

Figure Appendix 8-1-8. Baseplate Layout (Sheet 3 of 3)

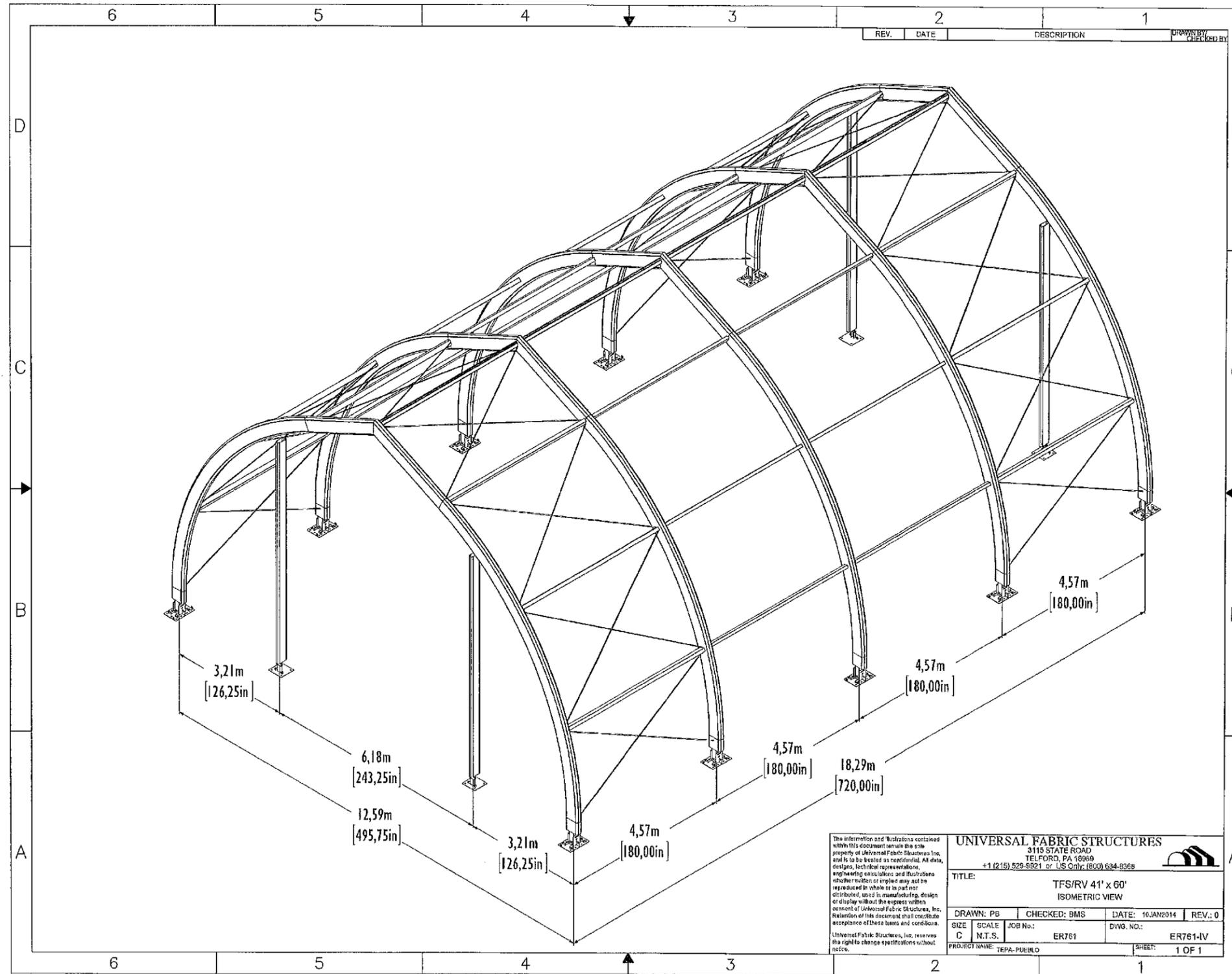


Figure Appendix 8-1-9. Isometric View

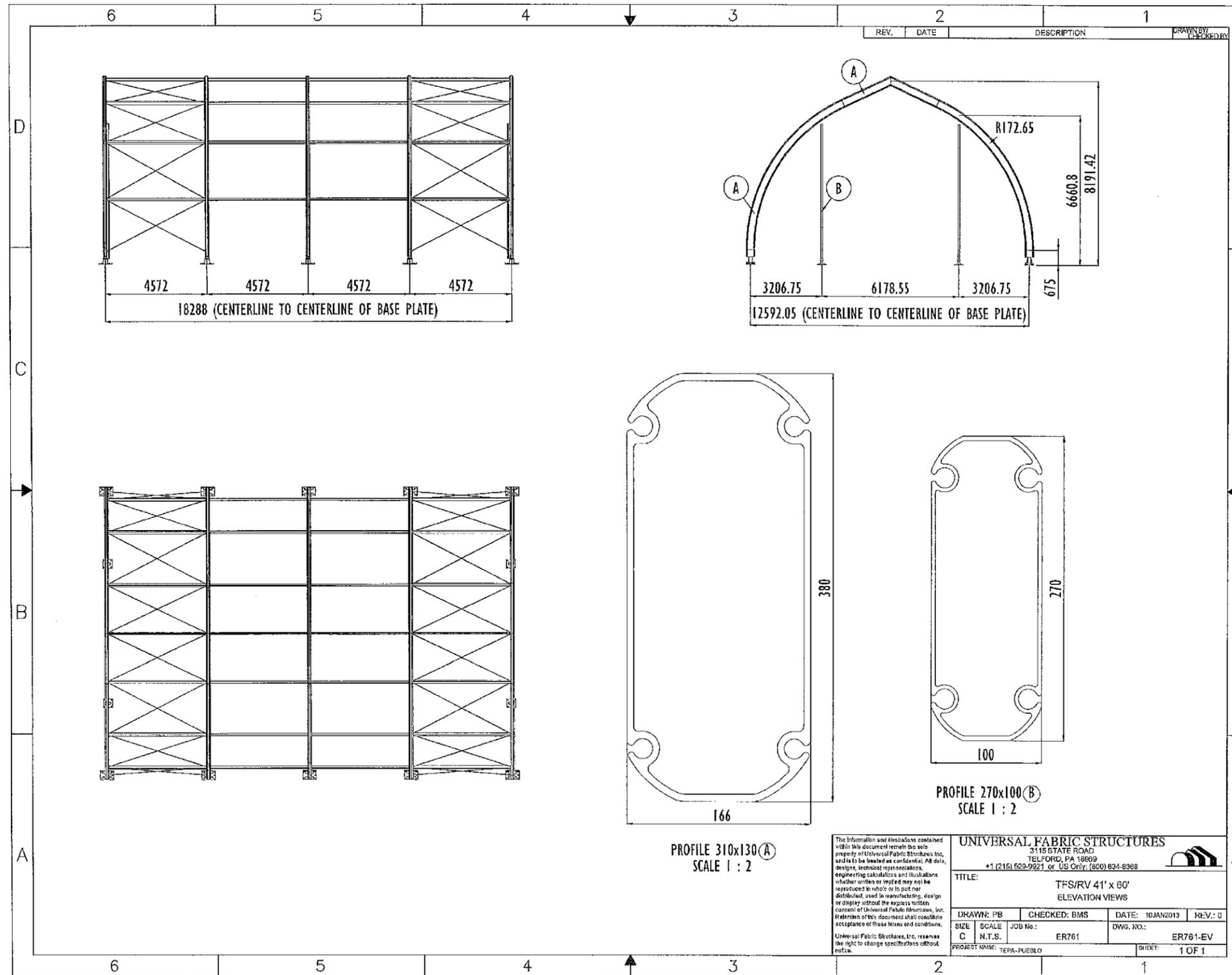


Figure Appendix 8-1-10. Elevation Views

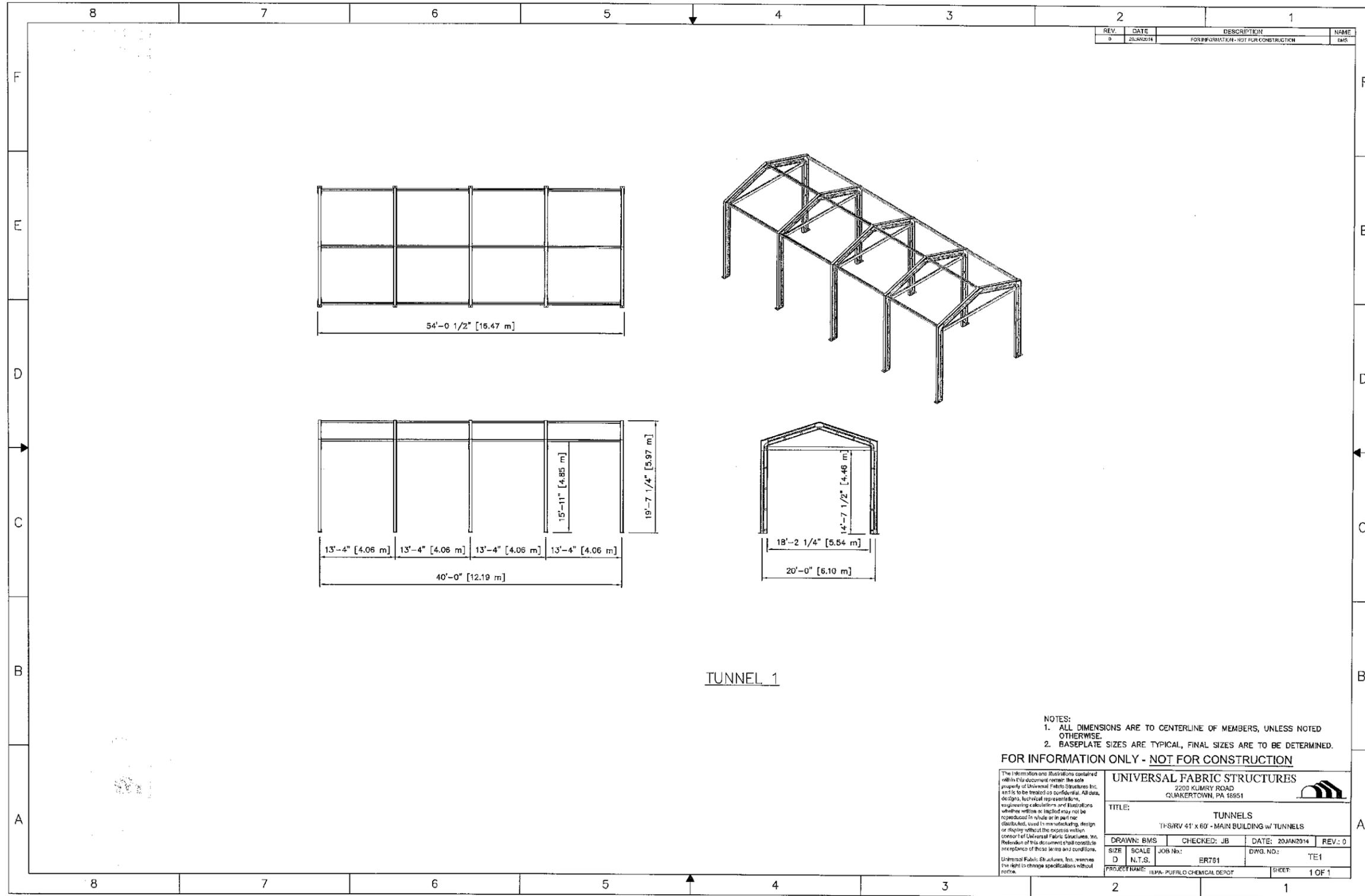


Figure Appendix 8-1-11. Tunnels

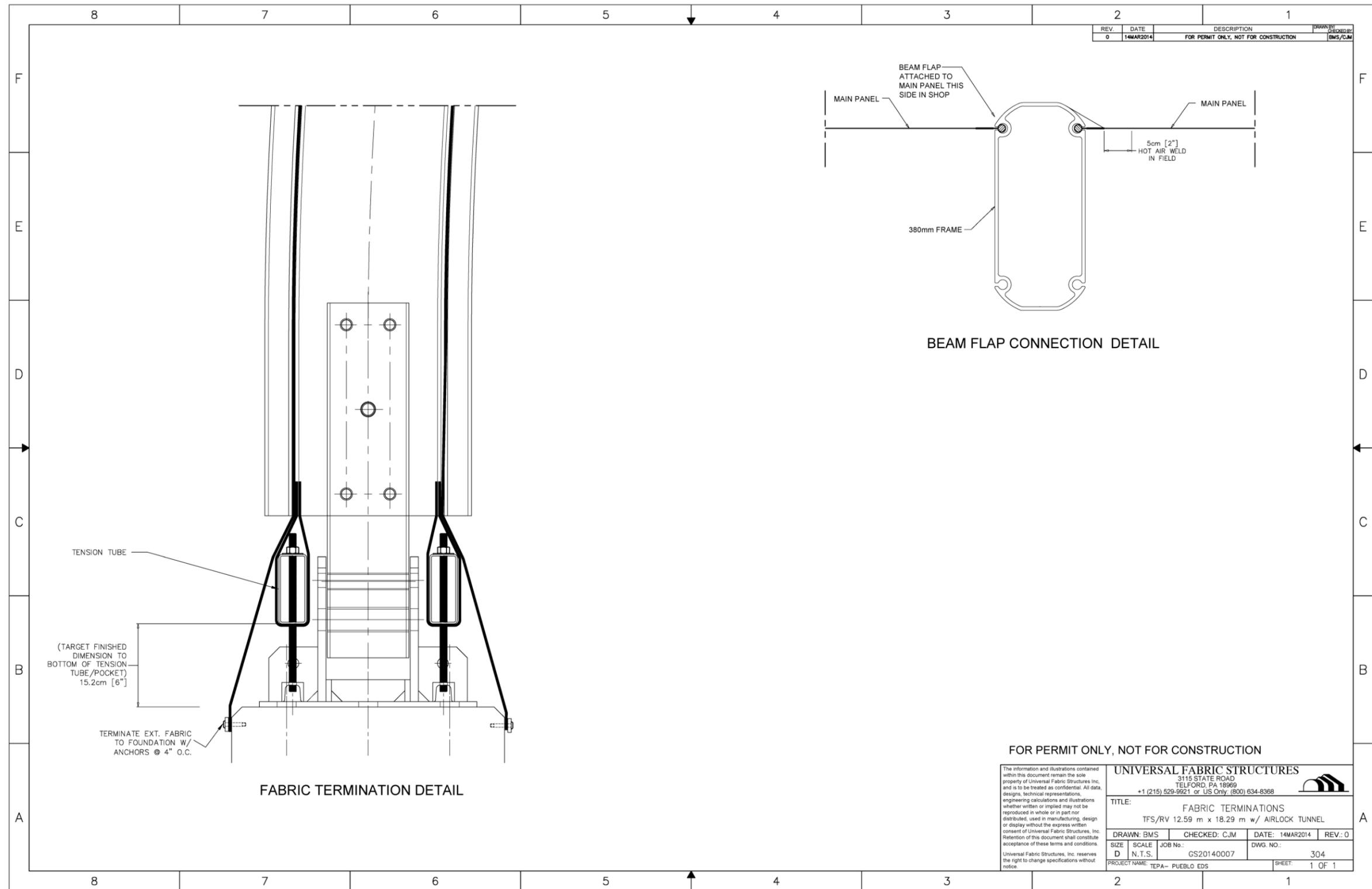


Figure Appendix 8-1-12. Fabric Terminations

Each HEGA filter bank contains nine ASTM Type IV cells. Each cell contains 16 or 18 inches of SIC. The HEGA filters are replaced when carbon filter performance deteriorates to the point where chemical agent breakthrough of the carbon bed occurs. MINICAMS[®] are used to monitor the concentration between the two HEGA banks and will detect chemical breakthrough. If detection is confirmed, the operation will be brought to a safe shutdown state. The first carbon filter will be removed and disposed of, the second carbon filter will be moved to the first, and new carbon will be added to the second filter. Upon completion, all filters will be leak checked and monitoring capabilities restored before operations resume.

