Glulam Garage Door Headers Offer Design Options

ENGINEERED WOOD SYSTEMS
APA EWS

GLULAM HEADERS OFFER VERSATILITY AND DESIGN OPTIONS

Glulam is a highly versatile product that can be manufactured to meet many design and appearance requirements for residential framing. One of the most common applications for glulam in home construction is garage door headers. Glulam can span distances long enough to allow garage door openings for up to three cars.

10 reasons to use glulam headers:

1. Glulam headers come as a single piece: they don't have to be nailed together like some other header materials.
2. Glulam is dry, straight, and dimensionally stable. Because it won't warp or twist, it makes it easy to frame a straight garage door opening.
3. Glulam is manufactured under strict industry-wide quality control standards, which means you can count on every piece to perform as intended.
4. Glulam is stronger than lumber headers, allowing wider openings with smaller members.
5. Glulam can be supplied in long lengths, so it's simple to extend the header over narrow end walls to gain added lateral strength at little additional cost.
6. Glulam is available in all major market areas and can be ordered in cut-to-length sizes, eliminating jobsite waste and cost.
7. Glulam is available in widths that match standard 2x4 and 2x6 wall construction, so there's no need for furring when you connect headers to end walls.
8. Glulam is supplied with zero or minimal camber assuring a level garage door opening with no sag.
9. Glulam is easy to work with using traditional carpentry tools.
10. And, glulam is environmentally friendly. It's manufactured from small dimension lumber harvested from managed timberlands.

Connection Details

APA EWS trademarked glulam beams are supplied with either zero camber or a very flat factory built-in camber which makes it easy to connect glulam with other wood frame components. Figures 1-5 illustrate some of the many simple connection details that can be used with glulam in residential garage door framing. These details are also available from APA in CAD format as a CD.

Installation Recommendations

Notching and Drilling of Glulam

Since glulam timbers are highly engineered components manufactured from specially selected and positioned lumber laminations, an improperly cut notch or a hole drilled in the wrong place can seriously affect the load carrying capacity of the member.

Field notching, cutting or drilling of a glulam beam, particularly on the tension side of the member, should be avoided. Field conditions may require making a cut, notch or hole that was not originally anticipated. In some instances, these can be made in areas of the glulam which are not highly stressed and will thus have minimal effect on the structural capacity of the member. For more information on these specific conditions, refer to the Engineered Wood Systems Technical Note: *Field Notching and Drilling of Glued Laminated Timber Beams,* Form EWS S560.

