

PLUTONIUM DISPOSITION PROJECT (U)

Project M09A

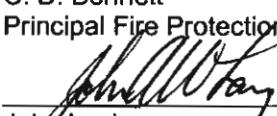
SCOPE OF WORK

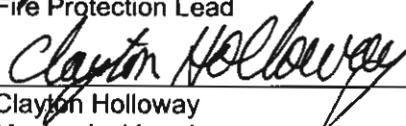
F-SOW-K-00001 Revision 0

for

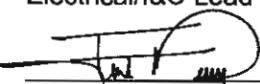
Fire Protection System (U)

Originated by:  Date: 4-2-07
C. D. Bennett
Principal Fire Protection Engineer

Reviewed by:  Date: 4/2/07
John Lavigne
Fire Protection Lead

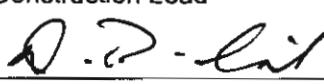
Approved by:  Date: 4/2/07
Clayton Holloway
Mechanical Lead

Approved by:  Date: 4/2/07
Roderick King
Electrical/I&C Lead

Approved by:  For Date: 04-03-07
Ghada Elchoufi
C/S/A Lead

Approved by:  for DN. Date: 4.3.07
Drew Negus
Plant Design Lead

Approved by:  (for JH) Date: 4/4/07
John Hammond
Construction Lead

Approved by:  Date: 9 APR 07
Mike Vitacco
Fire Protection Design Authority

Approved by:  Date: 4/9/07
B.C. Patel
Project Engineer

**UNCLASSIFIED
DOES NOT CONTAIN UNCLASSIFIED
CONTROLLED NUCLEAR INFORMATION**
DC/RO:  4-2-07

Table of Contents

Section	Page
1.0 SCOPE.....	4
1.1 General Description	4
1.2 Background.....	4
2.0 ACRONYMS/ABBREVIATIONS	4
3.0 DESCRIPTION OF PHYSICAL WORK	5
3.1 Performance Category and Functional Classification (SS, PS, GS)	5
3.2 Process Building	6
3.3 Non-Process Building	7
3.4 Gloveboxes, Hoods, and Material Handling	8
3.5 Instrumentation and Controls.....	9
3.6 Electrical.....	10
3.7 Mechanical	10
3.8 Plant Design.....	10
3.9 Civil/Structural/Architectural.....	10
4.0 ASSUMPTIONS.....	10
4.1 General Assumptions.....	10
4.2 Specific Assumptions.....	10
5.0 Technology Development Issues.....	11
6.0 REFERENCES	11
6.1 Drawing List	11
6.2 Design Input Documents.....	11
6.3 Applicable SRS & Industry Codes, Guides and Standards	12
6.4 Related Scopes of Work (SOW)	13
6.5 Miscellaneous	13
7.0 ATTACHMENTS	13
7.1 Attachment 1, Bulk Material List – Fire Detection & Alarm System (4 Pages).....	13

1.0 SCOPE

1.1 General Description

This scope of work describes the installation of Fire Protection equipment to protect all areas of process building, non-process building, gloveboxes, hoods, and material handling tunnels (between gloveboxes).

1.2 Background

The Office of Environmental Management has approximately 13 metric tons (MT) of plutonium in approximately 21 MT bulk materials without any defined disposition path. The Plutonium Disposition (PUD) Project is critical to meet the Department of Energy's strategic goal of providing a responsible resolution to the permanent disposal of the nation's excess high-level radioactive materials and waste; and to enable the cleanup of Environmental Management sites.

The Plutonium Disposition Facility (PDF) will be located at the K-Area Complex (KAC) to disposition up to approximately 13 Metric Tons (MT) of Environmental Management (EM) owned surplus plutonium. The facility will utilize a vitrification process to vitrify plutonium into a lanthanide borosilicate (LaBS) glass matrix. This glass will be packaged into bagless transfer cans and placed inside a Defense Waste Processing Facility (DWPF) type canister. The canister will be transported to DWPF and filled with High Level Waste (HLW) glass. The DWPF canisters will be stored in the Glass Waste Storage Buildings and later transported to the geologic repository at Yucca Mountain.

