PCS Structural Solutions

# STRUCTURAL SKETCHES

Provide structural plans to support all structural changes reflecting calculations and notes on sketch packet.
Page - PCS Structural Solutions for Hampton Inn modification to original Architectural and Structural plans


**Seattle** | 1011 Western Avenue, Suite 810 | Seattle, WA 98104 | 206.292.5076
**Tacoma** | 1250 Pacific Avenue, Suite 701 | Tacoma, WA 98402 | 253.383.2797
**Portland** | 101 SW Main Street, Suite 280 | Portland, OR 97204 | 503.232.3746

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PCS Structural Solutions

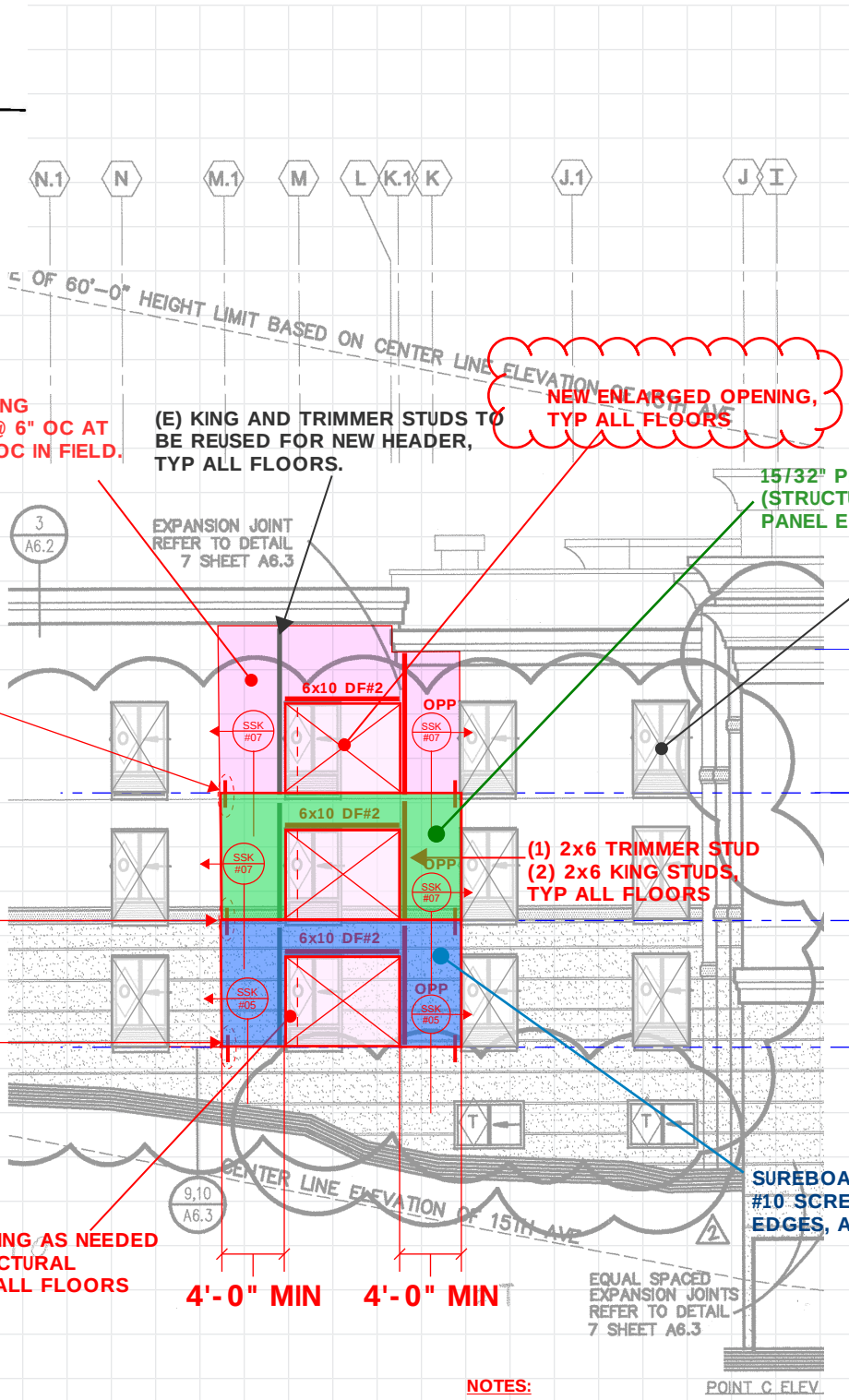
Project: HAMPTON INN PUYALLUP ADDITION | Job No: 18-741

Subject: _____ | Sheet _____ | Name: GSS

Originating Office: ☐ Seattle ☑ Tacoma ☐ Portland | Date: 10/25/2023

SSK 04

JARED A. PLANK — STATE OF WASHINGTON — 56734 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER




SSK #04 **EXISTING WALL EXTERIOR ELEVATION**

**NOTES:**

1. BUILT UP STUDS (KING AND TRIMMER) AT HEADERS TO BE ATTACHED TOGETEHR W/ 10d NAILS TO MATCH SHEAR WALL EDGE NAILING.
2. NAIL SHEATHING TO TRIMMER AND KING STUDS W/ EDGE DISTANCE NAILING PATTERN.
3. PROVIDE A35 CLIPS T & B EA END OF HEADER BEAMS.
4. CONNECT KING STUDS TO END OF HEADERS USING (4) 1/4" SDS SCREWS.
5. ALL ADDED SHEATHING IS ONE SIDED AND REINFORCEMENT SHALL BE DONE ON INTERIOR SIDE OF THE EXIST. WALL.

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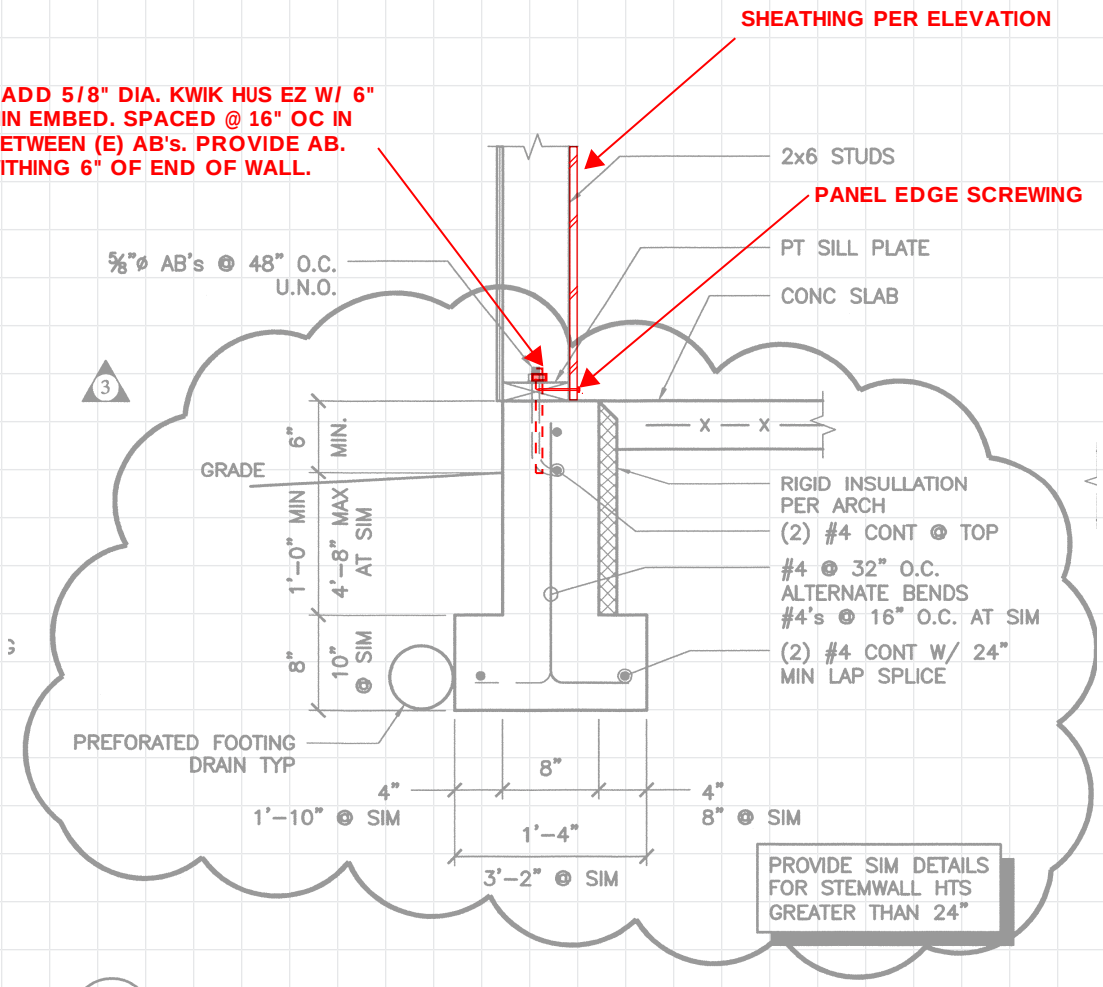
SSK 05



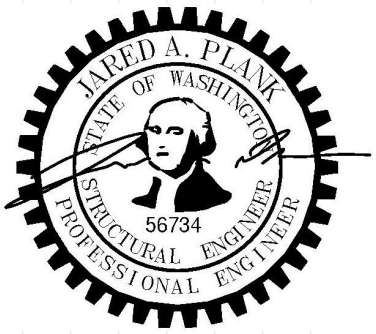

8 TYPICAL CONCRETE FOOTING

1" = 1'-0"