FIGURE 1

GARAGE DOOR HEADER TO END WALL

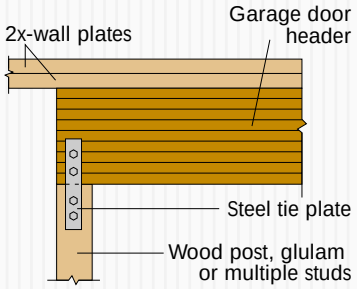


FIGURE 2

GARAGE DOOR HEADER TO END WALL

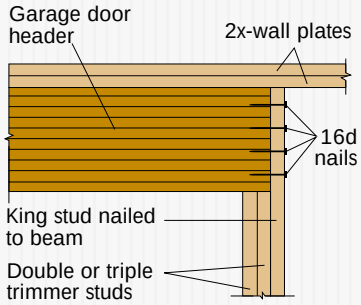


FIGURE 3

GARAGE DOOR HEADER TO END WALL

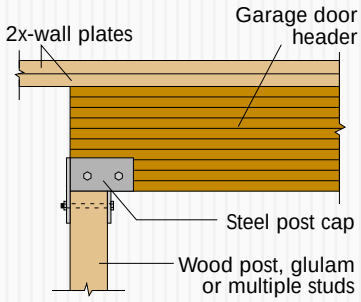


FIGURE 4

GARAGE DOOR HEADER OVER INTERMEDIATE SUPPORT

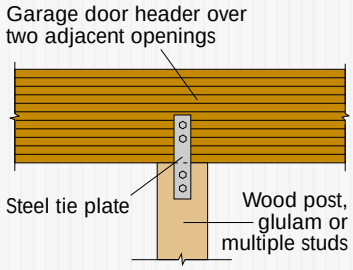


FIGURE 5

GARAGE DOOR HEADER OVER INTERMEDIATE SUPPORT

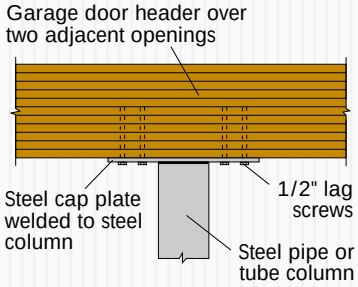


TABLE 1

***APA EWS 24F-1.8E GRADE*, GLULAM GARAGE DOOR HEADERS FOR SINGLE-STORY APPLICATIONS**
Rough Door Opening = 9 ft 3 in. (Beam depths based on 1-1/2" laminations.)

	Span of supported roof trusses (ft)							
	22	**24**	**26**	**28**	**30**	**32**	**34**	**36**
Non-Snow Load 15 psf Dead 20 psf Live	3-1/8 x 7-1/2 3-1/2 x 7-1/2 5-1/8 x 6 5-1/2 x 6	3-1/8 x 7-1/2 3-1/2 x 7-1/2 5-1/8 x 6 5-1/2 x 6	3-1/8 x 7-1/2 3-1/2 x 7-1/2 5-1/8 x 6 5-1/2 x 6	3-1/8 x 7-1/2 3-1/2 x 7-1/2 5-1/8 x 7-1/2 5-1/2 x 6	3-1/8 x 7-1/2 3-1/2 x 7-1/2 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 7-1/2 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 7-1/2 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 7-1/2 5-1/8 x 7-1/2 5-1/2 x 7-1/2
Snow Load 15 psf Dead 25 psf Snow	3-1/8 x 7-1/2 3-1/2 x 7-1/2 5-1/8 x 6 5-1/2 x 6	3-1/8 x 9 3-1/2 x 7-1/2 5-1/8 x 7-1/2 5-1/2 x 6	3-1/8 x 9 3-1/2 x 7-1/2 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 7-1/2 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2
Snow Load 15 psf Dead 30 psf Snow	3-1/8 x 9 3-1/2 x 7-1/2 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 7-1/2 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2
Snow Load 15 psf Dead 40 psf Snow	3-1/8 x 9 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9

TABLE 2

***APA EWS 24F-1.8E GRADE*, GLULAM GARAGE DOOR HEADERS FOR SINGLE-STORY APPLICATIONS**
Rough Door Opening = 16 ft 3 in. (Beam depths based on 1-1/2" laminations.)