This Scope of Work (SOW) has been developed for the purpose of facilitating construction cost and schedule estimates for the Conceptual Design Report (CDR) on the PUD project. The input to this SOW was the approved technical baseline consisting of a Facility Design Description (FDD) and associated System Design Descriptions (SDD). Every intent has been made to assure alignment and consistency between this SOW and the appropriate sections of the technical baseline, in order to provide accurate estimates. This SOW is not a PUD technical baseline document. A more detailed description of the system can be found in the associated SDD listed in the reference section.

A HOLD is placed to identify information that is preliminary in nature, results from a design uncertainty, originates from insufficient documentation, needs verification, or identifies a discrepancy. A TBD is placed to identify places in the text where numeric values or descriptive information is not available at the time that the current revision of the SOW is released.

2.0 ACRONYMS/ABBREVIATIONS

AC	Alternating Current
DCS	Distributed Control System
DACT	Digital Alarm Communicator Transmitter
DS	Design Services
ECF	Entry Control Facility
GS	General Services
HVAC	Heating, Ventilation and Air Conditioning
KAC	K-Area Complex
LaBS	Lanthanide Borosilicate
NFPA	National Fire Protection Association

PC	Performance Category
PU	Plutonium
PUD	Plutonium Disposition
PuVit	Plutonium Vitrification
SDD	System Design Description
SOW	Scope Of Work
SRS	Savannah River Site
SRSOC	Savannah River Site Operations Center
SS	Safety Significant
SSC	Structure, System, Component
TBD	To Be Determined
UCNI	Unclassified Controlled Nuclear Information
UNO	Unless Noted Otherwise
WBS	Work Breakdown Structure
WSRC	Washington Savannah River Company

3.0 DESCRIPTION OF PHYSICAL WORK

3.1 Performance Category and Functional Classification (SS, PS, GS)

3.1.1 Performance Category

The performance Category for the Fire Protection System in the Fan/Diesel Generator Building is PC-3. PC-2 Performance Category shall be used in all other areas.

3.1.2 Functional Classification

a) The systems in this SOW shall be designed in accordance with the requirements of WSRC Manual -E7, Conduct of Engineering and Technical Support Procedure 2.25 Rev 14 "Functional Classification", as follows:

- 1) Fire Suppression system (Gloveboxes) Functional Classification – Production Support (PS)
- 2) Fire Detection & Alarm System (Process & Non-process Building) Functional Classification – Safety Significant (SS)
- 3) Fire Suppression system (Fan/DG building) Functional Classification – Production Support (PS)

3.1.3 Functional Requirement

- a) New Fire Detection and Alarm System shall be designed, installed, and acceptance tested in accordance with, NFPA 72-2007, NFPA 70-2005, NFPA 101-2006, NFPA 170-2002, NFPA 801-2003, DOE-STD-1066-99 and SRS Engineering Standard 01120.
- b) New Fire Suppression System shall be designed, installed, and acceptance tested in accordance with NFPA 12-2005, NFPA 13-2007, NFPA 14-2007, NFPA 72-2007, NFPA 101-2006, NFPA 170-2002, NFPA 801-2003, NFPA 2001-2004, DOE-STD-1066-99 and SRS Engineering Standard 01120
- c) The following fire alarm circuits shall be designed and installed in accordance with NFPA 72 and NFPA 70:
 - Notification Appliance Circuit (NAC) - Class B (2 wire) Style Y
 - Signaling Line Circuit (SLC) - Class B (2 wire) Style 4
 - Initiating Device Circuit (IDC) - Class B (2 wire) Style B.

