DESIGN B&T & ENGINEERING

PRGA20241682

Full-Sized legible color report is required to be provided by the Permittee on site for all Inspections

City of Puyallup
Building
REVIEWED
FOR
COMPLIANCE
SKinnear
11/13/2024
2:11:00 PM

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Engineering | Public Works
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# STRUCTURAL CALCULATIONS

**FOR**

# THE LOCKWOOD GARAGE-SHOP

**3305 S FRUITLAND AVE**
**PUYALLUP, WA98373**

October 31, 2024
B&T JOB NO. - 24056

BUILDER:
FULL TILT CONSTRUCTION
10751 A Street South
Tacoma, WA 98444
CONTACT: PAUL LOCKWOOD
(425) 533-7315

DESIGN & B&T ENGINEERING
(425) 557-0779



***BUILDING CODES:***

2021 IBC w/ WA Amendments

ASCE7-16

***GRAVITY LOADS:***

**Roof** :

| | | |
|---|---|---|
| COMPOSITION ROOFING | 2.5 | PSF |
| 1/2" PLYWOOD | 1.5 | PSF |
| FRAMING @ 24"o.c. | 3.0 | PSF |
| INSULATION | 0.0 | PSF |
| GYPBOARD CEILING | 2.8 | PSF |
| MECH & ELEC | 1.0 | PSF |
| SPRINKLERS | 0.0 | PSF |
| MISC. | 1.0 | PSF |
| TOTAL DL = | 12 | PSF |
| x Slope factor = | 12 | PSF |
| TOTAL LL [SNOW - min] = | 25 | PSF |
| TOTAL Roof DESIGN LOAD = | 37 | PSF |
| LL @ EXITS = | 100 | PSF |

ROOF SLOPES:

| | |
|---|---|
| RISE = | 4 |
| RUN = | 12 |
| m = | 1.054 |

LD DUR = 115% [FOR WOOD MEMBERS]

**WALL TYPES:**

| | | |
|---|---|---|
| WOOD STUD | 10 | PSF |
| 8" CONCRETE | 100 | PSF |
| 10" CONCRETE | 125 | PSF |

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***LATERAL LOADS:***

BUILDING RISK CATEGORY II

| | | |
|---|---|---|
| WIND: | | |
| BASIC WIND SPEED V (MPH) = | 110 | |
| Exposure = | B | |
| Wind Importance Factor I = | 1.0 | |
| Kzt = | 1.0 | |
| Load Factor for ASD combinations = | 0.6 | ASCE7-10 2.4.1 EQ. 5. & 7. |

| EXPOSURE & GUST FACTOR "Ce" = | Height |
|---|---|
| 1.12 | 45 ft |
| 1.09 | 40 ft |
| 1.05 | 35 ft |
| 1.00 | 30 ft |
| 1.00 | 25 ft |
| 1.00 | 20 ft |
| 1.00 | 15 ft |

SEISMIC: CITY: Puyallup - 373 ZIP CODE: 98373

(Site Class "D" - Seismic Design Category "D")

| | | | | |
|---|---|---|---|---|
| Ss = | 1.271 | g | REDUNDANCY FACTOR (rho) = | 1.0 |
| S1 = | 0.439 | g | SYSTEM OVERSTRENGTH FACTOR = | 2.5 |
| Fa = | 1.200 | | FACTOR FOR PLAN IRREGULARITY = | 1.0 |
| Fv = | NULL | | | |
| SDS = | 1.017 | g | | |
| SD1 = | NULL | g | | |
| Load Factor for ASD combinations = | 0.70 | | ASCE7-10 2.4.1 EQ. 5. & 8. | |

| | | |
|---|---|---|
| Rbrg walls = | 6.5 | [PLYWOOD SHEARWALLS] |
| Importance Factor I = | 1.0 | |

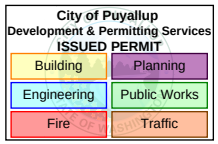
**v = 0.110 x W**

***BUILDING GEOMETRY:***

**DIMENSIONS:**

| | |
|---|---|
| LENGTH (FT) = | 42.00 |
| WIDTH (FT) = | 36.00 |

| | |
|---|---|
| LEVEL: | Roof |
| LENGTH (FT) = | 45.0 |
| WIDTH max (FT) = | 39.0 |
| AVERAGE HEIGHT (FT) = | 21.20 |
| Overhang (FT) = | 1.5 |
| WALL HT (FT) = | 18.00 |
| AREA (FT^2) = | 1,755 |



