



WIND PRESSURE ANALYSIS

FROM CIVIL NX MODEL TO FEA NX
STRUCTURAL ANALYSIS

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CONTENT

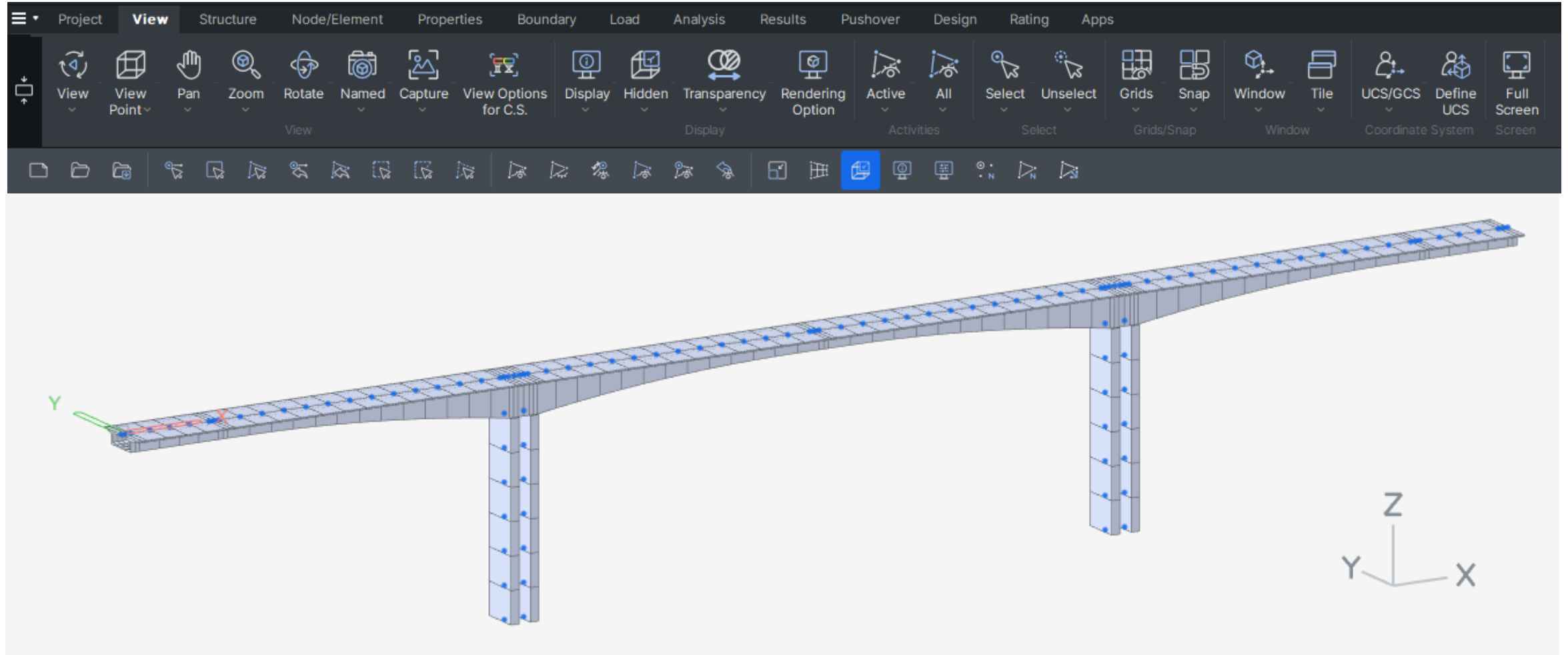
1. Modelling (from CIVIL NX to FEA NX)
2. CFD Analysis using NFX
3. Structural Analysis using FEA NX

PART 1

MODELLING

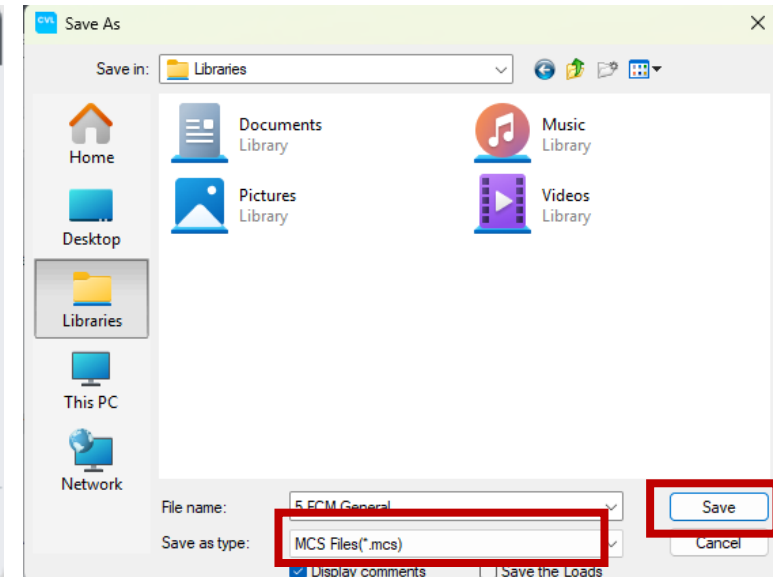
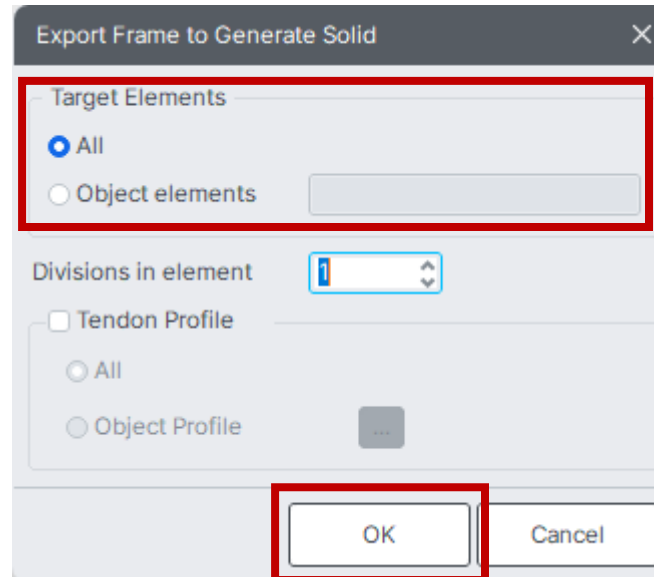
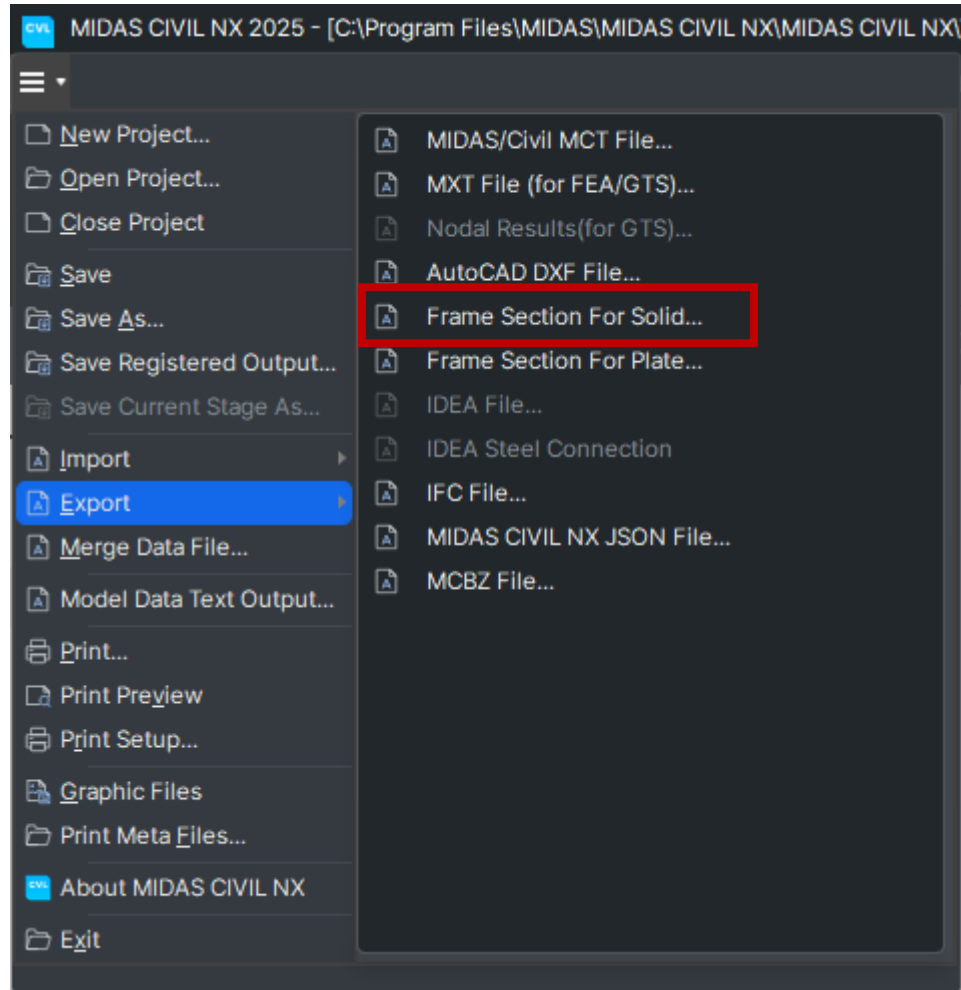
CIVIL NX MODEL (1D SECTION)

CVL



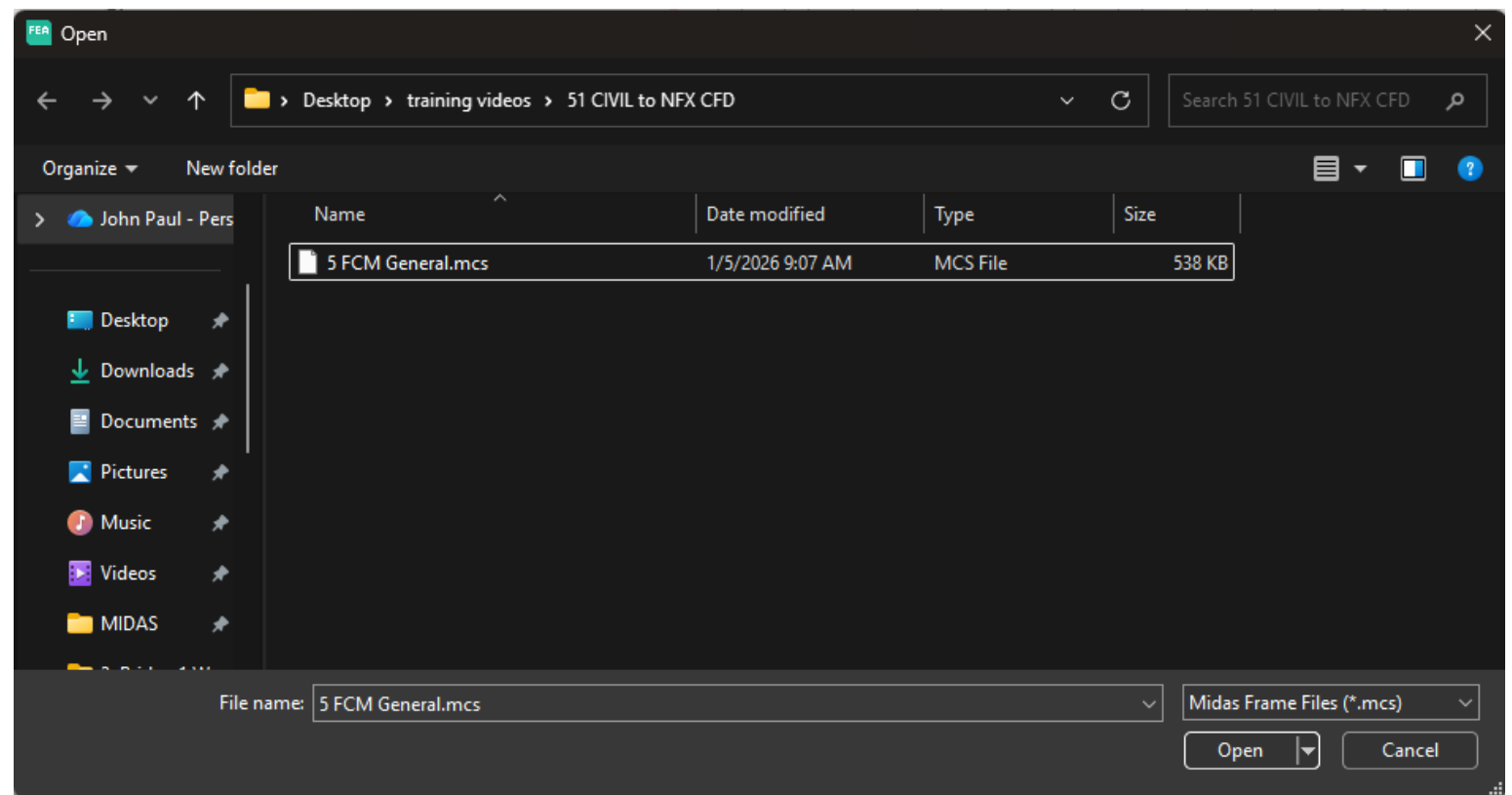
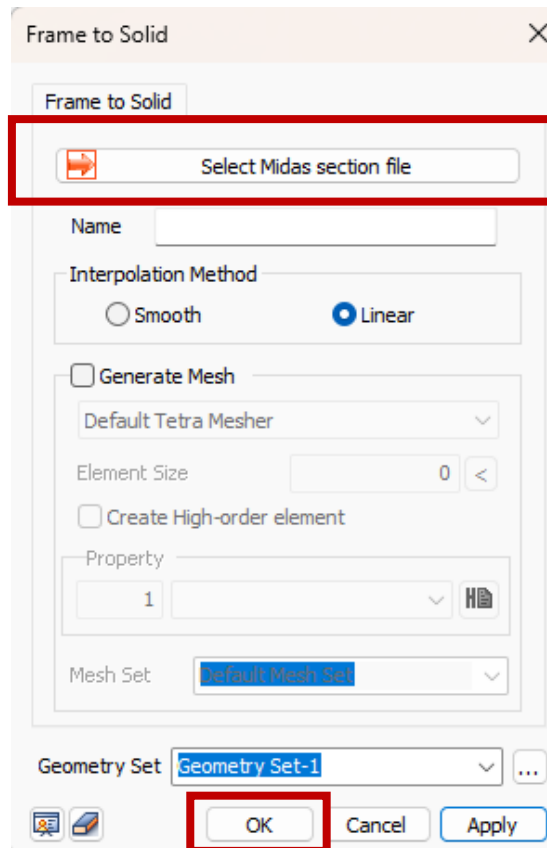
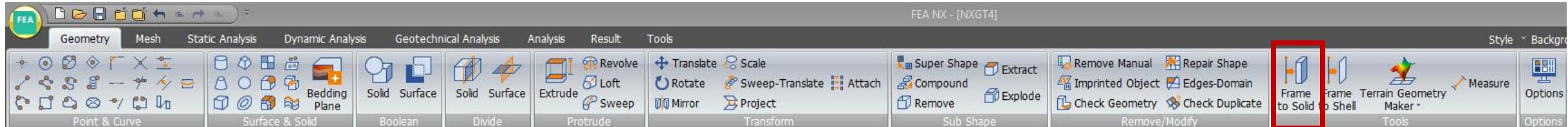
CIVIL NX FRAME EXPORT FROM 1D TO 3D

CVL



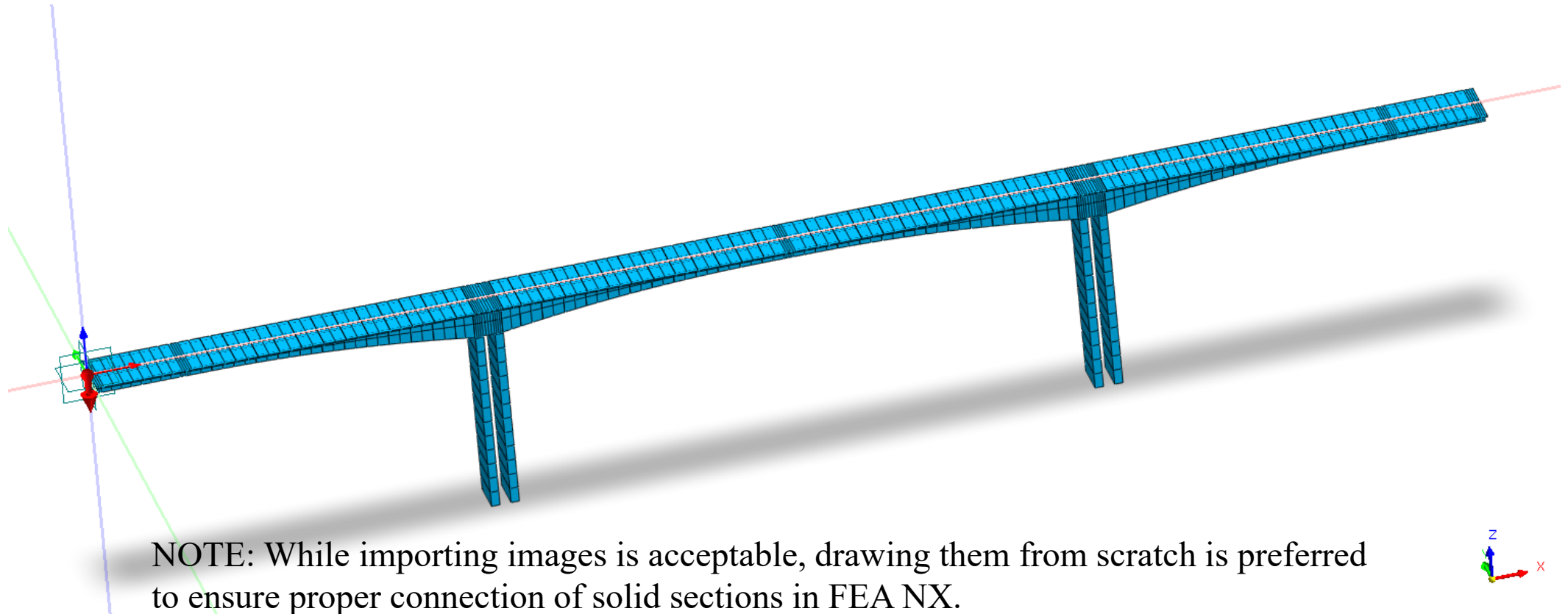
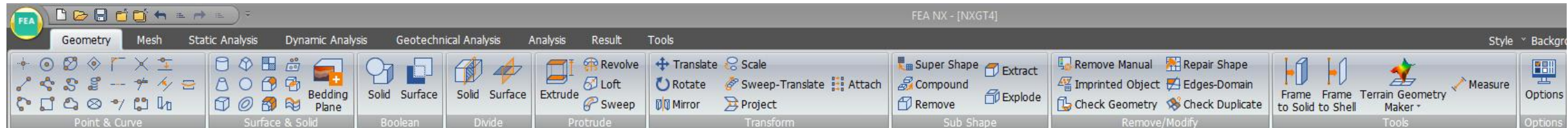
IMPORTING .mcs TO 3D CAD PROGRAM (FEA NX)

FEA



FEA NX 3D SECTIONS (MODEL)

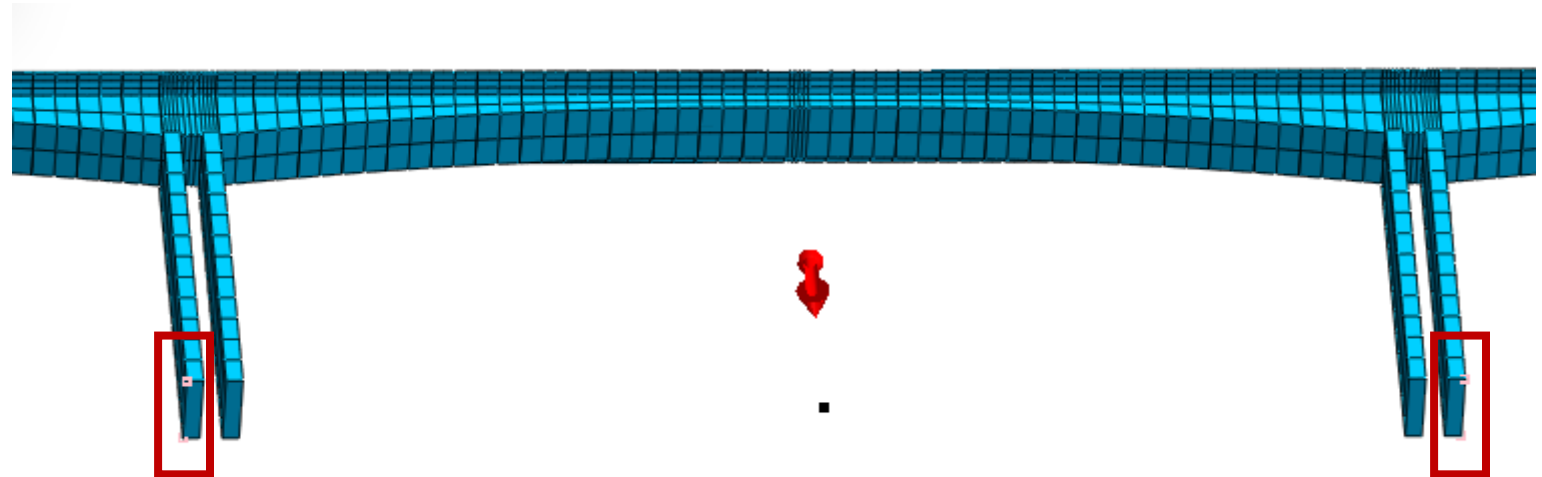
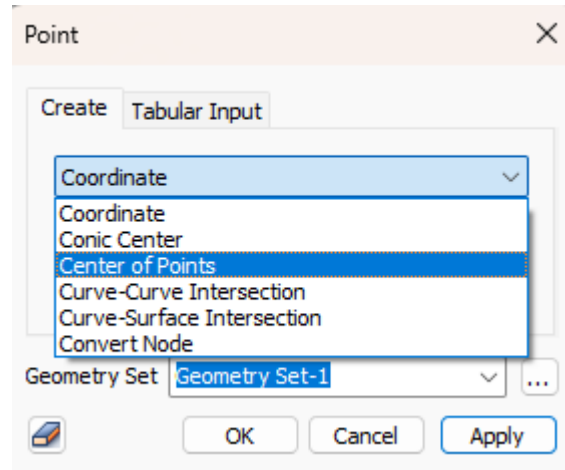
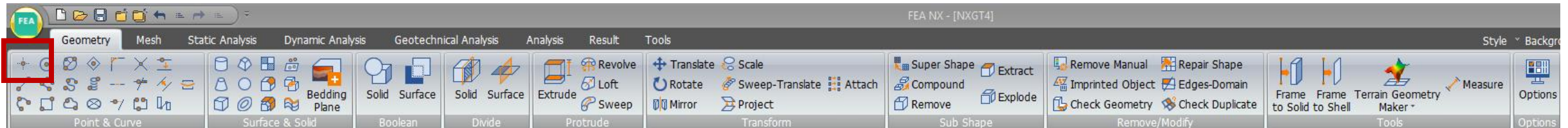
FEA



NOTE: While importing images is acceptable, drawing them from scratch is preferred to ensure proper connection of solid sections in FEA NX.

