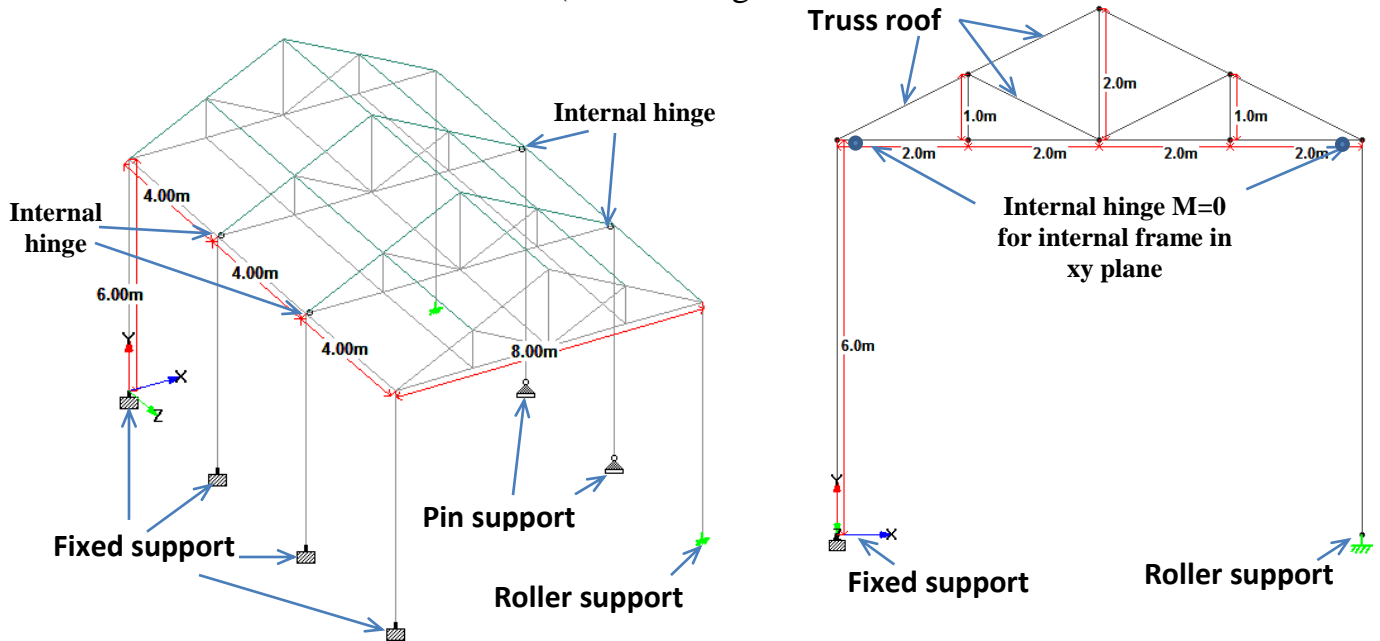


**Example 2 (Steel Frame Structure Modeling)**

According to STAAD-Pro V8i software, sketch the idealization of Steel frame structure with truss roof (inclined angle sections only) shown below

