

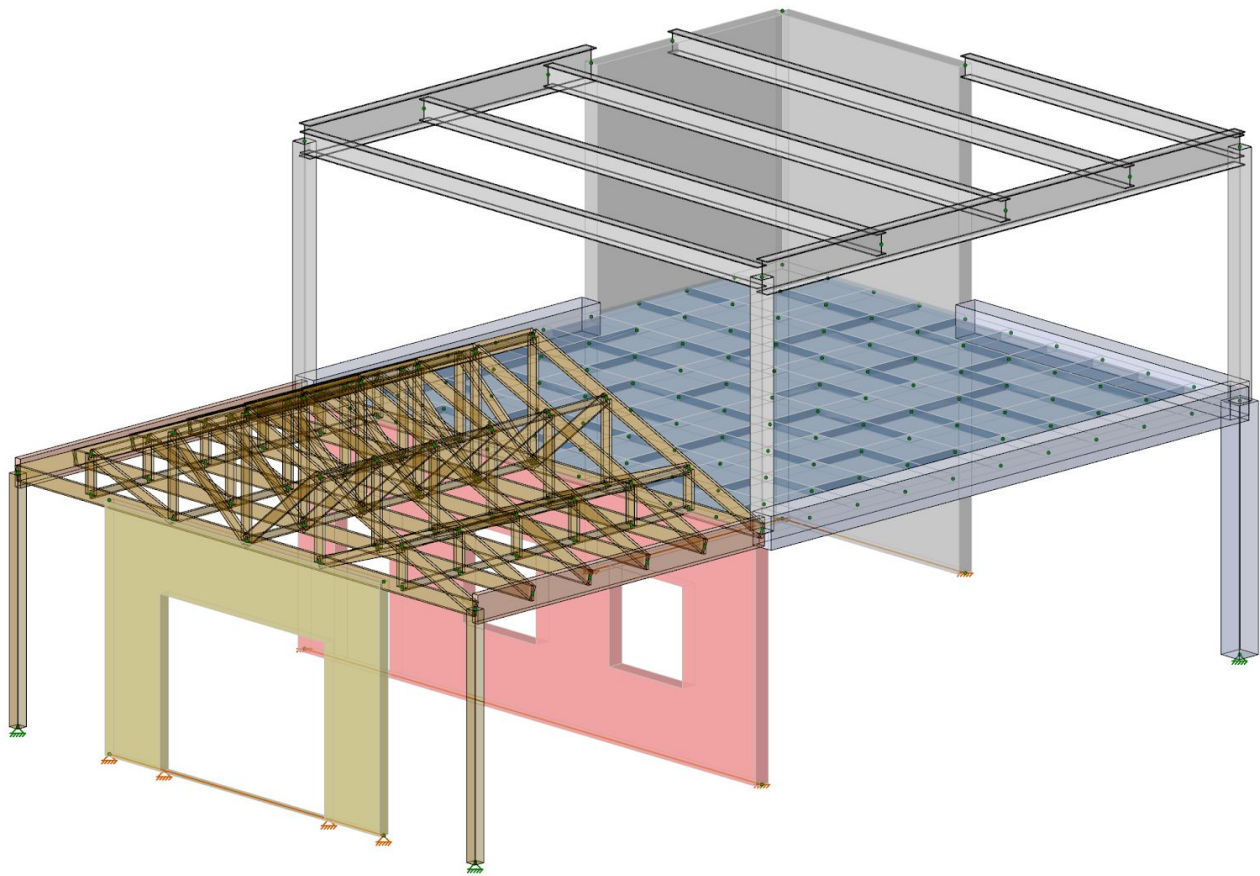
RISA-3D Quick Start Course

Handout - Examples & Homework



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Example: RISA-3D Tutorial Model



This model is intended to illustrate an advanced model within RISA-3D. We will use this model to navigate through the RISA-3D interface including the toolbars and become familiar with the different ways to view the model using selection tools.

