



DALLAS-FORT WORTH
INTERNATIONAL AIRPORT

ADDENDUM NO. 06

TO THE REQUEST FOR BIDS

Contract No. 9500414

DPS Fire Training Facility Upgrades

October 26, 2010

THE REQUEST FOR BIDS (RFB) FOR THE ABOVE IS HEREBY REVISED AS FOLLOWS:

THIS ADDENDUM CONSISTS OF Twelve (12) PAGES, PLUS ATTACHMENTS.

THE CONTRACT DOCUMENTS AND SPECIFICATIONS FOR THE ABOVE TITLED PROJECT ARE HEREBY AMENDED OR REVISED AS FOLLOWS:

- Item 1.** Delete Specification Section 00003, TABLE OF CONTENTS, and replace with the attached Section 0003, TABLE OF CONTENTS, marked "October 26, 2010".
- Item 2.** Delete Specification Section 01010, SUMMARY OF WORK, and replace with the attached Section 01010, SUMMARY OF WORK, marked "October 26, 2010".
- Item 3.** Add Specification Section 16715, COMMUNICATIONS CABLE MANAGEMENT AND LADDER RACKS, marked "October 26, 2010".
- Item 4.** Attached sketch 1 of 1 Revises Civil Utilities drawings, to provide a Fire Hydrant west of the existing propane burn pit.
- Item 5. Responses to Contractor Questions:**
 - 1. Further development of the location change is required to properly price Alternate 7, 8, and 9. Exact location is needed graphically to determine demolition / re-location of existing items, etc. No existing utility coordination is shown at the approximate new location, existing utilities coordination is needed at the new location for proper pricing.

Response: The list of Alternates was revised in Addendum No. 4.

2. Numerous portions of the existing 2" asphalt paving over flex base that surrounds the existing propane pit will be excavated out to accommodate new utility services, we assume the areas can be patched with like material and process. If this is incorrect, please advise.

Response: Correct

3. The documents do not properly reflect the existing conditions between the concrete wall of the propane burn pit and the existing trench grating. The existing area is currently covered with pavers that are failing. This is not represented on A/AR202 or on the existing civil paving documents. The documents do require specific loading requirements for access to the new pit. The pavers will not achieve this. Without proper site review, other bidders may interpret that this area does not require any new work. We believe this area will require new refractory concrete similar to the hydrocarbon pit, please further clarify this condition by Addendum.

Response: Addendum No. 4 clarified that the paver strip between the propane pit and the trench drain are to be removed, and new pavers installed.

4. Regarding the 300 HP Fire Pump, could you provide the following operating information on this motor?

1. What type of start will it have, i.e. across the line, reduced voltage, etc?

Response: The motor will be manually started via VFD Inverter. The operator will initially set the control knob on the inverter at a low frequency, apply power (via the inverter power switch or breaker box), then increase the frequency to the desired motor output.

2. Do you know the motor code letter (for example code letter F, G, etc.?)

Response: Refer to the motor information sheet attached to this Addendum.

3. How often is the motor started during the day or week?

Response: Per the Owner, the motor will be started two (2) times each day, two (2) times per week. This is worst case scenario.

4. How long does the motor typically run after it is started?

Response: Per the Owner, the motor will run five (5) hours. This is worst case scenario.

5. Please define scope of electrical and data conduit and service to the pits.

Response: This is to be determined by the Fire Trainer System provider.

6. Where does main electrical service come from?

Response: Refer to Sheet E.001.

7. Where is the primary service coming from for all facilities/buildings; Control Building, etc.?

Response: Refer to Sheet E.001.

8. It is anticipated that the upgrade of the existing burn pit will take minimum of 4 months while refurbishment is being done, is this acceptable

Response: Yes. Once the existing pit is shut down it will remain out of service until refurbishment is complete. The goal is to try to minimize down time.

9. Please let me know if Morin panels will be acceptable as an equal or superior to the specified MBCI Shadowrib panel since Morin is already listed as approved in the spec.

Response: The Morin panels are acceptable.

10. Item 6 on page 01010-9 of the specifications requires a contaminated media contingency plan (CMCP). While I was able to find items 1 through 5 on DFW's web site, I cannot find the CMCP. Can you point me in the right direction so that I can obtain a copy of it?

Response: The Airport has revised this document. It is now listed as the EAD Soil Management Plan in the Airport Web site.

11. Item 7 on page 01010-9 of the specifications discusses an air emission estimate. Do you have a sample copy of such an estimate so that I can review the content and format?

Response: The Owner has prepared this estimate as part of the environmental review process.

12. We are requesting that the Drivable Grass pavement system be considered as approved equal to the porous paving system shown on plan sheet CV5.02 of the contract documents.

Response: This is not approved.

13. Without knowing if the Fire Element contractor is qualified prior to our bid submittal how will our bid be viewed if we should use a contractor that isn't pre-qualified once their package is reviewed by DFW airport authorities.

Response: It is a requirement that the Fire Trainer Supplier meet the all elements of the Company Capabilities and Relevant Experience requirements listed in Volume 3 TECHNICAL SPECIFICATIONS – BURN PIT REQUIREMENTS.

14. Can't find Spec Section 16715.

Response: Section 16715, COMMUNICATIONS CABLE MANAGEMENT AND LADDER RACKS, is attached to this Addendum.

15. Please confirm that Note 3, Dwg E.003 is now superseded by Add 4 Spec Sec 13935 2.12 (starter is now part of UL listed Fire pump assembly and is NOT being furnished by the Div 16xxx sub-contractor)

Response: Correct

16. Need complete wiring diagrams for Hydrocarbon Fuel Distribution System.

Response: This is to be determined by the Fire Trainer System provider.

17. Where is existing Panel BBMP?

Response: Panel BBMP is on the first floor of the existing Burn Building / Control Tower.

18. Drawing CV10.08 shows ex DB E24 Top of duct bank @ 568.0'. CV10.03 shows finished grade at 564.5'. DB is not 3.5' above finish grade. This type of error occurs in several locations. We need correct top & bottom of duct bank elevations for all existing underground work that has to be removed, relocated, crossed, or tied into.

Response: The elevation of at the top of DB E24 should be 563'.

19. We have been trying for 3 weeks to co-ordinate transformer pad sizing & primary location & metering requirements with Oncor. They finally responded yesterday with a "no answer". We passed this info on to you earlier. Can you provide us with your "best guess" for pricing purposes with a note that pricing will be adjusted upon final co-ordination and design by the engineer of record?

Response: Follow the requirements in the Drawings and Specifications. Any changes required after award of the contract will be issued in accordance with the General and Special Provisions of the Contract.

20. On page AG203P inside of the galley, it requires the contractor to provide new vinyl flooring throughout the galley. I cannot find the finished floor schedule to indicate which type of vinyl flooring to price. Please provide this information.

Response: This information is on the Finish Schedule on Drawing Sheet A.G. 601.

21. Addendum No. 4, Item 27, Question 18, page 7 – The response to the question on fire resolution states that the maximum fire zone area shall be 50 square feet per burner. The existing 153 ft diameter octagon shaped burn area has a surface area of 19,583 square feet. Subtracting a mockup footprint (including wings) of 3500 sq ft, leaves a clear burner surface area of approximately 16,000 sq ft. A burn size of 50sq ft would therefore require 320 individually controlled burn zones to cover the 16,000 sq ft area. The existing burner system in the fuel spill burn area currently consists of 104 individually controlled burn zones. This equates to approximately 150 square feet per burn zones. Would you confirm, therefore, that there may have been a typographical error in the response and that the value intended in the response should have been "150 sq ft" vs "50 sq ft"?

Response: Fire Zone Areas shall not exceed a maximum of 150 square feet. This can be adjusted to a smaller area as needed to accommodate the final configuration of the burn pit.

22. Who will provide the programming (if required) to the existing DFW Airport master fire alarm system?

Response: The Fire Alarm Contractor is responsible for both the FACP programming and the Central System programming, as per Specification Section 16720, FIRE DETECTION AND ALARM SYSTEM, paragraph 3.5 SYSTEM PROGRAMMING.

23. Who will provide the EBI module to interface into the existing DFW Airport master fire alarm system?

Response: The EST3 specific LAN interface is provided by DFW Airport Board. The LAN interface shall be installed in the Comm Room on the third floor of the Central Utility Plant, for interconnection to the single mode fiber cable from Station 4 to the CUP communications room.

24. Addendum No. 4, Item 27, Question 71, page 15 – This question and response relates to the scope of work required to refurbish/rework the existing propane delivery system. It will be difficult to price this scope of work without knowing whether and how well the existing system is functioning. For example, is the existing delivery design system with its bypass regulation system adequate in maintaining flow and pressure if all components are functioning properly? Are the existing turbine pumps functioning? Is a different design required? What additional information can be provided on the existing delivery system to support pricing the rework/refurbishing scope of effort.

Response: The two liquid pumps still function. The original design controlled propane pressure and flow with a 4-20 mA pressure transmitter in sector 5 valve vault (the last vault in the liquid supply loop prior to the line returning to the tank farm). This transmitter, through the operating system, controlled Fisher pneumatically operated “throttling” valves, to maintain 180 psi at sector 5. There were minor issues with the discharge and return line flow valves, the system functioned well over a wide temperature range, which directly affected tank pressure. This system also allowed pumps to be turned on prior to turning on pilots, so maximum pressure was available when ready to burn.

In 2001, as part of a refurbishment effort, these valves were replaced with Mooney Flowgrid valves, using liquid propane pressure, through pilot regulators, to control flow and pressure. This resulted in pressure and fire quality to be low during cold weather. In addition, the system had to sense the pilot verification before the pumps activated, and pressure was slow to build. This is not a preferred condition. The pressure transmitter is still used to turn the pumps on and off.

It is anticipated that a relief valve back to the tanks will be installed, or a liquid header, and the loop piped to provide supply in both directions around the pit. The final configuration will be determined by the Fire Trainer System supplier.

25. Volume 3, Technical Specifications , Paragraph 7.0, Titled “Environmental Treatment Systems” – This paragraph states that “...the closed system environmental containment and treatment system applies to both the retrofit of the existing burn pit and the new tekflame burn pit installations.” Is our understanding correct that for the base bid only the new 5,000 ft hydrocarbon pit is drained to the environmental containment and treatment system, and not the propane fueled existing burn area, but that for alternates 4 and 5, with dual fuel usage, the existing fuel pit burn area must also be drained to the environmental containment and treatment area?

Response: Correct.

