MRW DESIGN ASSOCIATES INCORPORATED

ST. GEORGE UTAH - 435.628.2377

Washington County Library, Washington, Utah by: JHC date: January 7, 2020
IBC 2018

ROOF LOADS

DEAD LOAD:

Roofing(TPO)/SS:	0.4
Insulation(5"Rigid):	1.2
Roofing Felt:	0.5
Sheathing(1/2"):	1.5
Framing:	4.2
5/8" Gyp Ceiling:	2.75
Fire Sprinklers:	2.0
Miscellaneous:	1.75
	14.3 psf => 15 psf

LIVE LOAD:

15 psf (snow)

20 psf (roof live)
or 300 lb point load

SEISMIC (Risk Category II)

Lat/Long: 37.1343° / 113.5042° $S_{DS} = 0.498$ $S_{D1} = 0.266$ $I_E = 1.0$
R = 6.5 Site Class: D Seismic Design Category: D

WIND (Risk Category II)

$V_{ULT} = 105$ mph Exposure: C

SOILS Allowable Soil Bearing Pressure = **1,500 psf**

All Soil/Geotechnical information is assumed and is to be field verified by a licensed geotechnical engineer. All excavation, over-excavation, fill, compaction, and foundation & slab preparation shall comply with recommendations outlined by a Geotechnical Engineer.

