

Hanford Fire Protection Design Requirements

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract 89303320DEM000030



P.O. Box 1464
Richland, Washington 99352

Hanford Fire Protection Design Requirements

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Release Approval

Date



Release Stamp

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1	Updated to current fire protection system standards and Hanford practices, per HNF-EDC-10-46325	JR Bell	5/11/2010
2	Updated to current fire protection system standards and Hanford, per HNF-EDC-11-000025	JR Bell	1/6/2011
3	Updated to current fire protection system standards and Hanford, per HNF-EDC-12-000232	JR Bell	3/13/2012
4	Updated to current fire protection system standards and Hanford, per HNF-EDC-14-001080	JR Bell	9/30/2014
5	Reorganized and updated to include current fire protection related orders, codes, and standards, to facilitate logical grouping and flow of fire protection criteria, and to support planned modification and/or replacement of the aging Hanford I Site fire alarm system infrastructure, per ECR-17-001252.	BH Johnson	9/5/2017
6	Revised to identify and clarify fire protection requirements on the Hanford Site. Provided guidance for users to understand and implement the code of record for existing legacy fire protection systems and when to implement current codes and standards when "a modification of a substantial nature" or "major modification" is classified by the authority having jurisdiction. Provided a preferred fire protection equipment list to help standardize new fire protection systems on the Hanford Site.	BH Johnson	06/27/2018

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7	<p>This revision incorporates the following substantial changes as well as minor changes throughout the document:</p> <ul style="list-style-type: none"> - Clarification to design submittals and drawing requirements, removal of hard copy submittal requirement. An example sequence of operations matrix has been provided - A restriction on the use of fire hydrants installed for flushing and other non-emergency uses was added. - Clarification to the required provisions for a temporary air supply on dry systems - Emphasis on the requirement for a forward flow testing means on backflow preventers. - Addition of a standard reporting time for FACU loss of AC power signals - Clarification on bypass switch requirements. - The re-introduction of RFAR zoning criteria, updated for the Monaco BT-X units and with simplified zoning for dedicated function fire alarm systems. - Clarification on fire alarm wiring requirements. - Addition of a requirement to label all fire alarm field devices. - Clarification on monitoring conventional devices with RS addressable systems. - Addition of a recommendation to consider NFPA 3 and NFPA 4 in testing. - Additional items added to preferred equipment list. 	A. Popiel	10/18/2019
8 RS	Complete restructure of the document. Removed multiple code repetitions and references to company specific documents and requirements. Updated details for forward flow test headers and hydrants.	R. Eberle	09/06/2023

DA/TA Authorized for Release:

Randy Eberle

 Print First and Last Name

Eberle, Randy E Digitally signed by Eberle, Randy E
 Date: 2023.09.06 08:30:27 -07'00'

 Signature / Date

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Hanford Fire Protection Design Requirements

1.0 PURPOSE

The purpose of this document is to provide a reasonable degree of standardization of design, installation, testing, and operational requirements for fire protection on the Hanford Site. These criteria have been defined by the Hanford Fire Protection Forum (HFPF) to improve interoperability, integrate lessons learned, and consolidate inspection, testing and maintenance (IT&M).

This document is developed and maintained by the HFPF. A copy of the approved document is submitted to the Department of Energy (DOE).

2.0 SCOPE

This document applies to all new designs, upgrades, or modifications prepared for or by Hanford Contractors, its subcontractors, managed facilities, programs, projects, and activities.

These requirements are not intended to be applied retroactively to existing facilities or systems except modified. It shall apply to the modified portion(s) of those facilities and systems. Any retroactive applications shall be determined on a case-to-case basis by the Hanford Fire Marshal (HFM) when significant hazards, deficiencies, or similar problems are identified.

Specific requirements as dictated by a contract, Statements of Work, and company procedures/policies are outside the scope of this document.

3.0 GENERAL REQUIREMENTS

3.1 Approvals

1. All documentation of personnel qualifications, fire protection design, fire protection equipment, and acceptance testing shall be approved by a Deputy Fire Marshal (DFM).
2. Where approval by the HFM in consultation with HFD is required, a written response shall be provided to the requester in a timely manner.

3.2 Equivalencies, Exemptions, and Interpretations for Clarification Requests (ICR)

1. This standard does not prevent the use of approved equivalencies or exemptions allowed by DOE. A list of current equivalencies or exemptions can be requested from the responsible Deputy Fire Marshal (DFM).
2. Requests for clarification or interpretation of fire protection requirements shall be submitted to the appropriate DFM for processing.

