



BASIC PERMIT PACKAGE  
REVIEWED FOR CODE COMPLIANCE  
WITH IRC 2015  
KITSAP COUNTY BUILDING DEPARTMENT

Reviewed for code compliance  
with IRC 2015  
Kitsap County Building Department  
GShapiro@co.kitsap.wa.us  
05/04/2020

Reviewed for code compliance  
with IRC 2015  
Kitsap County Building Department  
PQuiriar@co.kitsap.wa.us  
05/01/2020

Structural Calculations For:

# Cottages on the Ridge

## Building Y

12xxx Ridgetop Blvd. NW  
Silverdale, WA

KITSAP COUNTY  
DEPARTMENT OF  
COMMUNITY  
DEVELOPMENT

Approved Building Permit #s:

19-02320  
19-03256  
19-03257



Prepared for: Norpoint Communities

Job #: 02329-2018-01

Date: April 2, 2019



SEATTLE  
TACOMA

2124 Third Ave, Suite 100, Seattle, WA 98121  
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Permit Number: 20-01252

Basic  
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253.284.9470

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Permit Number: 18-05976

## Criteria Sheet

### Codes:

Structural: IBC 2015  
Loading: ASCE 7-10  
Wood: NDS 2015  
Steel: AISC 360-10  
Concrete: ACI 318-14  
Masonry: TMS 402/602-13

### Project Location:

Street & Number: 12000 Ridgeway Blvd NW  
City: Silverdale State: WA  
ZIP: 98311  
Latitude: 47.6711 N  
Longitude: -122.6661 W

### Occupancy Category

Risk Category: II ASCE 7 Table 1.5-1

### Seismic Load Summary:

Analysis Procedure: Equivalent Lateral Force Procedure  
Lateral System: Wood Structural Panels Rated for Shear Resistance  
R: 6.50  $C_d = 4$   
Base Shear  $V = 13.4$  kips  $\Omega_o = 2.5$   
 $S_s = 1.371$   $S_1 = 0.547$   
 $S_{DS} = 0.91$   $S_{D1} = 0.55$   
 $C_s = 0.141$   $I_E = 1.0$

### Wind Load Summary:

$V = 110$   $K_{ZT} = 1.00$   
Exposure = B



### Dead Loads:

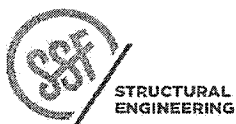
| Roof             |          |
|------------------|----------|
| Roofing          | 2.5 psf  |
| 1/2" Sheathing   | 1.8 psf  |
| Trusses @ 24" oc | 2.5 psf  |
| Misc./Mech.      | 1.5 psf  |
| Ceiling Finish   | 2.8 psf  |
| Solar Panels     | 4        |
|                  | 15.1 psf |
| Use              | 15 psf   |
| Floor            |          |
| Finish Floor     | 1 psf    |
| 3/4" Sheathing   | 2.7 psf  |
| Joists @ 16" oc  | 2.2 psf  |
| Misc./Mech.      | 2 psf    |
| Ceiling Finish   | 2.8      |
|                  | 10.7 psf |
| Use              | 12 psf   |

### Live Loads:

|          |     |
|----------|-----|
| Snow 25  | psf |
| Floor 40 | psf |

### Soils:

|                        |     |
|------------------------|-----|
| Allowable Bearing 1500 | psf |
|------------------------|-----|



