Universidad del sureste

LICENCIATURA EN ARQUITECTURA

“ANALISIS DE ESTRUCTURAS”

EXAMEN

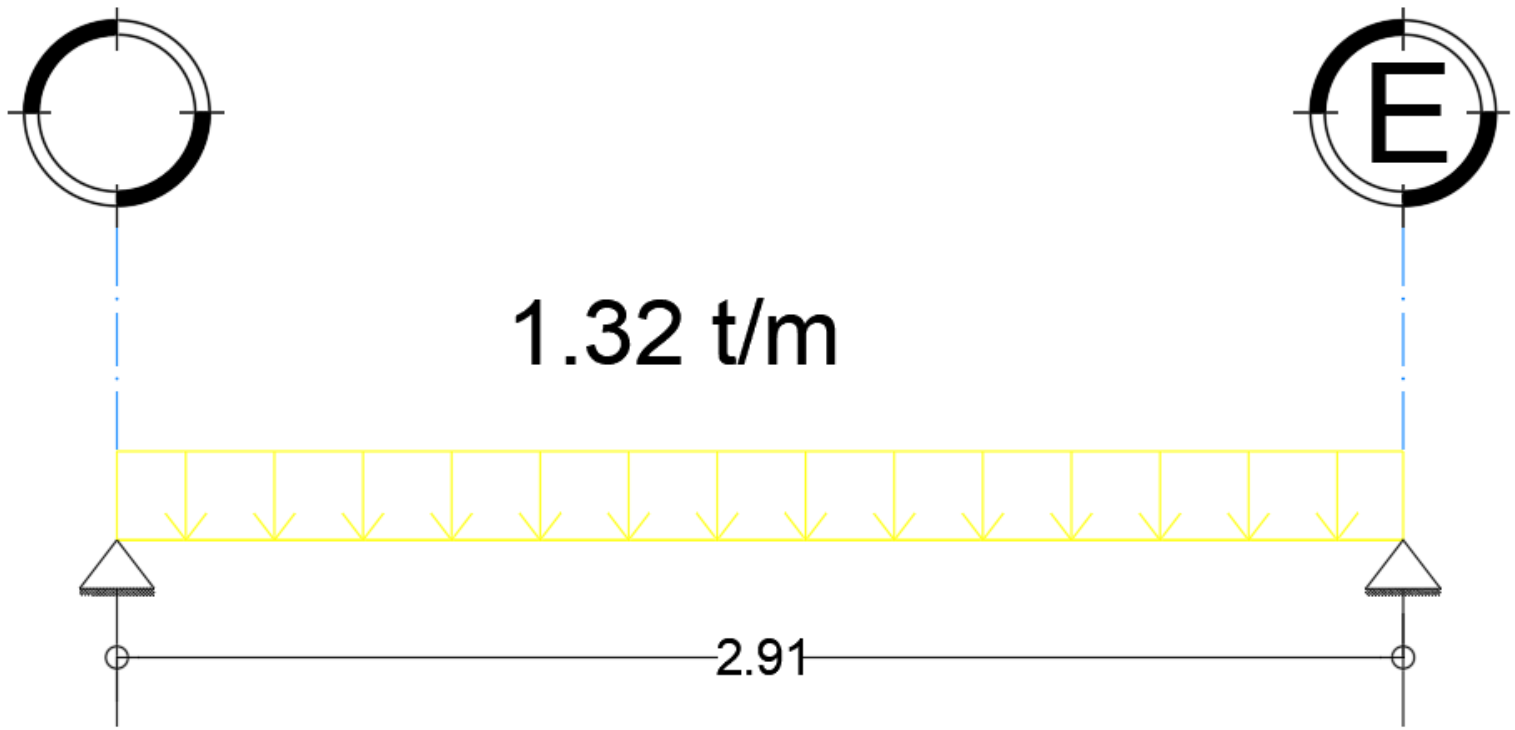
Presenta:

KARLA JUDITH ESCOBAR RODRIGUEZ

Profesor:

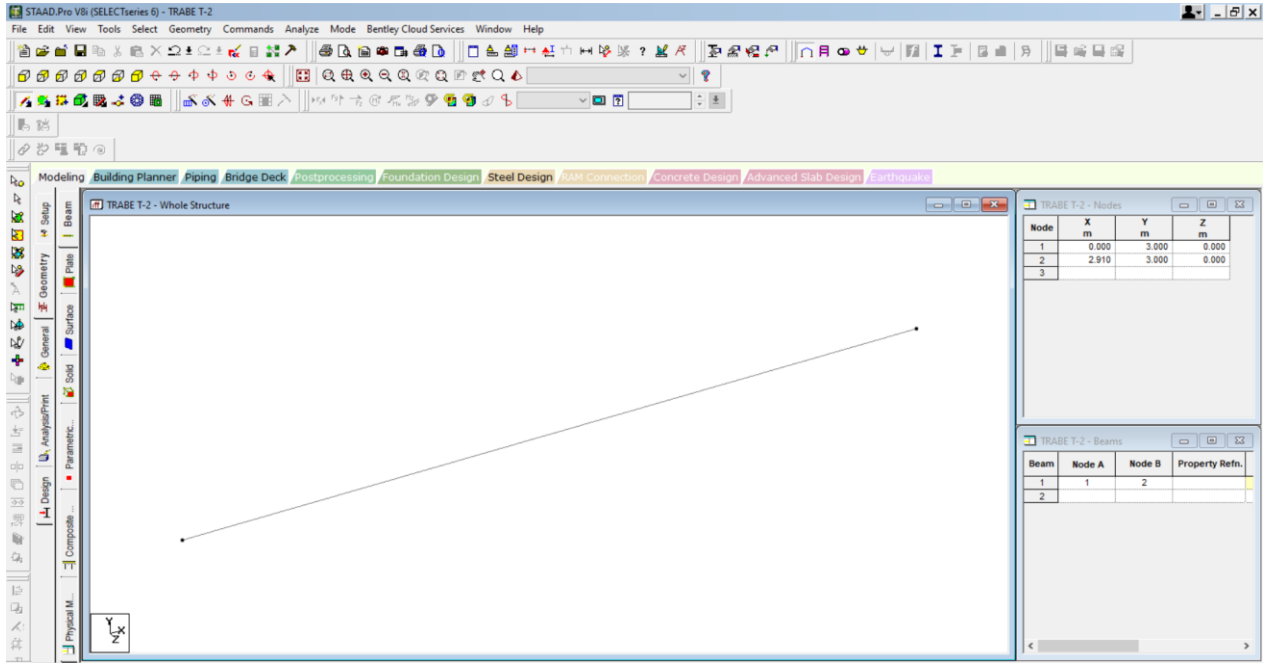
ARQUITECTO. Pedro Alberto García López

Comitán de Domínguez **Febrero 17 del 2021**

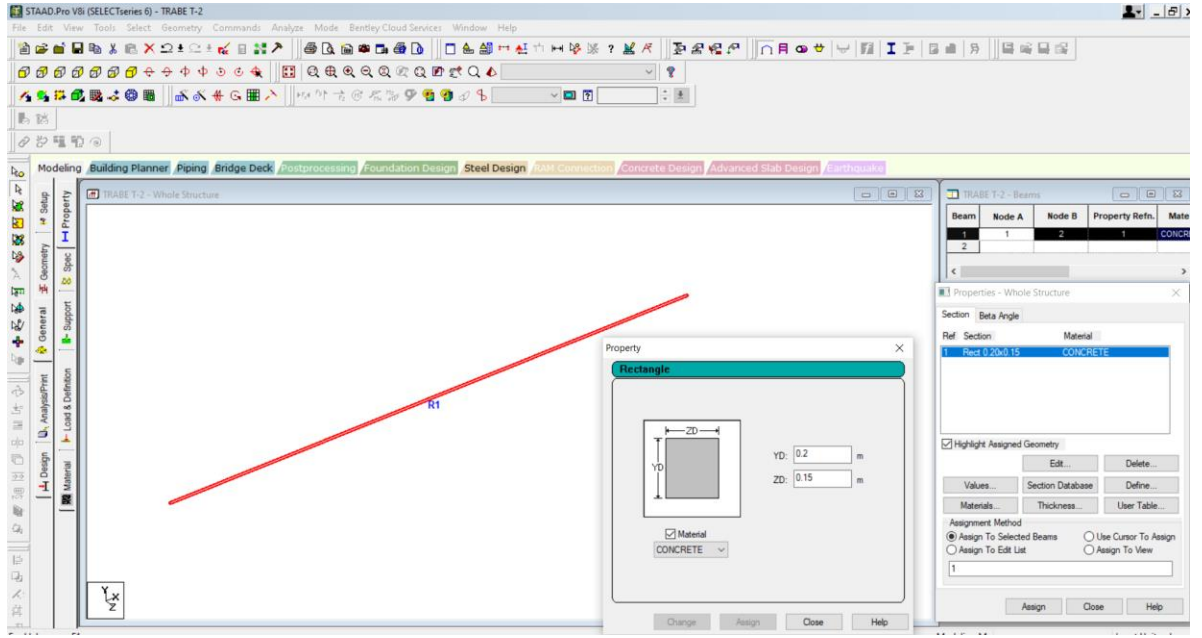


TRABE T3

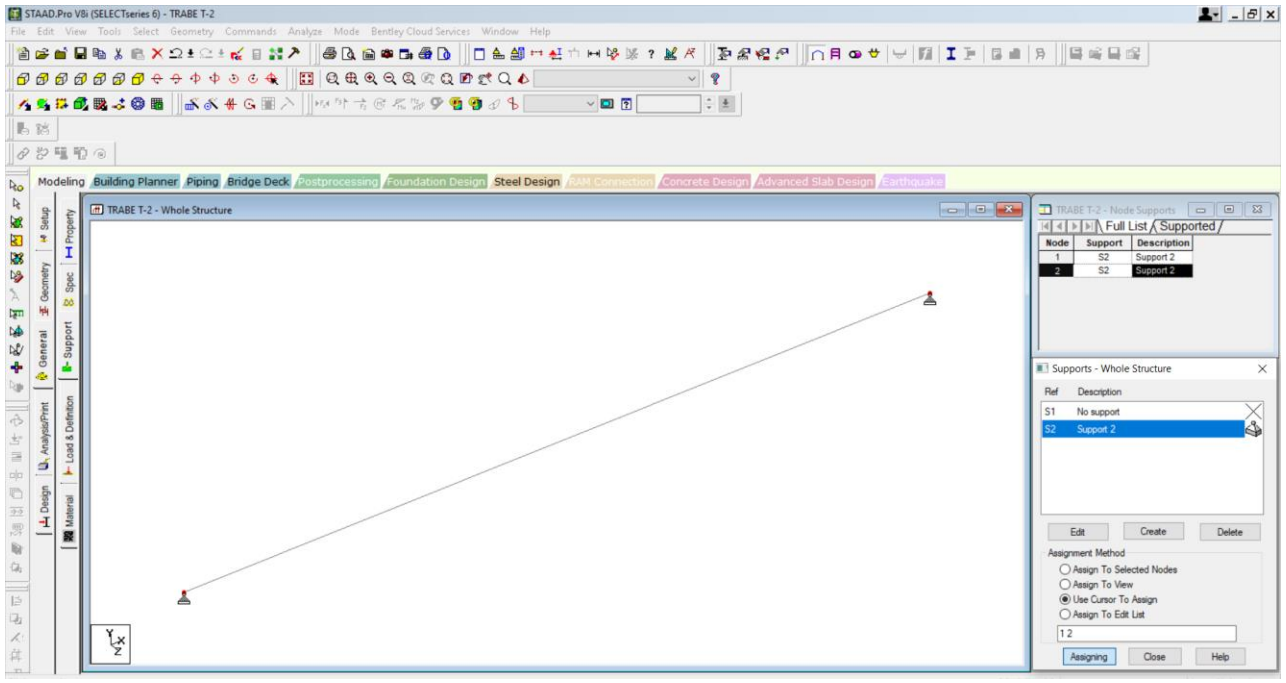
GEOMETRY



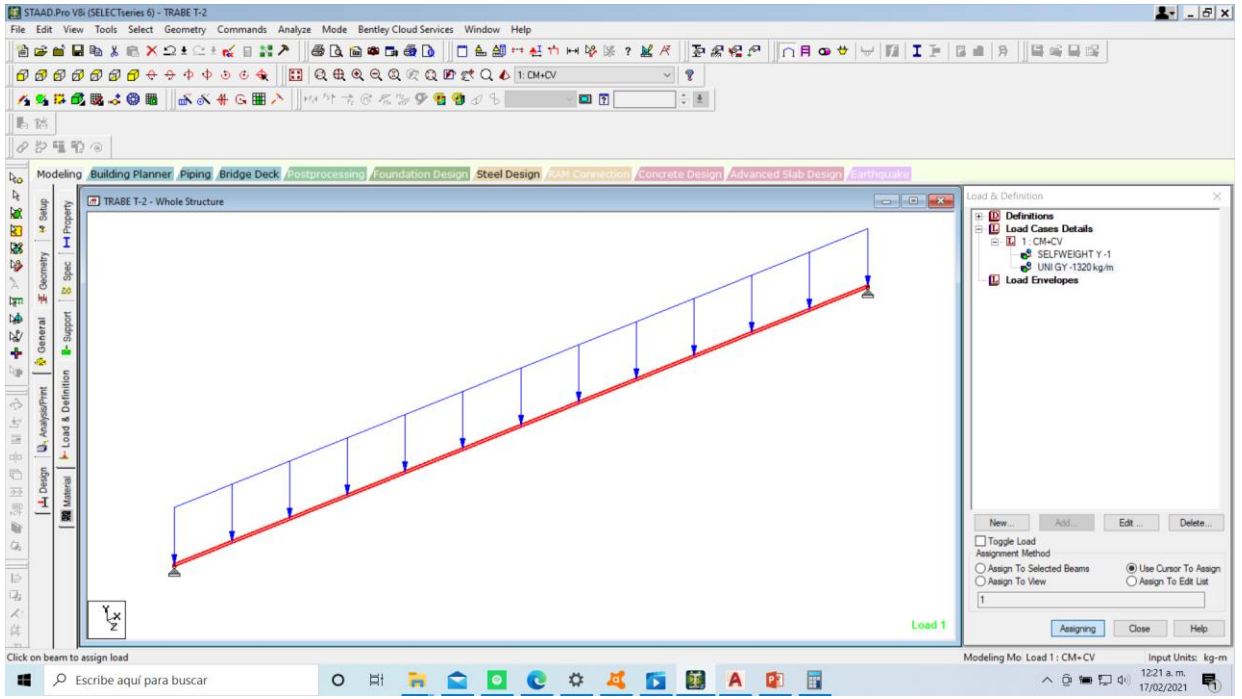
GENERAL



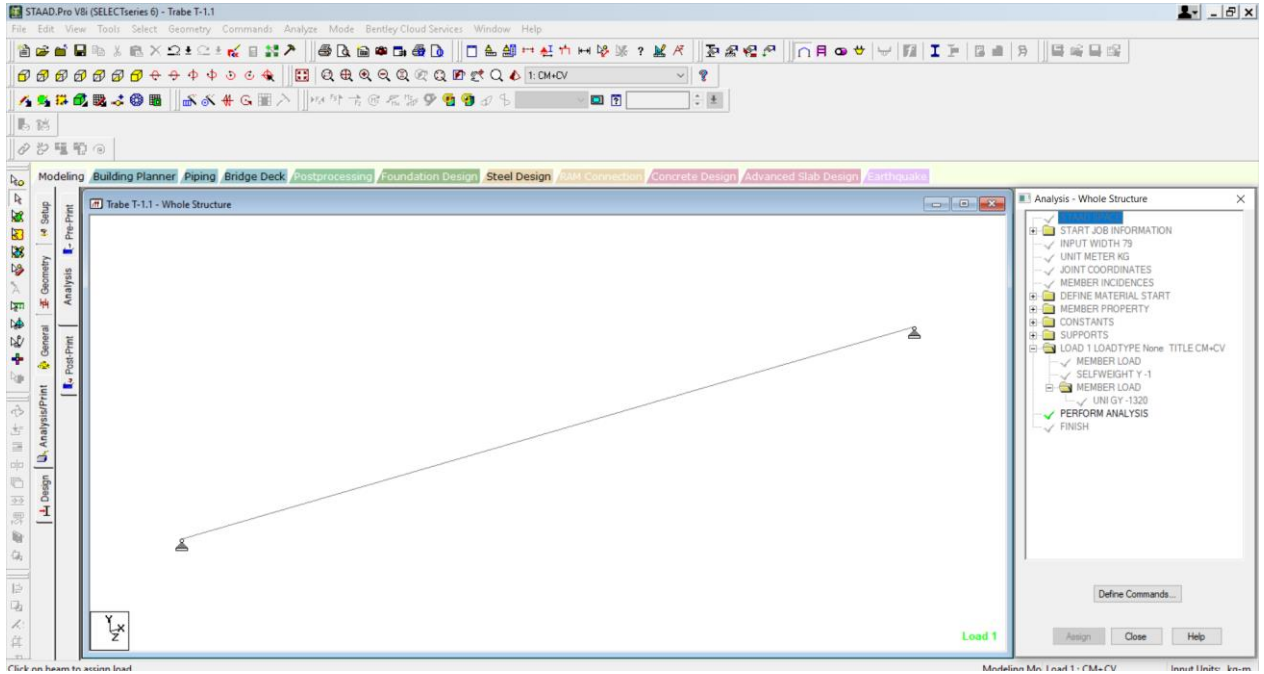
SUPPORT



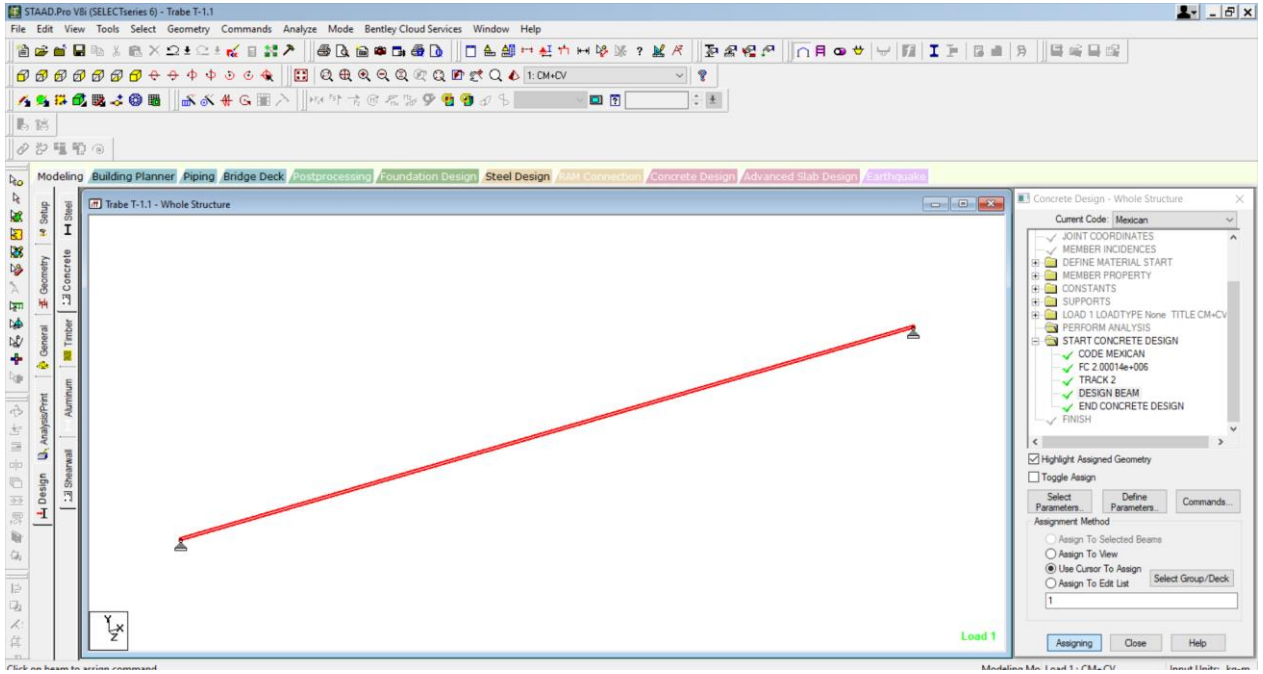
LOAD Y DEFINITION



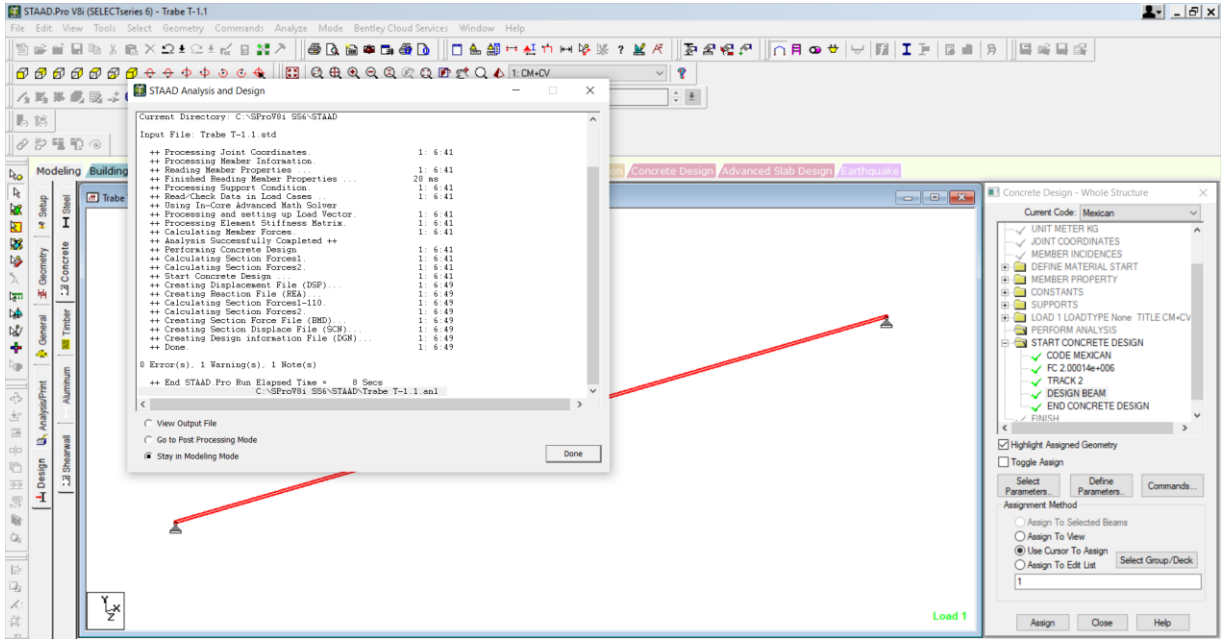
ANALYSIS/PRINT

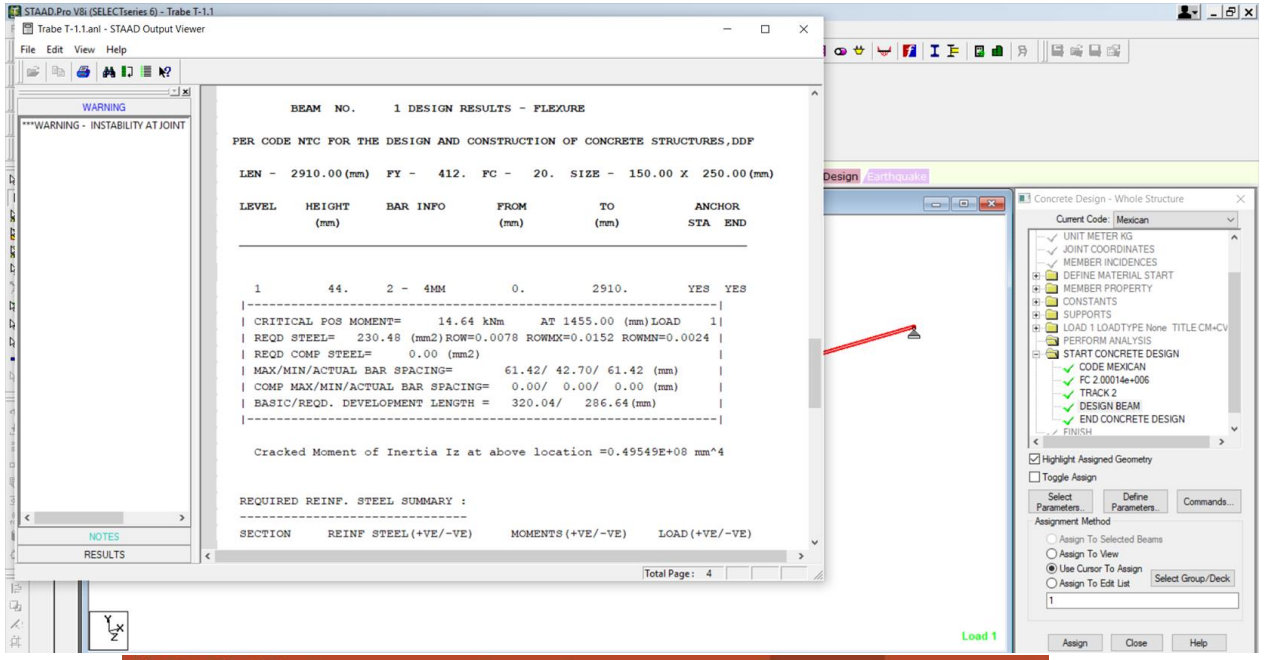


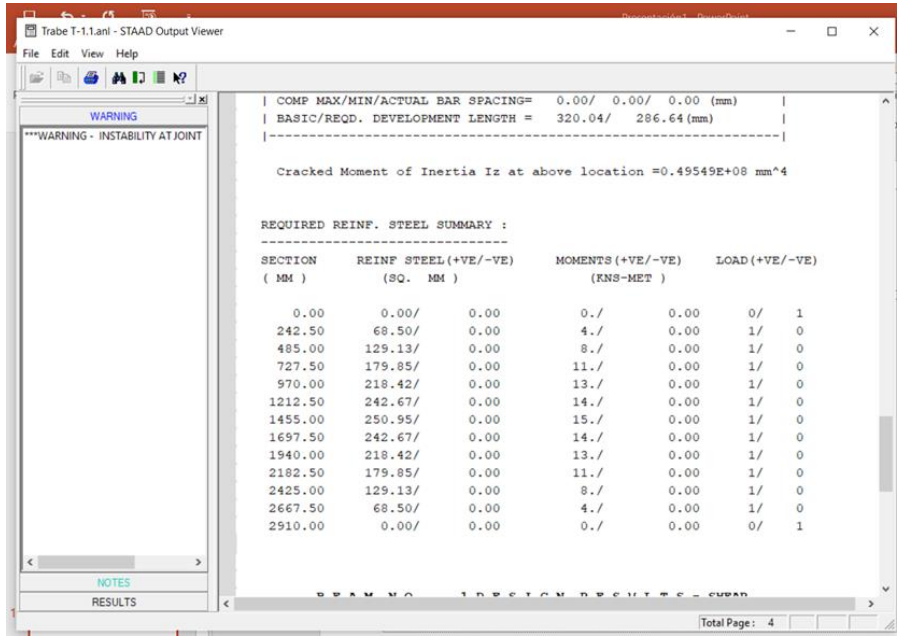
DESIGN

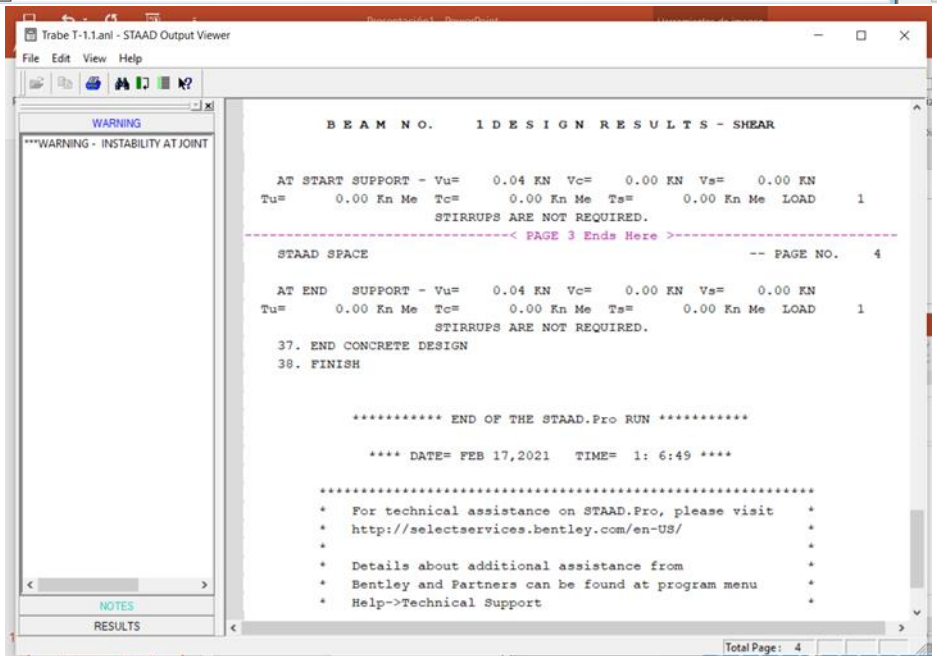


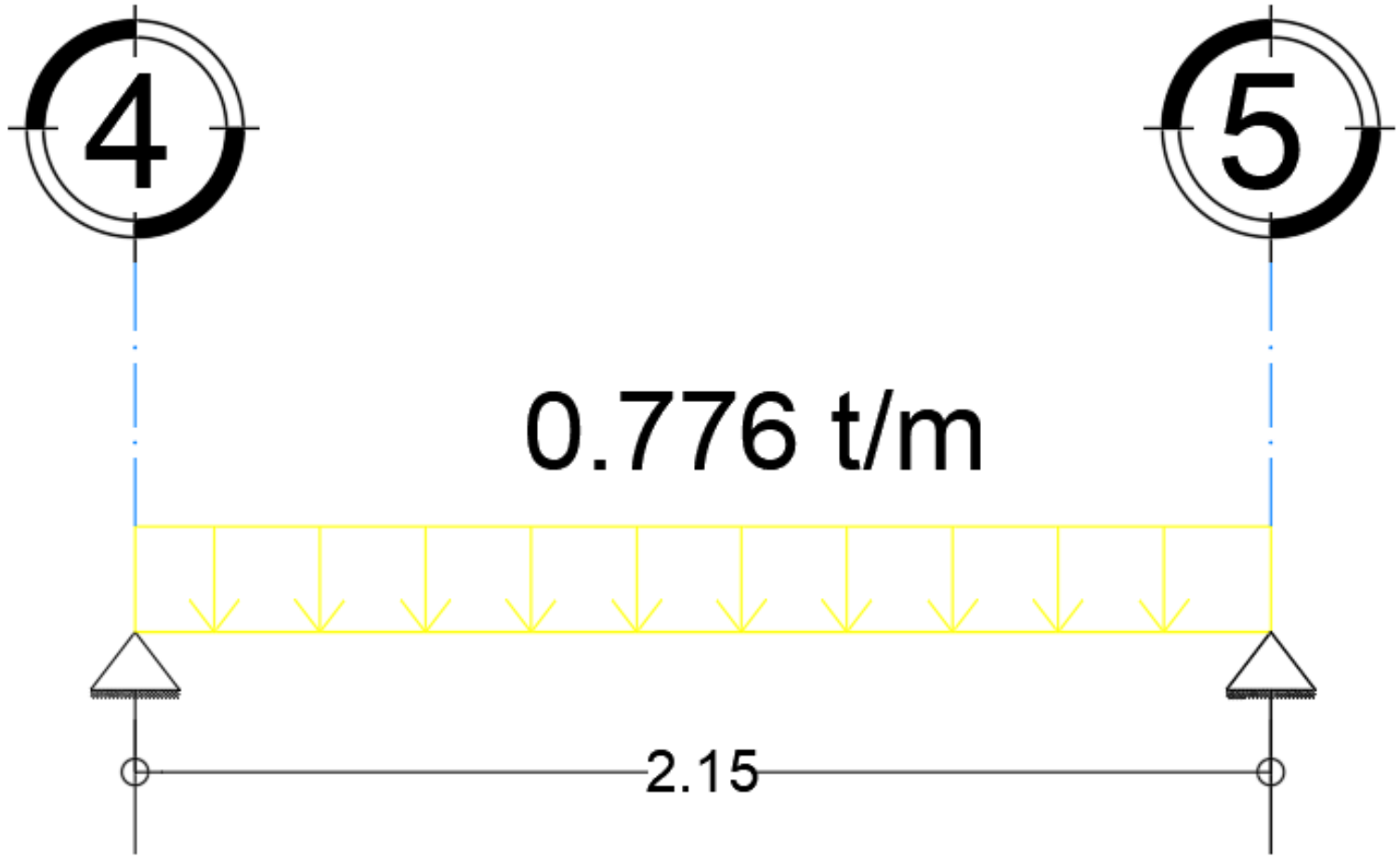
ANALISE


STAAD.Pro V8i (SELECTseries 6) - Trabe T-1.1
STAAD Analysis and Design
Current Directory: C:\SProV8i SS6\STAAD
Input File: Trabe T-1.1.std
++ Processing Joint Coordinates. 1: 6:41
++ Processing Member Information. 1: 6:41
++ Reading Member Properties ... 1: 6:41
++ Finished Reading Member Properties ... 20 ms
++ Processing Support Condition. 1: 6:41
++ Read/Check Data in Load Cases ... 1: 6:41
++ Using In-Core Advanced Math Solver
++ Processing and setting up Load Vector. 1: 6:41
++ Processing Element Stiffness Matrix. 1: 6:41
++ Calculating Member Forces. 1: 6:41
++ Analysis Successfully Completed ++
++ Performing Concrete Design 1: 6:41
++ Calculating Section Forces1. 1: 6:41
++ Calculating Section Forces2. 1: 6:41
++ Start Concrete Design 1: 6:41
++ Creating Displacement File (DSP)... 1: 6:49
++ Creating Reaction File (REA)... 1: 6:49
++ Calculating Section Forces1-110. 1: 6:49
++ Calculating Section Forces2 1: 6:49
++ Creating Section Force File (BND)... 1: 6:49
++ Creating Section Displace File (SCN)... 1: 6:49
++ Creating Design information File (DGN)... 1: 6:49
++ Done. 1: 6:49
0 Error(s), 1 Warning(s), 1 Note(s)
++ End STAAD.Pro Run Elapsed Time = 8 Secs
C:\SProV8i SS6\STAAD\Trabe T-1.1.anl
View Output File
Go to Post Processing Mode
Stay in Modeling Mode
Done
Concrete Design - Whole Structure
Load 1


STAAD.Pro V8i (SELECTseries 6) - Trabe T-1.1
Trabe T-1.1.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
BEAM NO. 1 DESIGN RESULTS - FLEXURE
PER CODE NTC FOR THE DESIGN AND CONSTRUCTION OF CONCRETE STRUCTURES,DDF
LEN - 2910.00(mm) FY - 412. FC - 20. SIZE - 150.00 X 250.00(mm)
LEVEL HEIGHT (mm) BAR INFO FROM (mm) TO (mm) ANCHOR STA END
1 44. 2 - 4MM 0. 2910. YES YES
| CRITICAL POS MOMENT= 14.64 kNm AT 1455.00 (mm)LOAD 1|
| REQD STEEL= 230.48 (mm2)ROW=0.0078 ROWMX=0.0152 ROWMN=0.0024 |
| REQD COMP STEEL= 0.00 (mm2) |
| MAX/MIN/ACTUAL BAR SPACING= 61.42/ 42.70/ 61.42 (mm) |
| COMP MAX/MIN/ACTUAL BAR SPACING= 0.00/ 0.00/ 0.00 (mm) |
| BASIC/REQD. DEVELOPMENT LENGTH = 320.04/ 286.64(mm) |
Cracked Moment of Inertia Iz at above location =0.49549E+08 mm^4
REQUIRED REINF. STEEL SUMMARY :
SECTION REINF STEEL(+VE/-VE) MOMENTS(+VE/-VE) LOAD(+VE/-VE)
Total Page: 4
Concrete Design - Whole Structure
Load 1

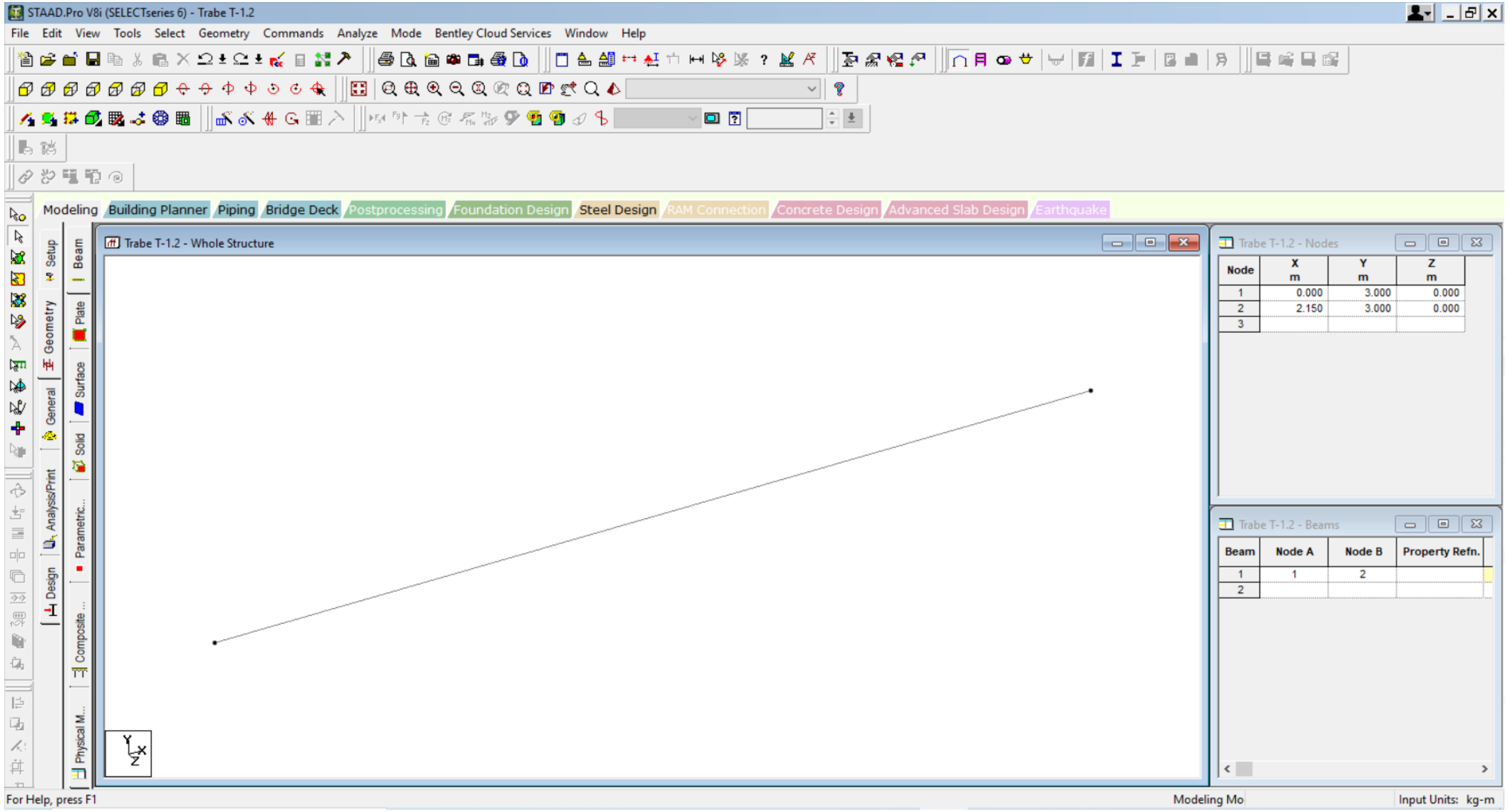

Trabe T-1.1.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
| COMP MAX/MIN/ACTUAL BAR SPACING= 0.00/ 0.00/ 0.00 (mm) |
| BASIC/REQD. DEVELOPMENT LENGTH = 320.04/ 286.64(mm) |
Cracked Moment of Inertia Iz at above location =0.49549E+08 mm^4
REQUIRED REINF. STEEL SUMMARY :
SECTION REINF STEEL(+VE/-VE) MOMENTS(+VE/-VE) LOAD(+VE/-VE)
(MM) (SQ. MM) (KNS-MET)
0.00 0.00/ 0.00 0./ 0.00 0/ 1
242.50 68.50/ 0.00 4./ 0.00 1/ 0
485.00 129.13/ 0.00 8./ 0.00 1/ 0
727.50 179.85/ 0.00 11./ 0.00 1/ 0
970.00 218.42/ 0.00 13./ 0.00 1/ 0
1212.50 242.67/ 0.00 14./ 0.00 1/ 0
1455.00 250.95/ 0.00 15./ 0.00 1/ 0
1697.50 242.67/ 0.00 14./ 0.00 1/ 0
1940.00 218.42/ 0.00 13./ 0.00 1/ 0
2182.50 179.85/ 0.00 11./ 0.00 1/ 0
2425.00 129.13/ 0.00 8./ 0.00 1/ 0
2667.50 68.50/ 0.00 4./ 0.00 1/ 0
2910.00 0.00/ 0.00 0./ 0.00 0/ 1
Total Page: 4


Trabe T-1.1.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
BEAM NO. 1 DESIGN RESULTS - SHEAR
AT START SUPPORT - Vu= 0.04 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
< PAGE 3 Ends Here >
STAAD SPACE -- PAGE NO. 4
AT END SUPPORT - Vu= 0.04 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
37. END CONCRETE DESIGN
38. FINISH
********** END OF THE STAAD.Pro RUN **********
**** DATE= FEB 17,2021 TIME= 1: 6:49 ****
For technical assistance on STAAD.Pro, please visit
http://selectservices.bentley.com/en-US/
Details about additional assistance from
Bentley and Partners can be found at program menu
Help->Technical Support
Total Page: 4

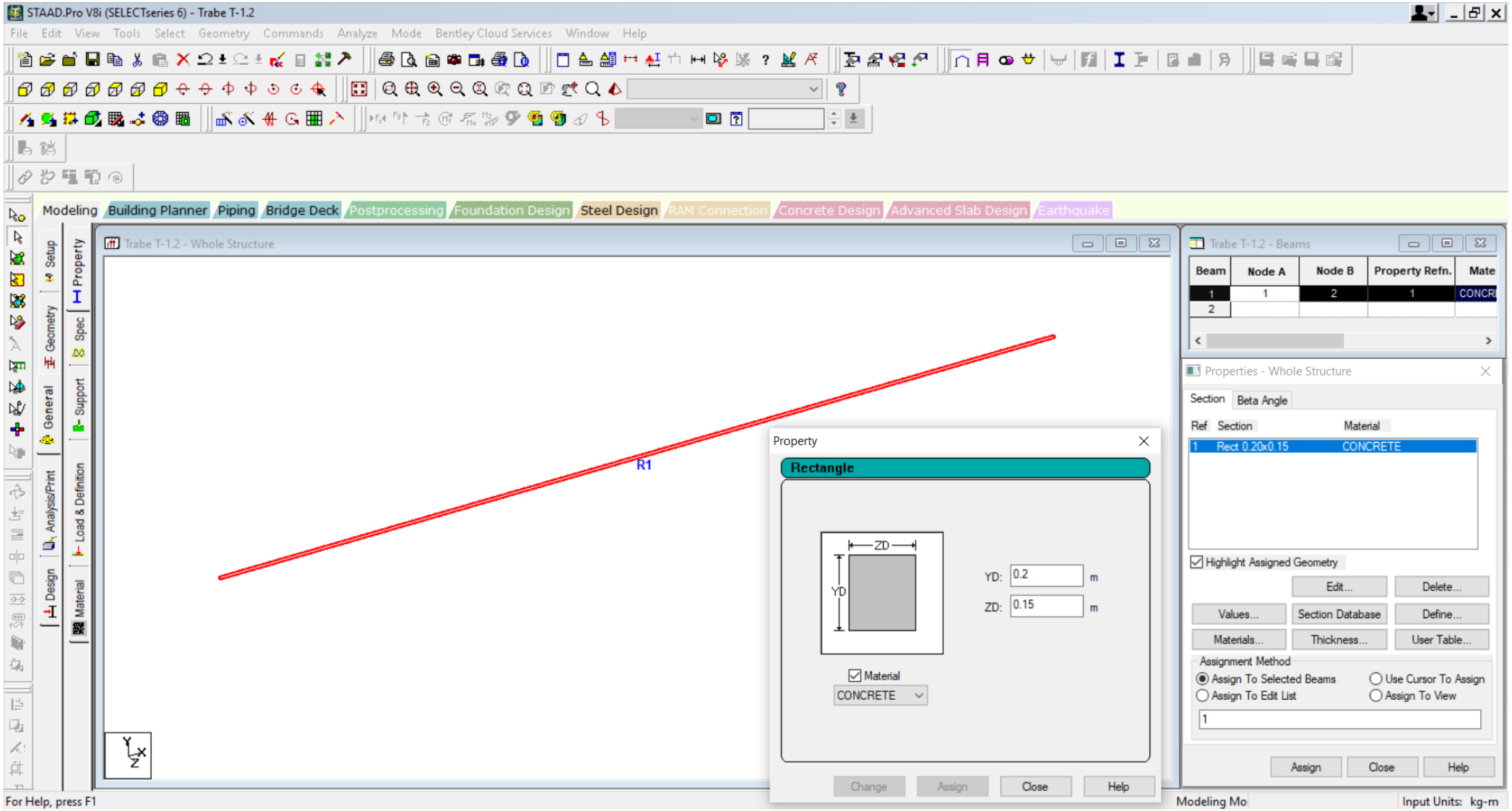


TRABE T5

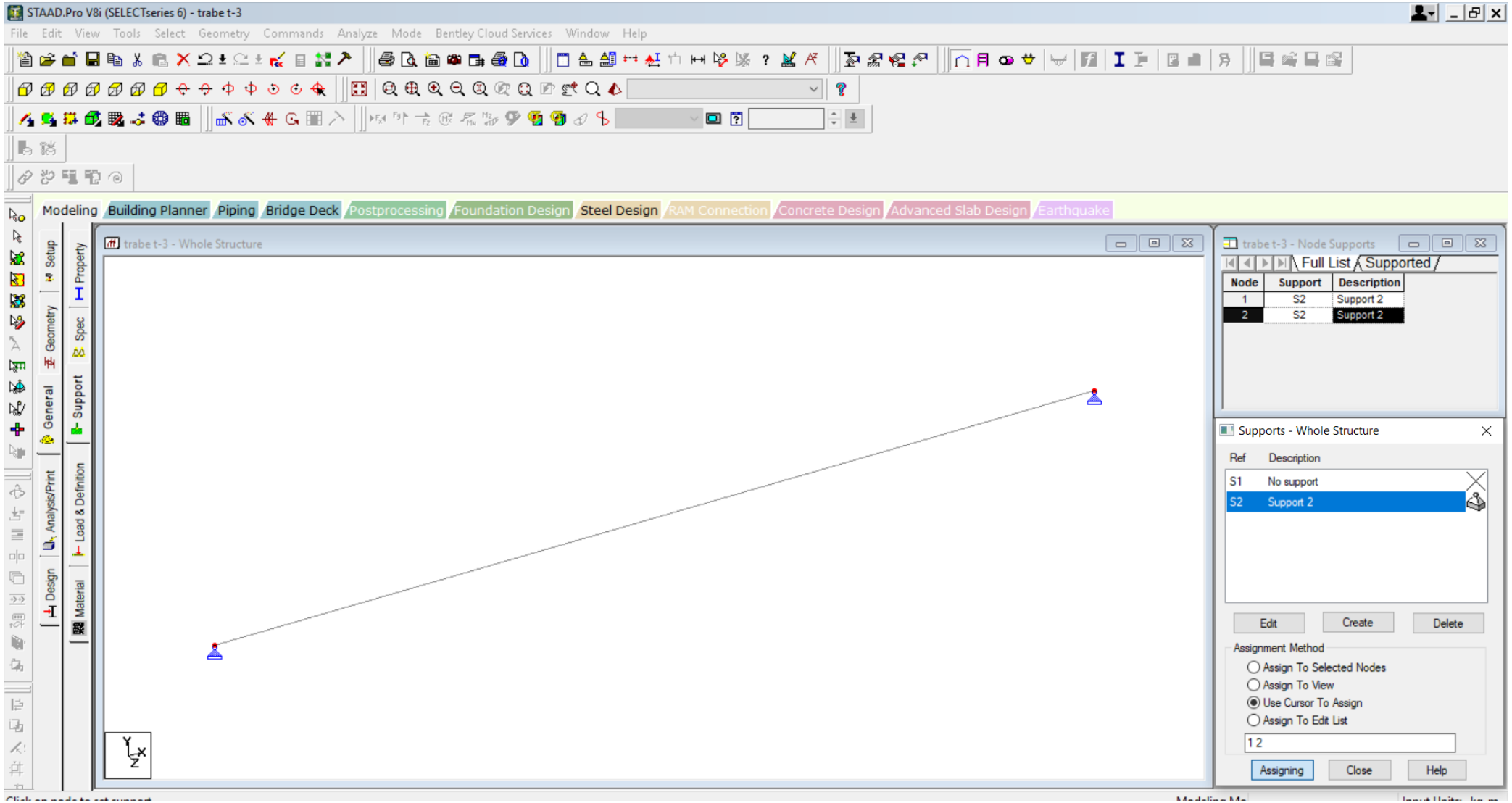
GEOMETRY


STAAD.Pro V8i (SELECTseries 6) - Trabe T-1.2
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
Trabe T-1.2 - Whole Structure
Trabe T-1.2 - Nodes
Node X m Y m Z m
1 0.000 3.000 0.000
2 2.150 3.000 0.000
3
Trabe T-1.2 - Beams
Beam Node A Node B Property Refn.
1 1 2
2
Setup Geometry General Analysis/Print Design
Beam Plate Surface Solid Parametric... Composite ... Physical M...
For Help, press F1
Modeling Mo
Input Units: kg-m

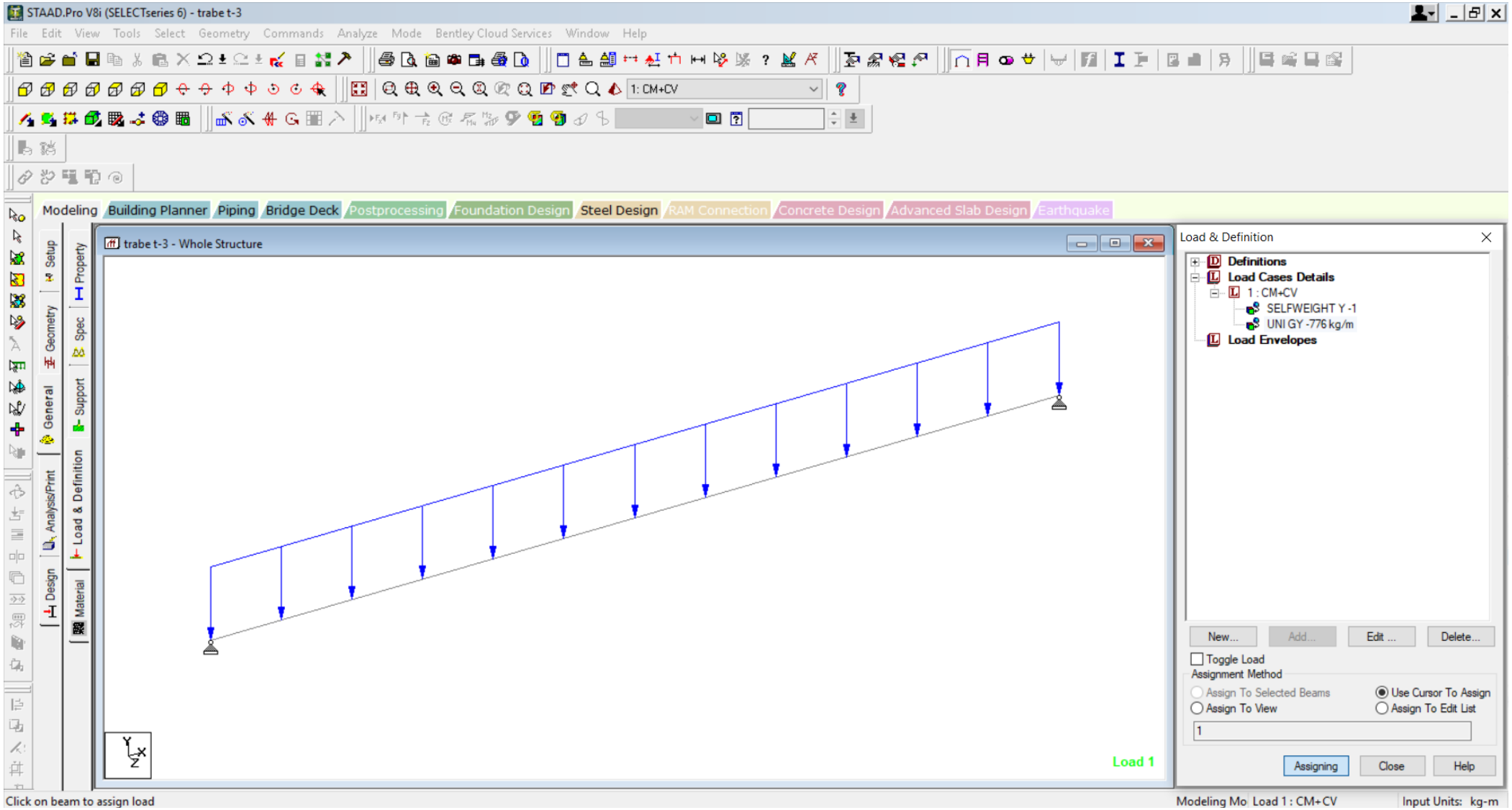
GENERAL


STAAD.Pro V8i (SELECTseries 6) - Trabe T-1.2
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
Setup Geometry General Analysis/Print Design
Property Spec Support Load & Definition Material
Trabe T-1.2 - Whole Structure
R1
Trabe T-1.2 - Beams
Beam Node A Node B Property Refn. Mate
1 1 2 1 CONCR
2
Properties - Whole Structure
Section Beta Angle
Ref Section Material
1 Rect 0.20x0.15 CONCRETE
Highlight Assigned Geometry
Edit... Delete...
Values... Section Database Define...
Materials... Thickness... User Table...
Assignment Method
Assign To Selected Beams
Use Cursor To Assign
Assign To Edit List
Assign To View
1
Assign Close Help
Property
Rectangle
ZD
YD
YD: 0.2 m
ZD: 0.15 m
Material
CONCRETE
Change Assign Close Help
For Help, press F1
Modeling Mo
Input Units: kg-m

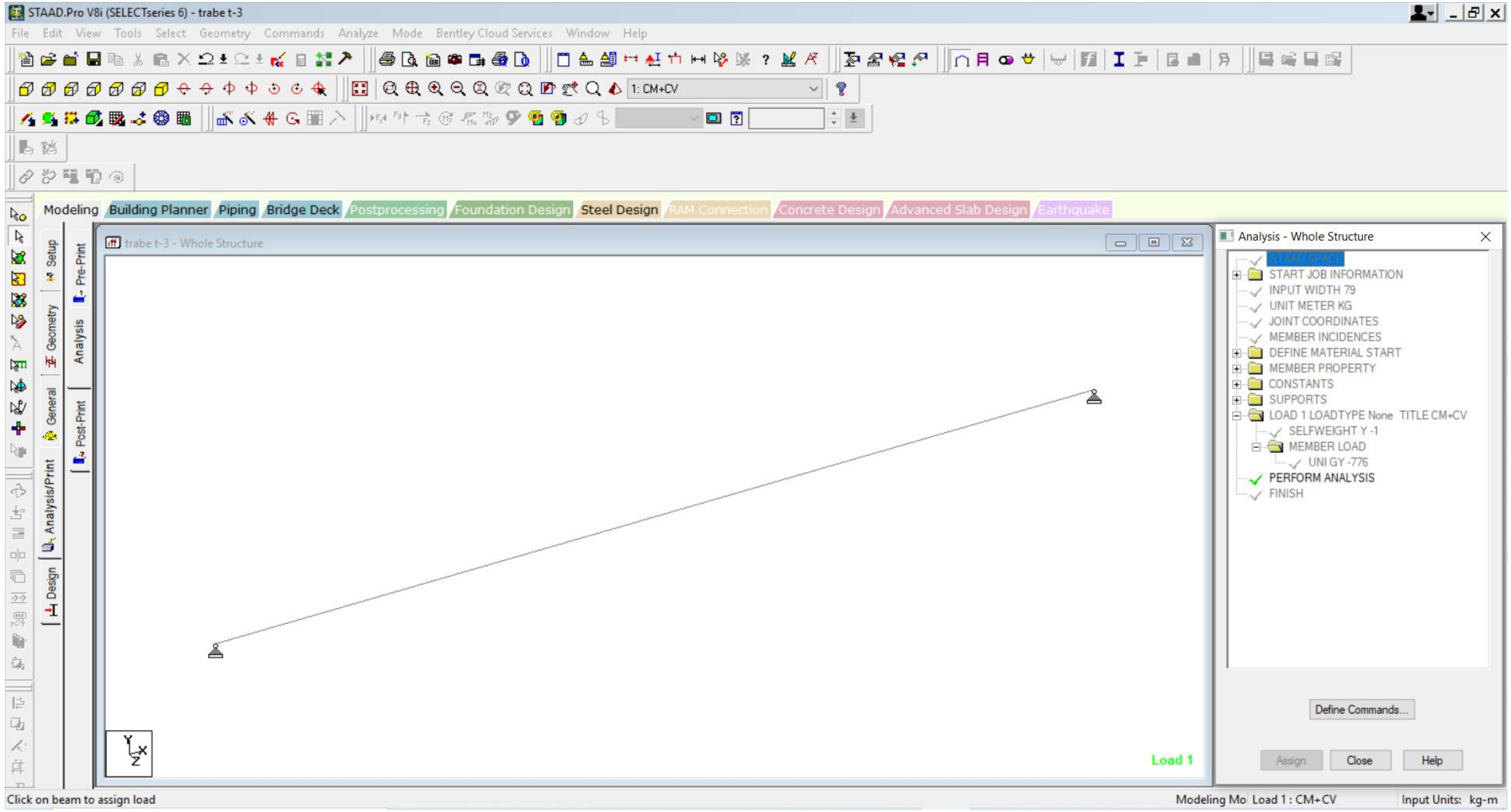
SUPPORT


STAAD.Pro V8i (SELECTseries 6) - trabe t-3
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
Setup Geometry General Analysis/Print Design
Property Spec Support Load & Definition Material
trabe t-3 - Whole Structure
trabe t-3 - Node Supports
Full List Supported
Node Support Description
1 S2 Support 2
2 S2 Support 2
Supports - Whole Structure
Ref Description
S1 No support
S2 Support 2
Edit Create Delete
Assignment Method
Assign To Selected Nodes
Assign To View
Use Cursor To Assign
Assign To Edit List
1 2
Assigning Close Help

