

TITAN PLATE T TIMBER

PLATE FOR SHEAR LOADS



SERVICE CONDITION

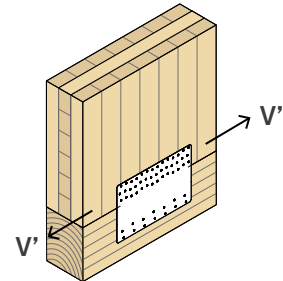


MATERIAL

DX51D
Z275

DX51D + Z275 carbon steel
(Similar to 16-gauge ASTM A653 Grade 40)

EXTERNAL LOADS



TIMBER-TO-TIMBER

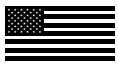
These plates are ideal for the flat connection of the base plate to load-bearing timber panels.

CONTINUOUS CONNECTION

The 3.9 ft long TTP1200 version allows the creation of long connections in panel floors, replacing the classic spline joint connection.

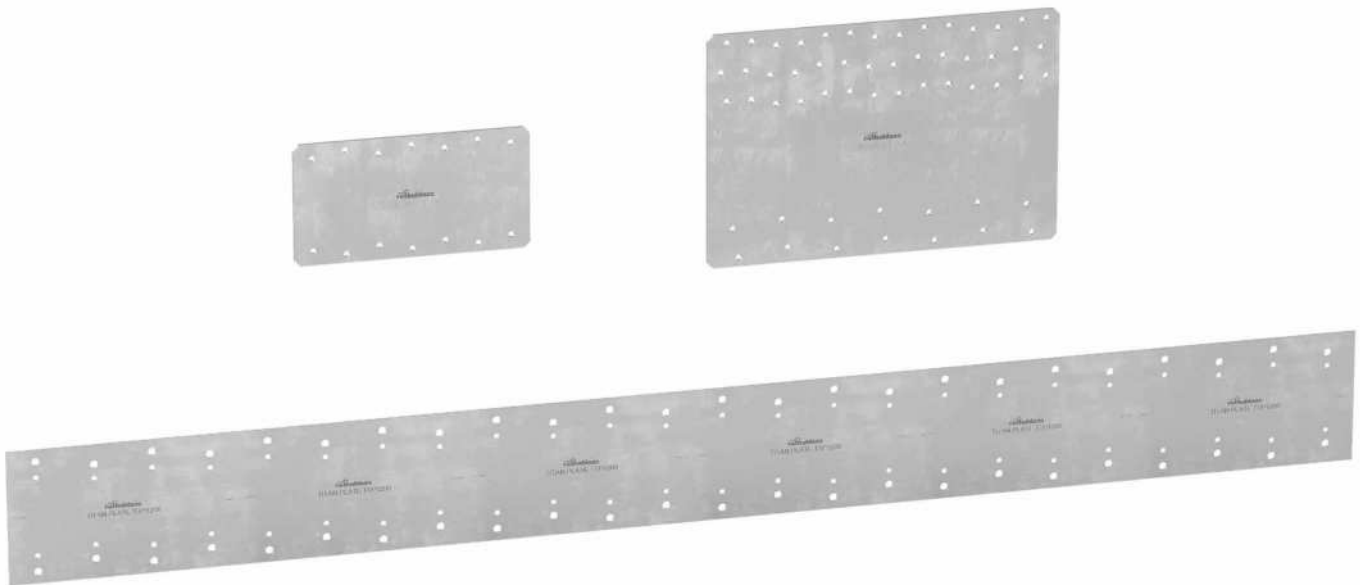
CALCULATED AND CERTIFIED

CE marking according to European standard EN 14545. Available in three versions. TTP300 and TTP1200 versions ideal for CLT.



USA DESIGN VALUES

CANADA, EU and more design values available online.



FIELDS OF USE

Shear joints for timber walls or floors.
Timber-to-timber configuration.