Given:

Interface

Ribbon Toolbar
Properties Panel
3D Window
ExplorerPanel

Materials

Steel
Masonry
Wood
Concrete

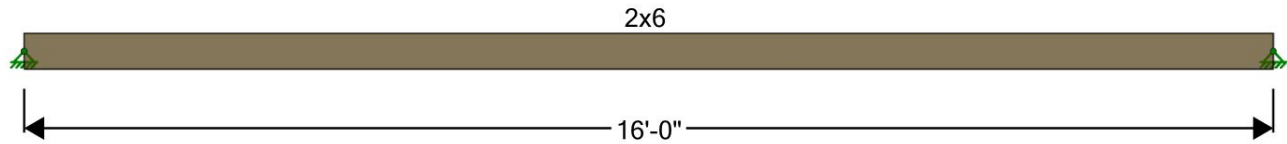
Elements

Members
Wall Panels
Plates

Loading

Point Loads
Line Loads Loads
Member Area Loads
Plate Surface Loads
Wall Panel Surface Loads

Example: Wood Beam



Given:

Design Code

AWC NDS-18: ASD

Units

Force: lbs

Length: ft

Deflection: in

Material

DF Grade No.2

Basic Load Cases

Dead (including -Y gravity)

Live

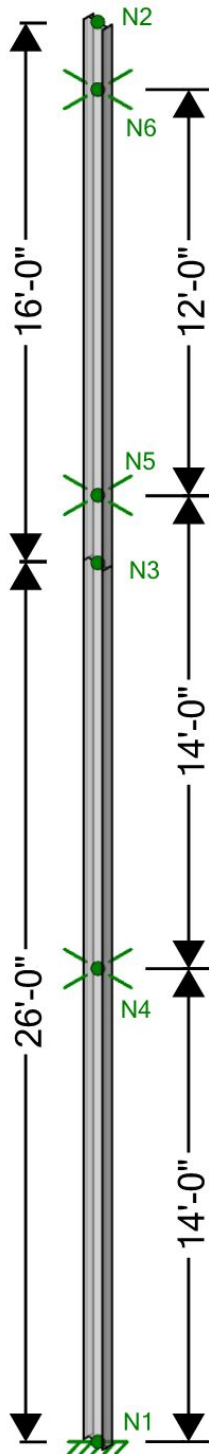
Loads

$w_{DL} = 10$ plf (in -Y direction)

$w_{LL} = 20$ plf (in -Y direction)

$P_{LL} = 100$ lbs (@ 5ft)

Example: Multi-Span Steel Column



Given:

Steel Column

W8x31

Boundary Conditions

Fixed @ Column Base

Reaction in X & Z directions @ N4, N5 and N6

Shear Splice (pin) @ N3

Material

A992

Basic Load Cases

Dead (including -Y gravity)

Live

Wind X

Wind Z

Loading

$P_{DL} = 10$ kips @ N4, N5 and N6

$P_{LL} = 12.5$ kips @ N4, N5 and N6

$w_{WLX} = 250$ plf (in X direction)

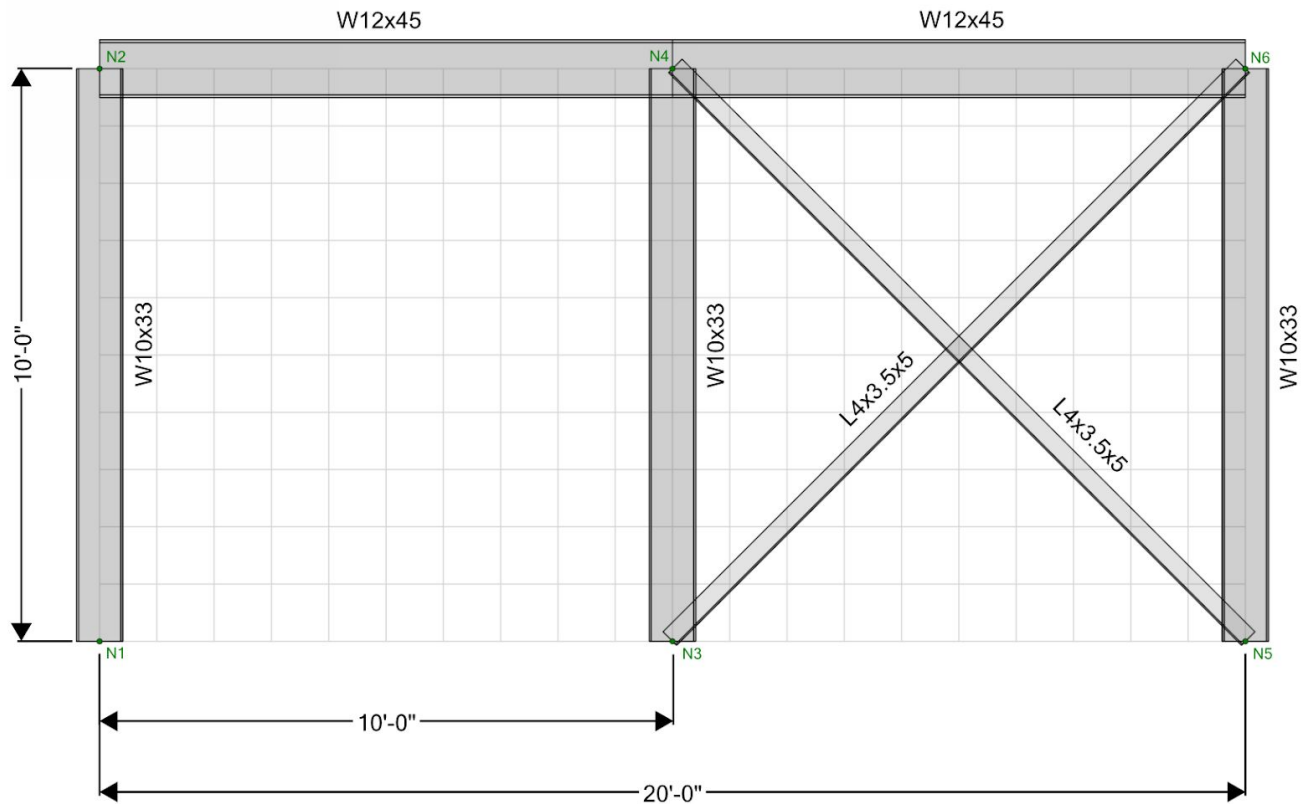
$w_{WLZ} = 150$ plf (in Z direction)

