

## APPENDIX H (DESIGN SUBMISSION CRITERIA)

### FIRE ALARM SYSTEM

As per ACCORD standard Part 5, section 5.7 Fire Alarm System Design to be verified by ACCORD Chief Safety Inspector. Testing of the installation shall be conducted in accordance with NFPA72 acceptance testing requirements. Documents of all testing shall be submitted for review to the Chief Safety Inspector. The Owner shall notify ACCORD prior to conducting final acceptance testing of the Fire Alarm System installation to allow the ACCORD the option of witnessing this testing and conduct a final inspection of the installation.

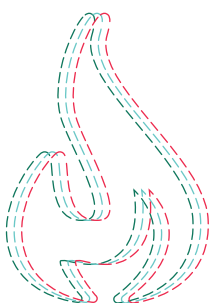
The factory has to submit the drawings for Accord review as per following design submission criteria:

**A. Product Data:** Product data submittal shall include the following as minimum:

1. Schedule of equipment proposed, with catalog reference number.
2. Name and address of the manufacturer and country of origin of the product.
3. Complete catalog pages of proposed equipment.
4. Name and address of the authorized local representative/ dealer.
5. Battery: Sizing calculations.
6. Voltage Drop calculations.
7. Other required calculation such as line resistance calculation where required.

**B. Shop Drawing:** Each shop drawing submittal shall include two sets of complete plans on minimum A2 size paper and the following as minimum:

1. Factory Forwarding Letter with factory name, address and contacts.
2. The drawing's cover page shall include Factory name, address and Accord ID; Designer name and address; Contractor name and address.
3. Each and every page of shop drawing to be stamped and signed by factory's concern authority/ representative.
4. Include a point of compass (North direction) on the drawing.
5. Include legends of fire alarm system's detecting, notification and interfacing devices as per NFPA170.
6. Include dimensioned site plan with all necessary information such as FACP location, outdoor cable route including cable and its installation details etc.
7. Detailed floor layouts drawn to scale showing all peripherals with label reference, primary power connection location & door, window, wall partitions, exhaust fans, cable risers, air source, light source locations etc., and exact routing of cabling, wire ways, and detection and evacuation zoning. Mention room description/ purpose of each and every area of the factory building/entire premises.
8. Include details of ceiling geometries such as clear ceiling height, beam depth, solid joists and all partitions extending to within 15 percent of the ceiling height should be mention on the drawing. Architectural elevation is required in case of shed building.
9. Include storage description such as rack height, ceiling height where required. Provide rack storage elevation if possible.
10. Include locations of fire alarm control panel, repeater panel (if applicable) detecting and notification devices, interfacing devices in ceiling and reflected ceilings including elevation and typical installation details.
11. Signaling line circuits, initiating device circuit and notification appliances circuit shall have to be separate.
12. Detailed system schematic diagram. Include diagrams for equipment and for system with all terminals and interconnections identified.
13. Include device address list: Coordinate with final system programming and labeling.
14. Cause and Effect Matrix: Show in a matrix format, the effect of every initiating device on the FACP, notification devices, system peripherals & auxiliary systems interfaced with it.
15. All cables to be used in the purpose of Fire Alarm System shall have to be as per Article 760 of NFPA 70. The cable for Notification Appliance Circuits shall have to contain a minimum 2-hour fire-resistive rating with minimum pathway survivability level 2 as per NFPA 72- Chapter 12 (12.4.3 & 12.4.4) and NFPA 70 –760. For Initiating Device circuit or Signaling Line Circuits minimum 2 core, 1.5 mm<sup>2</sup> cable shall be used as per NFPA 70- Table 760.154.



- Alarm Cable marking shall be as per NFPA 70-760.179 (I). All Fire Alarm Cables shall be tested and certified by recognized third party.
16. Lift, Sprinkler Zone Control Valve, HVAC system, exhaust fan, valves controlling water supplies shall be interfaced with fire alarm system.
  17. Connect signals from the fire pump controllers to the fire alarm system to provide a positive indication of pump running, loss of power, phase reversal, and loss of phase. Monitor fuel levels and battery charging for diesel engine-driven fire pumps. And monitor the water level of tanks and reservoirs to ensure the maintenance of an adequate reserve for firefighting.
  18. Provide automatic fire detection in concealed spaces used for mechanical and plumbing systems. Heat detectors work best in these areas.