26. Addendum No. 4, Items 14 and 15, page 4 – To properly evaluate the bid, and given that the prequalification of the fire training equipment suppliers has been deleted (paragraph 2.2.7 of the technical specification) will the training equipment designers be required to incorporate their proposed design concept for the mockups and drive-on burn pit into the company capabilities and experience qualifications documents submitted with the bid?

Response: No. The bidders are only required to submit company capabilities and experience with the bid. This information shall be as required in Volume 3 – TECHNICAL SPECIFICATIONS – BURN PIT REQUIREMENTS, paragraph 2.2.9.

27. Addendum No. 4, Attachment, Section 01010, Paragraph 1.2, Item B(8), and B(4) – These items are “Add Alternate No. 2” and “Add Alternate No. 3” and require that the A380 and B747 mockups be modified to comply with Advisory Circular 150/5220-17B. This circular requires that for ARFF index C-E airports the mockup length be at least 75 ft and that the wing span (measured to centerline of mockup) be at least 30 ft. The mockup

length and the wing span do not appear to be consistent with the intent of providing a wide body mockup. Given the size of the existing burn pit, would the Owner consider modifying the specification to require that the B747 and A380 mockup length be 150 feet in length and that the wing span be a minimal 50 ft in length as measured from the centerline of the mockup?

Response: Section 01010 has been revised to reflect additional requirements for the proposed mock-ups. The desired length of the mockups for Add Alternates No. 2 and 3 is 150', with a wing span of 50' measured from the centerline of the mockup.

28. Addendum No. 4, Attachment, Section 01010, Paragraph 1.2, Item B(8), and B(4) – No detailed requirements are provided for the B747 and A380 mockups other than referencing the FAA Advisory Circular which only provides minimal overall shell or exterior dimensional requirements. In order to provide a responsive price, could you provide more detailed requirements for the interior configuration and features for each mockup? The following attachments 1 and 2 to these clarification questions, for example, provide a sample of the type of feature requirements that affect pricing and need to be defined.

Response: Section 01010 has been revised to include additional requirements

Sample Excerpt From B747 Mockup Specifications (Fire Requirements Not Included)

Aircraft Mockup

The aircraft mockup shall be designed to represent a Boeing 747 commercial aircraft, and shall be dimensioned in such a way to be compatible with the available space while maintaining the appropriate proportions of a B747.

The interior of the mockup shall have three decks (cargo, main, and upper deck) and shall incorporate various interior components such as bulkheads, seats, stairs, lavatories, galleys, etc., typical of the real aircraft.

Aircraft Mockup Construction Features

	Item	Description
1	Main Body of Trainer	Static trainer representing B747, 20 ft diameter X 150 ft long constructed from carbon steel.
2	Nose Section	Realistic nose section complete with stainless steel mock cockpit windows
3	Starboard Wing Unit	Full profiled stub wing to represent B747 wing. Measuring 50 ft from center of fuselage to tip of wing.
4	Port Wing Unit	Full profiled stub wing unit to represent B747 wing in flaps down position. Measuring 50 ft from center of fuselage to tip of wing.
5	Port Engine Unit	Engine unit representative of B747 engine.
6	Port Undercarriage Unit	Dual Tandem wheeled undercarriage unit in orientation for B747.
7	Starboard Engine	Engine unit representative of B747 engine.

	Item	Description
	Unit	
8	Starboard Engine Unit	Dual Tandem wheeled undercarriage unit in orientation for B747 under wing.
9	Starboard Undercarriage Unit	Dual tandem wheeled undercarriage unit in orientation for B747 under body of fuselage.
10	Nose Wheel	Representation of nose wheel mounted beneath the cockpit mockup. Can be used to gain access to avionics hatch.
11	Not Used	
12	Internal Staircase	Stairs between decks. Two between cargo and main deck and one between main deck and top deck.
13	External fixed staircase	Fixed stairs from the cargo deck to exterior.
14	Overhead Lockers	Overhead lockers to length of seating areas on top deck, business seating area on main deck, economy seating area on main deck.
15	Cockpit seats	Single steel seat positioned in cockpit area.
16	Not Used	
17	Triple passenger seats	Steel units comprising three seats. Provide 60 three-seat units.
18	Quadruple passenger seats	Steel units comprising four seats. Provide 20 four-seat units.
19	Bulkhead cargo deck	Steel bulkhead with mesh panels and two apertures.
20	Bulkhead cargo deck	Cargo deck bulkhead, steel construction with mesh panels and single door opening in one direction.
21	Main Deck Bulkhead	Steel bulkhead with mesh panels and two apertures.
22	Cockpit bulkhead	Steel bulkhead with mesh panels and single door opening in single direction to be positioned on top deck.
23	Galley / Toilet Structures	Units containing one toilet unit and gone galley compartment. Unit constructed from steel with mesh walls.
24	Galley Structure	Galley compartments constructed from steel with mesh walls.
25	Sleeping cabin	Sleeping compartments constructed from steel with mesh walls.
26	Avionics Hatch	Hatch close to nose wheel allowing access to cargo deck. Ladder provides access to hatch in main deck floor.
27	Gull Wing door	Door to top floor. Door opens upwards to simulate actual door operation

	Item	Description
		on B747.
28	Generic doors	Doors to main deck. Door operation is via mechanism which replicates the actual opening mechanism on aircraft door. Handle is recessed and springs out for operation.
29	External doors	Side hinged doors to represent passenger access doors, providing access to main deck. Handles to be shoot bolt type.
30	Over-wing exits	Side hinged doors positioned over wings to represent over-wing emergency exit. Handles to be shoot bolt type.
31	Cargo door	Cargo door providing access to cargo deck. Manually operated, located at front of cargo deck on the left side.
32	Cargo door assisted.	Mechanically assisted cargo door, located at front of the cargo deck on right side.
33	Skin cut-outs	Provide openings on the aircraft mockup body similar to and located as shown on Drawing Sheet AR 301 (Issued for Bid Drawings), to be used for training purposes. Provide one 5'X3' hole fitted with removable aluminum panels bolted at 3" on center, for use with penetrating nozzle equipment, and provide one 7' X 10" hole and one 5' X 3' hole with mechanically assisted steel covers, to be used in conjunction with smoke generation/fire simulation.

Sample Excerpt From A380 Mockup Specifications (Fire Requirements Not Included)

Aircraft Mockup

The aircraft mockup shall be designed to represent an A380 commercial aircraft, and shall be dimensioned in such a way to be compatible with the available space while maintaining the appropriate proportions of an A380.

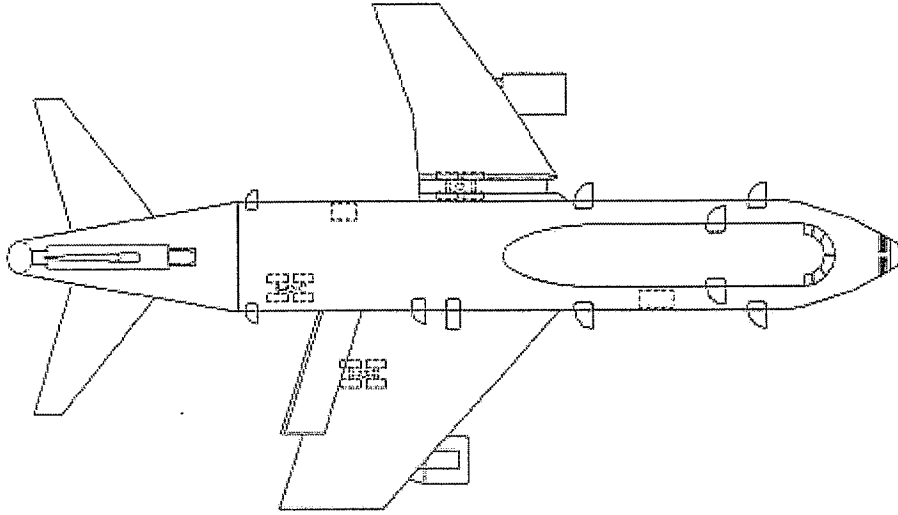
The interior of the mockup shall have three decks (cargo, main, and upper deck) and shall incorporate various interior components such as bulkheads, seats, stairs, lavatories, galleys, etc., typical of the real aircraft.

Aircraft Mockup Construction Features

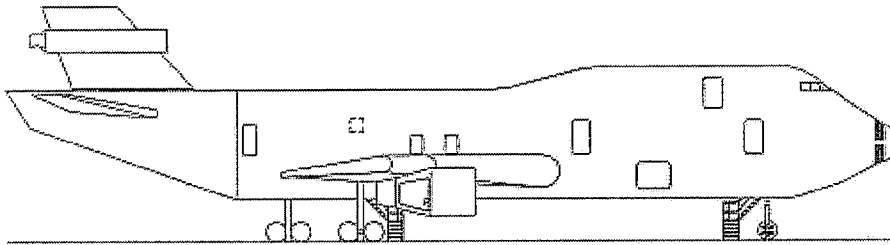
	Item	Description
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2	Nose Section	Realistic nose section complete with stainless steel mock cockpit windows

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3	Starboard Wing Unit	Full profiled stub wing to represent A380 wing. Measuring 50 ft from center of fuselage to tip of wing.
4	Port Wing Unit	Full profiled stub wing unit to represent A380 wing in flaps down position. Measuring 50 ft from center of fuselage to tip of wing.
5	Port Engine Unit	Engine unit representative of A380 engine.
6	Port Undercarriage Unit	Dual Tandem wheeled undercarriage unit in orientation for A380.
7	Starboard Engine Unit	Engine unit representative of A380 engine
8	Starboard Undercarriage Unit	Dual Tandem wheeled undercarriage unit in orientation for A380 under wing.
9	Starboard Undercarriage Unit	Dual Tandem wheeled undercarriage unit in orientation for A380 under body of fuselage.
10	Nose Wheel	Representation of nose wheel mounted beneath the cockpit mockup. Can be used to gain access to avionics hatch.
11	Not Used	
12	Internal Staircase	Stairs between decks. Two between cargo and main deck and one between main deck and top deck.
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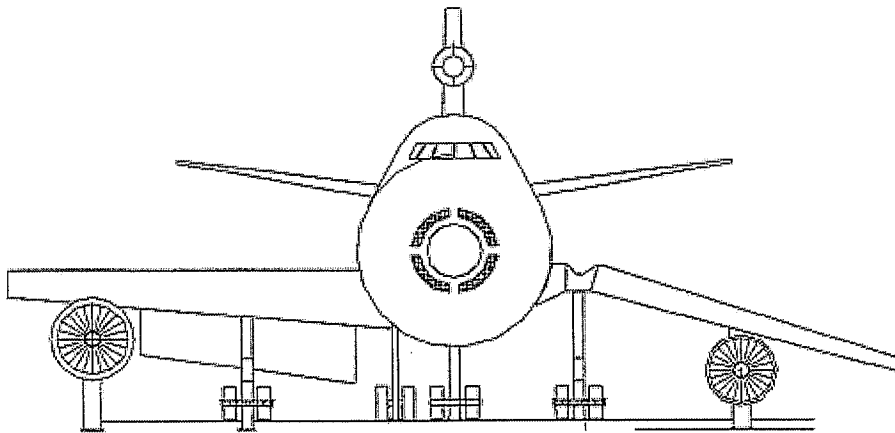
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747 Plan View



