

(a) Support vertical lines at locations indicated; where not indicated, support copper lines and cast iron soil pipe at every floor, steel pipe at every other floor with steel extension pipe clamps unless otherwise required by expansion conditions.

(b) Support bottom of risers with a base fitting set on either a concrete or brick pier or a pipe stand. In lieu of using a base fitting, a hanger at bottom horizontal connection may be used. Locate hanger as close to riser as possible, but permitting sufficient free offset where allowance for expansion and contraction is necessary.

(3) In Precast Concrete Plank construction, carry hanger rods through drilled holes in plank and bolt to 4"x4"xl/8" steel plate on top of plank.

(4) Insulation Protection (a) "Chilled Water Piping" (refer to Section INSULATION" for extent) provide hangers outside of covering. Between hanger and covering provide an 18 gauge galvanized sheet metal saddle formed to fit bottom half of the insulation. Minimum side dimension of saddle equal to one half the insulation circumference.

(b) Where other insulated lines are supported on rollers, provide curved steel pipe covering protection saddles with projecting lugs or turned up edges. Weld lugs to pipe.

7. PIPE ANCHORS:

a. Unless otherwise indicated, provide anchors consisting of steel collars, clamps or similar devices welded to pipe. Secure anchors directly to structural framing of building. Before making installation, obtain Engineer's approval of anchor details, location and method of securing to building.

8. EXPANSION JOINTS:

a. General

(1) Provide expansion joints where indicated.

b. Application

(1) Support and guide pipe lines so that the expansion joint is not subjected to any angular rotating movement.

(2) The installation is based on only axial movement being absorbed by the joint. If actual installation conditions require lines to have offsets between anchor points, refer the problem to the Engineer.

(3) Submit details of joint construction for Engineer's approval.

c. Materials

(1) Fin tube heating system equal to Robertshaw No.1291 having a contraction allowance of 1/4" and a maximum expansion of 1 3/4" per unit. Sizes 3/4" through 2" for copper tube. Ends, screwed union. Bellows, stainless steel.

d. Approved Manufacturers

- Badger Manufacturing Co., Flexonics Corporation, Robertshaw and Zallea.

9. TESTING:

a. General

(1) Piping shall be tested and proven tight.

(2) Test concealed piping before enclosing.

(3) Replace and retest pipe or fittings broken or damaged under test.

(4) Remove or protect from damage items not designed to withstand testing pressures; e.g., control devices, air vents and boilers.

(5) Advise Engineer prior to all tests.

b. Standing Water Test

(1) Sanitary, vent and storm piping shall be plugged and tested with water by filling to the top of highest pipe.

(2) Sections of piping may be separately tested with a minimum head of 10 feet of water.

(3) Piping shall show no appreciable leakage after standing for eight hours.

c. Pressure Testing

(1) Test pressures shall be 1 1/2 the system working pressures and a minimum of 100 psi, unless otherwise indicated.

(2) Test water, piping hydrostatically.

(3) Inspect each joint for leakage while under test.

(4) Pressure tests shall be maintained for a minimum of four hours.

SHEET METAL

The requirements of Section ME-1 apply to all work hereunder.

1. GENERAL

a. Physical interference - Offsets or changes in duct shape required to avoid structural or other interferences shall be made without extra cost to the Owner.

b. References - For details not specified, such as hangers, elbow construction, offsets, obstruction streamlining, branch connections, dampers, the following references shall apply:

(1) Low Pressure - Sheet Metal and Air Conditioning Contractors National Association (SMACNA) "Duct Manual and Sheet Metal Construction for Ventilating and Air Conditioning Systems, Second Edition", referred to herein as the "SMACNA Manual".

(2) Medium Pressure - Carrier Corporation Manual section 35Y dated 6-2-58 pertaining to high pressure ductwork and entitled "Carrier Construction". Specifications for Sheet Metal Fabrication", referred to herein as the "Carrier Manual".

c. Internal Insulation - Duct dimensions are internal. Increase duct size to compensate for lining thickness.

d. Workmanship - Make ducts true to indicated dimensions, straight and smooth on inside with neatly finished air tight joints.

e. Vibration - Brace or reinforce ducts where necessary to overcome vibration, buckling or breathing.

f. Elbows - Make all elbows square unless otherwise indicated. If throat radius on curved elbows must be less than duct width, provide full length metal turning vanes. In square elbows install double radius turning vanes. Unless otherwise indicated make offsets with 30° full radius elbows as maximum.

g. Flexible Collars - Provide 6" wide neoprene impregnated glass fabric collars between fans and ducts or casings.

h. Fire Dampers - Fire dampers Air Balance Model 118FS with Type "C" frame must meet local and NBFU requirements as to location, installation and design.

i. Access Doors - Provide airtight access doors in casings, plenum chambers and ducts in locations and sizes to give access to parts requiring maintenance or inspection and to permit cleaning of return and exhaust ducts.

(1) Duct Door construction - SMACNA Manual, plate 30, figures B, C and D.

