



**NOMBRE DEL ALUMNO:** BELVERI ELIAS ESCALANTE PÉREZ

**NOMBRE DEL PROFESOR:** ARQ. PEDRO ALBERTO GARCIA LOPEZ

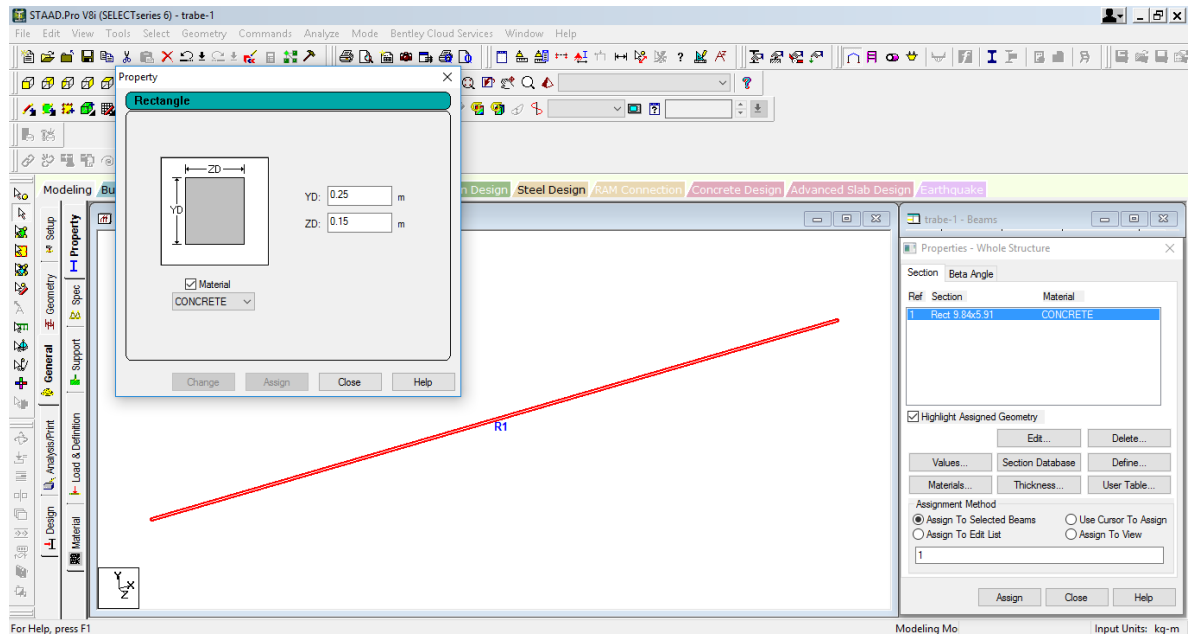
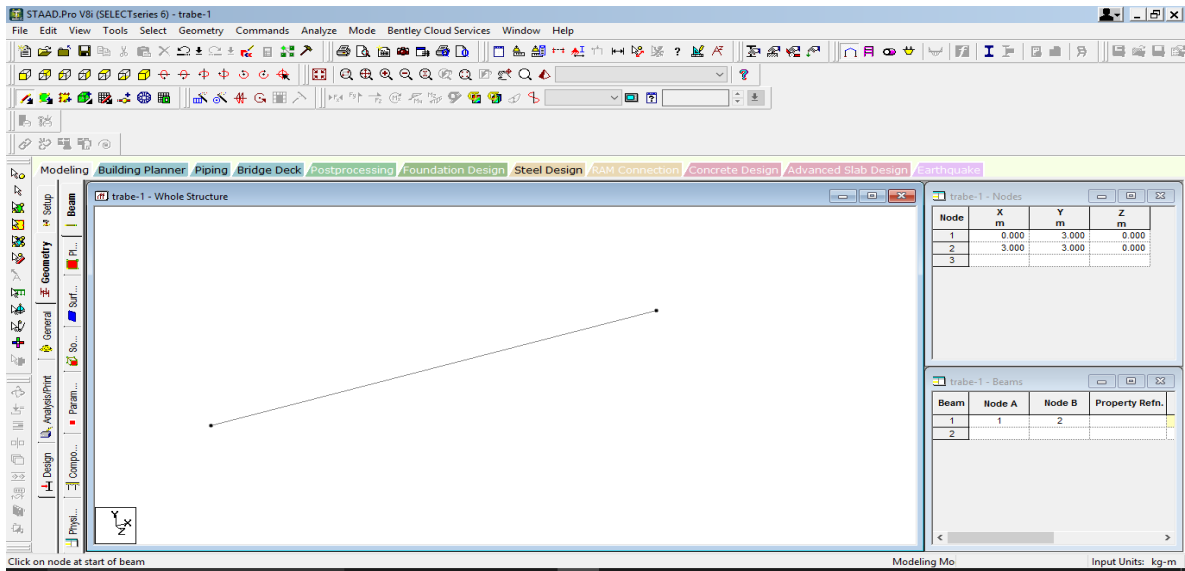
**NOMBRE DE LA MATERIA:** ANALISIS DE ESTRUCTURA

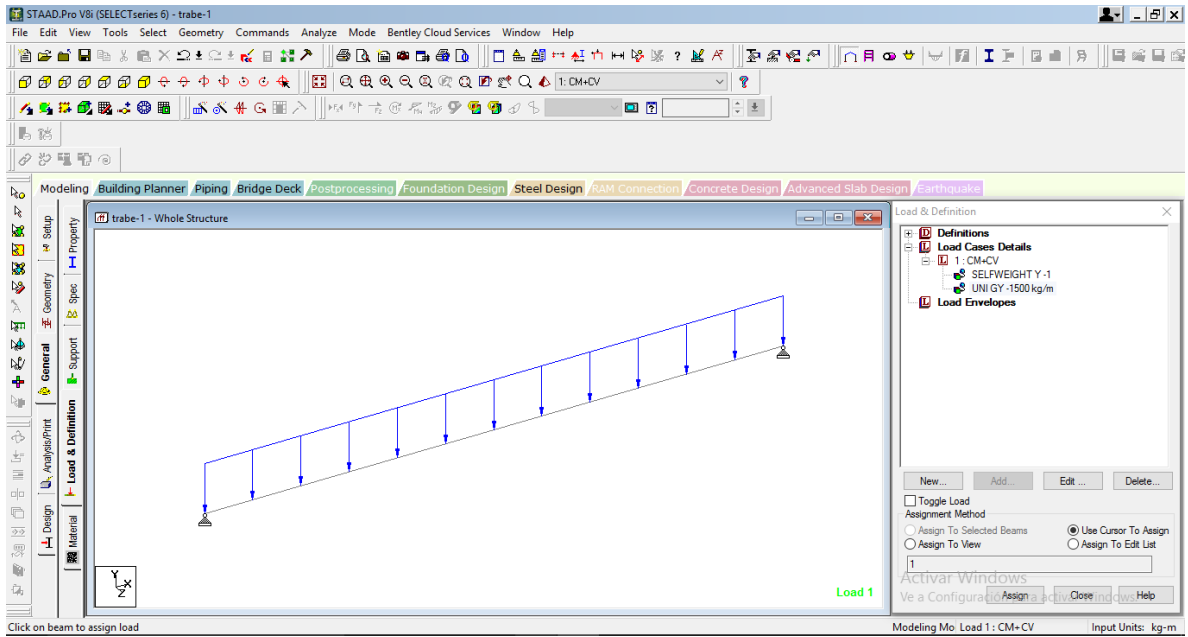
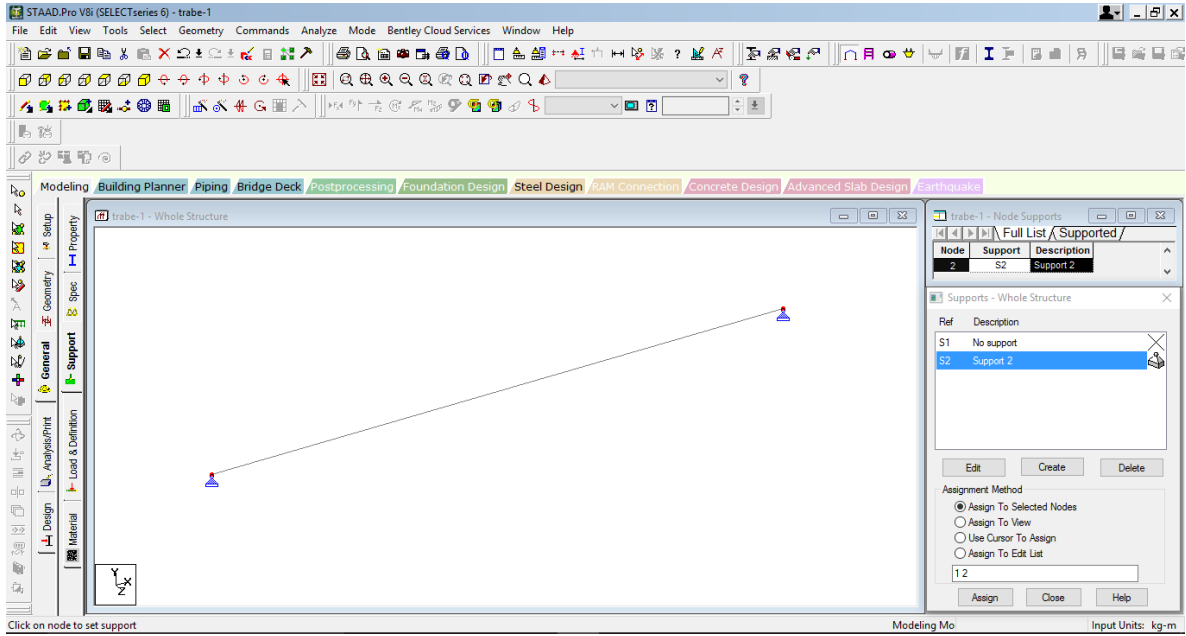
**NOMBRE DEL TRABAJO:** EXAMEN 2 UNIDAD