**NOTES:**

**GREYED-OUT DETAIL IS FROM EXISTING AS-BULIT DRAWINGS. CONTRACTOR TO VERIFY SITE CONDITIONS ARE MATCHING DRAWINGS AND ALERT E.O.R. IN CASE DISCPREPANCIES ARE FOUND.**

SSK #05 **BASE CONN. AT REINFORCED SHEAR WALL**



PCS Structural Solutions

Project: HAMPTON INN PUYALLUP ADDITION Job No: 18-741

Subject: _____ Sheet _____ Name: GSS

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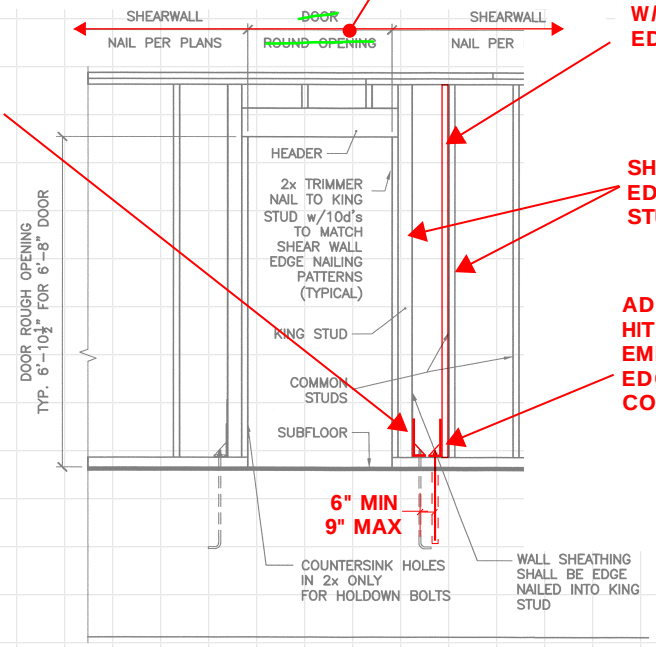
SSK 06

PROVIDE SHEARWALL INTERIOR SHEATHING AND NAILING (INCL. ABOVE OPENING) AS SHOWN ON ELEVATION

ADD SINGLE 2x STUD (TO MATCH EXISTING) AT NEW HOLDOWN LOCATION. NAIL W/10d's TO MATCH SHEAR WALL EDGE NAILING.

-> AT (E) HDU2 - REMOVE HOLDOWN BRACKET AND REUSE THE ANCHOR BOLT W/ NEW HD7B BRACKET. HD7B HOLDOWN IS SIZED FOR 7/8" ANCHOR ROD AND 1/2" PLATE WAHER W/STD. HOLE SHALL BE PROVIDED TO COMPENSATE FOR THE DIFFERENCE.
-> WHERE (E) HDU2 HOLDOWN IS NOT PRESENT AND ELEVATION CALLS OUT FOR (2) HD7B, ADD HD7B W/ 7/8" DIA. "HAS + HIT-HY200" EPOXIED W/ 16" MIN EMBEDMENT. PROVIDE 3 1/4" MIN EDGE DISTANCE TO EDGE OF (E) CONC EA SIDE.




1 SHEARWALL ELEVATION
1/2" = 1'-0"

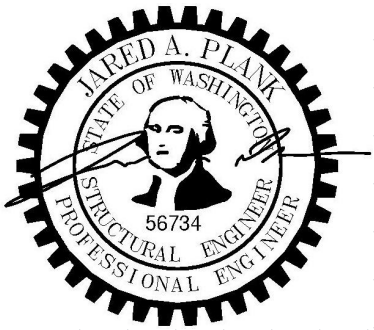
SHEATHING TO BE EDGE NAILED TO HD STUDS, TYP.

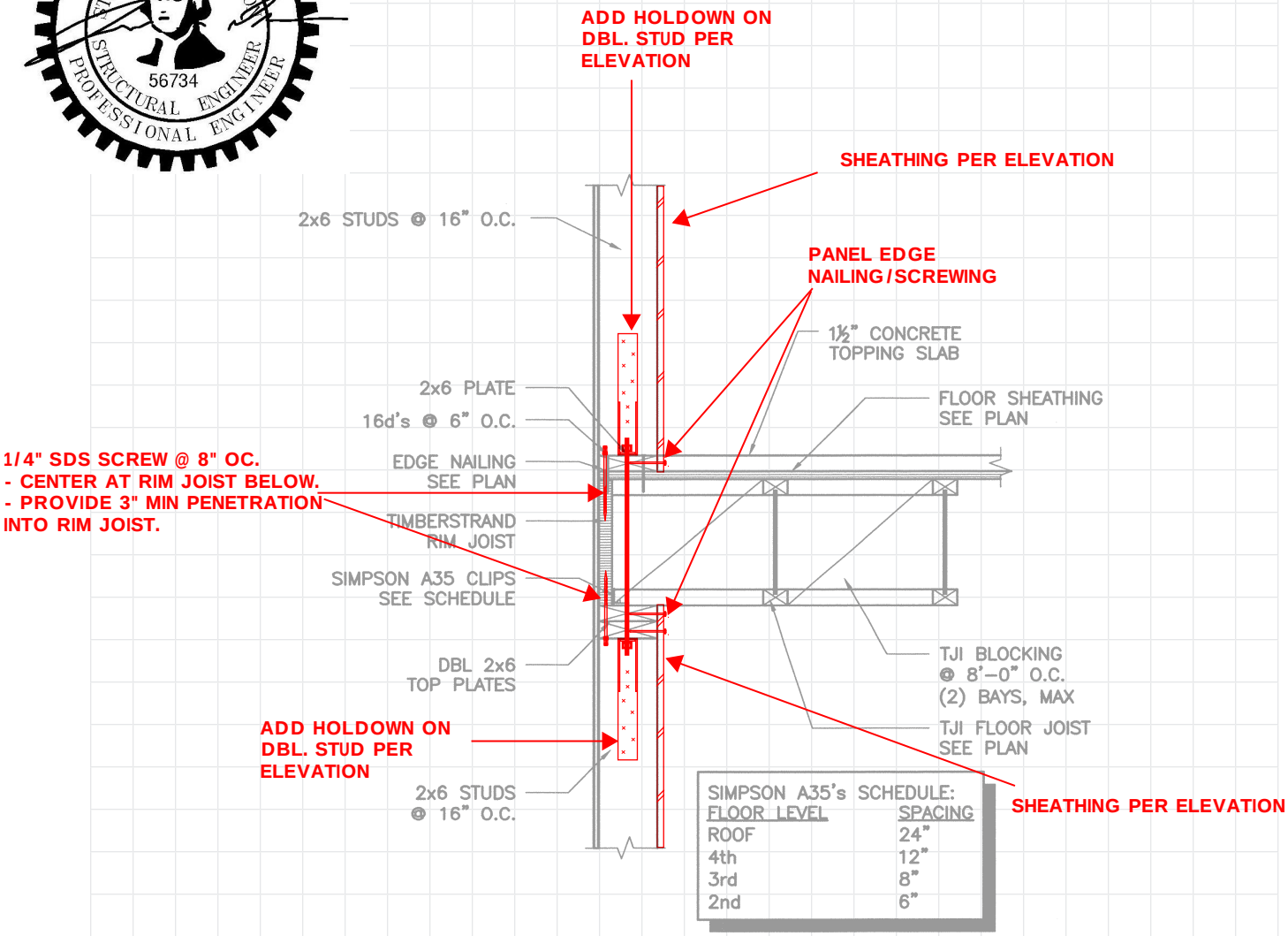
ADD HD7B W/ 7/8" DIA. "HAS + HIT-HY200" EPOXIED W/ 16" MIN EMBEDMENT. PROVIDE 3 1/4" MIN EDGE DISTANCE TO EDGE OF (E) CONC EA SIDE.

**NOTES:**

GREYED-OUT DETAIL IS FROM EXISTING AS-BULIT DRAWINGS. CONTRACTOR TO VERIFY SITE CONDITIONS ARE MATCHING DRAWINGS AND ALERT E.O.R. IN CASE DISCPREPANCIES ARE FOUND.

SSK #06 **HOLDOWN DETAIL AT BASE OF REINFORCED SHEAR WALL**




3 CONN FOR TJI FLOOR SYSTEM TO 2x6 STUD WALL
1" = 1'-0"

**NOTES:**

GREYED-OUT DETAIL IS FROM EXISTING AS-BULIT DRAWINGS. CONTRACTOR TO VERIFY SITE CONDITIONS ARE MATCHING DRAWINGS AND ALERT E.O.R. IN CASE DISCPREPANCIES ARE FOUND.

