

High Rise Sprinkler Design,

And

Non-Storage Sprinkler Systems
using Full Hydraulic Calculations

Course work booklet

Course Work No 1

1. How long do you have to complete the course ?
2. Where do you upload your work to allow the assessor to mark your submission ?
3. If you have any queries regarding the course how do you get in touch ?
4. What Body of organisations compile the Technical bulletins and why are they created ?
5. Are Technical Bulletins required to be implemented in the uk and Ireland ?
6. Why is compartmentation of a building so important ?
7. At What height does a building become multi story ?

8. At what Height does a building become high rise ?
9. Does a building installed to TB202 Have to be fully designed to BSEN12845 ?
10. What is a Mobile shelving Unit ?
11. What is the difference between a Class I and Class II Pallet ?
12. Why is it important a fire engineers report is developed to determine the hazard classification of a School ?
13. What is the main advantage of EPEC sprinkler protection ?
14. If a void is constructed of Wood and is 600mm deep does it need to be sprinkler protected ?

15. What is an air plenum ?

16. What table do you use to determine the hazard classification of the following

a. an ordinary hazard system

a. High Hazard process system

Upload your answers to your portal for marking

Course Work No 2

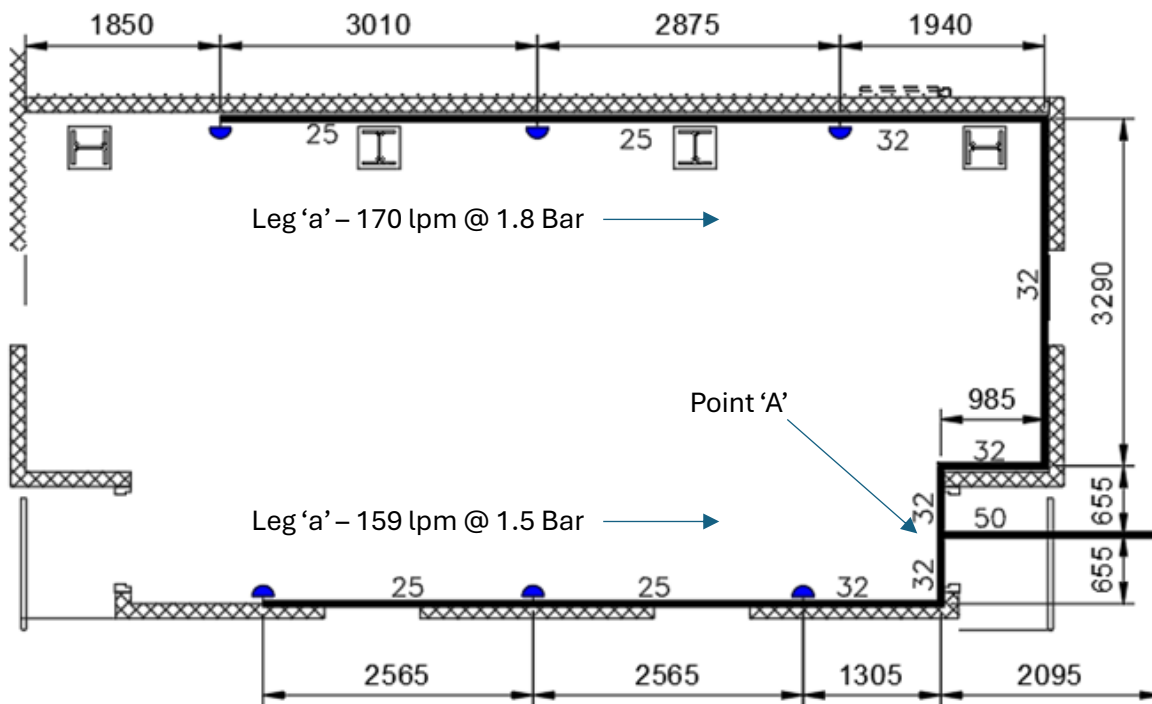
Answer the following Questions (Show your Workings)

1. What are the accuracy requirements for the following :
 - a. Length of Pipe
 - b. Height
 - c. Flow
 - d. Pressure
 - e. Area
 - f. Density
 - g. Pressure loss per meter
2. What is the pressure requirement per meter to work out static head ?
3. Calculate the following :
 - a. The Required flow from a sprinkler with a 12.5mm density covering an area of 7.9 M².
 - b. The Actual Flow from a sprinkler head with a K factor of 115 at a pressure of 0.5 Bar.
 - c. Work out the required pressure to deliver 12.5mm per minute with a K115 head covering an area of 8.2 M²