## BUILDING GEOMETRY (CONT'D):

### GRID DIMENSIONS:

*LONGITUDINAL*

| A | B |
|---|---|
| 0.00 | 36.00 |

*TRANSVERSE*

| 1 | 2 |
|---|---|
| 0.00 | 42.0 |

## MATERIAL PROPERTIES

### FOUNDATION:

qa (psf) = 1,500

soil weight (pcf) = 110
weight of water (pcf) = 62.4

Lateral soil Loads

E.F.P. (active - unrestrained) (pcf) = 35
P. (active - unrestrained) sloping Backfill (pcf) = 50
E.F.P. (at-rest) (pcf) = 55

E.F.P. (PASSIVE) = 330
Coefficient of friction (sliding) = 0.35

6 X "H" added to active - for seismic "active"
9 X "H" added to active - for seismic "at-rest"

### CONCRETE:

Slabs on Grade fc (psi) = 2,500
Retaining Walls & Ftgs fc (psi) = 3,000
fs (psi) = 60,000

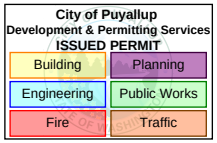
weight (pcf) = 150
t S.O.G. (in) = 4
Ec (psi) = 1.43E+08

### STEEL:

WF & WT Shapes - Fy (psi) = 50,000
HSS Shapes - Fy (psi) = 46,000
Channels & Angles - Fy (psi) = 36,000
Pipes - Fy (psi) = 36,000

**Footing Schedule**

| Mark | Width (ft) | Length (ft) | Capacity (lb) |
|---|---|---|---|
| F1.5 | 1.5 | 1.5 | 3,375 |
| F2.0 | 2.0 | 2.0 | 6,000 |
| F2.5 | 2.5 | 2.5 | 9,375 |
| F3.0 | 3.0 | 3.0 | 13,500 |
| F3.5 | 3.5 | 3.5 | 18,375 |
| F4.0 | 4.0 | 4.0 | 24,000 |
| F4.5 | 4.5 | 4.5 | 30,375 |
| F5.0 | 5.0 | 5.0 | 37,500 |



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**RB1** | **5 1/2" X 12" X-BEAM** | ***O.K.***

| | |
|---|---|
| Length cantilever (ft) = | 0 |
| Length backspan (ft) = | 12 |
| No. of Lams? | 1 |
| Rep Use? | NO |
| Slope Factor = | 1.0 |

| | | | |
|---|---|---|---|
| V Allow (lb) = | 20,114 | V / Vallow = | 27% |
| M Allow (lb-ft) = | 22,690 | M / Mallow = | 58% |

**Maximum deflections:**

| | | | |
|---|---|---|---|
| Cantilever - Δ max (in) = | 0.000 | = L / | N.A. |
| Backspan - Δ max (in) = | 0.239 | = L / | 603 |
| 1.5 * DLΔ (in) = | 0.079 | | |
| 2000 ft R (in) = | 0.108 | *Governs* | |

**UNIFORM LOADS :**

| | Cantilever | Backspan |
|---|---|---|
| Roof twDL (ft) = | 0 | 19.5 |
| Roof twLL (ft) = | 0 | 19.5 |
| Addtnl Load (plf) = | 0 | 0 |
| Total Uniform Load (per lam - plf) = | 0 | 730 |

**POINT LOADS:**

| | Cantilever | Backspan | | | |
|---|---|---|---|---|---|
| | P1 | P1 | P2 | P3 | P4 |
| PDL (lb) = | 0 | 0 | 0 | 0 | 0 |
| PLL (lb) = | 0 | 0 | 0 | 0 | 0 |
| x (ft) = | 0 | 0 | 0 | 0 | 0 |
| Total Point Load (per lam - lb) = | 0 | 0 | 0 | 0 | 0 |

