ENW STRUCTURAL ENGINEERS
Engineers Northwest Inc., P.S.

THE APPROVED CONSTRUCTION PLANS AND ALL ENGINEERING DOCUMENTS MUST BE POSTED ON THE JOB AT ALL INSPECTIONS IN A VISIBLE AND READILY ACCESSIBLE LOCATION.

COSTCO WHOLESALE

Puyallup, WA

STRUCTURAL CALCULATIONS FOR BREAKROOM REMODEL

PERMIT RESUBMITTAL #1

2018 International Building Code
May 5, 2022
ENW #99090014-3

9725 Third Avenue NE, Suite 207
Seattle, WA 98115
206.525.7560 . fax 206.522.6698
www.engineersnw.com

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
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PRCTI20220498

ENW ENGINEERS NORTHWEST, INC., P.S. ~ STRUCTURAL ENGINEERS

9725 THIRD AVE NE, SUITE 207, SEATTLE, WA 98115 (206) 525~7560 FAX (206) 522~6698

PROJECT # 99090014 PROJECT COSTCO PUYALLUP, WA DATE 2/17/2022

SUBJECT DESIGN SUMMARY SHEET 1 OF

BY NAZ AHMED

DESCRIPTION: NEW BREAKROOM MEZZANINE. LIGHT GAUGE FRAMING w/ PLYWOOD DIAPHRAGM.

CODE USED: 2018 INTERNATIONAL BUILDING CODE; UTAH STATE AMENDMENTS TO 2018 IBC.

SNOW LOAD: 2018 IBC.

SEISMIC:

Ss = 1.267	SMS = 1.165	SDS = 0.777
S1 = 0.364	SM1 = 0.706	SD1 = 0.471

DESIGN LOADS: WAREHOUSE ROOF: 25 PSF SNOW LOAD, 10 PSF DL
MEZZANINE: 100 PSF LL, 10 PSF DL

MEZZANINE DL BREAKDOWN:

FLOOR FINISH	0.5 PSF
1 1/8 PLYWOOD	3 PSF
MECH/DUCT	1.5 PSF
ELECTRICAL	1.0 PSF
16" JOIST AT 12" O.C.	7.1 PSF
MISC.	1.4 PSF

TOTAL = 14.5 PSF

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PROJECT # 99090014 PROJECT COSTCO PUYALLUP, WA DATE 2/17/2022

SUBJECT DESIGN SUMMARY SHEET 1 OF

BY NAZ AHMED

Gravity Members:

16" joist at 12" on center. max span 28'-0"

Member 1: 16" joist @ 12" o.c. with 28'-0" max span.

W_{DL} = 14.5 psf x 1' = 14.5 plf
W_{LL} = 100 psf x 1' = 100 plf
Total = 115 plf

1600S200-97 @ 12" O.C. OKAY. SEE CFS CALC

Member 2: stair stringer.
Length = (10.5^2 x 16.5^2)^0.5 = 19.6' - say 20' max
stair width = 5'-6" max. Use 4 stringer --> trib width = 5.5/3 = 1.83'

DL = 12 psf (conservative)
LL = 100 psf

WDL = 12 psf x 1.83 = 22 plf
WLL = 100 psf x 1.83' = 183 plf

2x12 D.F. #2 sistered with 2x6 D.F. #2 is okay. See attached enercalc calcs.

Member 3: header supporting stair stringer 5'-6" max span
try 16" x 2" x 12 ga boxed header

W_{DL} = 14.5 psf x 1' = 14.5 plf
W_{LL} = 100 psf x 1' = 100 plf

Point loads from stringer:
PDL = 22 plf x 20'/2 = 220 #
PLL = 100 plf x 20'/2 = 1000 #

Boxed 1600S200-97 is okay - see attached CFS CALC

Member 4: 13'-0" Header running parallel to the long direction of stairs

W_{DL} = 14.5 psf x 10'/2 = 73 plf
W_{LL} = 100 psf x 10'/2 = 500 plf

Member 3 point loads on Member 4 @ 5'-9" location ----114.5 psf x 21/2 X 5.5'/2 = 3306 #

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PROJECT # 99090014 PROJECT COSTCO PUYALLUP, WA DATE 2/17/2022

SUBJECT GRAVITY MEMBERS SHEET 3 OF

BY NAZ AHMED

Gravity Members continued:

Member 5: bearing header supporting main joist 6'-0" max
try 16" x 2" x 12 ga boxed header

W_{DL} = 14.5 psf x 28/2' = 203 plf
W_{LL} = 100 psf x 28'/2 = 1400 plf

Boxed 1600S200-97 is okay - see attached CFS CALC

Member 6: header parallel to main joist 6'-0" max

use 2' trib to account for wall above (consv.)
W_{DL} = 14.5 psf x 2 = 29 plf
W_{LL} = 100 psf x 2 = 200 plf

Use min. 1200S200-54 boxed header - see attached CFS calcs.