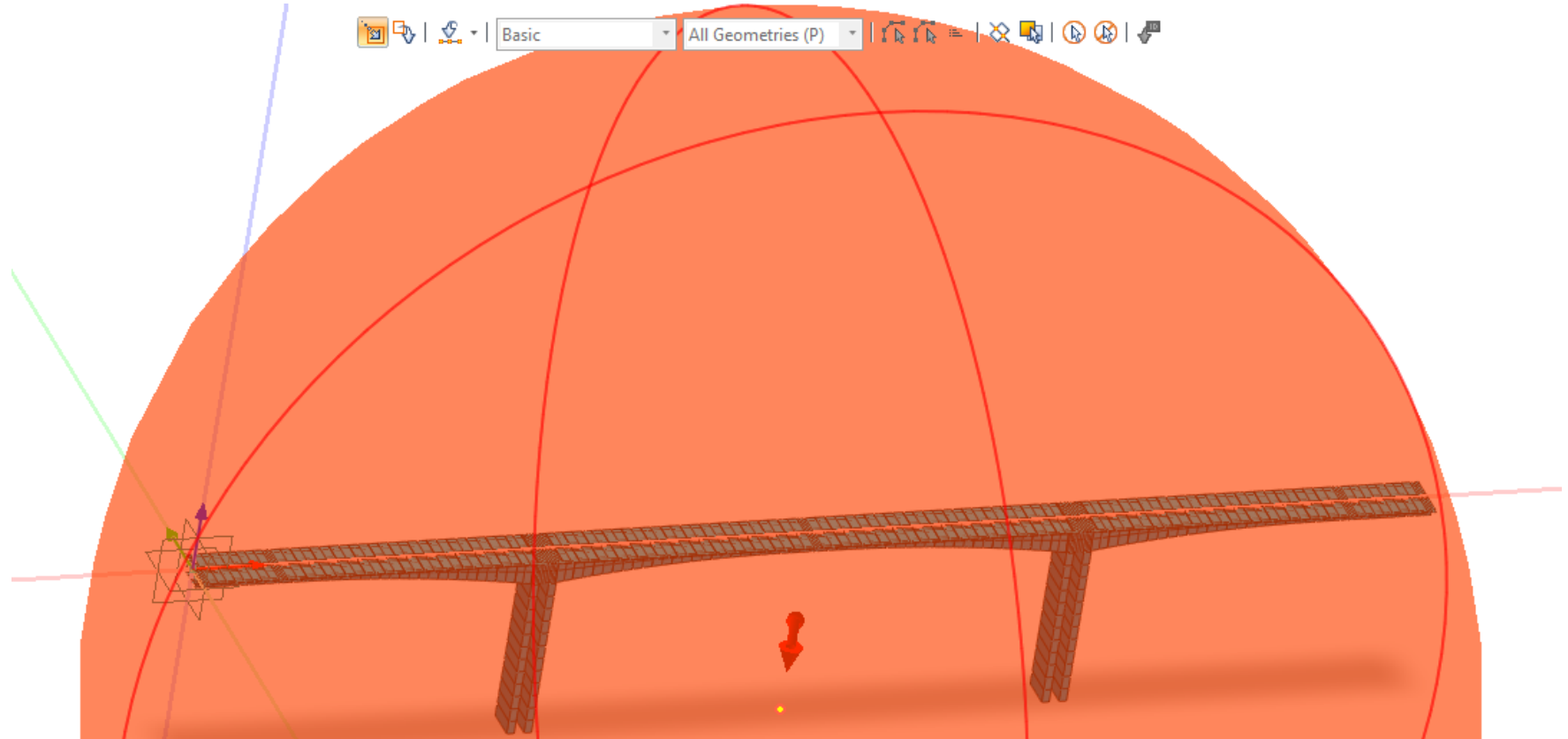
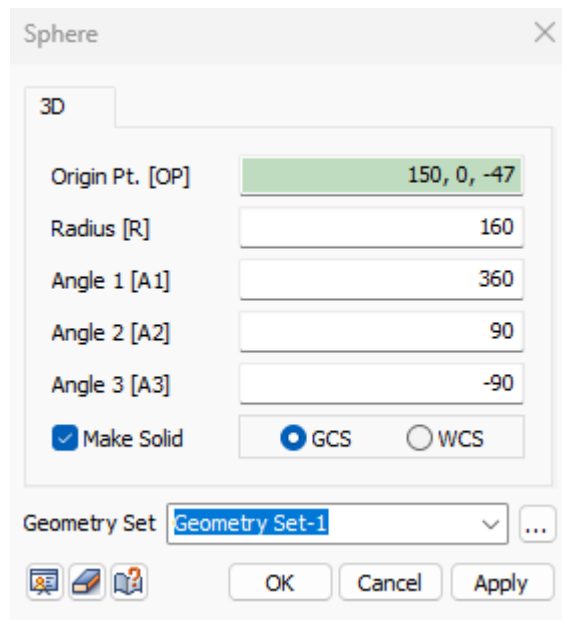
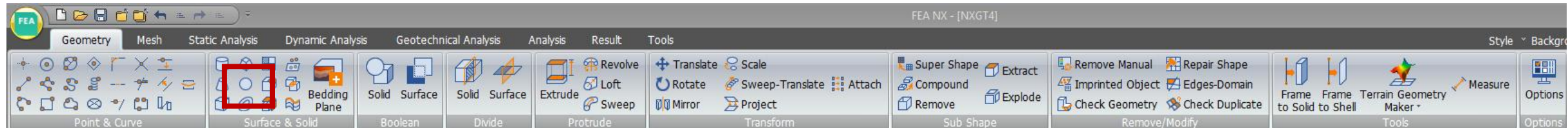
GEOMETRY EDIT (BASE CENTER POINT)

FEA



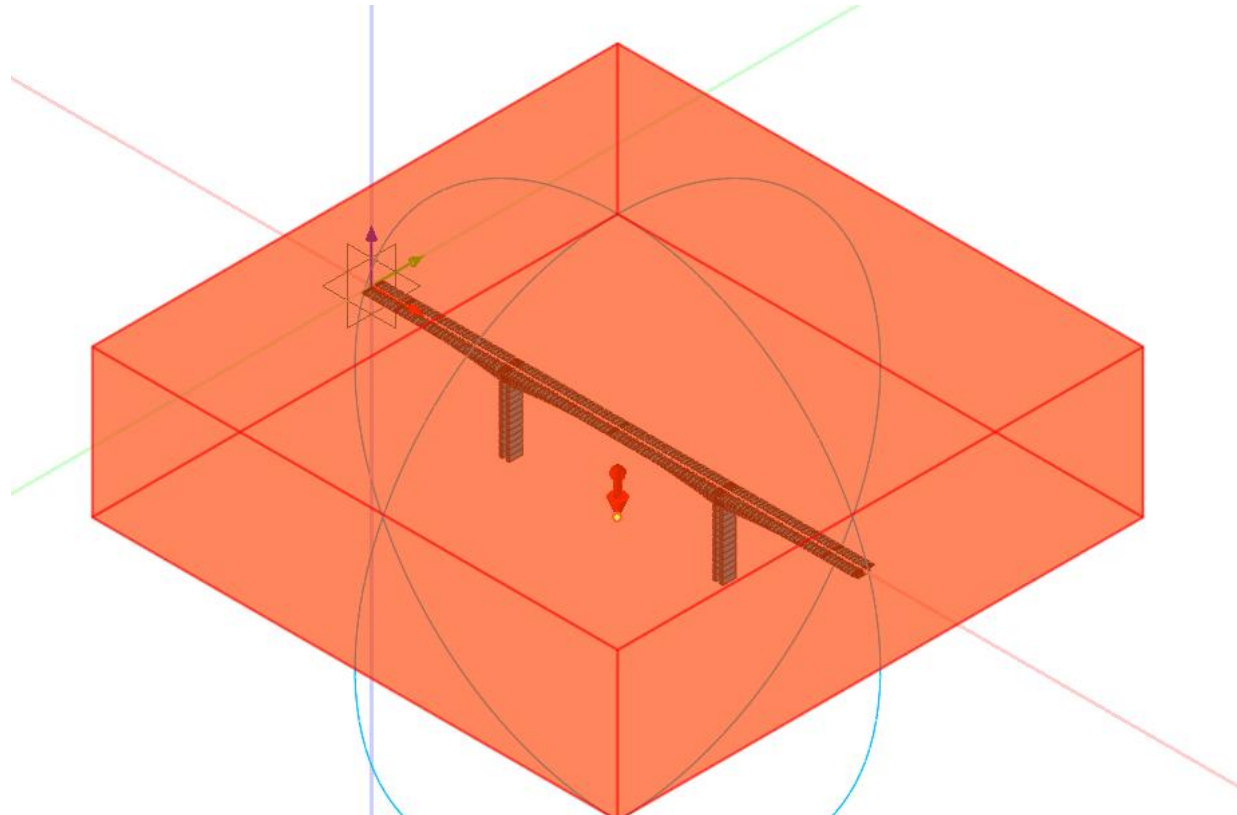
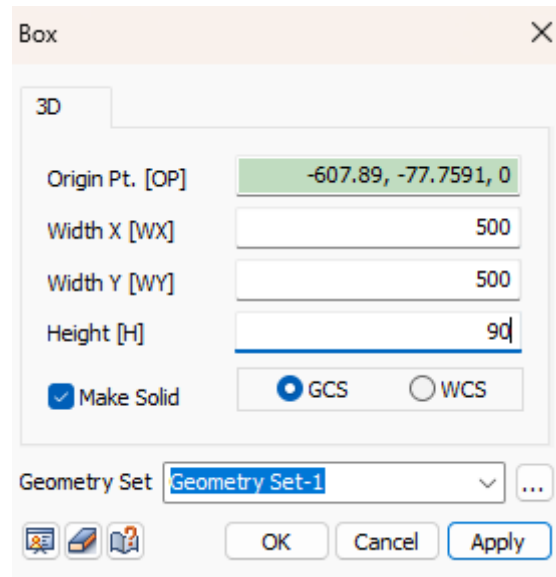
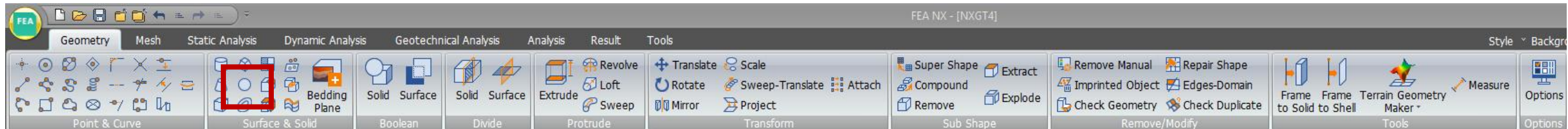
GEOMETRY EDIT (FLUID SECTION SPHERE)

FEA



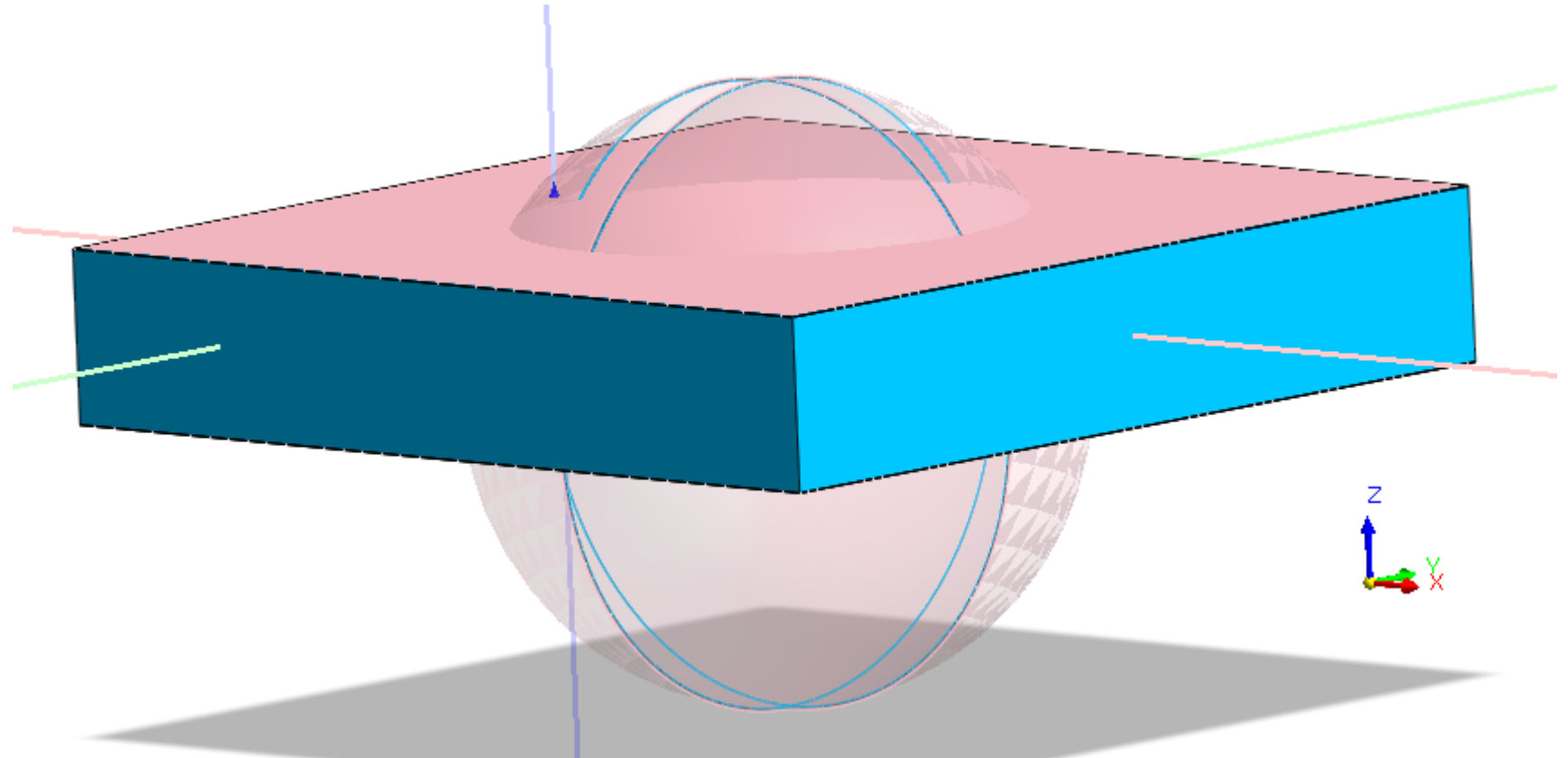
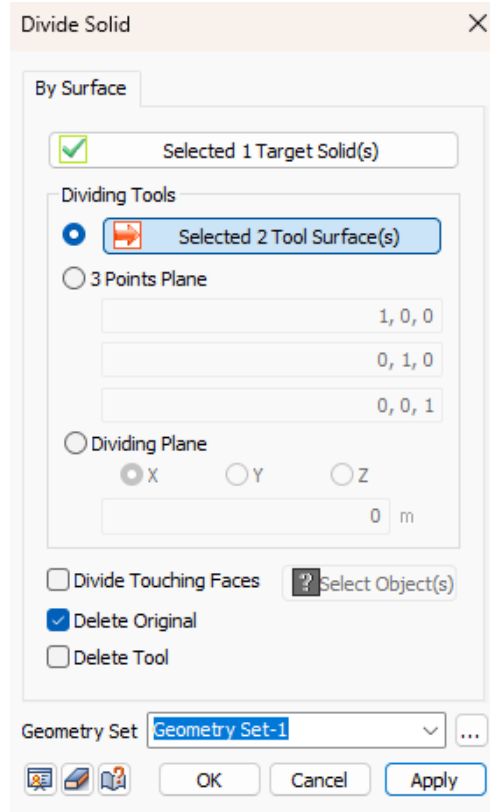
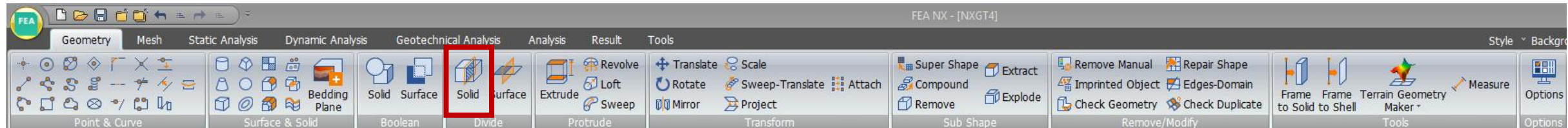
GEOMETRY EDIT (FLUID SECTION BOX)

FEA



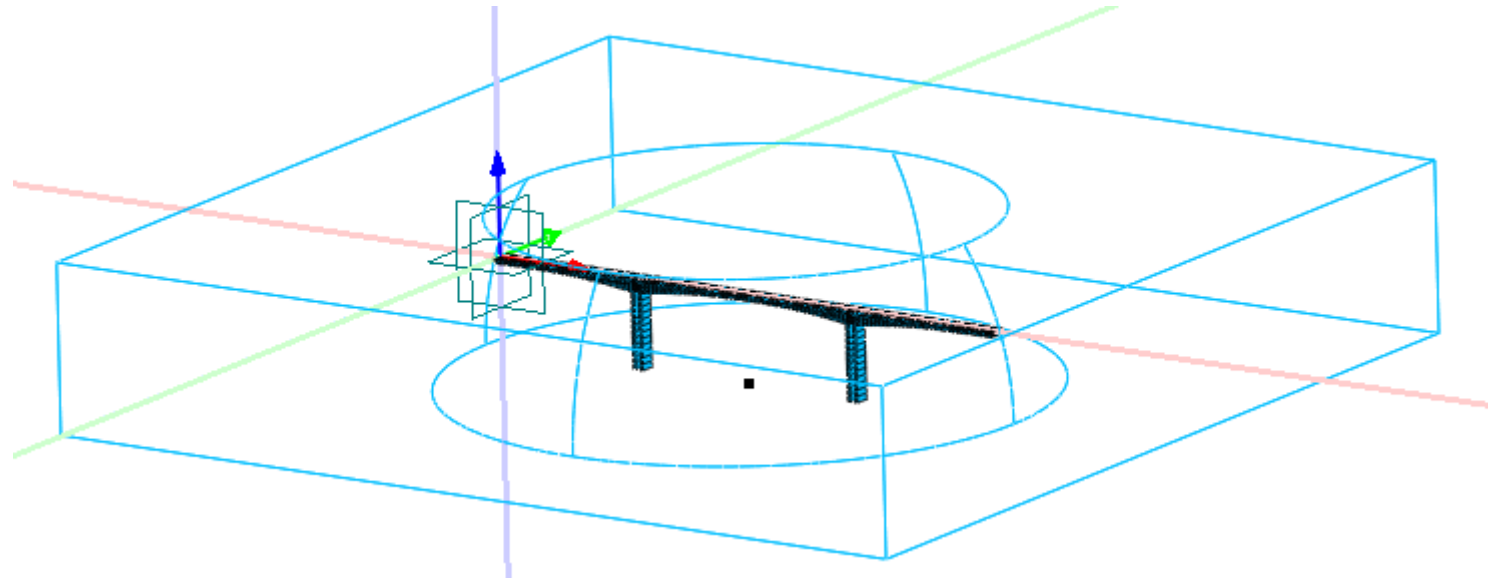
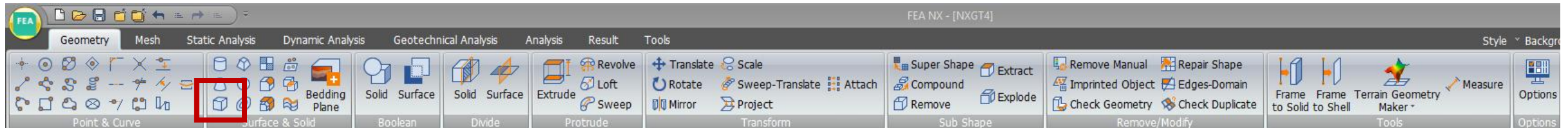
GEOMETRY EDIT (BOOLEAN/DIVIDE)

FEA



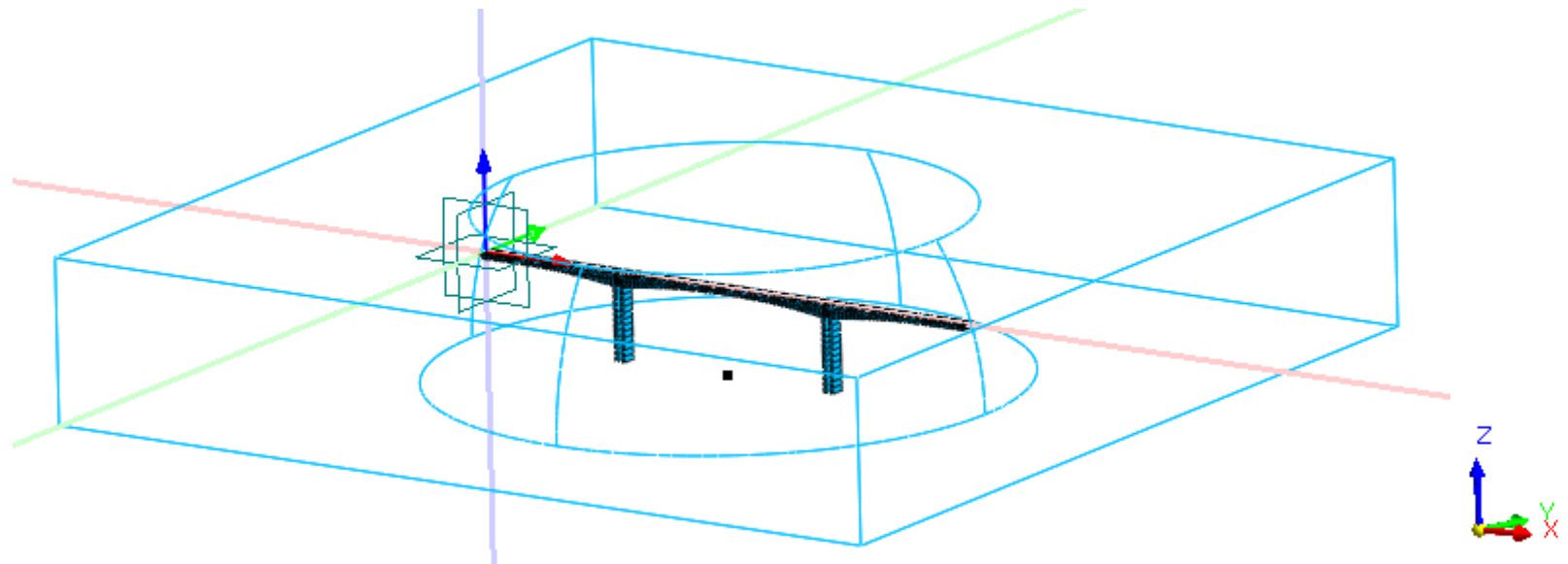
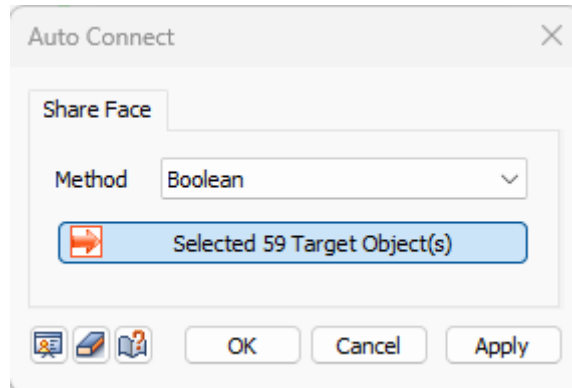
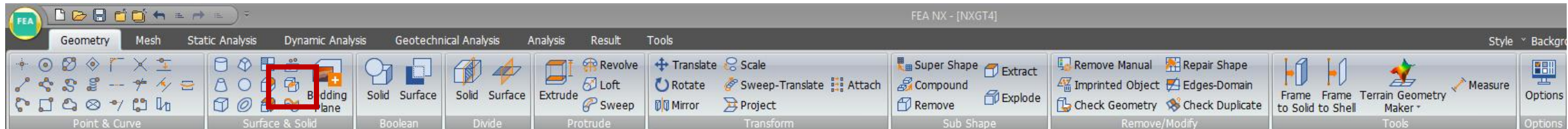
GEOMETRY EDIT (FINAL GEOMETRY)

FEA



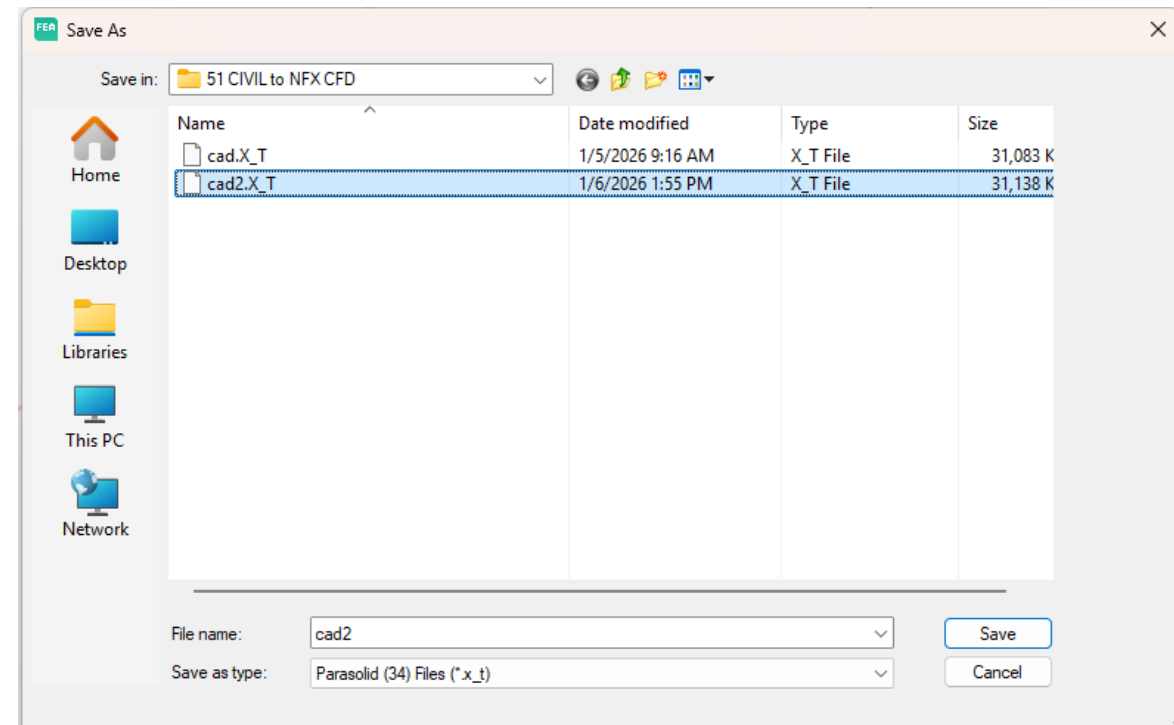
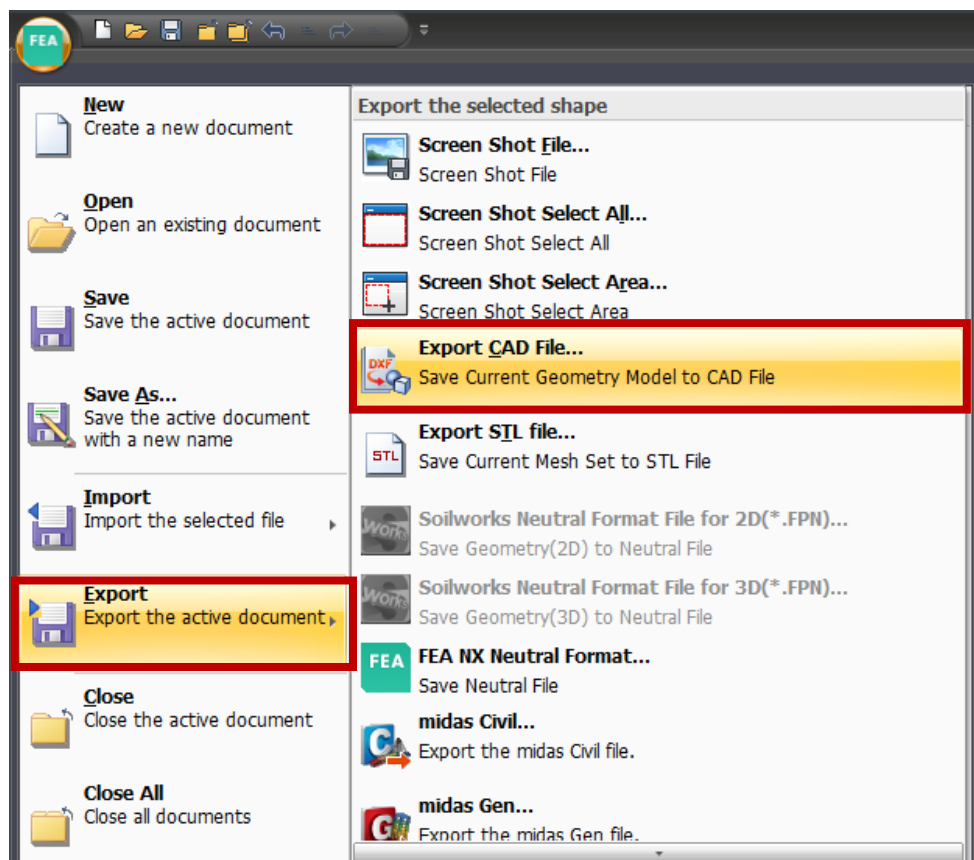
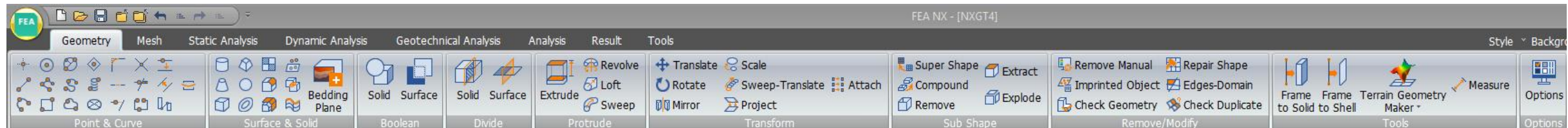
GEOMETRY EDIT (AUTO CONNECT)

FEA



EXPORT CAD

FEA



PART 2

COMPUTATIONAL FLUID

DYNAMICS

NFX IMPORT



midas NFX - [NFXD1]

Geometry | Mesh | Structural Static Analysis | Structural Dynamic Analysis | CFD | Analysis | Results | Tools

Import Export | Work Plane | Point | Line | Surface | Solid | Line | Surface | Solid | Extrude | Translate | Scale | Project | Super Shape | Sub Shape | Rank Modification | Check Shape | Simplify | Auto Connect | CFD Volume Extraction | Neutral Sheet Extraction | Convert Elem-Face | Measure

CAD File | Geometry Creation | Geometry Modification | Rank Modification | Tools

Import
Import the selected file

Import the geometries or FE model in the selected file

- Import CAD File...**
Import the CAD file into a current project
- DXF 2D (Wireframe)...**
Import the DXF 2D file into a current project
- DXF 3D (Wireframe)...**
Import the DXF 3D file into a current project
- midas NFX Model Merge...**
Load selected information from the model or analysis data of the midas NFX file.
- Import Nastran Input File...**
Import the ASCII input file of Nastran
- Import Abaqus Input File...**
Import the ASCII input file of Abaqus
- Import STL File...**
Import the input file of STL

Open CAD File...

