

8. Sealant must be forced into joints mechanically with sufficient pressure to expel all air and provide a solid filling against sides of the joint and bond breaker of backup material. Surfaces must be uniformly smooth and free of wrinkles. Tool joints in accordance with the Manufacturer's printed instructions. Do not use water or soap for lubricant. Material must finish flush with adjacent surfaces unless otherwise specified.
9. Joints adjacent to painted work must be caulked before final coat of paint is applied. Material must be placed before painting is started. Wherever possible sealant color to match substrate, metal finish or paint, as approved by the Commissioner.

3.5 SCHEDULE OF SEALANT AND CAULKING APPLICATIONS:

1. Generally, install specified sealing compounds in locations wherever "sealant" or "caulk or caulking " is typically noted on the Drawings or required by other sections of the specifications.

3.6 CLEANING:

1. Clean adjoining surfaces of smears, compound, or other soiling due to these operations, as work progresses. Restore, refinish or replace any adjacent surfaces or materials which are marred or damaged to the satisfaction of the Commissioner, at no cost to the City.

3.7 GENERAL CLEAN-UP:

1. All rubbish and debris resulting from the Work of this section must be collected, removed from the site and disposed of legally.
2. All Areas must be left in a broom clean condition.

**END OF SECTION 07900**

# **SEALANTS AND CAULKING**

## **SECTION 07920**

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES:

1. Work under this section is subject to the requirements of the Contract Documents.
2. Furnish and install sealant and caulking as specified herein, including but not limited to the following:
  1. Joint in horizontal and sloping surfaces.
  2. Top and backs of joints between newly set coping.
  3. Other miscellaneous exterior joints, to be caulked or sealed except those specified under other sections.

#### 1.2 RELATED WORK:

1. As specified in the following divisions:
  1. Division 7 - Sheet Metal Flashing and Trim
  2. Division 15 - Mechanical

#### 1.3 REFERENCES:

1. ASTM C 790 - Use of Latex Sealing Compounds.
2. ASTM C 804 - Use of Solvent-Release Type Sealants.
3. ASTM C 834 - Latex Sealing Compounds.
4. ASTM D 1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
5. ASTM D 1565 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Open-Cell Foam).
6. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.

#### 1.4 SUBMITTALS:

1. Submit the following
  1. Product Data
    1. Submit a minimum of four (4) copies of the following:
      - (1) Manufacturer's Literature - Materials description and installation instructions for each type of sealant and associated miscellaneous material required.
  2. Test Reports
    1. Submit test reports necessary to show compliance with the Contract Documents.

3. Manufacturer's Certification

1. Certify that products meet or exceed the specified requirements.

1.5 QUALITY ASSURANCE:

1. Contractor Qualifications - Installation of sealant and caulking must be performed only by a qualified installer. The term qualified means experienced in performing the Work required by this section. The qualified Installer will be responsible for demonstrating to the Commissioner's satisfaction that he/she has sufficient experience in its role. The Installer must submit evidence of such qualifications upon request by the Commissioner.
2. Perform Work in accordance with the latest edition, of the appropriate divisions, of the following:
  1. Sealant and/or caulking Manufacturer's requirements for preparation of surfaces and material installation instructions.
3. Obtain sealant materials only from Manufacturers who will, upon request by the Commissioner, send a qualified technical representative to visit the site at the beginning of the sealing and caulking work and periodically thereafter as necessary to ensure the proper installation of the sealing and caulking compounds.

1.6 DELIVERY, STORAGE AND HANDLING:

1. Materials must be delivered to the Project in sealed containers bearing Manufacturer's name and material identification. Materials must be stored in strict accordance with the Manufacturer's printed directions, copies of which will be furnished to the Commissioner.
2. Protect materials against damage from mechanical abuse, plaster, salts, acids, staining and other foreign matter by an approved means during transportation, storage and erection and until completion of construction work. All unsatisfactory materials must be removed from the premises, and all damaged materials replaced with new materials.
3. Access and Storage Areas.
  1. All access routes and storage areas will be subject to the approval of the Commissioner in order to reduce interference with Airport Operations.

1.7 WARRANTIES AND GUARANTEES:

1. The Contractor must repair or replace defective materials and workmanship during the Contract Period and for three (3) years from the date of Substantial Completion of the Project. Defective material and workmanship include, but are not limited to, the following:
  1. Warranty all sealant and caulking work.
  2. Warranty must include coverage for installed sealants and accessories which fail to achieve air tight seal, water tight seal, and exhibit loss of adhesion or cohesion, or do not cure.
  3. Contractor must specifically agree that warranty includes, but is not limited to any of the following defects in joints caulked with these sealants:
    1. Adhesive or cohesive failure in joints where movement is under a maximum of 45% as defined by Standard ASTM rubber testing elongation methods.
    2. Cracking or brittleness developing on surface of material.

3. Staining of adjacent surfaces or bleeding by sealant or primer.
4. Chalking, or color change on surface of cured sealant.
5. Increase or decrease in Shore a durometer in excess of 15% of readings taken one (1) month after cure.

#### 1.8 ENVIRONMENTAL REQUIREMENTS:

1. Maintain temperature and humidity recommended by the sealant/caulking Manufacturer during and after installation.
2. Do not proceed with installation of sealants or caulking under adverse weather conditions, or when temperatures are below 40 degrees For, above or below Manufacturer's recommended limitations for installation. Proceed with work only when forecasted weather conditions are favorable for proper cure and development of high-early-strength. Wherever joint width is affected by ambient temperature variations, install elastomeric sealants only when temperatures are in lower third of Manufacturer's recommended installation temperature range.

#### 1.9 SPECIAL REQUIREMENTS:

1. Job Conditions
  1. Installer must examine joint surfaces and backing, and their anchorage to structure, and conditions under which joint sealer and caulking work is to be performed, and notify the Contractor in writing of any conditions detrimental to proper and timely completion of work and performance of materials. Do not proceed with joint sealer or caulking work until unsatisfactory conditions have been corrected in a manner acceptable to Commissioner.
2. Coordination - Coordinate work of this section with related Work specified in the other divisions/sections of the Contract Documents.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS:

1. Polyurethane sealant - One (1) part. Use primer recommended by the sealant Manufacturer. Primer and sealant must not cause visible stain on top surface of the substrate to which they are applied and conforming to PS TT-S-00230C, Class A, Type II. The following products are acceptable:
  1. "NP1" - ChemRex, Inc., Sonneborn Building Products, Shakopee, MN 55379.
  2. "Dymonic" - Tremco, Inc., Beachwood, OH 44122.
  3. "Dynatrol 1" - Pecora Corp., Harleysville, PA.
2. Primers - Type recommended by Manufacturers of sealants and caulking compounds being used.
3. Compressible Gasket Material - "Ethafoam", as manufactured by The Dow Chemical Co., Bay City, MI 48707.; "Expand -O-Foam", as manufactured by Williams Products Inc., Troy, MI 48084; or "Expansion-Joint Filler", as manufactured by ChemRex, Inc., Sonneborn Building Products; Shakopee, MN 55379; closed cell flexible sheet stock.
4. Bond Breaker Tape - Polyethylene tape or other plastic tape recommended by sealant Manufacturer; to be applied to sealant contact surfaces where bond to substrate or joint filler

must be avoided for proper performance of sealant. Provide self-adhesive tape wherever applicable.

5. Sealant Backer Rod - "Ethafom", as manufactured by The Dow Chemical Co.; "Expando-O-Foam", as manufactured by Williams Products Inc.; or "Closed Cell Backer-Rod", as manufactured by ChemRex, Inc., Sonneborn Building Products, close-cell polyethylene flexible rod.
6. Colors - For exposed materials, provide color as indicated, or if not indicated, as selected by the Commissioner from Manufacturer's standard colors to match adjoining materials.
7. Hardness - As recommended by Manufacturer for application shown.
8. Modulus of Elasticity - Before purchase of each required material, confirm its compatibility with each other material it will be exposed to in jointing system.
9. Compatibility - Before purchase of each required material, confirm its compatibility with each other material it will be exposed to in jointing system.
10. Size and Shape - As shown or, if not shown, as recommended by Manufacturer for type and condition of joint, and for indicated joint performance or movement.
11. Grade of Sealant - For each application, provide grade of sealant (Non-sag, self-leveling.

### PART 3 - EXECUTION

#### 3.1 INSPECTION:

1. Before commencing installation, examine substrate surfaces to determine that they are free of conditions which might be detrimental to proper and timely completion of the Work. Start of Work will indicate acceptance of the substrate.
2. Verify that joint backing and release tapes are compatible with sealant/caulking.

#### 3.2 PREPARATION:

1. Clean joint surfaces immediately before installation of sealants/caulking. Remove dirt, insecure coatings, moisture, frost and other substances which would interfere with bond of sealant.
2. Prime or seal joint surfaces as recommended by sealant/caulking manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.
3. Install bond breaker tape wherever shown and wherever required by Manufacturer's recommendations to ensure that elastomeric sealants will not adhere to backing material and will perform properly.

#### 3.3 INSTALLATION:

1. Comply with Manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where Manufacturer's technical representative recommends otherwise.
2. Employ only proven installation techniques which will ensure that sealants/caulking will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise shown, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal

joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

3. Install sealants to depths as shown or, if not shown as recommended by sealant/caulking Manufacturer but within the following general limitations:
  1. For normal moving joints, sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but not more than 5/8 inch deep or less than 1/4 inch deep.
  2. For joints sealed with non-elastomeric sealants, fill joints to a depth in range of 75% to 125% of joint width.
4. Install backer rod 25% thicker than joint width, unless recommended to be omitted by sealant/caulking Manufacturer for application shown, using a blunt tool so as to not puncture surface skin.
5. Set joint filler units at proper depth or position in joint to coordinate with other work, including installation of bond breakers, backer rods and sealants/caulking. Do not leave voids or gaps between ends of joint filler units.
6. Spillage - Do not allow sealant/caulking to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces. Clean adjoining surfaces by whatever approved means may be necessary to eliminate evidence of spillage without damage to substrate.
7. Recess exposed edges of gaskets and joint fillers slightly behind adjoining surfaces, unless otherwise shown, so that compressed sealants/caulking will not protrude from joint.
8. Apply sealant/caulking with a pressure gun which has nozzle sized to fit into joints. Fill joints solidly and remove excess sealant/caulking with proper tool, leaving a smooth surface and clean adjoining surfaces, tooled smooth at right angles to sides of joint so that sealant is tight and flush with both sides of the joint. Exterior joints must be water and weathertight. Feather edging of joint is unacceptable.
9. Upon completion of sealing joints not entirely filled must be roughened and filled as specified and exposed surface tooled smooth to match adjacent work.