Load Combinations

2018 IBC ASD (Gravity)

2018 IBC ASD (Wind X & Z)

Work Session Example: Steel Braced Frame



Given:

Drawing Grid

X Increments: 20@1

Y Increments: 10@1

Member End Releases

Pinned (Torsion Fixed) @ brace ends

Boundary Conditions

Pinned @ N1, N3 & N5

Enable 2D Mode

Basic Load Cases (BLC)

Dead (including -Y gravity)

Live

Wind

Loads

$w_{DL} = 0.25$ k/ft (in -Y direction on beams)

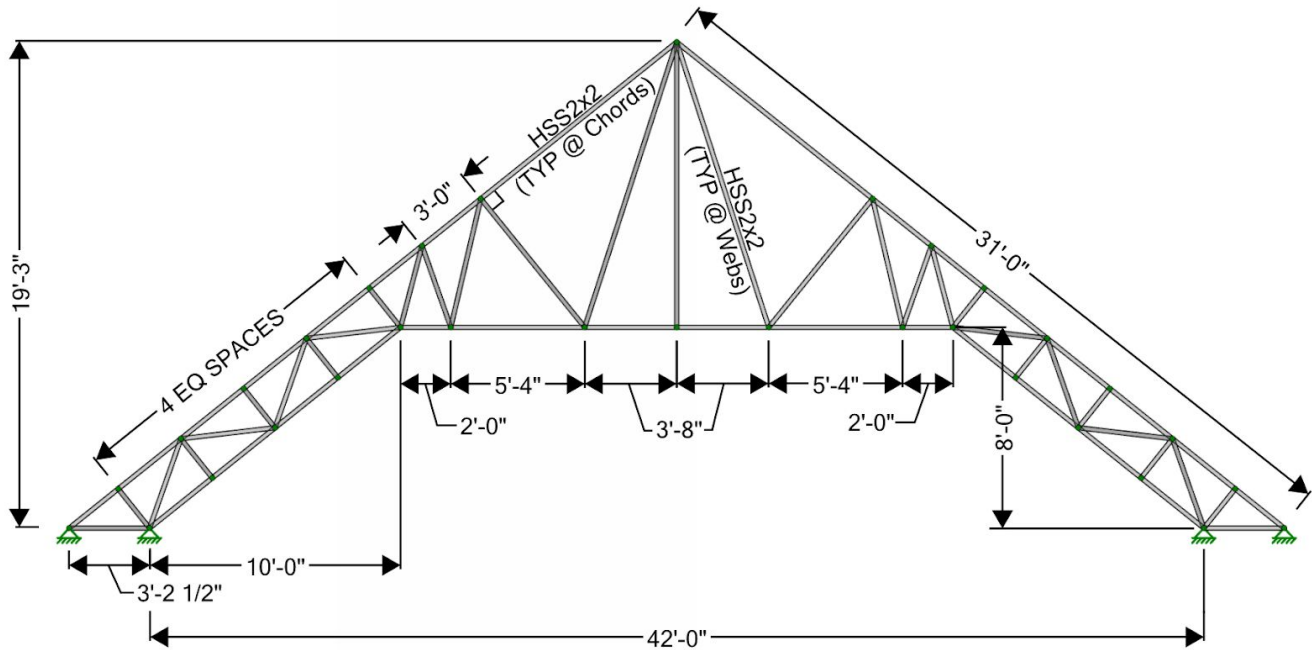
$w_{LL} = 0.35$ k/ft (in -Y direction on beams)