PROFESSIONAL STRUCTURAL ENGINEER
#323778
JOHN H. CRAVEN
STATE OF UTAH

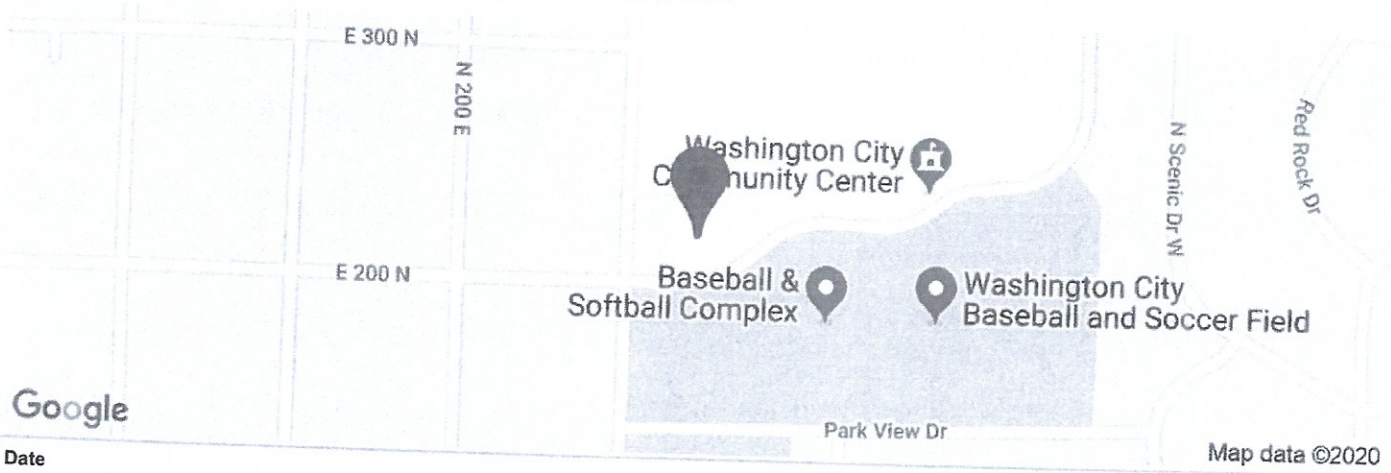
1/16/20

OSHPD

1

Washington City Library

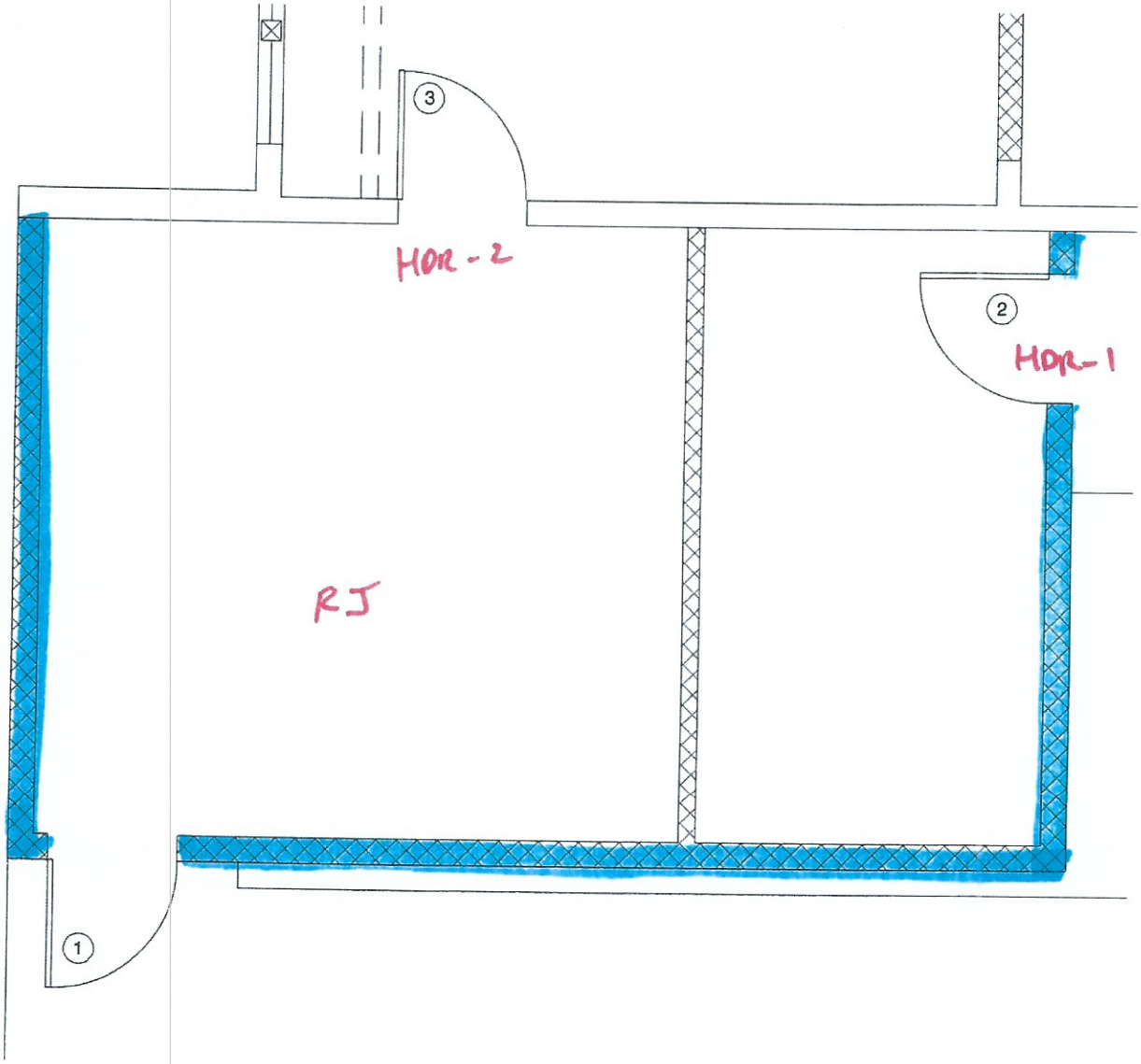
Latitude, Longitude: 37.1343111111111, -113.50417777778