Member 7: 6" studs
Length 10.5'
length above mezz = 10' max

P_{DL} = 14.5 psf x 28'/2 = 203 #
P_{LL} = 100 psf x 28'/2 = 1400 #

Use 600S162-54 (50 ksi) min at each joist or 12" o.c.

See attached CFS calcs.

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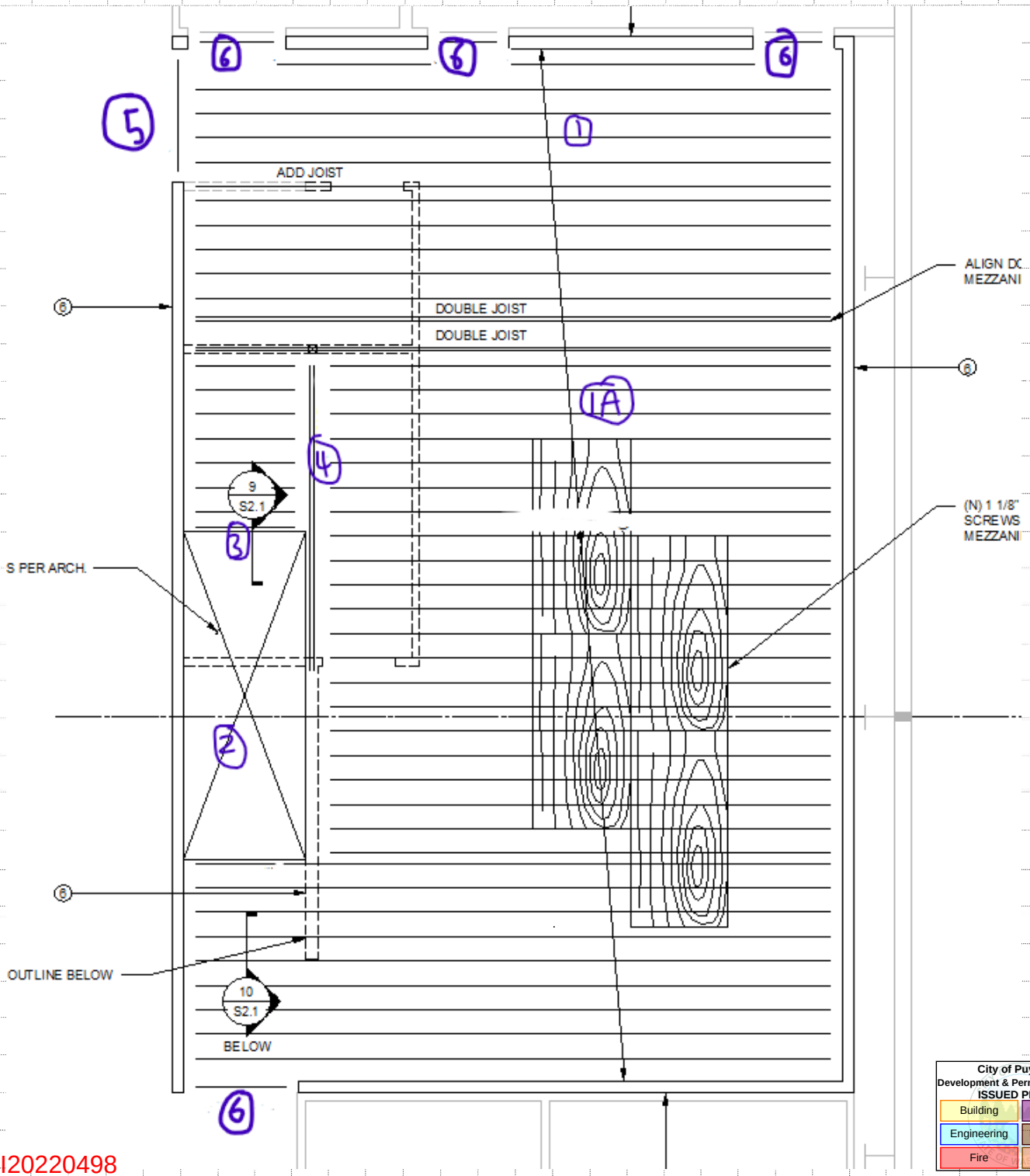
PROJECT # 99090014 PROJECT COSTCO PUYALLUP, WA DATE 2/17/2022