	Span of supported roof trusses (ft)							
	22	**24**	**26**	**28**	**30**	**32**	**34**	**36**
Non-Snow Load 15 psf Dead 20 psf Live	3-1/8 x 12 3-1/2 x 12 5-1/8 x 10-1/2 5-1/2 x 10-1/2	3-1/8 x 12 3-1/2 x 12 5-1/8 x 10-1/2 5-1/2 x 10-1/2	3-1/8 x 13-1/2 3-1/2 x 12 5-1/8 x 10-1/2 5-1/2 x 10-1/2	3-1/8 x 13-1/2 3-1/2 x 12 5-1/8 x 12 5-1/2 x 10-1/2	3-1/8 x 13-1/2 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 10-1/2	3-1/8 x 13-1/2 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 12	3-1/8 x 15 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 12	3-1/8 x 15 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 12
Snow Load 15 psf Dead 25 psf Snow	3-1/8 x 13-1/2 3-1/2 x 12 5-1/8 x 10-1/2 5-1/2 x 10-1/2	3-1/8 x 13-1/2 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 10-1/2	3-1/8 x 15 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 10-1/2	3-1/8 x 15 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 12	3-1/8 x 15 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 12	3-1/8 x 15 3-1/2 x 15 5-1/8 x 12 5-1/2 x 12	3-1/8 x 16-1/2 3-1/2 x 15 5-1/8 x 12 5-1/2 x 12	3-1/8 x 16-1/2 3-1/2 x 15 5-1/8 x 13-1/2 5-1/2 x 12
Snow Load 15 psf Dead 30 psf Snow	3-1/8 x 13-1/2 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 10-1/2	3-1/8 x 15 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 12	3-1/8 x 15 3-1/2 x 13-1/2 5-1/8 x 12 5-1/2 x 12	3-1/8 x 15 3-1/2 x 15 5-1/8 x 12 5-1/2 x 12	3-1/8 x 16-1/2 3-1/2 x 15 5-1/8 x 12 5-1/2 x 12	3-1/8 x 16-1/2 3-1/2 x 15 5-1/8 x 13-1/2 5-1/2 x 12	3-1/8 x 16-1/2 3-1/2 x 15 5-1/8 x 13-1/2 5-1/2 x 12	3-1/8 x 18 3-1/2 x 16-1/2 5-1/8 x 13-1/2 5-1/2 x 13-1/2
Snow Load 15 psf Dead 40 psf Snow	3-1/8 x 15 3-1/2 x 15 5-1/8 x 12 5-1/2 x 12	3-1/8 x 16-1/2 3-1/2 x 15 5-1/8 x 12 5-1/2 x 12	3-1/8 x 16-1/2 3-1/2 x 15 5-1/8 x 13-1/2 5-1/2 x 12	3-1/8 x 16-1/2 3-1/2 x 16-1/2 5-1/8 x 13-1/2 5-1/2 x 13-1/2	3-1/8 x 18 3-1/2 x 16-1/2 5-1/8 x 13-1/2 5-1/2 x 13-1/2	3-1/8 x 18 3-1/2 x 16-1/2 5-1/8 x 13-1/2 5-1/2 x 13-1/2	3-1/8 x 18 3-1/2 x 18 5-1/8 x 15 5-1/2 x 13-1/2	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 15 5-1/2 x 15

Notes to Tables 1 and 2:

1. These tables are for preliminary design use only. Final design should include a complete analysis, including bearing stresses and lateral stability.
2. Service condition = dry.
3. Maximum deflection under live load = span/240.
4. Maximum deflection under total load = span/180.
5. Maximum 2-ft roof truss overhangs.
6. Beam weight = 36 pcf.
7. Rough door opening assumes a maximum bearing length of 4-1/2 inches.
8. Design properties at normal load duration and dry service conditions F_b = 2,400 psi, F_v = 195 psi, E_x = 1.8 x 10^6 psi.
9. Beam widths of 3 and 5 inches may be substituted for 3-1/8 and 5-1/8 inches, respectively, at the same tabulated depth.

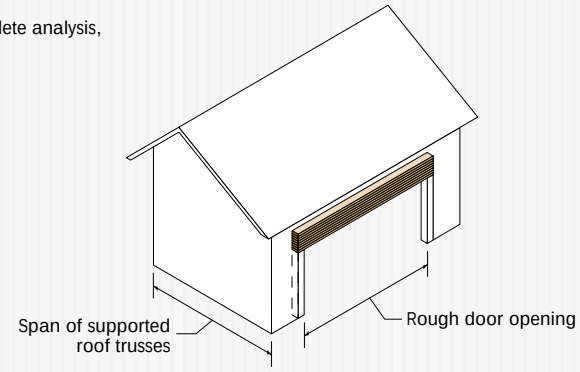


TABLE 3

GARAGE DOOR HEADERS FOR TWO-STORY APPLICATIONS
Rough Door Opening = 9 ft 3 in. (Beam depths based on 1-1/2" laminations.)
Dead Load Assumptions: 15 psf roof, 80 plf wall, 10 psf floor; Live Load Assumptions: 40 psf floor, roof as shown

