

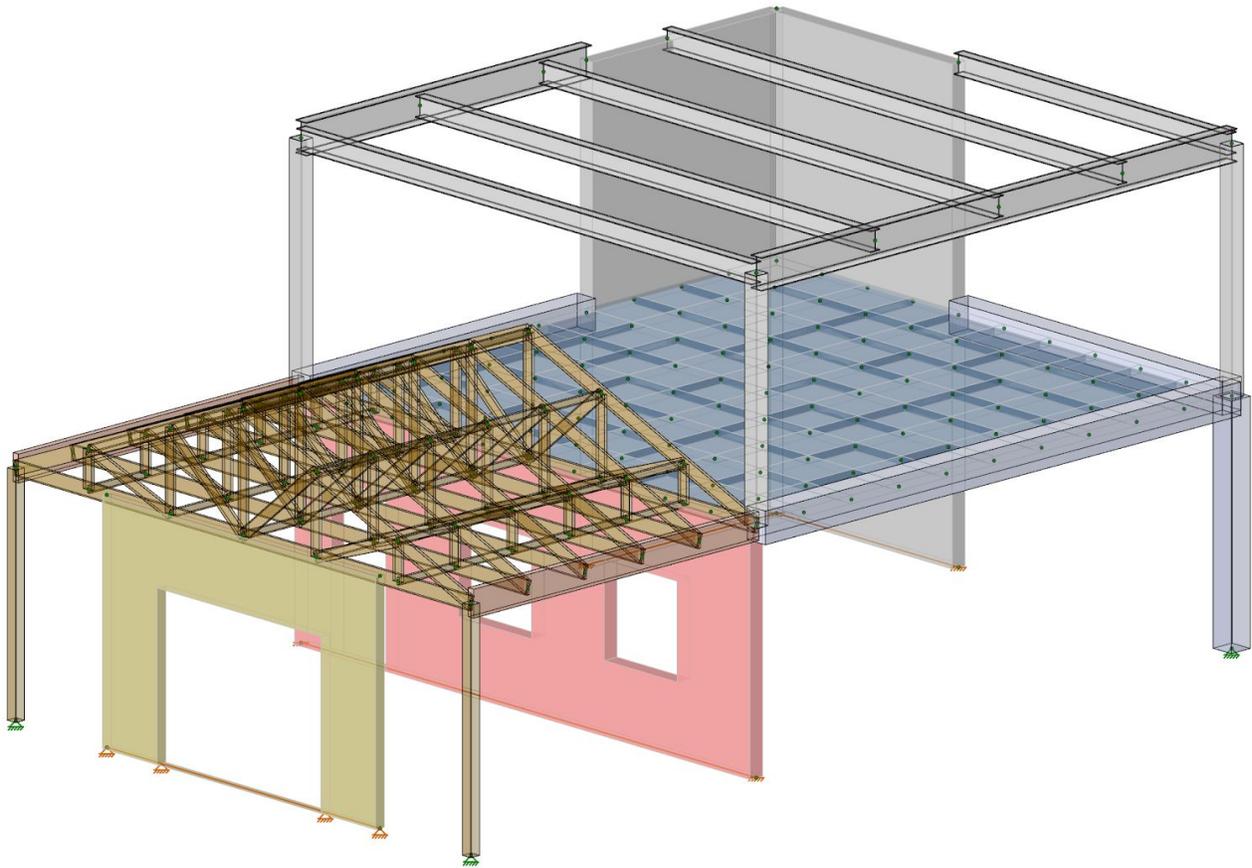
# RISA-3D Quick Start Course

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

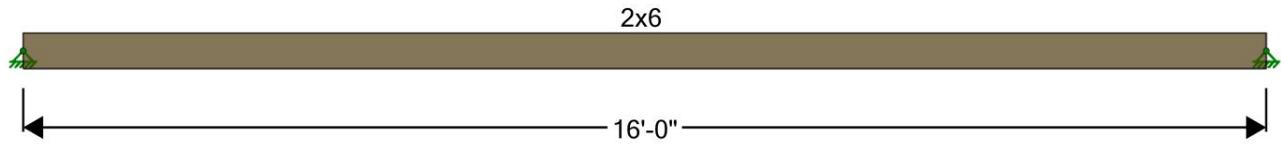
### **Elements**

Members  
Wall Panels  
Plates

### **Loading**

Point Loads  
Line Loads  