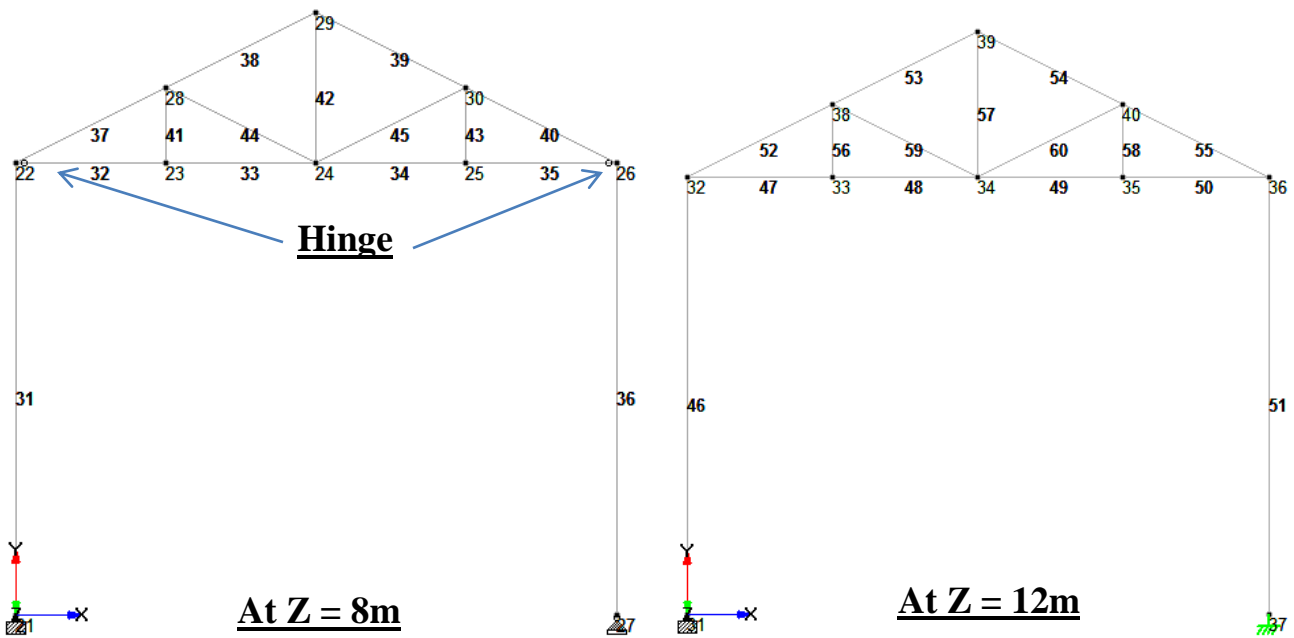
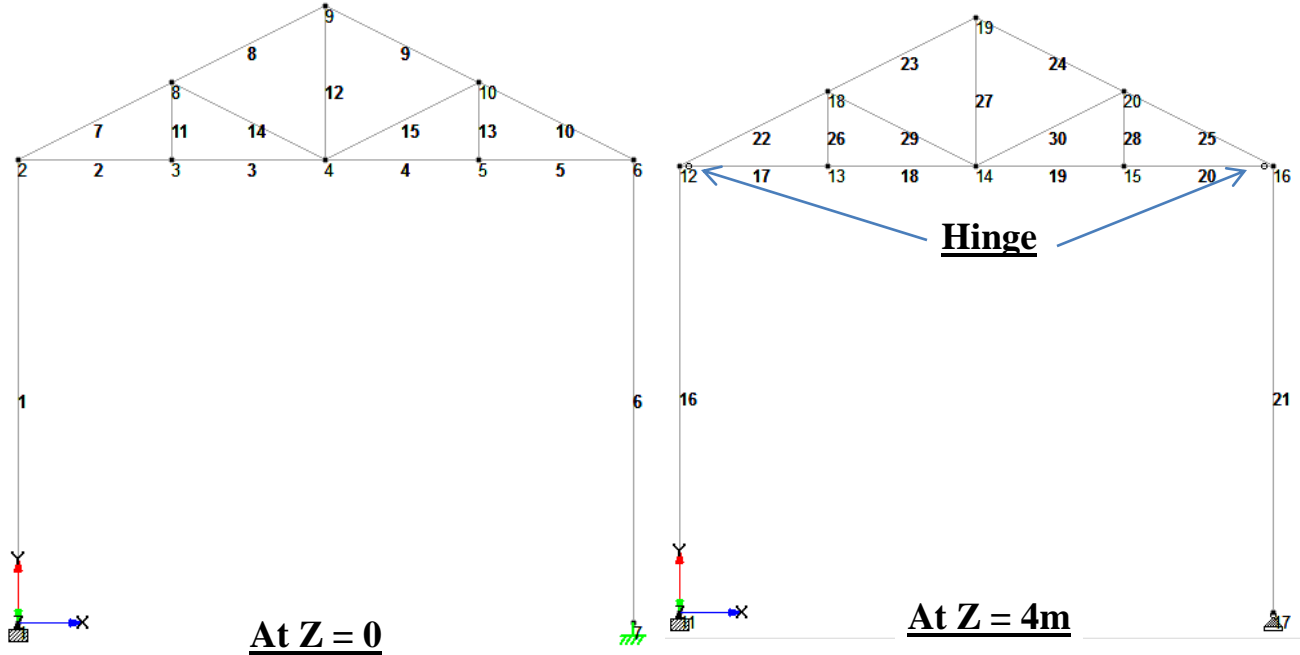