SUBJECT GRAVITY MEMBERS SHEET 4 OF

BY NAZ AHMED



City of Puyallup
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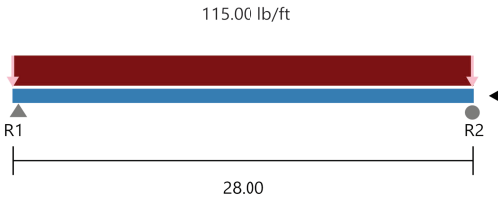
PRCTI20220498

Project Name: joist check
Model: Beam/Stud –1
Code: AISI S100-16

Date: 05/05/2022
Simpson Strong-Tie® CFS Designer™ 4.2.0.9

Section: 1600S200-97 (50 ksi) Single C Stud (punched)
Maxo = 16217.2 ft-lb **Va =** 6043.4 lb **I =** 59.93 in^4

Loads have not been modified for strength checks
Loads have been multiplied by 0.70 for deflection calculations



Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Span	60.0", 60.0"	60.0", 336.0"	N/A	-

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R1	1610.0	3.50	2252.1	0.0	0.37	NO
R2	1610.0	3.50	2252.1	0.0	0.37	NO

"*" after support means punched near support

	Code Check	Required	Allowed	Interaction	Notes
Span	Max. Axial, lbs	100.0(c)	11719.7(c)	1%	KΦ=0.00 lb-in/in Max KL/r = 106
	Max. Shear, lbs	1610.0	6043.4	27%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	11270.0	13314.7	85%	Ma-dist (control),KΦ=0.00 lb-in/in
	Moment Stability, ft-lbs	11270.0	13627.7	83%	
	Shear/Moment	0.69	1.00	69%	Shear 0.0, Moment 11270.0
	Axial/Moment	0.85	1.00	85%	Axial 100.0(c), Moment 11270.0
	Deflection Span, in	0.630	--meets L/534--		

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	100.0	1610.0	By Others & Anchorage Designed by Engineer	NA	NA
R2	0.0	1610.0	By Others & Anchorage Designed by Engineer	NA	NA

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

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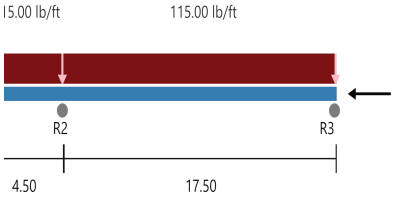
PRCTI20220498

Project Name: Member 2
Model: Beam/Stud –1
Code: AISI S100-16

Date: 05/05/2022
Simpson Strong-Tie® CFS Designer™ 4.2.0.9

Section: 1600S200-97 (50 ksi) Single C Stud (punched)
Maxo = 16217.2 ft-lb **Va =** 6043.4 lb **I =** 59.93 in^4



Loads have not been modified for strength checks
Loads have been multiplied by 0.70 for deflection calculations
If a span has a bracing setting larger than the span, the bracing is set

Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Left Span	Mid-Pt, Mid-Pt	54.0", 54.0"	N/A	-
Right Span	Mid-Pt, Mid-Pt	60.0", 210.0"	N/A	-

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R1*	-532.7	3.50	2203.8	0.0	0.13	NO
R2	2259.9	1.00	3691.8	3561.4	0.47	NO
R3	802.7	1.00	1547.2	0.0	0.27	NO

