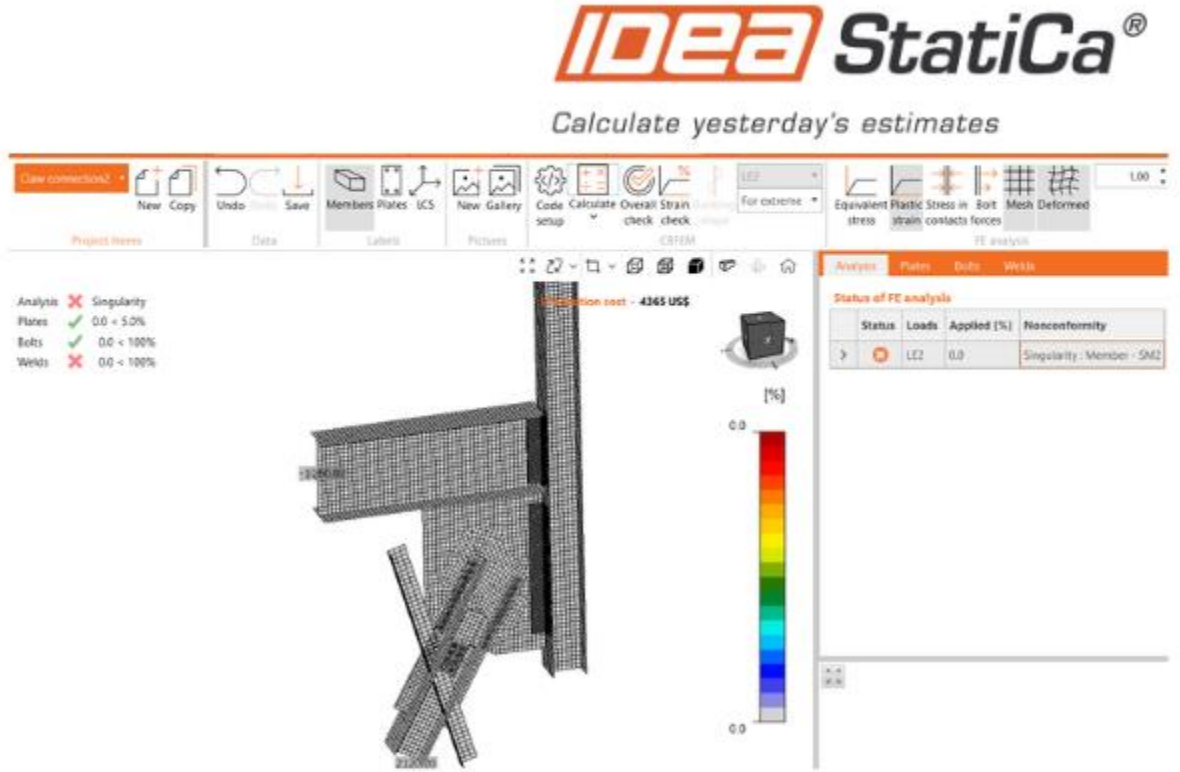
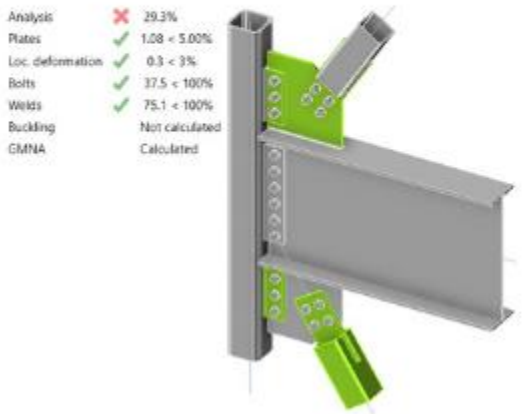
US Webinar

Troubleshooting IDEA StatiCa models

April 24, 2024



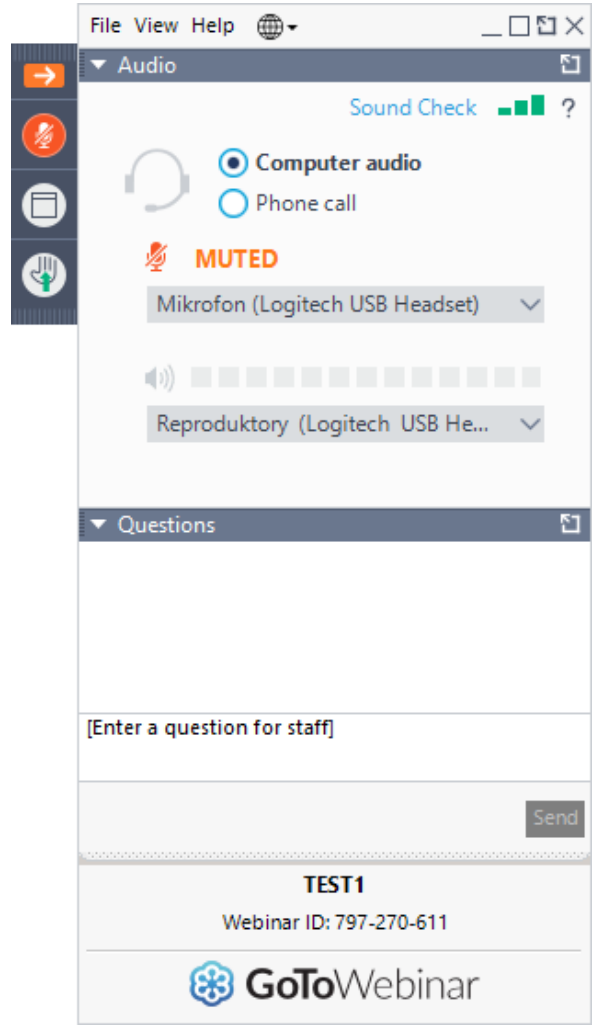


Control Panel

When you first join a session, the Control Panel appears on the right side of your screen. Use the Control Panel to manage your session. To free up space on your desktop, you can collapse the Control Panel and use the Grab Tab to continue to manage your session.

- **Grab Tab**: From the Grab Tab, you can hide the Control Panel, mute yourself (if you have been unmuted by the organizer), view the webinar in full screen and raise your hand.
- **Audio Pane**: Use the Audio pane to switch between Telephone and Mic & Speakers.
- **Questions Pane**: Ask questions for the staff.

QUESTIONS



Agenda

- The IDEA StatiCa Tech support checklist
- What is a singularity warning?
- How to identify meshing problems?
- The analysis ended before applying 100% of the loads
- What is the non-conformity table?
- Detailing check errors

IDEA StatiCa Tech Support Checklist

1. Calculate button

- Review the msg at the modeling window top left side
- Version of the software

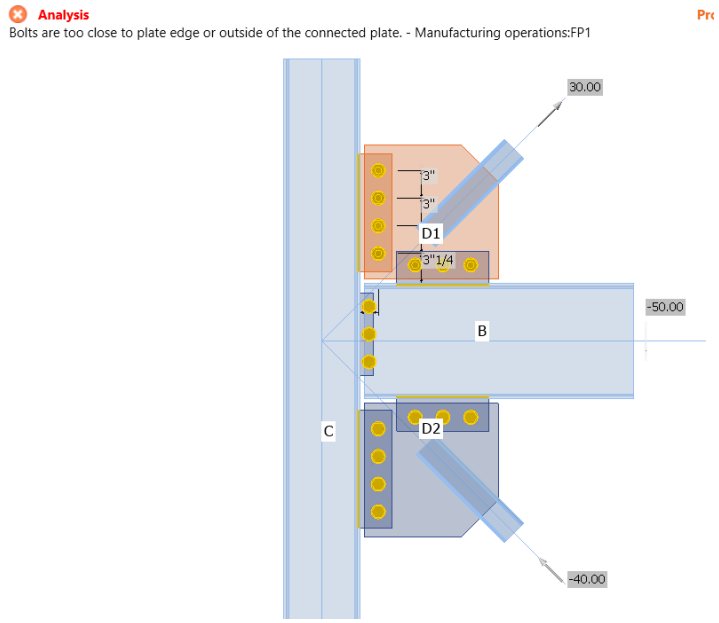
2. Check tab

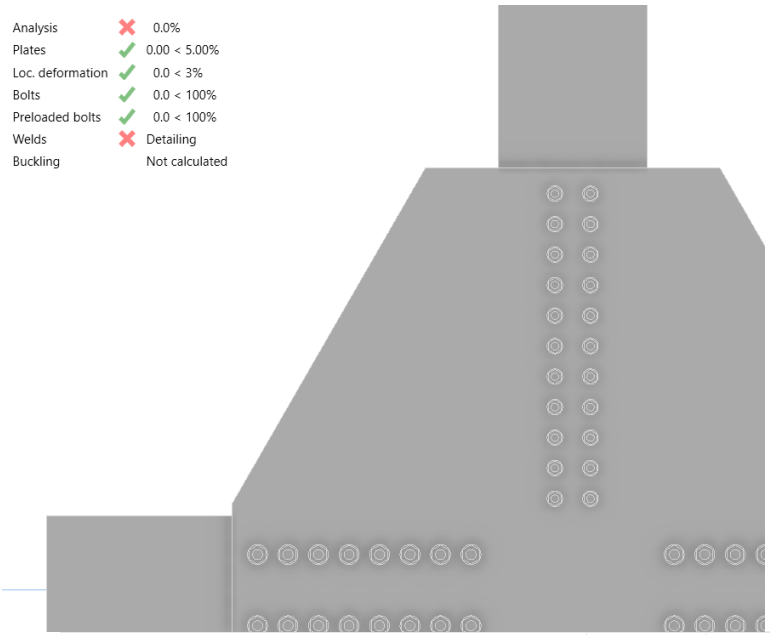
- Analysis tab>Deformed shape
- You get more info on the singularity

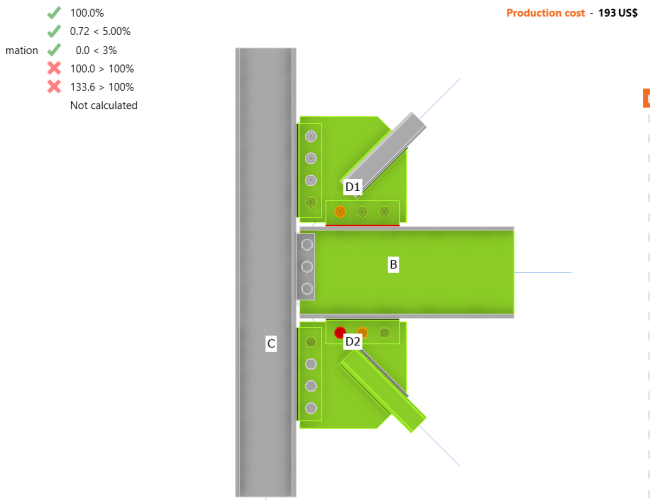
3.Modeling tab

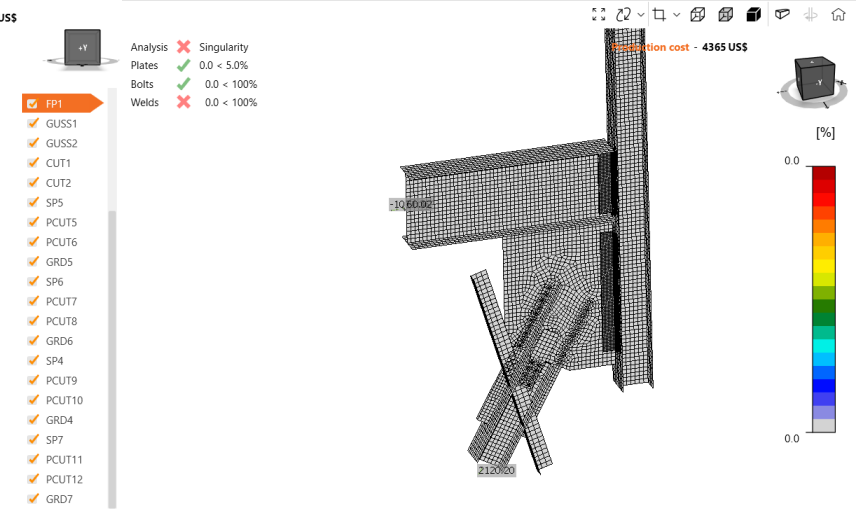
- Ensure correct bearing member and position at 0,0,0
- Model type and force position of all the members