#### 3.4 SCHEDULE OF SEALANT AND CAULKING APPLICATIONS:

1. Generally, install specified sealing/caulking compounds in locations wherever "sealant" or "caulk or caulking " is typically noted on the drawings or required by other sections of the specifications.

#### 3.5 CLEANING:

1. Clean adjoining surfaces of smears, compound, or other soiling due to these operations, as work progresses. Restore, refinish or replace any adjacent surfaces or materials which are marred or damaged to the satisfaction of the Commissioner, at no cost to the City.

#### 3.6 GENERAL CLEAN-UP:

1. All rubbish and debris resulting from the Work of this section must be collected, removed from the site and disposed of legally.
2. All work must be left in a broom clean condition.

### **END OF SECTION 07920**

# **PAINTING AND COATING**

## **SECTION 09900**

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES:

1. Work under this section is subject to the requirements of the Contract Documents.
2. Furnish and install Painting and Coating Work as shown on the Drawings and as specified herein, including but not limited to the following:
  1. Surface preparation and field application of paints and coatings.
3. Install products and materials (furnished in other sections) as shown on the Drawings and as specified herein.

#### 1.2 REFERENCES:

1. ASTM D 16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
2. NACE (National Association of Corrosion Engineers) - Industrial Maintenance Painting.
3. NPCA (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications.
4. PDCA (Painting and Decorating Contractors of America) - Painting - Architectural Specifications Manual.
5. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

#### 1.3 SUBMITTALS:

1. Submit the following
  1. Product Data
    1. Product Data
      - (1) Provide data on all finishing products.
      - (2) Manufacturer's Instructions indicating special surface preparation procedures and substrate conditions requiring special attention.
  2. Manufacturers Certification
    1. Submit certification that products meet or exceed the specified requirements.
      - (1) Indicating special surface preparation procedures, substrate conditions requiring special attention that apply to this Project.

#### 1.4 DELIVERY, STORAGE AND HANDLING:

1. Materials must be delivered to the Project in sealed containers bearing Manufacturer's name and material identification, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing. Materials must be stored in strict accordance with the Manufacturer's printed directions, copies of which must be furnished to the Commissioner.
  1. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by Manufacturer's instructions.
  2. All paints, varnishes, enamels, lacquers, stains and similar materials must be delivered in the original containers with the seals unbroken and label intact and with the Manufacturer's instructions printed thereon.
2. Protection - Protect materials against all damage by an approved means during transportation, storage and erection and until completion of construction work. All unsatisfactory materials must be removed from the premises, and all damaged materials replaced with new materials.
3. Access and Storage Areas
  1. All access routes and storage areas will be subject to the approval of the Commissioner in order to reduce interference with Airport Operations.

#### 1.5 ENVIRONMENTAL REQUIREMENTS:

1. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product Manufacturer.
2. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product Manufacturer.

#### 1.6 SPECIAL REQUIREMENTS:

1. Coordination - Coordinate Work of this section with related Work specified in the other divisions/sections of the Contract Documents.
2. The Contractor must prior to starting any work meet with the Commissioner to review in detail and to agree upon a program for scheduling work so as to make certain that the various stages of the work will not interfere with the normal conduct of business.

### PART 2 - PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS:

1. Products of one of the following Manufacturers will be acceptable:
  1. Benjamin Moore & Co., Montvale, NJ 07645.
  2. Detroit Graphite Co. (B Valspar Co.)
  3. The Glidden Co., Cleveland, OH 44115.
  4. PPG Industries, Inc., Pittsburgh, PA 15272.
  5. Pratt & Lambert Specialty Products, Cleveland, OH 44115.
  6. Rust-Oleum Corp., Vernon Hills, IL 60061.
  7. Sherwin-Williams Company, Cleveland, OH 44115.



8. Tnemec Co., Inc., Kansas, MO 64120.
2. The Contractor is advised that some of the above manufacturer's products may be specifically specified to meet required conditions and surface coatings.

## 2.2 PAINT AND COATING MATERIALS:

1. All painting materials, must be of the best quality, and must be approved by the Commissioner. They must bear identifying labels on the containers with the Manufacturer's instructions printed thereon.
2. Paint must not be settled badly, caked or thickened in the container, must be readily dispersed with a paddle to a smooth consistency and must have excellent application properties.
3. Paint must arrive on the job color-mixed except for tinting of undercoats and possible thinning.
4. All thinning and tinting materials must be as recommended by the manufacturer for the particular material thinned or tinted.
5. It must be the responsibility of the applicator to see that all mixed colors match the color selection made by the Commissioner, prior to application of the coating.
6. Coatings - Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.
7. Accessory Materials - Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

## PART 3 - EXECUTION

### 3.1 INSPECTION:

1. Before commencing installation, examine substrate surfaces to determine that they are free of conditions which might be detrimental to proper and timely completion of the work. Start of work will indicate acceptance of the substrate.
2. Test shop applied primer for compatibility with subsequent cover materials.

### 3.2 WORKMANSHIP - GENERAL:

1. Only skilled mechanics must be employed. Application may be by brush, roller or spray, upon approval from the Commissioner.
2. The Contractor must furnish the Commissioner a schedule showing when he/she expects to have completed the respective coats of paint for the various areas and surfaces. This schedule must be kept current as the job progresses.
3. The Contractor must protect its work at all times, and must protect all adjacent work and materials by suitable covering or other method during progress of his work. Upon completion of the Work, he/she must remove all paint and varnish spots from floors, glass and other surfaces. He/she must remove from the premises all rubbish and must leave its part of the work in clean, orderly and acceptable condition.

4. Remove and protect hardware, accessories, device plates, lighting fixtures, factory finished work, and similar items; or provide ample in-place protection. Upon completion of each space, carefully replace all removed items.
5. Remove electrical panel box covers and doors before painting wall. Paint separately and re-install after all paint is dry.
6. All materials must be applied under adequate illumination, evenly spread and smoothly flowed on to avoid runs, sags, holidays, brush marks, air bubbles and excessive roller stipple.
7. Coverage hide must be complete. When color, stain, dirt, or undercoats show through final coat of paint, the surface must be covered by additional coats until the paint film is of uniform finish, color, appearance and coverage.
8. All coats must be dry to Manufacturers recommendations before applying succeeding coats.
9. All suction spots or "hot spots" in plaster and/or cement after the application of the first coat must be touched up before applying the second coat.

### 3.3 PREPARATION OF SURFACES:

#### 1. General

1. Surfaces must be clean, dry and adequately protected from dampness.
2. Surface must be free of any foreign materials which will adversely affect adhesion or appearance of applied coating.
3. Mildew must be removed and the surface neutralized per the coating manufacturers recommendations.
4. Efflorescence on any area must be corrected before painting.
5. Where existing surfaces have been painted and new painting is required where indicated on the Drawings and in the "Room Finish Schedule" the following guide may be used to determine the degree of surface preparation required after making a through inspection of the old coating.

<u>Surface Condition</u>	<u>Preparation</u>
75% Intact	Remove failed portions of coating by specified method and spot prime bare areas.
Less than 75% intact	Total removal by surface preparation method specified
Brittle, eroded or underfilm rusting	Total removal by surface preparation method specified.

#### 2. Concrete

1. Patch large openings and holes and finish flush with adjacent surface. After priming, fill any remaining small holes with prepared patching material.
2. Acid etch concrete floor surface, scheduled for painting, with solution of one part 32% muriatic acid to three parts water. Flush floor with clean water and allow to

dry thoroughly before painting. Check the PH#, if not neutral then correct by using 3% solution of T.S.P. or ammonium hydroxide. The etched surface should look uniform in sheen and feel like 100 grit abrasive paper.

3. Remove form oil from poured-in-place concrete by washing concrete with xylol, or exempt type form oil solvent, or as required for complete removal.
4. These surfaces must be dry. No painting must be done until surfaces have cured for 28 days and are dry.
3. Ferrous Metal Surfaces
  1. Remove dirt and grease with mineral spirits and wipe dry with clean cloths.
  2. Remove rust, mill scale and defective paint down to sound surfaces or bare metal using scraper, sandpaper or wire brush as necessary. Grind, disc sand, etc. if necessary, to remove photographing thru finish coats.
  3. Touch up all bare metal and damaged shop coats with specified Shop Coat Primer.
  4. For ferrous surfaces with shop coats touched up, as above required, the first coat, as listed in the following schedule, will be applied to the dry mil film thickness specified.
  5. The surface preparation must also be in strict accord with the recommendations set forth in "Surface Preparation Specifications" issued by the "Steel Structures Painting Council" (SSPC latest issue), Pittsburgh, PA 15213
4. Galvanized Metal Surfaces
  1. Remove dirt and grease with mineral spirits and wipe dry with clean cloths.
5. Existing Surfaces to be Repainted (when and where applicable)
  1. Where existing work is cut, patched, or added to, all surfaces must be painted or touched up to match present work as closely as possible.
  2. Existing work, where scheduled for repainting, must be put in condition to provide good adhesion and to receive paint.

#### 3.4 WORKMANSHIP FOR EXTERIOR PAINTING:

1. Exterior Painting
  1. Must not be done when the surface temperature is below 50 degrees F, while the surface is damp, or during cold, rainy or frosty weather. The substrate temperature must be 5 degrees F or more above the Dew Point temperature while painting and during the coatings cure. Avoid painting surfaces while they are exposed to hot sun.

