TITAN PLATE T TIMBER

PLATE FOR SHEAR LOADS

DESIGN REGISTERED

UK CA EN 14545

CE EN 14545

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

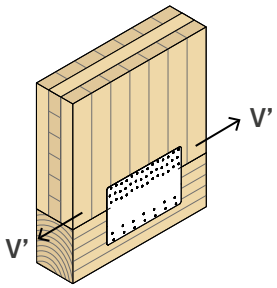
CANADA, EU and more design values available online.

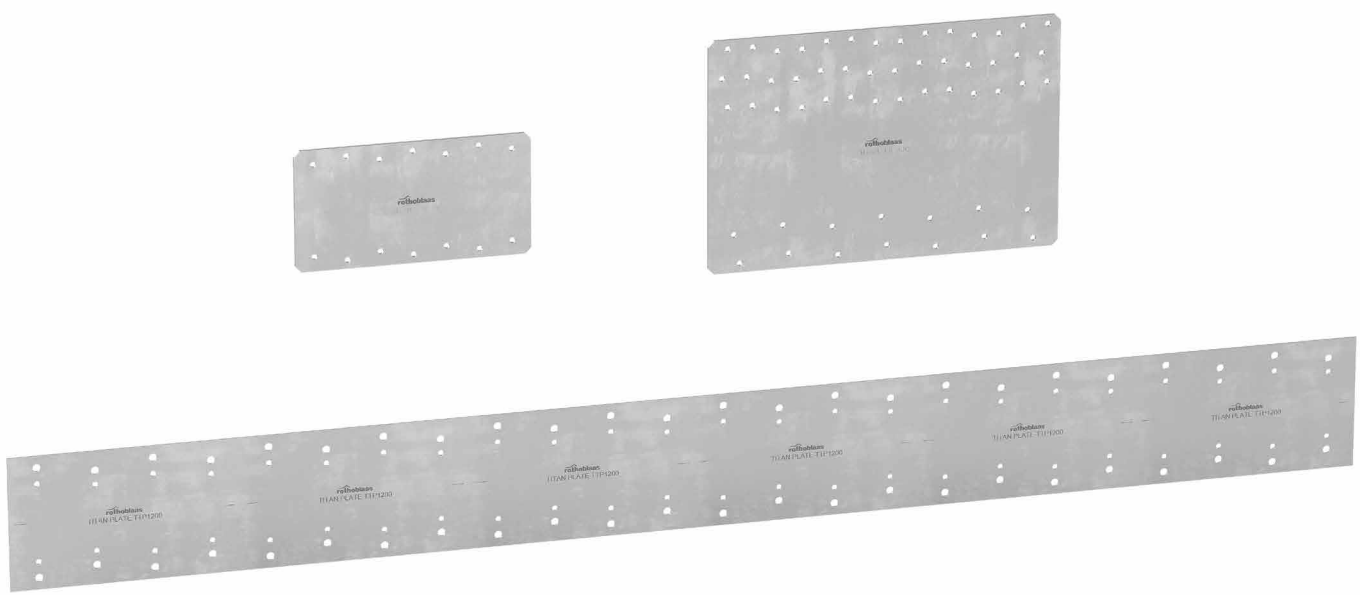
SERVICE CONDITION DRY

MATERIAL

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

EXTERNAL LOADS





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

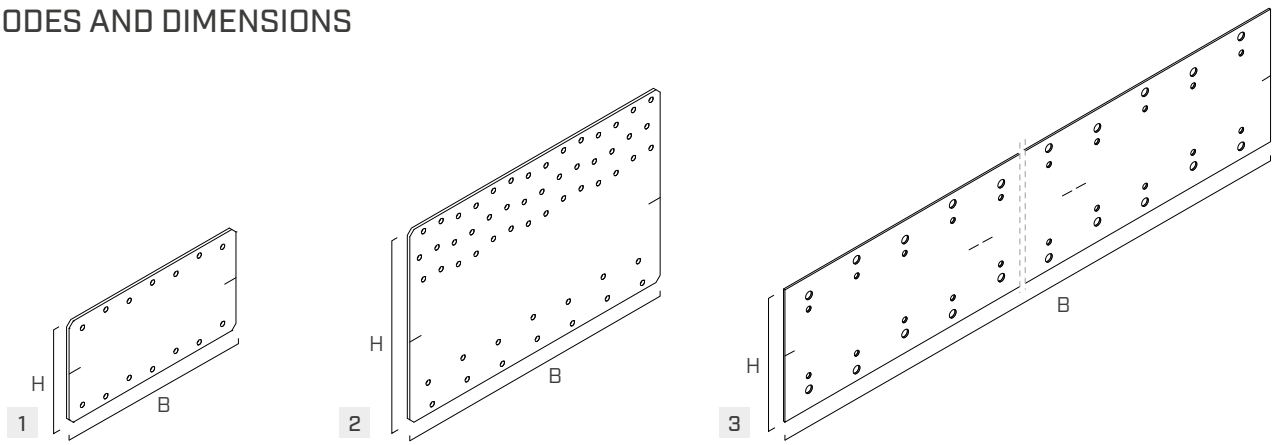
SPLINE STRAP