All filters (prefilter, HEPA, HEGA) are of the bag in/bag out type, which allows filters to be replaced from the exterior of the filter housing without exposing personnel to the contents of the spent filters. Plastic bags surrounding the access openings encapsulate the filters prior to removal.

The AFS carbon filter banks will be leak-tested according to the schedule and methodology outlined in **Appendix 8-4**, EDS Air Filtration System Carbon Filter Performance. Midbed agent monitoring and carbon changeout will be performed as stipulated in **Appendix 8-4**, EDS Air Filtration System Carbon Filter Performance.

Cascading Ventilation System

The Cascading Ventilation System is used to maintain the Environmental Enclosure at a negative pressure during chemical agent operations and also to provide a conditioned air space for operator safety and comfort. The Cascading Ventilation System major equipment consists of the AFS, the Environmental Enclosure Heating/Cooling supply unit, the PDS Heating/Cooling supply unit, airflow control dampers, and Environmental Enclosure pressure sensor.

The AFS is used to maintain a negative pressure in the Environmental Enclosure, PDS and associated airlocks, and to capture agent vapors that may result from handling and treatment operations. The AFS fans are sized to maintain the Environmental Enclosure at sufficient negative pressure relative to the outside air to ensure airflow is always moving from outside, in through the PDS and associated airlocks, into the Environmental Enclosure, and then out the AFS.

A volume control damper is installed in each PDS door wall and associated airlock door wall. Each damper is adjusted during initial system air balancing to ensure that, when working in conjunction with the negative pressure in the Environmental Enclosure, proper air exchange in each area is maintained.

Negative pressure within the Environmental Enclosure is measured using a pressure sensor. The sensor provides a readout and alarms to alert operators in the event the negative pressure deviates from the normal acceptable value. Monitoring and maintenance of the pressure sensor and alarm will be part of the Operating Record.

The acceptable negative pressure value is 0.25 inch water gauge.

2.3 Utility Systems Including Lighting, Water, Station and Instrument Air, and Breathing Air

Overhead lighting will be provided throughout each Environmental Enclosure. Water from a potable water supply line will be provided for processing, eyewash stations, and decontamination. Station and instrument air will be available for operation of air-operated process equipment and maintenance tools. Breathing air for emergency operations will be provided from a cascading air system.

2.4 Miscellaneous Structures, Equipment, and Areas

Cascading Air System

The Cascading Air System provides supplied breathing air to EDS operators when operations require escalation of personal protective equipment (PPE) to either Level A or B protection. Air is supplied from a main line to a manifold located within the Environmental Enclosure where each operator connects an individual line.

Monitoring Module

Monitoring equipment will be housed in a module for each Environmental Enclosure unit at the PCAPP EDS site. Sampling lines from the monitoring equipment will be installed to each sampling point for each EDS unit. All critical near real-time (NRT) monitoring equipment will be connected to an uninterruptible power supply.

PCAPP EDS Command Post

An operational Command Post will be located at the PCAPP EDS site outside the Chemical Limited Area (CLA) and will be equipped with the necessary computers and communications equipment to assist with the command and control of operations and collection of data for operations.

Explosive Storage Magazines

Two explosive storage magazines will be located on the PCAPP EDS site to store explosives used to access the items being treated in an EDS unit. Explosives will be transferred to each EDS unit as needed, on a daily basis.

The explosive storage magazines will be ATF Type 2 (Outdoor) units measuring 66 inches long x 84 inches wide by 84 inches high and meet the design and construction for storage per Army Regulation (AR) 190-11, Department of Defense (DoD) 5100.76M, Title 27 Code of Federal Regulations (CFR), Subpart K, Paragraph 555.208 Type 2 Magazine, and Code of Colorado Regulations (7 CCR 1101-9) for Type 2 storage magazine. Each magazine is bullet-resistant, fire-resistant, weather-resistant, and theft-resistant, ventilated, and weighs approximately 5,670 pounds. The magazines will be mounted on 4-inch channel skids equipped with seismic anchor plates and will be placed on concrete pads to prevent direct contact with the ground. The ground around each magazine will slope away for drainage. A grounding system for lightning protection will be attached to each magazine that meets the specification in Department of the Army Pamphlet (DA Pam) 385-64 and NFPA 780.

The exterior construction will be a minimum of 1/4-inch carbon steel for the exterior and door, and will be covered with a weather-resistant coating comprising acrylic enamel over rust inhibiting epoxy primer. Each magazine door will be equipped with two padlocks fastened in separate hasps. The locks will have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. The roof will be sloped 1 inch for water runoff with a screened top vent to prevent water from entering and insects and wildlife from nesting. There will be a 3/4-inch sealable pass-through for electrical. The interior will be lined with non-sparking material.