Silverdale Ridgeway Community

Criteria

Building 4

DATE 8/21/2018

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DESIGN BMB

SHEET 1

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# Seismic Design

ASCE 7-10 Seismic Analysis

Equivalent Lateral Force Procedure

|                                                  |                                                                                                |
|--------------------------------------------------|------------------------------------------------------------------------------------------------|
| Seismic Force Resisting System: Per Table 12.2-1 | System: Bearing Wall Systems                                                                   |
|                                                  | Type: Light-frame (wood) Walls Sheathed with Wood Structural Panels Rated for Shear Resistance |

|                       |          |                                                    |
|-----------------------|----------|----------------------------------------------------|
| Risk Category         | II       | I, II, or III, or IV per Table 1.5-1               |
| Site Class            | D        | per soils report (D assumed, without soils report) |
| Diaphragm Flexibility | Flexible |                                                    |

|                  |          |                                          |
|------------------|----------|------------------------------------------|
| $\Omega_o$       | 2.5      |                                          |
| $S_s$            | 1.371 g  | 2% in 50 yr, Latitude & Longitude lookup |
| $S_1$            | 0.547 g  | 2% in 50 yr, Latitude & Longitude lookup |
| $h_n$            | 9 ft     |                                          |
| $R$              | 6.50     |                                          |
| $I_e$            | 1.0      | Table 1.5-2                              |
| $C_d$            | 4        |                                          |
| $C_t$            | 0.02     | Table 12.8-2                             |
| $x$              | 0.075    | Table 12.8-2                             |
| $T$              | 0.02 sec | Eq. 12.8-7                               |
| $T_0$            | 0.12 sec |                                          |
| $T_s$            | 0.60 sec |                                          |
| $k$              | 1.000    |                                          |
| $F_a$            | 1.00     | Table 11.4-1                             |
| $F_v$            | 1.50     | Table 11.4-2                             |
| $S_{MS}$         | 1.37 g   | Eq. 11.4-1                               |
| $S_{M1}$         | 0.82 g   | Eq. 11.4-2                               |
| $S_{DS}$         | 0.914 g  | Eq. 11.4-3                               |
| $S_{D1}$         | 0.547 g  | Eq. 11.4-4                               |
| $C_s$            | 0.141    | Eq. 12.8-2                               |
|                  | 3.568    | Eq. 12.8-3 need not exceed, $T < T_L$    |
|                  | 0.010    | Eq. 12.8-5 or 12.8-6 minimum             |
| $C_s$ , design   | 0.141    |                                          |
| Bldg. Weight     | 95.4 k   |                                          |
| $V = C_s W$      | 13.4 k   | Eq. 12.8-1, Strength Level Base Shear    |
| $V = C_{sasd} W$ | 9 k      | Eq. 12.8-1 ASD Base Shear                |

$$T_a = C_t h_n^x \quad \text{Eq. 12.8.7}$$

$$S_{MS} = F_a S_s \quad \text{Eq. 11.4-1}$$

$$S_{M1} = F_v S_1 \quad \text{Eq. 11.4-2}$$

$$S_{DS} = \frac{2}{3} S_{MS} \quad \text{Eq. 11.4-3}$$

$$S_{D1} = \frac{2}{3} S_{M1} \quad \text{Eq. 11.4-4}$$

$$C_s = \frac{S_{DS}}{(R/I_e)} \quad \text{Eq. 12.8-2}$$

$$C_s = \frac{S_{D1}}{T(R/I_e)} \quad \text{Eq. 12.8-3}$$

$$C_s = \frac{S_{D1} T_L}{T^2 (R/I_e)} \quad \text{Eq. 12.8-4}$$

$$C_s \geq 0.044 S_{DS} I_e \quad \text{Eq. 12.8-5}$$

$$C_s \geq 0.01 \quad \text{Eq. 12.8-5}$$

$$C_{VX} = w_x h_x^k / \sum_{i=1}^n w_x h_i^k \quad \text{Eq. 12.8-12}$$

$$F_{px} = \frac{\sum_{i=x}^n F_i}{\sum_{i=x}^n w_i w_{px}} \quad \text{Eq. 12.10-1}$$