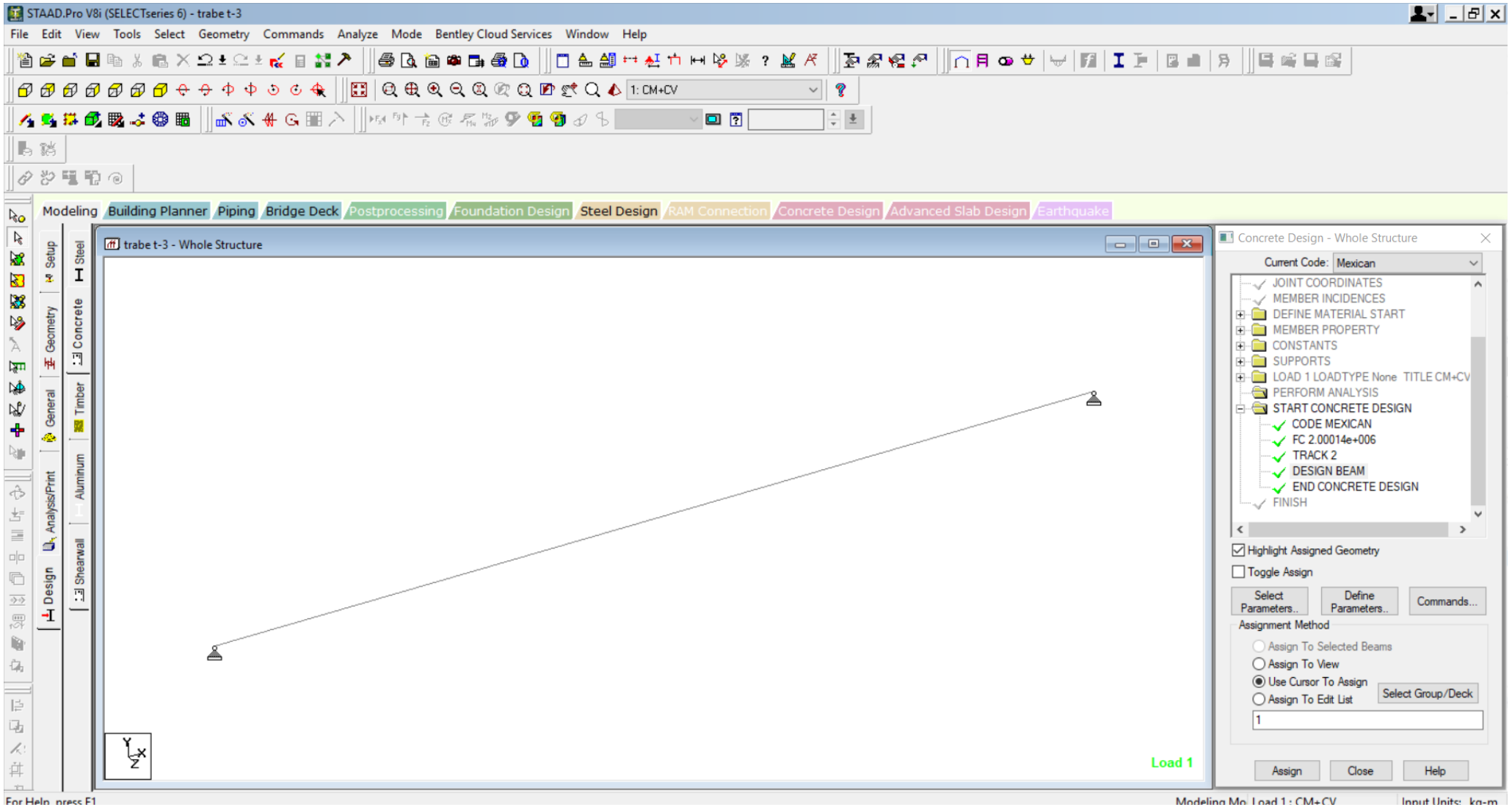
LOAD Y DEFINITION



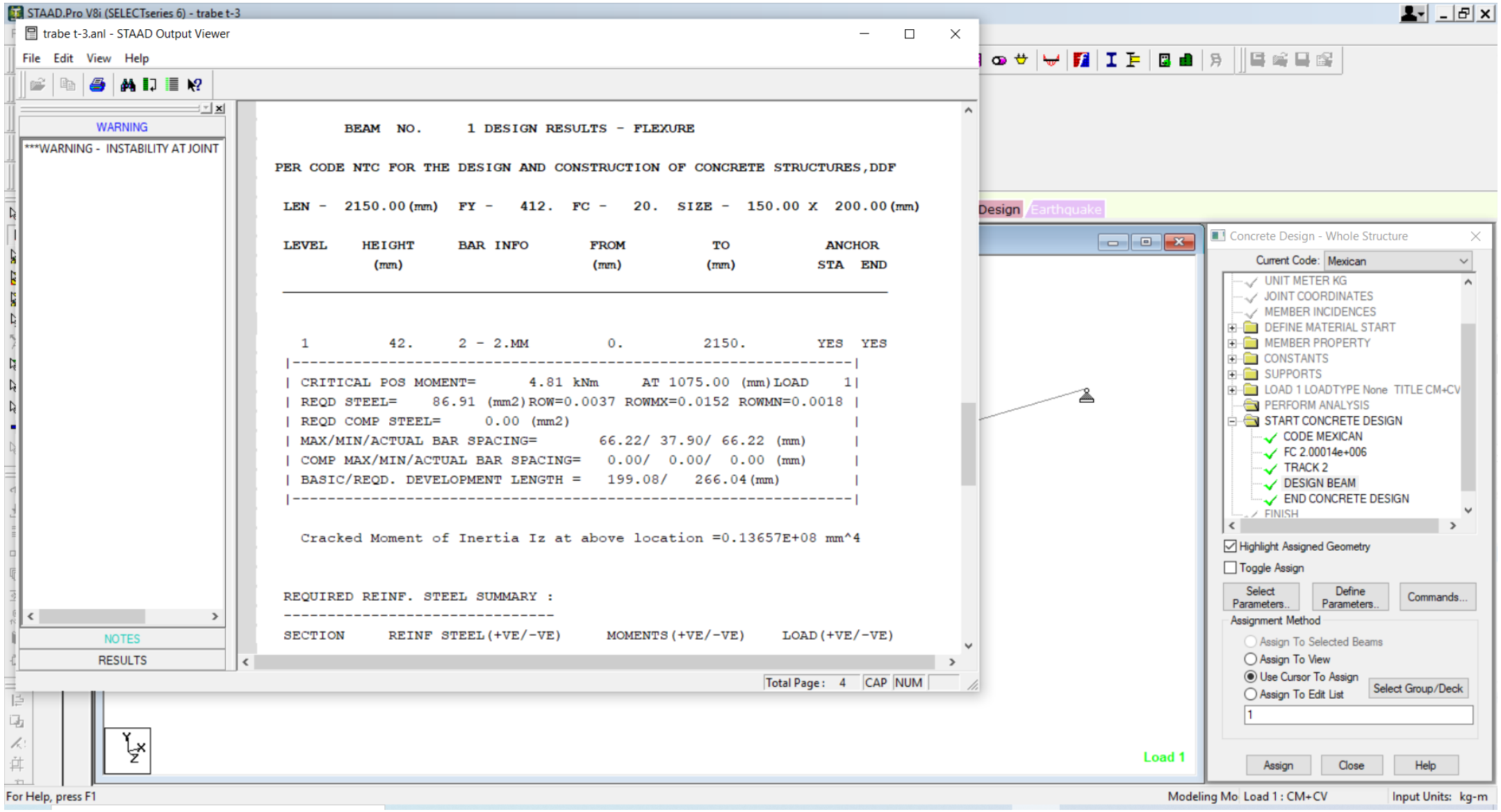
ANALYSIS/PRINT



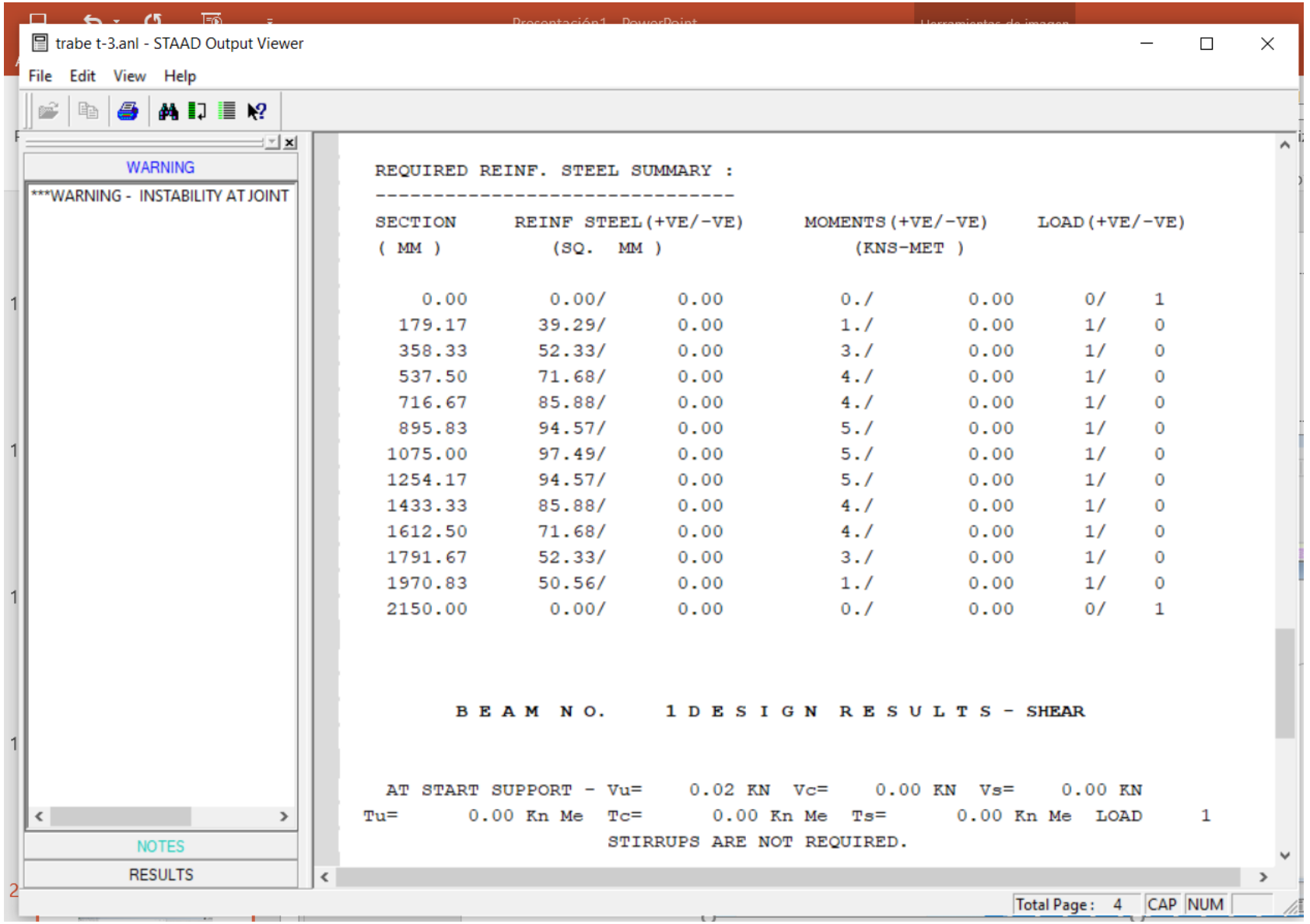
DESIGN


STAAD.Pro V8i (SELECTseries 6) - trabe t-3
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
trabe t-3 - Whole Structure
Load 1
Concrete Design - Whole Structure
Current Code: Mexican
JOINT COORDINATES
MEMBER INCIDENCES
DEFINE MATERIAL START
MEMBER PROPERTY
CONSTANTS
SUPPORTS
LOAD 1 LOADTYPE None TITLE CM+CV
PERFORM ANALYSIS
START CONCRETE DESIGN
CODE MEXICAN
FC 2.00014e+006
TRACK 2
DESIGN BEAM
END CONCRETE DESIGN
FINISH
Highlight Assigned Geometry
Toggle Assign
Select Parameters..
Define Parameters..
Commands...
Assignment Method
Assign To Selected Beams
Assign To View
Use Cursor To Assign
Assign To Edit List
Select Group/Deck
Assign
Close
Help

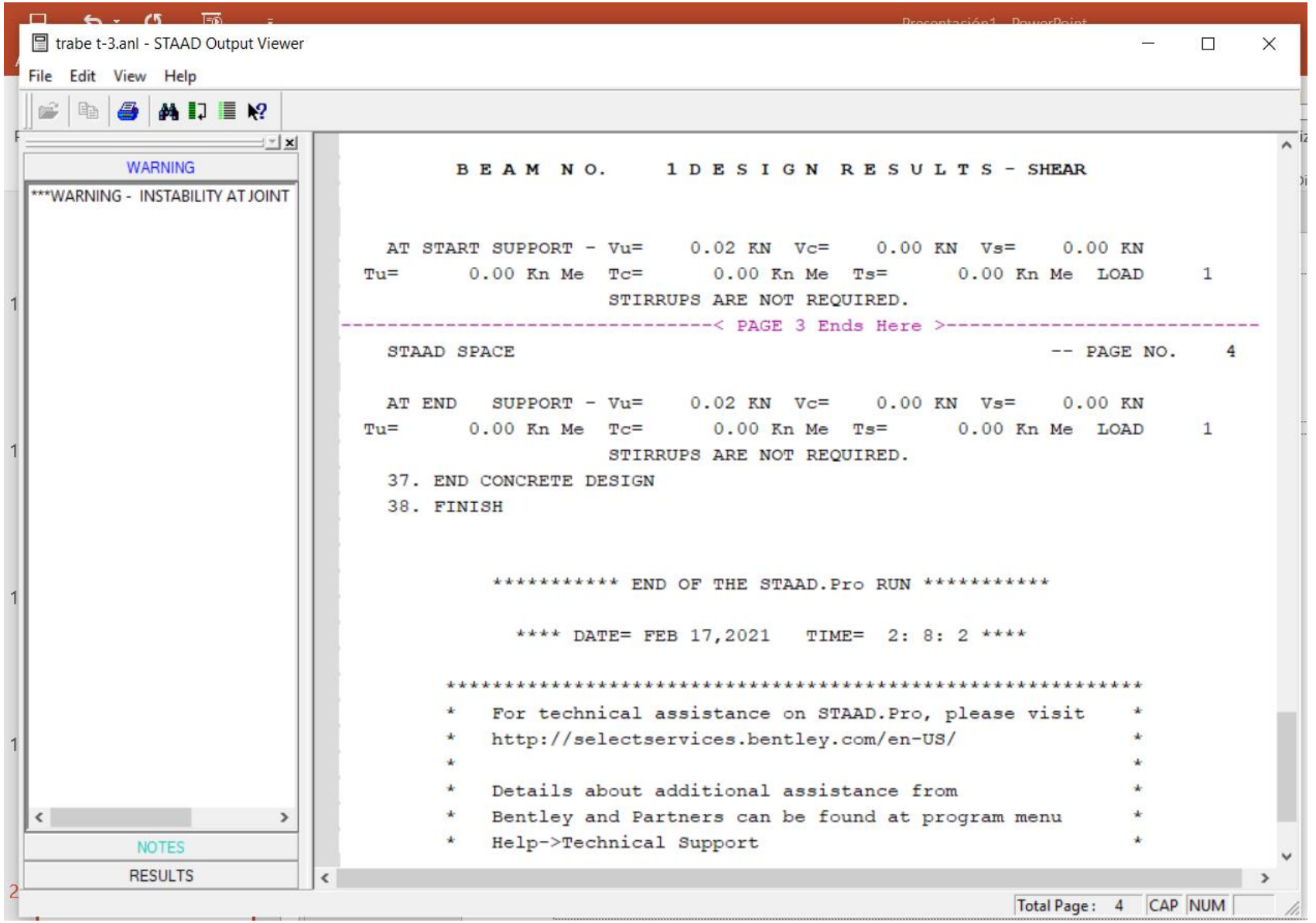
ANALISE

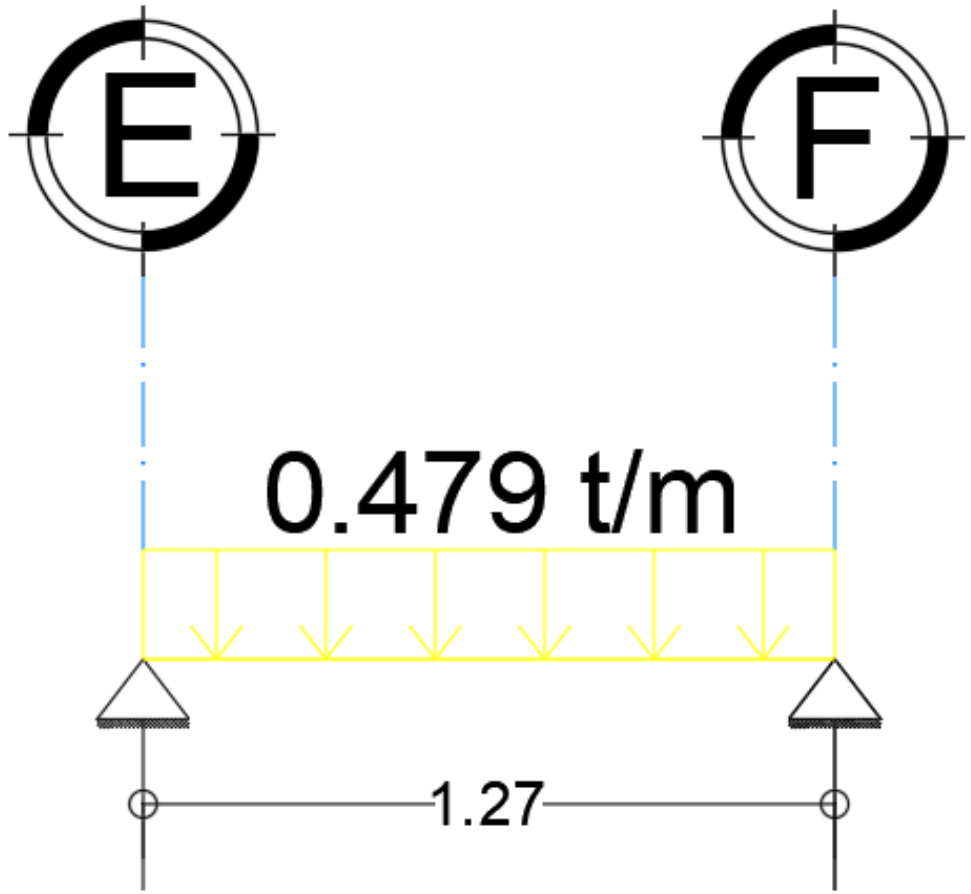

STAAD.Pro V8i (SELECTseries 6) - trabe t-3
trabe t-3.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
BEAM NO. 1 DESIGN RESULTS - FLEXURE
PER CODE NTC FOR THE DESIGN AND CONSTRUCTION OF CONCRETE STRUCTURES,DDF
LEN - 2150.00(mm) FY - 412. FC - 20. SIZE - 150.00 X 200.00(mm)
LEVEL HEIGHT (mm) BAR INFO FROM (mm) TO (mm) ANCHOR STA END
1 42. 2 - 2.MM 0. 2150. YES YES
CRITICAL POS MOMENT= 4.81 kNm AT 1075.00 (mm)LOAD 1
REQD STEEL= 86.91 (mm2)ROW=0.0037 ROWMX=0.0152 ROWMN=0.0018
REQD COMP STEEL= 0.00 (mm2)
MAX/MIN/ACTUAL BAR SPACING= 66.22/ 37.90/ 66.22 (mm)
COMP MAX/MIN/ACTUAL BAR SPACING= 0.00/ 0.00/ 0.00 (mm)
BASIC/REQD. DEVELOPMENT LENGTH = 199.08/ 266.04(mm)
Cracked Moment of Inertia Iz at above location =0.13657E+08 mm^4
REQUIRED REINF. STEEL SUMMARY :
SECTION REINF STEEL(+VE/-VE) MOMENTS(+VE/-VE) LOAD(+VE/-VE)
Total Page: 4 CAP NUM
Design Earthquake
Concrete Design - Whole Structure
Current Code: Mexican
UNIT METER KG
JOINT COORDINATES
MEMBER INCIDENCES
DEFINE MATERIAL START
MEMBER PROPERTY
CONSTANTS
SUPPORTS
LOAD 1 LOADTYPE None TITLE CM+CV
PERFORM ANALYSIS
START CONCRETE DESIGN
CODE MEXICAN
FC 2.00014e+006
TRACK 2
DESIGN BEAM
END CONCRETE DESIGN
FINISH
Highlight Assigned Geometry
Toggle Assign
Select Parameters..
Define Parameters..
Commands...
Assignment Method
Assign To Selected Beams
Assign To View
Use Cursor To Assign
Assign To Edit List
Select Group/Deck
1
Assign
Close
Help
Load 1
For Help, press F1
Modeling Mo
Load 1 : CM+CV
Input Units: kg-m

ANALISE


trabe t-3.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
REQUIRED REINF. STEEL SUMMARY :
SECTION (MM) REINF STEEL(+VE/-VE) (SQ. MM) MOMENTS(+VE/-VE) (KNS-MET) LOAD(+VE/-VE)
0.00 0.00/ 0.00 0./ 0.00 0/ 1
179.17 39.29/ 0.00 1./ 0.00 1/ 0
358.33 52.33/ 0.00 3./ 0.00 1/ 0
537.50 71.68/ 0.00 4./ 0.00 1/ 0
716.67 85.88/ 0.00 4./ 0.00 1/ 0
895.83 94.57/ 0.00 5./ 0.00 1/ 0
1075.00 97.49/ 0.00 5./ 0.00 1/ 0
1254.17 94.57/ 0.00 5./ 0.00 1/ 0
1433.33 85.88/ 0.00 4./ 0.00 1/ 0
1612.50 71.68/ 0.00 4./ 0.00 1/ 0
1791.67 52.33/ 0.00 3./ 0.00 1/ 0
1970.83 50.56/ 0.00 1./ 0.00 1/ 0
2150.00 0.00/ 0.00 0./ 0.00 0/ 1
B E A M N O. 1 D E S I G N R E S U L T S - SHEAR
AT START SUPPORT - Vu= 0.02 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
Total Page: 4
CAP
NUM

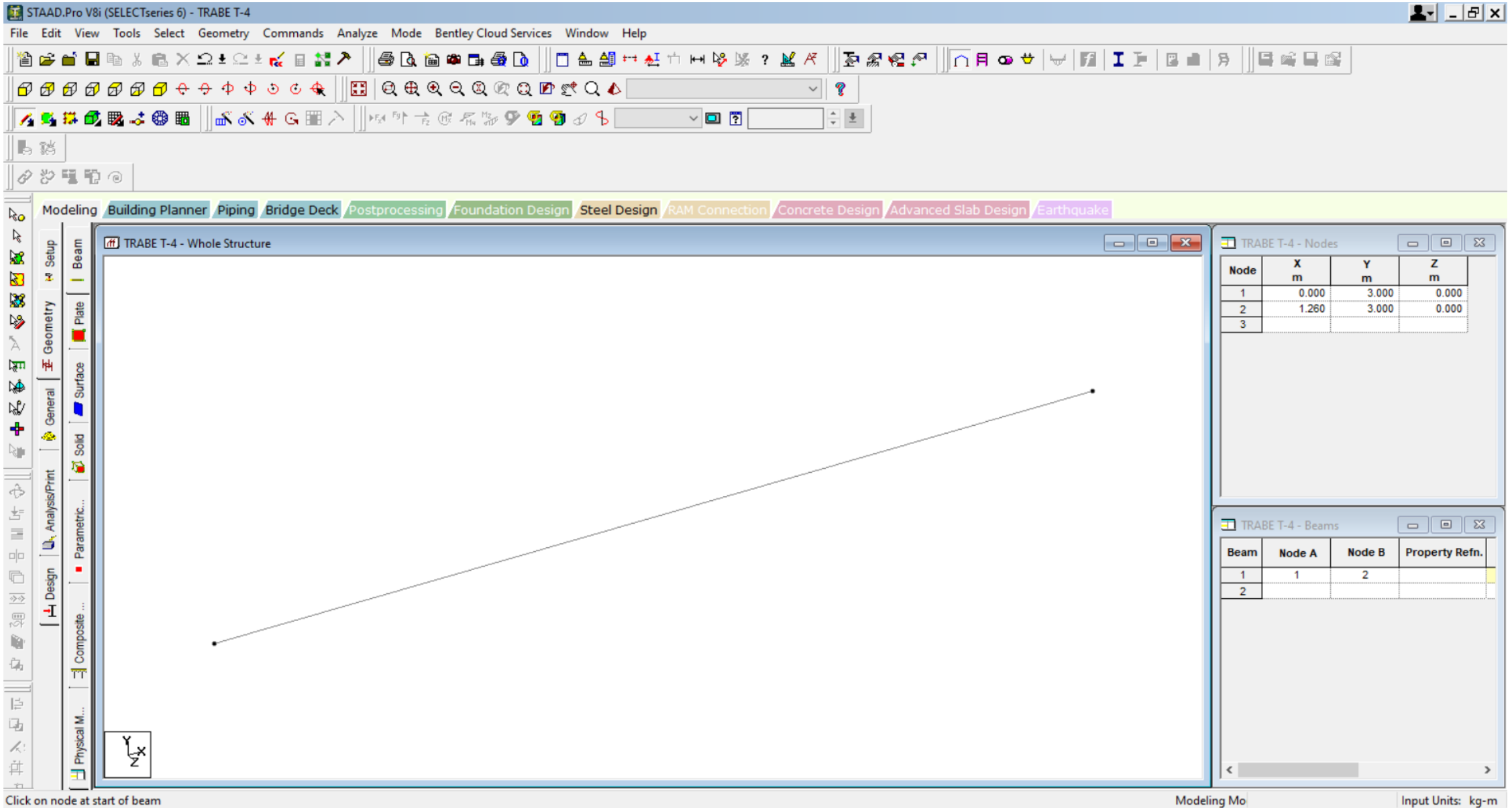
ANALISE


trabe t-3.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
B E A M N O. 1 D E S I G N R E S U L T S - SHEAR
AT START SUPPORT - Vu= 0.02 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
< PAGE 3 Ends Here >
STAAD SPACE -- PAGE NO. 4
AT END SUPPORT - Vu= 0.02 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
37. END CONCRETE DESIGN
38. FINISH
********** END OF THE STAAD.Pro RUN **********
**** DATE= FEB 17,2021 TIME= 2: 8: 2 ****
For technical assistance on STAAD.Pro, please visit
http://selectservices.bentley.com/en-US/
Details about additional assistance from
Bentley and Partners can be found at program menu
Help->Technical Support
Total Page: 4
CAP
NUM