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

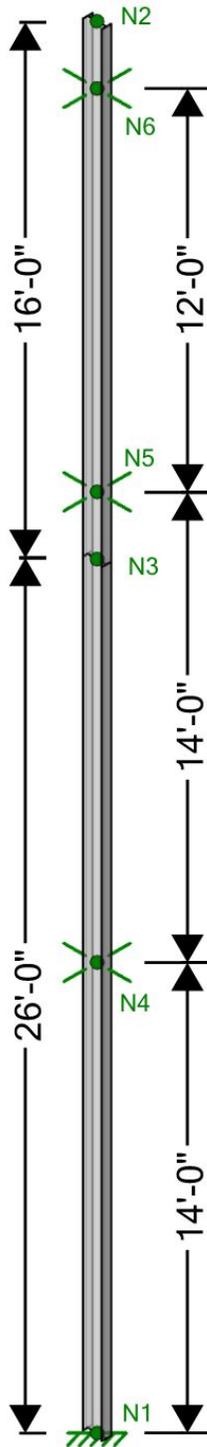
### **Loads**

$w_{DL} = 10$  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)

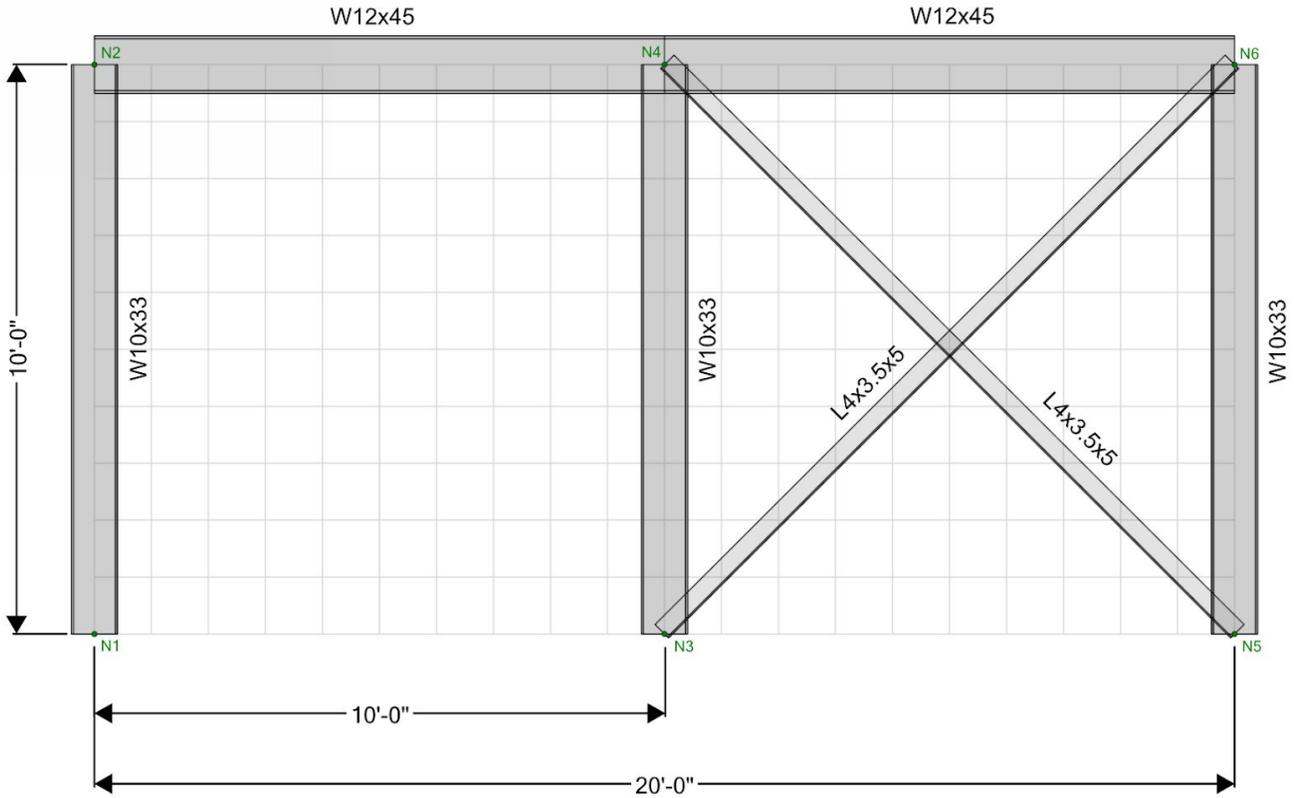
$w_{WLZ} = 150$  plf (in Z direction)

