STEEL CONSTRUCTIONS

DR. SAMEIR M. HAMMAD

LECTURER OF ARCHITECTURAL ENGINEERING, BENHA FACULTY OF ENGINEERING

LECTURE CONTENT

TRUSS STRUCTURE DETAILS

- Truss
- Space Truss
- Space Frame

STEEL SECTIONS

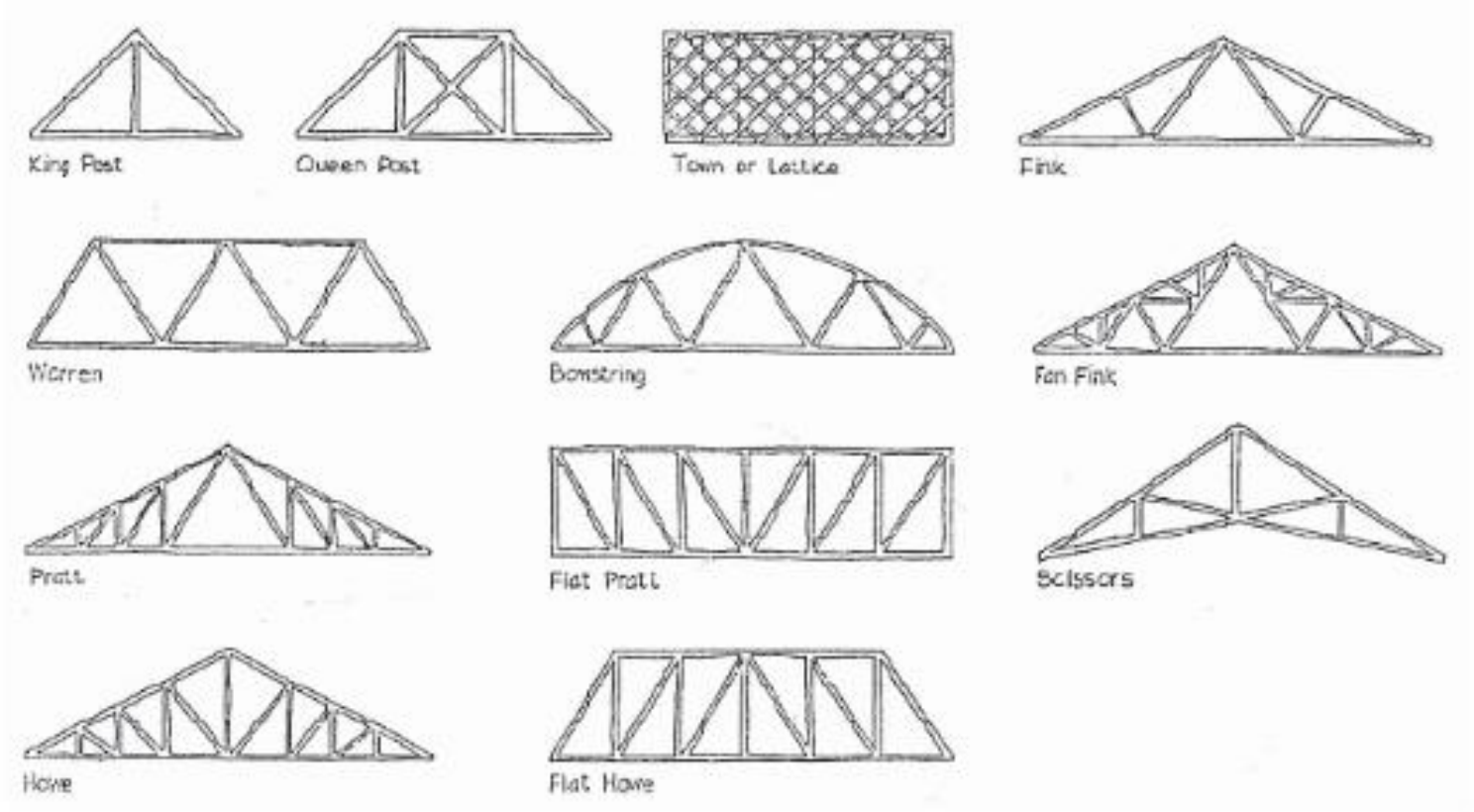
- Steel sections use in construction
- Composite Steel Members
- Fireproofing for steel members