Look in: 51 CIVIL to NFX CFD

Name	Date modified	Type	Size
cad.X_T	1/5/2026 9:16 AM	X_T File	31,083 KB
cad2.X_T	1/6/2026 1:55 PM	X_T File	31,138 KB

File name: cad2

Files of type: Parasolid (9 to 37.0.118) Files (*.x_t;*.xmt_txt;*.x_b;*.xmt_bin)

☐ Open as read-only

Repair Factory

- ☒ Geometry Clean
- ☒ Geometry Simplify

Repair Shape Level: Level 1 (Normal)

☐ Search Contact Faces

☒ Auto-Tolerance: 0.0001

☐ Reuse Analysis Information of Current Model

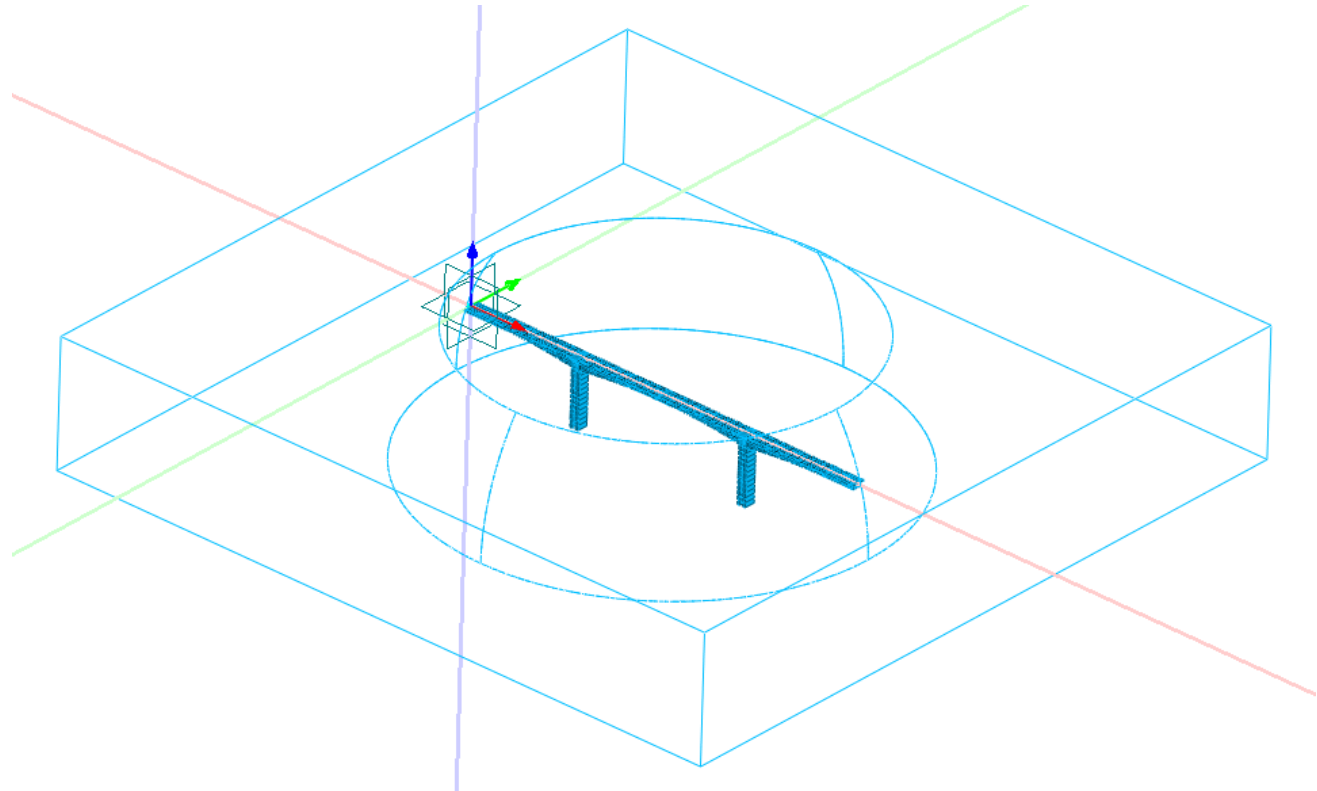
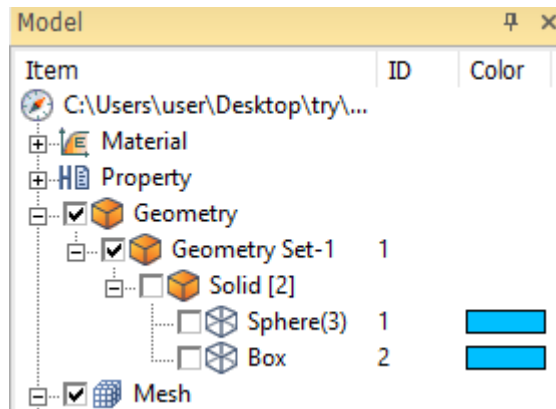
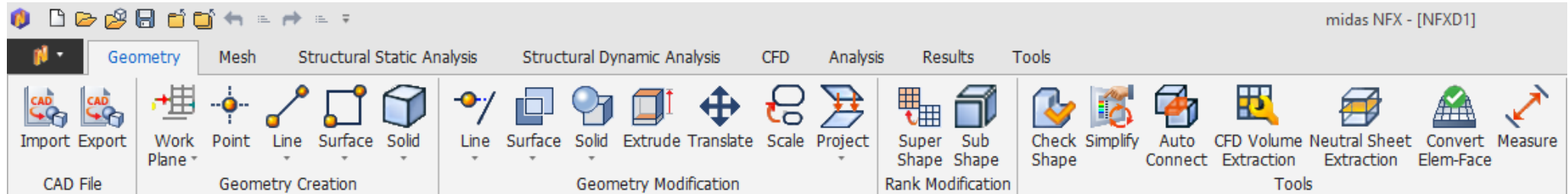
- ☒ B.C.
- ☒ Load
- ☒ Contact
- ☒ Analysis Cases

☒ Default Material

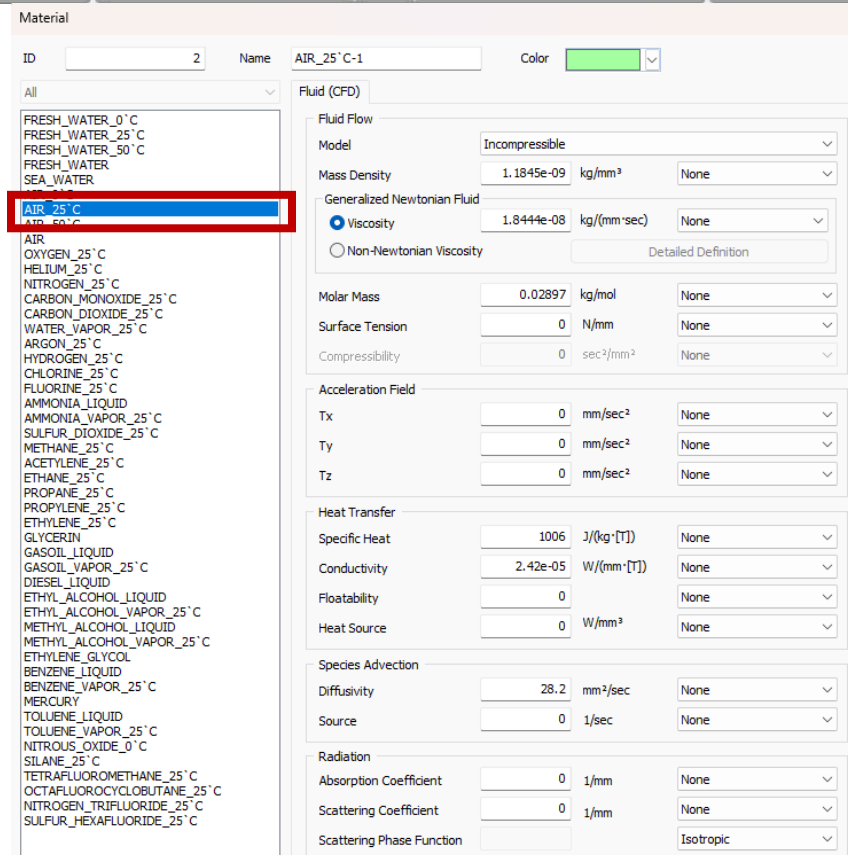
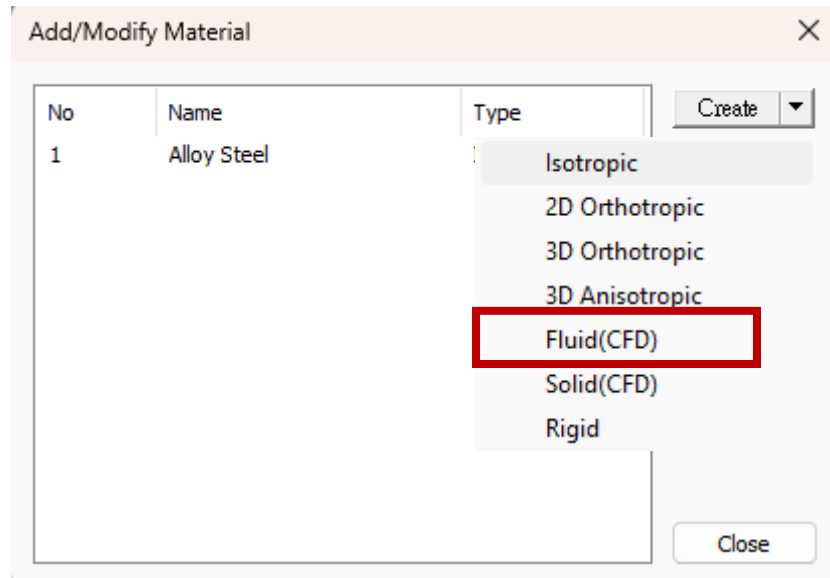
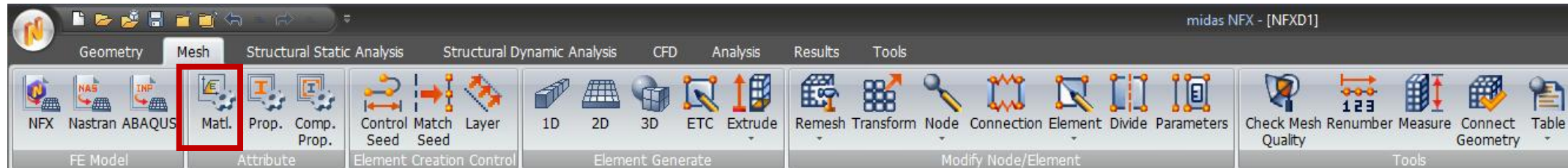
Length Unit of the Model(s): in

Import Option... Reset All

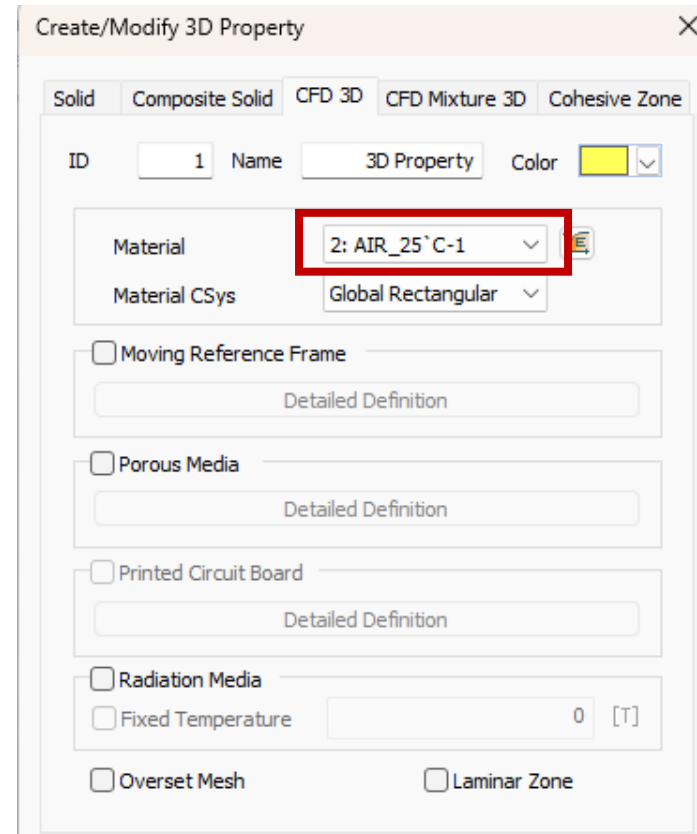
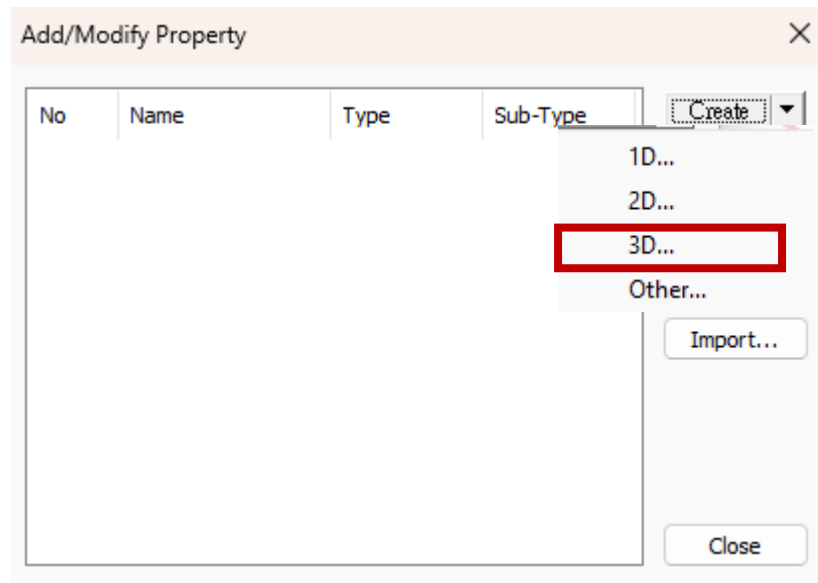
GEOMETRY



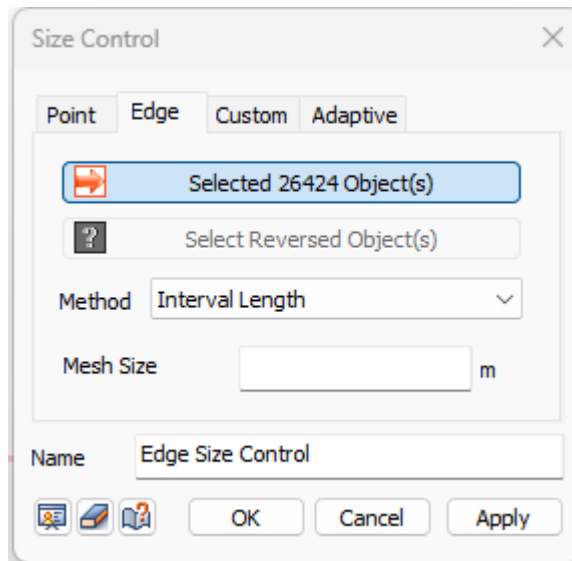
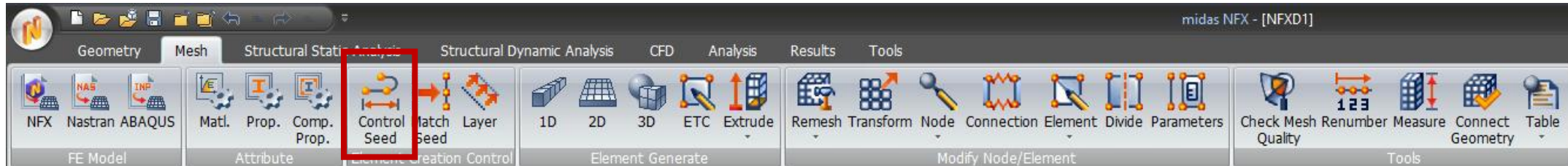
MATERIAL IMPORT



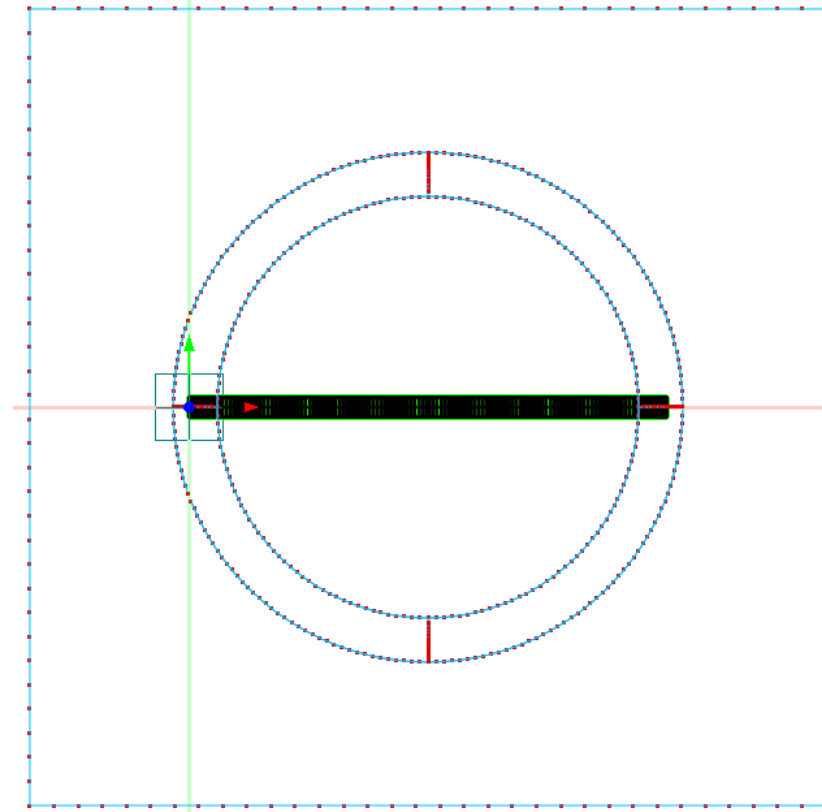
PROPERTY IMPORT



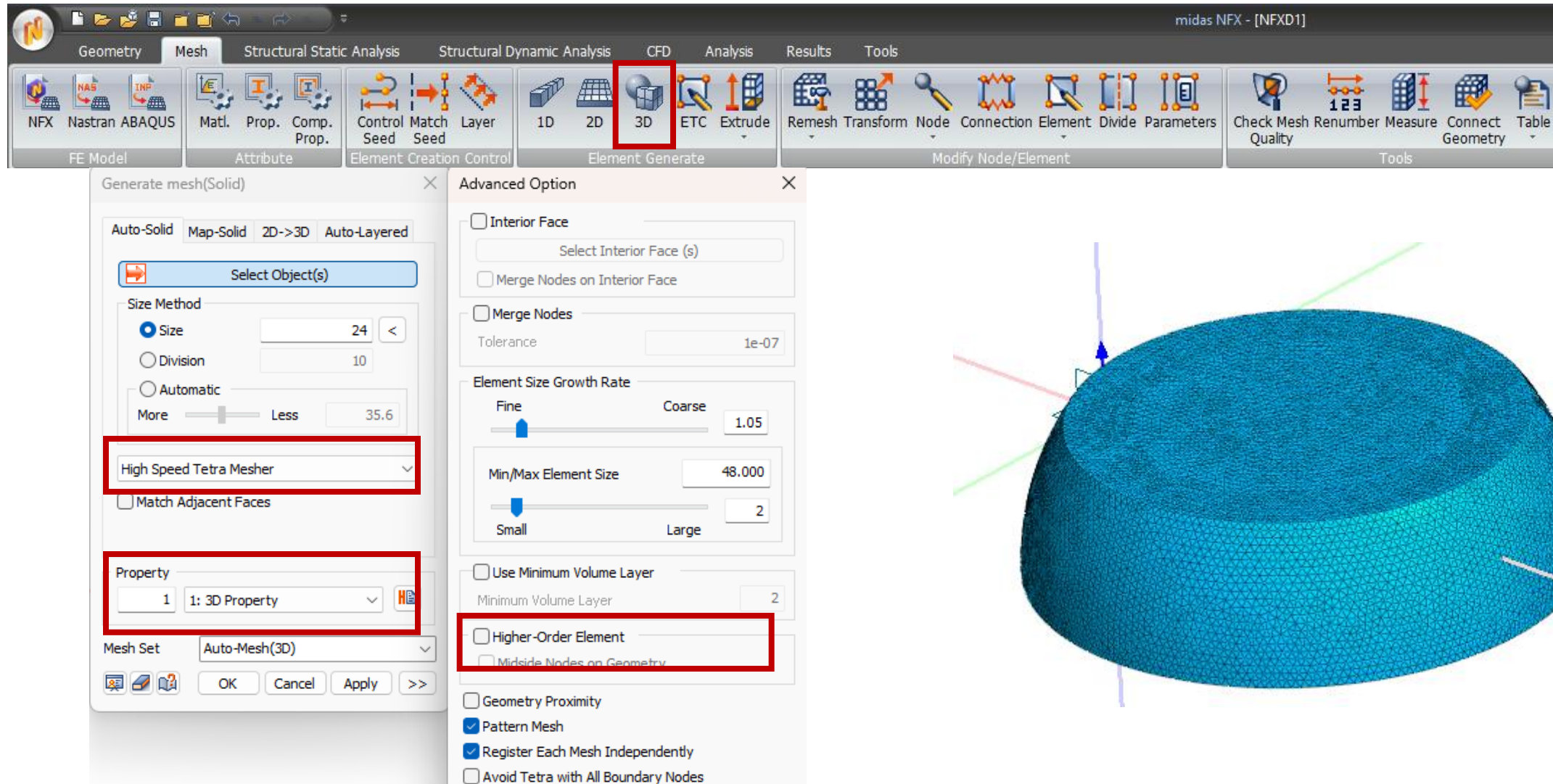
MESH SIZE CONTROL



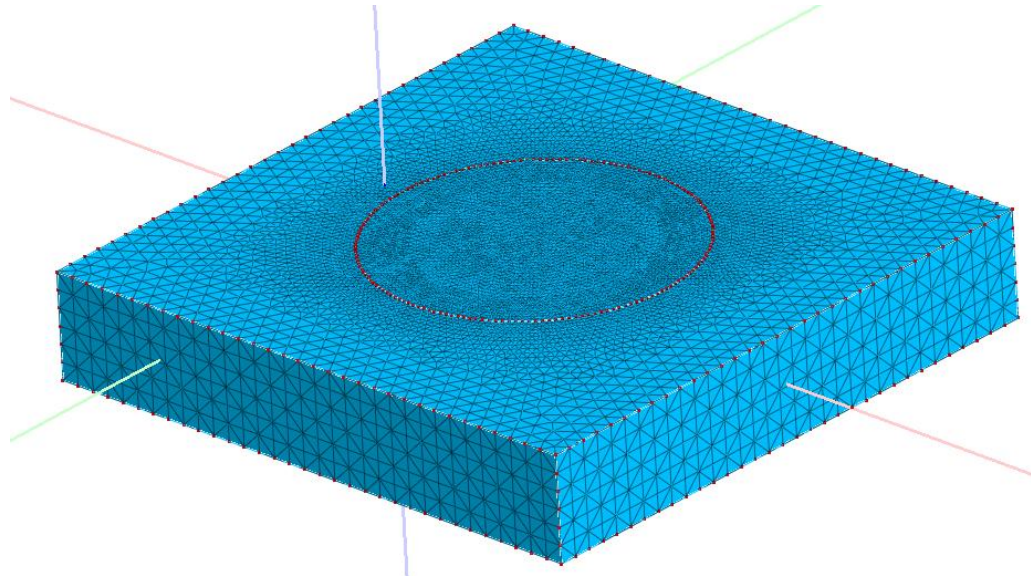
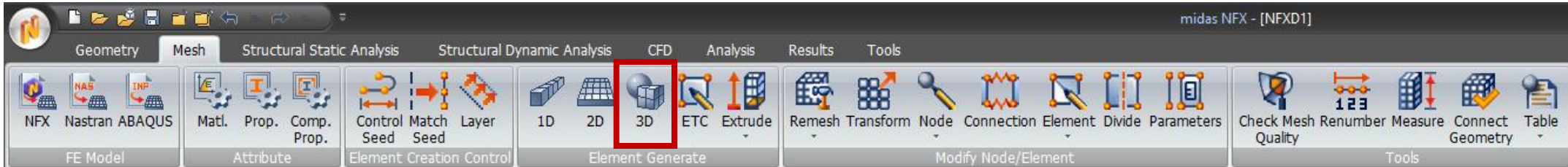
Bridge Mesh Size: 1.5
Sphere Mesh Size: 5
Box Mesh Size: 15



MESH GENERATION - SPHERE



MESH GENERATION – BOX



CONTACT PARAMETERS



midas NFX - [NFXD1]

Geometry Mesh Structural Static Analysis Structural Dynamic Analysis **CFD** Analysis Results Tools

Define CFD Function **Contact Condition** Inlet/Outlet Wall Motion/Deform Multiphase Flow Mixture Particle Porous 1D Pipe

Temp. Flux Source Convec. Radia. Cavity Radiation Wall Solar Load Wall Resistor Model Electric Potential Electric Current From Monitoring Results Tools

CFD Heat Transfer/Joule Heating

Param. eters

Auto Manual **2** Name Contact Parameters

Structural **CFD**

☒ Contact Tolerance m

☒ Penalty Scale Factor

Advanced Modules

Thermal Resistance

☒ Value [T]·m²/W

☐ Thermal Boundary Layer

[Notice] Thermal Boundary Layer can be used only for Fluid-Solid contact type.