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

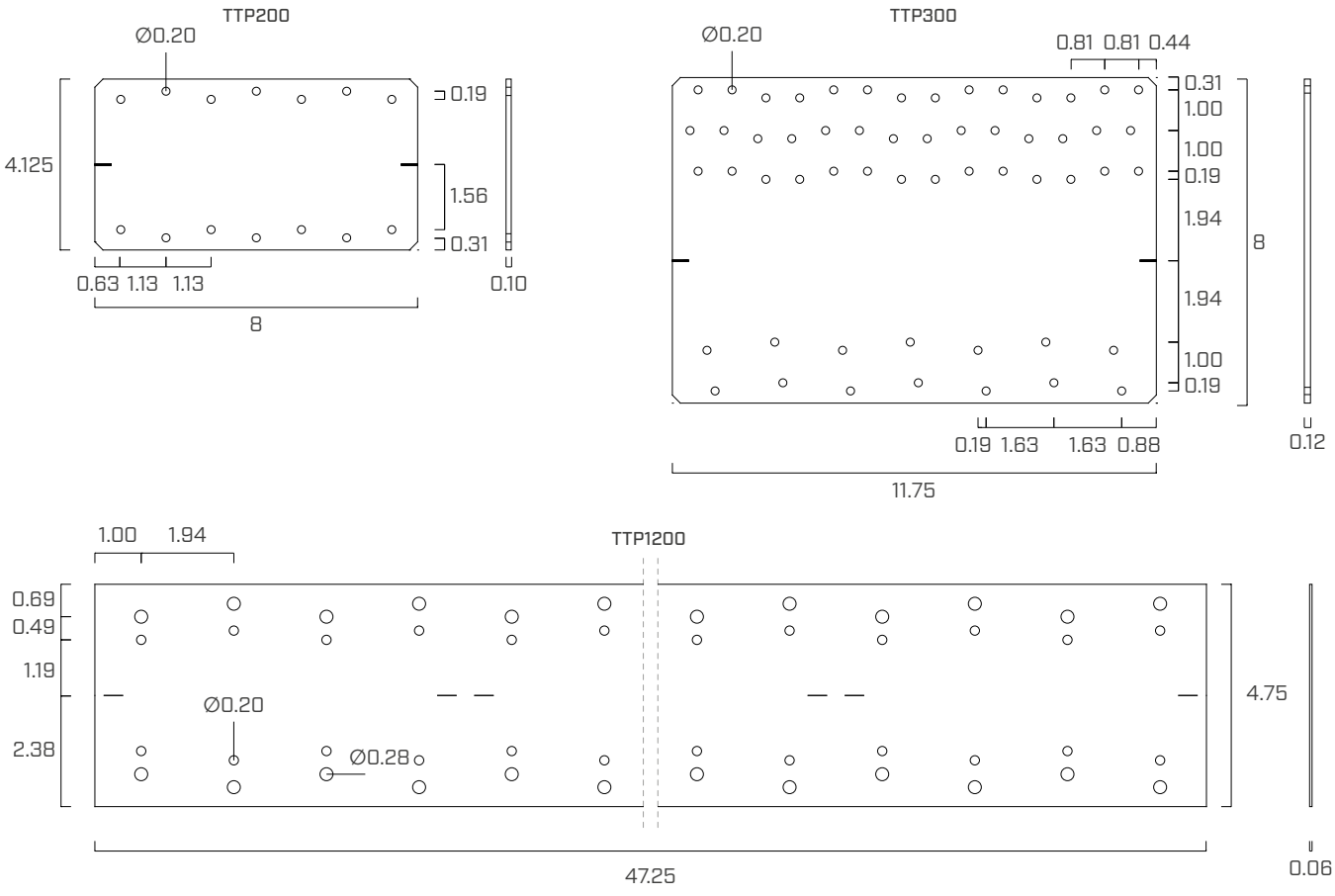


	CODE	B [in]	H [in]	s [in]	n_{V1} Ø0.20 [pcs]	n_{V2} Ø0.20 [pcs]	n_{V1} Ø0.28 [pcs]	n_{V2} Ø0.28 [pcs]		pcs
1	**TTP200**	8	4 1/8	0.10	7	7	-	-	●	10
2	**TTP300**	11 3/4	8	0.12	42	14	-	-	●	5
3	**TTP1200**	47 1/4	4 3/4	0.06	48	48	48	48	●	5

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	

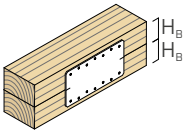
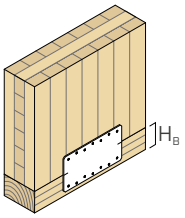
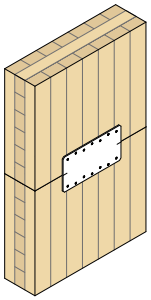
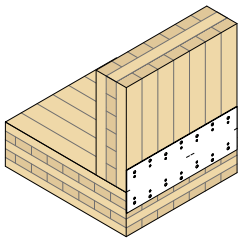
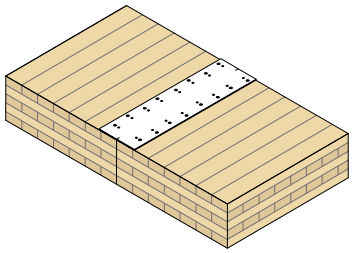
GEOMETRY



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

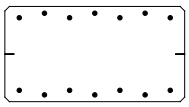
In the case of fastening on beam/platform beam, the relative minimum H_B height of the elements is shown in the table with reference to the installation diagrams.

configuration	fasteners	$H_{B\,min}$ [in]		
		TTP200	TTP300	
		total	partial	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 $\rho_k \leq 420$ kg/m^3.