#### 3.5 WORKMANSHIP FOR MECHANICAL AND ELECTRICAL EQUIPMENT PAINTING:

1. Paint shop primed equipment . Paint shop prefinished items occurring at interior areas.
2. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

3. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, and etc. except where items are prefinished.
4. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Color band and identify with flow arrows and names
5. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### 3.6 SCHEDULE OF PAINTING:

1. The following is a general guide to the extent of painting, finishing, and decorating required, but is not necessarily limited to the items listed.
2. All surfaces, unless otherwise excluded, must be painted. Surfaces or items which may be adjacent to areas to be painted, but not identified in the Schedule of Painting tabulation must be painted or finished as adjacent work. Note - All colors are to be selected by the Commissioner.
3. After prime coat has been applied over any wall or ceiling surfaces, surfaces must be examined and all voids and depressions spackled and touched up before proceeding with final coating.
4. Paint as follows:
  1. Metal Surfaces - Ferrous
    1. First coat - Pro-Hide primer/undercoating
    2. Second coat - Pro-Hyde-Alkyd Semi-Gloss
  2. Galvanized Surfaces
    1. Galvanized surfaces and corrosion resistant surfaces will not be painted.
  3. Concrete Floors
    1. Scarify existing or new surfaces after all other paints and adhesive materials have been removed. Age of new concrete must be 30 days.
    2. Two (2) coats of Pratt & Lambert's "Polygard Epoxy Coating" Total thickness of coatings to be 4.0 mils dry.
    3. Where concrete surfaces are of such density as to be difficult to scarify, then acid etch with a 10% solution of muriatic acid; after acid effervescence, thoroughly flush surface with clear water. Allow concrete to dry before painting.

### 3.7 CLEANING:

1. Oily or paint filled rags, waste and other combustible materials must be deposited in metal containers with tight fitting lids and same disposed of daily.

2. Just prior to final completion and acceptance, the Contractor must examine all painted and finished surfaces and retouch or refinish as necessary and required to leave all surfaces in perfect condition.
3. Upon completion of work, the Contractor must remove all paint and varnish spots from floors, glass and other surfaces and remove all rubbish and accumulated materials of whatever nature from premises and leave work in a clean, orderly and acceptable condition.

3.8 GENERAL CLEAN-UP:

1. All rubbish and debris resulting from the Work of this section must be collected, removed from the site and disposed of legally.
2. All work areas must be left in a broom clean condition.

**END OF SECTION 09900**

# **BASIC MECHANICAL REQUIREMENTS**

## **SECTION 15100**

### PART 1 - GENERAL:

#### 1.1 SECTION INCLUDES:

1. Work under this Section is subject to the requirements of the Contract Documents.
2. The scope of mechanical work for this Project is redevelopment of the Aircraft Rescue Fire Fighting Training Facility's Burn Pit at O'Hare International Airport, which includes replacement of the propane piping serving the Burn Pit and replacement or refurbishment of the corroded piping within the burn bunker.
3. This Section includes general provisions for mechanical work. This Section supplements other Sections within the Mechanical Division 15 and is an overview of all the mechanical work that is to be done.

#### 1.2 RELATED WORK:

1. Specified elsewhere.
  1. Division 3 - Concrete.
  2. Division 9 - Finishes.
  3. Division 16 - Electrical.

#### 1.3 REFERENCES

1. Where indicated, comply with requirements and recommendations of the standards or publications listed, except where more detailed and stringent requirements are required by other regulations.
  1. Building Codes of the City of Chicago, and the State of Illinois.
  2. Air Conditioning and Refrigeration Institute.
  3. Air Diffusion Council.
  4. Air Moving and Conditioning Association.
  5. American Institute of Architects.
  6. American National Standards Institute.
  7. American Society of Heating, Refrigeration and Air Conditioning Engineers.
  8. American Society of Mechanical Engineers.
  9. American Society for Testing Materials.
  10. American Water Works Association.
  11. American Welding Society.
  12. Associated Air Balance Council.
  13. Association of Safety Engineers.
  14. Cast Iron Soil Pipe Institute.
  15. Electronic Industries Association.
  16. Environmental Protection Agency.
  17. Factory Mutual Insurance Association.
  18. Hydraulic Institute Standards.
  19. Industrial Risk Insurers.
  20. Institute of Electrical and Electronics Engineers.
  21. Manufacturers Standardization Society of the Valve and Fitting Industry.
  22. Mechanical Contractors Association of America.
  23. National Institute of Standards and Testing.
  24. National Electrical Code.

25. National Electrical Contractor Association.
26. National Electrical Manufacturers Association.
27. National Environmental Balancing Bureau.
28. National Safety Council.
29. National Sanitary Foundation.
30. Occupational Safety and Health Administration.
31. Sheet Metal and Air Conditioning Contractors National Association.
32. Underwriters Laboratories.

#### 1.4 SUBMITTALS:

1. Shop Drawings: Prepare shop drawings to an accurate scale except where diagrammatic representations are specifically indicated by the Commissioner as being acceptable. For critical locations, show clearance dimensions.
2. As-built drawings.
3. Operation and Maintenance Manuals. Submit manufacturer's operating instructions for items of mechanical equipment in scope of Project. Supplement operating instructions with Project application instructions. Instructions are to be in typewritten form.
  1. The Contractor must prepare and deliver to the Commissioner ten (10) copies of "Installation, Operating and Maintenance Manuals and Parts Lists" for all items of mechanical equipment furnished under this Contract. Each manual must contain all information pertinent to the equipment and essential for good preventative maintenance practice. Include information about efficient replacement of all expendable components, such as data covering model, type, serial numbers, capacities, voltage, and maintenance schedules. Operation instructions must cover all phases of items installed.
  2. Manuals must be compiled in 3-ring binders and must be furnished complete with a typed index.
  3. Manuals must be prepared by the original equipment manufacturer and must be complete in all necessary details of information to permit the proper installation, operating and maintenance of the equipment. Manuals must refer only to the actual equipment provided and all references to alternative equipment must be deleted. Critical points of the operation and hazardous limits must be boldly underscored and emphasized.
  4. Authorized representatives of equipment manufacturers must review final installation of equipment at the job site and must then submit a letter to the Commissioner stating that the installation is complete and satisfactory and the equipment must operate satisfactorily when operated in accordance with the operation and maintenance manuals under the installed conditions.
  5. Generally, the manuals must include the items listed below and other features as may be recommended by the manufacturers:
    1. Catalog information of the unit installed.
    2. Capacity and installation details.
    3. Wiring diagrams of electrical components.
    4. Special valves and control devices.
    5. All points requirement lubrication and type of lubricant.
    6. Frequency of lubrication.
    7. Operating pressures and temperatures.
    8. Relief devices and settings.
    9. Electrical characteristics of all motors and frame members.

10. Exploded view of all machinery.
11. Complete list of parts, including a list of spare parts recommended to "keep on hand" for ordinary service requirements, with re-ordering numbers and current pricing.

#### 1.5 QUALITY ASSURANCE:

1. **Manufacturer Qualifications:** Fabrication of Basic Mechanical Requirements must be performed only by a qualified fabricator. The term qualified means experienced in performing the Work required by this section. The qualified fabricator must have substantial documented experience acceptable to the Commissioner on Projects similar in size and scope to this Project. The Contractor must submit evidence of such qualifications upon request by the Commissioner.
2. **Contractor Qualifications:** Installation of Basic Mechanical Requirements must be performed only by a qualified Installer. The term qualified means experienced in performing the Work required by this section. The qualified installer must have substantial documented experience acceptable to the Commissioner on Projects similar in size and scope to this Project. The Contractor must submit evidence of such qualifications upon request by the Commissioner.
3. Products must comply with the specified requirements and must provide a quality no less than that of the manufacturer's standard products, as specified by their published product data. Off-the-shelf conditions should not be assumed to comply with specified requirements. Do not purchase any mechanical materials and equipment until the review of submittals by the Commissioner that might affect the purchase.
4. Except as otherwise indicated, provide new mechanical products. All mechanical products must be free of defects and harmful deterioration. Provide each product complete with trim, accessories, finishes, guards, safety devices, and similar components recognized as integral to the product or required by governing regulations. To the greatest extent possible and unless otherwise indicated, complete the fabrication, assembly, finishing and testing of products prior to delivery to the site.

#### 1.6 DELIVERY, STORAGE AND HANDLING:

1. Deliver products properly identified with names, model numbers, types, grades and compliance labels. Products must be adequately packaged or protected to prevent deterioration during shipment, storage and handling. Except where prepared and protected specifically for exterior storage, store in a dry and well ventilated indoor space. So that storage requirements at the site are minimized, coordinate the deliveries of mechanical materials and products with the scheduling and sequencing of the work.
2. Delivery, storage and handling of valves:
  1. **Preparation For Transport:** Prepare valves for shipping as follows:
    1. Ensure valves are dry and internally protected against rust and corrosion.
    2. Protect valve ends against damage to threads, flange faces, and weld-end preps.
    3. Set valves in best position for handling. Set gate valves closed to prevent rattling, set ball and plug valves open to minimize exposure of functional surfaces; set butterfly valves closed or slightly open; and block swing check valves in either closed or open position.



2. Storage: Use the following precautions during storage:
  1. Do not remove valve end protectors unless necessary for inspection; then reinstall for storage.
  2. Protect valves from weather. Store valves indoors. Maintain valve temperature higher than the ambient dew point temperature. If outdoor storage is necessary, support valves off the ground or pavement in watertight enclosures.
3. Handling: Use a sling to handle valves whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handwheel and stems as lifting or rigging points.

#### 1.7 WARRANTIES:

1. The following materials have special Manufacturer's Warranties for the periods listed with each item, which may originate, in part or in whole, with the manufacturer or the fabricator and such warranties must be passed through the Contractor to the Department;

#### PART 2 - PRODUCTS:

##### 2.1 EQUIPMENT AND MATERIALS:

1. Base Bid shall include products of specified manufacturers only.

##### 2.2 MANUFACTURER'S NAMEPLATES:

1. Each major component piece of equipment must have the manufacturer's name and address as well as model number, capacity rating serial number, labels of tested compliances and other pertinent data on a nameplate securely affixed in a conspicuous place. The nameplates of the distributing agent are not acceptable. ASME Code Rating, or other pertinent data which is die-stamped into the surface of the equipment must be in an easily visible location that is accessible to service personnel.

##### 2.3 OPERATIONAL AND WARNING SIGNS:

1. Where needed for proper identification, operation, maintenance or safety, provide appropriate signs of engraved plastic-laminate. Where appropriate for normal operating and maintenance information, tags of plasticized card stock may be provided in lieu of signs.

##### 2.4 DIELECTRIC FITTINGS:

1. In all cases where copper pipe connections are made to piping or any items of equipment of dissimilar metal, provide dielectric fittings.
  1. Fittings provided must meet requirements of ASTM F-492.77 and must be capable of effectively isolating stray electrical currents and/or galvanic local cell current problems.