Figure Appendix 8-1-13 shows an exterior view of an explosives storage magazine. **Figure Appendix 8-1-14** shows the explosive arc relationships associated with the PCAPP EDS site operations in conjunction with the CLA and PCAPP storage operations. Note that the requirements and actuals as to

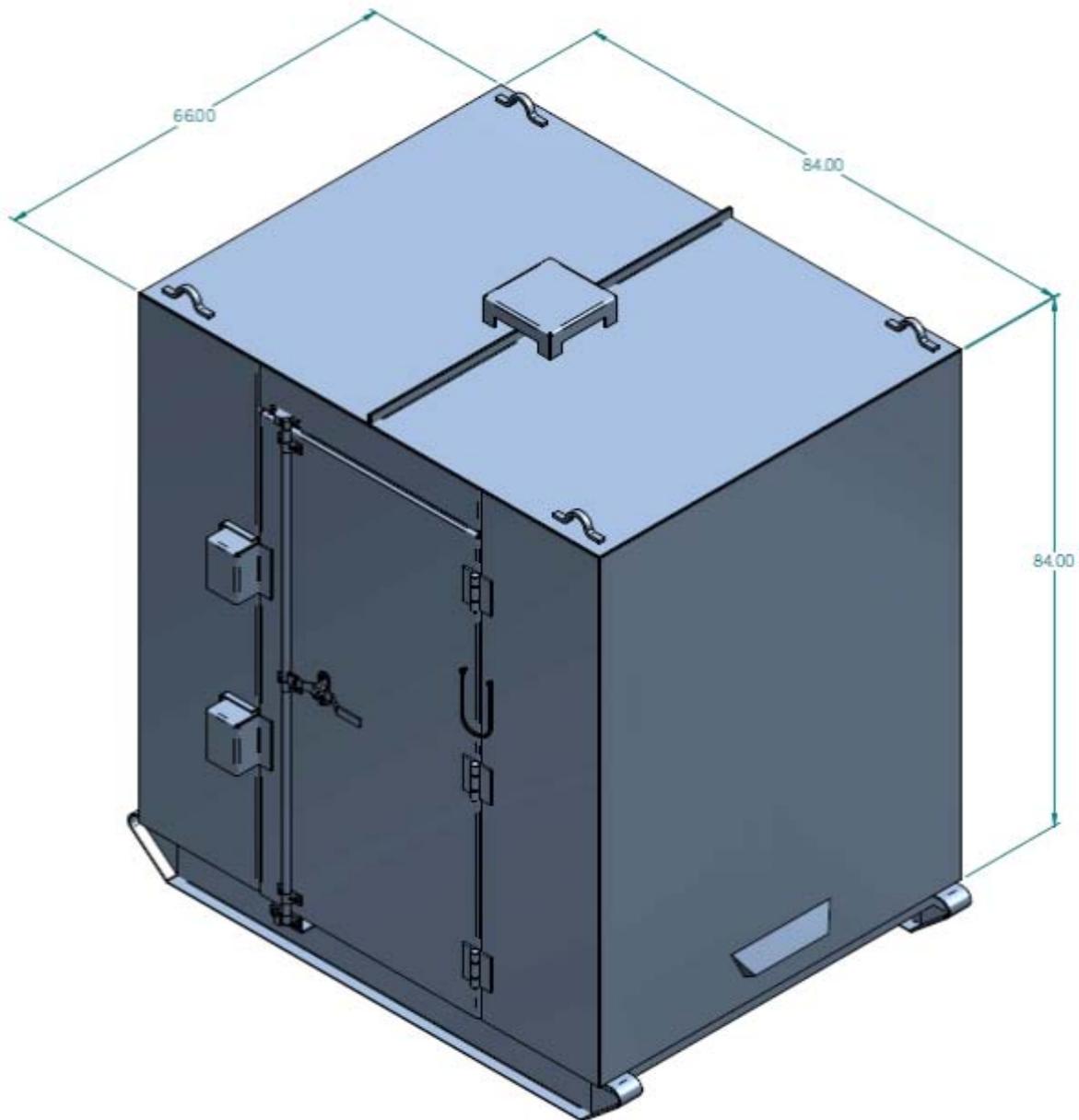


Figure Appendix 8-1-13. Explosive Storage Magazine

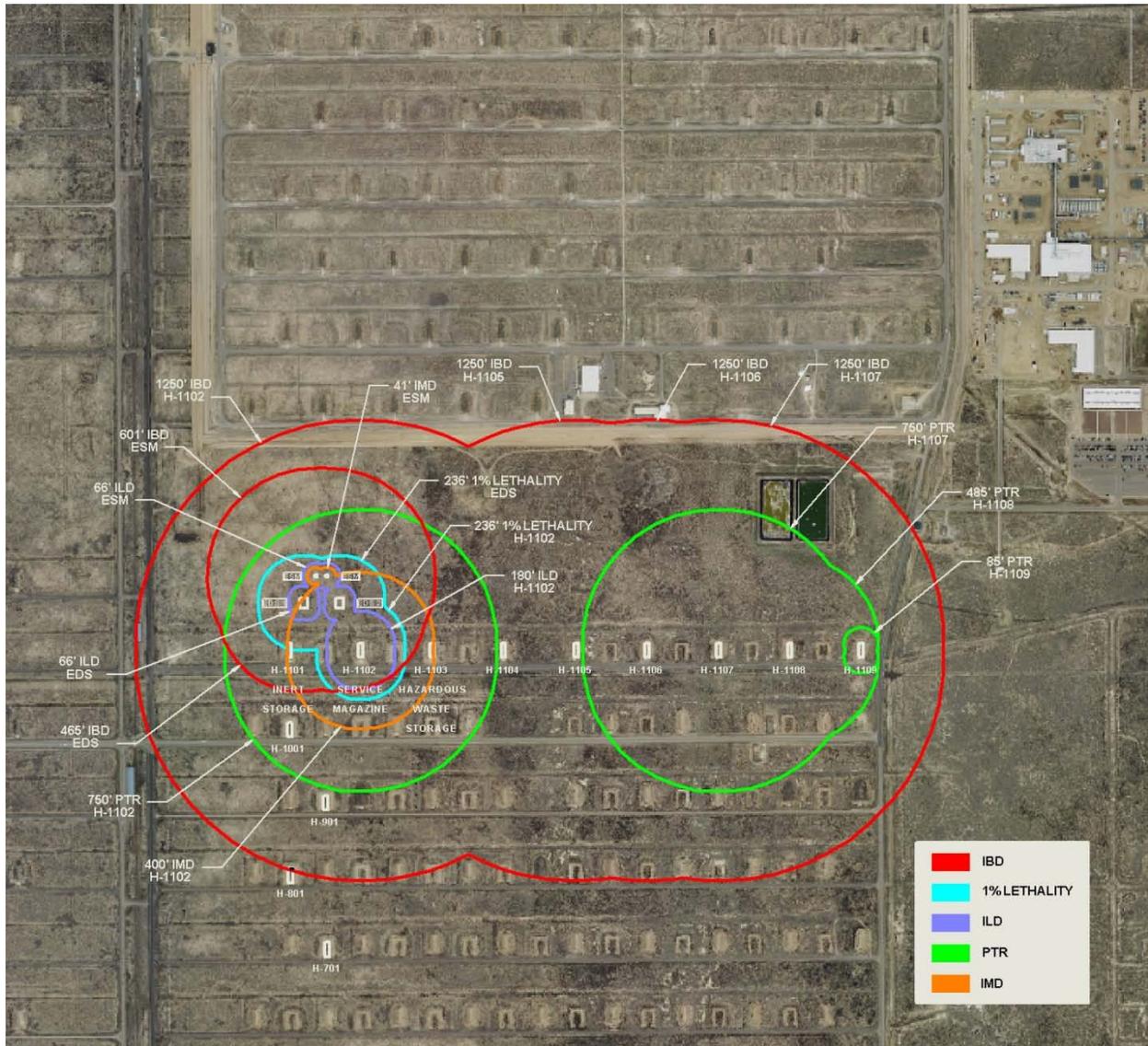


Figure Appendix 8-1-14. Explosive Arc Relationships

quantity-distance relationships and net explosive weight limits are provided and approved by Department of Defense Explosives Safety Board (DDESB) for this site. **Table Appendix 8-1-3** provides the explosive storage limits and required distances for the explosive storage magazines.

Personnel Decontamination Stations

A PDS for each EDS unit will be set up at the south end of each Environmental Enclosure in accordance with the site-specific Health and Safety Plan for personnel to decontaminate PPE and equipment when leaving the exclusion zone of each operation.

PPE Change Area

Facilities will be provided for personnel to don/doff PPE while passing through the PDS.

Change House

A change house will be provided within the CLA of the PCAPP EDS site for personnel.

Toilet Facilities