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3.3 Acceptable Equipment

1. A list of pre-approved fire protection equipment found in Appendix C shall be used for new fire protection equipment, unless the DFM approves a submitted substitution.
2. Requests for equipment substitution shall be formalized and send to the DFM for review.
 - a. Submittals will be evaluated against current and anticipated future site needs, project requirements, etc., and a formal response will be made by the responsible DFM within 60 days.

3.4 Drawing Configuration

1. Drawings for fire protection systems shall follow the format (level of detail, structure, information, et.) per page as shown on the applicable templates.

NOTE: Templates for specific fire protections system drawings is located in the Document Management Control System (DMCS). Fire Alarm and RFAR drawings are under HNF-69273.

2. Drawings shall be produced by AutoCAD (current edition) format. Drawing files shall be submitted electronically. If nonstandard fonts are used, the font file must be supplied with the drawing file.
3. Drawings shall be prepared using Hanford Title Blocks. The standard size sheet used is 28 inches by 40 inches, size F.
4. All drawing plans, sections, and details shall be useable and readable when printed on an 11" x 17" sheet of paper.
5. Multiple configured systems (i.e., RFAR and Fire Alarm) may be referenced but shall not be depicted in detail on the same drawings.

3.5 Acceptance Testing

1. When possible, fire protection acceptance tests are combined with standard engineering testing or commissioning to minimize time and resources.
2. Acceptance testing shall cover every inspection or test required by the manufacture, applicable codes, and company procedures.

NOTE: A link to an example of typical acceptance test template is located on Hanford Fire Marshal's webpage.

3. Acceptance testing shall include all integrated systems and emergency control functions.

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3.6 Training

1. All new fire protection installations shall include an initial familiarity training session with the Fire System Maintenance (FSM) craft responsible for IT&M.
2. Familiarity training shall at a minimum be one session accommodating up to ten FSM personnel.
3. Projects installing fire alarm control units not on the pre-approved list or not previously installed on site, will be responsible to provide initial manufacturer training, certification, and programming software for two individuals determined by FSM.
4. FSM will add the new systems to their internal training program.

4.0 FIRE ALARM/RADIO FIRE ALARM REPORTING (RFAR) SYSTEMS

4.1 Qualifications

1. Designs for fire alarms and RFAR systems provided by offsite contractor(s) shall be prepared by a National Institute for Certification in Engineering Technologies (NICET) Level III/IV Fire Alarm Designer or a licensed professional Fire Protection Engineer (FPE). The design media shall bear the stamp and signature of this individual.
2. Programming and testing shall be performed by persons factory trained and certified for the specific system being installed and holding a current NICET Fire Alarm Systems Certification Level II (minimum).

4.2 Drawings

1. Drawings shall meet all the requirements listed in NFPA 72, *National Fire Alarm and Signaling Code*, for Shop Drawings (Installation Documentation) and Record Drawings (As-Builts).
2. Drawings shall show annotated descriptions of jumpers, switch positions, mapping, and other "programming" features.
3. Power circuits, HVAC, miscellaneous control circuit diagrams shall be detailed on drawings where applicable.
4. Fire alarm matrices of operation shall show all individual devices, regardless of type or zoning.
5. Wire labeling shall be shown on the drawings.
6. Drawings shall use symbols from Chapter 8 of NFPA 170, *Standard for Fire Safety and Emergency Symbols*.

Hanford Fire Protection Design Requirements

4.3 Design and Installation

1. RFAR design and installation shall follow the process outlined in HNF-8818, *Radio Fire Alarm Reporter (RFAR) Acquisition and Installation*. Contact the HMIS INFRA-RFAR Design Authority (DA) for further information.
2. Zone reporting for fire alarm and RFAR systems shall utilize the Standard Hanford RFAR Zoning or Dedicated Function Fire Alarm System RFAR Zoning shown in Appendix B, depending on their type.
3. Alternative RFAR zoning, based on defined fire area, logical division of the building into geographic areas, etc. may be submitted to the DFM for review and approval.
4. All RFAR zoning must be approved by the HFM after consultation with the HFD.

4.4 Control Units

1. When the FACU is not located at or near the main entrance, a remote annunciator shall be provided. The remote annunciator location shall be approved by the HFM after consultation HFD.
2. The standard delay for transmission of primary power failure trouble signals to the supervising station shall be 60 minutes (nominal).
3. Factory locks on the FACU and RFAR units shall be replaced with a Corbin Cabinet Lock, Key Cat. No. 60.