#### PART 3 - EXECUTION

##### 3.1 PRODUCT INSTALLATION GENERAL:

1. Except where more stringent requirements have jurisdiction, comply with manufacturer's installation instructions and recommendations regarding but not limited to: handling, anchorage, assembly, connections, cleaning, testing, lubrication, start-up and shut-down of equipment within the scope of this Project.

2. The mechanical Contract Drawings serve as working drawings for the general layout of the various items of mechanical equipment. However, the layout of equipment, accessories, specialties, and piping systems shown are diagrammatic and do not necessarily indicate every required valve, fitting, trap, elbow, etc. Provide such items as required for proper and complete installation of the work.
3. Where new work is to be applied to existing surfaces, removals and patching must produce surfaces that are suitable for the new work. Patching must be performed in a neat and workmanlike manner. Finished surfaces of patched area must be flush with adjacent existing surfaces and must match the existing adjacent surfaces in texture and finish.
4. Removals and relocations must be as indicated. Removals and relocations must be performed in a neat and workmanlike manner. Items relocated that are damaged must be repaired or replaced with new undamaged items as required by the Commissioner.
5. Provide a union ahead of each screwed valve and on each piece of equipment and wherever needed to dismantle piping.
6. Changes in pipe sizes must be made with the proper size-reducing fittings, reducing elbows, or reducing tees. Bushings are not permitted.

### 3.2 COORDINATION WITH OTHER WORK:

1. Before making any installation, make necessary and proper arrangement for changes required to avoid interference with or improper effect on operation of other systems.
2. No additional cost must be charged to the City for any part of the Contractor's coordination of work.
3. If any work is installed so that Project work to be installed later lacks required clearances or interferes with finished design, the Contractor must make such changes in their work as directed by the Commissioner to permit the proper installation of all work under the Contract.
4. Where, in the opinion of the Commissioner, there are pre-installation changes that are deemed necessary to avoid interferences, the Contractor must make these changes.
5. For locations where several elements of mechanical or electrical work must fit into an available space, prepare coordination shop drawings showing accurate physical dimensions. Submit these drawings to the Commissioner for review prior to purchase, fabrication, and installation of work.

### 3.3 COORDINATION:

1. Piping must be positioned true, aligned with other work.
2. All unions, valves or other equipment requiring frequent adjustments, inspections, repairs, replacements or removals must be conveniently and accessibly located.
3. Wherever two or more pipes are to be installed in parallel this piping must be installed with sufficient space between pipes to allow for the proper application of pipe servicing.

4. Pipe or item of equipment must not be installed where it is supported on, or suspended from another pipe.
5. Accessibility:
  1. Install mechanical work to permit required periodic replacement or maintenance.

#### 3.4 VISITING THE SITE:

1. The Contractor must review the Contract Drawings and specifications and visit the site of the Project, before submitting bid, to get fully acquainted with all existing conditions.
2. The Contractor is not to proceed with work until all locations have been correctly determined. The Contractor must fully inspect all physical conditions, site characteristics, means of egress from and access to the structure and site, and any peculiarities or unusual features of the existing structure and site that may affect the cost of the work.

#### 3.5 WIRING DIAGRAMS:

1. Diagrams and instructions must not be of a general or typical nature but applicable only to the specific job.
2. All work must be done in accordance with the Electrical Division of these specifications.

#### 3.6 MAINTAINING PRESENT SERVICES:

1. It is necessary that Airport operations and use of the facility continue throughout the construction period. Schedule work, particularly as it applies to removal, relocation, and cutting into existing services, construction, and moving of equipment, so that operations are disrupted to the minimum practical extent.
2. Where new service connections are to be made to existing services and service interruptions can in no way be avoided, the service interruption must be made with the minimum of inconvenience to the City and the work must be done at such time of any day (Saturdays and Sundays included) and only as directed by the Commissioner. Any and all costs incurred or necessitated in order to comply with the foregoing must be included in the Contractor's bid for the work.
3. Detailed schedules for these operations must be prepared by the Contractor and reviewed by the Commissioner before any interruptions are permitted. Advance written notice must be given at least seven (7) working days in advance of each individual service interruption.
4. A written request must be filed with the Commissioner.
5. Operation of valves connected with existing systems must be performed only by Department of Aviation operating personnel. This includes shut down, drainage, start up and filling of the systems.

6. When existing systems are altered or affected by the new work, these systems must be left in operating condition and must be re-adjusted and balanced, if necessary.
7. Work that requires interruption of portions of critical Airport systems must be performed as reviewed by the Commissioner. Shutdown of Airport systems must only be allowed during time periods reviewed by the Commissioner.

### 3.7 PERMITS AND FEES:

1. The Contractor must be responsible for obtaining, and payments for all permits, licenses and certificates inspection necessary for the execution and completion of their work.

### 3.8 MECHANICAL SYMBOLS:

1. Mechanical Contract drawings are diagrammatic and show requirements by the use of symbols. In general, these are recognized symbols of the industry and of the engineering profession. Most of the symbols used to show mechanical work are from the "ASHRAE Handbook of Fundamentals" or the Chicago Airport CADD Standards.

### 3.9 PROTECTION OF WORK:

1. During installation, provide and maintain protection for equipment against damage or loss by factors such as vandalism; natural phenomena; dirt and debris; or any other similar type of injury. Protection must continue until the installation is finished and reviewed. Prior to acceptance of the work, all protective coverings, labels, and other types of protection must be removed and disposed.
2. The Contractor must be responsible for securing and maintaining materials and equipment stored on the premises in a neat and orderly manner and must keep all pipe and equipment openings closed by means of plugs or caps to prevent the entrance of foreign matter, and cover all equipment and material as required to protect them against dirt, water, chemical or mechanical damage before, during and after installation, in an effective manner acceptable to the Commissioner.
3. Any equipment or material damaged or covered with foreign matter prior to final acceptance of the work must be thoroughly cleaned and restored to its original condition or replaced by the Contractor.
4. Protect all work against injury by freezing or exposure to the weather while stored or installed in place.

### 3.10 CUTTING AND PATCHING:

1. Cut and patch site materials as required for the installation of work. Cut openings through concrete (for pipe penetrations and similar services) by sawing.

2. All cutting and patching and repair of damaged areas of work must be done in a neat and workmanlike manner.
3. Restore the cut work in every respect, including the elimination of visual defects in exposed finishes.

#### 3.11 ALIGNMENT OF ROTATING EQUIPMENT:

1. Before any rotating equipment is put in operation for testing purposes, it must be properly lubricated, with lubricants only as recommended by the manufacturer. As a minimum, this equipment must include pumps that are related as part of this project.

#### 3.12 HOIST, RIGGING AND SCAFFOLDING:

1. The Contractor must provide all necessary scaffolding, cribbing, tackle, hoists and rigging required for the installation of their work.
2. Scaffolding and hoisting equipment must comply with requirements of all pertinent federal, state and local codes and laws.

#### 3.13 DISPOSITION OF REMOVED EQUIPMENT:

1. Where existing materials or equipment are specified to be removed from service, the Contractor must take possession of same and remove them from the site promptly, except as specified below or unless otherwise noted on Drawings.
2. All salvageable material or equipment, including but not necessarily limited to, rock, piping, valves, etc., must be removed and maintained in as good condition as possible and turned over to the Commissioner. However, if the Commissioner decides any such materials are of no value to the City, they must become property of the Contractor, who must remove such discarded work from the premises and dispose of same.

#### 3.14 CORROSION PROTECTION:

1. All equipment furnished under this Section must be corrosion protected by the manufacturer or supplier prior to shipment. All surfaces subject to corrosion must be coated with accepted rust preventing compounds before shipment. Where equipment is shipped in protective crates and boxes, parts must be sealed in heavy duty plastic.

#### 3.15 PAINTING:

1. Supports installed outdoors must have two coats of rust inhibitor paint, to be applied after installation and adjustment.

#### 3.16 TOOLS:

1. On completion of the work, the Contractor must furnish and deliver to the Commissioner, any special tools that may be required for the proper servicing of any equipment that the Contractor has been furnished on the Project.

### 3.17 MECHANICAL TEMPORARY FACILITIES:

1. Temporary facilities required for mechanical work, include but are not necessarily limited to, the following. All work must be as directed by the Commissioner.
  1. Sanitary toilet facilities.
  2. Temporary potable water piping systems.

### 3.18 OPENINGS:

1. All openings in the existing structure must be core drilled with a diamond drill. The use of jack hammers is not permitted.

### 3.19 FIELD QUALITY CONTROL FOR VALVES:

1. Tests: After piping systems have been tested and put into service, but before final adjusting and balancing, inspect valves for leaks. Adjust or replace packing to stop leaks; replace valves if leak persists.

### 3.20 START-UP AND ACCEPTANCE TEST AND OPERATOR TRAINING:

1. The Contractor must provide manufacturer's field engineers to start-up the systems and perform a 24 hours Acceptance Test to certify that the systems meet capacity requirements. The Commissioner and the Department of Aviation operating personnel must be present to witness this test and accept the plant after successful 24 hour operation and receipt of outside testing data on product output quality meeting those standards stated in this specification and on the Contract Drawings.
  1. The 24 hour test must be broken down to three (3) 8 hour days during the day shift at the Airport.
2. Make final corrections or adjustments of systems to refine or improve performances. Provide acceptable testing or inspection devices for accurate observations of system performances. Demonstrate that controls and other items requiring regular service or maintenance are accessible.
3. After the final performance test run of each system, where applicable: clean systems both externally and internally; replace dirty filters; flush piping systems. Touch-up minor damage to painted finishes.
4. Furnish a competent engineer for an equivalent period of (1) 4-hour day, to be broken up as required by the Commissioner, to instruct representatives of the City in the operation and maintenance of the equipment installed under this Contract. Provide a video tape with four (4) copies of the training session for the Department of Aviation for their use in future training of

new personnel and for refresher training of current personnel, if required by the Commissioner.

5. Also, thirty (30) days after the installation of the systems complete a follow-up seminar which must be conducted for the primary purpose of answering any operation and maintenance questions that may have arisen during the use of the system. The equipment manufacturer agrees to train a maximum of three (3) of the City personnel during these seminars.

### 3.21 SYSTEM ADJUSTMENTS:

1. Kidde will provide telephonic and in-person technical support by a qualified technician, consistent with Kidde's Standard warranty to resolve system performance issues. Desired adjustments after the Acceptance Test to "fine tune" the system will be limited to either the follow-up seminar visit (30 days after the initial training) or to periodic maintenance visits (every 6 months).

