PROJECT SPECIAL PROVISIONS

PART I – SECTION 900 SPECIAL PROVISION ITEMS

2. B16.11 - Forged Steel Fittings, Socket-Welding and Threaded.
3. B16.25 - Buttwelding Ends.
4. B16.5 - Pipe Flanges and Flanged Fittings.
5. B31.3 - Chemical Plant and Petroleum Refinery Piping.

C. American Petroleum Institute (API):
1. Spec 5L - Line Pipe.

D. American Society of Mechanical Engineers (ASME):
1. B16.20 - Metallic Gaskets for pipe Flanges-Ring-Joint, Spiral-Wound, and Jacketed.

E. American Welding Society (AWS).

1.03 QUALITY ASSURANCE:

A. All pipe and piping materials shall be produced by a manufacturer acceptable to Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Manufacturer: Subject to compliance with requirements, provide products from one of the listed manufacturers.
1. Flange Gaskets:
a. Flexitallic.
b. Furon.
c. Klinger.
2. Pipe Supports:
a. Blaw-Knox.
b. Basic Engineering.
c. Fee and Mason.
d. Grinnell.
e. Piping Technology.
3. Instrument Tubing and Fittings:
a. Parker.
b. Swagelok.
c. Hoke.
d. B-Line.

2.02 FUEL CARRIER PIPING MATERIALS:

A. Pipe shall be ASTM A53 Grade B or API 5L Grade B, seamless or electric resistance welded. Stamp all pipe with specification and grade. Shop-wrapped pipe shall be stamped within 3 inches of end. Submerged arc welded pipe is not acceptable. Material certificates and mill test reports shall be provided. All pipe 2-inches and smaller and located downstream of the fuel supply filter and/or filter/separator shall be stainless steel.

B. Pipe 2 inches and smaller shall be Schedule ~~80~~ **40**, pipe 2-1/2 inches through 10 inches shall be Schedule ~~40~~ **10**. Socket-weld connections shall be used for 2 inches and smaller pipe except for connections to threaded valves, unions, and other equipment.

C. Pipe or fittings in the fuel piping systems shall not be galvanized.

D. Mill Cleaning and Coating of Pipe:
1. Pipe and fittings 2-1/2 inches and larger shall be internally epoxy lined at the mill as specified in SECTION 13063.
2. All pipe and fittings shall be externally coated as specified in SECTION 13063.

ITEM 13065 FUEL SYSTEM VALVES

B. Valve shall be rated for 275-psig working pressure.
C. Valves 2-1/2-inch size and smaller shall be of three-piece bolted construction, with threaded end connections unless indicated or specified otherwise.
D. Valves 3-inch size and larger shall be of two-piece split body construction, with flanged end connections. Valves shall comply with API 6D.
E. Seals and/or seats shall be reinforced TFE.
F. Provide with a vinyl-coated, stainless steel locking handle suitable for padlocking.
G. Valves shall be certified "fire safe" per API-607.
H. Where noted, valves shall have quick closing spring return handle.

2.03 BUTTERFLY VALVES (MONOFLANGE):

A. Valves shall be metal-lined, single-flanged type, drilled and tapped full lug body.
B. Valves shall be certified "fire safe" per API-607.
C. Valve shall be suitable for 275-psig working pressure, bubble-tight at differential pressure of 275 psig, and a maximum shutoff pressure of 300 psig.
D. Valve body shall be compatible to ANSI Class 150 with a face-to-face dimension or laying length in accordance with API-609.
E. The disc shall be "double offset" and shall be capable of bi-directional flow and shall be suitable for dead-end service in both directions.
F. Valve body shall be carbon steel, shaft material of stainless steel, disc shall be 316 stainless steel, with 316 stainless steel pins for attachment to the shaft. Valve shall have adjustable top packing for the shaft. ~~**Top of shaft shall be keyed to allow installation of operator at two positions 90º apart.**~~ Valve seat shall be 316 stainless steel with TFE insert material.
G. Valves shall be suitable for installation between 150-pound raised-face flanges.
H. Operators shall be as follows:
   1. Valve sizes 4 inches and smaller shall have a 10-position, spring-loaded, squeeze-trigger handle with locking device.

