GP — Gusset Plate

Prepunched Holes and Dimples Allow For Easy Installation

The GP gusset plate is designed to secure cold-formed steel (CFS) strapped shearwalls, truss connectors, miscellaneous wall connectors and other framing applications. The GP66 (6" x 6") and GP69 (6" x 9") have holes conveniently located 1" center-to-center to make screw installation easy and quick. The GP612 (6" x 12") and GP1212 (12" x 12") have holes on the outside edges and dimples in the center. The dimples act as screw locators when attaching from gusset plate to CFS member. When attaching from CFS member (i.e., strap bracing) to gusset plate, the dimples avoid the interference that prepunched holes could cause.

Features

- Multiple stocked sizes and thicknesses to meet job site needs
- Prepunched holes for easy and quick installation
- Dimples in the GP612 and GP1212 models provide more flexibility for fastening cross-bracing to the gusset plate as they act as screw placement locators that can accommodate various strap and framing dimensions

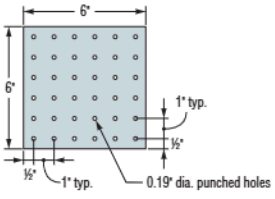
Material: 43 mil (18 ga.) — 33 ksi; 54 mil (16 ga.) — 50 ksi; 68 mil (14 ga.) — 50 ksi; 97 mil (12 ga.)— 50 ksi

Finish: Galvanized (G90)

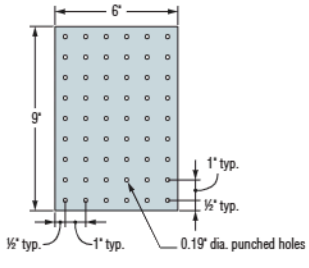
Ordering Information:

Model No.	Ordering SKU	Size (in.)	Thickness mil (ga.)	Package Qty.
GP66/54	GP66/54-R50	6 x 6	54 (16)	50
GP69/43	GP69/43-R30	6 x 9	43 (18)	30
GP69/54	GP69/54-R25		54 (16)	25
GP612/68	GP612/68-R20	6 x 12	68 (14)	20
GP1212/68	GP1212/68-R15	12 x 12	68 (14)	15
GP1212/97	GP1212/97-R10		97 (12)	10

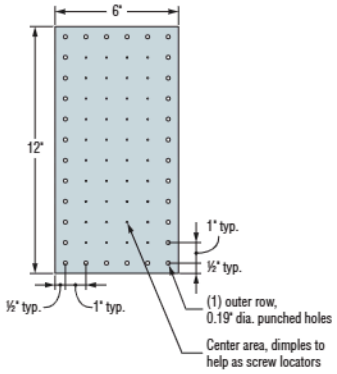
6" x 6" (GP66/54)



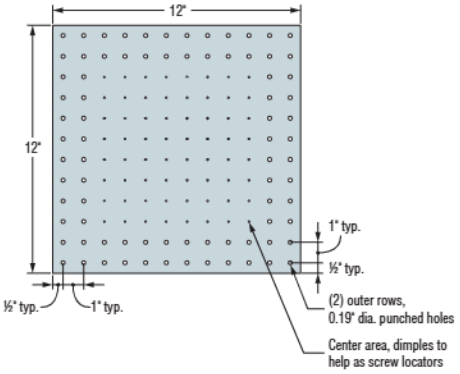
6" x 9" (GP69/43, GP69/54)



6" x 12" (GP612/68)



12" x 12" (GP1212/68, GP1212/97)

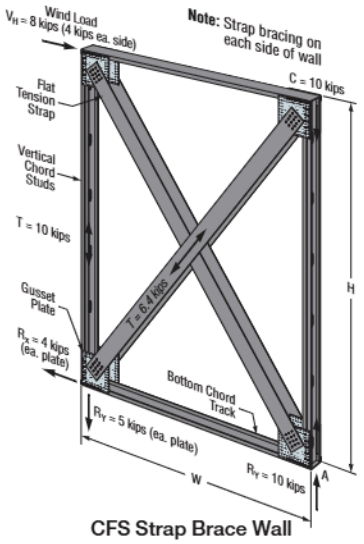


GP — Gusset Plate

Design Example

Given:

- 2024 IBC and AISI S100-16
- 600S162-68 (50 ksi) studs
- 600T125-68 (50 ksi) tracks @ top and bottom
- Gusset Plate: GP1212-68 (F_y = 50 ksi, F_u = 65 ksi)
- Strap 6" wide (F_y = 50 ksi , F_u = 65 ksi) — 14 ga. (0.0713" design thickness)
- Wall height, H = 10'; Wall width, W = 8'
- Horizontal wind load at top of wall from diaphragm = 8,000 lb. (ASD)
- The straps install on both side of the wall; screw spacing is specified as 1" in both horizontal and vertical directions