Can be applied to:

- solid timber and glulam
- timber frame
- CLT and LVL panels



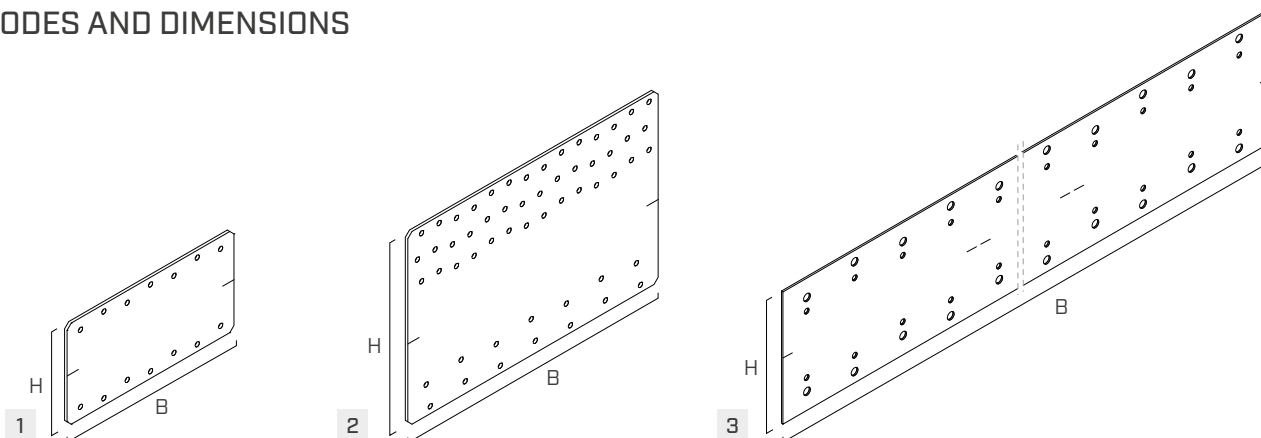
SPLINE STRAP

Ideal for the construction of floors with diaphragm behaviour, restoring shear continuity between the different panels that make up the floor.

FASTENING PATTERNS

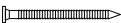
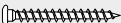
The TTP300, with asymmetrical nailing, allows fastening on both beams and CLT with optimised fastening patterns.