(2) Casing Door construction - Plate 50 figure B and D.

9# board insulation cores, thickness to match casing or duct insulation or 1/2" minimum, Ventlok latches, Series 100 for duct doors, Series 310 for casing doors, galvanized hinges with brass pins.

j. Balancing Dampers - locate where accessible for adjusting after completion of work. Furnish access panels where regulators are concealed. Damper regulators shall be as follows:
Approved Manufacturers: Ventfabrics, Young Regulator equal to "Ventlok" models listed.

(1) Concealed: #641. Exposed #688
(2) Splitter: #690

Mark balanced position. Elevate dial to face of insulation.

k. Instrument Test Holes - Locate where accessible in main or major branch ducts to permit measurement of fan air quantities according to ASHRAE Guide Pitot tube method. Place holes on more than two sides of larger ducts if required by available Pitot tube length. Equip holes with Ventlok #699 instrument ports.

l. Bolt Guards - Galvanized with expanded metal sides SMACNA Manual, plate 41 Fig. A or B.

2. SYSTEM CLASSIFICATION

a. Construct systems in accordance with the following Classification:

System	Classification
All ductwork	Low Pressure

3. LOW PRESSURE RECTANGULAR DUCTWORK

a. Materials and Construction - Prime quality, zinc coated steel sheets. Black steel reinforcing and companion angles. Gages of metal and construction of seams, joints and reinforcing shall be according to SMACNA Manual. Where rigid board insulation is to be applied, do not use alternate cross break construction. All sides of a section of duct shall be of gage specified for its maximum dimension.

4. MISCELLANEOUS EXHAUST DUCTWORK

a. General - Unless otherwise indicated the requirements for low pressure duct construction apply.

b. Material - Prime quality, zinc coated steel sheets.

5. RECTANGULAR DUCT LINING

a. Location - where indicated.

b. Material - 1" thickness 1.5 pcf density smooth coated or mat facing to conform to NBFU Bulletin 90A requirements.

c. Approved Manufacturers - Johns-Mansville Micro-Bar, Gustin-Bacon Ultraliner.

d. Application - Secure to metal with mechanical clips on not less than 15" centers and fire retardant adhesive over entire uncoated surface. Caulk all joints with fire retardant mastic with leading edges heavily coated or with shiplapped facing as recommended by manufacturer to keep moving air from getting behind insulation.

6. FLEXIBLE DUCT

a. Materials - Wiremold 54 or Thermoflex SN

b. Application - Runs of flexible duct may not exceed ten feet. Avoid kinking and compressing during installation. Throat radius may not be less than the diameter.

c. Fittings - 90° branch take-offs from mains shall be long or bell formed conical unless otherwise indicated.

7. GASKETS

a. Material - Minnesota Mining and Manufacturing Company EC-1202 tape sealer. Minimum size and thickness 1/2" x 1/16".

b. Application - Gaskets shall be V notched and unbroken at corners.

8. SEALING COMPOUND

a. Material - Minnesota Mining and Manufacturing Company "EO-800" or United Sheet Metal Company, Inc. "United Duct Sealer".

b. Application - Follow manufacturer's recommendations. If necessary to achieve an airtight joint, additionally apply a duct tape compatible with the sealer used. Allow adequate curing time before pressurizing system.

9. TESTING

a. Make a visual and aural inspection of all joints in all ducts during operation.

Seal all leaks and openings and make airtight.

c. The required static pressure may be built up by operating the system fan or by using an auxiliary pressure blower.

10. DIFFUSERS, GRILLES, REGISTERS

a. Equipment - Air delivery performance, noise level, function and type shall be suitable for the duty intended and equal in these respects to the following selections:

Perimeter Supply Diffusers - Carrier Model 37P Moduline Units. Units shall be complete with the couplings, end caps, trim, strips, 20 gauge galvanized plenums with 1/2 inch acoustical lining, damper assembly, diffuser assembly and where indicated thermostatic controls built in for volume regulation. Controls shall include feature for warm up on full volume and be suitable for duct pressure above 0.75 inches.

Interior Supply Diffusers - Provide ISO Tuttle & Bailey type DE - size #206 with No. 4 volume damper and type TF distributing grid and 1500 ft total length flexible duct - size 6". Install as directed or delineated on supplementary dygs. issued during construction.

Return Air Grilles - Tuttle & Bailey type TH0D. Provide ISO size #2x12, each with 1'-0" long acous. lined duct collar. Install same as Int. Supply Diffusers.

Exhaust Registers - Tuttle & Bailey T-117D

b. Approved Manufacturers - Agitair, Anemostat, Barber-Colman, Carnes, Connor, Titus, Tuttle and Bailey, except Perimeter Supply Diffusers.

c. Finish - Prime coat except Perimeter Supply Diffusers.

d. Installation - Coordinate location with lighting and ceiling pattern. Make minor duct modifications to suit. Add internal baffles where necessary to avoid drafts due to air impingement on nearby partitions, columns, etc.

e. Reference - Door grilles, fresh air intake and exhaust louvers and screens are specified under other sections of the specifications.

