

**CHILLICOTHE MUNICIPAL AIRPORT (CHT)
CHILLICOTHE, MISSOURI**

MoDOT PROJECT NO. 22-015A-1

BASE BID

Install New 12,000 Gallon AST 100LL AvGas Fuel System

ADD ALTERNATE NO. 1

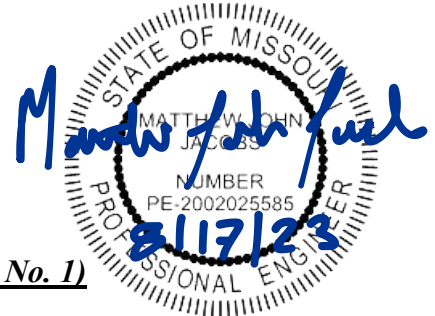
Install QT Pod System

ADD ALTERNATE NO. 2

Install Fuel Master System

ADD ALTERNATE NO. 3 (Added per Addendum No. 1)

Install Product Recovery Vessel



ADDENDUM NO. 2

August 17th, 2023

TO ALL PROSPECTIVE BIDDERS:

- A. You are hereby notified of the following amendments to the Contract Documents/Specifications for the subject project.**
1. Section 13, Fuel Storage and Delivery System. The requirements for floating suction and the pull to test cable have been removed from the fuel system's specification.
- Revised Section 13, Fuel Storage and Delivery System is included with this addendum for reference.**
- B. You are hereby notified of the following clarifications for the subject project.**
1. Per Plan Sheet No. 6, all dispensing equipment shall be installed in the proposed cabinet enclosure alongside the Aircraft Apron. No canopy, rain hood, or any other sheltering items are required to cover the proposed cabinet enclosure. The proposed cabinet enclosure should have a containment pan with a drain that has a closeable ball valve.
 2. A soak test of the tank system is not required after installation.
 3. To achieve the offload transport 5 HP 1 phase pump with a flow rate of 200 GPM, the Contractor can specify a Gorman Rupp RS pump with air release, or approved equal, to achieve the desired power and flow rate criteria.
- C. All bidders must acknowledge receipt of this addendum in the space provided on the REVISED Official Bid Form Page 3, included with Addendum No. 1, for use when submitting their bid. Failure to acknowledge receipt of an addendum may be cause for rejection of the bid.**

SECTION 13

LOCHNER MODIFICATION

ITEM FUEL

FUEL STORAGE AND DELIVERY SYSTEM

General Information

This specification covers the procurement, manufacture, shipping off-loading, placement and performance specifications of a fueling system for Chillicothe Municipal Airport in Chillicothe, Missouri. The fueling system shall consist of One (1) 12,000 Gallon UL2085 Double Wall Avgas Fueling System. The containment pan shall include a closeable ball valve and piping to the low point of the containment pan for draining product and water from the pan. The valve shall remain closed, except for draining the pan. The containment pan shall be large enough to contain the approximate amount of fuel in the piping and equipment of the pumping skid.

The fueling system shall include all the necessary pumps, valves and components to provide an operational system in accordance with industry standards for aviation fueling and comply with federal, state and local codes. These specifications are minimum standards and the engineer may consider approved equals. Price shall include all fees, permits, training and inspections required for the fueling systems to be operational. All equipment provided for this system shall be new, no used or refurbished equipment shall be permitted.

1. **Submittals:** The manufacturer of the fueling systems shall provide comprehensive submittals and gain approval of the submittals before fabrication of the fueling system. Submittals shall be submitted within 28 days after the Award of Contract by the successful bidder.
2. **Scope of Work:** The fueling system project at the airport will consist of:
 - a. **Jet Bulk System** - 12,000 Gallon UL2085 Double Wall Tank for the storage of 100 LL Avgas with a pumping system capable of off-loading transports at 200 GPM through filtration and overwing fuel aircraft at 20-30 GPM.
 - b. **NOTE:** See drawings for the location of the off-load box and the fueling cabinet.
3. The Site Contractor will be responsible to off-load the new tanks and anchor the tanks into place at the site per manufacturers or engineer's specifications.
4. Proper and complete installation will conform to the manufacturer's specifications and checklist.
5. The Contractor responsible for the construction of the fuel system must complete an "Annual Financial Responsibility for Manufacturers and Installers Form" prior to construction commencing. This form can be found at <https://agriculture.mo.gov/weights/>