Date	1/7/2020, 1:42:51 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

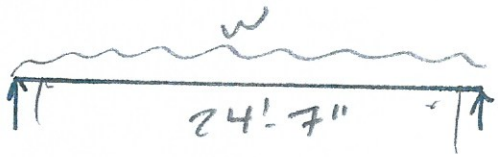
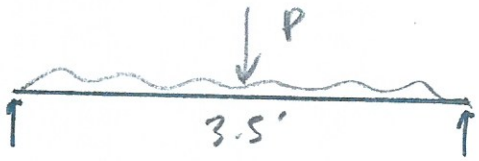
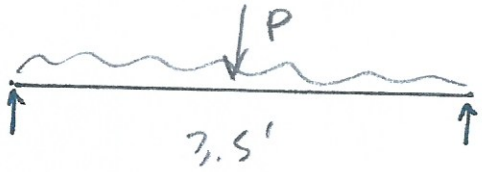
Type	Value	Description
S_S	0.548	MCE_R ground motion. (for 0.2 second period)
S_1	0.178	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.746	Site-modified spectral acceleration value
S_{M1}	0.399	Site-modified spectral acceleration value
S_{DS}	0.498	Numeric seismic design value at 0.2 second SA
S_{D1}	0.266	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1.361	Site amplification factor at 0.2 second
F_v	2.245	Site amplification factor at 1.0 second
PGA	0.241	MCE_G peak ground acceleration
F_{PGA}	1.359	Site amplification factor at PGA
PGA_M	0.327	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	0.548	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.607	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.785	Factored deterministic acceleration value. (0.2 second)
S1RT	0.178	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.194	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.702	Factored deterministic acceleration value. (1.0 second)
PGAd	0.675	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.903	Mapped value of the risk coefficient at short periods
C_{R1}	0.918	Mapped value of the risk coefficient at a period of 1 s


3
HDR - 2
2
HDR - 1
RJ
1

MRW DESIGN ASSOCIATES INCORPORATED
251 W. HILTON DR. #206 P.O. BOX 2775 ST. GEORGE, UT 84790
(435) 628-2377 (435) 673-1859 fax

SUBJECT: RF = (15 + 20)	PROJECT: WASH LIB	SHEET: 3 OF:	
	DESIGNED BY: JHC	JOB:	
	CHECKED BY:	DATE: 1/7/20	
		DATE:	

MARK	FBD	M (kft)	V (k)	SIZE F-	δ
RS-1	 w = SPACE (RF)			14" TSI 210 @ 24" o.c. 14" LPI 20 PLUS @ 24" o.c.	
HDR-1	 P = 24'-7/2 x 2 (RF) 523 w = 3x15 0.96	894	494 919	(2)-2x6 (2)-2x8	✓
HDR-2	 P = 16.5²/2 ÷ 13'-2 (RF) w = 3x15				

FORTE WEB

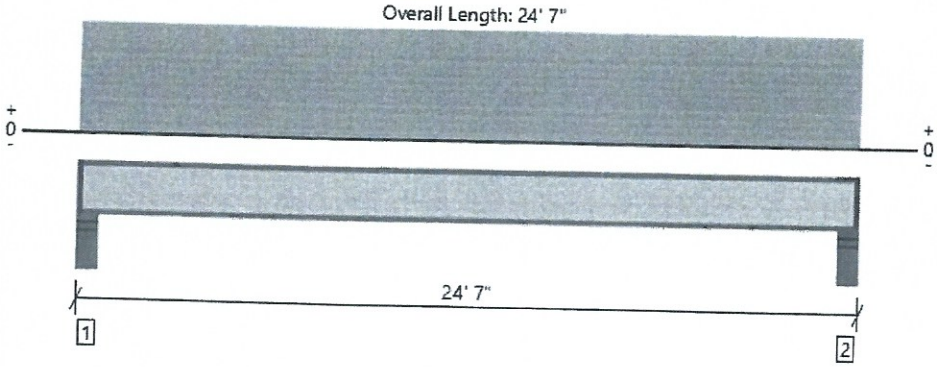
MEMBER REPORT

PASSED

Roof, Roof: Joist

1 piece(s) 14" TJI® 210 @ 24" OC

4



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	853 @ 4 1/2"	1825 (3.50")	Passed (47%)	1.25	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	828 @ 5 1/2"	2431	Passed (34%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	4970 @ 12' 3 1/2"	5613	Passed (89%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.672 @ 12' 3 1/2"	1.192	Passed (L/426)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	1.176 @ 12' 3 1/2"	1.589	Passed (L/243)	--	1.0 D + 1.0 Lr (All Spans)

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 6" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 24' 5" o/c unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	1.75"	369	492	861	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	1.75"	369	492	861	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (non-snow: 1.25)	Comments
1 - Uniform (PSF)	0 to 24' 7"	24"	15.0	20.0	Default Load

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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Weyerhaeuser