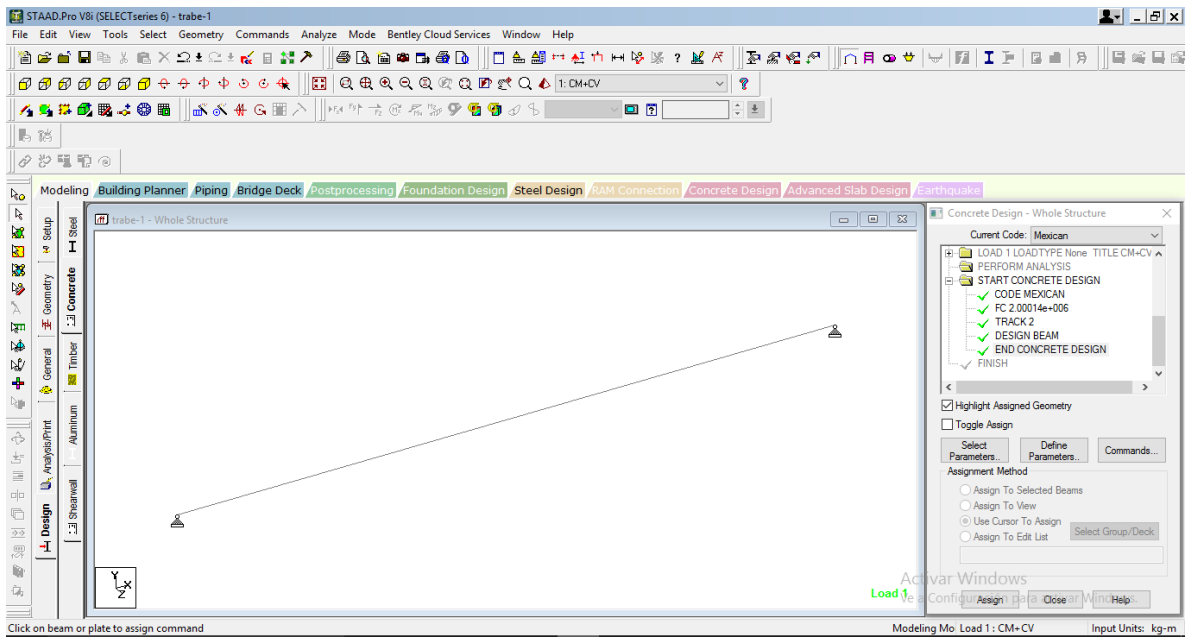
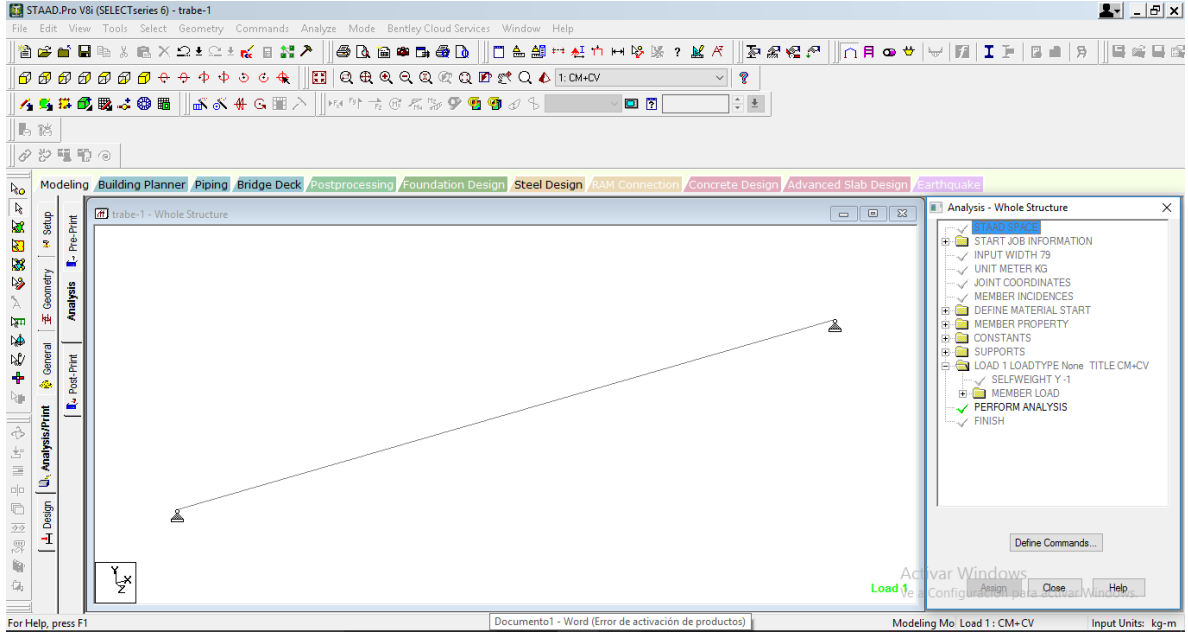
**LICENCIATURA EN ARQUITECTURA**

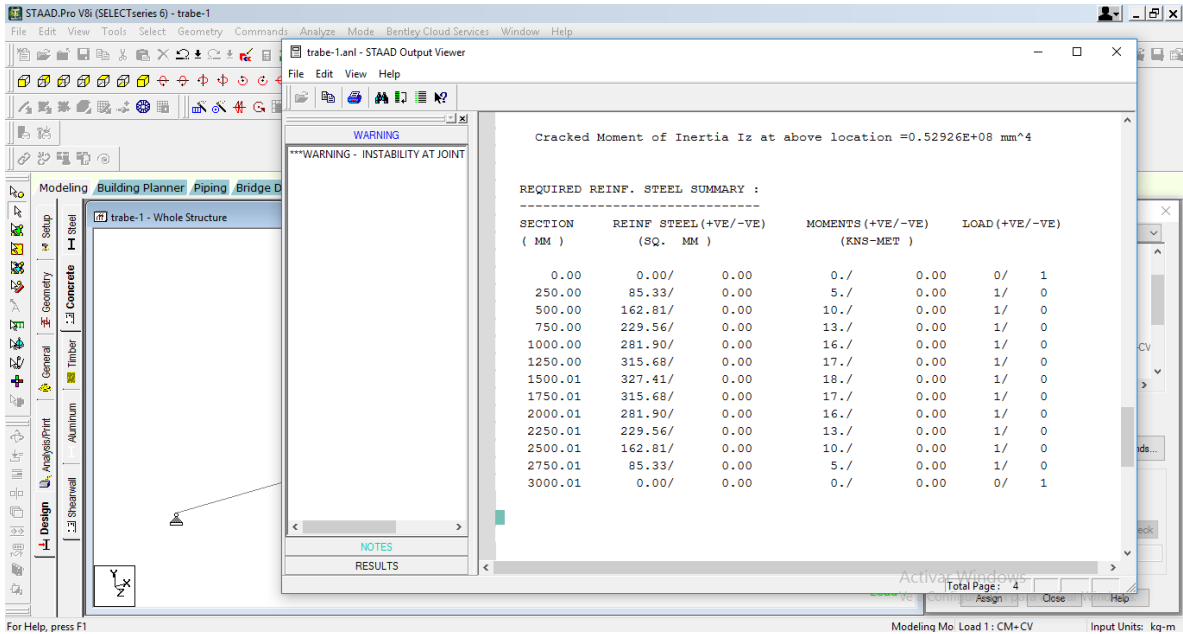
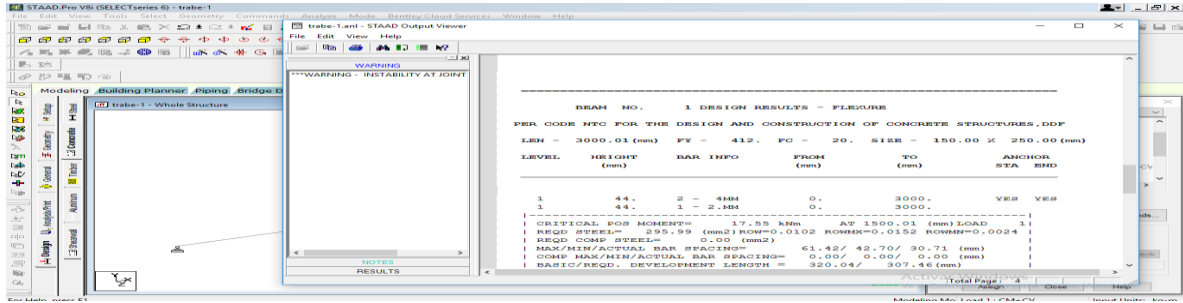
**18 DE ENERO DEL 2021**