"*" after support means punched near support

	Code Check	Required	Allowed	Interaction	Notes
Left Span	Max. Axial, lbs	100.0(c)	12998.4(c)	1%	KΦ=0.00 lb-in/in Max KL/r = 48
	Max. Shear, lbs	1050.2	6043.4	17%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	3561.4	13314.7	27%	Ma-dist (control),KΦ=0.00 lb-in/in
	Moment Stability, ft-lbs	2658.6	15539.7	17%	
	Shear/Moment	0.28	1.00	28%	Shear 1050.2, Moment 3561.4
	Axial/Moment	0.28	1.00	28%	Axial 100.0(c), Moment 3561.4
	Deflection Span, in	0.003	--meets L/19572--		
Right Span	Max. Axial, lbs	100.0(c)	5042.7(c)	2%	KΦ=0.00 lb-in/in Max KL/r = 185
	Max. Shear, lbs	1209.8	6043.4	20%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	3561.4	13314.7	27%	Ma-dist (control),KΦ=0.00 lb-in/in
	Moment Stability, ft-lbs	2801.7	13675.5	20%	
	Shear/Moment	0.30	1.00	30%	Shear 1209.8, Moment 3561.4
	Axial/Moment	0.29	1.00	29%	Axial 100.0(c), Moment 3561.4
	Deflection Span, in	0.050	--meets L/4174--		

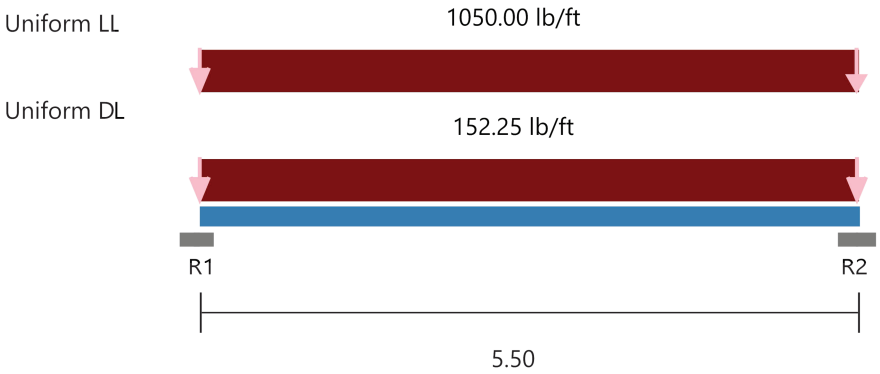
Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	100.0	-532.7	By Others & Anchorage Designed by Engineer	NA	NA
R2	0.0	2259.9	By Others & Anchorage Designed by Engineer	NA	NA
R3	0.0	802.7	By Others & Anchorage Designed by Engineer	NA	NA

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

PRCTI20220498

Project Name: Member 3-
Model: Member 3
Code: AISI S100-16

Date: 05/05/2022
Simpson Strong-Tie® CFS Designer™ 4.2.0.9



Section : 1600S200-97 (50 ksi) @ 126 in" o.c. Single C Stud (punched)
Maxo = 16217.2 ft-lb **Va =** 6043.4 lb **I =** 59.933 in^4

Deflection Limits: Total Load - 240 Live Load - 360

Load Comb:
1. DL + LL All spans
2. DL + LL Even spans
3. DL + LL Odd spans
4. LL All spans
5. LL Even spans
6. LL Odd spans

Joist Flexural and Deflection

	Mmax (ft-lb)	K-phi (lb-in/in)	Lm (in)	Ma-dist (ft-lb)	Mmax/ Ma min	Load Comb.	TL Defl	Load Comb.	LL Defl	Load Comb.
Span	4546	0.0	66.0	13314.7	0.341	1	L/4714	1	L/5398	4

Joist Bending and Web Crippling

Support	Load (lb)	Load Comb.	Bearing (in)	Pa (lb)	Pn (lb)	Max Intr.	Load Comb.	Stiffeners Required
R1	3306.2	1	1.00	1547.2	2707.5	1.11	1	YES
R2	3306.2	1	1.50	1729.1	3025.9	0.99	1	YES

Joist Bending and Shear

Support	Vmax (lb)	Load Comb.	Va Factor	V/Va	M/Ma	Intr. Unstiffened	Load Comb.	Intr. Stiffened	Load Comb.
R1	3306.2	1	1.000	0.55	0.00	0.55	1	N/A	N/A
R2	3306.2	1	1.000	0.55	0.00	0.55	1	N/A	N/A

Joist Reaction and Connections

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	0.0	3306.2	By Others & Anchorage Designed by Engineer	NA	NA
R2	0.0	3306.2	SSC4.25 (4#10) & (3) #10 to A36 steel (Joist Bearing on	0.00 %	0.00 %

PRCTI20220498

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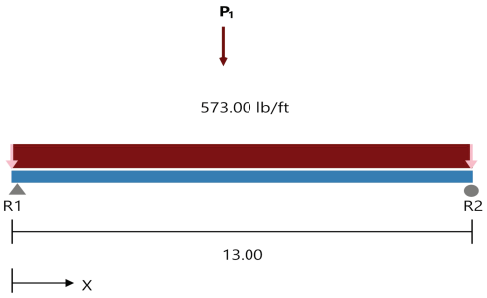
Project Name: Member 4
Model: Member 4
Code: AISI S100-16