4.5 Bypass Switches

1. All audible/visual notification circuits and each type of emergency control function (e.g., elevator recall, fan shutdown, door releasing, etc.) controlled by the FACU, shall have a bypass switch.
2. Bypass switches shall cause a non-latching trouble condition when activated, unless it is a bypass for suppression release then it shall cause a supervisory condition.
3. Each bypassed function shall have a separate clearly labeled switch.
4. All bypass switches shall be key-operated or preprogrammed soft-key located within a locked cabinet to provide equivalent protection against unauthorized or unintentional activation.

Hanford Fire Protection Design Requirements

4.6 Wiring

1. All pathways shall be designed to meet the criteria of NFPA 72 Pathway Survivability Level 1 “protected by metal raceways or metal armored cables”, unless an FHA or other appropriate design documentation indicates that a higher survivability level is required.
2. Wire nut type connections shall not be used.
3. Splices of any kind shall be minimized. When point-to-point wiring is not practical, splices shall be made in junction boxes using pressure-type solderless connections or terminal blocks.
4. Terminations of stranded conductors shall be made using crimp on terminal lugs.
5. All wiring shall be labeled at each termination point or splice. These labels must match the approved drawings.

4.7 Devices

1. Manual fire alarm boxes (pull stations) shall be non-break glass, double action type.
2. Each conventional device monitored by an addressable FACU shall have its own distinct addressable point.
3. Duct smoke detectors shall be programmed as supervisory signals, unless otherwise approved by the DFM.
4. All fire alarm field devices shall be marked, identified, tagged and/or labeled in accordance with the Hanford contractor’s requirements. Labels on field devices shall match the identification on the approved drawings.

4.8 Power

1. To ensure future expandability, initial design load shall not exceed 80% of the rated capacity of the fire alarm power supplies.
2. Standby batteries shall be sized to include a 25% safety margin.
3. Voltages above 50 volts are not permitted within the FACU except for the FACU power leads which shall be protected from personnel exposure.
4. Each means of circuit disconnects (e.g., breaker) shall have a red marking and be fitted with a suitable guard requiring manual removal before the breaker can be operated.
5. In new buildings, the FACU and RFAR shall not receive power from the same circuit.

Hanford Fire Protection Design Requirements

- a. In existing buildings where the FACU or RFAR are being replaced, sharing power from the same circuit shall be approved by the FPE.

5.0 FIRE SUPPRESSION – WATER BASED

5.1 Qualifications

1. The installing contractor for sprinkler systems shall be a licensed fire protection contractor holding a Washington State Level 3 license.
2. Sprinkler system designs provided by offsite contractor(s) are required to be stamped and signed by the holder of a current State of Washington Fire Sprinkler Level 3 Certificate of Competency or licensed Fire Protection Engineer. The design media shall bear the stamp and signature of this individual.

5.2 Drawings

1. Hanger and support details, fastener types, sizes, material to be fastened to and embedment depth shall be shown on the drawings.
2. Drawings shall use symbols from the Chapter 7 of NFPA 170, *Standard for Fire Safety and Emergency Symbols*.

5.3 Design and Installation

1. Fire suppression systems shall be designed to provide an actuation alarm through an approved fire alarm system to the HFD.
2. As a minimum, sprinkler systems shall be designed to NFPA 13, *Standard for the Installation of Sprinkler Systems*, Ordinary Hazard Group 2 occupancy classification unless otherwise approved by the HFM.
 - a. When determining the NFPA 13 occupancy classification consideration shall be given to expected future uses and facility specific hazards.
3. Sprinkler piping shall be schedule 40 steel pipe.
4. Fittings shall be as permitted by NFPA 13 and shall be listed for the intended use.
5. Check valves larger than 2 inches shall include a removable access cover to facilitate ease of inspection and maintenance.
6. When the building is seismically designed, the design of sway bracing for seismic supports of sprinkler piping shall meet site-specific acceleration criteria. These requirements may exceed the minimum seismic bracing requirements of NFPA 13.
7. Hydraulic designs shall include a basic 500-gpm outside hose stream allowance, any additional hose stream allowances, and other water demands that may be part of the requirements (in-rack sprinkler, other process demand, etc..).