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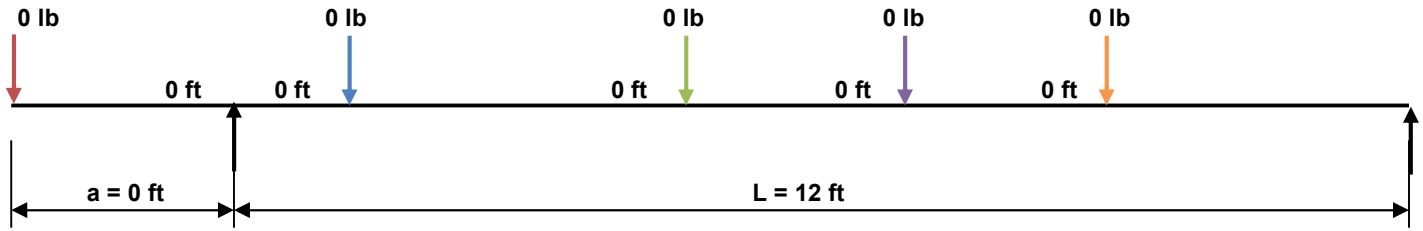
| | |
|---|---|
| Horiz. Shear Vmax (lb) = | 5,475 |
| Maximum Moment (lb-ft) = | 13,141 |




| | | | | |
|---|---|---|---|---|
| V (lb) = | 0 | 4,380 | | 4,380 |
| Mmax (lb-ft) = | 0 | | 13,141 | |
| x (ft) = | | | 6.00 | |

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**RB2** | **5 1/2" X 9" X-BEAM** | ***O.K.***

| | |
|---|---|
| Length cantilever (ft) = | 0 |
| Length backspan (ft) = | 9 |
| No. of Lams? | 1 |
| Rep Use? | NO |
| Slope Factor = | 1.0 |

| | | | |
|---|---|---|---|
| V Allow (lb) = | 15,085 | V / Vallow = | 27% |
| M Allow (lb-ft) = | 13,135 | M / Mallow = | 56% |

**Maximum deflections:**

| | | | |
|---|---|---|---|
| Cantilever - Δ max (in) = | 0.000 | = L / | N.A. |
| Backspan - Δ max (in) = | 0.179 | = L / | 603 |
| 1.5 * DLΔ (in) = | 0.060 | | |
| 2000 ft R (in) = | 0.061 | *Governs* | |

**UNIFORM LOADS :**

| | Cantilever | Backspan |
|---|---|---|
| Roof twDL (ft) = | 0 | 19.5 |
| Roof twLL (ft) = | 0 | 19.5 |
| Addtnl Load (plf) = | 0 | 0 |
| Total Uniform Load (per lam - plf) = | 0 | 730 |

**POINT LOADS:**

| | Cantilever | Backspan | | | |
|---|---|---|---|---|---|
| | P1 | P1 | P2 | P3 | P4 |
| PDL (lb) = | 0 | 0 | 0 | 0 | 0 |
| PLL (lb) = | 0 | 0 | 0 | 0 | 0 |
| x (ft) = | 0 | 0 | 0 | 0 | 0 |
| Total Point Load (per lam - lb) = | 0 | 0 | 0 | 0 | 0 |

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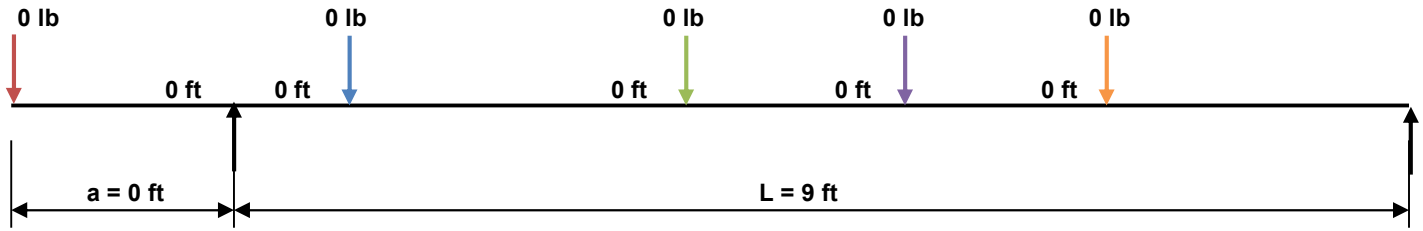
| | |
|---|---|
| Horiz. Shear Vmax (lb) = | 4,107 |
| Maximum Moment (lb-ft) = | 7,392 |




| | | | | |
|---|---|---|---|---|
| V (lb) = | 0 | 3,285 | | 3,285 |
| Mmax (lb-ft) = | 0 | | 7,392 | |
| x (ft) = | | | 4.50 | |