747 Side View

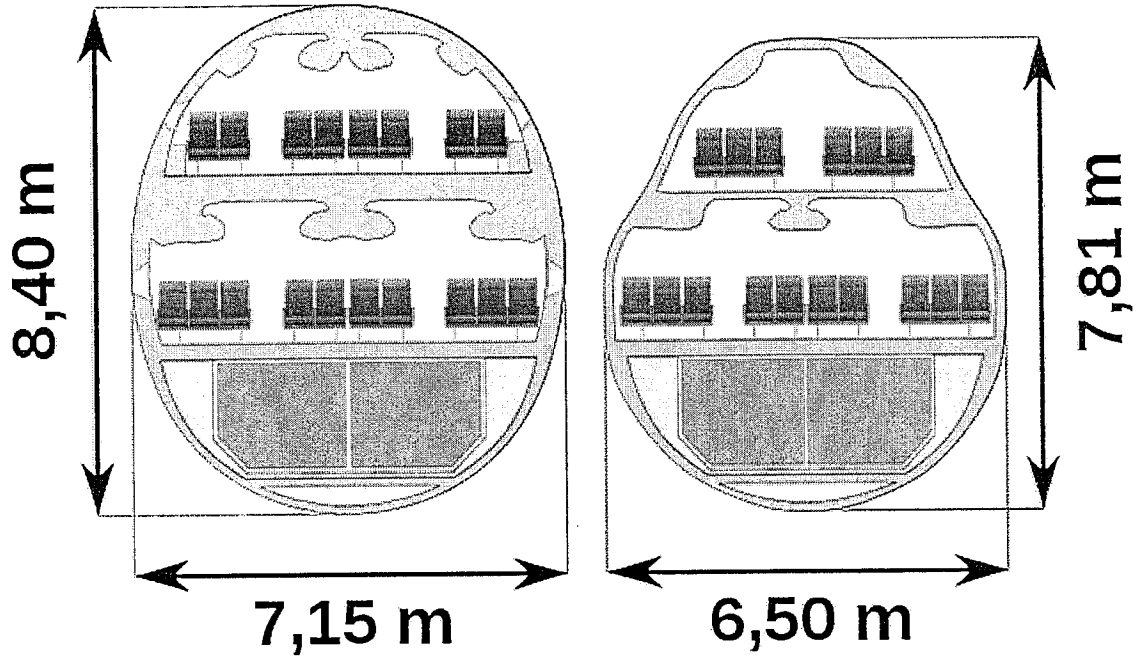


747 Front View

TYPICAL B747 AIRCRAFT MOCKUP

Airbus A380

Boeing 747



AIRCRAFT MOCKUP SECTION

END OF ADDENDUM NO. 06

CONTRACT NO. 9500414
DPS FIRE TRAINING FACILITY UPGRADES
ADDENDUM NO. 6 - ATTACHMENTS

A. Documents:

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Specification Section 00005, ADDENDUM MATRIX

Specification Section 01010, SUMMARY OF WORK

Specification Section 16715, COMMUNICATIONS CABLE MANAGEMENT AND LADDER RACKS.

Sketch 1 (of 1): Adding Fire Training Hydrant and piping.

Pump Motor Information Document

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Division 2

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END OF SECTION

**SECTION 00005
RFI and ADDENDUM MATRIX**

This EXHIBIT is a record of every issuance of "revision(s)" to the Technical Specifications and Construction Documents issued to the General Contractor or JOC and shall be attached to each written description for record keeping purposes.

ADDENDUM MATRIX

Cover Letter to the Written Description(s) of Contract Revisions

Contract No.	9500414
Project Name:	DPS Fire Training Facility Upgrades
Description:	Upgrade Burn Pit,

RFI'S (Responses to questions and clarifications requested by the General Contractor or JOC)		
#	Date	Description

Addendum (Pre-contract Changes to the Drawings and Technical Specifications)		
#	Date	Description
1	08/31/2010	Revised Drawing Availability Date and Bid Schedule
2	09/17/2010	Bid Opening date and time revised
3	09/29/2010	Bid Opening date and time revised
4	10/13/2010	Revisions to Section 01010 – Summary of Work. Add exterior painting and included two additional Add Alternates. Revised project schedule. Provided responses to contractors questions submitted during the bidding period. Added Specification Sections.
5	10/25/2010	Revised Contract language and clarified M/WBE participation goals.
6	10/26/2010	RFI Responses, added Spec Section 16715, general revisions.

Revisions (Post-contract Changes to the Drawings and Technical Specifications)		
#	Date	Description

SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work of this Contract comprises general construction for the DPS Fire Training Facility Refurbishment project. The Scope of Work is as follows:

The Contractor shall provide construction services to provide refurbishments to the existing Fire Training Facility located at DFW International Airport. The project includes the following general items of work (more detailed description of each item to follow):

1. Refurbish the existing propane burn pit and control system.
2. Remove the existing aircraft mock-up currently installed in the propane burn pit, and provide an install a new aircraft mock-up.
3. Provide a new liquid hydrocarbon fuel burn pit with a vertical surface fire simulator.
4. Construct a two-story training / briefing and observation / computer control facility.
5. Construct a Training Facility and parking area.
6. Refurbish the existing Structural Fire Trainer facility.
7. Refurbish the existing Briefing Building and convert to a Galley and Locker Room Facility.
8. Paint the exterior of the existing Briefing Building, metal Storage Building No. 2 and metal Storage Building No. 3 to match existing paint scheme. Paint the exterior metal components (railings, stairs, landings, platforms, sun shades, roof-mounted equipment, etc.) of the existing Structural Fire Trainer. Paint the exterior of the two (2) existing Aircraft Simulators. One of the aircraft simulators is located southwest of the existing Burn Pit. The other one (FedEx plane) is located northwest of the existing Burn Pit. Color shall be as selected by Owner from manufacturer's standard colors.

- B. The scope of the various areas of work is as follows:

1. Refurbish the existing propane burn pit and control system:

- a. Complete renovation of all MEP infrastructures, including replacing all sensors, piping, and fittings. Replace control system, infrastructure, and distribution system.
- b. Remove the existing gravel burn pit fill material, and provide a steel-grate and concrete drive-on and walk-on surface as illustrated on the Performance Specification documents. The existing pit consists of an octagonal concrete bowl approximately 152' across. The gravel material shall be removed, and a concrete foundation and steel grating system shall be provided as generally illustrated in the drawings and described in the Performance Specifications. All existing gravel and rock material shall be disposed of in accordance with the Airport's environmental guidelines.
Base Bid: Provide 1/2 of the new pit surface (east side) capable of supporting a vehicle of 83 ton Gross Vehicle Weight (GVW), and 1/2 of the pit surface to support pedestrian traffic.
- c. Provide a foundation support system for the new aircraft wide-body mock-up.
- d. Extend fuel and water piping and control wiring and conduit system as required to accommodate the new aircraft mock-up.
- e. Provide a metering system for the fuel systems.
- f. Replace all control wiring to all trainers, upgrading to current technology and code requirements. All existing trenched conduit shall be inspected for security and serviceability, and replaced if needed. Provide 10% additional connectivity capacity installed for maintenance or expansion purposes (spare wires).
- g. Replace the existing water pumping system of the hydrant system with new pump equipment to provide 2000 Gallons Per Minute (GPM). Extend the system as needed to accommodate the new configuration of burn pits. The existing pump equipment is currently located in a below-ground vault. This equipment is to be refurbished and relocated to an above-ground facility for safety and ease of maintenance.
- h. Modify the air delivery system serving the fire pit. Convert existing air delivery system housing to a quick-kill / unit reset station for fire control training. (Place all pit and mockup controls in the new Control Facility, relocating all controls from underground pits).
- i. Modify/add/replace the liquid propane pump system to meet new system demand for all ambient temperatures.
- j. Provide a system to maintain the water level in the burn pit at a safe level to protect the equipment.

- k. Remove and replace the entire existing cathodic protection system including test stations. Expand the cathodic protection as required to protect new infrastructure.
 - l. Abandon existing underground vaults or reseal and reuse existing vaults.
 - m. Extend all new control wiring to the existing aircraft fire trainer located southwest of the existing propane burn pit.
 - n. The new software provided for the refurbished burn pit shall be compatible with and shall also control the existing aircraft trainer and the structural trainer, as well as the aircraft trainer in the refurbished pit.
 - o. Installation of pier supports shall be sealed so penetration of the pit bowl remains water tight. The sealant for these joints shall not require frequent maintenance of joints/penetrations, but shall be a permanent solution.
 - p. Reseal all joints in the concrete driving surfaces surrounding the existing propane burn pit (approximately 150' wide).
 - q. Remove and discard the existing brick pavers surrounding the existing propane pit, and replace with new brick pavers. Install new sand base and pavers to match existing pattern. New pavers shall be PaveStone Holland or approved equal.
2. Remove the existing aircraft mock-up currently installed in the propane burn pit, and provide and install a new aircraft mock-up.
- a. Remove the existing aircraft training mock-up, and replace with a new enhanced mock-up to simulate a wide body (B747/A380) aircraft, as described in the drawings and Performance Specifications.
 - b. The new mock-up aircraft shall have cargo training capabilities, and be capable of having interior fires with smoke generation capability and three-dimensional exterior fires.
 - c. Provide central smoke generation equipment for the mock-up.
 - d. Provide water distribution to the mock-up to protect the unit from excessive heat impingement build-up during training operations. **Base Bid:** Provide the new hybrid mock-up configured as illustrated and described in the drawings and Performance Specifications, consisting of a wide body aircraft nose end, and a B757 or similarly sized tail end. See Paragraph 1.2 for Add Alternate Information.
3. Provide a new liquid hydrocarbon fuel burn pit with a vertical surface fire simulator

- a. **Base Bid:** Provide the new pit as illustrated and described in the drawings and Performance Specifications. See Paragraph 1.2 for Add Alternate Information.
 - b. Provide all components, including fuel distribution system, heads, piping, control system, water distribution, and waste water collection, recycling, and disposal systems.
 - c. A portion of the existing aircraft mock-up may be salvaged and reconfigured to provide the vertical surface fire simulator.
 - d. Provide a secure facility for the storage of foam, powder, and flammables. This facility shall include secondary containment provisions and meet EAD requirements.
 - e. Relocate the existing aircraft trainer located northwest of the proposed pit location. Coordinate new location with Owner.
4. Construct a two-story facility to house a training/briefing station on the first level, and a fire trainer control facility on the second level. This facility shall be located proximal to the existing fire pit and the existing observation tower. The facility shall provide the following:
- a. Lower Level:
 - 1) Accommodate 40 training personnel.
 - 2) Provide HVAC.
 - 3) Restrooms to comply with ADA requirements and to provide adequate room to accommodate personnel equipped with bulky fire fighting clothing and equipment.
 - 4) Utility extensions as required.
 - 5) Site development as required.
 - b. Upper Level:
 - 1) Provide an observation room with an integral computer area to control operation of the fire pit equipment, existing SAFT, Structure, and related activities.
 - 2) Provide restrooms.
 - 3) Refurbish all firefighting computers and simulator software to meet most current version available.
5. Construct a one-story facility to house Training Rooms and offices. The facility shall meet the following requirements:
- a. Approximately 10,000 square feet.