2.04 CHECK VALVES:

A. Check valves 2-1/2-inch and smaller:
   1. Forged steel, Class 800, lift check.
   2. Elastomers shall be compatible with jet fuel.
   3. End connections shall be threaded.
B. Check valves 3-inch and larger:
   1. Valve shall be dual-plate wafer style suitable for 275 psig working pressure, designed and tested to API 594.
   2. Valve body and plate shall be carbon steel with resilient Viton seat and 316 SS pins, and springs. Each plate shall have an independent spring (two springs).
   3. Ends shall be suitable for installation between ANSI 150-lb raised-face flanges.

2.05 THERMAL RELIEF VALVES:

A. Carbon steel body, stainless steel internals, disc and seat type, Viton elastomers (seat, O-ring), closed cap (no lever).
B. Valves shall be set to relieve at 125 psi.
C. All set points shall be a nominal point within a "SET POINT" range, adjustable for field conditions.
D. Inlet and outlet connections shall be 3/4-inch and 1 inch, respectively, with threaded connections.

ITEM 13067 FUEL SYSTEM ACCESSORIES

2. All other locations: 0 to 150 psi.

2.07 JET FUEL/AVGAS HOSE:

A. Hose shall be 4-inch or 3-inch diameter as required and capable of 300 psi working pressure to full vacuum.
B. Tube shall be nitrile with single ply, high-tensile nylon cord reinforcement interwoven hardwall construction. Cover shall be black neoprene.
C. Hose shall be API 1529 Grade 2 Type C and meet NFPA 407 requirements.
D. Hose size shall be determined by contractor based on the system flow characteristics.

2.08 JET FUEL/AVGAS HOSE SWIVEL JOINT:

A. Swivel Joint shall match piping diameter.
B. Swivel joint shall be capable of 275 psi working pressure.
C. End connections shall be flanged body with female threaded sleeve.

2.09 AVGAS VAPOR RECOVERY ADAPTER:

A. Adapter shall be rated at 10 psi maximum working pressure.
B. Elbow end and FNPT end shall be 3-inch size.
C. Adapter shall be hard coated aluminum.
D. Provide with dust cap OPW 1711T-7085-EVR or equal.

2.10 METERS:

A. General Requirements: Positive displacement temperature compensated meters shall be designed to meter aviation fuel, Jet A or 100LL Aviation Gasoline at the supply flow rate.
B. Manufacturer's Service Engineer:
   1. Furnish the services of a manufacturer certified service engineer to verify proper installation and assist in start-up, checkout, calibration, and meter proving.

2.11 SUMP SEPARATORS:

A. General Requirements: ~~50~~ **20**-gallon tank with self-contained pump, valves, and piping used to separate water from fuel tank and filter sump samples.
B. Construction:
   1. Tank capacity shall be ~~50~~ **20** gallons.
   2. Unit shall be internally epoxy coated.
   3. Provide self-contained centrifugal pump with check valve and piping for sending fuel through receipt filtration back to the storage tank, and water/waste fuel to waste tank. Pump shall be 5 gpm, 30-foot head with starter in explosionproof box. Motor shall be 120 volts, 60 hertz, 1/2 hp, single-phase explosionproof.
   4. Provide sight glass and ball stop with stainless steel fittings.

2.13 AUTOMATIC AIR VENTS:

A. Automatic air vents shall be all stainless steel construction including float and body. Seat shall be Buna-N for Jet A and Viton for aviation gasoline.
B. Connections shall be 1-inch FNPT inlet and outlet.
C. Provide with a tee with manual air vent between vessel or pipe and automatic air vent.