### **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)

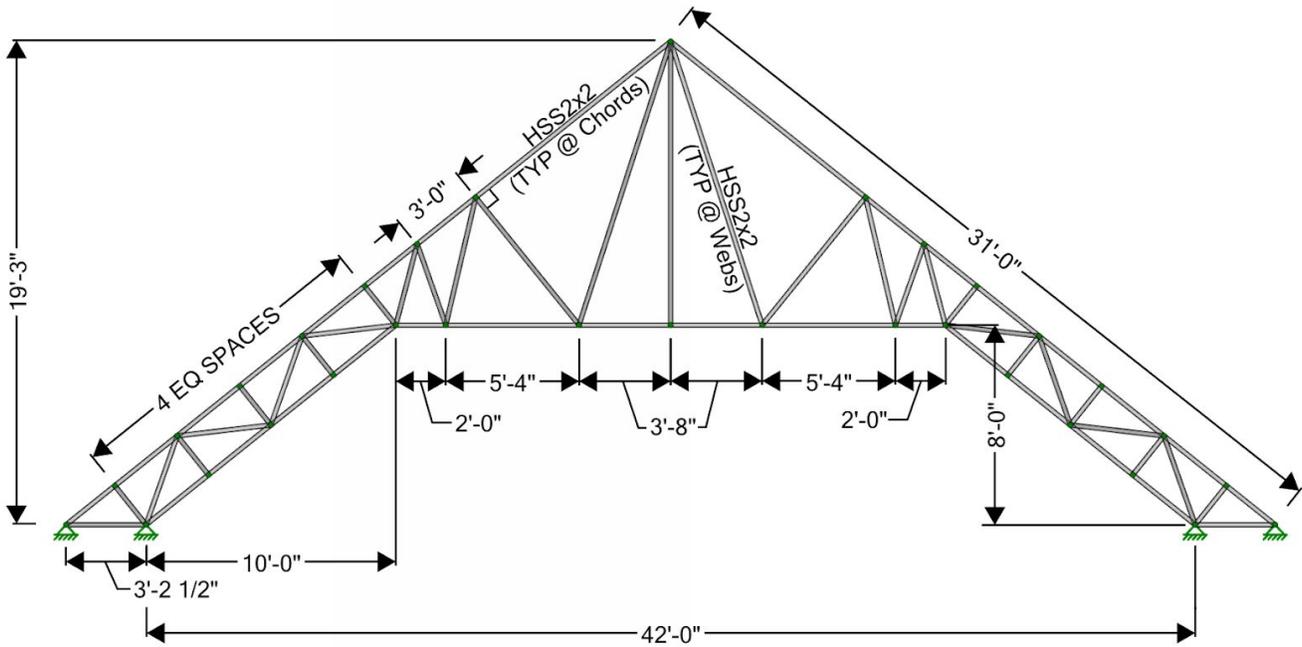
$w_{LL} = 0.35$  k/ft (in -Y direction on beams)

$P_{WL} = 15$  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)