CODES AND DIMENSIONS

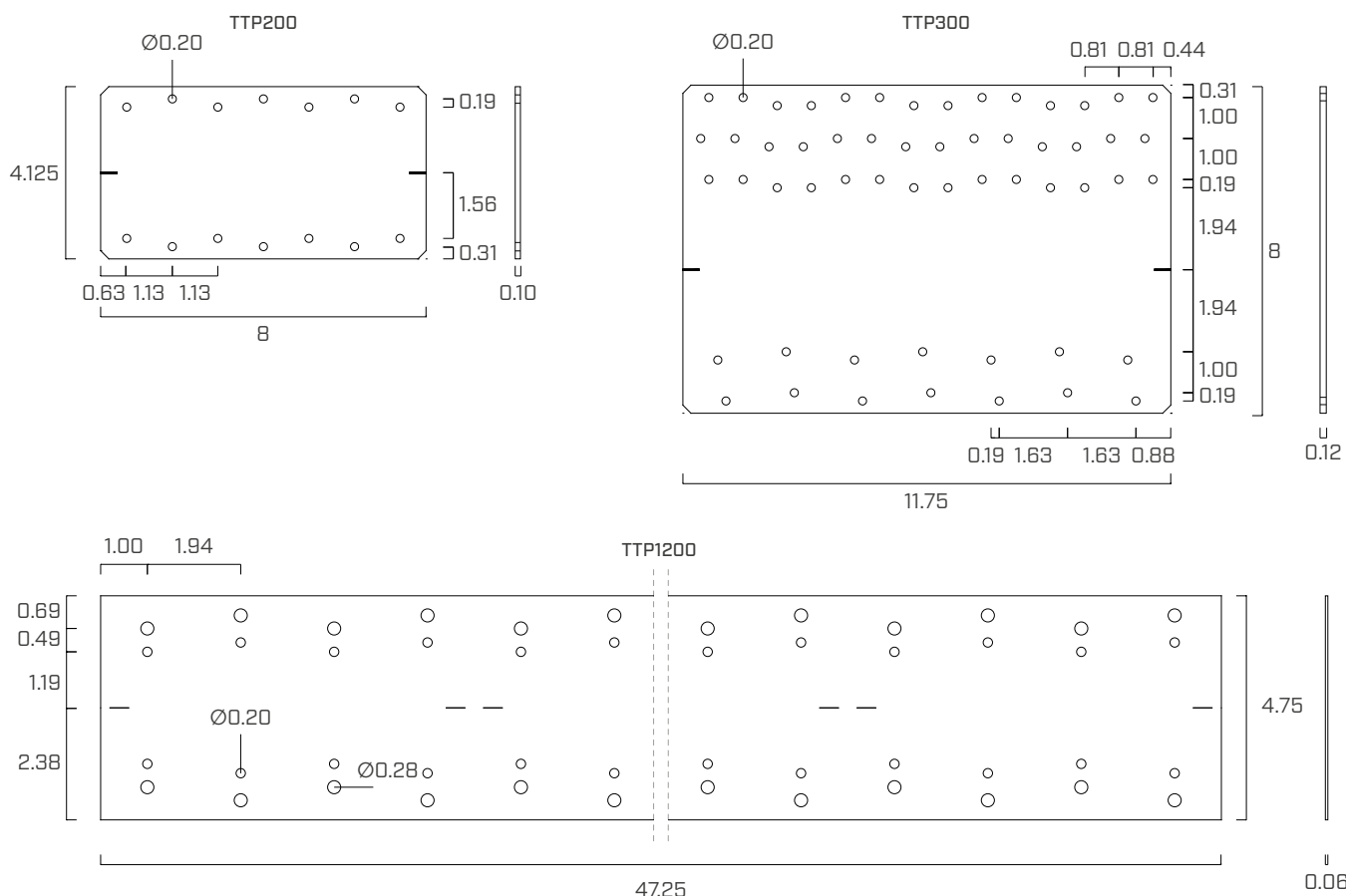


CODE	B [in]	H [in]	s [in]	n _{V1} Ø0.20 [pcs]	n _{V2} Ø0.20 [pcs]	n _{V1} Ø0.28 [pcs]	n _{V2} Ø0.28 [pcs]		pcs
1 TTP200	8	4 1/8	0.10	7	7	-	-	●	10
2 TTP300	11 3/4	8	0.12	42	14	-	-	●	5
3 TTP1200	47 1/4	4 3/4	0.06	48	48	48	48	●	5

FASTENERS

type	description		d [in]	support
LBA	high bond nail		0.16	
LBS	round head screw		0.20 - 0.28	
LBS HARDWOOD EVO	C4 EVO round head screw on hardwoods		0.28	

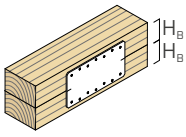
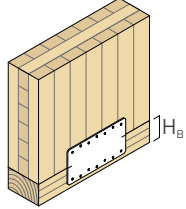
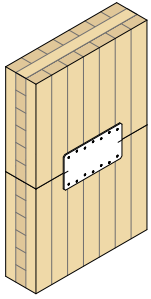
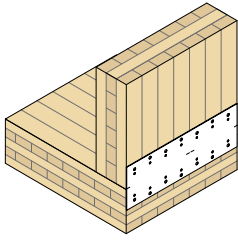
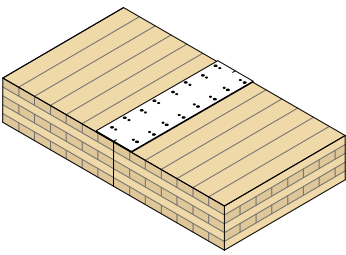
GEOMETRY



■ INSTALLATION

TITAN PLATE T plates can be used on both CLT and solid timber/glulam elements and must be positioned with the assembly notches at the timber-to-timber interface.

Possible fastening configurations are shown below:

configuration		fasteners	TTP200	TTP300	TTP1200
	timber-to-timber	LBA Ø0.16	●	●	-
		LBS Ø0.20	-	●	-
	CLT - timber	LBA Ø0.16	●	●	-
		LBS Ø0.20	-	●	-
	CLT - CLT lateral face - lateral face	LBA Ø0.16	●	●	-
		LBS Ø0.20	●	●	●
		LBS Ø0.28 LBSH EVO Ø0.28	-	-	●
	CLT - CLT lateral face - narrow face	LBA Ø0.16	-	-	-
		LBS Ø0.20	-	-	-
		LBS Ø0.28 LBSH EVO Ø0.28	-	-	●
	CLT - CLT lateral face - lateral face	LBA Ø0.16	●	●	●
		LBS Ø0.20	●	●	●
		LBS Ø0.28 LBSH EVO Ø0.28	-	-	●