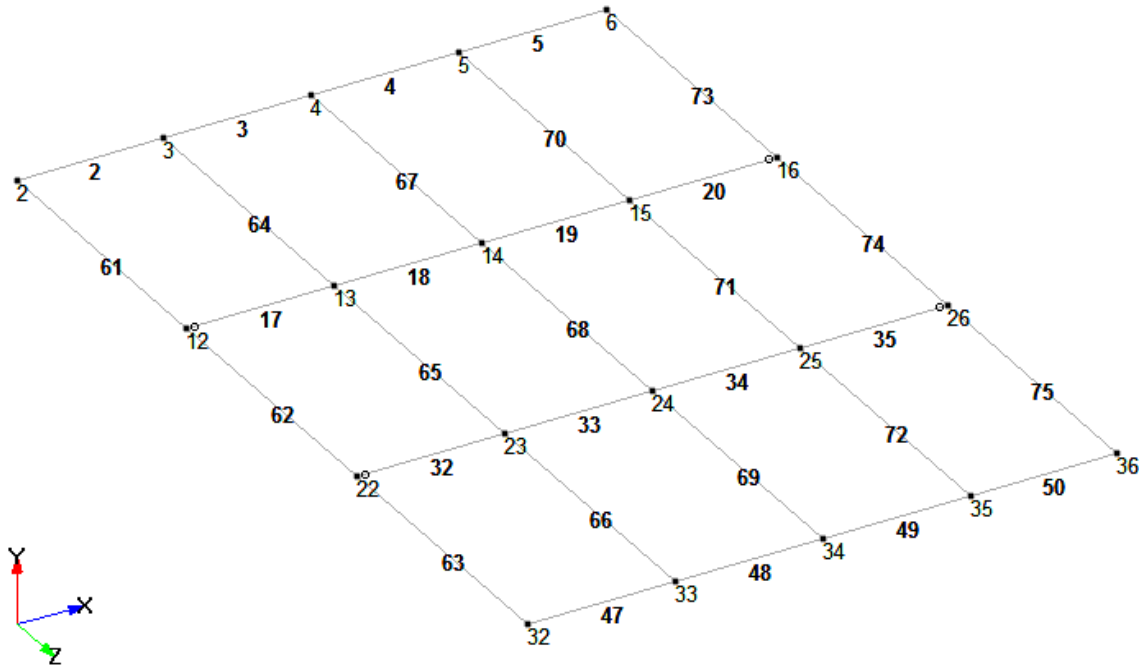
( x- 4bays @ 2m at level y = 6m, y- 2story @ 6m & 2m, z- 3bay @ 5m)

Edit the **modeling** commands of steel frame structure, where steel member section as follows:

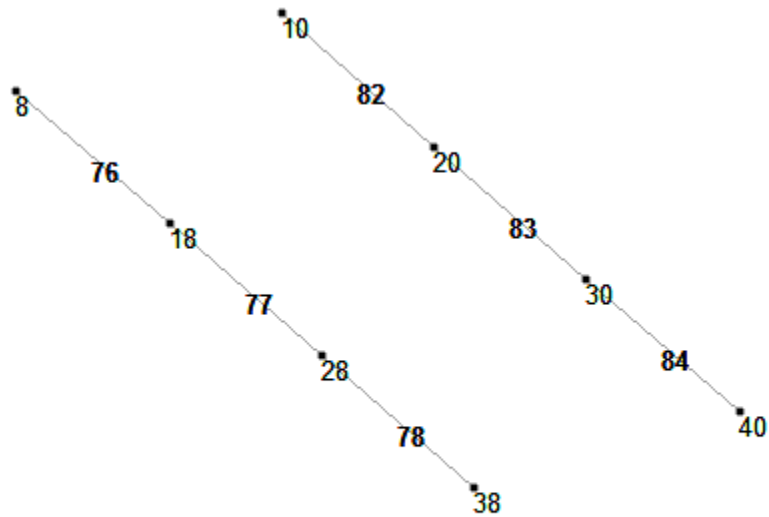
1. Frame columns W6X15
2. Truss frame (vertical C8X13)
3. Horizontal in x and z direction W8X21 at level y = 6m)
4. Horizontal in z direction double C10X30 at level y = 7m and y = 8m)
5. External inclined double angle L3X2X3/16)
6. Internal inclined angle L2.5X2X3/8)
7. Roof thickness 3cm

**SOLUTION:**  
**Frame Idealizations (Beams and Columns)**

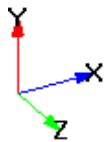
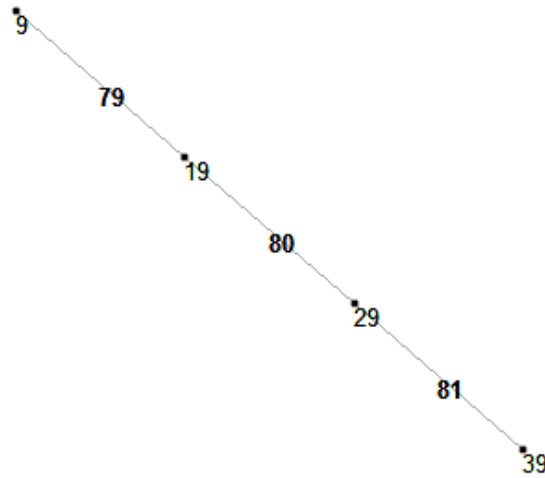