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8. All new dry pipe sprinkler systems shall be provided with means that allows the connection of a temporary air supply in the event of a failure of the normal compressor and/or air maintenance device so that the pressure is regulated. Installing a connection on the system side of the air maintenance device is permissible provided that the pressure from the alternate air source can be regulated. Regardless of the configuration, the connection shall be equipped with a shut-off valve with cap/plug.

5.4 Waterflow Alarm Gongs

1. The drainpipe for a mechanical gong shall be appropriately routed from the water motor gong terminating with a 45-degree elbow turned down. Provide a splash block where necessary to prevent erosion.
2. Wet sprinkler systems designed without alarm check valves and mechanical water motor alarm gongs shall be equipped with electric non-silenceable water flow alarm bells. This bell shall be continuous ringing, located in accordance with NFPA 13, 24 VDC and powered from the FACU via a supervised notification appliance circuit.

5.5 Backflow Preventers

1. The Water Purveyor shall be contacted to determine if a backflow prevention device is required to be installed in the water supply line feeding the sprinkler system.
2. Backflow preventers shall be a make and model approved for use by the State of Washington Department of Health. Per WAC 246-290, backflow prevention assemblies that appear on the USC-Approved Assemblies List (<http://fccchr.usc.edu/list.html>) are acceptable.
3. New and retroactive backflow preventer installations shall provide a means for forward flow testing at a minimum flow rate corresponding to system demand, see Appendix A for detail.
4. Backflow preventers shall be installed either outside in an approved Hot Box (or building) or inside the riser room.

5.6 Forward Flow Test Headers

1. Configuration of the test header piping and valves (see Appendix A) shall be meet the following criteria:
 - a. Sized for the most demanding remote area, to include hose stream allowance (where applicable) and associated system hydraulic analysis.
 - b. Provide sufficient hose valves so as not exceed 250 gpm per valve.
 - c. Hose valves shall be arranged to discharge perpendicular to the wall.

Hanford Fire Protection Design Requirements

2. Where building control valves are required to be electronically supervised, the valve controlling the test header shall be also.

5.7 Freeze Protection

1. New mobile structures with aboveground crawlspace, shall be equipped with a listed heating-cable systems (heat trace), for use on fire protection piping in the crawlspace.
 - a. Heating-cable systems shall be monitored by the FACU as a supervisory signal.
2. Sprinkler system water supply piping installed in unheated areas (e.g., crawl spaces) shall be provided with approved listed supervised freeze protection.

5.8 Control Valve Supervision

1. Locks, or locks and chains shall be used to secure sprinkler control valves and PIVs as an alternate method to electronic supervision, when not specifically required by NFPA 101, *Life Safety Code*, or NFPA 400, *Hazardous Materials Code*.

NOTE: *The alternate method of monitoring/securing control valves was approved by DOE on October 7, 2021 (letter 21-NSD-003060) in response to HMIS letter (HMIS-2103806).*

2. Steel padlocks with breakaway shackles for use on control valves and PIVs, will be provided by HFD upon request.

5.9 Fire Department Connections

- A. New permanent structures shall have Freestanding Fire Department Connections (FDCs), unless approved by the HFM after consultation HFD.
- B. Freestanding FDCs shall be located outside of the building collapse zone, facilitate ease of fire department access, and avoid conflict with firefighting activities, see Appendix A for detail.
- C. Wall-mounted FDCs are acceptable for new relocatable structures.

6.0 FIRE SUPPRESSION – SPECIAL HAZARDS

Special Hazards systems are those that are composed of suppression methods outside of typical sprinkler systems, such as clean agent, dry chemical, gaseous, foam, etc.

Hanford Fire Protection Design Requirements

6.1 Qualifications

1. Designers for Special Hazards systems provided by offsite contractor(s) shall meet the following:
 - a. NICET Level III/IV Special Hazards Certification or a licensed professional Fire Protection Engineer.
 - b. Be certified by the manufacturer for the specific system being installed.
 - c. Have a minimum documented 10 years designing the special hazards systems.
2. Special Hazards systems programming and testing by offsite contractor(s) shall be performed by persons factory trained and certified for the specific system being installed and holding a current NICET Special Hazards Certification Level II (minimum).

6.2 Drawings

1. Drawings shall meet all requirements listed in the applicable code or standard for the system, including the requirements in this document for other applicable systems (fire alarm, RFAR, etc.).

NOTE: Codes or standards may use phrases such as "Where documentation is required by the authority having jurisdiction," this enforces those requirements.

