RIDGE BEAM DATA:
LIVE LOAD = 30 PSF
DEAD LOAD = 14 PSF
(DEAD LOAD MANUALLY INCREASED FOR
ROOF SLOPE)
TOTAL LOAD = 44 PSF
SPAN IS 16'-0" TO CENTER OF POSTS
SUPPORTING RIDGE BEAM.
DURATION OF LOAD IS 1.15 (SNOW)
TRIBUTARY LENGTH = 12'-0"
(EXCLUDE OUTER 6 FT OF RAFTERS
WHICH BEAR ON OUTSIDE WALLS)

THE RIDGE BEAM

SECTION VIEW

LOADING DIAGRAM
WINDOW HEADER EXAMPLE SIMPLE SPAN
EXAMPLE No. 2
ACTUAL MATERIALS, LOADS AND CODE REQUIREMENTS MAY VARY. THIS IS AN ILLUSTRATION ONLY.

NOTE: SLOPE ADJUSTMENT WAS NOT USED IN THIS CASE. INSTEAD, THE DEAD LOAD WAS MANUALLY INCREASED TO ADJUST FOR THE ROOF SLOPE (ADDED TO THE LOADS BEFORE THEY WERE ENTERED).

THE AUTOMATIC RAFTER SLOPE DEAD LOAD ADJUSTMENT WOULD HAVE MULTIPLIED THE LOADS BY ADJUSTING THE ACTUAL LENGTH OF THE SPAN. IN THIS CASE, THE SPAN IS THE HEADER LENGTH, NOT THE LENGTH OF THE RAFTER.

Click here for window to multiply Partial Uniform Loads in PSF x tributary length

HEADER LOCATION: SUPPORTING HIP TRUSS ROOF LOAD AND UNDER HIP MASTER CONCENTRATED LOAD.

HEADER SPAN = 6’-3” (6”-0” ROUGH OPENING PLUS 1-1/2” AT EACH END FOR MINIMUM BEARING.)

LOAD DATA: LIVE = 25 PSF, DEAD = 13 PSF, TOTAL = 38 PSF
DURATION OF LOAD = 1.15 (SNOW)

LOAD H TRIBUTARY LENGTH = 12 FT + 2 FT EAVE = 14 FT
LOAD I TRIBUTARY LENGTH = 4 FT + 2 FT EAVE = 6 FT
LOAD B AREA = 8’ x 4’ = 32 SQ FT X 25# = 800# LIVE LD POINT
32 SQ FT X 38# = 1216# TOTAL LD POINT

APPROXIMATE LOAD CONDITIONS BASED ON A TRUSS CONFIGURATION THAT CAN VARY. EXAMPLE IS TO ILLUSTRATE THE USE OF PARTIAL UNIFORM LOADS. MORE ACCURACY COULD BE ACHIEVED BY TAKING EACH TRUSS AS AN INDIVIDUAL PT LOAD.
**FLOOR JOIST EXAMPLE**  SIMPLE SPAN

**EXAMPLE No. 3**

ACTUAL MATERIALS, LOADS AND CODE REQUIREMENTS MAY VARY. THIS IS AN ILLUSTRATION ONLY.

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**JOIST LOCATION:**
FLOOR OVER NON-HEATED SPACE.
ASSUME JOIST SPACING OF 12" O.C.

**LOAD DATA:**
- LIVE = 40 PSF
- DEAD = 10 PSF
- TOTAL = 50 PSF

**FLOOR DEAD LOAD:**
- 3/4" PLYWD SUBFLOOR 2.2 PSF
- JOISTS 3.8 APPROXIMATE
- 6" INSULATION BATTs 1.5
- 5/8" WALLBOARD 2.5
- TOTAL 10.0 PSF

**NOTE:** JOIST SELF-WEIGHT IS ALREADY INCLUDED.

**PARTITION DEAD LOAD:**
- 2X4s @ 16" O.C. 1.5 PSF
- 1/2" WALLBOARD 2.0
- 1/2" WALLBOARD 2.0
- TOTAL 5.5 PSF

**PARTITION HEIGHT:**
8 FT X 5.5 PSF = 44 PLF  THIS IS POINT LOAD 'B'
(44# DEAD LOAD + 0# LIVE LOAD = 44# TOTAL POINT LOAD)

---

**PLAN VIEW**

8 FT. HIGH NON-BEARING PARTITION ABOVE.
THIS IS POINT LOAD "B"

---

**LOAD DIAGRAM**

**DISTANCE =**

**POINT LD B (44#) PARTITION**

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**THE JOIST**

SPACED @ 12" O.C.
RAFTER EXAMPLE SIMPLE SPAN
EXAMPLE No. 4
ACTUAL MATERIALS, LOADS AND CODE REQUIREMENTS MAY VARY. THIS IS AN ILLUSTRATION ONLY.

34' - 0" OVERALL
17' - 0" SPAN

THE RAFTERS @ 16" O.C.

OUTSIDE BEARING WALL

R1

R2

SPR / SPF South

SPAN = 17' - 0"

THE RAFTERS

CATHEDRAL CEILING
LIVE LOAD = 30 PSF
DEAD LOAD = 10 PSF
TOTAL LOAD = 40 PSF

SPAN IS 17'-0" HORIZONTAL
EAVE OVERHANG: NONE

ROOF PITCH IS 7:12 (7 INCH RISE PER FT)
BEAMCHEK WILL AUTOMATICALLY ADD ADDITIONAL DEAD LOAD FOR ADDED LENGTH OF RAFTER DUE TO SLOPE.