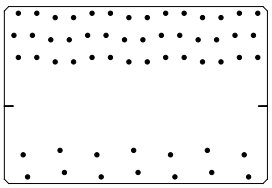
FASTENING PATTERNS

TTP200

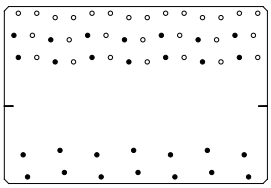


total fastening

TTP300

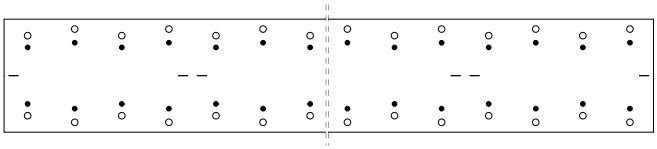


total fastening

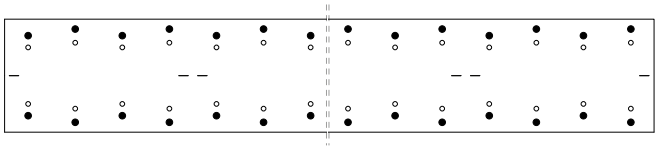


partial fastening

TTP1200



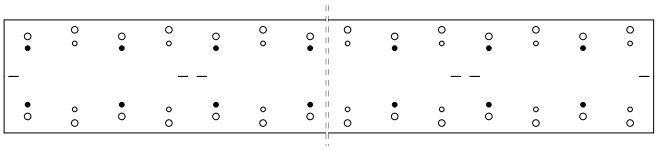
LBA Ø0.16 - LBS Ø0.20



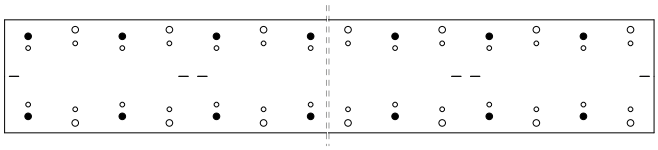
LBS Ø0.28 - LBSH EVO Ø0.28

total fastening

24 + 24 fasteners - spacing 2 inches



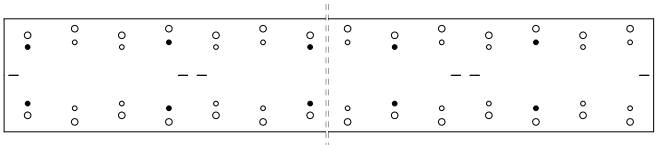
LBA Ø0.16 - LBS Ø0.20



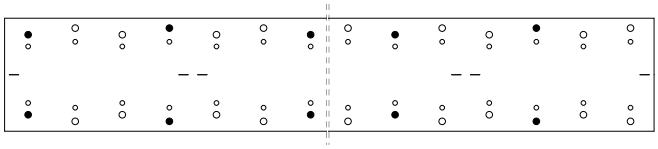
LBS Ø0.28 - LBSH EVO Ø0.28

partial fastening

12 + 12 fasteners - spacing 4 inches



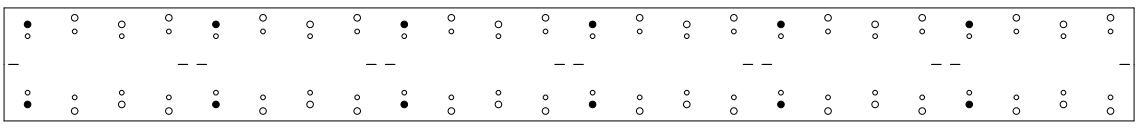
LBA Ø0.16 - LBS Ø0.20



LBS Ø0.28 - LBSH EVO Ø0.28

partial fastening

8 + 8 fasteners - spacing 6 inches

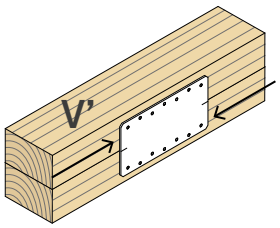


LBS Ø0.28 - LBSH EVO Ø0.28

partial fastening

6 + 6 fasteners - spacing 8 inches

STRUCTURAL VALUES | **TTP200** | V'

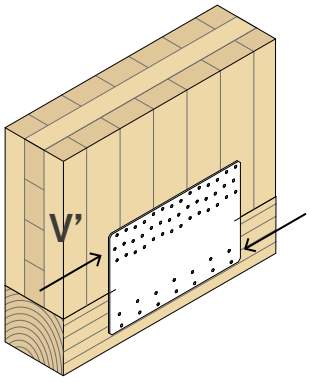


ASD VALUES

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'