SSK #07 **DETAIL IN BETWEEN FLOORS AT REINFORCED SHEAR WALL**

PCS
Structural *Solutions*

# CALCULATION REPORT

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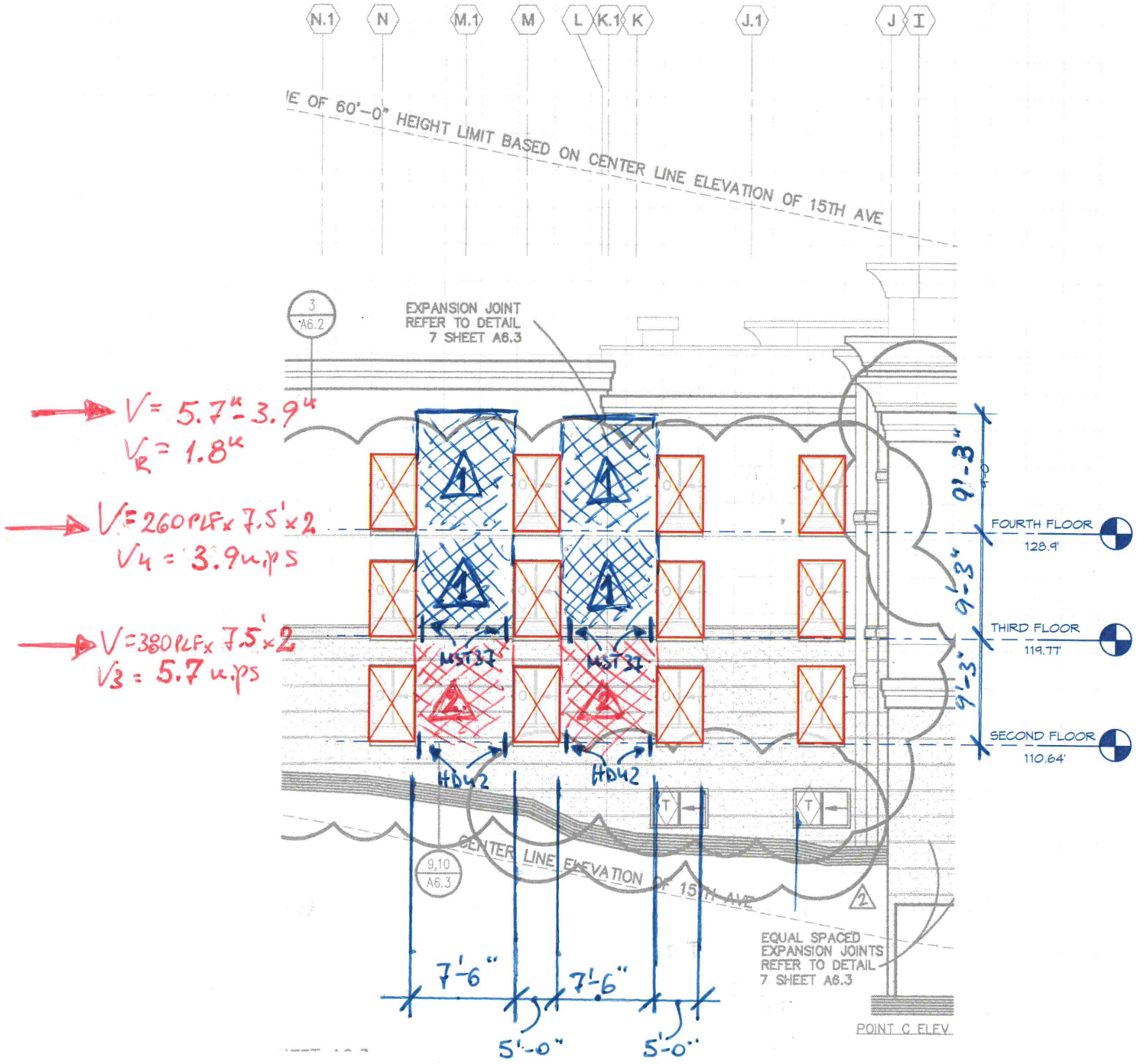
# EXISTING SHEAR WALLS CONDITION



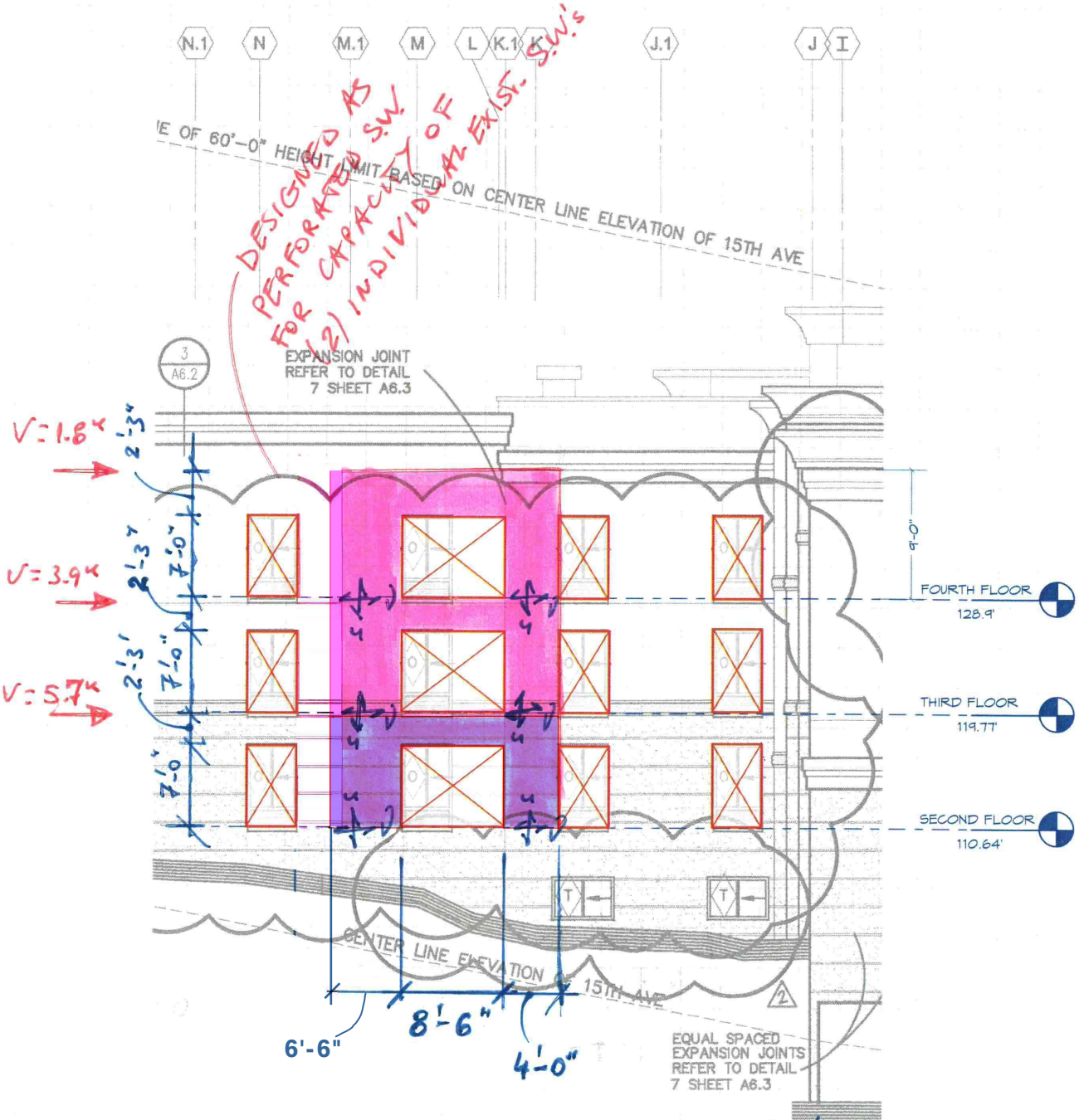
PCS Structural Solutions

Project: HAMPTON INN PUYALLUP ADDITION Job No: 18-741

Subject: _____ Sheet _____ Name: GSS

Originating Office: ☐ Seattle ☑ Tacoma ☐ Portland Date: _____

# REINFORCED EXISTING SHEAR WALL CONDITION




PERCENT FULL HT SHEATHING : $(6.5'+4') / (6.5'+8.5'+4') = 0.55$

MAX OPN'G HT = $7'\text{-}0 / 9.25' = 0.75\,H$

$C_o = 0.64$ BY INTERPOLATING IN TABLE 4.3.3.5 (NDS)

PCS Structural Solutions

Project: HAMPTON INN PUYALLUP ADDITION Job No: 18-741

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## SECOND FLOOR MAX SHEAR:

$u_{max} = v_{max} = \frac{V}{C_o \Sigma L_i} = \frac{5.7^k \text{ (ASD)}}{0.64 \times 10.5'} = 0.85 \text{ KLF}$

CURRENTLY ONE SIDED SW w/ 8d @ 4" o.c. ($v_{cap.} = 380$ PLF)

**TO BE DISREGARDED!!!**

*
* * **PROVIDE SHEATHING ON INSIDE FACE TO RESIST FULL SHEAR**

**ONE SIDED SUREBOARD (SERIES 200W) W/ #10 SCREWS @ 2" OC AT PANEL EDGES, AND 6" OC IN FIELD.** => $v_{cap.} = 950$ pLF

## THIRD FLOOR MAX SHEAR:

$u_{max} = v_{max} = \frac{V}{C_o \Sigma L_i} = \frac{3.9^k \text{ (ASD)}}{0.64 \times 10.5'} = 580 \text{ KLF}$

CURRENTLY ONE SIDED w/ 8d @ 6" o.c. ($v_{cap.} = 260$ PLF)