# Trabe 1









For Help, press F1

Modeling Mo Load 1: CM+CV

Input Units: Kq-m



## Trabe 2

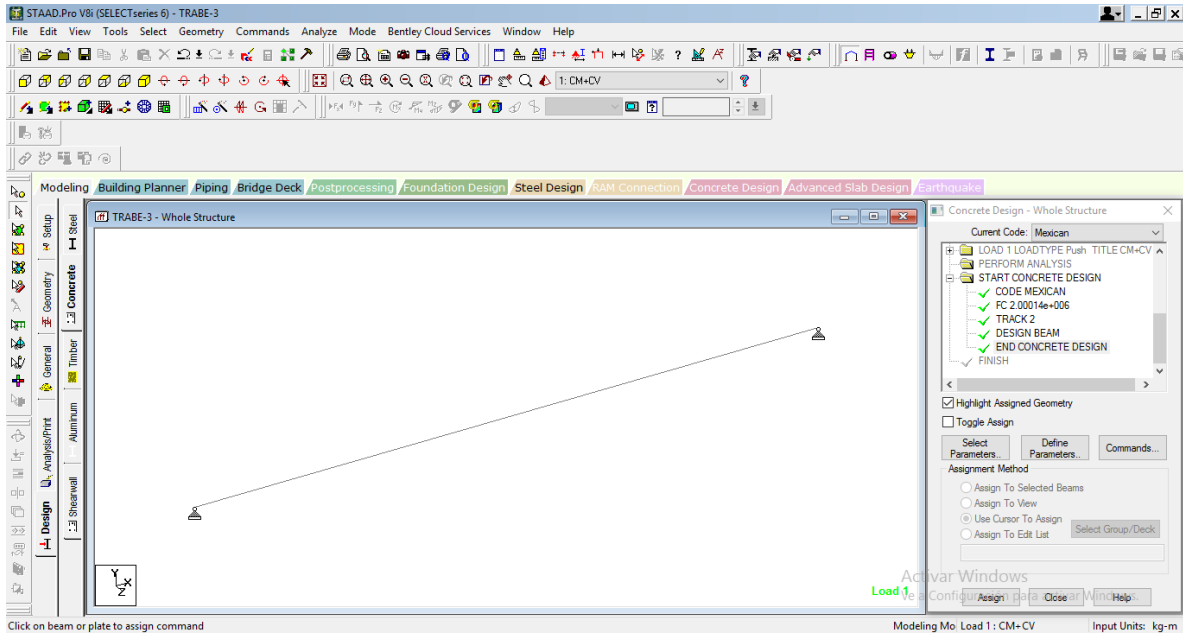
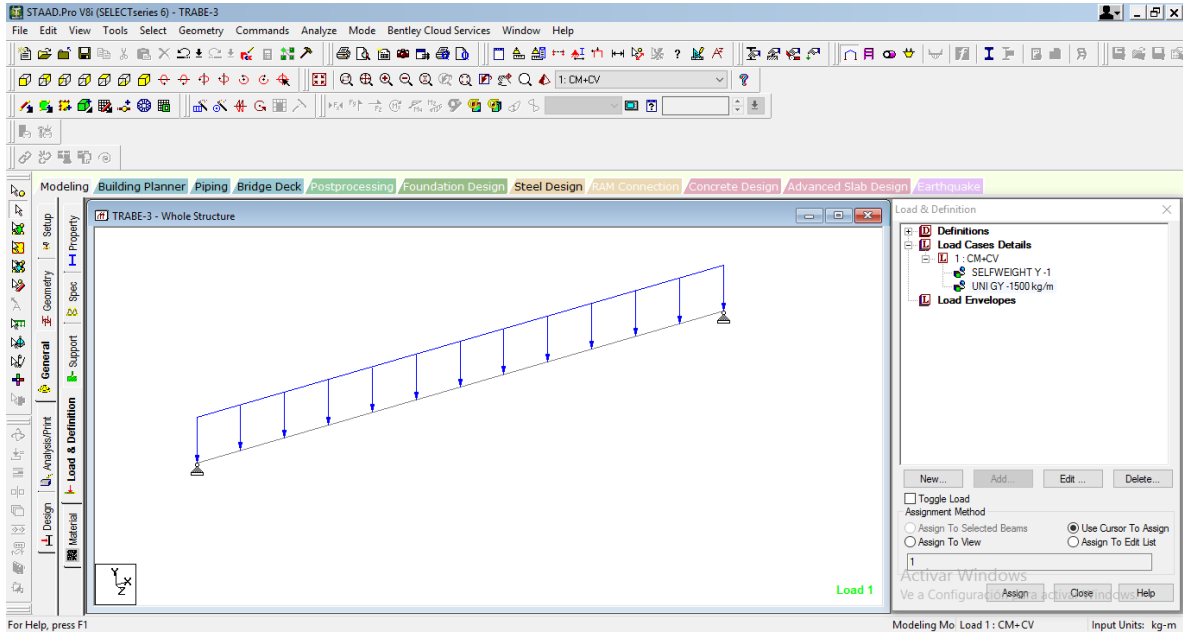
Change to the normal cursor (for selecting beams)

Node	X m	Y m	Z m
1	0.000	3.000	0.000
2	2.670	3.000	0.000
3	0.000	3.000	0.000

Beam	Node A	Node B	Property Refn.
1	1	2	
2	1	3	

For Help, press F1

Section	Material
1 Rect 8.66x5.91	CONCRETE





STAAD.Pro V8i (SELECTseries 6) - TRABE-3

TRABE-3 anl - STAAD Output Viewer

File Edit View Help

STAAD SPACE -- PAGE NO. 3

WARNING

\*\*\*WARNING - INSTABILITY AT JOINT

BEAM NO. 1 DESIGN RESULTS - FLEJURE

PER CODE NTC FOR THE DESIGN AND CONSTRUCTION OF CONCRETE STRUCTURES, DDF

LEN = 2670.01 (mm) FY = 412. FC = 20. SIZE = 150.00 X 220.00 (mm)

LEVEL	HEIGHT (mm)	BAR INFO	FROM (mm)	TO (mm)	ANCHOR STA	END
1	44.	2 - 4M	0.	2670.	YES	YES

CRITICAL POS MOMENT = 13.80 kNm AT 1335.01 (mm) LOAD 1

REQD STEEL = 247.92 (mm<sup>2</sup>) ROW = 0.0094 ROWM = 0.0152 ROWMN = 0.0017

REQD COMP STEEL = 0.00 (mm<sup>2</sup>)

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/ 312.37 (mm)

Cracked Moment of Inertia I<sub>z</sub> at above location = 0.38023E+08 mm<sup>4</sup>

NOTES

RESULTS

Total Page: 4

Design Earthquake

Concrete Design - Whole Structure

Current Code: Mexican

- LOAD 1 LOADTYPE Push 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

Assign Group/Deck

Acivar Windows

Load 1 Configure Assign Data Close Min Help

STAAD.Pro V8i (SELECTseries 6) - TRABE-3

TRABE-3 anl - STAAD Output Viewer

File Edit View Help

WARNING

\*\*\*WARNING - INSTABILITY AT JOINT

Cracked Moment of Inertia I<sub>z</sub> at above location = 0.38023E+08 mm<sup>4</sup>

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
222.50	73.18/	0.00	4./	0.00 1/ 0
445.00	139.12/	0.00	8./	0.00 1/ 0
667.50	195.43/	0.00	10./	0.00 1/ 0
890.00	239.16/	0.00	12./	0.00 1/ 0
1112.50	267.14/	0.00	13./	0.00 1/ 0
1335.01	276.80/	0.00	14./	0.00 1/ 0
1557.51	267.14/	0.00	13./	0.00 1/ 0
1780.01	239.16/	0.00	12./	0.00 1/ 0
2002.51	195.43/	0.00	10./	0.00 1/ 0
2225.01	139.12/	0.00	8./	0.00 1/ 0
2447.51	73.18/	0.00	4./	0.00 1/ 0
2670.01	0.00/	0.00	0./	0.00 0/ 1

BEAM NO. 1 DESIGN RESULTS - SHEAR

17.0000 SUPPOR... THE = 0.04 KN MET = 0.00 KN MET = 0.00 KN

NOTES

RESULTS

Total Page: 4

Design Earthquake

Concrete Design - Whole Structure

Current Code: Mexican

- LOAD 1 LOADTYPE Push 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

Assign Group/Deck

Acivar Windows

Load 1 Configure Assign Data Close Min Help

For Help, press F1

Modeling Mo: Load 1: CM+CV

Input Units: kg-m

### Trabe 3

The screenshot displays the STAAD.Pro V8i (SELECTseries 6) - TRABE-4 software interface. The main window shows a 2D beam model with a coordinate system (X, Y, Z) at the bottom left. The beam is represented by a single line segment connecting two nodes. The software interface includes a menu bar (File, Edit, View, Tools, Select, Geometry, Commands, Analyze, Mode, Bentley Cloud Services, Window, Help), a toolbar, and a ribbon with various design modules (Modeling, Building Planner, Piping, Bridge Deck, Postprocessing, Foundation Design, Steel Design, AAM Connection, Concrete Design, Advanced Slab Design, Earthquake).