Toilets will be available onsite for site personnel.

General Storage Facility

The PCAPP EDS site will have a general storage facility (i.e., Igloo H1101) that provides general storage for equipment, items, and treatment chemicals during operations.

Loading/Unloading Area

A loading/unloading area will be established at the north entrance of each Environmental Enclosure where supplies, items to be processed, and waste containers will be loaded and unloaded.

Table Appendix 8-1-3. Explosive Storage Magazine Storage Limits and Required Distances

PES	Type Distance	Nearest ES for Type Distance (feet)	Actual Distance (feet)	Required Distance (feet)	PES Net Explosive Weight Limits (lbs)			
					1.1	1.2.2 ^a	1.3 ^a	1.4
ESM 1	IBD	None at $\leq 1,250$	$> 1,250$	601	50	None	None	MEQ
	PTRD	None at ≤ 750	> 750	361	50	None	None	MEQ
	ILD	EDS 1	130	66	50	None	None	MEQ
	IMD	ESM 2	50	41	50	None	None	MEQ
	Net Explosive Weight Limits for this ESM 1					50	None	None
ESM 2	IBD	None at $\leq 1,250$	$> 1,250$	601	50	None	None	MEQ
	PTRD	None at ≤ 750	> 750	361	50	None	None	MEQ
	ILD	EDS 2	130	66	50	None	None	MEQ
	IMD	ESM 1	50	41	50	None	None	MEQ
	Net Explosive Weight Limits for this ESM 2					50	None	None

Notes:

^a The two ESMs are for storage of donor explosives for the EDS; one for HCD 1.1 charges and one for 1.4 detonators.