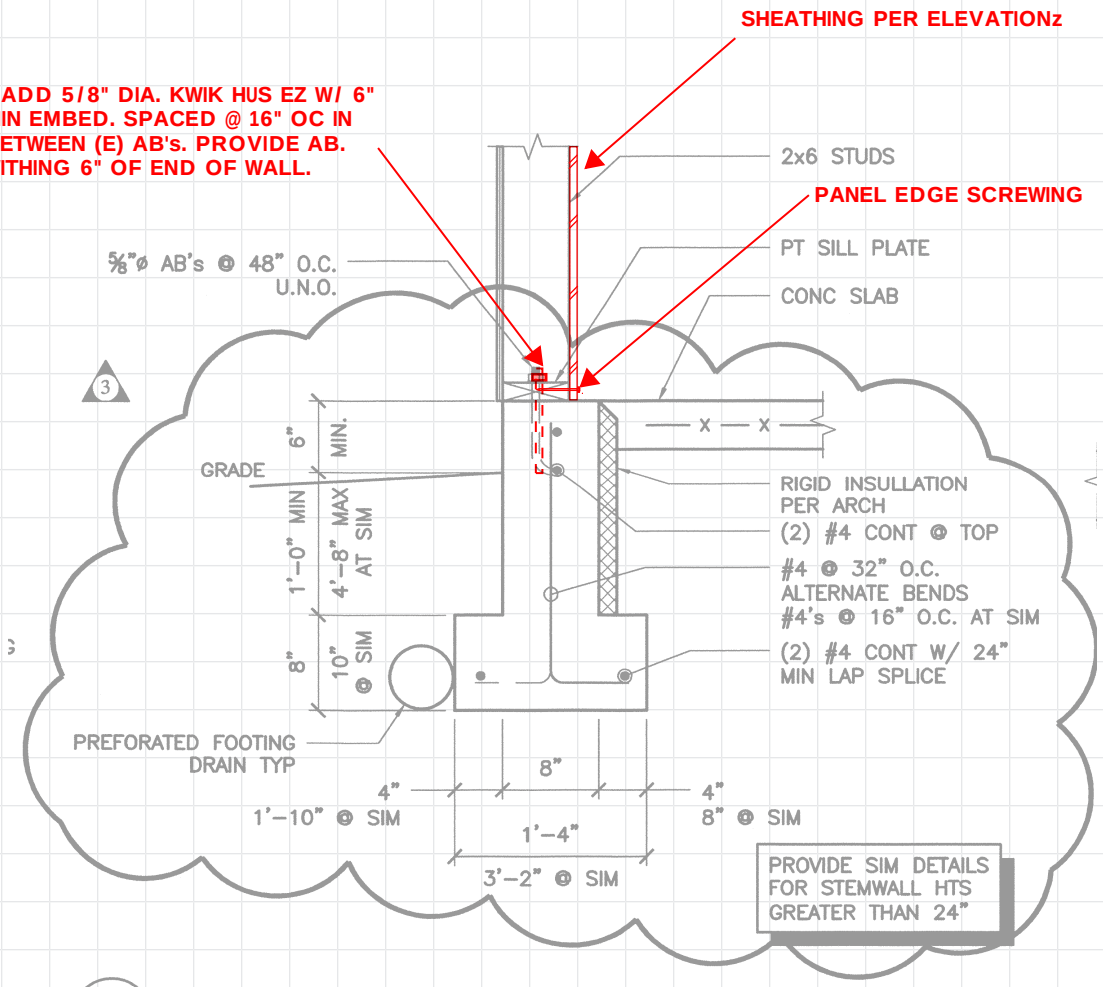
**TO BE DISREGARDED!!!**

*
* * **PROVIDE SHEATHING ON INSIDE FACE TO RESIST FULL SHEAR**

**ONE SIDED 15-32" PLYWOD SHEATHING (STRUCTURAL I) W/ 10d @ 3" OC AT PANEL EDGES, AND 12" OC IN FIELD.** => $v_{cap.} =$ 665 KLF

**AT ROOF:**

**PROVIDE ONE SIDED 15-32" PLYWOD SHEATHING (STRUCTURAL I) W/ 10d @ 6" OC AT PANEL EDGES, AND 12" OC IN FIELD.**




8 TYPICAL CONCRETE FOOTING
1" = 1'-0"

**NOTES:**

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SSK #05 **BASE CONN. AT REINFORCED SHEAR WALL**

| | | | |
|---|---|---|---|
| Company: | | Page: | 1 |
| Address: | | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Oct 24, 2023 | Date: | 11/15/2023 |
| Fastening point: | | | |

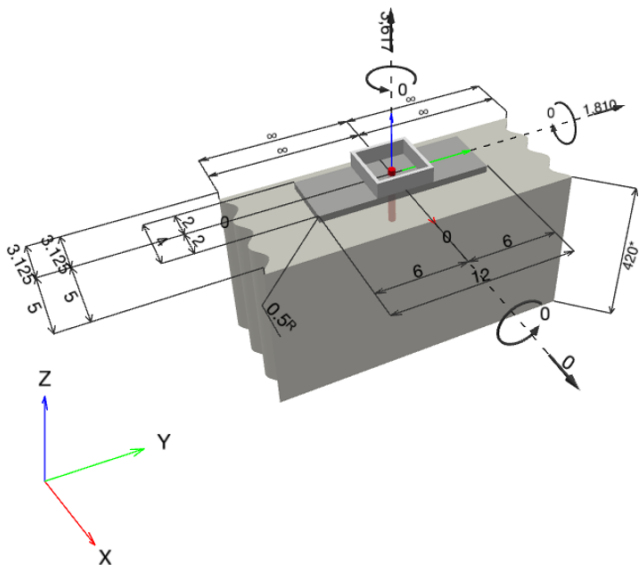
**Specifier's comments:**

## 1 Input data

| | |
|---|---|
| **Anchor type and diameter:** | **KWIK HUS-EZ (KH-EZ)-SS316 1/2 (4 1/4)** |
| Item number: | 2245621 KH-EZ SS316 1/2"x5" |
| Effective embedment depth: | $h_{ef,act}$ = 3.260 in., $h_{nom}$ = 4.250 in. |
| Material: | AISI 316 |
| Evaluation Service Report: | ESR-3027 |
| Issued I Valid: | 4/1/2022 \| 12/1/2023 |
| Proof: | Design Method ACI 318-19 / Mech |
| Stand-off installation: | $e_b$ = 0.000 in. (no stand-off); t = 0.500 in. |
| Anchor plate[R]: | $l_x$ x $l_y$ x t = 4.000 in. x 12.000 in. x 0.500 in.; (Recommended plate thickness: not calculated) |
| Profile: | Square HSS (AISC), HSS4X4X.25; (L x W x T) = 4.000 in. x 4.000 in. x 0.250 in. |
| Base material: | cracked concrete, 4000, $f_c'$ = 4,000 psi; h = 420.000 in. |
| **Installation:** | **hammer drilled hole, Installation condition: Dry** |
| Reinforcement: | tension: not present, shear: not present; no supplemental splitting reinforcement present<br>edge reinforcement: none or < No. 4 bar |
| Seismic loads (cat. C, D, E, or F) | Tension load: yes (17.10.5.3 (a))<br>Shear load: yes (17.10.6.3 (a)) |

[R] - The anchor calculation is based on a rigid anchor plate assumption.

**Geometry [in.] & Loading [lb, in.lb]**



| | | | |
|---|---|---|---|
| Company: | | Page: | 2 |
| Address: | | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Oct 24, 2023 | Date: | 11/15/2023 |
| Fastening point: | | | |

### 1.1 Design results

| Case | Description | Forces [lb] / Moments [in.lb] | Seismic | Max. Util. Anchor [%] |
|---|---|---|---|---|
| 1 | Combination 1 | N = 3,617; $V_x$ = 0; $V_y$ = 1,810; $M_x$ = 0; $M_y$ = 0; $M_z$ = 0; | yes | 64 |

**AMPLIFIED TENSION FORCES USING "Ω = 2.0"**
**INCL. REDUCTION FOR FLEXIBLE DIAPHRAGM.**

| | | | |
|---|---|---|---|
| Company: | | Page: | 3 |
| Address: | | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Oct 24, 2023 | Date: | 11/15/2023 |
| Fastening point: | | | |

## 2 Proof I Utilization (Governing Cases)

| | | Design values [lb] | | Utilization | |
|---|---|---|---|---|---|
| **Loading** | **Proof** | **Load** | **Capacity** | **$\beta_N$ / $\beta_V$ [%]** | **Status** |
| Tension | Concrete Breakout Failure | 3,617 | 5,713 | 64 / - | OK [A] |
| Shear | Steel Strength | 1,810 | 3,113 | - / 59 | OK |

[A] When 17.10.5.3 (a) is selected for seismic design, the design steel strength must be the governing design strength having the highest utilization.

| **Loading** | **$\beta_N$** | **$\beta_V$** | **$\zeta$** | **Utilization $\beta_{N,V}$ [%]** | **Status** |
|---|---|---|---|---|---|
| Combined tension and shear loads | - | - | - | - | N/A |