On the right side, there are two data tables:

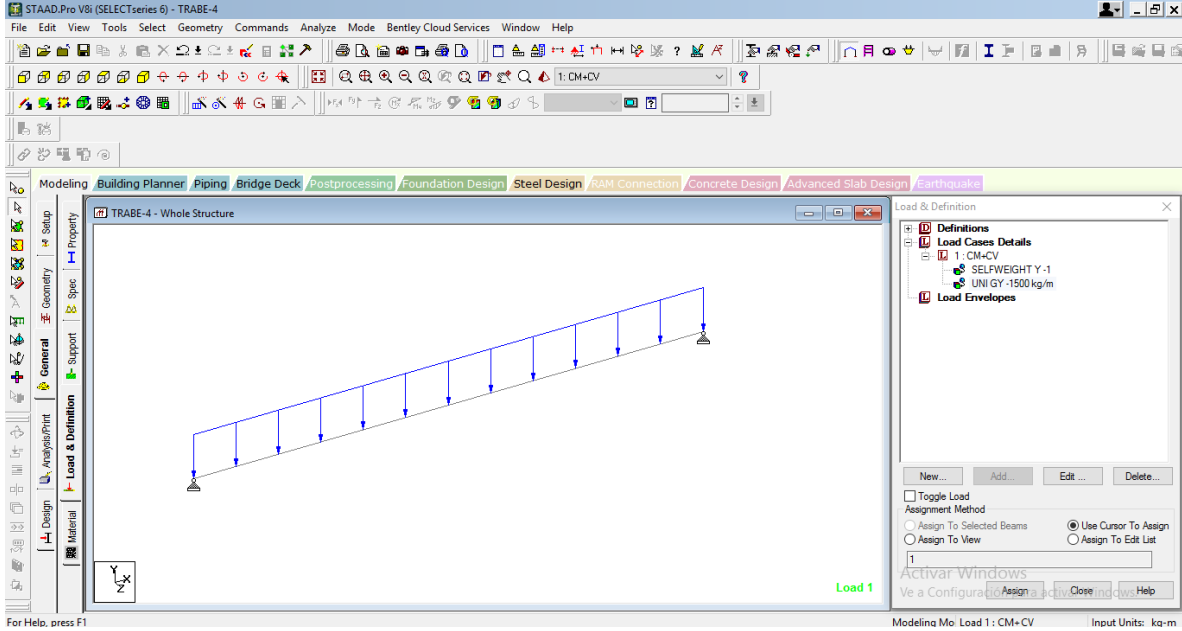
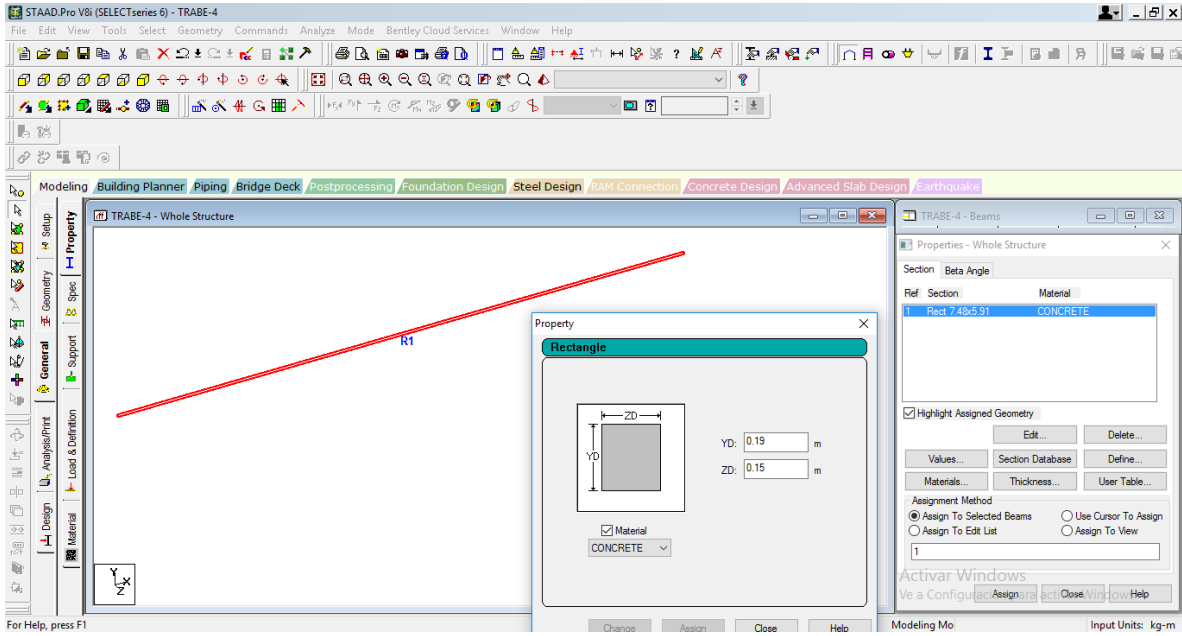
**TRABE-4 - Nodes**

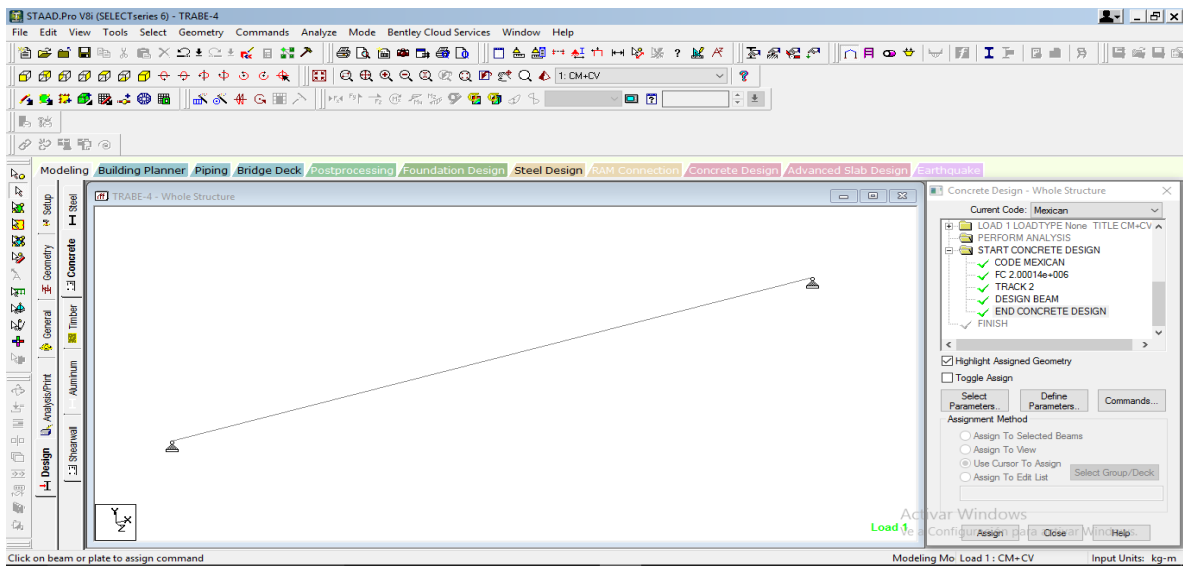
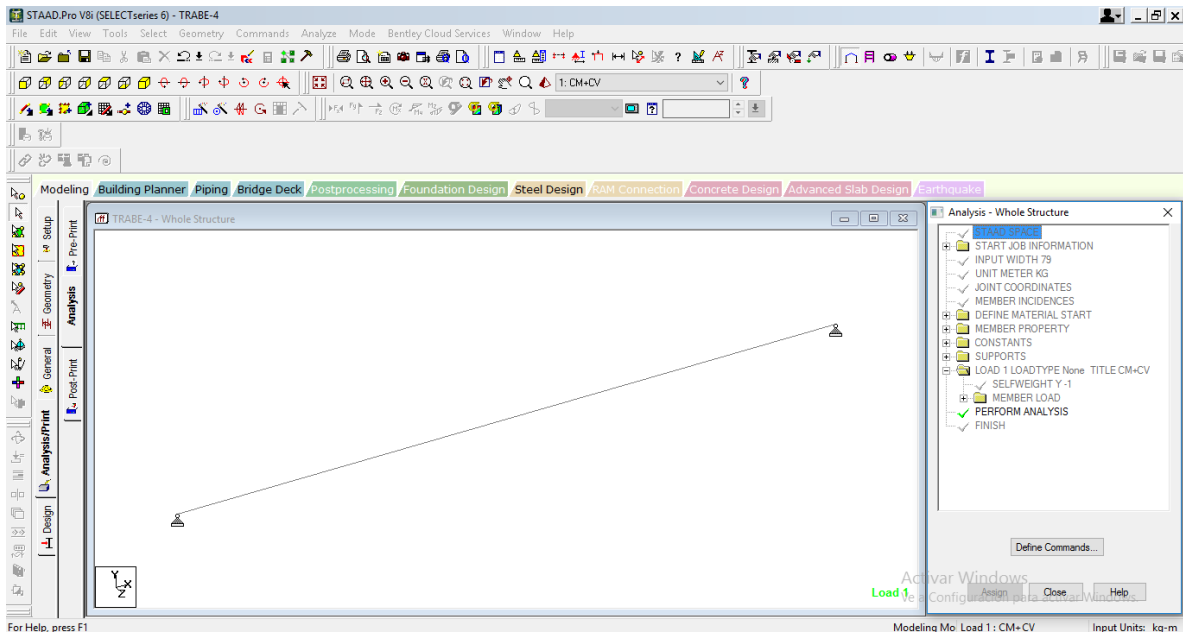
Node	X m	Y m	Z m
1	0.000	3.000	0.000
2	2.370	3.000	0.000
3			