Modeling window> Top left side

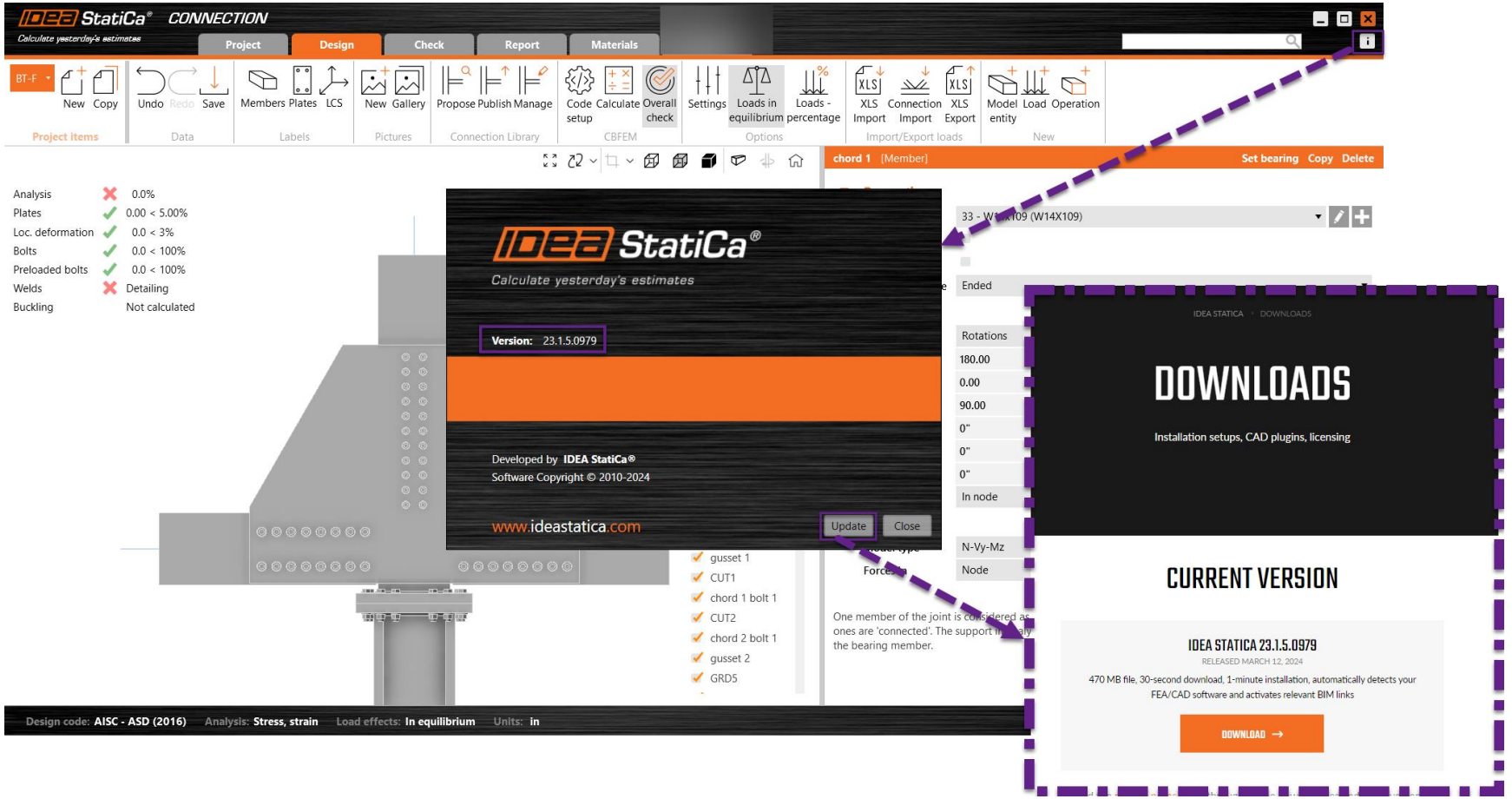








Version of the software



IDEA StatiCa Tech support Checklist

1. Calculate button

- Review the msg at the top left of the modeling window
- Version of the software

2. Singularity

- Analysis tab>Deformed shape
- You get more info on the singularity

3.Modeling tab

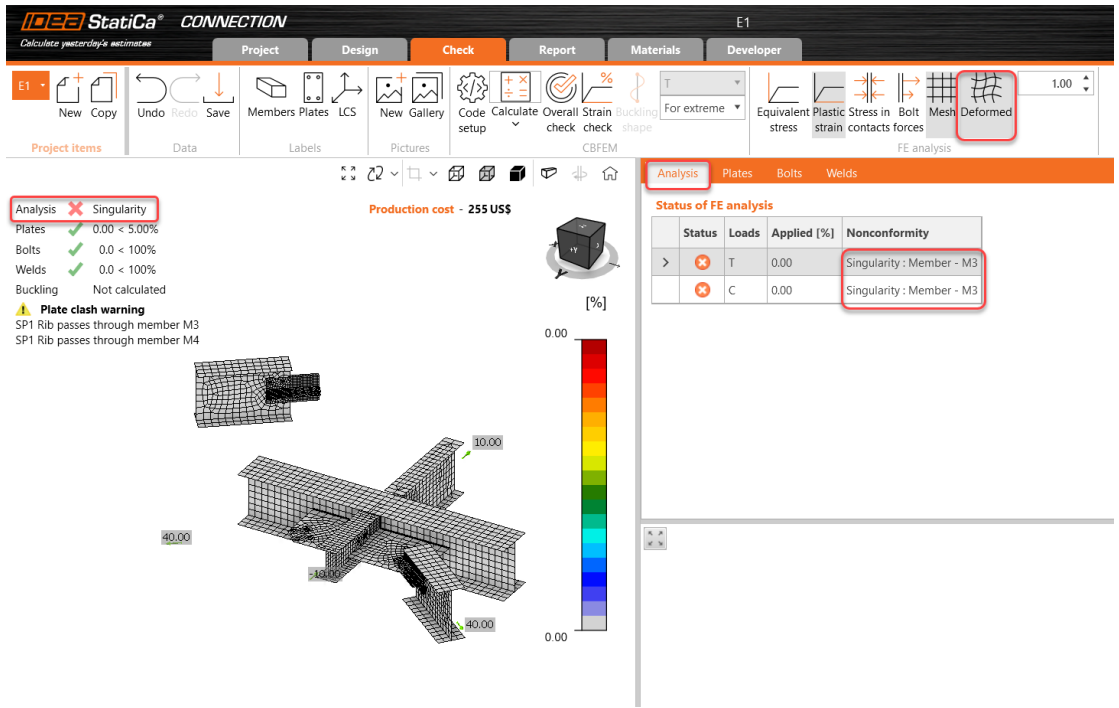
- Ensure correct bearing member and position at 0,0,0
- Model type and force position of all the members

Singularity

- The mesh was created but the analysis couldn’t start
- Something is unconnected, gaps, overlap of welds and bolts, etc.

Analysis	✗	Singularity
Plates	✓	0.00 < 5.00%
Bolts	✓	0.0 < 100%
Welds	✗	Detailing

- Review Check tab>Analysis tab>Deformed shape



IDEA StatiCa Tech Support Checklist

1. Calculate button

- Review the msg at the top left of the modeling window
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2. Check tab

- Analysis tab>Deformed shape
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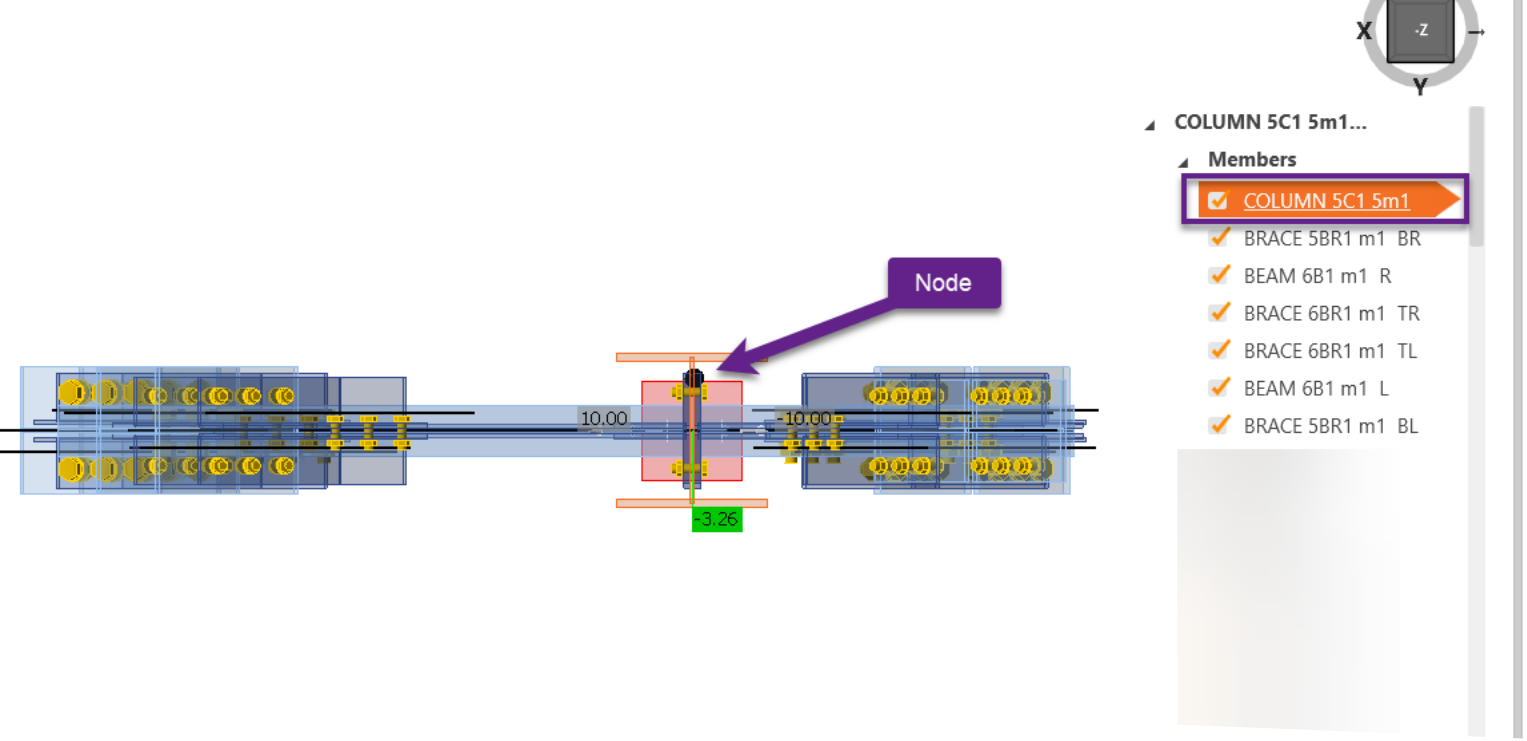
3.Modeling tab

- Ensure correct bearing member position at 0,0,0
- Model type and force position of all the members



Review all the members

- Bearing member at the node position= All offsets set to 0
- Geometrical type: continuous/ended
- Review offset ‘ex’
- Model type
- Force position