- b. One large Training Room to accommodate 60 people, with retractable partition to split the area into two smaller Training Rooms.
 - c. 6 private offices.
 - d. Restrooms to accommodate occupancy.
 - e. Break Room.
 - f. Communication and IT systems to support training and connectivity to Airport systems.
 - g. Parking and site development.
 - h. Extend Utilities as required.
 - i. Utility closet and other amenities as required.
 - j. Comply with ADA and Texas Accessibility Standards (TAS) requirements.
6. Refurbish the existing Structural Fire Trainer.
- a. Clean all ventilation ducts.
 - b. Provide a central smoke generation equipment.
 - c. Reseal all joints in concrete panels.
7. Convert existing Briefing Building ~~(to be identified as an Add Alternate to the Construction Contract).~~
- a. Convert training area to galley and break room, containing cook top and oven, counter space for three microwave ovens, refrigerator, icemaker, and vending area.
 - b. Refurbish locker and toilet areas.
 - c. Refurbish the existing HVAC system.
8. Paint the exterior of the following existing structures and equipment:
- a. Paint the existing Briefing Building.
 - b. Paint Metal Storage Buildings No. 2 (30' X 50'. Eave 14' above floor, peak 15' above floor) and Metal Storage Building No. 3 (42.5' X 82', eave 14' above floor, peak 27' above floor). Paint these buildings to match existing color scheme.
 - c. Paint the exterior metal elements (railings, stairs, landings, platforms, sun shades, roof-mounted equipment, etc.) of the existing Structural Fire Trainer.
 - d. Paint the two (2) Aircraft Simulators. One of the aircraft simulators is located southwest of the existing Burn Pit. The other one (FedEx plane) is located northwest of the existing Burn Pit.
 - e. Colors shall be as selected by Owner from manufacturer's standard colors.

1.2 CONTRACT METHOD

- A. Construct the work under a lump sum contract.

B. Provide Bids as follows (See Bid Forms):

1. **Base Bid:** Provide all work as shown on the drawings and specifications.
2. **Add Alternate No. 1:** Delete the requirement to provide a walk-on surface as illustrated on the northwest half of the propane burn pit, and provide a drive-on surface over this area. The cost indicated on the bid document shall reflect the difference between the cost of providing a drive-on surface on the northwest half of the burn pit and the cost of providing a walk-on surface on this same area.
3. **Add Alternate No. 2:** Delete the requirement to provide a hybrid aircraft mock-up as indicated on the drawings and described in the Performance Specifications, and provide a ~~full-scale~~ an A380 mock-up, modified to comply with Advisory Circular 150/5220-17B. Provide all other requirements for internal fires, control systems, etc. as listed in 1.1.B.2. and in the Performance Specifications. The cost indicated on the bid document shall reflect the difference between the cost of providing the ~~full-scale~~ A380 aircraft mockup and the cost of providing the hybrid as shown on the drawings.

The aircraft mockup shall be designed to represent an Airbus A380 commercial aircraft, and shall be dimensioned in such a way to be compatible with the available space while maintaining the appropriate proportions of an A380.

The interior of the mockup shall have three decks (cargo, main, and upper deck) and shall incorporate various interior components such as bulkheads, seats, stairs, lavatories, galleys, etc., typical of the real aircraft.

Aircraft Mockup Construction Features

	Item	Description
1	Main Body of Trainer	Static trainer representing A380, 20 ft diameter X 150 ft long constructed from carbon steel.
2	Nose Section	Realistic nose section complete with stainless steel mock cockpit windows
3	Starboard Wing Unit	Full profiled stub wing to represent A380 wing. Measuring 50 ft from center of fuselage to tip of wing.
4	Port Wing Unit	Full profiled stub wing unit to represent A380 wing in flaps down position. Measuring 50 ft from center of fuselage to tip of wing.
5	Port Engine Unit	Engine unit representative of A380 engine.

	Item	Description
6	Port Undercarriage Unit	Dual Tandem wheeled undercarriage unit in orientation for A380.
7	Starboard Engine Unit	Engine unit representative of A380 engine.
8	Starboard Engine Unit	Dual Tandem wheeled undercarriage unit in orientation for A380 under wing.
9	Starboard Undercarriage Unit	Dual tandem wheeled undercarriage unit in orientation for A380 under body of fuselage.
10	Nose Wheel	Representation of nose wheel mounted beneath the cockpit mockup. Can be used to gain access to avionics hatch.
11	Not Used	
12	Internal Staircase	Stairs between decks. Two between cargo and main deck and one between main deck and top deck.
13	External fixed staircase	Fixed stairs from the cargo deck to exterior.
14	Overhead Lockers	Overhead lockers to length of seating areas on top deck, business seating area on main deck, economy seating area on main deck.
15	Cockpit seats	Single steel seat positioned in cockpit area.
16	Double passenger seats	Steel units comprising two seats. Provide 40 two-seat units.
17	Triple passenger seats	Steel units comprising three seats. Provide 40 three-seat units.
18	Quadruple passenger seats	Steel units comprising four seats. Provide 40 four-seat units.
19	Bulkhead cargo deck	Steel bulkhead with mesh panels and two apertures.
20	Bulkhead cargo deck	Cargo deck bulkhead, steel construction with mesh panels and single door opening in one direction.
21	Main Deck Bulkhead	Steel bulkhead with mesh panels and two apertures.
22	Cockpit bulkhead	Steel bulkhead with mesh panels and single door opening in single direction to be positioned on top deck.
23	Galley / Toilet Structures	Units containing one toilet unit and gone galley compartment. Unit constructed from steel with mesh walls.
24	Galley Structure	Galley compartments constructed from steel with mesh walls.
25	Sleeping cabin	Sleeping compartments constructed from steel with mesh walls.

	Item	Description
26	Avionics Hatch	Hatch close to nose wheel allowing access to cargo deck. Ladder provides access to hatch in main deck floor.
27	Gull Wing door	Door to top floor. Door opens upwards to simulate actual door operation on A380.
28	Generic doors	Doors to main deck. Door operation is via mechanism which replicates the actual opening mechanism on aircraft door. Handle is recessed and springs out for operation.
29	External doors	Side hinged doors to represent passenger access doors, providing access to main deck. Handles to be shoot bolt type.
30	Over-wing exits	Side hinged doors positioned over wings to represent over-wing emergency exit. Handles to be shoot bolt type.
31	Cargo door	Cargo door providing access to cargo deck. Manually operated, located at front of cargo deck on the left side.
32	Cargo door assisted.	Mechanically assisted cargo door, located at front of the cargo deck on right side.
33	Skin cut-outs	Provide openings on the aircraft mockup body similar to and located as shown on Drawing Sheet AR 301 (Issued For Bid Drawings), to be used for training purposes. Provide one 5'X3' hole fitted with removable aluminum panels bolted at 3" on center, for use with penetrating nozzle equipment, and provide one 7' X 10" hole and one 5' X 3' hole with mechanically assisted steel covers, to be used in conjunction with smoke generation/fire simulation.

4. **Add Alternate No. 3:** Delete the requirement to provide a hybrid aircraft mock-up as indicated on the drawings and described in the Performance Specifications, and provide a full-scale B747 mock-up, modified to comply with Advisory Circular 150/5220-17B. Provide all other requirements for internal fires, control systems, etc. as listed in 1.1.B.2. and in the Performance Specifications. The cost indicated on the bid document shall reflect the difference between the cost of providing the full-scale B747 aircraft mock-up and the cost of providing the hybrid as shown on the drawings.

The aircraft mockup shall be designed to represent a B747 commercial aircraft, and shall be dimensioned in such a way to be compatible with the available space while maintaining the appropriate proportions of a B747.

The interior of the mockup shall have three decks (cargo, main, and upper deck) and shall incorporate various interior

components such as bulkheads, seats, stairs, lavatories, galleys, etc., typical of the real aircraft.

Aircraft Mockup Construction Features

	Item	Description
1	Main Body of Trainer	Static trainer representing B747, 20 ft diameter X 150 ft long constructed from carbon steel.
2	Nose Section	Realistic nose section complete with stainless steel mock cockpit windows
3	Starboard Wing Unit	Full profiled stub wing to represent B747 wing. Measuring 50 ft from center of fuselage to tip of wing.
4	Port Wing Unit	Full profiled stub wing unit to represent B747 wing in flaps down position. Measuring 50 ft from center of fuselage to tip of wing.
5	Port Engine Unit	Engine unit representative of B747 engine.
6	Port Undercarriage Unit	Dual Tandem wheeled undercarriage unit in orientation for B747.
7	Starboard Engine Unit	Engine unit representative of A B747 engine
8	Starboard Undercarriage Unit	Dual Tandem wheeled undercarriage unit in orientation for B747 under wing.
9	Starboard Undercarriage Unit	Dual Tandem wheeled undercarriage unit in orientation for B747 under body of fuselage.
10	Nose Wheel	Representation of nose wheel mounted beneath the cockpit mockup. Can be used to gain access to avionics hatch.
11	Not Used	
12	Internal Staircase	Stairs between decks. Two between cargo and main deck and one between main deck and top deck.
13	External fixed staircase	Fixed stairs from the cargo deck to exterior.
14	Overhead Lockers	Overhead lockers to length of seating areas on top deck, business seating area on main deck, economy seating area on main deck.
15	Cockpit seats	Single steel seat positioned in cockpit area.
16	Not Used	
17	Triple passenger seats	Steel units comprising three seats. Provide 60 three-seat units.