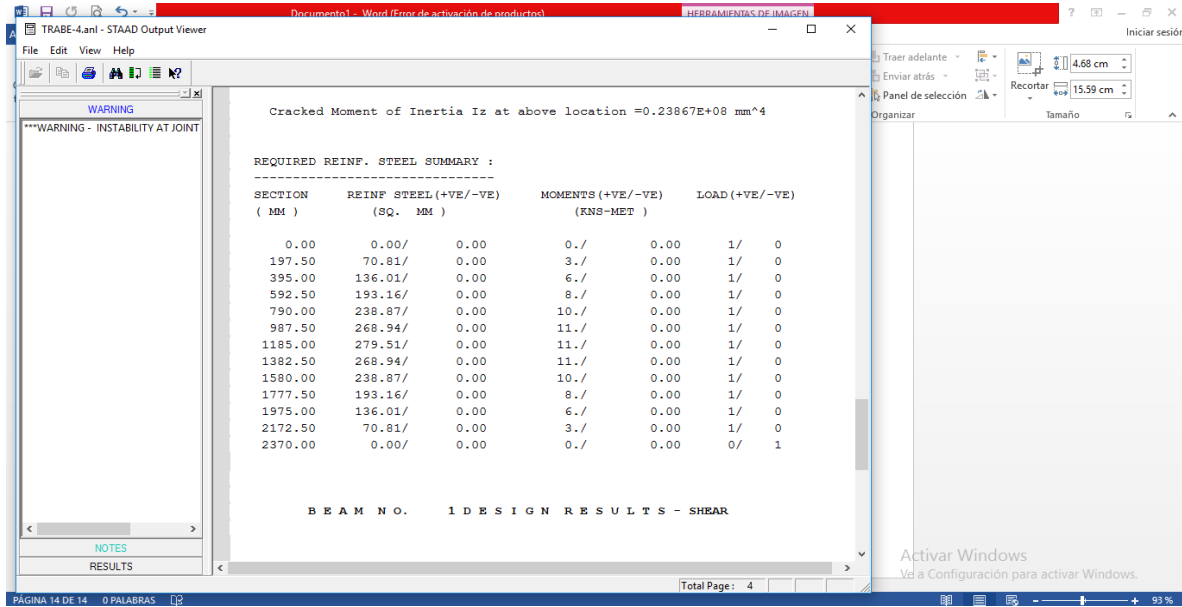
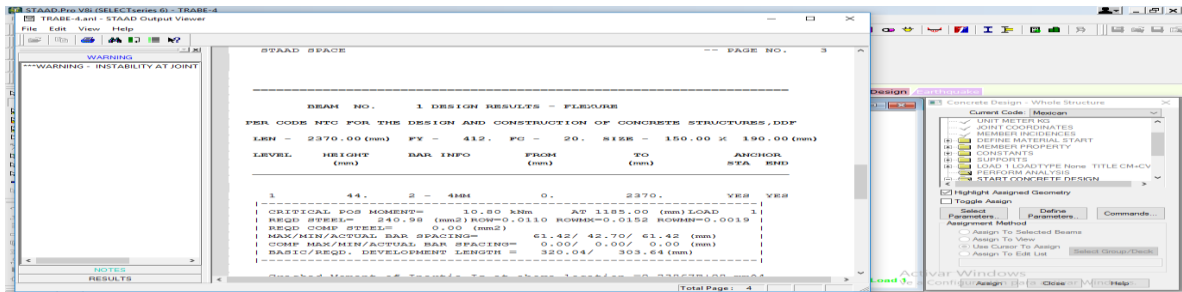
**TRABE-4 - Beams**

Beam	Node A	Node B	Property Ref.
1	1	2	
2			

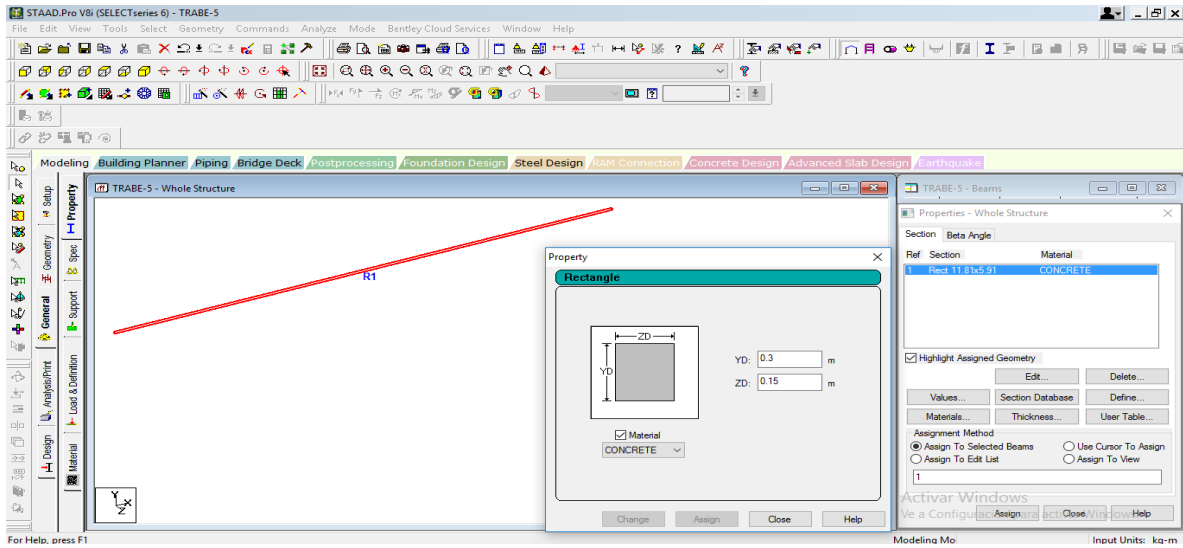
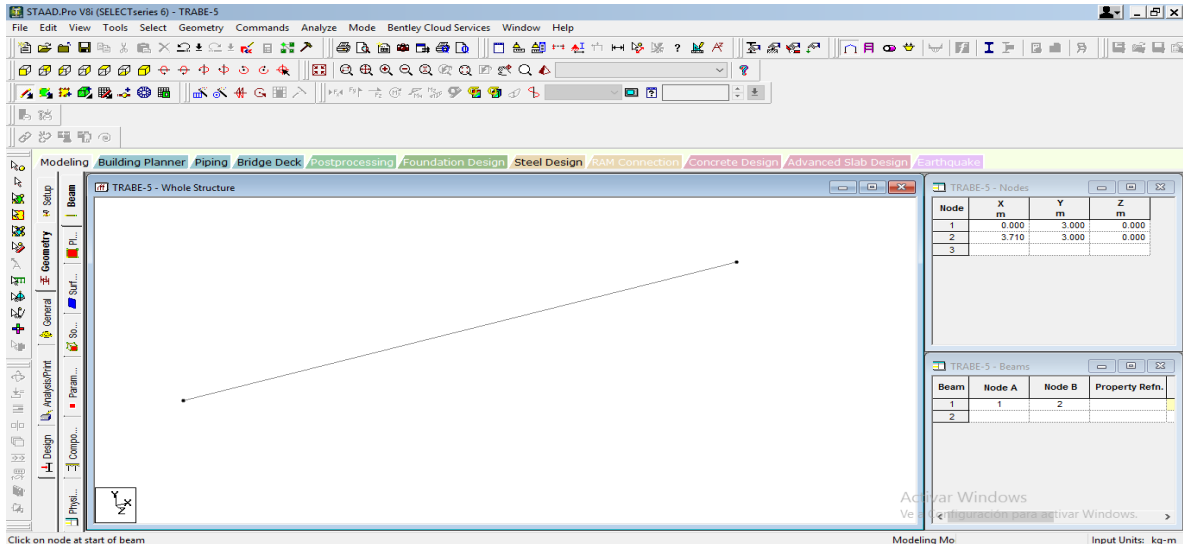
At the bottom of the interface, there is a status bar with the text "Click on node at start of beam", "Modeling Mo", and "Input Units: kg-m".

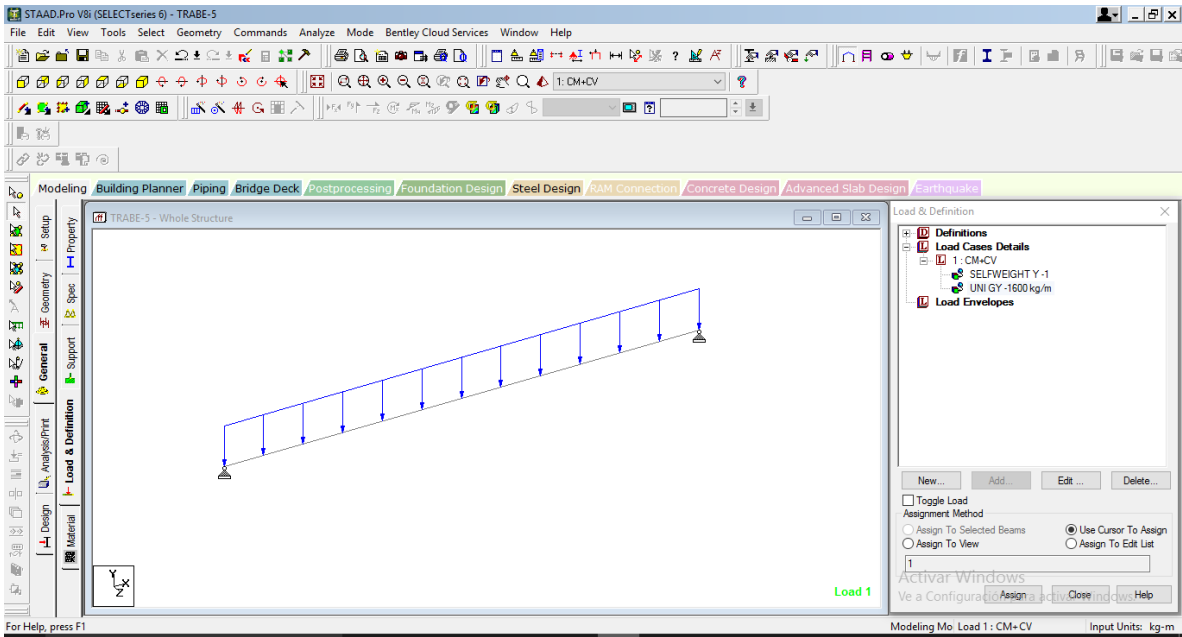
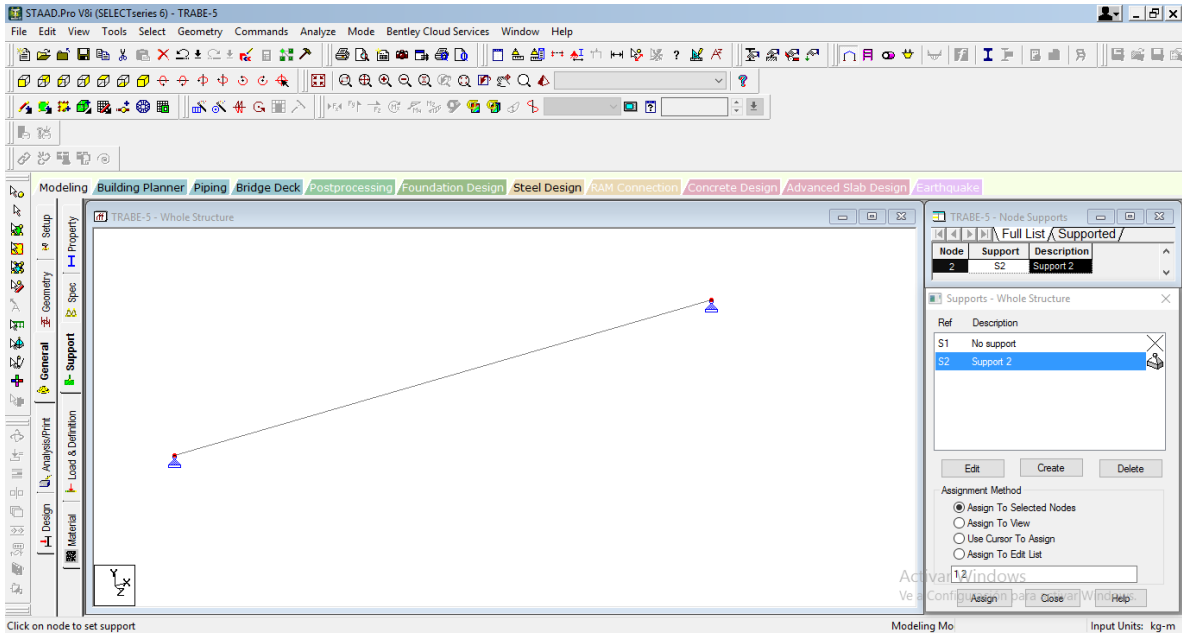