SUSTAINABLE FORESTRY INITIATIVE

ForteWEB Software Operator	Job Notes
John Craven MRW Design Associates, Inc. (435) 628-2377 jhc@mrwdesign.com	

1/7/2020 9:23:07 PM UTC
ForteWEB v2.1, Engine: V7.3.2.309, Data: V7.2.0.2
File Name: Wash Co Library

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phone: (435) 628-2377 • fax: (435) 673-3580

PROJECT: WASH CO LIB		SHEET: 5 OF:
		JOB:
DESIGNED BY: JHC		DATE: 1/7/20
SUBJECT:	CHECKED BY:	DATE:

TRIMMER = 960 lb 7' 1-2x6

WALL

9'-1 1/8 + 1/4" x 15'-9 = 9'-5"

W = 24'-7/2 (15+20) + (9.5/2 + 1) x 15

WIND = 105 mph Exp C

Kzv = 21 WIND = 20.49 psf

2x6 @ 16" o.c.

Ceiling.

h = 9'-5

W = 24'-7/2 (15+20) + (9.5/2 + 1) x 15

THUB = 9'-5 x (3' + 1'-4) WIND = 18.18 => 48.29

(1)-2x6

FTG = WP = 960/4.5 + 24'-7/2 (15+20) + 10 x 15 = 794

20" x CONT.

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Components and Cladding Wind ASCE 7-16
End Zone Wind Pressures

Pnet = λ Kzt pnet30

Enclosed Building? **Yes**
Low-rise building? **Yes**
h ≤ 60'? **Yes**

Risk Category =	II			
Exposure =	C	(C or D)		
Mean Roof Height =	21	(feet) <60'-0" and >15'-0"		
λ =	**1.30**		20 feet λ =	1.29
Kzt =	1.0		25 feet λ =	1.35

Basic Wind Speed V (mph) =	105	(105 or 110 mph)			
Area = 9.042 x 1.333					
Effective Wind Area =	12.06	10 sf < (sf) < 100 sf			
pnet30 =	**26.23**	(psf)	10 sf pnet30 =	26.6	
			20 sf pnet30 =	24.8	
pnet =	**34.15**	**(psf)**	asd	**20.49**	

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EXTERIOR STUD WALL CALCULATOR

Wall Height, h (ℓ_e) = 9.042 ft.
Wind Pressure, p = 20.49 psf
Stud Spacing, S = 16.00 in. O.C.
# of Studs per Spacing, n = 1
F_b = 700 psi
F_c = 850 psi
$F_{c\perp}$ = 625 psi

Stud Dimensions: t = 1.5 in. d = 5.5 in.
Section Modulus, s = 7.563 $in.^3$ Area = 8.250 $in.^2$

C_f = 1.35 $C_{F\,(comp.)}$ = 1.00
C_t = 1.00 C_M = 1.00
C_b = 1.25 C_i = 1.00

$F'_{c\perp}=F_{c\perp}*C_M*C_t*C_i*C_b$= 781.25 psi

E_{min} = 510000 psi c = 0.80

Gravity Loads

	Dead load psf	Dead trib. ℓ	Dead ttl plf	Live load psf	Live trib. ℓ	Live ttl plf	Roof Live load psf	Roof Live trib. ℓ	Roof Live ttl plf
High Roof	15	12.3	184	-	-	-	20	12.3	246
Low Roof			-	-	-	-			-
2nd Floor			-			-	-	-	-
1st Floor			-			-	-	-	-
			184			0			246

	Dead load psf	Dead trib. ℓ	Dead ttl plf	Live load psf	Live trib. ℓ	Live ttl plf	Snow load psf	Snow trib. ℓ	Snow ttl plf
Drift	-	-	-	-	-	-	15	12.3	184
Wall	15	5.8	86	-	-	-			0
2nd Floor Deck			-			-			-
1st Floor Deck			-			-			-
			86			0			184

Bending

Uniform Load, w = 27.32 plf

$C_{F\,(bending)}$ = 1.00 Live Trib (ft) = 1.333
Simply Supported Moment, M = 3350 lb.-in. Wind
Moment Override, M = lb.-in. Wind
Omega = 1.30