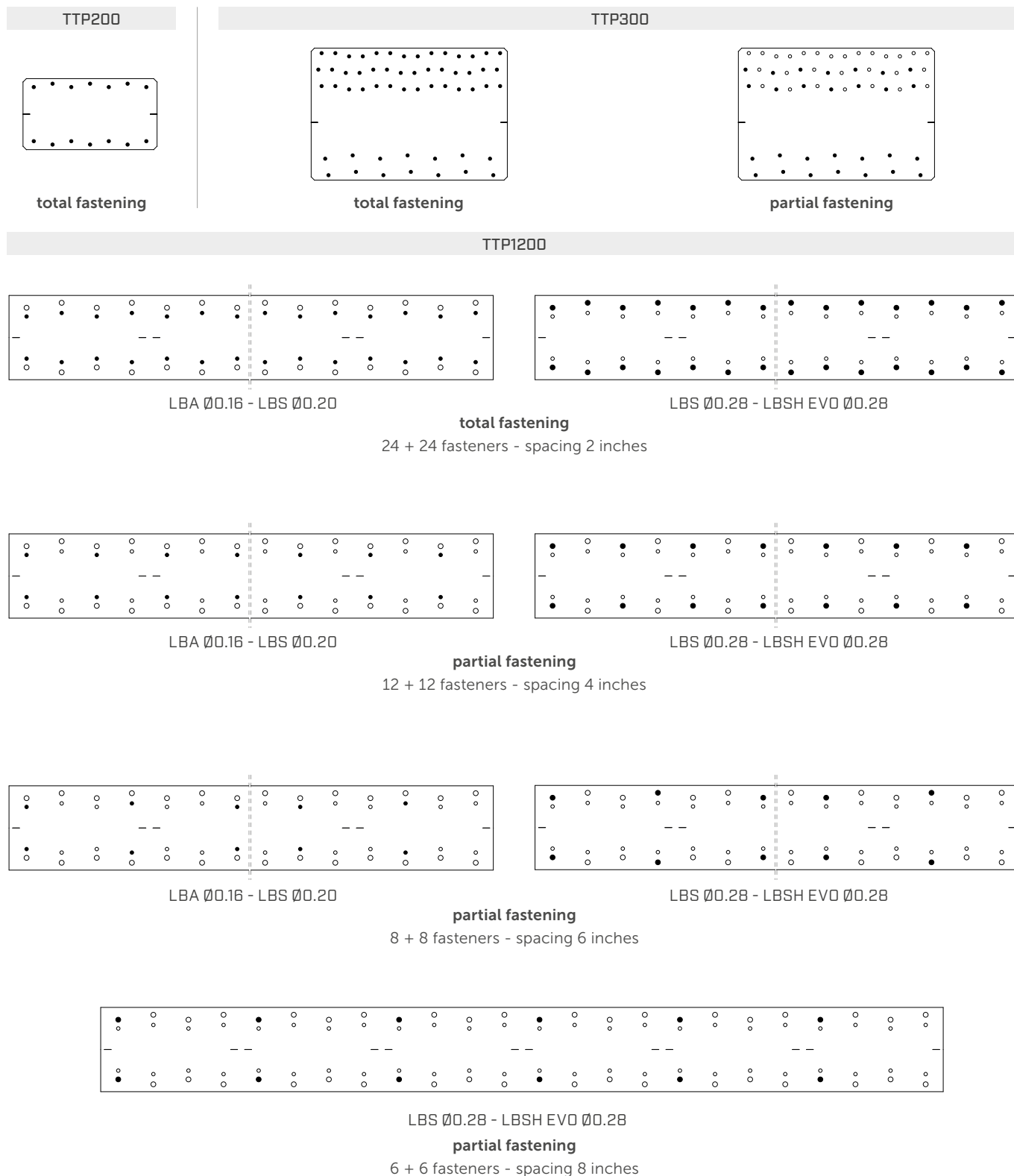
MINIMUM HEIGHT OF H_B ELEMENTS

In the case of fastening on beam/platform beam, the relative minimum H_B height of the elements is shown in the table with reference to the installation diagrams.

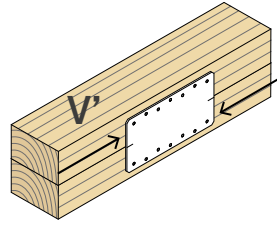
configuration	fasteners	$H_{B \min}$ [in]		
		TTP200 total	TTP300 partial	TTP300 total
timber-to-timber	LBA Ø0.16	2 15/16	4 3/8	-
	LBS Ø0.20	-	5 1/8	-
CLT - timber	LBA Ø0.16	2 15/16	4 3/8	4
	LBS Ø0.20	-	5 1/8	4 1/8

The H_B height is determined taking into account the minimum distances for solid timber or glulam consistent with EN 1995:2014 considering a timber density $\rho_k \leq 420 \text{ kg/m}^3$.