	Item	Description
18	Quadruple passenger seats	Steel units comprising four seats. Provide 20four-seat units.
19	Bulkhead cargo deck	Steel bulkhead with mesh panels and two apertures.
20	Bulkhead cargo deck	Cargo deck bulkhead, steel construction with mesh panels and single door opening in one direction.
21	Main Deck Bulkhead	Steel bulkhead with mesh panels and two apertures.
22	Cockpit bulkhead	Steel bulkhead with mesh panels and single door opening in single direction to be positioned on top deck.
23	Galley / Toilet Structures	Units containing one toilet unit and gone galley compartment. Unit constructed from steel with mesh walls.
24	Galley Structure	Galley compartments constructed from steel with mesh walls.
25	Sleeping cabin	Sleeping compartments constructed from steel with mesh walls.
26	Avionics Hatch	Hatch close to nose wheel allowing access to cargo deck. Ladder provides access to hatch in main deck floor.
27	Gull Wing door	Door to top floor. Door opens upwards to simulate actual door operation on B747.
28	Generic doors	Doors to main deck. Door operation is via mechanism which replicates the actual opening mechanism on aircraft door. Handle is recessed and springs out for operation.
29	External doors	Side hinged doors to represent passenger access doors, providing access to main deck. Handles to be shoot bolt type.
30	Over-wing exits	Side hinged doors positioned over wings to represent over-wing emergency exit. Handles to be shoot bolt type.
31	Cargo door	Cargo door providing access to cargo deck. Manually operated, located at front of cargo deck on the left side.
32	Cargo door assisted.	Mechanically assisted cargo door, located at front of the cargo deck on right side.
33	Skin cut-outs	Provide openings on the aircraft mockup body similar to and located as shown on Drawing Sheet AR 301 (Issued For Bid Drawings), to be used for training purposes. Provide one 5'X3' hole fitted with removable aluminum panels bolted at 3" on center, for use with penetrating nozzle equipment, and provide one 7' X 10" hole and one 5' X 3' hole with mechanically assisted steel covers, to be used in conjunction with smoke generation/fire simulation.

5. **Add Alternate No. 4:** Delete the requirement to install the new 5000 s.f. hydrocarbon pit in the location indicated on the drawings. Provide concrete pavement to the limits indicated on the drawings (including the deleted hydrocarbon pit area). Provide trench drain and asphalt pavement apron to the limits shown on the drawings. Refurbish the existing pit and infrastructure to provide a single pit capable of using both propane and hydrocarbon fuel, with a drive-on surface over the entire pit area. The cost indicated on the bid document shall reflect the difference between all costs associated with deleting the new 5000 s.f. hydrocarbon pit and providing a dual fuel drive-on Burn Pit in the existing propane burn pit location, and the cost of providing the work required as part of the Base Bid.

6. **Add Alternate No. 5:** Provide the new 5000 s.f hydrocarbon pit and infrastructure as indicated on the drawings. Refurbish the existing propane pit and infrastructure to provide a single pit capable of using both propane and hydrocarbon fuel, with a drive-on surface over the entire pit area. The cost indicated on the bid document shall reflect the difference between all costs associated with providing a dual fuel, drive-on Burn Pit in the existing propane burn pit location, and the cost of providing the work required as part of the Base Bid.

5. ~~**Add Alternate No. 4:** Increase the size of the hydrocarbon pit from the size indicated on the drawings (5,000 square feet) to 7,959 square feet (approximately 103' X 77'). Maintain clearance requirements for perimeter trench drain and perimeter concrete drive as shown on the drawings. The cost indicated on the bid document shall reflect the difference between all costs associated with providing a hydrocarbon pit of 7,959 square feet and required infrastructure, and the cost of providing the hydrocarbon pit of 5,000 square feet as shown on the drawings. Not used.~~

6. ~~**Add Alternate No. 5:** Increase the size of the hydrocarbon pit from the size indicated on the drawings (5,000 square feet) to 10,539 square feet (approximately 118' X 89'). Maintain minimum clearance requirements for perimeter trench drain and perimeter concrete drive as shown on the drawings. The cost indicated on the bid document shall reflect the difference between all costs associated with providing a hydrocarbon pit of 10,539 square feet and required infrastructure, and the cost of providing the hydrocarbon pit of 5,000 square feet as shown on the drawings. Not used.~~

7. ~~**Add Alternate No. 6:** Increase the size of the hydrocarbon pit from the size indicated on the drawings (5,000 square feet) to 14,475 square feet (approximately 139' X 104'). Maintain minimum~~

~~clearance requirements for perimeter trench drain and perimeter concrete drive as shown on the drawings. The cost indicated on the bid document shall reflect the difference between all costs associated with providing a hydrocarbon pit of 14,475 square feet and required infrastructure, and the cost of providing the hydrocarbon pit of 5,000 square feet as shown on the drawings. Not used.~~

8. ~~**Add Alternate No. 7:** Delete the requirement to install the new hydrocarbon pit in the location indicated on the drawings. Provide a stand-alone hydrocarbon pit to be located southwest of the existing control tower. The area of the new hydrocarbon pit shall be 10,539 square feet (approximately 118' X 89'), with perimeter trench drain 50' from the burn pit, and a 100' wide perimeter concrete drive around the entire perimeter drain (150' total width from the edge of the burn pit). Provide all utilities, controls, and infrastructure as required for full functionality. The cost indicated on the bid document shall reflect the difference between all costs associated with providing a stand-alone hydrocarbon pit of 10,539 square feet and required infrastructure, and the cost of providing the hydrocarbon pit of 5,000 square feet as shown on the drawings. Not used.~~
9. ~~**Add Alternate No. 8:** Delete the requirement to install the new hydrocarbon pit in the location indicated on the drawings. Provide a stand-alone hydrocarbon pit to be located southwest of the existing control tower. The area of the new hydrocarbon pit shall be 14,475 square feet (approximately 139' X 104'), with perimeter trench drain 50' from the burn pit, and a 100' wide perimeter concrete drive around the entire perimeter drain (150' total width from the edge of the burn pit). Provide all utilities, controls, and infrastructure as required for full functionality. The cost indicated on the bid document shall reflect the difference between all costs associated with providing a stand-alone hydrocarbon pit of 14,475 square feet and required infrastructure, and the cost of providing the hydrocarbon pit of 5,000 square feet as shown on the drawings. Not used.~~
10. ~~**Add Alternate No. 9:** Delete the requirement to install the new hydrocarbon pit in the location indicated on the drawings. Provide a stand-alone hydrocarbon pit to be located southwest of the existing control tower. The area of the new hydrocarbon pit shall be 18,090 square feet (approximately 155' X 116'), with perimeter trench drain 50' from the burn pit, and a 100' wide perimeter concrete drive around the entire perimeter drain (150' total width from the edge of the burn pit). Provide all utilities, controls, and infrastructure as required for full functionality. The cost indicated on the bid document shall reflect the difference between all costs~~

~~associated with providing a stand-alone hydrocarbon pit of 18,090 square feet and required infrastructure, and the cost of providing the hydrocarbon pit of 5,000 square feet as shown on the drawings. Not used.~~

1.3 CONTRACT TIME

- A. Sequence the work in accordance with the requirements of the Contract Documents so as to meet the following interim requirements and final contract completion dates.
1. **Milestone 1: Complete development of the system and components as required to procure the construction permit for the Burn Pit, Aircraft Simulator, Control Systems, Fuel and Water Distribution refurbishments, and Water recovery and recycling systems – 120 180 calendar days from Notice to Proceed.**
 2. Milestone 2: Complete the construction of the new Training Building, complete the construction of the new Training/Control/Briefing Building, and complete the refurbishment of the existing Briefing Building – 360 calendar days from Notice to Proceed.
 3. **Substantial Completion of Construction – 420 540 calendar days from Notice to Proceed.**
- B. The Contractor shall not begin on-site construction work until the contractor has submitted a detailed project schedule in accordance with Section 01310, "Progress Schedule", and until such schedule has been approved in writing by the Owner's Authorized Representative.

1.4 HOURS OF WORK

- A. Work may be performed in all areas up to 24 hours a day, 7 days a week as necessary to meet the project completion dates. Construction work that will require closing of the existing burn pit operation shall not start until the system performance characteristics have been approved by the Owner, a construction permit has been procured by the Contractor, and the materials are on hand to support continuous construction activities in a timely manner.

1.5 CONSTRUCTION

- A. The project shall be constructed in accordance with the requirements and restrictions shown on the plans.
- B. The Contractor can schedule as many work crews as necessary to complete the work within the duration noted in Section 01010-1.3. Within

the taxiway Object Free Area (OFA), objects or potentially hazardous conditions shall be properly marked.

1.6 WORK REQUIREMENTS AND RESTRICTIONS

- A. The specific work requirements and restrictions are identified throughout the specifications and contract drawings. Special attention is to be given to the notes on contract drawings for construction phasing and sequencing that may only be amended by executing a change order.
- B. All Contractor work activities shall be under the oversight of the Owner's Authorized Representative (OAR).
- C. Construction operations at the site shall be confined to areas permitted by Law, Ordinances, Permits, and these Contract Documents.
- D. Restrict construction personnel from access to areas other than those designated within these specifications and associated drawings.
- E. Obtain a permit from the DFW Department of Public Safety for all hot work activities including cutting, welding, grinding or open flame operations.
- F. Propane Vapor service shall remain operational throughout the construction period. Temporary propane service shall be maintained for building heat and existing aircraft and structural fire trainer activities during all phases of construction. Minor interruptions in service due to construction activities shall be coordinated and approved by the Owner.
- G. The Contractor will be required to submit the following items prior to issuance of a construction permit
 1. **Spill Response Plan (SRP)** - Projects that involve the use of fuels, oils, paints, chemicals, and any other material that may pose a threat to human health or the environment may require a Spill Response Plan (SRP).
 2. **Erosion Control Plan (ECP)** - Projects that involve the disturbance of surface soils, grass, vegetation or impervious surfaces require erosion control measures. An ECP is required for projects disturbing less than one acre.
 3. **Construction Stormwater Pollution Prevention Plan (SWPPP)** - Projects that involve the disturbance of surface soils, grass, vegetation or impervious surfaces require erosion control measures. A SWPPP is required for projects disturbing one acre or more.
 4. **Solid Waste Management Plan (SWMP)** - Identify the types and quantities of all solid wastes (including hazardous, non-hazardous or otherwise regulated wastes) that will be generated during this project and provide details on the management of these wastes, including labeling, storage, transportation and disposal. A sample

Solid Waste Management Plan spreadsheet is contained in the Guidance document.