**END OF SECTION 15100**

# **PIPING**

## **SECTION 15150**

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES:

1. Work under this Section is subject to the requirements of the Contract Documents.
2. Furnish and install piping and equipment as shown on the Contract Drawings and as specified herein, including but not limited to the following.
  1. Piping systems

#### 1.2 RELATED WORK:

- A. Division 15 - Testing, Adjusting, and Balancing, Section 15990
  1. Division 16 - Electrical

#### 1.3 REFERENCES:

- A. As a minimum, meet the requirements of the following codes and standards.
  1. Chicago Building Code
  2. For design, materials, fabrication, installation, examination, and testing: ASME B31.9 "Building Services Piping" and ASME B31.1 "Power Piping".
  3. For qualifications of welding processes and operators: ASME Boiler and Pressure Vessel Code, Section IX, "Welding and Brazing Qualification".

#### 1.4 SUBMITTALS:

1. Refer to the Basic Mechanical Requirements, Section 15100.
2. Product data, including rated capacities of selected models, weights, and installation instructions. Furnish flow and pressure drop curves for diverting fittings based on manufacturer's tests. For each tube submittal contractor shall provide manufacturer's RFIM test reports. Provide tube welding procedures.
3. Shop Drawings showing layout of piping, specialties, and fittings including, pipe and tube sizes, valve arrangements and locations, slopes of horizontal runs.
4. Brazer's certificates, signed by Contractor, certifying that brazers comply with requirements specified under the "Quality Assurance" Article below.
5. Welders' certificates certifying that welders comply with and meet the quality requirements specified herein. See Article entitled "Pipe Joint Construction."
6. If required by the Commissioner, submit certification of compliance with ASTM and ANSI manufacturing requirements for pipe, fittings, and specialties.



1.5 QUALITY ASSURANCE:

1. Refer to the Basic Mechanical Requirements, Section 15100.
2. All welding shall be done in accordance with the procedures of the National Certified Pipe Welding Bureau, or other procedures conforming to the requirements of the ASME Boiler and Pressure Vessel Code, or ANSI Code for Pressure Piping, or such state and local requirements as may supersede the Codes mentioned.
3. Qualify brazing processes and brazing operators in accordance with ASME "Boiler and Pressure Vessel Code," Section IX, "Welding and Brazing Qualifications".
- B. Contractor Qualifications: Installation of hydronic piping and accessories must be performed only by a qualified installer. The term qualified means experienced in performing the work required by this Section. The qualified installer will be responsible for demonstrating to the Commissioner's satisfaction that he/she has sufficient experience in its role. The installer must submit evidence of such qualifications upon request by the Commissioner.
4. Manufacturer Qualifications: Fabrication of hydronic, piping and accessories must be performed only by a qualified fabricator. The term qualified means experienced in performing the work required by this Section. The qualified fabricator will be responsible for demonstrating to the Commissioner's satisfaction that he/she has sufficient experience in its role. The qualified fabricator must submit evidence of such qualifications upon request by the Commissioner.

1.6 DELIVERY, STORAGE AND HANDLING:

1. Refer to the Basic Mechanical Requirements, Section 15100.
2. For the purpose of protecting piping from pre-installation contamination, all piping shall be shipped to job site with suitable caps, sheet metal covers, or plugs. Pipe caps, etc., shall not be removed until just before installation.

1.7 WARRANTIES:

- A. Refer to the Basic Mechanical Requirements, Section 15100.

PART 2 - PRODUCTS:

**0.1 ACCEPTABLE MANUFACTURERS:**

In light of the proposed design changes, the listed acceptable manufacturer for the gate/drain valve, float valve switches and other listed valve hardware may change.

1. Acceptable Manufacturers (subject to change): Subject to compliance with the requirements of the Contract Documents, the products shall be by one of the manufacturers listed in this Section of the specification.

Item	Manufacturer
Gate Valves (Drain, Shut-Off)	Crane, Powell, Stockham
Control Valves -Propane	Kinetrol, Kidde Fire Trainer (KFT)
Float Valve (Switch)	McMaster-Carr, Omega, Innovative Components

2. The design of this project, including all plans, drawings, and construction details, is based on the stated manufacturer's model numbers. If the Contractor intends to provide items or equipment from any of the other acceptable manufacturers listed in the Contract Documents, then the Contractor shall be responsible for the cost of any and all work, including, but not limited to additional design, engineering, labor, material, equipment and incidental costs, necessary to accommodate such items or equipment for this project.
3. Any and all work that may be required to accommodate any items or equipment of the other acceptable manufacturers listed in the Contract Documents is, without limitation, subject to the review of the Commissioner.

## 2.2 MATERIALS FOR WATER SYSTEMS:

In light of the proposed design changes, the listed acceptable manufacturer for the gate/drain valve, float valve switches and other listed valve hardware may change.

1. Valves (manufacturers used are subject to change)
  1. Gate valves 2" and smaller: 150 lb., forged steel, wedge disc, union bonnet, rising stem and screwed ends. Wheels to be malleable iron.
    1. Similar to Crane 431 UB, Powell, Stockham.
  2. Gate valves 2-1/2" and larger: 125 lb., cast iron, OS&Y, bronze seat and stem, and flanged ends. Valves to have malleable iron wheel.
    1. Similar to Crane 465-1/2, Powell, Stockham.
  3. Propane Valve with Actuator. Valves: double 1/2" NPT ball valves, 316SS compatible with liquid propane, minimum pressure 350 psi. steel. Actuator: pneumatic opening, spring return to closure limit switch, 2 SPST in a watertight housing.
    - a. Similar to Kidde Fire Trainer (KFT) 4C1-003-432, Kinetrol, Stockham.
  4. Liquid Level Valve (Switch). Single-Level liquid level switch. Non corrosive stainless steel 316SS (float and stem), high temperature (480F), high pressure (300psig), vertical mounted measuring fluid height differential of 1/4" to 1/2". .5 amps @ 120VAC, 22 ga. Teflon lead wires, 1/4" NPT Male.
    - a. Similar to McMaster-Carr model 4646K16, Strain Measurement Devices, Innovative Components.
2. Flexible Metal Hose: Flexible metal hose shall be annular, corrugated stainless steel core with single stainless steel wire braid and shall be rated for 600 psig at 100°F. Hose shall have 1/2" MNPT ends (swivel union on one end, fixed on the other) for piping 1 inch and smaller, provide size fitting adjuster for connection to larger size pipes. Maximum hose overall lengths shall be as specified in the table below.

1. Similar to Kidde Fire Trainer (KFT) 2C1-002-550-015, Mason, Parker.

Nominal Pipe Size (inches)	Maximum Overall Length (inches)
1/2	36
3/4 and 1	48

### **2.03 MATERIALS FOR PIPING SYSTEMS:**

- A. Pipe (Propane): ASTM A312, Schedule 40 stainless steel , standard weight.
- B. Pipe: ASTM A53 or A120 black steel, standard weight.
- C. Pipe (Propane) Fittings 2" and smaller: Schedule 40 stainless steel, ANSI B36.19.
- D. Fittings 2" and smaller: 150 lb. Malleable iron with threaded ends, ANSI B16.9.
- E. Fittings 2 1/2" and larger: Butt welding type ASTM A 234, WPA, ANSI B16.9.
- F. Flanges: Carbon steel ASTM A 105, or A 181, ANSI B16.5 150lb., class. All flanges must be weld neck type.

### **PART 3 - EXECUTION:**

#### **3.1 PIPING INSTALLATION:**

1. Maximum Velocity: The maximum velocity in hydronic water piping systems shall be 8 fps.

Pipe Size	Flow Range (gpm)	Maximum Velocity (fps)	Type of Pipe Required
3/4"	0 - 4	2.5	Schedule 80
1"	5 - 8	3.0	Schedule 80
2"	25 - 42	4.0	Standard Weight
4"	101 - 198	5.1	Standard Weight

2. Anchors and Inserts: The use of lead shield anchors, anchors which utilize lead parts, and powder-actuated fasteners is not permitted. Inserts installed after slabs have been poured shall be drilled-in, threaded type similar to Phillips "Redhead".
3. Connection Procedure: Care shall be taken in making new connections to existing piping to prevent introduction of metal cuttings, weld slag, etc. Piping is to be accurately cut with a wheel cutter or with a hole saw, and the cutout slug and all cuttings shall be removed from the interior of the pipe.

### 3.2 PIPE JOINT CONSTRUCTION:

1. Threaded Joints: Pipe screw threads shall conform to ANSI B2.1 "Pipe Threads." Pipe ends shall be reamed, and all burrs and chips formed in cutting and threading shall be removed. The internal length of threads in fitting or valve ends, and the proximity of internal seat or wall, shall dictate how far pipe shall be threaded into joint. Plated pipe and brass valve bodies shall be protected from wrench marks when making up joints. Thread lubricant shall be applied to male threads only. Thread lubricant shall be similar to "Never Seez".
  1. Teflon tape shall be used on all threaded joints. The teflon tape shall be applied in a clockwise direction, so as not to "peel-off" when mating joint. Do not apply the teflon tape to the first two threads on pipe. Threaded joints shall not be backed off to align pipe and fittings. Remake threaded joint with new portion of pipe, if Any threaded joint that leaks shall not be seal-welded to correct leakage. a pipe weld opens up during cutting or threading operations.
2. Flanged Joints: Flanges shall be made up with meeting face in a plane that is exactly perpendicular to the axis of the pipe. Upon erection, flanges shall be so positioned in rotation that the bolt holes straddle the vertical flange center line. All gaskets shall be evenly centered between the flange faces with ring gaskets engaging fully upon raised face flanges and full face gaskets engaging fully upon flat-faced flanges. The meeting flanges shall mate flush and true. Flange bolts shall be tightened uniform with an indicating torque wrench to draw the flanges evenly and firmly upon the gasket. All bolt threads shall be coated with similar to "Never Seez" thread lubricant. When made up, flange bolts shall extend through nuts by at least one full thread.
  1. The Contractor shall not use flat-faced flanges where raised face flanges are specified to mate with flat-faced flanges of valves, piping specialties, or other piping systems. The Contractor shall not machine-off the raised face of raised face flanges to mate with the flat-faced flanges.
  2. Flanges and gaskets, as specified in PART 2 of this Section, shall be used for all flanged joints. Gaskets shall be compressed to manufacturer's requirements.
3. Welding and Welded Joints:
  1. All black carbon steel piping, wherever hereinafter specified, for any service 2-1/2" and larger, shall be fabricated and assembled with (butt) welded joints and connections in accordance with the requirements of this Section.
  2. Standards: All pipeline welding shall conform to ASME/ANSI B31.1 Power Piping Code with latest addenda, and applicable portions of the ASME Boiler and Pressure Vessel Code, Section IX, with latest addenda, in accordance with the latest practice applicable to the particular service. Submit for review proposed welding procedure specifications in accordance with Section IX, Article II "Welding Procedure Specifications," on forms in accordance with Article QW-480 "Forms."
  3. Contractor's Qualifications: All welders engaged in work performed under this Section shall have been qualified in accordance with test requirements of Section IX, Article III, of the ASME Boiler and Pressure Vessel Code, with latest addenda.
  4. No welder shall be employed on the work who has not been fully qualified under the herein specified procedures and so certified by the local chapter of the National Certified Pipe Welding Bureau or similar testing authority.
  5. Each operator's certificate shall be on file at the site and shall be made available to the Commissioner upon request.