## 3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

**Fastening does not meet the design criteria!**

## 4 Remarks; Your Cooperation Duties

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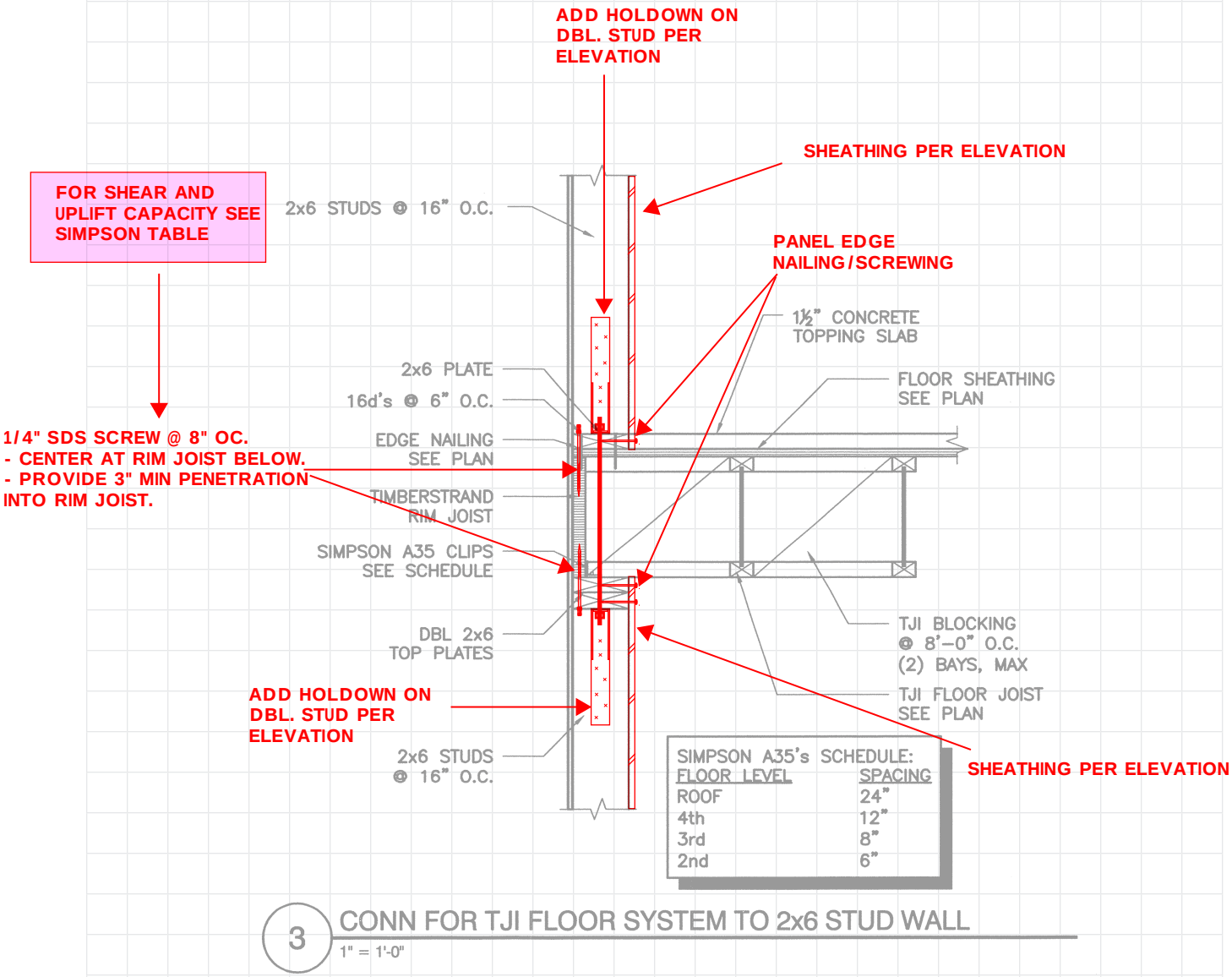


3 CONN FOR TJI FLOOR SYSTEM TO 2x6 STUD WALL
1" = 1'-0"

**NOTES:**

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SSK #07 **DETAIL IN BETWEEN FLOORS AT REINFORCED SHEAR WALL**

*Simpson Strong-Tie® Wood Construction Connectors*

# Strong-Drive® SDS HEAVY-DUTY CONNECTOR Screw

SIMPSON StrongTie

## Structural Fastener

The Simpson Strong-Tie® Strong-Drive SDS Heavy-Duty Connector screw is a ¼"-diameter structural wood screw ideal for various connector installations as well as wood-to-wood applications. It installs with no predrilling and has been extensively tested in various applications.

For more information about package quantities, visit **strongtie.com.**

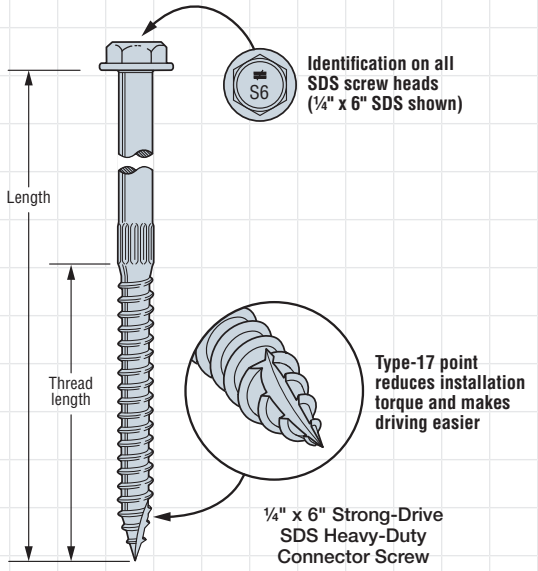
**Features:**

- The Type-17 point reduces installation torque and makes driving easier with no predrilling and minimal wood splitting.
- Available with a double-barrier coating or in Type 316 stainless steel. Carbon steel loads apply to corresponding stainless-steel models.
- ⅜" hex washer head is stamped with the No-Equal sign and fastener length for easy identification after installation.
- For the ⅜" hex-head driver bit, order model no. BITHEXR38-R1.

**Material:** Heat-treated carbon steel, Type 316 stainless steel

**Finish:** Double barrier (all lengths); Type 316 stainless steel (1½" thru 3½" lengths)

**Codes:** See p. 11 for Code Reference Key Chart




These products are available with additional corrosion protection. For more information, see p. 14.

SS For stainless-steel fasteners, see p. 21.

## Strong-Drive SDS Heavy-Duty Connector Screw

| | Model No. | Size (in.) | Thread Length (in.) | Fasteners per Carton[6] | DF/SP Allowable Loads (lb.)[4] | | | | | | SPF/HF Allowable Loads (lb.)[4] | | | | | | Code Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Shear (100) | | | | | Withdrawal[5] (100) | Shear (100) | | | | | Withdrawal[5] (100) | |
| | | | | | Wood Side Plate[3] | | Steel Side Plate | | | | Wood Side Plate[3] | | Steel Side Plate | | | | |
| | | | | | 1½" | 1¾" SCL | 16 ga. | 14 ga. and 12 ga. | 10 ga. or Greater | Wood or Steel Side Plate | 1½" | 1¾" SPF LVL | 16 ga. | 14 ga. and 12 ga. | 10 ga. or Greater | Wood or Steel Side Plate | |
| SS | SDS25112 | ¼ x 1½ | 1 | 1,500 | — | — | 250 | 250 | 250 | 170 | — | — | 180 | 180 | 180 | 120 | IBC, FL, LA |
| SS | SDS25200 | ¼ x 2 | 1¼ | 1,300 | — | — | 250 | 290 | 290 | 215 | — | — | 180 | 210 | 210 | 150 | |
| SS | SDS25212 | ¼ x 2½ | 1½ | 1,100 | 190 | — | 250 | 390 | 420 | 255 | 135 | — | 180 | 280 | 300 | 180 | |
| SS | SDS25300 | ¼ x 3 | 2 | 950 | 280 | — | 250 | 420 | 420 | 345 | 200 | — | 180 | 300 | 300 | 240 | |
| SS | SDS25312 | ¼ x 3½ | 2¼ | 900 | 340 | 340 | 250 | 420 | 420 | 385 | 245 | 245 | 180 | 300 | 300 | 270 | |
| | SDS25412 | ¼ x 4½ | 2¾ | 800 | 350 | 340 | 250 | 420 | 420 | 475 | 250 | 245 | 180 | 300 | 300 | 330 | |
| | SDS25500 | ¼ x 5 | 2¾ | 500 | 350 | 340 | 250 | 420 | 420 | 475 | 250 | 245 | 180 | 300 | 300 | 330 | |
| | SDS25600 | ¼ x 6 | 3¼ | 600 | 350 | 340 | 250 | 420 | 420 | 560 | 250 | 245 | 180 | 300 | 300 | 395 | |
| | SDS25800 | ¼ x 8 | 3¼ | 400 | 350 | 340 | 250 | 420 | 420 | 560 | 250 | 245 | 180 | 300 | 300 | 395 | |

1. Screws may be provided with the 4CUT™ or Type-17 point.
2. Strong-Drive SDS Heavy-Duty Connector screws install best using a low-speed ½" drill with a ⅜" hex-head driver.
3. Shear values are valid for connections between two members with full thread penetration into the main member. For other wood side plate values, see *Fastening Systems Technical Guide* (C-F-2019TECHSUP) at **strongtie.com**.
4. Allowable loads are shown at a wood load duration factor of $C_D$ = 1.0. Loads may be increased for load duration per the building code up to a $C_D$ = 1.6. Tabulated values must be multiplied by all applicable NDS adjustment factors.
5. Withdrawal loads shown are in pounds (lb.) and are based on penetration of the screw's entire threaded section into the main member. If thread penetration into the main member is less than the Thread Length as shown in the table for DF/SP, reduce allowable load by 172 lb./in. of thread not in main member. Use 121 lb./in. for SPF/HF.
6. Fasteners per Carton represents the quantity of screws that are available in bulk packaging. Screws are also available in mini-bulk and retail packs. Refer to Simpson Strong-Tie *Fastening Systems* catalog (C-F-2019) at **strongtie.com**.
7. LSL wood-to-wood applications that require 4½", 5", 6" or 8" SDS Heavy-Duty Connector screws are limited to interior-dry use only.
8. Where predrilling is required for Strong-Drive SDS Heavy-Duty Connector screws, predrill diameter is ⅝".
9. Minimum spacing, edge, and end distance requirements are listed in ICC-ES ESR-2236. For smaller spacing, please contact Simpson Strong-Tie Engineering.