Date: 05/05/2022
Simpson Strong-Tie® CFS Designer™ 4.2.0.9



Section: (2) 1600S200-97 (50 ksi) Boxed C Stud (punched)
Maxo = 32434.4 ft-lb **Va =** 12086.8 lb **I =** 119.87 in^4

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations

Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Span	NA	60.0", N/A	N/A	-

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R1	5519.5	1.50	3458.2	0.0	0.83	YES
R2	5239.5	1.50	3458.2	0.0	0.79	YES
P1	3310.0	1.50	7889.8	22693.7	0.65	NO

"*" after support means punched near support

Point Loads	P1
Load(lb)	3310.00
X-Dist.(ft)	5.95

	Code Check	Required	Allowed	Interaction	Notes
Span	Max. Axial, lbs	0.0(t)	-	0%	KΦ=0.00 lb-in/in Max KL/r = N/A
	Max. Shear, lbs	5519.5	12086.8	46%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	22698.5	32434.4	70%	
	Moment Stability, ft-lbs	22698.5	32434.4	70%	
	Shear/Moment	0.72	1.00	72%	Shear 2115.3, Moment 22679.4
	Axial/Moment	0.70	1.00	70%	Axial 0.0(c), Moment 22693.7
	Deflection Span, in	0.177	--meets L/879--		

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	0.0	5519.5	By Others & Anchorage Designed by Engineer	NA	NA
R2	0.0	5239.5	By Others & Anchorage Designed by Engineer	NA	NA

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

PRCTI20220498

City of Puyallup
Development & Permitting Services
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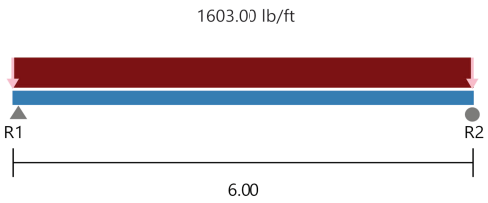
Engineering | Public Works
Fire | Traffic

Project Name: Member 5
Model: Member 5
Code: AISI S100-16

Date: 05/05/2022
Simpson Strong-Tie® CFS Designer™ 4.2.0.9

Section: (2) 1600S200-97 (50 ksi) Boxed C Stud (punched)
Maxo = 32434.4 ft-lb **Va =** 12086.8 lb **I =** 119.87 in^4

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations



Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Span	NA	60.0", N/A	N/A	-

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R1	4809.0	1.50	3458.2	0.0	0.72	YES
R2	4809.0	1.50	3458.2	0.0	0.72	YES

"*" after support means punched near support

	Code Check	Required	Allowed	Interaction	Notes
Span	Max. Axial, lbs	0.0(t)	-	0%	KΦ=0.00 lb-in/in Max KL/r = N/A
	Max. Shear, lbs	4809.0	12086.8	40%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	7213.5	32434.4	22%	
	Moment Stability, ft-lbs	7213.5	32434.4	22%	
	Shear/Moment	0.40	1.00	40%	Shear 4809.0, Moment 0.0
	Axial/Moment	0.22	1.00	22%	Axial 0.0(c), Moment 7213.5
	Deflection Span, in	0.013	--meets L/5447--		

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	0.0	4809.0	By Others & Anchorage Designed by Engineer	NA	NA
R2	0.0	4809.0	By Others & Anchorage Designed by Engineer	NA	NA

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

PRCTI20220498

City of Puyallup
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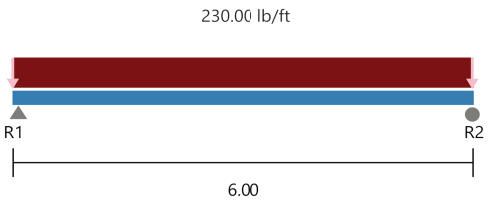
Project Name: Member 6
Model: Member 6
Code: AISI S100-16

Date: 05/05/2022
Simpson Strong-Tie® CFS Designer™ 4.2.0.9

Section: (2) 1200S200-54 (50 ksi) Boxed C Stud (punched)
Maxo = 10344.2 ft-lb **Va =** 2754.7 lb **I =** 32.67 in^4

