Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400

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DNF SAFETY BOARD

DEC 21 2000

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W.
Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

Consistent with the Department's implementation plan (IP) for the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 98-2, Revision 1, the following provides information regarding Commitment 4.3.8 due December 2000. The Department has completed the commitment represented above and proposes closure of this commitment.

"Project Design Statement (PDS) for 12-44 Fire Protection Upgrade"—This commitment is a new commitment. The draft fire SAR/BIO module, coupled with several weapon-specific HARs, indicated the need to establish UV-activated deluge capability for a number of areas at the Pantex Plant involved in the assembly and disassembly of nuclear explosives. For the majority of affected facilities, the ongoing project to upgrade the capability and reliability of the fire detection and suppression systems has been expanded to include UV detection as the actuator of deluge systems. In this manner, the speed of detection and actuation can be rapid enough to prevent propagation of a fire. Rapid detection and suppression activation would prevent all fire scenarios except those initiated in very close proximity from potentially causing a thermal reaction in the high explosive of a nuclear weapon. However, the Building 12-44 cells were not encompassed by the current upgrade and a separate project will be required. As a result, the Department developed the enclosed PDS to initiate upgrading the fire detection and suppression system in Building 12-44 to provide UV-activated deluge capability. The completion of the physical modifications to Building 12-44 are expected to be completed December 2002 as stated within Commitment 4.3.9.

If you have any questions, please contact me at 505-845-6050, or have your staff contact Dan Glenn at 806-477-3182 or Karen Boardman at 505-845-6045.

R. E. Glass
Manager

Enclosure (2)

cc: See Page 2

cc w/enclosures:
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW
Suite 700
Washington, DC 20004
Attn: J. McConnell, DNFSB Staff
Ann: W. Andrews, DNFSB Staff
M. Whitaker, S-3.1, HQ
D. Beck, DP-20, HQ

00·2286

PROJECT DESIGN STATEMENT

FOR

BUILDING 12-44

UV - DELUGE & FIRE ALARM UPGRADE

PANTEX PLANT
Amarillo, Texas

Project Number: 883
December 18, 2000

since 1827
MASON & HANGER CORPORATION

PANTEX PLANT
P.O. Box 30020
Amarillo, Texas 79120-0020
806-477-3000

Operated for the
U.S. DEPARTMENT OF ENERGY
Under
U.S. Government Contract DE-AC04-91AL-65030

DISCLAIMER

PROJECT DESIGN STATEMENT

FOR

BUILDING 12-44

UV - DELUGE & FIRE ALARM UPGRADE

Pantex Plant
Amarillo, Texas
(U)

December 18, 2000

Approved:

Daniel M. Kester 12/18/00
Project Engineer Date

R A Ellen 12/18/00
Project Manager Date

Robert McClary 12/18/00
Fire Protection Engineering (User) Date

K. C. Jones 18 DEC 00
Program Manager Date

12/18/00
TRD Manager Date

M. Lane 12/18/00
Eng Programs Dept Mgr. Date

Ronnie Barnett 12/18/00
Facility Manager Date

Jerry C. Jones 12/18/00
Facilities Business Group Mgr Date

Revision Number	Effective Date	Comments
0	12/18/00	Initial Issue.

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SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. This contract covers the engineering, design and construction, which includes furnishing of all parts, labor, equipment, supplies, materials, documentation, testing, inspection, and management support for the project entitled, **12-44 UV-Deluge & Fire Alarm Upgrade (FAU)**. The project is located at the Pantex Plant. All work is to be accomplished in strict accordance with the contract drawings, specifications, and terms of the contract.

1.2 DEFINITIONS

A. As used throughout the specifications and construction drawings associated with this contract, the following terms shall have the meaning set forth below.

1. The terms Contract Administrator, Subcontract Technical Representative, and Project Manager indicate BWXT Pantex, in the performance of this contract and include any duly authorized representative acting within the limits of their authority.

2. The term Contractor indicates the prime commercial construction company selected to perform this contract and includes any duly authorized representative acting within the limits of their authority.

3. The term Government Furnished and Contractor Installed (GFCI), indicates items purchased by BWXT Pantex and/or the Government and installed by the Contractor.

4. The term Government Furnished and Government Installed (GFGI), indicates items purchased and installed by BWXT Pantex and/or the Government.

1.3 PROJECT DESCRIPTION

A. This project will encompass the design and construction of a UV Detection System (complete with UV detectors, heat detectors, and manual deluge switches as initiators), a replacement of the existing ADT fire alarm control panels (FACP), and possibly a reuse of existing initiating and notification devices connected to the Maxsys FACP (See Bid Alternate 2 in this section). It will also encompass the modification of existing wet pipe sprinkler risers, replacement of the open sprinkler nozzles with open deluge nozzles with a 3/8" or larger orifice, installation of horizontal alarm check valves and associated trim, and the replacement of deluge valves (new valves must be high speed and interface with the new UV detection system).

1. For bidding purposes, the "Base Bid" will entail all of this work reporting to one main Fire Alarm Control Panel (FACP) for the whole building (Cells 1-8). The cost for design, materials, and labor of each of the systems shall be broken out and

totaled separately.

2. Requirements for modifying / upgrading the Fire Suppression System are defined in Specification Section 15300 of this document.

3. Requirements for the UV Detection System and Fire Alarm System are defined in Specification Section 16721 of this document.

4. Requirements for performing Firestopping are defined in Specification Section 07270 of this document.

5. The Fire Protection Design Criteria Manual (FPDCM) MNL-00008, provided with this specification, is referenced throughout this document. The requirements in the manual are mandatory. Any deviation and/or conflict between these specifications and the manual shall be brought to the Project Managers attention, in writing, immediately for resolution, as noted in paragraph 1.9 below.

6. The Pantex Plant Manual MNL-00014, Rev 7, Labeling Manual, provided with this specification, is referenced throughout this document for signage requirements. The requirements in the manual are mandatory. Any deviation and/or conflict between these specifications and the manual shall be brought to the Project Managers attention, in writing, immediately for resolution, as noted in paragraph 1.9 below.

B. Bid Alternate 1

1. Design and installation of a "Maintenance Communication System" such as the Gai-Tronics Electro-Sound II Communications System.

2. For bidding purposes, this work shall be identified as Bid Alternate 1 with the cost for design, labor, and materials broken out and totaled separately from the base bid.

C. Bid Alternate 2

1. Utilize the existing Maxsys Fire Alarm System initiating and notification devices located in 12-R-44 ramp, rather than replacing (if possible). If it is possible, the Maxsys FACP will be removed from service and the existing initiating and notification devices will be tied into the new Notifer FACP.

2. For bidding purposes, this work shall be identified as Bid Alternate 2 with the cost for design, labor, and materials broken out and totaled separately from the base bid.

1.4 LISTINGS AND APPROVALS

A. All equipment and devices furnished under these specifications shall be Factory Mutual (FM) approved or Underwriters Laboratories (U.L.) listed, unless specifically noted otherwise. Approved or Listed equipment shall be so noted in the latest edition of the FM Approval Guide (P7825) or the U.L. Fire Protection Equipment Directory.

B. Factory Mutual site acceptance shall be performed by Factory Mutual representative(s) for the Det-Tronics control panel. The site acceptance shall be performed to compare the installed system to the requirements of Factory Mutual Standard 3260, *Flame Radiation Detectors for Automatic Fire Alarm Signaling*, and Standard 1011, *Deluge and Preaction Systems*. The site acceptance shall be considered equivalent to the Det-Tronics control panel being listed or approved as a fire alarm control panel and a releasing panel.

C. All nuclear and explosive facility penetration assemblies in fire barriers shall have both "F" and "T" ratings, be Underwriters Laboratory (U.L.) listed, Factory Mutual (FM) approved, or be certified by a third party testing agency. Approved or listed assemblies shall also be so noted in the latest edition of the FM Approval Guide, the U.L. Fire Protection Equipment Directory, or third party testing agency with supporting documentation. It should be noted that all penetration seals listed in the Factory Mutual Approval Guide have both an "F" and "T" rating. The penetration seals listed in the U.L. Directories may have either rating or both ratings identified.

D. Third party or independent testing of penetration seal details is acceptable providing the test is equivalent in fire test qualifications and established testing criteria and has been approved by BWXT Fire Protection Engineering.

E. Penetration assemblies in fire barriers of non-nuclear or non-explosive facilities shall be U.L. listed and/or FM approved and have either an "F" rating, "T" rating, or both ratings.

1.5 CONTRACTOR QUALIFICATIONS

A. The qualification requirements identified below are minimal for this project. Deviations / exceptions to these requirements must be submitted to the Project Manager prior to Notice of Award, for approval or disapproval by the Authority Having Jurisdiction (AHJ). NOTE: The BWXT Pantex AHJ is the designated Fire Protection Engineer (FPE) assigned to the project.

B. A Professional Engineer is a person that is legally qualified to practice in the State of Texas and who is experienced in providing engineering services for the subject matter.

1. Fire Suppression Systems

a. Each person or organization engaged in the business of planning, certifying, leasing, selling, servicing, installing, monitoring, or maintaining fire suppression or fire suppression devices or systems shall have a certificate of registration issued by the State Board of Insurance. All such persons or organizations shall comply with the Texas Insurance Code, Article 5.43-2 unless approved by FPE.

b. The installation of automatic sprinkler systems shall be accomplished by a firm regularly engaged in the installation of automatic sprinkler systems, with a minimum 5 years experience, and having a current Certificate of Registration and Responsible Managing Employee License, per Article 5.43-3 of the Texas Insurance Code unless otherwise submitted and approved by the AHJ.

c. The design of automatic sprinkler systems shall be by a firm regularly engaged in the design of sprinkler systems, having a minimum of 5 years of experience, and licensed by the state of Texas as a Sprinkler System Designer. All sprinkler systems planned shall be stamped by a current Texas PE acting solely in his/her professional capacity, a person who holds a minimum NICET III certification in Automatic Sprinkler System Layout and is licensed by the State of Texas, unless otherwise submitted and approved by the AHJ. A copy of NICET certification may be submitted in lieu of a stamp.

d. Personnel qualification documentation shall be submitted with the contractors proposal. Deviations from these requirements must also be submitted with the proposals. The Project Engineer (PE) and/or AHJ will review submitted qualifications and/or qualification deviation requests during the proposal review.

2. Fire Detection / Alarm Systems

a. Each person or organization engaged in the business of planning, certifying, leasing, selling, servicing, installing, monitoring, or maintaining fire alarm or fire detection devices or systems shall have a Certificate of Registration issued by the State Board of Insurance. All such persons or organizations shall comply with the Texas Insurance Code, Article 5.43-2 and the FPDCM (Manual MNL-00008), unless otherwise approved by the AHJ.

b. The design of the fire detection and alarm systems shall be by a firm specializing in the design of fire detection and alarm systems, which comprises 51% of their work and have minimum of 5 years of fire detection and alarm system design experience, and licensed by the State of Texas as a Fire Alarm Planning Superintendent. All fire detection and alarm systems planned shall be stamped by a current Texas PE acting solely in his/her professional capacity or by a person who holds a minimum NICET III certification in Fire Alarm Systems, unless otherwise approved by the AHJ. A copy of NICET certification may be submitted in lieu of a stamp.

c. All installation, inspection, or servicing of fire protection systems and associated devices, performed by non-BWXT-Pantex personnel, shall be performed under the direct on-site supervision of a licensed Fire Alarm Technician or Fire Alarm Planning Superintendent, who must certify the work upon completion of the activity, unless otherwise approved by the AHJ.

d. The manufacturer of equipment, used in the design and installation, shall be performed by a company specializing in fire alarm and detection systems with a minimum of 10 years of documented experience and shall provide qualified engineering assistance for any problems or coordination of activities, as required during the submittal, installation, and testing phases.

e. Qualification documentation shall be submitted with the contractors proposal. Deviations from these requirements must also be submitted with the proposals. The Project Engineer (PE) and/or AHJ will review submitted qualifications and/or qualification deviation requests during the proposal review.

3. Firestopping Qualifications

a. This section covers the technical qualifications required for the Contractor's engineering and installation personnel. Proposed personnel shall be subject to the Project Engineer's approval.

1) Each person or organization engaged in the business of planning, certifying, selling, inspecting, installing, monitoring, or maintaining penetration seal assemblies or systems shall have a certificate issued by the manufacturer of the penetration seal stating the company is in good standing and is qualified to perform installations of their product unless otherwise approved by BWXT Pantex Fire Protection Engineering.

2) The installation of penetration seal assemblies shall be by a firm having a minimum of 5 years of experience in the installation of penetration seal assemblies . All penetration seal assemblies planned shall have detailed drawings with the detail system number identified on the detail sheet.

3) All installation, inspection, testing and servicing of all penetration seal assemblies shall be performed under the direct on-site supervision of a factory certified penetration seal installer, who must certify the work upon completion of the activity unless otherwise approved by BWXT Pantex Fire Protection Engineering.

4) All penetration assemblies utilized during this project shall be evaluated to determine if they are adequate in construction and meet required fire wall barrier ratings. If penetration seal assemblies are not adequate, they shall be removed and installed in accordance with this specification.

5) The manufacturer of penetration seal assemblies shall be a company specializing in penetration seal assembly systems with a minimum of 10 years of documented experience and shall provide qualified engineering assistance for any problems or coordination of activities, as required during the submittal and installation phases.

NOTE:	Be aware that proposals may be rejected if the proposed firm cannot show evidence of such qualifications.

1.6 PROJECT SITE LOCATION

A. The Project is located in Zone 12 North of the Pantex Plant, Building 12-44. Work in this location requires Construction Guard supervision.

1.7 PERFORMANCE OF WORK BY CONTRACTOR

A. The Contractor shall perform on the site, and with his own organization, work (man-hours) equivalent to at least __25__ percent of the total amount of work to be performed under this contract. If, during the progress of the work hereunder, the Contractor requests a reduction in such a percentage, and the Project Manager determines that (1) it would be to the advantage of the Government or (2) it would not have adverse impacts on other contracts related to this project, the percentage of the work required to be performed by the Contractor may be reduced with the written approval of the Project Manager.

1.8 CONTRACT DRAWINGS AND SPECIFICATIONS

A. The Contractor will be furnished, without charge, __5__ sets of drawings (full or half-sized) and specifications for this contract only. The drawings, which constitute a part of the contract documents, are as indexed on the cover sheet.

B. Drawings on disc (MicroStation V5 or J) will be made available to the Contractor to facilitate field surveys and design effort. **The Contractor shall be responsible for verification and determination of the accuracy of arrangements, architectural background and supplemental drawings, and perform detailed design and installation based on actual conditions.**

1.9 VARIATIONS FROM REQUIREMENTS AND SPECIFICATIONS

A. No change, variation, or deviation from the drawings or specifications shall be made, except by prior written approval of the Project Manager and Contract Administrator. Should the Contractor find at any time during the progress of the work, that in their opinion, existing conditions demand, make desirable, or beneficial a modification in requirements covering any particular item(s), they shall promptly report such matters in writing to the Project Manager for a written decision.

1.10 CONFLICTS - INTERPRETATIONS OF SPECIFICATIONS

A. Except as otherwise specifically provided, (1) in the event of conflict between the provisions of Division 1 of the technical specifications and Terms and Conditions, the Terms and Conditions shall govern and the Contractor shall seek written clarification; and (2) in the event of conflict between the provisions of Division 1 and/or the drawings, the Division 1 provisions shall govern.

B. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In cases of a difference between drawings and specifications, the specifications shall govern. In any case of discrepancy, in the figures, drawings, or specifications the matter shall be promptly submitted in writing to the Project Manager and/or Contract Administrator for resolution and a written determination. Any

adjustment by the Contractor without this determination shall be at his own risk and expense.

C. Unless otherwise specifically provided, the latest revision, publications, or standards of Federal Government, technical societies, or testing organizations included in these specifications by reference shall govern. In case of conflict between any document incorporated in this contract by reference and any express provision of this contract, the latter shall govern.

1.11 GOVERNMENT FURNISHED EQUIPMENT

A. BWXT Pantex will furnish and install the following:

1. Permanently installed fire extinguishers. (Note: Extinguisher mounting boards by Contractor.) Contractor is responsible for temporary fire extinguishers during construction - refer to Section 01562.

2. Manual pull stations (back box not provided) for contractor installation.

1.12 CUTTING AND PATCHING

A. The Contractor shall review drawings and specifications carefully to determine extent of all patch and repair work. The Contractor shall be responsible for and coordinate all such work related to patching and repairing.

B. Existing work and materials that are removed to facilitate construction and not covered over shall be replaced to match existing as approved by the Project Engineer.

1.13 SITE INFORMATION

A. Information shown on the drawings regarding this project is based upon the best available data from Plant records and drawings and is not intended as a warranty of accuracy. It is expressly understood that BWXT Pantex will not be responsible for interpretations or conclusions drawn therefrom by the Contractor. It shall also be recognized that adjustments in the work may be necessary to conform to existing conditions. Construction Management should be notified of any adjustments as soon as possible.

B. If the required adjustments in the work could affect safety (e.g. require additional utility shutdowns, lock outs, etc.), the Contractor should notify Construction Management before proceeding.

C. If the required adjustments in the work could affect Plant Operations (e.g. remove a system from service, reroute traffic, change access to buildings, etc.), the Contractor should notify Construction Management before proceeding.

1.14 COMPLETE SYSTEM

A. The Contractor shall provide all incidental items and parts necessary to provide a complete and functional system that performs as specified.

B. The Contract documents are diagrammatic in nature and show certain physical relationships between system components and their interface with other systems. The Contractor is responsible for establishing the physical interface between these systems and components.

C. The Contractor shall follow all manufacturers' recommendations and procedures for the installation of materials, equipment, and systems.

D. All equipment and systems shall comply with applicable codes, standards, laws, and regulations.

1.15 WAGES AND PAYROLL

A. The current Davis-Bacon rates are applicable to this contract.

B. All payrolls will be certified and submitted on our form PX-235 on a weekly basis, within seven (7) days of the actual payroll date, for prime and sub-tier Contractors.

1.16 TRANSFER OF EQUIPMENT OR MATERIAL

A. Form DS-MNL-53771C will be used to document the exchange of equipment/material between BWXT Pantex and the Contractor. The form must reflect the names of the BWXT Pantex and Contractor Representatives issuing and receiving the equipment/material, the date of exchange and acknowledgment the equipment/material has been received in satisfactory condition.

END OF SECTION 01010

SECTION 01019 - PROJECT ADMINISTRATION

PART 1 - GENERAL

1.1 CONTRACT ADMINISTRATOR

A. The Pantex Plant is owned by the United States Government and is operated on behalf of the Department of Energy (DOE) by BWXT Pantex. BWXT Pantex will be the Administrator of this construction contract.

B. The Contract Administrator (CA) for BWXT Pantex is Dick Darrah. The CA may be contacted at:

BWXT PANTEX
PANTEX PLANT
PO BOX 30020
AMARILLO, TEXAS 79120-0020
ATTN: Dick Darrah
PROCUREMENT, BUILDING 16-12
TELEPHONE: 806-477-3844 (NO COLLECT CALLS ACCEPTED.)
EMAIL: ddarrah@pantex.com

C. The CA shall be responsible for all contracts and contractual information including formal correspondence and change orders.

1.2 SUBCONTRACTOR TECHNICAL REPRESENTATIVE

A. The Subcontract Technical Representative (STR) for this contract is Rebecca Eller. The STR may be contacted at:

BWXT PANTEX
PANTEX PLANT
PO BOX 30020
AMARILLO, TEXAS 79120-0020
ATTN: Rebecca Eller
FACILITIES, BUILDING 12-5
TELEPHONE: 806-477-3097 (NO COLLECT CALLS ACCEPTED.)
EMAIL: reller@pantex.com

B. The STR shall be BWXT Pantex's Project Manager (PM).

C. The STR is responsible for the management of the project including, but not limited to, the following:

1. Monitoring the project through the review and approval of payment requests, construction schedule, change orders, and interpretations.

2. Review of the Contractor's work to ensure conformance with the contract documents.

3. Approve contract change authorizations and purchase requisitions.

D. The STR will use BWXT Pantex personnel for the management and inspection of this project.

E. The Alternate Subcontractor Technical Representative (STR) for this contract is Kevin Long . The Alternate STR may be contacted at:

BWXT PANTEX
PANTEX PLANT
PO BOX 30020
AMARILLO, TX 79120-0020
ATTN: Kevin Long
FACILITIES, BUILDING 12-5
TELEPHONE: 806-477-6347 (NO COLLECT CALLS ACCEPTED)
EMAIL: klong@pantex.com

1.3 STR'S REPRESENTATIVE

A. The BWXT Pantex personnel identified herein are designated as the STR's representatives. They may act on the STR's behalf to facilitate design reviews, construction site logistics, quality control, project communications, and similar tasks. These individuals are identified and their responsibilities are defined below.

1. The Project Engineer (PE) for BWXT Pantex is Daniel Kester . The PE may be contacted at:

BWXT PANTEX
PANTEX PLANT
PO BOX 30020
AMARILLO, TEXAS 79120-0020
ATTN: Daniel Kester
FACILITIES, BUILDING 12-5
TELEPHONE: 806-477-5558 (NO COLLECT CALLS ACCEPTED)
EMAIL: dkester@pantex.com

2. The PE shall provide comprehensive technical support for the project such as technical review of submittals, development and approval of design changes, and technical liaison to the Project Manager.

3. The BWXT Pantex Contract Administrator shall be contacted for all questions during the Preproposal period.

B. Construction Manager:

1. The Construction Manager (CM) for BWXT Pantex is Don Lankford . The CM may be contacted at:

BWXT PANTEX
PANTEX PLANT
PO BOX 30020
AMARILLO, TEXAS 79120-0020
ATTN: Don Lankford
FACILITIES, BUILDING 12-5
TELEPHONE: 806-477-3337 (NO COLLECT CALLS ACCEPTED.)
EMAIL: dlankford@pantex.com

2. The CM shall be responsible for:

a. Serve as the Contractor's point of contact for permits, site and building access, security clearances, utility shutdowns, training, lay down areas, batch plants, submittals, safety, waste management, site security, pollution prevention, and similar items.

b. Coordinate or perform BWXT Pantex construction inspection and laboratory testing for the project.

END OF SECTION 01019

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall be responsible for the supervision and coordination of the activities of his personnel and subcontractors.

B. Related Requirements specified in other sections:

1. 01200 - Project Meetings
2. 01300 - Submittals
3. 01310 - Construction Schedule with Cost Loaded Per Task
4. 01540 - Security
5. 01561 - Health and Safety
6. 01562 - Fire Safety
7. 01563 - Contractor Waste Management
8. 01568 - Radiation Safety - Contractor Work

1.2 CONTRACTOR'S REPRESENTATIVE

A. The Contractor shall give personal attention to the work at all times and will have a duly authorized representative (Superintendent) on the site to receive directions or instructions.

1. The Superintendent shall be on-site continuously during the hours of work, prior to the arrival of any materials at the job site, and throughout the progress of the work.

2. All instructions or directions given to the Superintendent by a BWXT Pantex representative shall be considered the same as though given to a principal of the Contractor.

3. The Superintendent shall supervise and direct the work efficiently and with their best skill and attention.

4. The Superintendent shall attend the Preconstruction and Progress Meetings and shall be involved in the development and approval of the construction schedule.

B. The Superintendent shall have five (5) years previous experience as a Superintendent for similar types of projects and be thoroughly familiar with the requirements of the project.

C. In the event the proposed Superintendent is not satisfactory to the Project Manager, the Contractor shall propose another Superintendent of proper qualifications.

D. If the Superintendent is absent from the site, a substitute, whom the Project Manager has approved, shall be provided.

E. In case the construction work should stop for a period of ten (10) days or longer through no fault of the Contractor, the Superintendent may be removed from the job and returned when active work resumes.

F. The Superintendent shall not be relieved except with the consent of BWXT Pantex unless he proves to be unsatisfactory, either to the Contractor or BWXT Pantex, or ceases to be in the Contractor's employment. If a replacement Superintendent is required, the Contractor shall submit a resume for the proposed replacement within five (5) calendar days for Project Manager approval.

1.3 WORK FORCES-PERIOD AND OVERTIME

A. The Contractor shall furnish enough qualified personnel, construction facilities, and equipment to complete the work in accordance with the approved construction schedule. Personnel qualifications for key personnel are defined in Specification Section 01010 and the FPDCM.

B. The Contractor shall work overtime, weekends, or holidays as necessary to recover schedule slippages and complete the work in accordance with the approved construction schedule.

C. Regular working hours for construction personnel on this contract will be swing shift, 4:15 p.m. to 12:15 a.m., Monday through Friday.

D. The Contractor may work weekends and holidays, 7:30 a.m. to 4:00 p.m. **with BWXT Pantex's prior approval**.

E. All Contractor's costs associated with overtime work shall be included in the lump-sum offer proposal at no additional cost to the Government.

1.4 FACILITY ACCESS REQUESTS

A. A Guards/Facility Access Request Form, PX-3933, shall be completed and

submitted 72 hours in advance of required access to a Pantex facility or building.

B. The Guards/Facility Access Request form can be given or faxed to the Construction Manager at 477-7820.

1.5 DISTURBANCE OF PLANT SERVICES

A. If a plant service has to be disturbed for a tie-in or testing, the operation shall be performed during off-shift hours with prior approval of BWXT Pantex.

B. The Contractor shall coordinate all building and equipment shutdowns with the Construction Manager. The Contractor shall notify BWXT Pantex in writing seven calendar days, unless otherwise specified, prior to any required outages. If a shutdown request is denied because of Plant Operations, BWXT Pantex will coordinate and schedule another shutdown at the earliest time convenient for both the Contractor and Plant Operations.

C. **Impairment** of the fire protection (fire alarm and sprinkler) systems shall be coordinated by the PE. The Contractor shall notify the PE in writing 10 calendar days, (unless otherwise specified), prior to any required outages involving fire protection systems. If a shutdown request is denied because of Plant Operations, BWXT Pantex will coordinate and schedule another shutdown at the earliest time convenient for both the Contractor and Plant Operations.

1. Impairment Sequencing:

   a. Work shall be phased to limit the impairment of initiating devices and notification appliances. No devices shall be kept in an impaired state outside of working hours without written approval from the PE. The new system shall be programmed each shift for the devices and appliances added that shift.

   b. All modifications of the existing fire alarm system shall be staged to limit the frequency and duration of alarm system impairments. Perform as much work as possible prior to performing system impairments.

   c. All necessary impairments shall be communicated to the PE 10 days prior to needing the impairment.

2. Impairment of fire protection systems will be performed by the Fire Department.

   a. A "Fire Protection Equipment Impairment/Restoration Request," PX-4209, shall be submitted by the Contractor to the Construction Manager.

   b. Construction Management will coordinate the shutdown or restoration

with the Fire Department and Building Manager as appropriate by initiating a "Utility System Shutdown Checklist," DS-IOP-1105 and delivering the completed PX-4209 and the DS-IOP-1105 to the Fire Department.

c. After receipt of a signed PX-4209 and DS-IOP-1105 from the Fire Department certifying that shutdown is authorized and energy sources have been blocked, Construction Management shall notify the Contractor when it is clear to begin work and will accompany the Contractor on a walk down of the system.

d. The Contractor shall verify the BWXT Pantex Fire Department Lockout/Tagout for adequacy and proper position of lockout points and perform their Lockout/Tagout. The Contractor shall then verify absence of energy, initiate and complete Lockout/Tagout procedures including installing locks at all energy isolation devices and sign the verification block of the DS-IOP-1105. If the Contractor cannot place a lock at the "energy isolation devices" due to location constraints, **THEN** the key(s) for the Plant Administrative lock(s) are placed inside a lock box and the Contractor places a lock on the lock box.

e. Construction Management will apply a lock(s) to the Contractor's lock box or lock and sign verification block of the DS-IOP-1105. The Construction Management lock(s) is for administration purposes only and does not relieve the Contractor of any responsibility of their lockout procedures.

f. Upon completion of work, the Contractor shall notify Construction Management.

g. Construction Management will review the work. If acceptable, the Contractor shall sign the Completion of Work block of the DS-IOP-1105.

h. Construction Management will make the appropriate notifications that the system is ready to place back into service, sign the completion of work section on DS-IOP-1105 and coordinate removal of lock(s).

1.6 ELECTRICAL CIRCUIT SWITCHING AND POWER SHUTDOWNS

A. BWXT Pantex will arrange switching on overhead and underground primary circuits. The Contractor shall notify the Construction Manager in writing 5 calendar days prior to any required switching operations.

B. BWXT Pantex will arrange switching of secondary circuits serving facilities. The Contractor shall notify the Construction Manager in writing 5 calendar days prior

to any required switching operations.

C. All primary electrical circuit switching operations will be performed on premium time, outside of regular working hours upon approval by the Construction Manager.

D. All material needed to complete work and restore power shall be on site before a power outage is initiated.

E. Electrical equipment and operations shall be in compliance with all applicable requirements of 29 CFR 1926.400.

F. All shutdowns of primary circuits and secondary power shutdowns; involving transformers, main switchgear, main feeders shall be performed by the Plant's Maintenance Department. Shutdowns shall be as follows:

1. A "Request for Shutdown of Utilities Services," PX-665A, shall be submitted by the Contractor to the Construction Manager.

2. Construction Management will coordinate the shutdown or restoration with the Utilities Department and Building Manager as appropriate by initiating a "Utility System Shutdown Checklist," DS-IOP-1105, and delivering the completed PX-665A and the DS-IOP-1105 to the Fire Department.

3. After receipt of a signed "Announcement of Equipment/System Shutdown," PX-665 and DS-IOP-1105 from the Utilities Department certifying that shutdown is authorized and energy sources have been blocked, Construction Management shall notify the Contractor when it is clear to begin work and will accompany the Contractor on a walk down of the system.

4. The Contractor shall verify BWXT Pantex Lockout/Tagout for adequacy and proper position of lockout points and perform their lockout of the system and apply their lock(s). The Contractor shall then verify absence of energy, initiate and complete Lockout/Tagout procedures including installing locks at all energy isolation devices and sign the verification block of the DS-IOP-1105. If the Contractor cannot place a lock at the "energy isolation devices" due to location constraints, **THEN** the key(s) for the Plant Administrative lock(s) are placed inside a lock box and the Contractor places a lock on the lock box.

5. Construction Management will apply a lock(s) to the Contractor's lock box or lock and sign verification block of the DS-IOP-1105. The Construction Management lock(s) is for administration purposes only and does not relieve the Contractor of any responsibility of their lockout procedures.

6. Upon completion of work, the Contractor shall notify Construction Management.

7. Construction Management will review the work. If acceptable, the Contractor shall sign the Completion of Work block of the DS-IOP-1105.

8. Construction Management will make the appropriate notifications that the system is ready to place back into service, sign the completion of work section on DS-IOP-1105 and coordinate removal of lock(s).

G. Shutdown of secondary branch circuits within a facility can be performed by Contractor personnel when circuits are feeding from panel boards of motor control centers as long as the Contractor has an approved lockout and tagging procedure in place consistent with the requirements of 29 CFR 1910.333(b). The Contractor shall notify the Construction Manager in writing 72 hours prior to any requested shutdowns regarding secondary branch circuits.

1. A "Request for Shutdown of Utilities Services," PX-665A, shall be submitted by the Contractor to the Construction Manager.

2. Construction Management will coordinate the shutdown or restoration with the Contractor and Building Manager as appropriate by initiating a "Utility System Shutdown Checklist," DS-IOP-1105.

3. After a joint walk down by the Contractor and the Construction Manager to determine what circuit(s) are required to be locked out, the Contractor will lockout and apply his lock(s). The Contractor will verify absence of energy prior to performing the work and sign the verification block of the DS-IOP-1105. If the Contractor cannot place a lock at the "energy isolation devices" due to location constraints, **THEN** the key(s) for the Plant Administrative lock(s) are placed inside a lock box and the Contractor places a lock on the lock box.

4. Construction Management will apply a lock(s) to the Contractor's lock box or lock and sign verification block of the DS-IOP-1105. The Construction Management lock(s) is for administration purposes only and does not relieve the Contractor of any responsibility of their lockout procedures.

5. Upon completion of work, the Contractor shall notify Construction Management.

6. Construction Management will review the work. If acceptable, the Contractor shall sign the completion of work block on the DS-IOP-1105.

7. Construction Management will make the appropriate notifications that the system is ready to place back into service, sign the completion of work section on DS-IOP-1105 and coordinate removal of lock(s).

8. Circuits may be worked energized only with prior approval of BWXT Pantex

and meet procedures in the Contractor's approved Safety Plan. Only equipment designed specifically to be installed with the circuit energized will be considered. This includes trouble shooting/current measurements to verify installation, relamping, installing stab-in breakers and infrared measurements where exposure to energized parts occur.

H. The operations of cranes, hoist or booms around electrical lines shall be in accordance with OSHA 1926.550. This regulation requires a minimum clearance of 10 feet between an energized line of 50 KV or less. This distance is measured from the line to any part of the hoist/boom and its load.

1.7 CONTRACTOR PERSONNEL ACCOUNTABILITY

A. The nature of business conducted at the Pantex Plant requires Emergency Management Planning. Emergency drills are conducted on a regular basis. The safety of all personnel on the Plant Site is the focus of these drills. Therefore, the Contractor must be able to rapidly account for all their personnel working at the Pantex Plant.

1. Each Contractor Superintendent shall maintain a daily list of crews and the specific work location of that crew. Each "crew" list shall contain each employee's name and badge number.

2. In the event of a drill or an actual emergency, the Contractor Superintendent or designee shall telephone or fax a list of the crew within fifteen (15) minutes of notification by the Construction Manager, otherwise contact the Operations Center at extension 5000.

1.8 REQUIRED TRAINING

A. General Employee Training (GET).

1. All BWXT Pantex visitors, Contractors, and temporary personnel possessing a clearance (Q or L) requiring access to any operating zone of the Plant must complete the following designated General Employee Training (GET) classes, including passing written tests if required:

   a. Introduction to GET.
   b. Hazard Communication.
   c. Explosives Safety.
   d. Fire Protection.
   e. Emergency Management.
   f. Industrial Safety.
   g. General Employee Radiation Training (GERT)*.

* All personnel (regardless of clearance level) requiring access to areas controlled for radiological purposes should refer to Section 01568 for radiological training requirements.

B. General Employee Radiation Training (GERT).

1. All BWXT Pantex Contractors requiring access to Pantex for greater than 10 calendar days must successfully complete General Employee Radiation Training (GERT). GERT is required every two years for Contractor personnel.

2. GERT study guides are available upon request from the Construction Manager.

C. Safety Video.

1. All Contractor personnel must attend the Safety Video Presentation annually. The Contractor and BWXT Pantex shall maintain a record of attendance.

D. Special Assistance.

1. Contact the Construction Manager in advance of training if special assistance (translator or oral testing) is required for any Contractor personnel.

END OF SECTION 01040

SECTION 01070 - ACRONYMS AND ABBREVIATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section defines acronyms and abbreviations used in these specifications including, but not limited to, all items listed below, and those identified in Section 01090. Abbreviations used on the drawings are defined on the drawings.

Acronym	1st Time Use	Meaning
AHJ	01010-3	Authority Having Jurisdiction
ANSI	01090-1	American National Standards Institute
AP	01563-9	Analysis Pending
ASME	01090-1	American Society of Mechanical Engineers
ASTM	01090-1	American Society for Testing & Materials
AWS	01090-1	American Welding Society
A/E	15300-6	Architect & Engineers
BTU or BTU/H	01070-1	(1) British Thermal Units or (2) British Thermal Units Per Hour
BWXT Pantex	01010-1	Prime Pantex M&O Contractor
BXUV	07270-3	U.L. Fire Resistance Directory - Fire Resistance Ratings
CA	01019-1	Contract Administrator
CAD	15300-6	Computer Aided Drawing
CARS	01421-2	Central Alarm Receiving Station
CCA	15300-26	Construction Change Authorization
CCCB	15300-7	Configuration Change Control Board
CD	01300-7	Compact Disk
CFM	01070-1	Cubic Feet per Minute
CFR	01070-1	Code of Federal Regulations
CSSC/SS	01300-5	Critical Safety, Safety Class / Safety Significant
CWC	01563-3	Contractor Waste Coordinator
CWMP	01563-3	Contractor Waste Management Plan
DACS	16721-???	Digital Alarm Communication System
DACT	16721-25	Digital Alarm Communicator Transmitter
Det-Tronics	01010-2	Detector Electronics Corporation
DOE	01019-1	Department of Energy
EMR	01561-5	Electro-Magnetic Radiation
EMT	01070-1	Electrical Metallic Tubing
EPD	01561-4	Environmental Protection Department
F	01070-1	Fahrenheit

Acronym	1st Time Use	Meaning
FACP	01010-1	Fire Alarm Control Panel
FAT	15300-20	Final Acceptance Test
FAU	01010-1	Fire Alarm Upgrade (12-44 UV Deluge)
FPDCM	01010-2	Fire Protection Design Criteria Manual
FM	01010-2	Factory Mutual (equipment certification)
FPE	01070-1	Fire Protection Engineering
FPT	01070-1	Female Pipe Thread
FS	01090-1	Federal Specifications (GSA)
FT	01070-1	Foot or Feet
Gai-Tronics	01010-2	Gai-Tronics Electro-Sound Communications
gal	01561-4	Gallon
GERT	01040-6	General Employee Radiation Training
GET	01040-5	General Employee Training
GFCI	01010-1	Government Furnished & Contractor Installed
GFCI	01561–4	Ground-Fault Circuit Interrupter
GFGI	01010-1	Government Furnished & Government Installed
GPM	01070-1	Gallons per Minute
GSA	01090-1	General Services Administration
H-O-A	01070-1	Hand-Off-Auto
HAD	01010-1	Pneumatic Heat Actuated Detector
HP	01070-1	Horsepower
HRA	01568-2	High Radiation Area
HS&Q	01561-5	Health, Safety & Quality Division
HVAC	01070-1	Heating, Ventilation & Air Conditioning
ICEA	01070-1	Insulated Cable Equipment Association
IEEE	01090-1	Institute of Electrical & Electronic Engineers
lb	01561-4	Pound
LNG	01561-4	Liquid Natural Gas
LPG	01561-4	Liquid Petroleum Gas
MDS	15300-2	Mechanical Deluge Switch
MDV	15300-2	Mechanical Deluge Valve
MSDS	01561-3	Material Safety Data Sheets
NEC	01070-1	National Electric Code
NFPA	01070-1	National Fire Protection Association
NICET	01010-3	National Institute for Certification in Engineering Technologies
NOI	01564-2	Notice of Intent
NOT	01564-2	Notice of Termination
NPDES	01564-1	National Pollutant Discharge Elimination System
OC	01561-3	Operations Center
OSHA	01090-2	Occupational Safety & Health Administration
OS&Y	15300-1	Outside Stem & Yoke

Acronym	1st Time Use	Meaning
oz	01561-4	Ounce
PE	01070-1	(1) Project Engineer or (2) Professional Engineer
PM	01070-1	Project Manager
PPE	01561-3	Personal Protective Equipment
psi	15300-6	Pounds per Square Inch
PSIG	01070-1	Pounds per Square Inch Gauge
QA	01400-4	Quality Assurance
RCRA	01563-2	Resources Conservation Recovery Act
RF	01561-5	Radio Frequency
RFP	01070-1	Request for Proposal
RGD	01568-1	Radiation Producing Device
RMA	01568-2	Radioactive Material Area
RSD	01568-1	Radiation Safety Department
RWP	01568-1	Radiation Work Permit
RWT	01568-2	Radiation Worker Training
STR	01019-1	Subcontractor Technical Representative
SWMU	01563-9	Solid Waste Management Unit
SWPPP	01564-2	Storm Water Pollution Prevention Plan
TAB	01070-1	Testing, Adjusting & Balancing
TNRCC	01563-1	Texas Natural Resource Conservation Commission
UBC	01070-1	Uniform Building Code
UFC	7270-1	Uniform Fire Code
UL	01010-2	Underwriters Laboratory Inc.
UMC	01070-1	Uniform Mechanical Code
UPC	01070-1	Uniform Plumbing Code
UV	01010-1	Ultraviolet
VHRA	01568-2	Very High Radiation Area
WOD	01563-6	Waste Operations Department
WWP	15300-16	Water Working Pressure
XHCR	07270-3	U.L. Fire Resistance Directory - Through-Penetration Firestop Devices
XHEZ	07270-3	U.L. Fire Resistance Directory - Through-Penetration Firestop Systems
XHHW	07270-3	U.L. Fire Resistance Directory - Fill, Void or Cavity Material

END OF SECTION 01070

SECTION 01090 - REFERENCE STANDARDS

PART 1 - GENERAL

1.1 REQUIREMENTS

A. Applicability of Reference Standards.

B. Provision of Reference Standards at the site.

C. Acronyms used in the contract documents for Reference Standards. Source of Reference Standards.

1.2 QUALITY ASSURANCE

A. The Contractor shall, for products of workmanship specified by association, trade, or Federal Standards, comply with that standard.

B. The revision or date of the applicable standard shall be the date in the BWXT Pantex specification, or if no date is specified, the revision that was in effect when the contract was bid.

1.3 SCHEDULE OR REFERENCES

A. The references to published construction industry standards, either by name or by abbreviation, include those by government agencies, trade associations, societies, and other recognized authorities and institutions publishing standards and are identified as follows:

ANSI	American National Standards Institute, 1430 Broadway, New York, NY 10018
ASME	American Society of Mechanical Engineers, 345 East 45th Street, New York, NY 10017
ASTM	American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103; 215-299-5400
AWS	American Welding Society, 2501 NW 7th Street, Miami, FL 33125

FS	Federal Specifications (General Services Administration), Building 197, Washington Navy Yard, S.E., Washington, DC 20405
IEEE	Institute of Electrical and Electronic Engineers, Inc., 245 East 47 Street, New York, New York 10017
NEC	National Electrical Code (of NFPA 70)
NFPA	National Fire Protection Association, Batterymarch Park Quincy, MA 02269
OSHA	Occupational Safety and Health Administration, U.S. Department of Labor
UBC	Uniform Building Code. International Conference of Building Officials, Whittier, California, 1994
UL	Underwriters Laboratories, Inc., 333 Pfingston Road, Northbrook, IL 60062

References within these specifications to the above publications are either by name or abbreviation.

END OF SECTION 01090

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall attend a Kick-Off Meeting prior to the start of this project and Progress Meetings throughout the life of this project. Related requirements specified in other sections:

1. 01250 - Construction Management Plan.
2. 01300 - Submittals.
3. 01310 - Construction Schedules.

1.2 PREPROPOSAL MEETING

A. Prior to the Proposal Closing date, a Preproposal Meeting shall be held to inform prospective Contractors as to the type of work, scope of work, and special procedures that must be adhered to during construction. The meeting will be held on Plant Site with the exact time and location set by BWXT Pantex. The following is a tentative itinerary of activities and information to be discussed at the Preproposal Meeting:

1. Scope of Work to be accomplished.
2. Sequence of Work.
3. Design and Construction Schedule.
4. Project Administration Procedures.
5. Fire Department Regulations.
6. Security Department Regulations.
7. Safety Department Regulation (all groups).
8. Utility Excavation.
9. Waste Management Regulations.
10. Question and Answer.
11. Tour of Construction Site.

Minutes of the meeting will be taken by BWXT Pantex. Modifications and clarifications resulting from the meeting will be issued as an amendment to the RFP. **Attendance at the Preproposal Meeting is mandatory for all bidders, no exceptions.**

1.3 KICK-OFF MEETING

A. This meeting will be administered by BWXT Pantex prior to the start of design.

The meeting will be held on Plant Site with the exact time and location set by BWXT Pantex.

B. Attendance:

1. BWXT Pantex Contract Administrator, Project Manager, and Project Engineer.
2. Officer of the Design Company.
3. Design Company Project Engineer(s)

C. Minimum Agenda:

1. BWXT Pantex will review and discuss requirements relative to Title I and Title II design, and the overall management of the project.

2. The Contractor shall provide **2 copies** of the following:

   a. The draft plan and cost loaded schedule for the project. The schedule shall include all work required for the project including milestones (submittals, procurement, fabrication, installation, inspections, and testing). Refer to Section 01310.

   b. Bonds and certifications of insurance.

   c. List of proposed subcontractors.

D. This will be a working meeting for the Contractor to work with the BWXT Pantex Project Team and gather as much data as possible to facilitate the design effort. **It is mandatory that the Contractors Engineering Team be present at this meeting.** If the data requested above is approved by BWXT Pantex, a Notice to Proceed for Title I Design can be issued. If the data is not satisfactory to BWXT Pantex, then the Notice to Proceed shall be withheld until submitted and approved according to the contract. In either event, the Time of Completion for this contract (calender days) shall commence at issue of the Notice to Proceed.

1.4 PRECONSTRUCTION MEETING

A. This meeting will be administered by BWXT Pantex prior to the start of work. The meeting will be held on Plant Site with the exact time and location set by BWXT Pantex.

B. Attendance:

1. BWXT Pantex Contract Administrator, Project Manager, Project Engineer, and Construction Manager.
2. Contractor Officer or representative.

3. Contractor's proposed Superintendent.
4. Major Subcontractor(s) representatives.
5. DOE/AAO representative.
6. BWXT Pantex Security, Explosive Safety, Radiation Safety, Occupational Safety & Health, Waste Management, Environmental Protection, and Fire Department representatives.