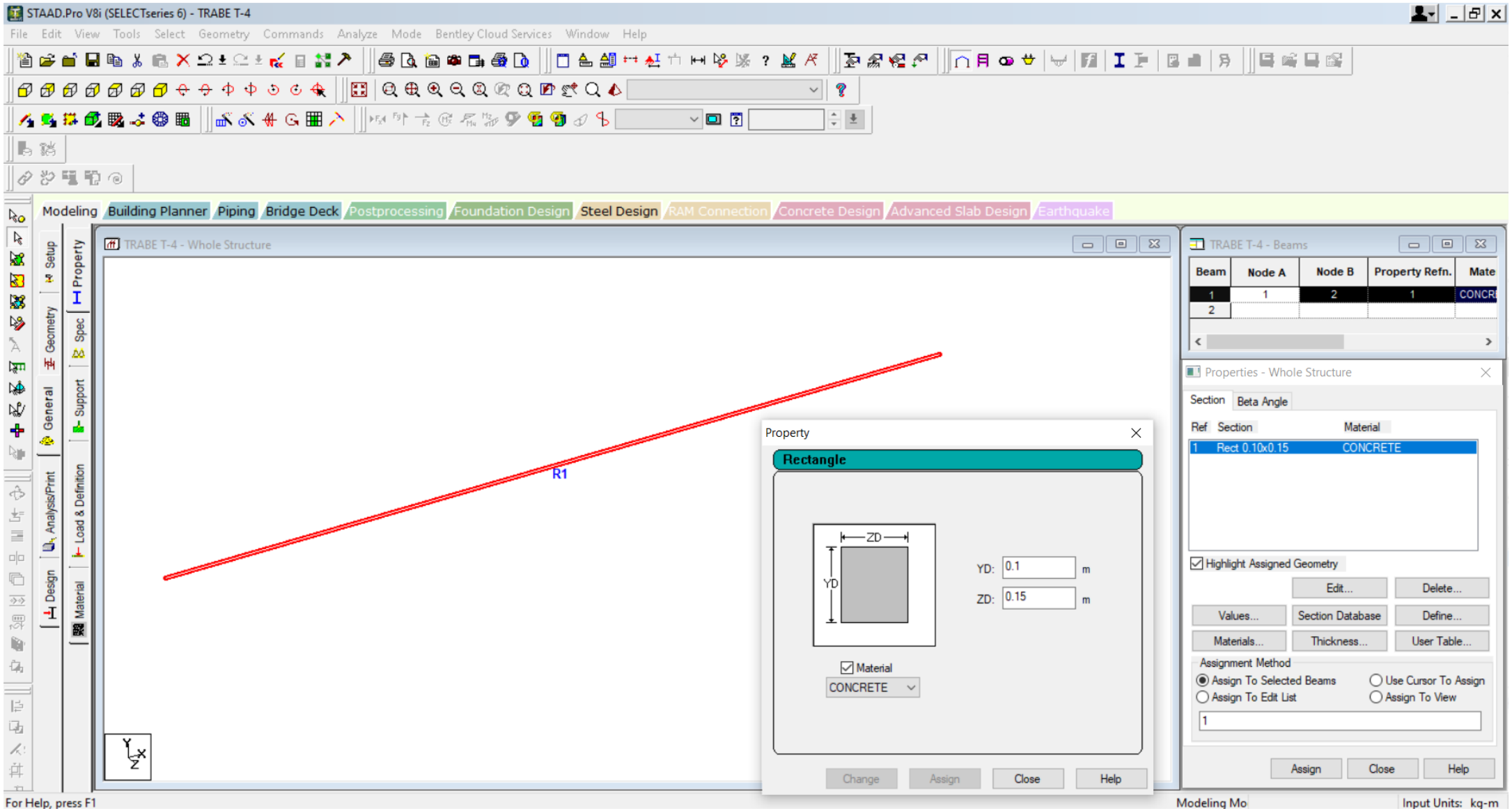


TRABE T9

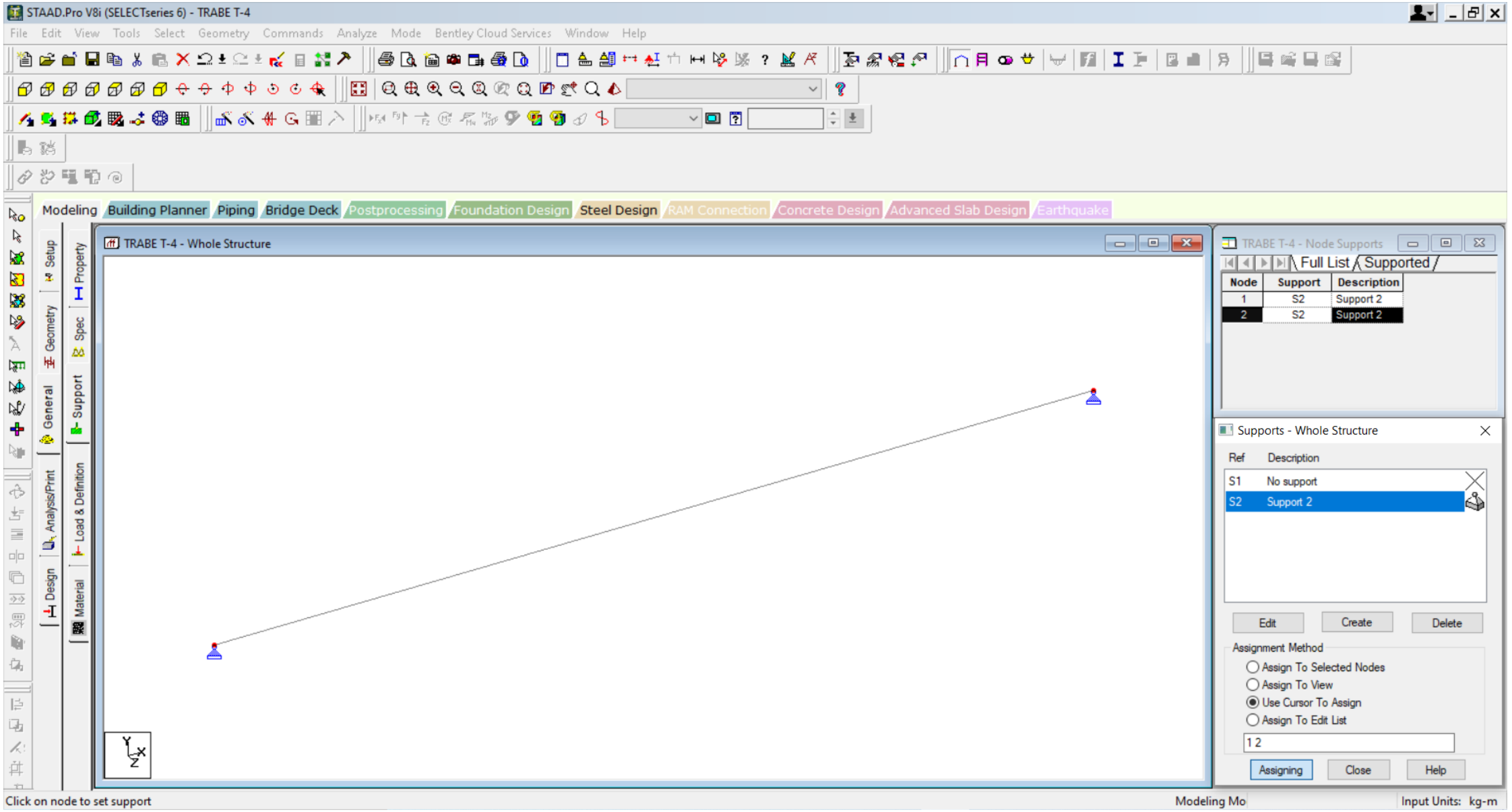
GEOMETRY


STAAD.Pro V8i (SELECTseries 6) - TRABE T-4
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
Setup Geometry General Analysis/Print Design
Beam Plate Surface Solid Parametric... Composite ... Physical M...
TRABE T-4 - Whole Structure
TRABE T-4 - Nodes
Node X m Y m Z m
1 0.000 3.000 0.000
2 1.260 3.000 0.000
3
TRABE T-4 - Beams
Beam Node A Node B Property Refn.
1 1 2
2
Click on node at start of beam
Modeling Mo
Input Units: kg-m

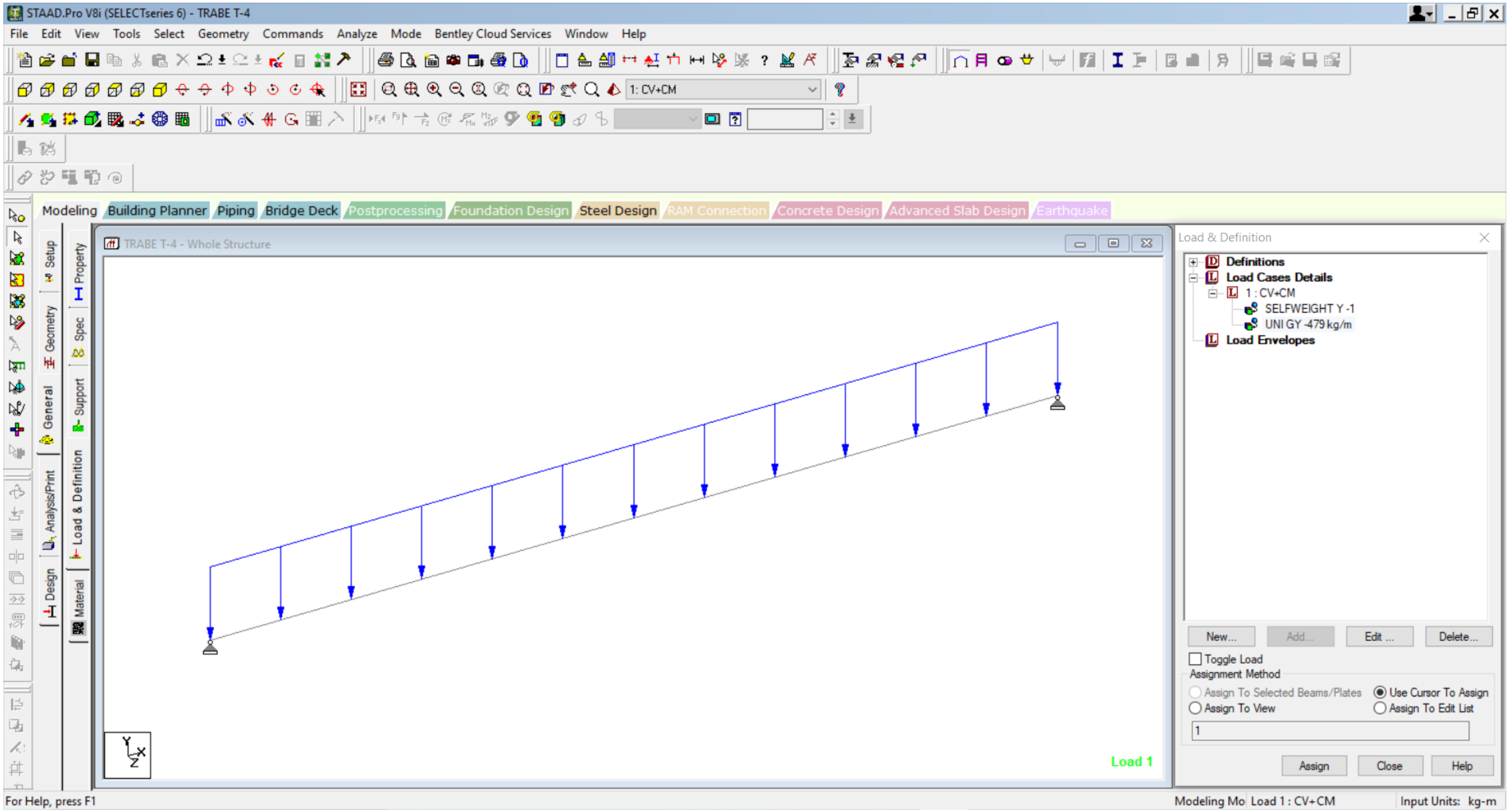
GENERAL


STAAD.Pro V8i (SELECTseries 6) - TRABE T-4
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
Setup Geometry General Analysis/Print Design
Property Spec Support Load & Definition Material
TRABE T-4 - Whole Structure
R1
TRABE T-4 - Beams
Beam Node A Node B Property Refn. Mate
1 1 2 1 CONCR
2
Properties - Whole Structure
Section Beta Angle
Ref Section Material
1 Rect 0.10x0.15 CONCRETE
Highlight Assigned Geometry
Edit... Delete...
Values... Section Database Define...
Materials... Thickness... User Table...
Assignment Method
Assign To Selected Beams Use Cursor To Assign
Assign To Edit List Assign To View
1
Assign Close Help
Property
Rectangle
ZD
YD
YD: 0.1 m
ZD: 0.15 m
Material
CONCRETE
Change Assign Close Help
For Help, press F1
Modeling Mo
Input Units: kg-m

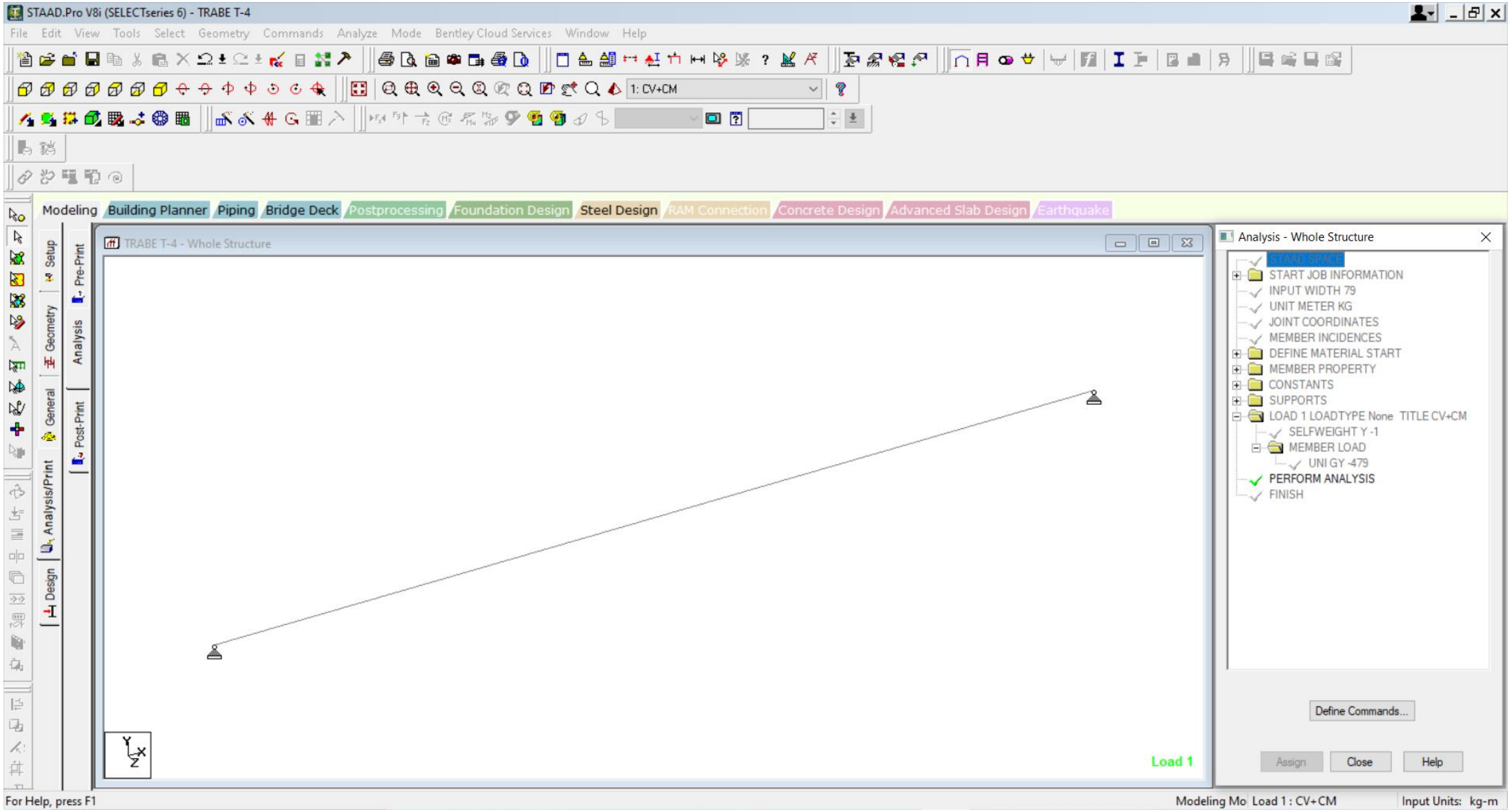
SUPPORT


STAAD.Pro V8i (SELECTseries 6) - TRABE T-4
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
Setup Geometry General Analysis/Print Design
Property Spec Support Load & Definition Material
TRABE T-4 - Whole Structure
TRABE T-4 - Node Supports
Full List Supported
Node Support Description
1 S2 Support 2
2 S2 Support 2
Supports - Whole Structure
Ref Description
S1 No support
S2 Support 2
Edit Create Delete
Assignment Method
Assign To Selected Nodes
Assign To View
Use Cursor To Assign
Assign To Edit List
1 2
Assigning Close Help
Click on node to set support
Modeling Mo
Input Units: kg-m

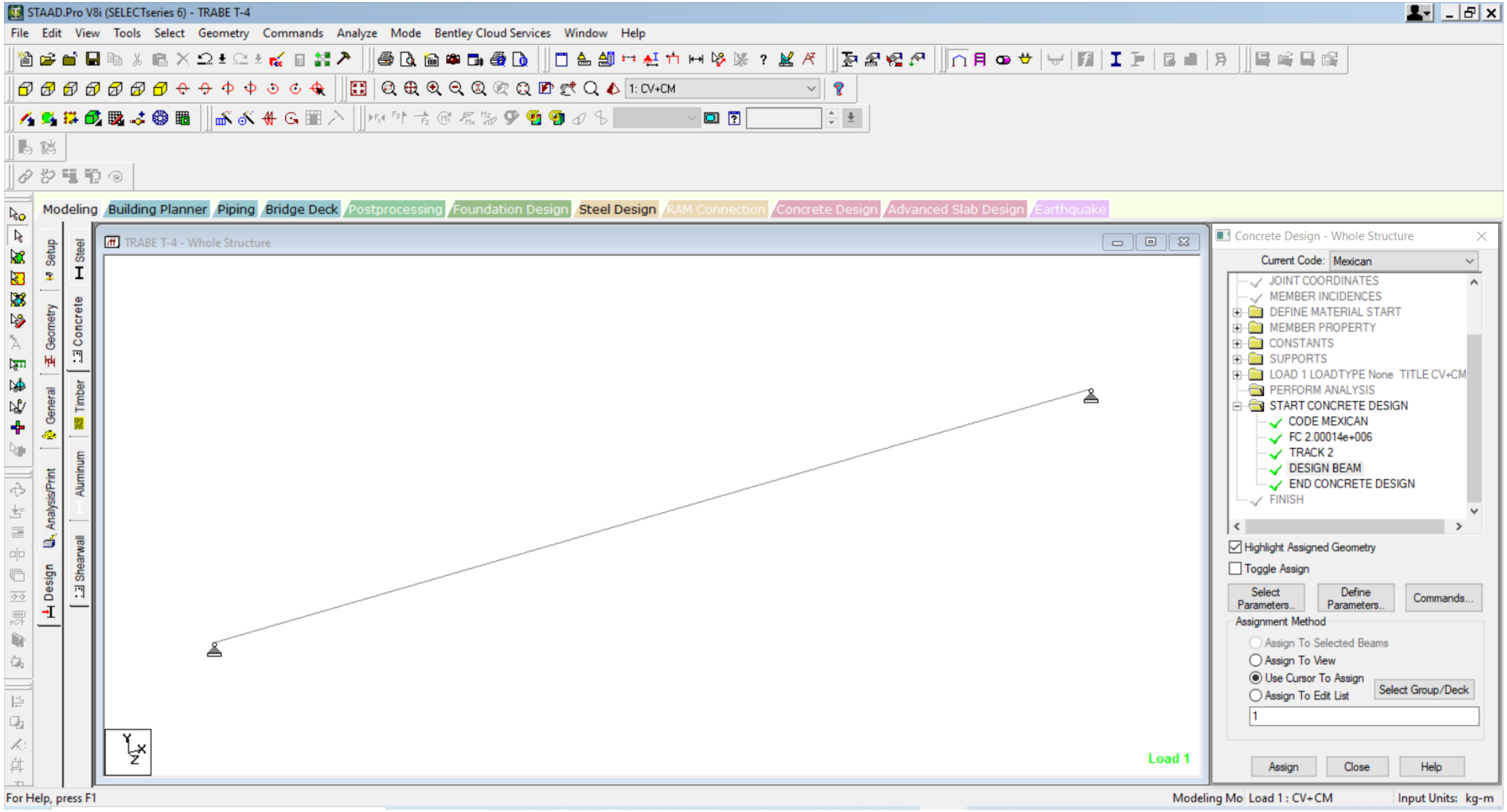
LOAD Y DEFINITION



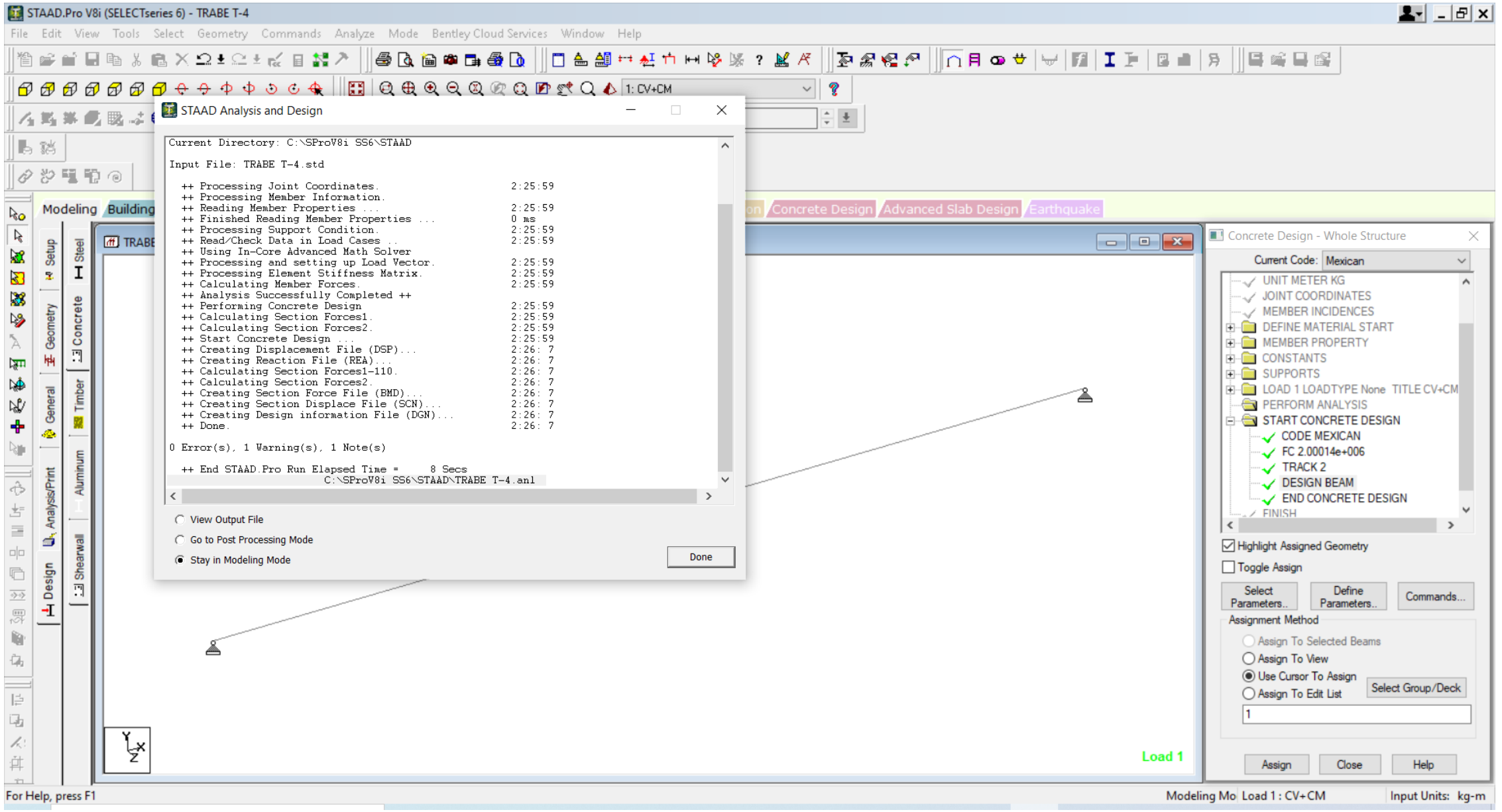
ANALYSIS/PRINT



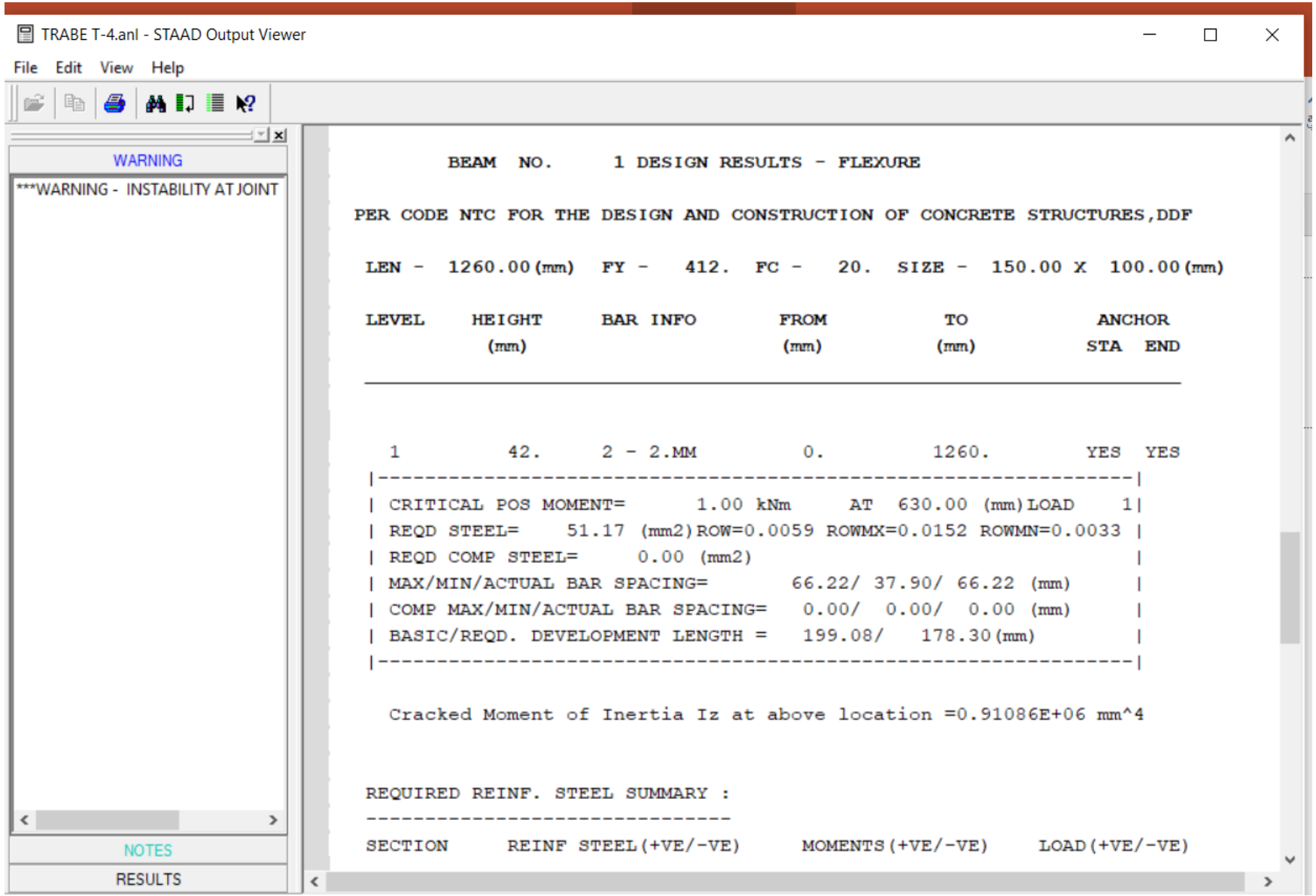
DESIGN


STAAD.Pro V8i (SELECTseries 6) - TRABE T-4
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
TRABE T-4 - Whole Structure
Load 1
Concrete Design - Whole Structure
Current Code: Mexican
JOINT COORDINATES
MEMBER INCIDENCES
DEFINE MATERIAL START
MEMBER PROPERTY
CONSTANTS
SUPPORTS
LOAD 1 LOADTYPE None TITLE CV+CM
PERFORM ANALYSIS
START CONCRETE DESIGN
CODE MEXICAN
FC 2.00014e+006
TRACK 2
DESIGN BEAM
END CONCRETE DESIGN
FINISH
Highlight Assigned Geometry
Toggle Assign
Select Parameters..
Define Parameters..
Commands...
Assignment Method
Assign To Selected Beams
Assign To View
Use Cursor To Assign
Assign To Edit List
Select Group/Deck
Assign
Close
Help
For Help, press F1
Modeling Mo
Load 1 : CV+CM
Input Units: kg-m