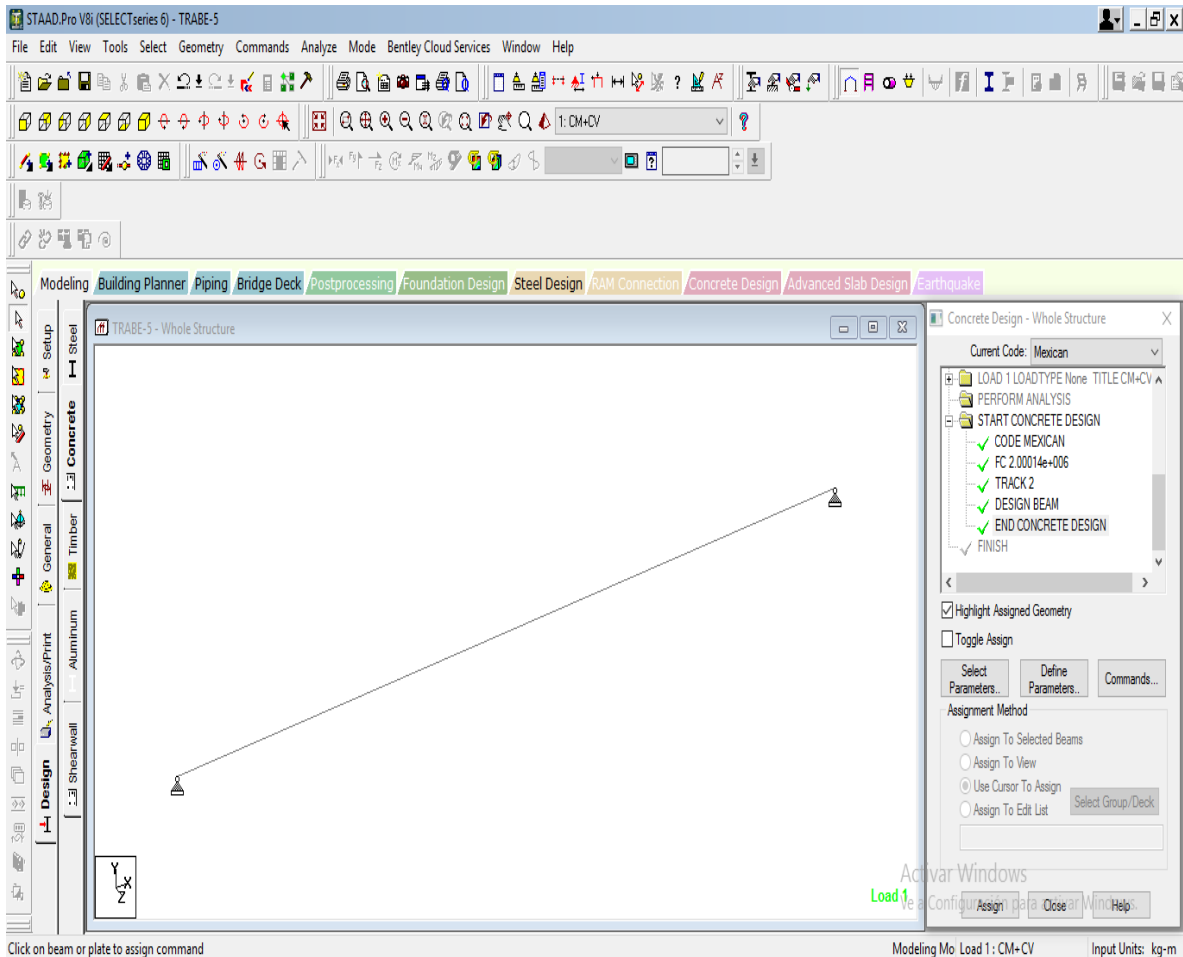
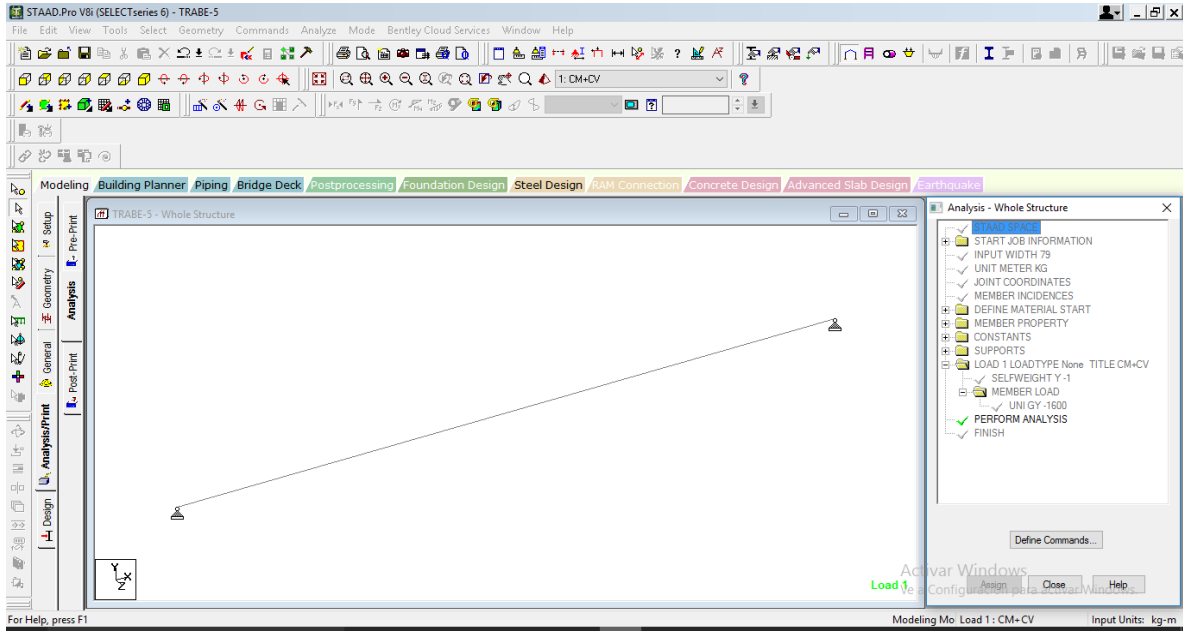




Trabe 4









STAAD.Pro V8i (SELECTseries 6) - TRABE-5  
 TRABE-5.anl - STAAD Output Viewer

STAAD SPACE -- PAGE NO. 3

WARNING  
 \*\*\*WARNING - INSTABILITY AT JOINT

BEAM NO. 1 DESIGN RESULTS - FLEURE

PER CODE NTC FOR THE DESIGN AND CONSTRUCTION OF CONCRETE STRUCTURES, DDF

LEN - 3710.01 (mm) FY - 412. FC - 20. SIZE - 150.00 X 300.00 (mm)

LEVEL	HEIGHT (mm)	BAR INFO	FROM (mm)	TO (mm)	ANCHOR STA	END
1	44.	3 - 4M	0.	3699.	YES	NO

CRITICAL POS MOMENT= 28.82 kNm AT 1855.01 (mm) LOAD 1  
 REQD STEEL= 354.74 (mm<sup>2</sup>) ROW=0.0092 ROWX=0.0152 ROWM=0.0015  
 REQD COMP STEEL= 0.00 (mm<sup>2</sup>)  
 MAX/MIN/ACTUAL BAR SPACING= 61.42/ 42.70/ 30.71 (mm)  
 COMP MAX/MIN/ACTUAL BAR SPACING= 0.00/ 0.00/ 0.00 (mm)  
 BASIC/REQD. DEVELOPMENT LENGTH = 320.04/ 297.98 (mm)

NOTES  
 RESULTS

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

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

Activar Windows  
 Load 1... Config... Assign... para... Close... Min... Help...