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**RB3** | **5 1/2" X 14" X-BEAM** | ***O.K.***

| | |
|---|---|
| Length cantilever (ft) = | 0 |
| Length backspan (ft) = | 18 |
| No. of Lams? | 1 |
| Rep Use? | NO |
| Slope Factor = | 1.0 |

| | | | |
|---|---|---|---|
| V Allow (lb) = | 23,466 | V / Vallow = | 37% |
| M Allow (lb-ft) = | 30,411 | M / Mallow = | 97% |
| **Maximum deflections:** | | | |
| Cantilever - Δ max (in) = | 0.000 | = L / | N.A. |
| Backspan - Δ max (in) = | 0.762 | = L / | 284 |
| 1.5 * DLΔ (in) = | 0.253 | *Governs* | |
| 2000 ft R (in) = | 0.243 | | |

**UNIFORM LOADS :**

| | Cantilever | Backspan |
|---|---|---|
| Roof twDL (ft) = | 0 | 19.5 |
| Roof twLL (ft) = | 0 | 19.5 |
| Addtnl Load (plf) = | 0 | 0 |
| Total Uniform Load (per lam - plf) = | 0 | 730 |

**POINT LOADS:**

| | Cantilever | Backspan | | | |
|---|---|---|---|---|---|
| | P1 | P1 | P2 | P3 | P4 |
| PDL (lb) = | 0 | 0 | 0 | 0 | 0 |
| PLL (lb) = | 0 | 0 | 0 | 0 | 0 |
| x (ft) = | 0 | 0 | 0 | 0 | 0 |
| Total Point Load (per lam - lb) = | 0 | 0 | 0 | 0 | 0 |

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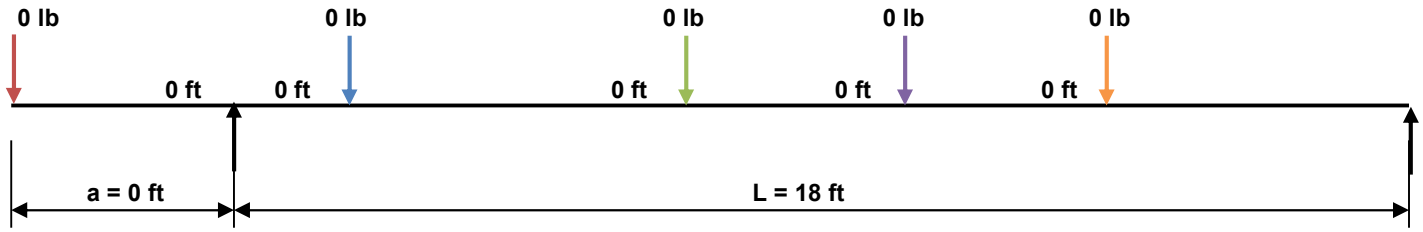
| | |
|---|---|
| Horiz. Shear Vmax (lb) = | 8,578 |
| Maximum Moment (lb-ft) = | 29,567 |




| | | | | |
|---|---|---|---|---|
| V (lb) = | 0 | 6,570 | | 6,570 |
| Mmax (lb-ft) = | 0 | | 29,567 | |
| x (ft) = | | | 9.00 | |

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## TOP PLATE — 2 X 6 DF#2 (FLAT) — *O.K.*

| | |
|---|---|
| Length cantilever (ft) = | 0 |
| Length backspan (ft) = | 1.33 |
| No. of Lams? | 3 |
| Rep Use? | NO |
| Slope Factor = | 1.0 |

| | | | |
|---|---|---|---|
| V Allow (lb) = | 1,708 | V / Vallow = | 22% |
| M Allow (lb-ft) = | 218 | M / Mallow = | 75% |
| **Maximum deflections:** | | | |
| Cantilever - Δ max (in) = | 0.000 | = L / | N.A. |
| Backspan - Δ max (in) = | 0.017 | = L / | 948 |
| 1.5 * DLΔ (in) = | 0.006 | *Governs* | |
| 2000 ft R (in) = | 0.001 | | |

### UNIFORM LOADS :

| | Cantilever | Backspan |
|---|---|---|
| Roof twDL (ft) = | 0 | 0.5 |
| Roof twLL (ft) = | 0 | 0.5 |
| Addtnl Load (plf) = | 0 | 0 |
| Total Uniform Load (per lam - plf) = | 0 | 6 |