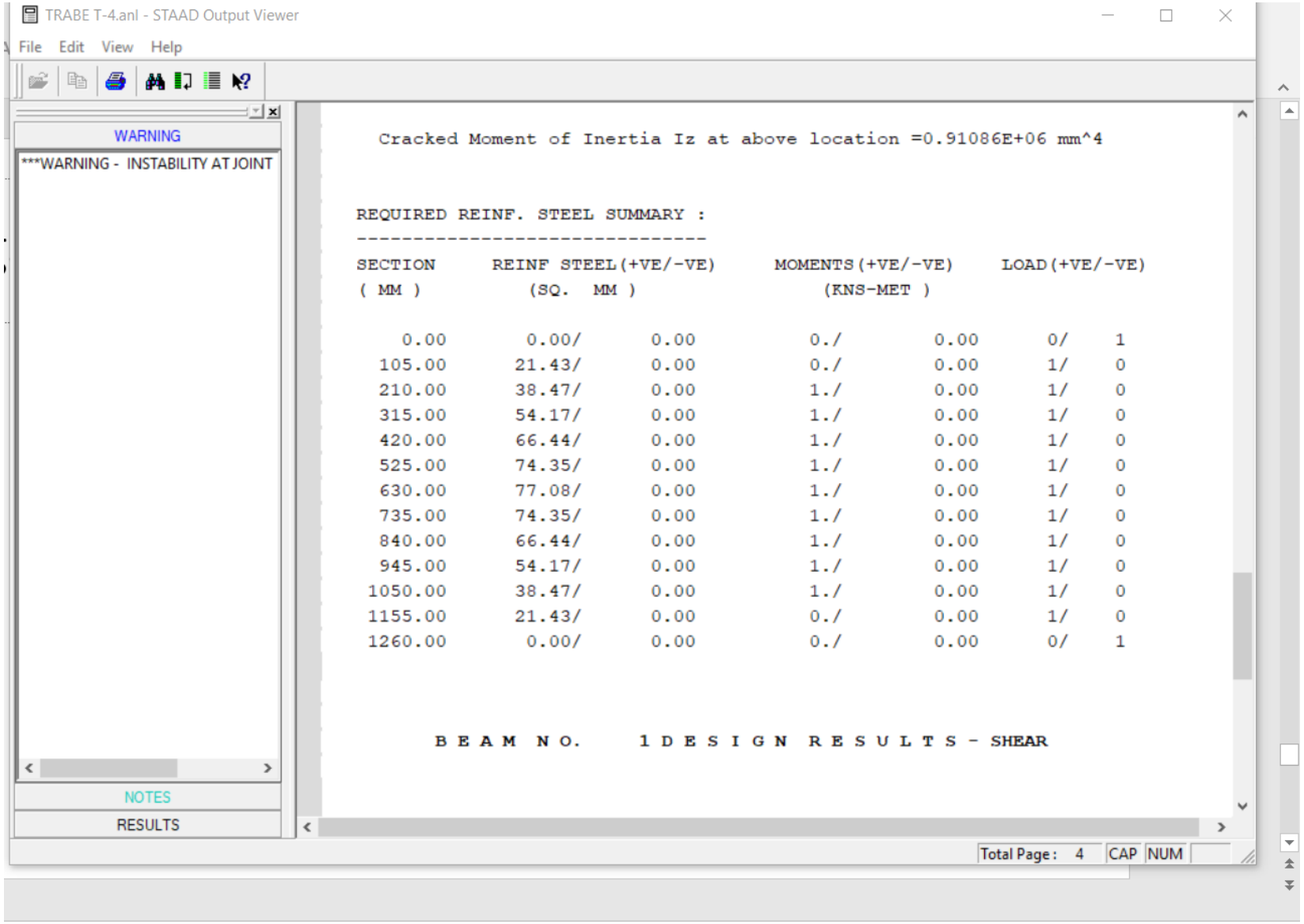
ANALISE


STAAD.Pro V8i (SELECTseries 6) - TRABE T-4
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
STAAD Analysis and Design
Current Directory: C:\SProV8i SS6\STAAD
Input File: TRABE T-4.std
++ Processing Joint Coordinates. 2:25:59
++ Processing Member Information.
++ Reading Member Properties ... 2:25:59
++ Finished Reading Member Properties ... 0 ms
++ Processing Support Condition. 2:25:59
++ Read/Check Data in Load Cases .. 2:25:59
++ Using In-Core Advanced Math Solver
++ Processing and setting up Load Vector. 2:25:59
++ Processing Element Stiffness Matrix. 2:25:59
++ Calculating Member Forces. 2:25:59
++ Analysis Successfully Completed ++
++ Performing Concrete Design 2:25:59
++ Calculating Section Forces1. 2:25:59
++ Calculating Section Forces2. 2:25:59
++ Start Concrete Design ... 2:25:59
++ Creating Displacement File (DSP)... 2:26: 7
++ Creating Reaction File (REA)... 2:26: 7
++ Calculating Section Forces1-110. 2:26: 7
++ Calculating Section Forces2. 2:26: 7
++ Creating Section Force File (BMD)... 2:26: 7
++ Creating Section Displace File (SCN)... 2:26: 7
++ Creating Design information File (DGN)... 2:26: 7
++ Done.
0 Error(s), 1 Warning(s), 1 Note(s)
++ End STAAD.Pro Run Elapsed Time = 8 Secs
C:\SProV8i SS6\STAAD\TRABE T-4.anl
View Output File
Go to Post Processing Mode
Stay in Modeling Mode
Done
Concrete Design - Whole Structure
Current Code: Mexican
UNIT METER KG
JOINT COORDINATES
MEMBER INCIDENCES
DEFINE MATERIAL START
MEMBER PROPERTY
CONSTANTS
SUPPORTS
LOAD 1 LOADTYPE None TITLE CV+CM
PERFORM ANALYSIS
START CONCRETE DESIGN
CODE MEXICAN
FC 2.00014e+006
TRACK 2
DESIGN BEAM
END CONCRETE DESIGN
Highlight Assigned Geometry
Toggle Assign
Select Parameters..
Define Parameters..
Commands...
Assignment Method
Assign To Selected Beams
Assign To View
Use Cursor To Assign
Assign To Edit List
Select Group/Deck
Assign
Close
Help
Load 1
For Help, press F1
Load 1 : CV+CM
Input Units: kg-m

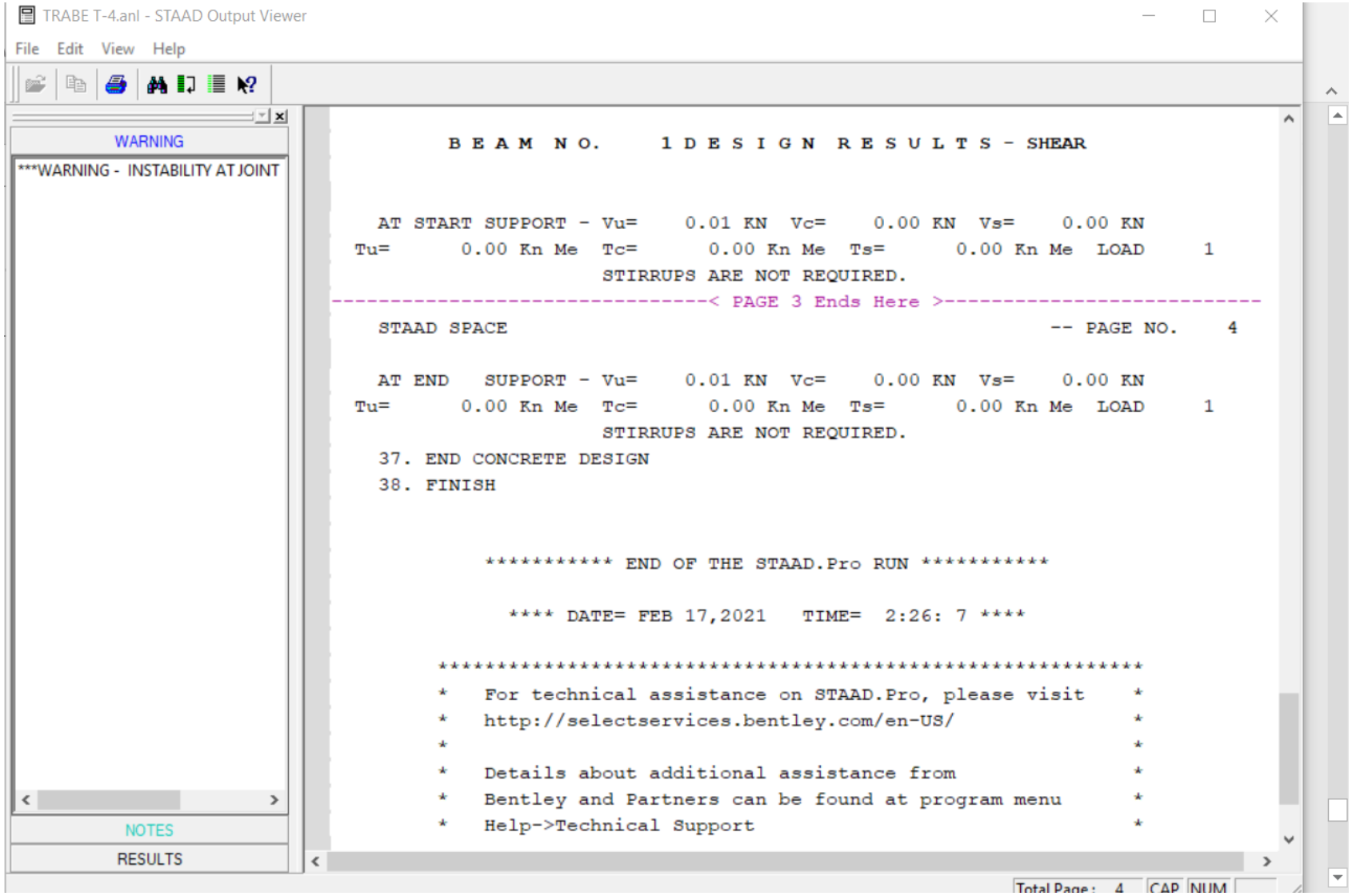
ANALISE

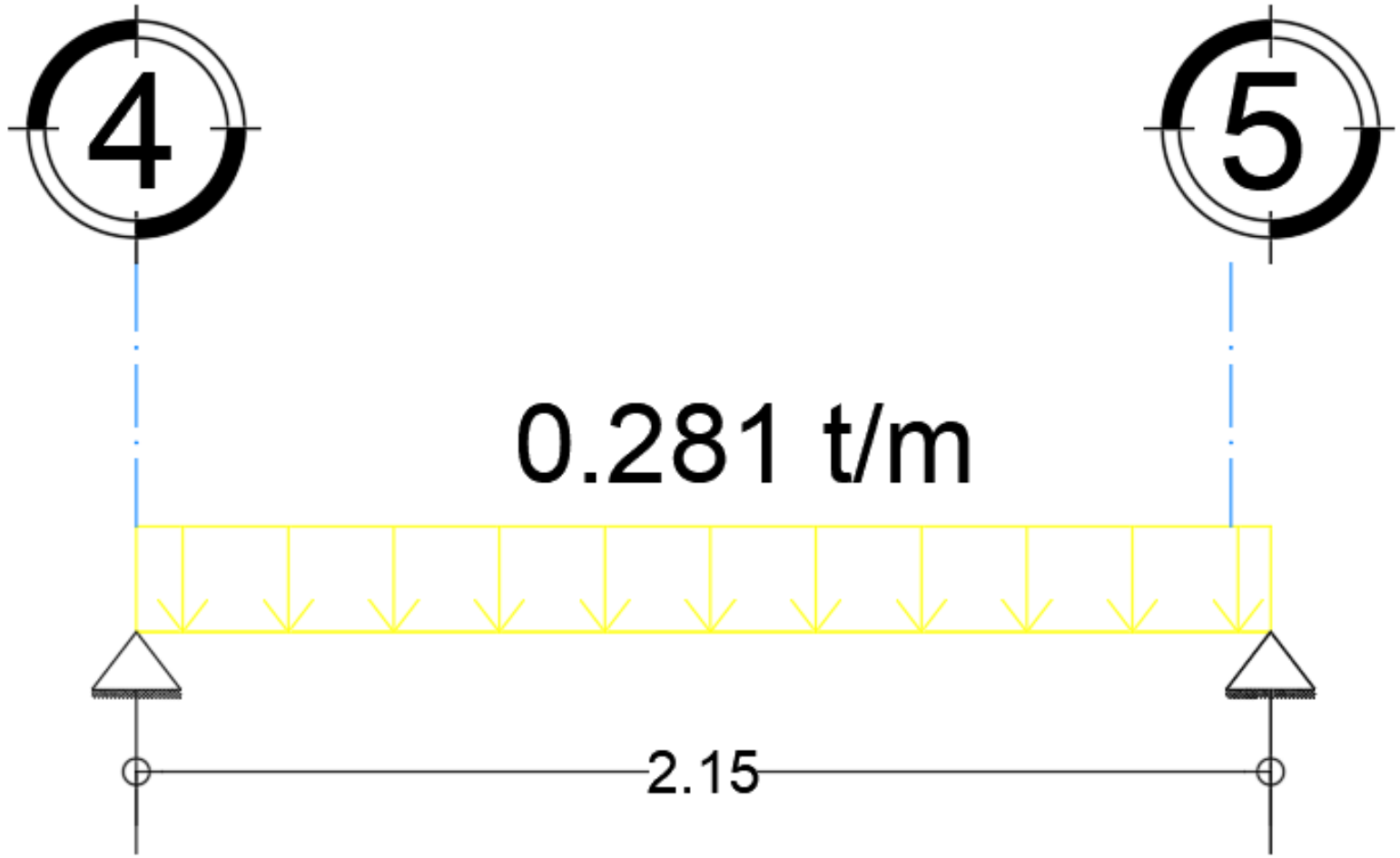

TRABE T-4.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
BEAM NO. 1 DESIGN RESULTS - FLEXURE
PER CODE NTC FOR THE DESIGN AND CONSTRUCTION OF CONCRETE STRUCTURES,DDF
LEN - 1260.00(mm) FY - 412. FC - 20. SIZE - 150.00 X 100.00(mm)
LEVEL HEIGHT (mm) BAR INFO FROM (mm) TO (mm) ANCHOR STA END
1 42. 2 - 2.MM 0. 1260. YES YES
CRITICAL POS MOMENT= 1.00 kNm AT 630.00 (mm)LOAD 1
REQD STEEL= 51.17 (mm2)ROW=0.0059 ROWMX=0.0152 ROWMN=0.0033
REQD COMP STEEL= 0.00 (mm2)
MAX/MIN/ACTUAL BAR SPACING= 66.22/ 37.90/ 66.22 (mm)
COMP MAX/MIN/ACTUAL BAR SPACING= 0.00/ 0.00/ 0.00 (mm)
BASIC/REQD. DEVELOPMENT LENGTH = 199.08/ 178.30(mm)
Cracked Moment of Inertia Iz at above location =0.91086E+06 mm^4
REQUIRED REINF. STEEL SUMMARY :
SECTION REINF STEEL(+VE/-VE) MOMENTS(+VE/-VE) LOAD(+VE/-VE)

ANALISE


TRABE T-4.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
Cracked Moment of Inertia Iz at above location =0.91086E+06 mm^4
REQUIRED REINF. STEEL SUMMARY :
SECTION (MM) REINF STEEL(+VE/-VE) (SQ. MM) MOMENTS(+VE/-VE) (KNS-MET) LOAD(+VE/-VE)
0.00 0.00/ 0.00 0./ 0.00 0/ 1
105.00 21.43/ 0.00 0./ 0.00 1/ 0
210.00 38.47/ 0.00 1./ 0.00 1/ 0
315.00 54.17/ 0.00 1./ 0.00 1/ 0
420.00 66.44/ 0.00 1./ 0.00 1/ 0
525.00 74.35/ 0.00 1./ 0.00 1/ 0
630.00 77.08/ 0.00 1./ 0.00 1/ 0
735.00 74.35/ 0.00 1./ 0.00 1/ 0
840.00 66.44/ 0.00 1./ 0.00 1/ 0
945.00 54.17/ 0.00 1./ 0.00 1/ 0
1050.00 38.47/ 0.00 1./ 0.00 1/ 0
1155.00 21.43/ 0.00 0./ 0.00 1/ 0
1260.00 0.00/ 0.00 0./ 0.00 0/ 1
B E A M N O. 1 D E S I G N R E S U L T S - SHEAR
Total Page: 4
CAP
NUM

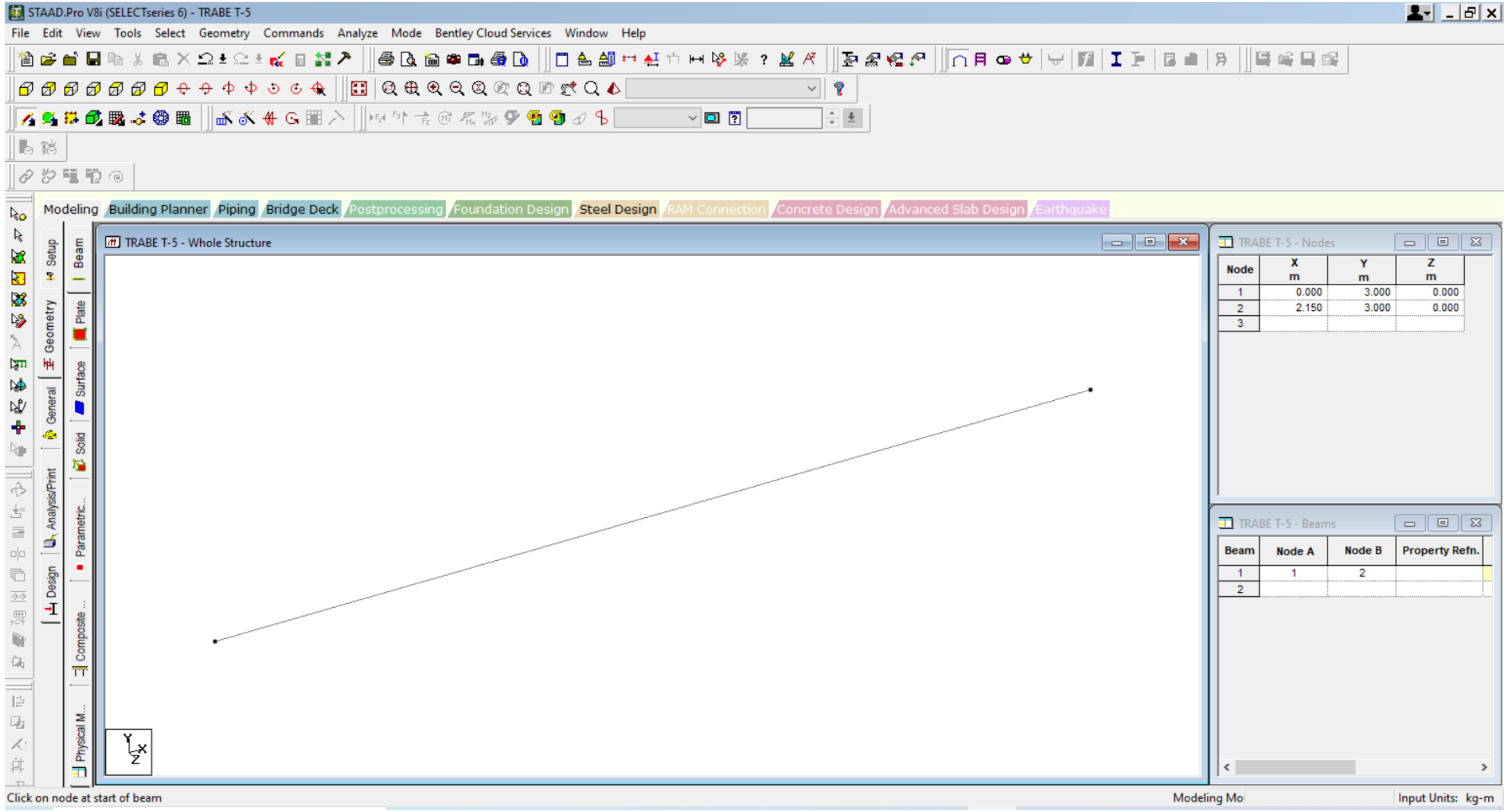
ANALISE


TRABE T-4.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
B E A M N O. 1 D E S I G N R E S U L T S - SHEAR
AT START SUPPORT - Vu= 0.01 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
-----------< PAGE 3 Ends Here >-----------
STAAD SPACE -- PAGE NO. 4
AT END SUPPORT - Vu= 0.01 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
37. END CONCRETE DESIGN
38. FINISH
********** END OF THE STAAD.Pro RUN **********
**** DATE= FEB 17,2021 TIME= 2:26: 7 ****
For technical assistance on STAAD.Pro, please visit
http://selectservices.bentley.com/en-US/
Details about additional assistance from
Bentley and Partners can be found at program menu
Help->Technical Support
Total Page: 4
CAP
NUM

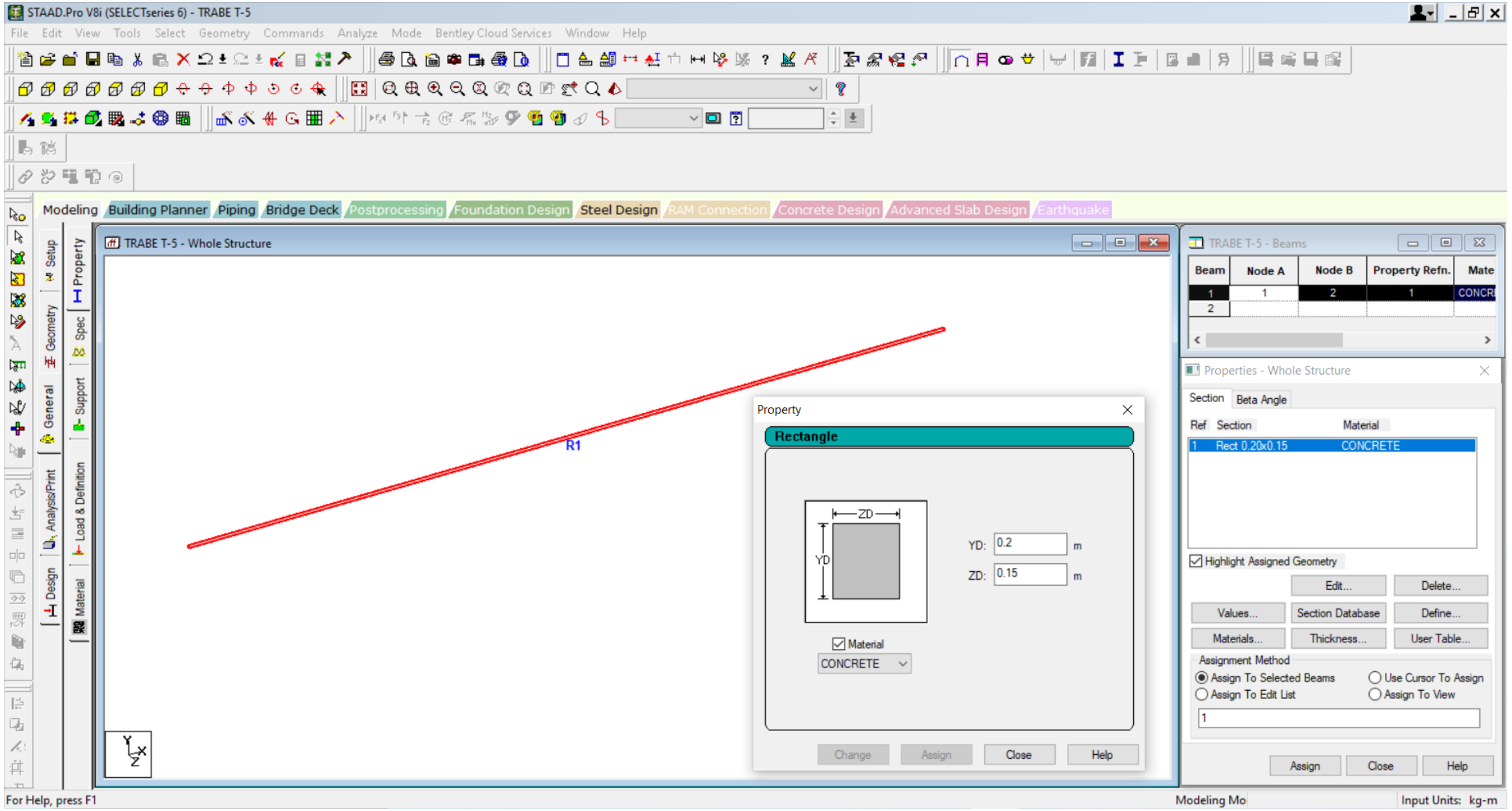


TRABE T6

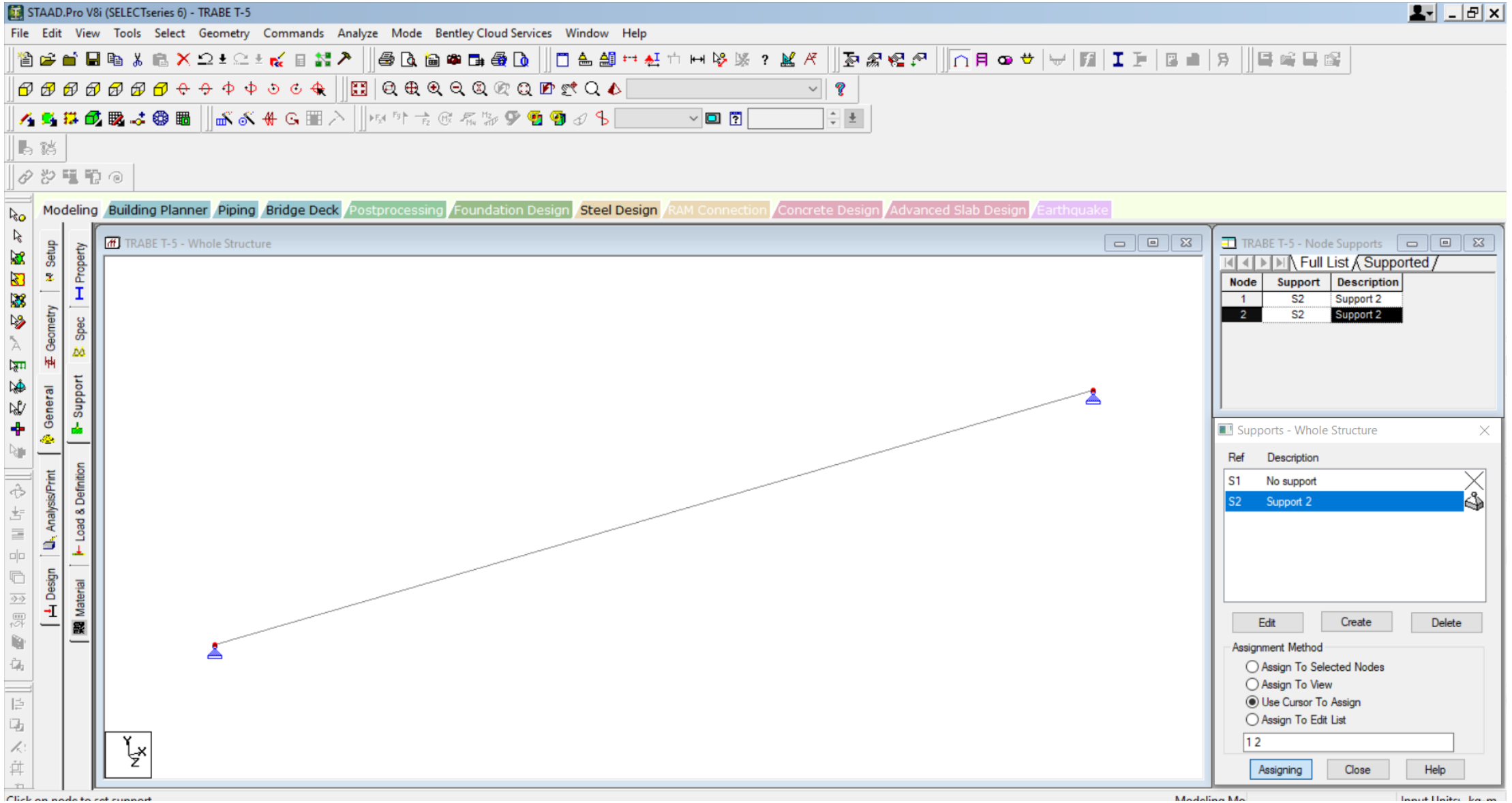
GEOMETRY


STAAD.Pro V8i (SELECTseries 6) - TRABE T-5
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
Setup Geometry General Analysis/Print Design
Beam Plate Surface Solid Parametric... Composite ... Physical M...
TRABE T-5 - Whole Structure
TRABE T-5 - Nodes
Node X m Y m Z m
1 0.000 3.000 0.000
2 2.150 3.000 0.000
3
TRABE T-5 - Beams
Beam Node A Node B Property Refn.
1 1 2
2
Click on node at start of beam
Modeling Mo
Input Units: kg-m