C. Minimum Agenda:

1. BWXT Pantex will review and discuss requirements relative to planning and the administration of the overall construction program. Security, safety, utility excavation, and fire prevention requirements will be discussed and clarified in this meeting.

2. The Contractor shall provide two copies of the following at the Preconstruction Meeting:

   a. The Safety, Waste Management, and Hazard Communication Plan. (Note: The Contractor is urged to communicate with the Safety, Waste Management, and Industrial Hygiene Departments after the Notice of Award concerning these submittals so that fully developed plans may be submitted at this meeting).

   b. The request for temporary utilities shall indicate the types, sizes, and general location of utilities required at each site. Include the requested location for office and storage trailers, if necessary.

   c. Name of surveyor and a print of site plan showing proposed location of office trailer.

   d. List of testing laboratories including addresses and phone numbers.

   e. List of proposed subcontractors.

D. This will be a working meeting for the Contractor to do final coordination work for the cost loaded construction schedules, work sequences, procedures, and procurements. The Contractor shall use the data from this meeting to develop the final construction schedule and arrange for permits. **It is mandatary the Contractor's Superintendent be present.** If the data requested is approved by BWXT Pantex, a Notice to Proceed can be issued. If the data is not satisfactory to BWXT Pantex, then the Notice to Proceed shall be withheld until submitted and approved according to the contract. **Failure to obtain a Notice to Proceed for construction, will not relieve the contractor of his responsibility to complete the project in the specified time period dictated when the Notice to Proceed was issued for design.**

1.5 PROGRESS MEETINGS

A. The BWXT Pantex Project Manager will schedule and preside at the periodic progress meetings, which will be held at least once each month on the Plant Site.

B. The Contractor shall record the minutes of the meeting and submit them to the BWXT Pantex Project Engineer for approval. The Contractor shall distribute the approved minutes within three days after the meeting to participants, and entities affected by decisions. Copies will go to BWXT Pantex Construction Manager and Project Manager.

C. Attendees of Progress Meetings: Contractor Project Team, BWXT Pantex Project Engineer, Project Manager, Contract Administrator, Construction Manager, DOE representative, and other personnel appropriate to the agenda.

D. Minimum Agenda:

1. Review of work progress since previous meeting.
2. Field observations, problems, conflicts, inspection deficiencies (technical and safety), and decisions made.
3. Review project status in relationship to approved construction schedule, and corrective measures recommended to regain projected schedules.
4. Review of submittal status.
5. As-Built markups including utility locations.
6. Review of off-site fabrication and delivery schedules.
7. Planned progress during the following three weeks: sequence procedures, utility interruptions, testing and required coordination, possible delays or problems, etc.
8. Maintenance of quality standards: test reports, review as-built records, etc.
9. Payment requests.

END OF SECTION 01200

SECTION 01250 - MANAGEMENT PLAN

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall develop a project specific Management Plan (MP) consisting of the elements described in this section and submit two draft copies to BWXT Pantex at the Preconstruction Meeting.

B. Within 14 calendar days after receipt of the draft MP submittal, the Project Manager will notify the Contractor of his actions, opinions, objections, and comments regarding the draft. Within 14 calendar days after receipt of the Project Manager's comments, the Contractor shall resubmit four (4) copies of the correct MP. The resubmittal will be reviewed by the Project Manager and, if found to be revised per the comments, will be approved. Once approved by the Project Manager these documents will become a part of the contract. **No payments will be made to the Contractor until the MP submittal is approved by BWXT Pantex.**

1.2 ORGANIZATION

A. The organization section of the MP shall identify the Contractor's field personnel and describe their assigned responsibilities and authorities. The authorities and responsibilities will include, as appropriate, the following: cost and schedule requirements, payment requests, change orders, corrective action, meeting minutes, submittals, as-builts, operation and maintenance (O&M) data, compliance with safety requirements, permit requests, compliance with OSHA regulations, hazards communication program, general reporting requirements, special sequencing and coordination with other projects. The names and telephone numbers for the interferences with BWXT Pantex will be included in the plan.

1.3 PLAN AND SCHEDULE

A. The "Plan and Schedule" described in Section 01310 shall be included in the Management Plan.

1.4 DESIGN CONTROL

A. The Contractor's MP shall describe the interface with BWXT Pantex for change orders. The procedures for the issuance and control of approved submittals shall be described, including the interface with BWXT Pantex and A-E. A procedure shall be implemented for the documentation of construction problems in minutes of progress meetings, which will be tracked until BWXT Pantex has approved the completed corrective action.

1.5 MATERIAL HANDLING

A. The Contractor shall describe the procedures for assuring materials are appropriately stored and handled on the site as specified. The procedure shall describe the methods for the control of nonconforming material (materials or items not meeting specified criteria).

1.6 CONFIGURATION CONTROL

A. Procedures for marking and tracking as-built information, including accurate utility information, shall be defined. The procedures for collecting, reviewing, and formatting the data required for O&Ms will be described and the deliverable shown on the construction schedule.

END OF SECTION 01250

PART 1 - GENERAL

1.1 INTRODUCTION

A. Submittals include, but are not limited to, plans, drawings and diagrams, data, information, certifications, schedules, material samples, manuals, parts, warranties, and test reports. The Contractor shall submit for review and approval all items identified in other specification sections and summarized in the table below. This table is provided as a convenience to the Contractor and the omission of an item from this table does not relieve the Contractor from the responsibility of submitting an item listed in the individual specification sections.

SUBMITTAL NO	SPECIFICATION SECTION	SUBMITTAL DESCRIPTION	NO OF COPIES
1	07270 15300 16721	Design Drawings & Diagrams	3
2	15300 16721	Design Calculations	3
3	07270 15300 16721	Shop Drawings	3
4	07270 15300 16721	Technical Specifications	3
5	01010 07270 15300 16721	Personnel Qualifications	3
6	07270 15300 16721	Product and Data Details	3
7	07270 15300 16721	Manufacturer's Installation Procedures	3
8	07270 15300 16721	Product Data	3

SUBMITTAL NO	SPECIFICATION SECTION	SUBMITTAL DESCRIPTION	NO OF COPIES
9	15300 16721	Material List/Schedule	3
10	15300 15300 16721	Contract Plans	3
11	07270 15300 16721	Certification/Warranty	3
12	07270 15300 16721	As-Builts	3
13	15300 16721	O&M Manual	3
14	07270	MSDS Sheets	3
15	15300 16721	System Certifications	3
16	15300 16721	Acceptance Test Procedure	3
17	15300	Design Analysis Document	3
18	16721	Notifier Magnifier Programming Software	3
19	07270	Quality Assurance Plan	3
20			
21			

B. Each submittal shall be complete and in sufficient detail to allow a ready determination the item satisfies contract requirements.

C. The Contract Administrator may request submittals in addition to those specified when necessary to adequately describe the work required.

D. No partial or inserted submittals will be accepted.

E. For products specified by reference standards or by description only, the Contractor may submit any product meeting those standards.

F. Where products are specified by naming one or more manufacturers, the Contractor shall submit a request for substitution if the manufacturer of an item he proposes is not specifically named.

1.2 FIRE ALARM SYSTEM SUBMITTALS

A. See Section 16721.

1.3 SPRINKLER SYSTEM SUBMITTALS

A. See Section 15300.

1.4 FIRESTOPPING SUBMITTALS

A. See Section 07270.

1.5 CONTRACTOR REVIEW AND APPROVAL

A. The Contractor shall review and approve all submittals. The Contractor shall inform BWXT Pantex in writing of any deviation from the contract drawings or specifications at the time of submission and shall include such information with the submission.

B. The Contractor shall stamp each approved submittal. The stamp shall provide the name of the Contractor's firm, approval (e.g. approved, approved with correction notes, etc.), signature, title, and date.

C. By approving a submittal, the Contractor represents all field measurements, field construction criteria, materials, catalog numbers, and similar data are accurate and the submittal satisfies the contract specifications.

1.6 TRANSMITTAL OF SUBMITTALS

A. All submittals shall be sent to the Construction Manager. **A completed Contractor Submittal Form shall accompany all submittals.** These forms are available upon request from the Construction Manager.

B. Submittals shall be transmitted in accordance with the approved construction schedule. They shall be shipped prepaid and delivered as specified, properly marked to show the name of the material, trade name of manufacturer, place of origin, the name of the project where the material represented by the sample is to be used, and name of the Contractor submitting the sample.

C. Samples not subject to destructive tests may be retained until completion of the work. They will be returned to the Contractor at his own expense, if so requested in writing at the time of submittal.

D. The Contractor should allow 20 working days from time of receipt for BWXT Pantex review of submittals. BWXT Pantex will review the submittals both as the owner and for technical adequacy.

E. Delays, damages, or time extensions will not be allowed for time lost due to late submittals.

1.7 DESIGN APPROVAL / DISAPPROVAL

A. The reviewed documents will be returned, in one of the following ways:

1. APPROVED AS SUBMITTED

2. APPROVED, EXCEPT AS NOTED

3. APPROVED, EXCEPT AS NOTED - RESUBMITTAL REQUIRED

4. DISAGREE

B. When the documents are returned marked APPROVED AS SUBMITTED, the Contractor is released to begin fabrication and installation.

C. When the documents are returned marked APPROVED, EXCEPT AS NOTED, the Contractor shall make the noted changes and is released to begin fabrication and installation. The changes do not need to be resubmitted until the As-Built markups are submitted. As built markups shall have the revisions back circled.

D. When the documents are returned APPROVED, EXCEPT AS NOTED - RESUBMITTAL REQUIRED, the basic design is approved, however, the Contractor is not released to fabricate or begin installation. A complete resubmittal is required (all documents) unless specifically noted otherwise. All revisions shall be back circled. The Engineer's seal or review letter is required on the resubmittal unless specifically noted otherwise.

E. When the documents are returned DISAGREE, the Contractor shall redesign based on the review comments and resubmit. All revisions shall be back circled. The Engineer's seal or review letter is required on the resubmittal.

F. Resubmittals will not be reviewed without a correction or response for each review comment.

1.8 APPROVAL OF OTHER THAN DESIGN SUBMITTALS

A. Approval of submittals by BWXT Pantex shall not relieve the Contractor of the responsibility for correcting any errors which may exist or for meeting the requirements of the construction.

B. After the submittals have been approved, no resubmittal for the purpose of substituting materials or equipment will be considered except as provided in the contract clauses titled "Substitutions".

C. Payment for materials will not be made if the required approvals have not been obtained.

1.9 DISAPPROVAL OF OTHER THAN DESIGN SUBMITTALS

A. Submittals that do not meet contract specifications will be disapproved.

B. If the Contractor submits items that do not meet specifications, BWXT Pantex will have the right to reject them and select the materials or equipment for the Contractor. The selection made by BWXT Pantex will be final and binding. The items shall be furnished and installed by the Contractor without change in the contract price.

C. The Contractor shall make all corrections required and promptly furnish corrected submittal.

D. If the Contractor considers any correction indicated on the submittals to be a change to the contract, he shall promptly notify the Contract Administrator in writing.

1.10 FAILURE TO PROVIDE SUBMITTALS

A. If the Contractor fails to provide submittals within the specified time, BWXT Pantex will select the materials or equipment for the Contractor.

B. The selection made by BWXT Pantex will be final and binding. The items shall be furnished and installed by the Contractor without change in the contract price.

1.11 SUBSTITUTIONS

A. Requests for substitutions will be considered IF made within 45 calendar days after the date of the Notice to Proceed. Subsequently, substitutions will be considered only when a product becomes unavailable through no fault of the Contractor.

B. Requests for substitution shall list the material or equipment under consideration and the specification section and paragraph number wherein the material or equipment is specified. The submittals for the substitution will be presented with the substitution request.

C. Each request shall be documented with complete data (technical descriptive and detailed drawings). A sample may be requested to verify the proposed substitution meets contract specifications.

D. A request for substitution constitutes a representation that the Contractor:

1. Investigated the proposed product and determined it meets or exceeds, in all respects, the specified product.
2. Provide the same warranty as for the specified product.
3. Provide all design and engineering drawings, calculations, and details (including modifications to structures, building layouts, mechanical, electrical, and fire protection systems) needed to accommodate the installation of substitute material.
4. Provide complete shop drawings, product data, Operating and Maintenance Manuals, and systems demonstrations as specified.
5. Coordinate the installation and make other changes which may be required for work to be complete in all respects.

6. Waive claims for additional costs which may subsequently become apparent.
7. Not create additional energy consumption to achieve design conditions.
8. Not have an adverse impact on approved schedules.
9. Not increase the cost of the contract.

E. Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without separate written requests.

F. BWXT Pantex will determine the acceptability of the proposed substitution and will notify the Contractor of acceptance or rejection in writing within ten days.

G. If a proposed substitution is incomplete or not in compliance with the specifications, the submittal will be rejected.

H. Only one request for substitution will be considered for each product. If the substitution is not accepted, the Contractor shall provide a submittal for the specified project.

I. Delays, damages, or time extensions will not be allowed for time lost due to requests for substitution.

1.12 OPERATING AND MAINTENANCE MANUALS

A. The Contractor shall submit a minimum of **two (2)** copies of all **proposed** Operating and Maintenance (O&M) Manuals (including drawings, data sheets, and calculations) in final format, for review, at least 30 calendar days prior to acceptance testing. The Contractor will be notified of any corrections necessary to make the documents acceptable.

B. Upon BWXT Pantex approval of the manual, **five (5)** final copies shall be provided. Final copies of the manual are required at least 7 calendar days prior to the Final Acceptance Test (FAT).

C. Equipment data sheets shall be updated if necessary due to any approved equipment substitutions or review comments and submitted in a clearly marked section of the manual.

D. Calculations shall be revised due to any as-built conditions or review comments and submitted in a clearly marked section of the manual.

E. Fire alarm system calculations shall include current requirements for each device in both standby and alarm conditions, and current values for the total number of devices of each type installed. Measured current draw data for fire alarm systems shall be included.

F. O&M Manuals shall meet the following criteria:

1. Each building's data shall be placed in its own binder, which will include but is not limited to a Table of Contents and Cell Matrix (see incomplete example below).

Index Tab	Cell / Building To Which Index Tab Applies									
	12-44E	12-44 EA	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Cell 8	Ramp 12-R-44
Multimatic				X	X	X	X	X		
FACP	X	X	X	X	X	X	X	X	X	X
Det-Tronics				X	X	X	X	X		
Firestop Assembly # XXXX			X	X	X	X	X	X	X	

2. Commercial quality three-ring binders with durable and cleanable plastic covers, 1 inch minimum ring size, shall be used.

3. Binders shall be imprinted with the name of the project on the spine and the front cover. Volume numbers shall be imprinted if more than one is required.

4. Standard paper, 8-1/2 inches by 11 inches, shall be used. The text shall either be typewritten or manufacturer's printed data. Illegible copies will not be acceptable.

5. Critical Safety, Safety Class, Safety Significant (CSSC/SS) Systems will be identified and separate.

6. If necessary, drawings shall be identified with the three-letter system data base copy (e.g. FPS, FAS) in the title block, provided with reinforced punched binder tabs, and folded to the size of text pages.

7. Provide indexed tabs for each separate product, each major piece of operating equipment, or system.

8. Data shall be presented in a systematic and orderly manner. Equipment data shall be grouped according to type (i.e. Fire Alarm System, Sprinkler System, Fire Stopping). Information presented shall include:

    a. Table of Contents
    b. Cell Matrix (see incomplete example above)
    c. Directory Listing: Names, Addresses, and Telephone Numbers of Contractor and Subcontractor
    d. Descriptive Equipment Data Provided (per system)
    e. Installation instructions
    f. Assembly drawings
    g. Sequence of Operation for Each System
    h. Normal and Emergency Operating Procedures of Each System
    i. Any Special Protective Devices and Operating Instructions
    j. Trouble Shooting/Malfunction Analysis Guide
    k. Preventive Maintenance Routines and Frequencies
    l. Disassembly , Repair, and Reassembly Procedures
    m. Exploded Drawings and Assemblies and Components
    n. Manufacturer's Parts List

o. Recommended Spare Parts List
p. Special Tools Required
q. Storage Requirements
r. Test Equipment Required for Maintenance and/or Check-out of Equipment Warranties
s. Name, Address, and Telephone Number of Vendor
t. Electrical Equipment, such as Grounding Cable and Connectors shall include brand, type, size, and other pertinent data
u. Parts List
v. List of maintenance tools furnished with equipment
w. Nameplate information and shop order numbers for each item of equipment and component thereof
x. Maintenance instructions
y. Complete and detailed operating instructions
z. Test data and operating instructions

9. The above listed requirements are minimum. Requirements which are clearly not applicable to the equipment may be deleted.

10. Proposal data sheets are not to be submitted as the O&M requirements. Each one of the items above needs to have descriptive vendor recommendations typed.

G. Final approval of shop drawings shall be contingent upon receipt and approval of all required O&M information.

1.13 RECORD DOCUMENTS

A. The Contractor shall maintain **two** full size sets of plans and specifications as record documents. These documents shall reflect as-built conditions and record the material installed and the work completed by the Contractor. They shall include a record of all deviations, modifications, change orders, field changes, and Contractor designed subsystems.

B. As a minimum, the record documents note:

1. The location and description of any marked, existing or new, utility lines or other installations of any kind or description known to exist within the construction area. The location includes dimensions to permanent features and exact elevations and change of direction of these lines. Correct utility location will be verified when Excavation Permits are requested.
2. Location of internal utilities and appurtenances concealed in construction. Reference these items to features of the structure that are visible and accessible.
3. Location of concealed valves, dampers, controls, balancing devices, junction boxes, clean outs, etc., that require access or maintenance.
4. The location and dimensions of any changes within the building or structure.
5. Correct grade or alignment of roads, structures or utilities, including cabling, ductbanks, and sleeves, if any changes were made from contract documents.
6. Correct elevations if changes were made in site grading.
7. Changes in details of design or additional information obtained from drawings specified to be prepared and/or furnished by the Contractor including, but not limited to fabrication, erection, installation plans and placing details, pipe sizes,

insulation material, dimensions of equipment foundations, etc.

8. The topography and grades of all drainage installed or affected as part of the project construction.
9. All changes or modifications which result from the final inspection.
10. Options: Where the drawings or specifications allow options, only the option selected for construction shall be shown on the as-builts prints.
11. The manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
12. Corrected specifications, including addenda, for each subproject per Section 01700.

C. The Contractor will use "red" pencil or ink to indicate changes (additions, deletions, etc.).

D. The record documents will be jointly inspected by the Contractor and BWXT Pantex for accuracy and completeness prior to submission of each monthly pay estimate. The Contractor shall correct all errors and deficiencies noted within ten calendar days.

E. Prior to Beneficial Occupancy, the Contractor shall submit the following record documents:

1. Two full-size sets of contractor and BWXT approved marked-up "As-Built" prints (including subcontractor designed systems). Note: Contractor is still responsible to provide Final As-Builts in Microstation V5 or J format in addition to the mark-ups.

2. One set of corrected specifications including addenda for each subproject. The record documents will be jointly inspected by the Contractor and BWXT Pantex for accuracy and completeness. The Contractor shall correct all error and deficiencies noted within ten calendar days.

F. All drawings including "As-Built" drawings shall be submitted in black ink on vellum paper, utilizing Intergraph Corporation MicroStation V5 or J format. Final drawings shall be right reading, legible, reproducible and meet any other applicable criteria defined in this section. Such drawings shall be submitted to the Project Engineer in rolls and not folded. Contractor shall also furnish electronic copies of all approved drawing versions and final approved as-builts on compact disk (CD) or 1.4MB disk.

1.14 LOCKOUT AND TAGOUT ANALYSIS FORMS

A. Lockout/Tagout Analysis Forms shall be completed for each piece of equipment. Instructions for completing the form are found on Page 1 of the form. The form shall be legible and completed using black ink.

B. Data shall be presented in a systematic and orderly manner.

1. Equipment data shall be grouped according to type (i.e. pumps, heating, ventilating, and air conditioning units).
2. Information presented for each piece of equipment shall include all applicable data requested on the analysis form for the isolation of all hazardous energy sources (i.e. electrical, hot water, steam, high pressure, etc.) and the isolating device associated with the hazard (i.e. circuit breaker, disconnect, switch, valves, etc.).

C. The Contractor shall submit two copies of the Lockout/Tagout Analysis Forms, PX-2027, available upon request from BWXT Pantex, for each new equipment item installed at least 14 calendar days prior to contract completion. The Contractor will be notified of any corrections necessary to make the documents acceptable.

D. Final acceptance of the contract shall be contingent upon receipt and approval of the completed forms.

END OF SECTION 01300

SECTION 01310 - CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies the requirements for construction schedule, coordination, constraints, and basis of payment.

B. The Contractor shall develop and submit a plan and schedule (P&S) demonstrating fulfillment of all contract requirements for this project. Failure to include in the P&S any element of work required for performance of this contract shall not excuse the Contractor from completing all work required. This P&S shall be updated in accordance with the requirements of this Section. The Contractor shall implement this P&S to coordinate and monitor the work of this contract (including activities of subcontractors, equipment vendors, and suppliers). This P&S, along with projected cash flow curve, will be utilized as a basis for substantiating the Contractor's payment requests.

1.2 RELATED WORK

A. 01010 - Summary of Work

B. 01040 - Coordination of Work

C. 01200 - Project Meetings

D. 01300 - Submittals

E. 01500 - Construction Facilities and Temporary Controls

F. 01540 - Security

1.3 WORK SEQUENCE

A. The following sequence is supplied as a general guide, and is used to note particular areas of concern. The Contractor shall schedule the work at their discretion, and shall be responsible for maintaining BWXT Pantex approved schedule, while completing the construction in a timely manner and in accordance with these specifications and general provisions.

1. Attend Kick-off Meeting presenting plans and schedules specified for BWXT Pantex approval. Refer to Section 01200.
2. Provide cost breakdown details with cost loaded schedule.
3. Prepare design and submittals as scheduled.
4. Request all specified permits, approvals, personnel badges, etc., as scheduled.
5. Mobilize onto the site with approval of BWXT Pantex.
6. Construct project.

7. Coordinate acceptance of work and closeout with BWXT Pantex.
8. Remove any temporary installations.
9. Clean sites and buildings, as applicable.
10. Training, as applicable.
11. Demobilize.

1.4 PLAN AND SCHEDULE (P&S)

A. At the Kick-off Meeting, the Contractor shall submit **2 copies** of a **draft P&S**, in bar graph form, on 24 inches by 36 inches size paper showing work to be performed on the project. As a minimum, the draft P&S shall include the following information:

1. Written narrative of work activities, i.e., electrical, painting, etc., to be worked during this period, including constraints and coordination applicable to work as defined in this Section.

2. Individual bars showing start date, finish date, and duration in calendar days of work for each trade and major element of work. As a minimum, each item on the cost breakdown shall be represented as a bar on this graph. Include mobilization, shop drawing submittals, materials and equipment procurement, proposed start date, etc.

3. A composite bar graph shall show the total construction time and interrelationship of construction work to be performed.

4. A cost breakdown shall be provided showing the cost of each major portion of the job. The insurance and bonding costs should be included as a part of each feature of the construction and not as a separate item.

5. The cost breakdown submittal shall utilize a "bottom up" estimate in the following format. **Bid Alternates shall be estimated and listed separately from each other and the Base Bid.**

COST BREAKDOWN			
(TITLE OF PROJECT)			
ITEM OF WORK	MATERIAL	LABOR	TOTAL

DIVISION	SUBJECT	SUBTOTAL
Division 1	General Requirements	
Division 2	Civil	
Division 3	Structural	
Division 4	Masonry	
Division 5	Metals	

Division 6	Wood and Plastics	
Division 7	Moisture Protection	
Division 8	Doors and Windows	
Division 9	Finishes	
Division 10	Specialities	
Division 11	Equipment	
Division 12	Furnishings	
Division 13	Special Construction	
Division 14	Conveying Systems	
Division 15	Mechanical	
Division 16	Electrical	
SUBTOTAL		
Overhead		
Profit		
Bonds		
SUBTOTAL		
TOTAL		

B. Within 14 calendar days after receipt of the draft P&S submittal, the Project Manager will notify the Contractor of his actions, opinions, objections, and comments regarding the draft. Within 14 calendar days after receipt of Project Manager's comments the Contractor shall **resubmit 2 copies of the corrected P&S.** The resubmittal will be reviewed by the Project Manager and, if found to be revised per the comments, will be approved. Once approved by the Project Manager, these documents will become a part of the construction contract.

C. The Contractor shall submit, with the revised P&S, an anticipated cash flow analysis in the form of a time/money curve with both monthly cash disbursements and cumulative total disbursement plotted for the duration of the project.

1.5 SCHEDULE REVISIONS

A. The Contractor shall submit 2 copies with monthly pay requests and review the P&S with the Project Manager at least monthly, to determine percentage of work completed, P&S revisions, and estimated duration of work necessary to complete the project. The Contractor shall submit a written report within 3 days outlining the results of the P&S review and briefly discuss potential problem areas that may exist or may result from scheduling problems.

B. Whenever it becomes apparent that forecast completion dates will not be met, the Contractor shall so inform the Project Manager. The Contractor shall revise the schedule at no additional cost to BWXT Pantex for the next month's submittal. Schedule revisions shall be made under one or more of the following conditions (at no additional cost to BWXT Pantex):

1. Delays in construction activities which affect the completion date of the particular construction area or the total project.

2. Delays in submittals, deliveries, or a general work stoppage which necessitates rescheduling of the work.

3. Whenever the schedule does not represent actual progress of the project.

4. Changes in the schedule necessitated by Change Orders issued by the Project Engineer.

C. Revisions which affect the previously approved P&S shall be furnished, in writing, to the Project Manager for approval prior to initiating the change on the P&S. The Contractor shall update and revise the cash flow analysis whenever the P&S is revised.

D. In the event the Contractor requests an extension of time he shall submit such a request to the Project Manager, and shall include in his request, a written narrative describing the reasons for the request, a sketch showing proposed changes to the P&S, estimated cost changes for the work in question, and the relationship between the requested change and other activities on the approved P&S. No changes will be made until they are approved by the Project Manager.

E. The cost of revisions to the P&S resulting from Contractor requested changes shall be the responsibility of the Contractor at no additional cost to BWXT Pantex. Failure to submit these schedules as specified shall be basis to withhold progress payments.

F. Time Extension For Unusually Severe Weather

1. This provision specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the Contract Clause entitled "DEFAULT (FIXED-PRICE CONSTRUCTION)." The Monthly Anticipated **Adverse Weather Days are 5 per month**, based on regularly scheduled work days-Monday through Friday.

2. The above anticipated adverse weather will constitute the base line for monthly (or portion thereof) weather time evaluations. Upon acknowledgment of the Notice to Proceed and continuing throughout the contract on a monthly basis, actual adverse weather days will be recorded and compared to the monthly anticipated adverse weather in subparagraph 1 above. For purposes of subparagraph 2 the term "actual adverse weather days" shall include days impacted by actual adverse weather.

3. The Contractor's schedule must reflect the above anticipated adverse weather

delays on all weather dependent activities.

4. The Contractor shall, within 10 days from the beginning of any delay (unless extended by the Contract Administrator), notify the Contract Administrator in writing of the causes of delay. The number of actual adverse weather days shall be calculated chronologically from the first working day to the last working day in each month. The Contract Administrator shall ascertain the facts and the extent of the delay and shall issue a modification in accordance with the Contract Clause entitled "DEFAULT (FIXED-PRICE CONSTRUCTION)."

5. Workdays outside the specified work periods may be allowed, but the provisions for time extensions for unusually severe weather will not apply for these days. BWXT Pantex alone will determine if a weather day will be given for these days.

1.6 LEAD TIMES

A. The following lead times are required for coordination and planning of activities related to construction:

B. Guards/Facility Access Request form shall be submitted before noon on Tuesday of the week proceeding the start date for the work in the limited area, protected area, or material access areas. However, a Facility Access Request form may be required for work in other areas of the plant based on project specifics.

1. Allow a minimum of 10 working days for initial Excavation Permit.

2. Allow a minimum of 72 hours for requesting changes relating to excavation activities, use of flame producing or heating devices, welding and cutting, access to restricted areas, and weekend or overtime work.

3. Allow a minimum of 24 hours for changes relating to security escorts for all construction personnel without security clearances.

4. Allow a minimum of 72 hours for changes related to work requiring a fire protection system shutdown. If the fire system shutdown request should be denied due to production schedule requirements, the Construction Manager will coordinate with the Contractor the earliest shutdown date acceptable to both parties.

1.7 CONSTRUCTION CONSTRAINTS

A. This project **is** in a security area and **requires** guard escort surveillance. Guard escorts shall be assigned for the support of this project on an as needed basis. Workers must remain in view of the guard. A maximum separation of 100 yards between the guard and workers is allowed only if there are no visual obstructions and the crews are small in number (2 to 3) and working in the same area.

NOTES:

1. Construction personnel working inside the property protected area with an "L" security clearance may work outside of buildings and ramps and/or inside isolated mechanical equipment rooms without guard escorts.

2. Construction personnel possessing a valid "Q" clearance will have access to many restricted areas involved in the project. Project specific information can be requested at the Preproposal Meeting.

3. Due to the construction duration for this project, it will not be timely to apply for a clearance if personnel do not already have one.

B. All building, equipment, and utility shutdowns shall be performed in accordance with Section 01040.

C. All switching of existing circuits including secondary circuits shall be performed in accordance with Section 01040.

D. Construction schedules must allow work to be performed in a safe manner. The Contractor cannot reduce safety or worker protection in order to shorten construction schedules, recover lost time, or accelerate the work in any way. Schedule performance shall never take precedence over safety.

1.8 PROJECT DURATION

A. The duration of this project shall be 458 calendar days, based on the following scheduled milestone dates.

1.	Kick-Off Meeting & Site Survey Start	Feb 26, 2001
2.	Title I Design Package Received	Mar 30, 2001
3.	Title II Design Package Received	May 24, 2001
4.	Final Title II Design Package Received	Jun 28, 2001
5.	Construction Activity Start NLT	Oct 31, 2001
6.	Final Inspection & Testing Complete By	Apr 02, 2002
7.	Final Acceptance / Project Complete By	May 29, 2002

B. Bid Alternate 1 design and construction, **IF awarded** should be accomplished in parallel to the Base Bid work.

1.9 LIQUIDATED DAMAGES

A. Timely performance of this contract is required for BWXT Pantex to achieve compliance with its prime contract with the U.S. Department of Energy. Failure to perform in accordance with the contract schedule will cause BWXT Pantex to suffer damages which are indefinite, uncertain, and difficult to compute; therefore, the parties agree that if BWXT Pantex elects to assess liquidated damages in the event that the project is not completed on or before the project completion date, the Contractor will pay BWXT Pantex as liquidated damages and not as penalty, $ **2,600.00** per day, an amount which is reasonable in light of the harm caused by the breach for each day after the

project extends beyond the project completion date identified in the contract.

B. Inclement weather days, if any, allowed by BWXT Pantex in writing may be added to the project completion date, refer to paragraph 1.5 F above. The decision concerning whether or not to allow any credit for adverse or unusual weather will be made by BWXT Pantex in its sole and complete discretion. In the event that a weather delay is permitted by BWXT Pantex in writing, the liquidated damages will not be assessed for delay in completing the project for that number of days designated as having been attributable to weather delay.

C. The amount of liquidated damages owed to BWXT Pantex will be calculated and withheld by BWXT Pantex from contract funds not yet paid for work performed. The amount of money withheld from final payment for liquidated damages will be clearly identified on the documentation given to the Contractor at the time final payment is made. BWXT Pantex may elect to pursue other legal remedies in lieu of liquidated damages.

END OF SECTION 01310

SECTION 01400 - QUALITY ASSURANCE

PART 1 - GENERAL

Quality Level 3

1.1 CONTRACTOR QUALITY ASSURANCE

A. The Contractor shall perform the activities required by this contract in accordance with the requirements specified in the contract, the specifications, accompanying drawings, and other associated documents.

B. The Contractor shall assure the quality of design, materials, and workmanship is in accordance with the specifications, accompanying drawings, and related documents, or industry accepted practice, whichever is more stringent.

C. The Contractor shall immediate report any inability to meet the specified quality requirements, or failure to meet the specified quality requirements, to the Project Manager.

D. Firestopping:

1. Firestopping materials shall conform to Flame (F) and Temperature (T) ratings as required by BWXT Pantex FPE and as tested by nationally accepted test agencies per ASTM E-814 or UL 1479 fire tests, UL 2079 for construction joints. The F rating shall be a minimum of two (2) hour but not less than the fire resistance rating of the assembly being penetrated. T rating is required by BWXT Pantex FPE and shall be based on measurement of the temperature rise on the penetrating item(s). The fire test shall be conducted with a minimum positive pressure differential of 0.01 inches of water column.

2. Firestopping material shall be free of asbestos, PCBs, ethylene glycol, and lead.

3. Do not use any product containing solvents or that requires hazardous waste disposal.

4. Equipment used shall be in accordance with firestop manufacturer's written installation instructions.

5. Submit forms for acceptance for proposed assemblies not conforming to specific UL Firestop System numbers, UL classified devices, FM Approved systems.

6. Materials shall have been tested to provide fire rating at least equal to that of the construction.

7. Field Quality Control

a. Follow safety procedures recommended in the Material Safety Data Sheets.
b. Finish surfaces of firestopping which is to remain exposed in the completed Work to a uniform and level condition.

c. All areas of Work must be accessible until inspection by Mason & Hanger Corporation Fire Protection Engineering.

d. Correct unacceptable firestops and provide additional inspection to verify compliance with this specification at no additional cost.

8. Manufacturer's Field Services:

a. During installation, provide periodic inspection to assure proper application.

b. After installation is complete, submit findings in writing with certification that Systems and Designs were followed.

E. Fire Suppresion:

1. Before installation of any fire protection system begins, all of the following information shall be submitted by the sprinkler contractor and reviewed by BWXT Pantex PE/FPE:

2. A complete set of working plans, as defined in NFPA 13, NFPA 15, and these specifications.

3. A complete list of all materials, equipment, and accessories proposed for installation, in compliance with the drawings and specifications. This list shall include catalog identification numbers, drawings, catalog cuts, and other descriptive material necessary to define completely all components of the work.

4. All hydraulic calculation information, including a summary sheet, detailed work sheets, graph sheets, and water supply information. This information shall be provided in the detail required by NFPA 13, and NFPA 15.

5. Detailed test plans for acceptance of the systems shall be in accordance with Specification Sections 15300, 16721, 07270.

6. Approval from BWXT Pantex Configuration Change Control Board (CCCB).

7. The construction contractor shall be responsible for quality assurance during the installation process. The construction inspector shall conduct periodic inspections to ensure adherence to the specifications.

8. The Contractor is responsible to assist BWXT Pantex personnel in returning systems to service, which includes furnishing all labor, materials, and tools as required.

9. Engineering Responsibility: Preparation of working plans, calculations, and field

test reports by a qualified professional engineer, or NICET III in Automatic Sprinkler System Layout. Base calculations on results of fire-hydrant flow test and field conditions.

10. Sprinkler Components: Listing/approval stamp, label, or other marking by a testing agency acceptable to authorities having jurisdiction.

11. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

12. NFPA Standards: Equipment, specialties, accessories, installation, and testing complying with the following:

    a. NFPA 13, "Installation of Sprinkler Systems."

    b. NFPA 15, "Water Spray Fixed Systems for Fire Protection."

    c. NFPA 25, Inspection, Testing, and Maintenance of Water Based Fire Protection Systems."

    d. NFPA 801, "Facilities Handling Radioactive Materials."

1.2 CONSTRUCTION INSPECTION

A. The work performed under this contract is subject to inspection by the Construction Manager or his representatives to ensure strict compliance with the scope of the contract.

B. The Construction Manager and their representatives have the primary responsibility to inspect the work for quality and compliance with the plans and specifications and to establish lines, grades, and controls for the work. Other BWXT Pantex representatives such as the Project Manager, Project Engineer, and project stakeholders may also inspect the work as necessary to discharge their assigned tasks.

C. **No changes to any provision of the plans and specifications is permitted without written authorization from the Project Manager. Approval from the Contract Administrator will be required in those instances where a contract modification is required.**

D. Neither the presence or absence of a Construction Manager or their representative shall relieve the Contractor from any requirements of the contract.

E. No interpretation of this contract or direction will be binding upon the Contractor unless in writing and signed by BWXT Pantex.

1.3 PREPARATORY INSPECTIONS

A. The Construction Manager will conduct a Preparatory Inspection before the Contractor begins construction on each definable feature of work. It shall include a review of

contract requirements, submittals, materials, testing requirements, and hold points.

B. The Contractor's Superintendent or Foreman will attend the Preparatory Inspection Meeting.

C. The Contractor shall notify the Construction Manager that an inspection will be required 24 hours prior to each preparatory activity.

1.4 INITIAL INSPECTIONS

A. The Construction Manager will conduct an Initial Inspection as soon as a representative segment of a particular item of work has been accomplished by the Contractor.

B. The Initial Inspection will examine the quality of workmanship, use of defective or damage materials, omissions, dimensions, and the results of laboratory tests.

C. The Contractor shall notify the Construction Manager that an inspection will be required 24 hours prior to each initial activity.

1.5 FOLLOW-UP INSPECTIONS

A. The Construction Manager will perform daily checks to assure continuing compliance with contract requirements.

B. Final follow-up inspections shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work.

C. The Contractor shall not build upon or conceal non-conforming work.

1.6 INSPECTION HOLD POINTS

A. Inspection hold points have been established for this project and are identified in each specification section where required. These points are summarized in the table below. This table is provided as a convenience to the Contractor and the omission of an item this table does not relieve the Contractor from the responsibility of holding at the points identified in the individual specification sections.

HOLD POINT	SPECIFICATION SECTION	DESCRIPTION
1		Title I Design
2		Title II Design
3		Safety Walkdown Prior to Start of Construction
4	01300	Submittals - Approval required prior to start of work.

5		Material & Equipment Inspection Prior to Installation.

B. The Contractor shall notify the Construction Manager an inspection will be required 24 hours prior to reaching the hold point. Delays, damages, or time extensions will not be allowed if the Contractor fails to make this notification.

C. The Contractor shall not proceed with work beyond the hold point until the Construction Manager has inspected the installed work and released the Contractor to proceed.

1.7 COMPLETION INSPECTIONS

A. The Construction Manager will conduct Completion Inspections on each definable feature of work and provide the Contractor with a "Punch List" of items that do not conform to the contract specifications.

B. The Contractor will notify the Construction Manager when deficiencies have been corrected.

1.8 CONSTRUCTION PHOTOGRAPHS

A. A photographic or video record may be kept of the entire construction process. BWXT Pantex will provide photographic and video services during construction to document work in place.

B. The Contractor shall provide the Construction Manager with at least 24 hours notice that work will be ready for photography:

1. Before any completed work is covered.
2. After each trade has completed their work.

C. BWXT Pantex reserves the right to photograph or videotape ongoing construction activities associated with the project. Copies of photographs or video tapes will not be issued to the Contractor.

1.9 MATERIALS AND EQUIPMENT

A. Equipment will be used and maintained as recommended by the manufacturer.

B. Materials will be used and applied as recommended by the manufacturer.

1.10 CONTRACTOR LOGS

A. The Contractor will maintain a daily (including non-working days) log of activity on this

contract.

B. The Contractor will provide a copy of each daily log entry to the Construction Manager by close of business the following day. Entries for weekends and holidays are to be provided by the close of business on the next work day.

C. Logs are to be provided via electronic mail.

D. A suggested format for the daily construction log is provided as an attachment to this specification section. The Contractor may use any format but the daily log must provide, at a minimum the following information:

1. Date.
2. Log number.
3. Contract number.
4. Location of work.
5. Weather conditions including sky conditions, minimum and maximum temperatures and precipitation.
6. Work force by Craft, subcontractor, and crew size.
7. Material deliveries.
8. Equipment, excluding hand tools, on site and whether or not it was used.
9. Testing and inspection performed including the results of QA activities, safety inspections.
10. Summary of progress and location of work performed.
11. Contractor's issues or concerns.
12. Verbal instructions received.

Daily Construction Log

Date: _____ **Log Number:** _____

Project Title: _____ **Building:** _____

Contractor: _____ **Contract Number:** _____

Weather									
Conditions	**Day Shift**			**Swing Shift**			**Graveyard Shift**		
Wind	Min.	Max.	Dir.	Min.	Max.	Dir.	Min.	Max.	Dir.
Sky	Clear	Pt. Cldy.	Cloudy	Clear	Pt. Cldy.	Cloudy	Clear	Pt. Cldy.	Cloudy
Temperature (°F)	Min.	Max.		Min.	Max.		Min.	Max.	
Precipitation	Rain	Snow	Inches	Rain	Snow	Inches	Rain	Snow	Inches
			0.00			0.00			0.00

Work Force - Contractor and Subcontractors					
Contractor	**Craft**	**Crew**	**Contractor**	**Craft**	**Crew**

Deliveries	
Material Identify new materials delivered to the site.	**Equipment** Identify equipment on site and whether it was used.

Testing & Inspections Performed Results of QA activities and tests, safety inspections, deficiencies observed, and corrective actions taken.

Work Performed Provide information on the progress and location of work, causes for delays, and extent of delays.

Verbal Instructions Received List any instructions given by BWXT Pantex personnel concerning deficiencies, action taken, re-testing, etc.

Issues or Concerns Cover conflicts in plans, specification, or verbal instructions. Also note any requests for information or clarification.

Superintendent: _____

END OF SECTION 01400

SECTION 01421 - REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section defines terms used in these specifications and discusses industry standard and governing regulation requirements.

B. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 DEFINITIONS

General - Basic contract definitions are included in the conditions of the contract.

Indicated - The term "indicated" refers to graphic representations, notes, or schedules on the Drawings or to other paragraphs or schedules in the specifications and similar requirements in the contract documents. Terms such as "shown", "noted", "scheduled", and "specified" are used to help the user locate the reference. Location is not limited.

Directed - Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean directed by the Project Manager, requested by the Project Manager, and similar phrases.

Approved - The term "approved" when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the conditions of the contract.

Regulations - The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the work.

Furnish - The term "furnish" means to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations.

Install - The term "install" describes operations at the project site including the actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning, and similar operations.

Provide - The term "provide" means to furnish and install, complete and ready for the intended use.

Installer - An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced" when used with the term "installer" means having successfully completed a minimum of five previous projects similar in size and scope to this project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.

2. Trades: Using a term such as "carpentry" does not imply that certain construction activities must be performed by an accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades persons of the corresponding generic name.

3. Assigning Specialists: Certain sections of the specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.

   a. This requirements shall not be interpreted to conflict with enforcing building codes and similar regulations governing the work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

Project Site - is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the project. The extent of the project site is shown on the drawings and may or may not be identical with the description of the land on which the project is to be built.

Testing Agencies - A testing agency is an independent entity engaged to perform specific inspections or tests, either at the project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

Acceptable - When applied to fire safety, "acceptable" is a level of protection that the Authority Having Jurisdiction, after consultation with the cognizant U.S. Department of Energy (DOE) fire protection engineer(s), considers sufficient to achieve the fire and life safety objectives defined in DOE Orders. In some instances, it is a level of protection necessary to meet a code or standard. In other instances, it is a level of protection that deviates (plus or minus) from a code or standard, as necessary, and, yet, adequately protects against the inherent fire hazards.

Approved - Acceptable to the Authority Having Jurisdiction.

Approved Contractor - A contractor that is approved for installation of Underwriters' Laboratories, Inc. (UL)-listed and/or Factory Mutual Engineering and Research approved penetration seal designs. This individual or company shall also meet the requirements necessary to perform work at the Pantex Plant.

ASTM - ASTM is the American Society for Testing and Materials, located at 1916 Race Street, Philadelphia, Pennsylvania, 19103.

Central Alarm Receiving Station (CARS) - This term is used at the Pantex Plant to describe the Proprietary Supervising Station located at the Fire Department where installed plant-wide protected premises fire alarm systems report to the proprietary supervisory station fire alarm system. The CARS is not a "central station" fire alarm signal receiving facility but is a

"proprietary supervising station."

Emergency Power - Design basis accident-qualified and Seismic Category-1-qualified (SC-1), fully redundant power generation, switching, and distribution system that meets the Institute of Electrical and Electronic Engineers 1E criteria. It is designed to activate on loss of the normal power supply (or in the case of Uninterruptible power supply systems, be online) and is used to supply SC-1 items, components, and/or systems with power to allow them to maintain their safety class functions.

Emergency Power System - An independent reserve source of electric energy that, upon failure or outage of the normal source, automatically provides reliable electric power within a specified time to critical devices and equipment whose failure to operate satisfactorily would jeopardize the health and safety of personnel or result in damage to property.

Evacuation Signal - Distinctive signal intended to be recognized by the occupants as requiring evacuation of the building.

Fire Seal - Foam, elastomer, caulk, ceramic fill, or other similar materials that have been designed and tested for the installed configuration fire rating.

Firestop System - A specific construction consisting of a fire-rated wall or floor assembly, a penetrating item or items passing through an opening in the assembly, and the materials designed to help prevent the spread of fire through the openings.

Fire Test Qualification - Penetration firestops, cable/conduit wraps, and fire break systems shall have successfully passed the applicable qualifying fire test.

Firewall - A wall subdividing a building to restrict the spread of fire and having fire resistance and structural stability.

Fire Zone/Area - An area bounded by a fire-rated assembly that is intended to contain a fire to that area if one should occur for a specified period of time (at least 2 hr).

FM - Factory Mutual Engineering and Research is a testing organizations dedicated to testing and approving equipment and devices.