☐ Include Mesh Deformation ☐ Include Radiation Intensity

☐ Include Electric Conduction

Param. eters

Auto Manual **Auto** Manual Con. (CFD)

☐ Name Auto-1

Surface to Surface Contact

Contact Type **Fluid - Fluid (CFD)**

Target

Object Type Mesh Set

Selected 2 Object(s)

☐ Search Duplicated Faces on 2-Solid Shapes

Contact Parameters

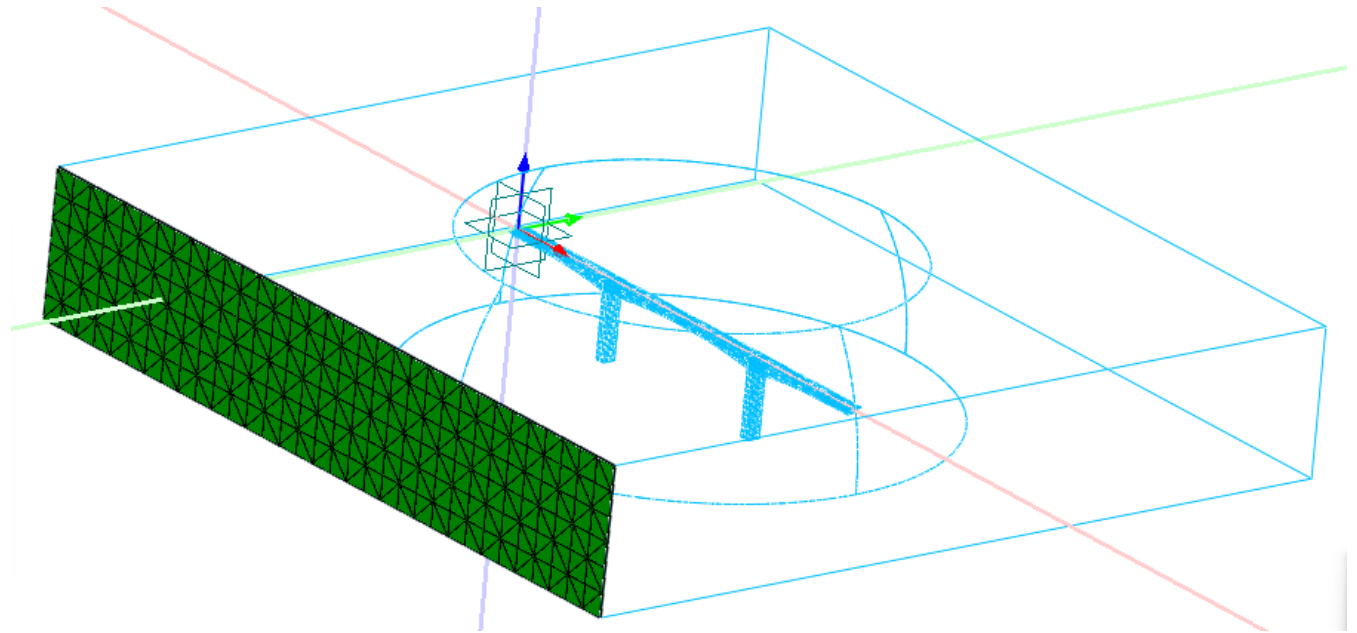
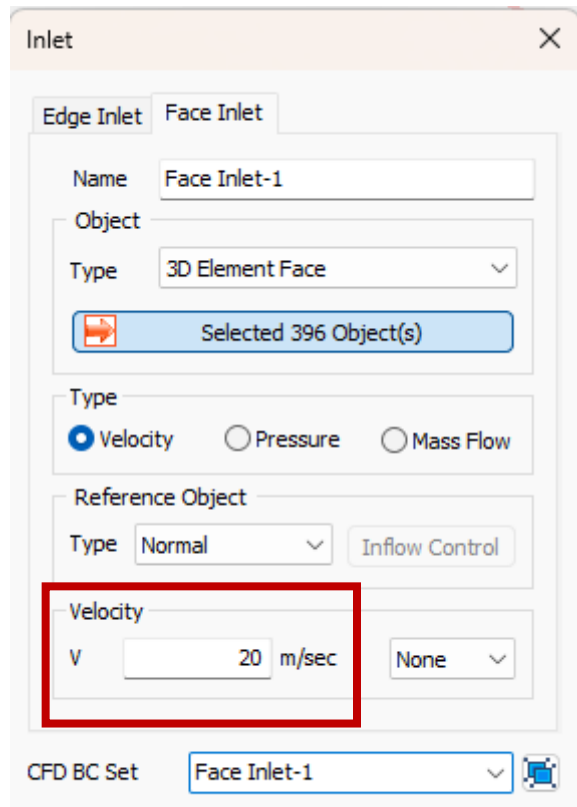
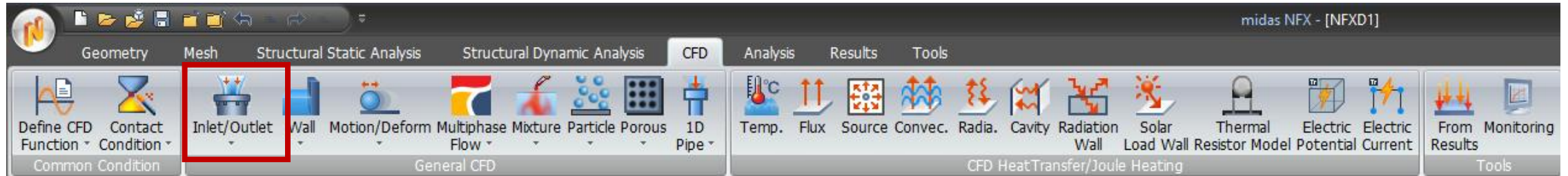
Contact Parameters

Searching Distance

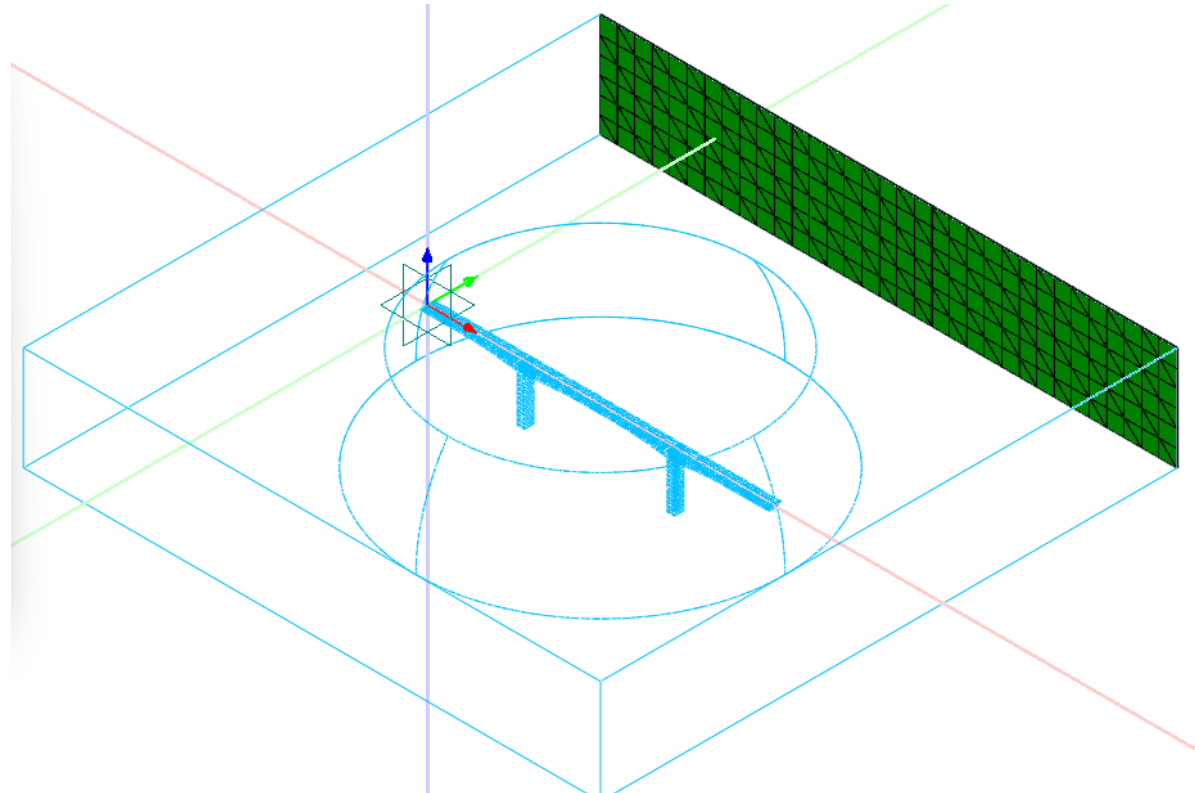
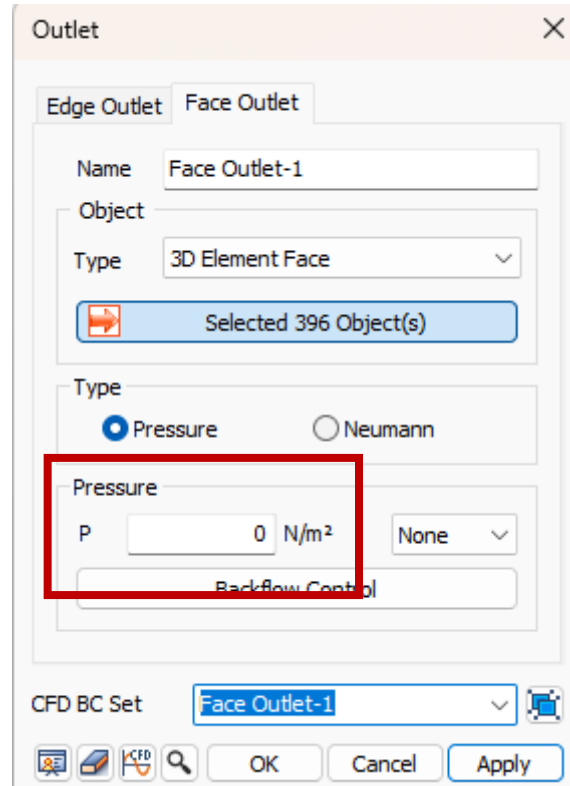
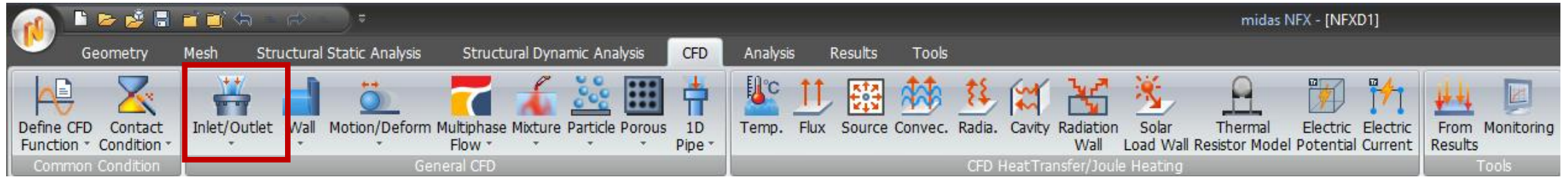
☒ Auto m

Select Sphere and Box only
(Fluid Meshes)

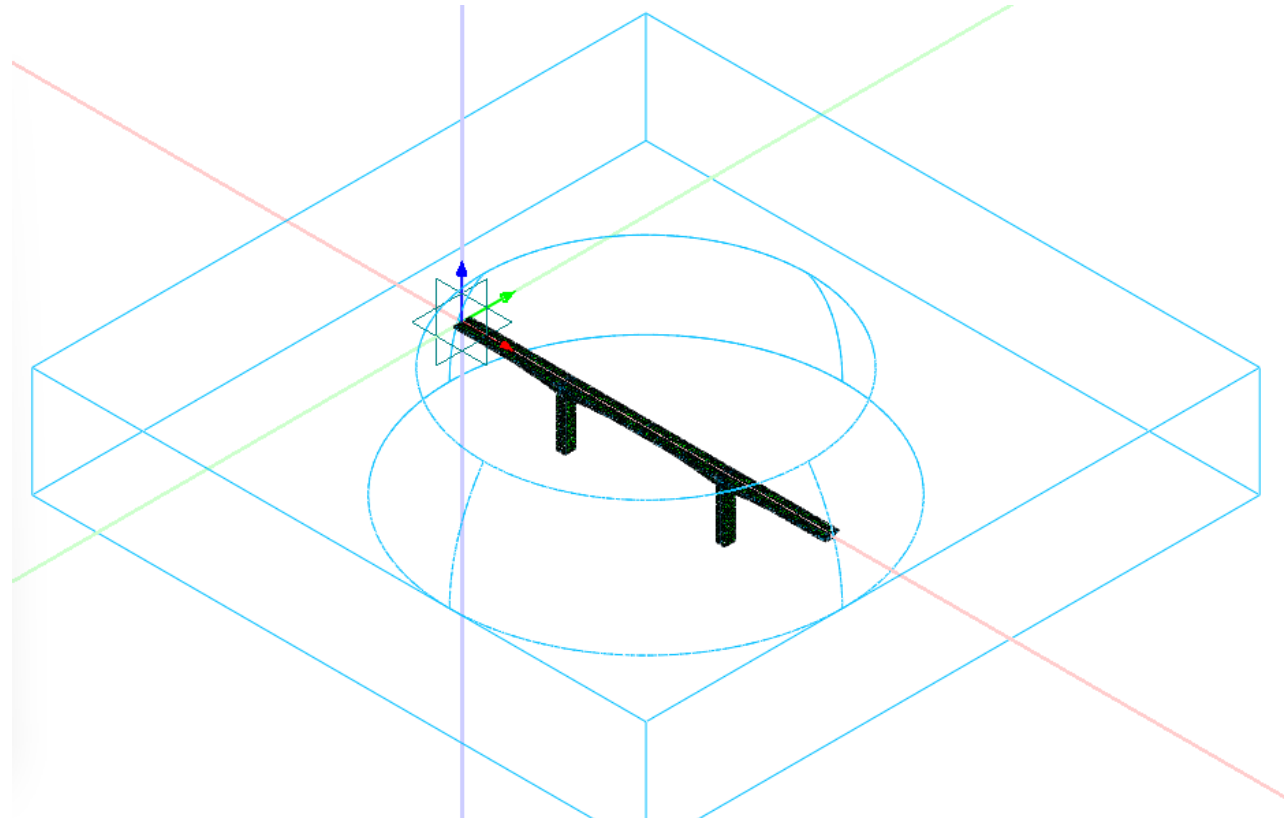
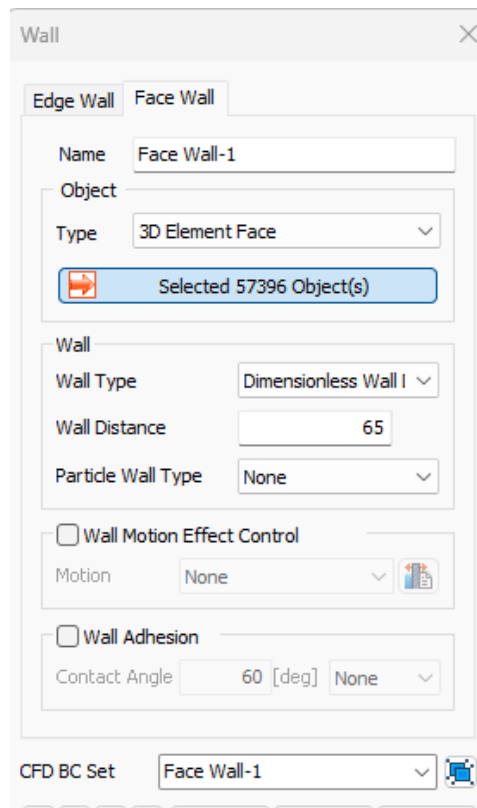
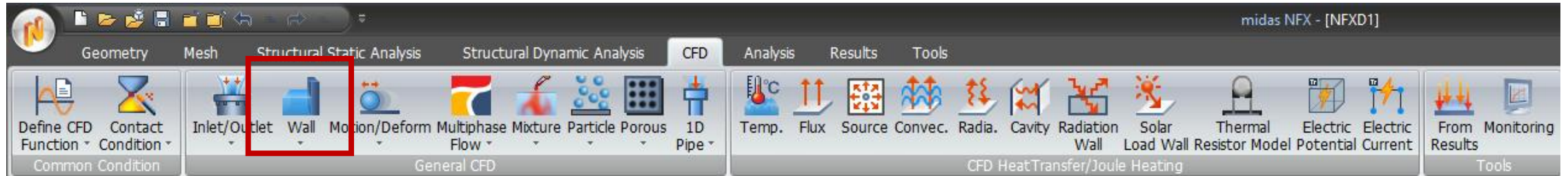
FLUID INLET



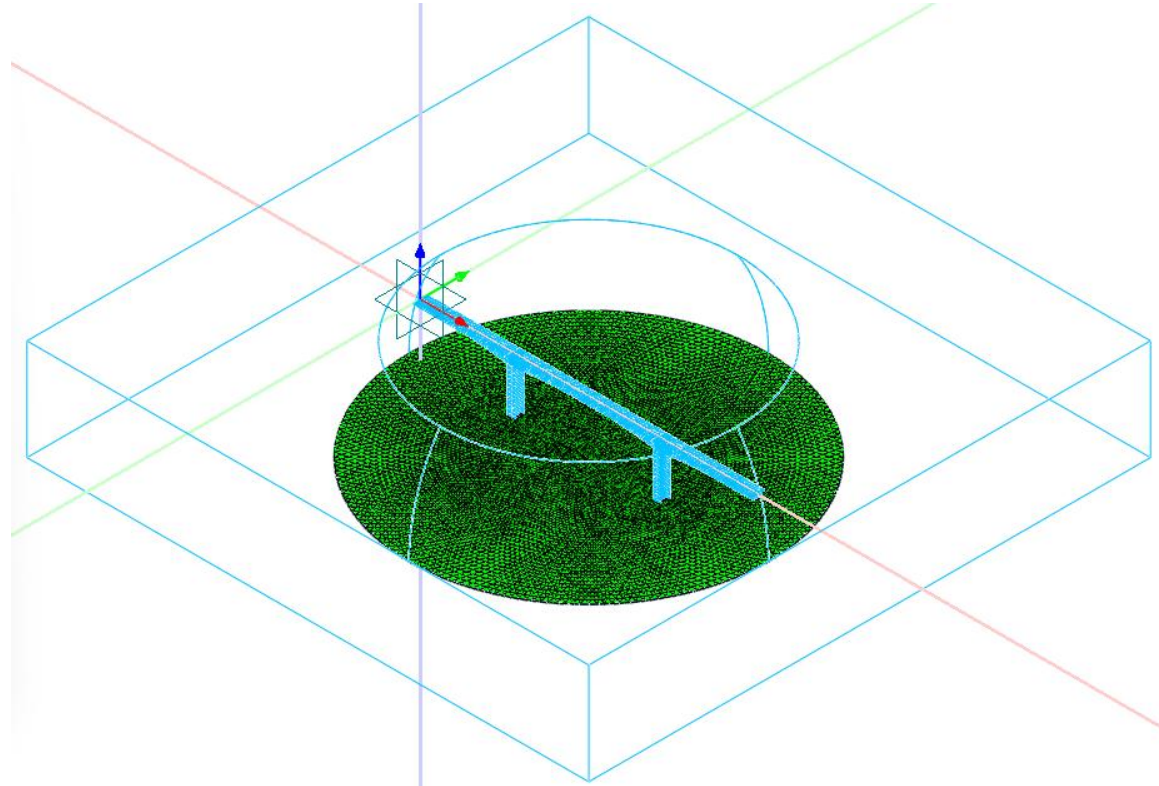
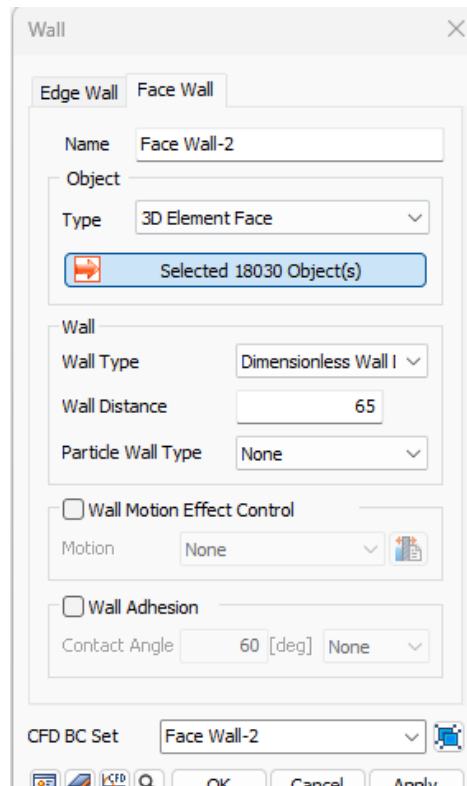
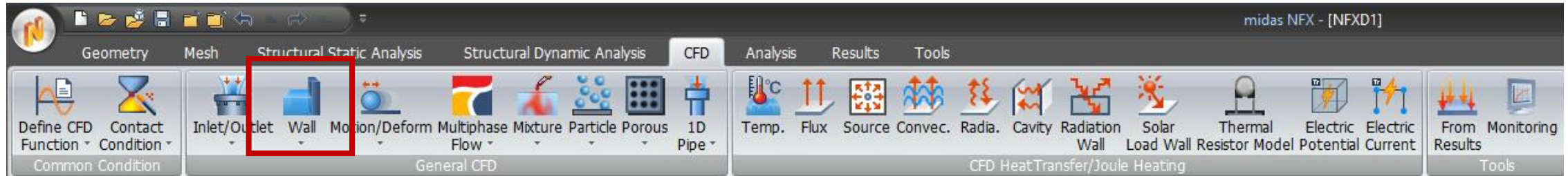
FLUID OUTLET



