

PRCTI20240892

**City of Puyallup
Building
REVIEWED
FOR
COMPLIANCE**

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06/25/2024

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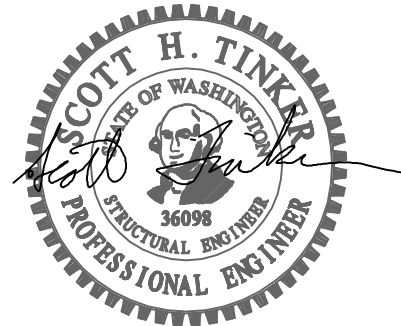
May 22, 2024

City of Puyallup Development & Permitting Services ISSUED PERMIT	
Building	Planning
Engineering	Public Works
Fire	Traffic

STRUCTURAL CALCULATIONS
(Permit Submittal)

**CENTERIS DATA CENTER
ELECTRICAL CMU WALL OPENINGS**
1023 39th Avenue SE
Puyallup, WA 98374

Quantum Job Number: 23444.01



Prepared for:
CENTERIS DATA CENTERS
18300 Cascade Avenue S
Seattle, WA 98118

Prepared by:
QUANTUM CONSULTING ENGINEERS
1511 Third Avenue, Suite 323
Seattle, WA 98101
TEL 206.957.3900
FAX 206.957.3901

Calculations required to be provided by
the Permittee on site for all Inspections



QUANTUM | CONSULTING ENGINEERS

STRUCTURAL DESIGN CRITERIA

CENTERIS – DATA CENTER
1023 39TH AVENUE SE
PUYALLUP, WA 98374

QUANTUM JOB NUMBER: 23444.01

CODE CRITERIA:

BUILDING CODE.....	2021 INTERNATIONAL BUILDING CODE
BUILDING DEPARTMENT.....	CITY OF PUYALLUP
SEISMIC ZONE.....	SDC = D
.....	SITE CLASS = D
.....	R 3.5
.....	$S_s = 1.26$ $S_1 = 0.43$
.....	$S_{DS} = 1.01$ $S_{D1} = 0.50$

MATERIALS CRITERIA:

CONCRETE (28 DAY STRENGTH):

FOUNDATION/S.O.G..... $f'c=3,000$ PSI

REINFORCING STEEL:

GRADE 60..... $F_y=60,000$ PSI

STRUCTURAL STEEL:

WIDE-FLANGE SECTIONS: A-992..... $F_y=50,000$ PSI

MISCELLANEOUS SECTIONS: A-36..... $F_y=36,000$ PSI

TUBE SECTIONS: A-500..... $F_y=46,000$ PSI

WELDING..... $F_y=70,000$ PSI

Steel Beam

Project File: Openings in Masonry Wall.ec6

LIC# : KW-06016450, Build:20.24.05.02

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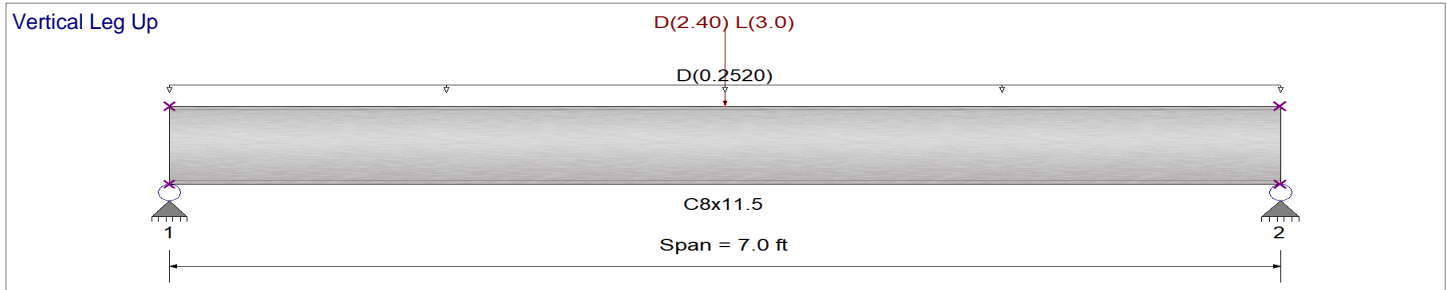
DESCRIPTION: Double Channel Openings At (E) CMU. Half Load Applied to Beam

CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Strength Design	Fy : Steel Yield :	36.0 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 1
 Point Load : D = 2.40, L = 3.0 k @ 3.50 ft, (Beam (1/2"))

Uniform Load : D = 0.0840 ksf, Tributary Width = 3.0 ft, (CMU Above)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.647 : 1	Maximum Shear Stress Ratio =	0.157 : 1
Section used for this span	C8x11.5	Section used for this span	C8x11.5
Ma : Applied	10.994 k-ft	Va : Applied	3.582 k
Mn / Omega : Allowable	16.980 k-ft	Vn/Omega : Allowable	22.764 k
Load Combination	+D+L	Load Combination	+D+L
Span # where maximum occurs	Span # 1	Location of maximum on span	0.000 ft
		Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.039 in	Ratio = 2,128	>=600. Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio = 0	<600.0 n/a
Max Downward Total Deflection	0.086 in	Ratio = 982	>=240. Span: 1 : +D+L
Max Upward Total Deflection	0 in	Ratio = 0	<240.0 n/a

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
D Only														
Dsgn. L =	7.00 ft	1	0.345	0.091	5.74		5.74	27.81	16.65	1.26	1.00	2.08	38.02	22.76
+D+L														
Dsgn. L =	7.00 ft	1	0.647	0.157	10.99		10.99	28.36	16.98	1.29	1.00	3.58	38.02	22.76
+D+0.750L														
Dsgn. L =	7.00 ft	1	0.572	0.141	9.68		9.68	28.27	16.93	1.28	1.00	3.21	38.02	22.76
+0.60D														
Dsgn. L =	7.00 ft	1	0.207	0.055	3.45		3.45	27.81	16.65	1.26	1.00	1.25	38.02	22.76

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0856	3.520		0.0000	0.000

Vertical Reactions

Support notation : Far left is #

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	3.582	3.582
Max Upward from Load Combinations	3.582	3.582
Max Upward from Load Cases	2.082	2.082
D Only	2.082	2.082

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

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Vertical Reactions

Support notation : Far left is #

Values in KIPS

Load Combination	Support 1	Support 2
+D+L	3.582	3.582
+D+0.750L	3.207	3.207
+0.60D	1.249	1.249
L Only	1.500	1.500