IDEA StatiCa Tech Support Checklist

4. Meshing Error

- It tells you what operation is stopping the analysis

5. Check the bolts operation

- Incorrect plate selection
- Slotted hole in the direction of the load

6. Code set up

- Reset to default
- Stop at limit strain
- GMNA

7. Nonconformity

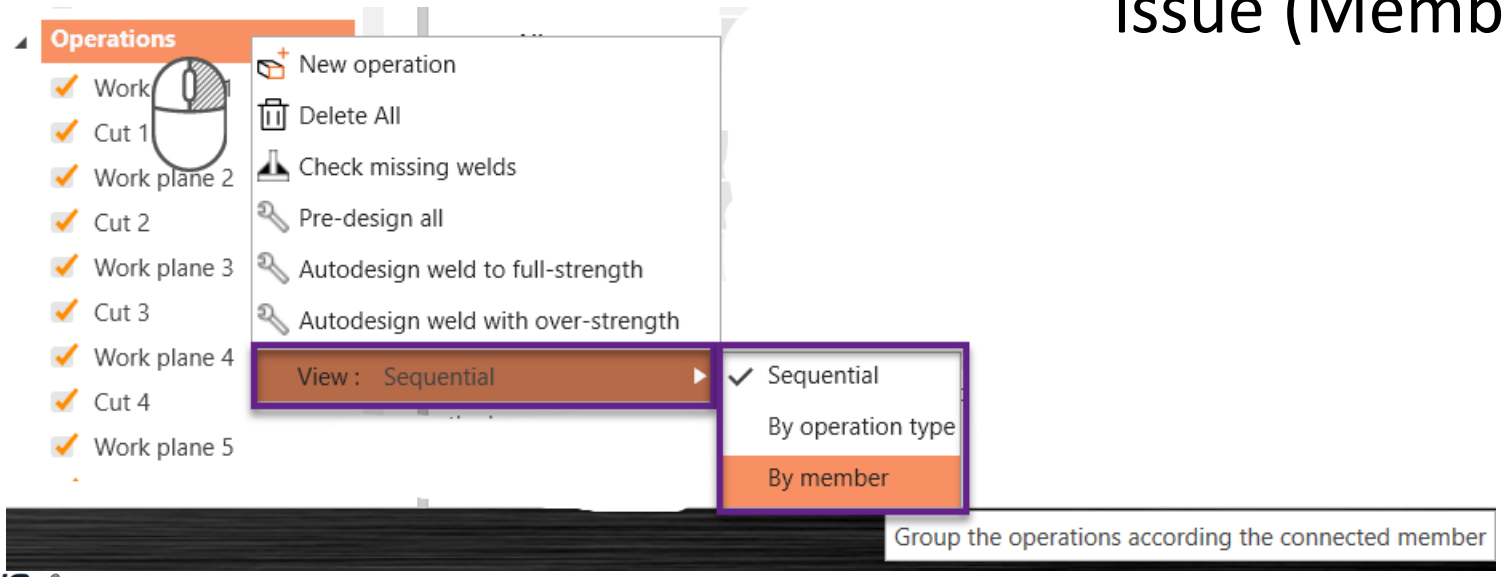
- Analysis and design OK, but you get non-conformities

Meshing error

Analysis
Mesh generation error – M564-Arc 14 – An item with the same key has already been added.

Analysis
Mesh generation error – Boomerang Gusset L6. – An item with the same key has already been added.

Analysis
Mesh generation error – 4-39-Web 1 – Mesh generation error – 4-39-Web 1 – Error code: -105



- Stops immediately the analysis, as it wasn't possible to create a mesh
- It tells you exactly where is the issue (Member or operation)

IDEA StatiCa Tech Support Checklist

4. Error msg in the modeling window

- It tells you what operation is stopping the analysis

5. Check the bolt operations

- Incorrect plate selection
- Slotted hole in the direction of the load
- The max allowable gap between plates is 1/16”

6. Code set up

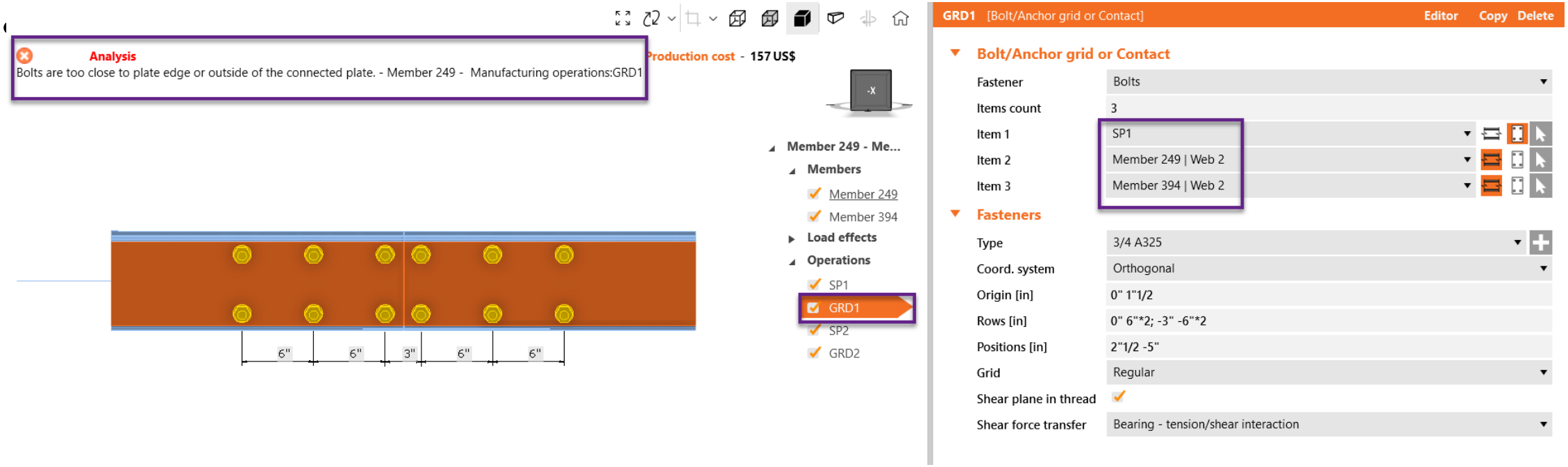
- Reset to default
- Stop at limit strain
- GMNA