### POINT LOADS:

| | Cantilever | Backspan | | | |
|---|---|---|---|---|---|
| | P1 | P1 | P2 | P3 | P4 |
| PDL (lb) = | 0 | 485 | 0 | 0 | 0 |
| PLL (lb) = | 0 | 975 | 0 | 0 | 0 |
| x (ft) = | 0 | 0.67 | 0 | 0 | 0 |
| Total Point Load (per lam - lb) = | 0 | 487 | 0 | 0 | 0 |

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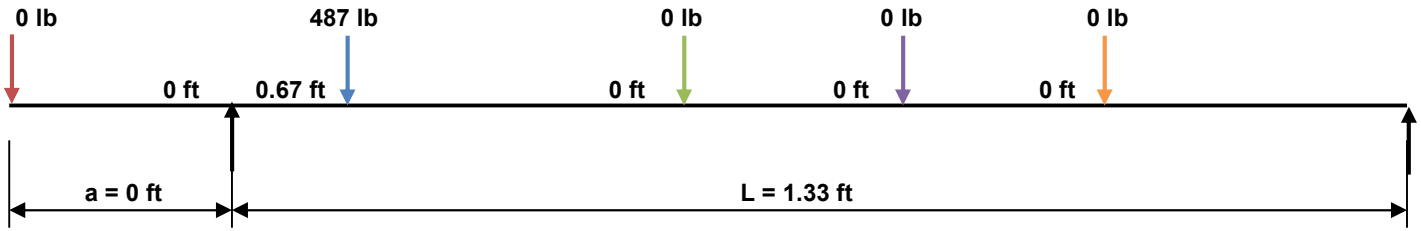
| | |
|---|---|
| Horiz. Shear Vmax (lb) = | 371 |
| Maximum Moment (lb-ft) = | 163 |




| | | | | |
|---|---|---|---|---|
| V (lb) = | 0 | 247 | | 248 |
| Mmax (lb-ft) = | 0 | | 163 | |
| x (ft) = | | | 0.67 | |

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| | | | | | | | | | Vertical Loads | | Vertical Loads | Horizontal Loads | Load Combinations | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Case 1 | | Case 2 | | |
| | | | | | | | | | | | | | DL + S + LL + W/2 | | DL + S/2 + LL + W | | |
| Location - Member | Item | Description | Height (ft) | No. of Lams? | Rep Use? | % Area for Bearing of Beam end on Post? | Int or Ext? | TW Lateral Load (ft) | Roof DL + Floor TL (lbs) | Roof LL (lbs) | TL (lbs) | Uniform lateral load (psf) | Axial + Bending | Bearing | Axial + Bending | Bearing | Post size & grade okay? |
| RB1 | **POST** | **4 X 6 DF#2 - POST** | 8 | 1 | NO | 100% | Ext | 2 | 1,455 | 2,925 | 4,380 | 32 | 0.16 | 0.36 | 0.24 | 0.24 | **O.K.** |
| RB2 | **POST** | **4 X 6 DF#2 - POST** | 14 | 1 | YES | 100% | Ext | 2 | 1,091 | 2,194 | 3,285 | 32 | 0.58 | 0.27 | 0.82 | 0.18 | **O.K.** |
| RB3 | **POST** | **4 X 6 DF#2 - POST** | 8 | 1 | YES | 100% | Ext | 2 | 2,183 | 4,388 | 6,570 | 32 | 0.24 | 0.55 | 0.28 | 0.36 | **O.K.** |
| Grids A & B | **STUD** | **3 X 6 DF#2 - STUD** | 18 | 1 | YES | 100% | Ext | 1.33 | 323 | 648 | 971 | 21 | 0.68 | 0.11 | 1.16 | 0.08 | **O.K.** |