ES = explosive site
 EDS = Explosive Destruction System
 ESM = explosive storage magazine
 IBD = inhabited building distance
 ILD = intraline distance
 IMD = intermagazine distance
 MEQ = mission essential quantity (what will be used that day)
 PES = potential explosive site
 PTRD = public transportation route distance

Reference Source: Pueblo Chemical Agent-Destruction Pilot Plant Explosive Destruction System (EDS) Site Plan for Pueblo Chemical Depot, December 2013, Table 1.

Utility Trailer

The utility trailer provides storage for small equipment, consumable supplies, and a work area to perform equipment maintenance.

Mobile Analytical Platform

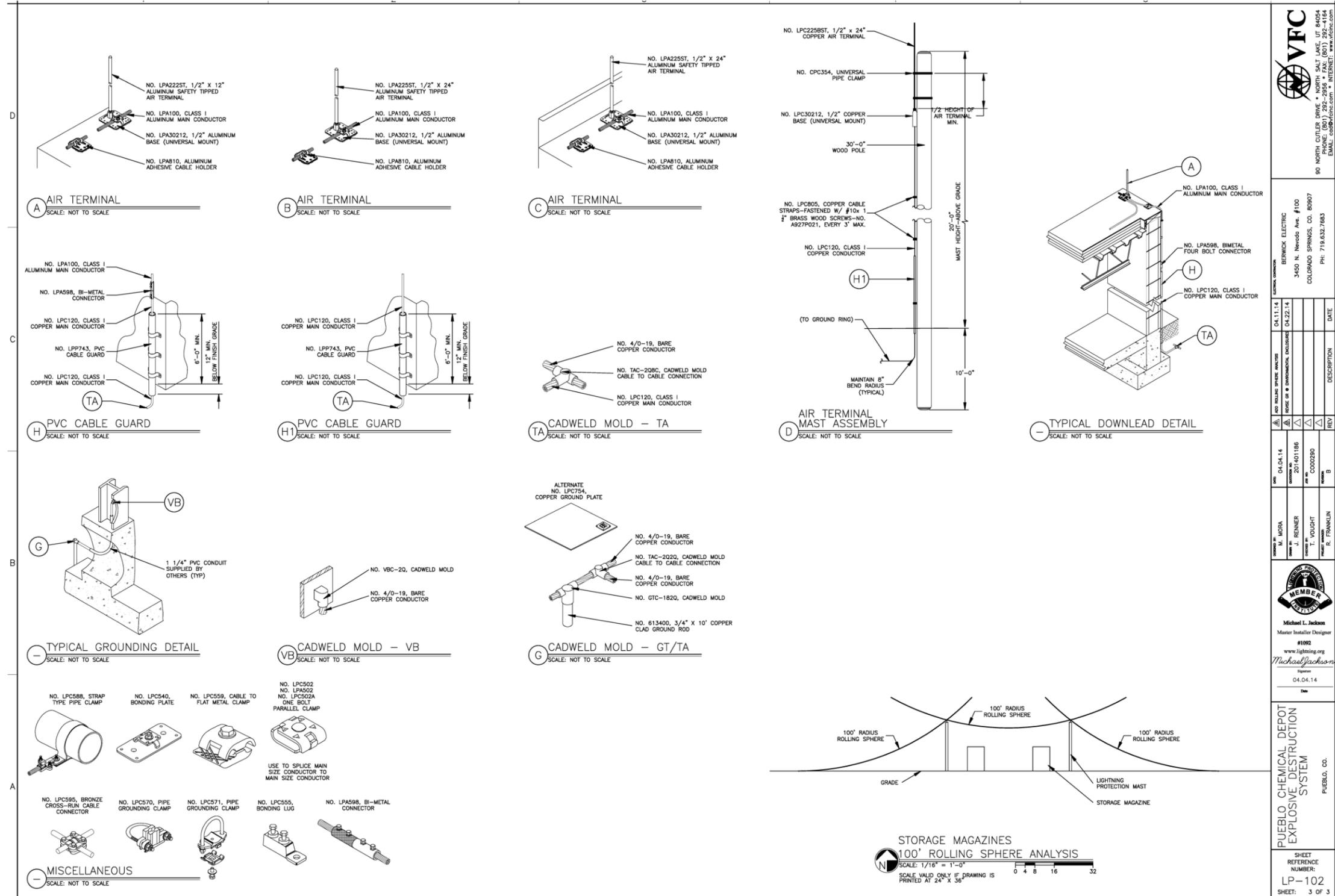
A Mobile Analytical Platform will be set up within the PCAPP EDS site to provide onsite chemical agent analysis services for air and liquid samples.

2.5 Lightning Protection Systems (LPSs)

An LPS for the PCAPP EDS has been designed according to the requirements set forth in DoD 6055.9 Chapter 7 and the requirements of National Fire Protection Association (NFPA) 780 - Standard for the Installation of Lightning Protection.

An LPS will be provided for each Environmental Enclosure, Explosive Storage Magazine, and other support structures as shown in **Figure Appendices 8-1-15** and **8-1-16**. The LPS for Container Storage Units (CSUs) H1102 and H1103 will be the same as provided for the PCD Resource Conservation and Recovery Act (RCRA)-permitted hazardous waste storage igloos (as described in the PCD Hazardous Waste Permit dated December 2013).