$$F_{px} \geq 0.2 S_{DS} I_e w_{px} \quad \text{Eq. 12.10-2}$$

$$F_{px} \leq 0.4 S_{DS} I_e w_{px} \quad \text{Eq. 12.10-3}$$

| Vertical Distribution |                     |                |                                  |                                            |                                  |                    |        |                      |                     |                     |                        |                       |
|-----------------------|---------------------|----------------|----------------------------------|--------------------------------------------|----------------------------------|--------------------|--------|----------------------|---------------------|---------------------|------------------------|-----------------------|
| ASD $\rho = 1.0$      |                     |                |                                  |                                            |                                  |                    |        |                      |                     |                     |                        |                       |
| Story Shear ASD       |                     |                |                                  |                                            | Diaphragm Force (p not included) |                    |        |                      |                     |                     |                        |                       |
| Level                 | h <sub>x</sub> (ft) | W <sub>x</sub> | h <sub>x</sub> <sup>k</sup> (ft) | W <sub>x</sub> h <sub>x</sub> <sup>k</sup> | C <sub>vx</sub> (%)              | F <sub>x</sub> (k) | SV (k) | F <sub>px</sub> calc | F <sub>px</sub> min | F <sub>px</sub> max | F <sub>px</sub> design | $\gamma = F_{px}/F_x$ |
| Roof                  | 9.0                 | 95.4           | 9.0                              | 858.6                                      | 1.000                            | 9.4                | 9.4    | 9.39                 | 12.21               | 24.41               | 12.21                  | 1.30                  |
| Roof                  | 9.0                 | 95.4           | 9.0                              | 858.6                                      | 1.000                            | 9.4                | 18.8   | 9.39                 | 12.21               | 24.41               | 12.21                  | 1.30                  |
| S                     | 95.4                |                |                                  | 858.6                                      |                                  | 9.4                |        |                      |                     |                     |                        |                       |



Silverdale Ridgetop Community

Seismic Criteria

Building  $\nabla$

DATE 8/21/2018

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DESIGN BMB

SHEET 2

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Permit Number: 18-05976

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# Wind Design - MWFRS

ASCE 7-10 Chapter 27 - Directional Procedure

|               |     |
|---------------|-----|
| Design Method | ASD |
|---------------|-----|

| Wind Coefficients     |              |
|-----------------------|--------------|
| Exposure   B          |              |
| V= 110                | mph          |
| K <sub>d</sub> = 0.85 | Table 26.6-1 |
| K <sub>e</sub> = 0.7  | Table 27.3-1 |
| G= 0.85               | 26.9.4       |

## Transverse Wind Pressures

L/B = 0.6 h/L = 0.3

Pressure Coefficients from Figure 27.4-1:

| Bldg Face     | C <sub>p</sub> |
|---------------|----------------|
| Windward Wall | 0.8            |
| Leeward Wall  | -0.50          |
| Windward Roof | -0.22 / 0.27   |
| Leeward Roof  | -0.60          |

## Location and Building Dimensions

| Calculate K <sub>zt</sub> ? | YES                |         |
|-----------------------------|--------------------|---------|
| K <sub>zt</sub>             | See Criteria Sheet |         |
| Roof Angle - Transverse Dir | 27                 | degrees |
| Roof Angle - Long Dir       | 0                  | degrees |
| Ground to top of roof       | 22                 | ft      |
| Bot of roof to top of roof  | 11                 | ft      |
| Mean Roof Height, h         | 16.5               | ft      |
| Short Plan Dimension        | 50.5               | ft      |
| Long Plan Dimension         | 84                 | ft      |
| Parapet ?                   | No                 |         |
| Ground to top of parapet    |                    | ft      |

|                                                         |      |     |
|---------------------------------------------------------|------|-----|
| Velocity Pressure at Mean Roof Height, q <sub>h</sub> = | 18.4 | psf |
|---------------------------------------------------------|------|-----|