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## ENCLOSED STRUCTURE, WIND SPEED = 110 MPH, EXPOSURE B - METHOD 1

**Simplified Design Wind Pressure, ps30 (psf) (Exposure B at h = 30 ft, I = 1.0)**

| | | ZONES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Horizontal Pressures | | | | Vertical Pressures | | | | Overhangs | |
| Roof Angle (degrees) | Load Case | A | B | C | D | E | F | G | H | E OH | G OH |
| 0 - 5 | 1 | 19.3 | -9.9 | 12.7 | -5.9 | -23.1 | -13.1 | -16.1 | -10.2 | -32.3 | -25.3 |
| 10 | 1 | 21.6 | -9.0 | 14.4 | -5.2 | -23.1 | -14.1 | -16.1 | -10.9 | -32.3 | -25.3 |
| 15 | 1 | 24.1 | -8.0 | 16.1 | -4.5 | -23.1 | -15.1 | -16.1 | -11.6 | -32.3 | -25.3 |
| 20 | 1 | 26.6 | -7.0 | 17.8 | -3.9 | -23.1 | -16.1 | -16.1 | -12.2 | -32.3 | -25.3 |
| 25 | 1 | 24.1 | 3.9 | 17.4 | 4.0 | -10.7 | -14.6 | -7.7 | -11.7 | -19.9 | -16.9 |
| | 2 | --- | --- | --- | --- | -4.0 | -7.9 | -1.2 | -5.0 | --- | --- |
| 30 - 45 | 1 | 21.6 | 14.7 | 17.1 | 11.7 | 1.7 | -13.1 | 0.5 | -11.2 | -7.5 | -8.7 |
| | 2 | 21.6 | 14.7 | 17.1 | 11.7 | 8.4 | -6.5 | 7.2 | -4.7 | -7.5 | -8.7 |

***WIND LOAD FACTORS:***

***Wind Importance Factor I =*** 1.0 ***Kzt =*** 1.00

***lambda =*** 1.00 (max) ***Load Factor for ASD combinations =*** 0.60 ***ASCE7-10 2.4.1 EQ. 5. & 7.***

***Building Dimensions:***

**L (ft) =** 42.00

**T (ft) =** 36.00

**Mean Roof Height (ft) =** 19.60

**wall ht (ft) =** 18.00

**roof ht (ft) =** 21.20

**Determine "a":**

10% of B (ft) = 3.60

40% of h (ft) = 7.84

4% of B (ft) = 1.44

a (ft ) = 3.60

***Roof Angle (deg) =*** 18.43

**Interpolation:**

High Value (deg) = 20

Low Value (deg) = 15

Interpolation Factor = 0.69

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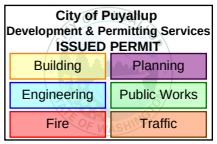
## ENCLOSED STRUCTURE, WIND SPEED = 110 MPH, EXPOSURE B - METHOD 1

***Tansverse forces***

| | | ZONES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Horizontal Pressures | | | | Vertical Pressures | | | | Overhangs | |
| Roof Angle (degrees) | Load Case | A | B | C | D | E | F | G | H | E OH | G OH |
| 18.43 | 1 | 15.51 | -4.41 | 10.34 | -2.44 | -13.87 | -9.46 | -9.65 | -7.21 | -19.39 | -15.17 |

***Longitudinal forces***

| | | ZONES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Horizontal Pressures | | | | Vertical Pressures | | | | Overhangs | |
| Roof Angle (degrees) | Load Case | A | B | C | D | E | F | G | H | E OH | G OH |
| 18.43 | 1 | 15.51 | -4.41 | 10.34 | -2.44 | -13.87 | -9.46 | -9.65 | -7.21 | -19.39 | -15.17 |



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***WIND FORCES*** 2a (ft) = 7.2 Troof (ft) = 39.00 Lroof (ft) = 45.00

***Transverse Forces***

| Level | Height (ft) | Wall Height (ft) | Ht/Exp Factor (lambda) | Zone A Minimum Dsn Pressure (psf) | Zone B Minimum Dsn Pressure (psf) | Zone C Minimum Dsn Pressure (psf) | Zone D Minimum Dsn Pressure (psf) | Total Shear (lb) |
|---|---|---|---|---|---|---|---|---|
| | | | | 16 | 8 | 16 | 8 | |
| Roof | 21.20 | 18.00 | 1.00 | 144 | 26 | 144 | 26 | 7,632 |
| | | | | | | | TOTAL BASE SHEAR (lb) = | 7,632 |

***Longitudinal Forces***

| Level | Height (ft) | Wall Height (ft) | Ht/Exp Factor (lambda) | Zone A Minimum Dsn Pressure (psf) | Zone B Minimum Dsn Pressure (psf) | Zone C Minimum Dsn Pressure (psf) | Zone D Minimum Dsn Pressure (psf) | Total Shear (lb) |
|---|---|---|---|---|---|---|---|---|
| | | | | 16 | 8 | 16 | 8 | |
| Roof | 21.20 | 18.00 | 1.00 | 144 | 26 | 144 | 26 | 6,614 |
| | | | | | | | TOTAL BASE SHEAR (lb) = | 6,614 |