F Rating - The time a firestop system prevents the passage of flame through an opening as determined by ASTM E-814, *Fire Tests of Through-Penetration Fire Stops* and UL 1479, *Standard for Safety Fire Tests of Through-Penetration Firestops.*

Graded - By graded approach, the U.S. Department of Energy intends that the depth of detail required and the magnitude of resources expended for a particular action be tailored to be commensurate with the actions relative importance to safety, environmental compliance, safeguards and security, programmatic importance, and/or other facility-specific requirements.

Hazard - A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death or damage to a facility or to the environment (without regard to the likelihood or credibility of accident scenarios or consequence mitigation).

Hydraulically Designed System - A calculated sprinkler system in which pipe sizes are selected on a pressure loss basis to provide a prescribed water density in gpm per ft^2, or a prescribed minimum discharge pressure or flow per sprinkler, distributed with a reasonable degree of uniformity over a specified area.

Intumescent - A term describing materials that expand significantly when exposed to heat. Intumescent materials are often used as firestops, particularly around combustible penetrants.

Labeled - Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization, acceptable to the Authority Having Jurisdiction and concerned with product evaluation, that conducts periodic inspections of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Legally Required Standby Systems - Legally required standby systems are those systems required and so classed as legally required standby municipal, state, federal, or other codes or by any governmental agency having jurisdiction. These systems are intended to automatically supply power to selected loads (other than those classed as emergency systems) in the event of failure of the normal source.

Listed - Equipment or materials included in a list published by an organization acceptable to the Authority Having Jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and by whose listing states either that the material meets appropriate standards or has been tested and found suitable for use in a specified manner.

Local Alarm System - A local system sounding an alarm as the result of the manual operation of a fire alarm box or the operation of protection equipment or systems, such as water flowing in a sprinkler system, the discharge of carbon dioxide, the detection of smoke, or the detection of heat.

Local Application - A system designed to discharge directly on a fire or spill at a specific location. A local application system is not intended to provide protection for the entire area in which it is installed.

Local Supervisory System - A local system arranged to supervise the performance of guard's tours, the operative condition of automatic sprinkler systems, or other systems for the protection of life and property against the fire hazard.

Maximum Free Area - Largest rectangular area for a specific sealant material between penetrating items or between a penetrating item and the wall or floor opening.

Maximum Possible Fire Loss (MPFL) - The value of property (a facility, its contents, and facility design), excluding land, within a fire area, unless a fire hazards analysis demonstrates a lesser (or greater) loss potential. This assumes the failure of both automatic fire suppression systems and manual fire fighting efforts.

May - Allowed or permitted, neither a requirement nor a recommendation.

Penetrant (Penetrating Item) - Any item passing completely through a wall or floor, such as pipes, conduits, cables, etc.

Penetration # - A unique identification number assigned to penetrations and penetrants in fire-rated assemblies.

Percent Fill - The cross-sectional area of an opening that is occupied by a penetrating item(s); it is typically found in UL systems containing cables.

Proprietary Supervising Station - A location which alarm or supervisory devices on proprietary fire alarm systems are connected and where personnel are in attendance at all times to supervise operation and investigate signals.

Proprietary Supervising Station Fire Alarm Systems - An installation of fire alarm systems that serves contiguous and noncontiguous properties, under one ownership, from a proprietary supervising station at the protected property, at which trained, competent personnel are in constant attendance. This includes the proprietary supervising station; power supplies; signal-initiating devices; initiating device circuits; signal notification appliances' equipment for the automatic, permanent visual recording of signals; and equipment for initiating the operation of emergency building control services.

Protected Premises - The physical location protected by a fire alarm system.

Protected Premises (Local) Fire Alarm System - A protected premises system that sounds an alarm at the protected premises as the result of the manual operation of a fire alarm box or the operation of protection equipment or systems, such as water flowing in a sprinkler system, the discharge of a gaseous fire protection system, the detection of smoke, or the detection of heat.

Protective Signaling Systems - Electrically operated circuits, instruments, and devices, together with the necessary electrical energy, designed to transmit alarms, supervisory, and trouble signals necessary for the protection of life and property.

Seal - Any material used to close a penetration or internally for a penetrant.

Shall - Denotes a mandatory requirement.

Should - Denotes a recommendation or that which is advised but not required.

Smoke Damper - A device within the air distribution system to control the movement of smoke. A smoke damper may also be a fire damper if its location lends itself to the multiple functions and it meets the requirements of both.

Smoke Detector - A device that senses visible or invisible particles of combustion.

Sprinkler System - For fire protection purposes, an integrated system of underground and overhead piping designed in accordance with FPE standards. The installation includes one or more automatic water supplies. The portion of the sprinkler system aboveground is a network of specially sized or hydraulically designed piping installed in a building, structure, or area, generally overhead, and to which sprinklers are attached in a systematic pattern. The valve controlling each system riser is located in the system riser or its supply piping. Each sprinkler system riser includes a device for actuating an alarm when the system is in operation. The system is usually activated by heat from a fire and discharges water over the fire area.

Sprinkler System Type Definitions:

a. **Wet-Pipe System** - A sprinkler system employing automatic sprinklers attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinklers opened by heat from a fire.

b. **Deluge System** - A sprinkler system employing open sprinklers attached to a piping system connected to a water supply through a valve that is opened by the operation of a detection system installed in the same areas as the sprinklers. When this valve opens, water flows into the piping system and discharges from all sprinklers attached hereto.

Standby Power - A reserve power source with switching devices that will supply power to selected loads during a normal power failure. A standby power system shall not be classified as a safety class system.

Standby Power System - An independent reserve source of electric energy that, upon failure or outage of the normal source, provides electric power of acceptable quality so that the user's facilities may continue in satisfactory operation.

Supervisory Devices - Alarm signal initiating devices arranged to monitor the operative condition of automatic sprinkler systems or other systems for the protection of life and property.

Supervisory Signal - A signal indicating the need of action in connection with the supervision of sprinkler and other extinguishing systems or equipment, or the maintenance feature of other protective systems.

Through-Penetration - An opening made completely through a concrete wall, blast wall, fire-rated wall or floor to accommodate a penetrating item(s).

T Rating - The time for the temperature on the unexposed surface of the firestop system or any penetrating item to rise 325°F above its initial temperature as, determined by ASTM E-814 and UL 1479.

Trouble Signal - An audible signal indicating trouble, such as a circuit break or ground, occurring in the wiring associated with a protective signaling system. The audible signal shall be supplemented with a visible signal that gives a continuing indication of the trouble condition after the audible trouble signal is silenced.

Typical Detail - Depicts the actual installation of the seal. The document that specifies the seal parameters to be matched during seal installation, the qualified ratings for the detail, supporting test reports, and appropriate notes and comments.

Uninterruptible Power Supply (UPS) - A power supply that provides automatic, instantaneous power, without delay or transients, on failure of normal power. It can consist of batteries or full-time operating generators. It can be designated as standby or emergency power depending on the application. Emergency installations must meet the requirements specified for emergency power.

Vented (Open) Piping System - A piping system that is atmospherically vented by design to prevent backflow or vacuum (e.g., drain, waste, or vent piping).

Water Spray System - A special fixed pipe system connected to a reliable source of fire protection water supply and equipped with water spray nozzles for specific water discharge and distribution over the surface or area to be protected. The piping system is connected to the water supply through an automatically or manually actuated valve that initiates the flow of water. An automatic valve is actuated by operations of automatic detection equipment installed in the same areas as the water spray nozzles. (In special cases the automatic detection equipment may also be located in another area.)

Zone - A defined area within the protected premises. A zone may define an area from which a signal can be received, an area to which a signal can be sent, or an area in which a form of control can be executed.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These specifications are organized into divisions and sections based on the 16-division format and CSI/CSC's "MasterFormat" numbering system.

B. Specification Content: These specifications use certain conventions for the style of language and the intended meaning of certain terms, works, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the specifications and other contract documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular and plural words should be interpreted as the context of the contract documents indicate.

2. Imperative mood and streamlined language are generally used in the specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the section text, subjective language is used for clarity to describe responsibilities that must be fulfilled directly by the Contractor or by others when so noted.

   a. The words "shall" and "shall be" or "shall comply with", depending on the context, are implied where a colon is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the contract documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the contract documents to the extent referenced. Such standards are made a part of the contract documents by reference.

B. Publication Dates: Comply with standards in effect as of the date of the contract documents.

C. Conflicting Requirements: Where compliance with two or more standards is specified and the standards establish different of conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to the

Project Manager for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Project Manager for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on the project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the contract documents.

1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source and make them available on request.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where abbreviations and acronyms are used in the specifications or other contract documents, they mean the recognized name of the trade association, standards-producing organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the US," which are available in most libraries.

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following abbreviations and acronyms, as referenced in the contract documents, mean the associated names. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the contract documents.

1.5 GOVERNING REGULATIONS AND AUTHORITIES

A. Copies of Regulations: Obtain copies of the following regulations and retain at the project site to be available for reference by parties that have a reasonable need.

1.6 SUBMITTALS

A. Permits, Licenses, Certificates: For the owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the work.

1.7 REFERENCES

A. National Fire Protection Association (NFPA) - Codes, Standards, and Recommended Practices.
B. Department of Energy Order, DOE 420.1, Facility Safety.
C. State of Texas local codes and fire protection criteria.
D. Uniform Building Code (UBC)

E. Pantex Design Criteria Manual
F. Pantex Fire Protection Design Criteria Manual (FPDCM)
G. Labeling Manual
H. Factory Mutual (FM)
I. Underwriters Laboratories, Inc. (UL)
J. American Society for Testing & Materials (ASTM)
K. American National Standards Institute (ANSI)
L. Americans With Disabilities Act (ADA)
M. Code of Federal Regulations (CFR)
N. Occupational Safety and Health Administration (OSHA)
O. Uniform Building Code (UBC)

END OF SECTION 01421

SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 UTILITY CONNECTIONS

A. Water and electricity will be available to the Contractor at locations shown on the project drawings. Utility taps, lines, and extensions to the site will be furnished by the Contractor.

B. The Contractor shall furnish, install, and maintain, at his expense, all temporary utility connections and extensions to the existing distribution systems.

C. The Construction Manager will approve the location and the Project Engineer (PE) will approved the method of installation prior to work being performed.

D. The Contractor should request utilities at the Kick-Off Meeting.

E. The installations will be made with acceptable protective devices necessary to prevent damage to Government property.

F. Inspection and acceptance of work by BWXT Pantex will not relieve the Contractor of any negligence associated with the installation or maintenance of such temporary services.

G. All utility services shall be restored to their original condition, unless otherwise authorized by the Project Engineer, at no additional cost to BWXT Pantex.

H. The Contractor shall practice energy management techniques to limit energy usage.

I. BWXT Pantex will provide and install one (1) telephone line for each Contractor for local calls. If additional lines are needed, the Contractor will pay $27.00 for each additional line and a connection fee of $42.00. The Contractor will need to use their own long-distance card for making long-distance calls. Long distance calls charged to plant telephones will be billed to the Contractor as well as any other labor charges involved.

1.2 UTILITY PROTECTION

A. Existing utilities and services shall be protected from damage due to construction activities or weather related events, such as rain, wind, freezing, lightning, etc. Adequate protection, coverage, or suspension shall be provided as appropriate.

1.3 SANITARY TOILET FACILITIES

A. Facilities will be made available to contractor.

1.4 FENCES AND BARRICADES

A. No materials or vehicles are allowed within 20 feet of security construction fences.

1.5 MOWING AND EROSION CONTROL

A. The areas utilized by the Contractor (i.e. construction sites, administrative areas, storage areas, and all-weather access roads to construction and laydown sites) shall be maintained by the Contractor at their cost.

B. Vegetation shall be mowed before it reaches a height of 6 inches. Mowing shall be to a maximum height of 3 inches. Mowing shall be accomplished with a rotary mower that leaves the clippings evenly distributed on the soil surface. Mowing shall be accomplished during periods and in such manner that the soil and grass will not be damaged. Areas inside and adjacent to all construction fences shall be mowed with hand-propelled mowers. After notice to the Contractor and at the discretion of the Construction Manager, BWXT Pantex may immediately mow the Contractor's areas when the vegetation height exceeds 6 inches and charge the costs to the Contractor.

1.6 CONSTRUCTION HOUSEKEEPING

A. The Contractor shall at all times keep the work sites and laydown areas free from accumulations of waste material, trash, rubbish, and prior to completion of individual items of work, shall remove any such accumulation from the premises, which includes all tools, scaffolding, equipment, and construction. Upon completion of contract work the Contractor shall leave the work and sites in a condition satisfactory to the Construction Manager.

B. Earth and other Class III Industrial Waste materials shall be disposed of at the Contractor's designated landfill. Refer to Section 01563, Contractor Waste Management, for additional requirements.

C. Burning of waste material is not permitted.

1.7 VEHICLE ACCESS

A. The Contractor shall use only established roadways or construct and use such temporary roadways as may be authorized.

B. Where materials are transported in the execution of work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicles or prescribed by any applicable federal, state, or local law or regulation.

C. When it is necessary to cross curbings or sidewalks or to operate heavily loaded vehicles on surfaced streets, sidewalks, or developed areas; protection against damage shall be provided by the Contractor, and any damaged roads, curbings, sidewalks, or developed areas shall be repaired at the expense of the Contractor.

END OF SECTION 01500

SECTION 01540 - SECURITY

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section clarifies Security's role in enforcing the Plant's rules and regulations as well as the requirements/responsibilities of the Contractor on the Pantex Plant. These requirements include:

1. Construction Security.
2. Construction Personnel Identification Badges.
3. "L" and "Q" Clearance Badges.
4. Visitor Badges.
5. Security Shuttle Services.
6. Security Escort.
7. Regulations.

1.2 RELATED REQUIREMENTS

A. Related requirements specified in other sections:

1. 01200 - Project Meetings
2. 01310 - Construction Schedules
3. 01500 - Construction Facilities and Temporary Controls.

1.3 CONSTRUCTION SECURITY

A. Security is a major concern at the Pantex Plant. **Construction personnel, including subcontractor and supplier personnel, shall comply with Plant security regulations.** To be allowed to work at a construction site, personnel shall, as a minimum, be at least 18 years old, a U.S. citizen, and have been issued a Pantex construction identification badge. **Construction personnel are not allowed the same degree of freedom of movement that would be permitted on a private commercial project.**

B. Arriving at a Plant entrance station, construction personnel shall stop and all construction personnel will present their identification badge to the Security Police Officer. Access to job sites inside security areas requires a security shuttle from the security area entrance station to the job site. Once at the job site, personnel will be under security escort (surveillance) and shall not be allowed to leave without a security shuttle or escort, unless they have a security clearance.

C. All personnel and vehicles are subject to security searches, and all prohibited articles found shall be confiscated. Security shall exclude any personnel it deems appropriate from the Plant.

D. The Contractor shall not conduct employment interviews or employment conferences at

the Plant.

E. Questions relating to security or other project-related requirements should be addressed to the Construction Manager or his/her designee.

F. A lay down area (yard) for building materials and equipment will be designated for use. The lay down area will not be the job site.

PART 2 - EXECUTION

2.1 CONSTRUCTION PERSONNEL IDENTIFICATION BADGES

A. Application:

1. The Contractor shall complete and furnish to Security Access Control a Signature Authorization Form, PX-1195. Only the Contractor or designated personnel who sign the PX-1195 form will be allowed to sign the Construction Badge Request Form, PX-1196, for construction personnel identification badges.

2. The Contractor shall fill out and sign a Construction Badge Request Form, PX-1196, for each employee who will be assigned work at Pantex.

   a. The information required on the form includes the employee's name, citizenship status, date of birth, height, and color of eyes and hair.

   b. It is the Contractor's responsibility to ascertain and assure that this information is correct and to retain a copy of PX-1196.
   Note: [A foreign born resident who has not become naturalized shall not be permitted to work at Pantex.]

3. Each employee shall present the completed and signed badge request form and a picture identification at the Access Control Office in Building 16-12. There a picture will be taken and a construction identification badge issued. The application form presented will be reviewed and retained by Access Control. New Construction I.D. badges will only be fabricated between the hours of 8:30 a.m. and 9:30 a.m., Monday through Friday. This includes company changes and new employees.

4. Subcontractors may be allowed to request badges for their own employees if they are contracting for more than one Pantex Contractor.

5. All badge holders are required to view the VPP Safety Film.

B. Reporting

1. The Contractor shall be responsible for the control and accountability of all badges requested by and issued to the Contractor's employees and/or subcontractors authorized by the Contractor. Retrieval of construction badges is evaluated on the Subcontractor Construction Evaluation Form (PX-3411). Payment for the contract may be withheld pending reconciliation of the badge account. Any future contracts

bid as best value type procurement include consideration of past performance which will review badge account management.

2. Within 30 days after the Notice to Proceed, the Contractor shall provide Security a list of all employees who have been issued a badge. This list shall include the employee's name, badge number, and name of employer (company name of subcontractor, vendor, etc.). The Contractor shall keep this list current throughout the life of the project, accounting for all assigned badges. The Contractor shall provide copies of the current list within 3 working days. No later than the fifth working day following March 31, June 30, and September 30.

3. The Contractor will attend a Security briefing prior to starting the job.

C. Usage

1. At the east or west Plant entrance station, all Contractor employees shall stop and present their badge to a Security Police Officer for examination and a comparison check.

   a. If a Contractor employee loses his badge off the Plant site, he will report the loss to his superintendent or foreman, who in turn notifies the Access Control Office in Building 16-12, Monday through Friday, to allow the employee to obtain a replacement badge.

   b. Employees shall return and retrieve a forgotten badge. Replacement badges will not be issued for forgotten badges.

2. The badge shall be worn conspicuously on the upper portion of the body while on the Plant site, unless safety considerations dictate otherwise. The badge will be removed from public view upon leaving the Plant and shall not be used for personal identification off the Plant.

3. All employees shall present their badges to a Security Police Officer at the entrance stations into security areas and at the gates of fenced construction sites. The Security Police Officer will log movements of the employee by name and badge number at each entrance gate and/or station.

4. The picture on the badge shall be kept current with facial features. Changes, such as growing or removing a beard or mustache, require the employee to have a new picture and badge issued by the Access Control Office.

5. Construction personnel who will be absent from the Plant for 5 or more days shall surrender their badge to the Contractor, or to Access Control. If relinquished to Access Control, the employee will report to Building 16-12 to pick up the badge upon return to the Plant.

6. Upon completion and/or termination of work, employees shall surrender their badge to the Contractor who shall return the badge to Access Control. If the badge is not returned, the Contractor shall notify Access Control immediately and continue actions to retrieve the badge. Access Control will notify the Security Force of the outstanding badge.

7. Upon request, badges may be held in Access Control until the expiration date if the Contractor expects additional work.

SPECIAL NOTE: Contractor projects located in the PANTEX MATERIAL ACCESS AREA (MAA) will have special handling. Contractors shall be instructed in detailed requirements at the Preproposal/Preconstruction Meetings. These instructions will include procedure requirements for all "L" cleared, or "Q" cleared and uncleared Contractor personnel requiring access to the PANTEX MATERIAL ACCESS AREA. Contractor projects located in the Pantex Property Protection Area, not under an escort, will maintain a daily log sheet of their personnel working on the Plant and submit the log to Construction Security by 3:30 p.m. on the last working day of the month.

2.2 "L" AND "Q" CLEARANCES

A. Applications:

1. Requests and applications for security clearances will be limited and will require the approval of the Construction Manager. Requests will not be considered until a construction contract has been awarded.

B. Usage:

1. Personnel holding an active "L" or "Q" clearance will be granted access to the appropriate security areas under special controls. Security may be contacted for further information on the application and usage of these clearances.

2. Personnel holding an "L" or "Q" clearance are subject to all security controls required by DOE and shall sign a DOE Form F5631.29 when terminating work at the Pantex Plant.

2.3 VISITOR BADGES

A. Application:

1. The Contractor shall notify Construction Security of any visitors requiring access to the construction site. **Visitors who are non-U.S. citizens will be denied access to the Plant, unless special approval is obtained from the US/DOE.**

2. All visitors, except those requiring a visitor badge for delivery purposes only, are required to view the VPP Safety Film.

3. After viewing the VPP Safety Film, visitors will proceed to the east Plant entrance station where they will present a picture identification. The Security Police Officer will log the following information: name, company name, address and telephone number, citizenship, and destination. After visitors sign the log, they will be issued a visitor badge valid for 1 day only.

4. See Special Note, after paragraph 3.1, C, 7 above.

B. Usage

1. Visitors coming onto Pantex property are subject to search. All vehicles will be searched. Prohibited articles will not be allowed on the Plant site.

2. The visitor badge will be worn on the outer most garment, chest level and plainly visible while on the Plant site.

3. Visitors shall return their visitor badges to the Security station where the badge was issued before departing the Plant site.

2.4 SECURITY SHUTTLE SERVICES

A. Requirements:

1. If the construction site is inside a secured area of the Plant, personnel with the red construction identification badges shall be escorted to and from the construction site from the designated security station. Transportation for construction personnel will be provided by the Contractor with a Security Police Officer in a lead security vehicle. A construction Security Police Officer may ride in the Contractor's vehicle, in which case an additional Security Police Officer and vehicle may not be required. **No one without a security clearance will be allowed out of the fenced construction site without a security escort.**

2. Security has Security Police Officers dedicated to provide shuttle service. They are not dedicated to one project or Contractor; therefore, there can be short delays for shuttle service. Requests for shuttle service should be made a few minutes ahead of the time needed. Shuttle requests will be made to the Security Police Officer assigned to maintain surveillance at the construction site.

3. Security Police Officers providing shuttle service will not perform other security duties. The Contractor shall minimize the usage of shuttle service by providing sufficient materials and equipment at the construction site.

4. "L" cleared Contractors will have access to the Pantex Limited Area and will not require a Security shuttle for that area. If an "L" cleared Contractor needs to enter the Pantex Protected Area or Material Access Area a Security escort is required.

5. "Q" cleared Contractors will have access to the Security areas and will not require Security escorts unless passengers in the vehicle are uncleared construction workers. Within the Material Access Areas, Personnel Assurance Program (PAP) escorts are required and should be coordinated with the Construction Manager.

2.5 SECURITY ESCORT

A. Requirements:

1. If the construction site is in a security area of the Plant, a security escort is required at the site for surveillance of construction personnel. **Uncleared personnel shall not leave the site without a security escort or shuttle.** Plant restrooms and

break areas will not be used by construction personnel.

2. The maximum number of security escorts that have been allocated for support of this project are/is __3____. **These escorts must be utilized prior to 5:00 p.m. each day or they will be reassigned for that day.** The Contractor shall notify Security of cancellations and any time personnel will be arriving later than scheduled. **Failure to notify Security of cancellations and/or late arrivals may affect future escort availability to the Contractor.**

3. Contractor "no shows" - The BWXT Pantex Contract Administrator, Security, Project Manager, and the Construction Manager will determine whether the contractor will be charged for failure to cancel the allotted guards. Exemption from this charge may be granted for weather days if it is determined that the weather also impacted the project. A charge of $600.00 per guard per incident will be charged.

4. Cancellations of guards shall be made to Security as follows:
   a. Day shift - guards shall be canceled by 2:00 p.m. the day before they will not be needed.
   b. Off shift - guards shall be canceled by 2:00 p.m. the day they will not be needed.
   c. Weekend - guards shall be set up by 2:00 p.m. on Thursday for weekend work. Guards shall be canceled by 2:00 p.m. on the Friday before the weekend when work is not to be performed.

5. The Contractor shall notify the Construction Manager before 2:00 p.m. in order to receive approval from Security to work past 4:00 p.m.

6. Requests to work on holidays shall be submitted to the Construction Manager representative three (3) working days (72 hours) prior to date of need.

2.6 REGULATIONS

A. Law Enforcement:

1. Security personnel are authorized to enforce all federal, state, and local laws applicable to Pantex.

2. Security personnel are authorized to issue citations for traffic violations.

   a. Non-Moving Violations
      1) Parking within 15 feet of a fire hydrant or blocking lanes marked by signs or striping.
      2) Parking backwards in parking spaces, resulting in the vehicle traveling against the designated flow of traffic when exiting.
      3) Parking in areas marked "No Parking."
      4) Parking in such a manner as to block traffic flow.
      5) Parking in handicap spaces without displaying an official disabled emblem issued by the SS&FP Division Traffic Safety Officer.
      6) Parking within 20 feet of a security fence.
      7) Parking within 10 feet of a construction fence.

8) Parking a vehicle with four or more wheels in a designated motorcycle parking area.
9) Failing to wear safety belts. Safety belts are required in both the front and back seat of government vehicles and are worn when provided in equipment.

b. Moving Violations

1) Operating a vehicle or equipment in excess of the posted or designated speed limit.
2) Passing vehicles other than slow-moving vehicles. Slow-moving vehicles are those vehicles operating at least 10 mph below the speed limit.
3) Passing an explosives vehicle displaying placards and flashing amber lights.
4) Passing on a road marked by signs or a double yellow line indicating a "No Passing Zone."
5) Driving against the designated flow of traffic by disobeying signs, markings or signals directing the flow of traffic.
6) Failing to yield the right-of-way.
   a) To emergency vehicles with sirens and flashing lights.
   b) To a shipment of displaying placards and flashing amber lights. All vehicles are required to pull to the side of the road and stop when approached by a convoy.
   c) At the direction of a Security Police Officer.
   d) At marked pedestrian crosswalks.
   e) At designated intersections.
7) Disregarding STOP signs or traffic signals.
8) Passing a vehicle involved in the movement of nuclear weapons, special nuclear weapons (SNM), or high explosives.
9) Following closer than 300 feet behind vehicles involved in the movement of nuclear weapons, SNM, or high explosives.
10) Following closer than 500 feet behind emergency vehicles displaying red lights and sirens.

B. Vehicle Controls:

1. All Plant traffic signs and regulations shall be observed. No passing is permitted during shift changes and other peak traffic hours. Emergency traffic shall be provided the right-of-way. When meeting a vehicle with a red, yellow, or blue flashing light, the Contractor vehicle will pull over and stop until the vehicle with the flashing light has passed.

2. The Contractor shall be notified of all traffic citations received by his employees or subcontractors. Repeated traffic violations by the same employee will result in the loss of the employee's authorization to operate a vehicle on Pantex Plant property.

3. Construction personnel may drive private vehicles onto the Plant, but shall park only in areas designated by the Construction Manager or prepared by the Contractor as defined in the construction documents.

4. Access of Contractor vehicles shall be limited to those deemed necessary for completion of the contract work. Only pickups, trucks, and van-type vehicles will be allowed on construction sites in security areas.

5. All Contractor vehicles will be searched on a random basis, as determined by shift supervision, when entering or exiting the limited area. All Contractor vehicles will be searched for prohibited articles upon entering and exiting the Protected Area

and Material Access Area. Each vehicle will display a current state license, safety inspection sticker, and a professional company sign and/or logo (minimum 12 inches x 12 inches) with the company's name printed in 3/4 inch or larger letters. Company sign shall be permanent or magnetic, no handwritten paper signs shall be taped to a vehicle. A safety sticker and license are not required on heavy construction equipment not normally licensed for highway usage. Fueling (service) vehicles will require Fire Extinguishers.

6. Unless otherwise approved by Security, Contractor vehicles and heavy equipment used inside security areas will be removed and returned to the lay down area at the end of each workday. If track-type vehicles are to remain in a security area, they must be disabled.

C. Construction Sites

1. Vehicles, equipment, construction materials, debris, etc., will be parked/placed a minimum of 10 feet from any of the facilities (buildings, ramps, towers, etc.). In addition, vehicles, equipment, materials, and debris cannot be parked closer than 10 feet from any temporary construction fence or 20 feet from a permanent security fence. Materials shall not be stacked higher than 5 feet.

2. Weeds and grass will be mowed, and construction sites and lay down areas will be maintained in an orderly manner.

3. All Contractor trailers, vehicles and other Contractor owned items will be removed from the Plant site within 2 weeks after completion of a construction project.

D. Deliveries

1. All deliveries to the Plant site shall enter at the east entrance station.
2. Make sure someone will be on hand to sign for the delivery; BWXT Pantex personnel are not permitted to sign for any type of delivery.
3. The paperwork that accompanies the delivery shall have the name of the Contractor (or subcontractor) on it, the job site location, building number, etc. This is extremely important, especially if doing more than one job on the Plant site.
4. Deliveries shall be made before 3:00 p.m. unless special arrangements have been made with Security.

E. Prohibited Articles

1. Articles listed below are prohibited at the Pantex Plant. It shall be the responsibility of the Contractor to assure that such articles are not brought onto the Plant or the job sites without prior authorization.
   a. Cameras
   b. Radio Transmitters*
   c. Radio Transceivers*
   d. Recording Equipment (audio, video, optical, or data)
   e. Incendiary Devices#
   f. Explosives#
   g. Explosive Devices#
   h. Firearms and Ammunition, other dangerous or deadly weapons
   i. Controlled substances, including illegal drugs and associated paraphernalia

(unless prescription medicine)#

j. Flares#
k. Alcoholic Beverages
l. Strike-Anywhere Matches
m. Automobile cigarette lighter, pocket lighter, or matches in security areas
n. Vehicle Mobile Phones*
o. Cellular Telephones*
p. Computers and associated media
q. Other items prohibited by law

* If a vehicle has a permanently installed amateur ham radio, citizen band (CB) radio, business band commercial radio, mobile telephone, or cellular telephone, the microphone or handset shall be removed. Portable equipment shall be removed from vehicles prior to entry to the Pantex Plant. Portable equipment and microphones may be left with a Security Police Officer or Security Officer at the Plant entrance station.

Items specifically prohibited in security areas by Department of Energy Orders.

2. Battery-powered telephones will not be permitted in a security area.

3. Calculators are not permitted in the Material Access Area or in buildings containing explosives.

F. Searches

1. All vehicles (company and private), tool boxes, lunch kits, personnel, etc., are subject to search while on the Plant site.

2. All vehicles will be searched upon entering and exiting the Protected Area (PA) and the Material Access Area (MAA). The driver will be expected to turn off the engine, raise the hood, open all vehicle doors, unlock and open any tool boxes or other compartments and comply with the Security Police Officer's instructions. All passengers will dismount so the Security Police Officer can look under and behind the seats. Random searches will be made of private vehicles on the parking lot and in the lay down area.

3. All hand-carried items (e.g. lunch pails, tool boxes, etc.) will be searched upon entering and exiting a security area. As an exception, items hand-carried by cleared Contractor personnel will be searched on a random basis when entering and exiting a Limited Area.

4. All personnel must successfully pass through Biometric devices, metal detectors, and electronic badge readers when entering the Protected and Material Access Area.

5. All prohibited articles will be confiscated.

a. The first offense (except illegal drugs) shall result in a warning.
b. The second offense shall result in removal of the identification or security badge and the violator will be escorted off the Plant and denied future access.

6. **An offense involving illegal drugs shall result in the violator being detained and turned over to the Carson County Sheriff.** The badge will be retained by Security and the violator will be denied future access to the Plant.

7. Drug Dog Searches - Pantex Security, with the assistance of Amarillo Police Department and their drug trained canines, will conduct unannounced searches on all construction projects at Pantex.

G. Termination of Employees

1. Contractor or subcontractor employees terminated on the job will be escorted off the Plant site. Any employee who is under the influence of alcohol or drugs will not be permitted to drive a vehicle off the Plant site. These individuals and other Contractor employees who do not have transportation will be furnished transportation to a predetermined location by the Contractor or subcontractor. In no case will a terminated employee be taken to the east or west gates of the Plant and set afoot on roadways adjacent to the Plant.

END OF SECTION 01540

SECTION 01561 - HEALTH AND SAFETY

PART 1 - GENERAL

1.1 HEALTH AND SAFETY - GENERAL

A. The Contractor shall take all reasonable precautions in the performance of the work under this contract to protect the safety and health of employees and of members of the public and shall comply with all applicable safety and health regulations and requirements including reporting requirements of BWXT Pantex.

B. The Contractor will comply with the safety regulations defined in these specifications and other applicable safety standards. If life threatening conditions exist, the Contractor shall stop work immediately and shall not allow work to resume until the unsafe condition has been corrected.

1. The Contractor will be notified in writing by the Contract Administrator of any noncompliance with the provisions of this contract and the required corrective action to be taken.

2. After receipt of such notice, the Contractor shall immediately take such corrective action. In the event the Contractor fails to comply with said regulations or requirements of the contract, BWXT Pantex may, without prejudice to any other legal or contractual rights of BWXT Pantex, issue an order stopping all or any part of the work; thereafter, a start order for resumption of the work may be issued at the discretion of BWXT Pantex. The Contractor shall make no claim for an extension of time or for compensation or damages by reason of, or in connection with, such work stoppage.

C. The Contractor shall provide fencing as necessary. The work sites of this project shall be a "Hard Hat" area and the Contractor shall post signs on the construction fence and limits of work areas.

D. There are medical facilities located in Building 12-2 that may be used by the Contractor only in the case of an emergency. **Ambulance service is available by phoning extension 3333.**

E. The Contractor shall be responsible for the monitoring and documentation of the air quality in all confined spaces, such as manholes and basements per Section 01566, Confined Spaces.

1.2 SAFETY PLAN

A. The Contractor shall submit a Safety Plan for review and approval by the Occupational Safety & Health Department prior to commencing any construction activities. All phases of construction must be addressed in the Safety Plan.

B. The Safety Plan shall contain a brief description of the construction activities to be performed and types of equipment to be used during the construction activities.

1. The Safety Plan shall be based upon an Activity Hazards Analysis (AHA) performed for each phase of construction.
2. The applicable OSHA requirements of 29 CFR 1926.20 shall be met for any work involving construction, alteration, and repair including painting and decorating.

3. The applicable OSHA requirements of 29 CFR 1926.65 and 29 CFR 1910.120 shall be met for environmental restoration activities.

C. The Safety Plan shall include the name of the Construction Superintendent who is assigned full responsibility and authority for implementing the construction safety program. This designation shall also include any individual(s) having authority to act for the construction contractor during the absence of the Superintendent. All construction activities will be terminated if the Superintendent or other duly designated contractor representatives are not present at the job site during the performance of any construction activities.

D. In addition to the Safety Plan, the Contractor shall submit past accident/injury, fire, property damage experience, and the industrial insurance experience modifiers or rates from the previous two years.

E. The Safety Plan must address all safety issues associated with every phase of construction during the construction project including removal of existing conduits and piping. When removal of conduit and piping is required, the Contractor shall include in the Safety Plan a means to positively identify the conduit and piping to be removed to prevent exposure to energized utilities. If a phase of construction is not addressed in the original Safety Plan, that phase of construction will not be permitted until the Safety Plan is modified to address specific safety and health concerns and the modification is approved by the Construction Safety group and the Construction Manager. The Contractor is liable to operate under the original Safety Plan until the revised Plan is approved.

F. The approved Safety Plan and Hazard Communication Program must be maintained on the work site and shall be available upon request to BWXT Pantex personnel, work site employees, employee representatives, and other personnel with assigned oversight responsibilities.

1.3 HAZARD COMMUNICATION

A. The Occupational Safety and Health Administration (OSHA) has mandated that Contractors shall have a hazard communication program in place by May 23, 1988. The Hazard Communication Standards of the United States Department of Labor, OSHA, (29 CFR 1926.59) present the requirements for the hazard communication program. The Contractor shall comply with all applicable requirements of these laws and/or regulations in the performance of this contract. All activities associated with complying with these regulations and/or statutes shall be at no additional cost to the Government. This requirement includes, but is not limited to, the obligation of the Contractor to provide copies of all reports, Material Safety Data Sheets (MSDS), and activities associated with the protection of plant personnel and property to BWXT Pantex or BWXT Pantex representative, promptly upon the creation, alteration or amendment of any such written material.

B. The Contractor shall maintain a current copy of the Material Safety Data Sheets (MSDS) and Master List of all the hazardous chemicals associated with the construction project on file at the Contractor's field office. Upon request by BWXT Pantex, the Contractor shall promptly provide copies of each master list and/or MSDS. The Contractor shall coordinate the usage of hazardous chemicals with BWXT Pantex's field representative to prevent and/or limit personnel exposure to these chemicals. When hazardous chemicals are being used in the Contractor's designated workplace, BWXT Pantex shall be notified in writing in advance of the use of the chemicals in order to limit personnel access to necessary construction support personnel. If exposure to hazardous chemicals is feasible to occupied areas adjacent to the Contractor's designated work area, the Contractor shall attempt to limit personnel exposure by requesting in writing that personnel be removed. In no event shall the Contractor proceed with any operation that could involve personnel exposure to hazardous chemicals without the prior consent of BWXT Pantex and without a plan to limit personnel exposure.

1.4 PESTICIDE APPLICATIONS

A. Pesticide - A pesticide is 1) any substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest, or 2) any substance or mixture of substances prepared for use as a plant regulator, defoliant, or desiccant. Types of pesticides include insecticides to control insects and other related pests, such as ticks and spiders; fungicides to control fungi; herbicides to control weeds; rodenticide for controlling rodents; predicides to control vertebrate pests; nematicides for controlling nematodes; avicides to control birds; molluscicides for controlling mollusks, such as snails and slugs; and piscides for fish control.

B. License for pesticide application - The Contractor is required to show proof of a current Certified Commercial Applicator License from the Texas Department of Agriculture or the Structural Pest Control Board and show proof of bonding and insurance.

C. Material Safety Data Sheets (MSDSs) - The Contractor shall have field copies of MSDSs for the pesticides being applied onsite. The MSDSs must be accessible to all worker/handlers associated with the project for which the pesticide application is required.

D. Personal Protective Equipment (PPE) - The Contractor shall provide PPE called for on the pesticide label, or the MSDS and it shall be worn in accordance with applicable standards. The Contractor shall enforce the proper wearing of PPE by all pesticide workers/handlers while they are handling, mixing, or applying pesticides.

E. Notifications:

1. Before applying any agriculture pesticides, the Contractor shall make proper notification of the application as specified in the Worker Protection Standard (40 CFR 170).
2. Before applying a structural pesticide, the Contractor shall make proper notification of the application as specified in the Texas Structural Pest Control Act (Article 135B-6).
3. The Contractor shall notify the Construction Manager of the type of application

(type of pesticide and pest targeted) and the schedule for application (date and time) at least two days prior to actual application.

4. If a scheduled application is canceled, the entire notification process shall be repeated for the new projected application date.
5. The Construction Manager shall notify the Operations Center (OC) as to the date and time the application will occur. Notification of the OC must be prior to the start of the application.

F. Record Keeping:

1. The Contractor shall submit the pesticide application records to the Construction Manager in the following format or may provide the information on the record of Pesticide Application (PX-3736):
   a. Date and time of day that each application started and ended.
   b. Name of the Subcontract Technical Representative (STR) for whom the application was made.
   c. The location of the building or land where the application was made, stated in a manner that would permit inspection by authorized parties (such as building numbers or grid numbers from a Plant grid map).
   d. The pesticide applied, including:
      1) product name
      2) the products Environmental Agency registration number
      3) rate of product applied per unit (e.g. lb/acre)
      4) total volume of spray mix, dust, granules, or other materials applied (e.g. lb, gal, oz)
   e. Name of the pest targeted.
   f. Total acreage or building area treated.
   g. Wind direction and velocity and air temperature during outdoor application.
   h. Description of application equipment used.
2. The Contractor shall submit a copy of application records to the Construction Manager no later than 14 days after application.
3. The Construction Manager shall submit a copy of the record of Pesticide Application (PX-3736) to the OC and EPD.

1.5 LADDERS AND SCAFFOLDS

A. If ladders are used (portable, fixed, or job-made), they shall conform to provisions of the applicable ladder safety code. Reference: ANSI 14.1, 14.2, 14.3, 14.4, and 29 CFR 1926.1053.

B. If scaffolds are used, they shall conform to provisions of the scaffold safety codes. Consideration shall be given to railings and toeboards. Reference: "Safety Requirements for Scaffolding," 29 CFR 1926.451.

1.6 ELECTRICAL WORK

A. All general use extension cords shall be of a 3 wire type designated for hard or extra-hard usage. Table 400-4 of the 1999 edition of the National Electric Code (NEC) contains a complete listing of hard and extra-hard usage cords that are permissible for use.

B. All portable electric devices, such as saws, drills, compressors, etc., must have 3 prong plug-ins or be double insulated. Equipment shall be inspected to ensure safe working conditions and shall be disconnected at the close of each working day.

C. All 120-volt, single-phase, 15- and 20-ampere receptacle outlets on construction sites shall have Type A ground-fault circuit interrupters (GFCI) for personnel protection. The "Assured Equipment Grounding Conductor Program" is not an acceptable alternative for the use of GFCI protective devices at Pantex Plant.

D. All Contractor personnel will perform monthly inspections of all extension cords and equipment cords. All defective equipment will be immediately removed from services until properly repaired. Monthly inspections shall focus on cord ends, plug-ins, insulation, grounding prongs, and/or end attachments. Failure to inspect cords and equipment will result in removal of such items from the job site. Monthly colors that will be used by all contractor personnel are as follows:

Month or Quarter	Quarterly	Monthly
January February March	White	White White plus Yellow White plus Blue
April May June	Green	Green Green plus Yellow Green plus Blue
July August September	Red	Red Red plus Yellow Red plus Blue
October November December	Orange	Orange Orange plus Yellow Orange plus Blue

E. The Contractor shall submit a lockout/tagout program prior to performing any electrical lockout activities. The program shall comply with the provisions of 29 CFR 1910.333(b) and be approved by the Occupational Safety and Health Department. The Contractor must provide padlocks and tags for lockout and tagging of applicable switching devices.

F. Protect extension cords crossing roadways (high vehicle traffic areas) by:

1. Burial in rigid conduit or pipe,
2. Routing between insulated (wooden) forms laid across the roadway and secured to prevent movement under vehicle traffic. Form height must be sufficient to prevent vehicles from contacting the cord.

G. All temporary wiring and fixtures shall be installed with adequate quality of workmanship to prevent exposure of personnel to energized electrical parts.

H. Extension cords routed through doorways or windows shall be protected inside a rigid sleeve, conduit, etc., this is secured to prevent the sleeve from being dislodged. Edge caps or edge finish shall be provided to protect draping cords from damage due to sharp edges of the sleeve.

1.7 EMR PRODUCING EQUIPMENT

A. Contractors, whose work is expected to involve the use of equipment intended to emit (transmit) radio frequency (RF) energy, are required to obtain the approval of the HS&Q Division prior to using the equipment at Pantex Plant. Coordinate all approvals through the Construction Manager. Approval from the HS&Q Division for EMR emitting equipment shall not be granted if the use of such equipment (i.e. radio transmitters, cellular phones, etc.) is prohibited by the Security and Emergency Operations Division. Approval for Contractor usage of non-prohibited EMR emitting equipment may be obtained by submitting a completed PX-740 to the HS&Q Division through the Construction Manager. The requirements governing this approval are contained in Plant Standard STD-3281.

1.8 EXCAVATIONS

A. All excavation activities involving personnel entry must be inspected by a competent person designated by the Contractor.

B. The Contractor must address excavation safety requirements as specified in 29 CFR 1926, "Subpart P - Excavations" if construction personnel will enter an excavation. This information must be included in the Safety Plan.

C. All open excavations must be barricaded when unattended. Any open excavation within 6 feet of roadway must be barricaded with flashing yellow lights. Any open excavations over personnel walkways must be covered with a physical barrier and equipped with standard railing.

D. If the Contractor encounters either visual evidence or olfactory (smell) evidence that contamination is suspected during any excavation activities, all work shall stop. The Occupational Safety & Health Department shall be notified in order to verify the contamination. Excavation activities will not resume until the Occupational Safety & Health Department determines the excavation activities will not jeopardize the health of Contractor personnel.

1.9 FALL PROTECTION

A. On February 6, 1995, OSHA implemented fall protection requirements for the construction industry. The fall protection requirements are detailed in 29 CFR 1926, "Subpart M - Fall Protection." The provisions outlined in Subpart M will be mandatory for all construction operations involving working heights greater than 6 ft. and operations considered to be leading edge work. The provision outlined in Subpart R - Steel Erection, will not be permitted on Pantex construction sites.

B. The Contractor will be required to address all applicable fall protection requirements

when working over 6 ft. in height and performing operations considered to be leading edge work. Fall protection requirements will be addressed in the Contractor generated health and safety plan.

C. The designated safety and health coordinator will be responsible for monitoring construction operations to ensure that fall protection requirements are followed. Any construction operation in violation of established fall protection requirements shall be terminated and a safety meeting be conducted by the Contractor to address protection requirements.

1.10 ASBESTOS

A. No asbestos is expected to be encountered during the performance of this project. If asbestos or suspected asbestos should be encountered, the Contractor shall stop work immediately and notify the Construction Manager for actions to be taken.

B. No asbestos products are to be used in the construction of this project.

C. A copy of the submitted TDH Asbestos Removal Notice shall be submitted to the Construction Manager for transmittal to EPD and IH.

D. The Contractor shall bear the TDH charge for filing the notification. The Contractor shall provide proof of invoice payment to the Construction Manager.

1.11 BRAZING, CUTTING, AND WELDING OPERATIONS

A. All brazing, welding, and cutting operations shall be accomplished per Section 01562 "Fire Safety" and 29 CFR 1926, "Subpart J - Welding and Cutting."