3.2 Process Building

3.2.1 Fire Suppression System

- a) Wet-pipe type suppression systems in accordance with NFPA 13 shall provide protection from fire in the following areas of the process building:
- -20' Level
 - -40' Level
 - Stair enclosures 2, 3, 4, and 5
 - Corridors 1 & 2 on 0' Level
 - Dumbwaiter shaft and access corridor on 0' Level
 - Magazine and canister loading area on 0' Level
 - Portions of main control room on +15 Level
 - Magazine and canister loading control room at +20' Level
- b) Fire hose and standpipe systems in accordance with NFPA 14 shall be extended from stair enclosures 1, 2, and 3 to provide manual fire fighting capability in the following areas of the process building:
- -20' Level
 - -40' Level
 - Stair enclosures 4 and 5
 - Corridors 1 & 2 on 0' Level
 - Magazine and canister loading area on 0' Level
 - Portions of main control room on +15 Level
 - Magazine and canister loading control room at +20' Level
- c) The following major components will be included in each wet-pipe suppression system, unless noted otherwise:
- Upright and pendent sprinklers with ordinary temperature rating and standard coverage areas
 - Extended coverage sidewall sprinklers with ordinary temperature rating
 - Fire department connections for new valve houses
 - Riser check valves
 - Fire department connection check valve for new valve houses
 - Water flow alarm switch
 - Inspector test/pressure control/ drain assemblies
 - Control (i.e. isolation) valves with tamper switch
 - Drain and vent valves, as required
 - Dead weight supports and seismic sway bracing
- d) The following major components will be included in the fire hose and standpipe systems:
- Fire hose valves
 - Sectional control (i.e. isolation) valves with tamper switch
 - Drain and vent valves, as required
 - Dead weight supports and seismic sway bracing

3.2.2 Fire Detection & Alarm System

- a) The Fire Detection & Alarm System shall provide full area coverage of the following areas of the process building:
- Process areas at -40' and -20' elevation

- Corridors 1 & 2 and dumb waiter access corridor at 0' elevation
 - Magazine & canister loading crane control room at +20' elevation and canister loading area at 0' elevation
 - Portions of main control room on +15 Level
 - Dumb waiter shaft
- b) This system consists of the following major components. Refer to PUD Project drawings (Section 6.1.1) and Attachment 1 for the locations and quantities of these devices:
- Intelligent/addressable Fire Alarm Control Panel
 - Addressable area smoke detectors
 - Addressable heat detectors
 - Addressable beam smoke detectors
 - Addressable manual fire alarm pull boxes
 - Addressable monitor, control, and relay modules
 - Area Notification appliances (horn/strobes)
 - Linear Heat detectors
 - Remote Annunciator
- c) This system provides following controls and interfaces:
- Monitor sprinkler flow and valve tamper switches
 - Initiate elevator shunt trip and recall upon detection of fire in elevator shaft or machine room
 - Provides area notification upon detection of fire in any of the glove boxes via Fire Suppression Control Panel
 - Remote Annunciator in the main control room at +15' elevation
 - Input to DCS upon detection of fire
 - Input to SRSOC upon detection of fire via DACT

3.3 Non-Process Building

3.3.1 Fire Suppression System

- a) Process Building wet-pipe type suppression systems shall provide protection from fire in the following areas of the non-process buildings:
- ECF (Building 108-2K) at -20' Level
 - Mechanical Equipment Room 1 (Bldg. 108-1K) at -20' Level
 - New elevator shaft and machine room at 0' Level
- b) The following major components will be included in each wet-pipe suppression system in the non-process buildings:
- Upright and pendent sprinklers with ordinary temperature rating and standard coverage areas
 - Drain and vent valves, as required
 - Dead weight supports and seismic sway bracing
- c) Clean agent fire suppression systems in accordance with NFPA 2001 will provide protection from fire in the following areas of the Fan / Diesel Generator Building:
- Fan Rooms 1, 2, and 3
 - Diesel Generator Rooms 1 and 2
 - Control Room
- d) The following major components will be included in each clean agent fire suppression system in the Fan / Diesel Generator Building:
- Main and reserve gas storage cylinders

- Nozzles
- Cylinder discharge heads
- Discharge pressure switches

3.3.2 Fire Detection & Alarm System

- a) The Fire Detection & Alarm System shall provide full area coverage of the following areas of the non-process building:
- ECF, Purification Wing, and Mechanical Equipment Room 1 (Bldg. 108-1K) at -20' elevation
 - ECF, and new elevator shaft and machine room
 - Fan / Diesel Generator Building
 - Dumb waiter shaft
- b) This system consists of the following major components. Refer to PUD Project drawings (Section 6.1.1) and Attachment 1 for the locations and quantities of these devices:
- Intelligent/addressable Fire Suppression Control Panel for Fan / Diesel Generator Building
 - Addressable area smoke detectors
 - Addressable heat detector
 - Linear heat detector
 - Addressable manual fire alarm pull boxes
 - Addressable Manual Clean Agent (FM-200) Release stations
 - Addressable monitor, control, and relay modules
 - Area Notification appliances (horn/strobes)
 - Remote Annunciator
- c) This system provides following controls and interfaces:
- Monitor sprinkler flow and valve tamper switches
 - Provides area notification upon detection of fire in Fan / Diesel Generator Building
 - Remote Annunciator in the main control room at +15' elevation
 - Initiate release of clean agent suppression system on detection of fire or manual actuation.
 - Isolate the area from HVAC system for gaseous suppression when fire is detected.
 - Input to SRSOC upon detection of fire via DACT

