SEISMIC BRACED FRAMES IN RISACONNECTION

Matt Brown, S.E.
SEISMIC BRACED FRAMES IN RISA CONNECTION

Design per IBC 2015...

...which references ASCE 7-10...

...which references AISC 341-10

Images courtesy of International Code Council, American Society of Civil Engineers, and American Institute of Steel Construction
SEISMIC BRACED FRAMES IN RISA CONNECTION

Initial Design

• Three Story Building
  • Height = (3)*(11’-6”) = 34’-6”
  • Risk Category: II
• $S_{DS} = 0.35g$
• $S_{D1} = 0.14g$
• Seismic Design Category C
• No Seismic Detailing Req’d
  \[ R = 3 \]
SEISMIC BRACED FRAMES IN RISACONNECTION

Design Revision

- Building will now house a 911 (Emergency) Call Center
  - Risk Category Increases to IV
  - Importance Factor increases to 1.5
  - Seismic Design Category D

- \( R = 3 \) is not allowed for Design Category D
  - Use OCBF
  - \( R = 3.25 \)
SEISMIC BRACED FRAMES IN RISACONNECTION

Design Revision

- Building Height Increased to 36 ft
- OCBF is not allowed for H > 35’
  - Use SCBF
  - R = 6
SEISMIC BRACED FRAMES IN RISACONNECTION

SCBF Load Cases

Brace Capacities:
Pnt = 200k
Pnc = 100k

BRACED FRAME

FREE BODY DIAGRAM
SEISMIC BRACED FRAMES IN RISA CONNECTION

SCBF Load Cases

- **T = Pnt = 200k**
- **C = 0.3 * Pnt = 30k**

**COMPRESSION BRACE BUCKLED**

**UNBALANCED FORCE ON BEAM**
<table>
<thead>
<tr>
<th>Material</th>
<th>Braced Frame Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>R = 3</td>
<td>60 kips</td>
</tr>
<tr>
<td>OCBF</td>
<td>125 kips</td>
</tr>
<tr>
<td>SCBF</td>
<td>150 kips</td>
</tr>
</tbody>
</table>
QUESTIONS?

Please let us know if you have questions

- We will answer questions for the next 5 minutes
- Once the webinar is closed, we will post all Q&A’s at risa.com
- For further information, contact us at info@risa.com