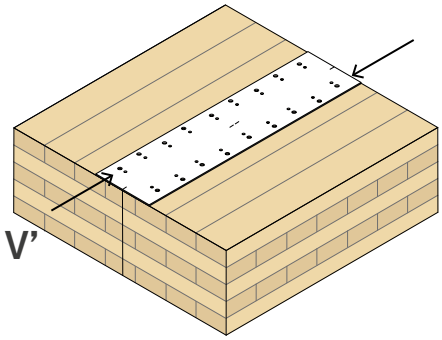


ASD VALUES

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



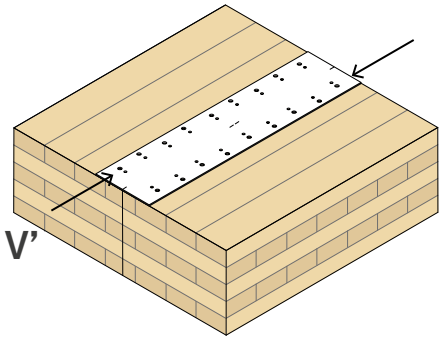
ASD VALUES

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 [lbf]	G=0.35 [lbf/ft]	G=0.42 [lbf]	G=0.42 [lbf/ft]	G=0.49 [lbf]	G=0.49 [lbf/ft]	G=0.55 [lbf]	G=0.55 [lbf/ft]
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 [lbf]	G=0.35 [lbf/ft]	G=0.42 [lbf]	G=0.42 [lbf/ft]	G=0.49 [lbf]	G=0.49 [lbf/ft]	G=0.55 [lbf]	G=0.55 [lbf/ft]
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



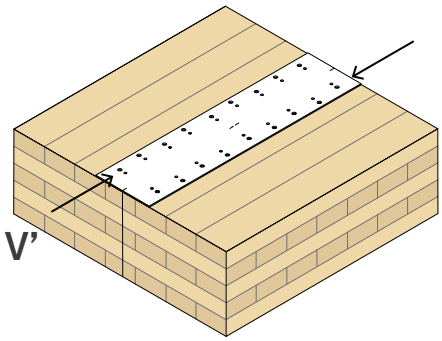
ASD VALUES

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 [lbf]	G=0.35 [lbf/ft]	G=0.42 [lbf]	G=0.42 [lbf/ft]	G=0.49 [lbf]	G=0.49 [lbf/ft]	G=0.55 [lbf]	G=0.55 [lbf/ft]
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 [lbf]	G=0.35 [lbf/ft]	G=0.42 [lbf]	G=0.42 [lbf/ft]	G=0.49 [lbf]	G=0.49 [lbf/ft]	G=0.55 [lbf]	G=0.55 [lbf/ft]
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

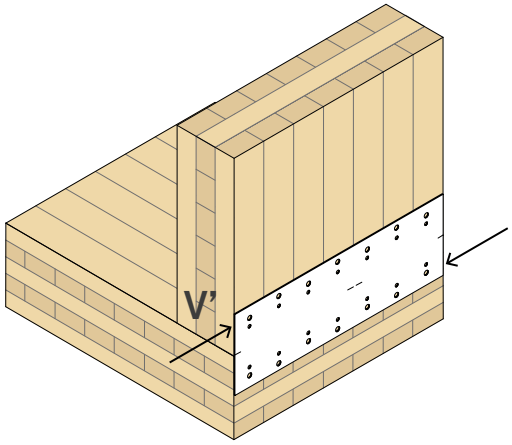
LRFD VALUES

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

STRUCTURAL VALUES | **TTP1200** | V'

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	
					[lbf]	[lbf/ft]	[lbf]	[lbf/ft]	[lbf]	[lbf/ft]	[lbf]	[lbf/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	
					[lbf]	[lbf/ft]	[lbf]	[lbf/ft]	[lbf]	[lbf/ft]	[lbf]	[lbf/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 stifness of the upper section is much greater, threfore 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 (λ=1.0), format Conversion factor (K_F = 3.32), resistance factor (φ_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.