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations



Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Span	NA	60.0", N/A	N/A	-

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R1	690.0	1.50	N/A	0.0	N/A	YES
R2	690.0	1.50	N/A	0.0	N/A	YES

"*" after support means punched near support

	Code Check	Required	Allowed	Interaction	Notes
Span	Max. Axial, lbs	0.0(t)	-	0%	KΦ=0.00 lb-in/in Max KL/r = N/A
	Max. Shear, lbs	690.0	2754.7	25%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	1035.0	10344.2	10%	
	Moment Stability, ft-lbs	1035.0	10344.2	10%	
	Shear/Moment	0.25	1.00	25%	Shear 690.0, Moment 0.0
	Axial/Moment	0.10	1.00	10%	Axial 0.0(c), Moment 1035.0
	Deflection Span, in	0.007	--meets L/10346--		

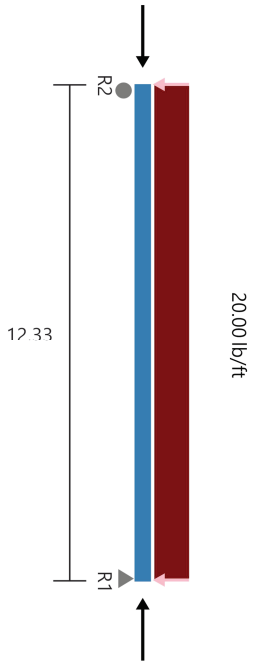
Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	0.0	690.0	By Others & Anchorage Designed by Engineer	NA	NA
R2	0.0	690.0	By Others & Anchorage Designed by Engineer	NA	NA

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

PRCTI20220498

Project Name: stud
Model: Member 7
Code: AISI S100-16

Date: 05/05/2022
Simpson Strong-Tie® CFS Designer™ 4.2.0.9



Section: 600S162-54 (50 ksi) Single C Stud (punched)
Maxo = 2313.4 ft-lb **Va =** 2822.9 lb **I =** 2.86 in^4

Loads have not been modified for strength checks
Loads have been multiplied by 0.70 for deflection calculations

Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Span	60.0", 60.0"	60.0", 148.0"	LSUBH3.25 (Min)	0.44

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R2	123.3	1.00	598.9	0.0	0.11	NO
R1	123.3	--Stud/Track Design, Ref Connectors--				NO

"*" after support means punched near support

	Code Check	Required	Allowed	Interaction	Notes
Span	Max. Axial, lbs	1605.0(c)	4478.9(c)	36%	KΦ=0.00 lb-in/in Max KL/r = 105
	Max. Shear, lbs	123.3	1947.4	6%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	380.1	1930.2	20%	Ma-dist (control),KΦ=0.00 lb-in/in
	Moment Stability, ft-lbs	380.1	1805.4	21%	
	Shear/Moment	0.16	1.00	16%	Shear 0.0, Moment 380.1
	Axial/Moment	0.59	1.00	59%	Axial 1605.0(c), Moment 380.1
	Deflection Span, in	0.086	--meets L/1715--		

Simpson Strong-Tie® Connectors

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie® Connector	Connector Interaction	Anchor Interaction
R2	123.3	0	By Others & Anchorage Designed by Engineer	NA	NA
R1	123.3	1605	600T150-54 (50) & (1) .157" SST PDPA/PDPAT-62KP to steel (3/16" to 1/2" thickness)	12.26 %	30.07 %

* Reference catalog for connector and anchor requirement notes as well as screw placements requirement

PRCTI20220498

Hazards by Location

Search Information

Address: 1201 39th Ave SW, Puyallup, WA 98373, USA

Coordinates: 47.1557222, -122.3078559

Elevation: 380 ft

Timestamp: 2022-02-18T00:05:53.747Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: II

Site Class: D

Basic Parameters

Name	Value	Description
S_S	1.267	MCE_R ground motion (period=0.2s)
S_1	0.437	MCE_R ground motion (period=1.0s)
S_{MS}	1.267	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	0.845	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.914	Coefficient of risk (0.2s)
CR_1	0.898	Coefficient of risk (1.0s)
PGA	0.5	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.55	Site modified peak ground acceleration

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T_L	6	Long-period transition period (s)
SsRT	1.267	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.387	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.437	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.487	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

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.