6.3 Design and Installation

1. All special hazard systems using an agent other than water for suppression shall have alternate supply of agent incorporated in the design, to allow the system to be reset in a timely manner.
2. Any specialized equipment needed for required testing and maintenance shall be included in the design and provided/installed in the finished system.

7.0 FIRE WATER DISTRIBUTION SYSTEMS

7.1 Qualifications

1. Offsite contractors performing installation of underground fire mains shall be licensed fire protection contractors holding a State Level 3 (State Level U for underground only) license issued by the State of Washington.

7.2 Drawings

Reserved.

Hanford Fire Protection Design Requirements

7.3 Design and Installation

1. Water mains used for fire protection water supplies shall have a minimum earth cover above top of pipe of 42 inches.
2. Underground water distribution mains shall be a minimum of 12 inches in diameter.
3. Underground fire water distribution mains shall comply with NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*.
4. Fire pumps shall comply with NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*.
5. Fire water supply tanks shall comply with NFPA 22, *Standard for Water Tanks for Private Fire Protection*.

7.4 Fire Hydrants

1. Fire hydrants shall have dry barrels, be compliant with AWWA C502, *Dry-Barrel Fire Hydrants*, and have compression type main valves that opens against pressure. Inlet valves shall have a minimum 5-inch opening. Hydrants shall have one 4½-inch pumper connection and two 2½-inch hose connections with caps and chains. Connection threads shall be in accordance with NFPA 1963, *Standard for Fire Hose Connections*. Hydrant operating nuts and cap nuts shall be National Standard Pentagon and open in a counterclockwise direction. Stem seals shall be O-ring type.
2. Hydrant shall be Clow Medallion or M & H Model 129 and shall be painted chrome yellow. A typical Hanford hydrant detail is shown in Appendix A.

8.0 FIRE EXTINGUISHERS

1. Acquisition and disposal of fire extinguishers shall follow HNF-62598, *Acquiring/Disposing of Fire Extinguishers*.

9.0 ELEVATORS

1. The Designated and Alternate level for recall shall be approved the HFM after consultation with the HFD.
2. Elevators equipped with Phase I emergency recall, Phase II emergency in-car operation, or a fire service access elevator shall be equipped to operate with a FEO-K1 fire service key.
3. Where a FEO-K1 key cylinder cannot be installed in an existing elevator, the fire service key will be provided in a Knox® box. The box will be installed in a location approved by the HFM after consultation with the HFD.

Hanford Fire Protection Design Requirements

10.0 IN-BUILDING EMERGENCY RESPONDER COMMUNICATION ENHANCEMENT SYSTEMS

Reserved.

