



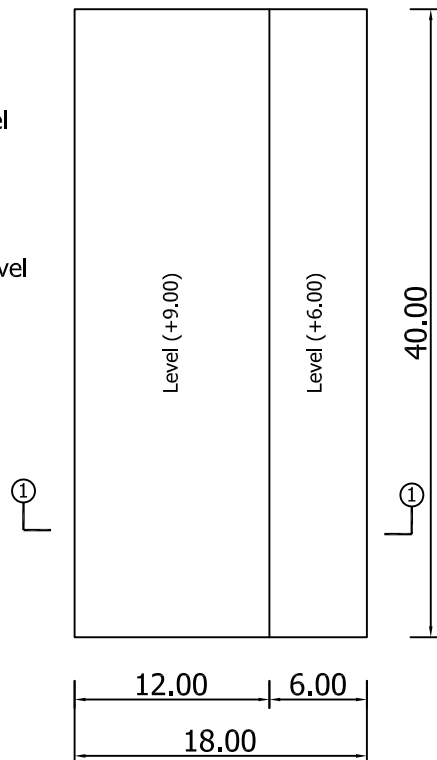
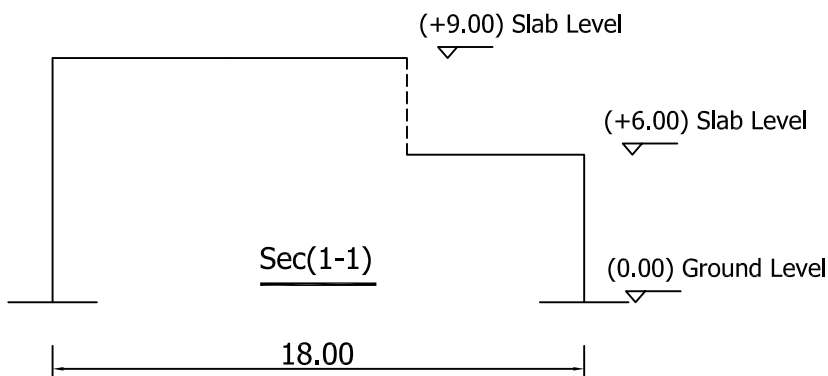
S H E E T (3)  
POLYGONS, ARCH GIRDERS & RADIAL FRAMES

Question(1)

The given figure shows a layout of an industrial factory. Columns are only allowed on the outer perimeter of the area. The structural system carries slabs as marked on sec (1-1).

It is required to:

- 1- Draw the concrete dimensions of the structural system in plan and section elevation to scale (1:50)
- 2- Design all slabs and main supporting elements.
- 3- Draw details of reinforcement of slabs in plan to scale (1:50)
- 4- Draw details of reinforcement of main supporting elements in elevation (1:50) and cross sections (1:25)



Data:

$$f_{cu} = 25 \text{ N/mm}^2$$

Steel used is 360/520

$$F.C. = 3.0 \text{ kN/m}^2$$

$$L.L. = 1.0 \text{ kN/m}^2$$

$$E_c = 4400 \sqrt{f_{cu}}$$

$$E_s = 2.1 \times 10^5 \text{ MPa}$$



### Question(2)

The given figure shows a layout of an industrial factory of an area ( $30.0 \times 40.0 \text{ m}^2$ ). Columns are only allowed on the perimeter of the area. It is required to:

- 1- Choose a suitable statical system for this factory hall and show its concrete dimensions in section elevation and section side view to scale (1:50).
- 2- Design all slabs and main supporting elements.
- 3- Draw details of reinforcement of slabs in plan to scale (1:50)
- 4- Draw details of reinforcement of main supporting elements in elevation (1:50) and cross section (1:25)

Data:

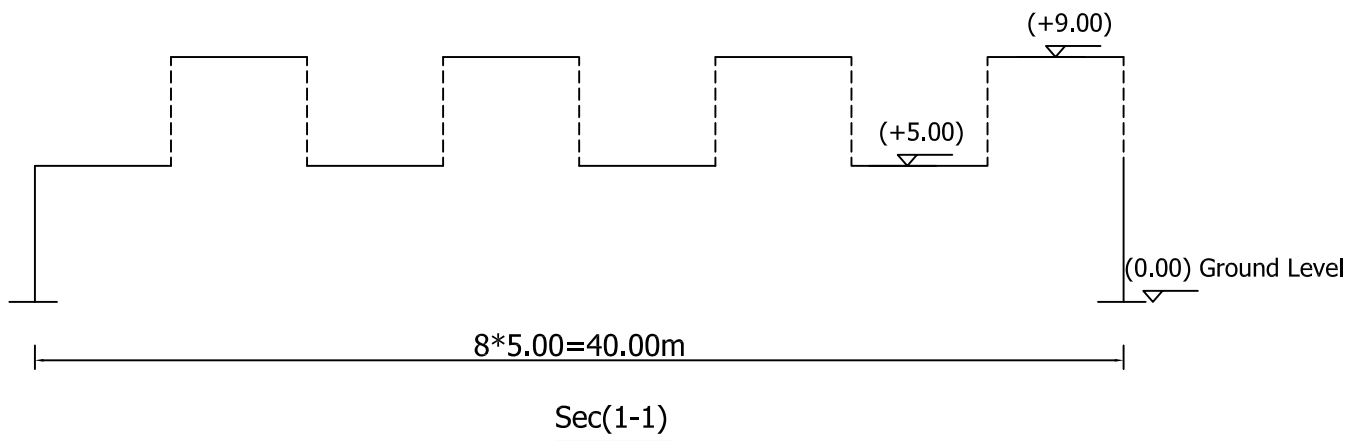
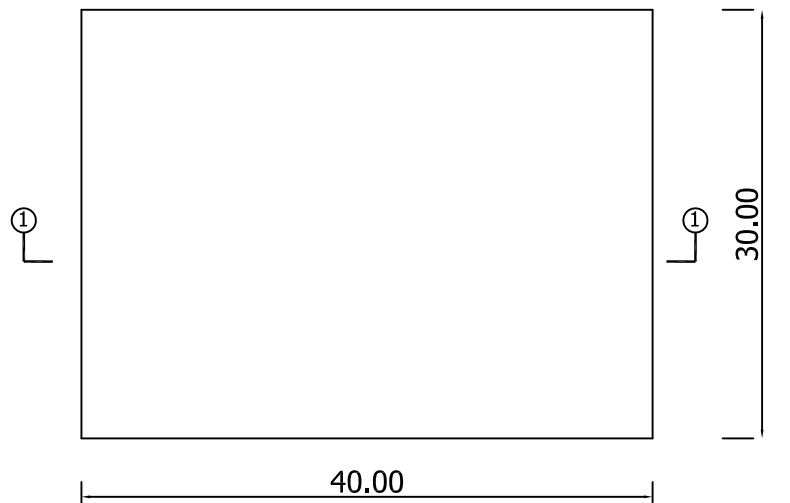
$$F_{cu} = 25 \text{ N/mm}^2$$

Steel used is 360/520

$$F.C. = 3.0 \text{ kN/m}^2$$

$$L.L. = 1.0 \text{ kN/m}^2$$

Spacing between main systems=5.0m





### Question(3)

The given figure shows a layout of a circular area of 24.0m diameter supported on 10 columns with a sky-light of 5.0m diameter. It is required to :

- 1- Choose a reasonable structural system to cover this area and show its concrete dimensions in plan, section elevation to scale (1:50)
- 2- Design all slabs, ring beams (B1 & B2) and main supporting elements.
- 3- Draw details of reinforcement of slabs in plan to scale (1:50)
- 4- Draw details of reinforcement of ring beam (B1) in elevation and cross sections.
- 5- Draw details of reinforcement of main supporting elements in elevation (1:50) and cross section (1:25)

Data:

$$f_{cu} = 25 \text{ N/mm}^2$$

Steel used is 360/520

$$F.C. = 1.5 \text{ kN/m}^2$$

$$L.L. = 1.0 \text{ kN/m}^2$$