$f_b = M / s$ = 443.0 psi
$F'_b = F_b*C_F*C_f*C_M*C_t*C_i$ = 945.0 psi

1) **IBC 2018 Eq 16-9 (D+L) w/ 5psf live lateral**
P= 360.8 lb. < $F'_{c\perp}*A$ = 6445.313 lb. **Adequate bearing area**
fc = P / A = 43.7 psi
$E'_{min} = E_{min}*C_M*C_t*C_i$ = 5.10E+05 C_D = 1.00
$(\ell_e/d)_x$ = 19.73
$F_{cE} = (0.822*E'min) / (\ell_e/d)_x^2$ = 1077.23 psi M= 818 Live
$F_C^* = F_C*C_D*C_F*C_M*C_t*C_i$ = 850.0 psi
F_{cE}/F_c^* = 1.267 fb= 108 Live
$C_P = [(1+(F_{cE}/F_c^*))/2*c] - \sqrt{[(1+(F_{cE}/F_c^*))/2*c]^2 - [(F_{cE}/F_c^*)/c]}$ = 0.766
$F'_C = F_C^*C_P$ = 651.1 psi > 43.7 **Adequate for comp., check combined stress**
Combined Stress: $(f_c/F'_c)^2 + 0.75f_b/(F'_b*(1-(f_c/F_{cE})))$ = 0.12 < 1.0, ADEQUATE, USE SPECIFIED SECTION

2) **IBC 2018 Eq 16-13 (D+0.75W+0.75L+0.75Lr)**
P= 606.7 lb. < $F'_{c\perp}*A$ = 6445.313 lb. **Adequate bearing area**
f_c = / A = 73.5 psi
C_D = 1.60
$F'_C = F_C^*C_P$ = 1041.7 psi > 73.5 **Adequate for comp., check combined stress**
Combined Stress: $(f_c/F'_c)^2 + 0.75f_b/(F'_b*(1-(f_c/F_{cE})))$ = 0.24 < 1.0, ADEQUATE, USE SPECIFIED SECTION

3) **IBC 2018 Eq 16-17 (D+L+Lr) w/ 5psf live lateral**
P= 688.6 lb. < $F'_{c\perp}*A$ = 6445.313 lb. **Adequate bearing area**
f_c = / A = 83.5 psi
C_D = 1.25
$F'_C = F_C^*C_P$ = 651.1 psi > 83.5 **Adequate for comp., check combined stress**
Combined Stress: $(f_c/F'_c)^2 + 0.75f_b/(F'_b*(1-(f_c/F_{cE})))$ = 0.12 < 1.0, ADEQUATE, USE SPECIFIED SECTION

4) **IBC 2018 Eq 16-19 (D+L+W+S/2)**
P= 483.8 lb. < $F'_{c\perp}*A$ = 6445.313 lb. **Adequate bearing area**
f_c = / A = 58.6 psi
C_D = 1.60
$F'_C = F_C^*C_P$ = 1041.7 psi > 58.6 **Adequate for comp., check combined stress**
Combined Stress: $(f_c/F'_c)^2 + 0.75f_b/(F'_b*(1-(f_c/F_{cE})))$ = 0.41 < 1.0, ADEQUATE, USE SPECIFIED SECTION

5) **IBC 2018 Eq 16-20 (D+L+S+W/2)**
P= 606.7 lb. < $F'_{c\perp}*A$ = 6445.313 lb. **Adequate bearing area**
f_c = / A = 73.5 psi
C_D = 1.60
$F'_C = F_C^*C_P$ = 1041.7 psi > 73.5 **Adequate for comp., check combined stress**
Combined Stress: $(f_c/F'_c)^2 + 0.75f_b/(F'_b*(1-(f_c/F_{cE})))$ = 0.21 < 1.0, ADEQUATE, USE SPECIFIED SECTION

6) **IBC 2018 Eq 16-10 (D + SL)**
P= 606.7 lb.
f_c = / A = 73.5 psi
C_D = 1.15
$F'_C = F_C^*C_P$ = 748.7 psi > 73.5 **Adequate for comp., check combined stress**

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Components and Cladding Wind ASCE 7-16
End Zone Wind Pressures