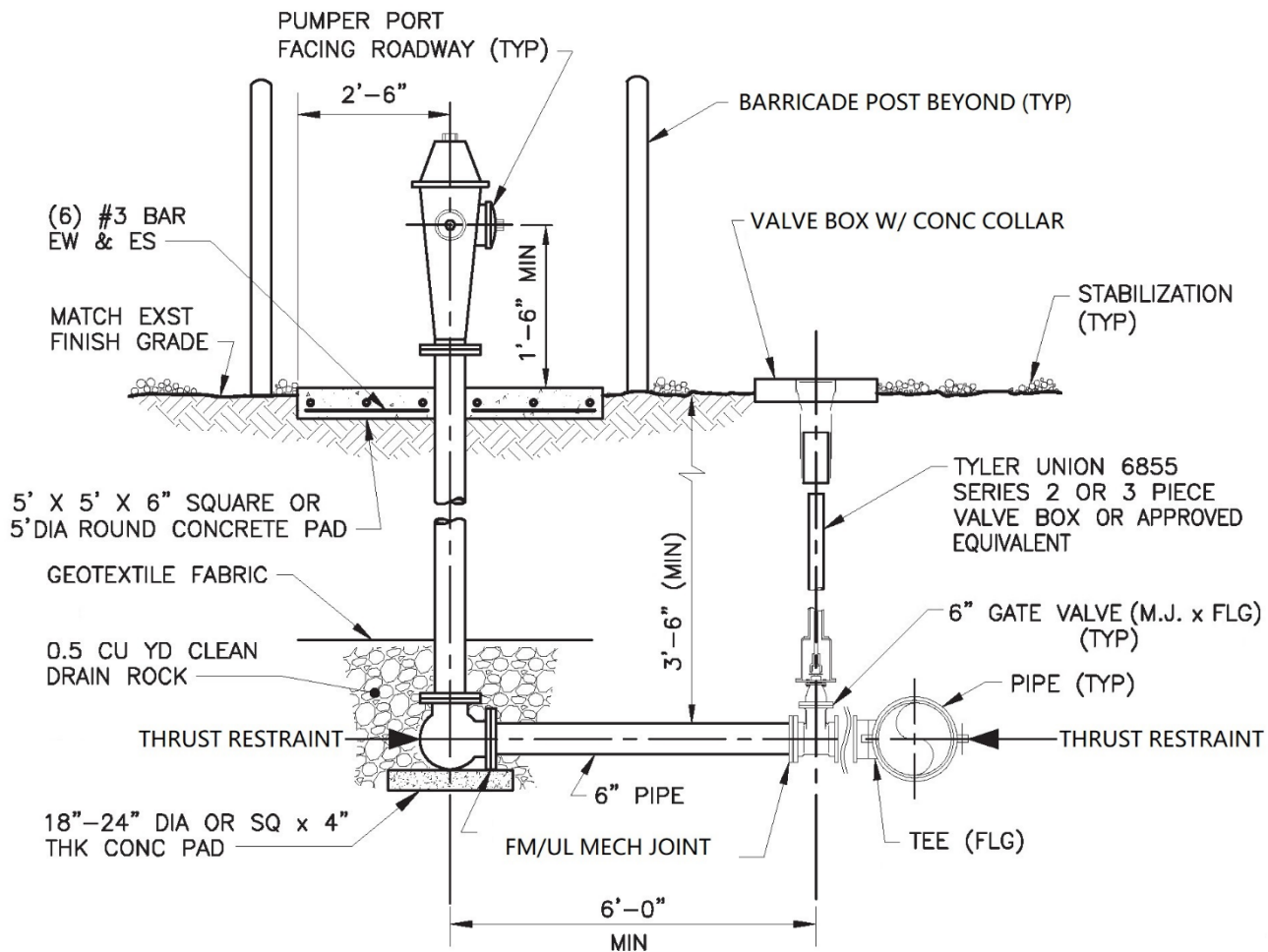
11.0 BUILDING POWER DISCONNECTS

1. To meet the Fire Code requirement for fire department building disconnects, any new building, including relocatable structures, shall meet one of the following options:
 - a. Disconnect(s) shall be provided on the exterior of the building or on a rack exterior to the building.
 - b. Shunt trip breaker(s) shall be provided with switches to activate the shunt trip(s) on the exterior of the building. If the switches to activate the shunt trip breakers need to be secured to prevent unwanted activation, refer to acceptable locking switches in Appendix C.
2. Where multiple utility sources are provided and/or a generator is provided, additional disconnects or shunt trip switches shall be provided so that all sources of power to the building can be shut off.
3. Each disconnect or shunt trip shall be clearly labeled with its function.
4. Shunt trip switches shall typically be located at the building main entrance. In all cases, the location of the disconnects or shunt trip switches will be approved by the HFM after consultation with the HFD.