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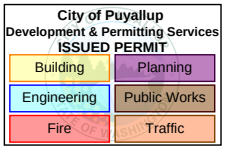

PRCTI20220498

ENGINEERS-NORTHWEST,INC.P.S.
9725 THIRD AVE. N.E. (SUITE 207)
SEATTLE, WA. 98115

ASCE 7-16

Seismic Loads per ASCE 7-16- Chapter 12 Seismic Design Requirements for Building Structures

Input Cells =	
Project Number:	99090014
Project Name:	Costco Puyallup, WA
Location:	
Design By:	

2018 IBC Section 1613 / ASCE 7-16 Section 12.8 Equivalent Lateral Force Procedure

All references below are to ASCE 7-16 (U.N.O.)

Input

Basic Seismic Force Resisting System =	A15. Light-frame (wood) walls sheathed with wood structural panels rated for shear resistance	
Basic Seismic Force Resisting System =	BWS	= Bearing Wall Systems
Is diaphragm considered flexible? =	YES	
Structural height, h_n =	10.5	ft
S_s =	1.267	spectral response acceleration at a period of 0.2s for Site Class B
S_1 =	0.437	spectral response acceleration at a period of 1.0s for Site Class B
T_L =	6	Long-period transition period
Site Class (soil) =	D	
Risk Category =	II	Table 1.5-1
Top of wall elevation (parapet) =	10.5	ft
Elev. of top of wall lateral support (max.) =	10.5	ft (roof high point- minimum parapet)
Elev. of top of wall lateral support (min.) =	10.5	ft (roof low point- maximum parapet)
Regular structure ≤ 5 stories ? =	YES	Section 12.8.1.3
ρ =	1.0	Section 12.3.4.2

Output

Site Coefficient, F_a =	1	Table 11-4.1
Site Coefficient, F_v =	1.863	Table 11-4.2
S_{MS} =	1.267	Eqn 11.4-1
S_{M1} =	0.814	Eqn 11.4-2
S_{DS} =	0.845	Eqn. 11.4-3
S_{D1} =	0.543	Eqn. 11.4-3
Seismic Design Category (SDC) =	D	Section 11.6 & Tables 11.6-1 & 11.6-2
T_0 =	0.129	Section 11.4.5, 0.2Sd1/Sds
T_s =	0.643	Section 11.4.5, Sd1/Sds
C_t =	0.02	Table 12.8-2
Period, T =	0.117	sec, Section 12.8.2.1 (Eqn 12.8-7)
S_a =	0.798	Section 11.4.5 (Eqns 11.4-5, 11.4-6, 11.4-7)
Response Modification Coefficient, R =	6.5	Table 12.2-1
System Overstrength Factor, Ω_o =	2.5	Table 12.2-1
Deflection Amplification Factor, C_d =	4	Table 12.2-1
Importance Factor, I_e =	1	Table 1.5-2, by Risk Category
Detailing Reference Section =	14.5	
$C_{s\ calc}$ =	0.13	Section 12.8.1.1, Eqn 12.8-2
$C_{s\ max}$ =	0.714	Section 12.8.1.1, Eqns 12.8-3 & 12.8-4
$C_{s\ min}$ =	0.037	Section 12.8.1.1, Eqns 12.8-5 & 12.8-6
$C_{s\ use}$ =	0.13	Section 12.8.1.1, Eqns 12.8-2 - 12.8-6
V_u =	**0.13**	*** W (LRFD)** Section 12.8.1, Eqn 12.8-1
V =	**0.091**	*** W (ASD)**
E_v =	**0.169**	*** D = +/- S_{DS} D (Eqn 12.4-4) - May be zero for proportioning foundations.**

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
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PRCTI20220498

ENW ENGINEERS NORTHWEST, INC., P.S. ~ STRUCTURAL ENGINEERS

9725 THIRD AVE NE, SUITE 207, SEATTLE, WA 98115 (206) 525~7560 FAX (206) 522~6698

PROJECT # 99090014 PROJECT COSTCO PUYALLUP, WA DATE 3/10/2022

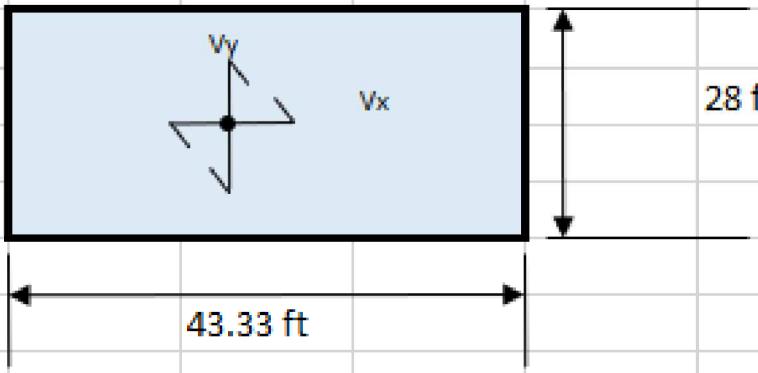
SUBJECT Lateral analysis SHEET ____ OF ____