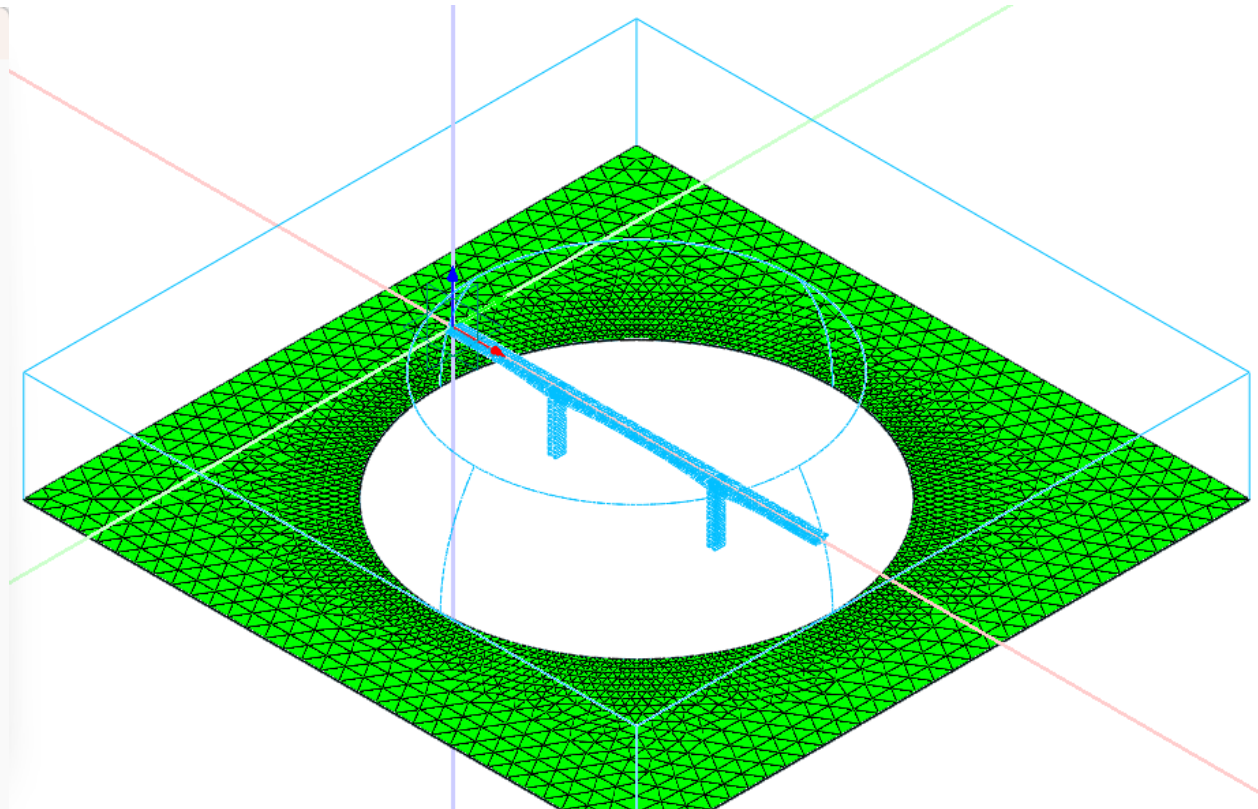
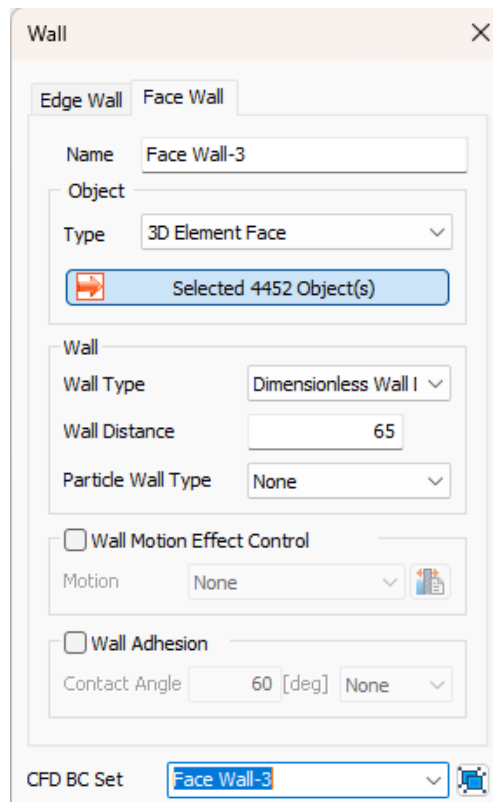
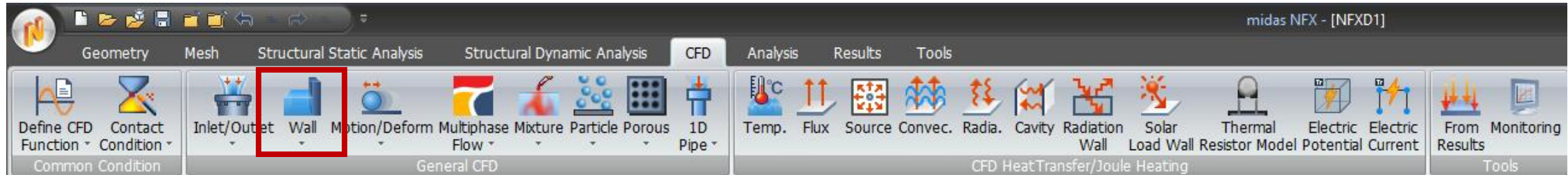
WALL BOUNDARY



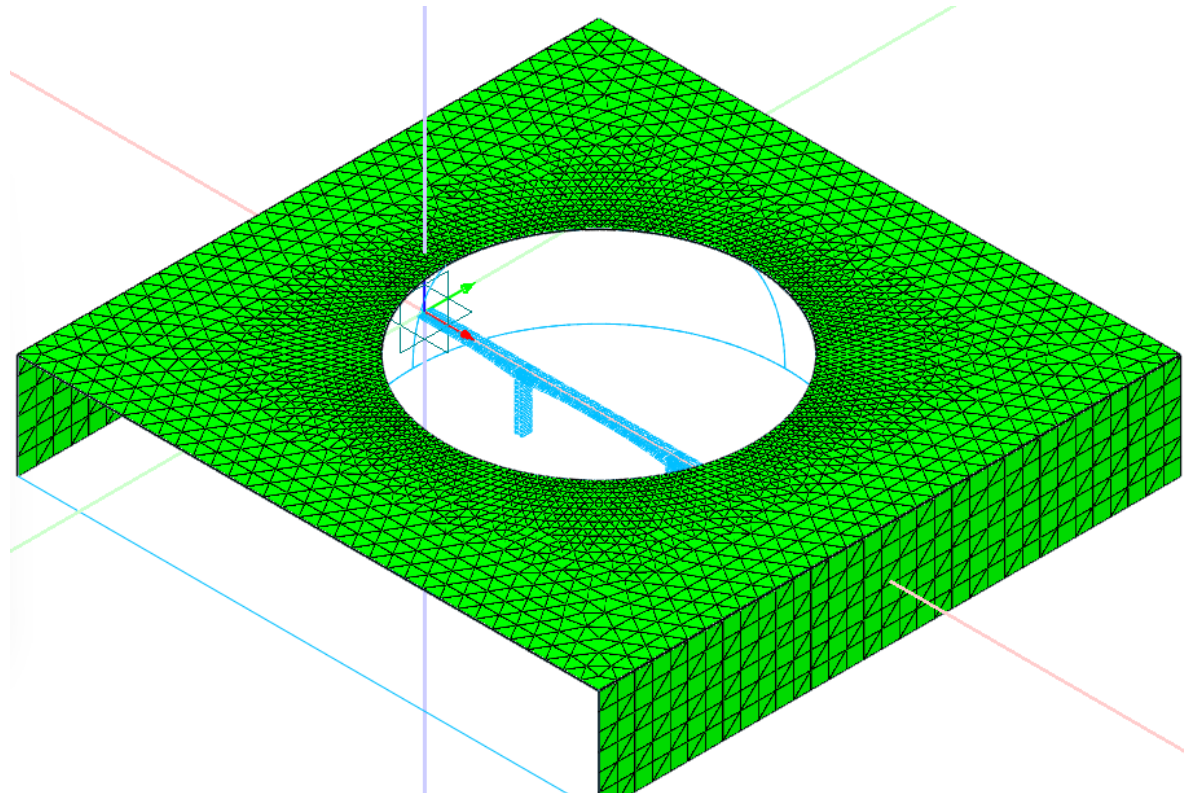
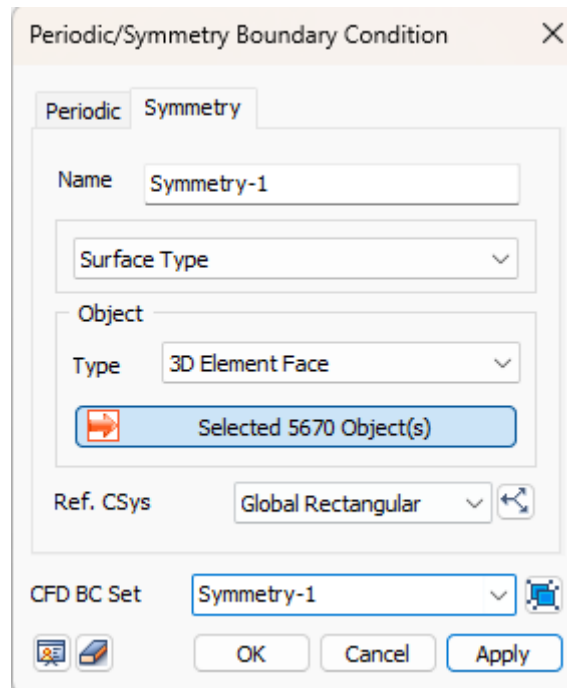
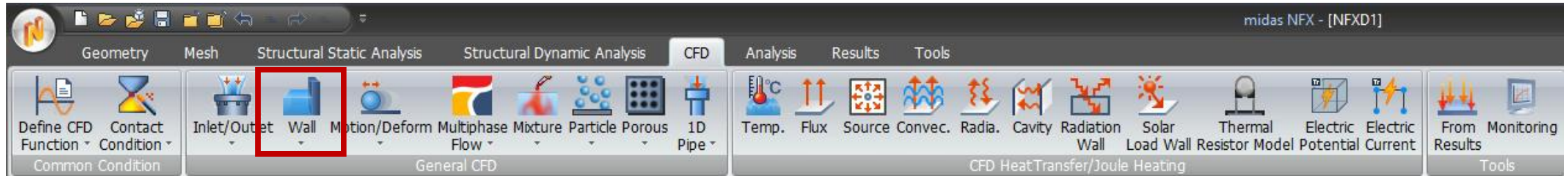
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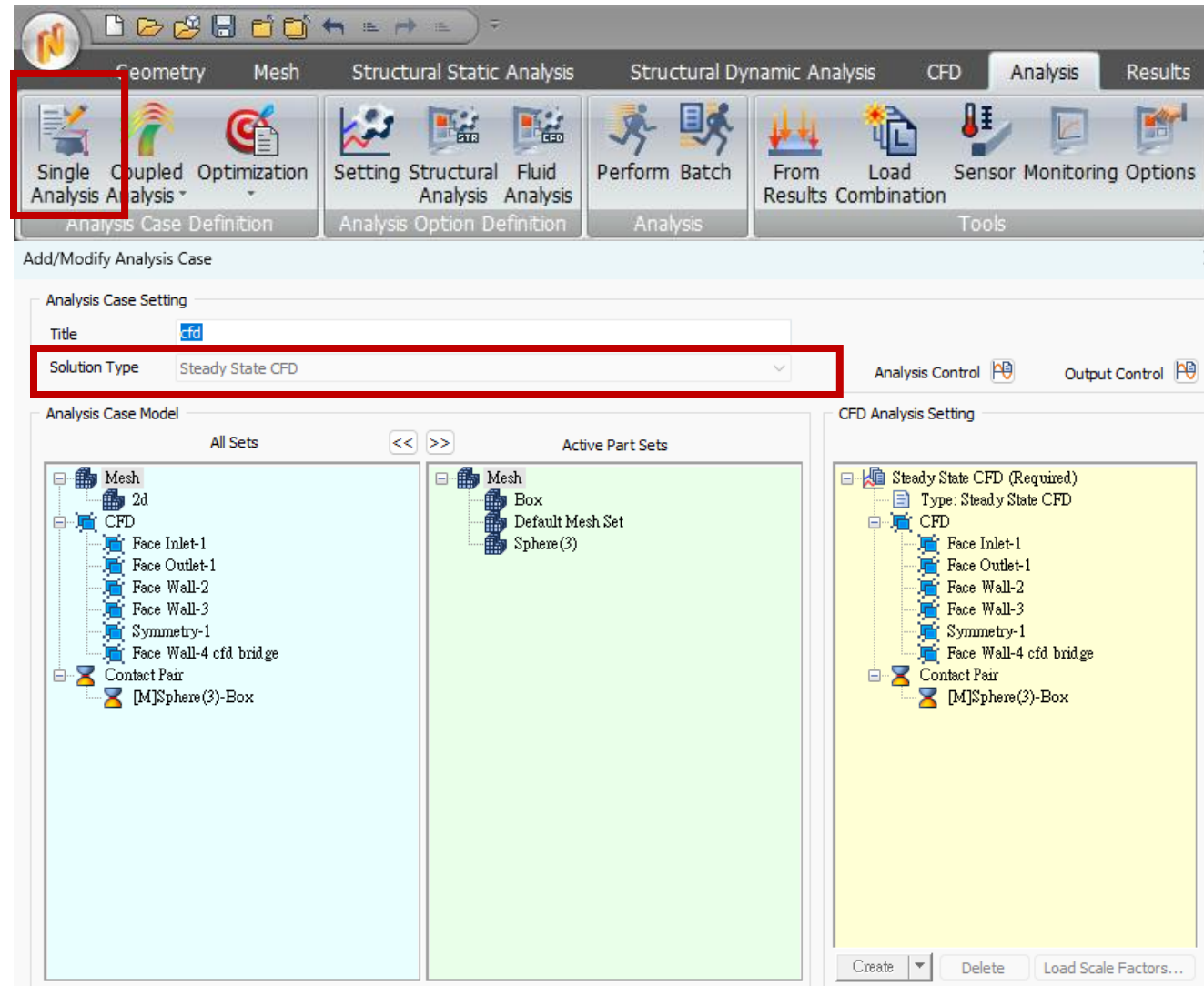
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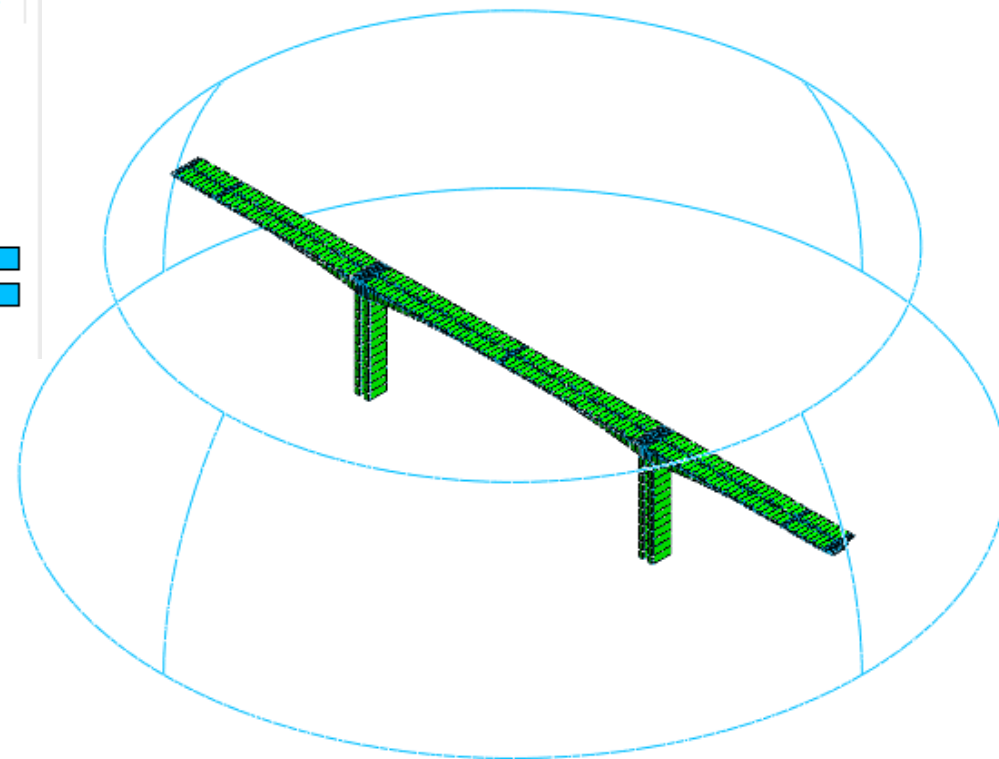
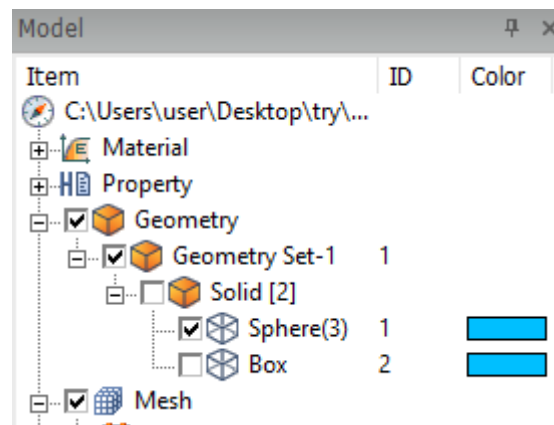
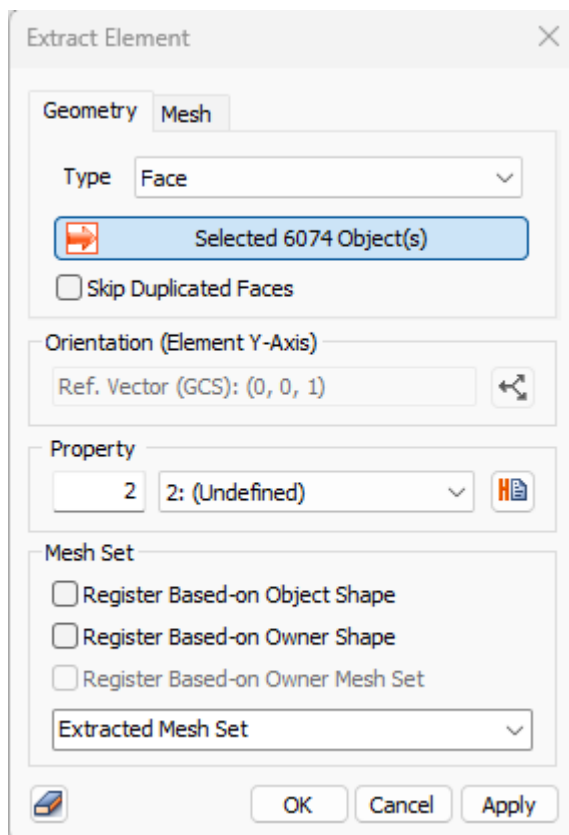
WALL BOUNDARY - SYMMETRY



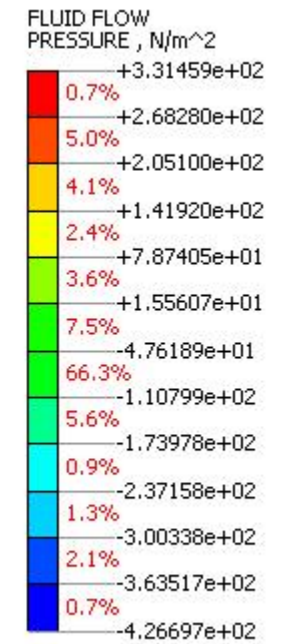
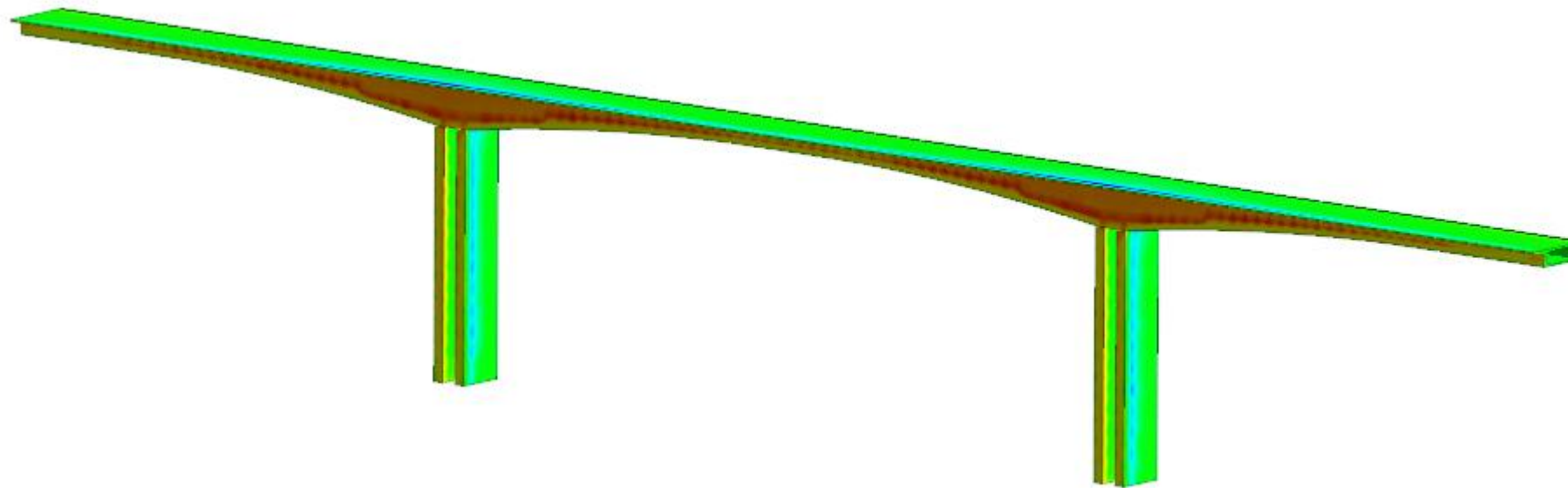
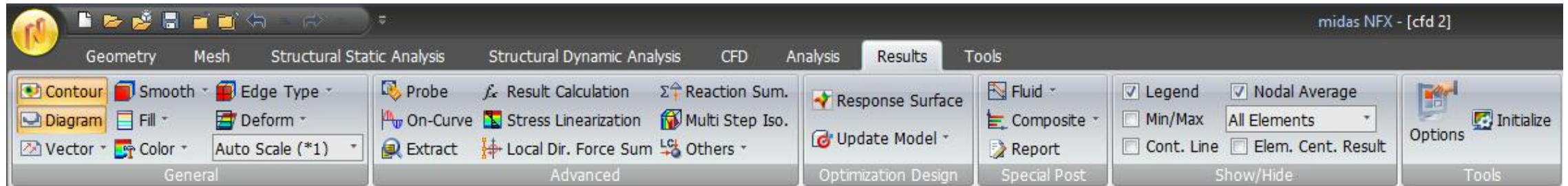
ANALYSIS CONDITION