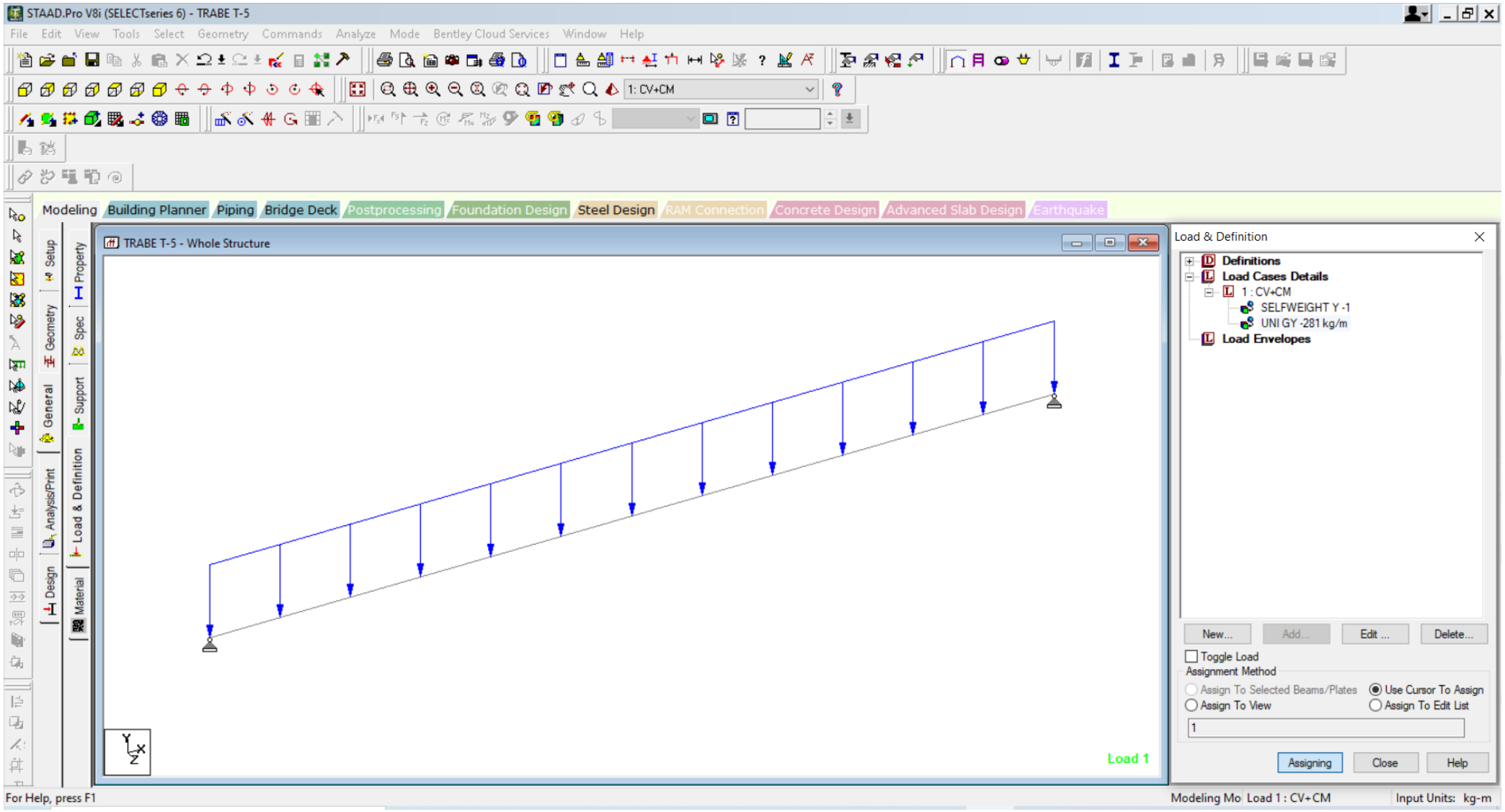
GENERAL


STAAD.Pro V8i (SELECTseries 6) - TRABE T-5
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
Setup Geometry General Analysis/Print Design
Property Spec Support Load & Definition Material
TRABE T-5 - Whole Structure
R1
Property
Rectangle
ZD
YD
YD: 0.2 m
ZD: 0.15 m
Material
CONCRETE
Change Assign Close Help
TRABE T-5 - Beams
Beam Node A Node B Property Refn. Mate
1 1 2 1 CONCR
2
Properties - Whole Structure
Section Beta Angle
Ref Section Material
1 Rect 0.20x0.15 CONCRETE
Highlight Assigned Geometry
Edit... Delete...
Values... Section Database Define...
Materials... Thickness... User Table...
Assignment Method
Assign To Selected Beams Use Cursor To Assign
Assign To Edit List Assign To View
1
Assign Close Help
For Help, press F1
Modeling Mo
Input Units: kg-m

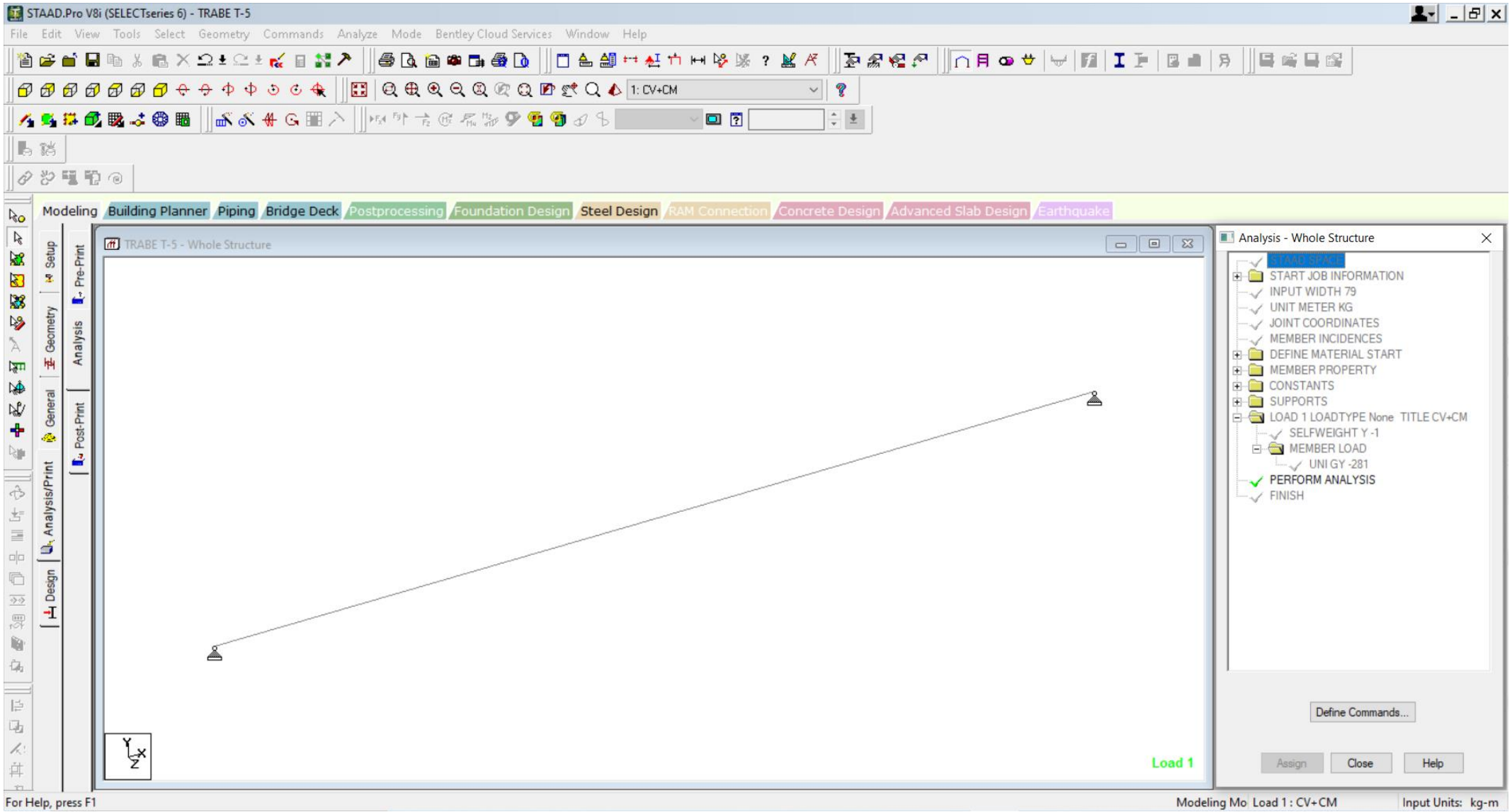
SUPPORT


STAAD.Pro V8i (SELECTseries 6) - TRABE T-5
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
TRABE T-5 - Whole Structure
TRABE T-5 - Node Supports
Full List Supported
Node Support Description
1 S2 Support 2
2 S2 Support 2
Supports - Whole Structure
Ref Description
S1 No support
S2 Support 2
Edit Create Delete
Assignment Method
Assign To Selected Nodes
Assign To View
Use Cursor To Assign
Assign To Edit List
1 2
Assigning Close Help

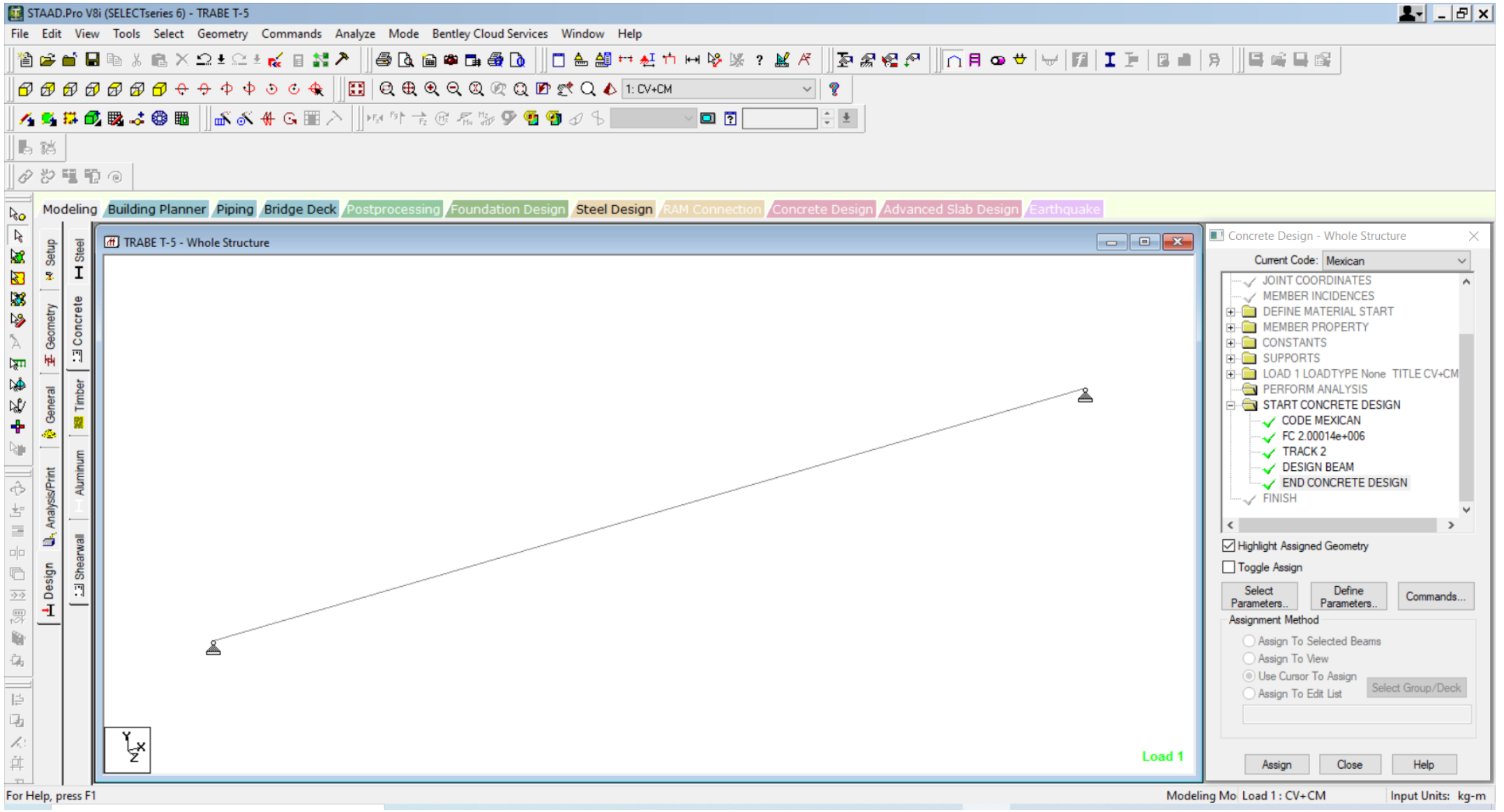
LOAD Y DEFINITION



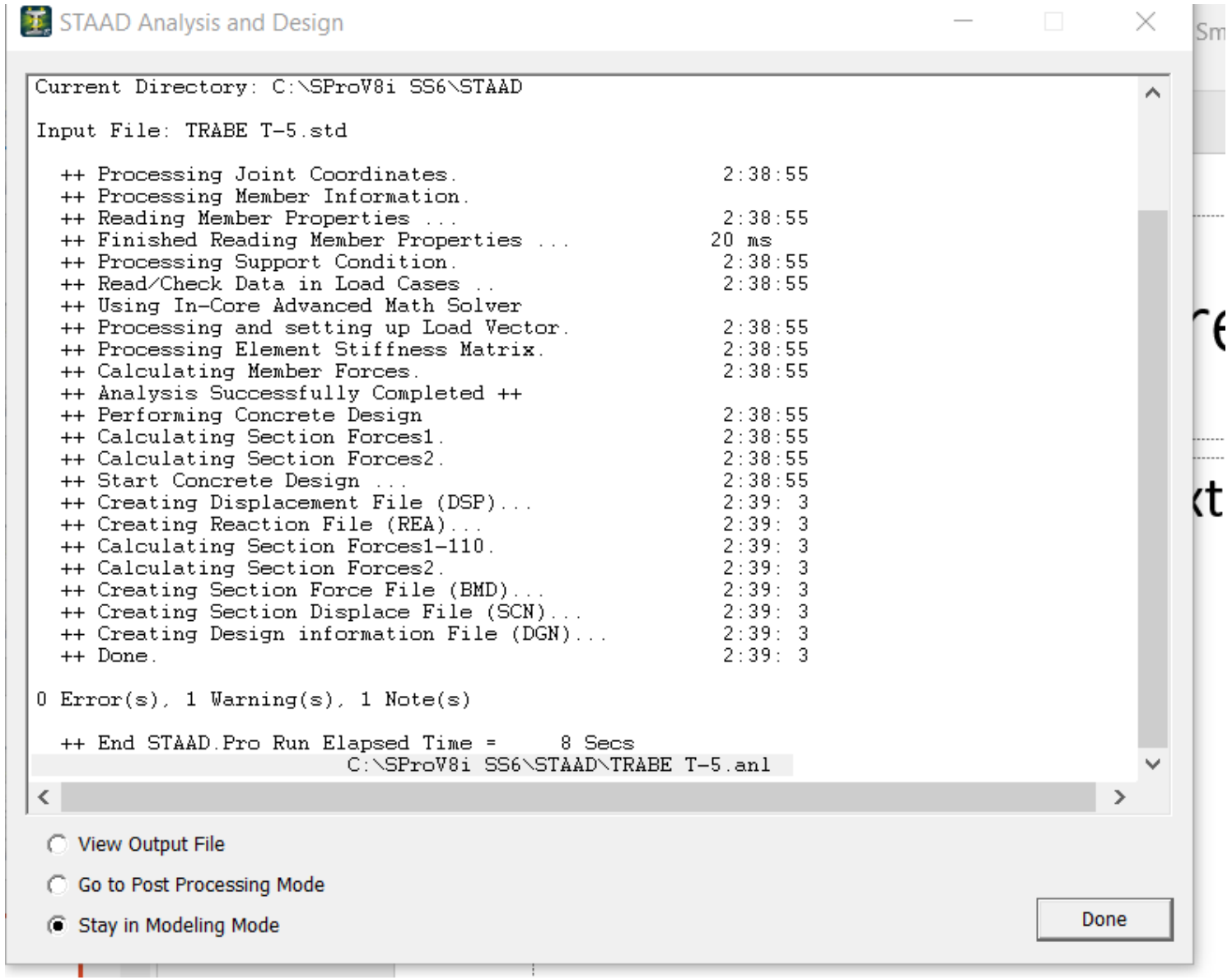
ANALYSIS/PRINT



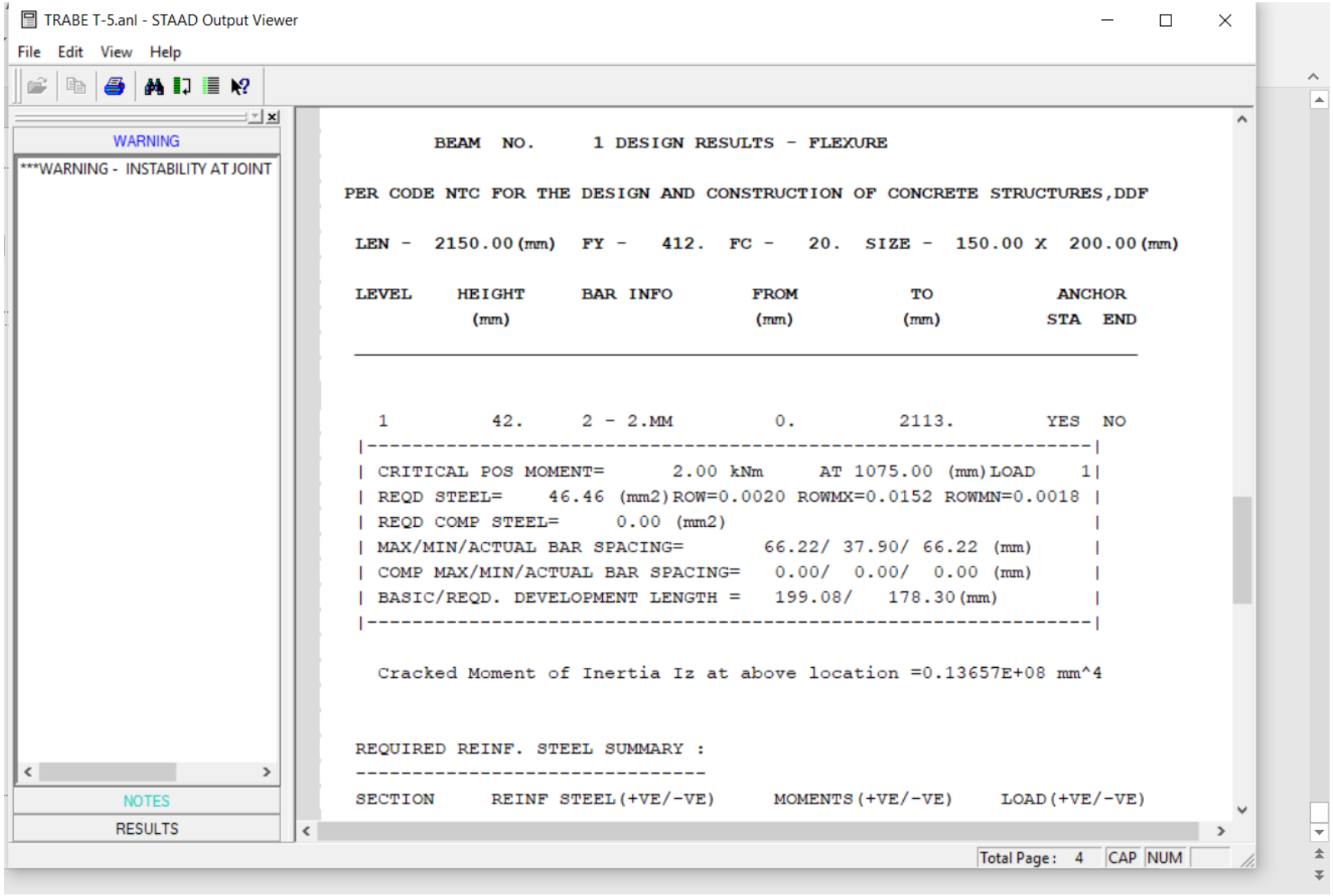
DESIGN


STAAD.Pro V8i (SELECTseries 6) - TRABE T-5
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
1: CV+CM
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
TRABE T-5 - Whole Structure
Load 1
Concrete Design - Whole Structure
Current Code: Mexican
JOINT COORDINATES
MEMBER INCIDENCES
DEFINE MATERIAL START
MEMBER PROPERTY
CONSTANTS
SUPPORTS
LOAD 1 LOADTYPE None TITLE CV+CM
PERFORM ANALYSIS
START CONCRETE DESIGN
CODE MEXICAN
FC 2.00014e+006
TRACK 2
DESIGN BEAM
END CONCRETE DESIGN
FINISH
Highlight Assigned Geometry
Toggle Assign
Select Parameters..
Define Parameters..
Commands...
Assignment Method
Assign To Selected Beams
Assign To View
Use Cursor To Assign
Assign To Edit List
Select Group/Deck
Assign
Close
Help
For Help, press F1
Modeling Mo
Load 1 : CV+CM
Input Units: kg-m

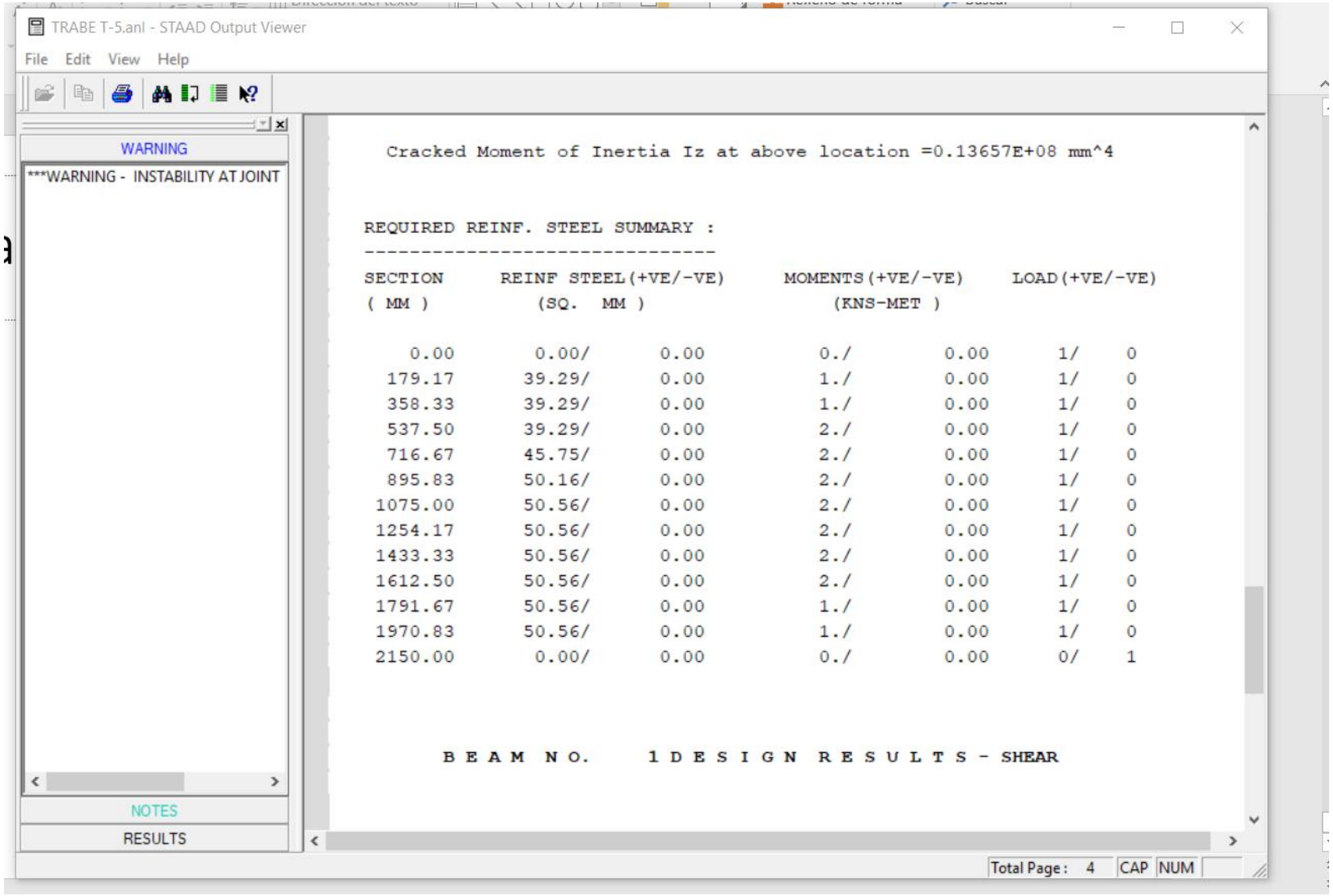
ANALISE


STAAD Analysis and Design
Current Directory: C:\SProV8i SS6\STAAD
Input File: TRABE T-5.std
++ Processing Joint Coordinates. 2:38:55
++ Processing Member Information.
++ Reading Member Properties ... 2:38:55
++ Finished Reading Member Properties ... 20 ms
++ Processing Support Condition. 2:38:55
++ Read/Check Data in Load Cases .. 2:38:55
++ Using In-Core Advanced Math Solver
++ Processing and setting up Load Vector. 2:38:55
++ Processing Element Stiffness Matrix. 2:38:55
++ Calculating Member Forces. 2:38:55
++ Analysis Successfully Completed ++
++ Performing Concrete Design 2:38:55
++ Calculating Section Forces1. 2:38:55
++ Calculating Section Forces2. 2:38:55
++ Start Concrete Design ... 2:38:55
++ Creating Displacement File (DSP)... 2:39: 3
++ Creating Reaction File (REA)... 2:39: 3
++ Calculating Section Forces1-110. 2:39: 3
++ Calculating Section Forces2. 2:39: 3
++ Creating Section Force File (BMD)... 2:39: 3
++ Creating Section Displace File (SCN)... 2:39: 3
++ Creating Design information File (DGN)... 2:39: 3
++ Done.
0 Error(s), 1 Warning(s), 1 Note(s)
++ End STAAD.Pro Run Elapsed Time = 8 Secs
C:\SProV8i SS6\STAAD\TRABE T-5.anl
View Output File
Go to Post Processing Mode
Stay in Modeling Mode
Done