BY NAZ AHMED

Lateral analysis

Cs = 0.13 (LRFD), 0.091 (ASD)

Length of Mezz. = 43-4"
Width of Mezz. = 28'-0"
Mezz. height 10-6"
Mezzanine weight = 14.5 psf
wall weight 8 psf
total wall height 21'-6"



Mezzanine plan view

Vx = 0.13 x ((14.5 psf/1000) x 43.33' + (2 x (21.5/2) x (8psf/1000))) = 0.1 klf

RT1 = RT2 = 1.46 k
RB1 = RB2 = 1.7 k

Vy = 0.13 x ((14.5 psf/1000) x 28' + (2 x (21.5/2) x (8psf/1000))) = .08 klf

RT3 = RT4 = 1.63 k
RB3 = RB4 = 1.78 k

Therefore, 1/2" plywood with #10 screws at 6" o.c. edges and 12" o.c. field is okay. Studs to be 600S200-54 (50 ksi) and tracks 600T1.25-54 (50 ksi) okay per attached CFS calcs.

Use simpson HTT4 holdown with 1/2" bolt each end of wall. Okay per attached CFS calc.

Floor diaphragm to ledge - use min. #10 screws at 4" o.c.

ENGINEERS NORTHWEST, INC., P.S.
9725 THIRD AVE NE, SUITE 207
SEATTLE, WA 98115

AISI S100-07 SPECIFICATION PROVISIONS FOR SCREWS

Steel Sheet Properties			
Gauge	Mils	Design Thickness (in)	Fu (ksi)
25	18	0.0188	45
22	27	0.0283	45
20	33	0.0346	45
18	43	0.0451	45
16	54	0.0566	65
14	68	0.0713	65
12	97	0.1017	65
10	118	0.1242	65

SCREW SCHEDULE - ASD DESIGN VALUES (POUNDS)										
SCREW DIA(in.)	1/4 0.25		#12 0.216		#10 0.19		#8 0.164		#6 0.138	
GAUGE	SHEAR	TENSION	SHEAR	TENSION	SHEAR	TENSION	SHEAR	TENSION	SHEAR	TENSION
25 (18 mils)	81	60	75	52	71	46	66	39	60	33
22 (27 mils)	150	90	139	78	131	69	121	59	111	50
20 (33 mils)	203	110	188	95	177	84	164	72	132	61
18 (43 mils)	302	144	280	124	263	109	244	94	132	79
16 (54 mils)	613	261	501	225	324	198	268	171	132	144
14 (68 mils)	651	328	501	284	324	249	268	215	132	181
12 (97 mils)	651	468	501	405	324	356	268	267	132	258
10 (118 mils)	651	572	501	494	324	365	268	267	132	267
Min edge dist. =	0.375		0.324		0.285		0.246		0.207	
Min o/c spac. =	0.750		0.648		0.570		0.492		0.414	

* TABLE ASSUMES THAT CONNECTED MEMBERS ARE THE SAME THICKNESS
* MINIMUM VALUES FOR EDGE DISTANCE & o/c SPACING ARE BASED ON VALUES FOR 1.5d & 3d, RESPECTIVELY
* SCREWS TO HAVE 5/16" MINIMUM HEAD DIAMETER

DESIGN STRENGTH [ASD] FOR TWO DIFFERENT THICKNESSES (POUNDS)										
							Ga	Mils	Inches	
THICKNESS OF MEMBER IN CONTACT WITH SCREW HEAD =							20	= 33 =	0.0346	
THICKNESS OF MEMBER NOT IN CONTACT WITH SCREW HEAD =							20	= 33 =	0.0346	
1/4 0.25		#12 0.216		#10 0.19		#8 0.164		#6 0.138		
SHEAR	TENSION	SHEAR	TENSION	SHEAR	TENSION	SHEAR	TENSION	SHEAR	TENSION	
203	110	188	95	177	84	164	72	132	61	