7. Non-conformity

- Analysis and design OK, but you get non-conformities

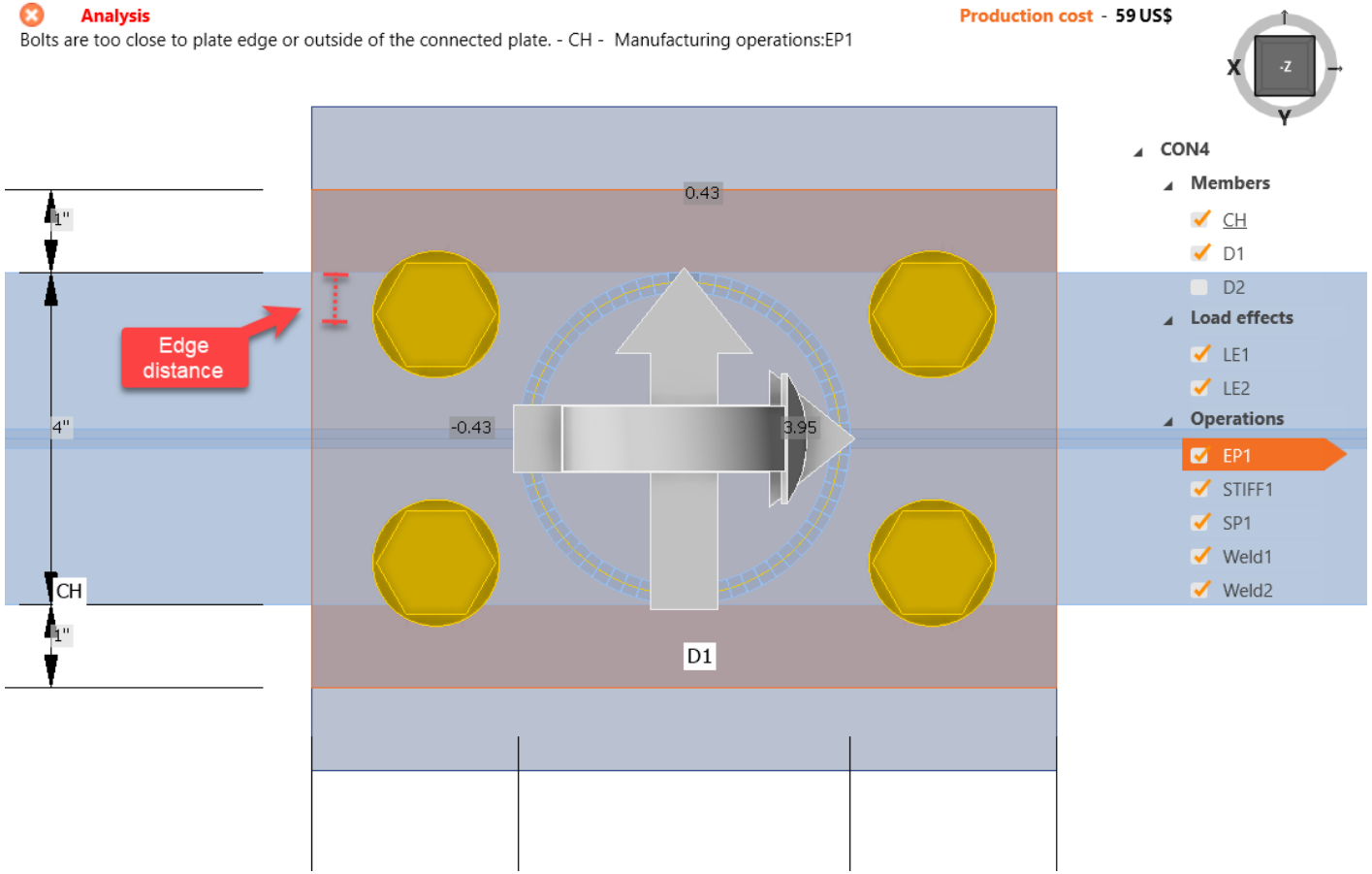
Bolts related error

- Incorrect plate selection in a grid operation



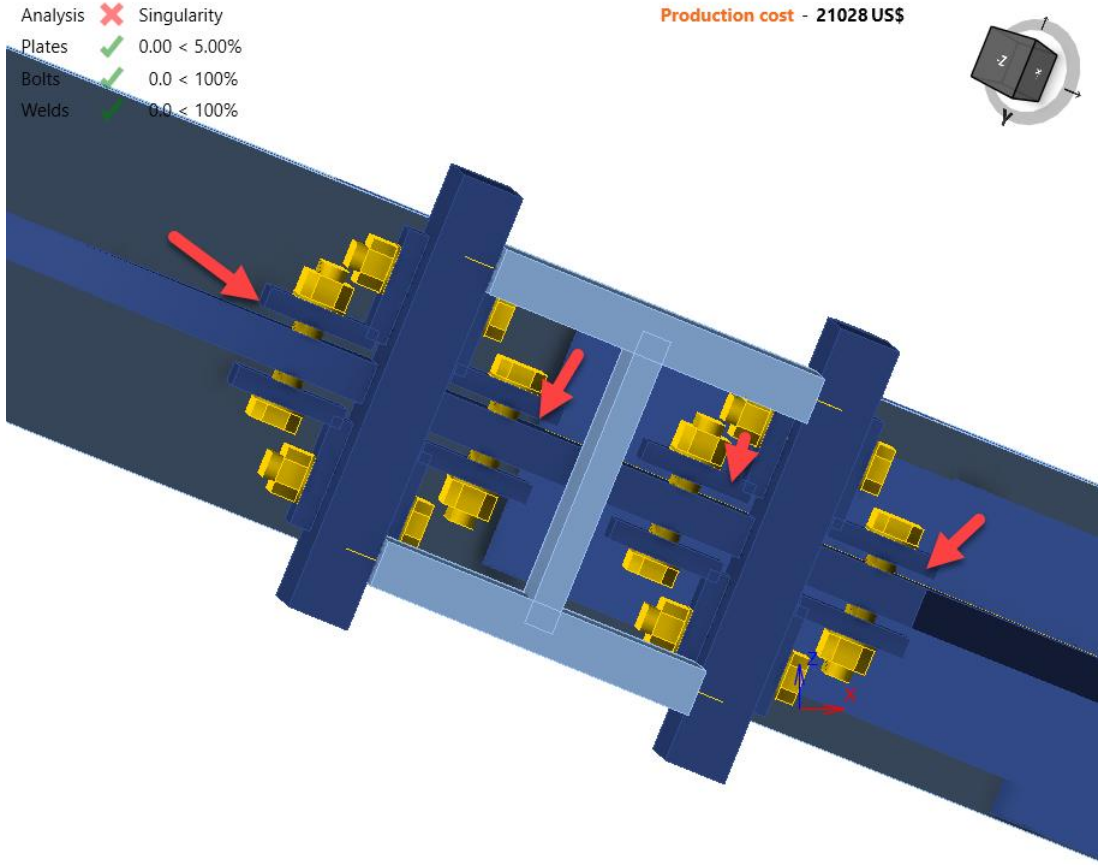
Bolts related error

- Not enough edge distance



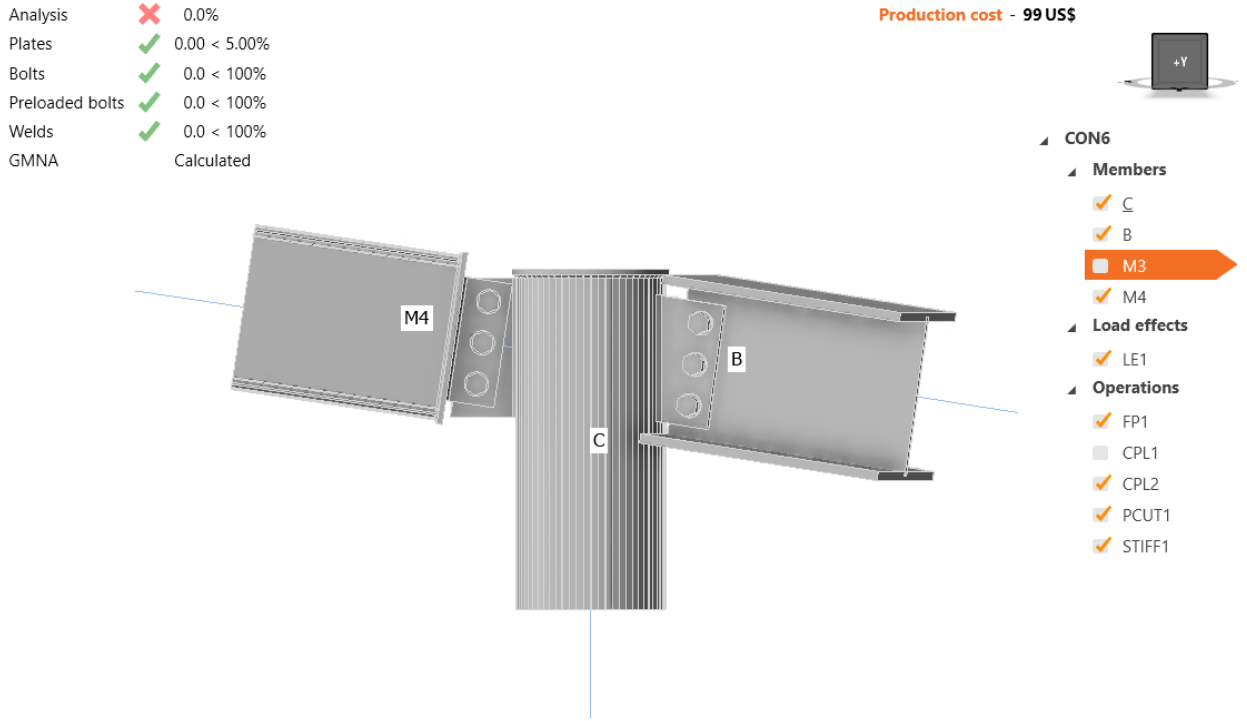
Bolts related error

- The max allowable gap between plates is 1/16”

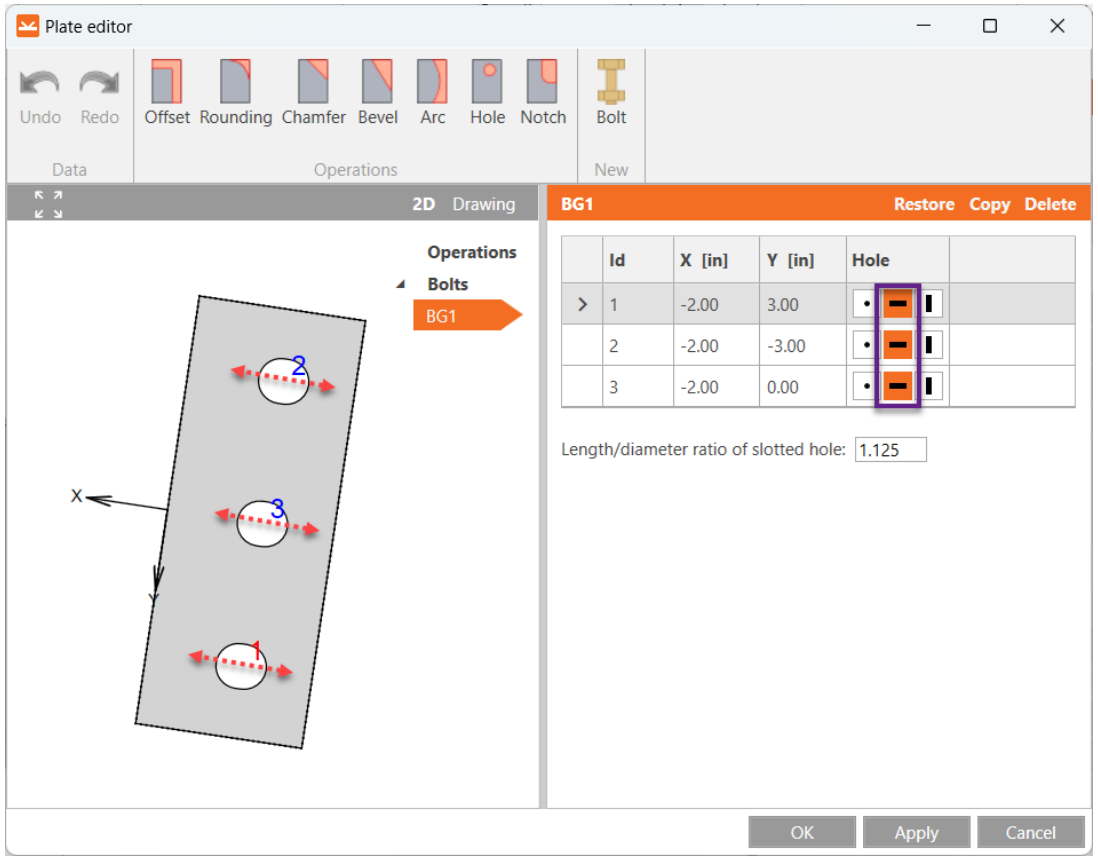


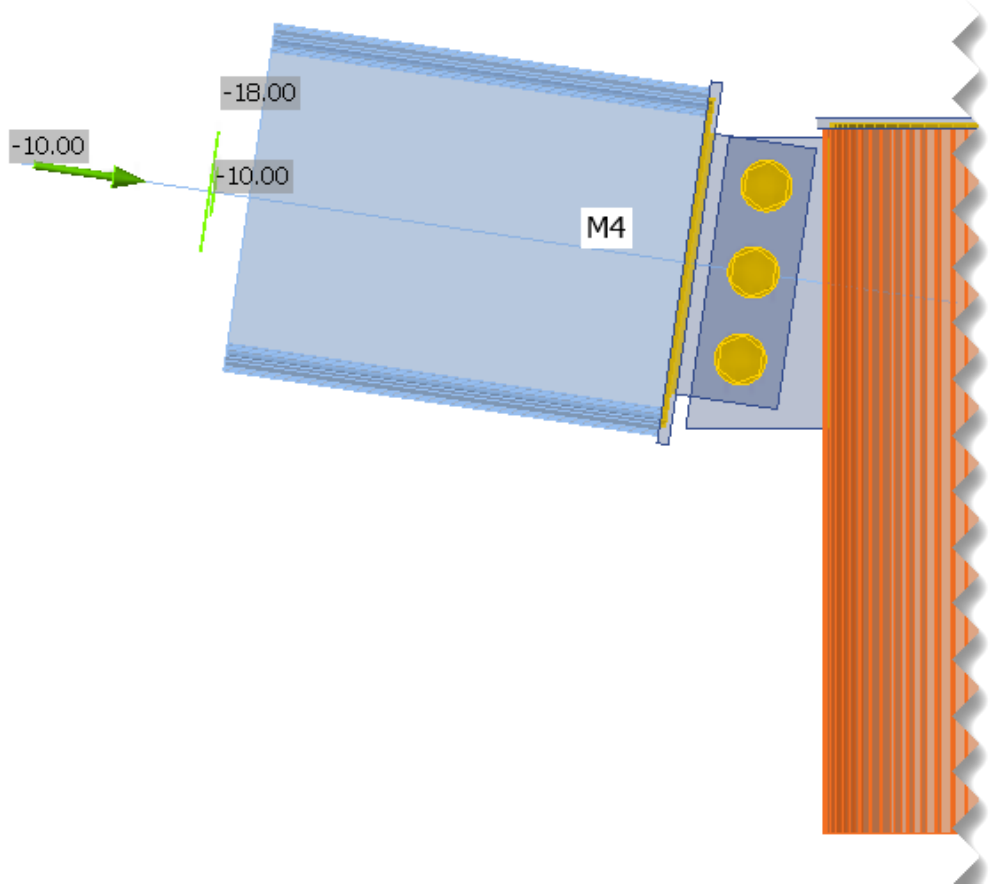
Bolts related error

- Slotted hole in the direction of the load
- Opening in the same position as the bolt



Editor>Slotted holes





IDEA StatiCa Tech Support Checklist

4. Error msg in the modeling window

- It tells you what operation is stopping the analysis

5. Check the bolts operation

- Incorrect plate selection
- Slotted hole in the direction of the load

6. Code set up

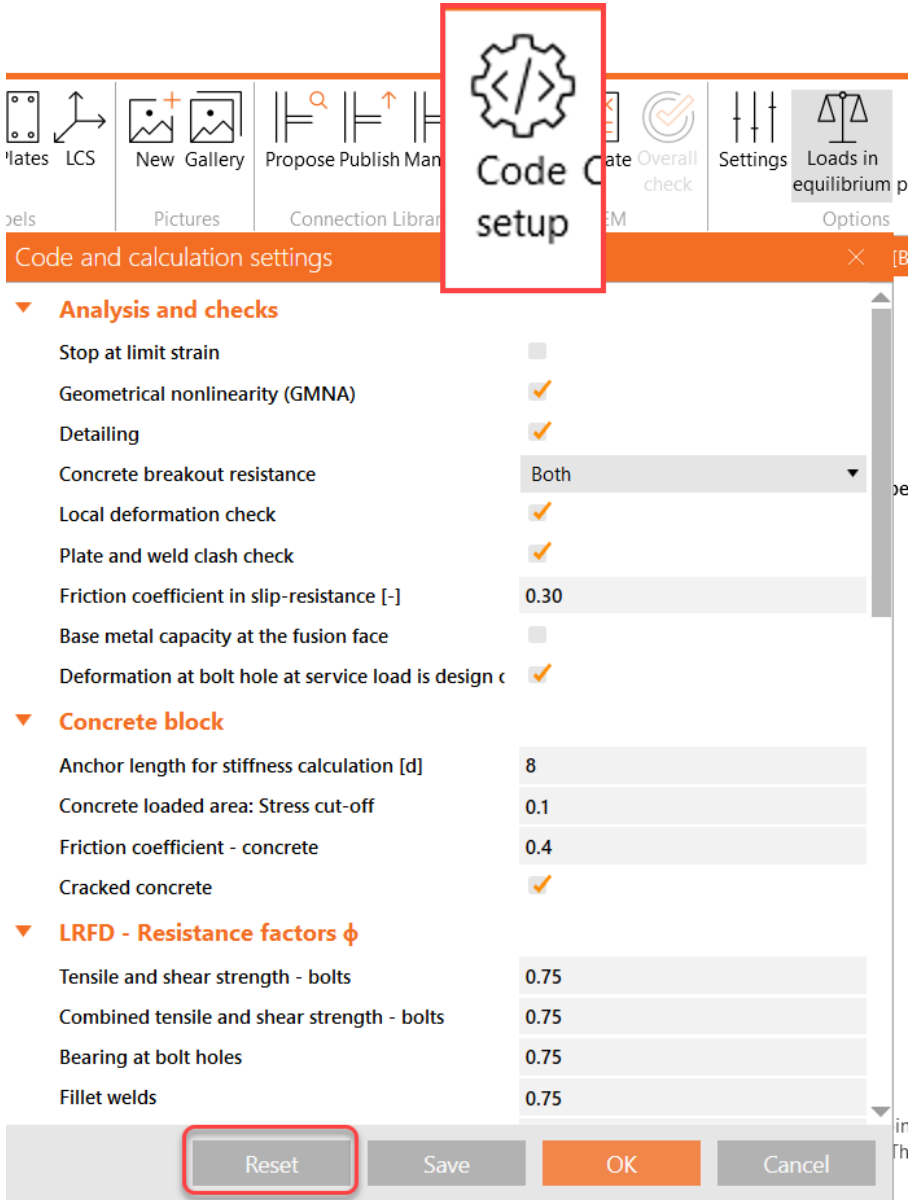
- Reset to default
- Stop at limit strain
- GMNA