**At y = 6m**

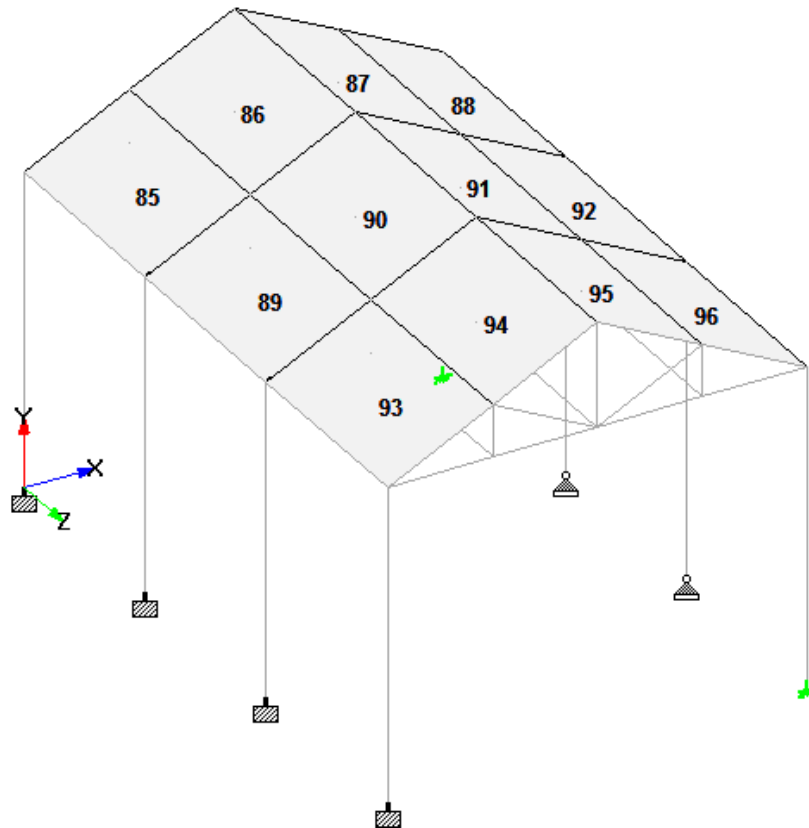


**At y = 7m**



At y = 8m

**Frame Idealizations (Plates)**



## STAAD-Pro Solution Editor

**STAAD SPACE** steel frame modeling by Prof. Dr. Nabeel Al-Bayati

**UNIT METER KN**

\*\*\*\*\*

\*Node numbering and define the coordinates of each node

**JOINT COORDINATES**

1 0 0 0  
2 0 6 0 6 8 6 0  
7 8 0 0  
8 2 7 0; 9 4 8 0; 10 6 7 0  
**REP ALL 3 0 0 4**

\*\*\*\*\*

\*Numbering of Members and connected each member by two nodes

**MEMBER INCIDENCES**

1 1 2  
2 2 3 5  
6 6 7  
7 2 8; 8 8 9 9; 10 10 6  
11 3 8 13  
14 4 8; 15 4 10  
**REP ALL 3 15 10**  
61 2 12 63 1 10  
**REP 3 3 1**  
76 8 18 78 1 10  
**REP 2 3 1**

\*\*\*\*\*

\*Plate element numbering

**ELEMENT INCIDENCES**

85 2 8 18 12  
86 8 9 19 18 to 87  
88 10 6 16 20  
**REP ALL 2 4 10**

\*\*\*\*\*

\*Define Beam & columns sections dimensions

**MEMBER PROPERTY**

1 TO 46 BY 15 6 TO 51 BY 15 TABLE ST W6X15  
2 TO 5 17 TO 20 32 TO 35 47 TO 50 61 TO 75 TABLE ST W8X21  
76 TO 84 TABLE D C10X30  
11 TO 13 26 TO 28 41 TO 43 56 TO 58 TABLE ST C8X13  
7 TO 10 22 TO 25 37 TO 40 52 TO 55 TABLE LD L30203  
14 15 29 30 44 45 59 60 TABLE ST L25206

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\*\*\*\*\*

\*Define plate s section

**ELEMENT PROPERTY**

85 TO 96 THICKNESS 0.03

\*\*\*\*\*

\*Define Truss members which resisted only axial loads

**MEMBER TRUSS**

7 TO 10 14 15 22 TO 25 29 30 37 TO 40 44 45 52 TO 55 59 60

\*\*\*\*\*

**MEMBER RELEASES**

17 32 START MZ

20 35 END MZ

\*\*\*\*\*

\*Define Materials Properties

**CONSTANTS**

E STEEL ALL

DEN STEEL ALL

POI STEEL ALL

ALPHA STEEL ALL

\*\*\*\*\*

\*Define Support Type

**SUPPORTS**

1 TO 31 BY 10 FIXED

17 27 PINNED

7 37 FIXED BUT FX FZ MX MZ

FINISH