1.01 Purpose:

This design guideline contained herein includes the requirements for medium and high-pressure ductwork at The University of Texas at Austin. It is the intent to provide the highest level of quality and standardization possible.

1.02 Description Of Work:

A. Extent of medium and high-pressure ductwork is hereby defined as ductwork subject to operating pressures in excess of 2” w.g., positive or negative.

B. Types of medium and high-pressure ductwork include the following:

1. Air conditioning supply air systems.
2. Corrosive fume exhaust air systems.

1.03 Quality Assurance:

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of metal ductwork products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer's Qualifications: Firm with at least 3 years of successful installation experience on projects with metal ductwork systems similar to that required for project.

C. Codes and Standards:

1. SMACNA Standards: Comply with SMACNA's "HVAC Duct Construction Standards, Metal and Flexible" for fabrication and installation of metal ductwork.


1.04 Submittals:

A. Shop Drawings: Submit scaled layout drawings of metal ductwork and fittings including, but not limited to, duct sizes, locations, elevations, and slopes of horizontal runs, wall and floor penetrations, and connections. Show interface and spatial relationship between ductwork and proximate equipment.
1.05 **Delivery, Storage, And Handling:**

A. **Protection:** Protect shop-fabricated ductwork, accessories and purchased products from damage during shipping, storage and handling. Prevent end damage and prevent dirt and moisture from entering ducts and fittings.

B. **Storage:** Store ductwork inside and protect from weather.

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**PART 2 PRODUCTS**

2.01 **Ductwork Materials:**

A. **Ductwork Materials:** Provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains and discoloration, and other imperfections, including those which would impair painting.

B. **Sheet Metal:** Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ASTM A 527, lockforming quality; with G 90 zinc coating in accordance with ASTM A 525; and mill phosphatized for exposed locations.

C. **Corrosive Fume Exhaust:** Typically 304 stainless steel with welded seams unless nature of corrosive fumes require otherwise.

2.02 **Miscellaneous Ductwork Materials:**

A. **Fittings:** Provide radius type fittings fabricated of multiple sections with maximum 15° change of direction per section.

B. **Ductwork Support:** Except as otherwise indicated, provide floor mounted "pipe column" type supports for new ductwork.

1. Galvanized Steel.
2. Vinyl Chloride Coated Steel.
3. Stainless Steel.

C. **Duct Sealant:** All ductwork (except welded exhaust duct) shall be sealed with either “MP” (Multi-Purpose), Hardcast “Iron-grip 601,” Polymer Adhesive “Airseal #11,” or “United Duct Seal” (United McGill Corp.) water base, latex or acrylic type sealant. Note that, except as noted, oil or solvent-based sealant are specifically prohibited for use on this project. For exterior applications, “Uni-Weather” (United McGill Corp.) neoprene based sealant shall be used. No other sealant may be used. All seams and joints in shop and field fabricated ductwork shall be sealed by applying one layer of sealant, than immediately spanning the joint with a single layer of 3” wide open weave fiberglass tape. Sufficient additional sealant shall then be applied to completely imbed the cloth. All sealant shall be UL rated and no more than flame spread of 5 and smoke developed of 0.
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2.03 Fabrication:

A. **Fabricate** and support as in accordance with SMACNA High Pressure Duct Construction Standards and ASHRAE handbooks, except as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

B. **Construct** elbows with radius of not less than 1-1/2 times width of duct on centerline.

C. **Transform** duct sizes gradually, not exceeding 20 degrees divergence and 30 degrees convergence.

D. **Fabricate** continuously welded medium and high-pressure duct fittings and two gages heavier than duct gages indicated in SMACNA Standard. Joints shall be minimum 4-inch joint electric welded. Prime coat welded joints.

**PART 3  EXECUTION**

3.01 Inspection:

A. **General**: Examine areas and conditions under which metal ductwork is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 Installation Of Metal Ductwork:

A. **General**: Assemble and install ductwork in accordance with recognized industry practices which will achieve air-tight and noiseless (no objectionable noise) systems, capable of performing each indicated service. Install each run with minimum number of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable braces, and anchors of type which will hold ducts true-to-shape and to prevent buckling. Support ducts from floor.

B. **Field Fabrication**: Complete fabrication of work at project as necessary to match shop-fabricated work and accommodate installation requirements.

C. **Penetrations**: Where ducts pass through interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gage as duct. Overlap opening on 4 sides by at least 1-1/2". Fasten to duct and substrate.

D. **Coordination**: Coordinate duct installations with installation of accessories, dampers, equipment, controls and other associated work of ductwork system.

E. **Installation**: Install metal ductwork in accordance with SMACNA HVAC Duct Construction Standards.
3.03 **Field Quality Control:**

A. **Leakage Tests:** After duct system is constructed test for duct leakage in accordance with SMACNA HVAC Air Duct Leakage Test Manual. Repair leaks and repeat tests until total leakage is less than 1% of system design airflow.

3.04 **Equipment Connections:**

A. **General:** Connect metal ductwork to equipment as indicated; provide flexible connection for each ductwork connection to building. Provide access doors as indicated.

3.05 **Adjusting And Cleaning:**

A. **Clean ductwork internally**, unit by unit as it is installed, of dust and debris. Clean external surfaces of foreign substances, which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration.

B. **Strip protective paper** from stainless ductwork surfaces, and repair finish wherever it has been damaged.

C. **Temporary Closure:** At ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent entrance of dust and debris until time connections are to be completed.

D. **Balancing:** Refer to Division-15 section "Testing, Adjusting, and Balancing" for air distribution balancing of metal ductwork; not work of this section. Seal any leaks in ductwork that become apparent in balancing process.

END OF STANDARD 15892