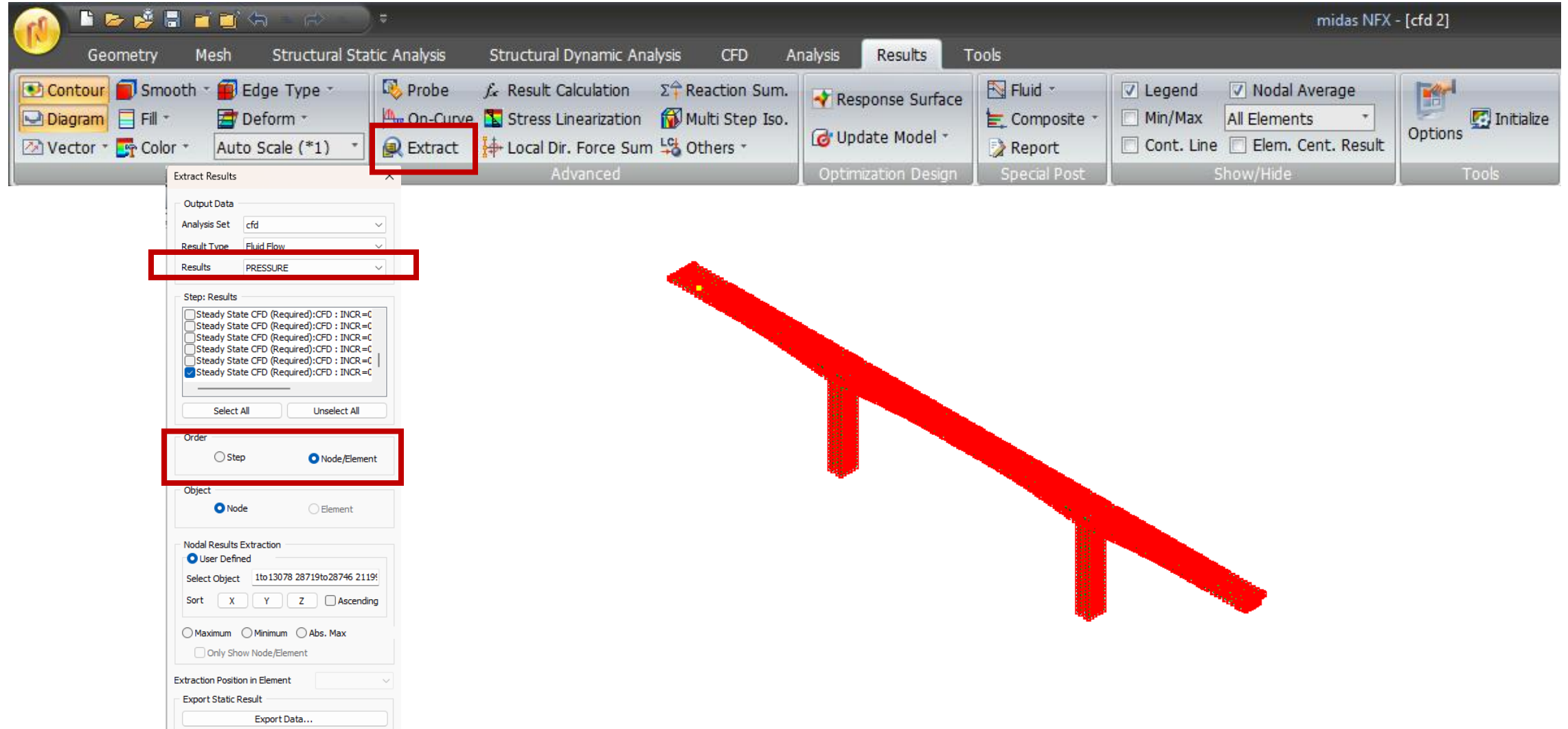
EXTRACT CFD ELEMENT



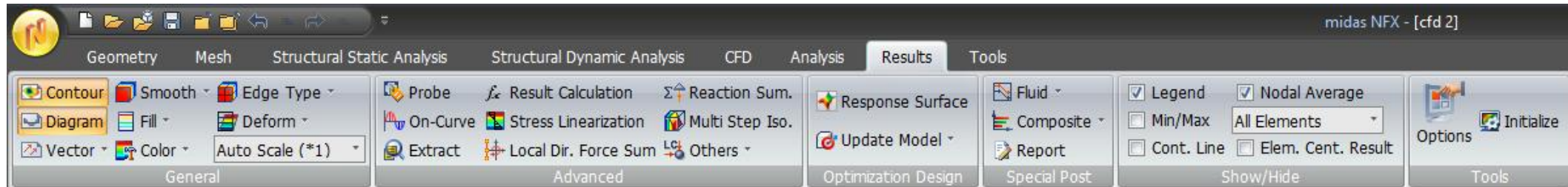
RESULT



RESULT EXTRACT



RESULT - PRESSURE



No	Node	X (m)	Y (m)	Z (m)	Steady State CFD (Required):CFD : INCR=0094 (TIME=92.5277) PRESSURE (N/m²)
1	1	2.120000e+02	3.550000e+00	-7.000000e+00	-9.774500e+01
2	2	2.120000e+02	4.050000e+00	-7.000000e+00	-1.042021e+02
3	3	2.138000e+02	4.050000e+00	-7.000000e+00	-9.988355e+01
4	4	2.138000e+02	3.550000e+00	-7.000000e+00	-8.852583e+01
5	5	2.133500e+02	3.550000e+00	-7.000000e+00	-9.420958e+01
6	6	2.129000e+02	3.550000e+00	-7.000000e+00	-9.552883e+01
7	7	2.124500e+02	3.550000e+00	-7.000000e+00	-9.405279e+01
8	8	2.162000e+02	3.550000e+00	-7.000000e+00	-7.439480e+01
9	9	2.162000e+02	4.050000e+00	-7.000000e+00	-1.041678e+02
10	10	2.180000e+02	4.050000e+00	-7.000000e+00	-9.286405e+01
11	11	2.180000e+02	3.550000e+00	-7.000000e+00	-9.911088e+01
12	12	2.175500e+02	3.550000e+00	-7.000000e+00	-8.865054e+01
13	13	2.171000e+02	3.550000e+00	-7.000000e+00	-8.608077e+01
14	14	2.166500e+02	3.550000e+00	-7.000000e+00	-8.877413e+01
15	15	8.620000e+01	3.550000e+00	-7.000000e+00	-8.369109e+01
16	16	8.620000e+01	4.050000e+00	-7.000000e+00	-1.127698e+02
17	17	8.800000e+01	4.050000e+00	-7.000000e+00	-1.021118e+02
18	18	8.800000e+01	3.550000e+00	-7.000000e+00	-1.004737e+02
19	19	8.755000e+01	3.550000e+00	-7.000000e+00	-9.477553e+01
20	20	8.710000e+01	3.550000e+00	-7.000000e+00	-9.382197e+01
21	21	8.665000e+01	3.550000e+00	-7.000000e+00	-9.784313e+01
22	22	8.200000e+01	3.550000e+00	-7.000000e+00	-9.458051e+01
23	23	8.200000e+01	4.050000e+00	-7.000000e+00	-1.027875e+02
24	24	8.380000e+01	4.050000e+00	-7.000000e+00	-1.029126e+02
25	25	8.380000e+01	3.550000e+00	-7.000000e+00	-8.840802e+01
26	26	8.335000e+01	3.550000e+00	-7.000000e+00	-9.798586e+01
27	27	8.290000e+01	3.550000e+00	-7.000000e+00	-9.690045e+01
28	28	8.245000e+01	3.550000e+00	-7.000000e+00	-9.448028e+01
29	29	1.442500e+02	-1.850000e+00	-2.440000e+00	-6.062426e+01
30	30	1.430625e+02	-1.850000e+00	-2.446614e+00	-6.062504e+01
31	31	1.418750e+02	-1.850000e+00	-2.453228e+00	-6.062645e+01
32	32	1.418750e+02	-9.250000e-01	-2.453228e+00	-6.062682e+01
33	33	1.430625e+02	-9.250000e-01	-2.446614e+00	-6.062494e+01
34	34	1.442500e+02	-9.250000e-01	-2.440000e+00	-6.062448e+01
35	35	1.442500e+02	-6.350000e+00	0.000000e+00	-7.018512e+01

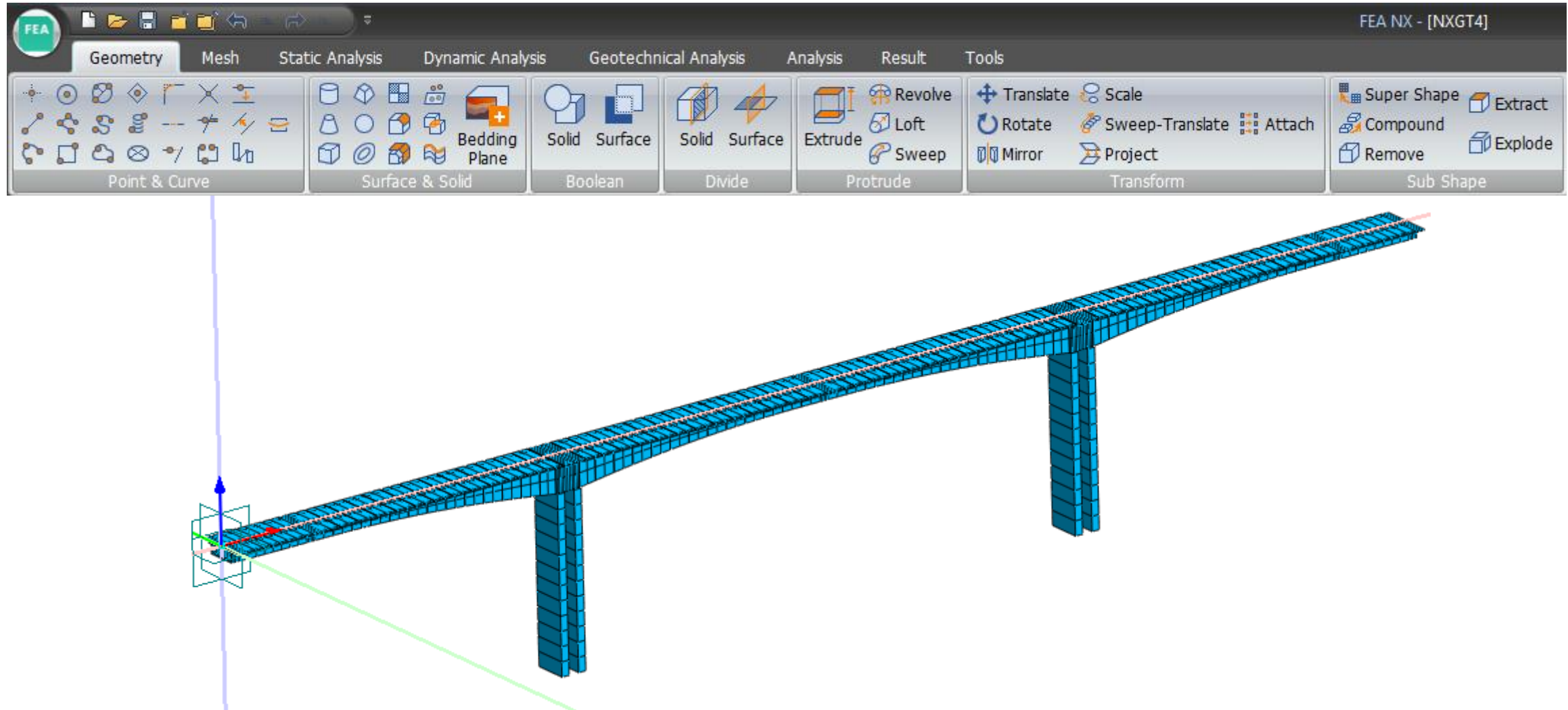
PART 3

STRUCTURAL PRESSURE

ANALYSIS

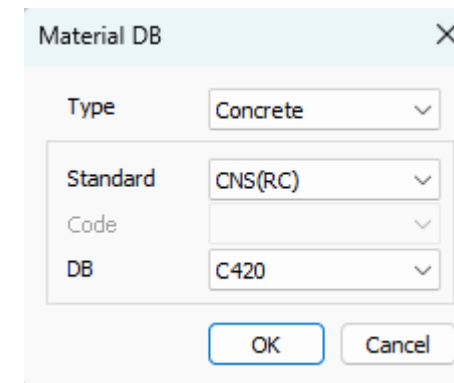
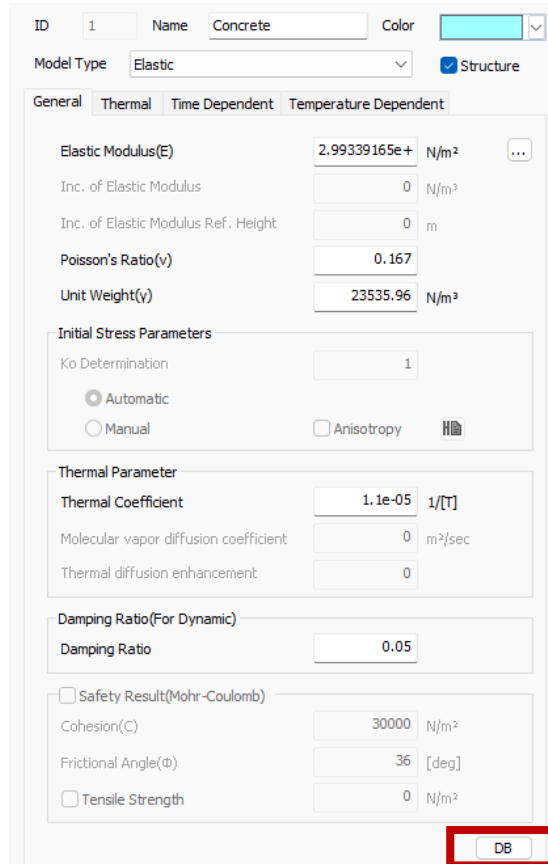
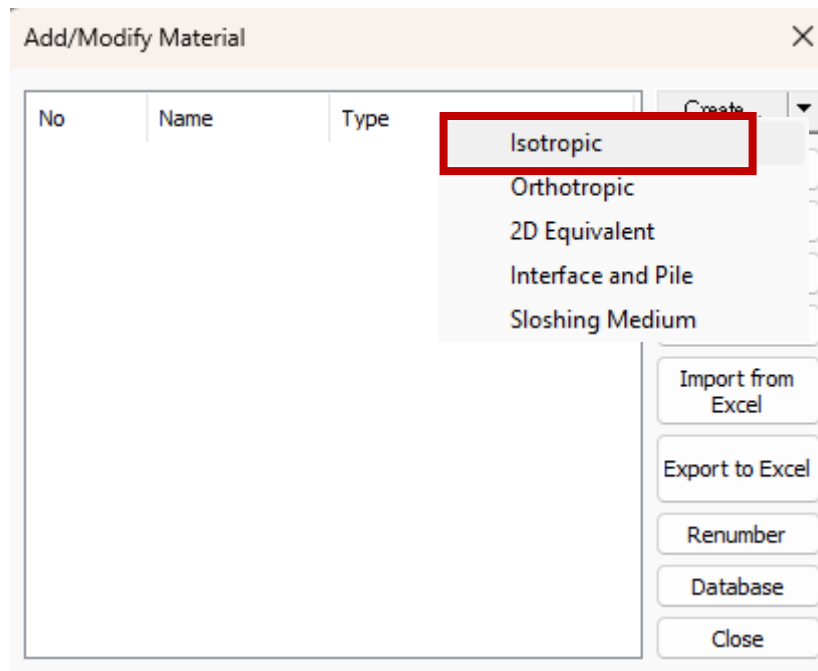
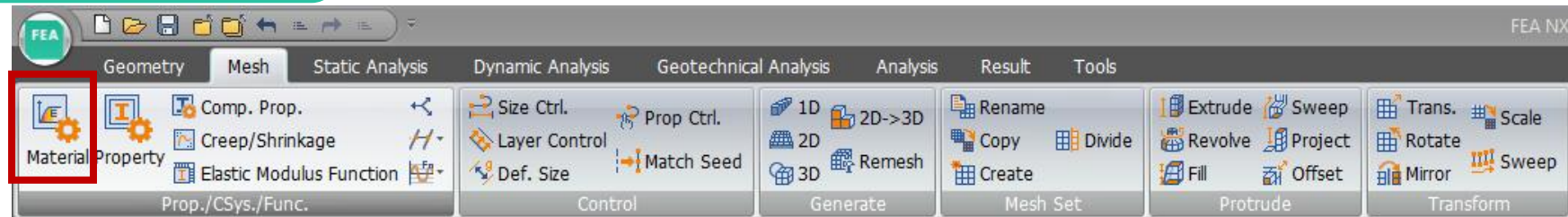
GEOMETRY MODEL

FEA



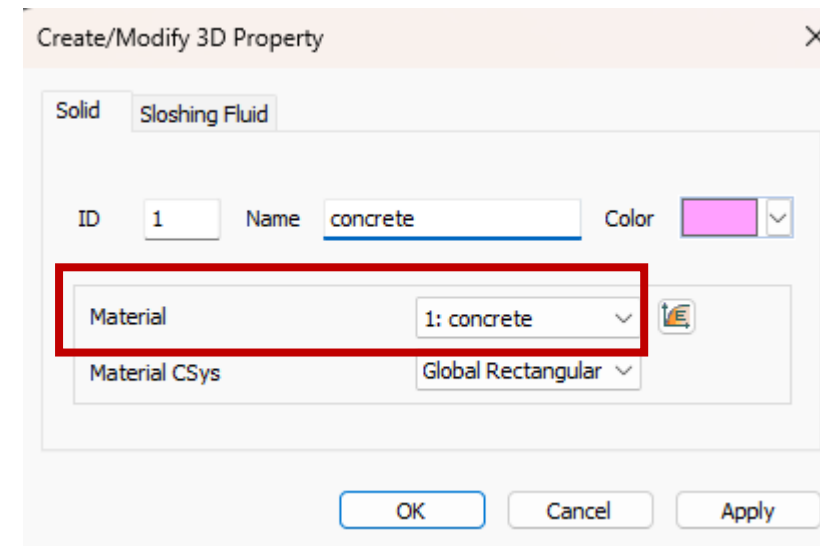
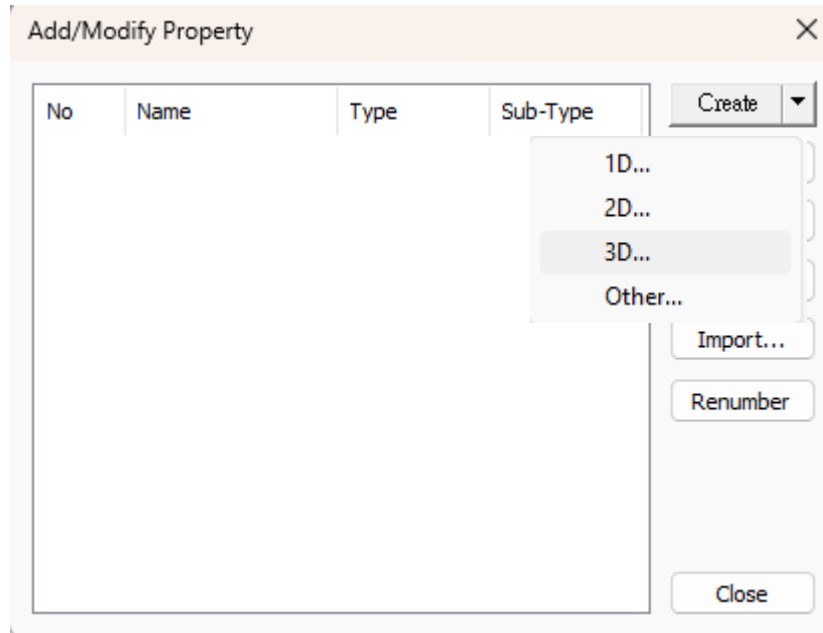
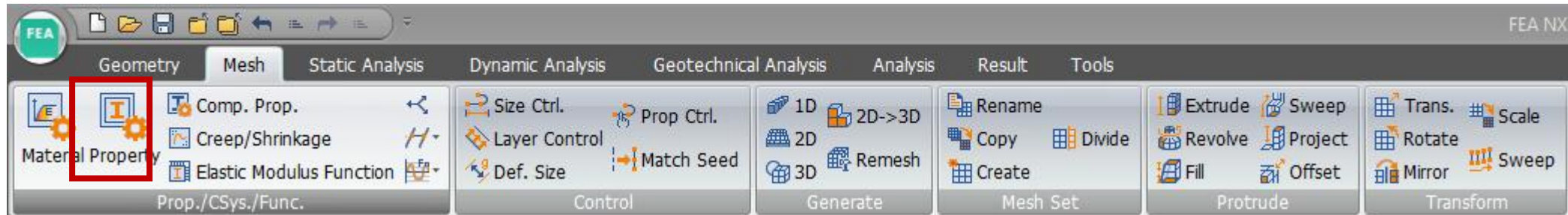
MATERIAL

FEA



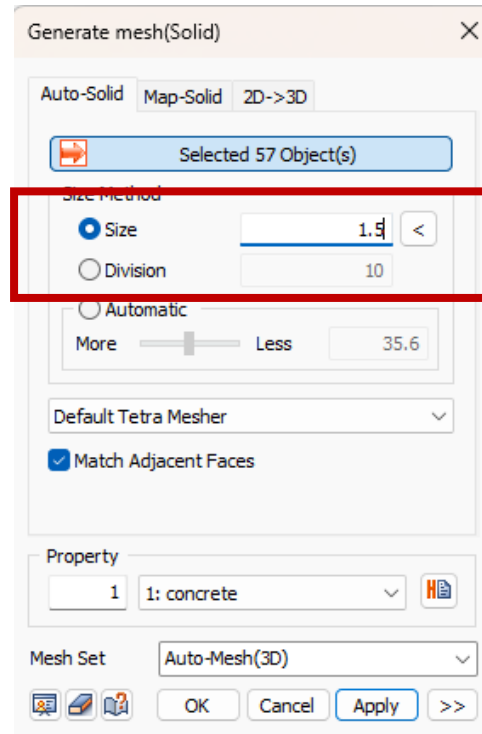
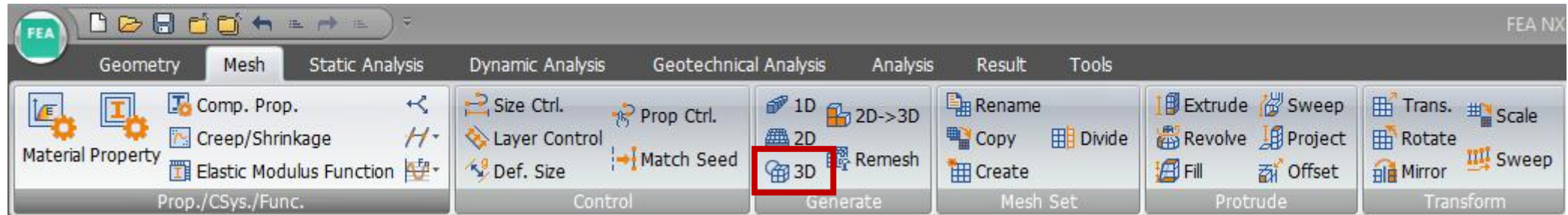
PROPERTY

FEA



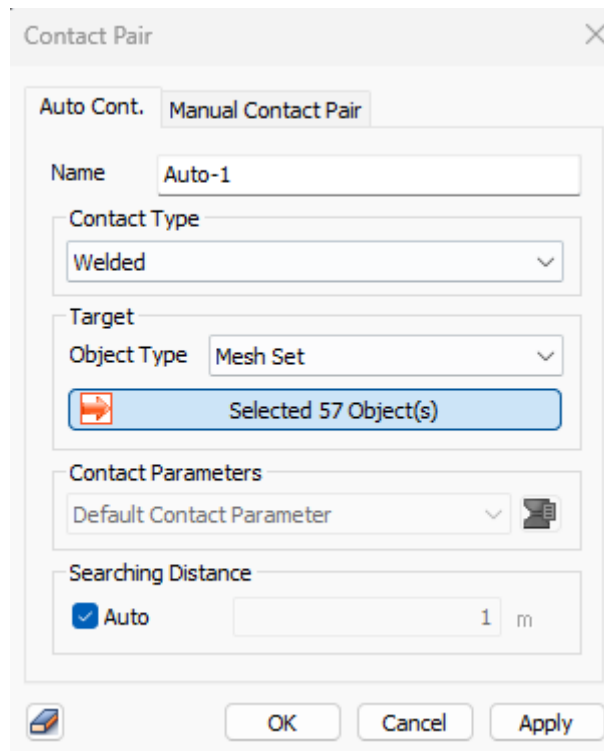
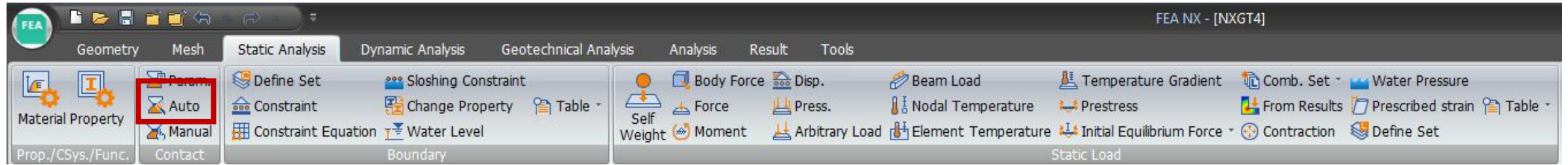
MESH GENERATION

FEA



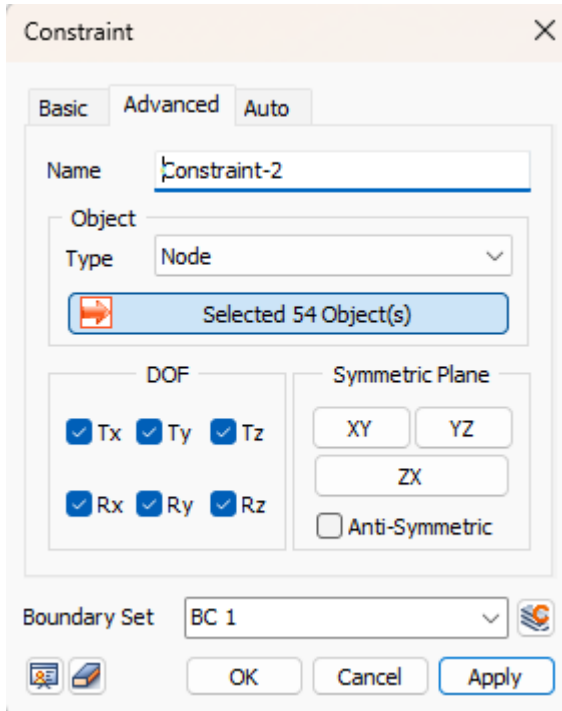
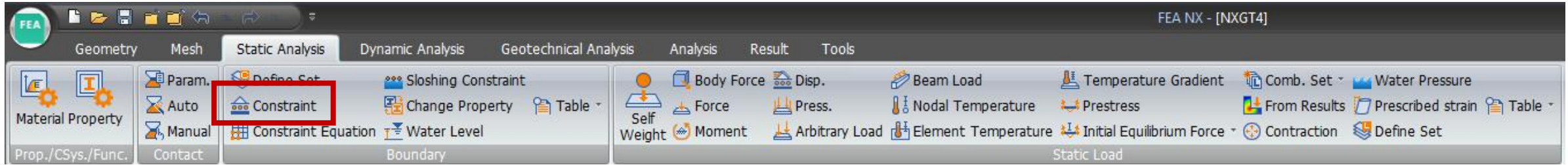
CONTACT PARAMETER