4. Work out the pressure loss for the following

- a. 3.2 meters of MQ Mild Steel Pipe, 32mm at a flow of 130 lpm
- b. 6.4 meters of HQ Mild Steel Pipe, 65mm with 2 elbows at a flow of 798 lpm.
- c. 150 meters of Cast Iron Pipe (C Factor 100, Id 207.01mm), 200mm at a flow of 3250 lpm
- d. 3.2 meters of CpvC Pipe (C Factor 150, Id 50.9mm), 150mm at a flow of 130 lpm

5. Work out the True Flow at point 'A' for the following

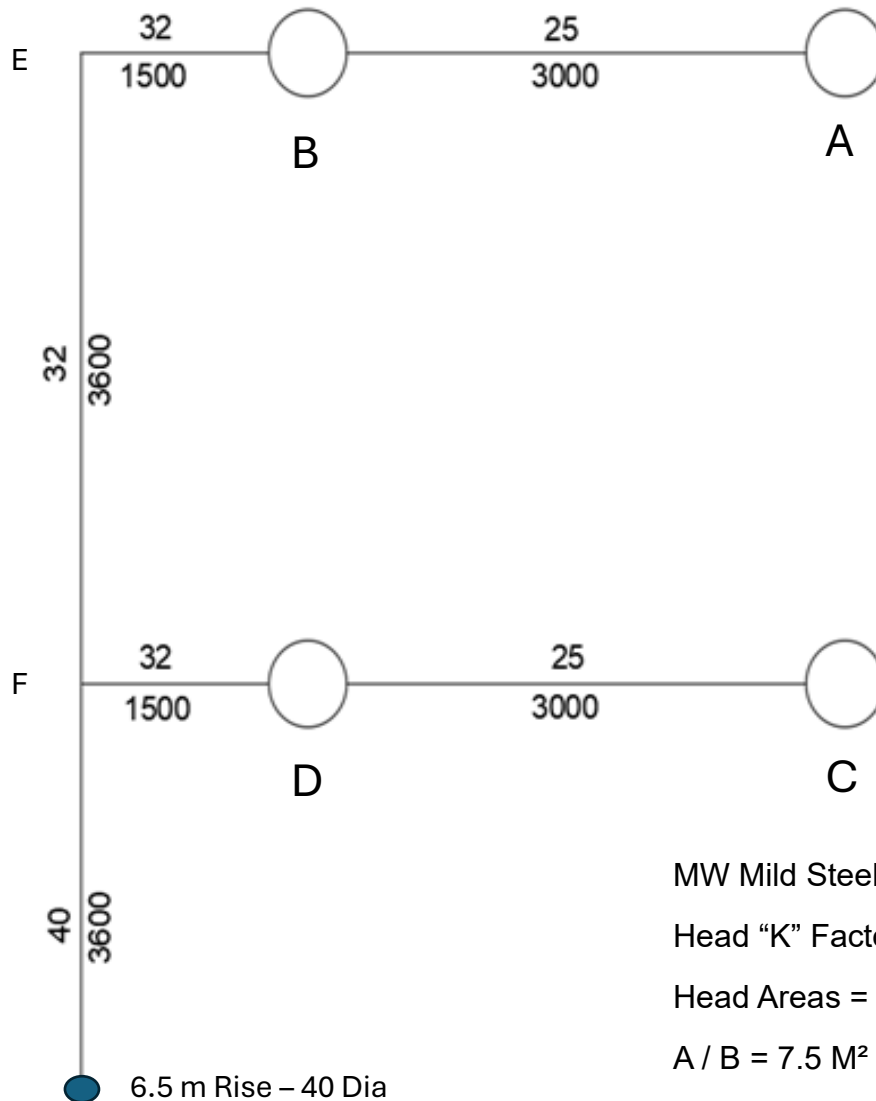


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Course Work No 3

Carry out the following Hand Calculation.

- 1.0 Work out the Flow and pressure required at WS
- 2.0 Work out the Actual Flows from Heads C & D
- 3.0 Work out the Actual Density from Heads C & D
- 4.0 Does it Work ?



MW Mild Steel

Head "K" Factor = 115

Head Areas =

$A / B = 7.5 \text{ M}^2$

$C / D = 8.2 \text{ M}^2$

Car Park

What is the Required Pressure at WS

WS

Bottom of rise

1 Gate Valve

Upload your answers to your portal for marking.