	Span of supported roof framing (ft)							
	22	**24**	**26**	**28**	**30**	**32**	**34**	**36**
Non-Snow Load 20 psf Live	3-1/8 x 9 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 9 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9
Snow Load 25 psf Snow	3-1/8 x 10-1/2 3-1/2 x 9 5-1/8 x 7-1/2 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 12 5-1/8 x 9 5-1/2 x 9
Snow Load 30 psf Snow	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 7-1/2	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 12 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 12 5-1/8 x 10-1/2 5-1/2 x 9	3-1/8 x 12 3-1/2 x 12 5-1/8 x 10-1/2 5-1/2 x 9
Snow Load 40 psf Snow	3-1/8 x 10-1/2 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 10-1/2 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 12 5-1/8 x 9 5-1/2 x 9	3-1/8 x 12 3-1/2 x 12 5-1/8 x 10-1/2 5-1/2 x 9	3-1/8 x 13-1/2 3-1/2 x 12 5-1/8 x 10-1/2 5-1/2 x 9	3-1/8 x 13-1/2 3-1/2 x 12 5-1/8 x 10-1/2 5-1/2 x 10-1/2	3-1/8 x 13-1/2 3-1/2 x 12 5-1/8 x 10-1/2 5-1/2 x 10-1/2

TABLE 4

GARAGE DOOR HEADERS FOR TWO-STORY APPLICATIONS
Rough Door Opening = 16 ft 3 in. (Beam depths based on 1-1/2" laminations.)
Dead Load Assumptions: 15 psf roof, 80 plf wall, 10 psf floor; Live Load Assumptions: 40 psf floor, roof as shown

	Span of supported roof trusses (ft)							
	22	**24**	**26**	**28**	**30**	**32**	**34**	**36**
Non-Snow Load 20 psf Live	3-1/8 x 16-1/2 3-1/2 x 15 5-1/8 x 13-1/2 5-1/2 x 12	3-1/8 x 16-1/2 3-1/2 x 15 5-1/8 x 13-1/2 5-1/2 x 12	3-1/8 x 16-1/2 3-1/2 x 16-1/2 5-1/8 x 13-1/2 5-1/2 x 13-1/2	3-1/8 x 18 3-1/2 x 16-1/2 5-1/8 x 13-1/2 5-1/2 x 13-1/2	3-1/8 x 18 3-1/2 x 16-1/2 5-1/8 x 13-1/2 5-1/2 x 13-1/2	3-1/8 x 18 3-1/2 x 16-1/2 5-1/8 x 15 5-1/2 x 13-1/2	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 15 5-1/2 x 13-1/2	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 15 5-1/2 x 15
Snow Load 25 psf Snow	3-1/8 x 16-1/2 3-1/2 x 16-1/2 5-1/8 x 13-1/2 5-1/2 x 13-1/2	3-1/8 x 18 3-1/2 x 16-1/2 5-1/8 x 13-1/2 5-1/2 x 13-1/2	3-1/8 x 18 3-1/2 x 16-1/2 5-1/8 x 15 5-1/2 x 13-1/2	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 15 5-1/2 x 13-1/2	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 15 5-1/2 x 15	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 15 5-1/2 x 15	3-1/8 x 21 3-1/2 x 19-1/2 5-1/8 x 16-1/2 5-1/2 x 15	3-1/8 x 21 3-1/2 x 19-1/2 5-1/8 x 16-1/2 5-1/2 x 16-1/2
Snow Load 30 psf Snow	3-1/8 x 18 3-1/2 x 16-1/2 5-1/8 x 13-1/2 5-1/2 x 13-1/2	3-1/8 x 18 3-1/2 x 16-1/2 5-1/8 x 15 5-1/2 x 13-1/2	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 15 5-1/2 x 15	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 15 5-1/2 x 15	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 16-1/2 5-1/2 x 15	3-1/8 x 21 3-1/2 x 19-1/2 5-1/8 x 16-1/2 5-1/2 x 15	3-1/8 x 21 3-1/2 x 19-1/2 5-1/8 x 16-1/2 5-1/2 x 16-1/2	3-1/8 x 21 3-1/2 x 19-1/2 5-1/8 x 16-1/2 5-1/2 x 16-1/2
Snow Load 40 psf Snow	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 15 5-1/2 x 13-1/2	3-1/8 x 19-1/2 3-1/2 x 18 5-1/8 x 15 5-1/2 x 15	3-1/8 x 19-1/2 3-1/2 x 19-1/2 5-1/8 x 16-1/2 5-1/2 x 15	3-1/8 x 21 3-1/2 x 19-1/2 5-1/8 x 16-1/2 5-1/2 x 15	3-1/8 x 21 3-1/2 x 19-1/2 5-1/8 x 16-1/2 5-1/2 x 16-1/2	— 3-1/2 x 21 5-1/8 x 18 5-1/2 x 16-1/2	— 3-1/2 x 21 5-1/8 x 18 5-1/2 x 16-1/2	— 3-1/2 x 21 5-1/8 x 18 5-1/2 x 18