EXAMPLES and PROJECT

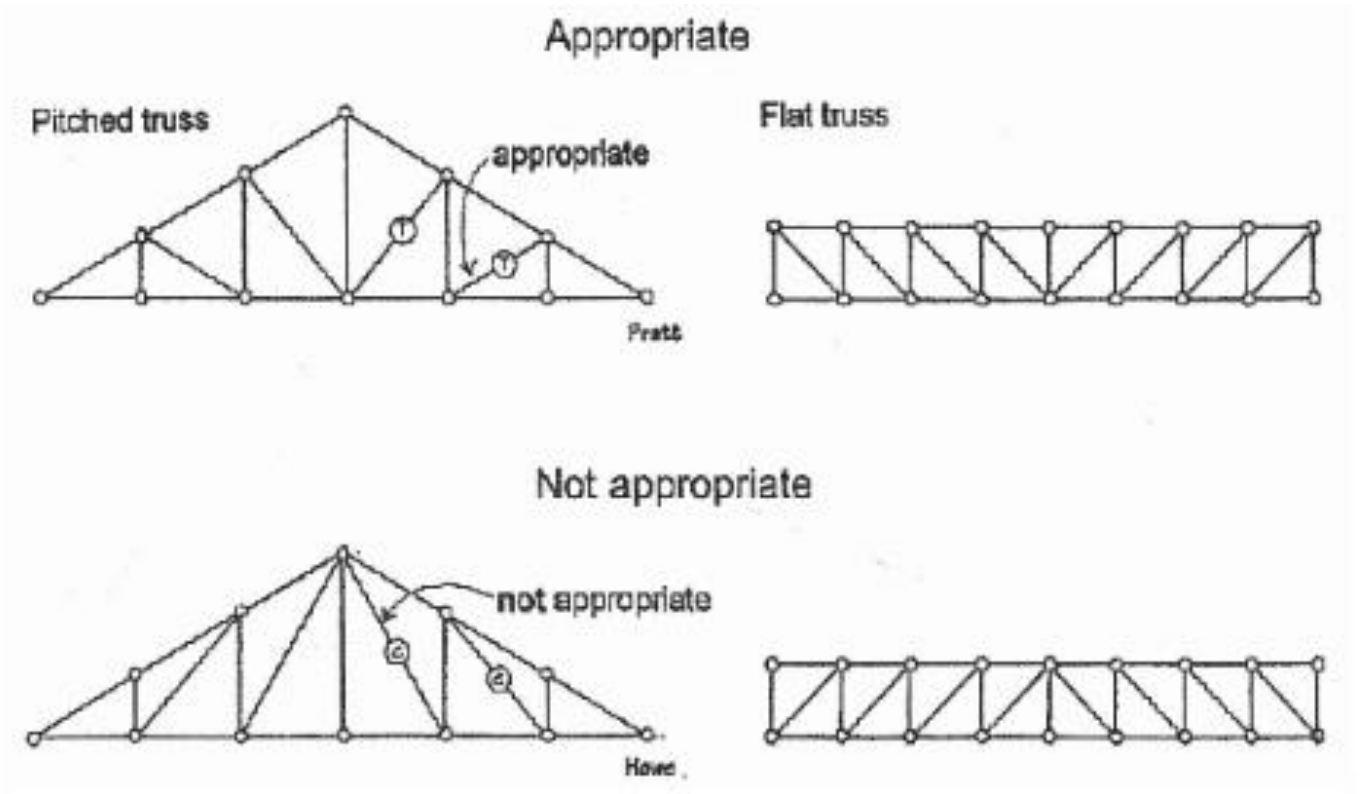
- International Projects
- Introducing Final Project

TRUSS STRUCTURES

TRUSS


King Post
Queen Post
Town or Lattice
Fink
Warren
Bowstring
Fan Fink
Pratt
Flat Pratt
Scissors
Howe
Flat Howe