FASTENING PATTERNS



STRUCTURAL VALUES | TTP200 | V'

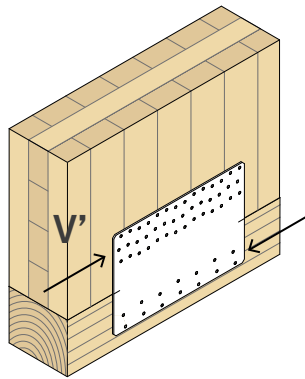


ASD VALUES

configuration	fastening holes				V'[ASD] ⁽¹⁾⁽²⁾ Allowable Shear Force			
	type	Ø x L [in]	n _{V1} [pcs]	n _{V2} [pcs]	G=0.35 [lbf]	G=0.42 [lbf]	G=0.49 [lbf]	G=0.55 [lbf]
total fastening	LBA	Ø0.16 x 2 3/8	7	7	556	646	732	802

Load duration of CD = 1.6

STRUCTURAL VALUES | TTP300 | V'

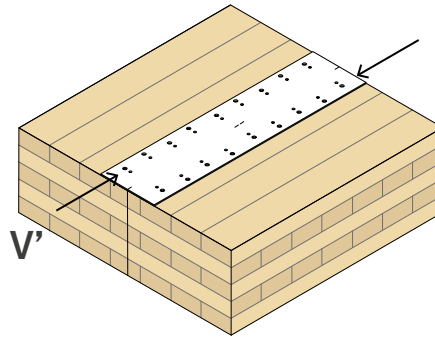


ASD VALUES

configuration	fastening holes				V'[ASD] ⁽¹⁾⁽²⁾ Allowable Shear Force			
	type	Ø x L [in]	n _{V1} [pcs]	n _{V2} [pcs]	G=0.35 [lbf]	G=0.42 [lbf]	G=0.49 [lbf]	G=0.55 [lbf]
total fastening	LBA	Ø0.16 x 2 3/8	42	14	2102	2440	2759	3019
	LBS	Ø0.20 x 2 3/8	42	14	3076	3572	4041	4423
partial fastening	LBA	Ø0.16 x 2 3/8	14	14	1143	1327	1501	1642
	LBS	Ø0.20 x 2 3/8	14	14	1673	1815	1949	2059

Load duration of CD = 1.6

CLT - CLT
lateral face - lateral face



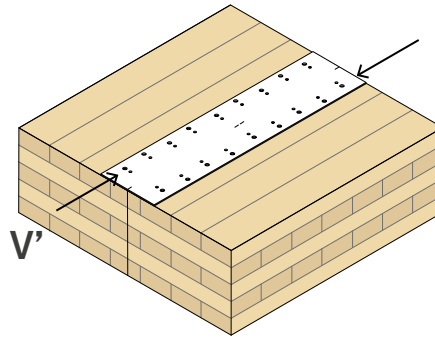
ASD VALUES

configuration	fastening holes				V'[ASD] ⁽¹⁾⁽²⁾⁽³⁾ Allowable Shear Force for Seismic							
	type	Ø x L [in]	n _{V1} [pcs]	n _{V2} [pcs]	G=0.35		G=0.42		G=0.49		G=0.55	
total fastening 24 + 24 fasteners 2 inches spacing	LBA	Ø0.16 x 2 3/8	24	24	3820	970	4463	1134	5079	1290	5588	1419
	LBS	Ø0.20 x 2 3/8	24	24	2964	753	3464	880	3943	1002	4339	1102
	LBS	Ø0.28 x 4	24	24	5086	1292	5960	1514	6802	1728	7501	1905
partial fastening 12 + 12 fasteners 4 inches spacing	LBA	Ø0.16 x 2 3/8	12	12	1910	485	2231	567	2540	645	2794	710
	LBS	Ø0.20 x 2 3/8	12	12	1482	376	1732	440	1972	501	2170	551
	LBS	Ø0.28 x 4	12	12	2543	646	2980	757	3401	864	3750	953
partial fastening 8 + 8 fasteners 6 inches spacing	LBA	Ø0.16 x 2 3/8	8	8	1273	323	1488	378	1693	430	1863	473
	LBS	Ø0.20 x 2 3/8	8	8	988	251	1155	293	1314	334	1446	367
	LBS	Ø0.28 x 4	8	8	1695	431	1987	505	2267	576	2500	635
partial fastening 6 + 6 fasteners 8 inches spacing	LBS	Ø0.28 x 4	6	6	1272	323	1490	378	1701	432	1875	476