3.4 Gloveboxes, Hoods, and Material Handling

3.4.1 Fire Suppression Systems

- a) Clean agent fire suppression systems in accordance with NFPA 2001 will provide protection from fire in the following gloveboxes:
- Green Fuel Disassembly
 - Oxidation Exit
 - Feed Prep
 - Milling and Mixing
 - Vitrification
 - Bagless Transfer
 - Material Transfer System

- b) Carbon dioxide fire suppression system in accordance with NFPA 12 will provide protection from fire in the following glovebox:
 - Oxidation Entry
- c) The following major components will be included in each gaseous suppression system, clean agent and carbon dioxide, in the non-process buildings:
 - Main and reserve gas storage cylinders
 - Nozzles
 - Cylinder discharge heads
 - Discharge pressure switches

3.4.2 Fire Detection & Alarm System

- a) The Fire Detection & Alarm System shall provide coverage of the following gloveboxes:
 - Green Fuel assembly glove box
 - Oxidation gloveboxes
 - Feed Prep glovebox
 - Milling & Mixing glovebox
 - Vitrification gloveboxes
 - Lag Storage glovebox
 - Empty Can Loading glovebox
 - Bagless Transfer glovebox
 - Material Handling System gloveboxes
- b) This system consists of the following major components. Refer to PUD Project drawings (Section 6.1.1) and Attachment 1 for the locations and quantities of these devices:
 - Intelligent/addressable Fire Suppression Control Panel
 - Addressable Manual Clean Agent (FM-200) and Carbon Dioxide Release stations
 - Addressable monitor, control, and relay modules
 - Area (Local) Notification appliances (strobes)
 - Linear Heat detectors
 - Remote Annunciator
- c) This system provides following controls and interfaces:
 - Interface with Fire Alarm Control Panel for area notification upon detection of fire in any of the glove boxes
 - Provide local notification of fire in the glove box
 - Remote Annunciator in the main control room at +15' elevation
 - Input to DCS upon detection of fire for control of HVAC system
 - Initiate release of clean agent or carbon dioxide into the protected area on automatic fire detection or manual actuation.
 - Isolate the protected area from the ventilation system when fire is detected.
 - Input to SRSOC upon detection of fire via DACT

3.5 Instrumentation and Controls

- a) The Fire Alarm System interface with HVAC system is provided through DCS.

3.6 Electrical

a) The following is the electrical scope:

- Provide 120 Vac dedicated power source to Fire Alarm Control Panel (total 1) and Fire Suppression Control Panel (total 2)

3.7 Mechanical

a) Refer to M-SOW-K-00020 for the installation details of fire dampers.

3.8 Plant Design

a) Fire Protection bulk piping material quantities can be estimated from wet-pipe suppression and fire hose and standpipe system layout drawings listed in Section 6.1.1 a).

3.9 Civil/Structural/Architectural

a) Refer to C-SOW-K-00009 for the installation details for fire walls/barriers, fire doors, seismic supports and anchors.

4.0 ASSUMPTIONS

4.1 General Assumptions

4.1.1 The Construction Agency will be the SRS Construction Group. DS will provide engineering documentation for the installation of this equipment and will rely on the use of SRS Guides and Standards.

4.1.2 SRS Construction Group will procure all bulk materials.

4.1.3 SRS Construction Group will procure all off-the-shelf components and equipment identified on engineering data sheets that do not require testing or quality documentation.

4.1.4 All water suppression piping will be per NFPA 13, NFPA 14, and Engineering Guide 15060-G, Appendix A, Piping Specification PS-905.