TRUSS

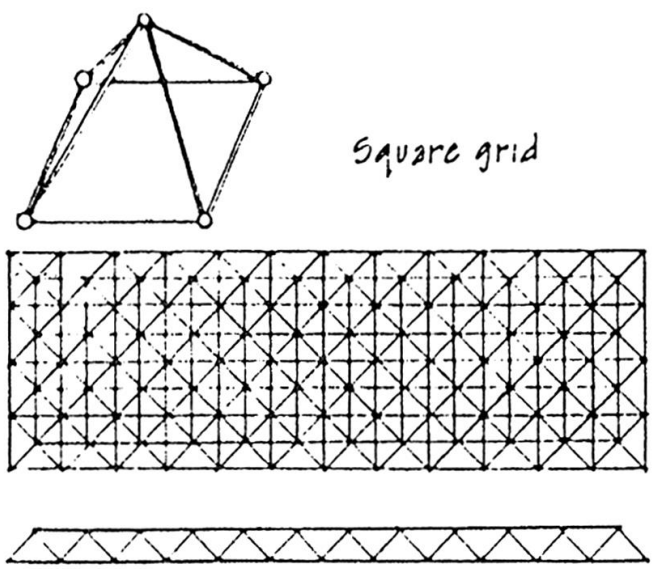

Appropriate
Pitched truss
appropriate
Pratt
Flat truss
Not appropriate
not appropriate
Howe

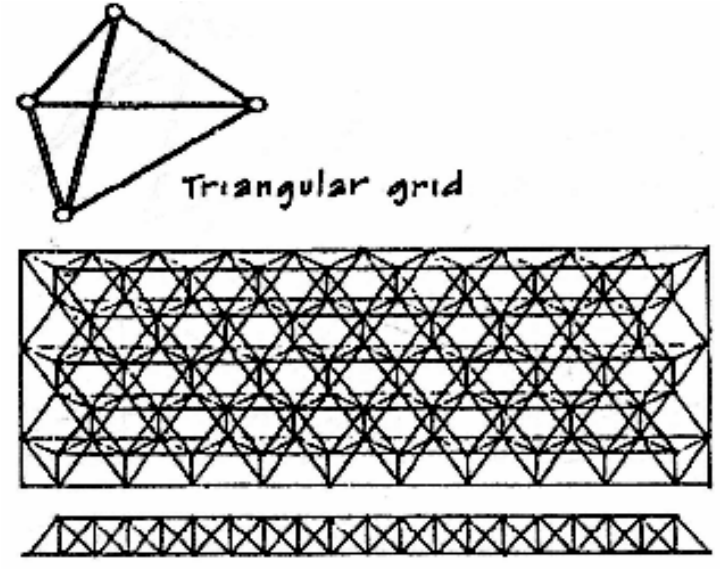
SPACE TRUSS

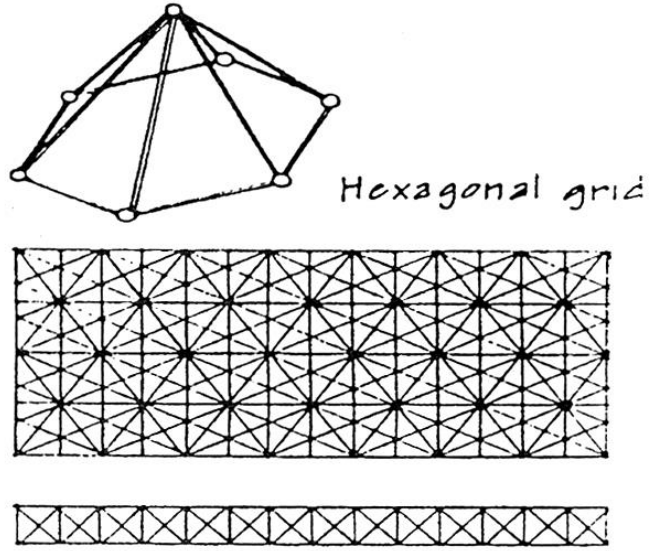
SPACE FRAME

SPACE FRAME

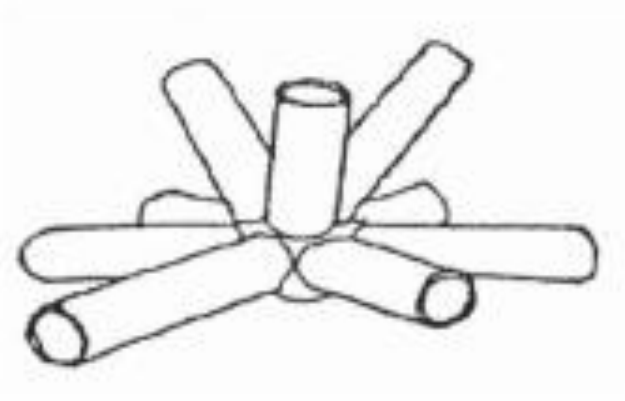
- **Space frame** is three dimension truss that all members compose in grid module to be a plane with Constance depth. Space frame can be composed in