## Wall Pressures (Unfactored):

| Ht     | K <sub>z</sub> | q <sub>z</sub> | P <sub>ww walls</sub> | P <sub>lw walls</sub> | P <sub>walls (psf)</sub> |
|--------|----------------|----------------|-----------------------|-----------------------|--------------------------|
| 0-15   | 0.58           | 15.27          | 10.38                 | 7.83                  | 10.93                    |
| 15-20  | 0.62           | 16.32          | 11.10                 | 7.83                  | 11.36                    |
| 20-25  | 0.66           | 17.38          | 11.82                 | 7.83                  | 11.79                    |
| 25-30  | 0.7            | 18.43          | 12.53                 | 7.83                  | 12.22                    |
| 30-40  | 0.76           | 20.01          | 13.61                 | 7.83                  | 12.86                    |
| 41-50  | 0.81           | 21.33          | 14.50                 | 7.83                  | 13.40                    |
| 51-60  | 0.85           | 22.38          | 15.22                 | 7.83                  | 13.83                    |
| 61-70  | 0.89           | 23.43          | 15.93                 | 7.83                  | 14.26                    |
| 71-80  | 0.93           | 24.49          | 16.65                 | 7.83                  | 14.69                    |
| 81-90  | 0.96           | 25.28          | 17.19                 | 7.83                  | 15.01                    |
| 91-100 | 0.99           | 26.07          | 17.73                 | 7.83                  | 15.33                    |

## ASD

## Roof Pressures (Unfactored)

| Windward |      | Leeward | Horiz Proj (psf) |
|----------|------|---------|------------------|
| Max      | Min  |         |                  |
| 4.2      | -3.4 | -9.4    | 3.71             |

## Parapet (Unf)

| Windward | Leeward | Total (psf) |
|----------|---------|-------------|
| -N/A-    | -N/A-   | -N/A-       |

## Transverse Direction

|                   |      |
|-------------------|------|
| Base Shear (kips) | 13.5 |
|-------------------|------|

## Longitudinal Wind Pressures

L/B = 1.7 h/L = 0.2

Pressure Coefficients from Figure 27.4-1:

| Bldg Face     | C <sub>p</sub> |
|---------------|----------------|
| Windward Wall | 0.8            |
| Leeward Wall  | -0.37          |
| Windward Roof | -0.9 / -0.18   |
| Leeward Roof  | -0.3           |

## Wall Pressures (Unfactored):

| Ht     | K <sub>z</sub> | q <sub>z</sub> | P <sub>ww walls</sub> | P <sub>lw walls</sub> | P <sub>walls (psf)</sub> |
|--------|----------------|----------------|-----------------------|-----------------------|--------------------------|
| 0-15   | 0.58           | 15.27          | 10.38                 | 5.75                  | 9.68                     |
| 15-20  | 0.62           | 16.32          | 11.10                 | 5.75                  | 10.11                    |
| 20-25  | 0.66           | 17.38          | 11.82                 | 5.75                  | 10.54                    |
| 25-30  | 0.7            | 18.43          | 12.53                 | 5.75                  | 10.97                    |
| 30-40  | 0.76           | 20.01          | 13.61                 | 5.75                  | 11.62                    |
| 41-50  | 0.81           | 21.33          | 14.50                 | 5.75                  | 12.15                    |
| 51-60  | 0.85           | 22.38          | 15.22                 | 5.75                  | 12.58                    |
| 61-70  | 0.89           | 23.43          | 15.93                 | 5.75                  | 13.01                    |
| 71-80  | 0.93           | 24.49          | 16.65                 | 5.75                  | 13.44                    |
| 81-90  | 0.96           | 25.28          | 17.19                 | 5.75                  | 13.77                    |
| 91-100 | 0.99           | 26.07          | 17.73                 | 5.75                  | 14.09                    |

## ASD

## Roof Pressures (Unfactored)

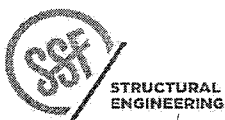
| Windward |       | Leeward | Horiz Proj (psf) |
|----------|-------|---------|------------------|
| Max      | Min   |         |                  |
| -2.8     | -14.1 | -4.7    | 0.00             |