$P_{WL} = 15$ k (in X direction @ N2)

Load Combinations

2018 IBC Strength (Gravity & Wind)

Homework Day 1: Steel Scissor Truss



Given:

Steel Material

A500 Gr.B

Member End Releases

Pinned (Torsion Fixed) @ web ends

Boundary Conditions

Pinned @ Truss base

Pinned/Roll for Deflection checks

Basic Load Cases (BLC)

Dead (including -Y gravity)

Live

Create Section Sets (Chords/Webs)

Objective:

Review Internal Forces

Review Deflections

Optimize Section Sets using Suggested Design

Loads

$w_{DL} = 10$ plf (in -Y direction on bottom chord)

$w_{DL} = 10$ plf (in -Y direction on top chord)

$w_{LL} = 20$ plf (in -Y direction on top chord)

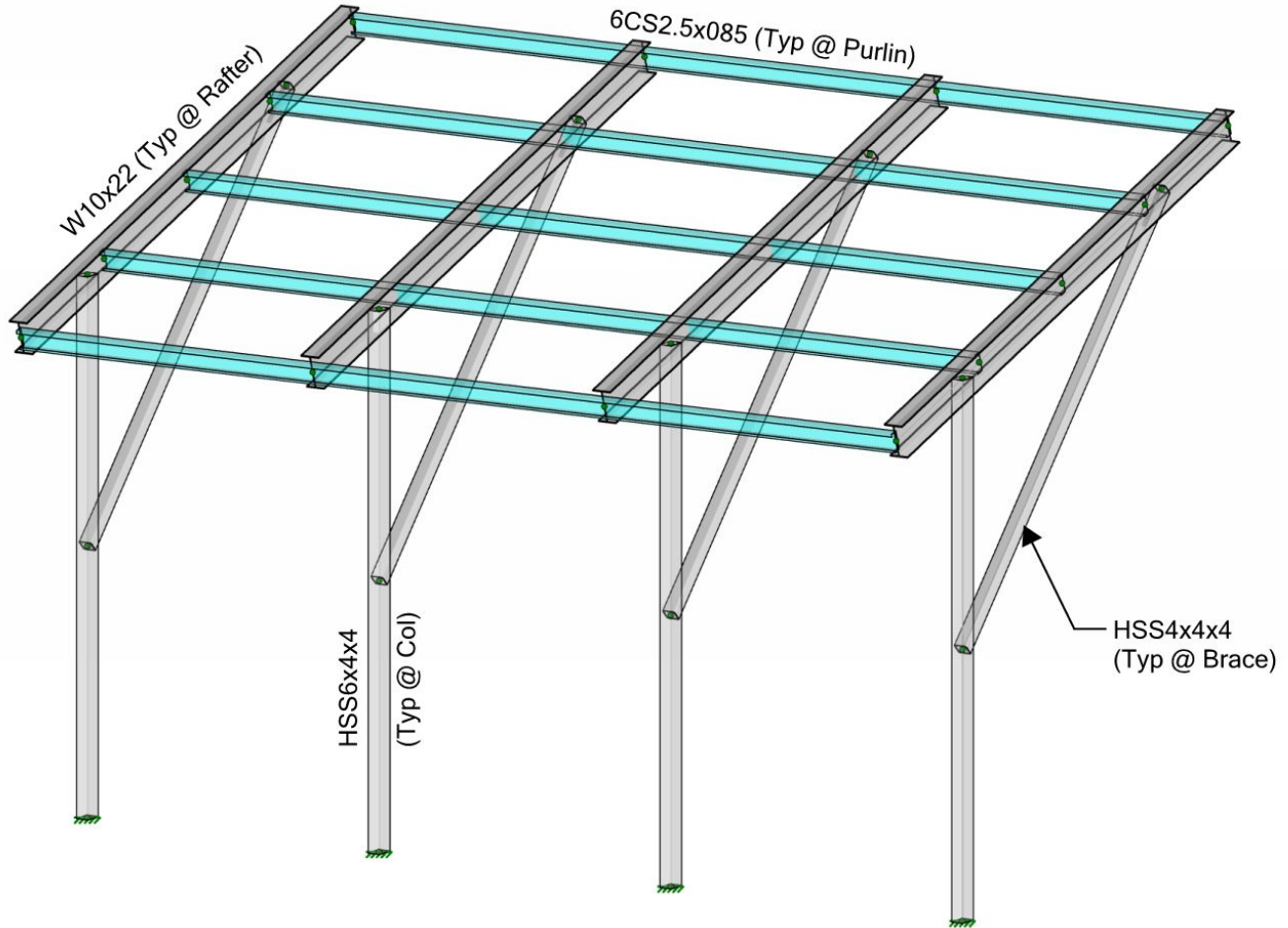
Purlin spacing (for unbraced length) of 3'