2.14 HAND PUMPS:

A. Hand pumps shall be sliding vane design and shall be suitable for handling jet fuel and avgas.

ITEM 13071 FUEL SYSTEM FILTRATION

2. Ball Valves:
   a. Provide valves as specified in SECTION 13065 - FUEL SYSTEM VALVES.
3. Check Valves:
   a. A Gammon Technical Products GTP 2916 check valve shall be installed in the automatic air vent outlet.
   b. Check valve shall be stainless steel with 3/4-inch MNPT connections.
4. Differential Pressure Gauges:
   a. Provide a direct-reading differential pressure indicator with a stainless steel housing, push-button test and a 0-30 psi scale. Indicator shall be a Gammon Technical Products GTP-534PB-30S or approved equal.
   b. Gauge shall be mounted directly on the vessel and shall be complete with dampeners, stainless steel tubing, valves, and fittings.
5. Differential Pressure Switches:
   a. Provide switch mounted directly on vessel.
   b. Switch shall be 24Vdc, SPDT.
   c. Switch shall be a Custom Control Sensor Model 646DZE1.
   d. Switch shall have a field adjustable set point range on increasing pressure of 1.2 to 18 psi.
6. Thermal Relief Valves:
   a. Provide valves as specified in SECTION 13065 - FUEL SYSTEM VALVES.
   b. Relief valves on vessels shall be set at 125 psi.
7. **Water Detection:**
   a. Hydraulic Water Detection
      (1) Water detection shall be via an internal float assembly, with a pilot valve that will hydraulically close the water slug control valve on detection of water in the sump.
      (2) System shall include an integral manual test lever to verify operation of the control pilot.
      (3) Cla-Val Model CFF 21-H2, or equal.
   b. Intrinsically Safe Electronic Water Detection
      (1) Water detection shall be via an instrinsically safe electronic sensor, controlling a solenoid pilot valve that will hydraulically close the water slug control valve on detection of water in the sump.
   (2) System shall include an integral manual test button to verify operation of the control pilot.
8. Provide clean-out connections with victaulic coupling and plug.
9. Provide one set of filter elements for each vessel for flushing operations. Provide an additional set of filter elements for each vessel to be installed after system start-up. Provide an additional set of filter elements for each vessel for spares.

F. Manufacturer's Service Engineer: Furnish the services of an experienced service engineer for (1) day on the Site to verify proper installation, assist in start-up, flushing, and testing, and instruct Owner's operating personnel.

PART 3 - EXECUTION

3.01 SETTING AND ALIGNING EQUIPMENT:

A. Set and align all equipment supplied under this Section in accordance with manufacturer's recommendations.

B. Set true and level all Equipment at the locations shown. Demonstrate adequate leveling of installed Equipment.
C. Retighten all bolted connections after installation.

3.02 INSPECTIONS:
A. The Work will be inspected by Owner at intervals appropriate to the stage of construction during the course of construction.
B. Provide for inspection by all others having jurisdiction over the work performed under the various Sections of the Specifications during the proper phase.
C. At time of final inspection, furnish certificate or certificates of final approval by all others having jurisdiction.

3.03 TUBING INSTALLATIONS:
A. Assemble using Hy-Fer-Set presetting device as recommended by the manufacturer.
B. Route as required to interconnect the instrumentation provided.
C. Provide an instrument valve and threadolet for all "root" valve locations where instrumentation tubing connections are made to the piping system or equipment.

3.04 GAUGES:
A. Install where readily accessible to operations personnel.

3.05 VALVE AND EQUIPMENT INSTALLATION:
A. Install in accordance with manufacturer's recommendations.
B. Replace any and all valves and Equipment that prove defective during testing.
C. Arrange all valves during installation such that operating handles and controls are accessible, have sufficient clearance, and in the correct orientation for Owner's operation.
D. For adapters with integral screens; remove, clean, and reinstall screen after completion of flushing, before putting system into service.

3.06 CLEANING AND PROTECTION:
A. Clean all fabricated assemblies and all Equipment items thoroughly before operating or testing.
B. Protect Equipment from damage, deterioration, paint or coating spills or spots, corrosion, or harm from any source.

3.07 EQUIPMENT TEST AND CHECKOUT:
A. Before Equipment installations will be accepted, Contractor-furnished Equipment shall be tested and demonstrated to be correctly connected and installed.
B. All testing and checkout procedures of the manufacturer shall be carried out completely.
C. All tested Equipment found to be defective or inoperable to any extent is to be reported to Owner immediately.
D. Any operating difficulty or defective item as a result of Contractor's Work shall be repaired or replaced and put into proper operation by Contractor immediately.
E. Protect all Equipment and surrounding areas from damage resulting from testing operations. Clean up any spills or leakage from testing.

END OF ITEM 13071

level. The Jet-A high-high level alarm shall be interlocked with the receipt pump to stop fuel receipt. The low-low level alarms in both the Jet-A and Avgas tanks shall be interlocked with the respective supply pump to stop fuel delivery.

For the Waste Tank, provide an analog gauge system with local read-out, in addition to separate high and low level visual alarms. Provide digital leak detection senor in the interstitial space between the primary and secondary containment tank walls. Connect all electronic level and leak detection sensors to a Veeder-Root TLS-350 tank monitoring system, or equal. Tank monitoring system shall also monitor fuel inventory and be capable of local printing of fuel inventory reports. System shall also control the visual alarm indication for tank level warning.