CFS Strap Brace Wall

Calculations:

The wind load is V = 8,000 lb. (4,000 lb./ea. side). Summing the moments about A to achieve equilibrium, we have the following expression. *Note axial load has been neglected because this assumption produces the highest anchor tension demand:*

$\Sigma M_A = V_H \times H - R_y \times W = 0$

Determine ASD Vertical , Horizontal and Diagonal Loads:

Vertical chord load =	10,000 lb. (5,000 lb. ea. GP plate)
Horizontal chord load =	8,000 lb. (4,000 lb. ea. GP plate)
Diagonal load =	6,403 lb. ea. strap

Flat Tension Strap:

- **For strap yielding:** $T_n = A_g F_y$ (Eq. D2-1)

Gross area of cross-section	A_g =	0.428 in²	
	Ω_t =	1.67	
	T_n / Ω_t =	12,808 lb.	

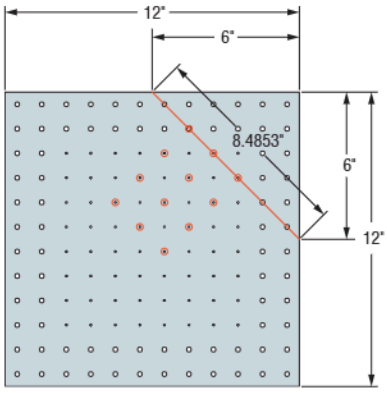
- **For fracture away from connection:**

Assume 3 screw holes:	d_{hole} =	0.190 in.	
	$T_n = A_n F_u$		(Eq. D3-1)
Net area of cross-section	A_n =	0.387 in²	
	Ω_t =	2.0	
	T_n / Ω_t =	12,583 lb.	

- **Tension Rupture:** $P_{nt} = A_e F_u$ (Eq. J6.2-1)

Effective net area subject to tension $A_e = U_{sl} A_{nt}$	A_e =	0.352 in²	
Shear lag factor	U_{sl} =	0.910	(Eq. J6.2-4)
Net area subject to tension	A_{nt} =	0.387 in²	
	Ω =	3	(Table J6-1)
	P_{nt} / Ω =	7,629 lb.	

Allowable Tension of Strap, T_{allow} = 7,629 lb. > 6,403 lb. OK



Gusset Plate Net Section

Tension capacity of Gusset Plate:

- **For Gusset Plate yielding:** $T_n = A_g F_y$ (Eq. D2-1)

Gross area of cross-section	A_g =	0.612 in²	
	Ω_t =	1.67	
	T_n / Ω_t =	18,318 lb.	

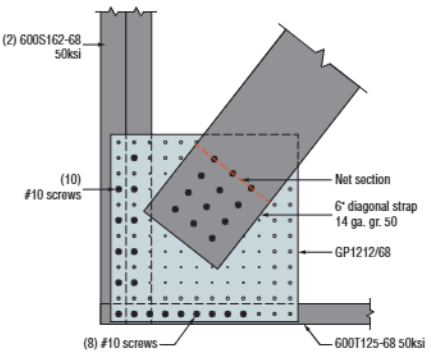
- **For fracture away from connection:**

Assume 6 screw holes:	d_{hole} =	0.190 in.	
	$T_n = A_n F_u$		(Eq. D3-1)
Net area of cross-section	A_n =	0.530 in²	
	Ω_t =	2.0	
	T_n / Ω_t =	17,213 lb.	

- **Tension Rupture:** $P_{nt} = A_e F_u$ (Eq. J6.2-1)

Effective net area subject to tension $A_e = U_{sl} A_{nt}$	A_e =	0.484 in²	
Shear lag factor	U_{sl} =	0.913	(Eq. J6.2-4)
Net area subject to tension	A_{nt} =	0.530 in²	
	Ω =	3	(Table J6-1)
	P_{nt} / Ω =	10,482 lb.	

Allowable Tension of Gusset Plate, T_{allow} = 10,482 lb. > 6,403 lb. OK



GP1212/68 Installation

#10 screws 14 ga. (50 ksi) Strap attached to 14 ga. (50 ksi) Gusset Plate

ASD Shear #10 Screws **540 lb.** (Simpson Strong-Tie® #10 X Metal Screw)

Strap-to-Gusset Plate Connection:	Number of screws required =	11.86	**Use 12 #10 screws**
Gusset-to-Stud Connection:	Number of screws required =	9.26	**Use 10 #10 screws**
Gusset-to-Track Connection:	Number of screws required =	7.41	**Use 8 #10 screws**

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