

Change as following:

R802.2 Design and construction. ~~The framing details required in Section R802 apply to roofs having a minimum slope of three 3 units vertical in 12 units horizontal (25-percent slope), or greater. Roof-ceilings shall be designed and constructed in accordance with the provisions of this chapter and Figures R605.11(1), R606.11(2) and R606.11(3) or in accordance with AWC NDS. Components of roof-ceilings shall be fastened in accordance with Table R602.3(1). Where the roof pitch is less than 3 units vertical in 12 units horizontal (25-percent slope), structural members that support rafters and ceiling joists, such as ridge beams, hips and valleys, shall be designed as beams.~~

R802.3 Fastening details. Rafters shall be framed not more than 1-1/2-inch offset from each other to a ridge board or directly opposite from each other with a gusset plate as a tie. ~~The R-ridge board shall be not less than 1-inch minimal thickness and not less in depth than the cut end of the rafter. At valleys and hips there shall be a valley or hip rafter not less than 2-inch nominal thickness and not less in depth than the cut end of the rafter. Hip and valley rafters shall be supported at the ridge by a brace to a bearing partition or be designed to carry and distribute the specific load at that point. Where the roof pitch is less than three units vertical in 12 units horizontal (25-percent slope), structural members that support rafters and ceiling joists, such as ridge beams, hips and valleys, shall be designed as beams.~~

R802.3.1 - no change

Reason:

1. The charging language in R802.2 says that Section R802 only applies to roofs with a minimum slope of 3:12. i.e. the rafters tables only apply if the roof slope is 3:12 or greater. The section does not tell us how to size rafters with less than 3:12 slope.

By deleting the charging language in R802.2, the rafter span tables from Section R802.5 would now apply.

2. I moved the last sentence in R802.3 into R802.2 where it seemed more appropriate, since it was dealing with design considerations.
3. R802.3 language was cleaned up.
4. To validate my argument that “flat rafters” (i.e. rafters <3:12 slope) are essentially the same as floor joists, I made the following comparison table: I compared floor joists with 40 psf live load + 10 psf dead load (Table R502.3.1(2)) with rafters at 50 psf +10 psf and 70 psf +10 psf. The results show that in the worst case, the results demonstrate that the rafter span tables should apply to rafters with <3:12 slope.

COMPARISON OF FLOOR JOISTS SPANS AND RAFTER SPANS FOR CONSIDERATION OF ROOF SLOPES < 3:12						
		Floors	Rafters < 3:12			
Joist size	Species	Table R502.3.1(2)	Table R802.5.1(4)	Table R802.5.1(6)	Table R802.5.1(7)	Table R802.5.1(8)
		LL = 40	GSL = 50	GSL = 50	GSL = 70	GSL = 70
		DL = 10	DL = 10	DL = 10	DL = 10	DL = 10
		L/360	L/180	L/240	L/180	L/240
2x6 @ 16" o.c.	SP#2	9-4	9-2	9-2	7-11	7-11
2x8 @ 16" o.c.	SP#2	11-10	11-7	11-7	10-0	10-0
2x10 @ 16" o.c.	SP#2	14-0	13-9	13-9	11-11	11-11
2x12 @ 16" o.c.	SP#2	16-6	16-2	16-2	14-0	14-0
2x6 @ 24" o.c.	SP#2	7-7	7-5	7-5	6-5	6-5
2x8 @ 24" o.c.	SP#2	9-8	9-5	9-5	8-2	8-2
2x10 @ 24" o.c.	SP#2	11-5	11-3	11-3	9-9	9-9
2x12 @ 24" o.c.	SP#2	13-6	13-2	13-2	11-5	11-5
2x6 @ 16" o.c.	HF#2	9-1	9-7	9-7	8-4	8-4
2x8 @ 16" o.c.	HF#2	12-0	12-2	12-2	10-6	10-6
2x10 @ 16" o.c.	HF#2	15-2	14-10	14-10	12-10	12-10
2x12 @ 16" o.c.	HF#2	17-7	17-3	17-3	14-11	14-11
2x6 @ 24" o.c.	HF#2	7-11	7-10	7-10	6-9	6-9
2x8 @ 24" o.c.	HF#2	10-2	9-11	9-11	8-7	8-7
2x10 @ 24" o.c.	HF#2	12-5	12-1	12-1	10-6	10-6
2x12 @ 24" o.c.	HF#2	14-4	14-1	14-1	12-2	12-1

Cost impact:

Cannot quantify because the 2015 IRC was tacit. Obviously rafters were needed, but the code did not provide any prescriptive language as to what size rafters the designers should use.