Hanford Fire Protection Standard

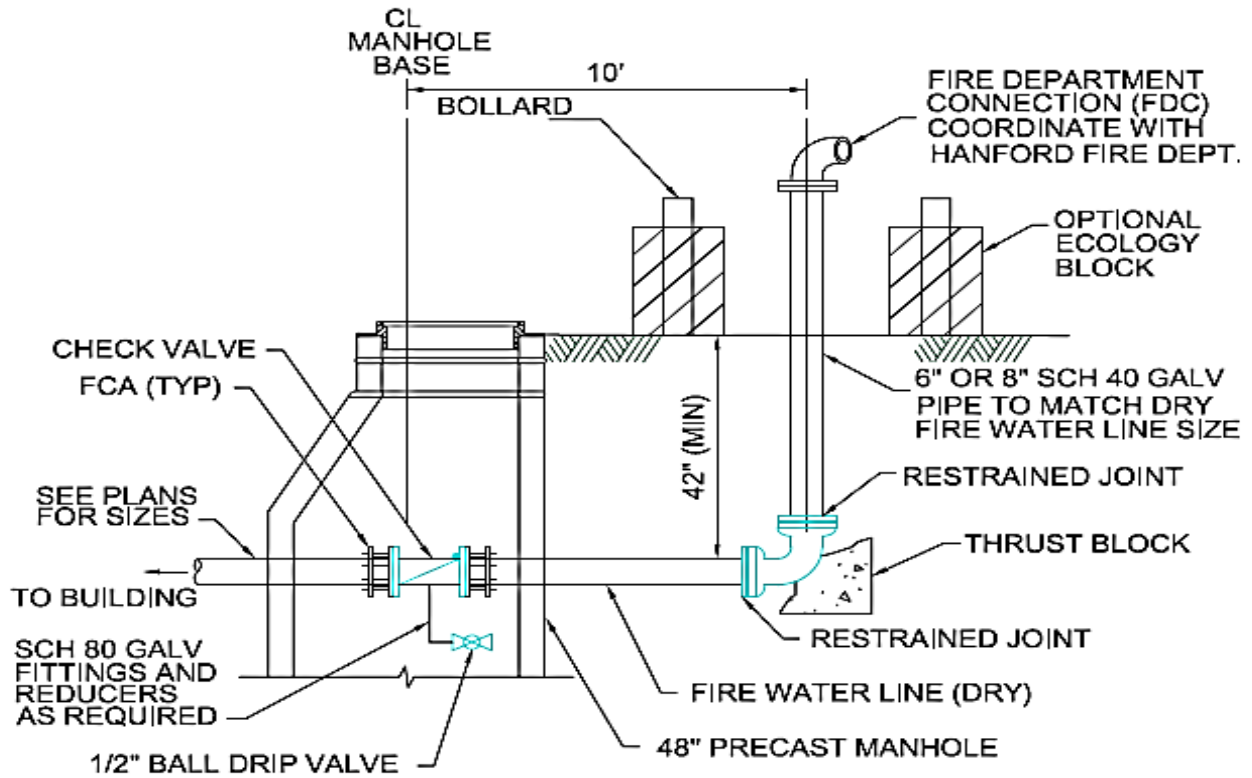
APPENDIX A. DETAILS, FIGURES AND TABLES

Typical Hydrant Detail



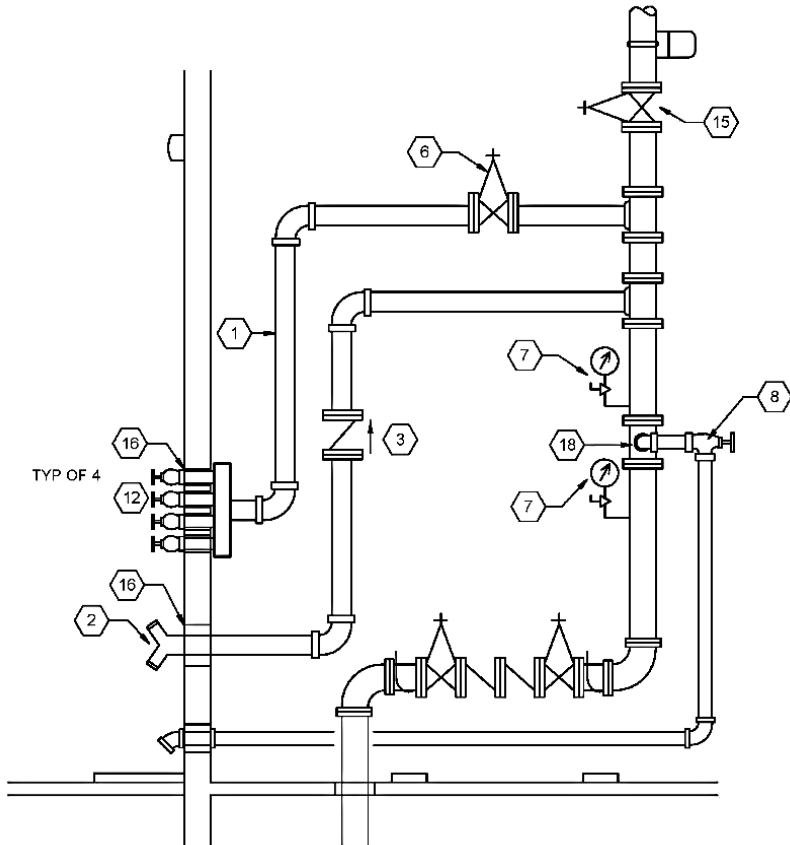
Hanford Fire Protection Standard

Freestanding FDC Detail



Hanford Fire Protection Standard

Forward Flow Test Header Detail



ITEM	DESCRIPTION
1	BACKFLOW PREVENTER FORWARD FLOW TEST HEADER
2	FIRE DEPEARTMENT CONNECTION
3	CHECK VALVE
6	NORMALLY CLOSED CONTROL VALVE
7	PRESSURE GAUGE
8	MAIN DRAIN VALVE
12	PROVIDE (X#) 2-1/2" FIRE HOSE VALVES
15	NORMALLY OPEN CONTROL VALVE
16	WATERTIGHT WALL SLEEVE
18	RISER/ALARM CHECK VALVE