Pnet = λ Kzt pnet30

Enclosed Building? **Yes**
Low-rise building? **Yes**
h ≤ 60'? **Yes**

Risk Category = II
Exposure = C (C or D)
Mean Roof Height = 21 (feet) <60'-0" and >15'-0"
λ = **1.30**
Kzt = 1.0

20 feet λ = 1.29
25 feet λ = 1.35

Basic Wind Speed V (mph) = **105** (105 or 110 mph)
Area = 9.042 x 4.333
Effective Wind Area = 39.18 10 sf < (sf) < 100 sf
pnet30 = **23.27** (psf)

20 sf pnet30 = 24.8
50 sf pnet30 = 22.4

pnet = 30.29 (psf) asd **18.18**

m= 8048 lb in asd **4829**

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EXTERIOR STUD WALL CALCULATOR

Wall Height, h (ℓ_e) = 9.042 ft.
Wind Pressure, p = 18.18 psf
Stud Spacing, S = 8.00 in. O.C.
# of Studs per Spacing, n = 1
F_b = 700 psi
F_c = 850 psi
$F_{c\perp}$ = 625 psi

Stud Dimensions: t = 1.5 in. d = 5.5 in.
Section Modulus, s = 7.563 $in.^3$ Area = 8.250 $in.^2$

C_r = 1.00 $C_{F\,(comp.)}$ = 1.00
C_t = 1.00 C_M = 1.00
C_b = 1.25 C_i = 1.00
$F'_{c\perp}=F_{c\perp}*C_M*C_t*C_i*C_b$ = 781.25 psi
E_{min} = 510000 psi c = 0.80

Gravity Loads

	Dead load psf	Dead trib. ℓ	Dead ttl plf	Live load psf	Live trib. ℓ	Live ttl plf	Roof Live load psf	Roof Live trib. ℓ	Roof Live ttl plf
High Roof	15	12.3	184	-	-	-	20	12.3	246
Low Roof			-	-	-	-			-
2nd Floor			-			-	-	-	-
1st Floor			-			-	-	-	-
			184			0			246

	Dead load psf	Dead trib. ℓ	Dead ttl plf	Live load psf	Live trib. ℓ	Live ttl plf	Snow load psf	Snow trib. ℓ	Snow ttl plf
Drift	-	-	-	-	-	-	15	12.3	184
Wall	15	5.8	86	-	-	-			0
2nd Floor Deck			-			-			-
1st Floor Deck			-			-			-
			86			0			184

Bending

Uniform Load, w = 12.12 plf

$C_{F\,(bending)}$ = 1.00 Live Trib (ft) = 2.167
Simply Supported Moment, M = 0 lb.-in. Wind
Moment Override, M = 4829 lb.-in. Wind
Omega = 1.30

$f_b = M / s$ = 638.5 psi
$F'_b = F_b*C_F*C_r*C_M*C_t*C_i$ = 700.0 psi

1) **IBC 2018 Eq 16-9 (D+L) w/ 5psf live lateral**
P= 180.4 lb. < $F'_{c\perp}*A$ = 6445.313 lb. **Adequate bearing area**
fc = P / A = 21.9 psi
$(\ell_e/d)_x$ = 19.73
$F'_{min} = E_{min}*C_M*C_t*C_i$ = 5.10E+05 C_D = 1.00
$F_{cE} = (0.822*E'min) / (\ell_e/d)_x^2$ = 1077.23 psi M= 1328 Live
$F_c^* = F_c*C_D*C_F*C_M*C_t*C_i$ = 850.0 psi
F_{cE}/F_c^* = 1.267 fb= 176 Live
$C_P = [(1+(F_{cE}/F_c^*))/2*c] - \sqrt{[(1+(F_{cE}/F_c^*))/2*c]^2 - [(F_{cE}/F_c^*)/c]}$ = 0.766
$F'_c = F_c^**C_P$ = 651.1 psi > 21.9 **Adequate for comp., check combined stress**
Combined Stress: $(f_c/F'_c)^2 + 0.75f_b/(F'_b*(1-(f_c/F_{cE})))$ = 0.26 < 1.0, ADEQUATE, USE SPECIFIED SECTION