LRFD VALUES

configuration	fastening holes				V' [LRFD] ⁽¹⁾⁽²⁾⁽³⁾ Factored Shear Force for Seismic							
	type	Ø x L [in]	n _{V1} [pcs]	n _{V2} [pcs]	G=0.35		G=0.42		G=0.49		G=0.55	
total fastening 24 + 24 fasteners 2 inches spacing	LBA	Ø0.16 x 2 3/8	24	24	5347	1358	6248	1587	7111	1806	7823	1987
	LBS	Ø0.20 x 2 3/8	24	24	4149	1054	4849	1232	5521	1402	6075	1543
	LBS	Ø0.28 x 4	24	24	7121	1809	8344	2119	9523	2419	10501	2667
partial fastening 12 + 12 fasteners 4 inches spacing	LBA	Ø0.16 x 2 3/8	12	12	2674	679	3124	793	3555	903	3911	993
	LBS	Ø0.20 x 2 3/8	12	12	2075	527	2425	616	2760	701	3037	772
	LBS	Ø0.28 x 4	12	12	3560	904	4172	1060	4761	1209	5251	1334
partial fastening 8 + 8 fasteners 6 inches spacing	LBA	Ø0.16 x 2 3/8	8	8	1782	453	2083	529	2370	602	2608	662
	LBS	Ø0.20 x 2 3/8	8	8	1383	351	1616	411	1840	467	2025	514
	LBS	Ø0.28 x 4	8	8	2374	603	2781	706	3174	806	3500	889
partial fastening 6 + 6 fasteners 8 inches spacing	LBS	Ø0.28 x 4	6	6	1780	452	2086	530	2381	605	2625	667

CLT - CLT
lateral face - lateral face



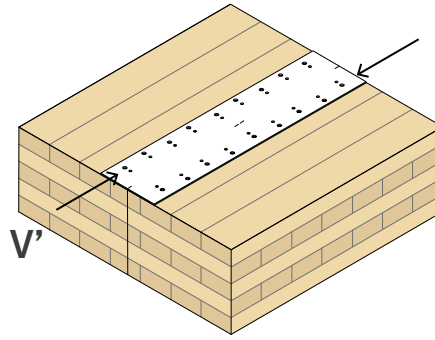
ASD VALUES

configuration	fastening holes				V' [ASD] ⁽¹⁾⁽²⁾⁽³⁾ Allowable Shear Force for Wind							
	type	Ø x L [in]	n _{V1} [pcs]	n _{V2} [pcs]	G=0.35		G=0.42		G=0.49		G=0.55	
total fastening 24 + 24 fasteners 2 inches spacing	LBA	Ø0.16 x 2 3/8	24	24	5347	1358	6248	1587	7111	1806	7823	1987
	LBS	Ø0.20 x 2 3/8	24	24	4149	1054	4849	1232	5521	1402	6075	1543
	LBS	Ø0.28 x 4	24	24	7121	1809	8344	2119	9523	2419	10501	2667
partial fastening 12 + 12 fasteners 4 inches spacing	LBA	Ø0.16 x 2 3/8	12	12	2674	679	3124	793	3555	903	3911	993
	LBS	Ø0.20 x 2 3/8	12	12	2075	527	2425	616	2760	701	3037	772
	LBS	Ø0.28 x 4	12	12	3560	904	4172	1060	4761	1209	5251	1334
partial fastening 8 + 8 fasteners 6 inches spacing	LBA	Ø0.16 x 2 3/8	8	8	1782	453	2083	529	2370	602	2608	662
	LBS	Ø0.20 x 2 3/8	8	8	1383	351	1616	411	1840	467	2025	514
	LBS	Ø0.28 x 4	8	8	2374	603	2781	706	3174	806	3500	889
partial fastening 6 + 6 fasteners 8 inches spacing	LBS	Ø0.28 x 4	6	6	1780	452	2086	530	2381	605	2625	667