An LPS consists of air terminals, roof conductors, down conductors, ground connections, and grounding electrodes and ground ring electrode conductor. All lightning protection components such as bonding plates, air terminals, air terminal supports and braces, chimney bands, clips, connector fittings, and fasteners will comply with the requirements of Underwriters Laboratories (UL) 96 classes as applicable. Conductors will be exposed on the structures except where they are required to be in protective sleeves. Secondary conductors will be bonded with grounded metallic parts within the building. Interconnections within side-flash distances will be at or below the level of the grounded metallic parts.



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04.04.14	201401186			
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NUMBER:
LP-102
SHEET: 3 OF 3

Figure Appendix 8-1-16. PCAPP EDS LPS Components

LPS Components:

- *Air Terminals:* Solid air terminals will contain a blunt tip. Tubular air terminals are not permitted. Air terminals more than 24 inches in length will be supported by suitable brace, at not less than one-half the height of the terminal.
- *Ground Rods:* Ground rods will use copper-clad steel and/or solid copper to conform to UL 467. Ground rods will measure not less than 3/4 inch in diameter and 10 feet in length. Ground rods of copper-clad steel or solid copper will not be combined. All ground rods are 3/4 inch by 10 feet copper-clad steel. **Table Appendix 8-1-4** lists the number of ground rods for PCAPP EDS structures and equipment.
- *Grounding Plates:* Grounding plates will be made of copper-clad steel/iron/stainless steel/solid copper conforming to UL 96.

Table Appendix 8-1-4. Quantity of Ground Rods for PCAPP EDS Equipment

Structure/Equipment	Qty of Ground Rods
Environmental Enclosures (each)	5
Explosive Storage Magazine (each)	2
Change House	4
Service Transformer and Emergency Generator Pad	4
Smoking Shelter	2
Entry Control Facility	2
Command Post	4
Dilute Laboratory	2
Treaty Trailer	2
Transformer Pad (Treaty Trailer)	2
Transformer Pad (Dilute Lab)	4
Transformer Pad (Command Post)	2

- *Connections and Terminations:* Connectors for splicing conductors will conform to the applicable UL 96 class. Conductor connections will be made by clamps or welds (including exothermic).
- *Connector Fittings:* Connector fittings for “end-to-end,” “Tee,” or “Y” splices will conform to NFPA 780 and UL 96.

The LPS design will not contain material combinations that form an electrolytic couple such that corrosion is accelerated in the presence of moisture unless moisture is permanently excluded from the junction of such metals. Where unusual conditions exist that would cause corrosion of conductors, conductors will be provided with protective coatings, such as tin or lead, or oversize conductors. Where a mechanical hazard is involved, conductor size will be increased to compensate for the hazard or protect conductors. When metallic conduit or tubing is provided, the conductor will be electrically bonded to conduit or tubing at the upper and lower ends by clamp type connectors or welds (including exothermic). For main and bonding conductors, NFPA 780 and UL 96 Class I, Class II, or Class II modified materials will be used as applicable.

Initial LPS inspection certification will be obtained from a commercial third-party inspection company to ensure compliance with NFPA 780. This inspection will entail a 100 percent visual inspection of every connection, air terminal, conductor, fastener, accessible grounding points, resistance and continuity tests, and verification of surge protection to ensure 100 percent compliance. Certification is to be part of the site Operating Record. There will be initial tests of each grounding rod using fall-of-potential method (goal, less than or equal to 25 ohms) and all bonds using appropriate test equipment (goal, less than or equal to 1 ohm) for the site Operating Record with future testing schedule as per **Table 2-1** in **Attachment 2**, Procedures to Prevent Hazards and as specified in NFPA 780.

Areas to be protected under the area/influence of the LPS include:

- Environmental Enclosures
- Explosive Storage Magazine(s)
- Change House
- Service Transformer/Emergency Generator
- Smoking Shelter

- Entry Control Facility
- Treaty Trailer
- Command Post
- Dilute Lab.

The following equipment will be directly bonded to the LPS:

- P2R EDS Trailer
- Phase 2 Unit A (P2A) EDS Skid
- Emergency Generator
- Environmental Enclosure heating, ventilation, and air conditioning (HVAC) unit
- PDS HVAC unit
- Boiler/Chiller Container
- Air Compressor
- Cascading Air System Trailer.

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APPENDIX ATTACHMENT 8-1-1
DOCUMENTS PROVIDED ON COMPACT DISK

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APPENDIX ATTACHMENT 8-1-1
DOCUMENTS PROVIDED ON COMPACT DISK

- *A Geotechnical Investigation for “Explosive Destruction System,”* North American Testing, Inc., December 12, 2013.
- *Construction Set Submittal Specifications Section 03.30.00, Cast-in-Place Concrete,* Merrick & Co., March 2014.
- EDS Foundation – Certification Matrices, USACE, March 2014.
- Surface Coating for Environmental Enclosure, VersaFlex Inc., December 2013.
- *Quality Control Plan for Explosive Destruction System, Pueblo Chemical Depot, Pueblo, Colorado,* Komada, LLC, December 2013.
- *JMAC-ESM Memorandum for U.S. Army Chemical Materials Agency (AMSCM-RD), DDESB Final Approval for Consolidation and Revision of the System Approvals for the Explosive Destruction System (EDS) Phase 1 and Phase 2 Units,* 16 September 2010.
- *UFS Permit Drawing Package,* Universal Fabric Structures, March 2014.
- *Products and Data Sheets,* Universal Fabric Structures, March 2014.
- *Reaction Package,* Universal Fabric Structures, March 2014.

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