FEA



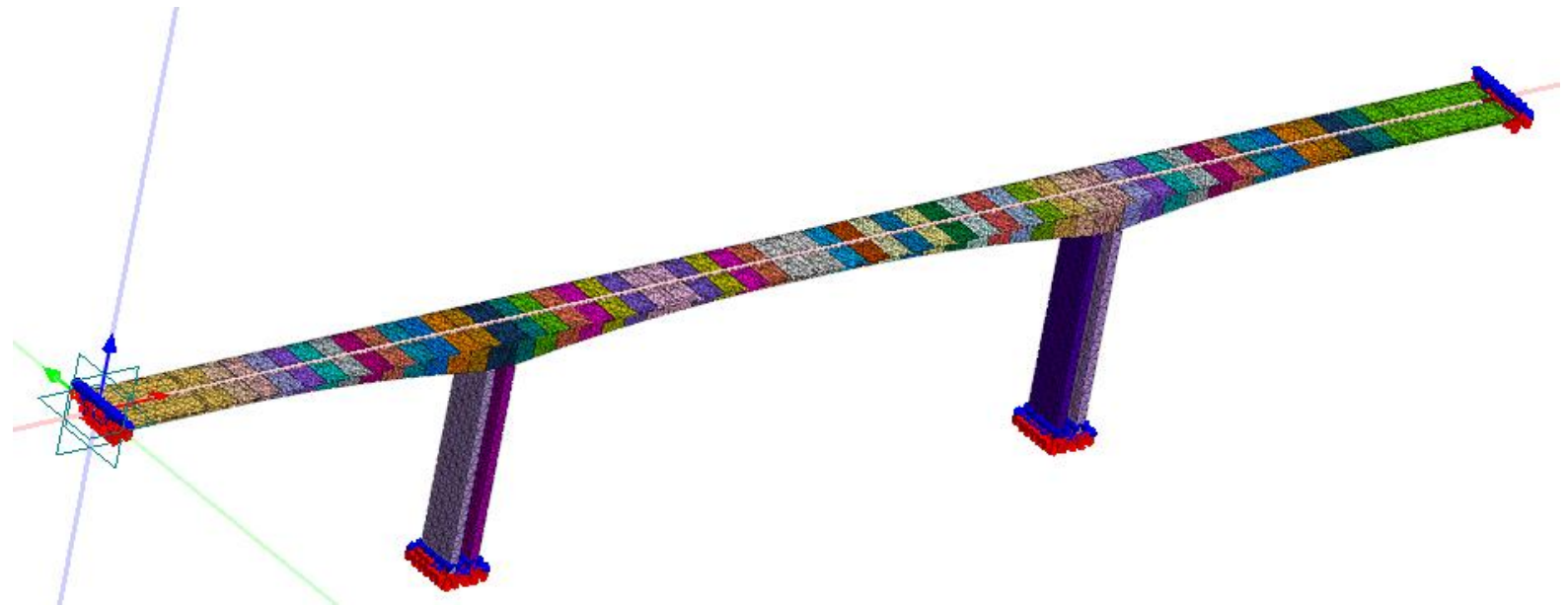
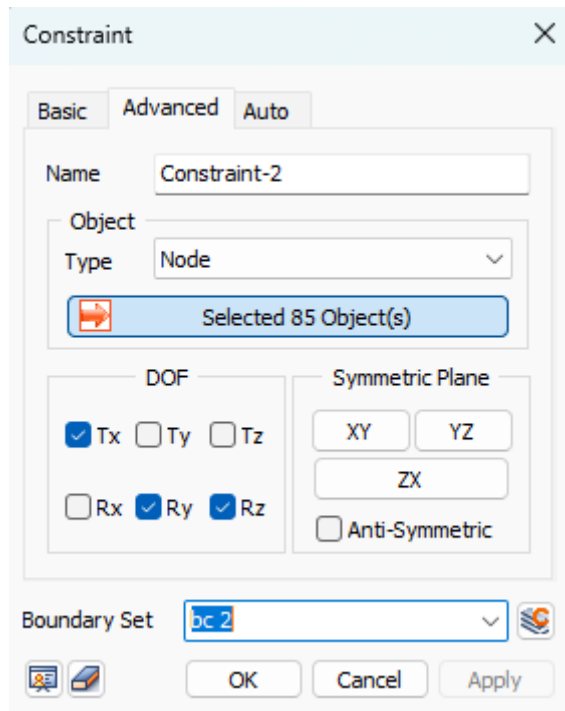
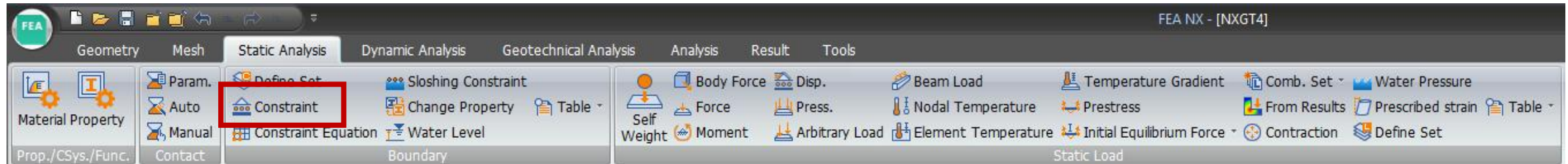
BOUNDARY CONDITION

FEA



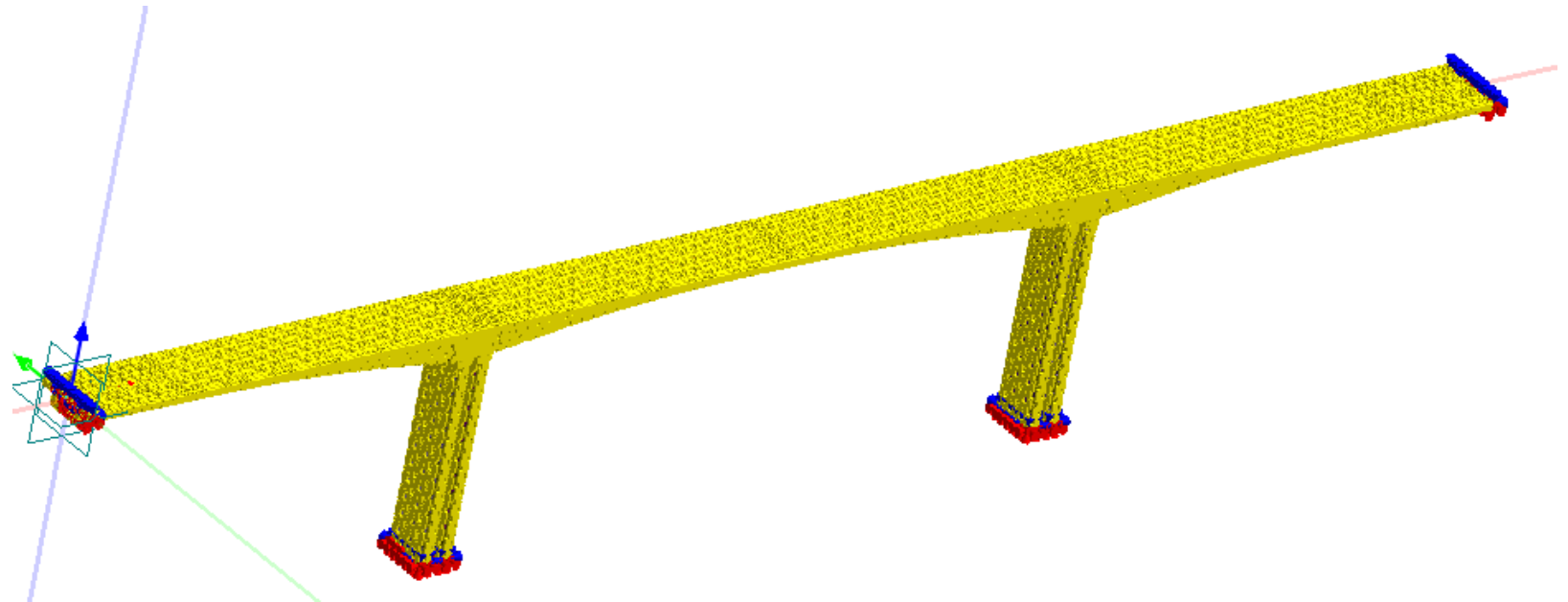
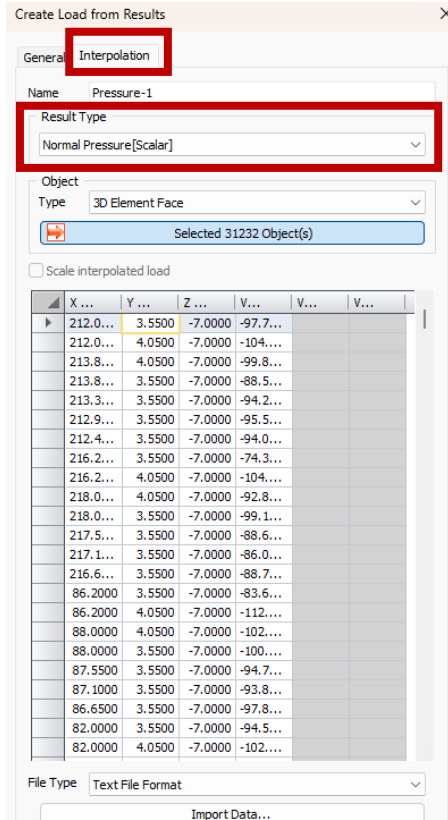
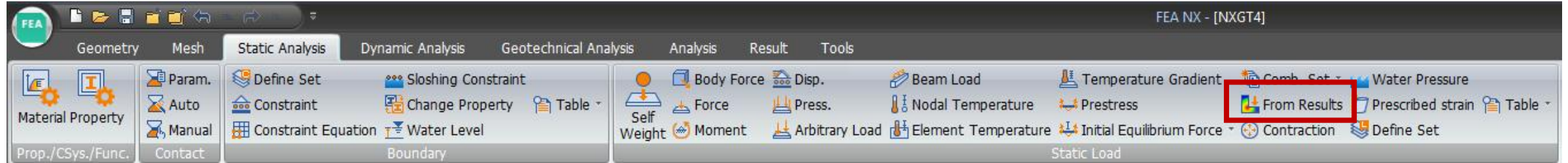
BOUNDARY CONDITION

FEA



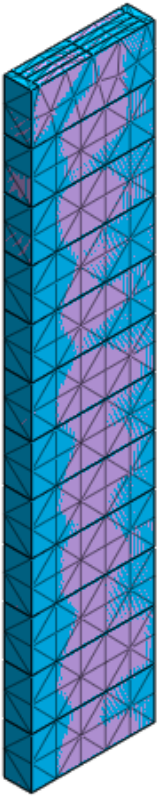
RESULT IMPORT - PRESSURE

FEA

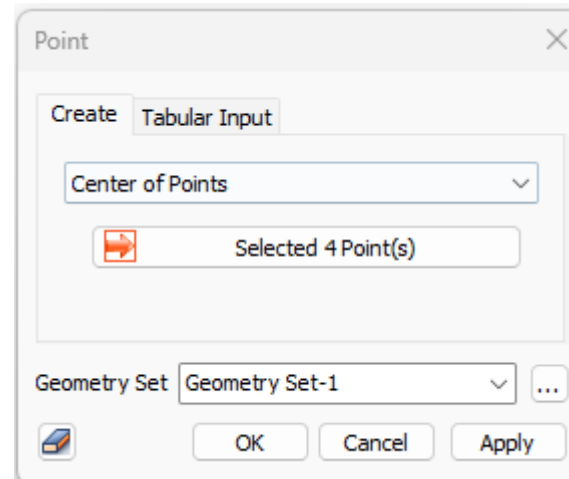


VIRTUAL BEAM (PIER)

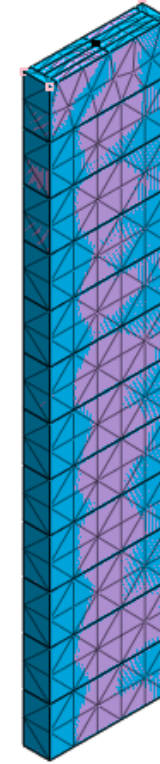
FEA



ISOLATE PIER
GEOMETRY AND MESH

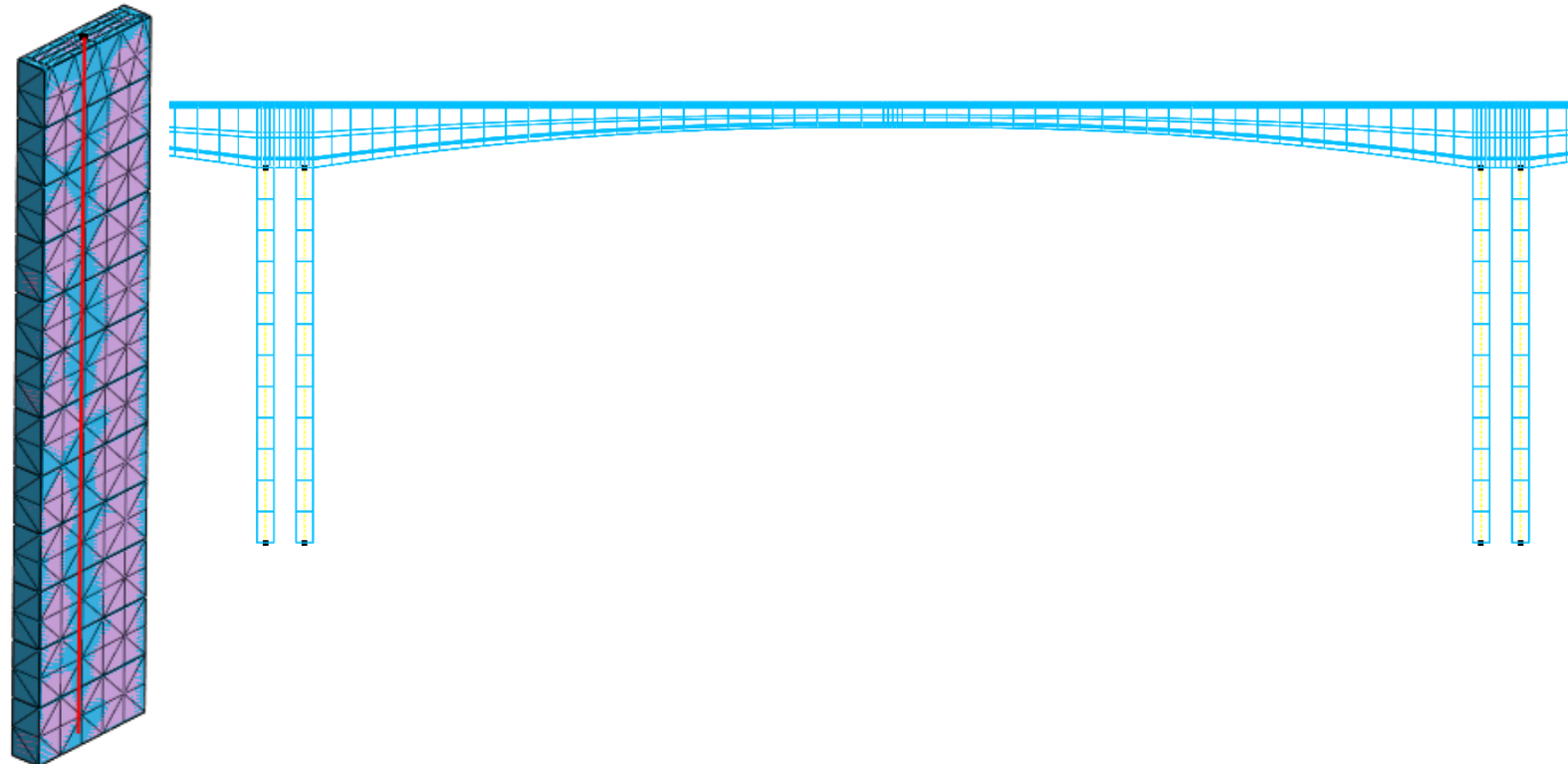
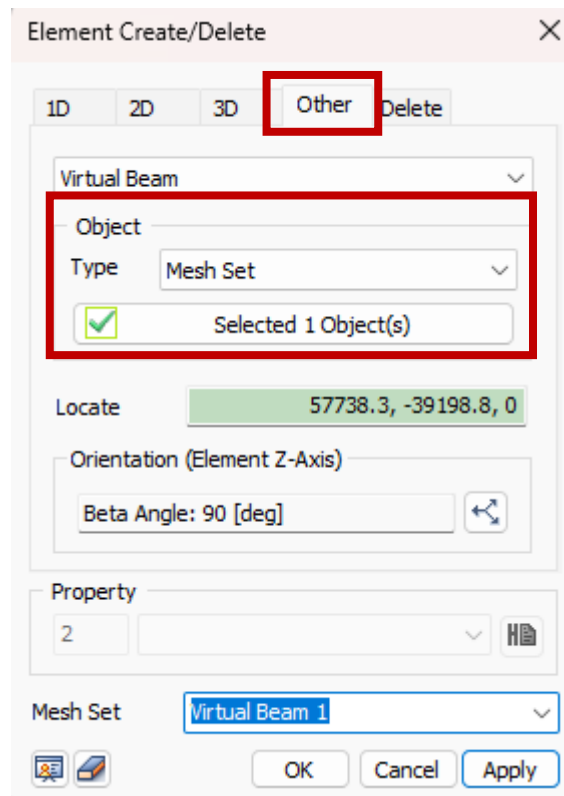


CREATE CENTER POINTS



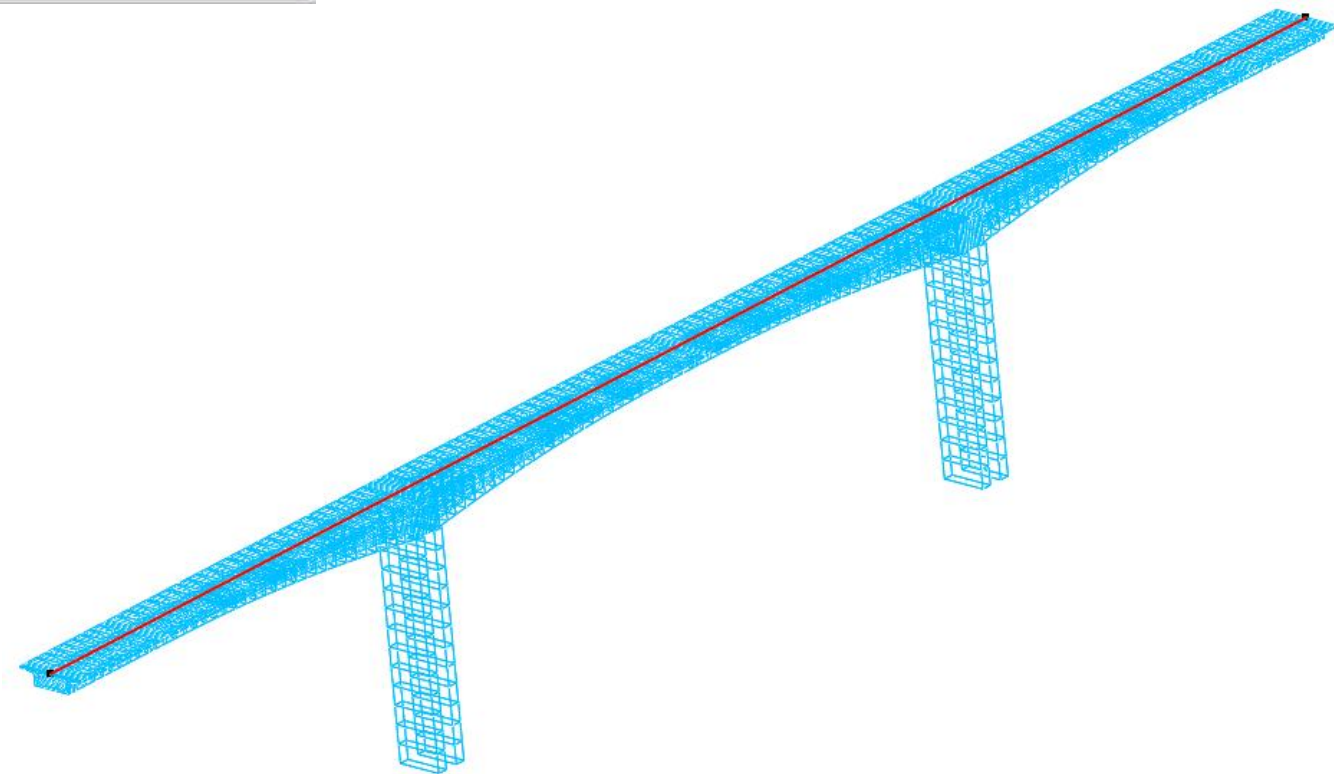
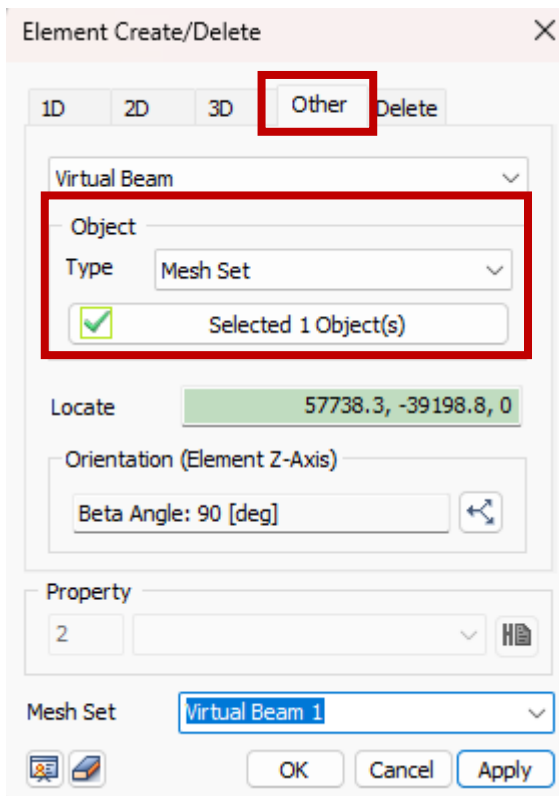
VIRTUAL BEAM (PIER)

FEA



VIRTUAL BEAM (DECK)

FEA



CONSTRUCTION STAGE SET - 1

FEA

Define Construction Stage

Construction Stage Set Name: **Construction Stage Set-1**

Stage ID: **1: Construction Stage-1** Move to Previous Move to Next

Stage Name: **Construction Stage-1** New Insert Delete

Stage Type: **Stress**

Set Data	Activated Data	Deactivated Data
- Mesh - Auto-Mesh(3D) - Auto-Mesh(3D)-1 - Auto-Mesh(3D)-10 - Auto-Mesh(3D)-11 - Auto-Mesh(3D)-12 - Auto-Mesh(3D)-13 - Auto-Mesh(3D)-14 - Auto-Mesh(3D)-15 - Auto-Mesh(3D)-16 - Auto-Mesh(3D)-17 - Auto-Mesh(3D)-18 - Auto-Mesh(3D)-19 - Auto-Mesh(3D)-2 - Auto-Mesh(3D)-20 - Auto-Mesh(3D)-21 - Auto-Mesh(3D)-22 - Auto-Mesh(3D)-23 - Auto-Mesh(3D)-24 - Auto-Mesh(3D)-25 - Auto-Mesh(3D)-26 - Auto-Mesh(3D)-27 - Auto-Mesh(3D)-28 - Auto-Mesh(3D)-29 - Auto-Mesh(3D)-3 - Auto-Mesh(3D)-30	- Auto-Mesh(3D)-55 - Auto-Mesh(3D)-56 - Auto-Mesh(3D)-6 - Auto-Mesh(3D)-7 - Auto-Mesh(3D)-8 - Auto-Mesh(3D)-9 - Default Mesh Set - Boundary Condition - bc1 - bc12 - Static Load - Default Self-Weight - Combined Load Sets - Contact - Auto-1-1 - Auto-1-10 - Auto-1-100 - Auto-1-101 - Auto-1-102 - Auto-1-103 - Auto-1-104 - Auto-1-105 - Auto-1-11 - Auto-1-12 - Auto-1-13 - Auto-1-14	- Mesh - Boundary Condition - Static Load - Combined Load Sets - Contact

Sort By: **Name** Show Data: **All**

Save Close

☐ Analysis Control...

☐ Output Control...

Initial Condition

☐ Define Water Level For Global
0 mm None ...

☐ Define Water Level For Mesh Set
Input Water Level...

☐ Sub Stage...

☐ LDF... Copy To Specific Stage...

☒ Clear Displacement

☒ Clear Strain

☐ Slope Stability(SRM)

CONSTRUCTION STAGE SET - 2

FEA

Define Construction Stage

Construction Stage Set Name: Construction Stage Set-1

Stage ID: 2: Construction Stage-2

Stage Name: Construction Stage-2

Stage Type: Stress

Buttons: Move to Previous, Move to Next, New, Insert, Delete

Set Data	Activated Data	Deactivated Data
- Mesh - Auto-Mesh(3D) - Auto-Mesh(3D)-1 - Auto-Mesh(3D)-10 - Auto-Mesh(3D)-11 - Auto-Mesh(3D)-12 - Auto-Mesh(3D)-13 - Auto-Mesh(3D)-14 - Auto-Mesh(3D)-15 - Auto-Mesh(3D)-16 - Auto-Mesh(3D)-17 - Auto-Mesh(3D)-18 - Auto-Mesh(3D)-19 - Auto-Mesh(3D)-2 - Auto-Mesh(3D)-20 - Auto-Mesh(3D)-21 - Auto-Mesh(3D)-22 - Auto-Mesh(3D)-23 - Auto-Mesh(3D)-24 - Auto-Mesh(3D)-25 - Auto-Mesh(3D)-26 - Auto-Mesh(3D)-27 - Auto-Mesh(3D)-28 - Auto-Mesh(3D)-29 - Auto-Mesh(3D)-3 - Auto-Mesh(3D)-30	- Mesh - Boundary Condition - Static Load - pressure - Combined Load Sets - Contact	- Mesh - Boundary Condition - Static Load - Combined Load Sets - Contact

Sort By: Name

Show Data: All

Buttons: Save, Close

Initial Condition

☐ Define Water Level For Global

0 mm None

☐ Define Water Level For Mesh Set

Input Water Level...

☐ Sub Stage...

☐ LDF... Copy To Specific Stage...