LRFD VALUES

configuration	fastening holes				V' [LRFD] ⁽¹⁾⁽²⁾⁽³⁾ Factored Shear Force for Wind							
	type	Ø x L [in]	n _{V1} [pcs]	n _{V2} [pcs]	G=0.35		G=0.42		G=0.49		G=0.55	
total fastening 24 + 24 fasteners 2 inches spacing	LBA	Ø0.16 x 2 3/8	24	24	8556	2173	9996	2539	11377	2890	12516	3179
	LBS	Ø0.20 x 2 3/8	24	24	6639	1686	7759	1971	8833	2244	9720	2469
	LBS	Ø0.28 x 4	24	24	11393	2894	13350	3391	15237	3870	16802	4268
partial fastening 12 + 12 fasteners 4 inches spacing	LBA	Ø0.16 x 2 3/8	12	12	4278	1087	4998	1270	5689	1445	6258	1590
	LBS	Ø0.20 x 2 3/8	12	12	3320	843	3880	985	4417	1122	4860	1234
	LBS	Ø0.28 x 4	12	12	5696	1447	6675	1695	7618	1935	8401	2134
partial fastening 8 + 8 fasteners 6 inches spacing	LBA	Ø0.16 x 2 3/8	8	8	2852	724	3332	846	3792	963	4172	1060
	LBS	Ø0.20 x 2 3/8	8	8	2213	562	2586	657	2944	748	3240	823
	LBS	Ø0.28 x 4	8	8	3798	965	4450	1130	5079	1290	5601	1423
partial fastening 6 + 6 fasteners 8 inches spacing	LBS	Ø0.28 x 4	6	6	2848	723	3337	848	3809	968	4200	1067

CLT - CLT
lateral face - lateral face



ASD VALUES

configuration	fastening holes				V'[ASD] ⁽¹⁾⁽²⁾⁽³⁾ Allowable Shear Force							
	type	Ø x L [in]	n _{V1} [pcs]	n _{V2} [pcs]	G=0.35		G=0.42		G=0.49		G=0.55	
					[lbf]	[lbf/ft]	[lbf]	[lbf/ft]	[lbf]	[lbf/ft]	[lbf]	[lbf/ft]
total fastening 24 + 24 fasteners 2 inches spacing	LBA	Ø0.16 x 2 3/8	24	24	3803	966	4443	1128	5057	1284	5563	1413
	LBS	Ø0.20 x 2 3/8	24	24	2951	749	3448	876	3926	997	4320	1097
	LBS	Ø0.28 x 4	24	24	5064	1286	5933	1507	6772	1720	7467	1897
partial fastening 12 + 12 fasteners 4 inches spacing	LBA	Ø0.16 x 2 3/8	12	12	1901	483	2221	564	2528	642	2781	706
	LBS	Ø0.20 x 2 3/8	12	12	1475	375	1724	438	1963	499	2160	549
	LBS	Ø0.28 x 4	12	12	2532	643	2967	754	3386	860	3734	948
partial fastening 8 + 8 fasteners 6 inches spacing	LBA	Ø0.16 x 2 3/8	8	8	1268	322	1481	376	1686	428	1854	471
	LBS	Ø0.20 x 2 3/8	8	8	984	250	1149	292	1309	332	1440	366
	LBS	Ø0.28 x 4	8	8	1688	429	1978	502	2257	573	2489	632
partial fastening 6 + 6 fasteners 8 inches spacing	LBS	Ø0.28 x 4	6	6	1266	322	1483	377	1693	430	1867	474