Industry Standards

1. The following Industry standards are listed for reference and shall govern all applicable aspects of this project. Should conflicts between standards arise, bidders shall apply the standard which is most stringent or restrictive:
 - a. Petroleum Equipment Installation Institute (PEI)
 - i. Publication RP 200
 - ii. Publication RP 300
 - b. American Petroleum Institute (API)
 - i. API Publication 1500, Storage and Handling of Aviation Fuels at Airports
 - ii. API Publication 1529, Aviation Fueling Hose
 - iii. API Publication 1542, Airport Marking for Fuel Identification
 - iv. API Publication 1581, Specifications and Qualification Procedures for Aviation Jet Fuel Filter/Separator
 - v. API Publication 1540, Design, Construction, Operation and Maintenance of Aviation Fueling Facilities.
 - c. Underwriters Laboratories, Inc. (UL)
 - i. UL 142, Steel Aboveground Tanks for Flammable and Combustible Liquids.
 - d. National Fire Protection Association (NFPA)
 - i. NFPA 30, Flammable and Combustible Liquids Code
 - ii. NFPA 70, National Electric Code (NEC).
 - iii. NFPA 407, Standard for Aircraft Fuel Servicing.
 - e. Air Transportation Association (ATA)
 - i. Specification 103, Standards for Jet Fuel Quality Control at Airports.
 - f. Federal Aviation Administration (FAA)
 - i. Advisory Circular 150/5230-4 – Aircraft Fuel Storage.
 - g. Applicable State of Missouri Codes shall apply.
 - h. System and installation shall comply with the requirements of the Missouri Department of Agriculture, Division of Weights, Measures and Consumer Protection.

Qualifications

1. The contractor or subcontractor shall be required to provide documentation and/or references stating that they are regularly engaged in projects similar to this and that all firms used by the bidder, including the bidders' own employees, contractor or subsidiary firms, that are associated with the fueling portion of this project certify that they are regularly engaged in the production and installation of such fuel storage tank systems for the past four (4) years. Furthermore, the bidder will have completed at least 3 similar aviation projects in the past two (2) years and be familiar with the aviation standards governing this project. Suitable references of three (3) similar projects shall be submitted upon request. The owner has the right to reject any and all bids. The system shall be manufactured at the factory and shipped complete to the site by a company that engages in this type of business on a regular basis.
2. The bidder shall be a recognized professional firm among his peers.
3. The bidder, upon request, must clearly demonstrate it has the financial capacity to manage the project and has maintained a strong financial performance for the past three (3) years.

Submittals

1. Within 28 days of Award of the Contract, bidder shall submit the following submittals for all of the major components of the fueling system, including:
 - a. Tank Manufacturers technical data: including tank drawing.
 - b. Shop / Fabrication Drawings including the following for each tank:
 - i. General Arrangement Drawings, Including Tank and Pumping Systems
 - ii. Piping Schematic
 - iii. Electrical Schematic – Including an electrical conduit plan.
 - iv. Detailed Bill of Material
 - v. Concrete fuel pad design schematic and plan
 1. Shall be sealed by a Structural Engineer in the State of Missouri
 - vi. Overhead light schematic and plan
 1. Shall include light (as described on Project Plans), light pole, foundation, and illumination plan
 - c. Proposed Project Schedule, including (as a minimum) milestone dates for the following:
 - i. Notice to Proceed for Site Work
 - ii. Mobilization
 - iii. Delivery of Fuel Storage Systems
 - iv. Installation of Fuel Storage and Delivery System and Associated Piping
 - v. System Testing
 - vi. System Start-up and Commissioning

Tank Specifications

Tanks shall be UL2085 labeled, manufactured by a member in good standing with Steel Tank Institute.