## Parapet (Unf)

| Windward | Leeward | Total (psf) |
|----------|---------|-------------|
| -N/A-    | -N/A-   | -N/A-       |

## Longitudinal Direction

|                   |     |
|-------------------|-----|
| Base Shear (kips) | 5.4 |
|-------------------|-----|



Silverdale Ridgetop Community

Wind Criteria

Building ☒

DATE 8/21/2018

PROJ. #

DESIGN BMB

SHEET 3

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# LATERAL DESIGN

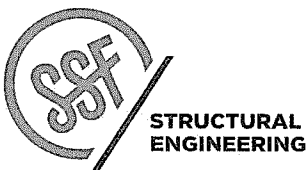
WIND LOADS GOVERN IN N-S DIRECTION  
SEISMIC LOADS GOVERN IN E-W DIRECTION

## N-S DIRECTION ROOF

|        |       |   |    |         |    |   |       |
|--------|-------|---|----|---------|----|---|-------|
|        | W     | ↑ | 42 | ↑       | 42 | ↑ | E     |
|        |       |   |    | 139 plf |    |   |       |
| LOAD   | 2.85k |   |    | 5.84k   |    |   | 2.85k |
| LENGTH | 30ft  |   |    | 30.0ft  |    |   | 30ft  |
| SHEAR  | 95plf |   |    | 195 plf |    |   | 95plf |
| WALL   | SWI   |   |    | SWI     |    |   | SWI   |
| OT     | 0.9 k |   |    | 1.5k    |    |   | 0.9 k |
| HD     | HOU4  |   |    | HOU4    |    |   | HOU4  |

## E-W DIRECTION ROOF

|        |        |   |    |         |   |
|--------|--------|---|----|---------|---|
|        | N      | ↑ | 44 | ↑       | S |
|        |        |   |    | 204 plf |   |
| LOAD   | 4.5k   |   |    | 4.5k    |   |
| LENGTH | 34.5ft |   |    | 27ft    |   |
| SHEAR  | 130plf |   |    | 155plf  |   |
| WALL   | SWI    |   |    | SWI     |   |
| OT     | 1.2k   |   |    | 1.4k    |   |
| HD     | HOU4   |   |    | HOU4    |   |



SILVERDALE RIDGETOP COMMUNITY  
PROJECT  
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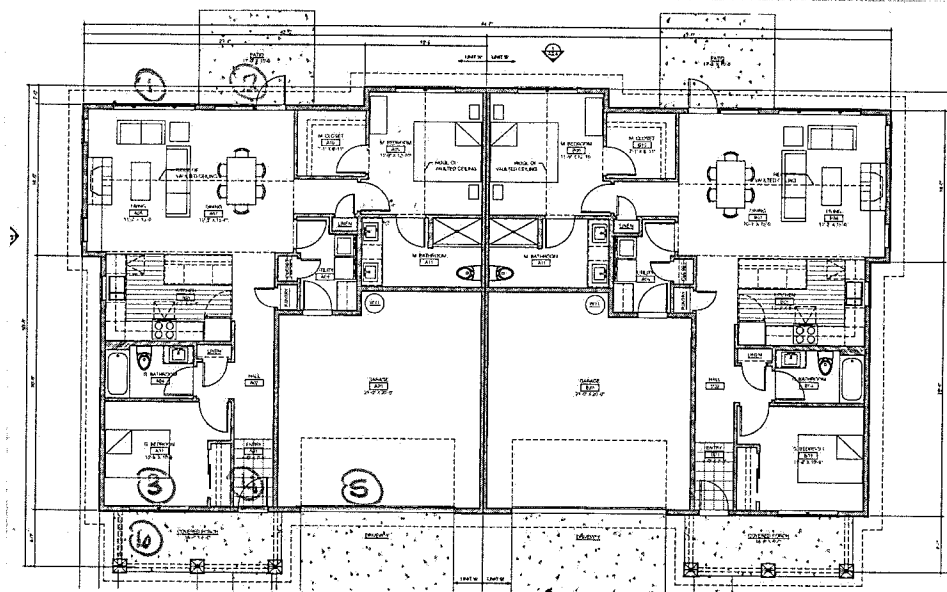
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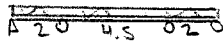
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# VERTICAL DESIGN