Load Combinations

2018 IBC ASD

Enable 2D Mode

Example: Bus Stop



Given:

Utilize DXF Underlay

Import busstop.dxf

Model Geometry

Frames spaced @ 8' o.c.

Purlins spaced @ rafter quarter points

Member End Releases:

Pinned (Torsion Fixed) @ purlin and brace ends

Boundary Conditions

Fixed @ column bases

Basic Load Cases (BLC)

Dead (including -Y gravity)

Roof Live

Wind

Member Area Loads (Gravity)

$w_{DL} = 10$ psf (in -Y direction)

$w_{RLL} = 25$ psf (in -Y direction)

Distributed Loads (Wind)

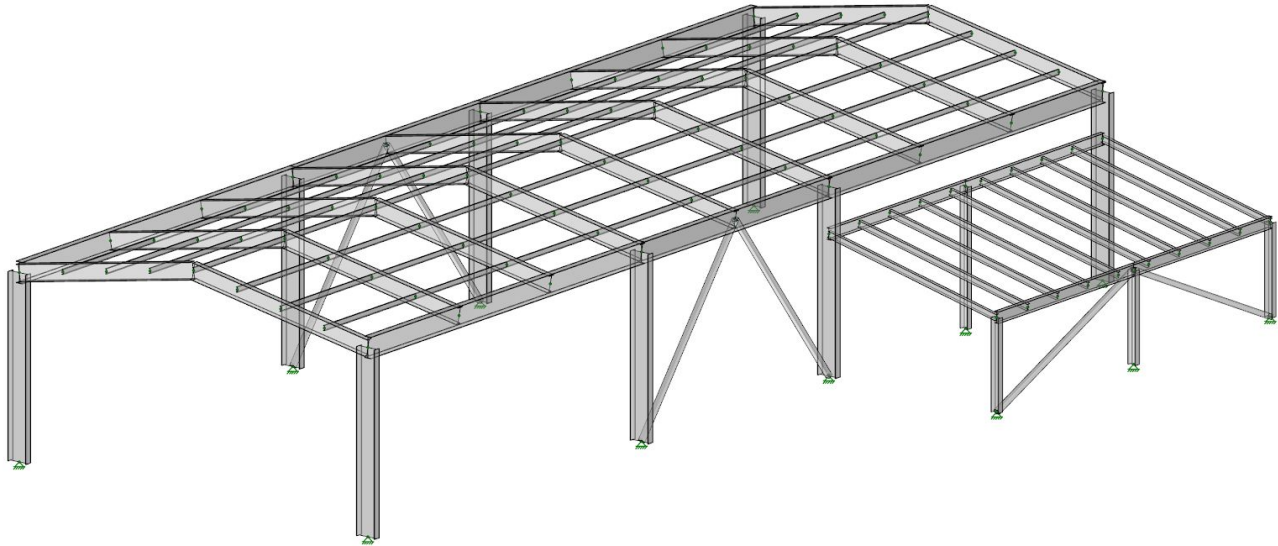
$w_{WL} = 0.25$ k/ft (in X direction on columns)