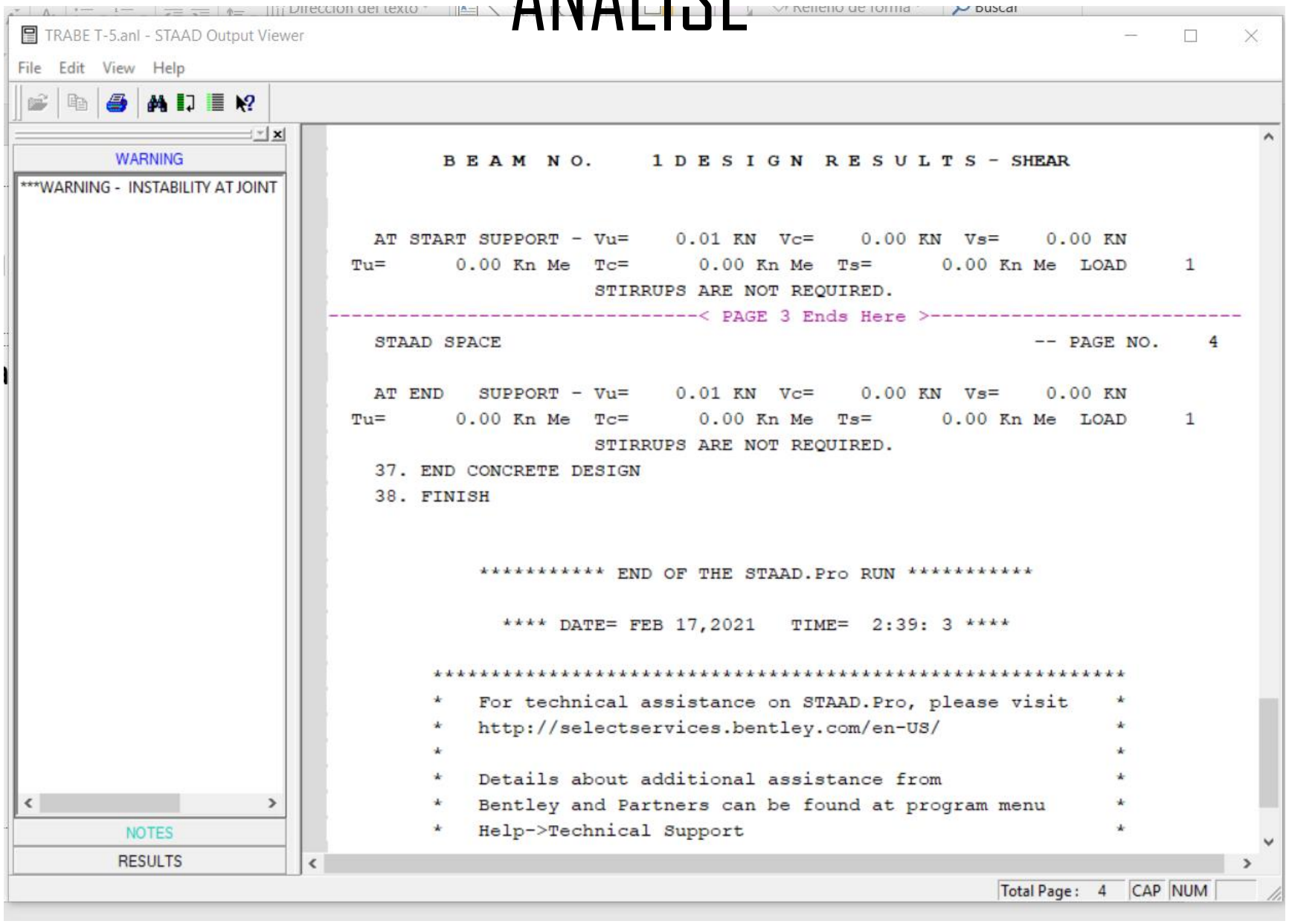
ANALISE

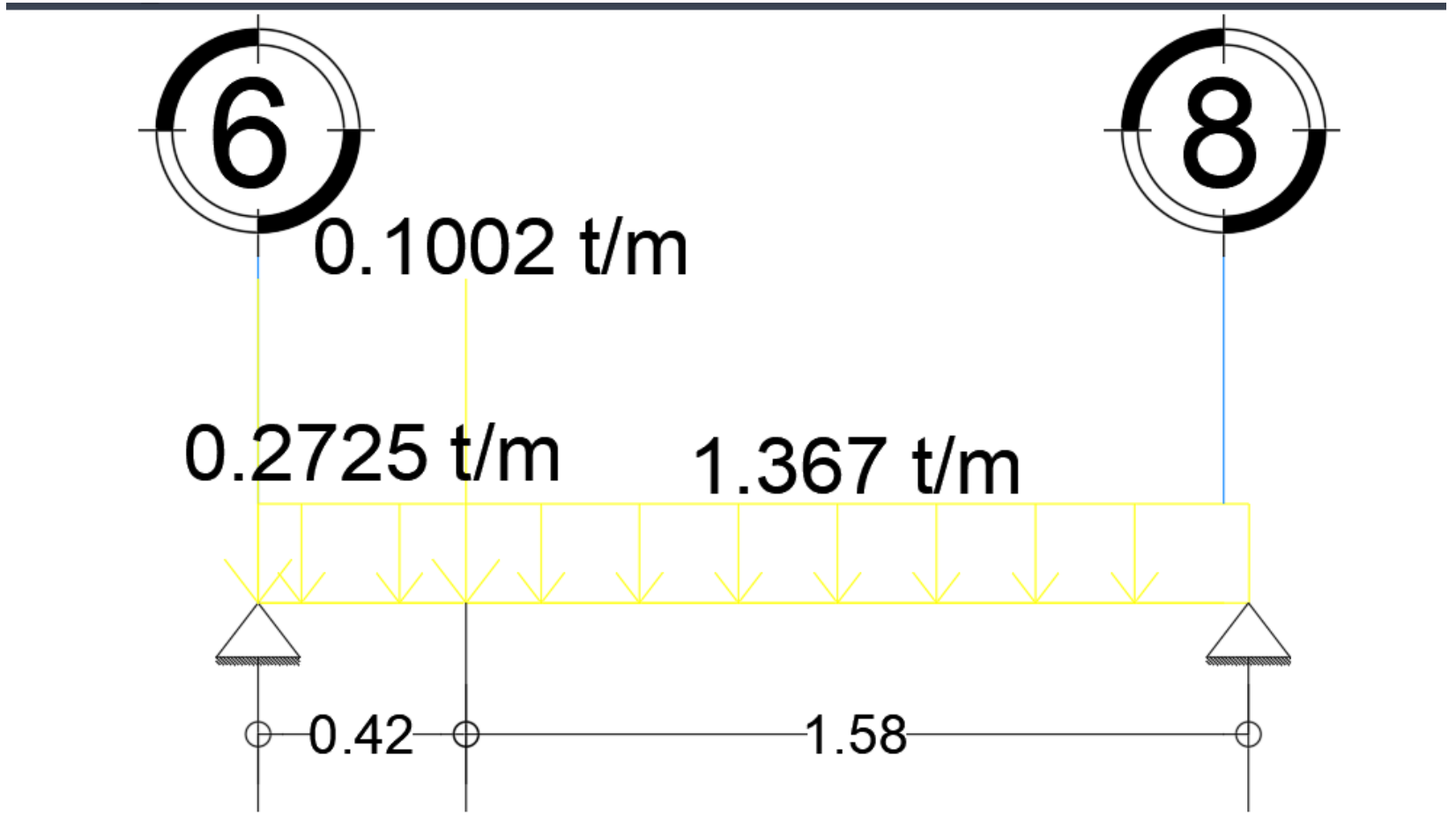

TRABE T-5.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
BEAM NO. 1 DESIGN RESULTS - FLEXURE
PER CODE NTC FOR THE DESIGN AND CONSTRUCTION OF CONCRETE STRUCTURES,DDF
LEN - 2150.00(mm) FY - 412. FC - 20. SIZE - 150.00 X 200.00(mm)
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(mm) (mm) (mm) STA END
1 42. 2 - 2.MM 0. 2113. YES NO
CRITICAL POS MOMENT= 2.00 kNm AT 1075.00 (mm)LOAD 1
REQD STEEL= 46.46 (mm2)ROW=0.0020 ROWMX=0.0152 ROWMN=0.0018
REQD COMP STEEL= 0.00 (mm2)
MAX/MIN/ACTUAL BAR SPACING= 66.22/ 37.90/ 66.22 (mm)
COMP MAX/MIN/ACTUAL BAR SPACING= 0.00/ 0.00/ 0.00 (mm)
BASIC/REQD. DEVELOPMENT LENGTH = 199.08/ 178.30(mm)
Cracked Moment of Inertia Iz at above location =0.13657E+08 mm^4
REQUIRED REINF. STEEL SUMMARY :
SECTION REINF STEEL(+VE/-VE) MOMENTS(+VE/-VE) LOAD(+VE/-VE)
Total Page: 4
CAP
NUM

ANALISE


TRABE T-5.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
Cracked Moment of Inertia Iz at above location =0.13657E+08 mm^4
REQUIRED REINF. STEEL SUMMARY :
SECTION (MM) REINF STEEL(+VE/-VE) (SQ. MM) MOMENTS(+VE/-VE) (KNS-MET) LOAD(+VE/-VE)
0.00 0.00/ 0.00 0./ 0.00 1/ 0
179.17 39.29/ 0.00 1./ 0.00 1/ 0
358.33 39.29/ 0.00 1./ 0.00 1/ 0
537.50 39.29/ 0.00 2./ 0.00 1/ 0
716.67 45.75/ 0.00 2./ 0.00 1/ 0
895.83 50.16/ 0.00 2./ 0.00 1/ 0
1075.00 50.56/ 0.00 2./ 0.00 1/ 0
1254.17 50.56/ 0.00 2./ 0.00 1/ 0
1433.33 50.56/ 0.00 2./ 0.00 1/ 0
1612.50 50.56/ 0.00 2./ 0.00 1/ 0
1791.67 50.56/ 0.00 1./ 0.00 1/ 0
1970.83 50.56/ 0.00 1./ 0.00 1/ 0
2150.00 0.00/ 0.00 0./ 0.00 0/ 1
B E A M N O. 1 D E S I G N R E S U L T S - SHEAR
Total Page: 4
CAP
NUM

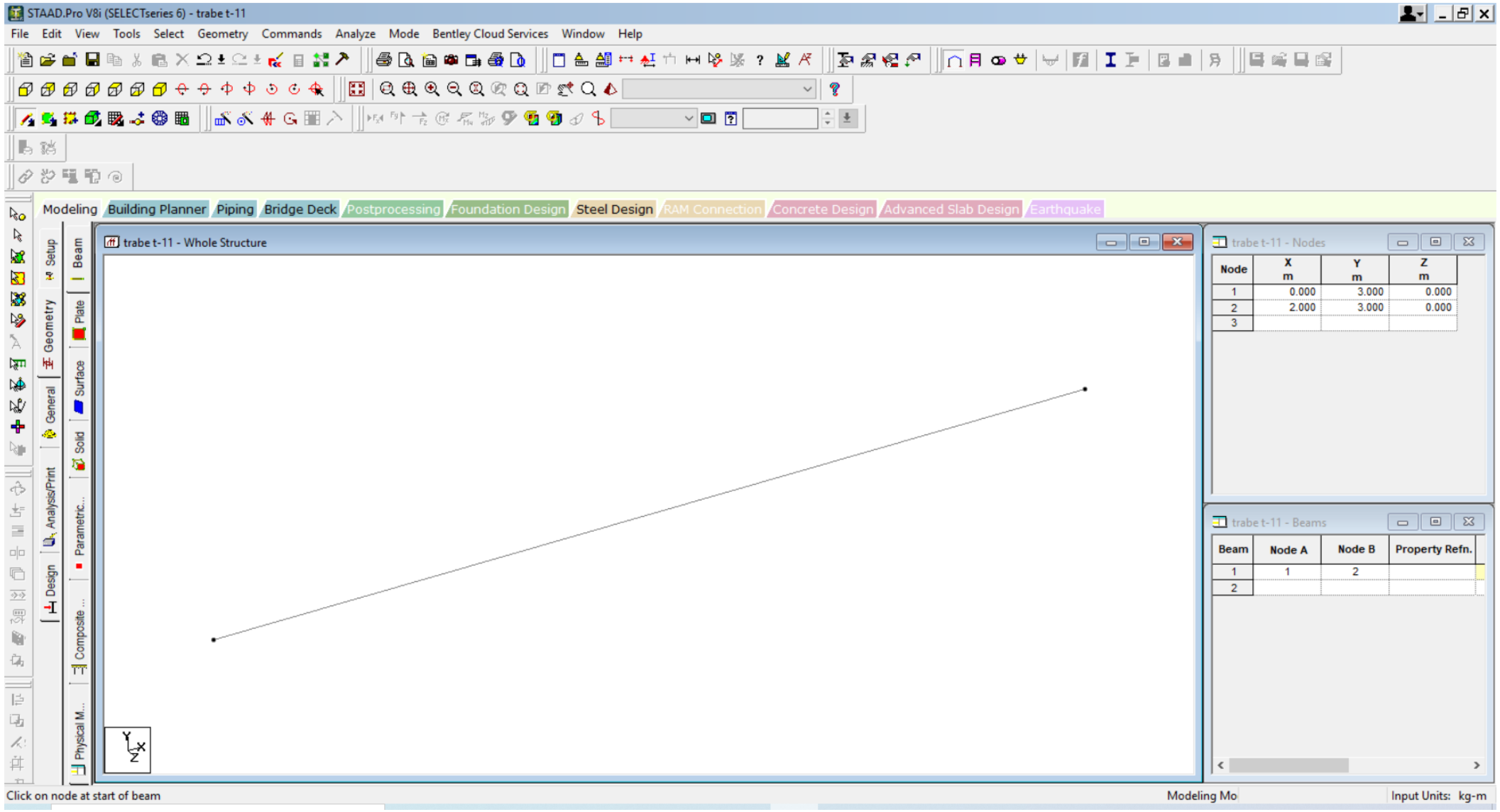
ANALISE


TRABE T-5.anl - STAAD Output Viewer
File Edit View Help
WARNING
***WARNING - INSTABILITY AT JOINT
NOTES
RESULTS
B E A M N O. 1 D E S I G N R E S U L T S - SHEAR
AT START SUPPORT - Vu= 0.01 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
-----------< PAGE 3 Ends Here >-----------
STAAD SPACE -- PAGE NO. 4
AT END SUPPORT - Vu= 0.01 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
37. END CONCRETE DESIGN
38. FINISH
********** END OF THE STAAD.Pro RUN **********
**** DATE= FEB 17,2021 TIME= 2:39: 3 ****
* For technical assistance on STAAD.Pro, please visit *
* http://selectservices.bentley.com/en-US/ *
* Details about additional assistance from *
* Bentley and Partners can be found at program menu *
* Help->Technical Support *
Total Page: 4
CAP
NUM

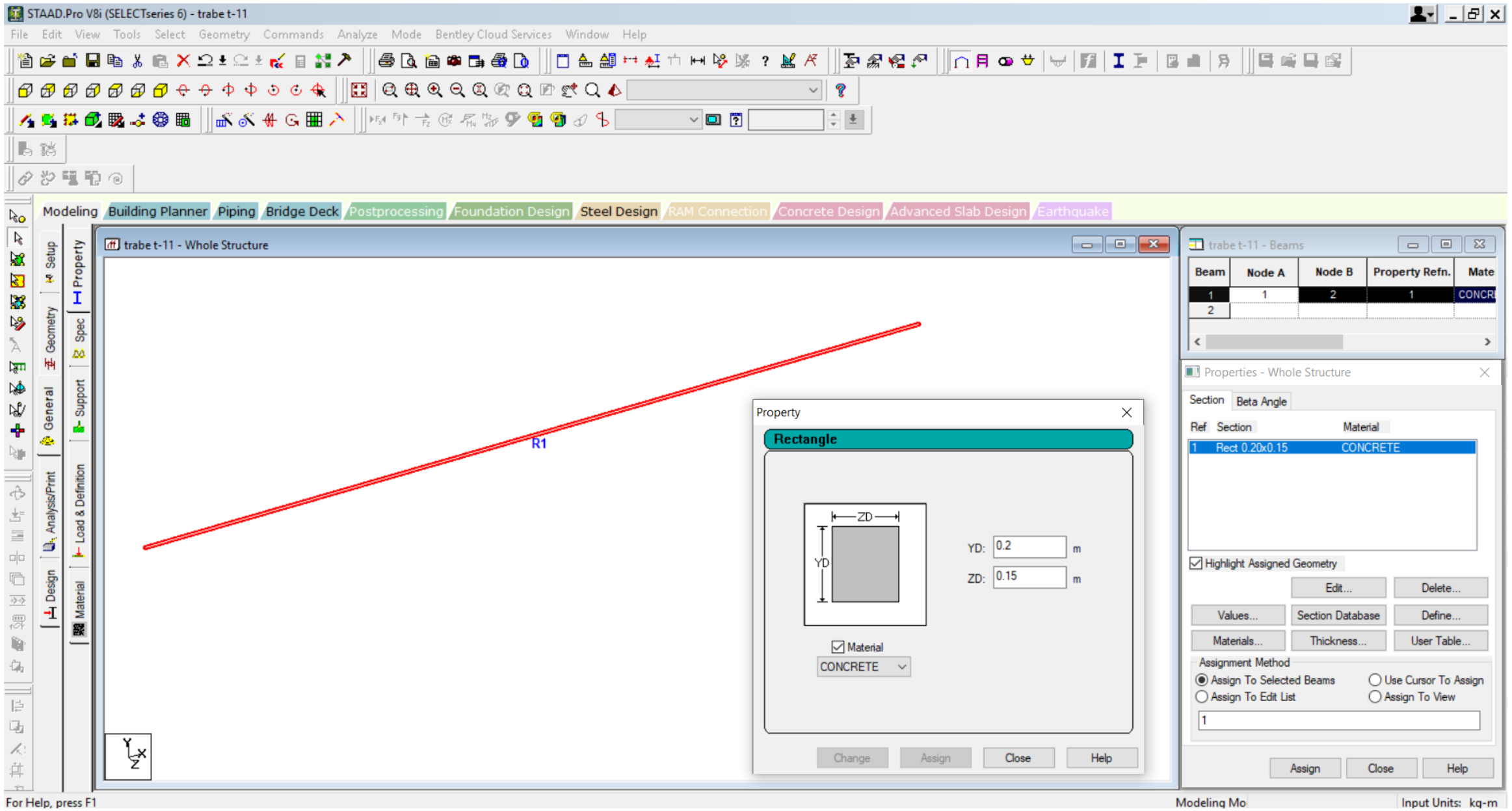


TRABE T11

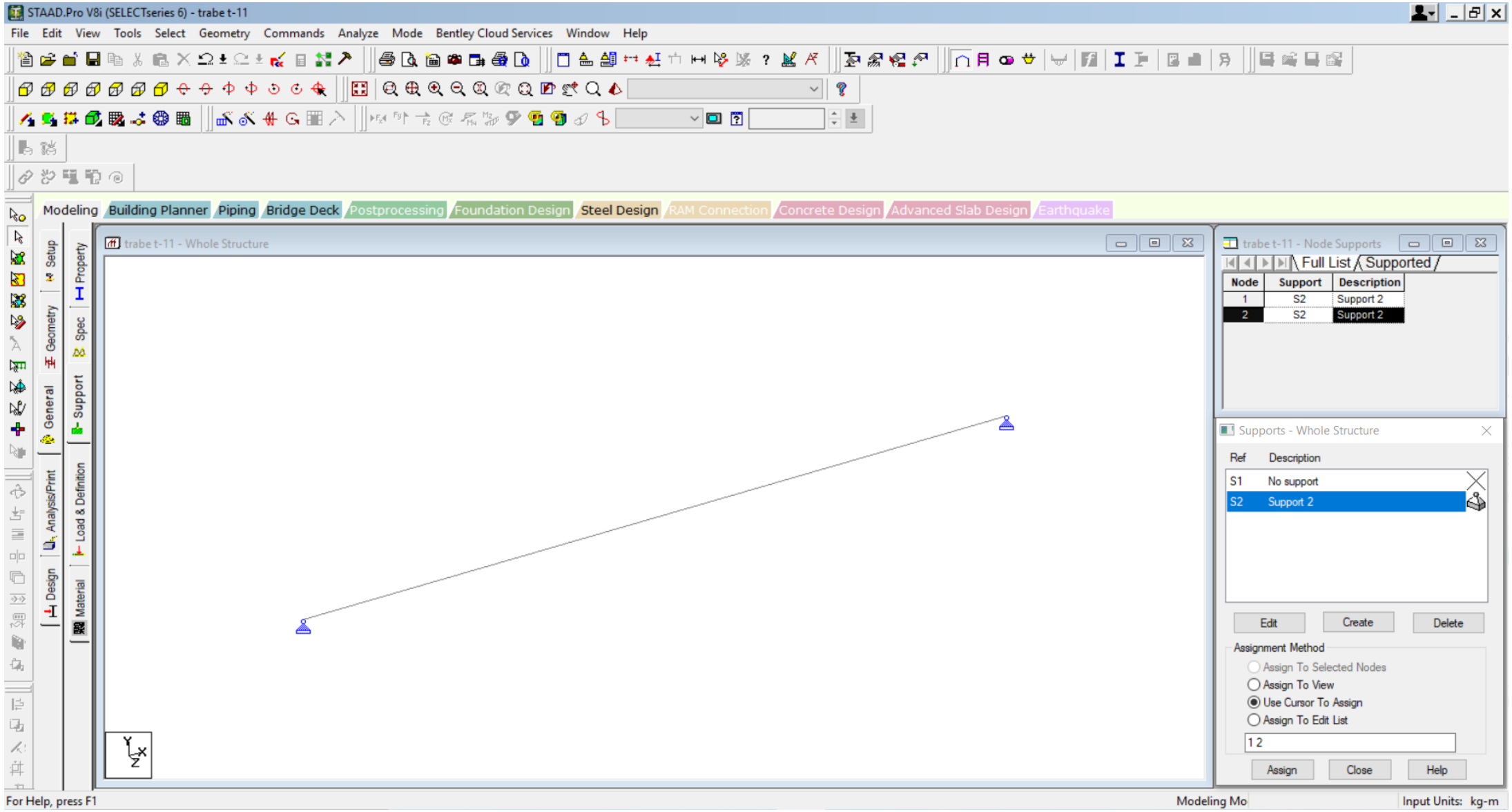
GEOMETRY


STAAD.Pro V8i (SELECTseries 6) - trabe t-11
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
Setup Geometry General Analysis/Print Design
Beam Plate Surface Solid Parametric... Composite ... Physical M...
trabe t-11 - Whole Structure
trabe t-11 - Nodes
Node X m Y m Z m
1 0.000 3.000 0.000
2 2.000 3.000 0.000
3
trabe t-11 - Beams
Beam Node A Node B Property Refn.
1 1 2
2
Click on node at start of beam
Modeling Mo
Input Units: kg-m

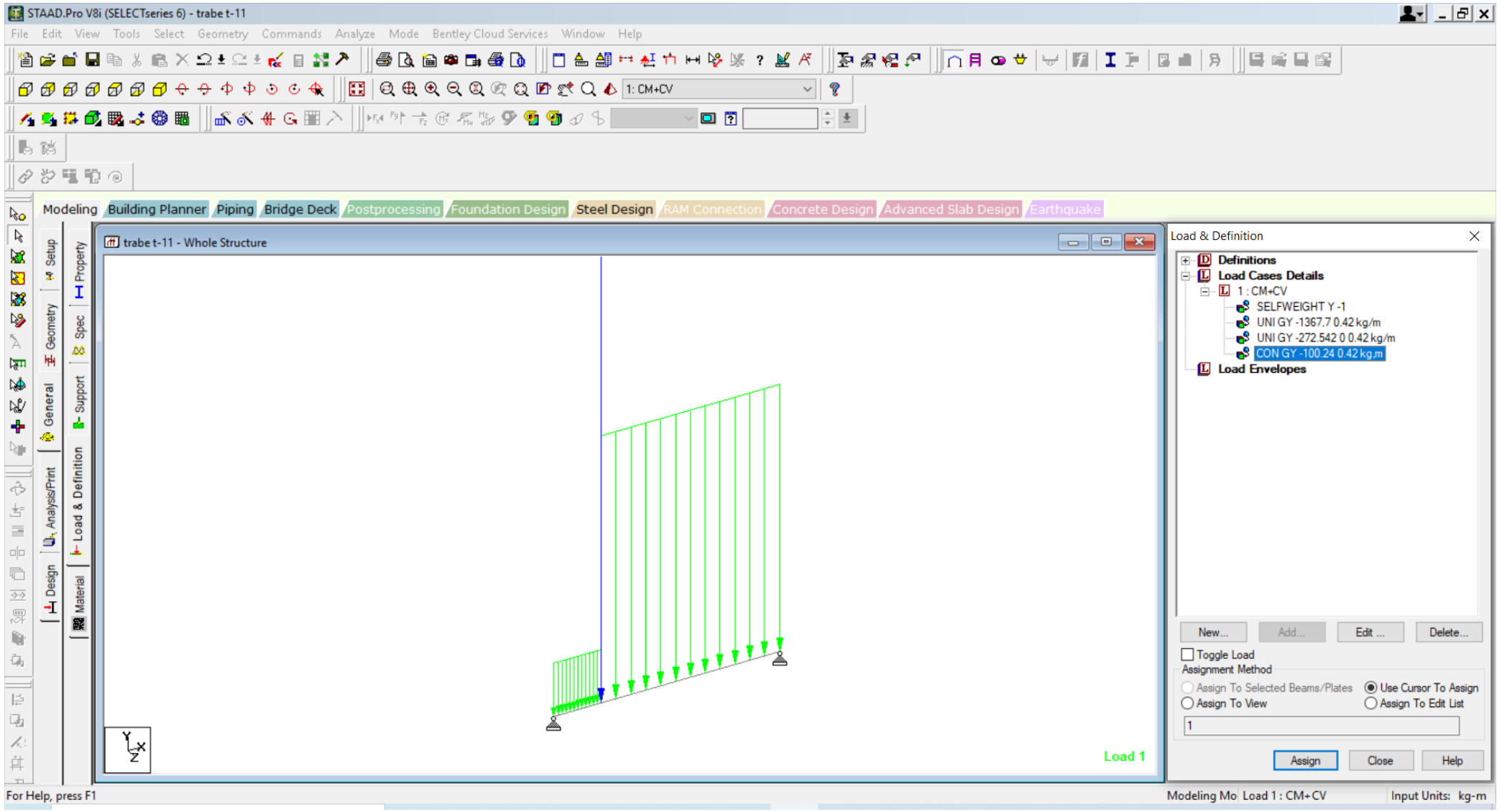
GENERAL


STAAD.Pro V8i (SELECTseries 6) - trabe t-11
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
trabe t-11 - Whole Structure
R1
Property
Rectangle
ZD
YD
YD: 0.2 m
ZD: 0.15 m
Material
CONCRETE
Change Assign Close Help
trabe t-11 - Beams
Beam Node A Node B Property Refn. Mate
1 1 2 1 CONCR
2
Properties - Whole Structure
Section Beta Angle
Ref Section Material
1 Rect 0.20x0.15 CONCRETE
Highlight Assigned Geometry
Edit... Delete...
Values... Section Database Define...
Materials... Thickness... User Table...
Assignment Method
Assign To Selected Beams
Use Cursor To Assign
Assign To Edit List
Assign To View
Assign Close Help
For Help, press F1
Modeling Mo
Input Units: kg-m

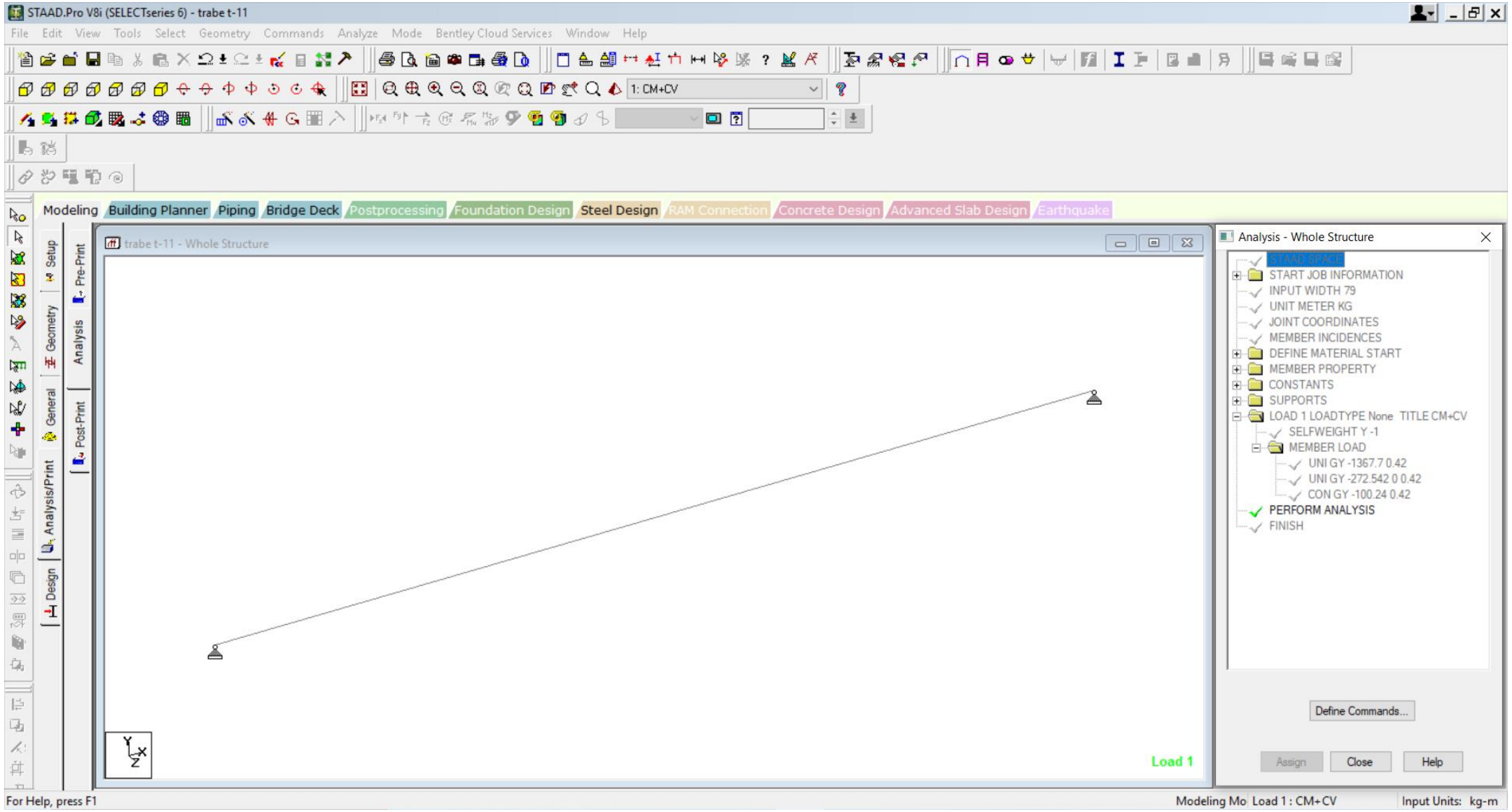
SUPPORT


STAAD.Pro V8i (SELECTseries 6) - trabe t-11
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
trabe t-11 - Whole Structure
trabe t-11 - Node Supports
Full List Supported
Node Support Description
1 S2 Support 2
2 S2 Support 2
Supports - Whole Structure
Ref Description
S1 No support
S2 Support 2
Edit Create Delete
Assignment Method
Assign To Selected Nodes
Assign To View
Use Cursor To Assign
Assign To Edit List
1 2
Assign Close Help
Setup Geometry General Analysis/Print Design
Property Spec Support Load & Definition Material
For Help, press F1
Modeling Mo
Input Units: kg-m