All openings shall be made above the normal maximum liquid level in accordance with UL standards.

1. **Avgas 100LL Tank:** One (1) 12,000 Gallon UL2085 Double Wall, 10-foot diameter tank meeting the requirements of NFPA 30. Tank shall include the following:
 - a. Cylindrical Steel Construction conforming to UL142 for horizontal atmospheric aviation fuel storage tanks.
 - b. All openings shall be above the normal maximum liquid level of the tank.
 - c. Tank shall be mounted on UL approved steel saddles welded to the tank.
 - d. Tank exterior shall be painted carbon steel.
 - e. The exterior surface of the tank shall be factory sand blasted free of any surface oxidation.
 - f. The exterior of the tank shall be coated with an epoxy primer.
 - g. The exterior of the tank shall be painted white with a polyurethane paint with a thickness of 10 to 12 mils.
 - h. Interstitial space shall be provided and have an emergency vent per NFPA 30. The interstitial space will be monitored by a float operated gauge.
 - i. Tank shall have lifting lugs for off-loading the tank onto the concrete pad.
 - j. Interior of the tank shall be butt-welded and ground smooth 12 inches on both sides of the bottom center line of the tank. “Lap” welds on primary (internal) tank are prohibited.

- k. Tank interior shall be epoxy coated. The inner tank shall be sand blasted and clean and dry before internally epoxy coating the tank and the epoxy coating shall be applied to mil Specification ML-C-4556-D and shall be a two (2) coat system and the dry film thickness shall be 5 to 7 mils. Final coat shall be white or near white.
- l. The Internally Epoxy Coating shall be:
 - a. Amercoat 395
 - b. Tnemec 61
 - c. Approved Equal
- m. Tank shall have an OSHA compliant side mounted ladder and platform. The platform and ladder shall be galvanized or painted safety yellow to allow access platform will “straddle” the manway for access to the manway, ~~pull-to-test cable~~ (***Removed per Addendum No. 2***) and a stick port opening.
- n. All painting shall be factory applied. No field painting is permitted, except for required touchup painting.

Tank Slope and Anchoring

- 1. The tank support system shall be fabricated with slope to the rear of the tank. The concrete pad will be slightly sloped to the rear so the tanks need to be sloped to the rear for a net slope to the rear of 2%. **Tank interstitial monitoring, tank sump and water removal systems shall be located at the rear of the tank.**
- 2. Tank shall be anchored to the concrete bases in accordance with the tank manufactures specifications and according to local seismic codes at the project location.
- 3. Tank shall be electrically grounded per local electrical codes.

1. Avgas Tank Equipment:

- a. Suction Piping:
 - i. The primary storage tank will be outfitted with a 3” suction pipe properly sized for the require flow rate and pump capacity. The suction piping will terminate approximately 6” from the bottom of the tank.
- b. Tank Gauging and Alarm:
 - i. Tank gauges shall be placed as close as possible to the centerline of the tank
 - ii. Tank gauge shall be ground readable in feet and inches.
 - iii. Tank gauging shall include an audible alarm that will sound at 90% capacity of the tank. Tank alarm shall be mounted close to the transport off-load connection, in view of the transport off-load area and shall be audible in the transport off-load area.
- c. Tank Overfill Protection:
 - i. Tank shall be outfitted with overfill protection that will provide a non-shocking fail-safe positive shut-off the flow of product into the tank at 95% capacity.
 - ii. Overfill protection will utilize a float device to positively shut-off the flow into the tank.