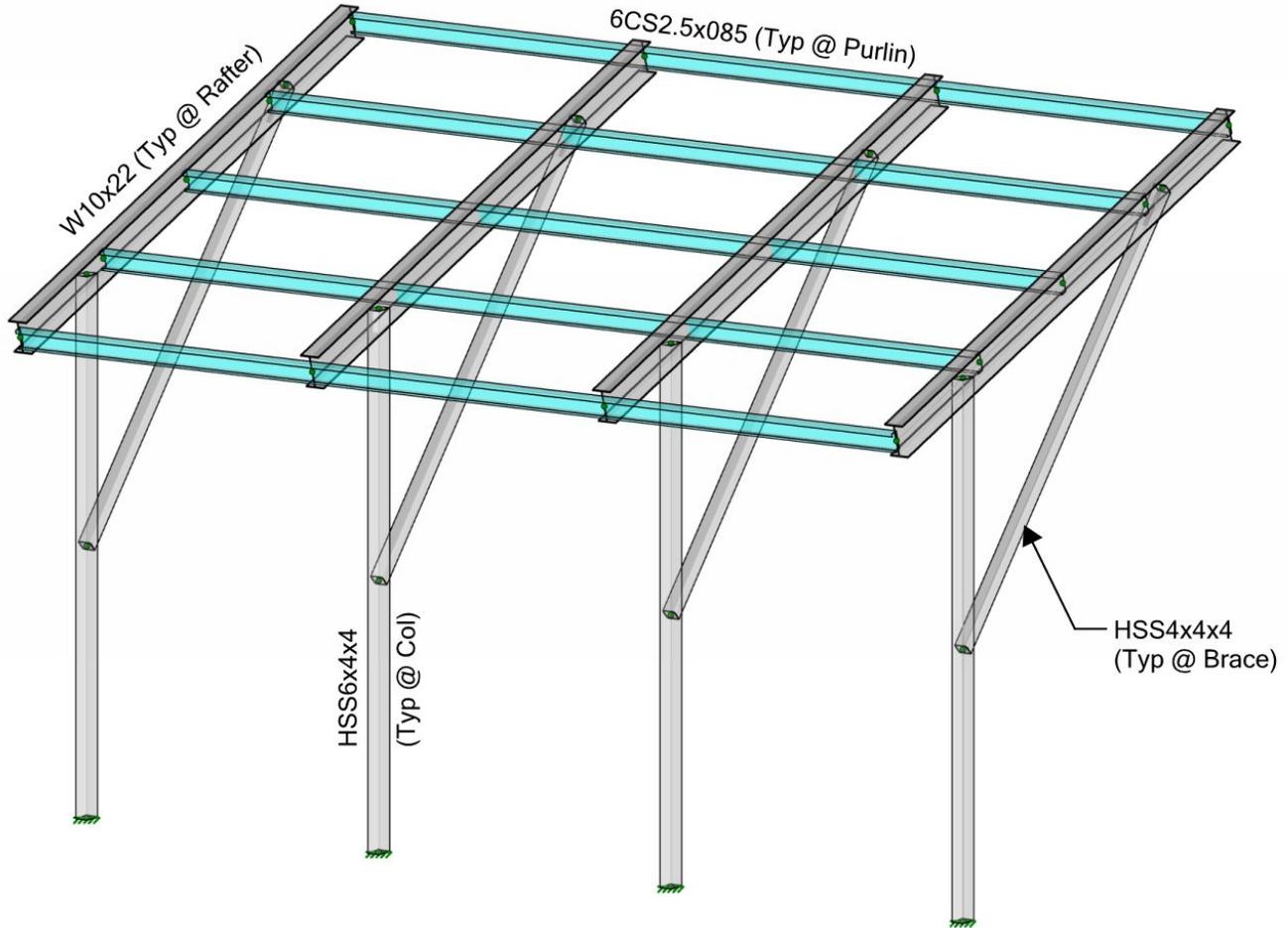
**Purlin spacing (for unbraced length) of 3'**

