British Automatic Fire Sprinkler Association

bafsa

System Classification and Design of Pre-Calculated Commercial Fire Sprinkler Systems

System Classification
and
Design of Pre-Calculated Commercial Fire Sprinkler Systems

This course reflects the contents of
The LPC Rules for Automatic Sprinkler Installations
Inc BS EN 12845: 2015

Course objectives

This course relates to the classification of Sprinkler systems and the design of pre-calculated commercial fire sprinkler systems in accordance with the LPC Rules inc BS EN 12845. However, in order to deliver the learning outcomes, the course aim is to address the knowledge and skills required to determine the sprinkler design in relation to; the classifications, storage configurations, storage heights, system requirements, head spacing, pipework sizing and water supply configurations.

The course is split into the following modules and specifically covers the following outcomes:

Classification and Design of Pre-Calculated Commercial Fire Sprinkler Systems

System Classification and Design of Pre-Calculated Commercial Fire Sprinkler Systems

1.0 Introduction Classifications

- How the LPCB Rules Inc Bs En 12845 Work.
- Minimum course requirements
- What the course covers and the required coursework and exam to pass the course.
- Course Timescales

2.0 System types and components

- System Design Principles
- Wet systems, Dry systems and Pre-action Systems
- LPC Approved Products (www.redbooklive.co.uk)
- Sprinkler tanks
- Sprinkler pumps
- Stop, check valves
- Pipework
- Bracket types and approvals
- Sprinkler heads

3.0 Classifications

- Storage types
- Classification of goods
- Storage heights for Ordinary Hazard systems
- Storage heights for High Hazard systems
- How to determine Density from the tables
- Excessive Clearance
- Palletised racking flue spaces for roof and in rack protection.
- TB 202 – Sprinkler protection to buildings featuring Residential occupancies.
- TB211 – Hanging Garment Storage
- TB212 – Mobile Shelving
- TB214 – Sprinkler protection of Flammable Liquid Stores
- TB215 – Sprinkler protection of Idle Pallet Storage
- TB216 – Sprinkler protection of aerosols
- TB219 – Sprinkler protection of Cold stores
- TB221 – Sprinkler protection of Schools

4.0 Initial Considerations Before Commencing a design

- Identify what information you need to effectively design a fire sprinkler system.
- How to identify fire rated walls from a fire engineering report / drawings.
- Understand the sprinkler system requirements against the clients specification and raise Non – Compliances on the system
- Gain an understanding of Architect, Steelwork and MEP Services drawings.
- How to determine what heads should be used in different classifications
- Determine the requirements of void heads (combustibility and void use).
- Understanding of basic co-ordination methods.
- Analyse drawings and services to best route pipework in an areas that gives you the easiest way to install and fabricate pipework (Design risk assessment).
- Understand on the location of brackets on the pipework installation.
- System Size and Limitations
- Zones systems (Zone Sizes and Limitations)

5.0 Head selection and Approval

- Where to use what type of head
- Head Approval (www.redbooklive.co.uk)
- Head RTI Rating
- What heads to use in what type of system / location
- Heads to be used in accordance with Annex “F”.

6.0 Spacing Sprinkler heads

- Spacing Sprinkler head Principles.
- How to Space sprinkler heads in Void Spaces.
- How to Space heads around Obstructions (Beam Rule)
- How to Space heads for beams and bays (concrete constructed beams and bays).
- How to space heads in relation to roof trusses
- How to Space sprinkler heads on an exposed roof (Wind Bracing etc).
- How to space heads around columns
- How to Space heads around platforms and ducts.
- How to Space heads around escalators and stair wells.
- Where to install heads in Vertical Shafts and Chutes.
- How to Space sprinkler heads in False ceilings.
- How to Space sprinkler heads in Open Cell Ceilings

6.0 Sprinkler Valveset

- Understanding the requirements of a Wet Valveset Arrangement
- Understanding the requirements of a Dry Valveset Arrangement
- Understanding the requirements of a Pre-action Valveset Arrangement
- Valveset Drains
- Valveset Alarm Devices
- Bell types and Locations
- Monitoring of Valves
- Alarm device schematic design (P&ID)
- Fire Alarm Signals

7.0 Routing Sprinkler pipework and positioning of Bracketry

- Understand the terminology of pipework (Pipework systems and Arrays).
- Acceptable types of pipework in their environment.
- Pipework Jointing systems.
- Brackey Types and approvals
- Bracket Positions
- Vulnerable pipework and Bracketry
- Second Fix pipework into ceilings (Hard and Flexible Connections)
- Drain Valve locations

