SECTION 233114 - MEDIUM-PRESSURE DUCTWORK

PART 1-GENERAL

1.1 SECTION INCLUDES

A. Medium-pressure round or flat oval supply (3- inch wg pressure class) sheet metal ductwork.

1.2 SUBMITTALS

A. Submit shop drawings and product data per applicable Division I Specifications.

B. Shop drawings shall include 1/4 inch scale layout shop drawings showing duct location sizes, duct fittings, gauges, sizes, welds, volume dampers, elevations and air flow quantities for each air terminal device. Electronic drawing files of floor plans and structural plans are available from the Architect upon request. Submittals shall be approved prior to start of work on any system.

1.3 QUALITY ASSURANCE

A. SMACNA HVAC Duct Construction Standards-Metal and Flexible.

B. UL181.

C. NFPA 90A and 90B.

D. ASHRAE Handbook, HVAC Systems and Equipment.

E. Ductwork shall be sealed and leak tested as required by ASHRAE standard 90.1, and as specified herein.

1.4 WARRANTY

A. Contractor shall warranty entire systems and equipment for a period of one (1) year.

PART 2-PRODUCTS

2.1 MANUFACTURERS

A. United McGill

B. Semco

C. Lindab Spiral 7 Shop fabricated Fittings

2.2 COMPONENTS

A. Supply air ductwork shall be spiral seam round or rectangular medium pressure, duct work constructed of galvanized steel lock-forming quality ASTM A 653/A 653/M, G90 (Z275) coating designation; milli-phosphatized finish for surfaces of ducts exposed to

view. Gauges shall be per the latest issue of SMACNA for listed pressure requirements, or as listed below, whichever is more stringent.

B. All round medium pressure ducts shall be galvanized steel spiral conduit of lock seam construction. Fittings shall be all welded 20 ga. Steel construction for tight slip fit with spiral. All connections from mains to branches or to flexible duct shall be as shown on the drawings and per schedule. Joints between fittings and conduit shall be made with synthetic rubber sealing compound, mechanically fastened with drive screws. All spiral ducts and fittings shall be as manufactured by United Sheet Metal Company, or Semco. All Medium pressure ductwork shall be constructed to SMACNA 3" W.G. pressure class.

C. Round medium pressure ducts shall be constructed of the following gauge metal:

Diameter	Spiral Seam Gauge	Longitudinal Seam Gauge
3 through 14 inches	26	24
15 through 26 inches	24	22
27 through 36 inches	22	20
37 through 50 inches	20	20
51 through 60 inches	18	18
61 through 84 inches	18	16

D. Round medium pressure fittings shall be constructed with continuous welds of the following gauge metal:

DIAMETER	GAUGE
3" to 36"	20
38" to 50"	18

E. Rectangular medium pressure ducts shall be constructed of the following gauge metal:

Duct up to & including 12"	- #22 U.S.S. Ga.
Ducts 13" to 30"	- #20 U.S.S. Ga.
Ducts 31" to 48"	- #18 U.S.S. Ga.
Ducts 49" to 60"	- # 16 U.S.S. Ga.

F. All supply air duct up to VAV boxes shall be medium pressure ductwork.

G. Sizes given are greatest dimensions or longest side of ducts. All ducts up to 16" shall be constructed with drive joints and all joints sealed. All ducts over 16" shall be constructed using angles at each joint bolted together to the companion angle with the sheet metal turned up on the leg of the angle and sealed. Angles shall be located 4'-0" on centers of sizes scheduled below.

Duct Size	Angle Size
16" to 30"	1 ½"X 1 ½" X18"
Over 30"	2 "X 2" X 3/16"

All angles shall be sheared or sawed.

H. Specially construct duct for medium pressure air distribution with all seams locked and rolled and all joints sealed.

I. Test all medium pressure ductwork per SMACNA leakage test manual to SMACNA leakage class 6 for rectangular metal and SMACNA leakage class 3 for round metal.

2.3 CASINGS

A. Fabricate casings in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible and construct of galvanized steel for operating pressures indicated with galvanized steel angle reinforcement.

B. Reinforce door frames with steel angles tied to horizontal and vertical plenum supporting angles. Install hinged access doors where indicated or required for access to equipment for cleaning and inspection. Provide clear wire glass observation ports, minimum 6X6 inch size.

PART 3-EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible. Seal class 'A' for all ductwork above 2" pressure class.

C. Duct Sizes are inside clear dimensions. For lined ducts, maintain sizes inside lining.

D. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pitot tube openings where required for testing of systems, complete with metal can and spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

F. Use double nuts and lock washers on threaded rod supports.

G. Install 1" x 18 gauge hanger straps or trapeze hangers. Ducts shall not be supported from metal ducts.

H. The contractor shall install the ducts and flues indicated on the drawings making all necessary changes in cross sections, offset, etc. whether or not same specifically indicated. If a duct cannot be run as shown on the drawings, the Contractor shall install the duct between the required points by any path available, subject to approval of the Architect

I. Install sheet metal sleeves for all ductwork passing through floors, wall, partitions, etc. Sleeves for insulated duct shall be large enough to allow insulation to pass through a sleeve. A 3" high concrete curb shall be provided around all duct openings through equipment room floors, floors in wet areas, and floors that are slab on grade. Refer to

structural details for construction information.

J. All vertical ducts or risers shall be self-supporting and shall be complete in themselves, no single thickness partitions between ducts being permitted.

K. Provide “Flexible” connections as noted on drawings between ducts and fans with 1” slack.

L. No pipes or other obstructions shall pass through air ducts.

M. All ducts at ceilings shall be run in such a manner as to maintain a maximum headroom in all rooms and corridors.

N. Ducts must be installed at such times as the construction alterations of the building will permit or as required by the Architects.

O. The Sheet Metal Contractor shall set all automatic dampers furnished by the Temperature Control Contractor which includes pressure relief dampers, outside air dampers and return air dampers.

Note: Where ducts pass through fire stops or fire walls, provide a steel sleeve as detailed on the drawings and required by NFPA Bulletin No. 90A. There shall be no openings between the steel sleeve and the fire partition.

P. Sheet Metal Contractor shall certify by letter to the Architect that all fire dampers have been installed as called for on the drawings and that all fire dampers are in proper operating condition.

Q. Connect terminal units to supply ducts with two feet maximum length of high pressure, flexible duct. Do not use flexible duct to change direction.

R. Connect flexible ducts to metal ducts with adhesive, plus stainless- steel draw bands. Maximum length shall be 5’-0” with no more than two 90 degrees elbows as installed. Connect to ducts with fittings with integral air extractor and balancing damper.

S. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction duct from entering ductwork system.

END OF SECTION 233114