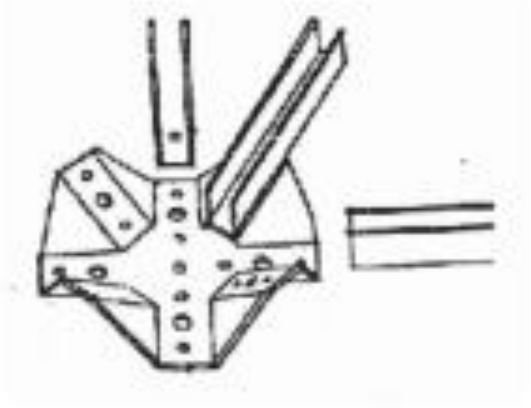




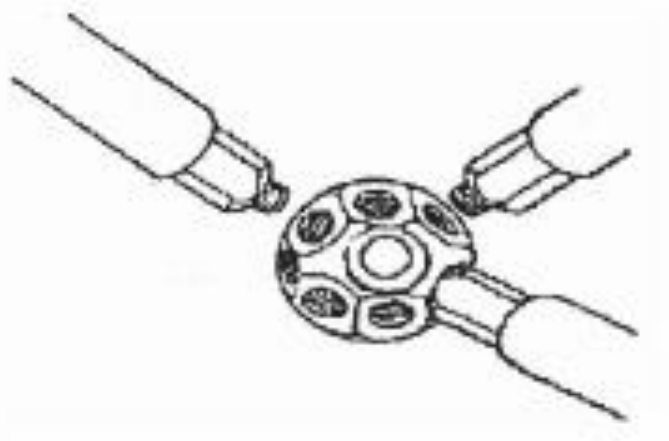
SPACE FRAME



welded