Notes to Tables 3 and 4:

1. These tables are for preliminary design use only. Final design should include a complete analysis, including bearing stresses and lateral stability.
2. Service condition = dry.
3. Maximum deflection under live load = span/240.
4. Maximum deflection under total load = span/180.
5. Maximum 2-ft roof truss overhangs.
6. Beam weight = 36 pcf.
7. Rough door opening assumes a maximum bearing length of 4-1/2 inches.
8. Design properties at normal load duration and dry service conditions F_b = 2,400 psi, F_v = 195 psi, E_x = 1.8 x 10^6 psi.
9. Beam widths of 3 and 5 inches may be substituted for 3-1/8 and 5-1/8 inches, respectively, at the same tabulated depth.
10. Span of supported floor framing is half that of roof framing, i.e., a center support is assumed for floor framing.

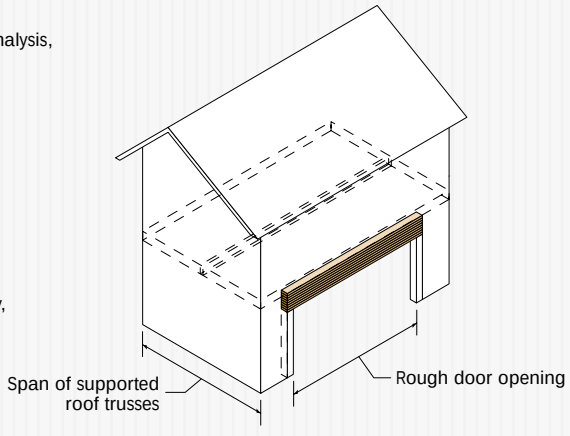


TABLE 5

EQUIVALENT DOUGLAS-FIR GLULAM SECTIONS AS SUBSTITUTES FOR NO. 1 DOUGLAS-FIR SAWN LUMBER

Sawn Section (Nominal)	Equivalent Glulam Sections	
	Headers (Snow)	Headers (Non-snow)
	No. 1	No. 1
3 x 10	3-1/8 x 9	3-1/8 x 9
3 x 12	3-1/8 x 9	3-1/8 x 10-1/2
3 x 14	3-1/8 x 10-1/2	3-1/8 x 10-1/2
4 x 10	3-1/8 x 10-1/2	3-1/8 x 10-1/2
4 x 12	3-1/8 x 10-1/2	3-1/8 x 10-1/2
4 x 14	3-1/8 x 12	3-1/8 x 12
6 x 10	5-1/8 x 10-1/2	5-1/8 x 10-1/2
6 x 12	5-1/8 x 12	5-1/8 x 12
6 x 14	5-1/8 x 13-1/2	5-1/8 x 13-1/2
6 x 16	5-1/8 x 13-1/2	5-1/8 x 15