7. Non-conformity

- Analysis and design OK, but you get non-conformities

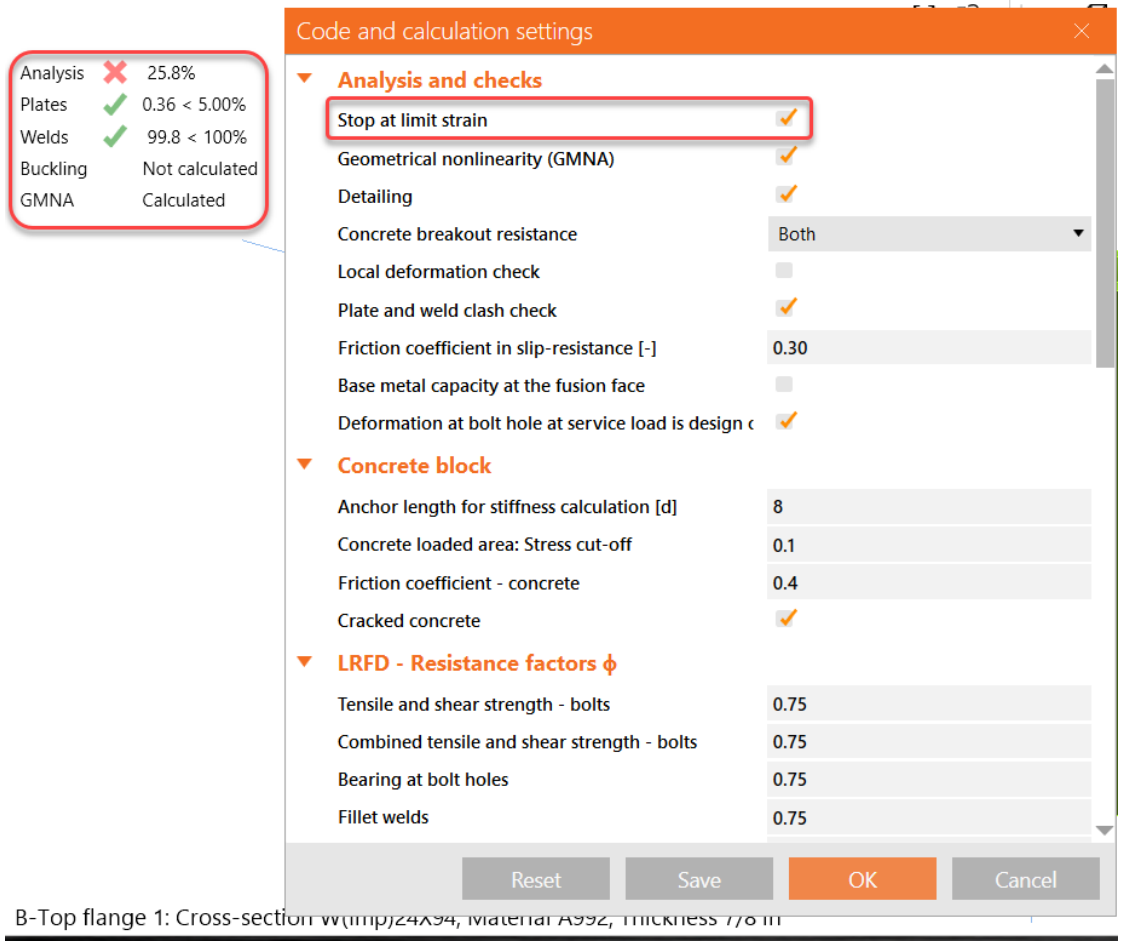
Code set up

- Reset to default



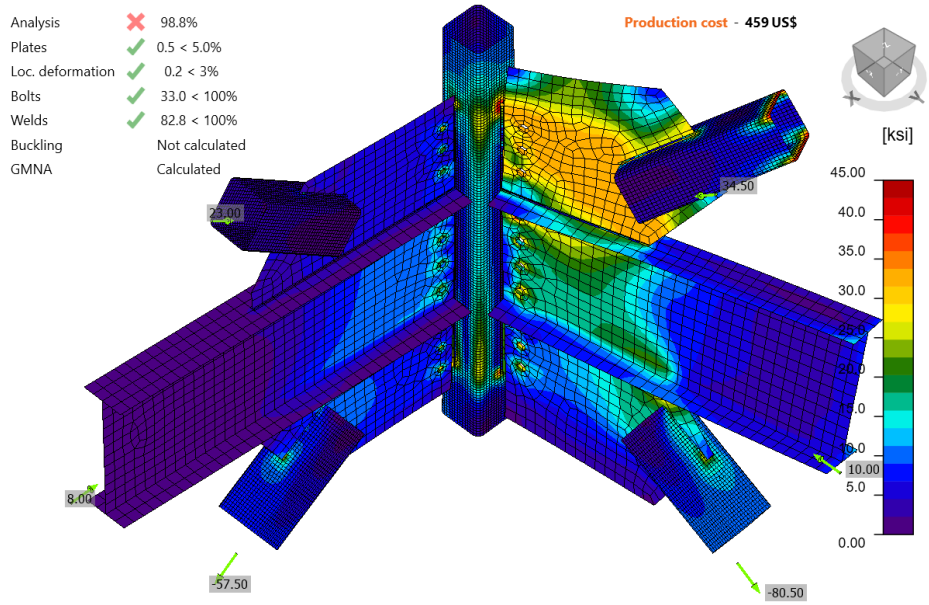
The analysis didn’t get to 100%

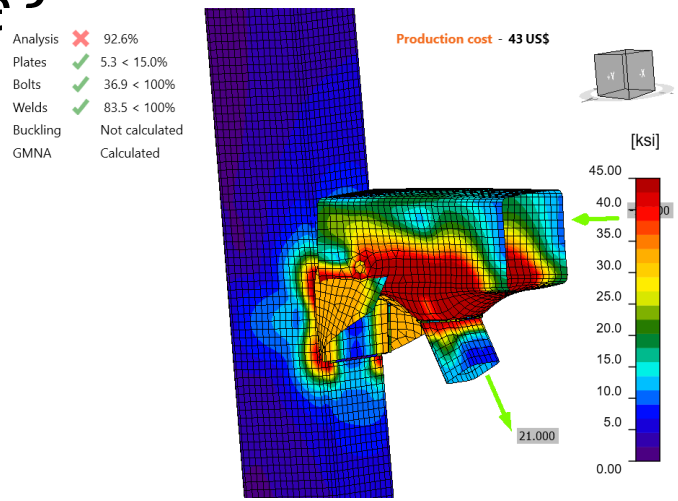
1. Stop at limit strain?



The analysis didn’t get to 100%

1. Stop at limit strain is not active and still the analysis stops
2. Bearing member is a hollow section?
3. Huge deformation?
4. GMNA Issue?





Analysis	✗	29.3%
Plates	✓	1.08 < 5.00%
Loc. deformation	✓	0.3 < 3%
Bolts	✓	37.5 < 100%
Welds	✓	75.1 < 100%
Buckling		Not calculated
GMNA		Calculated