B. Brazing, cutting, and welding operations can produce toxic gases (such as NO_2 and Ozone) and toxic metal fumes (from the base metal and/or filler metal/electrode). Adequate ventilation and respiratory protection (if needed) must be provided so that worker exposures do not exceed any OSHA Permissible Exposure Limit (PEL). Do not use lead-containing welding rods or electrodes, or cadmium-containing brazing filler metals, without approval from Industrial Hygiene Section for specific application.

1.12 REPORTING/POSTING REQUIREMENTS

A. DOE Order 232.1A, (Occurrence Reporting) reporting requirements.

1. All accidents/incidents, injuries, any near miss, damage or loss of property must be reported. Any occurrence or discovery which may affect the environment as a result of the release of a hazardous substance, regulated pollutant, fuel or oil must be reported. Any condition discovered which could result in the degradation of

personnel safety must be reported. Any condition which could result in the degradation of security must be reported. Any use or suspected use of illegal drugs or alcohol must be reported.

2. All reports of occurrences such as those identified above must be made immediately to the Occupational Safety & Health Department, Extension 5114. If after 1630 (4:30 p.m.) the report must be given to the Operations Center, Extension 5000.

B. DOE Form 5484.3 and DOE Form 5484.4.

1. DOE Form 5484.3 (Individual Accident/Incident Report) shall be submitted to the Pantex Occupational Safety & Health Department by the 15th day of the month following the month that any accident was reported. This is submitted for each type of accident listed on the form.
2. DOE Form 5484.4 (Tabulation of Work Hours, Vehicle Usage, and Property Valuation) shall be submitted on a quarterly basis on the 15th day of the month of the quarter (January 15, April 15, July 15, October 15). The submission of the 5484.4 is required for any construction project. In addition, the Contractor shall include the total number of hours worked by all construction personnel during the reporting period.

C. Poster DOE F-5483.1.

1. DOE F-5483.1 poster will be posted in a conspicuous place and accessible to all construction employees. The Maintenance and Operating Contractor is responsible for maintaining labels on posters and should not be included in the Division 1 Specifications.

D. DOE Form 5480.4.

1. Contractor employees may notify Construction Safety if they have an occupational safety or health complaint. Construction Safety will provide the employees with DOE Form 5480.4, "Contractor Employee Occupational Safety or Health Complaint."

E. DOE Order 231.1 and 29 CFR 1904.5.

1. Injury and illness records must be kept for each Contractor establishment. An establishment is defined as "a single physical location where business is conducted or where services or industrial operations are performed." Per DOE Interpretation D98-02-024, the Contractor site at Pantex Plant represents one establishment for the Contractor and separate records must be kept for this establishment. Therefore, each Contractor present at Pantex Plant must maintain the required OSHA 200 log onsite. This log should be kept up-to-date and be available for inspection by the Construction Safety Inspector on a monthly basis.
2. The annual summary of occupational injuries and illnesses for each Contractor establishment at Pantex Plant shall be posted no later than February 1 and remain in place until March 1 of each year.

1.13 EMERGENCY INSTRUCTIONS

A. In the event of an accident or incident, where it would be necessary to evacuate a construction site or evacuate personnel from a certain area, construction personnel will evacuate to the east or west entrance of the plant and await further directions from the Safeguards & Emergency Operations Division.

B. All construction personnel will remain at the locations until released or given other instructions.

C. Emergency Tornado Shelters

Firing Site and Area E: FS-4 & 5, Depressions and Culverts

Zone 4 - Staging Area: Ditches,or Depressions

Zone 4 East: Ditches or Depressions

Zone 11 West: Ditches or Depressions

Zone 11 East: Bottom Floor, Building 11-2

Zone 12 Northwest: Ditches or Depressions

Zone 12 Northeast: Ditches or Depressions

Zone 12 Southeast: Ditches or Depressions

Zone 12 South: Ditches or Depressions

Zone 12 Southwest: Ditches or Depressions

Zone 16: Ditches or Depressions

D. Emergency Services - Telephone Numbers

Emergency Service	Extension
Ambulance	3333
Fire	3333
Fire (Business Only)	4457
Medical (Physician)	3033
OS&H/Radiation Safety	5114
Security	3934/3916
Operations Center	5000

E. When necessary, static potential warnings will be issued by the Pantex Operations Center. These warnings are to inform all Pantex workers that conditions are such that could cause a shutdown of the Contractor's work.

F. When necessary lightning warnings will be issued by the Pantex Operations Center. These warnings are to inform all Pantex workers that conditions are such that lightning strikes are possible within the area. The Contractor's on-site representative will determine if it is necessary to leave the site until these warnings have been canceled. If conditions become severe, the Operations Center will direct all contractors to be escorted to a designated Emergency Shelter. These delays must prevent work for 50 percent or more of the Contractor's work day, and delay work critical to the timely completion of the project. to be considered an adverse weather day warranting a time extension. The Contract Administrator shall ascertain the facts and the extent of the delay, and if justified, shall issue a modification in accordance with the contract clause entitled "Default (Fixed-Price Construction)."

1.14 SPEED LIMITS ON PANTEX PLANT

A. Posted speed limits shall be observed by all construction personnel whether in their personal vehicle, coming to or going from work, or in Contractor work-related vehicles.

B. The speed limits are the maximum for paved roads and shall be reduced as necessary for safe operation of vehicles during inclement weather or poor road conditions caused by rain, snow, ice, fog, dust, etc.

1.15 VEHICLES

A. All construction vehicles entering Pantex Plant are subject to inspection. Brakes, lights, all glass, fuel, electrical and exhaust systems, etc., shall be maintained in good workable condition.

B. Prior to entering a construction site, all cranes must have annual inspection documentation and must be inspected by the Occupational Safety & Health Department.

C. Seat belts, as applicable, shall be installed and worn.

D. Passengers shall not exceed the number the vehicle was designated to transport. No personnel are allowed to ride in the back of a truck.

E. Getting on/off vehicles while in motion is prohibited.

F. Vehicles shall stop and yield the right of way when meeting a vehicle displaying flashing lights. They shall not proceed until the vehicle has passed their location. The passing of these vehicles is prohibited.

G. Vehicles are subject to a Fire Safety Inspection. Refer to Specification Section 01562.

1.16 EXPLOSIVES SAFETY

A. The use of explosives by Contractors at Pantex Plant is prohibited.

1.17 HEALTH AND SAFETY INSPECTIONS

A. Construction sites will be inspected regularly by the Occupational Safety & Health Department. The Waste & Environmental Management Department and Industrial Hygiene Section will conduct random inspections.

B. All violations will be documented and a copy of the violations will be provided to the Contractor. Any items not corrected during the construction site inspection will be entered into a computer tracking system until the violation(s) have been closed. The Contractor will be provided a copy of the computer log upon request.

C. The Contractor is responsible for conducting safety and health inspections at the job site and for correcting noted deficiencies. The Contractor shall prepare a brief safety checklist covering all activities at the job site and maintain a documented daily inspection of the job site. A copy of the checklist must be included in the Contractor's Safety Plan. The Construction Safety group will provide the Contractor a copy of a sample checklist upon request. A copy of the documented inspection will be retained at the construction site or a designated location. Construction Safety will audit the daily inspection checklist to ensure that safety and health inspections are being performed on a daily basis.

D. Construction Inspectors and Construction Managers have the authority to enforce health and safety standards.

1.18 SAFETY CONSIDERATIONS

A. The Contractor is required to conduct informal "Tool Box" safety and health training sessions at least weekly for all employees on the work site. Outlines of all "Tool Box" training sessions shall be prepared by the Contractor and annotated with the date, time, and names of all employees in attendance. A copy of the documented meetings will be retained at the construction site or a designated location. The Construction Safety group will audit the training documentation to ensure the Contractor is performing "Tool Box" safety and health training sessions on at least a weekly basis.

B. The Contractor shall periodically, during the "Tool Box" sessions, advise the personnel of the methods of locating, exposing, and protecting utilities in accordance with the requirements of Section 01565.

C. The Contractor shall immediately terminate any activity considered to be "imminently dangerous."

D. In cases where immediate corrective actions are not possible to eliminate noted safety discrepancies, the Contractor shall:

1. Immediately ensure all affected employees are aware of the hazard and its location.
2. Immediately post warning signs at the location of the hazard.
3. Implement further interim control measures, as needed, to protect their employees from the identified hazard.

4. If a hazard is not related to the construction project's scope, notify the Construction Safety group and the Construction Manager so it can be arranged for the abatement of the identified hazard.

E. Failure to follow safety requirements and approved procedures often has serious safety implications. Any incident where safety requirements and approved procedures are not followed requires BWXT Pantex to incur additional costs which vary depending on the severity of the incident. Such costs include, but are not limited to, costs associated with off-shift work, downtime for affected personnel, investigations, preparation and distribution of reports, development of corrective actions and other costs not normally incurred in the daily conduct of business. If it is determined by BWXT Pantex the incident occurred as a result of the Contractor failing to follow requirements or procedures specified in this contract, the Contractor will be charged $1,000 in liquidated damages, and not as a penalty, to reimburse BWXT Pantex for the costs of this additional unplanned work. This amount is in addition to the costs of repairs for which the Contractor shall be solely responsible. Damages will be charged for each incident of this type.

1.19 EMPLOYEE TRAINING

A. The Contractor shall ensure that each employee has received initial employee orientation prior to commencing construction activities. In addition, all subcontractors must provide initial employee orientation to all employees prior to commencing construction activities. The Construction Safety group reserves the right to attend any orientation training prior to commencing construction activities. A copy of the employee orientation program shall be included with the Safety Plan. The orientation program shall address, at a minimum, the following topics:

1. Employee rights and responsibilities.
2. Construction contractor responsibilities.
3. Use and maintenance of required personal protective equipment.
4. Disciplinary procedures.
5. Alcohol and drug abuse policies.
6. First aid and medical facilities.
7. General project hazards and applicable policies and procedures to addressing these hazards.
8. Hazard recognition and procedures for reporting or correcting unsafe conditions or practices.
9. Procedures for reporting accidents and incidents.
10. Fire prevention and control.
11. Emergency response procedures to include local warning and evacuation systems.
12. Hazard communication program.
13. Access to employee exposure monitoring data and medical records.
14. Location of and access to approved project safety and health plan.
15. Site specific programs or procedures applicable to the project.

B. Each employee shall be instructed in the recognition and avoidance of unsafe conditions and the regulations applicable to his/her work environment to control or eliminate any hazards or other exposures to illness or injury. The Construction Safety group will audit Contractor employees to ensure they have been instructed in the recognition and avoidance of unsafe conditions. All employees that are not instructed in the recognition

and avoidance of hazards will be removed from the work location until the Contractor provides proper instructions.

C. Contractors with continual onsite presence or with multiple projects utilizing the same work force may provide a general orientation prior to commencing work on the employees' first on site project and at least annually thereafter. Orientation on items that may vary from project to project shall be provided for each project.

1.20 PERSONAL PROTECTIVE EQUIPMENT (PPE)

A. The Contractor is responsible for requiring their employees to wear appropriate PPE for operations which present a hazard. In general, PPE includes, foot protection, eye/face protection, hearing protection, hand protection, head protection, and respiratory protection.

1. Foot protection is required when employees are exposed to falling or rolling objects, or objects which could pierce the sole. All protective footwear must comply with ANSI Z41-1991.

2. The Contractor shall clearly identify and delineate all areas where eye and face protection is required. These areas shall include all locations where hazards from flying particles, molten metals, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or injurious light radiation may be present. Any employee entering these areas must wear appropriate eye and face protection. All eye and face protection equipment must comply with ANSI Z87-.1-1989.

3. Properly rated hearing protectors shall be provided to employees exposed to 8-hour time-weighted average of 85 decibels or greater.

4. Hand protection shall be provided to employees exposed to hazards to the hands from skin absorption of harmful substances, severe cuts or laceration, severe abrasions, punctures, chemical burns, thermal burns, and harmful temperature extremes.

5. The Contractor shall clearly identify and delineate all areas where head protection is required (Hard Hat Areas). These areas shall include all locations where employees may be exposed to potential head injury from impact, falling or flying objects, or from electrical shock and burns. Any employee entering these areas must wear protective helmets. Protective helmets must meet the requirements of ANSI Z89.1-1969. Helmets for use by employees exposed high voltage electrical shock and burns shall meet the specifications of ANSI Z89.2-1971.

6. The Contractor shall clearly identify and delineate all areas where respiratory protection is required. These areas shall include all locations where employees may be exposed to air contaminated with harmful dusts, fogs, fumes, musts, gases, smokes, sprays, or vapors when engineering controls are not feasible. Construction Contractors must comply with OSHA's Respiratory Protection standard, 29 CFR 1910.134.

7. Appropriate electrical protective equipment is required when employees are working in areas where they may be exposed to electrical hazards. The electrical

protective equipment must comply with 29 CFR 1910.137.

END OF SECTION 01561

SECTION 01562 - FIRE SAFETY

PART 1 - GENERAL

1.1 FIRE EXTINGUISHERS (NFPA #10 PORTABLE FIRE EXTINGUISHERS)

A. Contractor supplied fire extinguishers are to be at the work site at all times. Fire extinguishers must be properly charged, sealed, and have up-to-date inspection tags from an approved inspection station. Fire extinguishers must have a gauge or operable indicator that can be visually checked to verify the extinguisher is charged. Fire extinguishers will be located so that the maximum travel distance shall not exceed 75 feet. Additional extinguishers may be needed if conditions require them. The Pantex Fire Department Fire Prevention section will specify what additional fire extinguishers are required.

1. Pressure water extinguishers may be used where only ordinary hazard combustible materials (wood, paper, plastics, etc.) are present. Minimum size: 2-1/2 gallons.
2. "ABC" dry chemical fire extinguishers must be available where flammable/combustible liquid or electrical energized fires may occur. Minimum sizes - "ABC" 10 lbs.

B. Government owned fire extinguishers must not be moved from their installed locations except for emergency use or after approval from the Pantex Fire Department.

1. DOE owned fire extinguishers are not to be included in the total number that are required at the job site.

1.2 REPORTING FIRES

A. All Contractor employees shall be familiar with the location of Fire Alarm Manual Pull Stations or Telephones to prevent any delay in reporting a fire.

B. All fires must be reported immediately to the Pantex Fire Department by one of the following methods.

1. Fire Alarm Manual Pull Station.
2. Telephone Number 3333.
3. Radio Notification by Security Inspectors.

C. Fires that have been extinguished by Contractor employees must be reported to the Fire Department so that a proper investigation may be made and to ensure the fire will not rekindle or flashback.

D. During an actual fire emergency or drill, Contractor personnel will evacuate the building or area by the quickest and safest route and will proceed to a protected area.

1.3 CUTTING AND WELDING

A. Reference NFPA 51B - "Standard for Fire Prevention in Use of Cutting and Welding Processes.

B. Hot work (cutting, welding, or grinding of any type) that is to be performed in or within 50 feet of any existing structure must be coordinated through Construction Safety. Construction Safety will contact the Fire Prevention Officer or alternate who will inspect the area to determine the need for a standby or to give special instructions.

1. Any cutting, grinding, and welding activities require either fire retardant clothing shall be provided and utilized or a fire watch established. The fire watch person's main duty shall be to watch the cutting and/or welding operation so that personnel safety can be answered.
2. Openings in floors, wall, ducts, and blind areas must be covered if within 35 feet of the work.
3. No cutting, welding, or grinding will be allowed on H.E. contaminated piping or piping that is painted white without approval by the Safety Department.
4. After completion of any hot work operations inside a building, ramp, structure or any area where combustible materials are located, a 30 minute Fire Watch must be provided by the Contractor. The person assigned the duties of a Fire Watch must check all concealed and blind areas to ensure that all hidden or smoldering fires are extinguished and reported to the Fire Department.
5. All curtains for welding flash protection shall be suitable to protect personnel from the flash.

C. Oxygen-fuel cylinders must be stored, moved, and handled in accordance with NFPA 51B.

1. Oxygen-Fuel cylinders must be secured so that they cannot be knocked over.
2. Cylinder valves shall be closed when equipment is unattended.
3. Cylinders not in service must have valve caps in place.
4. Cylinders located at the site shall be connected for use. Only one day's working supply cylinder will be allowed at the work site. Additional cylinders will be located away from the work site in a protected location. Fuel and oxygen lines will contain one-way valves.
5. Fuel cylinders will be placed in an upright position to prevent liquid fuel from being introduced into the supply lines.

D. Electric arc welders shall be operated in accordance with NFPA Code #70, Sec. 630 "Electric Welders".

1. No part of the building frame, lightning protection system, or grounding system will be used as an earth ground for welding operations. EXCEPTION - if the building frame is completely exposed between the ground and the work site, it may be used as the earth ground.
2. Ground leads will be connected as near as possible to the work site to prevent arcing in blind areas.
3. Cables shall be adequate for the current and duty cycles and be in good condition. Damaged cables shall be properly repaired or replaced.
4. Cutting, welding and grinding operations shall, as near as practical, be conducted to direct sparks or slag toward open areas where all combustibles have been

removed. A 30 minute Fire Watch shall be established after these operations to detect any possible fire sources.

1.4 SPRINKLER AND RISER SYSTEMS

A. Building sprinkler, risers, or any part of a fire system shall not be used as an anchor or suspension point for any construction activities.

1.5 EMERGENCY EXITS AND MEANS OF EGRESS

A. NFPA #101, "Life Safety Code", will be used as the guideline for all means of egress (Exits). Special attention should be made to NFPA 101 Chapter 31-1.1.

B. Existing Facilities or Partially Occupied New Facilities - Emergency exits and passageways will be kept clear at all times. Access to exits will have a minimum clear path of travel of at least 44 inches.

C. No materials or equipment will be stored, stacked, or parked to prevent personnel access to an emergency exit or door.

D. If an exit must be blocked, it will only be done after agreement by the Construction Manager and the Fire Prevention Officer. They will ensure that acceptable alternate exits are available and that all building occupants have been informed of the locations of these exits.

E. Hasps or locking devices will not be placed on an Emergency Exit until approval is given by the Fire Department Fire Prevention Officer.

F. Exit signs will be removed or covered to prevent personnel movement towards exits that are out of service. A "NO EXIT" sign (minimum letter height 3 inches) made of reflective material will be placed on the door. Advise the Construction Inspector to informed building occupants that the exit is no longer available for use.

G. Emergency exits will be placed back in service as soon as possible after completion of work. This will be accomplished after checking with the Fire Prevention Officer.

H. Chains or locks placed on exit doors for security reasons shall be removed at the end of each Contractor's work shift if that facility is to be occupied by plant personnel.

I. New Facilities - The Construction Manager and the Superintendent will ensure that adequate means of escape are provided for all construction employees. Mustering Stations or Assembly Points will be established so that personnel may be accounted for in emergency situations. Construction employees will be familiar with escape routes, mustering stations, and assembly points prior to being assigned to a work area.

1.6 SMOKING AREAS

A. Smoking will be allowed only in the designated area(s). Smoking areas are posted with signs.

1.7 VEHICLE AND EQUIPMENT INSPECTION

A. All construction vehicles and equipment are subject to inspection by the Fire Department or Security Police Officer. The inspection includes, but is not limited to:

1. Fuel systems must be permanently mounted (exception LPG or LNG for tar pots or portable heaters).
2. When fuel systems are equipped with air cleaners they must be in place.
3. Fuel caps or covers must be in place.
4. Battery(s) must be firmly mounted to prevent arcing. External mounted batteries must be covered and firmly mounted.
5. All electrical wires must be in good condition.
6. Motor vehicles must have a muffler or spark arrestor in place while in operation.
7. Exhaust manifolds and header pipes must be free from leaks.
8. Exhaust shall be directed away from operating personnel.
9. Any vehicle or equipment that fails an inspection must be removed from the work area and must be reinspected by the Fire Department before it will be allowed back into the work area.

1.8 FIRE EXTINGUISHERS ON CONSTRUCTION VEHICLES AND EQUIPMENT

A. Fire extinguishers must be properly charged, sealed, and have up to date inspection tags from an approved inspection station. Only extinguishers with visual pressure gauges or indicators that will show if the extinguisher is fully charged will be approved for use.

B. Fire extinguishers must be located where they are readily available for use by operating personnel.

C. The following equipment list (not all inclusive) must have as a minimum, 1 each 2 ½ lb [redacted]

FLAMMABLE/COMBUSTIBLE LIQUIDS

A. Reference NFPA #30 "Flammable and Combustible Liquid Code."

B. Class II combustible liquids (flash point at or above 100 degrees Fahrenheit and below 140 degrees Fahrenheit) will be handled and stored as a flammable liquid. This class includes Diesel fuel, Kerosene, some types of parts and equipment cleaners, and various paint thinners.

C. Flammable/Class II Combustible liquids of 5 gallons or less will be transported and stored in safety containers approved by a nationally recognized testing laboratory. The safety container must be equipped with a spring closing lid and internal spark arrestor.

1. Spring operated lids must function as designed.
2. Spark arrestor screens must be in place and in good condition.
3. Containers must be properly identified and labeled as to the contents.

D. Bulk storage of flammable or combustible liquids must be approved by Fire Protection Engineering with the concurrence of the Security Department Construction Officer and the Environmental Protection Section.

E. Fueling of heavy equipment (motor graders, tracked vehicles, and other specialized equipment) may be performed at the job site provided the following requirements are met:

1. A minimum of 2 each 10 lb "ABC" fire extinguishers will be properly mounted on all fuel trailers or trucks.
2. All engines and motors (except approved dispensing motors) shall be stopped during fueling operations. All open flames will be extinguished, and the "No Smoking within 50 feet" rule shall be enforced.
3. Only flammable liquid dispensing pumps approved by a nationally recognized testing laboratory will be used. (No gravity flow fuel dispensing will be allowed at the job site.) Automatic shut-off nozzles are required on all electric or pneumatic pumps.
4. Only approved flammable liquid dispensing nozzles will be used. (Nozzle shall be in contact with the vehicles being fueled to prevent static discharge from occurring.) Bonding straps between the two vehicles may be required.
5. Fueling will not be allowed inside buildings, ramps, other enclosures, or within 50 feet of existing structures.
6. Fuel pump(s) shall not operate from the dispensing vehicle's engine unless it is powered by an approved power take off (PTO) driven pump.
7. Service vehicles and fuel trailers will be placarded on four sides with:
   a. "No Smoking Within 50 Feet", and
   b. The proper UN or DOT Identification numbers (1203 and/or 1993).

F. Immediately after fueling operations are complete, service vehicles and/or trailers will be removed from the job site. They will be kept at the bulk fuel storage area or off Pantex property.

1.10 TAR KETTLES

A. Tar kettles and roofing operations will be in accordance with the NFPA Codes, #1 "Fire Prevention Codes" and #241 "Safeguarding Construction Alteration & Demolition Operations".

B. Site locations will be designated by Fire Protection Engineering with the following restrictions:

1. All vegetation will be removed from under and 10 feet around the kettle.
2. Kettles must not be positioned closer than 25 feet to a structure if the adjacent wall has no openings. If doors, windows, or other openings are in place, the minimum distance will be extended to 50 feet.
3. The minimum distance from any building containing high explosive or marked with the symbol "1" will be 50 feet.
4. Motorized vehicles will be detached and moved away from the kettle prior to lighting the burners.
5. At sites where the tar kettle is positioned over blacktop or pavement, a 3 inch layer of sand or soil will be placed between the pavement and the kettle. The layer of sand or soil will extend 12 inches beyond the outside edge of the kettle.

C. Only persons familiar with the operation and safety features of the tar kettle should be assigned as operators.

1. A dedicated 10 lb "ABC" fire extinguisher will be available to the operator at a distance no greater than 25 feet from the tar kettle.
2. Temperature probes or sensors will be in place and operational.
3. Fuel tanks will be permanently mounted or so positioned to prevent tipping or falling over.
4. The fuel tank will be attached to the tar kettle with hose or piping designed for use with that fuel.
5. One way check valves between the burner and the fuel source will be in place.
6. Fuel tanks, if not permanently mounted, must be removed from the work site at the end of the work day.
7. Fuel containers located at the site shall be connected for use. Only a 1 day's working supply (container) of fuel will be allowed at the job site. Additional fuel containers will be located away from the work site in a protected location.
8. Metal covers or lids must be in place to smother potential fires.
9. Tar kettles must be attended at all times when the burner(s) are lit.
10. Tar pumps and piping must be properly supported and stabilized to prevent falling.

D. Roofing operations are subject to the following guidelines:

1. A sufficient number of fire extinguishers will be located on the roof so that the maximum travel distance does not exceed 25 feet.
2. Scrapers with internal combustion engines may be fueled on the roof if a 10 lb "ABC" fire extinguisher is located at the fueling site and:
   a. All engines, motors, and spark producing devices within 50 feet are stopped.
   b. Approved safety containers of 5 gallons or less are used and they are removed immediately after fueling.

c. All roofing mops will be removed from the roof at the end of the work day. They must be kept away from ignition sources and combustible materials.

1.11 PORTABLE HEATING EQUIPMENT

A. Use of Portable Heating Equipment - Use of portable heating equipment may be allowed with the following restrictions and guidelines (Ref. NFPA #58 and #31). Heaters designed for use with liquid fuels with a flash point at or below 100 degrees Fahrenheit will not be approved for use.

B. The Preferred Method of Use - The preferred method of use is to station the heating units outside the building and duct the heat inside. Only duct approved and rated for this use will be allowed.

C. Combustible Liquid Fueled Heaters - Combustible liquid fueled heaters must be approved by a nationally recognized testing laboratory and have legible labels and instructions affixed to the heater.

1. All operations producing heat, flame, or sparks within 50 feet of the heater must be shut down prior to fueling.
2. Heaters will be shut down and allowed to cool before fueling. Approved safety containers of 5 gallon capacity or less will be used to fuel portable heaters. The safety container will be moved at least 50 feet from the heater prior to relighting.
3. Remove all combustible materials from around the heating unit. The minimum distances are: 10 feet from the rear and sides, and 30 feet from the discharge side.
4. A dedicated fire extinguisher (minimum 10 lb "ABC") will be kept within 10 feet of the heating unit.
5. Heaters shall have as a minimum:
   a. A safety control to prevent discharge of fuel in case of ignition failure or flame extinguishment.
   b. Safety shut-off device that minimizes fire hazard in the event of a tip-over.

D. Portable heaters fueled by liquid petroleum gas must be Underwriters Laboratories or Factory Mutual approved, and follow the guidelines in NFPA #58 "Installation of LP Gas System".

1. Flexible hose may be used on the low pressure side of the fuel regulator to connect to the portable heater. For indoor use, the hose will be kept to a minimum length. Hose length should be as near 6 feet in length as practical.
2. A leak test, at normal operating pressure, will be performed on the complete system prior to lighting the pilot or burner.
3. All combustibles must be removed from around the heating unit. Minimum 10 feet from the back and sides and 30 feet from the discharge side.
4. A fire extinguisher (minimum 10 lb "ABC") will be kept within 10 feet of the heating unit.
5. Refilling of LPG cylinders will not be allowed inside structures. All ignition sources within 50 feet must be extinguished when changing cylinders. LPG cylinders will be securely fastened to prevent tipping/falling over.
6. Heaters shall have as a minimum:
   a. An automatic device to shut off the flow of gas to the main burner or pilot in

the event of flame extinguishment or combustion failure.

b. An approved electric ignition system or a pilot which must be lit and proved before the main burner can be turned on.

7. Portable heating equipment will only be used after approval by the Fire Prevention Officer and with the concurrence of the Construction Safety Inspector.

1.12 STORAGE OF COMBUSTIBLE BUILDING MATERIALS

A. Temporary storage of combustible building materials will not be permitted inside existing structures when the fire protection system is out of service. Combustible building materials will not be stored in unprotected structures under construction or alteration until authorized by the Construction Manager and the Fire Department Fire Prevention Officer.

B. Outside storage of combustibles will be kept at a safe distance (minimum 30 feet) to prevent a fire from communicating from the storage area to the structure. (Reference NFPA #231 "General Storage" and #241 "Safeguarding Construction Operations").

1.13 TEMPORARY ENCLOSURES

A. Temporary enclosures, barricades, or sight barriers must be of a flame retardant material or painted with an approved flame retardant paint. (Ref. NFPA #701 "Standard Methods of Fire Tests for Flame-Resistant Textiles and Films" and #241 "Safeguarding Construction, Alteration & Demolition Operations".) The Contractor must supply an approval form or qualification test of the material prior to its use.

B. Plastic films, tarpaulins, and other type of drapes shall not be used. Only materials (such as Griffolyn 75FR type) that will not support or contribute to a fire may be used.

1.14 REFUSE

A. Waste materials, trash, packing crates, and other types of refuse will be removed daily and accumulations of combustibles will not be permitted.

1.15 ACCIDENTS AND MEDICAL EMERGENCIES

A. Personnel accidents and medical emergencies will be managed to prevent or reduce further injury to an ill or incapacitated employee. The following guidelines shall be used to determine when emergency medical treatment is required:

1. All falls where a person loses consciousness or has pain or numbness in any portion of the body.
2. Cuts or abrasions that may require suturing by a physician.
3. All injuries where a bone may be fractured or dislocated.
4. Burns to the face, hands, or eyes (second or third degree burns to any portion of the body). This covers electrical, thermal, and chemical burns.
5. Any chest pain, difficulty in breathing, or stomach pain.
6. Allergic reactions to food products or insect stings.

7. Snake bites.

B. Regular first aid treatment will be under OSHA guidelines by the Contractor; but, when in doubt, call the Fire Department emergency phone number extension 3333 or request a Security Police Officer to summon an ambulance.

C. Ambulance service and transportation to a medical facility or emergency doctor will be by Pantex ambulance. This service is provided at no cost to the Contractor. The ambulances are staffed by State Certified Paramedics and Emergency Medical Technicians. Fire Department personnel are also trained in vehicle, Hi-Angle, and Confined Space rescue.

D. Patients requiring medical attention may first be taken to the Pantex Medical Facility (8:00 a.m. to 4:30 p.m.) for stabilization prior to transportation to an emergency room or doctor.

E. Equipment or vehicles that may have caused or been a contributing factor in an accident with personal injury shall not be moved until investigated by the Pantex Safety Department.

1. Exception - Equipment or vehicles may be moved to prevent further injury to, or allow access to, an accident victim.

F. SPECIAL HAZARD - The security fencing in certain areas of the Plant is double-barbed concertina (razor) wire. The wire is designed and positioned to impale and hold an intruder in place. Specific tools and techniques are required to remove person(s) trapped in this wire. The Fire Department has the equipment to extricate persons who may have become entangled. Call EXT 3333 immediately or request a Security Police Officer to notify the Fire Department that a person is trapped in the razor wire.

Contractors shall conduct safety meetings to instruct their employees on the hazards of razor wire. The Fire Department is available for help with these safety meetings or any safety meetings involving Fire Prevention or Life Safety.

If a project will place Contractor employees in close proximity to this wire, the following guidelines shall be followed:

1. Stay alert and know the location of the wire at all times.
2. Do not touch the wire if the job does not require it.
3. Instruct person(s) who may become entrapped in the wire not to move and do not attempt to extricate them from the wire. Attempts to untangle a person will only jeopardize the rescuer and cause additional injury to the victim.

1.16 QUESTIONS

A. Fire Department personnel are available for advice or assistance on any matters concerning Fire Prevention or Protection. Questions should be directed through the Construction Manager.

END OF SECTION 01562

SECTION 01563

CONTRACTOR WASTE MANAGEMENT

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The Contractor shall manage all hazardous and state regulated waste generated in the performance of the contract, in accordance with all applicable regulations and requirements. The Contractor shall maintain good housekeeping practices, minimize waste generation, and comply with inspection, record keeping, reporting and closure requirements.

B. The Contractor shall submit a contract specific Waste Management Plan for review and approval by BWXT Pantex. Notice to Proceed will not be issued to the Contractor until BWXT Pantex has approved the Waste Management Plan. A Conditional Notice to Proceed may be granted by BWXT Pantex at its discretion. The Conditional Notice to Proceed will be revoked if the Contractor has not submitted a revised Waste Management Plan for approval within 10 calendar days following the Preconstruction Meeting. The Waste Management Plan will be reviewed and either approved or returned with a request for additional information within five calendar days.

C. The Contractor shall have all waste generated during the construction project characterized by BWXT Pantex for proper disposal.

D. The Contractor shall initiate request for issuance, transfer, and movement of waste containers through the Construction Manager.

E. The Contractor shall submit to periodic inspections of their designated construction sites and lay down area.

1.2 REFERENCES

A. 40 CFR §261 - 262, *Hazardous Waste Identification and Standards Applicable to Hazardous Waste Generators*

B. 30 TAC §335, *Texas Natural Resource Conservation Commission (TNRCC) Solid Waste programs*

C. 29 CFR §1910, *Occupational Safety and Health Standards*

D. 29 CFR §1910.145, *Specifications For Accident Prevention Signs and Tags*

E. 29 CFR §1910.1200, *Hazard Communication*

F. 29 CFR §1926.200, *Accident Prevention and Tags*

G. 49 CFR §171.3, *Hazardous Materials Transportation*

1.3 WASTE CLASSIFICATIONS

A. Hazardous Waste, as defined in 40 CFR §261.3 (RCRA), shall be accumulated and managed by the Contractor as specified in 30 TAC §335.69 at Less Than 55 Gallon Waste Accumulation Site(s) or Less Than 90 Day Accumulation Site(s) (e.g., solvent or heavy metal-contaminated solids/soils, mineral spirits/solvents, paint waste/thinners, acids, used batteries, sandblasting sand contaminated with a hazardous material, aerosol containers, etc.). The Contractor shall accumulate and manage hazardous waste in accordance with applicable regulations and request disposition by BWXT Pantex.

B. Class I waste, as defined in 30 TAC §335.1, does not meet the definition of hazardous waste as defined by RCRA regulations, but is regulated by TNRCC rules as posing "substantial present or potential danger to human health or the environment" (e.g., empty containers, waste oil, asbestos, metal scrap, antifreeze, etc.). Class I waste shall be accumulated and managed as a Class I waste using care and control for the safety of personnel and the environment. The Contractor shall accumulate and manage Class I waste in accordance with applicable regulations and request disposition by BWXT Pantex.

C. Class II waste, as defined in 30 TAC §335.1, is "any individual solid waste or combination of industrial solid waste which cannot be described as hazardous, Class I, or Class III waste" (e.g., paper, cardboard, plastic wrapping, dumpster waste, etc.). The Contractor shall accumulate Class II Waste in appropriate waste containers.

D. The Contractor has the option of having BWXT Pantex provide commercial dumpsters. If BWXT Pantex does not have any commercial dumpsters available, the Contractor can contract out to a reputable waste Contractor to handle some Class II waste. Due to limited availability, there may be delays in BWXT Pantex providing waste containers that could slow the contract down. These delays cannot be used as the basis for time extensions or as the basis for claims. BWXT Pantex will provide certification of the Class II waste before it leaves the plant site. The Contractor will provide Waste Operations Department with the actual quantities of Class II waste that leaves the plant.

E. Class III waste, as defined in 30 TAC §335.1, is "inert and essentially insoluble industrial waste, usually including, but not limited to, material such as rock, brick, glass, dirt, and certain plastics and rubbers, etc., that are not readily decomposable". The Contractor shall accumulate and deliver Class III waste to the Pantex Plant Construction Landfill or may include with Class II waste if the Contractor hires a reputable waste Contractor for disposal.

1.4 SUBMITTALS

A. The Contractor shall submit a project specific Waste Management Plan (CWMP) for review and approval by BWXT Pantex. A generic model Waste Management Plan will be available from BWXT Pantex and may be requested by the Contractor. The Plan shall include, at minimum, the following:

1. Purpose, scope, and project description.

2. Waste management responsibilities of Contractor personnel.
3. Practices/procedures for waste minimization, addition of new waste streams and expected waste streams, overall management of the different classifications of waste.
4. Security measures for controlling containers that will be storing hazardous waste.
5. Inventory of hazardous materials to be used, estimated use and storage volume, description and diagram of proposed hazardous materials storage area(s) and materials to be stored.
6. Bulk fuel storage and applicable security measures to prevent spillage during fuel operations.
7. Description of proposed waste stream(s) to be generated, hazardous constituent/characteristic(s), waste classification(s), generation process(es), and estimated generation volume(s).
8. Description of proposed hazardous waste and/or Class I Waste accumulation, as less than 55 gallons or less than 90 day accumulation(s).
9. Description of proposed Class II and Class III waste accumulation.
10. Diagram or map of hazardous waste accumulation areas, and empty drum storage areas.
11. Inspection schedule for each waste accumulation site.
12. Spill prevention and control plan, including Personnel Protective Equipment (PPE), equipment, response procedures, and clean-up and mitigation.
13. Good housekeeping practices.
14. Schedule and activities for closure of the work site(s).
15. Submit name and qualification of the person who will be assigned as the Contractor Waste Coordinator (CWC). Submit any changes to the assignment of a replacement CWC.
16. Immediate action procedures in the event a bulging drum is discovered.

B. Changes in waste generation process, number and/or location of storage/accumulation sites, type and/or volume of materials/waste, schedule, or operations will necessitate modification of the CWMP. The Contractor shall submit these modifications to BWXT Pantex for review, approval, and update of the CWMP that is kept on file.

C. The Contractor shall submit written notification at least ten days in advance to start a Less Than 90 Day Waste Accumulation Site(s).

D. The Contractor shall submit written notification of all waste streams that will be generated during the construction project. This notification will allow the Waste Operations Department to characterize all waste being generated to direct proper storage and disposal.

E. The Contractor shall submit a closure plan for each Less Than 90 Day Accumulation Site that complies with the State of Texas criteria.

F. The Contractor shall submit a written report of spills to the Project Engineer.

G. The Contractor will submit corrective action plans for discrepancies identified by BWXT Pantex inspections as required.

1.5 PANTEX PLANT STANDARD PX-FORM

A. Waste container issuance, movement, and transfer requests shall be initiated by submittal of applicable PX-form to the Project Engineer. PX-forms for waste container tracking, inventory, and site inspections shall be maintained by the Contractor. The following PX-forms shall be initiated/completed by the Contractor.

1. Material Evaluation Request Form (MERF), PX-2643, page 1: submit through the Construction Manager to BWXT Pantex, Waste Operations Department to characterize waste streams and to initiate container request.
2. Material Evaluation Form (MEF), PX-2643 page 2: returned to the Contractor for use to verify waste being disposed at the Pantex Plant construction landfill.
3. Inventory of Container At Waste Accumulation Site, PX-2844: log of waste material and volume of waste placed in container/drum at all accumulation sites.
4. Less Than 55 Gallon Accumulation Site Inspection Log, PX-3000: monthly inspection checklist.
5. Inspection Log of a Less Than 90 Day Accumulation Site, PX-3001: weekly inspection checklist.
6. Drum Inventory of Empty Containers, PX-1447: log of empty containers placed in drum.
7. Chemical or Waste Disposition Information Request, PX-1071: request for container transfer to storage or waste disposition. The Contractor must sign the PX-1071.

1.6 CONTRACTOR PERSONNEL

A. The Contractor shall designate a Contractor Waste Coordinator (CWC), who will be responsible for the following:

1. Implement provisions of the CWMP.
2. Inspect the following waste accumulation site(s):
   a. Less than 55 gallon waste accumulation site(s) monthly.
   b. Less than 90 day waste accumulation site(s) weekly.
   c. Class II commercial dumpsters weekly for any unauthorized materials being transported to the landfill.
   d. Class I Non-RCRA regulated waste accumulation site(s) monthly.
3. Maintain a copy of all inspections at the construction site.
4. Submit a PX-2643 MERF for each waste stream for characterization and classification of the waste for proper disposal.
5. Request waste containers and waste disposition through Waste Operations Department (WOD) at extension 5449.
6. Notify Pantex Operations Center (extension 5000) and WOD (extension 5449) of spills.
7. Perform proper closure of the site at completion of the contract.

B. All Contractor personnel shall perform activities in accordance with the CWMP. Wastes shall be segregated as appropriate and good housekeeping practices maintained at all times.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Asphalt is considered a Class II waste and is recycled at the Pantex Plant. The Contractor will transport all used asphalt to the Pantex Plant construction landfill where it will be stored for recycling.

B. Metals that are not considered hazardous or Class I can be recycled. The Pantex Plant will provide an area for recyclable metals. The Contractor shall submit a PX-2643.

C. Scrap Wood will be collected at the designated area within the Pantex Construction Landfill. No scrap wood with preservatives will be collected for recycling and no other plant trash will be placed into the collection pile. The Contractor shall submit a PX-2643.

D. Asphalt and concrete will be removed from metal (e.g. bollards, fence posts, sign posts, etc.) prior to placing the metal or concrete in a recycling area.

PART 3 - EXECUTION

3.1 WASTE CHARACTERIZATION

A. All waste that is generated during the construction phase will be characterized. A PX-2643 MERF will be submitted for all waste streams so that the proper characterization may occur. The Contractor will receive a MEF from the Waste Operations Department that shows proof that the waste stream characterization is correct. No waste will be accepted at the Pantex Plant construction landfill without the MEF.

3.2 HAZARDOUS WASTE MANAGEMENT

A. Hazardous waste may be accumulated per 30 TAC §335.69, in approved containers in waste accumulation waste sites as approved and provided by BWXT Pantex.

B. Each Less Than 55 Gallon Waste Accumulation and Less Than 90 Day Waste Accumulation site shall be designed to meet the following minimum criteria:

1. Controlled access through the use of fencing with locking gates.
2. Provide secondary containment as necessary to prevent contact of spilled or accumulated waste/liquids with the ground.
3. Minimum of 24 inches of aisle space around drums, adequate to permit inspection and access by personnel and emergency equipment.
4. Impermeable barrier to separate incompatible wastes.
5. Posted signs at entrance to accumulation site, "Warning - Unauthorized Personnel Keep Out" and "No Smoking within 25 Feet", legible from 25 feet.
6. Containers shall be stored in a closed condition with lid and bungs secure when not

adding waste.

7. Drums shall not be stacked.

8. Appropriate inspection and record keeping (PX-2844, PX-1447, PX-3000, PX-3001, PX-1071).

C. Waste containers shall be provided by BWXT Pantex.

D. Each container/drum shall be properly labeled. Containers shall be issued by Waste Operations Department (WOD) with "Hazardous Waste" labels, waste stream code(s) as applicable, and container/drum identification bar code.

3.3 LESS THAN 55 GALLON WASTE ACCUMULATION SITE(S)

A. The Contractor shall contact WOD to have the full container removed from the Less Than 55 Gallon Waste Accumulation Site. The full container must be removed within 72 hours. The Contractor will conform to all the applicable regulations within 3 calendar days (72 hours).

(NOTE: This is the only exception when a Less Than 55 Gallon Waste Accumulation Site can have more than 1 container at the accumulation site for each waste stream.)

B. The Contractor shall contact WOD (EXT 5449) when a container in a Less Than 55 Gallon Waste Accumulation site(s) reaches 350 days. WOD will determine if the drum needs to be released to WOD or if there will be an extension to the 1 year time limit for drums in a waste accumulation site.

3.4 NOTIFICATION FOR STARTING LESS THAN 90 DAY SITE

A. If the Contractor requires a less than 90-day site, the Contractor must notify the Waste Operations Department, Regulatory Compliance Section 120 days prior to generation of any waste.

3.5 CLASS I WASTE MANAGEMENT

A. Class I Waste will be accumulated in approved containers provided by BWXT Pantex. Extra precautions will be taken to protect employees and the environment by:
   1. Impermeable barrier to separate incompatible wastes.
   2. Containers shall be stored in a closed condition with lid and bungs secure when not adding waste.
   3. Drums shall not be stacked.
   4. Appropriate inspection and record keeping (PX-2844, PX-1447, PX-1238B, PX-1071).

B. Each container/drum shall be properly labeled. Containers shall be issued by Waste Operations Department (WOD) with "Class I Non RCRA Regulated" labels and container/drum identification bar code.

3.6 CLASS II WASTE MANAGEMENT

A. The Contractor shall accumulate Class II waste in collection containers destined for Amarillo Landfill or other municipal landfill approved by BWXT Pantex. Containers/dumpsters for Class II waste shall be requested by the Contractor through the Construction Manager.

B. Asphalt and concrete must be separated from other materials (wood, metal, etc.) prior to leaving the construction site.

C. The Contractor can hire a reputable organization to transport all Class II and Class III Waste off-site (this will be at no cost to the Pantex Plant). The Pantex Plant personnel will inspect all waste leaving and will certify that the load is acceptable to leave the Pantex Plant.

D. Asphalt and concrete that is clear of wood, metal and other debris, can be recycled for reuse by the Pantex Plant. A collection area has been established for this material. The Contractor should first contact Waste Operations at extension 5449 for directions and clarification of any questions about the type and condition of this material.

E. Asphaltic roofing material and debris will be characterized as a Class II Waste. The material, when possible, will be disposed at an off-site managed landfill capable of receiving this type of material. Waste Operations will have the final approval for the declared disposal facility.

F. Scrap wood will be segregated and collected at the designated area within the Pantex Landfill. This wood can consist of all applicable scrap wood, pallets, crates and all other types that can be shredded and reused. No wood that contains wood preservative will be collected and placed into this pile. The wood preservative does not decompose and will damage composting processes.

3.7 TRANSPORTATION WASTE

A. Waste Disposition Information Request, PX-1071, shall be initiated when,
   1. Waste container is full (90% volume capacity).
   2. No more hazardous waste is to be accumulated in the container.
   3. After 83 days of accumulation at a Less Than 90 Day Accumulation site.