6. Each welder shall identify their production welds by marking their regularly assigned identification number or mark within 1 inch of the weld. Submit to the Commissioner a complete list of the individual numbers or identifying marks and operators name.
7. Before the start of any welding, remove all corrosion products and other foreign material from the surface to be welded. Bevel piping on both ends, as required and defined in the code, per ANSI B16.25, Figure 2A. In joining pipe, welding rings shall be used and proper joint fit-up shall be certified prior to completing the weld.
8. After deposition, clean each layer of weld metal to remove all slab and scale by wire brushing or grinding, then chip, where necessary, to prepare for the proper deposition of the next layer. The weld reinforcement shall not be less than 1/16 inch nor more than 1/8 inch above the normal surface of the joined sections. The reinforcement shall be crowned at the center and shall taper on each side to the surface being joined. The exposed surface of the weld shall present a workmanlike appearance and shall be free of depressions below the surfaces of the joined members.
9. Welding of piping 2" and smaller shall be by oxy-acetylene method and with socket weld fittings only. Welding of piping 2-1/2" and larger shall be by shielded electric arc method. Weld neck flanges shall be provided at flanged connections, unless stated otherwise. Welding rod for oxy-acetylene method shall be similar to Tensox, mild steel welding rod as manufactured by Central Steel and Wire, Chicago, Illinois and shall be similar to Fleetweld #5 as manufactured by Lincoln Electric for electric arc welding.
10. Openings cut into pipe for welded connections shall be accurately made to provide carefully matched intersections. All plugs from openings shall be retrieved and turned over to the Commissioner. Long turn welding ells shall be used at all turns in welding piping. Mitered ells will not be accepted.
11. Abutting ends of joints will be separated before welding by the thickness of 1/8" welding rod tacked in at least four points to maintain alignment. Welding back-up rings shall be used on all piping 2-1/2" size and larger.
12. Shielded electric arc welds for pipe 2-1/2" and larger shall be of single Vee butt type for which pipe shall be mill or machine beveled at 37-1/2 degrees to within 1/16" of inside pipe wall. Each weld shall be made with three passes; a stringer bead, a fill-in bead bringing weld flush with pipe, and final wash or lace pass.
13. Where branches or connections are made to a welded main and the branch or connection is less than one-half the diameter of the main, and branch is 2-1/2" and larger, install a Bonney-Forge Weldolet at the branch connection to the main, and where the branch or connection to the main is 2" and smaller, install a Bonney-Forge Thredolet at the branch connection to the main. Screwed coupling, half couplings or screwed nipples welded to mains for screwed branches will not be permitted.
14. The method of attaching Weldolet and Thredolet unit to piping shall be in strict accordance with A.N.S.I. B.31.1, Section 6, Paragraph 63B of the American Standard for Steel Butt-Welding Fittings.
2. Where socket welding is permitted, socket weld joints shall be assembled so the space between the end of the pipe and the bottom of the socket is no less than 1/16 inch or no more than 1/8 inch.

15. Welded branch connections to headers shall be made with welded outlet fittings, such as reducing tees, weldolets, sockolets, and threadolets, in compliance with ANSI B31.1, Paragraph 127.4.8.
4. Weld Inspections
  1. For all hydronic piping services of this project, welds will be inspected visually by the Commissioner and the Contractor. Any weld judged defective by the Commissioner, from a visual inspection, shall be cut out and tested in the presence of the Commissioner. Welders performing welds found to be unsound shall be subject to appropriate retest provisions of the ASME Boiler and Pressure Vessel Code and other applicable standards.
  2. In the event any welder consistently produces a high percentage of unsatisfactory production welds, that welder shall be discharged at the request of the Commissioner, even though that welder is able to produce satisfactory welds when specially tested. Removal and replacement of test coupons and samplings shall be done at the expense of the Contractor.

### 3.3 PRESSURE TESTS:

1. As portions of the mechanical systems are complete, the following tests shall be performed in the presence of the Commissioner. The Commissioner shall be given five (5) days advance notice "in writing" of the proposed time of all tests. Tests shall be repeated until acceptable to the Commissioner
2. All defective work shall be promptly repaired or replaced at the Contractor's expense. Any damage resulting from tests shall be repaired, and damaged materials shall be replaced at Contractor's expense.
3. Test shall be observed after the pipe and contents have stabilized at the ambient temperature and the source of test pressure has been shut off. Pressure tests, in general, shall apply to piping only, with all equipment, traps, relief valves, and instruments blocked off or disconnected. In no case shall piping or components be subjected to pressures exceeding their rating. All system valves within the section being tested shall be open. Temporary restraints shall be provided on expansion joints and flexible connections during pressure testing.
4. Test may be made of isolated portions of the piping as will facilitate general progress of the installation. Any subsequent revision made in the piping system, will necessitate retesting of such affected portions of the piping systems.
5. Where new piping connection are made to existing systems, two pressure tests will be required.
  1. During the first test, do not impose test pressure on the existing systems. Terminate new pipe with a temporary capped-end and valved test connection.
  2. After the first test is satisfactorily completed, remove temporary capped-end, provide a spool connection piece of the required length to make the final connection between new and existing pipe systems. After the final connection is completed, perform the second pressure test, allowing test pressure to act upon the final welds, flanges, and new and existing valves, to an extent acceptable to the Commissioner.

6. Test Performance

1. Hydrostatic and pneumatic tests shall apply to piping as indicated in the Piping Testing Table (perforated stainless steel propane pipe is excluded). The pressure shall be gradually raised to the value given, and the source shall then be blocked off. The pressure shall not drop more than the amount indicated during the corresponding minimum time interval. All joints shall be visually examined while applying a soapy bubble leak detecting solution. If an audible or visible leak is detected during testing, this leak shall be cause to disapprove the test, even though the maximum allowable pressure drop has not been exceeded. Leaks shall be repaired and the complete testing procedure shall be repeated. Upon successful completion of the test, the piping shall be relieved of pressure and drained.

Pipe Service	Test Type	Test Pressure (psig)	Minimum Test Time (hr)	Maximum Test Pressure Drop (psig)
Hydronic piping,	Hydrostatic	200	4	2

(\*) See NFPA 54 for detection of leaks and defects.

(\*\*) Perforated stainless steel propane pipe is excluded from pressure testing.

7. Test pressures shall be increased if necessary to comply with applicable codes.
8. Test Records and Reports: Prepare and keep records of each system or section of system tested. Test reports shall be signed and reviewed by the Commissioner. Test reports shall include, but not necessarily be limited to, the following:
  1. Identification of piping system or section tested
  2. Date of test and date of Commissioner signature
  3. Testing medium, test equipment description (sketch, if necessary), and method or description of test procedure
  4. Test pressure, duration of test, and recorded pressure drop

3.4 PIPING CLEANING PROCEDURES:

- A. Piping systems and equipment shall be thoroughly cleaned, after pressure testing, to the complete satisfaction of the Commissioner. Prior to pressure testing, the Contractor shall provide all necessary valved connections, temporary cross connections, to the new piping systems for fill, drainage and cross-connections as required to facilitate complete cleaning operations.
  1. Cleaning Prior to Pipe Assembly for All Systems: Prior to assembly of pipe and piping components, all loose dirt, scale, oil, and other foreign matter or internal or external surfaces shall be removed. Chips and burrs from machinery or thread cutting operations shall be blown out of pipe before assembly. Cutting oil shall be wiped from internal and external surfaces.
  2. Cleaning During Fabrication and Assembly: During fabrication and assembly, slag and weld spatter shall be removed from both internal and external pipe joints by grinding, peeling, chipping, and wire brushing. All partially installed piping systems shall have the open ends suitably capped (sealed) whenever the systems are left unattended. Prior to capping or

sealing, ensure the loose bolts, nuts , small tools, rags, or any other foreign materials are not left inside the piping system.

3. After cleaning, all temporary piping shall be removed and the connections on the piping shall be capped and sealed with materials and procedures as outlined for the respective systems.
4. Tests will be conducted by the Commissioner to verify that the cleaning programs conducted by the Contractor have removed all foreign materials from the piping systems and equipment.

**END OF SECTION 15150**



**CLEANING OF  
PIPING SYSTEMS  
SECTION 15151**

PART 1 - GENERAL

1.1 SECTION INCLUDES:

1. The Work under this Section is subject to the requirements of the Contract Documents.
2. Provide cleaning services for piping systems as indicated on the contract drawings and as specified herein, including but not limited to the following.
  1. Cleaning, flushing, and filling of the following systems.
    1. Propane Piping Systems
  2. All other related pipe cleaning specified in this Section or shown on the contract drawings.

1.2 RELATED WORK:

1. Division 15 - Basic Mechanical Requirements Section 15100.
2. Division 15 - Piping and Equipment Section 15150.

1.3 SUBMITTALS:

1. Refer to the requirements within the Basic Mechanical Requirements Section 15100.

1.4 QUALITY ASSURANCE:

1. Contractor Qualifications: The cleaning of piping must be performed only by a qualified Installer. The term qualified means experienced in performing the work required by this section. The qualified installer must have substantial documented experience acceptable to the Commissioner on projects similar in size and scope to this project. The contractor must submit evidence of such qualifications upon request by the Commissioner.
2. Refer to the requirements within the Basic Mechanical Requirements Section 15100.