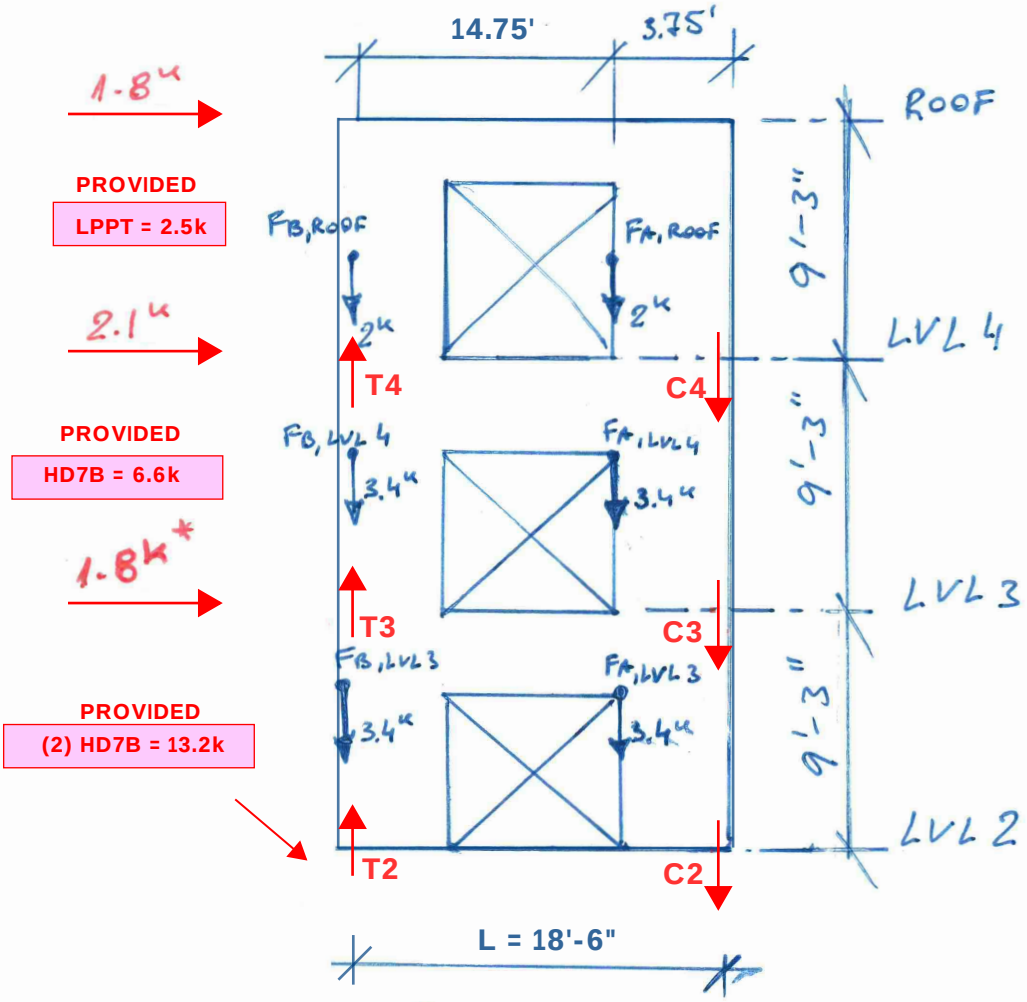




(1.5) 1/4" SCREWS PER FT = 1.5 x 350# x 1.6 = 840#/ft > 580#/ft SHEAR DEMAND

(1.5) 1/4" SCREWS PER FT = 1.5 x 475# x 1.6 = 1140#/ft > 580#/ft UPLIFT DEMAND

# HD CALCULATION




$$T_2 = \frac{O.T.M.}{C_o \times L_i} - (0.6 - 0.14 S_{DS}) \times \frac{(F_A + F_B) \times L_i/3}{L_i} = 15.7^k - 2.8^k = 12.9 \text{ kips}$$

($C_o$ = 0.64, $L_i$ = 10.5', $S_{DS}$ = 0.833)

$T_2$ = 12.9 kips (ASD)

$$T_3 = \frac{O.T.M.}{C_o L_i} - (0.6 - 0.14 S_{DS}) \times \frac{(F_A + F_B) \times L_i/3}{L_i} = 8.3 \text{ kips} - 2.2 \text{ kips} = 6.1 \text{ kips}$$

$T_2$ = 6.1 kips (ASD)

$$T_4 = \frac{O.T.M.}{C_o L_i} - (0.6 - 0.14 S_{DS}) \times \frac{(F_A + F_B) \times L_i/3}{L_i} = 2.5 \text{ kips} - 1.1 = 1.4 \text{ kips}$$

$T_2$ = 1.4 kips (ASD)

$F_{x3}$ & $F_{x4}$ DUE TO FORCES BASED ON SW CAPACITIES CONSERVATIVE FOR O.T. CALC

# HDB/HD

## Holdowns (cont.)



These products are available with additional corrosion protection. For more information, see p. 14.

| Model No. | Material | | Dimensions (in.) | | | | | | | Fasteners (in.) | | Minimum Wood Member Size (in.) | Allowable Tension Loads (160) | | Deflection at Highest Allowable Load | Code Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Base (in.) | Body (ga.) | HB | SB | W | H | B | CL | SO | Anchor Dia. Bolt | Stud Bolts | | DF/SP | SPF/HF | | |
| HD3B | — | 12 | 4¾ | 2½ | 2½ | 8⅝ | 2¼ | 1⁵⁄₁₆ | ⅜ | ⅝ | (2) ⅝ | 1½ x 3½ | 1,895 | 1,610 | 0.156 | IBC, FL, LA |
| | | | | | | | | | | | | 2½ x 3½ | 2,525 | 2,145 | 0.169 | |
| | | | | | | | | | | | | 3 x 3½ | 3,130 | 3,050 | 0.12 | |
| | | | | | | | | | | | | 3½ x 3½ | 3,130 | 3,050 | 0.12 | |
| HD5B | ⅜ | 10 | 5¼ | 3 | 2½ | 9⅜ | 2½ | 1¼ | 2 | ⅝ | (2) ¾ | 1½ x 3½ | 2,405 | 2,070 | 0.153 | |
| | | | | | | | | | | | | 2½ x 3½ | 3,750 | 3,190 | 0.129 | |
| | | | | | | | | | | | | 3 x 3½ | 4,505 | 3,785 | 0.156 | |
| | | | | | | | | | | | | 3½ x 3½ | 4,935 | 4,195 | 0.15 | |
| | | | | | | | | | | | | 3 x 3½ | 6,645 | 5,650 | 0.142 | |
| HD7B | ⅜ | 10 | 5¼ | 3 | 2½ | 12⅜ | 2½ | 1¼ | 2 | ⅞ | (3) ¾ | 3½ x 3½ | 7,310 | 6,215 | 0.154 | |
| | | | | | | | | | | | | 3½ x 4½ | 7,345 | 6,245 | 0.155 | |
| HD9B | ⅜ | 7 | 6⅛ | 3½ | 2⅞ | 14 | 2½ | 1¼ | 2⅜ | ⅞ | (3) ⅞ | 3½ x 3½ | 7,740 | 6,580 | 0.159 | |
| | | | | | | | | | | | | 3½ x 4½ | 9,920 | 8,430 | 0.178 | |
| | | | | | | | | | | | | 3½ x 5½ | 9,920 | 8,430 | 0.178 | |
| | | | | | | | | | | | | 3½ x 7¼ | 10,035 | 8,530 | 0.179 | |
| HD12 | ⅜ | 3 | 7 | 4 | 3½ | 20⁵⁄₁₆ | 4¼ | 2⅛ | 3⅝ | 1 | (4) 1 | 3½ x 3½ | 11,350 | 9,215 | 0.171 | |
| | | | | | | | | | | | | 3½ x 4½ | 12,665 | 10,765 | 0.171 | |
| | | | | | | | | | | | | 5½ x 5½ | 14,220 | 12,085 | 0.162 | |
| | | | | | | | | | | 1⅛ | (4) 1 | 3½ x 3½ | 11,775 | 9,215 | 0.171 | |
| | | | | | | | | | | | | 3½ x 4½ | 13,335 | 11,055 | 0.177 | |
| | | | | | | | | | | | | 3½ x 7¼ | 15,435 | 13,120 | 0.194 | |
| | | | | | | | | | | | | 5½ x 5½ | 15,510 | 12,690 | 0.162 | |
| HD19 | ⅜ | 3 | 7 | 4 | 3½ | 24½ | 4¼ | 2⅛ | 3⅝ | 1⅛ | (5) 1 | 3½ x 7¼ | 16,735 | 14,225 | 0.191 | |
| | | | | | | | | | | | | 5½ x 5½ | 16,775 | 12,690 | 0.2 | |
| | | | | | | | | | | 1¼ | (5) 1 | 3½ x 7¼ | 19,360 | 15,270 | 0.18 | |
| | | | | | | | | | | | | 5½ x 5½ | 19,070 | 16,210 | 0.137 | |

1. To achieve published loads, machine bolts shall be installed with the nut on the opposite side of the holdown. If this orientation is reversed, the designer shall reduce the allowable loads shown per NDS requirements when bolt threads are in the shear plane.
2. All references to bolts are for structural quality through bolts (not lag screw or carriage bolts) equal to or better than ASTM A307, Grade A.
3. HD19 with 1¼" anchor rod requires No.1 post (or better) to achieve published loads.

| | | | |
|---|---|---|---|
| Company: | | Page: | 1 |
| Address: | | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Oct 24, 2023 | Date: | 11/15/2023 |
| Fastening point: | | | |