NOTES:
 THIS DETAIL IS FOR DIAGRAMMATIC PURPOSES ONLY.
 SPECIFIC SYSTEM DETAILS SHALL DETERMINE FINAL
 CONFIGURATION AND LAYOUT.

Hanford Fire Protection Standard

APPENDIX B. TYPICAL RFAR ZONING ARRANGEMENTS

Dedicated Function Fire Alarm System RFAR Zoning

RFAR Zone	Description
Zone 1	All Alarm Signals (May include waterflow, single manual fire alarm station or smoke detector(s) as applicable)
Zone 2	Spare
Zone 3	Supervisory signals
Zone 4	Trouble signals

Standard Hanford RFAR Zoning

RFAR Zone	Description
First	Automatic sprinkler system water flow
Second	Additional automatic sprinkler system water flow or other suppression systems (e.g., deluge, clean agent, preaction, etc.)
Third	Manual Fire Alarm Stations
Fourth	Fire Detectors (e.g., smoke, thermal, flame, video)
Spare*	If necessary, based on RFAR configuration
Next to last**	Supervisory signals
Last***	Trouble signals

* The Monaco BT-X RFARs provide 4 zone inputs. Expansion cards provide 4 zones per card. Each unit may be expanded up to 28 zone capacity.

** The supervisory zone will be the zone immediately prior to the trouble zone

*** The trouble zone shall be the last available zone on the RFAR. The trouble zone will either be zone 4, 8, 12, etc. depending on the RFAR configuration.

Hanford Fire Protection Standard

APPENDIX C. HANFORD SITE APPROVED FIRE PROTECTION EQUIPMENT LIST

To simplify training, spare parts, maintenance, and operation of Fire Protection systems standardization of equipment should be maintained. This list is developed and maintained by the Hanford Fire Protection Forum.

Fire Alarm Equipment		
Fire Alarm Control Unit (FACU)	Conventional FACU	<i>FIRE-LITE MS-5UD</i> <i>FIRE-LITE MS-10UD</i>
	Addressable FACU	<i>FIRE-LITE ES-50X</i> <i>FIRE-LITE ES-200X</i>
Power Expander	Notification Circuit Expander	<i>HONEYWELL HPFF8</i>
Initiating Device	Smoke Detector	<i>SYSTEM SENSOR 2151</i>
	Duct Smoke Detector	<i>SYSTEM SENSOR D2</i>
	Manual Pull Station	<i>FIRE-LITE BG-12</i>
	Heat Detector	<i>SYSTEM SENSOR 5151</i>
Notification Appliance	Horn Strobe	<i>SYSTEM SENSOR P2RL/ PC2RL</i>
	Strobe	<i>SYSTEM SENSOR SRL/SCRL</i>
Accessories/ Peripherals	Annunciator	<i>FIRE-LITE ANN-80</i>
	Bypass Switch	<i>STI SS2003ZA-EN</i>
	Circuit Breaker Lock	<i>ECLIPS ELOCK-FA, E-SERIES</i> <i>ELOCK FIRE LOCKOUT KIT</i>

Hanford Fire Protection Standard

Fire Suppression Equipment		
Valves	Fire Department Connection (FDC) Check Valves	<i>TYCO CV-1F</i>
	Alarm Check Valves	<i>TYCO CV-1FR</i>
	Dry Pipe Valves	<i>TYCO DPV-1</i>
Supervisory Switches	Sprinkler Trim Supervised Valves – Supervised Ball Valve	<i>POTTER BVS</i>
	Sprinkler Trim Supervised Valves – Retrofit Ball Valve	<i>POTTER RBVS</i>
	OS&Y Tamper Switches	<i>POTTER PTS-C</i>
Elevator Equipment		
Shunt Trip Switches	Lockable	<i>Knox ® Remote Power Box™ (keyed to HFD requirements)</i>
	Non-lockable	<i>STI SS2275PO-EN</i>