Load Combinations

2018 IBC Strength (Gravity & Wind)

P-Delta enabled

Work Session Example: Steel Building



Given:

Boundary Conditions

Pinned @ bases

Basic Load Cases

Dead (including -Y gravity)

Live

Wind X

Load Combinations

2018 IBC LRFD (gravity & wind)

2018 IBC ASD (gravity & wind)

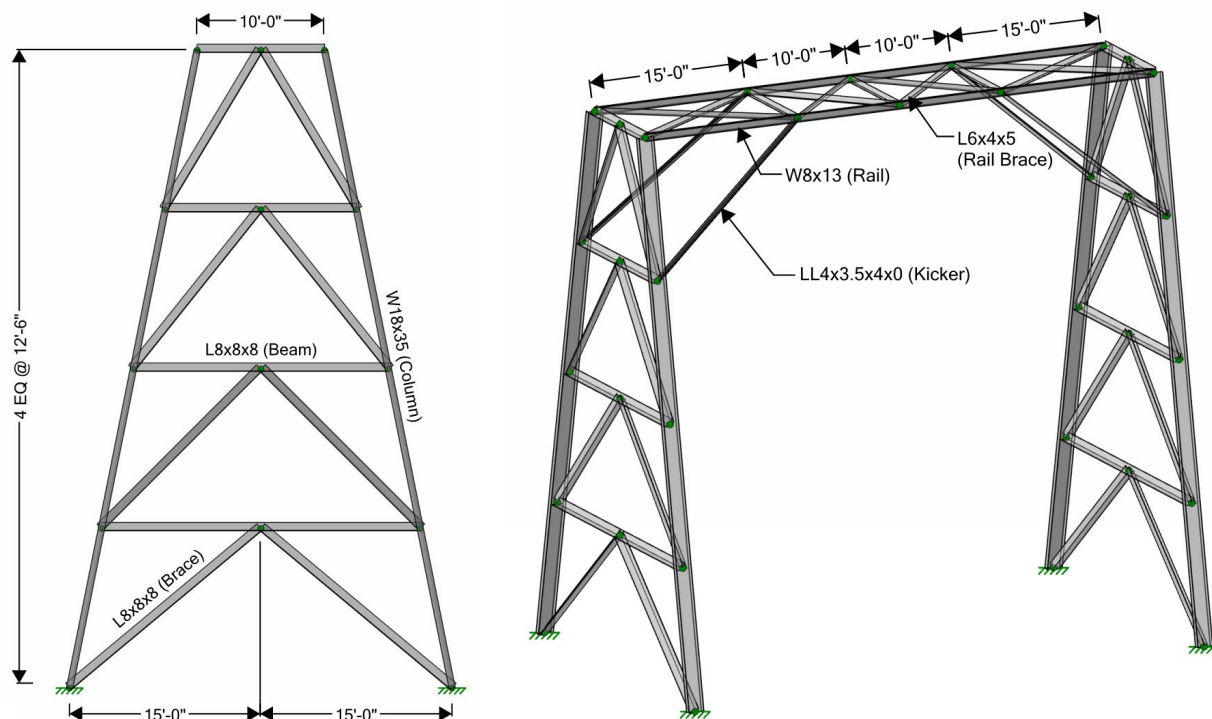
P-Delta enabled

Review Results & Deflections

Solve Model Instabilities

Obtain Code Check < 1.0 for Rafters & Purlins

Homework Day 2: Hanging Steel Frame



Given:

Drawing Grid

Plane XY

X Increments: 10,5,5,10

Y Increments: 4@12.5

Section Sets

Beam: L8x8x8

Column: W18x35

Brace: L8x8x8

Rail: W8x13

Rail Brace: L6x4x5

Kicker: LL4x3.5x4x0

Boundary Conditions

Fixed @ column bases

Objectives:

Review Reactions

Review Deflections

Review Code Check

Update sizes using Suggested Design

Member End Releases:

Pinned (Torsion Fixed) @ beam, brace and rail brace ends

Basic Load Cases

Dead (including -Y gravity)

Hanging

Loading

$w_{DL} = 100$ plf (in -Y direction on rail brace)

$P_{HL} = 5$ kips (in -Y direction @ rail brace midpoint)

Load Combinations

2018 IBC LRFD (gravity)

P-Delta enabled