4.1.5 All clean agent system piping will be per NFPA 2001 and Engineering Guide 15060-G, Appendix A, Piping Specification PS-906.

4.1.6 All carbon dioxide system piping will be per NFPA 12 and Engineering Guide 15060-G, Appendix A, Piping Specification PS-907.

4.2 Specific Assumptions

4.2.1 Instrumentation and Controls

a) No specific assumptions have been made in this group.

4.2.2 Electrical

a) No specific assumptions have been made in this group.

4.2.3 Plant Design

- a) No specific assumptions have been made in this group.

4.2.4 Civil/Structural/Architectural

- a) No specific assumptions have been made in this group.

5.0 Technology Development Issues

- a) There are no Technology Development Issues

6.0 REFERENCES

6.1 Drawing List

6.1.1 PUD Project Drawings & Sketches

a) Fire Suppression Systems

- F-M6-K-00016 – Fire Protection Interior Header P&ID
- F-M6-K-00017 – Fire Suppression, -40' & -20' P&ID
- F-M6-K-00018 – Typical Gaseous Fires Suppression P&ID
- SK-DE-FP-0001 – Fire Protection Interior Header P&ID
- SK-DE-FP-0002 – Fire Protection Interior Header P&ID
- SK-DE-FP-0003 – Fire Protection Interior Header P&ID
- F-PF-K-00008 – Wet Pipe Fire Suppression System Layout, -40' Elevation
- F-PF-K-00009 – Wet Pipe Fire Suppression System Layout, -20' Elevation
- F-PF-K-00010 – Wet Pipe Fire Suppression System Layout, 0' Elevation
- F-PF-K-00012 – Fire Hose & Standpipe System Layout, -40' Elevation
- F-PF-K-00013 – Fire Hose & Standpipe System Layout, -20' Elevation
- F-PF-K-00014 – Fire Hose & Standpipe System Layout, 0' Elevation

b) Fire Detection & Alarm System

- F-JF-K-00003 – Fire Protection System, Functional Block Diagram
- F-JF-K-00004 – Fire Protection System, Functional Block Diagram
- F-J9-K-00007 – Location Plan – (-) 40' Elevation
- F-J9-K-00008 – Location Plan – (-) 20' Elevation
- F-J9-K-00009 – Location Plan – 0' Elevation
- F-J9-K-00014 – Location Plan – Fan/DG Bldg.
- F-J2-K-00008 – Fire Alarm Control Panel, Logic Diagram
- F-2F-K-00009 – Fire Suppression Control Panel, Logic Diagram
- F-2F-K-00010 – Fire Suppression Control Panel, Logic Diagram

6.1.2 Existing Savannah River Site (SRS) Drawings

- a) None

6.2 Design Input Documents

The following Facility Design Description, System Design Descriptions, and other baseline documents that are used to develop this SOW.

6.2.1 Facility Design Description

- a) G-FDD-K-00001, Rev B "PVF Facility Design Description"

6.2.2 System Design Description

- a) None

6.2.3 Miscellaneous

- a) F-PFHA-K-00007, Rev. 0, "Project Fire Hazard Analysis for PuVit Facility"
- b) F-ESR-K-00054, Rev. 0, "Project Fire Protection Requirement Study for PuVit Facility"
- c) F-CLC-K-00023, Rev. 0, "Maximum Fire Protection Discharge Capacity and Expected Flooding Depth"

6.3 Applicable SRS & Industry Codes, Guides and Standards

6.3.1 Industry Codes and Standards

- a) NFPA 72, 2007 – National Fire Alarm Code
- b) NFPA 12, 2005 – Carbon Dioxide Extinguishing Systems
- c) NFPA 13, 2007 – Installation of Sprinkler Systems
- d) NFPA 14, 2007 – Installation of Standpipe and Hose Systems
- e) NFPA 101, 2006 – Life Safety Code
- f) NFPA 70, 2005 – National Electrical Code
- g) NFPA 170, 2002 – Standard for Fire Safety & Emergency Symbols
- h) NFPA 801, 2003 – Standard for Fire Protection for Facilities Handling Radioactive Material
- i) NFPA 2001, 2004 – Standard for Clean Agent Fire Extinguishing System
- j) ASME A17.1, 2004 – Safety Code for Elevators & Escalators