Analysis | Local deformation

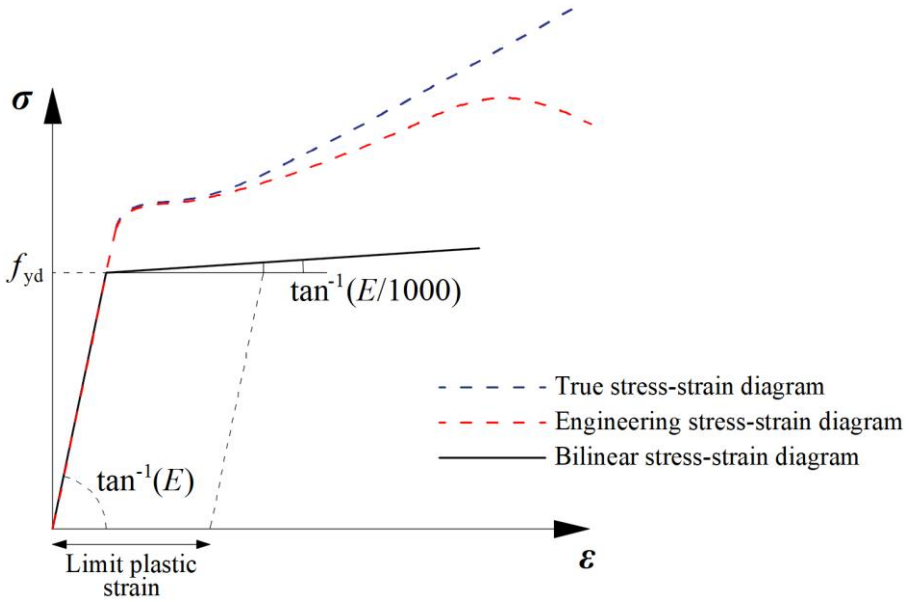
Status of FE analysis

	Status	Loads	Applied [%]
>	✗	LE1	42.19
	✗	LE2	29.30

Nonlinear analysis in IDEA StatiCa

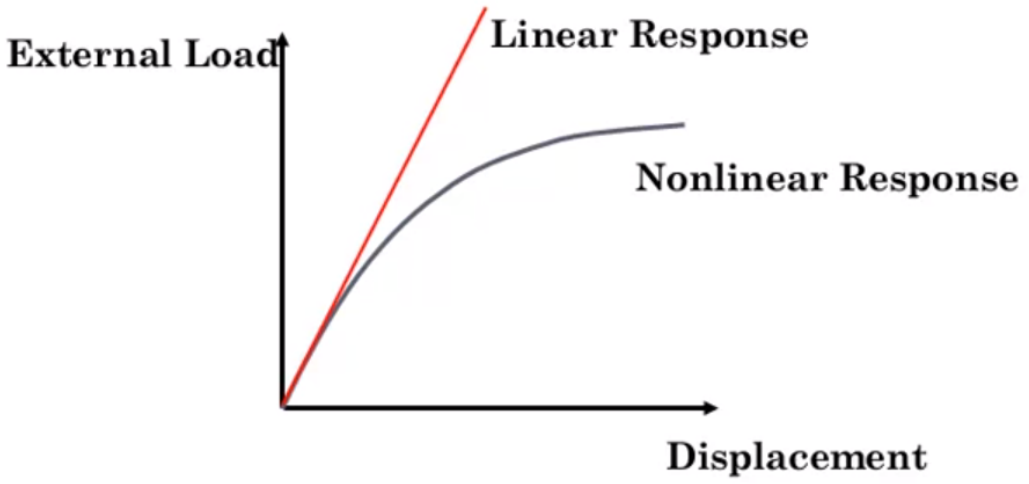
Material nonlinearity

*Active in all the analysis

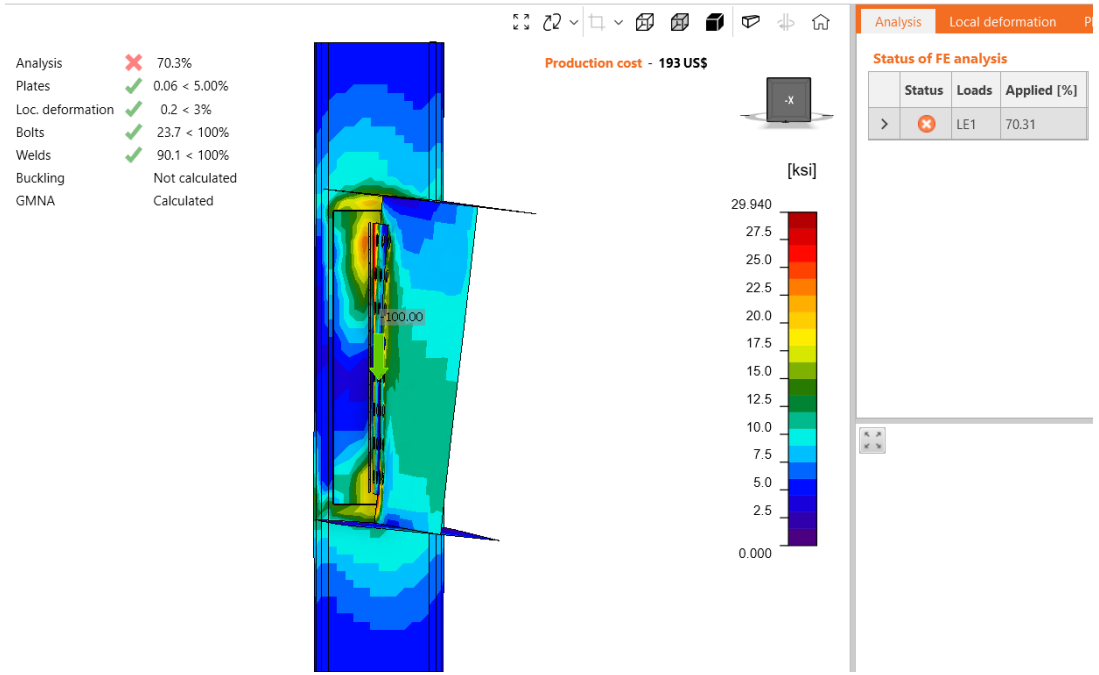


Geometrical nonlinearity

*Only active when the bearing member is a Hollow section



HSS Stability solution



1. Turn off GMNA from Code set up

2. Run the analysis

3. Spot the issue

4. Fix the design and run the analysis again

5. All good?

6. Now run the analysis with GMNA Active again and ensure design is OK.

IDEA StatiCa Tech Support Checklist

4. Error msg in the modeling window

- It tells you what operation is stopping the analysis

5. Check the bolts operation

- Incorrect plate selection
- Slotted hole in the direction of the load

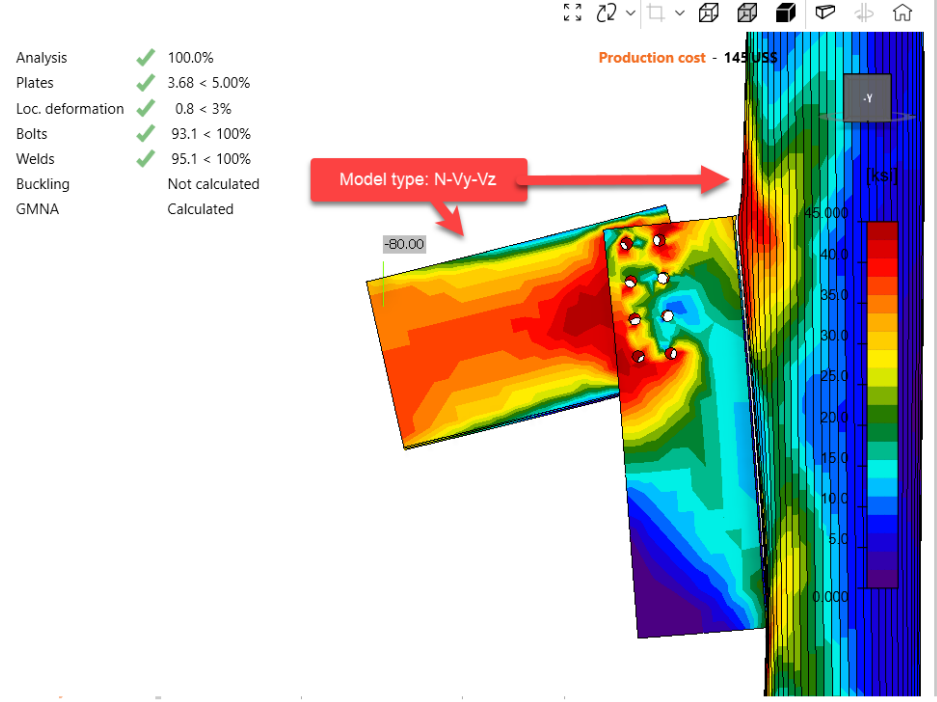
6. Code set up

- Reset to default
- Stop at limit strain
- GMNA

7. Non-conformity

- Analysis and design OK, but you get non-conformities

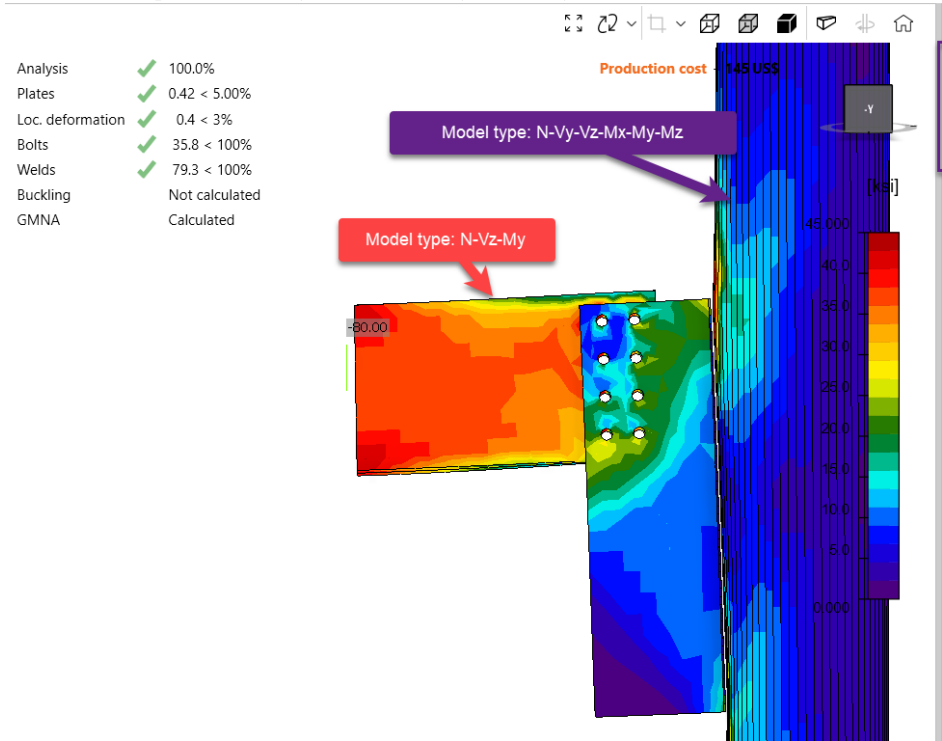
Non-conformity



Analysis | Local deformation | Plates | Bolts | Welds

Status of FE analysis

	Status	Loads	Applied [%]	Nonconformity
>	✓	LE1	100.00	Rx - -0.03[kip.ft] Ry - -110.42[kip.ft] Rz - 0.29[kip.ft]



Analysis | Local deformation | Plates | Bolts | Welds

Status of FE analysis

	Status	Loads	Applied [%]	Nonconformity
>	✓	LE1	100.00	Y - 0.54[kip] Rx - -0.39[kip.ft] Rz - 3.38[kip.ft]

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IDEA StatiCa Tech Support Checklist

8. Detailing error?

- Review the detailing warning under Check tab>Welds or bolts

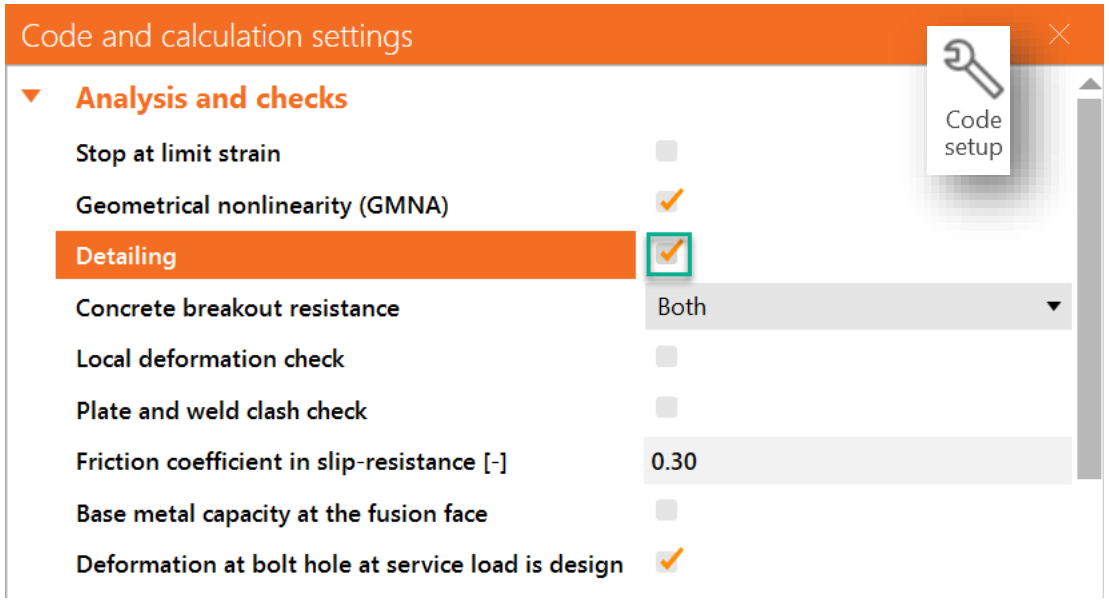
9. Order of operations

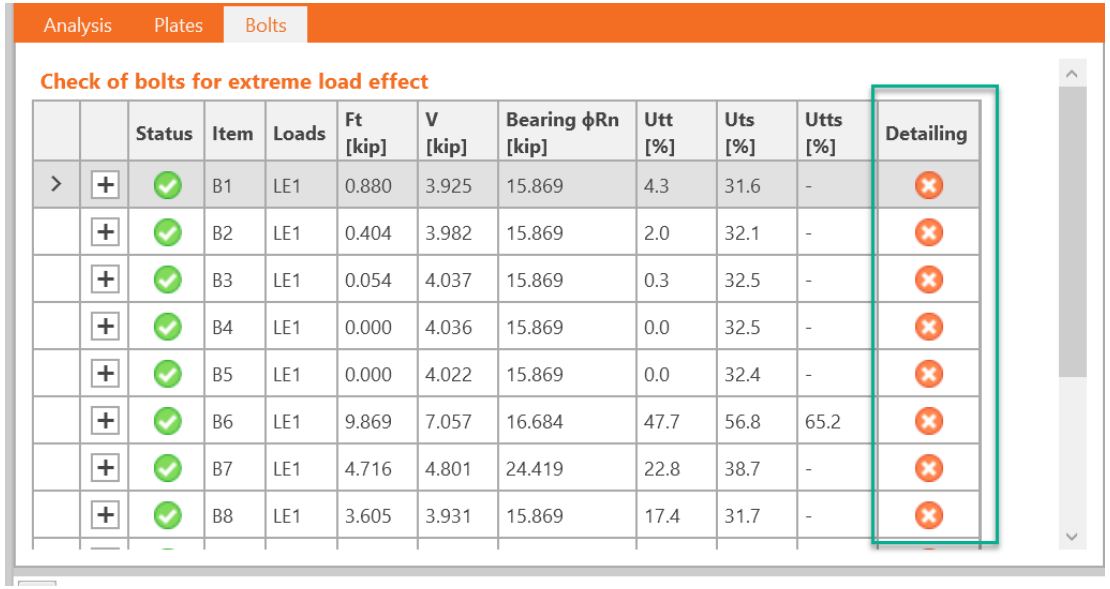
- The modeling order matters and affect the analysis

10. Round HSS cross section modeling issue

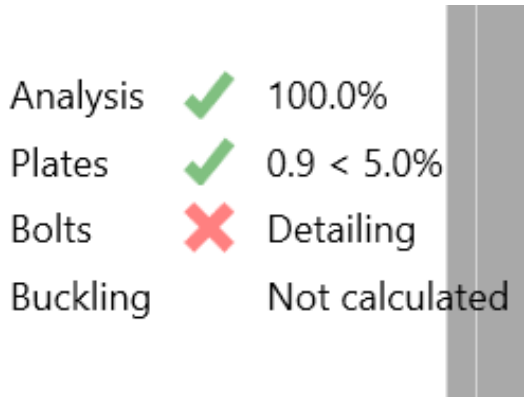
- Use the hollow polygon section under cold formed database