Notes:

1. Span = uniformly loaded simply supported beam with a span ranging from 8 ft up to 20 ft.
2. For roof beams, maximum deflection = L/180 under total load. Deflection under live load must be verified when live load/total load > 3/4.
3. Service condition = dry.
4. Beam weights for solid-sawn and glulam members are assumed to be the same.
5. Design properties at normal load duration and dry-use service conditions: No. 1: $F_b = C_F$ x 1,000 psi; F_v = 95 psi; E = 1.7 x 10^6 psi; where C_F = size factor per 2001 NDS. Glulam: $F_b = C_v$ x 2,400 psi; F_v = 240 psi; E_x = 1.8 x 10^6 psi; where C_v = volume factor per 2001 NDS.

TABLE 6

EQUIVALENT DOUGLAS-FIR GLULAM SECTIONS AS SUBSTITUTES FOR NO. 1 BUILT-UP DOUGLAS-FIR SAWN LUMBER

Sawn Section (Nominal)	Equivalent Glulam Sections	
	Headers (Snow)	Headers (Non-snow)
	No. 1	No. 1
2 – 2 x 8	3-1/8 x 7-1/2	3-1/8 x 7-1/2
2 – 2 x 10	3-1/8 x 9	3-1/8 x 9
2 – 2 x 12	3-1/8 x 10-1/2	3-1/8 x 10-1/2
2 – 2 x 14	3-1/8 x 10-1/2	3-1/8 x 10-1/2
3 – 2 x 8	3-1/8 x 9	3-1/8 x 9
3 – 2 x 10	3-1/8 x 10-1/2	3-1/8 x 10-1/2
3 – 2 x 12	3-1/8 x 12	3-1/8 x 12
3 – 2 x 14	3-1/8 x 13-1/2	3-1/8 x 13-1/2

Notes:

1. Span = uniformly loaded simply supported beam with a span ranging from 8 ft up to 20 ft.
2. For roof beams, maximum deflection = L/180 under total load. Deflection under live load must be verified when live load/total load > 3/4.
3. Service condition = dry.
4. Beam weights for solid-sawn and glulam members are assumed to be the same.
5. Design properties at normal load duration and dry-use service conditions – No. 1: $F_b = C_F$ x 1,000 psi, F_v = 95 psi, E = 1.7 x 10^6 psi, where C_F = size factor per 2001 NDS. Glulam: $F_b = C_v$ x 2,400 psi, F_v = 240 psi, E_x = 1.8 x 10^6 psi, where C_v = volume factor per 2001 NDS. Repetitive member factor is assumed to be 1.15 for the 3-member built-up lumber beams and 1.0 for 2-member built-up lumber beams and glulam beams.

Glulam Equivalents for Other Framing Products

The substitution of *APA EWS* glulam for other framing products is simple. Tables 5 and 6 show the glulam equivalents for sawn lumber and built-up lumber, respectively. For instance, Table 5 shows that a 3-1/8 x 12 glulam can be substituted for a 4 x 14 No. 1 Douglas-fir solid sawn beam. For additional member substitution information, see EWS Data File Form No. S570, *Substitution of Glulam Beams for Steel or Solid-Sawn Lumber.* The tables are for preliminary design use only. Final design should include a complete analysis, including bearing stresses and lateral stability.

APA Sturd-I-Frame

One of the most challenging design areas in a home is the narrow wall adjacent to the garage door opening. This short wall section must withstand the same lateral forces that bear on other, larger wall and roof sections of the home.