6.3.2 SRS Guides & Standards

- a) WSRC-TM-95-1, Standard No.01120, Rev. 6 – SRS Fire Protection Design Criteria
- b) WSRC 2Q, Procedure 2.13, Rev. 2 – Fire Protection Training
- c) WSRC-IM-95-58, Guide No. 01120-G, Rev. 0 – SRS Fire Protection Recommended Practices & Guidance Criteria
- d) WSRC-IM-95-58, Guide No. 16051-G, Rev. 2 – Installation of Electrical Raceway Systems and Cable Treys
- e) WSRC-IM-95-58, Guide No. 16052-G, Rev. 3 – Installation of Electrical Wires, Cables and Terminations
- f) WSRC-IM-95-58, Guide No. 16053-G, Rev. 2 – Installation of Electrical Equipment

6.4 Related Scopes of Work (SOW)

6.4.1 C-SOW-K-00009, Structural & Architecture Modifications for Process Bldg. Systems- This related SOW provides the details of fire walls/barriers, fire doors, seismic supports and anchors.

6.4.2 M-SOW-K-00020, HVAC Systems

6.4.3 E-SOW-K-00017, Electrical General Scope of Work - Electrical power is supplied to Fire Alarm Control Panel & Fire Suppression Control Panel as described in this related SOW.

6.4.4 J-SOW-K-00002, Integrated Control System & MC&A Network

6.5 Miscellaneous

6.5.1 N/A

7.0 ATTACHMENTS

7.1 Attachment 1, Bulk Material List – Fire Detection & Alarm System (4 Pages)

FIRE PROTECTION SYSTEM F-SOW-K-00001, REV. 0, ATTACHMENT 1

DESCRIPTION, MANUFACTURER & MODEL NUMBER	PROCESS BUILDING FIRE DETECTION SYSTEM	NON-PROCESS BUILDING FIRE DETECTION SYSTEM	GLOVEBOXES, HOODS, & MATERIAL HANDLING FIRE DETECTION SYSTEM
Intelligent Addressable Fire Alarm Control Panel Onyx Series NFS2-640 Notifier Model Number: CPU2-640	1	1	1
Loop Expander Module Notifier Model LEM-320	1	0	0
80 Character Display Notifier Model Number: KDM-R2	1	1	1
Digital Alarm Communicator Transmitter Notifier Model Number: UDACT	1	1	1
Battery, 12 Volt, 26 AH Notifier Model Number: BAT-12260	0	2	2
Battery, 12 Volt, 55 AH Notifier Model Number: BAT-12550	2	0	0
Battery Charger Notifier Model CHG-120	1	0	0
Battery Cabinet Notifier Model BB-55	1	0	0
Remote Annunciator Notifier Model LCD-80TM	1	1	1
Remote Power Supply Notifier Model FCPS-24S8	3	0	1
Battery, 12 Volt, 7 AH for FCPS-24S8 Notifier Model Number: BAT-1270	6	0	2
Addressable Photo Smoke Detector w/ base & 4" square metallic electrical box Notifier Model Number: FSP-851 w/ B710LP	200	40	0

FIRE PROTECTION SYSTEM F-SOW-K-00001, REV. 0, ATTACHMENT 1

DESCRIPTION, MANUFACTURER & MODEL NUMBER	PROCESS BUILDING FIRE DETECTION SYSTEM	NON-PROCESS BUILDING FIRE DETECTION SYSTEM	GLOVEBOXES, HOODS, & MATERIAL HANDLING FIRE DETECTION SYSTEM
Addressable Heat Detector w/ base & 4" square metallic electrical box Notifier Model Number: FST-851 w/ B710LP	4	1	0
Linear Heat Detector Protectowire Model PHSC-155-EPC	100'	20'	1000'
Addressable Manual Fire Alarm Pull Box, Dual Action with Back Box Notifier Model Number: NBG-12LX w/ SB-I/O	20	4	0
Addressable Clean Agent Manual Release Station with Back Box	0	7 1 per System	23 1 per System
120 V AC Power Supply Disconnect Switch Allen-Bradley Model Number: 600-TAX49	1	1	1
24 VDC Horn and Strobe Light Assembly, 90 & 95 dBA, 15/30/75/110cd Selectable w/ Back Box System Sensor Model Number: P2R w/ BBS-2	70	20	0
24 VDC Strobe Light Assembly, 15/30/75/110cd Selectable w/ Back Box System Sensor Model Number: SR w/ BBS-2	0	10	40
Smart Sync Module w/ 4-11/16" sq. X 2-18" back box System Sensor Model MDL	2	2	2
Addressable Duct Smoke Detector Notifier Model Number: FSD-751P	0	0	0
Addressable Beam Smoke Detector With Remote Test Feature w/ Multi-mount Kit Notifier Model Number: FSB-200S w/ BEAMMMK	2	0	0
Key-Activated Remote Test Switch For Duct and	2	0	0