B. The Contractor shall ensure the containers are prepared for transport, including, but not limited to, closure of containers, tightening bungs and bolts, palletizing of drums, removal of contamination from surface of drums, and inclusion of proper documentation with the drum. WOD prepares the PX-1071 and sends it to the Contractor for signature. The Contractor signs and sends the original back to WOD within five working days. The Contractor also returns inventory sheets (PX-1244 and PX-1447) within 5 working days.

3.8 BULK FUEL STORAGE

A. A plastic protective sheeting shall be placed on the bottom of the bermed area to protect

the ground from leakage and spills. If there is any spillage of gasoline or diesel fuel the Contractor shall immediately stop the fueling process and contact the Operations Center at extension 5000 so the Spill Response process can be implemented (see Section 3.13, Spill Response Notification of this specification).

B. Refer to Section 01562, Fire Safety.

3.9 SOLID WASTE MANAGEMENT UNITS (SWMU)

A. Solid Waste Management Units Excavated Soils:

1. Excavated SWMU soils shall be placed back into the excavation whenever possible. The State of Texas will approve the disposition of the excess excavated soils, and will specify containerization requirements, as required.
2. Based on process knowledge, excess SWMU soil shall be classified as **Hazardous, Class I,** or **Class II** Waste. SWMU soil shall be characterized as **Analysis Pending** (AP) if the WOD does not have enough information to classify the soils.
3. Excess soils that have been characterized as Class II, will be placed in the Environmental Landfill at the Pantex Plant. The Contractor shall contact Waste Management for specific directions for this process.
4. The Contractor shall estimate in the CWMP the amount of excess soil and decontamination water for each SWMU interference.

B. Decontamination Materials:

1. If the materials are classified in a SWMU as Hazardous, Class I, or Analysis Pending waste, the Contractor shall decontaminate all equipment to applicable release limits before leaving a SWMU. If the materials in a SWMU is classified as Class II waste, decontamination will not be necessary.
2. Decontamination water shall be containerized and labeled according to the classification of the SWMU waste.

3.10 OTHER

A. No material having value, as defined by BWXT Pantex, shall be taken off the Plant site. The Contractor shall contact the Construction Manager to have the property turned into Zone 10.

B. The Contractor shall minimize waste generated by using returnable and/or recyclable containers and packages for all materials. The Contractor is encouraged to use soil from excavation for grading and foundation where possible.

C. The Contractor shall not accumulate waste piles. The work site shall be kept clean and orderly with debris, scrap, and waste removed as it is created/accumulated.

D. All waste generated by the Contractor in performance of this contract shall be managed on Plant. Burning of waste shall not be permitted. Waste material shall not be removed by the Contractor from the Plant without prior approval from BWXT Pantex.

E. The Contractor will be directed where to place uncontaminated soils that will not be used within the construction site. Proposed areas for dumping of these soils will be the existing bury pit on 13th Street next to Building 12-103 and the large existing Borrow Pit just outside the Pantex Construction Landfill. The Contractor shall contact the Project Engineer prior to disposal to ensure the soils are going into the correct cell.

3.11 SPILL RESPONSE AND NOTIFICATION

A. The Contractor shall report spills greater than one gallon of a petroleum product. Any spill of material that is considered **Hazardous or Class I Waste** will be reported to the Operations Center at extension 5000. The Contractor will follow all directions given by the Operations Center and the Spill Response teams.

B. The Contractor is responsible for starting the spill response clean up for all materials that are spilled. Damming, diking and stopping the flow of materials is essential for reducing the environmental impact of a spill. If the spill is less than one gallon of a petroleum product the Contractor will clean up the spill and report the incident to the Operations Center at extension 5000.

C. The Contractor will provide an approved spill response kit for each job site. The spill response kit will include a clean, plastic five gallon bucket labeled "Spill Kit"; a piece of plastic measuring 10 feet x 10 feet square for the purpose of placing contaminated soils during clean-up; and a shovel. This kit will be available during all heavy equipment operations so that the Contractor can start clean up of the spill (reducing the impact) while waiting for direction from the Operations Center.

3.12 CLOSURE

A. Less Than 90 Day Waste Accumulation Site(s):

1. The Contractor shall contact Waste Operations Department at least 30 days prior to closing a Less Than 90 Day Waste Accumulation site(s). Risk Reduction Standards, as stated in 30 TAC 335.8, will be accomplished before the Contractor can perform closure of the construction site.
2. Waste Operations Department will perform all closure activities at the construction site. Sampling will be directed and performed by BWXT Pantex. All reports, analytical data, and contact with the State of Texas will be performed by Applied Technology Division.
3. The Contractor shall be required to follow all appropriate directions from Waste Operations Department to ensure timely closure.
4. Waste Operations Department will direct the Contractor's representative to ensure that proper closure is accomplished. The Contractor shall be responsible for any restoration or clean up required to achieve State of Texas approval to remove and close the Less Than 90 Day Waste Accumulation site(s).

B. Lay down Areas and Other Waste Accumulation site(s).

1. The Contractor shall notify BWXT Pantex (WOD) 5 working days prior to closure of the work site. Notification shall include the number of hazardous materials storage areas, waste accumulation sites, empty drum storage areas, and

containers at each area. BWXT Pantex shall inspect and approve closure.

2. The Contractor shall close the work site according to the requirements of the CWMP, including, but not limited to,
   a. Cleaning and decontaminating the area as necessary.
   b. Provide any documentation of spill(s) or clean up during the construction project.
   c. Ensure that all waste containers have been properly removed from the construction site.

END OF SECTION

SECTION 01564 - PERMITS

PART 1 - GENERAL

1.1 SAFETY WORK PERMIT

A. A Safety Work Permit, PX-30A, is required for any construction activity. The Contractor is responsible for ensuring all permits issued have not expired.

B. A Safety Work Permit must be issued by the Safety Department prior to the start of any construction activity. The permit is normally issued for the term of the contract period. A separate permit will be issued for entry into any existing confined space.

C. A Safety Work Permit must be issued by the Safety Department before performing Hot Work.

D. A Safety Work Permit must be issued by the Safety Department prior to entering confined spaces.

1.2 PENETRATION/EXCAVATION PERMIT

A. An Penetration/Excavation Permit, PX-2872B, shall be obtained prior to any excavation work. The Contractor shall refer to Section 01565, Underground Utilities.

B. A Penetration/Excavation Permit may be required for work requiring drilling, cutting, boring, or other penetrations of walls, floors, ceilings, and roof. Refer to Section 01560, Wall, Floor, Ceiling, and Roof, for details.

1.3 REQUEST FOR SHUTDOWN OF UTILITIES SERVICE

A. A Request for Shutdown of Utilities Service, PX-665A, must be initiated prior to the planned shutdowns of electric, compressed air, domestic water, natural gas, heating, ventilation, air-conditioning, steam, fire protection, and vacuum systems. The Contractor shall request the shutdown through the Construction Manager.

1.4 NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM PERMITS

A. The Contractor shall comply with the National Pollutant Discharge Elimination System (NPDES) Environmental Protection Agency (EPA) General Permit for Storm Water Discharge Associated with Construction Activity. Each Contractor whose construction activity is covered by the General Permit (construction activities with a cumulative affect on five acres or more, or construction activities in sensitive areas such as ditches or 100 year flood plains) must develop a Pollution Prevention Plan (PPP), tailored to the site specific conditions, and designed with the goal to control the amount of pollutants (including sediment) in storm water discharges from the construction site. A EPA document (EPA 833-R-92-001) titled "Storm Water Management for Construction

Activities, Developing Pollution Prevention Plans and Best Management Practices, Summary Guidance" may be used when developing the PPP.

1. The PPP shall be completed and certified by the Contractor prior to the submittal of the required Notice of Intent (NOI) to EPA that is prepared by Pantex Plant Waste and Environmental Management Protection Department. The NOI is required to be certified by all permittees and submitted to the EPA at least two days prior to the start of the activity on the project.
2. NPDES requires a monthly inspection or an inspection within 24 hours of any storm event of 0.5 inches or more of precipitation. All disturbed areas of the site, areas for material storage, locations where vehicles enter or exit the site, and all of the erosion and sediment controls that were identified as part of the Storm Water Pollution Prevention Plan (SWPPP) must be inspected. Controls must be in good operating condition until the area protected has been completely stabilized and the construction activity completed.
3. Records shall be maintained by the Contractor and made available to BWXT Pantex of all inspections, maintenance and repairs to control measures and dates when major grading activities occur, construction activities cease, and when an area is stabilized. All records, including a copy of the SWPPP and data used to complete the NOI must be kept by the permittees for at least three years after final stabilization is achieved.
4. Final stabilization is defined by the NPDES as occurring when all soil disturbing activities at the site have been completed, and a uniform perennial vegetative cover with a density of 70% of the native background vegetative cover for all unpaved areas or areas not covered with permanent structures has been established or the equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) has been employed. For construction projects on land used for agricultural purposes, final stabilization is accomplished by returning the disturbed land to its preconstruction condition.
5. A Notice of Termination (NOT) shall be submitted to EPA by the Pantex Plant Waste and Environmental Management Department 30 days after cessation of construction activities and when final stabilization has been achieved or when an operator of a construction activity changes. The NOT is required to be certified by all permittees.

END OF SECTION 01564

SECTION 01565 - UNDERGROUND UTILITIES

PART 1 - PENETRATION/EXCAVATION PERMITS

1.1 PENETRATION/EXCAVATION PERMIT REQUIREMENTS

A. An Penetration/Excavation Permit, PX-2872B, must be obtained prior to any digging, boring, scraping, penetration, or excavations to a depth of 6 inches or more below the ground within the Perimeter Intrusion Detection System (PIDAS) fences and to a depth of 12 inches or more in all other areas within the boundaries of the Pantex Plant site. A Subsurface Penetration Permit may be required for work involving drilling, boring, cutting, or other penetrations of walls, floors, ceilings, and roofs. Refer to Section 01560 for existing Wall, Floor, Ceiling, and Roof Penetrations.

1.2 PENETRATION/EXCAVATION PERMIT PROCESS

A. The process outlined below will be used to request and issue Penetration/Excavation Permits.

1. The Contractor will clear the intended excavation area of vegetation and stake the intended route or location of all excavations before applying for an Penetration/Excavation Permit.
2. The Contractor performing an excavation submits and Penetration/Excavation Permit application, PX-2872A, to the Construction Manager.
3. The Penetration/Excavation Permit application should be for work which can be accomplished within 30 days.
4. The Contractor must allow ten days for the permit to be issued. Additional time must be allowed if the excavation is to be within the Solid Waste Management Unit or a Radiological Area.
5. BWXT Pantex will locate and mark all known utilities in the area of the planned excavation.
6. BWXT Pantex will issue a Penetration/Excavation Permit to allow the Contractor to perform exploratory excavations to expose and confirm the location and depth of known utility lines. No other excavation work is allowed.
7. The Contractor shall mark and protect the identified utility lines.
8. The Contractor shall update as-built drawings, field notes, and other documentation as necessary to reflect the location and depths of the lines identified.
9. BWXT Pantex and the Contractor will conduct a joint walkdown of the area to be excavated to verify the exploratory excavations have been satisfactorily performed and the Contractor's documentation is correct.
   a. The Contractor shall notify BWXT Pantex at least one day in advance that they are ready to perform the walkdown.
10. Upon completion of a satisfactory walkthrough, BWXT Pantex will issue a Penetration/Excavation Permit to the Contractor.
11. The Contractor shall make the location and depths of identified utility lines known to all equipment operators and spotters before beginning an excavation.

12. Penetration/Excavation Permits are valid for 30 days. Penetration/Excavation Permits may be renewed if the Contractor maintains accurate marking and or documentation of utility lines.

1.3 PENETRATION/EXCAVATION PERMIT

A. Penetration/Excavation Permits may be revoked, without prior notice, if the Contractor fails to comply with the terms found in this section until the reason for the revocation is corrected.

PART 2 - UTILITY MARKINGS

2.1 MAINTENANCE OF UTILITY MARKERS

A. BWXT Pantex will physically mark all utilities known to exist within the permitted area prior to issuing a Penetration/Excavation Permit. However, it is possible that there are utility lines in the area that are not known to BWXT Pantex and that have not been located or marked. Consequently, the Contractor must conduct the excavation with due caution.

B. The Contractor shall note the exact location of all flagged and aboveground utilities in red pencil on his drawings. The locations shall be referenced from known features.

C. The Contractor shall document the exact location and depth of all utility lines exposed during the excavation.

D. The Contractor shall retain the location data pertinent to the excavation(s) until completion of the project.

E. The Contractor shall maintain all physical utility markings until the excavation(s) are complete.

F. The Contractor shall update As-built drawings to show the exact location and depth of new or modified utilities.

2.2 DAMAGED UTILITIES

A. The exact locations and depths of existing utilities must be confirmed by the Contractor prior to proceeding with excavations.

B. Damaged utilities often have serious safety implications. Any incident where utilities are damaged requires BWXT Pantex to incur additional costs which vary depending on the severity of the incident. Such costs include, but are not limited to, costs associated with off-shift work, downtime for affected personnel, investigations, preparation and distribution of reports, development of corrective actions and other costs not normally incurred in the daily conduct of business. If it is determined by BWXT Pantex the damaged utility occurred as a result of the Contractor failing to follow excavation procedures specified in this contract, the Contractor will be charged $1,000 in liquidated

damages, and not as a penalty, to reimburse BWXT Pantex for the costs of this additional, unplanned work. This amount is in addition to the cost of repairs for which the Contractor shall be solely responsible. Damages will be charged for each incident of this type.

C. If the Contractor cuts or damages a line that BWXT Pantex has marked, the Contractor will repair the line at their expense (except as specified below):

1. All telephone cables damaged by the Contractor will be repaired by the telephone company that serves the plant and the costs associated with the repair will be charged to the Contractor.
2. All security cables damaged by the Contractor will be repaired by BWXT Pantex and the costs associated with the repair will be charged to the Contractor.

2.3 PROCEDURES FOR DAMAGED OR CUT UTILITIES

A. If a utility is accidentally cut, the Contractor shall evacuate all personnel to a safe distance. No one will be permitted to work on a damaged line or pipe until it is proven safe.

B. If a utility is damaged during excavation, the Contractor shall notify the Operations Center at extension 5000.

C. Electrical lines will be tested with a nonconductive type electrical tester.

D. Prior to covering the utility, the Contractor shall notify the Construction Manager that repairs are complete. The Contractor shall not cover the utility until the Construction Manager has verified the trace wire has been repaired, is continuous, and is traceable.

E. Prior to backfilling the last 12 inches, the Contractor shall notify the Construction Manager and discontinue backfilling until the Construction Manager has approved placement of the utility marking tape.

2.4 SUSPECTED ARCHEOLOGICAL RESOURCES

A. If suspected archeological resources (ie. bones, ceramic vessels fragments, stone artifacts, areas of charcoal or red-stained earth) are uncovered during excavation, the Contractor shall stop work immediately and contact the Environmental Protection Department and the Construction Manager.

2.5 UNMARKED OR INCORRECTLY MARKED UTILITY LINES

A. If an unmarked or incorrectly marked line is discovered during excavation, the Contractor shall stop excavating immediately and contact the Construction Manager.

PART 3 - PRODUCTS

3.1 UTILITY IDENTIFICATION

A. Trace Wire - Trace wire shall be burial USE, multi-strand single conductor #12 XHHW.

B. Waterproof splices shall be made with splice kits approved by the conductor manufacturer or BWXT Pantex.

3.2 UTILITY MARKING TAPE

A. Utility marking tape shall be made of an inert plastic film (ie. polyethylene plastic) that is impervious to alkalis, acids, or chemicals likely to be encountered in soils.

B. Utility marking tape shall be made a minimum of 6 inches wide and have a minimum thickness of 4 mil.

C. Marking tape shall be color coded in accordance with the American Public Works Association Uniform Color Code as follows:

COLOR	UTILITY
Green	Sewer and drain lines.
Red	Electrical power lines, cables, conduits, and lighting cables.
Orange	Communications alarm or signal lines, cables, and conduit.
Blue	Water, irrigation, or slurry lines.
Yellow	Gas, oil, steam, petroleum, or gaseous materials.

D. Marking tape identification printing shall be on one side in permanent black letters 1 inch high and shall be repeated for the full length of the tape. The printing shall consist of words printed in two rows as follows:

CAUTION CAUTION CAUTION
BURIED (insert utility name) LINE BELOW

3.3 UTILITY LINE MARKER

A. Utility line marker posts shall be produced from high strength "hat" channel. The weight of each post before punching shall be 2.00 lbs/ft. The posts shall be punched with .438 inch diameter holes on 1 inch centers its full length with the first and last holes a minimum of 1 inch from each end. After fabrication, the post shall be galvanized to ASTM A128 or have a baked-on enamel finish.

B. Utility line marker sign blanks shall measure 10 inches by 14 inches and be manufactured from 16 gage (minimum) aluminum or 20 gage (minimum) galvanized steel. The corners shall be rounded.

C. Signs shall either be painted directly onto the metal blank or a preprinted plastic sign may be laminated to the metal blank. The sign blank shall be prepared per manufacturer's recommendations prior to painting or lamination. Signs shall be lettered and colored as shown on the attached detail.

D. Utility identification tags shall be made of brass and stamped with the following information:

1. Utility Type (ie. WTR, SWR, CC, T, etc.).
2. Depth (inches).
3. Burial Description (ie. direct burial, conduit, ductbank, steel pipe, etc.).
4. Date Installed.

PART 4 - EXECUTION

4.1 EXCAVATION PROCEDURES

A. The Contractor shall obtain a Penetration/Excavation Permit prior to beginning excavations.

B. The Contractor shall inform all personnel involved in the excavation of the location of all known aboveground and underground utility lines prior to excavation.

C. The Contractor shall ensure all personnel involved in the excavation are familiar with the specifications found in this section prior to excavation.

D. When mechanical digging crosses utility lines, the Contractor shall accurately locate the lines using appropriate marking techniques (ie. curb markings, batter boards, stakes, etc.).

E. The Contractor shall use the following procedure for excavating electrical lines in a concrete encased primary ductbank:

1. Excavate by machine to within 3 feet of either side of the line.
2. De-energize the line before excavating closer than 3 feet.
3. Expose the utility by hand digging using nonconductive tools. If the marking utility is not located at the depth of the new utility, excavate an additional 1 foot to ensure the existing utility is deep enough that it will not present a problem when mechanical excavation is resumed.
4. Cover the utility with a nonconductive physical barrier.
5. Expose the utility by hand digging using nonconductive tools to a distance of 1foot on either side of the line.
6. Resume mechanical excavation using caution and a spotter.

F. The Contractor shall use the following procedure for excavating primary electrical lines in rigid conduit:

1. Excavate by machine to within 6 feet on each side of the line.
2. De-energize the line.
3. Expose the utility by hand digging using nonconductive tools. If the marked utility is not located at the depth of the new utility, excavate an additional 1 foot to ensure the existing utility is deep enough that it will not present a problem when mechanical excavation is resumed.
4. Cover the utility with a nonconductive physical barrier.
5. Expose the utility by hand digging using nonconductive tools to a distance of 1 foot on either side of the line.
6. Resume mechanical excavation using caution and a spotter.

G. The Contractor shall use the following procedure for excavating direct burial electrical primary cable:

1. Excavate by machine to within 6 feet on each side of the line.
2. De-energize the line.
3. Expose the utility by hand digging using nonconductive tools. If the marked utility is not located at the depth of the new utility, excavate an additional 1 foot to ensure the existing utility is deep enough that it will not present a problem when mechanical excavation is resumed.
4. Cover the utility with a nonconductive physical barrier.
5. Expose the utility by hand digging using nonconductive tools to a distance of 1 foot on either side of the line.
6. Resume mechanical excavation using caution and a spotter.

H. The Contractor shall use the following procedure for excavating secondary electrical lines:

1. Excavate by machine to within 3 feet on each side of the line.
2. De-energize the line.
3. Expose the utility by hand digging using nonconductive tools. If the marked utility is not located at the depth of the new utility, excavate an additional 1 foot to ensure the existing utility is deep enough that it will not present a problem when mechanical excavation is resumed.
4. Cover the utility with a nonconductive physical barrier.
5. Expose the utility by hand digging using nonconductive tools to a distance of 1foot on either side of the line.
6. Resume mechanical excavation using caution and a spotter.

I. The Contractor shall use the following procedure for excavating metal natural gas lines 10 inches or more in diameter:

1. Excavate by machine to within 10 feet on each side of the line.
2. Expose the utility by hand digging using nonconductive tools. If the marked utility is not located at the depth of the new utility, excavate an additional 1 foot to ensure the existing utility is deep enough that it will not present a problem when

mechanical excavation is resumed.
3. Cover the utility with a nonconductive physical barrier.
4. Expose the utility by hand digging using nonconductive tools to a distance of 2 feet on either side of the line.
5. Resume mechanical excavation using caution and a spotter.

J. The Contractor shall use the following procedure for excavating natural gas lines less than 10 inches in diameter:

1. Excavate by machine to within 10 feet on each side of the line.
2. Shut down the line.
3. Expose the utility by hand digging using nonconductive tools. If the marked utility is not located at the depth of the new utility, excavate an additional 1 foot to ensure the existing utility is deep enough that it will not present a problem when mechanical excavation is resumed.
4. Cover the utility with a nonconductive physical barrier.
5. Expose the utility by hand digging using nonconductive tools to a distance of 2 feet on either side of the line.
6. Repressurize the line and resume mechanical excavation using caution and a spotter.

K. The Contractor shall use the following procedure for excavating all other utilities:

1. Excavate by machine to within 3 feet on each side of the line.
2. De-energize the line.
3. Expose the utility by hand digging using nonconductive tools. If the marked utility is not located at the depth of the new utility, excavate an additional 1 foot to ensure the existing utility is deep enough that it will not present a problem when mechanical excavation is resumed.
4. Cover the utility with a nonconductive physical barrier.
5. Expose the utility by hand digging using nonconductive tools to a distance of 1 foot on either side of the line.
6. Resume mechanical excavation using caution and a spotter.

4.2 UTILITY IDENTIFICATION

A. The Contractor must obtain approval from the Project Engineer before placing more than one utility in a single trench.

B. The Contractor must install trace wire, marking tape, signage, and identification tags for each utility if more than one utility is permitted in a trench.

C. The Contractor shall install trace wires in accordance with the following specification:

1. The Contractor shall backfill, and compact the backfill to a depth of at least 12 inches prior to installing the trace wire.
2. The wire shall be placed 1 foot above the centerline of the utility to be traced.
3. Splices shall be marked with a line post.
4. The trace wire shall be electronically continuous from termination to termination.
5. Trace wire terminations are required at the beginning and end of the utility. Additional terminations shall be installed as required to achieve a maximum

distance of 300 feet between terminations.

6. Trace wires shall be terminated in a weatherproof electrical junction box. The box shall be located where the utility enters a building or attached to a line marker post as appropriate. An insulated banana plug shall be installed in a gasketed cover plate stamped with the abbreviated name of the utility. The trace wire shall be connected to the banana plug.
7. The Contractor shall install utility marking tape 12 inches below the surface in non-paved areas and just below the sub-base in paved areas. The Contractor shall notify the Construction Manager upon completion of the utility tape installation. The marking tape shall not be covered before the installation has been approved by the Construction Manager.

D. The Contractor shall install utility identification tape according to the following specifications:

1. The tape shall be installed with the printed side up.
2. Precautions shall be taken to ensure the tape is not pulled, distorted, or otherwise misplaced when backfilling the trench.
3. The Contractor shall repair any marking tape associated with existing utilities that is damaged during excavation.
4. The Contractor shall notify the Construction Inspector upon completion of the marking tape installation or repair. The tape shall not be covered until the installation is inspected and accepted by the Construction Manager.
5. The Contractor shall install utility marker signs in accordance with specifications in this section.
6. Utility marker signs shall be attached to the marker post with at least 2 bolts with lockwashers and nuts. The bolts, lockwashers, and nuts must be galvanized per ASTM A128.
7. Utility line marker signs and posts shall be located as follows:
   a. At any bend of the utility line,
   b. At each splice point,
   c. At each change in direction,
   d. At each end of the utility (where applicable),
   e. At intervals of 300 feet or less on straight runs (except when in roadways, parking lots, etc.).
8. Utility marker signs and posts shall be placed 2 feet to the side of the utility with the sign reading from the utility side. The marker must be on the same side of the line for the full length of the utility run.
9. Utility marker posts shall be embedded in concrete as shown on attached detail.

END OF SECTION 01565

SECTION 01568 - RADIATION SAFETY - CONTRACTOR WORK

PART 1 - GENERAL

1.1 CONTRACTOR WORK IN RADIOLOGICALLY CONTROLLED AREAS

A. Work at Pantex will require entry into one or more of the following areas:

1. Uncontrolled Areas do not require any radiological controls, except when a Contractor transports a radiation source or RGD onto Pantex Plant. For this case, refer to Section 01567.
2. Controlled Areas and Radioactive Material Areas are areas where access is managed to protect individuals from exposure to radiation or radioactive materials. Controlled Areas surround Radiological Areas.
3. Radiological Areas are areas that contain specific radiological hazards. These areas include the following: Radiation Area, High Radiation Area, Very High Radiation Area, Radiological Buffer Area, Contamination Area, High Contamination Area, Soil Contamination Area, Fixed Contamination Area, and Airborne Radioactivity Area, as defined in MNL-RS-0001, "Pantex Radiological Control Manual," 10 CFR 835, and the Pantex Plant Radiation Protection Program.

B. All work at the Pantex Plant that involves the use of radioactive material or entry into areas controlled for radiological purposes must be performed in accordance with the Pantex Plant Radiation Protection Program.

C. The Radiation Safety Department will review all work plans and determine if a Radiation Work Permit (RWP) or other radiological controls are necessary to ensure the scheduled work is performed in accordance with plant procedures. RWPs or other administrative controls may require a Contractor to participate in the Pantex Plant dosimetry program. The Contractor must comply with all RWP requirements, if issued.

D. The Contractor is responsible for conducting operations in a safe manner. The Radiation Safety Department will oversee all operations conducted in Radiological Areas.

E. The Radiation Safety Department reserves the right to conduct random inspections, to suspend or terminate operations, and to have Contractor personnel removed from the plant, if there is an unsafe radiological condition or a violation of the applicable existing RWP, or Radiation Safety Department operational instructions.

F. The Contractor is required to notify Radiation Safety Department at extension 4452 or 5665, or the Radiation Safety Office at 5681 AND the Construction Manager of any unusual or abnormal radiological occurrence.

1.2 RADIATION TRAINING

A. Access to areas not controlled for radiological purposes requires GERT if on plant more than 10 working days in a year.

B. Table of Minimum Training Requirement for Unescorted Access to and for Performing Escort Duty for Work in Radiological Areas.

Radiological Area	VISITOR WITH QUALIFIED ESCORT	GERT ONLY	RWT I (HRA/ VHRA) ONLY	RWT II ONLY
Controlled Area	yes	yes	yes	yes
Radioactive Material Area	yes	yes	yes	yes
Radiation Area	yes	no	yes	yes
High Radiation Area	no	no	yes	yes
Very High Radiation Area	no	no	yes	yes
Radiological Buffer Area	no	no	yes	yes
Contamination Area	no	no	no	yes
High Contamination Area	no	no	no	yes
Airborne Radioactivity Area	no	no	no	yes
Soil Contamination Area (soil is not disturbed)	yes	no	yes	yes
Soil Contamination Area (if soil is disturbed)	no	no	no	yes
Fixed Contamination Area (fixed contamination not disturbed)	yes	no	yes	yes
Fixed Contamination Area (if fixed contamination is disturbed)	no	no	no	yes

C. There are two classifications of individuals at the Pantex Plant which is a DOE nuclear (non-reactor) facility, either general employee or visitor. A general employee is defined as an individual who is either a DOE or DOE contractor employee; an employee of a subcontractor to a DOE contractor; or a visitor who performs work for or in conjunction with DOE or utilizes DOE facilities.

1. A general employee is required to successfully complete General Employee Radiological Training (GERT) prior to unescorted access to a Controlled Area. This training must be completed prior to the individual receiving occupational exposure to ionizing radiation at Pantex.
   a. A radiological worker is a general employee whose job assignment involves operation of radiation producing devices or working with radioactive materials, or who is likely to be routinely occupationally exposed above 100 mrem per year total effective dose equivalent.
   b. A qualified radiological worker is a radiological worker who has

successfully completed Radiological Worker I or II training in the designated time frames.

c. A qualified radiological worker shall escort and directly supervise all work activities of a visitor or general employee who has not successfully completed the minimum training required for unescorted access to a radiological area (see Table). The qualified escort is required to ensure dosimetry requirements are met and if applicable, to ensure RWP requirements are followed; the escort shall not perform work.

d. A qualified radiological worker may escort and supervise a maximum of 4 unqualified visitors or general employees within any radiological area at a time.

2. A visitor is an individual who is not defined as a general employee and is one of the following:
   a. Visiting dignitary (federal, state or local official).
   b. Member of the public (ie. tour group, media personnel).
   c. Minor and/or student.
   d. Contractor management representative (perform contract job estimates, but no hands-on radiological work), at the plant less than 10 working days per year.
3. A visitor shall:
   a. Acknowledge receipt of a handbook "Radiological Orientation for Visitors Handbook," at Building 16-12.
   b. Be continuously escorted by a qualified radiological worker in the radiologically controlled area(s) to be accessed.
   c. Properly wear a Pantex-issued dosimeter.
   d. Not perform hands-on work in any radiological area.
4. The Pantex Contract Point-of-Contact individual is responsible for ensuring visitor requirements are met.
5. Pantex Points-of-Contact and Division/Department Training Coordinators are to ensure that general employees and visitors receive and successfully complete the radiation safety training requirements.
6. An allowance may be made for previous DOE training on generic radiation safety topics provided the training was received at another DOE site or facility within the past 2 years. If such an allowance is made, Pantex specific training must be completed before access to controlled areas or posted radiological areas is granted.

D. Training Courses

1. General Employee Radiation Training (GERT).
   a. The GERT training is a 2 hour introduction to radiation safety. This GERT qualification is valid for 2 years. Requalification training must be successfully completed within 2 years after initial training. If more than 2 years have elapsed since initial GERT without successful completion of requalification training, the initial GERT course must be successfully retaken.
2. Radiological Worker Training I (RWT I).
   a. The Radiological Worker Training I is an 8-hour course about radiation safety. The RWT I qualification is valid for 2 years. Requalification training must be successfully completed within 2 years after initial training. If more than 2 years have elapsed since initial RWT I without successful

completion of requalification training, the initial RWT I course must be successfully retaken.

3. Radiological Worker Training II (RWT II).
   a. The Radiological Worker Training II is a 12-hour course about radiation safety. The RWT II qualification is valid for 2 years. Requalification training must be successfully completed within 2 years after initial training. If more than 2 years have elapsed since initial RWT II without successful completion of requalification training, the initial RWT II course must be successfully retaken.

E. Training shall be scheduled by contacting the Construction Manager.

1.3 RADIATION DOSIMETRY

A. If the work requires Contractor personnel to enter any area controlled by Pantex for radiological purposes, personnel may be required to wear a Pantex personnel radiation dosimeter in accordance with plant procedures.

1. These dosimeters are issued at Building 16-12 between the hours of 8:00 a.m. and 4:00 p.m. on normal workdays.
2. The dosimeters are to be worn as specified by the Radiation Safety Department.
3. When the Contractor employee is off-site, the dosimeter is to be stored at a designated on-site storage location approved by Radiation Safety.
4. Each dosimeter will be picked up from these storage locations for reading and exchanged for a new dosimeter each month. Contractor management is notified each month of employees whose dosimeters are unavailable for reading.

B. If work requires Contractor personnel to enter any area controlled by Pantex for radiological purposes, personnel may be required to participate in the internal dosimetry program in accordance with plant procedures.

1. Baseline, routine and termination bioassay samples may be required to be submitted by Contractor personnel.
2. Termination samples must be submitted prior to an employee's departure from the site upon completion of work. The RSD must be notified 48 hours in advance of the employee's final departure, to permit the collection of the termination sample prior to departure.

[For Information Only - The Construction Manager should coordinate access to RMAs and RMMAs to allow Contractor access without swiping materials and tools.]

END OF SECTION 01568

SECTION 01569 - CRITICAL SAFETY SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Critical Safety Systems are those systems which are critical to the safe operation of the facility. The Critical Safety Systems related to this project are the Fire Alarm and Fire Suppression Systems.

B. The Critical Safety Systems in the vicinity of this project are as follow:

Category A (safety class) Critical Safety Systems include the following: Gravel-Gertie structure; Blast Door Interlock (BDI) System; HVAC blast valves; and the suppression system.

Category B (non-safety class) Critical Safety Systems include the following: Alpha continuous air monitor; Tritium continuous air monitor; RAMS ventilation interlock; RAMS local warning lights and alarm; Communications (telephone and PA System); Contaminated vacuum system; Emergency lighting; Uninterruptible power supply (UPS); and Fire detection and alarm system.

PART 2 - PRODUCTS

(Not Used.)

PART 3 - EXECUTION

3.1 NOTIFICATION

A. If a Critical Safety System other than those identified in Section 01010 is damaged or altered in any way, the Contractor shall immediately notify the Construction Manager and Project Engineer or Project Manager.

3.2 REPAIRS

A. The Contractor shall not attempt to repair the Critical Safety System without notifying the Construction Manager and without authorization from the Project Engineer. In the event the Contractor is not certified to make the necessary repairs, the Contractor shall contract to others for the repairs at their own expense.

B. An As-Built drawing of any repairs must be prepared by the Contractor if requested by the Construction Manager. If the Construction Manager indicates testing of the system is required, documentation concerning the tests which were done and the results of those tests shall be forwarded to the Construction Manager.

END OF SECTION 01569

SECTION 01590 - FIELD OFFICES AND SHEDS

PART 1 - GENERAL

1.1 STORAGE AND WORK AREAS

A. Warehouse, shop, and office facilities and stockpile areas shall be provided by the Contractor at his own expense. BWXT Pantex will designate a location on the site for this purpose and the Contractor may erect structures, install utilities, and establish storage areas as may be necessary to execute the work under the contract. All the above structures and facilities shall remain the property of the Contractor and, unless otherwise authorized by BWXT Pantex, shall be removed from the property of the Government at the Contractor's expense upon completion of the work or when directed by BWXT Pantex. Government premises shall be made available for use by the Contractor without cost except as otherwise stated in the Technical Provisions, whenever such use will not interfere with other uses of the Government or its Contractors.

B. Only materials, appliances, and plans to be used for the performance of the contract work may be stored in stockpile areas or in warehouses and shop facilities (whether erected by the Contractor or not) located on Government controlled land. If the Contractor abandons the performance of the contract work or if the Contractor's right to proceed is terminated pursuant to the Contract clause entitled "Default-Fixed-Price Construction". The Contractor shall hold BWXT Pantex and the Government and its officers and agents free and harmless from any liability of any nature or kind, arising from BWXT Pantex's and the Government's entry into such stockpile areas, warehouses, or shop facilities and from BWXT Pantex's taking possession of and utilizing such materials, appliances, and plant in completing the contract work.

C. All operations of the Contractor, including storage of construction materials and equipment, upon Government premises shall be confined to areas authorized or approved by BWXT Pantex. No unauthorized or unwarranted entry upon or passage through, or storage or disposal of materials shall be made upon Government premises. The Contractor shall hold BWXT Pantex and the Government, its officers, and agents free and harmless from liability of any nature or kind arising from any use, trespass, or damage occasioned by his operations on premises of third persons.

D. The Contractor shall, under regulations prescribed by BWXT Pantex, use only established roadways or construct and use such temporary roadways as may be authorized. Where materials are transported in the execution of the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicles or prescribed by any applicable Federal, state, or local law or regulation. When it is necessary to cross curbings or sidewalks or to operate heavily loaded vehicles on surfaced streets, sidewalks or developed areas, protection against damage shall be provided by the Contractor, and any damaged roads, curbings, sidewalks or developed areas shall be repaired by or at the expense of the Contractor.

E. The Contractor shall provide and maintain during the entire period covered by this contract a weather tight bulletin board approximately 3 feet high by 5 feet long. It shall be mounted in a conspicuous place, as approved by BWXT Pantex, accessible to all

employees of the Contractor and subcontractors. The bulletin board will remain the property of the Contractor. All Government posters or notices, the contract Davis-Bacon wage rate decision, Contractor safety programs, and any publications in the interest of workmen shall be displayed.

F. The Contractor shall mount a durable sign on the fence near the main gate of the lay down yard. Minimum letters shall be 3 ½ inches for the company name. The sign shall also include the names of all subcontractors at a smaller letter size.

END OF SECTION 01590

SECTION 01600 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.1 DELIVERY TO PANTEX PLANT

A. If the Contractor has scheduled the delivery of materials or supplies by a third party, it is the responsibility of the Contractor to ensure the third party has the following information on the delivery invoice:

1. Contractor's name.
2. Location of construction or storage area.

B. The Contractor shall notify Guard Headquarters, extension 3934, of the anticipated delivery 48 hours prior to the arrival.

C. No personnel or equipment from the Pantex Plant may be used by the Contractor for loading or unloading of materials.

D. Refer to Section 01540 - 3.6.E for security requirements relative to deliveries.

E. Deliveries must be made by a US citizen possessing a valid driver's license.

F. BWXT Pantex employees shall not accept nor sign for Contractor deliveries.

1.2 STORAGE AND PROTECTION

A. The Contractor shall store materials and equipment at the construction site or an assigned laydown area. The storage location and method shall be approved by the Construction Manager.

B. BWXT Pantex will not be responsible for improperly stored and secured materials. Contractor shall provide protection for all stored materials from the elements of wind-blown debris, animals, etc.

C. The Contractor shall provide approved secure containment for any hazardous materials stored on site.

D. The Contractor shall construct and maintain secondary containment around all hazardous materials stored on Pantex property and promptly report any spills to the Construction Manager and to the Operations Center. The construction site is subject to inspection without prior notice.

1.3 ASBESTOS-CONTAINING MATERIALS

A. No asbestos-containing materials are permitted.

END OF SECTION 01600

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 BENEFICIAL OCCUPANCY/FINAL ACCEPTANCE

A. When the Contractor has reasonably completed construction at the site, he shall notify the Construction Manager. The Construction Manager and Project Manager will inspect the progress to determine if a preliminary inspection is warranted. If BWXT Pantex determines that substantial work has been completed and a preliminary inspection is warranted, the Construction Manager will organize such an inspection. The inspection committee consists of the Project Manager, the Project Engineer, the Construction Manager, DOE Representative, the Contractor (and their subcontractors if required), and other key BWXT Pantex organizations as requested by the Project Manager. The preliminary inspection will determine the remaining work to be completed and shall be known as the Punch List. Based on the completion of the preliminary inspection and the accuracy of the As-Built drawings (refer to Section 01300), the Project Manager will determine whether or not Beneficial Occupancy is accepted. The Punch List will be forwarded to the Contractor for completion.

B. BWXT Pantex will retain 10 % of the contract total to be submitted to the Contractor when the project is complete. The Contractor has 30 days from Beneficial Occupancy to submit the Final As-Builts or an independent firm may be hired to perform walkdowns and produce the drawings. The firm will be paid from the Contractor's retainage.

C. When the Contractor has completed the Punch List, the Construction Manager shall be notified. If it is determined by the Construction Manager that the entire Punch List has been completed, the Construction Manager will schedule a final inspection. This is to ensure all Punch List items have been satisfactorily and properly completed. If all Punch List items have been satisfactorily completed, the Project Manager will issue a statement of Final Acceptance for the facility and the Contractor may proceed with the final payment process.

1.2 FINAL PAYMENT

A. After BWXT Pantex has officially taken Final Acceptance of the facility, the Contractor may submit his application for final payment.

B. Before the Project Manager will accept the Contractor's application, the Contractor must complete all outstanding contract requirements. These include, but are not limited to, the following (in accordance with the Contract):

1. Approved submittals, shop drawings, and diagrams.
2. As-Built submittals, shop drawings, and diagrams.
3. All operation and maintenance manuals as required.
4. All lockout and tagout information.
5. All warranties.
6. Spare parts and maintenance materials.
7. Completed all testing and training programs.

8. Waste Stream closeout.
9. Badge return.
10. Dosimeter return.
11. Affidavits and releases.

C. When the Project Manager has verified that all contract requirements have been fulfilled, both the Project Manager and the Contract Administrator will approve the Contractor's final pay request and final payment will be made in accordance with the terms and conditions of the contract.

1.3 TESTING OF FIRE ALARM AND SUPPRESSION SYSTEMS

A. All Fire Alarm and Fire Suppression System tests (acceptance, operational and pretests) shall be performed per the minimum requirements of NFPA, state and local codes and standards and as depicted in Sections 15300 and 16721 of this document. All tests shall be performed in the presence of the Project Engineer or their representative. All test sheets and documents shall be submitted to the Project Engineer for final approval.

1.4 WARRANTIES

A. The Contractor shall warrant all work covered by this contract (including all machinery equipment, parts, supplies, materials, systems and assemblies thereof) against failure caused by omissions of materials, defective materials or poor workmanship for a period of one year from the date of Final Acceptance.

B. For the benefit of BWXT Pantex, the Contractor shall obtain the required warranties and guaranties from his subcontractors. The warranties and guaranties of this provision are in addition to any other rights or remedies available to BWXT Pantex under this contract or pursuant to applicable law. These warranties and guaranties are in addition to any implied manufacturers or other suppliers' warranties indicated in the specifications or the contract.

1.5 GUARANTEE PERIOD SERVICES

A. Complete warranty and maintenance services for the new installed UV Detection, Fire Alarm Systems, valves, nozzles, and associated trim devices shall be provided by a factory trained authorized representative of the manufacturer, of the major equipment, during construction and the warranty period.

B. Maintenance Service - Maintenance service shall include adjustments, cleaning, calibration and repair or replacement of any equipment or components of the fire suppression system to keep the system in reliable condition and proper working order. The Contractor shall furnish all tools, test instruments, cleaning materials, and parts required. Batteries and charger shall be included.

C. Response - Response to service calls (normal [code 1] and emergency [code 3] (overtime) service) shall consist of responding to calls within six hours of notification of system trouble or malfunction. Emergency service shall be limited to impairment of zones, panels or other major components that affect the integrity of the system.

D. Submit copies of written guarantee agreeing to repair or replace joint sealers which fall in joint adhesion, extrusion resistance, migration resistance, or general durability or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated. The guarantee period shall be one year from date of substantial completion.

END OF SECTION 01700

SECTION 01710 - CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. Provide facilities and equipment, as necessary, to keep the work and site clean and safe as set forth in other sections of Division 1 and as specified herein.

1. Pollution Control: conduct clean-up and disposal operations to comply with applicable anti-pollution laws and ordinances.

2. Burning or burying of waste materials on the project site is not permitted.

3. Take appropriate means to prevent windblown trash and debris. Control dust during earthwork operations.

1.2 RELATED REQUIREMENTS

A. Individual Specification Sections: Specific cleaning for product or work.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS

A. Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.

B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer. Furnish a list of cleaning materials to BWXT Pantex.

C. Management and disposal of cleaning materials and associated articles (rags, etc.) shall be in accordance with federal, state, and local regulations and BWXT Pantex standards. Refer to Section 01563, Contractor Waste Management for additional requirements.

PART 3 - EXECUTION

3.1 CLEANING UP

A. Cleaning and protection of work:

1. Repeat cleaning and protection operations during construction period, wherever work might otherwise be damaged by sustained soiling or exposure.

2. At the time of acceptance of the project, clean the building and project site to a

condition suitable for occupancy and use as intended.

B. Final cleaning:

1. Use experienced workers or professional cleaners for final cleaning.

2. At completion of construction and just prior to acceptance or occupancy, conduct a final inspection of exposed interior and exterior surfaces.

3. Remove labels which are not required as permanent labels.

4. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.

5. Wipe surfaces of mechanical and electrical equipment clean.

6. Remove debris and surface dust from limited-access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

7. Broom clean all exposed concrete floors.

8. Repair, patch, and touch up marred surfaces to match adjacent finishes.

9. Broom clean paved surfaces; rake clean other surfaces of grounds.

10. Clean light fixtures and lamps so as to function with full efficiency.

11. Replace air supply unit filters, and other equipment filters, if equipment was operated during construction.

12. Clean ducts, blowers, and coils if air supply units were operated during construction.

13. Clean all equipment strainers prior to final inspection.

14. Maintain cleaning until acceptance of the project or portion thereof

END OF SECTION 01710

SECTION 01732 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Demolition and replacement of the deluge valves, associated trim and appurtenances in Cells 2-6.

2. Demolition and replacement of the existing 12-44 & 12-R-44 Fire Alarm System.

3. Demolition of the existing pneumatic heat actuated detectors (HADs).

4. Modify existing lead-in spool pieces to cells 2-6, to remove waterflow vane switch and install horizontal alarm valve & associated trim with pressure switch.

5. Modify sprinkler risers in 12-44E and 12-44EA to remove waterflow vane switch, pressure pump, and associated trim, and install pressure switch.

B. Remove and Salvage:

1. Suprotex deluge valves, associated trim and appurtenances;
2. FA bells and/or strobes;
3. Pull stations;
4. FA panels;
5. Gauges;
6. Rotating lights;
7. Pressure switches;
8. HADs;
9. Pressure pumps;
10. Supervisory switches;
11. Vane water flow switches.

Note: Salvaged materials shall be moved to a warehouse identified by the PE or PM.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Government [**ready for reuse**].