5. **Soil Management Plan (SMP)** - Projects that involve the excavation, stockpiling or movement of soils and subsurface drilling require a Soil Management Plan (SMP). The SMP details the procedures that will be employed to ensure the proper handling and disposition of soils.
6. ~~**Contaminated Media Contingency Plan (CMCP)** - Projects that involve excavation, drilling or other movement of soils require a Contaminated Media Contingency Plan (CMCP). The CMCP details the field screening and confirmatory laboratory sampling planned for the project to detect the presence of contaminants in the soil. The CMCP in association with the SMP will provide the appropriate disposal options for any impacted soil.~~ **Not Used.**
7. **Air Emission Estimate** - Projects that involve the emission of volatile organic compounds (VOC's) or nitrogen oxides (NOx) into the atmosphere during construction or subsequent operations may require an emissions estimate.
8. **Asphalt Documentation** - Projects that involve the installation of asphalt pavement require documentation of the asphalt characteristics. The use of cutback asphalt is prohibited between April 15 and September 15.
9. **Concrete Batch Plant Documentation** - Projects that involve the operation of a concrete batch plant require information on the plant location, documentation of TCEQ's approval for the plant and a SWPPP for the plant.
10. **HVAC Documentation** - Projects that involve the installation, maintenance, repair or removal of HVAC equipment that uses Class I or Class II refrigerants require documentation as to the procedures that will be used to prevent release of refrigerants to the atmosphere.
11. **Underground Storage Tank (UST) and Above Ground Storage Tank (AST) Documents** - Projects that involve the installation, removal, repair or refurbishment of UST or AST require certain documentation including the TCEQ 30-Day Construction Notification form, copy of TCEQ Contractor Registration Certificate, copy of TCEQ Contractor UST On-Site Supervisor license A and/or B, as applicable and documents evidencing how installation will comply with 40 CFR 112 (in particular, provide design of spill containment to be installed pursuant to 40 CFR 112.7).
12. **Construction Site SPCC Plan** - Projects that involve the temporary storage of petroleum fuels for fueling construction

equipment in quantities greater than 42,000 gallons below ground or 1,320 gallons aboveground (with any single container greater than 660 gallons) will require submittal of a Construction Site Spill Prevention, Control and Countermeasure (SPCC) Plan.

1.7 CONTRACTOR USE OF PREMISES

A. Authority and Project Coordination:

1. Coordination with the Board, governmental agencies, utility companies or other entities associated with performance of work required under this Contract shall be accomplished through the OAR.
2. Under unusual, urgent or emergency circumstances, Board Representatives such as the Departments of Public Safety and/or Airfield Operations may issue instructions directly to Contractor or subcontractor personnel.
3. Cooperate fully with other Contractors, Board, or FAA personnel who may be performing maintenance, navigational aid or other work within the project areas. Access to FAA facilities shall be coordinated through the OAR.
4. Notify the OAR immediately of any project conditions or situations that might affect the safety of Airport operations or constitute a deviation from the requirements and restrictions contained in these Contract Documents.

B. Safety:

1. The Contractor and all subcontractors are required to attend a kickoff safety meeting prior to the start of work. Periodic safety meetings will be required during the construction of the project.
2. Implement and maintain an effective program to control the blowing of dust and debris due to wind or jet blast.
3. Provide reverse movement alarms on construction vehicles as required under OSHA regulations.
4. Ensure that all Contractor and subcontractor employees present on the job site are thoroughly familiar with and adhere to the safety and security requirements and restrictions stipulated in the Specifications before commencing work.
5. Employ adequate and OAR-approved fire and safety precautions when using open flame welding or torch cutting operations. Maintain adequate shielding to prevent pilot, employee, or public viewing of such open flame operations.

6. Provide adequate levels of artificial temporary lighting for areas of work when natural lighting is not adequate for safety and for the proper performance of work. Temporary lighting shall be approved in advance by the OAR. Lighting shall be shielded and/or aimed in a manner to prevent lighting from impairing the vision of pilots, airport personnel, air traffic controllers or the general public.
7. Adhere to supplemental project safety or security procedures that shall be prepared and issued by the OAR from time to time on an as-needed basis.
8. The Contractor shall provide a full time safety/security representative who has the authority to enforce safety requirements. That representative shall not be the project manager, superintendent, or foreman.
9. Maintain, on a 24-hour per day, seven days-a-week basis, clear unobstructed routes for routine and emergency vehicle traffic within project areas and access routes to and from project areas.

C. Construction Facilities and Storage Areas:

1. Restrict Contractor's material/equipment storage and employee parking to areas defined in the Contract documents and/or as approved by the OAR.
2. The Contractor assumes full responsibility for protection and safekeeping of all stored products.
3. General Storage: Store products immediately upon delivery and in accordance with the manufacturer's instructions, with labels and seals intact. Protect until installed. Contractor will not be allowed to store materials in terminal areas. Storage shall be arranged to provide access for maintenance and inspection.
4. Enclosed Storage: Store products subject to damage by the elements in substantial weather tight enclosures. Maintain temperature, humidity, and ventilation per manufacturer's instructions.
5. Exterior Storage: Provide substantial platforms, blocking or skids to support fabricated products above ground; slope to provide drainage. Provide impervious sheeting over products subject to dislocation and deterioration from exposure to the elements. Provide proper drainage and prevent the mixing of refuse and chemically injurious materials.
6. Do not block or obstruct any portion of any roadway while conducting activities associated with delivery or movement of materials, equipment or personnel, unless approved by the OAR in conjunction with a Traffic Control Plan.

D. Vehicle Access and Haul Routes:

1. Do not unreasonably encumber site with material or equipment.

E. Storage and Disposal of Spoils and Refuse:

1. Maintain project areas in a clean and safe condition at all times. Immediately remove all trash, debris, and surplus materials from work areas regardless of source. Clean paved surfaces within project related areas as required or directed by OAR.

F. Summary of Notification Requirements:

1. Notify the OAR in advance of commencement of the following work activities by not less than the number of calendar days shown:

ACTIVITY		NOTICE (DAYS)
1.	Crane Operations (FAA Approval)	45 *
2.	Crane Operations (AOA Approval)	Daily
* Denotes "Notice" process initiated by the Airport		

G. Vehicle Relocation Procedures:

1. The following procedures are established in order to relocate legally parked vehicles in public parking facilities operated by the Airport Board due to construction.

a. The Contractor shall post a "30 Day Closure Notice" sign at the entrance to the parking facility. Sign specifications are available from the DFW Sign Shop.

b. If the closure involves only a section of the parking facility, the signs should be posted in the affected area to delineate closure of the specific section. Cones, barrels, tape, barricades, or any combination thereof may be used to secure vacant spaces.

c. If vehicles have not been removed after 30 days, the DFW Project Manager will ensure that the Contractor:

1) Contacts the Board's contract wrecker service 48 hours in advance to ensure the company has adequate staffing.

2) Barricade the entrance to prevent additional vehicles from parking (only if the entire facility is involved).

3) Ensure that before and after photographs are taken of vehicles that will be relocated.

- 4) Create a vehicle log that includes the color, make, model, license plate number and any existing damage.
- 5) Note the location where the vehicle was parked and where it has been relocated. Relocation should be as close as practical to the original location.
- 6) Fax a copy of the vehicle log to DPS Communications at 972-574-1586 and the Airport Operations Center (AOC) at 972-574-0825.

1.8 WORK BY OTHERS

- A. During this contract, there may be other construction activities occurring on behalf of the AIRPORT BOARD in the same area(s). Coordination and cooperation with these contractors will be required during the prosecution of the project.

1.9 INDEX OF DRAWINGS

- A. An index of all the drawings for this project is included in the Contract Drawings set.

PART 2 – PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

- END OF SECTION -

SECTION 16715

COMMUNICATIONS CABLE MANAGEMENT AND LADDER RACKS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide all labor, materials and equipment for the complete installation of Work called for in the contract documents.

1.2 SCOPE OF WORK

- A. This section includes the minimum requirements for the equipment and cable installations in telecommunications rooms.
- B. Included in this section are the minimum composition requirements and installation methods for the following:
- C. Ladder Rack System within IDF room (IDF/MDF).

1.3 QUALITY ASSURANCE

- A. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the owner or owner representative.
- B. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed. Where "approved equal" is stated or a substitution is requested, equipment shall be equivalent in every way to that of the equipment specified. All substitutions are subject to the control and approval of the owner or the owner representative.
- C. Strictly adhere to all Building Industry Consulting Service International (BICSI), Electronic Industries Alliance (EIA) and Telecommunications Industry Association (TIA) recommended installation practices when installing communications/data cabling.
- D. Contractor' Qualifications: A Firm experienced in the provision of systems similar in complexity to those required for this project.

- E. Manufacturer's Qualifications: No less than 5 years continuous experience in the production of specified types of product, with production capabilities per applicable NEMA standards.
- F. Material and Work specified herein shall comply with the applicable requirements of:
 - 1. ANSI/TIA/EIA – 568-B *Commercial Building Telecommunications Cabling Standard, 2000-2004*
 - 2. TIA – 569-B *Commercial Building Standard for Telecommunications Pathways and Spaces, 2004*
 - 3. ANSI/TIA/EIA – 606-A *Administration Standard for the Telecommunications Infrastructure of Commercial Buildings, 2002*
 - 4. ANSI-J-STD – 607-A *Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications, 2002*
 - 5. NFPA 70 – *National Electric Code, 2005*
 - 6. BICSI – *Telecommunications Distribution Methods Manual, 12th Edition.*
 - 7. NEMA – VE-1 – *Metal Cable Tray Systems, 2002*
 - 8. NEMA – VE-2 – *Metal Cable Tray Installation Guidelines, 2001*

1.4 SUBMITTALS

- A. Comply with provisions of Division 1.
- B. Provide product data for the following:
 - 1. Submit manufacturer's data/cut sheets, product drawing/specifications and installation instructions for all products for review.

1.5 CONTRACTOR CLOSE OUT SUBMITTALS

- A. Submit Closeout documentation in accordance with Division 1 of the Project Manual and any applicable supplements. The number of submittal sets required is the greater of either the requirements of Division 1 of the

Project Manual, or a minimum of four (4) sets.

1. Segregate documents into separate binders containing data relevant to operational, maintenance and warranty issues.
2. Warranty and Maintenance:
3. Test Report Binder(s)
4. Record Drawings

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Ship product in its original container, to prevent damage or entrance of foreign matter.
- B. Handling and shipping in accordance with manufacturer's recommendation.
- C. Provide protective covering during construction, to prevent damage or entrance of foreign matter.
- D. Replace at no expense to Owner, product damaged during storage, handling or the course of construction.