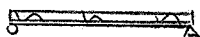


## ① 4x8 HDR



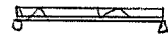
$$\begin{aligned} L &= 8.5\text{ft} & R_{1,4} &= 0.09\text{k} \\ \text{TRIB} &= 8\text{ft} & R_{2,3} &= 1.27\text{k} \\ W &= 320\text{plf} & f_b &= 176\text{psi} \\ M &= 0.36\text{kft} & f_v &= 42\text{psi} \\ M &= 0.45\text{kft} & \Delta &= 0.005\text{in} = L/10588 \end{aligned}$$

## ② 4x8 HDR



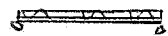
$$\begin{aligned} L &= 7.5\text{ft} & R &= 1.2\text{k} \\ \text{TRIB} &= 3\text{ft} & f_b &= 880\text{psi} \\ W &= 320\text{plf} & f_v &= 60\text{psi} \\ M &= 2.25\text{kft} & \Delta &= 0.12\text{in} = L/746 \end{aligned}$$

## ③ 4x8 HDR



$$\begin{aligned} L &= 6.25\text{ft} & R &= 1.6\text{k} \\ \text{TRIB} &= 13\text{ft} & f_b &= 993\text{psi} \\ W &= 520\text{plf} & f_v &= 77\text{psi} \\ M &= 2.53\text{kft} & \Delta &= 0.09\text{in} = L/793 \end{aligned}$$

## ④ (2) 2x8 HDR



$$\begin{aligned} L &= 3\text{ft} & R &= 0.78\text{k} \\ \text{TRIB} &= 13\text{ft} & f_b &= 267\text{psi} \\ W &= 520\text{plf} & f_v &= 32\text{psi} \\ M &= 0.58\text{kft} & \Delta &= 0.007\text{in} = L/4704 \end{aligned}$$



STRUCTURAL  
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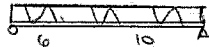
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# VERTICAL DESIGN

## ROOF FRAMING CONT.

⑤ GLB 5" x 12 HDR



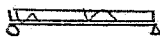
$$L = 16 \text{ ft} \quad R = 3.68 \text{ k}$$

$$\text{TRIB} = 11.5 \text{ ft} \quad f_b = 1.40 \text{ ksi}$$

$$W = 460 \text{ plf} \quad f_v = 77 \text{ psi}$$

$$M = 14.72 \text{ kft} \quad \Delta = 0.49 \text{ in} = L/385$$

⑥ 4 x 8 HDR



$$L = 6 \text{ ft} \quad R = 0.96 \text{ k}$$

$$\text{TRIB} = 8 \text{ ft} \quad f_b = 563 \text{ psi}$$

$$W = 320 \text{ plf} \quad f_v = 45 \text{ psi}$$

$$M = 1.44 \text{ kft} \quad \Delta = 0.049 \text{ in} = L/1457$$

⑦ 4 x 3 HDR

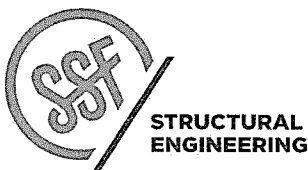


$$L = 7 \text{ ft} \quad R = 1.12 \text{ k}$$

$$\text{TRIB} = 3 \text{ ft} \quad f_b = 767 \text{ psi}$$

$$W = 320 \text{ plf} \quad f_v = 56 \text{ psi}$$

$$M = 1.76 \text{ kft} \quad \Delta = 0.09 \text{ in} = L/918$$



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