***SEISMIC FORCES***

| Level | Height | Area (sf) | DL (psf) | Addtnl DL (psf) | Weight (lb) | W*H | W*H / Sum(W*H) | V (lb) | v (psf) |
|---|---|---|---|---|---|---|---|---|---|
| Roof | 18.00 | 1,755 | 12 | 2 | 25,339 | 456,106 | 1.000 | 2,775 | 1.58 |
| | | 1,755 | | | 25,339 | 456,106 | 1.000 | 2,775 | |

***Check governing forces for short shearwalls (h/l< or = 3.5)***

Transverse Direction: EQ/Wind = 0.36 x 1.75 = ***0.64*** ***O.K.***

Longitudinal Direction: EQ/Wind = 0.42 x 1.75 = ***0.73*** ***O.K.***

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***WIND FORCES GOVERN IN TRANSVERSE DIRECTION***

***WIND FORCES GOVERN IN LONGITUDINAL DIRECTION***

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## Shearwall Schedule

| *Shearwall Types (plf):* | 1/2" GYP OR 15/32" PLYWOOD Capacity (plf) | | Nailing | Max Stud Spacing (in) | SILL PLATE | |
|---|---|---|---|---|---|---|
| | Seismic | Wind | | | 16d | #10 CTWS |
| **Type G-1** | 125 | 125 | 5d cooler @ 7"o.c | N.A. | 14 | 15 |
| **Type G-2** | 150 | 150 | 5d cooler @ 4"o.c | N.A. | 11 | 12 |
| **Type P-1** | 225 | 315 | 8d @ 6"o.c. | N.A. | 5 | 6 |
| **Type P-2** | 325 | 455 | 8d @ 4"o.c. | N.A. | 4 | 4 |
| **Type P-3** | 650 | 910 | 8d @ 4"o.c.E.S. | N.A. | 2 | 2 |
| **Type P-4** | 1100 | 1540 | 8d @ 2"o.c. E.S. | N.A. | 1 | 1 |
| **Type P-5** | 1495 | 2095 | 10d @ 2"o.c. E.S. | N.A. | 1 | 1 |

## Holdown Straps (for wood framing)

| Mark | Capacity (lb) | NOTES |
|---|---|---|
| **MSTC28** | 1,325 | (16) 16d Sinkers |
| **MSTC40** | 2,650 | (32) 16d Sinkers |
| **MSTC66** | 5,840 | (68) 16d Sinkers |
| **MST72** | 6,475 | (62) 16d Sinkers |

## Holdowns (for concrete)

| Mark | Capacity (lb) | NOTES | |
|---|---|---|---|
| **HDU2-SDS2.5** | 2,215 | (6) 1/4" x 2 1/2" SDS | DBL STUD MIN |
| **HDU5-SDS2.5** | 4,065 | (14) 1/4" X 2 1/2" SDS | DBL STUD MIN |
| **HDU8-SDS2.5** | 5,020 | (20) 1/4" x 2 1/2" SDS | 4 X 4 POST MIN |
| **HHDQ11-SDS2.5** | 11,810 | (24) 1/4" x 2 1/2" SDS | 6 X 6 POST MIN |

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***APPLIED SHEARS:***

***Longitudinal - WIND Governs***

Roof 6,614

***Transverse - WIND Governs***

Roof 7,632

DL Factor EQ = 75%

DL Factor Wind = 67%

Allowable Shear = 648 lb/bolt

Allowable Tension = 950 lb/bolt

*Longitudinal uplift (psf) =* 9.65

*% Uniform Uplift Taken by Longitudinal Walls =* *100%*

**EXTERIOR WALL @ GRID A**

UPLIFT DUE TO WIND FORCES AT TOP STORY SHEARWALLS: contributing wall length(ft) = 45.00; uplift (plf) = 564

| Level | Trib Length (ft) | Trib Width (ft) | % Shear | Total Shear (lb) | Mark | wall length (ft) | wall height (ft) | minimum shearwall length (ft) | v (plf) | Wall Type | v allowable (plf) | | OTM (lb-ft) | % T.W. DL to use for Mr | Mr (lb-ft) | Uplift from above (lb) | uplift (lb) | Holdown | Max Anchor bolt spacing (ft) | Net uniform uplift (plf) | Drag Forces (lb) | Omega | % to Drag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roof | 45.00 | 19.50 | 50.0% | 3,307 | 1 | 15.00 | 18.00 | 5.14 | 220 | Type P-1 | 315 | O.K. | 86,652 | 75% | 60,186 | N.A. | 1,825 | HDU2-SDS2.5 | 2.9 | 241 | 827 | 1.0 | 25% |
| | | | | | | 15.00 | | | | | | | | | | | | | | | | | |