ASSUMED RAFTER SPACING IS 16" OC
BEAMCHEK WILL AUTOMATICALLY MULTIPLY ALL THE LOADS BY 1.333 FOR THE 16" SPACING.

DURATION OF LOAD IS 1.25 (NO SNOW)

R1 IS THE REACTION AT THE RIDGE BEAM
R2 IS THE REACTION AT THE OUTSIDE BEARING WALL

UNIFORM LOAD OF 30# LL, 40# TL

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OVERHANGING JOIST EXAMPLE
EXAMPLE No. 5
ACTUAL MATERIALS, LOADS AND CODE REQUIREMENTS MAY VARY. THIS IS AN ILLUSTRATION ONLY.

OVERHANGING FLOOR JOIST DATA:
FLOOR PSF:
LIVE = 40, DEAD = 10, TOTAL = 50
BACKSPAN = 14 FT, OVERHANG = 3 FT

ROOF TRIBUTARY LENGTH = 9 FT
ROOF PSF LIVE = 25, DEAD = 13, TOTAL = 38

LOAD F:
ROOF POINT LOAD
LIVE 9 FT X 25 = 225 LBS LIVE LOAD
TOTAL 9 FT X 38 = 342 LBS
WALL DEAD LOAD = 8 PSF X 8 FT = 64 LBS
ROOF POINT LOAD TOTAL: 342 + 64 = 406 LBS TOTAL
ASSUMED JOIST SPACING AT 16" O.C.
(LOADS WILL BE AUTO-MULTIPLIED BY 1.33)

TEST UNBALANCED LOADS:
CALCULATE A JOIST WITH ALL LOADS FIRST, THEN REMOVE THE LIVE LOADS FROM BACKSPAN (CHECK FOR UPLIFT AT R1), THEN REMOVE ONLY LIVE LOADS FROM OVERHANG AND CHECK AGAIN. YOU ARE LOOKING FOR THE MOST RESTRICTIVE LOAD COMBINATION OF LOADS.

OVERHANGING DESIGNS MUST BE CHECKED FOR THE MOST CRITICAL CONDITION. CLICK HERE TO UNBALANCE OR RESTORE BACKSPAN AND OVERHANG LIVE LOADS AND RE-TEST YOUR BEAM CANDIDATE.
HIP RAFTER UNIFORMLY INCREASING LOAD

EXAMPLE No. 6

ACTUAL MATERIALS, LOADS AND CODE REQUIREMENTS MAY VARY. THIS IS AN ILLUSTRATION ONLY.

AUTOMATICALLY CALCULATED AFTER CLICKING ‘OK’ BUTTON BELOW

SELECT HIPS AND VALLEYS

ROOF SLOPE IS 9:12 PITCH. ADJUSTMENT WILL INCREASE THE DEAD LOAD

AUTOMATICALLY CALCULATED ‘ETL’ IS THE EQUIVALENT TABULAR LOAD

HIP SELF-WEIGHT AUTOMATICALLY ADDED TO LOADS

DURATION OF LOAD IS SET TO 1.15 FOR SNOW

ENTER PSF 25 LL, 39 TL. CLICK ‘OK’ BUTTON AND 39 IS INCREASED TO 42.5 FOR ROOF PITCH ADJUSTMENT

AREAS WITH ‘X’ ARE CONTRIBUTING WEIGHT TO THE HIP IN THIS EXAMPLE.

HIP RAFTER DATA:
LIVE = 25 PSF (SNOW), DEAD = 14 PSF
TOTAL = 39 PSF

ROOF PITCH = 9:12 (9 INCH RISE PER FOOT)
BEAMCHEK WILL AUTOMATICALLY ADJUST THE DEAD LOAD FOR SLOPING INCREASE IN LENGTH OF THE RAFTERS.

SPAN: BEAMCHEK WILL AUTOMATICALLY CALCULATE THE HORIZONTAL LENGTH OF THE HIP.

LOADS ARE ENTERED IN PSF, BEAMCHEK WILL AUTOMATICALLY CALCULATE THE AREA CONTRIBUTING LOAD TO THE HIP RAFTER.

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HEADER BELOW HIP  INCORPORATING LOAD + UNIFORM LOAD  EXAMPLE No. 7

ACTUAL MATERIALS, LOADS AND CODE REQUIREMENTS MAY VARY. THIS IS AN ILLUSTRATION ONLY.

ENTER SPAN

SEE NOTE BELOW

AUTO-FILLED WHEN 'OK' BUTTON IS CLICKED

AUTOMATIC BEAM SELF-WT TO BE ADDED

AREAS CONTRIBUTING AN INCREASING LOAD TO HEADER
(HALF OF RECTANGLE, NOT HALF OF SQUARE)

SPAN AUTO-CALC SWITCHED OFF. SPAN IS LENGTH OF HEADER, NOT THE DIAGONAL LENGTH OF HIP.

CLICK HERE FOR ETL CALC THEN CLICK 'OK CALCULATE'

ROOF LOAD DATA:
LIVE = 25 PSF (SNOW), DEAD = 13 PSF
TOTAL LOAD = 38 PSF

NOTE: DEAD LOAD WAS MANUALLY INCREASED FOR ROOF SLOPE ADJUSTMENT TO DEAD LOAD. AUTOMATIC RAFTER SLOPE ADJUSTMENT DOES NOT APPLY BECAUSE IT MULTIPLIES BY AN ADJUSTED SPAN WHICH IS THE HEADER LENGTH, NOT THE TRIBUTARY LENGTH!