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Government's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Schedule of Selective Demolition Activities:

1. Detailed sequence of selective demolition and removal work, with anticipated starting and ending dates for each activity. **Contractor shall coordinate all system impairments and disturbance of plant services with the Construction Manager, as defined in Specification Section 01040.**

2. Interruption of utility services.

3. Coordination for shutoff, capping, and continuation of utility services.

4. Coordination of Government's continuing occupancy of portions of existing building and of Government's partial occupancy of completed Work.

B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

1.6 QUALITY ASSURANCE

A. Ensure all requirements are met in Section 01400, Quality Assurance.

1.7 PROJECT CONDITIONS

A. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from the Construction Manager or Project Engineer.

B. BWXT Pantex assumes no responsibility for condition of areas to be selectively demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by Government as far as practical.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by BWXT Pantex before start of the Work.

2. If materials suspected of containing hazardous materials are encountered, **do not disturb**; immediately notify Project Engineer. Hazardous materials will be removed by BWXT Pantex under a separate contract.

D. Hazardous Materials: Hazardous materials are present in building to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.

2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

E. Sale of removed items or materials on-site will not be permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

1. If possible, retain original Installer or fabricator to patch the exposed work listed below that is damaged during selective demolition. If it is impossible to engage original Installer or fabricator, engage another recognized experienced and specialized firm.

a. Processed concrete finishes.
b. Firestopping.
c. Wall covering.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

A. Use repair materials identical to existing materials.

1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
2. Use materials whose installed performance equals or surpasses that of existing materials.

B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. **Promptly submit a written report to the PM or PE.**

E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

F. Perform surveys as the work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by the PM or PE.

1. Provide at least 72 hours' notice to Construction Management, as defined in Specification Section 1040, if shutdown of service is required.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from BWXT Pantex.

2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required.

3. Protect existing site improvements, appurtenances, and landscaping to remain.

3.4 POLLUTION CONTROLS

A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.

1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

2. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

D. Mercury Control: An air line mercury check valve is located near the deluge valve in Cells 2-6. The mercury check valve must be capped / plugged at both ends to prevent the escape of mercury. Once removed, turn over to PE or Construction Inspector immediately.

3.5 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Obtain prior approval and maintain **fire watch and** portable fire-suppression devices during flame-cutting operations.

5. Maintain adequate ventilation when using cutting torches.

6. Dispose of demolished items and materials promptly.

7. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.

B. Existing Facilities: Comply with building manager's requirements for using and protecting elevators, stairs, walkways, loading docks, building entries, and other building facilities during selective demolition operations.

C. Removed and Salvaged Items: Comply with the following:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.

3. Place items in a secure area until delivery to BWXT Pantex.

4. Transport items to BWXT Pantex designated storage area.

5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items: Comply with the following:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.

2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.6 PATCHING AND REPAIRS

A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.

B. Patching: Comply with Division 1 Section "Cutting and Patching."

C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.

D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

E. Floors and Walls: Where walls or partitions that are demolished extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

1. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

2. Where patching occurs in a painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.

3. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

F. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

G. Firestopping shall comply with Section 07270.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.

C. Burning: Burning of demolished materials will be permitted only at designated areas on Government's property, providing required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

D. Disposal: Transport demolished materials and dispose of at designated spoil areas on Government's property.

E. Disposal: Transport demolished materials off Government's property and legally dispose of them.

END OF SECTION 01732

SECTION 07270 - FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - 1 Specification Sections, apply to work specified in this section.

B. The requirements of the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, and DIVISION 1 GENERAL REQUIREMENTS apply to the work of this SECTION.

C. Coordinate work of this Section with the work of the following Sections to properly execute the work in order to maintain the hourly ratings of the walls and floors where firestopping and smoke seals are applied.

1. Division 15 and 16 Sections: Mechanical, Plumbing, and Electrical Work.

1.2 SUMMARY

A. The Contractor is responsible for design, installation, and inspection of all new and project utilized penetrations and penetration details, and shall meet the requirements of this specification.

B. Penetration assembly work will include but not be limited to:

1. Review existing penetrations utilized during this project and determine if they meet the criteria within this SECTION.

2. Provide new penetration assemblies as necessary.

C. Remove suspect penetration assemblies and replace to meet the criteria below as determined by:

1. Uniform Building Code (UBC),

2. Uniform Fire Code (UFC),

3. National Fire Protection Association (NFPA),

4. Code of Federal Regulations (CFR), and

5. Nuclear Industry Standards.

D. Install new penetration assemblies to meet the criteria below as determined by:

1. Uniform Building Code (UBC),

2. Uniform Fire Code (UFC),

3. National Fire Protection Association (NFPA),

4. Code of Federal Regulations (CFR), and

5. Nuclear Industry Standards.

1.3 DESCRIPTION

A. This SECTION describes the requirements for furnishing and installing firestopping for fire-rated construction. This includes:

1. Through-penetration firestopping in fire-rated construction.

2. Construction-gap firestopping at connections of the same or different materials in fire-rated construction.

3. Construction-gap firestopping occurring within fire-rated wall, floor or floor-ceiling assemblies.

4. Construction-gap firestopping occurring at the top of fire-rated walls.

5. Through-penetration smoke-stopping in smoke partitions,

6. Construction-gap smoke-stopping in smoke partitions.

B. References:

1. Underwriters Laboratories

a. U.L. Fire Resistance Directory

b. Through-penetration firestop devices (XHCR)

c. Fire resistance ratings (BXUV)

d. Through-penetration firestop systems (XHEZ)

e. Fill, void, or cavity material (XHHW)

f. U.L. 1479, Test Method for Fire Tests of Through-Penetration Firestops, including optional air leak test.

g. U.L. Component Listing Test Criteria

2. Factory Mutual Research Corporation (FMRC)

a. Approval Guide

1) Wall & Floor Penetrating Fire Stops

3. American Society For Testing And Materials Standards:

a. ASTM E 814 - 88, Standard Test Method For Fire Tests of Through-Penetration Firestops.

4. Uniform Building Code (UBC)

5. Uniform Fire Code (UFC)

6. National Fire Protection Association (NFPA)

7. Nuclear Industry Standards

1.4 LISTINGS & APPROVALS

A. See Section 01010

1.5 QUALIFICATIONS

A. See Section 01010

1.6 SUBMITTALS

A. Also see Section 01300.

B. Submit manufacturer's product literature for each type of firestop material to be installed. Literature shall indicate product characteristics, typical uses, performance and limitation criteria, and test data. If options are listed on the product literature, the specific option for the project shall be clearly marked.

C. Material safety data sheets (MSDS) shall be submitted for each firestop product.

D. Shop drawings shall show typical installation details for methods of installation. Indicate which firestop materials will be used and the locations where they will be used.

E. Submit manufacturer's installation procedures for each type of product.

F. Submit quality assurance plan identifying penetrations, penetration seal details, and hold points for each penetration detail as it is worked.

G. Submit manufacturer's Warranty. If Manufacturer's states that the Owner or user shall determine the suitability of the product for it's intended use, or Warranty states that the Owner or user shall test application for specific use, then the Contractor shall have independently monitored tests performed on the construction configurations identical to the proposed construction on this project, and Contractors shall submit copies of Test Reports covering same, for review by BWXT Pantex Fire Protection Engineering.

H. Review foreseeable methods related to Firestopping work, including but not necessarily limited to the following:

1. Tour representative areas where firestopping is to be installed; inspect and discuss each type of condition and each type of substrate that will be encountered, and preparatory work to be performed by other trades.

2. Construction Manager to record discussion, including agreement or disagreement on matters of significance; furnish copy of recorded discussions to each participant. If substantial disagreements exist at the conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

I. Owner, at his discretion, may employ and pay a qualified inspection agency to check installed firestopping systems for compliance with requirements.

J. The Contractor shall submit three copies of the documents, for review, to the Project Engineer. Additionally, an electronic copy of all drawings shall be included. The submittal shall include required information for <u>all</u> work included in this section as detailed in Paragraph 1.6. Documents shall be fully completed and certified by the Contractor as to the compliance of the information contained thereon with the requirements of the contract documents. Incomplete submittals will not be reviewed. Complete submittals will be reviewed by the Project Engineer and Fire Protection Engineering and will processed as specified in Division 1. The Engineer's review will be for general conformity to the specified requirements and is not intended to constitute detailed review or approval of content. Documents stamped APPROVED do not relieve the Contractor from any contract requirements.

K. Drawings and data shall be in sufficient detail to indicate the kind, size, arrangement, and operation of component devices; the external connections, anchorages, and supports required; and dimensions needed for installation and correlation with other equipment. All drawings shall be to a standard architectural scale which shall be noted on the drawings (Graphic Representation). All drawings shall utilize the standard BWXT Pantex title block and border which is available from the Project Engineer. Drawing size shall be 24 inches by 36 inches ("D" size). Drawings shall be folded to 8½ inches by 11 inches or rolled. Reproducibles shall be rolled.

L. The Project Engineer will make available to the Contractor, any existing penetration seal drawings to assist in the field survey of the building. The Contractor shall be responsible to determine the accuracy of arrangements, architectural background and supplemental drawings and perform detailed design and perform installation based on actual conditions.

M. Each document submitted shall be clearly marked with the specification title, the specification number, the project equipment nomenclature, Contractor's name, and the contract number.

N. Arrangement drawings shall be submitted showing the exact locations of all penetration seal assemblies installed. The arrangement drawings shall include a scaled elevation detail of the wall/floor with penetration assemblies.

1.7 AS-BUILT DOCUMENTS

A. See Section 01300.

1.8 QUALITY ASSURANCE

A. See Section 01400.

1.9 CONDITIONS REQUIRING FIRESTOPPING

A. Insulation types specified in other SECTIONS shall not be installed in lieu of firestopping material specified herein.

B. Building Exterior Perimeters:

1. Where exterior facing construction is continuous past a structural floor, and a space would otherwise remain open between the inner face of the wall construction and the outer perimeter edge of the structural floor, provide firestopping to equal the fire resistance of the floor assembly. Mineral wool by itself is not an acceptable firestop, neither is mineral wool used with

beads of caulking applied along length of mineral wool/curtain wall or mineral wool/floor slab junctures. If mineral wool is part of firestop system, the mineral wool must be completely covered by appropriate thickness of listed or approved sealant per approved detail.

C. Firestopping shall be provided whether or not there are any clips, angles, plates, or other members bridging or interconnecting the facing and floor systems, and whether or not such items are continuous.

D. Where an exterior wall of composite type construction passes a perimeter structural member, such as a girder, beam, or strut, and the finish on the interior wall face does not continue up too close with the underside of the structural floor above, thus interrupting the fire-resistive integrity of the wall system, and a space would otherwise remain open between the interior face of the wall and lower edge of the structural member; provide firestopping to continuously fill such open space.

E. Interior Walls and Partitions:

1. Where a wall or partition is continuous past a structural floor, such as a stairwells and vertical shafts, and a space would otherwise remain open between the wall face and perimeter edges of the adjoining structural floor, provide firestopping.

2. Provide firestopping whether or not there are any clips, angles, plates, or other members bridging or interconnecting the wall and floor systems, and whether or not such items are continuous.

3. Where the top edge of a fire-rated wall or partition abuts and is at right angles to fluted-type metal decking, and the construction is such that would otherwise leave the flute spaces open, provide firestopping.

F. Penetrations:

1. Penetrations include conduit, cable, wire, pipe, duct, or other elements which pass through one or both outer surfaces of a fire rated floor, wall, or partition.

2. Except for floors on grade, where a penetration occurs through a structural floor or roof and a space would otherwise remain open between the surfaces of the penetration and the edge of the adjoining structural floor or roof, provide firestopping to fill such spaces in accordance with ASTM E-814 and U.L. 2079 for dynamic movement.

3. Where penetrations occur at fire-rated walls or partitions of solid-type construction, provide firestopping to completely fill spaces around the penetration, in accordance with ASTM E-814.

4. Where penetrations occur at fire-rated walls or partitions of hollow-type construction, provide firestopping to completely fill spaces around the penetration, on each side of the wall or partition, in accordance with ASTM E-814.

5. These requirements for penetrations shall apply whether or not sleeves have been provided, and whether or not penetrations are to be equipped with escutcheons or other trim. If penetrations are sleeved, firestop annular space between sleeve and wall of opening

G. Provide firestopping to fill miscellaneous voids and openings in fire-rated construction in a manner essentially the same as specified herein before.

1.10 SEQUENCING

A. Coordinate with plumbing, mechanical, electrical, HVAC, and other trades to assure that all pipe, conduit, cable, HVAC, and other items which penetrate fire rated construction have been permanently installed prior to installation of Firestops, schedule and sequence the work to assure that partitions and other construction, which would conceal penetrations, are not erected prior to the installation of Firestops.

B. Firestopping shall precede gypsum board finishing.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Deliver material in the manufacturer's original, unopened containers or packages with manufacturers name, product identification, lot numbers, U.L.-labels, and mixing and installation instructions, as applicable.

B. All Firestop materials shall be installed prior to expiration of shelf life.

C. Coordinate delivery with scheduled installation date, allow minimum storage at site.

D. Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing when required. Following manufacturer's instructions.

1.12 PROJECT CONDITIONS

A. Where firestopping is installed at locations which will remain exposed in the completed work, provide protection as necessary to prevent damage to adjacent surfaces and finishes, and protect as necessary against damage from other construction activities.

B. Existing Conditions:

1. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

2. Proceed with installation only after penetrations of the substrate and supporting brackets have been installed.

C. Environmental Requirements:

1. Furnish adequate ventilation if using solvent.

2. Furnish forced air ventilation during installation if required by manufacturer.

3. Keep flammable materials away from sparks or flame.

4. Provide masking and drop cloths to prevent contamination of adjacent surfaces by firestopping materials.

5. Comply with manufacturing recommendations for temperature and humidity conditions before, during and after installation of firestopping.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Firestopping shall meet the specified requirements.

B. Acceptable Manufacturers of assemblies and accessories:

1. PROMOTEC,

2. BRAND Inc.,

3. Or other qualified manufacturers.

C. Through-penetration Firestopping of Fire-rated Construction:

1. Systems or devices listed in the latest edition of the FM Approval Guide, the U.L. Fire Protection Equipment Directory, or third party testing agency with supporting documentation may be used providing that it conforms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos-free.

2. Additional requirements: Withstand the passage of cold smoke either as an inherent property of the system, or by the use of a separate product included as a part of the U.L. system or device, and designed to perform this function.

3. All firestopping products must be from a single manufacturer. All trades shall use products from the same manufacturer.

D. Construction Gap Firestopping of Fire Rated Construction

1. Firestopping at construction gaps between edges of floor slabs and exterior wall construction.

2. Firestopping at construction gaps between tops of partitions and underside of structural systems.

3. Firestopping at construction gaps between tops of partitions and underside of ceiling or ceiling assembly.

4. Firestopping of control joints in fire-rated masonry partitions.

5. Firestopping expansion joints.

6. Acceptable manufacturers and products - those listed in the U.L. Fire Resistance Directory for the U.L. System involved, FM Approval Guide, or third party testing agency with supporting documentation.

E. Smoke Stopping at Smoke Partitions

1. Through penetration smoke stopping: Any system complying with the requirements for through-penetration firestopping in fire rated construction, as specified in this SECTION is acceptable, provided that the system includes the specified smoke seal or will provide a smoke seal. The length of time of the fire resistance may be disregarded.

2. Construction gap smoke stopping: Any system complying with the requirements for construction gap firestopping in fire rated construction, as specified in this SECTION is acceptable, provided that the system includes the specified smoke seal or will provide a smoke seal. The length of time of the fire resistance may be disregarded.

F. Accessories

1. Fill, void or cavity materials: As classified in the U.L. Fire Resistance Directory, Factory Mutual Approval Guide, or third party testing agency with supporting documentation.

2. Forming materials: As classified in the U.L. Fire Resistance Directory, Factory Mutual Approval Guide, or third party testing agency with supporting documentation.

PART 3 - EXECUTION

3.1 EXAMINATION AND INSPECTION

A. Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Verify barrier penetrations are properly sized and in suitable condition for application of materials.

2. Do not proceed until unsatisfactory conditions have been corrected.

B. Examine the areas and conditions where Firestops are to be installed and notify the architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected by the contractor in a manner acceptable to the architect.

C. Verify that environmental conditions are safe and suitable for installation of Firestop product(s).

D. Provide labels at each location, which state:

1. Firestop System: Do Not Disturb

2. Manufacturer's name _____

3. System Number _____

3.2 PREPARATION

A. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting, adhesion, or the required fire resistance.

3.3 INSTALLATION

A. Install penetration seal materials or mortars in accordance with printed instructions of the U.L. Fire Resistance Directory, Factory Mutual Approval Guide, or third party testing agency with supporting documentation and in accordance with

manufacturer's instruction.

B. Seal holes or voids made by penetrations to ensure an effective smoke barrier.

C. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor.

D. Protect materials from damage on surfaces subject to traffic.

E. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable tray, bus duct or other items, close unused portions of opening with firestopping material tested for the application.

F. Install smoke stopping as specified for firestopping.

G. Where rated walls are constructed with horizontally continuous air space, double width masonry, or double stud frame construction, provide vertical, 12 inch wide fiber dams for full thickness and height of air cavity at maximum 15 foot intervals.

H. Install dams when required to properly contain Firestopping materials within openings and as required to achieve required fire resistance rating. Combustible damming material must be removed after appropriate curing. Incombustible damming materials may be left as a permanent component of the Firestop system.

3.4 FIELD QUALITY CONTROL

A. All hold points identified by the penetration seal detail and manufacturers instructions shall be inspected by BWXT construction inspectors prior to performing the next step of the installation.

B. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.

C. Keep areas of work accessible until inspection by applicable code authorities.

D. Perform under this section patching and repairing of firestopping caused by cutting or penetration by other trades.

3.5 ADJUSTING AND CLEANING

A. Clean up spills of liquid components.

B. Neatly cut and trim materials as required.

C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

END OF SECTION 07270

SECTION 15300 - FIRE SUPPRESSION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - 1 Specification Sections, apply to work specified in this section.

1.2 DESCRIPTION OF WORK

A.

1. All contractor associated work shall start at the sprinkler riser floor flange in Buildings 12-44E and 12-44EA.

2. The Fire Suppression System specifications (Section 15300) provide detailed information and requirements related to the deluge systems in Building 12-44 (Cells 2-6), and the sprinkler systems in 12-R-44, 12-44E and 12-44EA. An overview of the sprinkler and deluge system modifications is provided within this section.

3. The suppression systems shall be designed/upgraded, installed, tested, and placed into operational condition in strict accordance with the applicable mandatory and advisory provisions of NFPA 13, 15, and 25, the requirements of the State of Texas, and as described herein and shown on the drawings. Where conflicts exist between codes, the more strict requirements shall be applied. Each cell (round room only) shall be protected by an automatic high-speed deluge system, Extra Hazard Group - 1, hydraulic design of 0.5 - gpm/ft^2 utilizing listed/approved deluge nozzles with a coverage of 90 ft^2 per nozzle.

4. The high-speed deluge system shall employ open nozzles (capable of suppressing HE fires) attached to a piping system connected to the water supply through a deluge valve. A supplemental Ultraviolet (UV)-flame detection system shall be employed to provide high-speed actuation, via an electric solenoid valve. The deluge system will have manual (release at the riser), local electric remote release (ERR)), remote (electric release at the Det-Tronics panel), and automatic (UV and Heat detection) operation. The new heat detection system, located in the Cell round room will be utilized as a redundant (backup) to the flame detection system to actuate the high-speed deluge valve. This system shall be provided in each cell round room. The deluge valve shall be actuated by an electric solenoid valve, which is operated by a signal received from the Det-Tronics panel.

5. The Contractor shall design, install and test all equipment, devices and components for the Fire Suppression system in Building 12-44, Cells 2-6 at the DOE-Pantex Facility, Amarillo, Texas.

6. The Contractor shall develop wet pipe and deluge system hydraulic calculations for Cells 2-6 beginning at the Underground Main. The contractor shall request a

confirmation flow test from the Contracting Officer prior to performing any hydraulic calculations.

7. Testing of the deluge/UV detection system shall be performed to validate detector/deluge response, design density, nozzle pattern, and overall system operation.

8. The system layout and installation will include, but may not be limited to the following work:

   a. Remove the existing Building 12-44 (Cells 2-6) 2½" "Suprotex" deluge valves, trim and appurtenances, devices, appliances and components (this includes the pneumatic heat actuation devices (HADs) and air supply tubing in conduit) and replace with new 4" Gem Multimatic deluge valves. The new valve, trim, and associated appurtenances must interface with the new Det-Tronics control panel and new FACP. The new 4" high-speed deluge valves shall be actuated via electrical solenoid. The new deluge valves shall be provided with a mechanical deluge valve (MDV) connected via the valves diaphragm chamber.

   b. Replace the existing 17/32" open sprinkler nozzles in 12-44 (Cells 2-6) "Round Rooms" with new deluge nozzles with 3/8" or larger orifice.

   c. Remove the existing flow switch from outside of Cells 2-6 and install new horizontal alarm check valve and associated trim and appurtances with pressure switch.

   d. Remove the existing excess pressure pump and water flow vane switches from Buildings 12-44E and 12-44EA and install pressure switch. In addition provide new supervisory devices on all valves as necessary to meet code and specification requirements.

   e. Install electrical operated manual deluge switches (MDS) in Building 12-44, Cells 2-6, "Round Rooms", near the exit and in the Det-Tronics control panel.

   f. Installation must conform to NFPA Codes and Standards, Pantex Fire Protection Design Criteria Manual (FPDCM), and these specifications.

   g. Provide new and replace existing supervisory devices and notification appliances as shown on drawings and as described in the fire alarm specification (Section 16721).

   h. Interconnect with other building and/or ramp systems as required by this specification.

   i. Remove and replace the 2.0"-OS&Y valve and supervisory switch to the wet pipe sprinkler system above the ceiling in each round room, with a new, listed OS&Y type control valve and supervisory switch.

   j. Test all existing applicable suppression piping after installation to verify it meets the requirements set forth in this document, NFPA 13 and 15, and Section 16721.

k. Paint applicable suppression piping in the "Round Rooms" only.

l. Remove and replace the existing 2.5" OS&Y type deluge system control valves with new listed 4" OS&Y type control valves.

1.3 DESIGN REQUIREMENTS

A. The design and installation of deluge and water spray systems shall be in accordance with NFPA 13 and 15, as applicable, except when calculating pipe friction loss, a C value of 100 shall be used for open nozzle deluge systems with black steel pipe.

B. All deluge systems and components shall be designed and listed as a system for the service intended.

1.4 INTERFACING FLAME DETECTION SYSTEM

A. All fire detection and alarm signaling system equipment specifications are furnished under Section 16721. All fire alarm / supervisory signals shall be transmitted to the Pantex Fire Department via the building Fire Alarm Control Panel (FACP).

1.5 CONTRACT DRAWINGS

A. The Fire Suppression Configuration drawings included with these specifications are utilized to illustrate the general locations of the new and existing major components of the fire suppression system. The Contractor shall be responsible to determine the accuracy of these drawings and perform installation based on actual conditions.

B. The Fire Suppression Riser diagrams are included to illustrate the general requirements for the fire suppression system layout. The Contractor's Arrangement and Schematic drawings are required to show the detailed suppression and interface configurations, in compliance with the riser diagrams, detailed to the specific equipment provided.

1.6 CODE REQUIREMENTS

A. Fire suppression system design, materials, manufacture, examination, testing, inspection, stamping, certifications, and documentation shall conform to applicable portions of the latest issue of the following adopted codes and all addenda thereto, standards, and tentative specifications as applicable.

1. Uniform Building Code (UBC) - 2000 Edition
2. NFPA - 13, Standard for the Installation of Sprinkler Systems (1999)
3. NFPA - 15, Standard for Water Spray Fixed Systems for Fire (1996)
4. NFPA - 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems (1998)
5. NFPA - 70, National Electrical Code (1999)
6. NFPA - 72, National Fire Alarm Code (1999)

7. Underwriters Laboratories (UL), Fire Protection Equipment Directory (Latest Edition)
8. Factory Mutual (FM), FM Approval Guide
9. ASTM - A53, Welded and Seamless Steel Pipe for Ordinary Uses, Specifications for Black and Hot Dipped Zinc Coated (Galvanized)
10. ANSI - B2.1, Pipe Thread
11. ANSI - B16.3, Malleable-Iron Screwed Fittings, 150 lb and 300 lb
12. ANSI - B16.5, Steel Pipe Flanges, Flanged Valves and Fittings
13. ANSI - B16.9, Factory Made Wrought Steel Buttwelding Fittings
14. ANSI - B16.11, Forged Steel Fittings, Socket-Welding and Threaded
15. ANSI - B16.15, Cast Bronze Threaded Fittings Class 125 and 250
16. ANSI - B16.21, Non-Metallic Gaskets for Pipe Flanges
17. AWS - D10.9, Standard for Building Service Piping

B. These specifications are based upon the latest standards and codes in force at the time of issue of these specifications. Any conflict between referenced standards shall be referred to the Project Engineer (PE) who will determine which standard shall govern. BWXT Pantex Fire Protection Engineering (FPE) shall be the authority having jurisdiction (AHJ) over interpretation of the Codes, Standards or laws referenced above, and for the installation and testing of the systems. All correspondence requiring decision by the authority shall be directed through the PE for resolution. The requirements of these specifications and associated drawings take precedence over the minimum requirements of the Codes and Standards listed above.

1.7 CONTRACTOR QUALIFICATIONS

A. See Section 01010.

1.8 DOCUMENT SUBMITTALS

A. Submittals shall be provided for all sprinkler systems and be a complete package to permit analysis of the entire system and components simultaneously; partial submittals/resubmittals will not be accepted. Submittals shall include the following:

1. Technical specifications.
2. Contract plans.
3. Design Analysis Document (design calcs, analysis & decision).

B. Technical specifications shall be submitted to the PE for review and approval by BWXT Pantex FPE and include a complete itemized list of all materials, equipment, and accessories proposed for installation. This list shall include quantities, sizes, catalog identification numbers, drawings, catalog cuts, and other descriptive data and material necessary to define all components of the work.

C. Contract plans shall be developed by the contractor and submitted to the PE for review and approval by BWXT Pantex FPE. These plans shall include the following:

1. Plot plan showing the protected facility underground water mains and sizes, control valves and fire hydrants. The plans shall also show the flow information on the existing water supply including:

a. Static pressure (psi).
b. Residual pressure (psi).
c. Flow (gpm).
d. Location and elevation of the above readings.

2. Riser details as shown in Pantex standard detail CAD drawings or modified for the specific project in the design criteria.

3. Plans for hydraulically designed systems, to include:

a. Area of water application (ft^2).
b. Minimum rate of water application (density - gpm/ft^2).
c. Maximum area per sprinkler (ft^2).
d. Allowance for inside hose and outside hydrants (gpm).

4. All drawings shall be submitted in Intergraph Corporation MicroStation format unless otherwise approved by BWXT Pantex FPE.

5. Detailed system layout plans shall also be provided to include cross-sections, details, notes, and other data, as required by NFPA 13 and 15 for working plans and as needed to clearly indicate the design requirements.

6. All designs shall use common Pantex drawing symbols and abbreviations as identified in the FPDCM.

1.9 CONSTRUCTION CONTRACTOR SUBMITTALS

A. Construction contractor submittals shall be provided for all sprinkler systems and be a complete package to permit analysis of the entire system and components simultaneously; partial submittals/resubmittals will not be accepted. Submittals shall include the following:

1. A complete set of working plans and calculations, as required by NFPA 13 and 15.

2. Record drawings.
3. Catalog data.

4. Descriptive literature for each system.

5. Manufacturer data sheets.

6. Operation and Maintenance Manual.

7. Acceptance test procedures and reports.

B. Working plans shall be developed by the sprinkler contractor, or A/E in special circumstances, and submitted as a complete package to the PE for review and approval by BWXT Pantex FPE. **No installation work will be permitted prior to approval of complete working plans, including approval by BWXT Pantex Configuration Change**

Control Board (CCCB). These plans shall comply with the following:

1. Drawings shall be identical in size, scale, and orientation as the contract plans and conform to the requirements established for working plans by NFPA 13, 15, and 24.

2. If departures from the contract plans are deemed necessary by the contractor, details of such departures, including changes in related portions of the project and the reasons, therefore, shall be submitted with the working plans. Approved departures shall be made at no additional cost to BWXT Pantex.

3. Calculations shall be submitted with the working plans for all systems required to be hydraulically designed. The calculations shall be prepared in accordance with NFPA 13 and NFPA 15, preferably using HASS 7.1 or later. All calculations shall also be submitted to FPE on Compact Disk (CD) or 1.4 MB disk.

4. Working plans shall use standard Pantex drawing symbols and abbreviations.

5. Sprinkler system layouts shall be coordinated with other features of the facility, such as structure, lights, ductwork, etc.

6. Drawings shall be submitted as required in Section 01300.

C. Upon completion of the work, the Contractor shall revise the original reproducible shop drawings to agree with the construction as actually accomplished. Contractor shall furnish one full size and one half size set of reproducibles, and electronic copies of approved as-builts on compact disk (CD) or 1.4MB disk (reference Section 01300).

D. Product Data: For the following:

1. Pipe and fitting materials and methods of joining for sprinkler piping.

2. Sprinklers (nozzles). Include sprinkler flow characteristics, mounting, finish, and other pertinent data.

3. OS&Y type control valves.

4. High Speed deluge valves complete with trim, appurtances, devices, appliances and components.

E. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction. Include hydraulic calculations.

F. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13, NFPA 15, and NFPA 25. Submit completed certificates including "Contractor's Material and Test Certificate for Aboveground Piping (PX-1194)".

G. Maintenance Data: For each type of sprinkler specialty to include in maintenance manuals specified in Division 1.

H. Deluge Valve, Trim & Associated Appurtenances

1. The following drawings/documentation shall be submitted for suppression system(s). Separate drawings are not required for each item listed below, however, shall include all required information.

   a. Riser diagram and sprinkler layout of typical cell round room.

   b. Hydraulic calculations shall be submitted for each system. The calculations shall be prepared in accordance with NFPA 13 and shall include a water supply/system demand graph. Hydraulic calculations shall be submitted for each deluge system/sprinkler system. Each deluge system shall be designed as 0.5 gpm/ft^2/over entire area protected (Round Rooms).

I. Certifications

1. The certification from the major equipment (deluge valve) manufacturer indicating that the proposed supervisor of installation and the proposed performer of contract maintenance is an authorized representative of the major equipment manufacturer. Include name and address in the certification.

2. The Inspection and Testing forms as required by NFPA 13, 15 and 25.

3. The certificate of completion shall be filled in as described in the standard. Provide the preliminary copies after completion of all pre-tests but before the final inspection. Provide the final copies after the completion of the final acceptance tests.

J. Owner's Manuals

1. See Section 01300.

1.10 DOCUMENT DISPOSITION

A. See Section 01300.

1.11 AS-BUILT DOCUMENTS

A. See Section 01300.

B. As-built calculations shall be submitted. The As-Built calculations shall be prepared preferably using HASS 7.1 or later.

1.12 SYSTEM ARRANGEMENT AND DESIGN

A. The existing Deluge Valve (Automatic Sprinkler Corporation - Suprotex Model C) shall be replaced with a Gem Model A-4 Multimatic, high-speed, UV/heat detection-actuated, Vertical Deluge Valve or equivalent. The new deluge valve shall be provided with all associated trim and appurtenances to interface and operate with a UV-flame detection

system, initiating devices and FACP, per Section 16721, Fire Alarm Replacement Specification.

B. The deluge valve configuration, associated trim and appurtenances shall be located as shown on the fire suppression arrangement drawings.

C. The existing open 17/32", pendant sprinkler nozzles shall be replaced with listed / approved deluge nozzles, capable of suppressing HE fires, with an orifice of 3/8" or larger.

1.13 EXISTING CONDITIONS

A. Building 12-44 is an existing weapons assembly and disassembly facility, housing seven (7) cells and associated corridors, ramp areas, mechanical rooms, and office/break areas. Two wet pipe sprinkler risers protect Building 12-44. The sprinkler riser located in Building 12-44E protects: 12-44E, Cells 2-6, and a large portion of 12-R-44. Cells 2-6 have wet pipe sprinkler protection in the Equipment Airlock, Storage Rooms, Cell Corridor, Cell Equipment Room, and the area above the round room false ceiling. The wet pipe sprinkler system in Cells 2-6 serves as the source to the Deluge system. The sprinkler riser located in Building 12-44EA protects: 12-44EA, Cell 8, and a portion of 12-R-44. Cell 8 has wet pipe sprinkler protection in the Equipment Airlock, Storage Rooms, Cubicle Rooms, Cell Corridor, Cell Equipment Room, Decontamination Rooms, the round room, and the area above the round room false ceiling.

B. The round rooms in Cells 2-6 are protected by automatic deluge systems (Automatic Sprinkler Corporation Suprotex Model C), actuated by pneumatic rate-of-rise heat actuation devices (HAD). The deluge system is manifolded off the wet-pipe sprinkler system cross main in the round room of each cell. A 6-in above ground feed main extends the length of Ramp 12-R-44 and supplies water to the ramp and cell sprinkler systems (wet-pipe and deluge). A 5-in supervised outside screw and yoke (OS&Y) control valve and water flow switch is provided prior to the cross main penetrating the cell wall.

1.14 SYSTEM OPERATION

A. The new deluge valve shall have automatic actuation capability from the UV flame detection, heat detectors, and electric releasing stations, via electric solenoid.

B. Any alarm condition shall be distinctly transmitted to the Central Alarm Receiving Station (by zone) via the DACT integral with the new FACP. Messages on the DACR shall be in accordance with Specification 16721, Fire Alarm Replacement.

1.15 QUALITY ASSURANCE

A. See Section 01400.

1 **PART 2 - PRODUCTS / MATERIALS**

2.1 GENERAL

A. Applicable equipment shall be furnished as outlined in the following subsections. Unless specifically provided otherwise, all materials and equipment furnished for permanent installation in the work shall conform to applicable standard specifications and shall be new, unused, and undamaged.

B. Individual parts shall be manufactured to standard sizes and gauges so that repair parts, furnished at any time, can be installed in the field. Like parts of duplicate units shall be of the same manufacturer and interchangeable.

C. The Contractor shall review any Pantex Plant inventory of components with the PE prior to providing bid.

2.2 MATERIALS AND EQUIPMENT

A. The following is a listing of material and equipment requirements. It is not intended that all items will necessarily be required but that those required for the work conform to this listing.

Material	Size	Specifications
Pipe	All	Shall be sch 40, ASTM A-53
Fittings, screwed	All	Shall be malleable iron, 150 lb, ANSI B16.3
Fittings, flanged	All	Shall be steel, 150 lb, ANSI B16.5, no cast iron
Fittings, Welded	All	Shall be steel, sch 40, ANSI B16.9
Flanges	All	Shall be steel, 150 lb, ANSI B16.5, no cast iron
Threadolets / Sockolets	Through 2"	Shall be steel, ANSI B16.11, ASTM A105
Weldolets	2" & larger	Shall be steel, 90-deg, Std only, ANSI B16.9, ASTM A105
Plugs	All	Shall be brass, square head, 125 lb, ANSI B16.15
Unions	Through 2"	Shall be malleable iron, 300 lb, bronze to iron ground joint
Flange Gaskets	All	Shall be red rubber 1/16", ANSI B16.21

Material	Size	Specifications
Globe Valves.	Through 2"	Shall be screwed, bronze body, rising stem, 175 lb WWP, screw-in bonnet, renewable disc, UL listed
Angle Valves	Through 2"	Shall be screwed, bronze body, rising stem, 175 lb WWP, screw-in bonnet, renewable disc, UL listed
Gate Valves	Through 2"	Shall be screwed, bronze body, OS&Y, 75 lb WWP, UL listed
Gate Valves	2-1/2" & Up	Shall be flanged, iron body, OS&Y 175 lb WWP, UL listed
Check Valves.	Through 2"	Shall be screwed, bronze body, 175 lb WWP, horizontal swing, renewable disc, UL listed
Check Valves	2-1/2" & Up	Shall be flanged, iron body, 175 lb WWP, bolted bonnet, horizontal swing, renewable seat and rubber-faced disc, UL listed
High-Speed Deluge Valve	4"	UL approved, supervised solenoid actuated, provided with standard trim, solenoid valve, all necessary equipment as required for a complete system, suitable for automatic and manual operation, including pressure alarm switch. Gem Model A-4 Multimatic or equivalent, Vertical Electric Actuation Trim No. 2, and Vertical Alarm and Test Trim No. 5.
Solenoid Valve	½"	UL listed or FM approved Grinnell 24V Solenoid Valve, Catalog Number R8210A107, or latest model.
Sprinkler Nozzles	All	Shall be UL listed, high velocity, Grinnell Model Mulsifyre Nozzles, Model F834 or equivalent. Nozzles shall be capable of suppressing HE Fire, with 3/8" or larger orifice.
Water Flow Alarm Check Valves	All	Shall be approved type, provided with Standard trim and all necessary accessories required for complete installation, UL listed, Grinnell Model F200 or equivalent.
Pressure Alarm Switches		Shall be a Potter Electric Signal Company Model WFS-1 or equivalent.

Material	Size	Specifications
Waterflow Switches	All	Shall be Potter Electric Signal Company Type VSR-F (or latest model) vane type waterflow alarm switch with two Form C single-pole, double-throw (SPDT) alarm contacts.
Sprinkler Escutcheon		One piece or adjustable type, finish to match sprinkler nozzle. Depth as required to position sprinkler.
Valve Tamper Switch		Potter Electric Model OSYS-U or equivalent.
Water Pressure Gauge	3"	Minimum dial, 0-300 psi range, polished brass case.

B. All pipe and fittings shall be either screwed or welded, except alarm check valve and deluge valve trim, as follows:
   1. All piping 2-1/2 inches and larger shall be welded.
   2. All piping 2 inches and smaller may be welded or threaded.
   3. Flexible couplings and fittings of the rubber-gasketed grooved-end, or plain-end type are not permitted.
   4. Aboveground Pipe and Fittings:

PART 3 - EXECUTION

3.1 GENERAL

A. This section covers the installation and installation material requirements for the fire suppression system.

1. The system shall be designed, assembled, mounted, connected, and installed in conformity with this specification, the drawings, applicable NFPA codes and standards, and manufacturer's recommendations.

2. All work performed on this project and all installation materials, methods, and practices shall be in strict compliance with the requirements of OSHA.

3. Install all system components in accordance with manufacturers' instructions.

4. Materials and equipment furnished by the Contractor shall be inspected prior to installation to ensure that all items are available and undamaged.

3.2 CLEANING

A. Prior to installation, the interior of all piping shall be cleaned of all metal cuttings, loose scale, or other foreign materials. The interior of all welded piping shall be cleaned with a steel wire brush. The brush shall have a diameter at least 5 percent greater than the inside diameter of the pipe. At the discretion of the Contracting Officer, nonwelded piping and welded piping with backing rings may require brush cleaning. After erection and prior to testing, all valves, caps, and plugs at all low points in each system shall be opened and the entire piping system thoroughly flushed with water.

3.3 JOINTS

A. All joints shall comply with the requirements of Part 2 - Materials.

1. Threaded Joints: Threads shall be concentric with the outside of the pipe and shall conform to ANSI B2.1. Threaded joints shall be made tight with an approved thread joint compound or tape. Joint compound shall be applied lightly but sufficiently to cover male threads only. Leaking joints shall not be repaired by peaning or packing.

2. Flanged Joints: Flanged joints shall be faced-true, provided with 1/16-in. Asbestos gaskets, and made square and tight. When made up, flange bolts shall extend through nuts by at least one full thread. No flanges shall be placed in locations that will be inaccessible after erection.

3. Welded Joints: All welding shall be in strict accordance with the standards and requirements specified in NFPA 13.

4. Cutting: Pipe shall be cut accurately to suit field conditions and shall be carefully worked into place without forcing or springing. All cuts shall be reamed to remove fins and burrs.

3.4 SIGNS

A. All hydraulically designed systems shall have signs of metal and have permanent markings as required by NFPA 13.

B. Signage for the sprinkler and deluge systems shall be provided as required by NFPA 13 and 15, and be fabricated from 20-gage sheet metal. Lettering height shall be 1-in. for easy reading. Signs shall have white background with red lettering.

3.5 SYSTEM TESTS

A. Upon completion and prior to acceptance of the installation, the Contractor shall subject the systems to the tests required by NFPA 13, 15, 25 and their associated appendixes; test certificates shall be furnished.

1. The Contractor shall submit a written test procedure to the PE/FPE for approval before any tests.

2. The cells shall have a full flow deluge test using an electrically operated deluge

switch (MDS) for actuation.

3. All tests shall be performed in the presence of the Project Engineer (PE) and Fire Protection Engineer (FPE).

4. The Contractor shall perform or have performed by an independent commercial laboratory acceptable to BWXT Pantex PE & FPE all tests required by this section.

5. The Contractor, shall perform pre-tests as necessary to ensure system operability prior to Final Acceptance Testing (FAT).

6. Troubleshooting and retesting will be required at the expense of the contractor, if the FAT fails. In case of conflict between Contractor and government test results, the government test shall govern.

B. Acceptance Test Procedure:

1. A comprehensive and methodological written acceptance test procedure for acceptance of each Deluge System shall be developed by the Contractor to be used as the means for accomplishing the final system acceptance test.

2. As a minimum, the Deluge System Final Acceptance Test procedures shall provide:

   a. Design criteria of the deluge system,

   b. Tools (testing devices, instruments, and gauges) necessary to conduct the test.

   c. Explanation of how the design criteria will be proved (e.g., Six pre-weighed buckets will be randomly placed on the floor and their locations documented. The system will be activated and allowed to flow for 2 minutes. After 2 minutes of flow, the buckets will immediately be covered and the OS&Y to the cell will be shut. The buckets will then be weighed on a calibrated scale to collect data for computation of design density using the following formula), and (e.g., An observer from the Contractor and Pantex will observe each deluge nozzle as it is flowing to verify each nozzle is flowing at full rate and unobstructed), and (e.g., An observer from the Contractor and Pantex will observe a pressure gauge at the most remote sprinkler to verify residual pressure meets NFPA 13, NFPA 15, NFPA 25, and FPDCM criteria).

   d. Detailed information of how test will be performed.

   e. Detailed acceptance criteria.

   f. Space for each step to be initialed by the Project Engineer.

3. The acceptance test procedure shall be submitted to the Owner (BWXT) for review and approval 30 days prior to the acceptance test. The approved procedure shall be submitted to the PE within 10 days prior to the acceptance test.

4. Manufacturers specifications and recommendations, NFPA 13, NFPA 15, NFPA 25, NFPA 72, system design requirements, and specifications herein shall be

utilized as a minimum for determining scope of testing, acceptance criteria, and those requirements herein.

5. An editable electronic copy of the acceptance test procedure shall be submitted to the Owner in WordPerfect 6.1 or higher format prior to completion of the project.

6. After testing, the completed acceptance test procedure shall be signed by the Installing Contractor, PE and the BWXT Pantex Authority Having Jurisdiction which is Fire Protection Engineering.

7. The Contractor shall provide and maintain all testing devices, instruments, and gauges necessary to accomplish the required Contractor testing. All testing devices, instruments, and gauges shall be calibrated at established intervals against certified standards that have known valid relationships to national standards. The Contractor's testing devices, instruments, and gauges shall be made available for use by the government for verification of their accuracy and condition.

8. When performing full flow tests on each cells high-speed deluge system, calibrated gauges shall be placed, as a minimum, on the supply side of the building sprinkler riser located in Building 12-44E, on the deluge riser, and at the most hydraulically remote nozzle. The Contractor shall verify the design flows either by a mechanical or electronic flowmeter.

9. The high-speed deluge system piping shall be flushed in accordance with NFPA 15.

10. Cells 2-6 sprinkler piping, beginning at the cell lead-in OS&Y (in the ramp outside of each cell), shall be hydrostatic pressure tested at 200 psi for 2-hours and in accordance with NFPA 13 and the FPDCM. This hydrostatic test shall include the wet pipe and deluge system.

11. The Contractor shall furnish all plugs, caps, and labor required for the acceptance tests for the high-speed deluge system, including all test repetitions required to achieve approved test results.

12. Full water flow discharge tests of the high-speed deluge sprinkler systems shall be made in the presence of the PE and FPE prior to acceptance to verify nozzle layout, discharge pattern, density, calculations, in accordance with the Contractor required Design Analysis Document. A complete trip test of the high-speed deluge system shall be made in the presence of the PE and FPE. Any damage shall be reported by the Contractor.

13. Prior to any system flushing or testing procedures involving water discharge, the Contractor shall take precautions to prevent water damage. These precautions shall include, as a minimum:

    a. Give ample notice to other trades or disciplines to allow them time to remove or otherwise protect any of their materials, equipment, or tools that could be damaged by water.

    b. Provide temporary piping, hose or other water conduits, containers, pumps.

Sandbags, and labor to safely dispose of the discharged water.

c. Splash blocks or some other method shall be used to defuse the flow of water outside of the building eliminating erosion.

d. Contractor shall notify the PE/FPE 5 working days prior to testing systems that require water flow. The PE/FPE will arrange all required BWXT Pantex support (Fire Dept., Craft, etc.).

3.6 PAINTING

A. Contractor shall touch up piping in areas where new valves are installed. Sprinkler piping, shall be painted with one coat of primer and red paint.