- d. Tank Fill Piping:
 - i. The tank shall have a 3" off-load connection, 3" butterfly valve and 3" cast steel swing check valve. Top or splash filling of the tank will not be allowed.
 - ii. The fill piping will include a drop tube that will terminate within 6" of the bottom of the tank and terminate with a diffuser.
- e. Emergency Vent Primary and Secondary (interstitial) Tank:
 - i. Tank will be outfitted with an emergency vent for the primary tank in accordance with NFPA 30.
 - ii. Tank will be outfitted with an emergency vent for the secondary tank in accordance with NFPA 30
- f. Operating Vent:
 - i. Avgas Tank shall be outfitted with a 3" Pressure / Vacuum Vent. Operating vents shall be a minimum of 12' above grade and a minimum of 24" above the tank top.
- g. Tank Openings:
 - i. Tank will be outfitted with two (2) 24" manways.
- h. Interstitial Opening:
 - i. Interstitial space shall be provided and have an emergency vent per NFPA 30.
 - ii. Interstitial Space shall be monitored by a float gauge.
- i. Tank Fittings:
 - i. Tank shall be outfitted with the proper number of openings plus two additional 4" opening for future use. One 4" opening could be utilized for electronic tank gauging, so both openings can't be above the floating suction and as close to the center of the tank as possible. Additional opening shall be as close to the midpoint of the tank as possible and capped for future use.
- j. Tank Sump
 - i. Tank will have hand pump, mounted at the rear of the tank, anti-siphon valve, and the piping shall enter the top of tank on the centerline of the tank and shall terminate within 1" of the bottom of the tank. Hand pump shall be mounted on a bracket at the rear of the tank and shall be located approximately 40" from the ground level for operation at ground level. The drain shall terminate approximately 12" from grade at the rear of the tank. Piping shall be stainless steel.
- k. Tank Testing
 - i. Tank shall be pressure tested at the factory in accordance with UL142.
 - ii. Tank shall be field tested for tank tightness, after the installation of the tank at the airport.
- l. Anti-Siphon:
 - i. Tank shall have a means to prevent the release of liquid from the tank by siphon flow on the primary suction piping.
- m. Manual Gauge Port:
 - i. Tank shall have a 2" water-tight gauge port located near the center of the tank, accessible from the maintenance platform, for manually "sticking" the tank to determine the level of product in the tank. Contractor will provide a calibrated gauge stick and strapping chart for the tank.

- n. Vapor Recovery:
 - i. The storage tank shall be provided with stage 1 vapor recovery and will include vapor adaptor and cap. Vapor recovery connection at the tank shall be through the top of the tank.
 - ii. Vapor recovery connection shall be within the spill containment pan area.
- o. Fusible Link Emergency Fire Valve:
 - i. In Accordance with NFPA 407, a Fusible link valve shall in the suction piping at the head of the tank, it shall close when it senses temperatures in excess of 165 degrees.

Pumping System

- 1. **Avgas System** – As per NFPA 407 piping valves and fittings shall be of metal suitable for aviation fuel service and designed for working pressure and mechanically and thermally produced structural stresses to which they could be subjected. Cast iron, copper, copper alloy and galvanized steel piping, valves and fittings shall not be permitted. Fueling system butterfly valves shall be ¼ turn butterfly style rated at 250 psi. Valve bodies and lugs shall be constructed of ductile iron with stainless steel stems and viton seals.

All electrical, wiring and grounding shall be of a type specified by, and installed in accordance with NFPA 70. All fuel facility control boxes, wiring components, motors, starters and electrical equipment located in the hazardous area shall be explosion proof. All electrical components shall be rated Class 1 Division 1.

a. **Pumping System:** The fueling system with a porch and rainshield with a drainable containment pan, will be designed with the off-load connection and vapor recovery connection within the containment pan area. The pumping system will be designed to off-load transports at approximately 200-240 GPM, through filtration and overwing fuel aircraft at 20-30 GPM. The system will also be capable of re-circulating product at approximately 200 GPM. The system will incorporate the following equipment:

- i. Centrifugal Pump with a **5 HP 1 phase** explosion proof motor and explosion proof starter. Pump and motor shall be base mounted and the base shall be welded to the frame in the cabinet. Base shall be welded steel channels or I-Beams. Motor shall incorporate an internal heater.
- ii. Motor Starter – Explosion proof starter box with appropriate sized motor starter.
- iii. Pump Motor – Pump motor shall be Class I Division I Group D explosion proof motors, 208-230 Volt single (1) Phase, 60 Hertz. Motor shall be appropriately sized for the pumping requirements of the system.