**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)

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

### **Distributed Loads (Wind)**

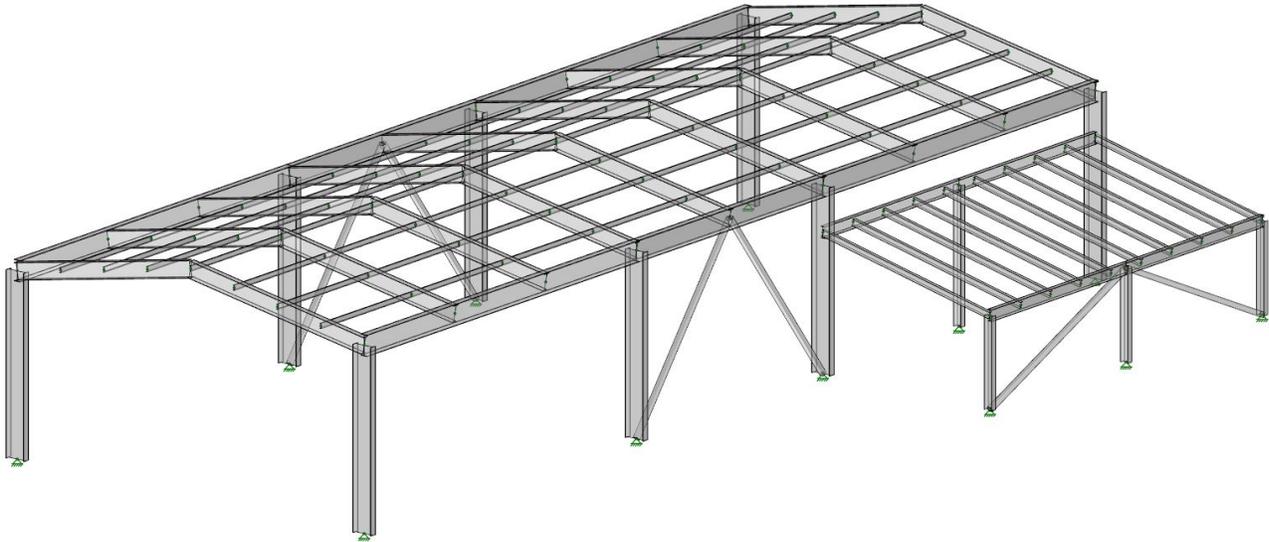
$w_{WL} = 0.25$  k/ft (in X direction on columns)

### **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)

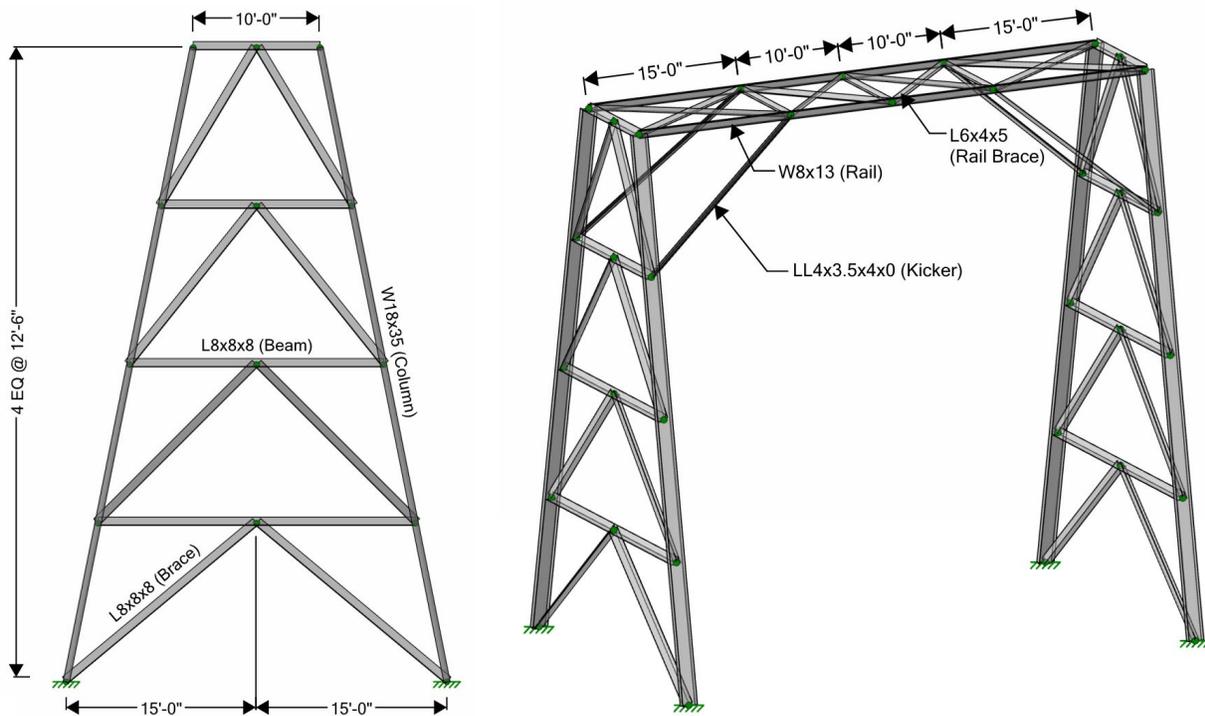
P-Delta enabled

### **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