PART 1 GENERAL

1.01 Purpose:

This design guideline contained herein includes the requirements for low-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 low-pressure ductwork is indicated on drawings and by requirements of this section. Low pressure ductwork is hereby defined as ductwork subjected to velocities of 2500 fpm or less, and operating pressure of 2" w.g. or less, positive or negative.

B. Types of low-pressure ductwork required for project include the following:

1. Air-conditioning supply air systems.
2. Air conditioning return air systems.
3. Exhaust air systems.
4. Corrosive fume exhaust systems.

C. External Insulation for low-pressure ductwork is specified in Division-15 insulation sections. Refer to Division-15 insulation sections for external insulation required in conjunction with low-pressure ductwork; not work of this section.

1.03 Quality Assurance:

A. SMACNA Standards: Comply with SMACNA "Low Pressure Duct Construction Standards" for fabrication and installation of low-pressure ductwork.

1.04 Submittals:

A. Product Data: Submit manufacturer's specifications on manufactured products and factory-fabricated ductwork, used for work of this section.

1.05 Delivery, Storage, And Handling:

A. Protect shop-fabricated and factory-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.

PART 2 - PRODUCTS

2.01 Ductwork Materials:

A. Sheet Metal: Except as otherwise indicated, fabricated ductwork from galvanized sheet steel complying with ANSI/ASTM A 527, lockforming quality, with ANSI/ASTM A 525, G90 zinc coating; mill phosphatized for exposed locations.

B. Contact Molded Fiberglass Reinforced Plastic: The National Bureau of Standards "Voluntary Product Standard, PS-15-69" shall form the minimum basis for the fabrication of these FRP exhaust duct systems. Resin used shall be the Hetron 197 for its fire retardant and corrosion resistant properties.

C. Flexible Ducts: Interlocking spiral of galvanized steel or aluminum construction rated to two (2) inches WG positive and 1.5 inches WG negative for low pressure ducts. Flexible duct shall be wrapped with flexible glass fiber insulation, enclosed by seamless aluminum pigmented plastic vapor barrier jacket; maximum 0.23 K value at 75 degrees F.

D. Corrosive Fume Exhaust Ducts: Construct from 304 stainless steel with welded joints unless corrosive requirements dictate otherwise.

2.02 Miscellaneous Ductwork Materials:

A. General: Provide miscellaneous materials and products of types and sizes indicated and, where not otherwise indicated, provide type and size required to comply with ductwork system requirements including proper connection of ductwork and equipment.

B. Duct Liner: Fibrous glass, complying with Thermal Insulation Manufacturers Association (TIMA) AHC-101; 1" thick, 1-1/2 pounds/cu.ft. density.

C. Duct Sealant: Non-hardening, non-migrating mastic or liquid elastic sealant (type applicable for fabrication/installation detail) as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork.

D. Ductwork Support Materials: Except as otherwise indicated, provide 16-gauge galvanized steel, 1" wide bands for support of ductwork.

2.03 Fabrication:

A. Shop fabricate ductwork in 4, 5, or 8-foot lengths, unless otherwise indicated or required to complete runs. Pre-assemble work in shop to greatest extent possible, so as to minimize field assembly of systems. Disassemble systems only to extent necessary for shipping and handling and mark sections for re-assembly and coordinated installation.

B. Shop fabricate ductwork of gages and reinforcement complying with SMACNA "Low Pressure Duct Standards - 5th Edition."

C. Fabricate duct fittings to match adjoining ducts, and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with center-line radius equal to 1-1/2 x the duct width; and fabricate to include turning vanes in elbows where shorter radius is necessary. Limit angular tapers to 30^{o} for diverging tapers and 20^{o} for converging tapers.

D. Fabricate ductwork with accessories installed during fabrication to the greatest extent possible. Refer to Division-15 section "Duct Accessories" for accessory requirements.

E. Fabricate ductwork with duct liner in each section of duct where indicated. Laminate liner to internal surfaces of duct in accordance with instructions by manufacturers of lining and adhesive, and fasten with mechanical fasteners.

PART 3 - EXECUTION

3.01 Installation Of Sheet Metal Ductwork:

A. General: Assemble and install ductwork in accordance with recognized industry practices which will achieve air tight (5% leakage) and noiseless (no objectionable noise) systems, capable of performing each indicated service. Install each run with minimum of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers and anchors of type, which will hold ducts true-to-shape, and to prevent buckling.

B. Support ductwork in manner complying with SMACNA "Low Pressure Duct Standards - 5th Edition" hangers and supports section.

3.02 Installation Of Frp Ductwork:

A. General: Segments of the duct system shall be jointed by the "Butt Wrap" procedure by tradesmen with three years experience. After the two segments are jointed by the resin catalyst putty, they shall be wrapped with a series of fiberglass "C-Veil" bands saturated with resin in increasingly wider bonds of fiberglass until the built-up joint is equal to or greater than the duct thickness. Apply a post-cure about 20-30 minutes after the "Butt Wrap" at 180^{o}F with an electric heat tape for a period of 4 hours.

B. Support FRP ductwork in manner complying w/SMACNA standards as above, with modifications as required for support spacing in accordance with manufacturer's recommendations.

3.03 Installation Of Flexible Ductwork:

A. Connect flexible ducts to metal ducts with adhesive plus sheet metal screws.

B. Connect terminal units to ducts directly or with one-foot maximum length of flexible duct. Do not use flexible duct to change direction.

C. Connect diffusers or troffer boots to low pressure ducts with four (4) feet maximum length of flexible duct. Hold in place with strap or clamp.

END OF STANDARD 15891