2) **IBC 2018 Eq 16-13 (D+0.75W+0.75L+0.75Lr)**
P= 303.3 lb. < $F'_{c\perp}*A$ = 6445.313 lb. **Adequate bearing area**
f_c = / A = 36.8 psi
C_D = 1.60
$F'_c = F_c^**C_P$ = 1041.7 psi > 36.8 **Adequate for comp., check combined stress**
Combined Stress: $(f_c/F'_c)^2 + 0.75f_b/(F'_b*(1-(f_c/F_{cE})))$ = 0.44 < 1.0, ADEQUATE, USE SPECIFIED SECTION

3) **IBC 2018 Eq 16-17 (D+L+Lr) w/ 5psf live lateral**
P= 344.3 lb. < $F'_{c\perp}*A$ = 6445.313 lb. **Adequate bearing area**
f_c = / A = 41.7 psi
C_D = 1.25
$F'_c = F_c^**C_P$ = 651.1 psi > 41.7 **Adequate for comp., check combined stress**
Combined Stress: $(f_c/F'_c)^2 + 0.75f_b/(F'_b*(1-(f_c/F_{cE})))$ = 0.21 < 1.0, ADEQUATE, USE SPECIFIED SECTION

4) **IBC 2018 Eq 16-19 (D+L+W+S/2)**
P= 241.9 lb. < $F'_{c\perp}*A$ = 6445.313 lb. **Adequate bearing area**
f_c = / A = 29.3 psi
C_D = 1.60
$F'_c = F_c^**C_P$ = 1041.7 psi > 29.3 **Adequate for comp., check combined stress**
Combined Stress: $(f_c/F'_c)^2 + 0.75f_b/(F'_b*(1-(f_c/F_{cE})))$ = 0.76 < 1.0, ADEQUATE, USE SPECIFIED SECTION

5) **IBC 2018 Eq 16-20 (D+L+S+W/2)**
P= 303.3 lb. < $F'_{c\perp}*A$ = 6445.313 lb. **Adequate bearing area**
f_c = / A = 36.8 psi
C_D = 1.60
$F'_c = F_c^**C_P$ = 1041.7 psi > 36.8 **Adequate for comp., check combined stress**
Combined Stress: $(f_c/F'_c)^2 + 0.75f_b/(F'_b*(1-(f_c/F_{cE})))$ = 0.38 < 1.0, ADEQUATE, USE SPECIFIED SECTION

6) **IBC 2018 Eq 16-10 (D + SL)**
P= 303.3 lb.
f_c = / A = 36.8 psi
C_D = 1.15
$F'_c = F_c^**C_P$ = 748.7 psi > 36.8 **Adequate for comp., check combined stress**

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Main Force Wind Resisting System Ultimate Pressures ASCE 7-16

Ps = λ Kzt ps30

Chapter 28 Section 28.5

Risk Category of Building =	II	
Basic Wind Speed V (mph) =	105	(105 or 110 mph)
Exposure =	D	(C or D)
Topographical Factor Kzt =	1.00	
Mean Roof Height =	21.00	(feet) <60'-0" and >15'-0"
λ =	1.56	

Enclosed?
Simple Dia?
Low Rise?

20 feet λ = 1.55

25 feet λ = 1.61

Roof Pitch =	0.00	(x : 12) > 1.05 < 6.928
Roof Angle (degrees) =	5.00	(degrees (0° = 5°) (30°- 45° = 30) <30° and >5°)

Roof End Zone ps30 = -9.10 psf

Roof End Zone ps = -14.21 psf

Service = 0.6 x Ultimate

Service = -8.53 psf

Roof Int. Zone ps30 = -5.40 psf

Roof Int. Zone ps = -8.43 psf

Service = -5.06 psf

Wall End Zone ps30 = 17.50 psf

Wall End Zone ps = 27.34 psf

Service = 16.4 psf

Wall Int. Zone ps30 = 11.60 psf

Wall Int. Zone ps = 18.12 psf

Service = 10.87 psf

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phone: (435) 628-2377 • fax: (435) 673-3580

SUBJECT:	PROJECT: WASHCO. CID.	SHEET: 11 OF:
	DESIGNED BY: JHC	JOB:
	CHECKED BY:	DATE: 1/7/20
		DATE:

WIND N-S = $\left(\frac{9.5'}{2} + 1.5'\right) \times 6' \times 27.34 +$

$6.25' \times 9' \times 18.12 = \underline{2.04k}$ N-S

E-W = $6.25' \times 6' \times 27.34 +$

$6.25' \times -16'-7 \times 18.12 = \underline{3.13k}$ E-W

SEISMIC $15 \times 24'-7 \times 15 +$

$6.25' \times 15' \times 2 \times 15 = 8.34k$

$V = \frac{0.498}{6.5} \times 8.34 = \underline{0.64}$

WIND CONTROLS

SHEAR WALL

N = V = 3.13/2 = 1.57k l_w = 11' V = 143

S = V = 1.57k l_w = 15' V = 105

E = V = 2.04k l_w = 20'-8 V = 99

7/16" APA 8d@6" o.c.

DIAPHRAGM

N & S V = 1.57k l_D = 15' V = 105 plf

EAST V = 2.04k l_D = 24'-7" V = 83plf

7/16" APA 8d@6" o.c.

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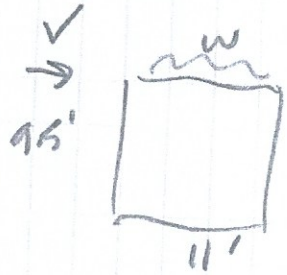
PROJECT: WASHCO LIB.		SHEET: 12 OF:
DESIGNED BY: JCK		JOB:
CHECKED BY:		DATE: 1/7/20
SUBJECT:		DATE:

MID DAMP

N



V = 1.57k

w = 24'-7/2 (15) + 11 x 15

= 349

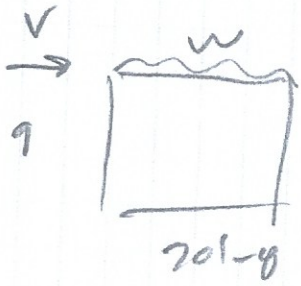
0.6D + 0.6W

MOT = 0.6 x 1.57 x 9.5' = 8.95 kft

MR = 0.6 x 349 x 11²/2 = 12.67 kft

MID NOT REQ'D

FIRST



V = 2.04k

w = 2/2 x 15 + 11 x 15 = 180

0.6D + 0.6W

MOT = 0.6 x 2.04 x 9 = 11.02 kft

MR = 0.6 x 180 x 20'-8²/2 = 23.06 kft

MID NOT REQ'D

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SUBJECT:	PROJECT: WASH CO LIB. WASH. CITY	SHEET: 13 OF:
	DESIGNED BY: JHC	JOB:
	CHECKED BY:	DATE: 1/9/20
		DATE:

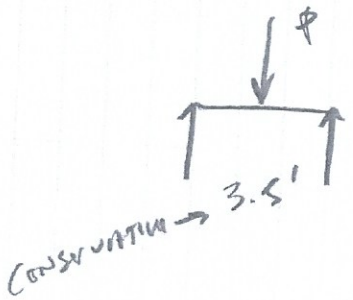
LATERAL NARATIVE

EAST WALL OF LIBRARY.

IT IS DESIRABLE TO CUT A 3'-2" WIDE DOOR INTO THE EAST WALL. ACCORDING TO EXISTING DRAWINGS THERE IS 35'-6" + 24'-6" = 60'-0" OF SHEARWALL

3'-2 / 60 = 5.3%

ASPER IEBC 2018 SECTION 806.3 EXCEPTION THIS IS ok. ALTERATION < 10%



$P = \frac{17^2}{2} \div 13'-8 \times 2\,(18+20) = 381_{D} + 423_{Lr}$

W = 6 x 15

M = 919 lbft. /2 = 5.51 kin

V = 524 lb 939 lb /2 470

R = 579 lb 978 lb /2 =

Provide (2) - 8" x 2" x 18 GAUGE (45 mil) METAL STUDS

250 S 125 - 54 0.95
400 S 125 - 43 1.0
550 S 125 - 33 0.95 ←
350 S 200 - 33 0.99

Use 550 S 125 - 33

	mN	Dsgn
43 = 18	0.0428 /	0.0451
33 = 20 STRONGER	0.0329 /	0.0346