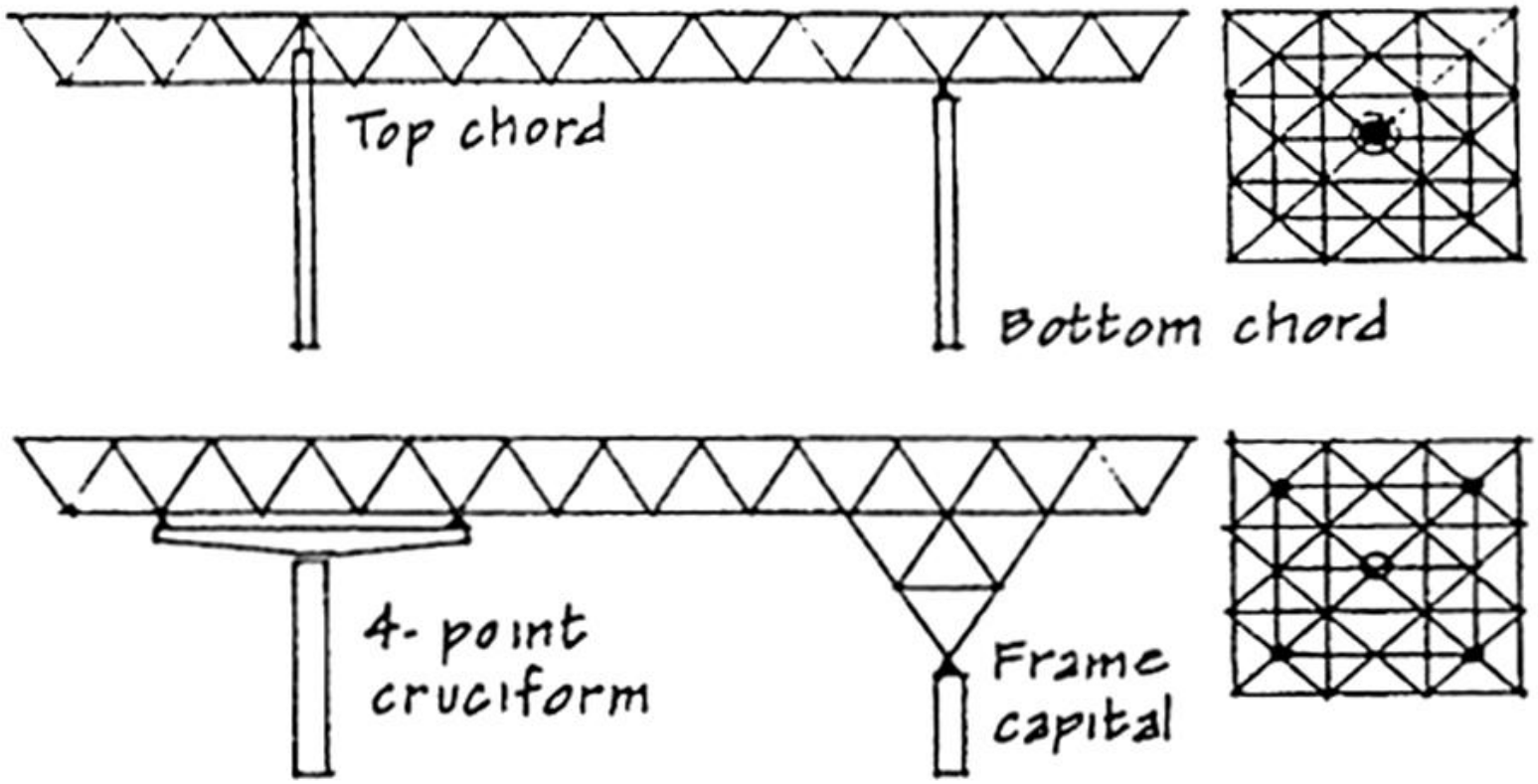


bolted

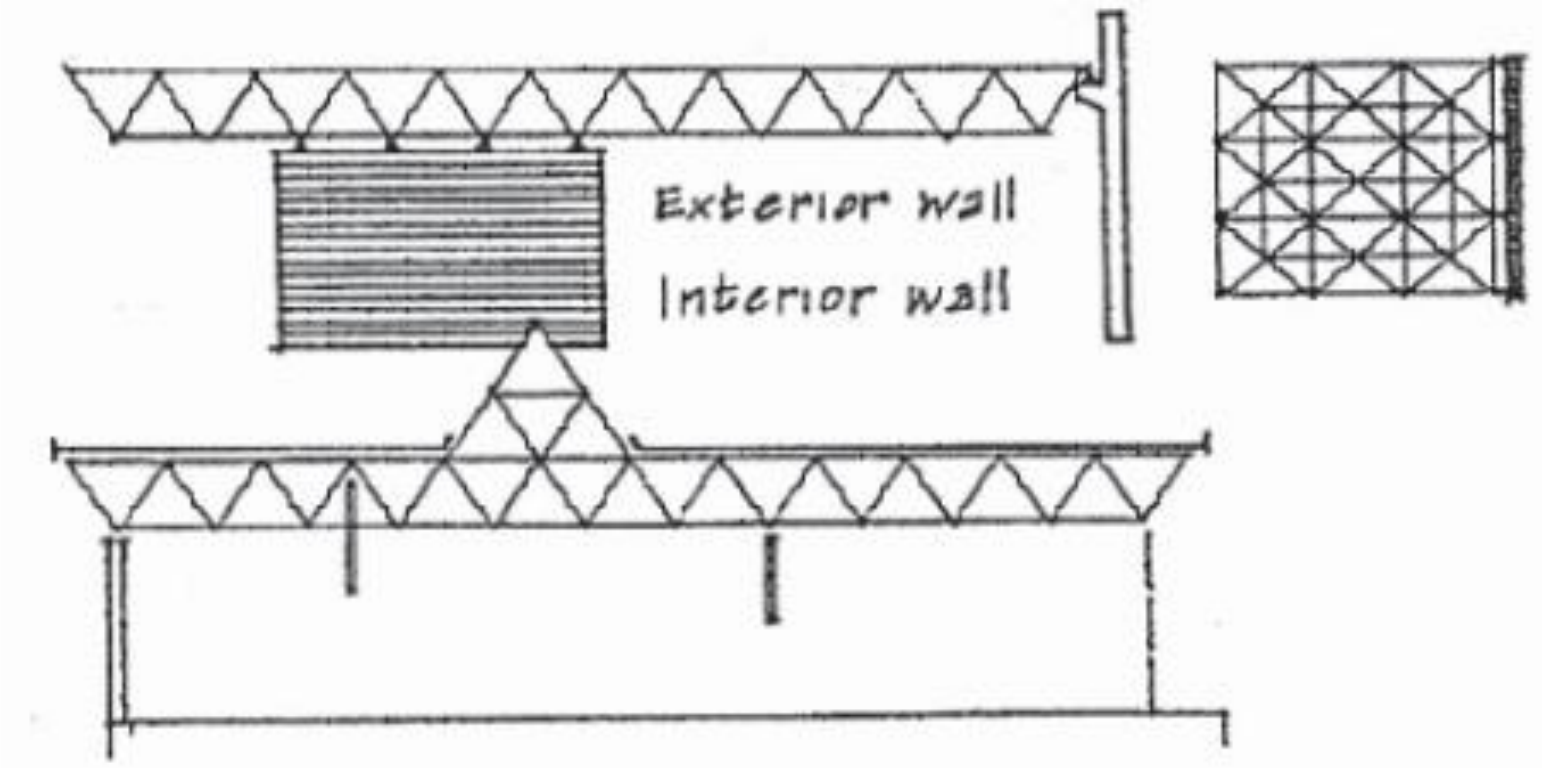


screw-in (ball joint).