FIRE PROTECTION SYSTEM F-SOW-K-00001, REV. 0, ATTACHMENT 1

DESCRIPTION, MANUFACTURER & MODEL NUMBER	PROCESS BUILDING FIRE DETECTION SYSTEM	NON-PROCESS BUILDING FIRE DETECTION SYSTEM	GLOVEBOXES, HOODS, & MATERIAL HANDLING FIRE DETECTION SYSTEM
Beam Smoke Detector Notifier Model Number: RTS451KEY			
Addressable Dual Monitor Module w/ surface mount box & face plate Notifier Model Number: FDM-1 w/ SMB500	8	0	0
Addressable Monitor Module w/ surface mount box & face plate Notifier Model Number: FMM-1 w/ SMB500	10	29 7 systems	92 4 per System
Addressable Relay Module w/ surface mount box & face plate Notifier Model Number: FRM-1 w/ SMB500	10	23 7 systems	69 3 per System
Addressable Control Module w/ surface mount box & face plate Notifier Model Number: FCM-1 w/ SMB500	2	8 7 systems	23 1 per System
Temperature Switch Potter Model Number: RTS-0	3	0	0
Electrical Enclosure, 16" x 12" x 6", CAB-1 with Sub-Panel Hoffman Cat. Number: A-1614CHQR w/ A-16P12	8	6	10
16 Pole Terminal Block, Panel Mount Sliding Link Type Disconnect States Products Cat. Number: M-25016	16	12	20
16 AWG Twisted-Unshielded Pair, Power Limited Fire Protective SLC Cable, Type FPL PAIGE Electric Co. Notifier Part # 162LN or equal	11,000'	2,000'	2,000'
16 AWG Twisted-Unshielded Pair, Power Limited Fire Protective SLC Cable, Type FPL, 2 hour Fire Rated PAIGE Electric Co. Part # 73162CIC or equal	2,000'	400'	400'
16 AWG Twisted-shielded Pair, Power Limited Fire	400'	1,000'	400'

FIRE PROTECTION SYSTEM F-SOW-K-00001, REV. 0, ATTACHMENT 1

DESCRIPTION, MANUFACTURER & MODEL NUMBER	PROCESS BUILDING FIRE DETECTION SYSTEM	NON-PROCESS BUILDING FIRE DETECTION SYSTEM	GLOVEBOXES, HOODS, & MATERIAL HANDLING FIRE DETECTION SYSTEM
Protective EIA 485 Cable, Type FPLR, 2 hour fire Rated PAIGE Electric Co. Part # 73162SCI			
12 AWG Twisted Pair, Power Limited Fire Alarm Rated Cable For NAC, IDC, 24V DC, Type FPL PAIGE Electric Co. Notifier Part # 122LN or equal	8,000'	2,400'	3,600'
12 AWG Twisted Pair, Power Limited Fire Alarm Rated Cable For NAC, 24V DC, Type FPL, 2 hour Fire Rated PAIGE Electric Co. # 73122CIC or equal	1,600'	400'	600'
12 AWG Solid 1/C, 120 V AC Power Supply Cable, THHN/THWN PAIGE Electric Co. Notifier Part # 12THHN or equal	200'	200'	200'
22 AWG Solid 4/C, NEC Type FPLR, Color: BK, WH, RD, GRN PAIGE Electric Co. Notifier Part # 454608AWH1 or equal	200'	200'	200'
¾" Rigid Galvanized Steel (RGS) Conduit	6,400'	2500'	2500'
¾" Flexible Galvanized Steel Conduit	200'	200'	200'