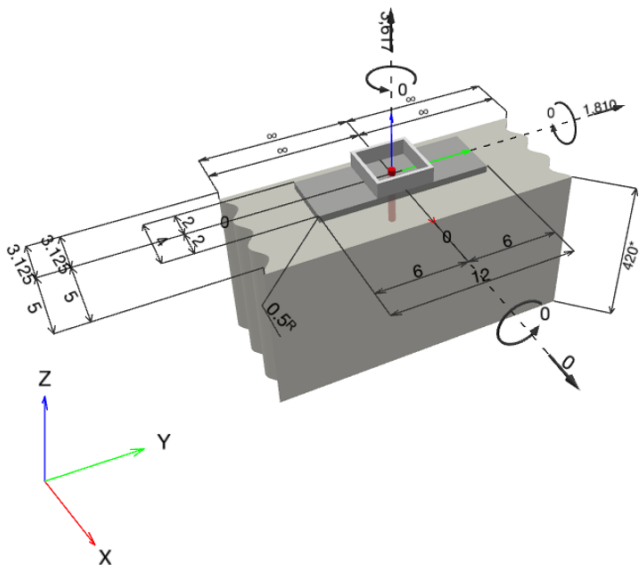
**Specifier's comments:**

## 1 Input data

| | |
|---|---|
| **Anchor type and diameter:** | **KWIK HUS-EZ (KH-EZ)-SS316 1/2 (4 1/4)** |
| Item number: | 2245621 KH-EZ SS316 1/2"x5" |
| Effective embedment depth: | $h_{ef,act}$ = 3.260 in., $h_{nom}$ = 4.250 in. |
| Material: | AISI 316 |
| Evaluation Service Report: | ESR-3027 |
| Issued I Valid: | 4/1/2022 \| 12/1/2023 |
| Proof: | Design Method ACI 318-19 / Mech |
| Stand-off installation: | $e_b$ = 0.000 in. (no stand-off); t = 0.500 in. |
| Anchor plate[R]: | $l_x$ x $l_y$ x t = 4.000 in. x 12.000 in. x 0.500 in.; (Recommended plate thickness: not calculated) |
| Profile: | Square HSS (AISC), HSS4X4X.25; (L x W x T) = 4.000 in. x 4.000 in. x 0.250 in. |
| Base material: | cracked concrete, 4000, $f_c'$ = 4,000 psi; h = 420.000 in. |
| **Installation:** | **hammer drilled hole, Installation condition: Dry** |
| Reinforcement: | tension: not present, shear: not present; no supplemental splitting reinforcement present<br>edge reinforcement: none or < No. 4 bar |
| Seismic loads (cat. C, D, E, or F) | Tension load: yes (17.10.5.3 (a))<br>Shear load: yes (17.10.6.3 (a)) |

[R] - The anchor calculation is based on a rigid anchor plate assumption.

**Geometry [in.] & Loading [lb, in.lb]**



| | | | |
|---|---|---|---|
| Company: | | Page: | 2 |
| Address: | | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Oct 24, 2023 | Date: | 11/15/2023 |
| Fastening point: | | | |

### 1.1 Design results

| Case | Description | Forces [lb] / Moments [in.lb] | Seismic | Max. Util. Anchor [%] |
|---|---|---|---|---|
| 1 | Combination 1 | N = 3,617; $V_x$ = 0; $V_y$ = 1,810; $M_x$ = 0; $M_y$ = 0; $M_z$ = 0; | yes | 64 |

| | | | |
|---|---|---|---|
| Company: | | Page: | 3 |
| Address: | | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Oct 24, 2023 | Date: | 11/15/2023 |
| Fastening point: | | | |

## 2 Proof I Utilization (Governing Cases)

| | | Design values [lb] | | Utilization | |
|---|---|---|---|---|---|
| **Loading** | **Proof** | **Load** | **Capacity** | **$\beta_N$ / $\beta_V$ [%]** | **Status** |
| Tension | Concrete Breakout Failure | 3,617 | 5,713 | 64 / - | OK [A] |
| Shear | Steel Strength | 1,810 | 3,113 | - / 59 | OK |

[A] When 17.10.5.3 (a) is selected for seismic design, the design steel strength must be the governing design strength having the highest utilization.

| **Loading** | **$\beta_N$** | **$\beta_V$** | **$\zeta$** | **Utilization $\beta_{N,V}$ [%]** | **Status** |
|---|---|---|---|---|---|
| Combined tension and shear loads | - | - | - | - | N/A |

## 3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

**Fastening does not meet the design criteria!**

## 4 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

# LTT/HTT

## Tension Ties (cont.)

These products are available with additional corrosion protection. For more information, see p. 14.

SD Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 348–352 for more information.

| Model No. | Ga. | Dimensions (in.) W | L | CL | SO (in.) | Fasteners (in.) Anchor Rod Diameter | Wood Fasteners | Minimum Wood Member Size (in.) | Allowable Tension Loads (160) DF/SP | SPF/HF | Deflection at Highest Allowable Load (in.) | Code Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LTTP2 | 10 | 2⁹⁄₁₆ | 14¹⁵⁄₁₆ | 1⅛ | ⁷⁄₁₆ | ½, ⅝, ¾ | (15) 0.148 x 2½ | 1½ x 3½ (narrow edge)[4,5] | 1,845 | 1,695 | 0.104 | IBC, FL, LA |
| | | | | | | ½ | (12) 0.148 x 1½ | 1½ x 3½ | 1,680[6] | 1,545[6] | 0.138 | |
| | | | | | | ⅝, ¾ | | | 2,135 | 1,965 | 0.112 | |
| | | | | | | ½ | (12) #9 x 1½" SD | 1½ x 3½ | 2,320 | 1,970 | 0.112 | |
| | | | | | | ⅝, ¾ | | | 2,570 | 2,045 | 0.136 | |
| | | | | | | ½, ⅝, ¾ | (12) 0.148 x 2½ | 3 x 3½ | 2,275 | 2,230 | 0.128 | |
| LTTI31 | 18 | 3¾ | 31 | 1⅜ | ¼ | ⅝ | (18) 0.148 x 1½ | 3 x 3½ | 1,350 | 1,160 | 0.193 | — |
| HTT4 | 11 | 2½ | 12⅜ | 1⁵⁄₁₆ | ⁷⁄₁₆ | ⅝ | (18) 0.148 x 1½ | 1½ x 3½ | 3,000 | 2,580 | 0.090 | IBC, FL, LA |
| | | | | | | | (18) 0.148 x 1½ | 3 x 3½ | 3,610 | 3,105 | 0.086 | |
| | | | | | | | (18) 0.162 x 2½ | 3 x 3½ | 4,235 | 3,640 | 0.123 | |
| | | | | | | | (18) #10 x 1½" SD | 1½ x 5½ | 4,455 | 3,830 | 0.112 | — |
| | | | | | | | (18) #10 x 1½" SD | 3 x 3½ | 4,455 | 3,830 | 0.112 | |
| HTT5 | 11 | 2½ | 16 | 1⅜ | ⁷⁄₁₆ | ⅝ | (26) 0.148 x 1½ | 3 x 3½ | 4,350 | 3,740 | 0.120 | IBC, FL, LA |
| | | | | | | | (26) 0.148 x 3 | 3 x 3½ | 4,670 | 4,015 | 0.116 | |
| | | | | | | | (26) 0.162 x 2½ | 3 x 3½ | 5,090 | 4,375 | 0.135 | |
| | | | | | | | (26) #10 x 1½" SD | 1½ x 5½ | 4,555 | 3,915 | 0.114 | — |
| HTT5KT | 11 | 2½ | 16 | 1⅜ | ⁷⁄₁₆ | ⅝ | (26) #10 x 2½" SD | 3 x 3½ | 5,445 | 5,360 | 0.103 | |
| HTT5-3/4 | 11 | 2½ | 16 | 1⅜ | ⁷⁄₁₆ | ¾ | (26) 0.148 x 1½ | 1½ x 5½ | 4,065 | 3,495 | 0.103 | IBC, FL |
| | | | | | | | (26) 0.162 x 2½ | 3 x 3½ | 5,090 | 4,375 | 0.121 | |
| | | | | | | | (26) #10 x 1½" SD | 1½ x 7¼ | 4,830 | 4,155 | 0.100 | |

1. LTTI31 installed flush with concrete or masonry has an allowable load of 2,285 lb.
2. Allowable load for HTT5 with a BP5/8-2 bearing-plate washer installed in the seat of the holdown is 5,295 lb. for DF/SP and 4,555 lb. for SPF/HF.
3. For LTTP2, standard cut washer is required when using ½" and ⅝" anchor rods.
4. For (15) nail installations on narrow edge of 2x4 (minimum) joist, LTTP2 installed flush with concrete or masonry has an allowable load of 2,560 lb. for DF/SP and 2,355 lb. for SPF/HF.
5. LTTP2 installed with (15) #9 x 1½" SD screws on narrow edge of 2x joist has an allowable load of 2,105 lb. for DF/SP and 1,935 lb. for SPF/HF.
6. For (12) nail installations on I-joist or wide face of 2x member, LTTP2 installed flush with concrete or masonry has an allowable load of 1,950 lb. for DF/SP and 1,795 lb. for SPF/HF.
7. **Fasteners:** Nail dimensions are listed diameter by length. SD screws are Simpson Strong-Tie® Strong-Drive SD Connector screws. See pp. 21–22 for fastener information.