SPACE FRAME



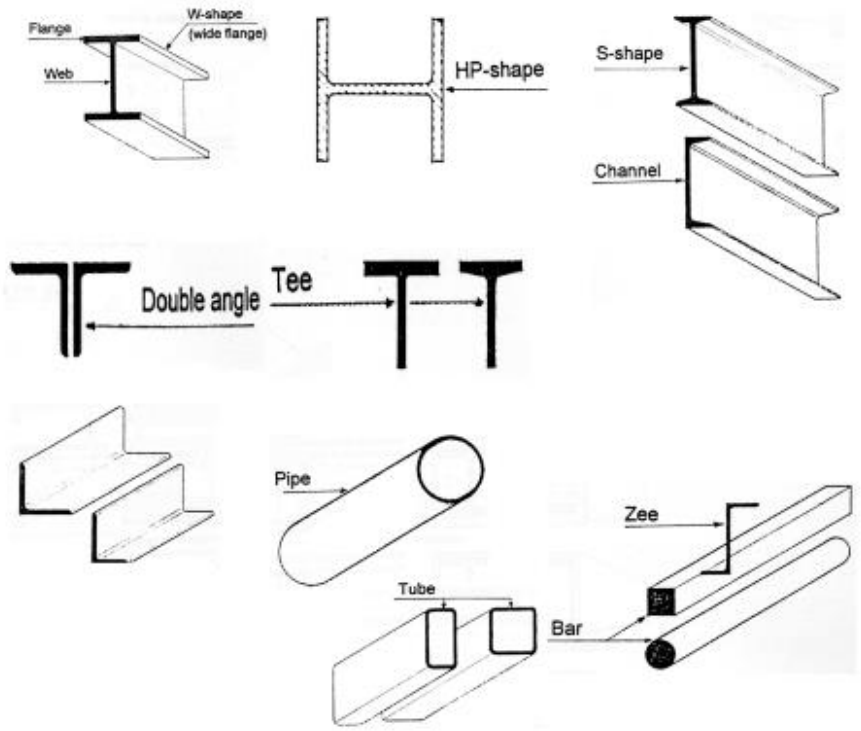
SPACE FRAME

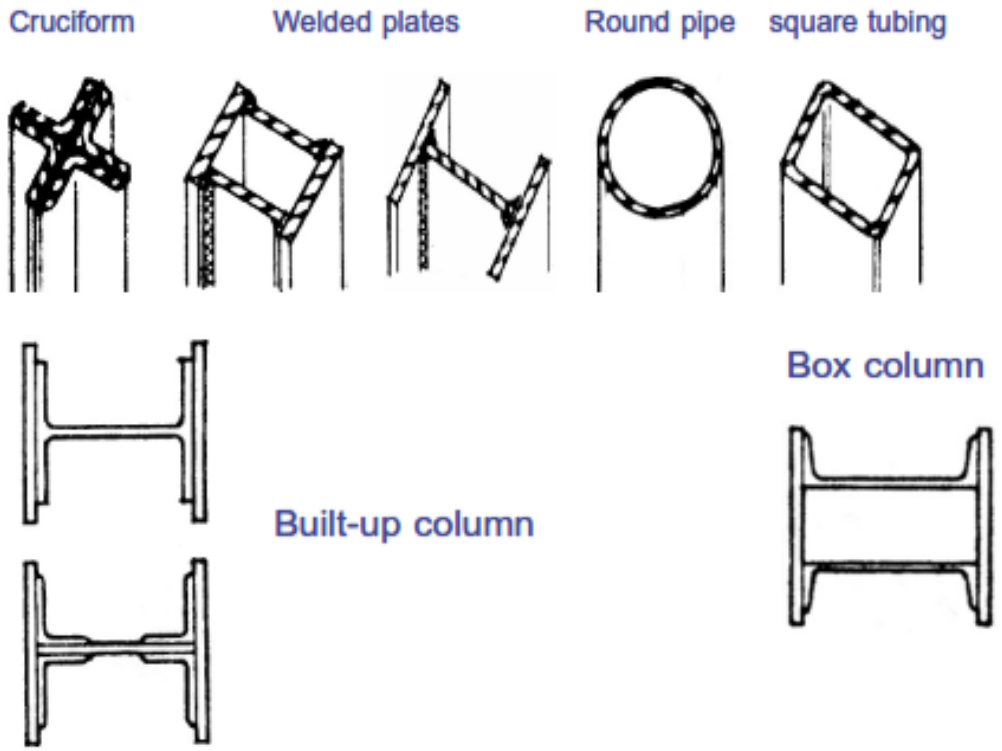


SPACE FRAME

- The appropriate shortest span to use truss is **7.20 m** and the longest span is up to **120.00 m**
- Truss structure can **cantilever** out from the support about **15-30%** of the span
- The **depth** of truss when use as **roof** beam is ratio to span at **1:18** if it is supported by columns
- The **depth** of truss when use as **floor** beam is at **1:11** of the span ratio.