**Recommendations:**

1. If the factory wants to keep the fire door open “Door Hold Open device” to be used which shall be interfaced with fire alarm system in such a way that in case of fire the door will be closed automatically getting the signal from Fire Alarm Panel. It should be clearly shown on the drawing.
2. Multi sensor detectors or heat detector are recommended on the sewing, cutting, iron, knitting& finishing and other areas where there is a possibility of floating fabric dust, threads and cottons etc. to avoid false alarm.
3. Air Sampling System (Aspiration, Vesda) is recommended for the floors with high heights eg warehouses, dying sheds and other double height areas.
4. Avoid installing smoke detectors in areas exposed to moisture, high temperatures, or airborne contaminants such as dust, fumes, or vapors, including toilet blocks, loading docks, and vehicle parking areas.

**Re-submittals:**

The rejected drawing should be resubmitted within 15 days of email received with necessary corrections as mentioned on the design review comments. Submittals requiring additional information will be placed “on hold” until required information has been submitted. Plan information revisions shall be submitted with changes clouded. Changes in other documents shall be clearly identified.

If there is any major modification or correction on the drawing, the drawing shall be resubmitted for ACCORD’s review.

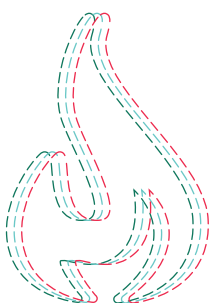
**Record Drawings**

One month prior to the issue of the “hand-over certificate” the Contractor shall provide the fully detailed “As Built” drawings of the whole of the works together with all working and maintenance instruction.

It shall be the responsibility of Contractor to ensure that a set of up to date accurate record drawings are submitted to the Consultant “As Installed” status of the works. The drawings shall be regularly updated at intervals not exceeding one week and will be subject to inspection at any time by the Engineer.

The “As Built” drawings shall show the followings:

- a) 1:100 or 1:50 scale drawings and schematic diagram of complete installation showing all switchgear and distribution with the appropriate code letters and identification marks.
- b) The location of the supply authority connection provided within the contract whether carried out by the Contractor or by appropriate authority, together with the points of origin and termination, size and type of cables.
- c) The layout, location and extent of all Detectors showing that the type in accordance with the schedule of the detectors and other outlets
- d) Manufacturer drawings showing the arrangement and assembly of component parts of all machines and of equipment which may need servicing.
- e) Layouts giving circuit details including circuit reference, origin, route, distribution and where buried for each cable, conduit, tray and trunking. The circuit reference shall relate to the appropriate cable schedule and distribution board schedule.



Three prints of each “As Built” drawing shall be issued to the Engineer for approval prior to final issue.

The Contractor’s main Works program must show the dates of submission of draft “As Built” drawings and a three week approval period to ensure that all drawings are approved to enable practical completion which will not be certified if approved drawings are not available. Contractor’s program must show preparation periods for the drawings and the first issue of drawings should occur not less than three months before practical completion date.

**Testing:**

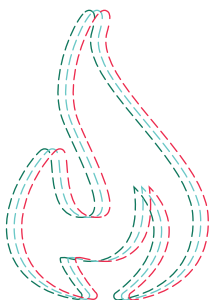
- Submit a test plan for review with the design documents. Ensure the test plan includes 100% acceptance testing of all initiating devices, notification appliances, and circuit wiring in all normal and trouble conditions. Perform operational and calibrated testing of all initiating devices in each mode (normal and trouble). Submit test reports and certificates to the Accord upon completion.

**Training:**

- Verify qualified personnel are available and engaged to inspect, test, and maintain the completed installation, including regular periodic tests of all devices and controls.

**Operation and Maintenance Documents:**

- Deliver complete as-built drawings and operation and maintenance documents to the building owner and factory management, including the manufacturer’s operating instructions. Provide copies of require maintenance and test reports for completion and submission by qualified personnel.