7. Provide a maintenance platform along the full length of the top of the tank for access to all tank nozzles and tank accessories. Platform width shall be a minimum of 36 inches. Provide platform with OSHA approved handrails. Extend catwalk as required. Platform and handrails shall be constructed of structural shapes and grates of ASTM carbon steel materials. Platform shall be coordinated with catwalk for a step down to the platform from the catwalk. Platform shall maintain access to and clearances from manways and all other tank appurtenances. Platforms, steps, external ladders and handrails shall be galvanized. **Full-length catwalks may be reduced to a ladder (or stairs) and a platform for access if the modification meet applicable ladder and platform regulatory safety standards for the proposed tank configuration.**

2.03 PUMPS, VALVES, FILTRATION AND METERING EQUIPMENT:

A. Provide as complete units, the pumping, filtration and metering equipment. The equipment units shall be shop fabricated and shall be attached, either in the field or in the shop, to the tank storage system. Units shall include frame, secondary containment pan, pump, filters, filter/separators, meters, valves, instruments, and piping specified and as necessary to provide a complete operational system. As a minimum, each system shall include the following:

1. Jet-A System Fuel Receipt:
   4-inch Kamlok adaptor with lockable dust cap, 4x3 eccentric reducer, 3-inch steel fire rated API-607 full port ball valve, 3-inch basket strainer, 15 Gallon (min.) spill container, self- priming centrifugal pump sized for 200-gpm receipt flow rate at the maximum system head, dead-man control of pump, 3-inch check valve, 200-gpm tank-type bulk air eliminator with control valve, API-1581, 5th Edition compliant 200-gpm rated filter/separator with water float valve, sump heater, and flow limiting slug valve (in accordance with 2-4.3 of ATA-103), air eliminator with check valve and pressure relief valve, and 3-inch isolation butterfly valves, spring rewind static grounding reel.
2. Jet-A System Over the Wing Fuel Supply:
   22-gpm rated direct into plane delivery system including: 2-inch Fire Rated shut-off valve with fusible link, 2-inch steel fire rated API-607 full port ball valve, self-priming centrifugal or sliding vane type positive displacement pump, API-1581, 5th Edition compliant filter/separator with water float valve, sump heater, and flow limiting slug valve (in accordance with 2-4.3 of ATA-103), air eliminator with check valve and pressure relief valve, and 2-inch isolation ball valves, positive displacement meter with electronic pulsar, electric rewind hose reel, 75-ft API-1529 aviation fueling hose, and mechanical dead-man type 22-gpm duck-bill nozzle, spring rewind static grounding reel. In addition, the Jet-A delivery system shall be configured to re-circulate fuel back to the tank to facilitate Millipore testing. The hose and static ground cable shall be mounted with in a enclose cabinet to protect against accumulation of snow or ice on the reels. The access door of the cabinet shall be at least 2-ft above the apron surface to prevent blockage from accumulated snow and ice. **Provide secondary over fill emergency shutoff system with connector to bottom loaded truck.**
3. Jet-A System Single Point Connection Fuel Supply:

50-gpm rated single point delivery system including: 2-inch Fire Rated shut-off valve with fusible link, 2-inch steel fire rated API-607 full port ball valve, self-priming centrifugal or sliding vane type positive displacement pump, API-1581, 5th Edition compliant filter/separator with water float valve, sump heater, and flow limiting slug valve (in accordance with 2-4.3 of ATA-103), air eliminator with check valve and pressure relief valve, and 2-inch isolation ball valves, positive displacement meter with electronic pulsar, electric rewind hose reel, 75-ft API-1529 aviation fueling hose, single point refueling nozzle, spring rewind static grounding reel, and spring rewind intrinsically safe electric deadman switch on 75-ft cable. The hose, static ground cable and deadman control shall be mounted with in a enclose cabinet to protect against accumulation of snow or ice on the reels. The access door of the cabinet shall be at least 2-ft above the apron surface to prevent blockage from accumulated snow and ice.