* Lobby Grilles - (First Flr.) Tuttle & Bailey T-50.
* Lobby Supply Diffuser - (First Flr.) Tuttle & Bailey Imperialine Series 4000 with type B margin, straight grille bars, rear set of adjustable louvers. (Grand Flr. & 1st Flr. Corridor) T-4 B. Type M with grid of damper.
* Air Valves - Tuttle & Bailey type PRV air pressure reducing valves for manual operation with proper operator for each location.

PREFABRICATED PANEL CASINGS AND PLENUMS

The requirements of Section ME-1 apply to all work hereunder.

1. GENERAL

a. Scope - Provide casings and plenums constructed of prefabricated panels as indicated for the following systems: Exterior Air Conditioning System and intake section of Interior Air Cond. System.

b. References - Construction and insulation of field fabricated casings are specified under other sections of the specifications.

c. Shop Drawings - Must be prepared after close coordination with related work and physical conditions using approved certified drawings of equipment to be contained or connected.

d. Approved Manufacturers - Air and Refrigeration Corporation, United Sheet Metal Company, Inc., Koppers.

2. CONSTRUCTION:

a. Air and Refrigeration Corporation casings and plenums shall be constructed as follows:

(1) Panels: Sandwich form with 22 gauge galvanized steel inner surface, 1/8" tempered fiber board outer surface, 2" thickness internal glass fiber blanket insulation with vapor barrier. Panels shall be externally bonded and bound by angle frames to be self-supporting.

(2) Base Channel: Install panels on a factory insulated 10 gauge steel base channel.

(3) Corner Pieces: All corner pieces shall be factory insulated.

(4) Finish: Shop coat of gray enamel on all external surfaces and on black steel interior surfaces.

(5) Sound Panels: Where indicated, similar to thermal panel except perforated inner panel, 2" 6 PCF density glass fiber internal insulation, 22 gauge galvanized outer sheet with 1/8" fiber board exterior facing.

b. United Sheet Metal Co., Inc. casings and plenums shall be constructed as follows:

(1) Panels: Enclosed steel box section with 2" internal glass fiber 2 PCF insulation. 20 gauge galvanized inside and outside except 18 gauge exterior for panel length over 10 feet. Panels shall be assembled with H shaped joining members.

(2) Base Channel: Install panels on a formed 16 gauge flush type base channel anchored to curb base with air seal mastic between curb and channel.

(3) Joint Strips: Furnish internally insulated galvanized joint strips downstream of cooling coils.

(4) Finish: Galvanized steel meeting ASTM A-93-59T.

c. Accessory Items

(1) Access Doors: 2'-0" wide by 6'-0" high unless otherwise indicated. Construction similar to panels with inverted or box steel frame on door, replaceable sealing gaskets, two cast aluminum latches with inside and outside handles, heavy butt hinges. Stationary frame of structural angles or channels.

(2) Joint Seals: Manufacturer shall furnish his standard sealing mastic, cement, and/or continuous rubber gasket to provide air tight seal at all joints.

(3) Fasteners: Manufacturer shall furnish his standard form of fasteners for securing the assembly. Fasteners shall be rust resistant.

d. Structure: Casing shall be reinforced, braced and supported for structural rigidity, air tightness and maximum span deflection of 1/2" for positive pressure differential of 10" w.g.

3. INSTALLATION:

a. Sealing - Seal all joints and below base channel air tight. Doors shall swing freely and seal tightly.

b. External Mountings - Make provision for external mounting for all drives, controls and similar devices required for the operation of equipment within the casing.

c. Openings in panels - Where piping, drives, etc. pass through panels, provide sealed sleeves. Caulk annular space between service line and sleeve. Standard practice as required.

d. Blanking Sheets - Provide blanking sheets within casing to prevent bypassing of air around any item of equipment. Construct blanking sheets between areas having a temperature difference similar to field fabricated casing with double wall and 2" insulation.

e. Filler Sections - Where unavoidable provide field fabricated filler with insulation lining not exceeding 8" in length between prefabricated panels and building construction. Flash over piping with 22 gauge galvanized sheet at floor line, outside all intake and wherever necessary, to avoid wetting of lining.


f. Casing sections and lining shall be as specified in the sheet metal section.

REVISIONS

NO.	DATE	ITEM	REF.

FIRM SEAL, H.A. JOB NO. N16

DESIGNED BY
DRAWN BY
CHECKED BY A E W
APPROVED BY K V B



CHRISTIE, NILES & ANDREWS ARCHITECTS

OFFICE BUILDING FOR NOTTINGHAM FARMS INC. 102 N. PENNSYLVANIA AVE. TOWSON, MARYLAND 21204

SPECIFICATIONS

JOB NO.	6522
SCALE	ME 4
DATE	SEPT. 27, 1960
LAST REV.	