8.0 Sprinkler pipework sizing for pre-calculated systems

- Sizing range pipework from Tables
- Sizing distribution pipework from Tables
- Positioning of Design points
- Tolerances within sprinkler system calculations
- Hydraulic Principles (scientific calculator required)
- Pipework routes and Equivalent lengths (Valves, Elbows and tees).
- How to understand static gain.
- Calculating Pressure loss through Pipework (Pre calculated systems).
- Pressure loss calculations for stand alone systems
- Pressure loss calculations for Base Build systems

9.0 Sprinkler Pumphouse design for pre-calculated systems

- Initial Planning and limitations of sprinkler pumphouse design relating to the hazard classification
- Sprinkler tank and pump approvals (www.redbooklive.co.uk)
- How to size a sprinkler tank in a pre-calculated design
- How to size a sprinkler pump in a pre-calculated design
- How to understand a sprinkler pump general arrangement drawing
- Sprinkler pumphouse suction pipework design
- Sprinkler pumphouse pump delivery pipework design
- Sprinkler pumphouse test return pipework design
- Sprinkler pumphouse jockey pump design

- Sprinkler pumphouse small bore pipework design
- Sprinkler pumphouse initiation panel
- Sprinkler pumphouse fire protection design
- Sprinkler pumphouse builders work drawings (Inc Grp Housing, Plinths and drains)
- Electric Fire pump electrical and monitoring requirements (P&ID)
- Diesel Fire pump electrical and monitoring requirements (P&ID)

Structure

This training course is designed to provide an improvement in employment related skills through,

- Interactive / facilitated learning assessments.
- Participative exercises
- Test
- Self-delivered learning
- Submission of a series of designs by the candidate for verifying.

Competence to Capability

It is intended that the learning outcomes designed in the course will enable you to become competent in,

- You will be able to Classify a system into its category
- You will gain an understanding of categorisation of goods.
- Identifying storage types and identify the required density.
- Be able to identify different types of systems and their limitations.
- Reading architect / steelwork / Mep service drawings to design system.
- Understand How to Space sprinkler heads
- How to identify types and locations of hangers.
- How to run Pipework through services (co-ordination)
- How to size pipework using tables and pressure loss calculations
- How to identify the level of monitoring required for a system
- How to layout a sprinkler water supply
- How to lay out drawings so they can be used for construction purposes

The above learning outcomes are all theory, these skills will need to be put into practice to classify a sprinkler system and also for the design of pre calculated sprinkler systems.

With sufficient application of this knowledge, your skills and capability as a fire sprinkler design engineer in commercial systems will develop, taking you to various levels of qualifications, i.e., team member, designer, senior designer or project manager.

With further training, the knowledge gained on this course will get access into Unit 4 for the design of full hydraulically calculated systems for ordinary hazard systems and high-rise systems

Over the duration of the course, you will gain a general appreciation of auditing that, like any other acquired skill, requires practise. The best place to practise and extend your experience is carrying out inspections & commissioning under the guidance of a qualified and experienced member of the team.

Entrance criteria

Candidates shall have the following before they can be entered onto the course:

- 3 years fire sprinkler design experience in pre calculated systems
- The Candidate shall have designed at least 2 pumphouses

The Application must be backed up with the following

- A CV Detailing there experience
- A Reference from their employer stating they meet the minimum criteria for the course

Successful completion criteria

There are four independent elements in the assessment of delegates, each of which must be satisfied if the delegate is to successfully complete the course: -

- 100% attendance and completion of all elements of the course.
- Pass the continuous assessments throughout the course.
- Pass the Formal assessments.
- Pass the exam at the end of the course.
- Submission of post course work submit 3 full designs for review, one must include a diesel and electric pumphouse.
- Once you have passed the exam and submitted the 3 designs for review you will be interviewed (recorded) on one of the designs you have submitted.

Continuous Assessment Criteria

Criteria will include:-

- Punctuality in time keeping programming and full attendance.
- Participation in theory and discussion session including sharing of experience, questioning and feedback.
- Completing the Formal assessments at the end of each section of the course.

Course work

- The candidate will have to attend a 5-day training course which will have various assessments through the duration of the course.
- The candidate will also need to submit 3 full designs with at least 1 being a sprinkler pump house (Electric and Diesel) of their choosing.
- If the candidate does not have a pumphouse in their day to day work a scheme will be given to them.
- This work has to be submitted within 52 weeks of the start of the course
- The candidate will also need to sit and pass the exam which will be held in Manchester and Garston.
- Finally the candidate will be interviewed (Recorded) on the designs they have submitted, this will be recorded.

For Dates, Availability and Costs Please visit : https://www.bafsa.org.uk/booking/

To Apply for a position on a course please book your place through the Bafsa Website.