**EXTERIOR WALL @ GRID B**

UPLIFT DUE TO WIND FORCES AT TOP STORY SHEARWALLS: contributing wall length(ft) = 45.00; uplift (plf) = 1,411

| Level | Trib Length (ft) | Trib Width (ft) | % Shear | Total Shear (lb) | Mark | wall length (ft) | wall height (ft) | minimum shearwall length (ft) | v (plf) | Wall Type | v allowable (plf) | | OTM (lb-ft) | % T.W. DL to use for Mr | Mr (lb-ft) | Uplift from above (lb) | uplift (lb) | Holdown | Max Anchor bolt spacing (ft) | Net uniform uplift (plf) | Drag Forces (lb) | Omega | % to Drag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roof | 45.00 | 19.50 | 50.0% | 3,307 | 1 | 6.00 | 18.00 | 5.14 | 607 | Type P-3 | 910 | O.K. | 74,929 | 75% | 17,528 | N.A. | 10,437 | HHDQ11-SDS2.5 | 1.1 | 521 | 910 | 1.0 | 25% |
| | | | | | | 6.00 | | | | | | | | | | | | | | | | | |

Roof 1,755 SF 100.0%

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| | |
|---|---|
| *Transverse uplift (psf) =* | 9.65 |
| *% Uniform Uplift Taken by Longitudinal Walls =* | *100%* |

| EXTERIOR WALL @ GRID 1 | | | | | | | | | | | | | | | | | | UPLIFT DUE TO WIND FORCES AT TOP STORY SHEARWALLS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | contributing wall length(ft) = | 39.00 | uplift (plf) = | 268 | |
| Level | Trib Length (ft) | Trib Width (ft) | % Shear | Total Shear (lb) | Mark | wall length (ft) | wall height (ft) | minimum shearwall length (ft) | v (plf) | Wall Type | v allowable (plf) | | OTM (lb-ft) | % T.W. DL to use for Mr | Mr (lb-ft) | Uplift from above (lb) | uplift (lb) | Holdown | Max Anchor bolt spacing (ft) | Net uniform uplift (plf) | Drag Forces (lb) | Omega | % to Drag |
| Roof | 39.00 | 22.50 | 50.0% | 3,816 | a | 31.58 | 18.00 | 5.14 | 121 | Type P-1 | 315 | O.K. | 83,918 | 75% | 210,202 | N.A. | -4,063 | Not Req'd | 5.4 | 31 | 954 | 1.0 | 25% |
| | | | | | | 31.58 | | | | | | | | | | | | | | | | | |

| EXTERIOR WALL @ GRID 2 | | | | | | | | | | | | | | | | | | UPLIFT DUE TO WIND FORCES AT TOP STORY SHEARWALLS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | contributing wall length(ft) = | 39.00 | uplift (plf) = | 235 | |
| Level | Trib Length (ft) | Trib Width (ft) | % Shear | Total Shear (lb) | Mark | wall length (ft) | wall height (ft) | minimum shearwall length (ft) | v (plf) | Wall Type | v allowable (plf) | | OTM (lb-ft) | % T.W. DL to use for Mr | Mr (lb-ft) | Uplift from above (lb) | uplift (lb) | Holdown | Max Anchor bolt spacing (ft) | Net uniform uplift (plf) | Drag Forces (lb) | Omega | % to Drag |
| Roof | 39.00 | 22.50 | 50.0% | 3,816 | a | 36.00 | 18.00 | 5.14 | 106 | Type P-1 | 315 | O.K. | 68,688 | 75% | 260,406 | N.A. | -5,401 | Not Req'd | 6.1 | -2 | 954 | 1.0 | 25% |
| | | | | | | 36.00 | | | | | | | | | | | | | | | | | |

**Roof** 1,755 **SF** 100.0%

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