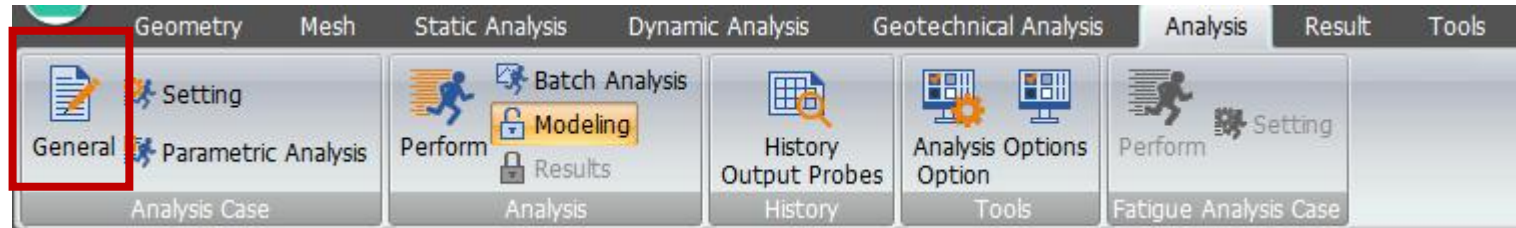
☐ Clear Displacement

☒ Clear Strain

☐ Slope Stability(SRM)

ANALYSIS CASE

FEA



Add/Modify Analysis Case

Analysis Case Setting

Title: Pressure analysis

Description:

Solution Type: Construction Stage

Construction Stage Set: Construction Stage Set-1

Analysis Control: [Icon]

Output Control: [Icon]

Analysis Case Model

All Sets << >> Active Sets

[Empty Light Blue Box] [Empty Light Green Box]

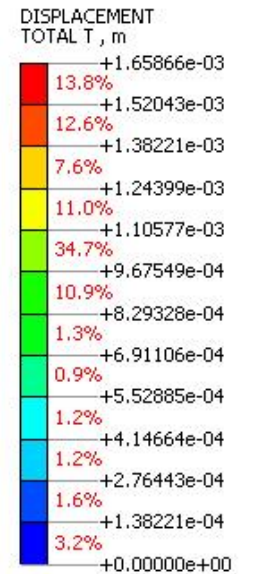
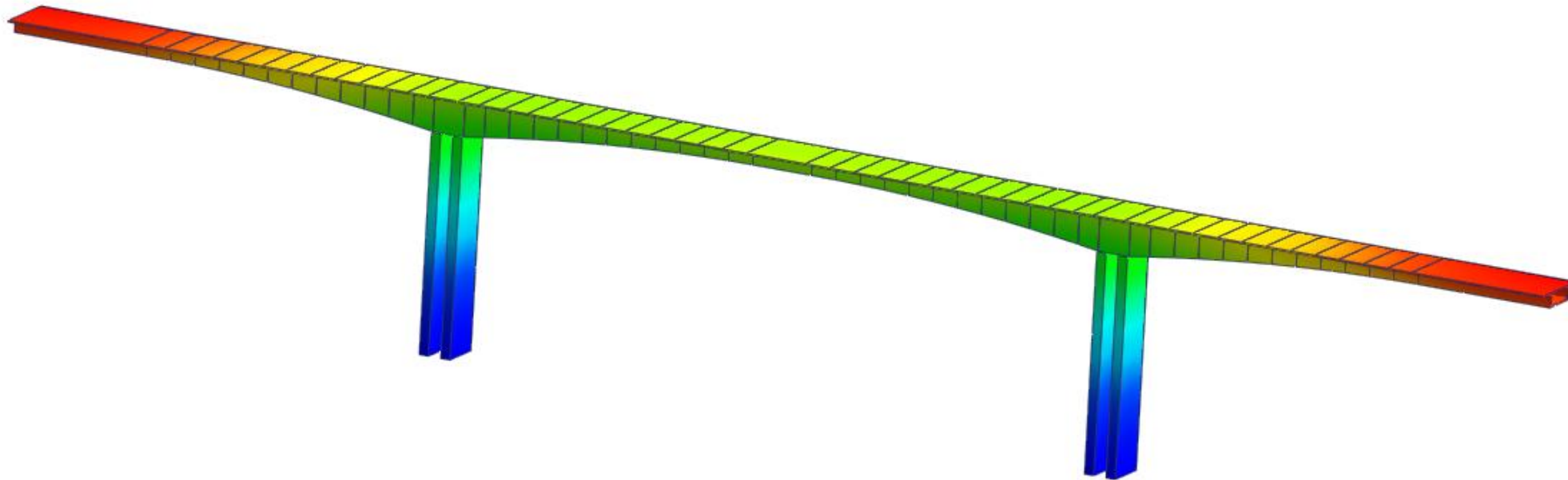
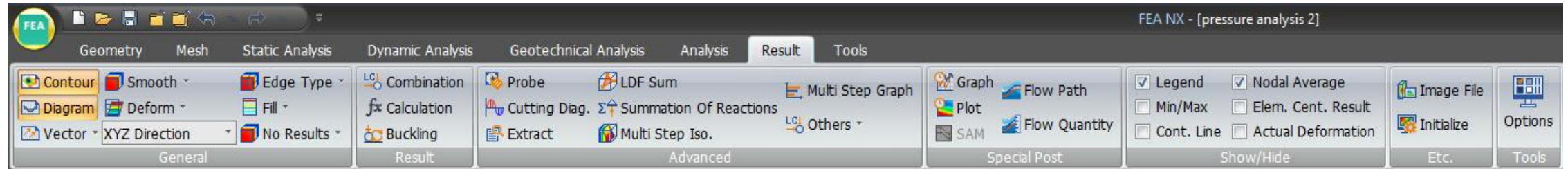
☐ Solve Each Load Set Independently

Sorting: Name

OK Cancel Apply

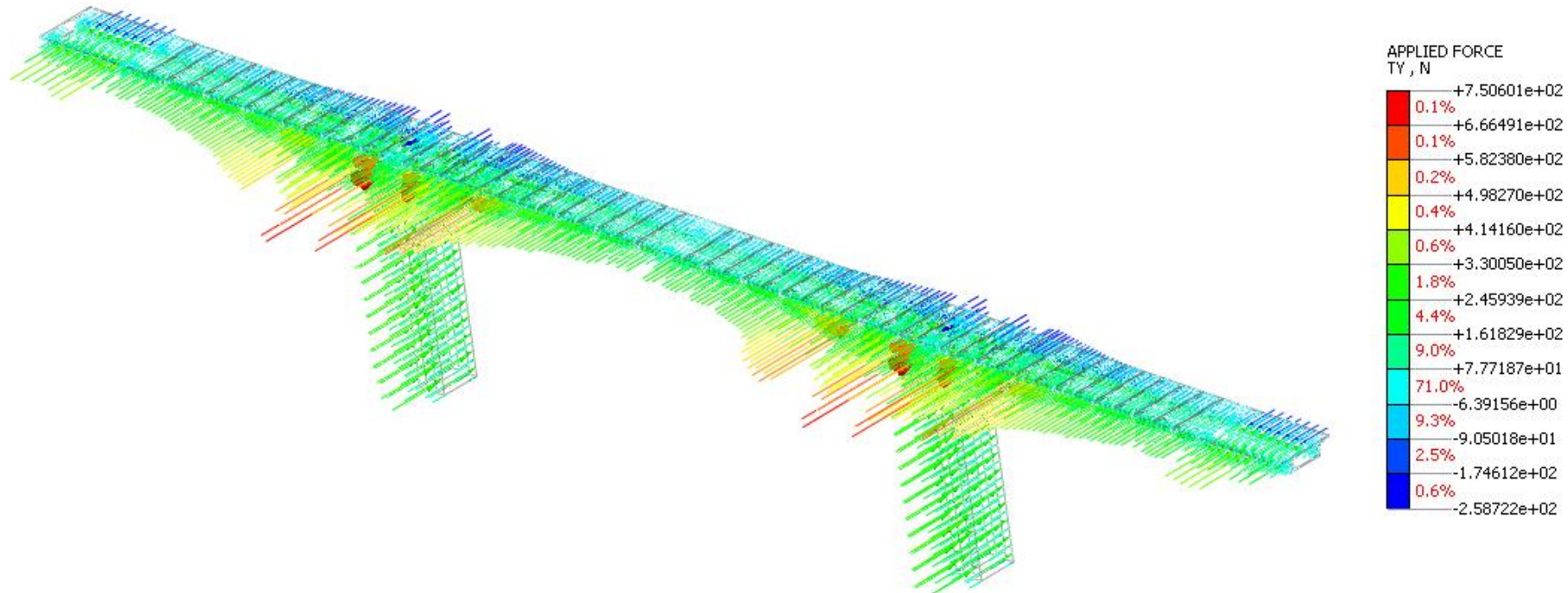
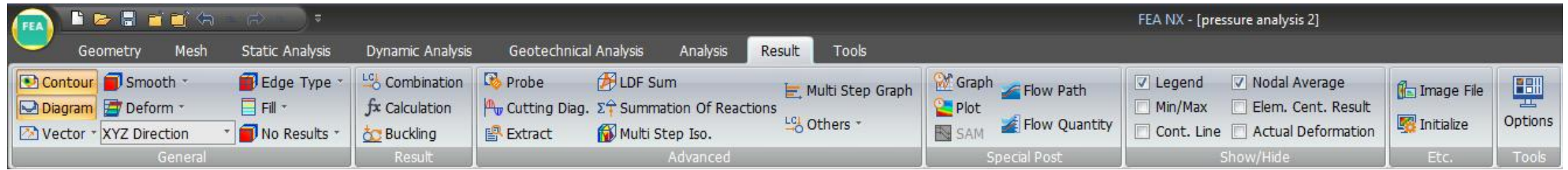
RESULTS - DISPLACEMENT

FEA



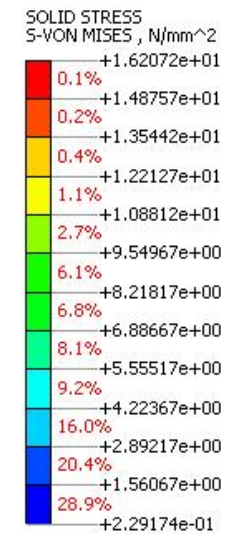
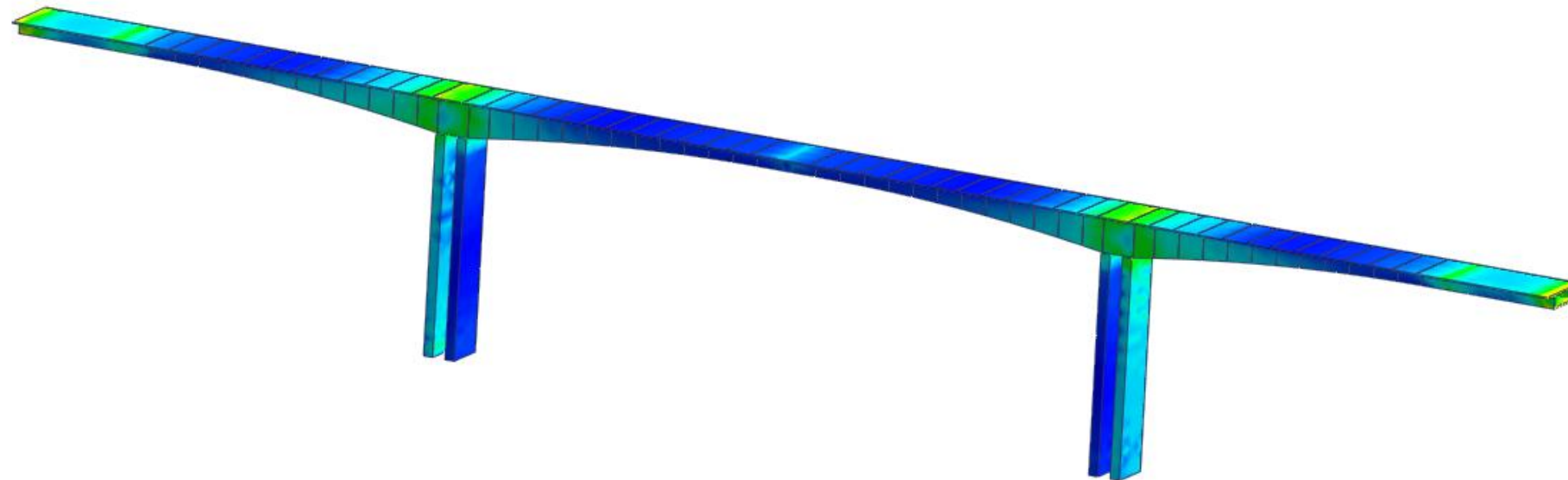
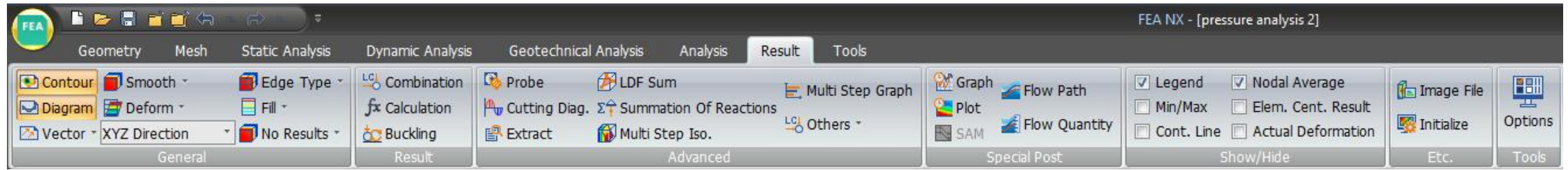
RESULTS – APPLIED FORCE (WIND PRESSURE)

FEA



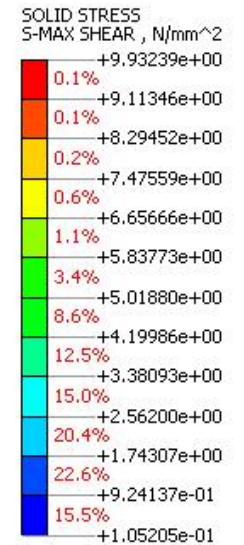
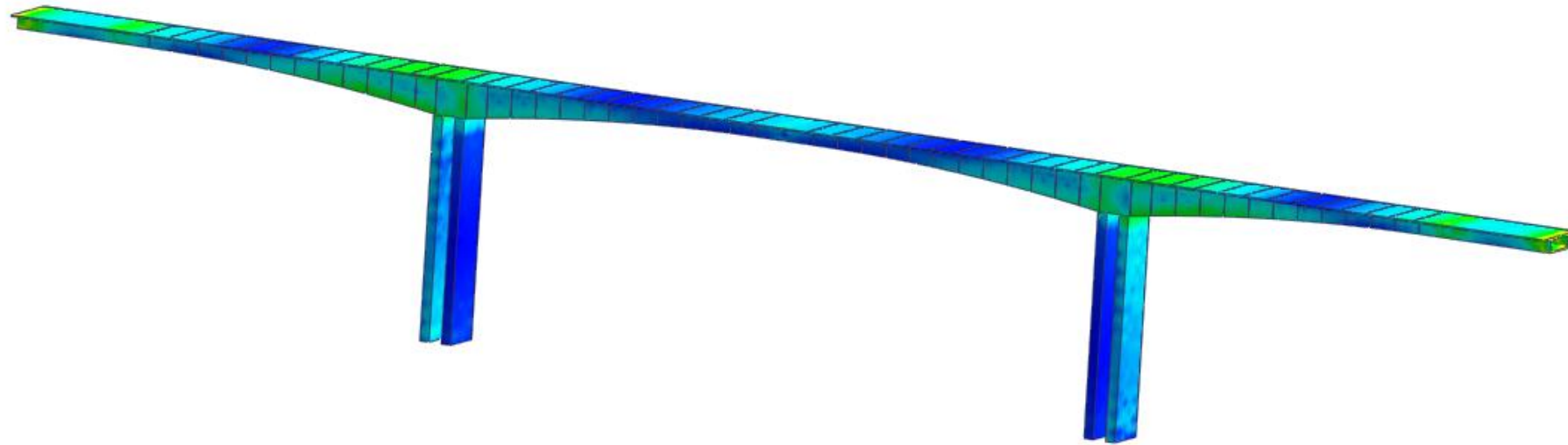
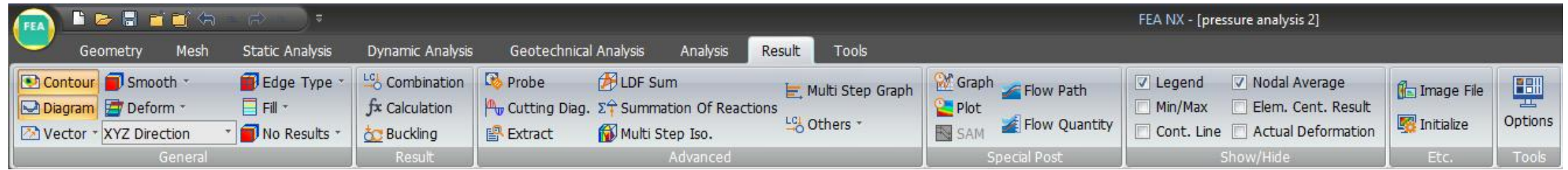
RESULTS – STRESS VON MISES

FEA



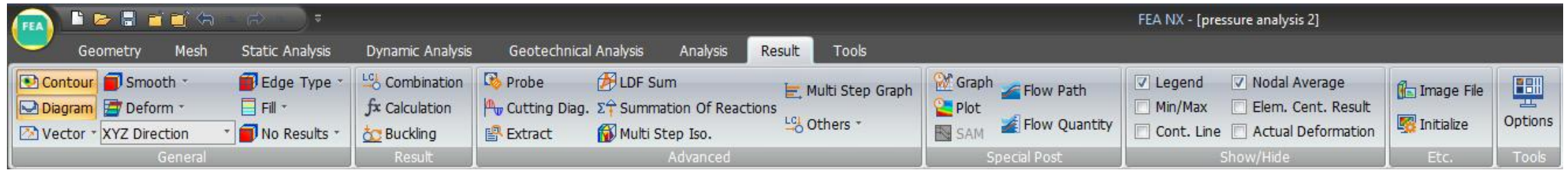
RESULTS – MAX SHEAR

FEA



RESULTS | VIRTUAL BEAM- AXIAL FORCE

FEA



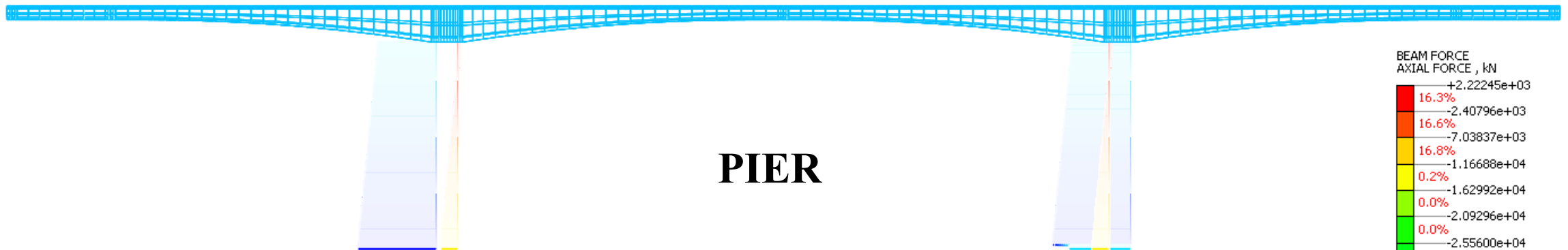
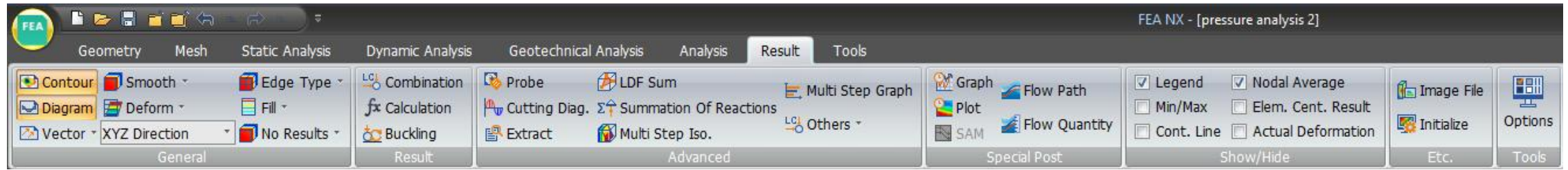
DECK

BEAM FORCE
AXIAL FORCE , kN

	+5.52003e+04
0.6%	+4.89476e+04
0.0%	+4.26948e+04
0.0%	+3.64421e+04
0.7%	+3.01894e+04
0.5%	+2.39366e+04
0.6%	+1.76839e+04
0.0%	+1.14312e+04
0.1%	+5.17842e+03
0.0%	-1.07433e+03
0.0%	-7.32706e+03
39.7%	-1.35798e+04
57.8%	-1.98325e+04

RESULTS | VIRTUAL BEAM- AXIAL FORCE

FEA

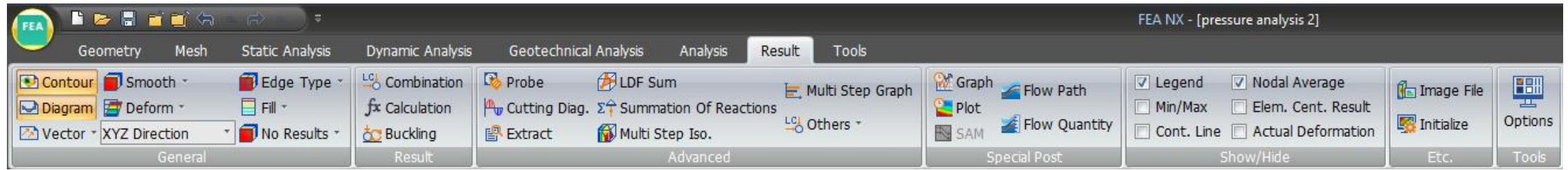


BEAM FORCE
AXIAL FORCE , kN

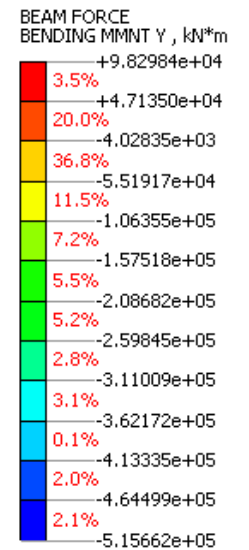
16.3%	+2.22245e+03
16.6%	-2.40796e+03
16.8%	-7.03837e+03
0.2%	-1.16688e+04
0.0%	-1.62992e+04
0.0%	-2.09296e+04
0.0%	-2.55600e+04
0.0%	-3.01904e+04
0.0%	-3.48208e+04
0.0%	-3.94512e+04
15.7%	-4.40816e+04
16.7%	-4.87121e+04
17.6%	-5.33425e+04

RESULTS | VIRTUAL BEAM- BENDING MOMENT

FEA

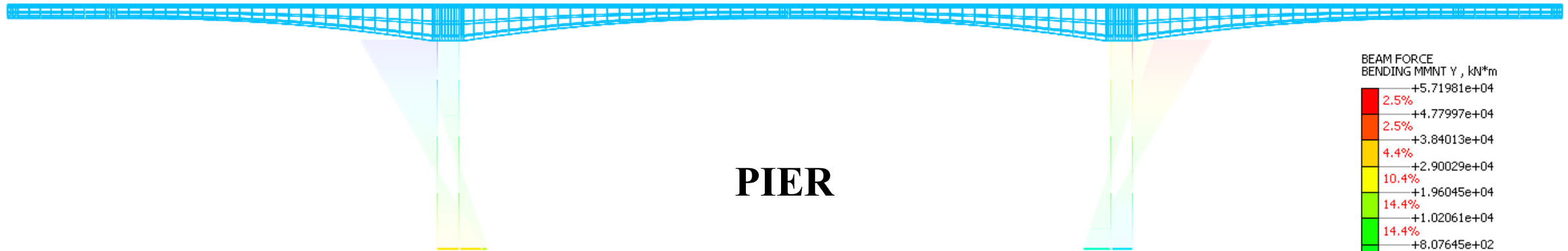
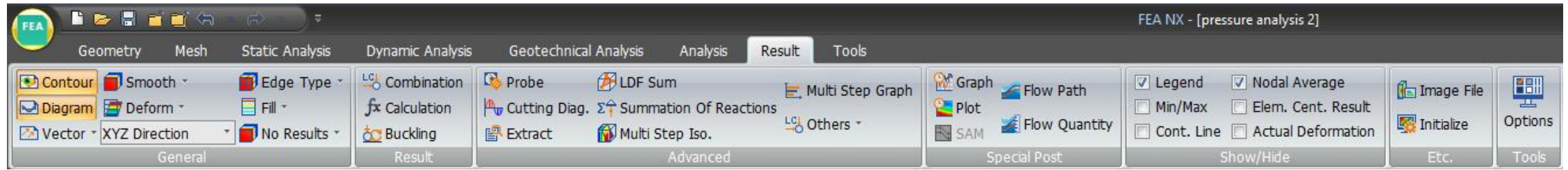


DECK



RESULTS | VIRTUAL BEAM- BENDING MOMENT

FEA



BEAM FORCE
BENDING MMNT Y , kN*m

2.5%	+5.71981e+04
2.5%	+4.77997e+04
4.4%	+3.84013e+04
10.4%	+2.90029e+04
14.4%	+1.96045e+04
14.4%	+1.02061e+04
14.5%	+8.07645e+02
14.4%	-8.59076e+03
10.8%	-1.79892e+04
6.4%	-2.73876e+04
2.6%	-3.67860e+04
2.6%	-4.61844e+04
	-5.55828e+04