- iv. Filtration – 200-240 GPM filter separator with Class-C coalescer / separator filter elements, externally testable water defense (Gammons 1cc, Crown Products or approved equal), piston style differential pressure gauge, air eliminator, pressure relief, and ¾” spring load drain valve. Stainless Steel drain lines and Stainless-Steel lockable ball valve will be routed to edge of the containment pan for draining into Stainless Steel buckets.
- v. Filter Vessel – Filter vessel shall be a 6th edition filter separator with coalesce / separator filters. Filter vessel shall be internally epoxy coated. Filter vessel shall be an ASME code vessel and have 150# flanges and a pressure relief set at 125 PSI. Filter vessel shall be manufactured by Facet or Velcon. All air eliminator and pressure relief lines will be Stainless Steel and plumbed back to the tank.
- vi. Spare Elements – Provide one set of spare elements to be changed after flushing the system.
- vii. Static Relaxation Vessel – Static relaxation vessel shall be internally epoxy coated. Filter Vessel shall be an ASME code vessel and have 150# flanges, air eliminator and a pressure relief set at 125 PSI. Air Eliminator and Pressure relief shall be piped back into the tank. Stainless Steel drain lines will be routed to edge of the containment pan for draining into Stainless Steel buckets.
- viii. Off-Load Connection – 3” off-load connection including 3” camlock adapter and lockable aluminum dust cover, 3” quick closing butterfly valve, 3” top cleanout 40 mesh stainless steel strainer.
- ix. Stage 1 Vapor Recovery – Stage 1 vapor recovery with a 3” vapor recovery connection, lockable cap, quick closing butterfly valve, with a vapor recovery line piped back into top of tank.
- x. 15 Gallon Product Recovery Tank - Product Recovery Tank shall be self-contained and utilized to separate water and particulate from the fuel. It shall be piped with stainless steel piping to allow draining of the water and particulate into a waste bucket. The product recovery system will be piped through sump suction and filtered before returning to tank. The product recovery system will incorporate a stainless-steel lockable valve on the return line to prevent water and particulate from being released into pump suction.
- xi. Electric Rewind Hose Reel with 1” x 75’ of API-1529 hose and an OPW 295 SAC overwing nozzle.
- xii. Spring rewind grounding reel 80 feet of coated steel cable and military style clamp. The grounding reel shall be bonded to the pumping cabinet. Cable shall have a ball stop installed next to the clamp.
- xiii. Positive Displacement Meter with “1/10th Gallons” register, non-resettable totalizer, pulsar and two stage pre-set valve.
- xiv. Valves: Valves in the fill and suction piping at the tank head shall be API 607 fire rated valves as well as fire resistant gaskets.

Piping

1. Piping shall be Schedule 10, 304 Stainless Steel with 304 Stainless Steel 150 # Flanges.
2. Piping shall be air pressure tested at 90 PSI for 30 minutes.
3. All piping 2" and greater shall be welded.
4. Piping less than 2" in diameter can be threaded or welded. Minimal threaded pipe shall be utilized in the construction of the fueling system.
5. Product piping shall include a low point drain to drain product from the piping.
6. All necessary pressure relief to prevent pressure buildup from pump pressure or thermal expansion, shall be included.

CC System

1. Provide a fuel management system to allow 24-hour self-service fueling of the Avgas system. The fuel management system shall include one credit card terminal to be located as shown on the Contract Drawings. The Credit card system for the avgas system will be upgraded to control both the avgas and for future jet self-serve sales. The Contractor will provide either a AT M4000 POD or a Fuelmaster System. Either system shall have a High Visibility Display. The contractor will also confirm and upgrade the unit as necessary to control the two systems. The system shall operate via cellular service.