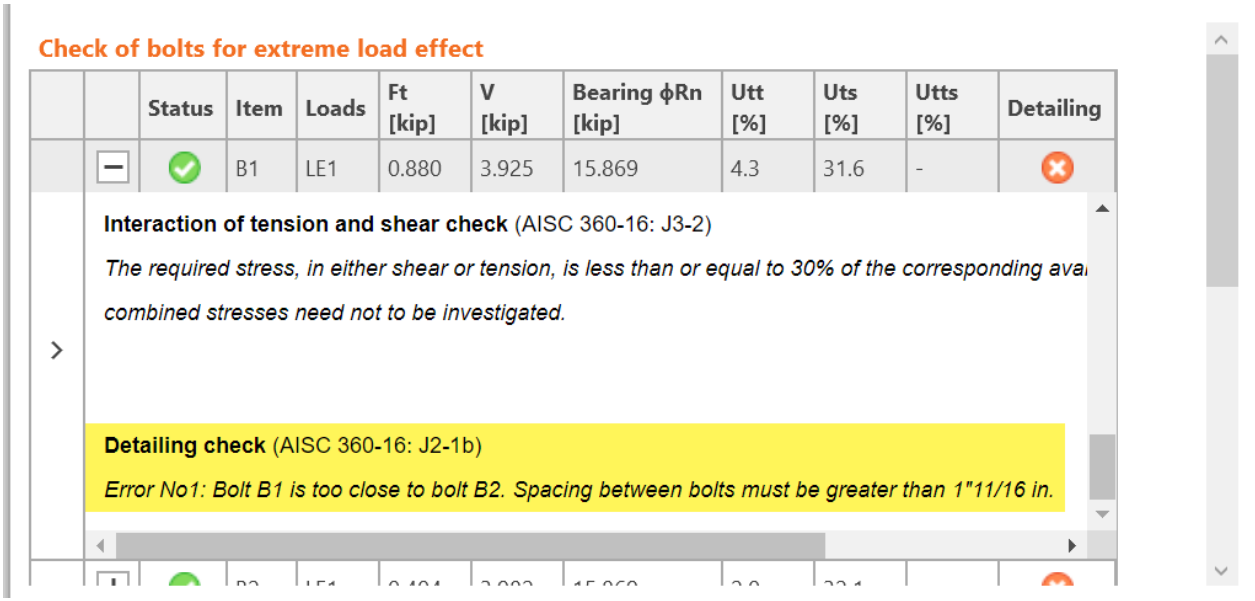
Detailing checks





		Status	Item	Loads	Ft [kip]	V [kip]	Bearing ϕRn [kip]	Utt [%]	Uts [%]	Utts [%]	Detailing
>	+	✓	B1	LE1	0.880	3.925	15.869	4.3	31.6	-	✗
	+	✓	B2	LE1	0.404	3.982	15.869	2.0	32.1	-	✗
	+	✓	B3	LE1	0.054	4.037	15.869	0.3	32.5	-	✗
	+	✓	B4	LE1	0.000	4.036	15.869	0.0	32.5	-	✗
	+	✓	B5	LE1	0.000	4.022	15.869	0.0	32.4	-	✗
	+	✓	B6	LE1	9.869	7.057	16.684	47.7	56.8	65.2	✗
	+	✓	B7	LE1	4.716	4.801	24.419	22.8	38.7	-	✗
	+	✓	B8	LE1	3.605	3.931	15.869	17.4	31.7	-	✗





		Status	Item	Loads	Ft [kip]	V [kip]	Bearing ϕRn [kip]	Utt [%]	Uts [%]	Utts [%]	Detailing
	−	✓	B1	LE1	0.880	3.925	15.869	4.3	31.6	-	✗

IDEA StatiCa®

Detailing checks (bolts)

3. Minimum Spacing

The distance between centers of standard, oversized or slotted holes shall not be less than $2^2/_3$ times the nominal diameter, d, of the fastener. However, the clear distance between bolt holes or slots shall not be less than d.

User Note: A distance between centers of standard, oversize or slotted holes of $3d$ is preferred.

TABLE J3.4
Minimum Edge Distance[a] from Center of Standard Hole[b] to Edge of Connected Part, in.

Bolt Diameter, in.	Minimum Edge Distance
1/2	3/4
5/8	7/8
3/4	1
7/8	1 1/8
1	1 1/4
1 1/8	1 1/2
1 1/4	1 5/8
Over 1 1/4	1 1/4 d

[a] If necessary, lesser edge distances are permitted provided the applicable provisions from Sections J3.10 and J4 are satisfied, but edge distances less than one bolt diameter are not permitted without approval from the engineer of record.
[b] For oversized or slotted holes, see Table J3.5.

Detailing checks welds

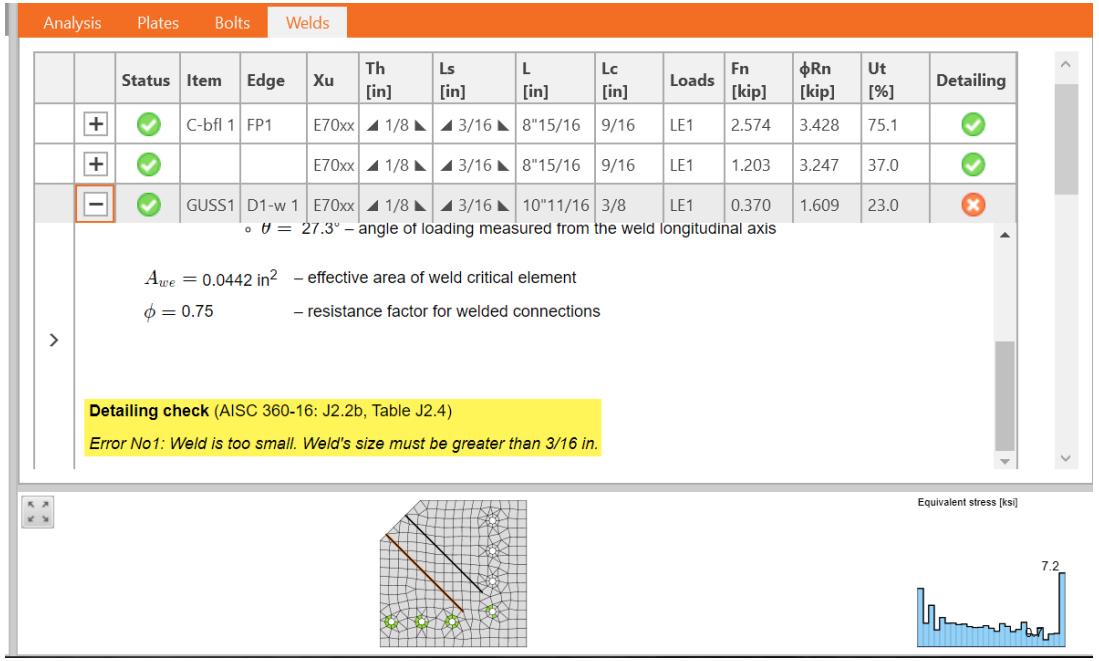


TABLE J2.4
Minimum Size of Fillet Welds

Material Thickness of Thinner Part Joined, in. (mm)	Minimum Size of Fillet Weld,[a] in. (mm)
To 1/4 (6) inclusive	1/8 (3)
Over 1/4 (6) to 1/2 (13)	3/16 (5)
Over 1/2 (13) to 3/4 (19)	1/4 (6)
Over 3/4 (19)	5/16 (8)

[a] Leg dimension of fillet welds. Single pass welds must be used.
Note: See Section J2.2b for maximum size of fillet welds.