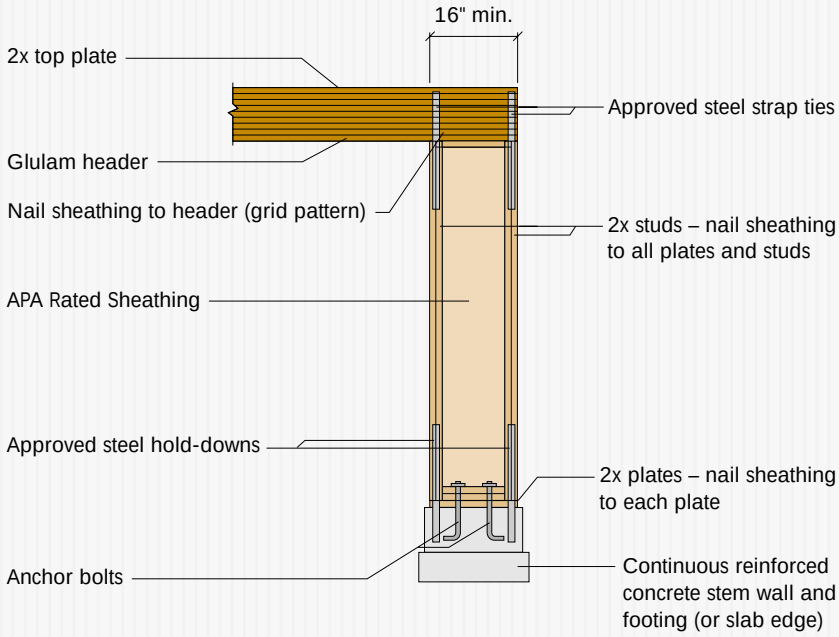
The APA Sturd-I-Frame system gives builders and homeowners a design solution that allows for the narrow walls while providing the necessary strength and stiffness. The connections in the frame allow the Sturd-I-Frame to act as a moment-resisting "portal frame" that resists lateral loads from winds or earthquakes.

Glulam beams are readily available in the long lengths that are needed to extend the header over the adjacent walls. The vertical wall segment is wood structural panel sheathing that overlaps the glulam header and is attached with nails in a specified grid pattern. At the base of the wall, a hold-down connector attaches the wall segment to the foundation (see Figure 6). These two moment-resisting connections, combined with the bending capacity of the vertical segment and glulam header, provide the lateral resistance normally facilitated by shear walls or braced wall sections of a substantially greater width.

For more information on the Sturd-I-Frame Construction System, refer to the APA guide: *Sturd-I-Frames for Narrow Wall Bracing*, Form B440.

FIGURE 6

THE APA STURD-I-FRAME BRACING PANEL – 16" AND 24" WIDTHS



Note:

For use in narrow wall applications commonly found in garage openings. Provide hold-downs, bolts and wood structural panel nailing as shown in *Sturd-I-Frames for Narrow Wall Bracing,* APA Form B440.

About Engineered Wood Systems

Engineered Wood Systems, a related corporation of *APA – The Engineered Wood Association*, is an organization dedicated to the promotion of engineered wood products and systems. Operating in close cooperation with APA, Engineered Wood Systems provides services to manufacturers of engineered wood products, including glued laminated timber (glulam). Engineered Wood Systems manufacturers certify their products with the *APA EWS* trademark.

Glulam Garage Door Headers Offer Design Options

We have field representatives in most major U.S. cities and in Canada who can help answer questions involving APA and *APA EWS* trademarked products. For additional assistance in specifying APA engineered wood products, contact us:

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The product use recommendations in this publication are based on the continuing programs of laboratory testing, product research, and comprehensive field experience of Engineered Wood Systems. However, because EWS has no control over quality of workmanship or the conditions under which engineered wood products are used, it cannot accept responsibility for product performance or designs as actually constructed. Because engineered wood product performance requirements vary geographically, consult your local architect, engineer or design professional to assure compliance with code, construction, and performance requirements.

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