4. Avgas System Receipt:
   3-inch Kamlok adaptor with lockable dust cap, 15 gallon (min.) spill container, , self- priming centrifugal pump sized for 200-gpm receipt flow rate at the maximum system head, dead-man control of pump, 3-inch API-607 fire rated butterfly valve, 200-gpm rated Avgas filter, 3-inch check valve, and spring rewind static grounding reel. Provide 3-inch vapor recovery pipe with 3-inch fire rated shut-off valve with fusible link, 3-inch API 607 fire rated butterfly valve, and 3-inch Kamlok adaptor with locking dust cap.
5. Avgas System Fuel Supply:
   22-gpm rated direct into plane delivery system including: 2-inch Fire Rated shut-off valve with fusible link, 2-inch steel fire rated API-607 full port ball valve, self-priming centrifugal or sliding vane type positive displacement pump, dispenser with electronic pulsar, avgas filter, electric rewind hose reel, 75-ft API-1529 aviation fueling hose, aviation avgas over-wing nozzle, and spring rewind static grounding reel. The hose and static ground cable shall be mounted with in a enclose cabinet to protect against accumulation of snow or ice on the reels. The access door of the cabinet shall be at least 2-ft above the apron surface to prevent blockage from accumulated snow and ice.
6. Fuel Recovery:
   Provide sump separators with return pumps for both the Jet-A and Avgas system. The sump drains from the Jet-A system filter/separators shall be piped to the Jet-A sump separator, and the drain line from the Avgas receipt filter shall be piped to the Avgas sump separator. Provide valves and piping to enable selected return of fuel through filtration to the applicable storage tank, or to the waste tank.
7. Waste Fuel Tank:
   Inlet line to the waste tank shall include a 1-inch check valve, and a 1-inch steel fire rated API-607 full port ball valve. The suction line from the tank shall include a 2-inch Fire Rated shut-off valve with fusible link, 2-inch steel fire rated API-607 full port ball valve, and a 2-inch Cam-lok adaptor with an aluminum dust cover.
8. Water Draw Off Pump:
   A 1-inch line shall be routed from the water draw off port to a hand operated diaphragm pump. The pump shall discharge to the waste tank inlet line. 1-inch isolation valves shall be installed on either side of the hand pump to allow for maintenance as well as a 1-inch check valve downstream of the hand pump. Water draw off nozzle with drip tube shall be installed upstream of the pump to test for the presence of water. Elevation of the water draw off nozzle shall be at or below the elevation of the water drain off port on the tank. All lines installed prior to the water draw off nozzle shall be installed at or below the level of the water draw off port on the tank to prevent creating a water trap. A 1-inch isolation valve shall be installed immediately downstream of the water draw off connection point on the fuel tank for isolation of the entire water draw off

line. The Avgas and Jet A shall each have their own water draw off system connected to the respective waste fuel tank.

9. Self-Service System:
   Fuel supply shall be controlled through a card access system equivalent to a QT Technologies M4000 system, and shall include: Credit Card fuel management unit with pedestal, hose control for up to four hoses, Smartcard activation, alphanumeric keypad, USB connection and Wireless for connection between system and office computer, Smartcard access keys, weather covering to protect the panel and controls from snow and ice buildup, and pedestal mounted credit card receipt printer. Note: The Jet-A system shall be configured as a slave to the Avgas master system.

B. Piping, valves, equipment, and instruments shall be provided as specified in the following sections:
   1. Piping shall meet the requirements of SECTION 13061 - FUEL SYSTEM PIPE, CONNECTIONS, AND INSTALLATION.
   2. Valves shall meet the requirements of SECTION 13065 - FUEL SYSTEM VALVES.
   3. Meters, equipment and instruments shall meet the requirements of SECTION 13067 - FUEL SYSTEM ACCESSORIES.
   4. Pumps shall meet the requirements of SECTION 13069 - FUEL SYSTEM PUMPS.
   5. Filter separators shall meet the requirements of SECTION 13071 - FUEL SYSTEM FILTRATION.

C. All exterior carbon steel surfaces shall be coated in accordance with the requirements of Section 13063. This includes frame and secondary containment pan, piping, valves, equipment, and applicable instruments.

D. All wetted carbon steel surfaces shall be coated in accordance with the requirements of Section 13063.

E. Do not coat stainless steel, galvanized or aluminum surfaces.

2.04 ADDITIONAL ACCESSORY EQUIPMENT:

A. Contractor to include providing a spill kit. Coordinate with local authority having jurisdiction on the size of the spill kit.

B. Contractor to include an enclosure for a fire extinguisher located at the fueling station. This should protect the extinguisher from ice and snow. Enclosure should conform to all NFPA, state and local code requirements.

C. A second Emergency Fuel Shutoff (EFSO) shall be installed at the Terminal Building. Primary EFSO shall be installed per NFPA 407 location requirements.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. System shall be installed per manufacturer's recommendations; recognized industry standards; and federal, state and local codes.