IDEA StatiCa Tech Support Checklist

8. Detailing error?

- Review the detailing warning under Check tab>Welds or bolts

9. Order of operations

- The modeling order matters and affect the analysis

10. Round HSS cross section modeling issue

- Use the hollow polygon section under cold formed database

IDEA StatiCa Tech Support Checklist

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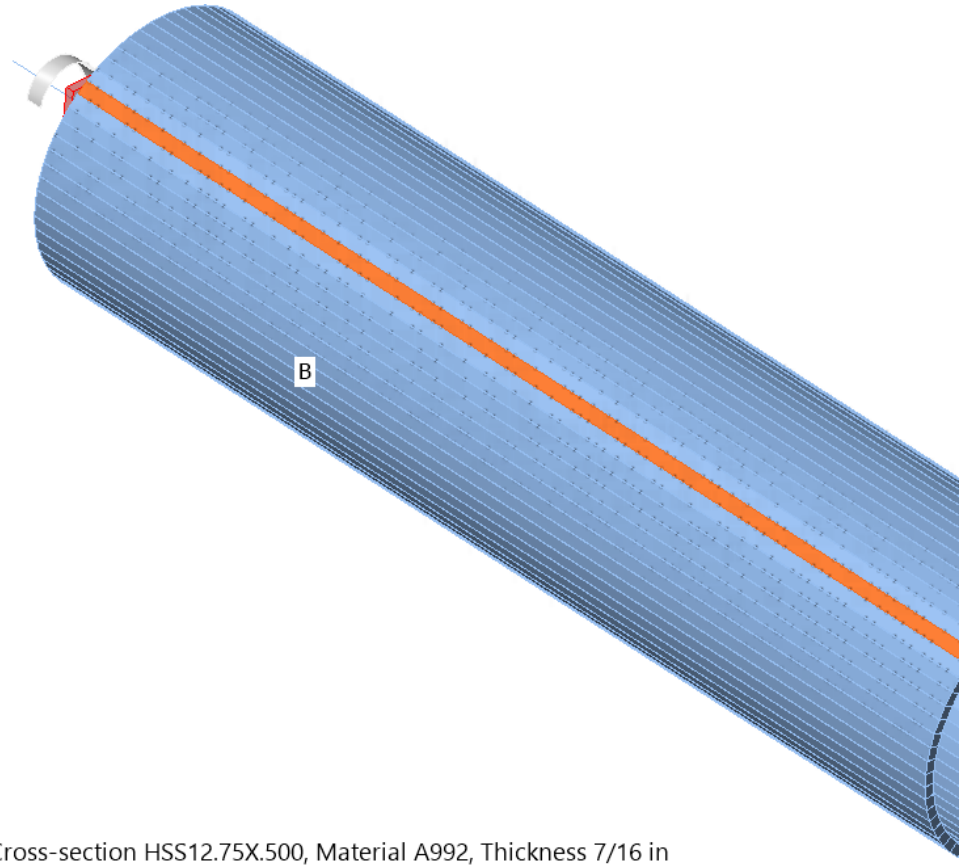
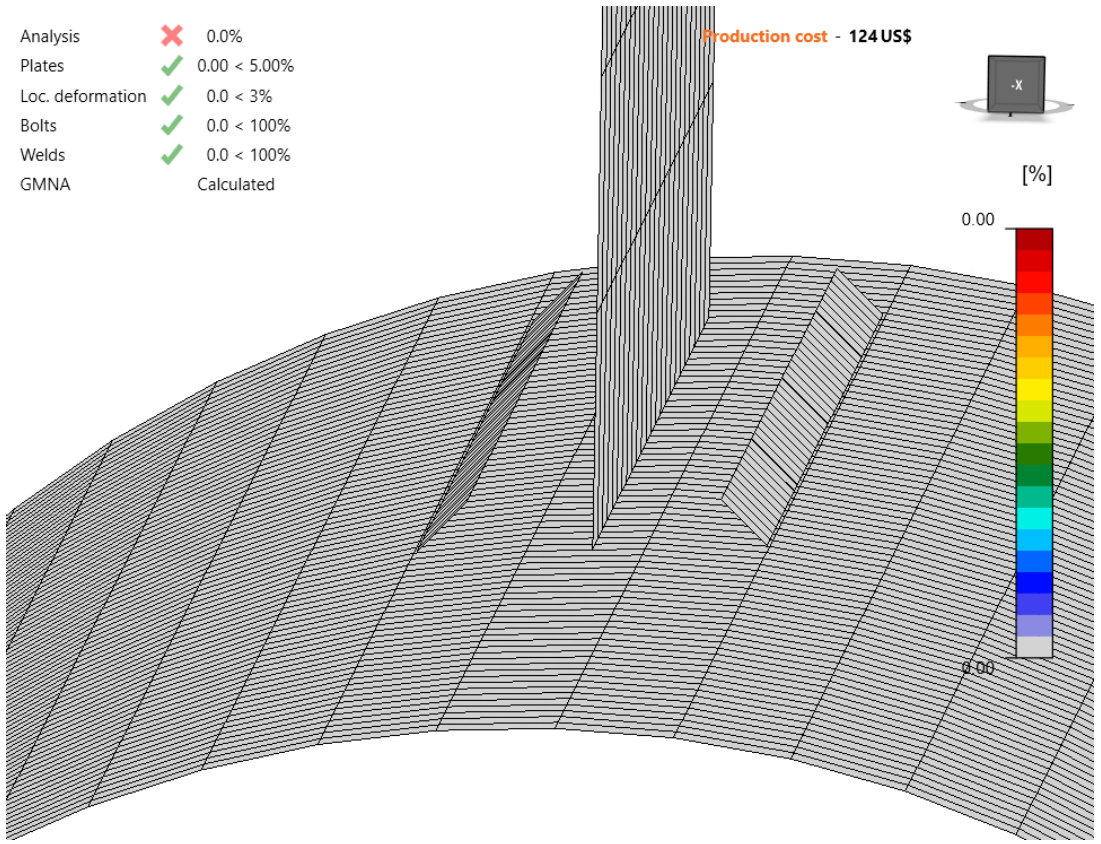
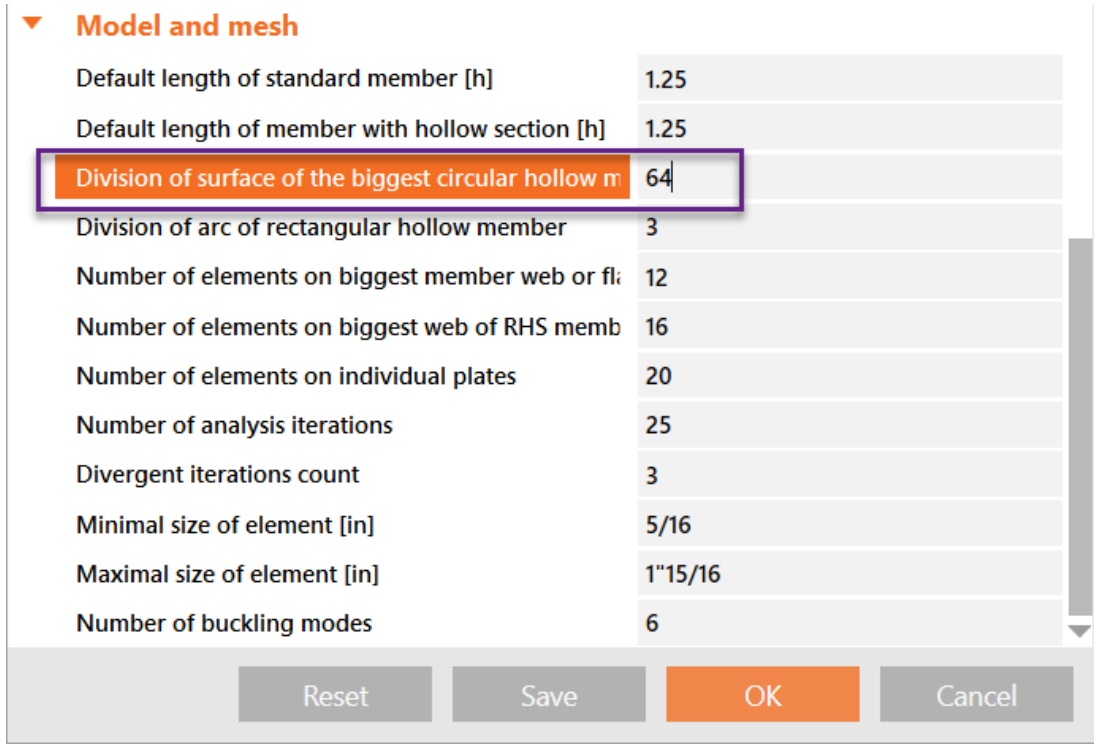
Round HSS Cross section



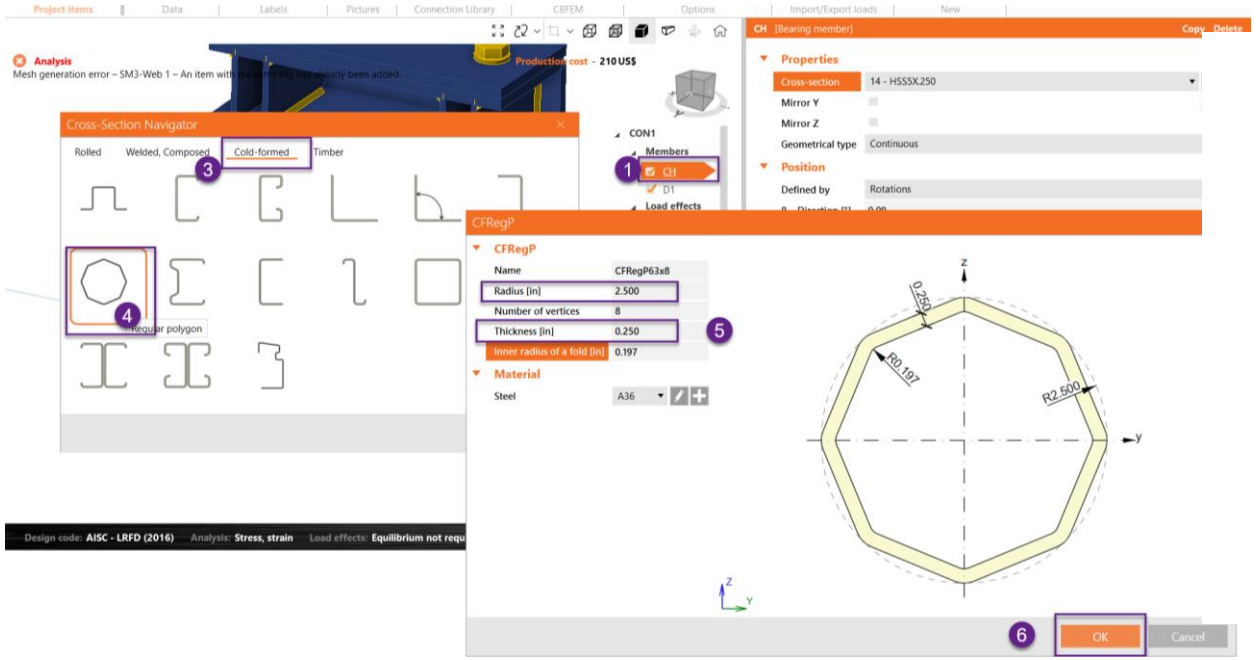


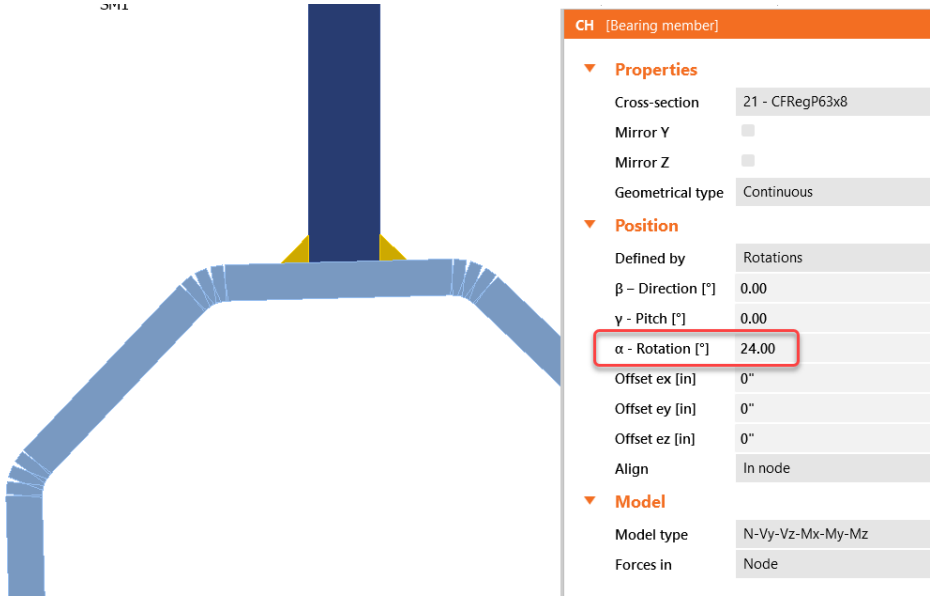
B-Arc 24: Cross-section HSS12.75X.500, Material A992, Thickness 7/16 in

Solution 1: Division of HSS surface



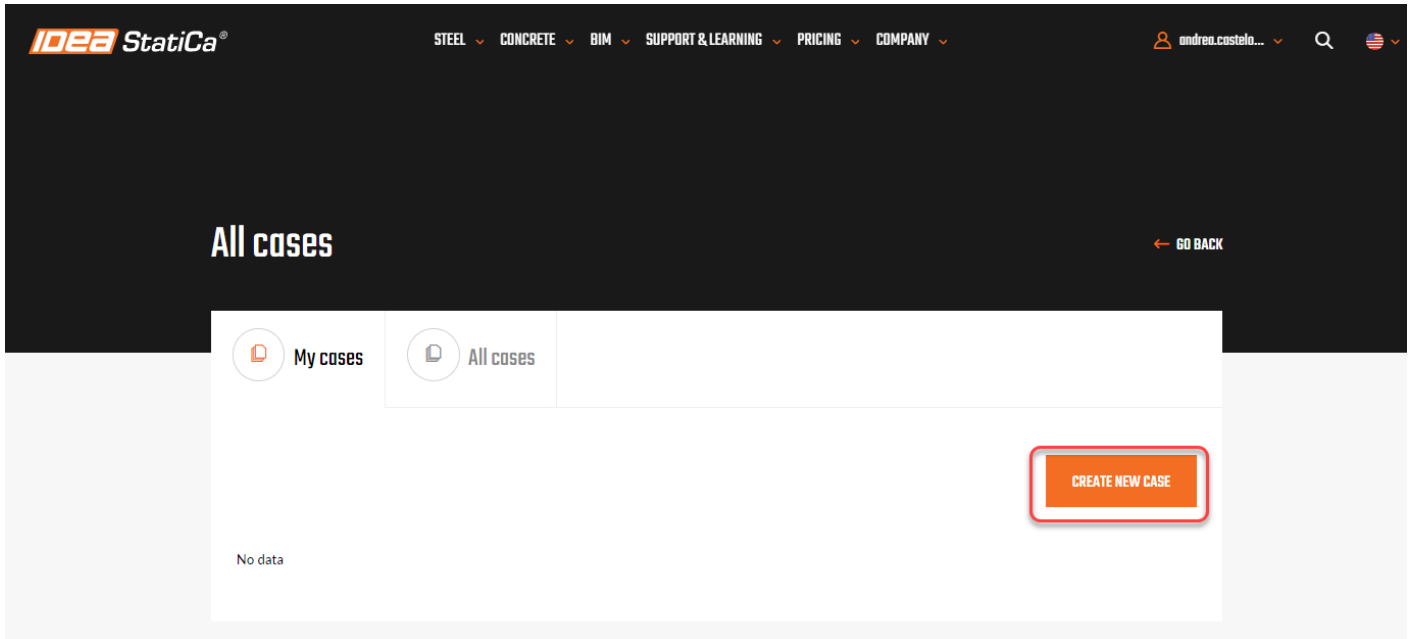
Solution 2: Use hollow section polygon under cold formed database





User portal>User case

https://www.ideastatica.com/Portal/Case



Q&A

UP COMING EVENTS

SEA Kentucky, May 22nd

SEA Arizona, June 20th

Webinar: IDEA StatiCa v24, May 22nd

Webinar: TBD, June 26th