Total Page: 4

STAAD.Pro V8i (SELECTseries 6) - TRABE-5  
 TRABE-5.anl - STAAD Output Viewer

WARNING  
 \*\*\*WARNING - INSTABILITY AT JOINT

Cracked Moment of Inertia  $I_z$  at above location =  $0.12654E+09 \text{ mm}^4$

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
309.17	102.19/ 0.00	9./ 0.00	1/ 0
618.34	193.65/ 0.00	16./ 0.00	1/ 0
927.50	271.12/ 0.00	22./ 0.00	1/ 0
1236.67	330.77/ 0.00	26./ 0.00	1/ 0
1545.84	368.66/ 0.00	28./ 0.00	1/ 0
1855.01	381.69/ 0.00	29./ 0.00	1/ 0
2164.17	368.66/ 0.00	28./ 0.00	1/ 0
2473.34	330.77/ 0.00	26./ 0.00	1/ 0
2782.51	271.12/ 0.00	22./ 0.00	1/ 0
3091.68	193.65/ 0.00	16./ 0.00	1/ 0
3400.84	102.20/ 0.00	9./ 0.00	1/ 0
3710.01	0.00/ 0.00	0./ 0.00	0/ 1

BEAM NO. 1 DESIGN RESULTS - SHEAR

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

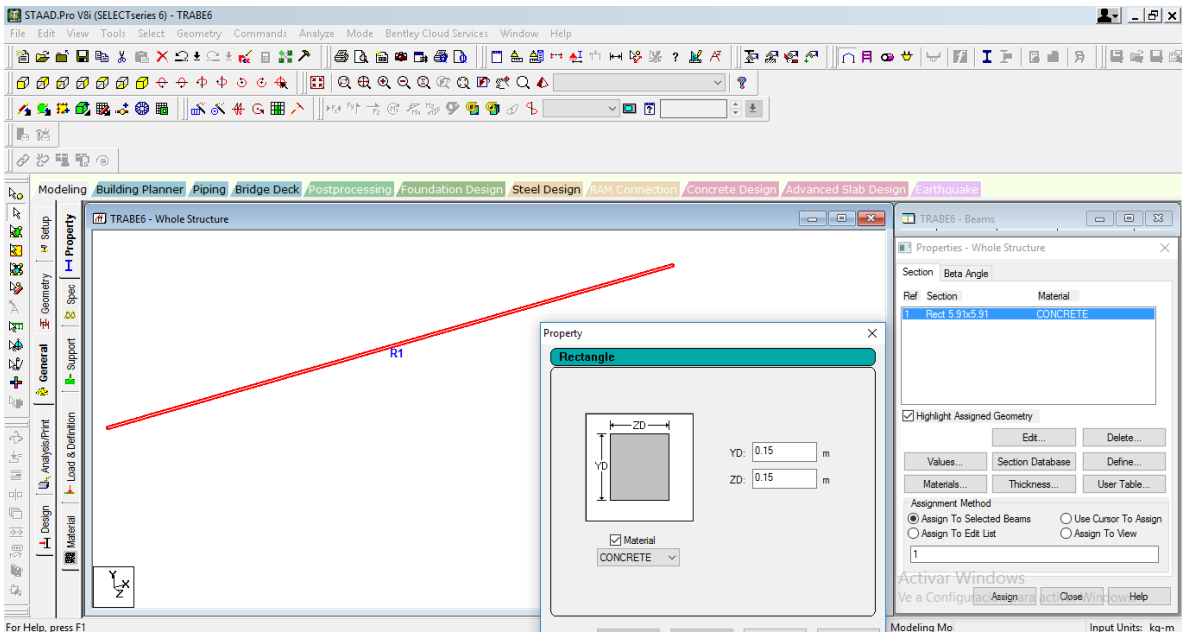
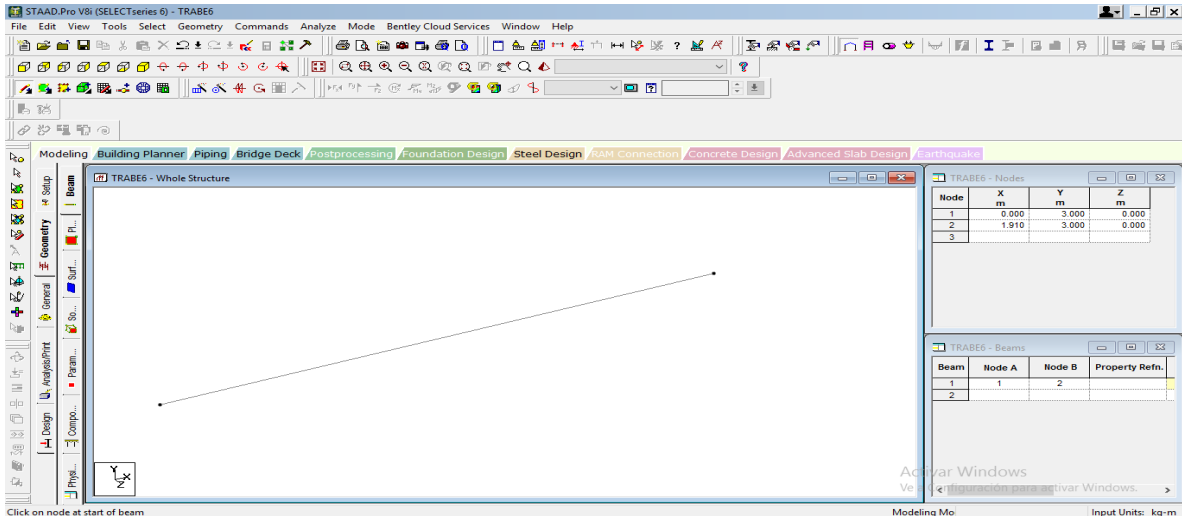
Highlight Assigned Geometry  
 Toggle Assign  
 Select Parameters... Define Parameters... Commands...  
 Assignment Method  
 Assign To Selected Beams  
 Assign To View  
 Use Cursor To Assign  
 Assign To Edit List

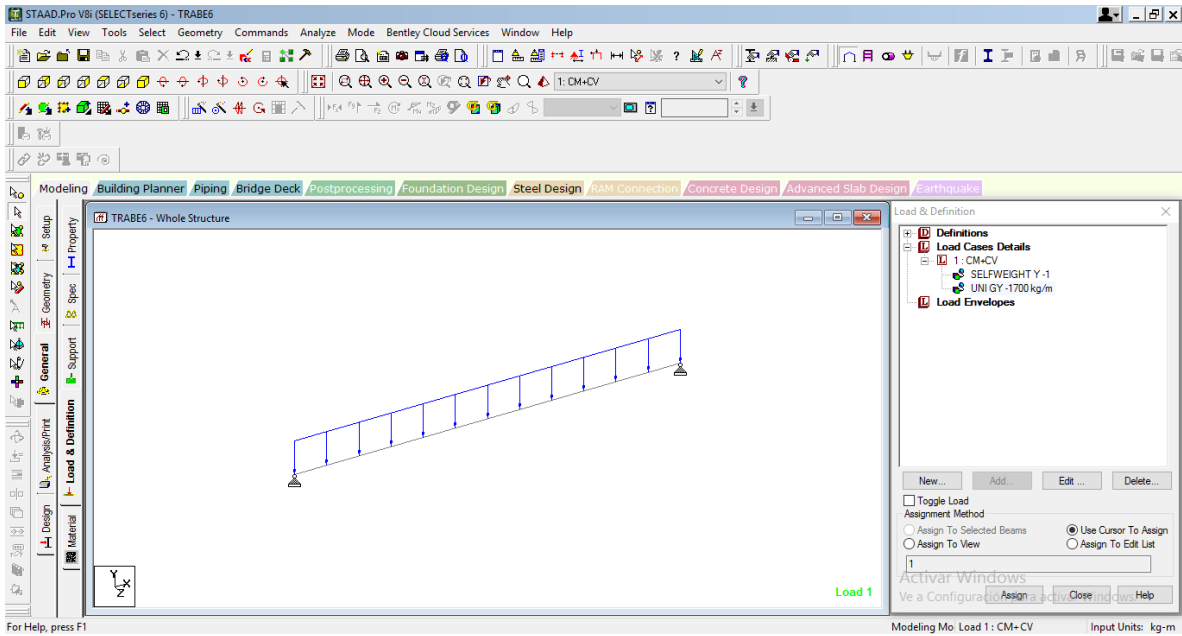
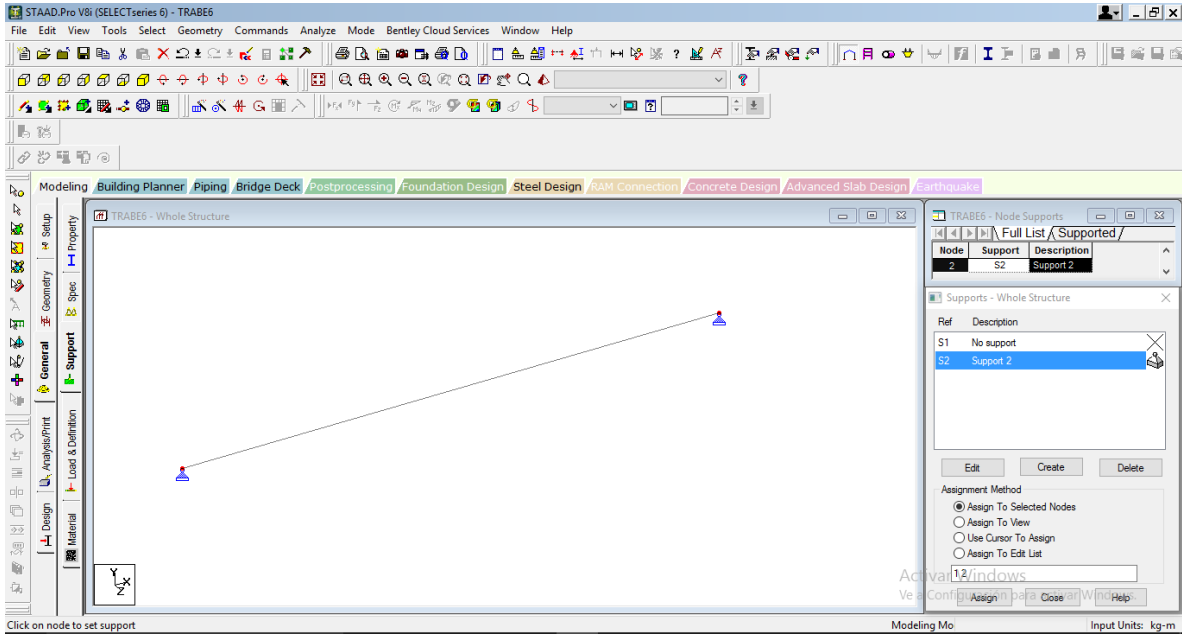
Activar Windows  
 Load 1... Config... Assign... para... Close... Min... Help...