1.7 PROJECT CONDITIONS

- A. Verify conditions on the job site applicable to this Work. Notify Architect in writing of discrepancies, conflicts or omissions promptly upon discovery.
- B. The Drawings diagrammatically show cabling and arrangements of equipment fitting the space available without interference. If conditions exist which make it impossible to install Work as shown, recommend solutions and/or submit drawings to the Architect for approval, showing how the Work may be installed.

1.8 WARRANTY

- A. Warrant labor and product to be free of defects and deficiencies, and to conform to the drawings and specifications as to kind, quality, function, and characteristics, following Contractor Warranty requirements defined in Division 1. Repair or replace defects occurring in labor or product within the Warranty period without charge.

PART 2 - PRODUCTS

2.1 LADDER RACK, SUPPORTS, AND ACCESSORIES

- A. Ladder Rack (Cable Runway)

- B. Ladder rack shall be manufactured from 3/8" wide by 1-1/2" high tubular steel.
- C. Ladder rack (side stringers) will be 9'-11½ " long. Cross members will be welded in between stringers on 12" centers beginning 5-3/4" from one end so that there are 10 cross members per ladder rack. There will be 10-1/2" of open space in between each cross member.
- D. Finish shall be epoxy-polyester hybrid powder coat (paint) in the color(s) specified below.
- E. Acceptable Manufacturers:
1. Chatsworth Products, Inc. (CPI)
 2. Cooper B-Line
 3. Owner Approved Equivalent
- F. Horizontal 90° Turns
1. Horizontal 90° turns shall be manufactured from 3/8" wide by 1-1/2" high tubular steel with .065" wall thickness.
 2. Stringers (sides) will be formed in a 90° arc. Cross members will be welded in between stringers on approximate 23° increments so that there are 5 cross members per turn. The welded assembly will have a 15" inside radius and will create a smooth horizontal 90° turn.
 3. Horizontal 90° turns will be available in the width(s) specified below.
 4. Finish shall be epoxy-polyester hybrid powder coat (paint) in the color(s) specified below.
 5. Acceptable Manufacturers:
 - a. Chatsworth Products, Inc. (CPI)
 - b. Cooper B-Line
 - c. Owner Approved Equivalent
- G. Vertical-To-Horizontal 90° Turns
1. Vertical-to-horizontal 90° turns shall be manufactured from 3/8" wide by 1-1/2" high tubular steel with .065" wall thickness.

2. Stringers (sides) will be formed in a 90° arc with a 12-1/2" outside radius. Cross members will be welded in between stringers on approximate 23° increments so that there are 3 cross members per turn. The welded assembly will create a smooth 90° vertical-to-horizontal turn.
3. Vertical-to-horizontal 90° turns will be available in width(s) specified below.
4. Finish shall be epoxy-polyester hybrid powder coat (paint) in the color(s) specified below.
5. Design Make:
 - a. Chatsworth Products, Inc. (CPI)
 - b. Cooper B-Line
 - c. Owner Approved Equivalent

H. Corner Brackets

1. Corner brackets shall be manufactured from 3/8" wide by 1-1/2" high tubular steel with .065" wall thickness.
2. The inside stringers of the corner bracket will be formed at 90° with a small chamfer at the vertex. The outside stringer of the corner bracket will be formed in a 90° arc that is either 15" or 24" in radius. A single cross member will connect the chamfered portion of the inside stringer to the outside stringer. The welded assembly will create a smooth 90° turn within the L-shaped corner created by two intersecting ladder racks.
3. Corner brackets will be available in the size(s) specified below. Installation hardware will be included with the corner bracket. Corner bracket installation hardware does not include the junction splice kit required to form the L-shaped intersection between two ladder racks.
4. Finish shall be epoxy-polyester hybrid powder coat (paint) in the color specified below.
5. Design Make:
 - a. Chatsworth Products, Inc. (CPI)
 - b. Cooper B-Line
 - c. Owner Approved Equivalent

I. Ladder Rack Splices

1. Splice kits will provide a method of mechanically connecting ladder rack sections and turns together end-to-end or side-to-end to form a continuous pathway for cables.
2. Grounding kits will provide a method of bonding ladder rack sections and turns together that is independent of the pathway splices. The grounding kit should be constructed of UL Listed components. The preferred solution is a #6 AWG green insulated stranded copper conductor connected on both ends to ladder rack using two-hole compression lugs and stainless steel hardware.
3. An insulator bar kit will provide a means of electrically isolating individual ladder rack sections through an end-to-end splice separated with a non-conductive material. The preferred solution is a 3/8" wide by 1-1/2" high by 5-1/2" long insulator bar made of Delrin® (by DuPont, Delrin is a registered trademark of E.I. du Pont de Nemours and Company).
4. Splices (splice plates) will be manufactured from steel. Splice, grounding and insulator bar kits will include installation hardware.
5. Finish (of splice plates and hardware) shall be zinc plate in the color(s) specified below. Colors are applied as a chem. film over the zinc plate.
6. Design Make:
 - a. Chatsworth Products, Inc. (CPI)
 - b. Cooper B-Line
 - c. Owner Approved Equivalent

J. Ladder Rack Supports

1. Supports will be sized to match the width of the ladder rack that is supported. Some supports will Work with all widths of ladder rack.
2. Each support will include a means of securing ladder rack to the support.
3. Supports will be manufactured from steel or aluminum.
4. Finish shall be epoxy-polyester hybrid powder coat (paint) in the color(s) specified below or zinc plate with a gold chem. finish

specified gold. Included hardware shall be zinc plated with a gold chem. finish.

5. Design Make:
 - a. Chatsworth Products, Inc. (CPI)
 - b. Cooper B-Line
 - c. Owner Approved Equivalent

K. Ladder Rack Accessories

1. Cable straps used for attaching cable bundles to the ladder rack cross members must be reusable with a hook and loop-style closure, at least $\frac{3}{4}$ " wide and sized for cable bundles that are 2", 3" or 4" in diameter.
2. End caps used to cover the ends of ladder rack will be manufactured from a black fire-retardant rubberized material. End caps will be sized for $\frac{3}{8}$ " wide by 1-1/2" high side stingers and will be sold in pairs.
3. End closing kits used to cover the end of ladder rack will be manufactured from $\frac{3}{8}$ " wide by 1-1/2" high tubular steel with .065" wall thickness. Kits will consist of a bar cut to match the width of the ladder rack and the hardware required to attach the bar to the end of a length of ladder rack.
4. Radius drops used to create a radius to form cables over as the cables exit or enter the ladder rack will be manufactured from aluminum extrusion. The extrusion will be formed in a 90° arc with a minimum bend radius of 3". Radius drops will attach to either the side stringer or the cross member of the ladder rack using a clevis pin. Radius drops will include 1-1/2" high cable spools that attach to the top of the radius drop to guide cables.
5. Movable cross members used to support cross member radius drops in between welded cross members on ladder rack will be manufactured from $\frac{3}{8}$ " by 1-1/2" aluminum bar. Movable cross members will attach to ladder rack at the side stringers with included hardware so that the location of the movable cross member can be adjusted. Moveable cross member will support a cross member radius drop.
6. Auxiliary support brackets used to support cables that should be physically separated from the cables in the ladder rack will be made from $\frac{1}{8}$ " x 1" steel bar. The bracket will be L-shaped and will

attach to the side stringer of the ladder rack. The bracket will hang below the ladder rack a minimum of 4". The bracket support surface will be 4" long. The bracket will be zinc plated with a gold chem. finish.

7. Touch-up paint used on ladder rack and ladder rack system components will be color-matched to the finish on the ladder rack or component. A spray on and brush on option will be available.
8. Unless otherwise noted, finish on all metal components shall be epoxy-polyester hybrid powder coat (paint) in the color(s) specified below. Hardware will be zinc plated with a gold chem. finish.
9. Design Make:
 - a. Chatsworth Products, Inc. (CPI)
 - b. Cooper B-Line
 - c. Owner Approved Equivalent

PART 3 - EXECUTION

3.1 INSTALLATION

A. Ladder Rack

1. Provide all components of the ladder rack system (ladder rack, turns, splices, supports and accessories) from a single manufacturer.
2. Ladder rack shall be installed with side stringers facing down so that the ladder forms an inverted U-shape and so that welds between the stringers (sides) and cross members (middle) face away from cables.
3. Ladder rack shall be secured to the structural ceiling, building truss system, wall and the tops of equipment racks and/or cabinets using the manufacturer's recommended supports and appropriate installation hardware and methods as defined by local code or the authority having jurisdiction (AHJ).
4. Ladder rack splices will be made in mid-span, not over a support, with the manufacturer's recommended splice hardware.
5. Ladder rack shall be supported every 5' or less in accordance with TIA-569-B. Ladder rack shall be supported within 2' of every splice and within 2' on both/all sides of every intersection. Support ladder

rack within 2' on both sides of every change in elevation. Support ladder rack every 2' when attached vertically to a wall.