## SPRINKLER AND STANDPIPE SYSTEM

As per ACCORD standard Part 5, section 5.3 & 5.4 Fire Protection System Design to be verified by ACCORD Chief Safety Inspector. Testing of the installation shall be conducted in accordance with NFPA acceptance testing requirements. Documents of all testing shall be submitted for review to the Chief Safety Inspector. The Owner shall notify ACCORD prior to conducting final acceptance testing of the Fire Protection System installation to allow the ACCORD the option of witnessing this testing and conduct a final inspection of the installation.

### Shop Drawing

Each shop drawing submittal shall include two sets of complete plans on minimum A2 size paper and the following as minimum:

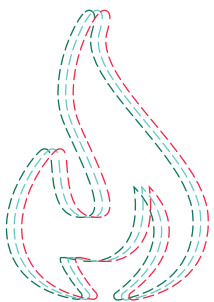
- Factory Forwarding Letter with factory name, address and contacts.
- The drawing's cover page shall include Factory name, address and Accord ID; Designer name and address; Contractor name and address.
- Each and every page of shop drawing to be stamped and signed by factory's concern authority/ representative.
- Include a point of compass (North direction) on the drawing.
- Include legends of each and every firefighting equipment with detail description.
- Include dimensioned site plan with all necessary information such as Fire Pump location, outdoor piping route including gate valves and its installation details etc.
- Include details of ceiling geometries such as clear ceiling height, beam depth, solid joists and all partitions extending to within 15 percent of the ceiling height should be mentioned on the drawing. Architectural elevation is required in case of shed building.
- Include storage description such as rack height, ceiling height where required. Provide rack storage elevation if possible.
- Include detailed system schematic diagram.
- Include diagrams for equipment and for system.
- Include room description and purpose of each and every area.
- Include Hazard Classification
- Identify hydraulically most remote/demanding area on drawing.

### Sprinkler System

- Make, type, Model, and nominal K –factor of sprinklers including sprinkler identification number.
- Temperature rating and location of high-temperature sprinklers.
- Total area of protected by each system on each floor.
- Number of sprinklers on each riser per floor.
- All design approaches for CMSA, ESFR & Extra large orifice sprinkler systems shall comply with relevant class, commodity & hazard classification plans and calculations as per NFPA 13.
- For storage design approach refer to relevant provision CMSA, ESFR & Extra large orifice sprinkler design /Density curve of NFPA -13
- Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear.
- Hydraulic calculation shall be submitted along with the design in compliance with NFPA 13; Chapter 23.

### Standpipe System

- Size and location of standpipe risers, hose outlets and related equipment.
- Hose valve manufacture and model.
- Pressure – reducing valves manufacturer and model.
- Standpipe system demand shall be provided
- Hydraulic calculation shall be submitted along with the design in compliance with NFPA 14- Chapter 8.



### **Pipe and Fittings**

- Pipe type and schedule of wall thickness.
- Nominal pipe size and cutting lengths of pipe (or center to center dimensions). Where typical line branch lines prevail, it shall be necessary to size only one typical line.
- Location and size of riser nipple.
- Type of fittings and joints and location of all welds and bends. The contractor shall specify on drawing any section to be shop welded and the type of fittings or formation to be used.
- Type and location of hangers, sleeves braces, and methods of securing sprinklers when applicable.
- All control valves, check valves, drain pipes, and test connections shall be provided.
- The materials for pipes fittings and pipe support shall comply with NFPA-13.
- Private fire service main size, lengths, location, weights materials, point of connection to city main; the sizes ,types and locations of valves, valve indicators , regulators, meters, and valve pits; and the depth that the top of the pipe is laid below grade.
- Piping Provisions for flushing.

### **Fire Pump**

- Fire pump design and installation shall comply with all requirement of NFPA -20

### **Testing:**

- Perform all required acceptance tests upon completion of the installation. Submit all test reports and completion certificates required by NFPA 13 to the Accord for review. Ensure tests include a hydrostatic test, an alarm and flow test, supervisory signal tests, and a main drain test.

### **Training:**

- Verify qualified personnel are available and engaged to inspect, test, and maintain the completed installation, including regular periodic tests of all devices and controls.

### **Operations and Maintenance Documents:**

- Deliver complete as-built drawings and operation and maintenance documents to the building owner and factory management, including the manufacturer's operating instructions. Provide copies of require maintenance and test reports for completion