System Testing

1. Pressure Testing – All product piping shall be pressure tested with air at 90 PSI for a minimum of 30 minutes. Test results shall be submitted to the Engineer.
2. Tank shall be factory tested per UL standards for aboveground storage tanks.
3. The avgas systems shall be flushed with the installed pumps to remove any construction debris, using fuel identical to the tank's intended contents.
4. Comply with all State of Missouri and the Missouri Department of Agriculture, Division of Weights, Measures and Consumer Protection testing requirements.

Signs and Markings

1. Product Piping: All product piping shall be clearly marked as to the type of product and the direction of flow.
2. Arrows – Product piping shall be labeled with the appropriate flow arrows.
3. An engraved placard shall be created and installed in the fueling area outlining specific instructions on:
 - a. The proper procedure for off-loading transports, including proper valve selection.
 - b. The proper procedure and valve placement for re-circulation fuel.
 - c. The proper procedure for fueling directly into aircraft.
 - d. Signage with emergency contact, airport manager, and fire department.
 - e. Any other decals or signage required by the State of Missouri and the Missouri Department of Agriculture, Division of Weights, Measures and Consumer Protection.

Decals

1. The tank shall be appropriately decaled on all sides, according to the product stored (Avgas) and marked with all safety decals and shall be in accordance with the Fire Marshall's requirements and the requirements or NFPA.
2. Tank shall be labeled with the appropriate UL labels, UL number, date of manufacture, model number, capacity and fabricator of the tank.
3. All other decals required by the State of Missouri and the Missouri Department of Agriculture, Division of Weights, Measures and Consumer Protection.

Fire Extinguisher

Provide one (1) 20lb - 40 B:C Fire Extinguisher, mounted at a location within 20 feet of the tank. Fire Extinguisher shall be easily accessed in case of a fire and shall be protected from the weather with a cover. Fire extinguisher shall be UL listed.

Installation and Start-up

The manufacturer of the fueling system to have a factory trained representative on site to instruct the owner(s) on the operation of the fueling system. The technician shall be on-site for the arrival and off-loading of the first load of fuel into the tank to ensure there are no leaks or issues during this operation. The contractor is responsible to have the meters will be calibrated for retail use by the Missouri Department of Agriculture, Division of Weights, Measures and Consumer Protection.

Warranty Period

The tank, pumping system and all other components shall have a warranty for a period of one (1) year after start-up. The one (1) year warranty period shall not commence until the system is installed, tested, certified by the Missouri Department of Agriculture, Division of Weights, Measures and Consumer Protection, and accepted by the owner. Tank shall carry a 30-year warranty.

Operation and Maintenance Manuals

The contractor shall provide one (1) hard copy of the operation and maintenance manual and two (2) copies loaded onto “jump stick/drives”. The Operation and Maintenance Manuals shall have a list of all equipment and materials used in the manufacturer of the fueling system, including the General Arrangement, Piping Schematic and Electrical Schematic drawings for the new fueling system.

Spill Containment Kit

Supply and install a spill containment kit (approximately 95 Gallon Size - similar to a ENPAC 95 Gallon Spill Kit Universal) or approved equal.

Product Recovery Vessel (*Added per Addendum No. 1*)

Add an additional 15-20 Gallon product recovery vessel back by the offload connection to pump sumped fuel from a transport directly back into the tank. The product recovery vessel shall be equipped with an electric pump and small filter. Piping back to the tank shall have an inline swing check valve and lockable ball valve and the piping shall be stainless steel. This item shall only be supplied and installed if Add Alternate No. 3 is awarded.

Ladder and Mount (*Added per Addendum No. 1*)

Supply a 4-foot fiberglass A-Frame step ladder to the Owner. Supply and install a mount for the ladder such that the ladder isn't stored by laying on the ground or against fueling equipment.