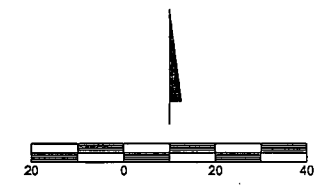
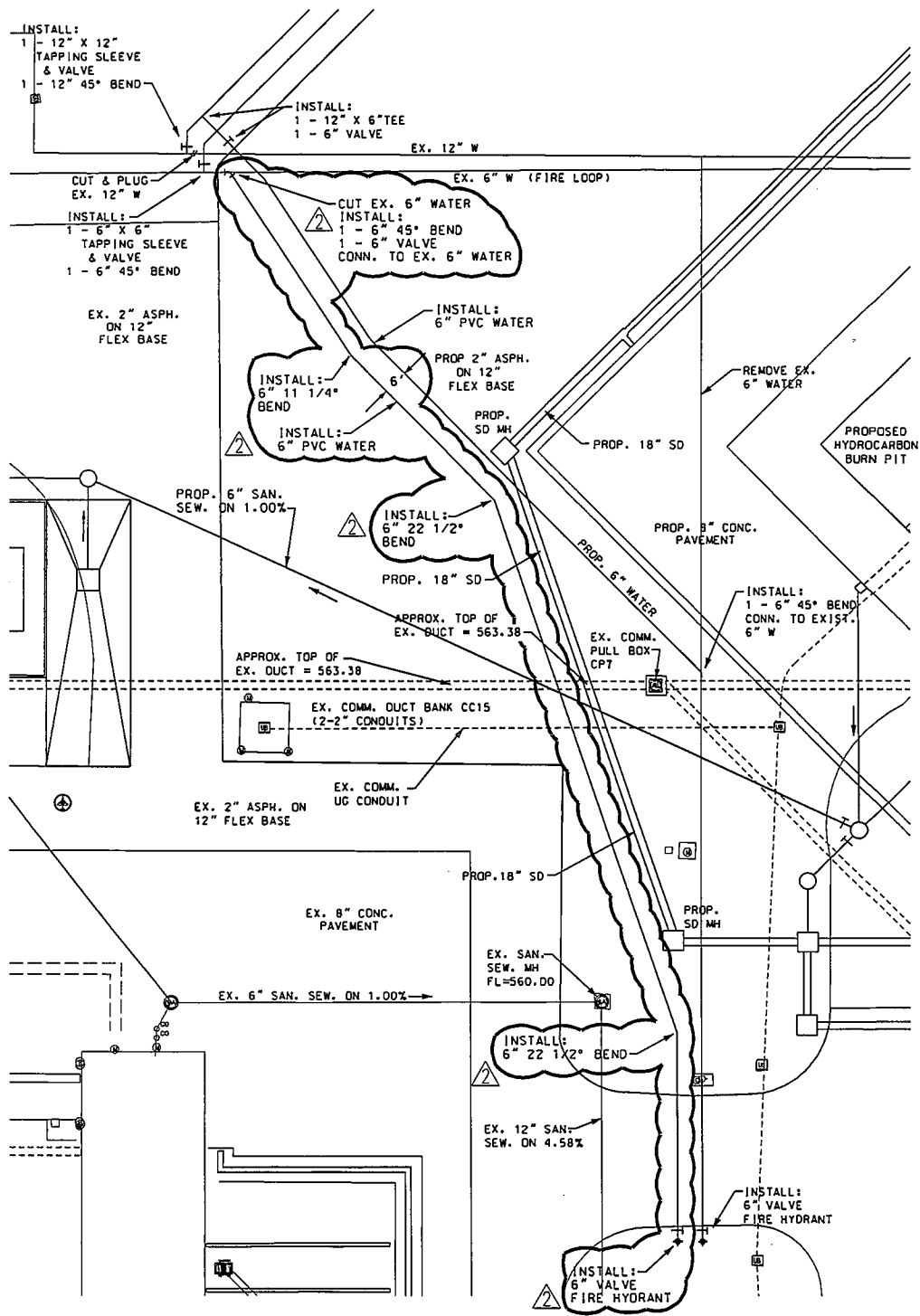
6. Heavy-duty splices are recommended for ladder rack in excess of 18" width (18" wide ladder rack). Heavy-duty splices are required for any splice formed in the vertical orientation including changes in elevation formed using vertical-to-horizontal 90° turns or horizontal-to-vertical 90° turns. Use heavy-duty splices to secure all overhead turns to the overhead horizontal pathway(s).
7. When the pathway is overhead, ladder rack shall be installed with a minimum clearance of 12" above the ladder rack. Leave a minimum of 12" in between ladder rack and ceiling/building truss structure. Leave a minimum of 3" in between ladder rack and the tops of equipment racks and/or cabinets. Multiple tiers of ladder rack shall be installed with a minimum clearance of 12" in between each tier of ladder rack. When located above an acoustical drop ceiling, leave a minimum of 3" clearance between the top of the drop ceiling tiles and the bottom of the ladder rack.
8. When installed under a raised floor, ladder rack shall be installed with a minimum 3" clearance between the top of the ladder rack and the bottom of the floor tiles or floor system stringers, whichever is lower in elevation. Maintain a 3" clearance between ladder racks wherever ladder racks cross.
9. Within each telecommunications room, ladder rack should be bonded together, electrically continuous and bonded to the TGB, unless otherwise noted in the specifications and contract documents. Ladder rack and turns shall be bonded across each splice with a bonding kit. Ladder rack shall be bonded to the Telecommunications Grounding Busbar (TGB) using an approved ground lug on the ladder rack and a minimum #6 grounding wire or as recommended by the AHJ. Remove paint from the ladder rack where bonding/ground lugs contact the ladder rack so that the lug will contact bare metal. Use antioxidant joint compound in between the bare metal on the ladder rack and ground lug. Use antioxidant joint compound in between the bus bar and the ground lug. Verify continuity through the bonds at splices and intersections between individual ladder rack sections and turns and through the bond to the TGB.
10. The quantity of cables within the ladder rack will not exceed a whole number value equal to 50% of the interior area of the ladder rack divided by the cross-sectional area of the cable. The interior area of ladder rack will be considered to be the width of the ladder

rack multiplied by a height of 2", unless cable retaining posts are added to the ladder rack. The interior area of ladder rack equipped with cable retaining posts will be considered to be the width of the ladder rack multiplied by a height of 6". Actual cable fill for ladder rack that is not equipped with cable retaining posts will not exceed 2" in height. Actual cable fill for ladder rack equipped with cable retaining posts will not exceed 6" in height.

11. The combined weight of cables within the ladder rack will not exceed the stated load capacity of the ladder rack as stated in the manufacturer's product specifications or load/design tables.
12. Cables (cable bundles) will be secured to the cross members of ladder rack with ¾" wide reusable straps. Straps are not required when ladder rack is equipped with cable retaining posts.
13. Add 8" high cable retaining posts to the open sides of ladder rack when cable fill exceeds 2" in height or when cable bundles cannot be secured directly to the ladder rack cross members with a strap. Cable fill within any ladder rack should not exceed 6" in height.
14. When a single ladder rack supports different types of cable media, the cable media will be separated within the pathway by cable spools that attach to the cross members on the ladder rack. Treat each type of cable media and divided area of the ladder rack separately when determining cable fill limits.
15. Use a radius drop to guide cables wherever cable exits overhead ladder rack to access a rack, frame, cabinet or wall-mounted rack, cabinet or termination field. If necessary, provide a moveable cross member also to attach and align the radius drop in between the welded cross members of a ladder rack.
16. Cover the exposed ends of cable runway that do not terminate against a wall, the floor or the ceiling with end caps or an end closing kit.
17. Use auxiliary support brackets that attach to the side stringer of the ladder rack to support interconnect cabling (patch cords, equipment cords, jumper cords) that is routed between racks using the ladder rack. Auxiliary support brackets can be used to support other conductors that should be physically separated from cables within the ladder rack as defined by local code or the authority having jurisdiction (AHJ).

18. Whenever possible, maintain a 2' separation between ladder rack used for communications cables and pathways for other utilities or building services.
19. The installer will provide touch-up paint color-matched to the finish on the ladder rack and will correct any minor cosmetic damage (chips, small scratches, etc.) resulting from normal handling during the installation process prior to delivery to the owner. If a component is cosmetically damaged to the extent that correction in the field is obvious against the factory finish, the component will be replaced with a new component finished from the factory. If a component is physically damaged due to mishandling or modification during the installation process, it shall not be used as part of the ladder rack system.

- END SECTION -



DRAWING LEGEND

—	EXISTING CURB
—	PROPOSED 6" CONCRETE CURB
—	EXISTING WATER
—	EXISTING SANITARY SEWER
—	EXISTING STORM DRAIN
—	EXISTING UG ELECTRICAL
—	EXISTING UG COMMUNICATION CONDUIT
—	PROPOSED WATER
—	PROPOSED SANITARY SEWER
—	PROPOSED COMMUNICATION CONDUIT
—	PROPOSED ELECTRICAL CONDUIT (2)

FIRE TRAINING HYDRANT

**FIRE TRAINING CENTER SITE IMPROVEMENTS
DFW AIRPORT**

AZ&B
 ARREDONDO, ZEPEDA
 & BRUNZ, LLC
 FIRM REGISTRATION # F-10098

		DRAWING BY SBH	DATE OCT. 25, 2010
		CHECKED BY	SHEET 1 OF 1
△	10-25-10	SBH	ISSUE: ADDENDUM NO. 6
REV. NO.	DATE	BY	

TECO Westinghouse

ISSUED 5/5/2006	PERFORMANCE DATA 3-PHASE INDUCTION MOTOR	ENCLOSURE TEFC
TYPE AEHH8N		CATALOG# EP3002

NAMEPLATE INFORMATION

OUTPUT		POLE	FRAME SIZE	VOLTAGE	HZ	RATED AMBIENT	INS. CLASS	NEMA DESIGN	TIME RATING	SERVICE FACTOR
HP	KW									
300	223.8	2	449TS	460	60	40°C	F	B	CONT.	1.15

VARIABLE FREQUENCY DRIVE SERVICE

VARIABLE TORQUE				OHMS/PHASE EQUIVALENT WYE CIRCUIT (AT RATED OPERATING TEMPERATURE 28°C)				
HZ	HP	RPM	TORQUE (lb-ft)	R1	R2	X1	X2	X _m
3~60	0.0375~300	180~3600	1.093~439	0.0126	0.011	0.1338	0.23	9.3

CONSTANT TORQUE				CONSTANT HORSEPOWER			
HZ	HP	RPM	TORQUE (lb-ft)	HZ	HP	RPM	TORQUE (lb-ft)
6~60	30~300	360~3600	439	60	300	3600	439

TYPICAL PERFORMANCE

FULL LOAD RPM	EFFICIENCY				POWER FACTOR			SOUND PRESSURE LEVEL @ 3 FT Db(A)
	FULL LOAD		3/4 LOAD %	1/2 LOAD %	FULL LOAD %	3/4 LOAD %	1/2 LOAD %	
	MIN. %	NOM. %						
3583	95.8	95	95.4	94.5	88	85.5	82.5	83

CURRENTS						NEMA KVA CODE LETTER	SAFE STALL TIME IN SECONDS	
NO LOAD		FULL LOAD		LOCKED ROTOR			COLD	HOT
AT 460 VOLT		AT 460 VOLT		AT 460 VOLT				
50.5		333		2220		G	22	15

TORQUE				INERTIA			ACCEL TIME (DOL)		ALLOWABLE STARTS PER HOUR	
FULL LOAD (lb-ft)	LOCKED ROTOR %FLT	PULL UP %FLT	BREAK DOWN %FLT	ROTOR WR ² (lb-ft ²)	NEMA LOAD WK ² (lb-ft ²)	MAX ALLOWABLE WK ² (lb-ft ²)	NEMA LOAD WK ² Sec	MAX ALLOWABLE WK ² Sec	COLD	HOT
439.00	102	81	210	52.5	246	246	5.08	7.50	2	1

APPROVED:	M. PRATER	DRAWING NO.	3A057EP3002	REVISION:	0
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