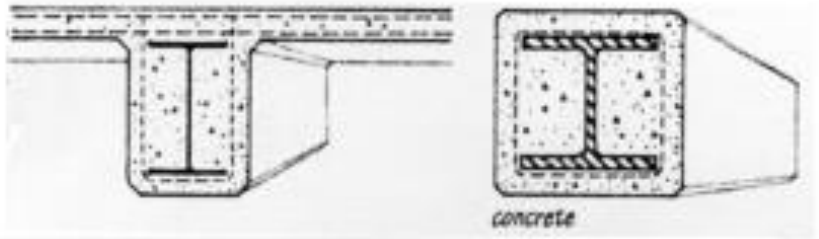
STEEL SECTIONS



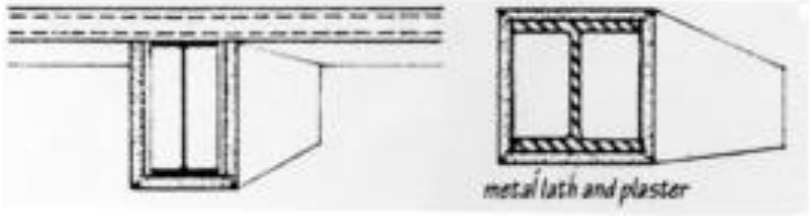


FIREPROOFING FOR STEEL MEMBERS

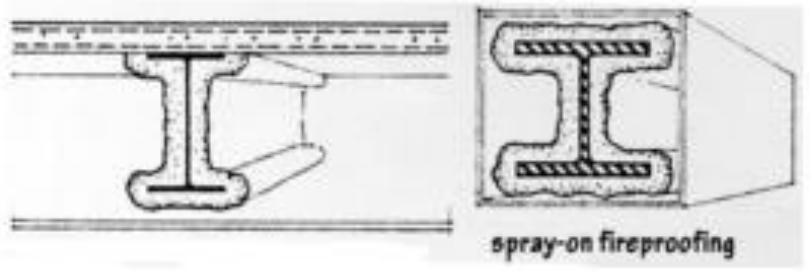
- Concrete



- Gypsum



- Mineral fiber



EXAMPLES

- Schiphol International Airport : Netherlands

EXAMPLES

- Shopping mall : Milan, Italy

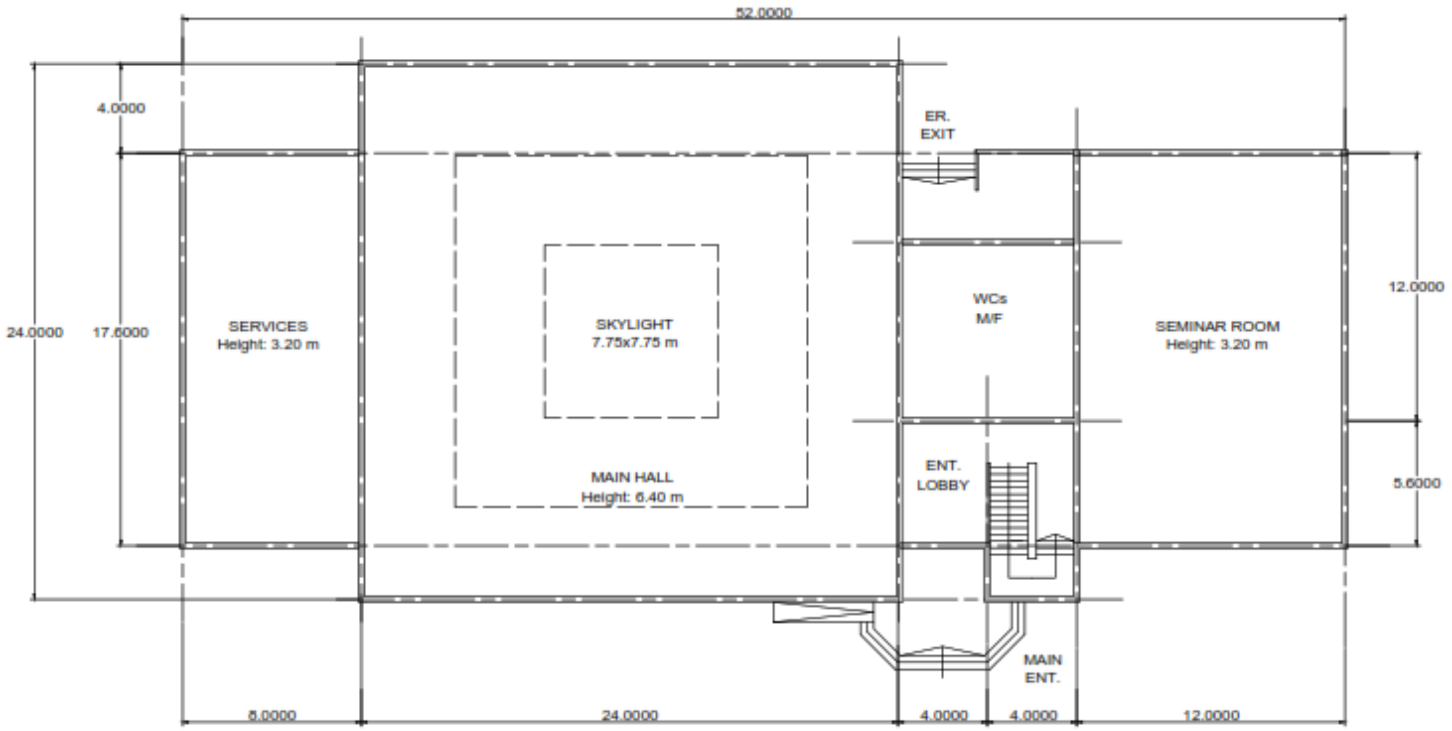
EXAMPLES

- Tokyo International Forum : Japan

FINAL PROJECT

The following drawing indicates roughly plan view for a PUBLIC LIBRARY consists of a group of spaces that differentiate in functions, areas and heights. The designer intends to use Suitable structural systems. You are required to:

- Choose the suitable structural systems for these spaces. You should determine the parameters of all elements. **(2.00 Marks)**
- Draw to scale 1:100 a detailed plan showing all structural elements, furniture and dimensions. **(5.00 Marks)**
- Draw to scale 1:100 looking-up plan showing all structural details. **(5.00 Marks)**
- Draw to scale 1:50 a cross section A-A. **(5.00 Marks)**
- Draw to scale 1:20 a detailed plan of wet area. **(3.00 Marks)**
- Draw to scale 1:20 a set of necessary details. **(5.00 Marks)**



ASSIGNMENT # 14

On 50x70 cm paper, Draw to scale **1:20** all Space Frame details (Types, Sections and Joints)

Assume:

- column dimensions 450x450 mm
- Any missing dimensions.

CONTACTS

http://bu.edu.eg/staff/sameir.hammad

Saturday, Sunday and Tuesday … 9:00 am to 2:00 pm

Sameir M. Hammad