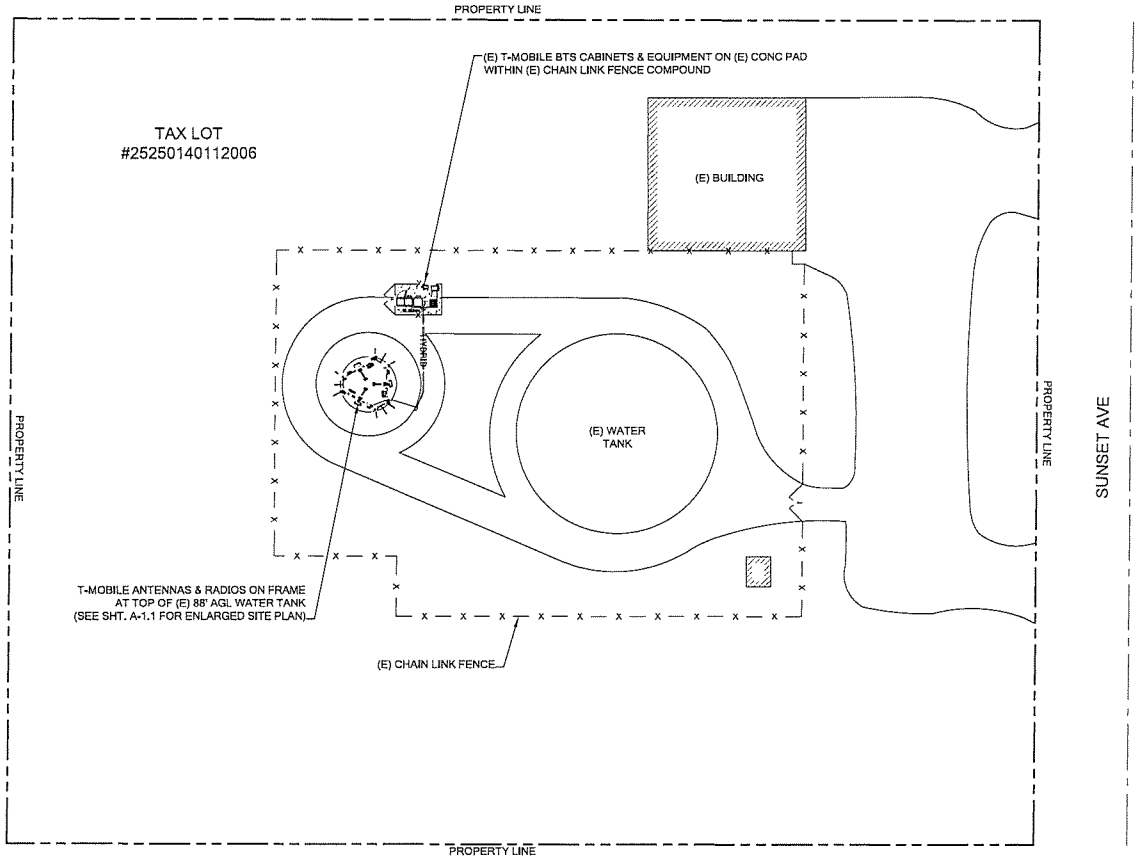
LICENSURE:
B. J. THOMAS — STATE OF WASHINGTON — 33841 — REGISTERED PROFESSIONAL ENGINEER

DRAWING INFORMATION:
DO NOT SCALE DRAWINGS. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND ADVISE CONSULTANTS OF ANY ERRORS AND OMISSIONS. ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED BY THE LATEST REVISION. THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN WHICH IS RELATED TO NAMED CLIENT IS STRICTLY PROHIBITED.

