

<https://www.strongtie.com>[www.strongtie.com](https://www.strongtie.com)

Fastener Designer is a quick, easy-to-use tool for providing Simpson Strong-Tie structural screw alternatives to specified standard NDS fasteners in withdrawal, lateral load parallel-to-grain, lateral load perpendicular-to-grain, multi-ply, ledger connections and sole plate to rim board. This application provides detailed load calculations for both the NDS fastener and the recommended Simpson Strong-Tie structural screw.

[Report Application Issues or Provide Customer Feedback \(https://app.smartsh\)](#)[About FD](#)

## Side Member

### Side Member Type

☒ Wood ☐ Steel

### Side Member Properties

Side Member Species ⓘ

Douglas Fir-Larch

OR

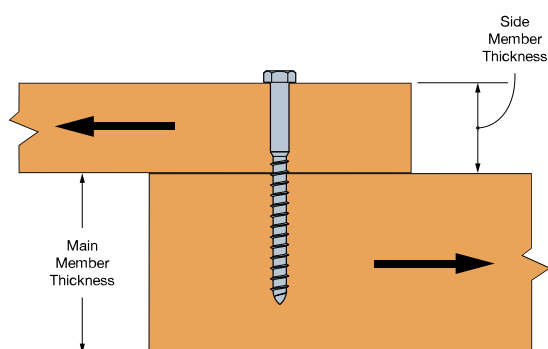
Specific Gravity ⓘ

e.g., 0.49

### Side Member Thickness ⓘ

2

in



Lateral Load Parallel to Grain

## Main Member

### Main Member Properties

Main Member Species ⓘ

Douglas Fir-Larch

OR

Specific Gravity ⓘ

e.g., 0.49

### Main Member Thickness ⓘ

4

in

## Factors ⓘ

### Load Duration Factor ⓘ

1.6

### Temperature Factor ⓘ

1

### Wet Service Factor ⓘ

1

[RESTART](#)[FASTENER SUBSTITUTION OPTIONS](#)

## Simpson Strong-Tie Fastener Substitution Options

### Fastener Type

☒ All Types☐ SDWH TIMBER-HEX Screw☐ SDWH TIMBER-HEX SS Screw☐ WSNTL SUBFLOOR Screw☐ DWP Wood SS Screw☐ SDWS FRAMING Screw☐ SDWS TIMBER Screw☐ SDWH TIMBER-HEX HDG Screw☐ SDS HEAVY-DUTY CONNECTOR Screw☐ SDWS LOG Screw

### Fastener Type Corrosion Resistance ⓘ

☐ All Types☒ Low☐ Medium☐ High☐ Severe

Click on a fastener tile below to view detailed information regarding the chosen fastener substitution



Supply (1) 0.195" x 4" Strong-Drive® SDWH TIMBER-HEX Screw SDWH19400DB

Medium

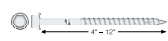


Supply (3) 0.160" x 3" Strong-Drive® SDWS FRAMING Screws SDWS16300

Medium



Medium



Supply (1) 0.276" x 5" Strong-Drive® SDWH TIMBER-HEX SS Screw SDWH27500SS

Severe



Supply (1) 0.22" x 4" Strong-Drive® SDWS TIMBER Screw SDWS22400DB

Medium



Severe



Supply (4) 3" Strong-Drive® WSNTL SUBFLOOR Screws WSNTL3S

Low

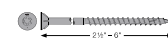


Supply (1) 0.276" x 6" Strong-Drive® SDWH TIMBER-HEX HDG Screw SDWH27600G

Medium

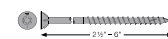


Medium



Supply (2) #12 x 3-1/2" Deck-Drive™ DWP WOOD SS Screws T12350

Severe



Supply (2) #14 x 3-1/2" Deck-Drive™ DWP WOOD SS Screws T14350

Severe



Low

🔧

CALCULATION RESULTS

👤

FASTENER DESIGNER

📅

JULY 31, 2019

🔄

RESTART

📄

CREATE PDF

Input

Input	SST Fastener Capacity
Design Method	Allowable Stress Design (ASD)
Code	NDS 2012/2015
Main Member Thickness, $t_m$ (in)	4
Side Member Thickness, $t_s$ (in)	2
Dowel Length, $l$ (in)	4.0
Main Member Bearing Angle, $\theta_m$ (deg)	0
Side Member Bearing Angle, $\theta_s$ (deg)	0
Main Member Specific Gravity, $G_m$	0.5
Side Member Specific Gravity, $G_s$	0.5
Actual Diameter, $D$ (in)	0.194
Load (lb)	450
Load Duration Factor, $C_D$	1.6
Temperature Factor, $C_t$	1
Wet Service Factor, $C_M$	1
End Grain Factor, $C_{eg}$	1

Calculation

Calculation	SST Fastener Capacity
Dowel Root Diameter, $D_r$ (in)	0.174
Main Member Dowel Bearing Length, $l_m$ (in)	2.000
Side Member Dowel Bearing Length, $l_s$ (in)	2.000
Main Member Dowel Bearing Strength, $F_{em}$ (psi)	4637
Side Member Dowel Bearing Strength, $F_{es}$ (psi)	4637
Dowel Bending Yield Strength, $F_{yb}$ (psi)	165000
	1
	1
	0.41
	1.13
	1.13

Penetration Check

Penetration Check Detail	SST Fastener Capacity
Penetration, $p$ (in)	2.00
Minimum Penetration Requirement, $p_{min}$ (in)	$6D = 1.16$
Minimum Penetration Requirement Met	Yes

End/Edge Distance and Spacing

End Distance, Edge Distance, and Spacing	SST Fastener Capacity
	≠

2 of 4

31/07/2019, 20:07

Yield Mode <b>❶</b>	Yield Limit Equation <b>❶</b>	SST Fastener Capacity	
		Yield Limit, Z	Reduction Term, $R_D$
Mode I <sub>m</sub>		Z = 720 lb	$R_D = 2.2$
Mode I <sub>s</sub>		Z = 720 lb	$R_D = 2.2$
Mode II		Z = 298 lb	$R_D = 2.2$
Mode III <sub>m</sub>		Z = 271 lb	$R_D = 2.2$
Mode III <sub>s</sub>		Z = 271 lb	$R_D = 2.2$
Mode IV		Z = 216 lb	$R_D = 2.2$

Adjusted Yield Value  Z = 480 lb

Supply (1) 0.195" x 4" Strong-Drive® SDWH TIMBER-HEX Screw SDWH19400DB

31/07/2019, 20:07