Course Work No 4

NPSH CALCULATION

We Have an Ordinary Hazard Group 3 Installation where the is using the canal for his sprinkler tank, LL'X' is 3.2 meters below the ground level.

The tank suction pipe is 600 Centre line from the ground level.

The Suction Pipe is 200mm Dia Meters Medium Quality Mild steel Pipe.

The system has a Qmax of 2250 Lpm

There is

- 23 meters of Straight Pipe
- 3off Elbows
- 1 off Tee
- 2off Gate Valves

Questions

- Carry out an NPSH Calculation ?
- Carry out a calculation to prove the suction pipe is acceptable ?
- What advice would you give your client ?
- Carry out an NPSH Calculation ?

Upload your answers to your portal for marking

Course Work No 5

Answer the following Questions

1. What are the limitations of an Annex 'F' Zone on a system ?

Answers

2. What are the requirements for the monitoring panel indicating lights and where do you find a list of signals from a sprinkler system ?
3. How do you work out a tank size on a high-rise staged system
4. If you have a 4-stage system How many Jockey pumps do you require ?



THE FIRE SYSTEMS

ACADEMY

7. What are confirmed signals and where do you find the guidance for them ?

Upload your answers to your portal for marking

Course Work No 6

Work out the Pump Requirements

Work out the Tank Size

Work out the pressure available at each zone valve

Use the pre calculated sizing method (TB210 Table 5)

Use the following Link

[Course work 6.pdf](#)

Upload your answers to your portal for marking

Course Work No 7

Work out the Pump Requirements

Work out the Tank Size

Work out the pressure available at each zone valve

Use the calculated sizing method.

Use the following Link

[Course work 7.pdf](#)

Upload your answers to your portal for marking

Course Work No 8

Retail Unit – Tree system

Heated building

Carry out a full Hydraulic Calculation of the pipework provided

Work out the Pump Requirements

Work out the Tank Size

Use the following Link

[CW 8.4..tree](#)

Upload your answers to your portal for marking

Course Work No 9

Retail Unit – Lopped system

Heated building

Carry out a full Hydraulic Calculation of the pipework provided

Work out the Pump Requirements

Work out the Tank Size

Use the following Link

[CW 9..4..Loop](#)

Upload your answers to your portal for marking.

Course Work No 10

Retail Unit – Gridded system

Heated building

Carry out a full Hydraulic Calculation of the pipework provided

Work out the Pump Requirements

Work out the Tank Size

Use the following Link

[CW 10..4..grid](#)

Upload your answers to your portal for marking

Course Work No 11

Using the Calculations developed for the Retail Units

Analyse the results and produce an essay to determine the flow and pressure characteristics of each Pipework layout.

From this compile a comparison and determine the benefits of each system.

This essay should be a minimal of 500 words.

Upload your answers to your portal for marking

Course Work No 12

Using the Tree system Calculations developed for the Retail Units

Develop a Figure 9 Curve (TB210.F9).

Curves can be developed manually or using an Electronic programme

You will have to get a pump curve from a pump supplier to suit your calculations

From the curve you work out the following

1. Suction Pipework size Calculation
2. NPSH Calculation
3. Tank Size Calculation

Upload your answers to your portal for marking

Course Work No 13

Bus depot – Gridded system

Heated building

Pipework runs Parallel with the roof slope at 10°

Carry out a full Hydraulic Calculation of the pipework provided

Work out the Pump Requirements

Work out the Tank Size

Use the following Link

[CW 13..Grid 2](#)

Upload your answers to your portal for marking

Course Work No 14

School Project

Heated building

One room used for storage

One room used as a plenum

School Classed at OH1 (to be Confirmed).

Carry out a full Hydraulic Calculation of the pipework provided

Work out the Pump Requirements

Work out the Tank Size

Use the following Link

[CW 14..School](#)

Upload your answers to your portal for marking

Final Project

Submit 1 design high Rise

High Rise project for non-storage purposes, it can be a school, retail unit or office – it's your choice.

The design can be one you have carried out during your work or an adapted piece of work you have done, where you may need to add a pumphouse or carry out a calculation on a pre calculated system you have completed.

It must have a Superior supply pumphouse.

Submit 1 design Fhc

Submit a Fully Hydraulically calculated project for non-storage purposes, it can be a school, retail unit or office – it's your choice.

The design can be one you have carried out during your work or an adapted piece of work you have done, where you may need to add a pumphouse or carry out a calculation on a pre calculated system you have completed.

It must have a Superior supply pumphouse

Upload your answers to your portal for marking