DRAWING TITLE:
TITLE SHEET

DRAWING NUMBER:
T-1

A1



OVERALL SITE PLAN
22x34 SCALE: 1" = 20'
11x17 SCALE: 1" = 40'
20' 0 10' 20' 40'

T-Mobile

PROJECT INFORMATION:

BURKE
SE06033A

6563 SUNSET AVE NE
BREMERTON, WA 98310

ISSUED FOR:

BUILDING PERMIT

REVISION HISTORY:

NO.	DATE:	DESCRIPTION:	CHK. BY:
1	9/4/2020	ISSUED DESIGN REVIEW	BJT

PLANS PREPARED BY:

B. J. THOMAS, P.E.
7607 80TH AVE NE
MARYSVILLE, WA 98270
206-851-1106

DRAWN BY: JL **CHK. BY:** BJ

LICENSURE:

B. J. THOMAS STATE OF WASHINGTON 37441 REGISTERED PROFESSIONAL ENGINEER

DRAWING INFORMATION:

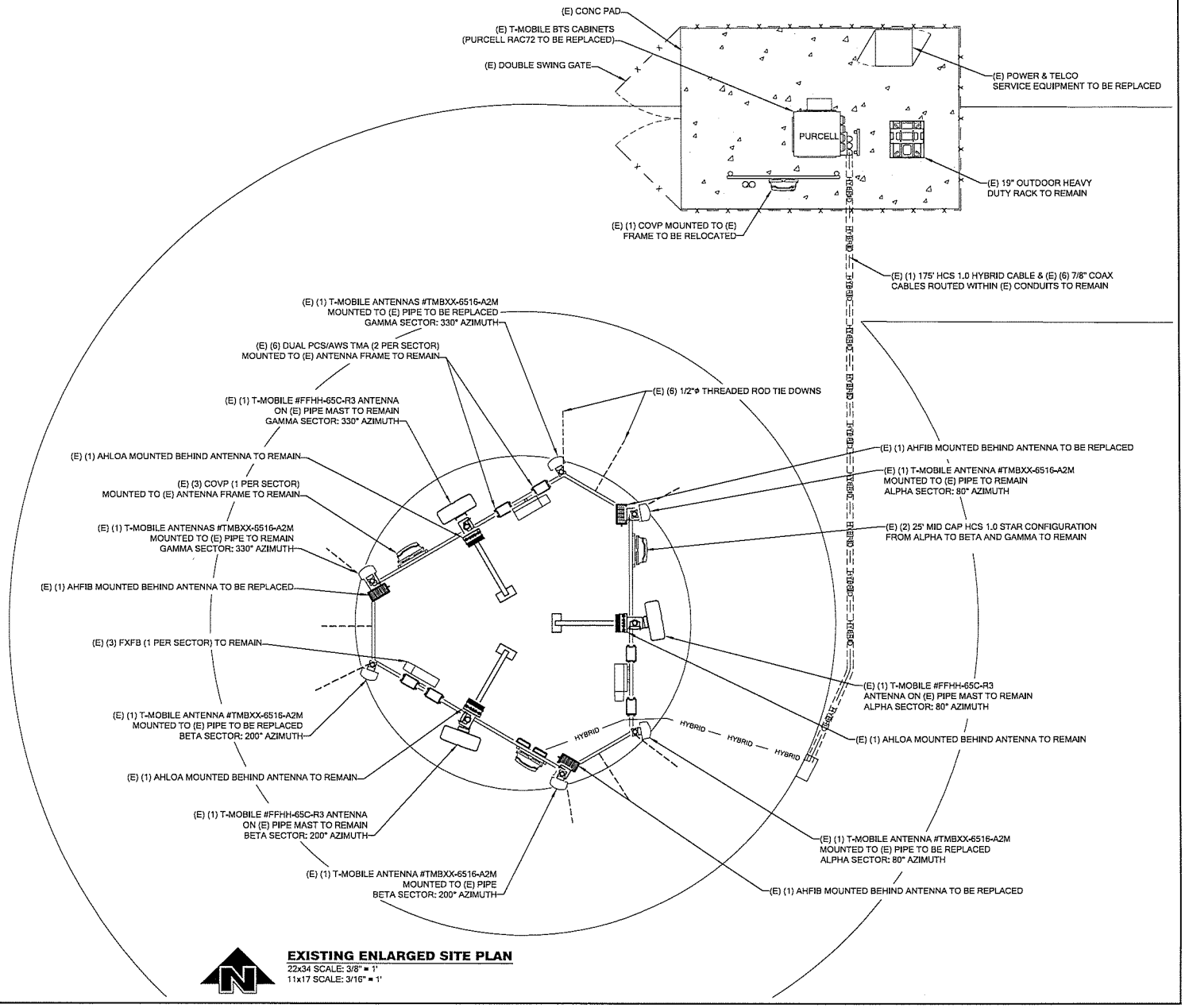
DRAWING TITLE:

OVERALL SITE PLAN

DRAWING NUMBER:

A-1

A2



EXISTING ENLARGED SITE PLAN
22x34 SCALE: 3/8" = 1'
11x17 SCALE: 3/16" = 1'

T-Mobile

PROJECT INFORMATION:

BURKE
SE06033A

6563 SUNSET AVE NE
BREMERTON, WA 98310

ISSUED FOR:

BUILDING PERMIT

REVISION HISTORY:

NO.	DATE:	DESCRIPTION:	CHK. BY:
1	9/4/2020	ISSUED DESIGN REVIEW	BJT

PLANS PREPARED BY:

B. J. THOMAS, P.E.
7607 80TH AVE NE
MARYSVILLE, WA 98270
206-851-1106

DRAWN BY:	CHK. BY:
JL	BJ

LICENSURE:

B. J. THOMAS STATE OF WASHINGTON 37441 REGISTERED PROFESSIONAL ENGINEER

DRAWING INFORMATION:

DRAWING TITLE:

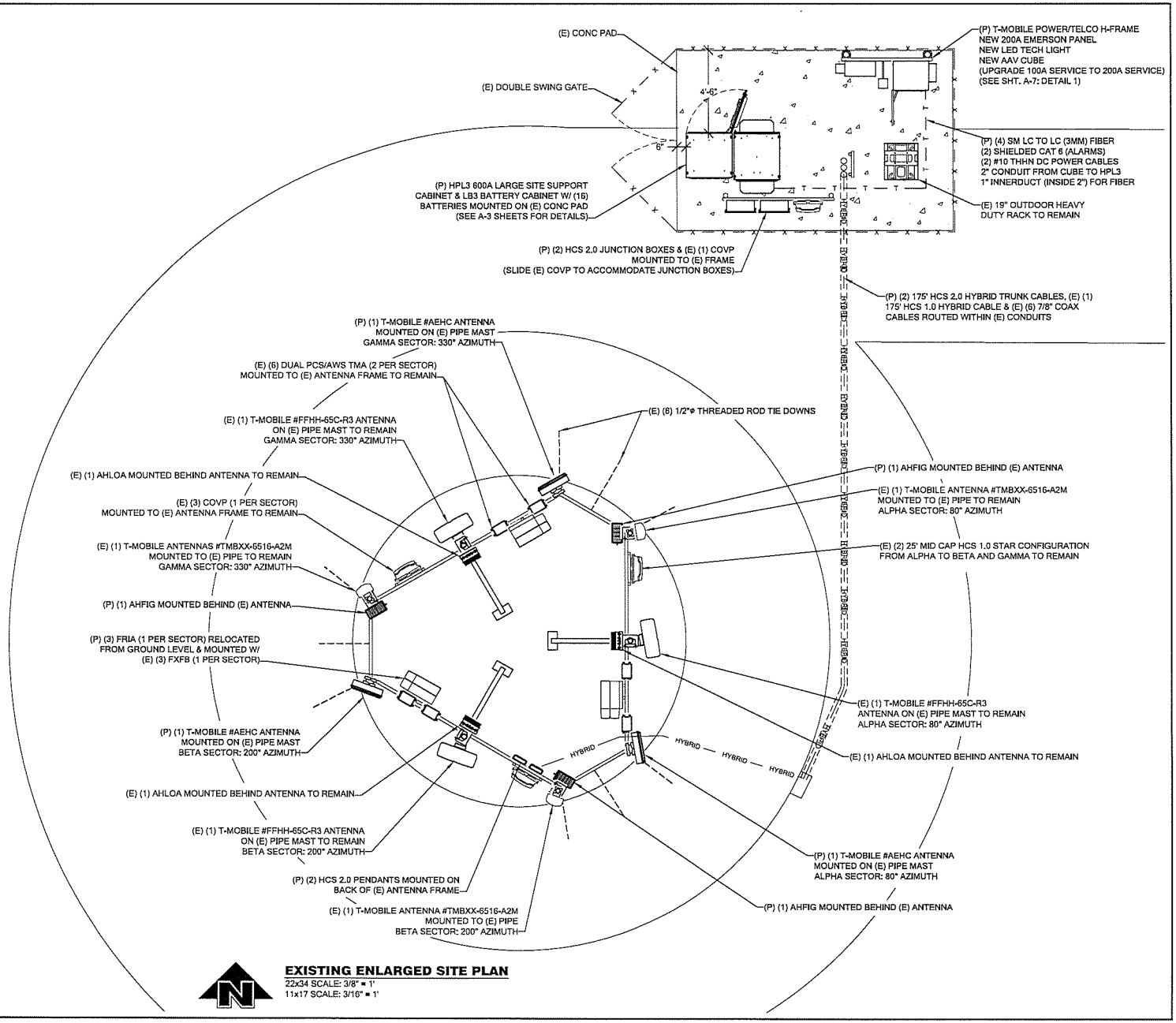
EXISTING ENLARGED SITE PLAN

DRAWING NUMBER:

A-1.1

Permit Number: 20-04364

A3



EXISTING ENLARGED SITE PLAN
22x34 SCALE: 3/8" = 1'
11x17 SCALE: 3/16" = 1'

T-Mobile

PROJECT INFORMATION:

BURKE
SE06033A

6563 SUNSET AVE NE
BREMERTON, WA 98310

ISSUED FOR:

BUILDING PERMIT

REVISION HISTORY:

NO.	DATE:	DESCRIPTION:	CHK. BY:
1	9/4/2020	ISSUED DESIGN REVIEW	BJT

PLANS PREPARED BY:

B. J. THOMAS, P.E.
7607 80TH AVE NE
MARYSVILLE, WA 98270
206-851-1106

DRAWN BY:	CHK. BY:
JL	BJ

LICENSURE:

B. J. THOMAS STATE OF WASHINGTON 37841 REGISTERED PROFESSIONAL ENGINEER

DRAWING INFORMATION:

DRAWING TITLE:

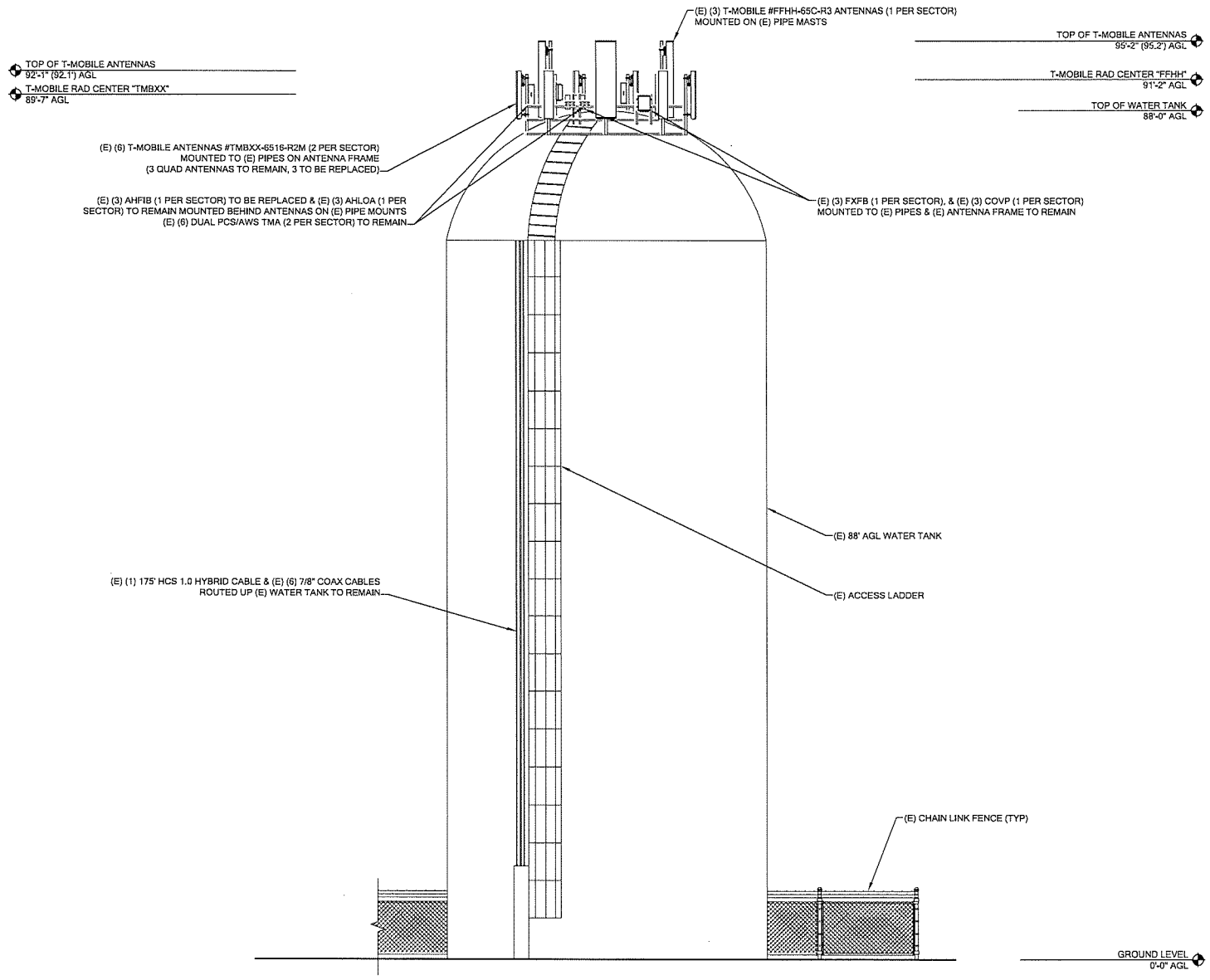
EXISTING ENLARGED SITE PLAN

DRAWING NUMBER:

A-1.1

Permit Number: 20-04364

A4



1 / A-2 **EXISTING EAST ELEVATION**
SCALE: NTS

T-Mobile

PROJECT INFORMATION:

BURKE
SE06033A

6563 SUNSET AVE NE
BREMERTON, WA 98310

ISSUED FOR:

BUILDING PERMIT

REVISION HISTORY:

NO.	DATE:	DESCRIPTION:	CHK. BY:
1	9/4/2020	ISSUED DESIGN REVIEW	BJT

PLANS PREPARED BY:

B. J. THOMAS, P.E.
7607 80TH AVE NE
MARYSVILLE, WA 98270
206-851-1106

DRAWN BY:	CHK. BY:
JL	BJ

LICENSURE:

B. J. THOMAS STATE OF WASHINGTON 37441 REGISTERED PROFESSIONAL ENGINEER

DRAWING INFORMATION:

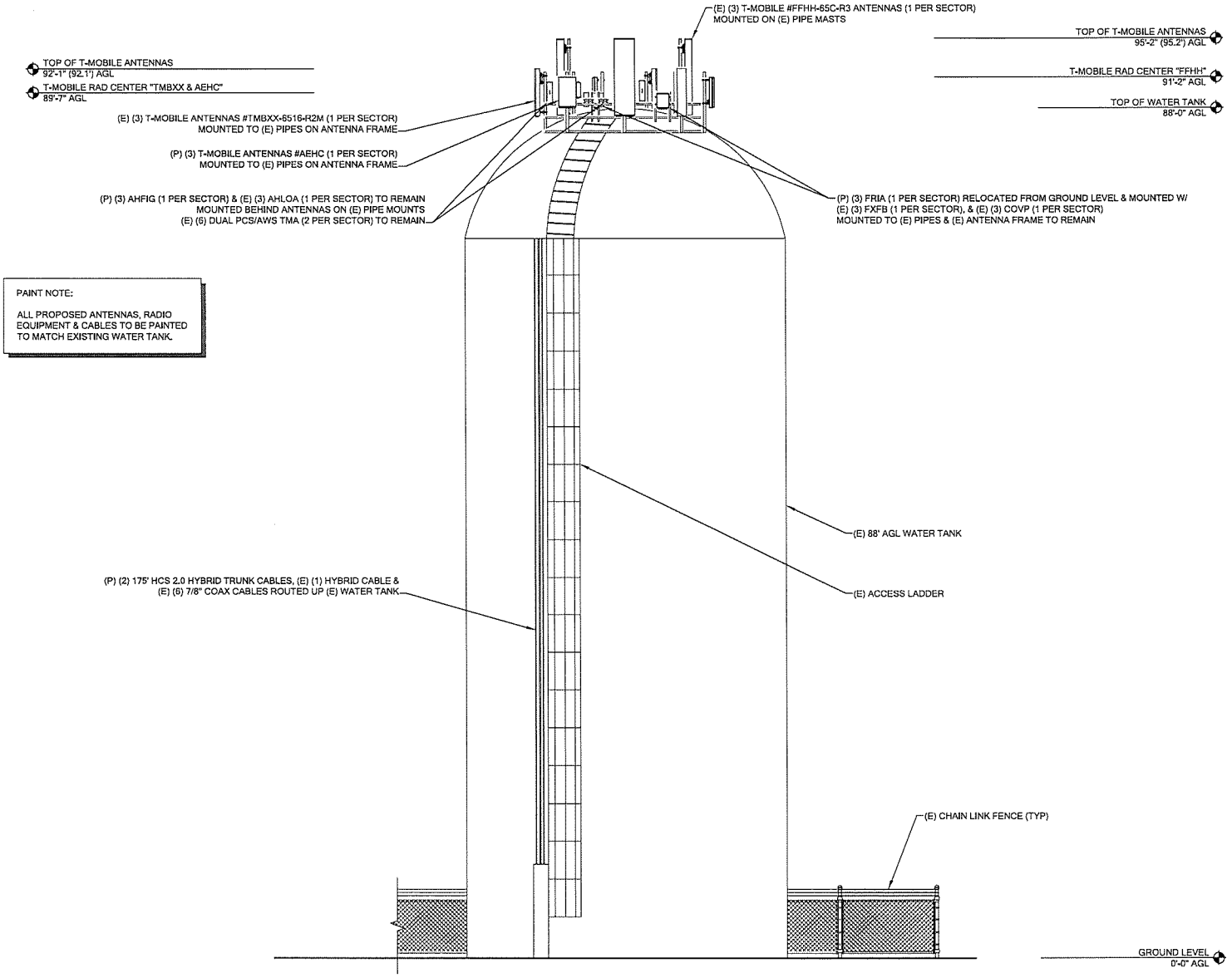
DRAWING TITLE:

EXISTING SITE ELEVATION

DRAWING NUMBER:

A-2

A5



1 A-2.1 **PROPOSED EAST ELEVATION**
SCALE: NTS

T-Mobile

PROJECT INFORMATION:

BURKE
SE06033A

6563 SUNSET AVE NE
BREMERTON, WA 98310

ISSUED FOR:

BUILDING PERMIT

REVISION HISTORY:

NO.	DATE:	DESCRIPTION:	CHK. BY:
1	9/4/2020	ISSUED DESIGN REVIEW	BJT

PLANS PREPARED BY:

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7607 80TH AVE NE
MARYSVILLE, WA 98270
206-851-1106

DRAWN BY:	CHK. BY:
JL	BJ

LICENSURE:

B. J. THOMAS STATE OF WASHINGTON 37441 REGISTERED PROFESSIONAL ENGINEER

DRAWING INFORMATION:

DRAWING TITLE:

PROPOSED SITE ELEVATION

DRAWING NUMBER:

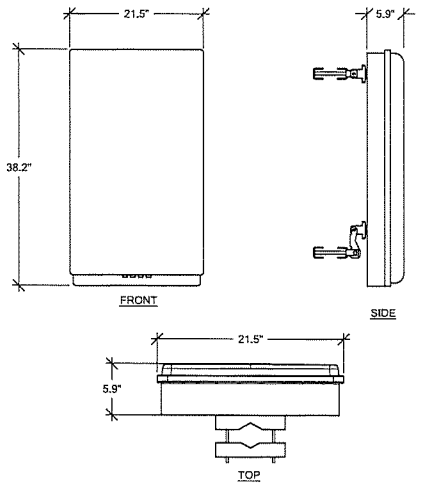
A-2.1

"FINAL" SITE LOADING CHART

SECTOR	COLOR	POSITION	ANTENNA MODEL #	VENDOR	AZIMUTH (TN)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	RADIATION CENTER	HYBRID CABLE LENGTH	COAX CABLES	ADDITIONAL EQUIPMENT
ALPHA	RED	1	AEHC	NOKIA	90"	TBD	TBD	89'-8" AGL	(2) 175' HCS 2.0 HYBRID TRUNK CABLE & (1) 175' HCS 1.0 HYBRID CABLE	(2) 7/8" COAX CABLES	(1) AHLOA
		2	FFHH-65C-R3	COMMSCOPE				91'-3" AGL			(1) AHFIG
		3	TMBXX-6516-A2M	ANDREW				89'-8" AGL			(1) FXFB
											(1) FRIA
BETA	GREEN	1	AEHC	NOKIA	200"	TBD	TBD	89'-8" AGL		(2) 7/8" COAX CABLES	(1) AHLOA
		2	FFHH-65C-R3	COMMSCOPE				91'-3" AGL			(1) AHFIG
		3	TMBXX-6516-A2M	ANDREW				89'-8" AGL			(1) FXFB
											(1) FRIA
GAMMA	BLUE	1	AEHC	NOKIA	330"	TBD	TBD	89'-8" AGL		(2) 7/8" COAX CABLES	(1) AHLOA
		2	FFHH-65C-R3	COMMSCOPE				91'-3" AGL			(1) AHFIG
		3	TMBXX-6516-A2M	ANDREW				89'-8" AGL			(1) FXFB
											(1) FRIA

RFDS	
PROJECT TYPE	ANCHOR
RFDS VERSION	6 - 8/28/2020 10:49:53 PM

MANUFACTURER:	NOKIA
MODEL:	AEHC
WEIGHT:	108 LBS
DIMENSIONS:	38.2" x 21.5" x 5.9"



1 RF-1 **AEHC DETAIL**
SCALE: NTS

T-Mobile

PROJECT INFORMATION:

BURKE
SE06033A

6563 SUNSET AVE NE
BREMERTON, WA 98310

ISSUED FOR:

BUILDING PERMIT

REVISION HISTORY:

NO.	DATE:	DESCRIPTION:	CHK. BY:
1	9/4/2020	ISSUED DESIGN REVIEW	BJT

PLANS PREPARED BY:

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206-851-1106

DRAWN BY:	CHK. BY:
JL	BJ

LICENSURE:

B.J. THOMAS STATE OF WASHINGTON 37041 REGISTERED PROFESSIONAL ENGINEER

DRAWING INFORMATION:

DRAWING TITLE:

RF DETAILS

DRAWING NUMBER:

RF-1

A7