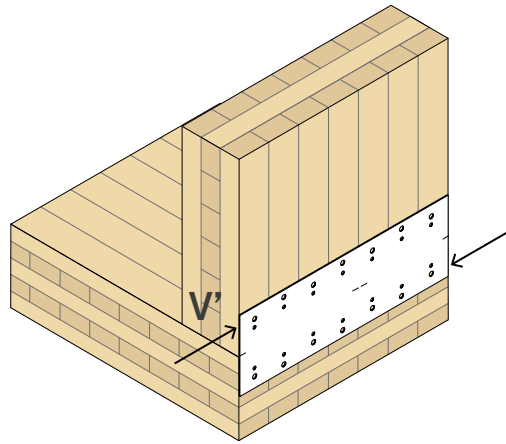
Load duration of CD = 1.6

LRFD VALUES

configuration	fastening holes				V'[LRFD] ⁽¹⁾⁽²⁾⁽³⁾ Factored Shear Force							
	type	Ø x L [in]	n _{V1} [pcs]	n _{V2} [pcs]	G=0.35		G=0.42		G=0.49		G=0.55	
					[lbf]	[lbf/ft]	[lbf]	[lbf/ft]	[lbf]	[lbf/ft]	[lbf]	[lbf/ft]
total fastening 24 + 24 fasteners 2 inches spacing	LBA	Ø0.16 x 2 3/8	24	24	5129	1303	5992	1522	6820	1732	7503	1906
	LBS	Ø0.20 x 2 3/8	24	24	3980	1011	4651	1181	5295	1345	5826	1480
	LBS	Ø0.28 x 4	24	24	6829	1735	8002	2033	9134	2320	10072	2558
partial fastening 12 + 12 fasteners 4 inches spacing	LBA	Ø0.16 x 2 3/8	12	12	2564	651	2996	761	3410	866	3751	953
	LBS	Ø0.20 x 2 3/8	12	12	1990	505	2326	591	2648	672	2913	740
	LBS	Ø0.28 x 4	12	12	3415	867	4001	1016	4567	1160	5036	1279
partial fastening 8 + 8 fasteners 6 inches spacing	LBA	Ø0.16 x 2 3/8	8	8	1710	434	1997	507	2273	577	2501	635
	LBS	Ø0.20 x 2 3/8	8	8	1327	337	1550	394	1765	448	1942	493
	LBS	Ø0.28 x 4	8	8	2276	578	2667	678	3045	773	3357	853
partial fastening 6 + 6 fasteners 8 inches spacing	LBS	Ø0.28 x 4	6	6	1707	434	2001	508	2283	580	2518	640

Load duration of λ = 1.0

CLT - CLT
lateral face - narrow face



ASD VALUES

configuration	fastening holes				V'[ASD] ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾ Allowable Shear Force							
	type	Ø x L [in]	n _{V1} [pcs]	n _{V2} [pcs]	G=0.35		G=0.42		G=0.49		G=0.55	
					[lb]	[lb/ft]	[lb]	[lb/ft]	[lb]	[lb/ft]	[lb]	[lb/ft]
total fastening 24 + 24 fasteners 2 inches spacing	LBS	Ø0.28 x 4	24	24	3798	965	4450	1130	5079	1290	5601	1423
partial fastening 12 + 12 fasteners 4 inches spacing	LBS	Ø0.28 x 4	12	12	1899	482	2225	565	2539	645	2800	711

LRFD VALUES

configuration	fastening holes				V'[LRFD] ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾ Factored Shear Force							
	type	Ø x L [in]	n _{V1} [pcs]	n _{V2} [pcs]	G=0.35		G=0.42		G=0.49		G=0.55	
					[lb]	[lb/ft]	[lb]	[lb/ft]	[lb]	[lb/ft]	[lb]	[lb/ft]
total fastening 24 + 24 fasteners 2 inches spacing	LBS	Ø0.28 x 4	24	24	6829	1735	6002	1524	6850	1740	7554	1919
partial fastening 12 + 12 fasteners 4 inches spacing	LBS	Ø0.28 x 4	12	12	2561	651	3001	762	3425	870	3777	959

STRUCTURAL VALUES

GENERAL PRINCIPLES

- The steel plate made of Z275 carbon steel has a specified tensile strength equal to ~47.8 ksi with a DX51D coating, similar to galvanized finish.
- The specified bending yield strength values are as follows: LBA with a diameter of 0.16 in has $f_{yb} = 94000$ psi, LBS/LBS EVO with a diameter of 0.20 in has $f_{yb} = 180000$ psi, and LBS/LBS EVO with a diameter of 0.28 in has $f_{yb} = 192000$ psi.
- G is the mean relative density according to Table A.11. Most common wood species are assumed such as Northern species (G = 0.35), Spruce-Pine-Fir (G = 0.42), Douglas Fir (G = 0.49), and Southern Pine (G = 0.55).
- It is admitted that the distance between the center of mass of the two nailed parts generates a transport moment that is already absorbed by the fasteners in the calculated values. For TTP300, the rotational stiffness of the upper section is much greater, therefore the moment was distributed only on this portion of the steel plate.
- Dimensioning and verification of the timber elements must be carried out separately.

NOTES

- (1) Strength values are valid for all full/partial configurations indicated in the INSTALLATION section.
- (2) The design values for nails and wood screws has been determined following the guidelines according NDS2018 or SDPWS2021 Section 4.5.4. For values according NDS2018, the listed values are based on standard load duration factor (CD = 1.6), time effect factor ($\lambda = 1.0$), format Conversion factor ($K_F = 3.32$), resistance factor ($\phi_Z = 0.65$), dry service condition factor ($C_M = 1.0$), and temperature factor ($C_T = 1.0$).
- (3) Values calculated according to SDPWS2021 can be use if following 2021 International Building Code (IBC) and onward.
- (4) $C_{eg} = 0.75$ factor was considered in the calculations of narrow face connection.