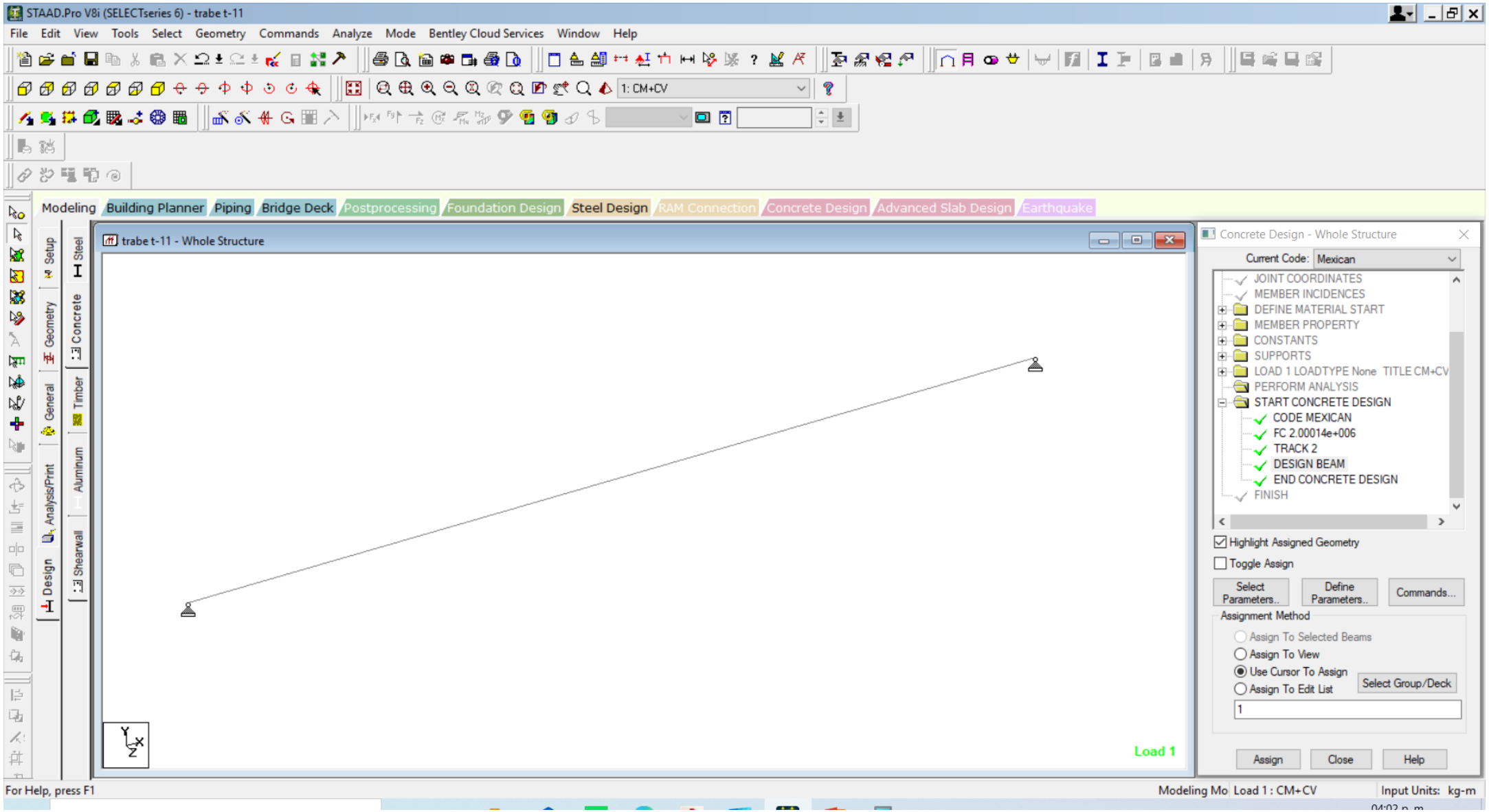
LOAD Y DEFINITION



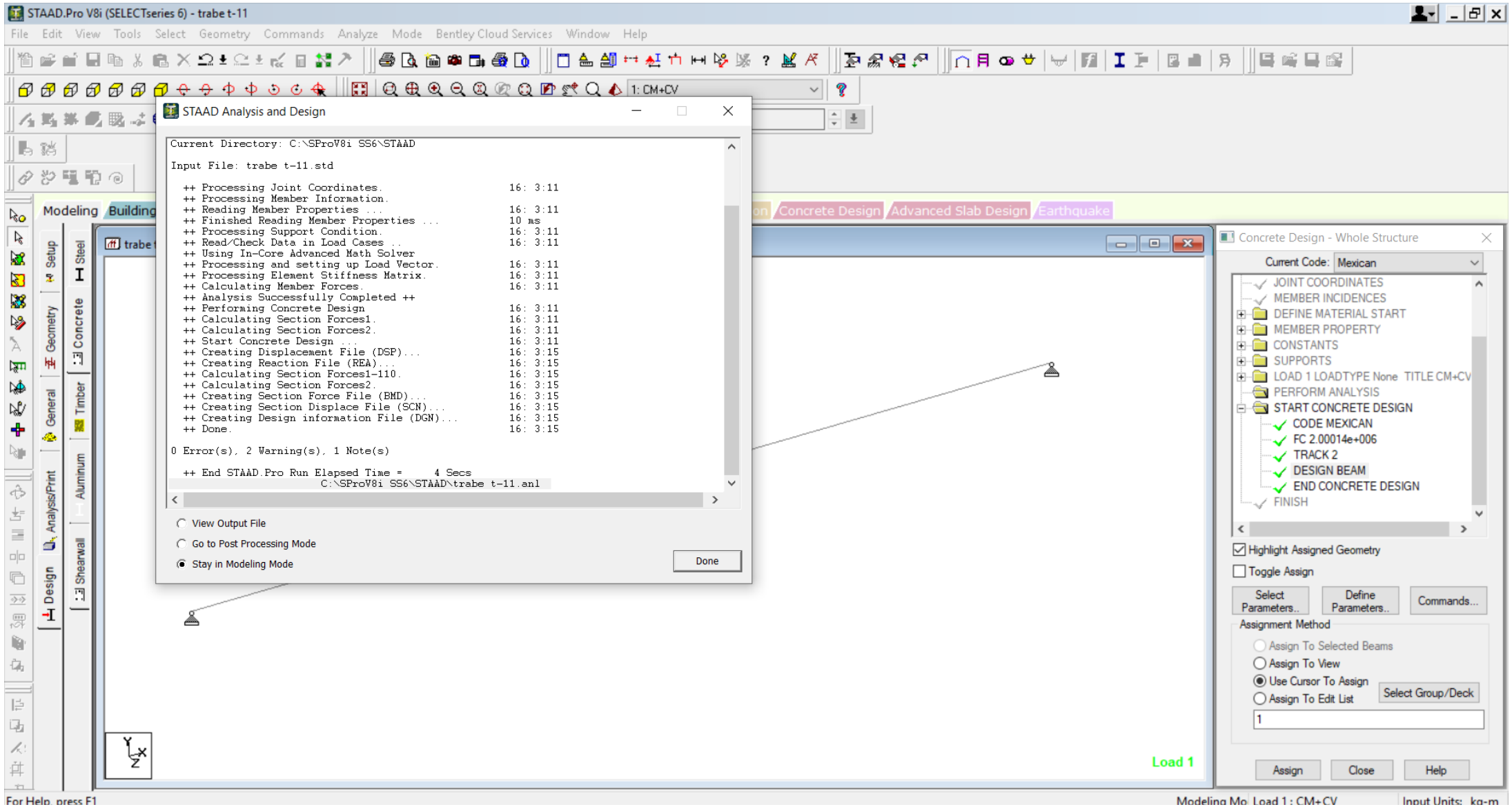
ANALYSIS/PRINT



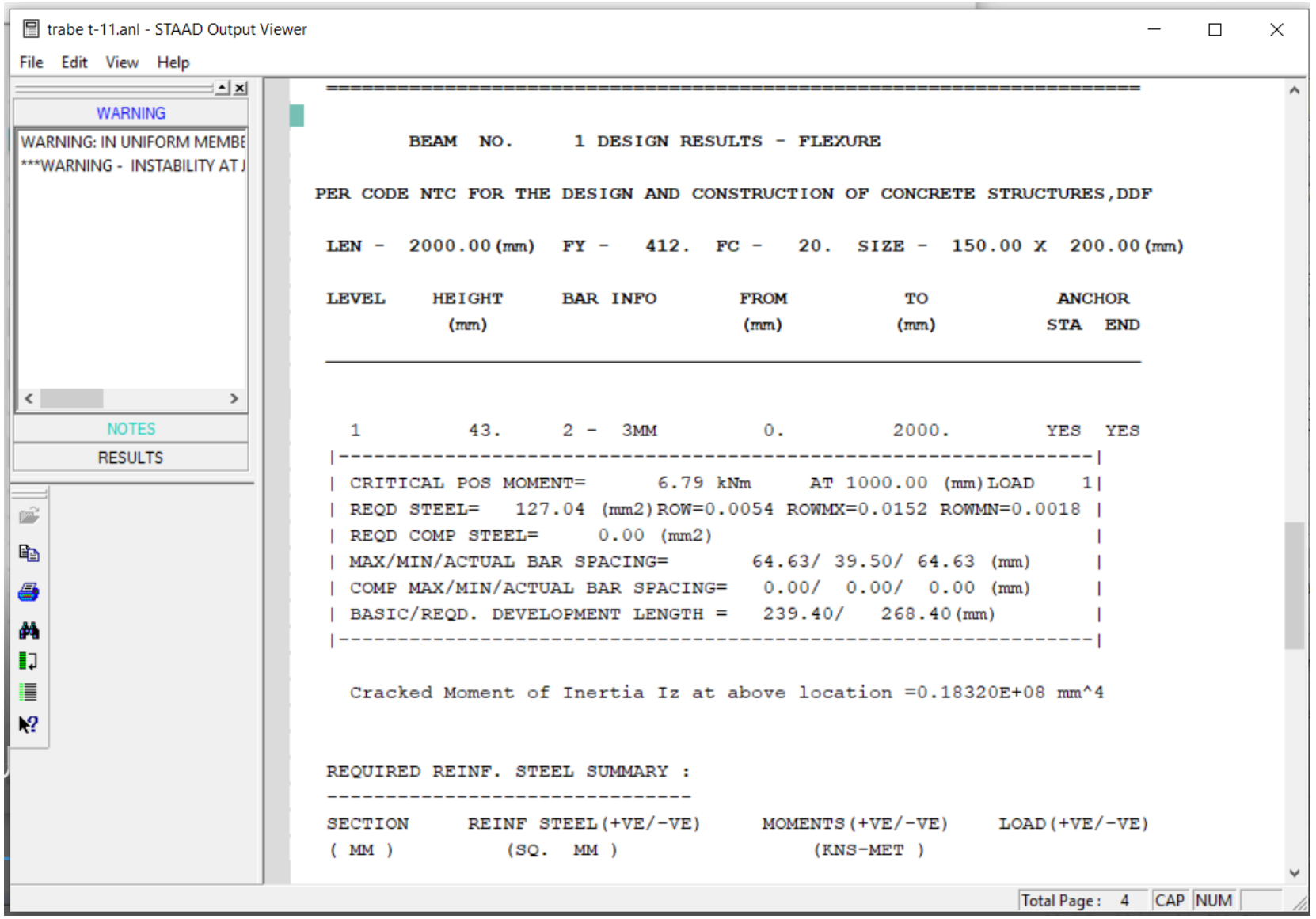
DESIGN


STAAD.Pro V8i (SELECTseries 6) - trabe t-11
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Earthquake
trabe t-11 - Whole Structure
Load 1
Concrete Design - Whole Structure
Current Code: Mexican
JOINT COORDINATES
MEMBER INCIDENCES
DEFINE MATERIAL START
MEMBER PROPERTY
CONSTANTS
SUPPORTS
LOAD 1 LOADTYPE None TITLE CM+CV
PERFORM ANALYSIS
START CONCRETE DESIGN
CODE MEXICAN
FC 2.00014e+006
TRACK 2
DESIGN BEAM
END CONCRETE DESIGN
FINISH
Highlight Assigned Geometry
Toggle Assign
Select Parameters..
Define Parameters..
Commands...
Assignment Method
Assign To Selected Beams
Assign To View
Use Cursor To Assign
Assign To Edit List
Select Group/Deck
Assign
Close
Help
For Help, press F1
Modeling Mo
Load 1 : CM+CV
Input Units: kg-m

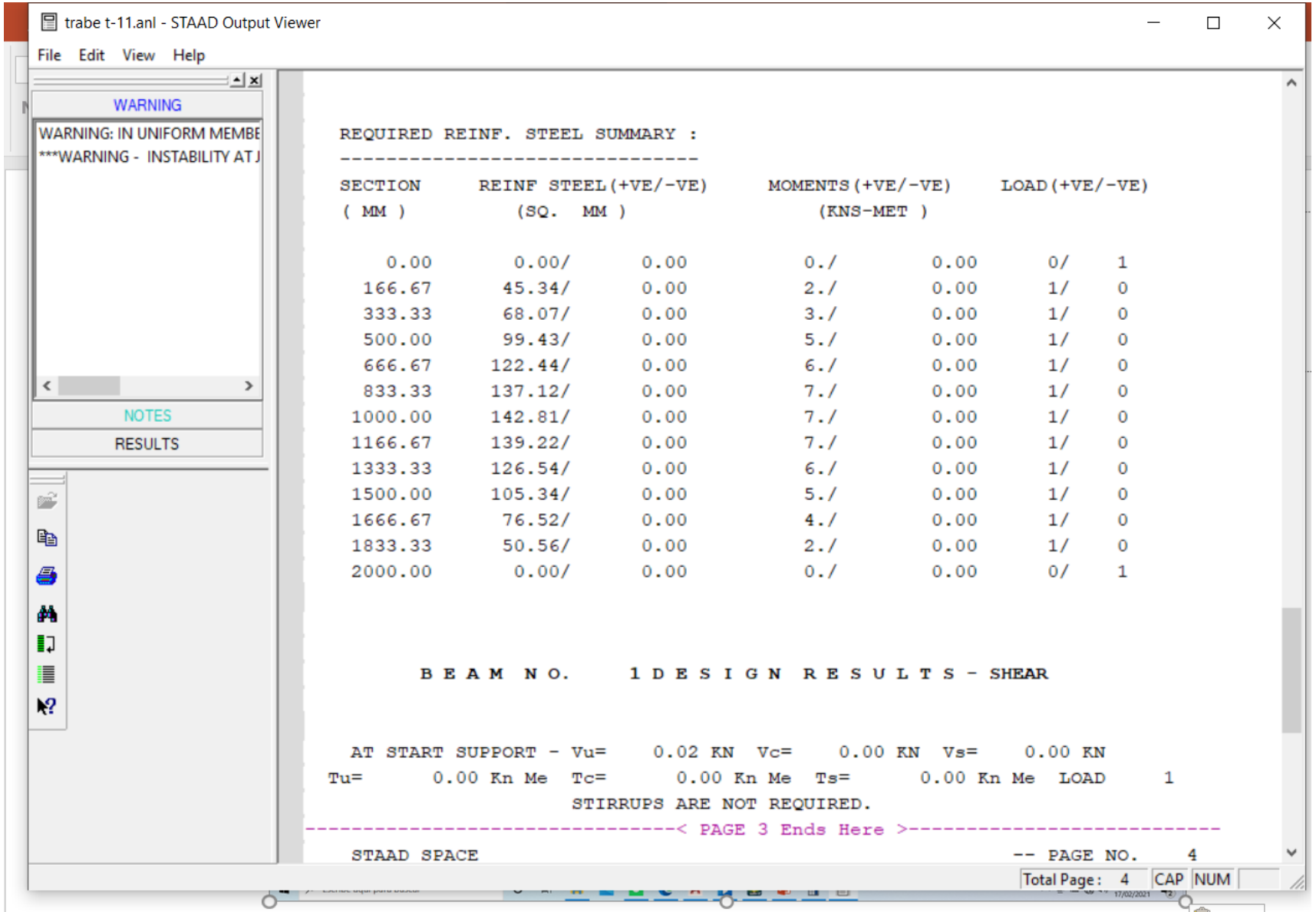
ANALISE


STAAD.Pro V8i (SELECTseries 6) - trabe t-11
File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help
STAAD Analysis and Design
Current Directory: C:\SProV8i SS6\STAAD
Input File: trabe t-11.std
++ Processing Joint Coordinates. 16: 3:11
++ Processing Member Information.
++ Reading Member Properties ... 16: 3:11
++ Finished Reading Member Properties ... 10 ms
++ Processing Support Condition. 16: 3:11
++ Read/Check Data in Load Cases .. 16: 3:11
++ Using In-Core Advanced Math Solver
++ Processing and setting up Load Vector. 16: 3:11
++ Processing Element Stiffness Matrix. 16: 3:11
++ Calculating Member Forces. 16: 3:11
++ Analysis Successfully Completed ++
++ Performing Concrete Design 16: 3:11
++ Calculating Section Forces1. 16: 3:11
++ Calculating Section Forces2. 16: 3:11
++ Start Concrete Design ... 16: 3:11
++ Creating Displacement File (DSP)... 16: 3:15
++ Creating Reaction File (REA)... 16: 3:15
++ Calculating Section Forces1-110. 16: 3:15
++ Calculating Section Forces2. 16: 3:15
++ Creating Section Force File (BMD)... 16: 3:15
++ Creating Section Displace File (SCN)... 16: 3:15
++ Creating Design information File (DGN)... 16: 3:15
++ Done.
0 Error(s), 2 Warning(s), 1 Note(s)
++ End STAAD.Pro Run Elapsed Time = 4 Secs
C:\SProV8i SS6\STAAD\trabe t-11.anl
View Output File
Go to Post Processing Mode
Stay in Modeling Mode
Done
Concrete Design - Whole Structure
Current Code: Mexican
JOINT COORDINATES
MEMBER INCIDENCES
DEFINE MATERIAL START
MEMBER PROPERTY
CONSTANTS
SUPPORTS
LOAD 1 LOADTYPE None TITLE CM+CV
PERFORM ANALYSIS
START CONCRETE DESIGN
CODE MEXICAN
FC 2.00014e+006
TRACK 2
DESIGN BEAM
END CONCRETE DESIGN
FINISH
Highlight Assigned Geometry
Toggle Assign
Select Parameters..
Define Parameters..
Commands...
Assignment Method
Assign To Selected Beams
Assign To View
Use Cursor To Assign
Assign To Edit List
Select Group/Deck
Assign
Close
Help
Load 1
For Help, press F1

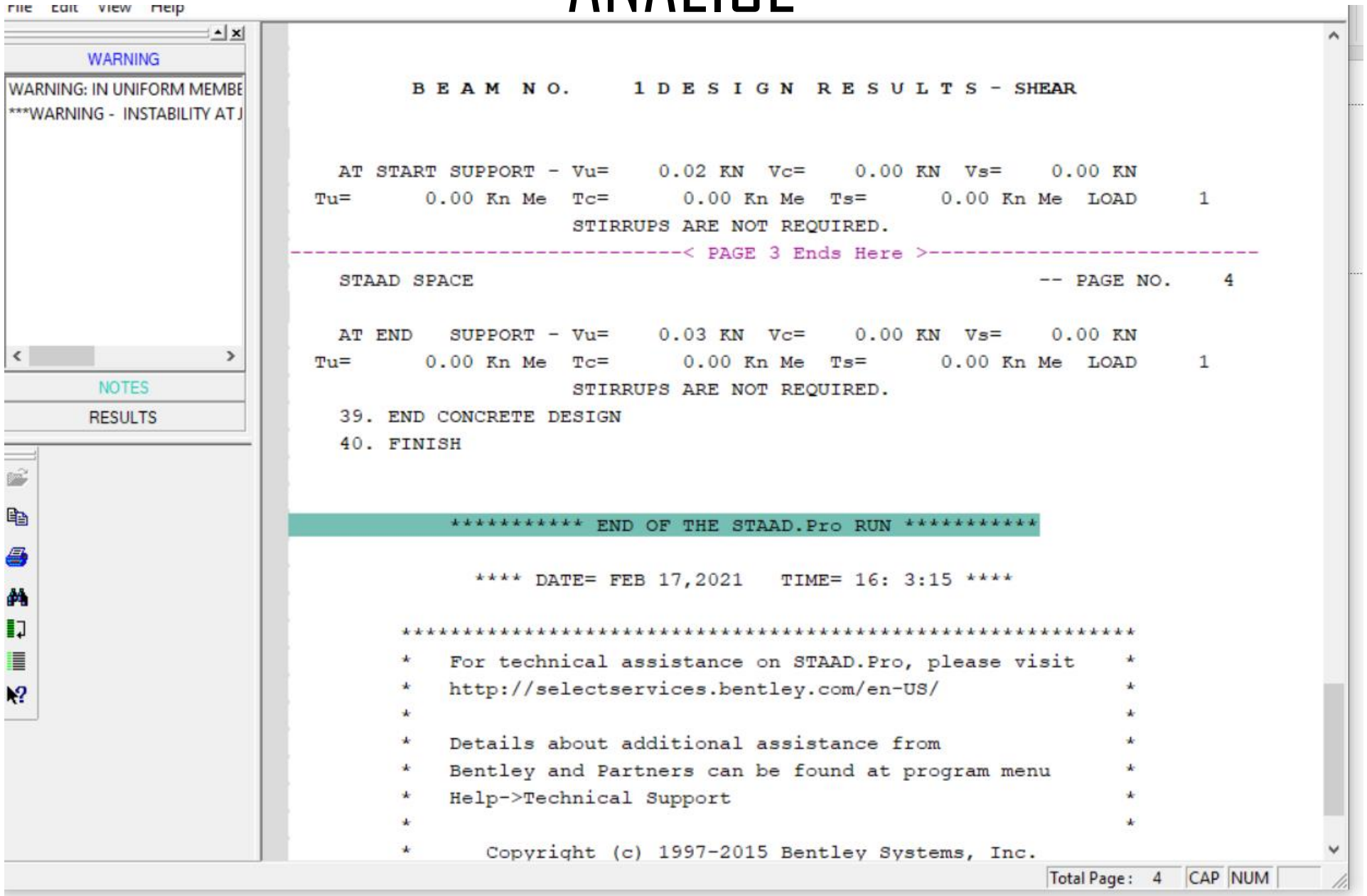
ANALISE


trabe t-11.anl - STAAD Output Viewer
File Edit View Help
WARNING
WARNING: IN UNIFORM MEMBE
***WARNING - INSTABILITY AT J
NOTES
RESULTS
BEAM NO. 1 DESIGN RESULTS - FLEXURE
PER CODE NTC FOR THE DESIGN AND CONSTRUCTION OF CONCRETE STRUCTURES,DDF
LEN - 2000.00(mm) FY - 412. FC - 20. SIZE - 150.00 X 200.00(mm)
LEVEL HEIGHT (mm) BAR INFO FROM (mm) TO (mm) ANCHOR STA END
1 43. 2 - 3MM 0. 2000. YES YES
CRITICAL POS MOMENT= 6.79 kNm AT 1000.00 (mm)LOAD 1
REQD STEEL= 127.04 (mm2)ROW=0.0054 ROWMX=0.0152 ROWMN=0.0018
REQD COMP STEEL= 0.00 (mm2)
MAX/MIN/ACTUAL BAR SPACING= 64.63/ 39.50/ 64.63 (mm)
COMP MAX/MIN/ACTUAL BAR SPACING= 0.00/ 0.00/ 0.00 (mm)
BASIC/REQD. DEVELOPMENT LENGTH = 239.40/ 268.40(mm)
Cracked Moment of Inertia Iz at above location =0.18320E+08 mm^4
REQUIRED REINF. STEEL SUMMARY :
SECTION (MM) REINF STEEL(+VE/-VE) (SQ. MM) MOMENTS(+VE/-VE) (KNS-MET) LOAD(+VE/-VE)
Total Page: 4
CAP
NUM

ANALISE


trabe t-11.anl - STAAD Output Viewer
File Edit View Help
WARNING
WARNING: IN UNIFORM MEMBE
***WARNING - INSTABILITY AT J
NOTES
RESULTS
REQUIRED REINF. STEEL SUMMARY :
SECTION (MM) REINF STEEL(+VE/-VE) (SQ. MM) MOMENTS(+VE/-VE) (KNS-MET) LOAD(+VE/-VE)
0.00 0.00/ 0.00 0./ 0.00 0/ 1
166.67 45.34/ 0.00 2./ 0.00 1/ 0
333.33 68.07/ 0.00 3./ 0.00 1/ 0
500.00 99.43/ 0.00 5./ 0.00 1/ 0
666.67 122.44/ 0.00 6./ 0.00 1/ 0
833.33 137.12/ 0.00 7./ 0.00 1/ 0
1000.00 142.81/ 0.00 7./ 0.00 1/ 0
1166.67 139.22/ 0.00 7./ 0.00 1/ 0
1333.33 126.54/ 0.00 6./ 0.00 1/ 0
1500.00 105.34/ 0.00 5./ 0.00 1/ 0
1666.67 76.52/ 0.00 4./ 0.00 1/ 0
1833.33 50.56/ 0.00 2./ 0.00 1/ 0
2000.00 0.00/ 0.00 0./ 0.00 0/ 1
B E A M N O. 1 D E S I G N R E S U L T S - SHEAR
AT START SUPPORT - Vu= 0.02 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
-----------< PAGE 3 Ends Here >-----------
STAAD SPACE -- PAGE NO. 4
Total Page: 4
CAP
NUM

ANALISE


File Edit View Help
WARNING
WARNING: IN UNIFORM MEMBE
***WARNING - INSTABILITY AT J
NOTES
RESULTS
B E A M N O. 1 D E S I G N R E S U L T S - SHEAR
AT START SUPPORT - Vu= 0.02 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
-----------< PAGE 3 Ends Here >-----------
STAAD SPACE -- PAGE NO. 4
AT END SUPPORT - Vu= 0.03 KN Vc= 0.00 KN Vs= 0.00 KN
Tu= 0.00 Kn Me Tc= 0.00 Kn Me Ts= 0.00 Kn Me LOAD 1
STIRRUPS ARE NOT REQUIRED.
39. END CONCRETE DESIGN
40. FINISH
********** END OF THE STAAD.Pro RUN **********
**** DATE= FEB 17,2021 TIME= 16: 3:15 ****
* For technical assistance on STAAD.Pro, please visit *
* http://selectservices.bentley.com/en-US/ *
* Details about additional assistance from *
* Bentley and Partners can be found at program menu *
* Help->Technical Support *
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Total Page: 4
CAP
NUM