1.5 DELIVERY, STORAGE AND HANDLING:

1. Refer to Division 15 - Basic Mechanical Requirements Section 15100.

1.6 WARRANTIES AND GUARANTEES:

1. Refer to Basic Mechanical Requirements Section 15100

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

3.1 PIPING SYSTEM CLEANING GENERAL:

1. The systems to be cleaned consists of all new piping and equipment installed as part of the Contract.
2. Cleaning Prior to Pipe Assembly for All Systems: Prior to assembly of pipe and piping components, all loose dirt, scale, oil, and other foreign matter on internal or external surfaces must be removed. Chips and burrs from machinery or thread cutting operations must be blown out of pipe before assembly. Cutting oil must be wiped from internal and external surfaces.
3. Cleaning During Fabrication and Assembly - During fabrication and assembly, slag and weld spatter must be removed from both internal and external pipe joints by grinding, peeling, chipping, and wire brushing. All partially installed piping systems must have the open ends suitably capped (sealed) whenever the systems are left unattended. Prior to capping or sealing, ensure the loose bolts, nuts, small tools, rags, or any other foreign materials are not left inside the piping systems.
4. General Cleaning Parameters After Pipe Installation is Complete:
  1. Piping systems must be thoroughly cleaned, after pressure testing, to the complete satisfaction of the Commissioner. Contractor must provide all necessary valved connections, temporary cross connections to the new piping systems for fill, drainage and cross-connections as required to facilitate complete cleaning operations.
    1. After cleaning, all temporary piping must be removed and the connections on the piping must be capped and sealed.
  2. A complete cleaning and testing procedure must be submitted by the contractor and must be reviewed by the Commissioner.
  3. The Contractor must submit for review the procedure that must be used to test for concentration levels as required by the Department of Aviation Chemical Department.
  4. Defective valves must be replaced by the Contractor with new valves at no additional cost to the City.
5. Tests must be conducted by the Commissioner to verify that the cleaning programs conducted by the Contractor have removed all foreign materials from the piping systems and equipment.

3.2 PIPE SYSTEM CLEANING:

1. Propane Lines: Blow out lines with a dry, oil-free compressed non-reacting gas for two (2) hours, or until accepted by the Commissioner.

**END OF SECTION 15151**

# **PROGRAMMING**

## **SECTION 16700**

### PART 1 -- GENERAL

#### 1.1 SECTION INCLUDES:

1. Work under this section is subject to the requirements of the Contract Documents.
2. Furnish all materials, equipment and personnel to update existing Fuel Spill Fire Trainer software to meet the functional requirements of the new Fuel Spill Fire Trainer system.

#### 1.2 RELATED WORK:

1. As specified in the following divisions:
  1. Division 15: Mechanical
  2. Division 16: Electrical

#### **0.1 SUBMITTALS:**

2. Submit the following
  1. Shop Drawings
  2. Test Reports
  3. System Certification
1. Operation and Maintenance Manuals

#### **0.2 WARRANTIES AND GUARANTEES:**

1. The Contractor shall guarantee all programming performed for a period of one year from the date of Substantial Completion of the Project as necessary to meet system function requirements..
3. Kidde will provide telephonic and in-person technical support by a qualified technician, consistent with Kidde's Standard warranty to resolve system performance issues. Desired adjustments after the Acceptance Test to "fine tune" the system will be limited to either the follow-up seminar visit (30 days after the initial training) or to periodic maintenance visits (every 6 months).

### PART 2 -- PRODUCTS

## **2.1 ACCEPTABLE SUPPLIERS:**

1. Kidde Fire Trainers, Inc shall be the sole acceptable supplier of software for the new fuel spill fire trainer. The existing fuel spill fire trainer programming is proprietary to Kidde Fire Trainers. Therefore, Kidde Fire Trainers shall be used to update the existing software.

Kidde Fire Trainers, Inc.  
17 Philips Parkway  
Montvale, NJ 07645

Steven Williamson  
P. (201) 300-8100  
F. (201) 300-8101

## **2.2 SOFTWARE FUNCTIONAL REQUIREMENTS:**

1. Software must accommodate the following system functions:
  1. Automatic Agent Detection in 78 zones (3 thermocouples per zone), two burner control bunkers (one thermocouple per bunker) and three ignition points (one thermocouple per ignition point).
  2. Water bath level sensing and adjustment via 120V float switch.
    1. Float switch actuation set at minimum acceptable water bath basin level. When float switch is actuated, existing pump shall operate to fill water bath basin until desired water level is reached. Automatic shut off at desired water level.
  3. Manually operated draining of water bath basin.

## **PART 3 – EXECUTION**

### **3.1 INSPECTION:**

1. Verify job site conditions prior to development of software. Any discrepancies or variations in related Work that may affect the proper software programming of the items must be coordinated with the Engineer and corrected to the satisfaction of the Commissioner.

**END OF SECTION 16700**

# **TESTING**

## **SECTION 16950**

### **PART 1 - GENERAL**

#### **1.1 SECTION INCLUDES:**

1. Work under this section is subject to the requirements of the Contract Documents.
2. Furnish and provide all work, materials, instruments and accessories necessary to provide, but is not limited to, the following:
  1. Testing of electrical systems.

#### **1.2 RELATED WORK:**

1. As specified in the following divisions:
  1. 16010 - Basic Electrical Requirements

#### **1.3 REFERENCES:**

1. See Specification Section 16010 1.03.

#### **1.4 SUBMITTALS:**

1. The Contractor shall submit data to the Commissioner prior to purchasing and installation. The data shall include but not be limited to the following:
  1. All test reports as witnessed and signed by the Commissioner.
  2. All certified test reports as specified elsewhere.

#### **1.5 QUALITY ASSURANCE:**

1. See Specification Section 16010 1.05.

#### **1.6 DELIVERY STORAGE AND HANDLING:**

1. See Specification Section 16010 1.06.

### **PART 2 - PRODUCTS**

#### **2.1 TESTING:**

1. The following tests are required, but shall not be limited to, this list. All tests will be witnessed by the Commissioner.
  1. Inaccurate Temperature Reading.
  2. Short circuits.
  3. Improper grounds.
  4. Conductor Continuity.
2. The Contractor shall furnish all meters, instruments, cable/wire connections, etc., for all tests.

3. The Contractor shall check all thermocouple and float switch wires, lightning protection system, control cables and connections.
4. After wires and cables are in place and connected to devices and equipment, the system shall be tested for short circuits, improper grounds and other faults. If a fault condition occurs the trouble shall be corrected and the system shall be retested.
5. Any wiring device, electrical apparatus or lighting fixture grounded or shorted on any "live" part shall be removed and the trouble rectified by replacing the defective parts or materials.
6. Upon completion of the electrical work the Contractor shall place the entire installation in operation, test for proper function and show systems and equipment to be free from all defects.
7. The Commissioner shall conduct from time to time such tests as may be required to any part of the equipment to determine if it is installed in accordance with the Contract Documents. The Contractor shall extend to the Commissioner all facilities to this end and shall furnish skilled or unskilled help required. All tests shall be witnessed by the Commissioner and three copies of the verified test report shall be given to the Commissioner promptly upon completion of the test.
8. The Contractor shall provide assistance to the various equipment manufacturers field personnel as required in the testing and adjusting of the electrical power and control equipment. Cooperation of the Contractor shall be such that a minimum of time is required for equipment testing.
9. A log shall be maintained of all tests. This log shall be certified before completion of the job, both as to test values and date of test. All major equipment such as switchgear, motor control centers and motors shall be initially energized in the presence of the Commissioner.
10. Any faults in the work performed by the Contractor or in materials or equipment furnished by the Contractor shall be corrected or replaced promptly by the Contractor at his/her own expense. Any faults in materials or equipment furnished by the Contractor which are the result of careless, incompetent or improper handling or installation by the Contractor shall be corrected or replaced, as directed by the Commissioner, at the Contractors expense.
11. All tests shall be made by the Contractor at the Contractors' expense and certification of the tests shall be submitted to the Commissioner. If any failures occur during the tests the Contractor shall replace the faulty equipment of materials and retest.

**PART 3 - EXECUTION**

**3.1 TEST EQUIPMENT:**

1. All test equipment shall be in good operating condition and shall have been calibrated within 6 months of date of usage. At the time of testing the Contractor shall present a copy of the certification of calibration to the Commissioner.
2. All test shall be done with the proper equipment for the type of test being performed. When necessary the Contractor shall obtain the services of a testing company to perform those tests which the Contractor either does not have trained personnel or proper testing equipment.
3. All test reports shall be signed and dated.

**END OF SECTION 16950**

**STATEMENT OF WORK**

**FOR**

**WARRANTY AND MAINTENANCE SERVICES**

**FOR THE**

**Walk-On AquaMesh™ FUEL SPILL FireTrainer® A-2000 and**

**Specialized Aircraft FireTrainer® A-2000 (SAFT)**

**AT**

**CHICAGO O'HARE INTERNATIONAL AIRPORT**

**Revision 9 November 2007**

**Prepared By:**

**Kidde Fire Trainers, Inc.**

**17 Philips Parkway**

**Montvale, New Jersey 07645 USA**

## **WARRANTY & MAINTENANCE SERVICES**

### **1.0 SCOPE**

This document provides a description of the warranty and maintenance support services provided by Kidde Fire Trainers, Inc. for both the existing Specialized Aircraft FIRETRAINER® (SAFT) A-2000 and refurbished Fuel Spill FIRETRAINER® A-2000 Live Fire Training System owned and operated by Chicago O'Hare International Airport.

### **2.0 APPLICABLE DOCUMENTS**

Kidde FT supplied Operation and Maintenance Manual for the Fire Training Equipment.

### **3.0 MAINTENANCE PHILOSOPHY**

Kidde FT Technical Support Programs are designed to assist the Owner in the upkeep of the Fire Training Equipment by providing regularly scheduled support and unscheduled (corrective) support. Of critical importance to the success of any trainer support program is the participation of the Owner's training and support personnel in keeping detailed records, regularly performing system checks, providing interim maintenance and following troubleshooting procedures outlined in the Operation and Maintenance Manual.