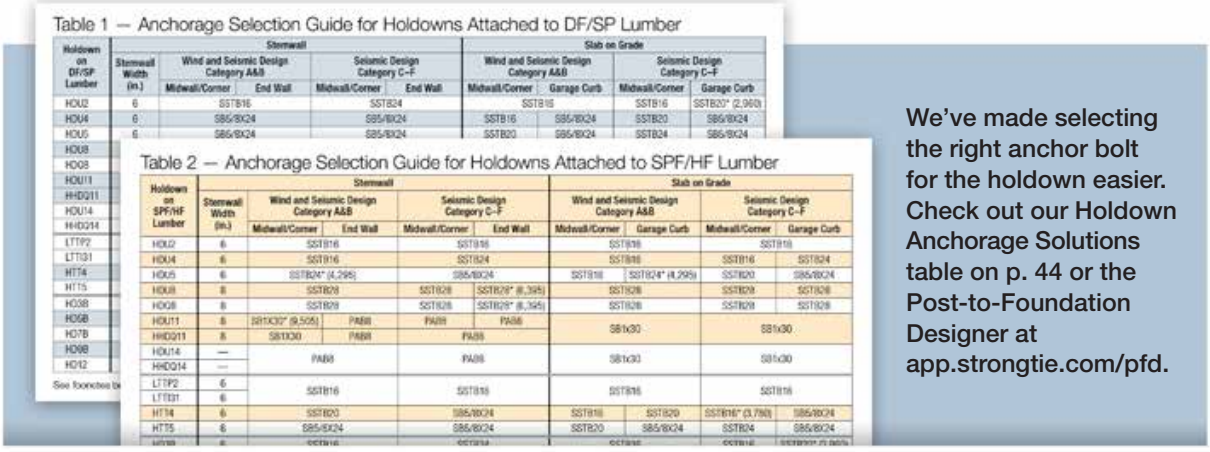


Table 1 — Anchorage Selection Guide for Holdowns Attached to DF/SP Lumber

Table 2 — Anchorage Selection Guide for Holdowns Attached to SPF/HF Lumber

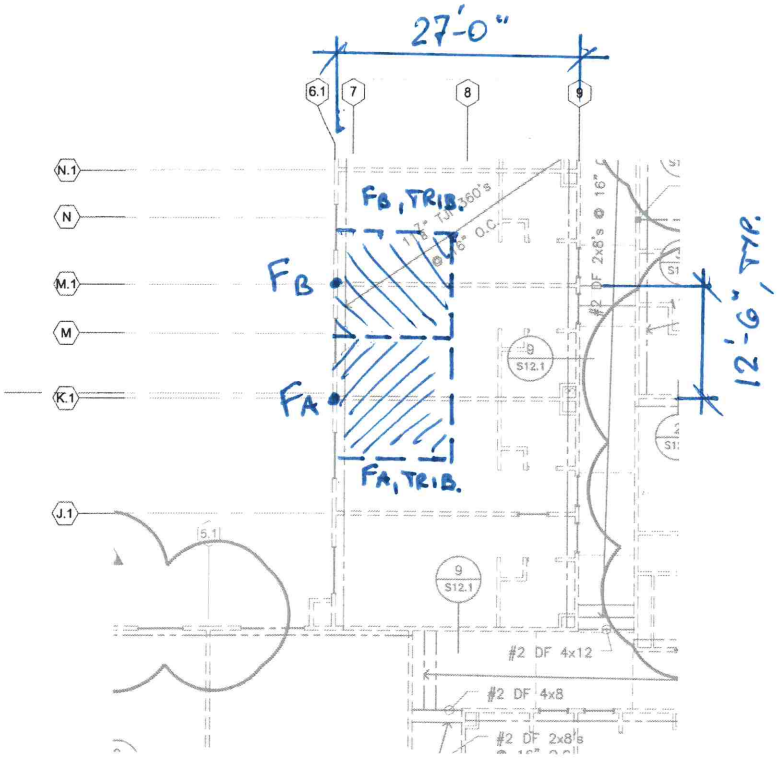
We've made selecting the right anchor bolt for the holdown easier. Check out our Holdown Anchorage Solutions table on p. 44 or the Post-to-Foundation Designer at app.strongtie.com/pfd.

PCS Structural Solutions

Project: HAMPTON INN PUYALLUP ADDITION Job No: 18-741

Subject: _____ Sheet _____ Name: GSS

Originating Office: ☐ Seattle ☑ Tacoma ☐ Portland Date: _____

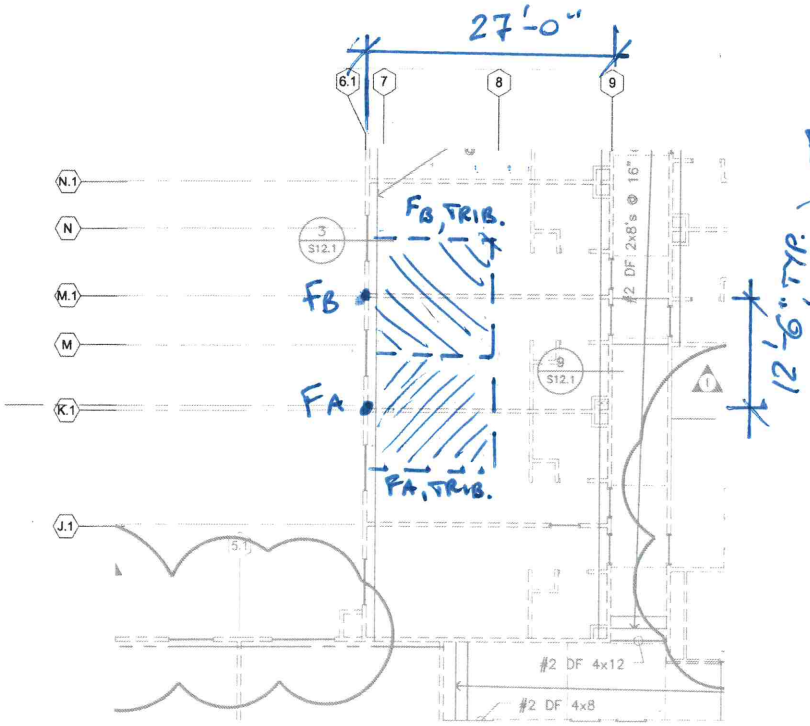



FLOOR DL ≈ 20 PSF

$F_{A(DL)} = F_{B(DL)} = \frac{27'}{2} \times 12.5' \times 20 psf$

$F_{A(DL)} = F_{B(DL)} = 3.4 kips$

THIRD FLOOR FRAMING - PARTIAL PLAN




FLOOR DL ≈ 20 PSF

$F_{A(DL)} = F_{B(DL)} = \frac{27'}{2} \times 12.5' \times 20 psf$

$F_{A(DL)} = F_{B(DL)} = 3.4 kips$

FOURTH FLOOR FRAMING - PARTIAL PLAN


Seattle | 1011 Western Avenue, Suite 810 | Seattle, WA 98104 | 206.292.5076
Tacoma | 1250 Pacific Avenue, Suite 701 | Tacoma, WA 98402 | 253.383.2797
Portland | 101 SW Main Street, Suite 280 | Portland, OR 97204 | 503.232.3746

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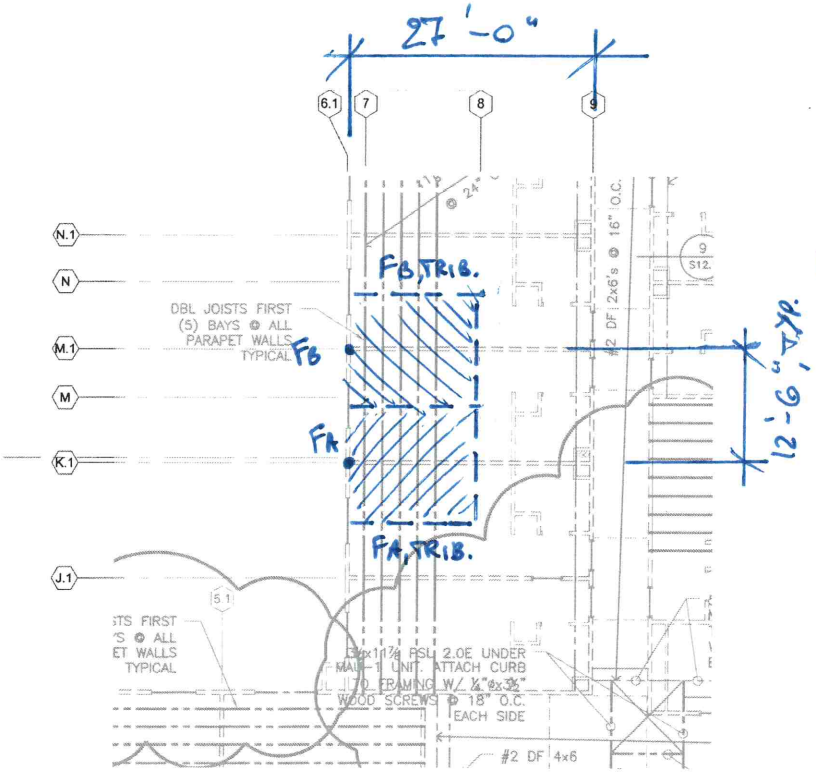
PCS Structural Solutions

Project: HAMPTON INN PUYALLUP ADDITION Job No: 18-741

Subject: _____ Sheet _____ Name: GSS

Originating Office: ☐ Seattle ☑ Tacoma ☐ Portland Date: _____




ROOF DL ≈ 12 PSF

$F_{A\,(DL)} = F_{B\,(DL)} = \frac{27'}{2} \times 12.5' \times 12_{PSF} = 2\,kips$

ROOF FRAMING - PARTIAL PLAN