3.7 CONSTRUCTION PHASING

A. Work shall be phased to limit the impairment of suppression systems, initiating/supervisory devices, and notification appliances. No devices shall be kept in an impaired state outside of working hours without written approval from the PE. The new system shall be programmed each shift for the devices and appliances added that shift.

B. Each device transferred during the shift shall be tested and operating properly prior to the end of that work shift. This testing may be observed by the PE.

3.8 EQUIPMENT LOCATIONS AND INSTALLATION

A. All equipment shall be installed in accordance with the codes and standards listed as well as the manufacturers guidelines.

B. Supervisory switches shall be mounted so as not to interfere with normal operation of the valve and adjusted to operate within two revolutions toward the closed position or no more than one-fifth of the distance from its normal position. The minimum groove depth and width shall be in accordance with the manufacturer's guidelines.

3.9 PENETRATIONS / FIRE STOPPING

A. Fire stopping shall be provided, in accordance with requirements defined in Specification Section 07270.

3.10 DEMOLITION

A. In general, the existing fire suppression system shall remain in service as long as possible during the construction/upgrade period.

B. Where components are removed from walls or painted ceilings, holes shall be patched and walls shall be repainted to match existing (paint only area where equipment was located or where wall was damaged during removal). Where components are removed

from suspended ceilings, ceiling tiles shall be replaced with new matching tiles.

C. Abandoned penetrations shall be sealed to at least the rating of the rating of the wall or floor with a listed assembly. All assembly details shall be reviewed and approved by PE/FPE prior to installation.

D. All components of the existing system noted to be removed or replaced shall remain the property of the Government including, but not limited to, the following:

1. Existing deluge valves, with controlling OS&Y valves, associated trim, appurtenances, devices, appliances, and components as indicated on the drawings.

2. Heat Actuated Detectors (HADs) - Remove from service, all pneumatic HADs and associated equipment in 12-44 Cells 2-6 round rooms. Supply air lines to existing deluge system shall be capped at the most remote supply point without interfering with other air supplied equipment. This cap point will be identified by the PE.

NOTE: The air line mercury check must be capped / plugged at both ends to prevent the escape of mercury. Once removed, turn over to PE or Construction Inspector immediately.

E. The items noted above shall be removed and delivered to Building 12-118, unless otherwise directed by the PE.

3.11 TRAINING

A. Formal training shall be provided for the operations and maintenance staff. Training shall be conducted in the building where the system is installed (lab). The training for Building 12-44 must consist of one 2-hour session and shall start after the system is functionally completed and pre-tested but prior to final acceptance tests. The instructions shall cover all of the items contained in the technician-level operating, trouble shooting and maintenance instructions.

B. Instructors for the class shall be Manufacturer certified technicians with substantial experience with the fire protection system equipment installed. At least one instructor shall have first hand knowledge of the fire protection system equipment configuration at Pantex.

C. The training shall include the following:

1. Theory of system operation
2. System operation, logic and control functions
3. Component operation and compatibilities

One copy per attendee of operations and maintenance manuals shall be delivered to the PE ten days prior to the class. The Contractor shall provide and hand out a more general outline of class topics to all attendees (up to 40 attendees may be present).

D. Lab/on-site field training shall include the following:

1. Installed equipment locations
2. System operation (hands on)
3. Inspection and testing
4. Maintenance/troubleshooting procedures

E. The following types of personnel may attend the system training:

1. Facility division fire protection system design staff
2. Fire department staff
3. Fire protection engineering staff
4. Preventative maintenance staff (includes but is not limited to SMI's and Electricians).
5. Facility management

F. Certificates shall be provided to all class attendees.

3.12 SPARE PARTS

A. A list of components required for the installation and upgrade of the new deluge valves/associated trim and its attachments shall be submitted to the PE with the first required project submittal. The list shall contain a unit price for each component. The spare parts will be purchased through a Construction Change Authorization (CCA) to the contract.

B. Spare parts shall be packaged in boxes with shipping type packing and, if applicable, anti-static bags. The boxes shall be labeled to note the device(s) within. Identification includes name, model number, serial number and revision number (where applicable). The following spare parts shall be provided as part of this contract:

1. Additional deluge valve and all trim - for future use in 12-44, Cell 1.

2. Additional nozzles to supply Cell 1 including replacements, and replacements for Cells 2-6.

3. Additional controlling OS&Y type valves for future use in 12-44 Cell 1.

4. Additional horizontal check valve and all trim for future use in 12-44 Cell 1.

END OF SECTION 15300

SECTION 16721 - FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - 1 Specification Sections, apply to work specified in this section.

1.2 SUMMARY

A. The fire alarm system specifications (Section 16721) provide detailed information and requirements related to the facility fire alarm and Ultraviolet (UV) Flame Detection systems. An overview of the Fire Alarm Upgrade (FAU) is provided within this section.

B. The Contractor shall design (except for Cell 1), install (except for Cell 8), program, and test all equipment, devices and components for the FAU in Building 12-44, Cells 1-8, 12-R-44 Ramp, 12-44E, and 12-44EA at the DOE-Pantex Facility, Amarillo, Texas. The new FACP shall interface with the existing initiating and notification devices located in Cell 1, and existing smoke detectors in Cells 1-8. If possible, the new FACP may also interface with the existing Maxsys Fire Alarm System initiating and notification devices located in 12-R-44 Ramp (See Section 1010, Bid Alternate 2). The new FACP shall, in addition, have enough available space for future fire alarm system modifications to Cell 1 that mimic the system configuration in Cells 2-6. The smoke detectors located in Cells 1-8 shall be reused if compatible and listed with the new FACP. The existing smoke detectors are Pyrotector Model 30-3003.

C. The two primary components of the fire alarm system are as follows:

1. A Detector Electronics Corporation (a.k.a. Det-Tronics) R7404/C7051 Nuclear Surveillance UV Flame Detection System. The Det-Tronics flame detection system shall consist of R7404A Controller Modules, R6006C Relay Modules, and R1425 Detonator Modules that interface with C7051 Detectors equipped with DE1888G2 UV detector tube modules. The Det-Tronics control panel shall also interface with rate compensated heat detectors and a deluge fire suppression system releasing solenoid (Grinnell 24V Solenoid Valve, Catalog Number R8210A107, or latest model). The panel assembly will require FM field inspection to receive approval as a fire alarm control panel and a releasing panel as specified by Section 01010. The Det-Tronics panel shall be powered by a LaMarche charger or other charger specified by Det-Tronics.

2. A Notifier fire alarm system centered on a AFP 1010 FACP with emergency voice alarm communication (EVAC) features using Notifier transponder panels and Notifier System 5000 panels shall be provided. The new fire alarm system shall interface with all notification appliance, supervisory devices, and alarm initiating devices. The new fire alarm control panel shall be provided with a Notifier U-DACT for communications of signals to the Pantex Plant fire alarm receiving system. The new FACP shall interface with the following Det-Tronics control panel alarm outputs

through contact closure from the Det-Tronics control panel Relay Module:

a. Electric remote releasing stations
b. Heat detectors, and
c. UV detectors

D. The system layout and installation will include, but may not be limited to the following work:

1. UV Flame Detection System

a. Design and install a Det-Tronics Nuclear Surveillance UV Flame Detection System, in Building 12-44, Cells 2-6 round rooms. The control equipment provided shall also provide the equipment and capability for future installation of UV detectors in Cell 1.

2. Fire Alarm System

a. Replace the existing Building 12-44 and 12-R-44 Fire Alarm Systems, with a new single Fire Alarm System. If possible and recommended, utilize the existing Pyrotronics manual pull stations, waterflow devices and bell/strobes in 12-R-44 Ramp (see Paragraph 1.7C, General Fire Alarm Control Panel, within this section, and also see Section 01010 Bid Alternate 2).

b. Provide new Notifier fire alarm control panel(s) (FACP).

c. Provide new or replace existing initiating devices and notification appliances as required by this specification.

d. Interconnect with other building systems as required by this specification.

e. Install all wire and conduit as required for system performance. Any fire walls that are penetrated must also be sealed as required by other sections of the contract specification.

f. Remove any existing fire alarm components, conduit and wiring that is not required for the new fire alarm system.

3. Design and installation shall conform to NFPA Codes and Standards, Pantex Fire Protection Design Criteria Manual (FPDCM), and these specifications.

1.3 CONTRACT DRAWINGS

A. The Fire Alarm Arrangement drawings included with these specifications are utilized to illustrate the general locations of the new and existing major components of the fire alarm system. The Contractor shall be responsible to determine the accuracy of these drawings and perform installation based on actual conditions.

B. The Fire Alarm Riser diagrams are included to illustrate the general requirements for the fire alarm system layout. The Contractor's Arrangement and Schematic drawings are

required to show the detailed circuit arrangements, in compliance with the riser diagrams, detailed to the specific equipment provided.

1.4 CODE REQUIREMENTS

A. Fire alarm system design, materials, manufacture, examination, testing, inspection, stamping, certifications, and documentation shall conform to applicable portions of the latest issue of the following adopted codes and all addenda thereto, standards, and tentative specifications as applicable.

1. Uniform Building Code (UBC) - 2000 Edition
2. NFPA 13, Standard for the Installation of Sprinkler Systems
3. NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems (1998)
4. NFPA 70, National Electrical Code (1999)
5. NFPA 72, National Fire Alarm Code (1999)
6. NFPA 90A, Installation of Air Conditioning and Ventilation Systems (1999)
7. NFPA 101, Life Safety Code (2000)
8. FM Standard 1011 - Deluge and Preaction Systems
9. FM Standard 3260 - Flame Radiation Detectors for Automatic Fire Alarm Signaling

B. These specifications are based upon the latest standards and codes in force at the time of issue of these specifications. Any conflict between referenced standards shall be referred to the Project Engineer (PE) who will contact Fire Protection Engineering (FPE) to which standard shall govern. BWXT Pantex FPE shall be the authority having jurisdiction over interpretation of the Codes, Standards or laws referenced above. All correspondence requiring decision by the authority shall be directed through the PE for resolution. The requirements of these specifications and associated drawings take precedence over the minimum requirements of the Codes and Standards listed above.

1.5 CONTRACTOR QUALIFICATIONS

A. See Section 01010.

1.6 DOCUMENT SUBMITTALS

A. The Contractor shall submit three copies of the documents, for review, to the PE. Additionally, an electronic copy of all drawings shall be included. The submittal shall include required information for all work included in this section as detailed in Paragraph 1.6. Documents shall be fully completed and certified by the Contractor as to the compliance of the information contained thereon with the requirements of the contract documents. Incomplete submittals will not be reviewed. Complete submittals will be reviewed by the PE and processed as specified in Division 1. The Engineer's review will be for general conformity to the specified requirements and is not intended to constitute detailed review or approval of content. Documents stamped APPROVED AS SUBMITTED do not relieve the Contractor from any contract requirements.

B. Drawings and data shall be in sufficient detail to indicate the kind, size, arrangement, and operation of component devices; the external connections, anchorages, and supports

required; and dimensions needed for installation and correlation with other equipment. All drawings shall be to a standard architectural scale which shall be noted on the drawings (Graphic Representation). All drawings shall utilize the standard Pantex title block and border which is available from the PE. Drawing sizes shall be 24 inches by 36 inches ("D" size). Drawings shall be folded to 8½ inches by 11 inches or rolled. Reproducibles shall be rolled. "D" size drawings shall be such that legibility is maintained when reproduced and reduced to 16 inches by 24 inches as determined by FPE.

C. Building architectural background drawings on disk (MicroStation V5 or J) will be made available to the Contractor. The PE will make available to the Contractor, any existing electrical drawings to assist in the field survey of the building. The Contractor shall be responsible to determine the accuracy of arrangements, architectural background and supplemental drawings and perform detailed design and perform installation based on actual conditions.

D. All fire detection and alarm systems planned shall be stamped (both designer and reviewer) possessing a current Texas PE acting solely in his/her professional capacity or by a person who holds a minimum NICET III Certification in fire alarm systems, unless otherwise approved by FPE. A copy of NICET Certification can be submitted in lieu of stamp.

E. Each document submitted shall be clearly marked with the specification title, the specification number, the project equipment nomenclature, Contractor's name, contract number, and the signatures of the designer and reviewer.

F. The following documents shall be submitted for this project.

1. Equipment Data Sheets

a. Equipment data sheets shall be submitted for all standard equipment and devices used in the systems. If options are listed on the data sheets, the specific option for the project shall be clearly marked. The equipment shall include but not be limited to the following:

1) Alarm Panels and Components
2) Batteries and Enclosures
3) Wire (including color code schedule)
4) Notification Appliances
5) Initiating Devices
6) Filters or Surge Suppression Devices
7) Other field devices
8) Conduits and Supports
9) Firestopping Materials and Systems
10) Junction Box Labels

G. Arrangement Drawings

1. Arrangement drawings shall be submitted showing the exact locations of all devices and equipment. This includes noise suppressors or filters, transponders, etc. The arrangement drawings shall include a scaled elevation detail of the wall with fire alarm panel and battery enclosure. The arrangement drawings shall also

illustrate proposed standard equipment and component mounting details.

H. Schematic Drawings

1. Schematic type drawings shall be submitted that show all external circuits associated with the fire alarm system. Drawings shall show the arrangement of all devices on each circuit. Circuit and device numbers shall be shown to correlate with the other drawings and contract documents.

I. Fire Alarm Control Panel Documents (Including Voice Evacuation System)

1. The following drawings shall be submitted for each panel. Separate drawings are not required for each item listed below if a typical is possible, however, shall include all required information.

a. Outline Drawings. Drawings shall be submitted of each panel showing the dimensions and arrangement of all lights, switches, and labels. Information shall be provided such as weight, mounting details, and wording of all labels. A second drawing shall be provided to show the arrangement of all circuit boards and modules in the panel(s).

b. Fire Alarm System Matrix. A fire alarm matrix shall be submitted that shows complete operation of all alarm and control functions of the panels. A well written sequence of operations document may be substituted if approved by PE/FPE.

c. Interconnection Diagrams. Interconnection drawings shall be submitted which show all electrical connections (new and modified) required for complete operation of the system as specified. Circuit numbers shall be shown on all connections to the terminal blocks and shall correlate with other drawings. A typical interconnection detail shall be shown for each type of field device, appliance and connection to other equipment.

d. Calculations. Battery calculations shall be submitted for the Fire Alarm Control Panels. If standard manufacturer forms are used, the manufacturer's instructions shall also be included. Calculations shall also be provided for each external initiating, notification and control circuit to prove that wire sizes chosen have voltage losses and current draws within the acceptable limits as stated by the manufacturer. Manufacturer data indicating maximum acceptable current draw and voltage loss shall be included with calculations.

e. Digital Dialer Data. All data required for programming of the Digital Alarm Communication Transmitter (DACT) to transmit signals shall be submitted. All data required to programming of the Digital Alarm Communication Receiver (DACR) to receive and interpret signals from the DACT shall be submitted.

f. Programming. All programming required to make the fire alarm system perform in accordance with the contract documents shall be submitted. Three copies of Notifier's Magnifier programming software shall be submitted to

Pantex Plant FPE prior to performing final acceptance testing of the system.

J. Certifications

1. The certification from the major equipment (control panel) manufacturer indicating that the proposed supervisor of installation is an authorized representative of the major equipment manufacturer. Include name and address in the certification.

2. The certificate of completion, as required by Section 1.08.3.2 of this specification shall be filled in as described in the standard. Provide the preliminary copy after completion of all pre-tests but before the final inspection. Provide the final copy after the completion of the final acceptance tests.

K. Owner's Manuals

1. Installation, maintenance, operating, and programming manuals for all monitoring, initiating, notification and data communication devices shall be submitted with design and calculations.

2. Also refer to Specification Section 01300.

L. Other Information

1. Acceptance Test Procedure

a. A comprehensive and methodological written acceptance test procedure shall be developed by the Contractor to be used as the means for accomplishing the final system acceptance test. Note: the acceptance test procedure for a similar building and system configuration was approximately 650 pages in length and very condensed (utilized tables to accomplish repetition of procedure). The acceptance test procedure shall be submitted to the Owner (BWXT) for review and approval 30 days prior to the acceptance test. The approved procedure shall be submitted to the PE within 10 days prior to the acceptance test. Manufacturers specifications and recommendations, NFPA 72 and NFPA 25 shall be utilized as a minimum for determining scope of testing, acceptance criteria, and those requirements herein. An editable electronic copy of the acceptance test procedure shall be submitted to the Owner in WordPerfect 6.1 or higher format prior to completion of the project.

b. The acceptance test procedure shall provide detail information of what is being tested, how it is tested and provide detailed acceptance criteria. The acceptance test procedure shall be comprehensive by accounting for 100% of all devices, modules, circuits and components installed, modified or reused. The test for each device, module, circuit, and component installed, modified or reused, new or existing, shall verify 100% of the functions associated with applicable alarm trouble or supervisory condition. After testing, the completed acceptance test procedure shall be signed by the Installing Contractor, PE and the BWXT Pantex Authority Having Jurisdiction

which is Fire Protection Engineering. A sample acceptance test procedure will be provided with this specification that illustrates the level of detail required by the procedure.

2. Document Disposition

   a. See Section 01300.

3. As-Built Documents

   a. See Section 01300.

4. Equipment Data Sheets and Calculations

   a. See Section 01300.

5. System Certifications

   a. Pantex form number PX-0274, *Certificate of Completion for Fire Alarm Systems,* which will be provided to the contractor by the PE.

   b. The Inspection and Testing form as required by NFPA 72.

   c. A Factory Mutual site acceptance shall be performed by Factory Mutual representative(s) for the Det-Tronics control panel. The site acceptance shall be performed to compare the installed system to the requirements of Factory Mutual Standard 3260, *Flame Radiation Detectors for Automatic Fire Alarm Signaling*, and Standard 1011, *Deluge and Preaction Systems.* The site acceptance shall be considered equivalent to the Det-Tronics control panel being listed or approved.

1.7 SYSTEM ARRANGEMENT AND DESIGN

A. Detector Electronics UV Detection Releasing Panel and Associated System

1. A Detector Electronics (a.k.a. Det-Tronics) R7404/C7051 Nuclear Surveillance UV Flame Detection System comprised of R7404A7014 Nuclear Surveillance UV Flame Detector Controllers, R6006C1008 Relay Modules, and R1425A2024 Detonator Modules that interface with C7051 Detectors equipped with DE1888G2 UV detector tube modules.

2. The Det-Tronics control panel shall be supplied in a NEMA 4 Enclosure with a front and rear access panel. The enclosure shall be ventilated as required to maintain equipment temperatures as required by Det-Tronics. The front access panel shall be provided with a plexi-glass window that allows viewing of all control panel modules and related components. The power supply/battery charger may be installed in the same enclosure; however, the batteries shall be installed in a separate enclosure.

3. The Det-Tronics control panel shall be provided with a separate controller mounting

rack for each cell. The control panel shall be designed and installed to support Cells 1-6. Although components necessary for a full and functional panel shall be supplied for all cells. Only equipment to be installed for Cells 2-6 will be required. Upgrades to UV detection, heat detector detection, and manual deluge switches within Cell 1 will not be performed as a part of this contract. Each rack/group of modules for a specific cell shall be provided with a fused power and a power disconnect switch. The fuses and power disconnect switches shall be mounted together on a blank filler plate on each cell rack. The panel shall also be provided with master panel disconnect switch that allows the entire panel to be powered off by one switch.

4. The system shall be configured such that when two UV detectors sense a fire simultaneously for a period of 10 seconds that initiation of the deluge fire suppression will occur. The time delay feature associated with the Relay Module should be used to accomplish this function. The relay of the panel shall be configured such that it can be turned to an "off" position so that the UV detectors will not be allowed to initiate the deluge fire suppression system.

5. The Det-Tronics control panel Detonator module shall be utilized to monitor conventional rate-compensated 140° Fahrenheit fixed temperature heat detectors and manual deluge switches. Activation of either a single heat detector or the a manual deluge switch shall initiate the deluge fire suppression without delay.

6. The manual deluge switch installed in the cell shall be a Kilark model number XAL-53. A second contact block which is an Square D model 9001-KR-1 will need to be installed on the existing contact so that the switch will have two sets of contacts that are held in the normally open position. The XAL-53 pull station cover will need to be installed on a Kilark model SWB-45 backbox which will support the added depth of the second contact block. The SWB-45 backbox will need to be red in color. One set of contacts will provide a signal directly to the Det-Tronics control panel and the second set of contacts shall provide a signal directly the general building fire alarm control panel.

7. A manual deluge switch shall be provided in the control panel for each cell. The manual deluge switch shall consist of the following three components:

   a. 33MM Padlock Attachment, Grainger Item No. 5B541, or Square D Part No. 9001K7

   b. 330MM Push Button (use red insert), Grainger Item No. 5B517, or Square D Part No. 9001KR1U

   c. 30 MM Contact Block, Grainger Item No. 5B536, or Square D Part No. 9001KA2

8. The output of the Detonator module shall be used to operate a solenoid valve on the deluge fire suppression which is the deluge fire suppression system initiator.

9. The Det-Tronics control panel will also interface with rate compensated detectors and a deluge fire suppression system releasing solenoid. The panel assembly will require FM field inspection to receive approval as a fire alarm control panel and a releasing panel as specified by Section 01010. The Det-Tronics panel shall be

powered by separate power supply/battery charger as specified by Det-Tronics. Sealed Lead Acid batteries shall be used for the secondary power source for the system and connected to the charger.

10. To provide a installation and system configuration similar to previously installed systems the following module configurations are required:

    a. The Relay Module shall be configured as follows:

        1) Relay 1 shall be configured to provide a "heat detector" output signal to the general fire alarm control panel.

        2) Relay 5 shall be configured to provide a signal indicating "2 UV detectors in alarm simultaneously".

        3) Relay 6 shall be configured to provide to provide a signal to the Detonator Module for initiation of the deluge system after two UV detectors have been in alarm simultaneously for a period of ten seconds.

        4) The alarm relay shall be configured to provide a "Single UV detector" alarm output to the general fire alarm control panel.

        5) The fault relay shall be configured to provide a "Det-Tronics common trouble" output to the general fire alarm control panel.

    b. The Detonator Module shall be configured as follows:

        1) Zone 1, Aux Input A, shall be a spare zone.

        2) Zone 1, Aux Input B, shall be used to monitor the heat detectors.

        3) Zone 2, Aux Input A, shall be used to receive the UV detector input from Relay 6 on the Relay module.

        4) Zone 2, Aux Input B, shall be used to monitor the manual deluge switches.

        5) The deluge valve solenoid shall be installed on Zone 1 Detonator Module output.

    c. The Controller Module shall be configured as follows:

        1) The alarm setting of the controller modules shall be 16 counts per second (cps).

        2) Note: The Project Engineer will provide a copy of design information from a previously installed Det-Tronics control panel, if necessary.

B. UV Detection System Performance Requirements

1. The UV detectors need to be installed to protect the round room portion of the cell only. UV detectors shall be installed such that the design basis fire can be detected at any location in the cell from the floor up to a height of 7 feet above the floor, by at least four detectors. The design basis fire is a fire that would generate a continuous output of a DE1888G2 detector tube module of 16 counts per second continuously at an on-axis distance of 30 feet. The detector placement shall be such that potential obstruction to the UV detectors are minimized or prevented due to equipment and tooling within the cell such as overhead cranes that is moveable.

C. General Fire Alarm Control Panel

1. A Notifier fire alarm system with emergency voice alarm communication (EVAC) features including all other required peripherals shall be provided. The core of the Notifier fire alarm control panel shall be a AFP-1010 master panel connected to transponder panels and System 5000 panels as slave control panels. The new fire alarm control panels shall utilize hard-wired conventional initiating, supervisory and notification circuits and appliances. The new fire alarm control panel may consist of both conventional and addressable type control panels for ease of interfacing functions equipment such as with multiple control panels and to consolidate communications signals through a single DACT. The DACT shall communicate to the Pantex Central Alarm Receiving System (CARS) using Contact ID reporting format. The new fire alarm system shall interface with all notification appliance, supervisory devices, and with all alarm initiating devices. All zones initiating, supervisory or trouble indicators shall be displayed via LED and/or LCD annunciators. The new fire alarm control panel will interface with heat detectors, electric remote release stations, and UV detector alarm outputs from the Det-Tronics control panel.

2. The transponder panel(s) shall support the speakers, cell strobes, cell annunciation strobes and voice equipment. The System 5000 panel(s) shall support the alarm initiating devices, supervisory devices, control functions, Det-Tronics control panel supervision, Det-Tronics panel charger supervision, and general building notification appliances. The AFP-1010 master panel shall be the link between the System 5000 panels and the transponder panels. The AFP-1010 panel shall also support the DACT as a single communications device for communicating all system signals to the alarm receiving system.

3. The fire alarm system panel(s) shall be located as shown on the fire alarm arrangement drawings. The main control panel(s) shall be of the hard wired type. All initiating device circuits shall be Style B. Notification appliance circuits shall be Style Y.

4. The general locations of the fire alarm initiating devices are shown on the Fire Alarm Arrangement Drawings. Exact placement of all initiating devices is the responsibility of the Contractor and subject to the review of the PE/FPE.

5. The building, equipment room and cell waterflow switches shall be replaced with new devices as indicated on the drawings and shall be supervised by the new panel(s).

6. Fire alarm notification appliances shall consist of combination bell/strobes, or bells

and strobes in all areas of the building, except the cell facility. Speakers and/or speaker strobe units shall be utilized in the cell facility. The locations where speakers or bells are required are shown on the plan layout drawing provided with this specification. Strobe only appliances may be used to meet NFPA 72 visual requirements in rooms where NFPA 72 audibility requirements are already met by other appliances. Where strobes are utilized as occupant emergency notification appliances, only the U.L. 1971 rated value of the strobes shall be used for determining proper strobe size and placement. The Fire Alarm Arrangement Drawings show specific locations for notification appliances in ramps, corridors and other areas requiring visual appliances as well as a minimum number of appliances in other areas.

7. The Contractor shall be responsible to determine and install additional appliances, as necessary, to meet audibility and visual requirements of NFPA 72 requirements. Additional appliances required for audibility requirements shall be bell/strobes, or speaker/strobes as applicable. It should be noted a large portion of the 12-R-44 ramp is currently provided with Pyrotronics bells, strobes and pull stations which may be re-used (if possible) and connected to the new FACP (see Specification 01010 Bid Alternate 2). If Bid Alternate 2 is not possible or recommended, initiating and notification devices and wire from the Maxsys fire alarm system shall be replaced with like devices compatible with the new FACP. Conduit from the Maxsys fire alarm system may be reused. New initiating and notification devices will be required on the north end of the Ramp (where the Maxsys fire alarm system does not presently cover) and be designed to meet code and specification requirements.

8. Any discovered zoning differences shall be corrected by the Contractor at no additional cost to the Owner.

9. All wiring, to new and to existing devices and appliances (except Cell 1), shall be new. If it is determined the Maxsys fire alarm system initiating devices can be reused, the wiring may also be reused (see Specification 01010 Bid Alternate 2).

1.8 EXISTING CONDITIONS / BUILDING SPECIFIC DESIGN REQUIREMENTS

A. Building 12-44 is an existing weapons assembly and disassembly facility, housing seven (7) cells and associated corridors, ramp areas, mechanical rooms, and office/break areas. Two wet pipe sprinkler risers protect Building 12-44. The sprinkler riser located in Building 12-44E protects: 12-44E, Cells 2-6, and a large portion of 12-R-44. Cells 2-6 have wet pipe sprinkler protection in the Equipment Airlock, Storage Rooms, Cell Corridor, Cell Equipment Room, and the area above the round room false ceiling. The wet pipe sprinkler system in Cells 2-6 serves as the source to the Deluge system. The sprinkler riser located in Building 12-44EA protects: 12-44EA, Cell 8, and a portion of 12-R-44. Cell 8 has wet pipe sprinkler protection in the Equipment Airlock, Storage Rooms, Cubicle Rooms, Cell Corridor, Cell Equipment Room, Decontamination Rooms, the round room, and the area above the round room false ceiling.

B. The round rooms in Cells 2-6 are protected by automatic deluge systems (Automatic Sprinkler Corporation Suprotex Model C), actuated by pneumatic rate-of-rise heat actuation devices (HAD). The deluge system is manifolded off the wet-pipe sprinkler

system cross main in the round room of each cell. A 6-in above ground feed main extends the length of Ramp 12-R-44 and supplies water to the ramp and cell sprinkler systems (wet-pipe and deluge). A 5-in supervised outside screw and yoke (OS&Y) control valve and water flow switch is provided prior to the cross main penetrating the cell wall.

C. The smoke detectors located in Cells 1-8 shall be reused if compatible and listed with the new FACP. The existing smoke detectors are Pyrotector Model 30-3003.

D. There are three existing fire alarm system for this building:

E. The ADT Unimode FACP interfaces primarily with the building 12-44 suppression systems and devices within the cells such as:

PANEL	ZONE
ADT Unimode	Supervises Valves (including alarm trim valves) Supervises common trouble output Supervises water flow pressure alarm switches Interfaces manual fire alarm pull station(s) Interfaces heat-activated devises (HAD) Interfaces deluge activation switch Interfaces smoke detectors Supervises water flow vane switch Supervises air pressure switch Provides communications to the CARS through the ADT CentraScan 6000 system

F. The Pyrotronics PXL FACP and Maxsys DACT panel interfaces with the 12-R-44 ramp equipment such as:

PANEL	ZONE
Pyrotronics FACP	Supervises Control Valve Supervises water flow switch Interfaces manual fire alarm pull station(s) Controls bells and strobes
Maxsys DACT Panel	Provides communications to the CARS through the SurGard/SIS DACS system using plant telephone lines.

G. The Notifier FACP is no longer in use but once interfaced with Cell 8 equipment.

H. The function of the ADT and Pyrotronics/Maxsys FACPs shall be replaced by the new FACP(s), capable of interfacing with UV Flame Detection and deluge valve, associated trim and appurtenances, initiation and notification devices. The existing phone lines used for communication by the Maxsys panel shall be used for Notifier U-DACT communications interface to the DACS.

I. All new wiring shall be per the required type and color coded as specified in Paragraph 2.1 G 4 e.

1.9 SYSTEM OPERATION

A. The sequence of operations for the system is outlined on the fire alarm matrix drawings, included in this contract.

B. All alarm, supervisory or trouble condition shall be distinctly transmitted to the Central Alarm Receiving Station (by zone) via the DACT integral with the new FACP. Each initiating device zone shall correspond with the Logic Matrix and be communicated to the Digital Alarm Communication System (DACS).

PART 2 - PRODUCTS

2.1 Materials

A. General

1. Equipment shall be furnished as outlined in the following subsections. Unless specifically provided otherwise, all materials and equipment furnished for permanent installation in the work shall conform to applicable standard specifications and shall be new, unused, and undamaged.

2. Individual parts shall be manufactured to standard sizes and gauges so that repair parts, furnished at any time, can be installed in the field. Like parts of duplicate units shall be of the same manufacturer and interchangeable.

3. All electronics shall be rated to withstand the temperature and humidity expected in the different areas of the building.

4. Field components, such as conduit, fittings, wire, manual pull stations, bells, and waterflow switches are available at the facility and shall be used if U.L. Listed compatible with the new system, in satisfactory condition and proper for the system design. The Contractor shall review the inventory of these components with the PE prior to providing bid.

5. Signs for each fire alarm panel, initiating, notification, and supervisory device installed and reused shall be provided and be in accordance with Pantex Plant Manual MNL-00014, Rev. 7.

B. Heat Detectors

1. Heat detectors shall be restorable rate compensated 140° F type heat detectors, Model Number 27121-0, manufactured by Fenwall. The actual locations of heat detectors within the cell round room and the quantity required shall be determined by the contractor.

2. The detectors shall interface with the Det-Tronics FACP and provide actuation of the new deluge valves.

3. Detectors shall be listed by U.L. as "Single and Multiple Station Heat Detectors" tested in accordance with U.L. 539. Detector sensitivity shall be set at the factory per manufacturers recommendations. The Contractor shall be responsible for determining the correct sensitivity range for the particular applications.

4. Heat detectors shall be numbered for identification.

C. Fire Alarm Notification Appliances

1. Existing fire alarm notification appliances (i.e., visual and audible notification devices), if used (see Bid Alternate 2, Section 01010), shall be compatible and listed with the new FACP and meet NFPA 72 and specification requirements.

2. Fire alarm bells shall operate on 24 vdc. The minimum sound output shall exceed 90 dBA at 10 feet, not exceed 120 dBA at the minimum hearing distance from the appliance and be at least 15 dBA above average ambient sound levels. The output shall be chosen to meet or exceed the sound level required for the room or area in accordance with NFPA 72 requirements. Bells shall be OSHA red.

3. Alarm bells shall be 24 VDC polarized, 10 inch motor driven alarm bell, red in color, with a 92 dBA audible output at 10 feet. Alarm bells shall be provided with the manufacturer's recommended mounting base for the mounting location.

4. The strobes shall have a clear lens with the word "Fire" in one inch minimum height letters. The strobe intensity shall not be less than the rating identified on the contract drawings. The appliances shall be listed in accordance with U.L. 1971. The bell/strobe housing shall be painted OSHA red. Individual appliances are acceptable if mounted immediately adjacent to one another. These devices shall be factory polarized if polarization is required to operate with the Fire Alarm Control Panel. Factory mounted terminals shall be provided for external wiring connections.

5. Strobe-only appliances used for cell alarm annunciation shall have a red lens. A sign meeting Pantex Plant Manual MNL-00014, Rev. 7, (tailored to each cell) shall be installed immediately adjacent to each appliance. These strobes may be listed in accordance with U.L. 1638 in lieu of U.L. 1971.

6. Visual alarm lights (strobe type) for outdoor applications shall be 24 VDC, polarized, xenon strobe lamp, rated at 117 candela, with the word "FIRE" vertically imprinted in red on both sides of a transparent white lens. The visual alarm light shall be provided with the manufacturer's recommended mounting base for the mounting location required.

7. Visual alarm lights (strobe type) for indoor applications shall be polarized, xenon, strobe lamp, rated at the correct peak candlepower required for the application, with the word "FIRE" vertically imprinted in red on both sides of a transparent white lens. The visual alarm light shall be provided with the manufacturer's recommended mounting base for the mounting location required.

D. Manual Pull Stations

1. Existing Pyrotronics manual pull stations, if used (see Bid Alternate 2, Section 01010), shall be compatible and listed with the new FACP and meet NFPA 72 and specification requirements.

2. New manual pull stations, for use in all areas except within the cells, will be Government Furnished Equipment (GFE).

E. Waterflow Paddle Switches

1. Sprinkler waterflow alarm switches for 2- to 10-inch pipe shall be Potter Electric Signal Company Type VSR-F (or latest model) vane-type waterflow alarm switch, with two Form C single-pole, double-throw (SPDT) alarm contacts and an adjustable (approximately 0 to 90 seconds) pneumatic alarm retard to prevent false alarms due to water pressure fluctuations. The time delays shall be set by the contractor to operate upon waterflow with a time delay between 10 and 30 seconds.

F. Valve Tamper Switches

1. Valve tamper switches shall be "Potter Model PIVSU and OSYSU" or acceptable equal and shall be watertight. Two sets of SPDT contacts shall be provided. The switch shall be arranged to cause a supervisory alarm if the housing cover is removed, or if the unit is removed from its mounting.

2. The mechanism for post indicator valves shall be contained in a weatherproof die cast aluminum housing, which shall provide a 3/4 inch tapped conduit entrance and incorporate the necessary facilities for attachment to the valves.

G. Pressure Alarm Switches

1. Pressure alarm switches shall be a be "Potter Electrical Model PS10-2" or equivalent (regular hazard locations); or "Potter Electrical Model WFS-1-EX" or equivalent (Explosion Proof - for hazardous locations).

H. Fire Alarm Control Panel

1. Fire Alarm Control Panel

a. Each fire alarm control panel (FACP) shall be U.L. Listed and/or FM Approved, and designed in accordance with NFPA 72 for Protected Premises Fire Alarm Systems. The panel(s) shall be designed for surface mounting. The panel(s) components shall be assembled and (burned in) for at least 24 hours prior to attaching field circuits. The panel(s) shall have the following features:

b. The panel(s) shall be of the hard wired type.

c. The panel(s) shall be U.L. Listed for operation with the proposed initiating devices and notification appliances.

d. Primary power for the panel(s) shall be from the building's 120 vac power and be provided with a battery backup. The electrical breaker of the branch circuit supplying each FACP or supplemental power supply shall be identified by a red dot adjacent to each breaker. The panel(s) shall be provided with surge protection on the 120 vac incoming power. Equipment shall meet the requirements of ANSI C62.4.1. Upon failure of the normal power, the system shall automatically revert to the battery power without any interruption or loss of alarm, control, status or supervisory function. Operation of the system on secondary power shall be annunciated separately on the panel(s). All power for the entire system shall be derived from the panel(s).

e. The battery system shall include a charger in compliance with NFPA 72. If the charger has a fast charge mode, a visual indicator shall be provided to annunciate this condition.

f. The batteries shall be located in a separate enclosure immediately adjacent to the FACP. The batteries shall be sized to operate the system under the maximum normal load for 24 hours and then be capable of operating the system for five minutes in the alarm condition (50% of the initiating devices in alarm mode and all notification appliances operating). The system loads used to size the batteries (alarm and normal conditions) shall be a minimum of 20% above actual calculated loads. Batteries shall be sealed Lead-Acid. Battery sizes shall not exceed 150% of the calculated required size, not including the safety factor unless otherwise approved by PE/FPE.

g. The design load connected to any one power supply shall not exceed 80% of its rated capacity.

h. Upon change of state in any circuit, there shall be a visual display and audible signal at the fire alarm control panel(s) reporting the change in state.

i. An alarm acknowledge switch shall be provided so that the operator may silence the control panel(s) audible signal. Alarm silencing shall include audible and visual portions of each appliance. Activation of an initiating device after the acknowledge switch has silenced the alarms shall cause alarms to resound.

j. A "lamp test" switch shall be provided for periodic testing of all lamps in the control panel(s).

k. The panel(s) shall be capable of accepting 10% additional alarm initiating zones without providing additional internal panel hardware.

l. The panel(s) shall be of physical size to accommodate, and capable of operating additional components for 24 additional zones above the previously noted 10%.

m. Annunciation within the panel(s) shall include all zones indicated in Table

16721. The panel annunciator shall be an LED annunciator. Each zone shall have annunciation for its alarm or supervisory condition and trouble on the circuit. The label or wording shall be as outlined in Table 16721 and subject to the final review by the PE.

n. Notification Appliance Circuits (Zones) shall not be loaded beyond 75% of their rated capacity (amperage). Six additional zones shall be provided for potential future use.

o. Each initiating device zone and notification appliance zone shall be capable of being individually disabled with a supervised switch integral with the panel(s).

p. The panel(s) shall be provided with an integral DACT capable of transmitting a distinct signal for each zone (present and spare) to the Central Alarm Receiving Station.

q. The panel(s) shall supervise the all zones or points shown on the drawings or referenced in these specifications.

r. The panel(s) shall have supervised output contacts for the required external trouble horn/strobe.

s. The panel door shall be provided with a permanent nameplate identifying it as noted on the Riser Diagram. A label shall be provided on the inside of the door indicating the associated panel number and circuit breaker number.

t. The panel(s) shall be provided with 8 spare relay points. If a "slave" type panel arrangement is used, at least 4 usable relay points shall be provided for each "slave" panel.

2. Ultraviolet Flame Detectors

a. UV flame detectors shall be Det-Tronics model C7051 for use with the R7404/C7051 nuclear surveillance UV flame detector controllers. The C7051 detectors shall be equipped with DE1888G2 detector tube modules.

3. Voice Alarm System Panel

a. The voice alarm system panel shall be integral with the FACP if U.L. Listed in this arrangement. The voice alarm system in this building is an automatically activated system. The requirements for the Voice Alarm System Panel are as follows:

1) The system shall be U.L. Listed for automatic and manual operation with the proposed fire alarm system and notification appliances.

2) Primary power for the panel(s) shall be from the building's 120 vac power and be provided with a battery backup. The panel(s) shall be provided with surge protection on the 120 vac incoming power. Equipment shall meet the requirements of ANSI C62.4.1. Upon failure of the normal power, the system shall automatically revert to the

battery power without any interruption or loss of alarm, control, status or supervisory function. Operation of the system on secondary power shall be annunciated separately on the panel(s). All power for the entire system shall be derived from the panel(s).

3) The battery system shall include a charger in compliance with NFPA 72. The batteries shall be located in a separate enclosure immediately adjacent to the voice alarm panel(s). The batteries shall be sized to operate the system under the maximum normal load for 24 hours and then be capable of operating the system for two hours in the alarm condition per NFPA 72 requirements. The system loads used to size the batteries (alarm and normal conditions) shall be a minimum of 20% above actual calculated loads. Batteries shall be sealed Lead-Acid.

4) The amplifier(s) shall be sized at least 20% above the calculated power requirements.

5) Speaker circuits shall not be loaded beyond 80% of their capacity.

6) The panel(s) shall be configured to allow manual voice paging that will override the automatic message system. Manual voice paging shall also override the alarm silence switch. Manual voice paging and zone selection shall be from the panel(s).

   a) Selective paging zones shall be provided for each cell and the muster/break room area.

   b) The panel(s) shall be able to accommodate any combination of zones activated at one time up to all zones.

   c) A permanently attached microphone with a minimum of a 10 foot coiled cord shall be provided.

7) The panel door shall be provided with a permanent nameplate identifying it as noted on the Riser Diagram.

4. Cable and Connectors

a. The type of cable chosen should be based on fire alarm system requirements, specification requirements and applicable code requirements. Consideration should also be given to the length of cable runs and potential interference.

b. All wiring provided on this project shall be U.L. Listed for the intended use. All external circuitry to new and existing devices and appliances shall be new.

c. All electrical cables shall be selected for the electrical and environmental conditions of the installations and shall be of the best construction for the service where unusual service conditions are encountered. Proper temperature application cable shall be used throughout. Except where required to be otherwise to perform satisfactorily in the service, all electrical

conductors shall be solid copper, minimum 16 AWG for initiating device circuits and 14 AWG for notification appliance circuits. Wire and cable shall be sized (above minimums noted above), or twisted and shielded if recommended by the system manufacturer. Initiating, notification, and control circuits shall be sized (above minimums noted above) based on 20% additional power consuming devices.

d. General service power and control cables, integral to the equipment furnished but not internal wiring of control cabinets or panels, shall be rated for the maximum service voltage but not less than 600 volts. Power conductors and single conductor control cables shall have ethylene propylene rubber insulation with a neoprene conductor jacket and multi conductor control cables shall have flame resistant cross-linked polyethylene conductor insulation and an overall neoprene jacket or acceptable equal insulation systems.

e. Cables chosen shall be color coded to indicate the type of circuit (i.e. detector, waterflow, manual pull, telephone, bell, strobe, etc.). The color coding schedule shall be as follows:

Type of Circuit	Wire Color
Waterflow Switches	Red
Manual Pull Stations	Violet
Smoke Detectors	Blue
Heat Detectors	Blue
Duct Smoke Detectors	Blue
Supervisory Devices	Black
Notification Appliances	Yellow (+) Brown (-)
Control Circuits	White-blue
Speaker Circuits	White (+) Black (-)

f. All wiring shall be terminated at devices or panels using terminal connectors. All terminal connectors for conductors shall be pre-insulated ring type or pre-insulated spade type. Pre-insulated terminal connectors shall include a vinyl sleeve, color coded to indicate conductor size. Pre-insulated terminal connectors shall include a metallic support sleeve bonded to the vinyl insulating sleeve and designed to grip the conductor insulation.

5. Raceway

a. Unless specified otherwise, all raceway, interconnections between devices, panels, boxes, and fittings shall conform to ANSI C80.1 and U.L. 6. Existing dedicated fire alarm raceway may be used if meeting all requirements listed below.

b. The electrical conduit system shall be furnished and installed as required by the Contractor's design and the following specifications. Conduit shall include all fittings and supports and all flexible conduit and fittings. Electrical conduit and associated materials shall be metallic and conform with the

requirements of the codes and standards listed in this section.

c. Raceways and conduits shall be provided with permanent labels at every junction box cover indicating that fire alarm wiring is within. All junction box covers shall be painted red. Labels shall be subject to approval by the PE. The raceway system provided for all interconnecting wiring shall be acceptable to the PE.

d. The minimum allowable conduit size shall be ¾ inch.

6. Conduit Supports

a. Hanger rods shall be electro-galvanized all-thread steel rods.

b. Supports for conduits in single runs or groups of two shall be one-hole cast metal clamps and clamp-backs. They shall be galvanized malleable iron or acceptable equal cast ferrous metal for steel conduit.

c. Supports for banks of three or more conduits shall be constructed of support channels (Unistrut, Kindorf, or acceptable equal) with associated conduits clips. Support channels shall be steel, hot-dip galvanized after fabrication with galvanized steel conduit clips for steel conduit.

7. Fittings

a. Compression type (rain tight) fittings shall be used throughout the raceway system.

I. Electrical Enclosures

1. Electrical enclosures shall be in accordance with the applicable sections of NFPA 70, "National Electrical Code," for the intended use.

PART 3 - EXECUTION

3.1 General

A. This section covers the installation and installation material requirements for the fire alarm system.

B. The Contractor shall install, program and test all new equipment identified in this contract and revise existing equipment as noted.

C. The installation supervisor shall maintain marked up copies of the drawings at the job site showing as-built conditions. These drawings shall be updated daily and available for PE/FPE review.