### **4.0 SUMMARY OF PROVIDED SERVICES**

#### **4.1 Planned (Preventive) Support**

At a predetermined interval, Kidde FT will schedule a site visit by a trained technician to evaluate the Fire Training Equipment and implement all scheduled adjustments and parts replacements to ensure that the system is at a fully operational state. This service will include the following:

- Check the operating performance of all fireplaces and make adjustments as required.
- Clean and/or replace all filter elements.
- Inspect all fans and blowers and lubricate all bearings.
- Inspect all pilot spark igniters and replace as required.
- Inspect all pilot spark flame rods and replace as required.
- Inspect the fuel control station and make adjustments as required.
- Clean the fuel control station inlet strainer
- Inspect and calibrate all gas detection assemblies and replace sensor elements as required.
- Inspect and adjust all smoke generators



- Inspect the Programmable Logic Controller battery and replace as required.
- Clean all equipment cabinets

Kidde FT will provide Two (2) scheduled support visits per year at 6-month intervals. The approximate length of each visit will be 4 days.

#### **4.2 Unplanned (Corrective) Technical Support**

Upon receipt of a request from the Owner, Kidde FT will dispatch a trained technician to evaluate and repair the Fire Training Equipment. The complexity of the required repair will determine the length of the visit. Kidde FT will furnish all parts, material, and labor required. Kidde will provide a technician onsite within two business days (48 hours excluding weekends) of the request. (Kidde cannot guarantee that Dave Bosse will be the service/support technician.)

### **5.0 EXTENT OF COVERAGE**

#### **5.1 Items to be Maintained**

Kidde FT responsibility for Technical Support includes the Fire Training Equipment hardware and software provided by Kidde FT as described in the Operation and Maintenance Manual.

#### **5.2 Personnel**

Kidde FT will utilize factory-employed, qualified and trained technicians to service and support the training system from its staff of customer/field service technicians. (A dedicated individual or full-time individual solely for Chicago O'Hare is not part of the work scope.)

#### **5.3 Exclusions**

Kidde FT will not be responsible for the following:

- System hardware that has been abused or damaged (physical damage to hardware not typical of normal operation or damage due to an act of God.)
- Loss of the Owner's ability to train because of conditions beyond Kidde FT control.

### **6.0 OWNER RESPONSIBILITIES**

Consistently safe and reliable operation of the Fire Training Equipment depends on professional operation and quality scheduled support by skilled operating and maintenance personnel. Kidde FT, therefore, requires the cooperation of the Owner in the following areas:

## 6.1 Routine Record Keeping

The Owner shall maintain daily log of Fire Training Equipment performance during training. Kidde will provide specific descriptions in the O&M manual of the types of records to be kept. In general, this brief record keeping task seeks to capture date/time, operator name(s), training performed, and operator comments on problems/issues encountered. The logbook shall be made available to the Kidde technician during service visits.

## 6.2 Interim Maintenance

The Owner shall perform all interim maintenance tasks as described in the Operation and Maintenance Manual and maintain a log of all tasks performed. Owner will be responsible for keeping the equipment and associated equipment rooms neat and clean.

## 6.3 Approved Materials

All parts required during interim maintenance of the Fire Training Equipment shall be selected in accordance with the approved parts list provided in the Operation and Maintenance manual.

## 7.0 COVERAGE PERIODS

The following defines the coverage periods of the systems.

Warranty & Maintenance Coverage	Coverage Start	Coverage End
<b>SAFT during Refurb of Fuel Spill</b>	Upon contract execution	Upon acceptance of Fuel Spill Refurb by DOA
<b>Fuel Spill &amp; SAFT Year 1</b>	Upon acceptance of Fuel Spill Refurb by DOA	1 year after acceptance of Fuel Spill Refurb by DOA
<b>Fuel Spill &amp; SAFT Year 2</b>	1 year after acceptance of Fuel Spill Refurb by DOA	2 years after acceptance of Fuel Spill Refurb by DOA
<b>Fuel Spill &amp; SAFT Year 3</b>	2 years after acceptance of Fuel Spill Refurb by DOA	3 years after acceptance of Fuel Spill Refurb by DOA

**CITY OF CHICAGO  
 PURCHASE REQUISITION**

**Copy (Department)**

<b>DELIVER TO:</b>  085-2015 O'HARE O'HARE AIRPORT Chicago, IL 60666	<b>REQUISITION:</b> 35920  <b>PAGE:</b> 1 <b>DEPARTMENT:</b> 85 - DEPT OF AVIATION <b>PREPARER:</b> Gregory L Palis <b>NEEDED:</b> <b>APPROVED:</b> 11/8/2007
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**REQUISITION DESCRIPTION**

DOA REQ. FOR NEW, NON-COMPETITIVE, BLANKET P.O.: REHABILITATION OF ARFF BURN PIT AT O'HARE; DOA PROJ. #H6164.07. THIS PROJECT IS TO REBUILD THE ARFF BURN PIT AND TO INCLUDE THREE (03) YEARS OF MAINTENANCE TO KEEP FACILITY OPERATIONAL.  
 SPECIFICATION NUMBER: 61600

**COMMODITY INFORMATION**

LINE	ITEM	QUANTITY	UOM	UNIT COST	TOTAL COST						
1	9392153312	#####	Lump Sum	0.00	0.00						
AIR CRAFT RESCUE & FIRE FIGHTING/TRAINER - REFURBISHMENT OF WALK ON AQUA MESH FUEL SPILL FIRE TRAINER A2000 PER VENDOR PROPOSAL											
<b>SUGGESTED VENDOR:</b>			<b>REQUESTED BY:</b> Gregory L Palis								
<b>DIST</b>	<b>BFY</b>	<b>FUND</b>	<b>COST CTR</b>	<b>APPR</b>	<b>ACCNT</b>	<b>ACTV</b>	<b>PROJECT</b>	<b>RPT CAT</b>	<b>GENRL</b>	<b>FUTR</b>	<b>Dist. Amt.</b>
1	086	0751	0854971	9071	220540	0000	B200371E	000000	00000	0000	0.00
<b>LINE TOTAL:</b>											0.00

LINE	ITEM	QUANTITY	UOM	UNIT COST	TOTAL COST						
2	9392153310	15,000.00	Lump Sum	0.00	0.00						
AIR CRAFT RESCUE & FIRE FIGHTING/TRAINER - SPECIALIZED AIRCRAFT FIRE TRAINER (SAFT) PREVENTIVE & CORRECTIVE HARDWARE/SOFTWARE MAINTENANCE WARRANTY DURING REFURBISHMENT OF FUEL SPILL FIRE TRAINER											
<b>SUGGESTED VENDOR:</b>			<b>REQUESTED BY:</b> Gregory L Palis								
<b>DIST</b>	<b>BFY</b>	<b>FUND</b>	<b>COST CTR</b>	<b>APPR</b>	<b>ACCNT</b>	<b>ACTV</b>	<b>PROJECT</b>	<b>RPT CAT</b>	<b>GENRL</b>	<b>FUTR</b>	<b>Dist. Amt.</b>
1	086	0751	0854971	9071	220540	0000	B200371E	000000	00000	0000	0.00
<b>LINE TOTAL:</b>											0.00

LINE	ITEM	QUANTITY	UOM	UNIT COST	TOTAL COST						
3	9392153300	1.00	Year	0.00	0.00						
AIR CRAFT RESCUE & FIRE FIGHTING/TRAINER - SPECIALIZED AIRCRAFT FIRE TRAINER AND FUEL SPILL FIRE TRAINER, YEAR 1, PREVENTIVE & CORRECTIVE HARDWARE/SOFTWARE MAINTENANCE WARRANTY											
<b>SUGGESTED VENDOR:</b>			<b>REQUESTED BY:</b> Gregory L Palis								
<b>DIST</b>	<b>BFY</b>	<b>FUND</b>	<b>COST CTR</b>	<b>APPR</b>	<b>ACCNT</b>	<b>ACTV</b>	<b>PROJECT</b>	<b>RPT CAT</b>	<b>GENRL</b>	<b>FUTR</b>	<b>Dist. Amt.</b>
1	086	0751	0854971	9071	220540	0000	B200371E	000000	00000	0000	0.00
<b>LINE TOTAL:</b>											0.00

LINE	ITEM	QUANTITY	UOM	UNIT COST	TOTAL COST						
4	9392153302	1.00	Year	0.00	0.00						
AIR CRAFT RESCUE & FIRE FIGHTING/TRAINER - SPECIALIZED AIRCRAFT FIRE TRAINER AND FUEL SPILL FIRE TRAINER, YEAR 2, PREVENTIVE & CORRECTIVE HARDWARE/SOFTWARE MAINTENANCE WARRANTY											
<b>SUGGESTED VENDOR:</b>			<b>REQUESTED BY:</b> Gregory L Palis								
<b>DIST</b>	<b>BFY</b>	<b>FUND</b>	<b>COST CTR</b>	<b>APPR</b>	<b>ACCNT</b>	<b>ACTV</b>	<b>PROJECT</b>	<b>RPT CAT</b>	<b>GENRL</b>	<b>FUTR</b>	<b>Dist. Amt.</b>
1	086	0751	0854971	9071	220540	0000	B200371E	000000	00000	0000	0.00
<b>LINE TOTAL:</b>											0.00

Where a commodity is for a particular or unique use other than standard quality, grades, color, size or other characteristics, give details of how it will be and for what purpose.  
 Requisitions prepared incorrectly will be returned to the using department.

**CITY OF CHICAGO  
 PURCHASE REQUISITION**

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**REQUISITION DESCRIPTION**

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 SPECIFICATION NUMBER: 61600

**COMMODITY INFORMATION**

LINE	ITEM	QUANTITY	UOM	UNIT COST	TOTAL COST						
5	9392153304	1.00	Year	0.00	0.00						
AIR CRAFT RESCUE & FIRE FIGHTING/TRAINER - SPECIALIZED AIRCRAFT FIRE TRAINER AND FUEL SPILL FIRE TRAINER, YEAR 3, PREVENTIVE & CORRECTIVE HARDWARE/SOFTWARE MAINTENANCE WARRANTY											
<b>SUGGESTED VENDOR:</b>						<b>REQUESTED BY:</b> Gregory L Palis					
DIST	BFY	FUND	COST CTR	APPR	ACCNT	ACTV	PROJECT	RPT CAT	GENRL	FUTR	Dist. Amt.
1	086	0751	0854971	9071	220540	0000	B200371E	000000	00000	0000	0.00
<b>LINE TOTAL:</b>											<b>0.00</b>
<b>REQUISITION TOTAL:</b>											<b>0.00</b>

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 2007 NOV - 9 01 09 10  
 01919 6-11-07

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