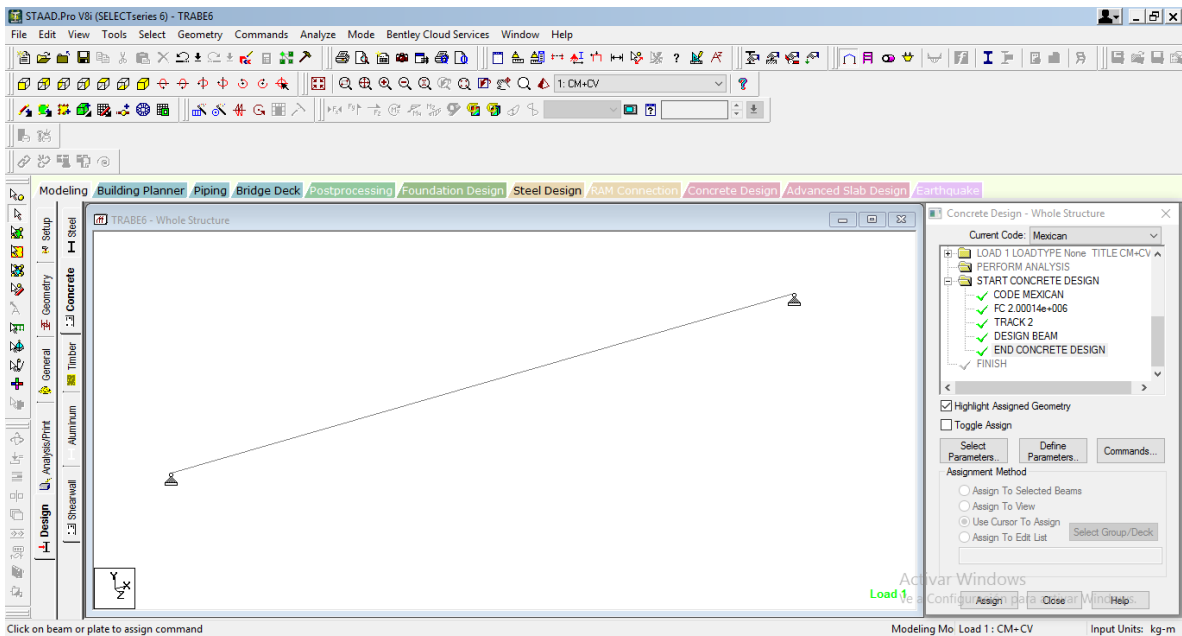
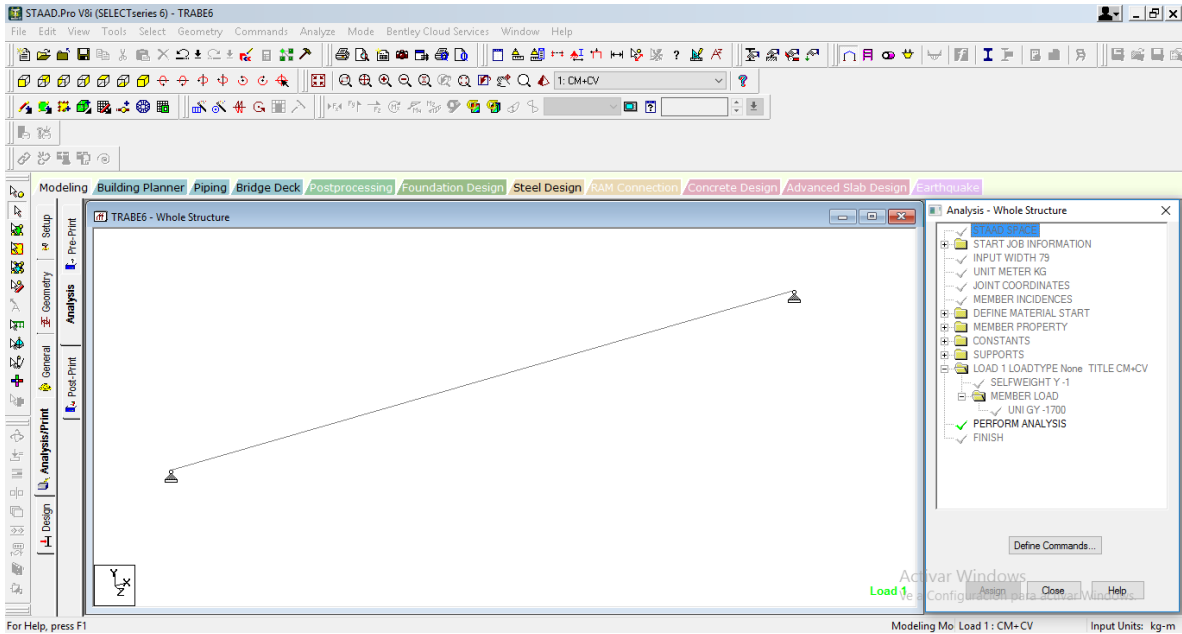
Total Page: 4

For Help, press F1  
 Modeling Mo. Load 1: CM+CV  
 Input Units: kg-m

# Trabe 5







STAAD.Pro V8i (SELECTseries 6) - TRABE6

TRABE6.anl - STAAD Output Viewer

File Edit View Help

WARNING

\*\*\*WARNING - INSTABILITY AT JOINT

32. START CONCRETE DESIGN  
 33. CODE MEXICAN  
 34. FC 2.00014E+006 ALL  
 35. TRACK 2 ALL  
 36. DESIGN BEAM 1

-----< PAGE 2 Ends Here >-----

STAAD SPACE -- PAGE NO. 3

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BEAM NO. 1 DESIGN RESULTS - FLEGURE

PER CODE NTC FOR THE DESIGN AND CONSTRUCTION OF CONCRETE STRUCTURES, DDF

LEN = 1910.00 (mm) FY = 412. FC = 20. SIZE = 150.00 X 150.00 (mm)

LEVEL	HEIGHT (mm)	BAR INFO	FROM (mm)	TO (mm)	ANCHOR STA	END

\*\*\* BAR SIZE CAN NOT BE MATCHED TO MEET ALL REQUIREMENTS.  
 REQD. STEEL = \*\*\*\*\* . MAX. STEEL PERMISSIBLE = \*\*\*\*\*  
 MAX POS MOMENT = 7.84 kNm LOADING 1

NOTES

RESULTS

Total Page: 4

Concrete Design - Whole Structure

Current Code: Mexcan

- 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

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

Acivar Windows

Load 1: Config Assign Close Min/Help

Modeling Mo. Load 1: CM+CV Input Units: kg-m

STAAD.Pro V8i (SELECTseries 6) - TRABE6

TRABE6.anl - STAAD Output Viewer

File Edit View Help

WARNING

\*\*\*WARNING - INSTABILITY AT JOINT

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
159.17	50.56/ 0.00	2./ 0.00	1/ 0
318.33	88.72/ 0.00	4./ 0.00	1/ 0
477.50	123.02/ 0.00	6./ 0.00	1/ 0
636.67	148.83/ 0.00	7./ 0.00	1/ 0
795.83	164.92/ 0.00	8./ 0.00	1/ 0
955.00	170.40/ 0.00	8./ 0.00	1/ 0
1114.17	164.92/ 0.00	8./ 0.00	1/ 0
1273.33	148.83/ 0.00	7./ 0.00	1/ 0
1432.50	123.02/ 0.00	6./ 0.00	1/ 0
1591.67	88.72/ 0.00	4./ 0.00	1/ 0
1750.83	50.56/ 0.00	2./ 0.00	1/ 0
1910.00	0.00/ 0.00	0./ 0.00	0/ 1

BEAM NO. 1 DESIGN RESULTS - SHEAR

AT START 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

NOTES

RESULTS

Total Page: 4

Analysis - Whole Structure

- STAAD SPACE
- START JOB INFORMATION
- INPUT WIDTH 79
- 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
- FINISH

Define Commands...

Acivar Windows

Load 1: Config Assign Close Min/Help

Modeling Mo. Load 1: CM+CV Input Units: kg-m