D. The Contractor shall furnish and install all required conduit and all associated hardware,

and shall install (pull), connect, and test all cable for a complete fire alarm system. All wiring shall be installed in accordance with the guidelines of these specifications and documents as well as the NFPA codes and standards listed in these specifications.

E. Wiring and terminations specifically included under this section includes, but is not limited to the following:

1. Between all initiating devices, notification appliances and components supplied or noted to be reused under this section and the fire alarm control and voice alarm system panel.

2. Between all fire alarm control panels.

3. Between the waterflow switches, air pressure switches and valve tamper switches on the fire suppression systems and the fire alarm control panel(s).

4. From the FACP's DACT to the building's telephone block.

5. To other equipment controllers or panel boards for shutdown as specifically required.

6. All additional wiring required for a complete operational system, and not specifically excluded above.

F. The Contractor shall furnish and install a complete electrical cable and conduit system as outlined in these specifications for a complete operating system.

3.2 CONDUIT SYSTEM

A. All wire and cable shall be installed in conduit. Conduit installation shall be as required by the Contractor's design and as described in these specifications. All conduit field routing shall be acceptable to the PE. Routing not acceptable shall be rerouted and replaced without expense to the Owner (BWXT).

1. All wire, cable, conduit and raceways shall be concealed in walls, ceiling spaces, electrical shafts or closets in finished areas except as specifically noted otherwise. Conduit and raceways may be exposed in unfinished areas or where specifically approved by the PE.

2. Conduit shall be located at least six inches from hot water or steam pipes, and from other hot surfaces. Conduit shall not block access to any existing equipment or fixtures.

3. Sizing: Minimum allowable conduit size shall be 3/4 inch. The conduit and junction boxes shall be sized so that conduit fill does not exceed 75% of NFPA 70 maximum fill requirements.

4. Routing: Except as otherwise specified or indicated on the drawings, all conduit shall be installed parallel or perpendicular to dominant surfaces with right angle

turns made of symmetrical bends or fittings. Except where prevented by the location of other work, a single conduit or a conduit group shall be centered on structural members.

5. Penetrations: See Specification 07270.

6. Moisture Pockets: Moisture pockets shall be eliminated from conduits. If water cannot drain to the natural opening in the conduit system, a hole shall be drilled in the bottom of a pull box or a "C-type" conduit fitting provided in the low point of the conduit run.

7. Bends and Offsets: A run of conduit shall not contain more than the equivalent of four quarter bends, including those immediately at outlets or fittings. Bends in conduit shall be made without reducing the internal diameter of the conduit. The use of a pipe tee or vise for bending conduit will not be permitted. The inside radius of conduit bends shall be not less than six times the inside diameter of the conduit. Conduits deformed or crushed in any way shall not be used and removed from the job site.

8. Connections to Boxes and Cabinets: Conduit shall be securely fastened to all boxes and cabinets. Threads on metallic conduit shall project through the wall of the box to allow the bushing to butt against the end of the conduit. The locknuts both inside and outside shall then be tightened sufficiently to bond the conduit securely to the box. Conduit shall enter cabinets from the bottom and sides only.

9. Cleaning: Precautions shall be taken to prevent the accumulation of water, dirt, or concrete in the conduit. Conduit in which water or other foreign materials have been permitted to accumulate shall be thoroughly cleaned or, where such accumulation cannot be removed by methods acceptable to the PE, the conduit shall be replaced.

10. Flexible Conduit: Flexible conduit inserts shall be installed in all conduit runs which are supported by both building steel and by structures subject to vibration or thermal expansion.

    Flexible conduit shall be installed in conduit runs which cross expansion joints or which connect to building supported independent structures.

    The necessity for flexible conduit inserts shall be considered in all long conduit runs where differential expansion problems may be expected.

11. Spacing and Attachment of Supports: All conduit runs shall be rigidly supported. Each conduit shall be supported within one foot of junction boxes and fittings. Support spacing along conduit runs shall be as outlined in NFPA No. 70.

B. Cable

1. General: The type of cable chosen should be based on fire alarm system requirements and applicable code requirements. Consideration should also be given to the length of cable runs and potential interference. Splices are not permitted in field wiring except as specifically allowed.

2. Terminations: All field wiring shall terminate on terminal blocks in fire alarm panels and at field devices and appliances. Connections using wire nuts are not permitted.

3. Identification: The Contractor shall identify the ends of all circuits. The Contractor shall also identify all circuits in pull and junction boxes. A conductor identification sleeve shall be provided on each end of each internal conductor. Conductor identification shall be permanent, unaffected by heat, solvents, or steam, and not easily dislodged. Each marker shall bear the number of the circuit according to the drawings. One end of each marker shall remain free of the fastening tail, and the entire marker shall be so attached that it is readily visible for circuit identification.

3.3 EQUIPMENT LOCATIONS AND INSTALLATION

A. General

1. All equipment shall be installed in accordance with the codes and standards listed as well as the manufacturers guidelines. All initiating devices, notification appliances and any other equipment or devices located external to the fire alarm panel(s), shall be provided with typed, self adhesive labels (permanent) indicating System Type (FA) and device numbers. Text height shall be at least 1/8 inch. Labels shall not cover the component's factory identification numbers or interfere with the intended operation. All field equipment, including interface devices, initiating devices and notification appliances shall be located in compartments, enclosures or junction boxes, in such arrangement that a serviceman will have direct access to the equipment without disturbing other building equipment or utilities. NOTE: The FACP interfacing with the UV Flame Detectors shall be located in 12-44E.

B. Fire Alarm Panels / Battery Enclosure

1. The panel(s) and battery enclosures shall be surface mounted and located as noted on the fire alarm arrangement drawings. Exact locations are subject to the approval of the PE.

2. Fasteners and methods shall be suitable for the appropriate earthquake zone.

3. A 120 Vac circuit disconnect switch shall be provided and located immediately adjacent to the FACP(s). The power disconnect switch shall be as manufactured by Hubbel Incorporated, with a double pole single-throw (DPST) Toggle switch (Model 1202). The power disconnect switch shall be enclosed in a standard utility box (RACO Model 662) provided with a standard utility box switch cover (RACO Model 865). Each power disconnect switch assembly shall be provided with a Square D Manufacturing Model 2510-FL-1 (#31058-012-01) "Handle Guard Kit" to facilitate the application of a padlock for power lock-off switch protection.

C. Heat Detectors

1. Heat detectors shall be mounted in flush mounted boxes in areas with finished ceilings. Heat detectors may be surface mounted on the structure in unfinished areas. Locations and quantities shall be in accordance with NFPA 72, these specifications, contract drawings, applicable codes and the manufacturer's guidelines.

D. Valve Tamper Switches

1. Switches shall be mounted so as not to interfere with normal operation of the valve and adjusted to operate within two revolutions toward the closed position or no more than one-fifth of the distance from its normal position. The minimum groove depth and width shall be in accordance with the manufacturer's guidelines.

E. Notification Appliances

1. Notification appliances shall be located in accordance with NFPA 72 requirements. Notification appliances shall be located to meet audible the requirements of NFPA 72 for all other areas. The minimum ambient sound levels (dB) for any room shall be as follows:

   Ramps/Corridors - 65
   Cells - 65
   Break Areas/Lunch Room - 70
   Mechanical Rooms (No Chillers) - 75
   Mechanical Rooms (Chillers) - 85

2. The above sound levels are minimums only. The Contractor shall be responsible to verify actual conditions and install the correct appliances based on the findings.

3. The mandatory locations of notification appliances are shown on the contract drawings. The Contractor shall provide additional appliances, as needed, to meet NFPA 72 requirements. The appliances' exact location shall be proposed by the Contractor and are subject to the acceptance of the PE. In general, the appliances shall be located with bottoms not less than 80 inches above finished floor and no greater than 96 inches. The placement along the wall shall be chosen to provide the best field of viewing from any place within the room. The appliances shall be flush mounted in all finished spaces and in other spaces where possible. Sound levels of individual units shall be chosen to meet or exceed NFPA 72 required sound levels throughout the room or area.

4. Strobe only appliances in the corridor for annunciation of individual Cells shall have Signs in accordance with Pantex Plant Manual MNL-00014, Rev. 7, provided and attached immediately above or below.

3.4 PENETRATIONS / FIRESTOPPING

A. See Specification 07270.

3.5 DEMOLITION

A. In general, the existing fire alarm system shall remain in service as long as possible during the construction period or until the new system is completely functional and accepted. The new system shall be operating prior to moving devices from the old system to the new system.

B. Where any fire alarm initiating device is marked for deletion, the device and all wiring shall be removed. Existing conduit, including hangers, etc., shall be removed where not being reused for the new system.

C. Where devices are removed from walls or painted ceilings, holes shall be patched and walls shall be repainted to match existing (paint only area where equipment was located or where wall was damaged during removal). Where devices are removed from suspended ceilings, ceiling tiles shall be replaced with new matching tiles.

D. Abandoned penetrations shall be sealed to at least the rating of the rating of the wall or floor with a listed assembly. All assembly details shall be reviewed and approved by FPE prior to installation.

E. All components of the existing system noted to be removed or replaced shall remain the property of the Government including, but not limited to, the following:

1. ADT Unimode FACP
2. Notifier FACP ((12-R-44, Room 50)
3. Pyrotronics PXL FACP (12-R-44 Ramp)
4. Maxsys PC4020 DACT Panel (12-R-44 Ramp)
5. Remoced supervisory, alarm and notification appliances
6. Existing HADs.

F. These items shall be removed and delivered to Building 12-118, unless otherwise directed by FPE.

G. Conduit, wiring and other scrap materials removed shall be delivered to Building 10-9 unless otherwise directed by the PE.

3.6 TRAINING

A. Formal training shall be provided for the operations and maintenance staff. Training shall be conducted in the building where the system is installed (lab) and off-site (formal class) as designated by the PE. The formal training class shall be held at the Pantex Plant in a typical classroom type setting. The training for Building 12-44 shall be a minimum of two 4-hour sessions (1 class and 1 lab) and shall start after the system is functionally completed and pre-tested but prior to final acceptance tests. The instructions shall cover all of the items contained in the technician-level operating, trouble shooting and maintenance instructions.

B. Instructors for the class shall be Manufacturer certified technicians with substantial experience with the panel(s) installed. At least one instructor shall have first hand knowledge of the panel configuration at Pantex.

C. Classroom training shall include the following:

1. Theory of system operation
2. System operation, logic and control functions
3. Component operation and compatibilities
4. Review of specific system operation (building matrix)

D. One copy per attendee of operations and maintenance manuals shall be delivered to the PE ten days prior to the class. The Contractor shall provide and hand out a more general outline of class topics to all attendees (up to 40 attendees may be present).

E. Lab/on-site field training shall include the following:

1. Installed equipment locations
2. System operation (hands on)
3. Inspection and testing
4. Maintenance/troubleshooting procedures

F. The following types of personnel may attend the system training:

1. Facility division fire protection system design staff
2. Fire department staff
3. Fire protection engineering staff
4. Preventative maintenance staff (includes SMI's & Electricians)
5. Facility management

G. Certificates shall be provided to all class attendees.

3.7 SPARE PARTS

A. A list of components required for the installation of the new fire alarm system and its attachments shall be submitted to the PE with the first required project submittal. The list shall contain a unit price for each component. The PE along with FPE will determine which parts to purchase for spare stock. The spare parts will be purchased with a CCA to this contract.

B. Spare parts shall be packaged in boxes with shipping type packing and anti-static bags as applicable to the particular item. The boxes shall be labeled to note the device(s) within. Identification includes name, model number, serial number and revision number (where applicable).

C. Additional parts shall be provided to upgrade Cell 1 in the future and allow for adequate replacement of parts on the remainder of the fire alarm systems.

3.8 SYSTEM TESTS

A. General

1. This sub-section covers testing of the fire alarm systems furnished, modified, or

installed under these specifications. All defects discovered by testing shall be corrected and the systems retested.

2. All labor and equipment for testing shall be the responsibility of the Contractor.

3. The Contractor shall completely pre-test the system(s) after installation is complete and prior to the final acceptance test. The Contractor shall provide written confirmation of the results of the pre-test to the PE at least 48 hours before the final acceptance test. The Contractor shall notify the PE in writing of the proposed test date at least two weeks in advance. The test date and time is subject to the approval of the PE. Pre-testing involving notification appliances shall be coordinated with the PE.

B. Pre-Tests

1. The pre-test shall include but not be limited to the following tests:

a. The 120 vac power shall be turned off 24 hours prior to the test time. The first test will put each system into alarm for five minutes. Battery voltage and current readings shall be taken by the Contractor to verify calculations and power supply capacities. The remainder of the test shall be performed under normal power.

b. Field Wiring Tests

1) Stray Voltages. Verify that stray (unwanted) voltages that could constitute a hazard or prevent proper system operation do not exist between the installation conductors and ground or between installation conductors.

2) Ground Faults. All installation conductors other than those intentionally and permanently grounded should be tested for isolation from ground using an insulation testing device that will not damage connected equipment.

3) Short Circuit Faults. All installation conductors other than those intentionally connected together should be tested for conductor-to-conductor isolation using an insulation testing device. These same circuits should be tested conductor-to-ground, also.

4) Loop Resistance. With each initiating and indicating circuit installation conductor pair short-circuited at the far end, measure and record the resistance of each circuit. Verify that the loop resistance, voltage drop and current do not exceed the manufacturer's specified limits. Records of reading from these tests shall be submitted to the PE with a copy of the manufacturer's requirements on all data lines.

5) Normal and Alarm Mode Current Draw. The system current shall be measured in the normal mode and with 50% of the devices in alarm to confirm numbers used in battery calculations. Actual readings shall be submitted to the PE.

6) Device Test

a) Each new or modified device or appliance shall be functionally tested.

b) New or modified initiating, notification and control device circuits shall be tested to confirm their integrity under ground and short circuit conditions as required by their style.

c. Final Testing

C. Final Testing

1. The completed system shall be acceptance tested by the Contractor and witnessed by the Owner and the PE. The PE shall be notified of the test date at least 72 hours in advance. The date and time is subject to the approval of the PE. Testing shall be in accordance with all applicable building and fire codes, and the referenced NFPA codes, as well as the following specific requirements:

a. All conductor pairs shall be tested for shorts to ground and between pairs.

b. Each new or modified initiating device and notification appliance on each zone shall be tested. Transmission of all signals to the fire alarm control panel(s), Central Alarm Receiving Station and other auxiliary devices shall be verified.

c. Supervisory functions of all circuits and transmission of all fault signals to the fire alarm control panel(s) shall be verified.

d. The Contractor shall supply the PE with a written report certifying that all equipment has been inspected and tested by a manufacturer's certified representative.

e. The Contractor shall supply documentation of the test and attendance.

2. Final acceptance of the alarm system shall be based on satisfactory completion of all items listed above and trouble free operation for a period of 30 days after completion of the tests.

Submittal	Documents	Due Date
1st Submittal:	1) Contractor Qualifications	
	2) Equipment Data Sheets	
	3) Arrangement Drawings	

Submittal	Documents	Due Date
	4) Schematic Drawings	
	5) FACP Outline Drawings	
	6) FACP Fire Alarm Matrix	
	7) FACP Interconnection Diagrams	
	8) Calculations	
	9) FACP and DACT Programming Data	
	10) Certifications (Y2Km Mfgr's Rep., etc.)	
	11) Owners Manual	
2nd Submittal	1) Final Acceptance Test Procedure	
3rd Submittal	1) All As-Built Documents	

Appendix A
to 16721
Sample Acceptance Test Procedure

Initials / Date

9.2 Universal Digital Alarm Communicator Transmitter Test

NOTE: THE UDACT TESTED IN THIS SECTION IS LOCATED INSIDE THE AFP1010.

NOTE: THE NFAP INDICATIONS, THE BUILDING 1284 SPEAKER/STROBES AND BELL/STROBES WILL NOT BE VERIFIED IN THIS SECTION.

9.2.1 **DISCONNECT** the PH1 telephone line at the UDACT. 2, ____

9.2.2 **CONNECT** the PH1 telephone line to a Modapt Test Adapter and **CONNECT** the Modapt Test Adapter to the PH1 phone connection on the UDACT. 2, ____

9.2.2.1 **VERIFY** that only the POWER LED is **ON** on The UDACT. 2, ____

9.2.3 **DISCONNECT** the PH2 telephone line at the UDACT. 2, ____

9.2.4 **CONNECT** the PH2 telephone line to a Modapt Test Adapter and **CONNECT** the Modapt Test Adapter to the PH2 phone connection on the UDACT. 2, ____

9.2.4.1 **VERIFY** that only the POWER LED is **ON** on the UDACT. 2, ____

9.2.5 **MOMENTARILY PRESS** the MODE key on the UDACT. 2, ____

9.2.6 **ENTER** the code **5267** into the UDACT. 2, ____

9.2.7 **MOMENTARILY PRESS** the ENTER/STORE key on the UDACT. 2, 7-18

Initials / Date

9.2.7.1 **VERIFY** the following on the UDACT:

Verify	[✓]
• POWER LED is **ON**.	[✓]
• COMM FAIL LED is **ON**.	[✓]
• EIA-485 LED is **ON**.	[✓]
• KISS OFF LED is **ON**.	[✓]
• LED display reports **8.8.8.8.**	[✓]
• TEST LED is **ON**.	[✓]

2, ____

9.2.7.2 **VERIFY** after approximately five seconds that only the POWER LED is **ON**.

2, ____

9.2.8 **MOMENTARILY PRESS** the MODE key on the UDACT.

2, ____

9.2.9 **ENTER** the code **7764** into the UDACT.

2, ____

9.2.10 **MOMENTARILY PRESS** the ENTER/STORE key on the UDACT.

2, ____

9.2.10.1 **VERIFY** the AFP1010:

- TROUBLE/SECURITY ALARM LED is **FLASHING**. [✓]
- Tone-alert **SOUNDS** a steady tone. [✓]
- LCD reports a trouble description. [✓]

2, ____

9.2.11 **MOMENTARILY PRESS** the AFP1010 ACK STEP key.

2, ____

9.2.11.1 **VERIFY** the AFP1010:

- TROUBLE/SECURITY ALARM LED is **ON**. [✓]
- Tone-alert is **SILENT**. [✓]

2, 7-18

Initials / Date

9.2.12 **VERIFY** the number following **00** on the UDACT LED display is 7. Z /

9.2.13 **MOMENTARILY PRESS** the 5 key on the UDACT. Z /

9.2.14 **MOMENTARILY PRESS** the ENTER/STORE key on the UDACT. Z /

9.2.15 **PRESS** the 1st EVENT key twice and enter the number 26 into the UDACT. Z /

9.2.16 **MOMENTARILY PRESS** the ENTER/STORE key on the UDACT. Z /

9.2.16.1 **VERIFY** the number following 26 on the UDACT LED display is 7. Z /

9.2.17 **MOMENTARILY PRESS** the 5 key on the UDACT. Z /

9.2.18 **MOMENTARILY PRESS** the ENTER/STORE key on the UDACT. Z /

NOTE: TO DETERMINE THE NUMBER OF ATTEMPTS TO ESTABLISH COMMUNICATION WITH THE CENTRAL ALARM RECEIVING STATION IN STEP 9.2.22, BEGIN LISTENING TO THE HANDSET ATTACHED TO THE UDACT AND COUNT THE NUMBER OF DIALING ATTEMPTS. THE LAST ATTEMPT WILL BE FOLLOWED BY THE AFP1010 DISPLAYING A TROUBLE.

9.2.19 **MOMENTARILY PRESS** the MODE key on the UDACT. Z /

9.2.20 **ENTER** the code **6676** into the UDACT. Z / 7-18

Initials / Date

9.2.21 **MOMENTARILY PRESS** the ENTER/STORE key on the UDACT and activate PIV 12P-84-18 to send a supervisory condition to the UDACT

Z / ____

NOTE: THE ACK STEP KEY MAY BE PRESSED AS REQUIRED AS STEP 9.2.22 IS BEING VERIFIED.

9.2.22 **VERIFY** the UDACT makes a minimum of five attempts and no more than a maximum of 10 attempts to transmit to the Central Alarm Receiving Station.

Attempts = 10 (5 - 10) ||||

Z / ____

9.2.22.1 **VERIFY** the AFP1010:

	Verify [✓]
• TROUBLE/SECURITY ALARM LED is **FLASHING**.	[✓]
• Tone alert **SOUNDS** a steady tone.	[✓]
• LCD reports a trouble description.	[✓]

Z / ____

NOTE: THE ACKNOWLEDGE LED INDICATIONS WILL NOT BE VERIFIED FOR THE REMAINDER OF THIS SECTION.

9.2.23 **MOMENTARILY PRESS** the AFP1010 ACK STEP key.

Z / ____

9.2.24 **MOMENTARILY PRESS** the MODE key on the UDACT.

Z / ____

9.2.25 **ENTER** the code **7764** into the UDACT.

Z / ____

9.2.26 **MOMENTARILY PRESS** the ENTER/STORE key once on the UDACT.

Z / 2/6

Initials / Date

9.2.27 **MOMENTARILY PRESS** the 7 key on the UDACT. Z/___

9.2.28 **MOMENTARILY PRESS** the ENTER/STORE key on the UDACT. Z/___

9.2.29 **PRESS** the 1st EVENT key twice and enter the number 26 into the UDACT. Z/___

9.2.30 **MOMENTARILY PRESS** the ENTER/STORE key on the UDACT. Z/___

9.2.31 **MOMENTARILY PRESS** the 7 key on the UDACT. Z/___

9.2.32 **MOMENTARILY PRESS** the ENTER/STORE key on the UDACT. Z/___

9.2.33 **MOMENTARILY PRESS** the MODE key on the UDACT. Z/___

9.2.34 **ENTER** the code **6676** into the UDACT. Z/___

9.2.35 **MOMENTARILY PRESS** the ENTER/STORE key on the UDACT. Z/___

NOTE: DO NOT PERFORM STEP 9.2.36 UNTIL THE UDACTTROUBLE CONDITION HAS CLEARED.

9.2.36 **MOMENTARILY PRESS** the AFP1010 SYSTEM RESET key. Z/___

9.2.36.1 **VERIFY** the AFP1010:

Verify	[✓]
• TROUBLE/SECURITY ALARM LED is **OFF**.	[✓]
• Tone alert is **SILENT**.	[✓]
• LCD reports **ALL SYSTEMS NORMAL**.	[✓] Z/7-18

Initials / Date

9.2.37 **CONNECT** a clip-on telephone handset to the Modapt Test Adapter installed on the UDACT PH2 telephone line connection. ZT

9.2.37.1 **VERIFY** a dial tone can be heard over the telephone handset. ZT

NOTE: COMMUNICATION ESTABLISHED IN STEP 9.2.38 MUST BE MAINTAINED UNTIL THE UDACT SEIZES THE TELEPHONE LINE.

9.2.38 **DIAL** an on-site telephone number with the telephone handset and establish communication. 4464 ZT

NOTE: PREPARE TO START A STOPWATCH IN STEP 9.2.39 TO DETERMINE THE TIME FOR THE UDACT TO INDICATE THE PH1 TELEPHONE LINE FAILURE.

9.2.39 **DISCONNECT** the telephone line from the Modapt Test Adapter on the UDACT PH1 telephone line connection. **START** a stopwatch. ZT

9.2.39.1 **VERIFY** the SECONDARY ACTIVE LED on the UDACT is **ON** within 240 seconds of performing Step 9.2.39. **STOP** the stopwatch.

Time = 20 Sec
(0 - 240) ZT

9.2.39.2 **VERIFY** the AFP1010:

	Verify [✓]
• TROUBLE/SECURITY ALARM LED is **FLASHING**.	[✓]
• Tone alert **SOUNDS** a steady tone.	[✓]
• LCD reports a trouble description.	[✓] ZT 7-18

Initials / Date

9.2.39.3 **VERIFY** telephone communications established in step 9.2.37 is **DISCONNECTED.** ZT

9.2.39.4 **VERIFY** the Central Alarm Receiving Station reports the Phone Line 1 failure. ZT

9.2.40 **MOMENTARILY PRESS** the AFP1010 ACK STEP key. ZT

NOTE: THE SECONDARY ACTIVE LED WILL REMAIN ON UNTIL THE KISS-OFF LED FLASHES.

9.2.40.1 **VERIFY** the following on the UDACT:

	Verify [✓]
• SECONDARY ACTIVE LED is **OFF.**	[✓]
• KISS OFF LED **FLASHES.**	[✓]

ZT

9.2.41 **DISCONNECT** the clip-on telephone handset from the Modapt Test Adapter installed on the UDACT PH2 telephone line connection. Z/

9.2.42 **CONNECT** the lifted telephone line to the Modapt Test Adapter on the UDACT PH1 telephone line connection. Z/

NOTE: PERFORM THE FOLLOWING STEP WHEN THE UDACT CLEARS.

9.2.43 **MOMENTARILY PRESS** the AFP1010 SYSTEM RESET key. Z/18

Initials / Date

9.2.43.1 **VERIFY** the AFP1010:

Verify [✓]

- TROUBLE/SECURITY ALARM LED is **OFF**. [✓]
- Tone alert is **SILENT**. [✓]
- LCD reports **ALL SYSTEMS NORMAL**. [✓] 2 /

9.2.43.2 **VERIFY** the Central Alarm Receiving Station Phone Line 1 failure has **RESTORED**. 2 /

NOTE: THE PRIMARY ACTIVE LED MAY MOMENTARILY BE ILLUMINATED FOLLOWING STEP 9.2.43. ALLOW RE-ESTABLISHMENT OF NORMAL COMMUNICATION AND THE LED TO GO OFF BEFORE PERFORMING STEP 9.2.44.

NOTE: PREPARE TO START A STOPWATCH IN STEP 9.2.44 TO DETERMINE THE TIME FOR THE UDACT TO INDICATE THE PH2 TELEPHONE LINE FAILURE.

9.2.44 **DISCONNECT** the telephone line from the Modapt Test Adapter on the UDACT PH2 telephone line connection. **START** a stopwatch. 2 /

9.2.44.1 **VERIFY** the PRIMARY ACTIVE LED on the UDACT is **ON** within 240 seconds of performing Step 9.2.44. **STOP** the stopwatch.

Time = 121 Sec
(0 - 240)

2 / 2/8

Initials / Date

9.2.44.2 **VERIFY** the AFP1010:

Verify [✓]

- TROUBLE/SECURITY ALARM LED is **FLASHING.** [✓]
- Tone alert **SOUNDS** a steady tone. [✓]
- LCD reports a trouble description. [✓] 2 /

9.2.44.3 **VERIFY** the Central Alarm Receiving Station reports the Phone Line 2 failure. 2 /

9.2.45 **MOMENTARILY PRESS** the AFP1010 ACK STEP key. 2 /

NOTE: **THE PRIMARY ACTIVE LED WILL REMAIN ON UNTIL THE KISS-OFF LED FLASHES.**

9.2.45.1 **VERIFY** the following on the UDACT:

- PRIMARY ACTIVE LED is **OFF.** [✓]
- KISS-OFF LED **FLASHES.** [✓] 2 /

9.2.46 **CONNECT** the lifted telephone line to the Modapt Test Adapter on the PH2 telephone line connection. 2 /

9.2.46.1 **VERIFY** the AFP1010:

- TROUBLE/SECURITY ALARM LED is **OFF.** [✓]
- Tone-alert is **SILENT.** [✓]
- LCD reports **ALL SYSTEMS NORMAL.** [✓] 2 / 2/8

Initials / Date

9.2.46.2 **VERIFY** the Central Alarm Receiving Station Phone Line 2 failure has **RESTORED**. Z /

9.2.47 **CONNECT** a clip-on telephone handset to the Modapt Test Adapter installed on the PH1 telephone line connection of the UDACT. Z /

9.2.47.1 **VERIFY** a dial tone can be heard over the telephone handset. Z /

NOTE: COMMUNICATION ESTABLISHED IN STEP 9.2.48 MUST BE MAINTAINED UNTIL THE UDACT SIEZES THE LINE (0 TO 90 SEC).

9.2.48 **DIAL** an on-site telephone number with the telephone handset and establish communication. Z /

NOTE: PREPARE TO START A STOPWATCH IN STEP 9.2.49 TO DETERMINE THE TIME FOR AN ALARM TO BE TRANSMITTED TO THE CENTRAL ALARM RECEIVING STATION.

9.2.49 **MOMENTARILY JUMPER** the System 5000 NFAP IZM-8 Row 1 Card B (Bay 9 ERR) terminal points 5 & 6. Z /

9.2.49.1 **VERIFY** the PRIMARY ACTIVE LED is **ON.** Z /

9.2.49.2 **VERIFY** the Central Alarm Receiving Station reports the ALARM message in Attachment 2 within 90 seconds of establishing the alarm condition in Step 9.2.49. **STOP** the stopwatch.

Time = 42 seconds
(0 - 90)

Z / Z

Initials / Date

9.2.49.3 **VERIFY** telephone communications established in step 9.2.48 is **DISCONNECTED.** 2/

NOTE: **THE PRIMARY ACTIVE LED WILL REMAIN ON UNTIL THE KISS OFF LED FLASHES.**

9.2.49.4 **VERIFY** the following on the UDACT:

	Verify [✓]
• KISS OFF LED **FLASHES.**	[4
• PRIMARY ACTIVE LED **OFF.**	[4 2/

9.2.49.5 **VERIFY** the AFP1010:

• FIRE ALARM LED is **FLASHING.**	[4
• Tone alert **SOUNDS** a pulsing tone.	[4 2/

Ack step

9.2.50 **MOMENTARILY PRESS** the SIGNAL SILENCE key. 2/

9.2.50.1 **VERIFY** the building 1284 speaker/strobes are **SILENT/~~ON~~**: OFF 2/

9.2.50.2 **VERIFY** the building 1284 bell/strobes are **SILENT/OFF.** 2/

9.2.50.3 **VERIFY** the AFP1010:

• SIGNAL SILENCE LED is **ON.**	[4
• Tone alert is **SILENT.**	[4 2/

9.2.51 **MOMENTARILY PRESS** the AFP1010 ACK STEP key. 2/

9.2.52 **DISCONNECT** the clip-on telephone handset from the Modapt Test Adapter installed on the UDACT PH1 telephone line connection. 2/7-18

Initials / Date

NOTE: PERFORM THE FOLLOWING STEP WHEN THE UDACT CLEARS.

9.2.53 **MOMENTARILY PRESS** the AFP1010 SYSTEM RESET key. 2 1

9.2.53.1 **VERIFY** the AFP1010:

Verify	[✓]
• FIRE ALARM LED is **OFF**.	[ ]
• SIGNAL SILENCE LED is **OFF**.	[ ]
• LCD reports **ALL SYSTEMS NORMAL**.	[ ] 2 1

9.2.53.2 **VERIFY** the System 5000 NFAP:

• Only the AC POWER LED is **ON**.	[ ]
• Tone alert is **SILENT**.	[ ] 2

9.2.53.3 **VERIFY** the building 1284 speaker/strobes are **OFF**. 2 1

9.2.53.4 **VERIFY** the Central Alarm Receiving Station ALARM message has **RESTORED**. 2 1

9.2.54 **DISCONNECT** the PH1 telephone line from the Modapt Test Adapter and **DISCONNECT** the Modapt Test Adapter from the PH1 phone connection on The UDACT. 2 1

9.2.55 **DISCONNECT** the PH2 telephone line from the Modapt Test Adapter and **DISCONNECT** the Modapt Test Adapter from the PH2 phone connection on the UDACT. 2 1 7-18

Initials / Date

9.2.55.1 **VERIFY** the AFP1010:

Verify [✓]

- TROUBLE /SECURITY ALARM LED is **FLASHING.** [✓]
- Tone-alert **SOUNDS** a steady tone. [✓]
- LCD reports trouble description. [✓]
- Trouble horn/strobe is **SOUNDING/FLASHING.** [✓] 2/___

9.2.56 **MOMENTARILY PRESS** the AFP1010 ACK STEP key. 2/___

9.2.56.1 **VERIFY** the AFP1010:

- TROUBLE/SECURITY ALARM LED is **ON.** [✓]
- Tone-alert is **SILENT.** [✓] 2/___

9.2.57 **CONNECT** the primary telephone line to the UDACT PH1 telephone line connection. 2/___

9.2.58 **CONNECT** the secondary telephone line to the UDACT PH2 telephone line connection. 2/___

9.2.59 **RESET** the AFP 1010 after the UDACT has cleared. 2/___

9.2.59.1 **VERIFY** the AFP1010:

- TROUBLE /SECURITY ALARM LED is **OFF.** [✓]
- Tone-alert is **SILENT.** [✓]
- LCD reports **ALL SYSTEMS NORMAL.** [✓] 2/___

9.2.59.2 **VERIFY** that only the POWER LED is **ON** on the UDACT. 2/2/18

Initials / Date

9.3 Audio/Message Test

NOTE: THE SFAP AND NFAP INDICATIONS WILL NOT BE VERIFIED IN THIS SECTION.

9.3.1 **REMOVE** power from the AFP1010 South Audio Panel AA-120 to simulate failure. Z

9.3.1.1 **VERIFY** the AFP1010:

	Verify [✓]
• TROUBLE/SECURITY ALARM LED is **FLASHING**.	[✓]
• AA-120 Amplifier (South Audio Panel) Trouble LED is **ON**.	[✓]
• AA-120 (South Audio Panel) Input Trouble LED is **ON**.	[✓]
• Tone-alert **SOUNDS** a steady tone.	[✓]
• LCD reports trouble description (module failure). point trouble	[✓] Z

9.3.1.2 **VERIFY** the Central Alarm Receiving Station reports a TROUBLE message for Building 1284. Z

9.3.2 **RESTORE** power to the AFP1010 South Audio Panel AA-120. Z

9.3.2.1 **MOMENTARILY PRESS** the AFP1010 SYSTEM RESET key. Z, 7-17

Initials / Date

9.3.2.2 **VERIFY** the AFP1010:

Verify	[✓]
• TROUBLE /SECURITY ALARM LED is **OFF**.	[ ]
• AA-120 (South Audio Panel) Amplifier Trouble LED is **OFF**.	[ ]
• AA-120 (South Audio Panel) Input Trouble LED is **OFF**.	[ ]
• Tone-alert is **SILENT**.	[ ]
• LCD reports **ALL SYSTEMS NORMAL**.	[ ]

2

9.3.2.3 **VERIFY** the Central Alarm Receiving Station TROUBLE message for Building 1284 has **RESTORED**.

2

9.3.3 **REMOVE** power from the AFP1010 North Audio Panel AA-120 to simulate failure.

2

9.3.3.1 **VERIFY** the AFP1010:

• TROUBLE/SECURITY ALARM LED is **FLASHING**.	[ ]
• AA-120 (North Audio Panel) Amplifier Trouble LED is **ON**.	[ ]
• AA-120 (North Audio Panel) Input Trouble LED is **ON**.	[ ]
• Tone-alert **SOUNDS** a steady tone.	[ ]
• LCD reports trouble description (module failure).	[ ]

2

9.3.3.2 **VERIFY** the Central Alarm Receiving Station reports a TROUBLE message for Building 1284.

2

9.3.4 **RESTORE** power to the AFP1010 North Audio Panel AA-120.

2, 7-17

Initials / Date

9.3.4.1 **MOMENTARILY PRESS** the AFP1010 SYSTEM RESET key. Z

9.3.4.2 **VERIFY** the AFP1010:

	Verify [✓]
• TROUBLE /SECURITY ALARM LED is **OFF**.	[ ]
• AA-120 (North Audio Panel) Amplifier Trouble LED is **OFF**.	[ ]
• AA-120 (North Audio Panel) Input Trouble LED is **OFF**.	[ ]
• Tone-alert is **SILENT**.	[ ]
• LCD reports **ALL SYSTEMS NORMAL**.	[ ]

Z/

9.3.4.3 **VERIFY** the Central Alarm Receiving Station TROUBLE message for Building 1284 has **RESTORED**. Z

9.3.5 **PRESS** and **HOLD** the AFP1010 ACM-16AT (1) LOCAL SILENCE /ACKNOWLEDGE key. Z/

9.3.5.1 **VERIFY** all the AFP1010 ACM-16AT (1) LEDs are **ON** and the On Line LED is **FLASHING.** Z

9.3.6 **RELEASE** the AFP1010 ACM-16AT (1) LOCAL SILENCE /ACKNOWLEDGE key. Z/

9.3.6.1 **VERIFY** only the AFP1010 ACM-16AT (1) On Line LED is **FLASHING**. Z/

9.3.7 **PRESS** and **HOLD** the AFP1010 ACM-16AT (2) LOCAL SILENCE /ACKNOWLEDGE key. Z/

9.3.7.1 **VERIFY** all the AFP1010 ACM-16AT (2) LEDs are **ON** and the On Line LED is **FLASHING.** Z/7-18

Initials / Date

9.3.8 **RELEASE** the AFP1010 ACM-16AT (2) LOCAL SILENCE /ACKNOWLEDGE key. 2/

9.3.8.1 **VERIFY** only the AFP1010 ACM-16AT (2) On Line LED is **FLASHING**. 2/

9.3.9 **MOMENTARILY JUMPER** the System 5000 NFAP IZM-8 Row 1 Card B (Bay 9 Wet Pipe Water Flow Switch) terminal points 1 & 2. 2/

9.3.9.1 **VERIFY** the AFP1010:

Verify	[✓]
• FIRE ALARM LED is **FLASHING**.	[ ]
• All ACM-16AT Red LED are **ON**.	[ ]
• Tone-alert **SOUNDS** a pulsing tone.	[ ]
• LCD reports the ALARM message in Attachment 2.	[ ] 2/7-15

9.3.9.2 **VERIFY** the Speaker/Strobes **MESSAGE** and **VOICE CLARITY**:

• Bay 9 10091.1 **SOUNDING EVACUATE MESSAGE.**	[ ]
• Bay 9 10091.2 **SOUNDING EVACUATE MESSAGE.**	[ ]
• Bay 10 10101.1 **SOUNDING STAY IN PLACE MESSAGE.**	[ ]
• Bay 10 10101.2 **SOUNDING STAY IN PLACE MESSAGE.**	[ ]
• Bay 10 10101.3 **SOUNDING STAY IN PLACE MESSAGE.**	[ ]
• Bay 10 10101.4 **SOUNDING STAY IN PLACE MESSAGE.**	[ ]

Initials / Date

9.3.9.2 (Cont'd)

Verify [✓]

- Bay 10 10101.5 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 11 10111.1 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 11 10111.2 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 12 10121.1 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 12 10121.2 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 13 10131.1 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 13 10131.2 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 14 10141.1 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 14 10141.2 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 15 10151.1 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 15 10151.2 **SOUNDING STAY IN PLACE MESSAGE.** [ ]
- Bay 16 10161.1 **SOUNDING STAY IN PLACE MESSAGE.** [ ]

Initials / Date

9.3.9.2 (Cont'd)

Verify [✓]

- Bay 16 10161.2 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Bay 17 10171.1 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Bay 17 10171.2 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Bay 18 10181.1 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Bay 18 10181.2 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Bay 19 10191.1 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Bay 19 10191.2 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Bay 20 10201.1 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Bay 20 10201.2 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- DCR Room 10011.1 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Muster Station 10003.1 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Muster Station 10003.2 **SOUNDING STAY IN PLACE MESSAGE.** [✓]

Initials / Date

9.3.9.2 (Cont'd)

Verify [✓]

- Muster Station 10003.3 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Muster Station 10003.4 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Muster Station 10003.5 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Muster Station 10003.6 **SOUNDING STAY IN PLACE MESSAGE.** [✓]
- Muster Station 10003.7 **SOUNDING STAY IN PLACE MESSAGE.** [✓] N/___

9.3.10 **KEY** the AFP1010 AMG-1 microphone and begin live audio voice announcement. 2/178

9.3.10.1 **VERIFY** the Speakers:

Verify [✓]

- Bay 9 10091.1 **SOUNDING EVACUATE MESSAGE.** [✓]
- Bay 9 10091.2 **SOUNDING EVACUATE MESSAGE.** [✓]
- Bay 10 10101.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 10 10101.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 10 10101.3 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]

Initials / Date

9.3.10.1 (Cont'd)

Verify [✓]

- Bay 10 10101.4 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 10 10101.5 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 11 10111.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 11 10111.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 12 10121.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 12 10121.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 13 10131.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 13 10131.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 14 10141.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 14 10141.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 15 10151.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 15 10151.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [ ] ✓

Initials / Date

9.3.10.1 (Cont'd)

Verify [✓]

- Bay 16 10161.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 16 10161.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 17 10171.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 17 10171.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 18 10181.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 18 10181.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 19 10191.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 19 10191.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 20 10201.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Bay 20 10201.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- DCR Room 10011.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Muster Station 10003.1 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]

Initials / Date

9.3.10.1 (Cont'd)

Verify [✓]

- Muster Station 10003.2 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Muster Station 10003.3 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Muster Station 10003.4 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Muster Station 10003.5 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Muster Station 10003.6 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓]
- Muster Station 10003.7 **SOUNDING LIVE AUDIO VOICE MESSAGE.** [✓] 7/1

NOTE: THE AFP1010 ACKNOWLEDGE LED INDICATIONS ARE VERIFIED IN SECTION 9.2 AND WILL NOT BE VERIFIED IN THIS SECTION.

9.3.11 **MOMENTARILY PRESS** the AFP1010 ACK STEP key. 7/1

NOTE: THE AFP1010 SIGNAL SILENCE LED INDICATIONS ARE VERIFIED IN SECTION 9.2 AND WILL NOT BE VERIFIED IN THIS SECTION.

9.3.12 **MOMENTARILY PRESS** the AFP1010 SIGNAL SILENCE key. 7/1

Initials / Date

9.3.12.1 **VERIFY** the Speaker/Strobes are **SILENT/OFF**:

	Verify [✓]
• Bay 9 (2 devices).	[✓]
• Bay 10 (5 devices total, 1 speaker only).	[✓]
• Bay 11 (2 devices).	[✓]
• Bay 12 (2 devices).	[✓]
• Bay 13 (2 devices).	[✓]
• Bay 14 (2 devices).	[✓]
• Bay 15 (2 devices).	[✓]
• Bay 16 (2 devices).	[✓]
• Bay 17 (2 devices).	[✓]
• Bay 18 (2 devices).	[✓]
• Bay 19(2 devices).	[✓]
• Bay 20 (2 devices).	[✓]
• DCR Room (1 device).	[✓]
• Muster Station (7 devices total, 2 speaker only).	[✓]

2/1

9.3.13 **MOMENTARILY PRESS** the All Call Key.

2/1

9.3.14 **KEY** the AFP1010 AMG-1 microphone and begin live audio voice announcement.

2/1

9.3.14.1 **VERIFY** the Speakers:

	Verify [✓]
• Bay 9 10091.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.**	[✓]
• Bay 9 10091.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.**	[✓]
• Bay 10 10101.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.**	[✓]
• Bay 10 10101.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.**	[✓]

Initials / Date

9.3.14.1 (Cont'd)

Verify [✓]

- Bay 10 10101.3 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 10 10101.4 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 10 10101.5 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 11 10111.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 11 10111.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 12 10121.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 12 10121.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 13 10131.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 13 10131.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 14 10141.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 14 10141.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]
- Bay 15 10151.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [ ]

Initials / Date

9.3.14.1 (Cont'd)

Verify [✓]

- Bay 15 10151.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Bay 16 10161.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Bay 16 10161.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Bay 17 10171.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Bay 17 10171.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Bay 18 10181.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Bay 18 10181.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Bay 19 10191.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Bay 19 10191.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Bay 20 10201.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Bay 20 10201.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- DCR Room 10011.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]

Initials / Date

9.3.14.1 (Cont'd)

Verify [✓]

- Muster Station 10003.1 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Muster Station 10003.2 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Muster Station 10003.3 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Muster Station 10003.4 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Muster Station 10003.5 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Muster Station 10003.6 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓]
- Muster Station 10003.7 **SOUNDING LIVE AUDIO VOICE ANNOUNCEMENT.** [✓] 2,

9.3.15 **MOMENTARILY PRESS** the All Call Key. 2,

9.3.16 **MOMENTARILY PRESS** the AFP1010 SYSTEM RESET key. 2,

9.3.16.1 **VERIFY** the AFP1010:

- TROUBLE/SECURITY ALARM LED is **OFF**. [✓]
- FIRE ALARM LED is **OFF**. [✓]
- SIGNAL SILENCE LED is **OFF**. [✓]
- LCD reports **ALL SYSTEMS NORMAL**. [✓] 2, 7/8

Initials / Date

9.3.16.2 **VERIFY** the Speaker/Strobes are **SILENT/OFF**:

	Verify [✓]
• Bay 9 (2 devices).	[✓]
• Bay 10 (5 devices total, 1 speaker only).	[✓]
• Bay 11 (2 devices).	[✓]
• Bay 12 (2 devices).	[✓]
• Bay 13 (2 devices).	[✓]
• Bay 14 (2 devices).	[✓]
• Bay 15 (2 devices).	[✓]
• Bay 16 (2 devices).	[✓]
• Bay 17 (2 devices).	[✓]
• Bay 18 (2 devices).	[✓]
• Bay 19(2 devices).	[✓]
• Bay 20 (2 devices).	[✓]
• DCR Room (1 device).	[✓]
• Muster Station (7 devices total, 2 speaker only).	[✓] 2, 1-18

END OF SECTION 16721

NOTE TO READER:

Drawings that normally would accompany this document are being drafted and will be included at a later date.