230020-H: SUPPLEMENTAL DUCT SYSTEM DESIGN (15890-H)

Related Sections

Basis Guideline: 230020 – “Duct System Design”  
230000-H – “Supplemental Basic Mechanical Requirements”  
230022-H – “Supplemental Grilles, Registers, Diffusers and Air Balancing Accessories”

For an explanation of the use of these guidelines, see “Design Guidelines for UMHHC Facilities”

Included as part of this UMHHC guideline section are the details described within the following UM Master Specification sections.

MS233100 – “HVAC Ducts & Casings”  
MS233300 – “Air Duct Accessories & RGDS”

The UM Master Specifications may be used as a reference and/or basis, but the A/E is completely responsible for contract specifications (meeting the intent of the UMHHC Guidelines and Preferred Manufacturers List) that are used in UMHHC projects.

UMH Standard Details:

D230020H-1 “Duct Elbow Detail”  
D230020H-2 “Typical Interstitial Level Terminal Box Installation”  
D230020H-3 “Typical Interstitial Level Duct Support”  
T 15890 001 “Sample Duct Construction Schedule”

General

See 230000-H “Supplemental Basic Mechanical Requirements” for discussion on duct sizing criteria and the use of duct liner.

See 230022-H “Supplemental Grilles, Registers, Diffusers and Air Balancing Accessories” for discussion on dampers used in ductwork systems.

All ductwork should be sized on the even dimension (i.e. 10”x12” vs. 11”x12”).

AE shall clearly label all ductwork mains as supply air (SA), return air (RA), exhaust air (EA) or fume hood exhaust (FHEA). Branch ductwork is not required to be labeled.

All return air and exhaust air systems shall be fully ducted systems. Designs utilizing a return air plenum system shall not be permitted except by special approval from UMHHC FPD.

Duct liner shall not be permitted; either in supply, return or exhaust systems, except by special approval from UMHHC FPD. Systems using duct liner are prone to erosion into the air stream, accumulation of dirt and dust and are very difficult to keep clean. The AE shall be responsible for utilizing hospital grade duct attenuators and the layout of the ductwork to provide an acceptable level of acoustical attenuation (see NC/RC requirements under 230000-H “Supplemental Basic Mechanical Requirements”).

Tie rods are NOT allowed in any return or exhaust air ducts in UMHHC inpatient facilities.

Duct Sizing

All ductwork systems shall be distributed according to the following criteria:

- Medium Pressure, typically supply ductwork upstream of Terminal Air Box (VAV/CAV): Maximum friction loss of 0.25”/100 ft with a maximum air velocity of 2,500 FPM.
• Low Pressure, typically supply ductwork downstream of Terminal Air Box (VAV/ CAV), all Return, Outside Air, Relief Air and General Exhaust ductwork: Maximum friction loss of 0.1”/ 100 ft with a maximum air velocity of 1,800 FPM.

The AE shall consider the eventual need to clean the interior of the ductwork in the future. Minimum ductwork size shall be 8”x6”, except where prohibited by installation obstructions. In as much as possible, the AE shall utilize smooth radius (radius of 1.5 times duct width) 90 degree elbows in all exhaust and return duct systems, which will help facilitate cleaning in the future.