

# Mechanical Symbols and Abbreviations

Abbreviations	Drawing Symbols	Sheet Metal Symbols																		
CD ceiling diffuser (supply air) CFM cubic feet per minute DB dry bulb Ø diameter EF exhaust fan EG exhaust grille ER exhaust register FD fire damper IN inch RA return air RG return air grille RTU roof top unit SA supply air SP static pressure	<p>Denotes section</p> <p>Section number</p> <p>Arrow indicates Direction in which Section is cut</p> <p>Sheet number Where section is located</p> <p>Denotes detail</p> <p>Detail number</p> <p>Letter designating Elevation</p> <p>Sheet number Where detail is located</p> <p>Denotes Construction Start point</p> <p>Sheet number Where elevation is located</p>	<table border="1"> <tr> <td>Fire damper</td> <td></td> </tr> <tr> <td>Volume damper</td> <td></td> </tr> <tr> <td>Supply diffuser</td> <td></td> </tr> <tr> <td>Supply duct riser</td> <td></td> </tr> <tr> <td>Return duct riser</td> <td></td> </tr> <tr> <td>Flexible connection</td> <td></td> </tr> <tr> <td>Return air grille</td> <td></td> </tr> <tr> <td>Exhaust grille</td> <td></td> </tr> <tr> <td>Exhaust fan</td> <td></td> </tr> </table> <p><b>Temperature Control Symbols</b></p> <p>Room thermostat or sensor </p> <p><b>Note Designation</b></p> <p><u>Plan Notes:</u> Specific information as indicated on a drawing</p> <p> Leader line of plan note referenced directed to item of plan note reference</p> <p>Circle with number indicates a plan note reference, with the number indicating the item number of the plan note referenced</p> <p><u>General Plan Notes:</u> General information as it pertains only to the drawing it is on</p> <p><u>General Notes:</u> General information pertaining to all the drawings of the discipline it is on</p>	Fire damper		Volume damper		Supply diffuser		Supply duct riser		Return duct riser		Flexible connection		Return air grille		Exhaust grille		Exhaust fan	
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## Mechanical General Notes

### APPLICABLE CODES AND ORDINANCES:

Provide all materials and equipment and perform all labor required to install complete and operable mechanical systems as indicated on the drawings, as specified and as required by code.

Entire installation shall be in strict accordance with applicable codes and ordinances.

Secure and pay for all required permits.

Provide a minimum of 10'-0" between exhaust outlets, plumbing vents and all outside air intakes.

Contractor shall not locate any duct or piping directly over any electrical panel, switchgear, transformer, etc. Coordinate locations of ducts and piping with the Electrical Contractor to avoid these conflicts.

### ARCHITECT:

Contractor shall be guided by the Architect's reflected ceiling plan for exact location of diffusers, registers and grilles unless otherwise noted.

Coordinate diffuser, register, and grille locations with architectural reflected ceiling plans, lighting, and other ceiling items and make minor duct modifications to suit.

Furnish all material and equipment as specified, except where specific approval for substitution is given by the Architect/Engineer.

### GENERAL:

These drawings indicate required sizes and points of termination for piping, ductwork, conduit, etc. The equipment shown illustrates suggested routing, but all necessary offsets and fittings may not be shown. Contractor shall install his work in a manner that will conform with the structure. Contractor shall avoid obstructions, preserve head room and maintain maximum clearance without additional cost to the Owner.

All dimensions shown on these plans are in feet and/or inches unless otherwise noted.

Mechanical work shall be complete in every detail and all miscellaneous items of material and labor necessary to complete the work described, shown or reasonably implied on drawings or specifications, shall be included in the contract.

Proposal shall be based on specified material and equipment. In order to promote competition, however, bidders may submit alternate proposals on any alternate materials and/or equipment they wish to propose, including any price changes affected by acceptance of alternatives. These must be provided in addition to the base bid, not in place of the base bid.

Contract document drawings for mechanical work are diagrammatic and are intended to convey scope and general arrangement only.

Install all mechanical equipment and appurtenances in accordance with Manufacturers' recommendations, contract documents, and applicable codes and regulations.

Provide vibration isolation as specified for all mechanical equipment to prevent transmission of vibration to building structure.

Coordinate construction of all mechanical work with Architectural, Structural, Civil, Electrical work, etc., shown on other contract document drawings.

Each respective contractor shall be responsible for coordinating the installation of his work with the work of other contractors and trades prior to the installation.

Maintain a minimum of 6'-8" clearance to underside of pipes, ducts, conduits, suspended equipment, etc., throughout access routes in mechanical rooms.

All tests shall be completed before any mechanical equipment or piping insulation is applied.

Work shall include startup of all systems, furnishing of operating and maintenance instructions and one (1) year guarantee, commencing on date of acceptance by the Owner or as otherwise specified.

Testing, adjusting, and balancing agency shall be by a member of the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB). Testing, adjusting, and balancing shall be performed in accordance with the AABC standards.

Where two or more items of the same type of equipment are required, the product of one Manufacturer shall be used unless otherwise noted.

Coordinate all equipment connections with Manufacturers' certified drawings. Coordinate and provide all duct and piping transitions required for final equipment connections to furnished equipment. Field verify and coordinate all duct and piping dimensions before fabrication.

The locations of all items shown on the drawings or called for in the specifications that are not definitely fixed by dimensions are approximate only.

The exact locations necessary to secure the best conditions and results must be determined by the project site conditions and shall have the approval of the Engineer before being installed. Do not scale drawings.

All miscellaneous steel required to ensure proper installation and/or as shown in details for piping, ductwork, and equipment shall be furnished and installed by the Mechanical Contractor.

All equipment, piping, ductwork, etc., shall be supported as detailed, specified, and/or required to provide a vibration free installation.

All ductwork, piping, and equipment supported from structural steel shall be coordinated with the General Contractor. All attachments to steel bar joists, trusses, or joist girders shall be at panel points. Provide beam clamps meeting mss standards. Welding to structural members shall not be permitted. The use of c-clamps shall not be permitted.

Mechanical equipment, ductwork, and piping shall not be supported from metal deck.

All roof mounted equipment curbs for equipment provided by the Mechanical Contractor shall be furnished by the Mechanical Contractor and installed by the General Contractor.

Locations and sizes of all floor, wall, and roof openings shall be coordinated with all other trades.

All openings in fire walls due to ductwork, piping, conduit, etc., shall be fire stopped with a product similar to 3M or equal. Product shall be listed by UL or FM and meet the requirements of local and state codes.

Refer to typical details for ductwork, piping, and equipment installation.

All valves, coils, dampers, etc. Shall be installed allowing easy access to them. Areas adjacent to the access panels shall be clear of obstruction.

Furnish and install all equipment and material required to complete the installation as shown on the drawings.

Equipment sizes and service space requirements may vary between different Manufacturers. Consult approved Manufacturer drawings as submitted and coordinate with these drawings.

Refer to mechanical details for additional equipment requirements.

### HVAC/SHEETMETAL:

Certain items such as rises and drops in ductwork, access doors, volume dampers, etc., are indicated on the contract document drawings for clarity for a specific location requirement and shall not be interpreted as the extent of the requirements for these items.

All ductwork dimensions, as shown on the drawings, are internal clear dimensions.

All air handling units shall operate without moisture carryover.

Locate all mechanical equipment (RTUs, single duct, variable volume, constant volume and fan powered boxes, fan coil units, cabinet heaters, unit heaters, unit ventilators, coils, steam humidifiers, etc.) for unobstructed access to unit access panels, controls, and valving.

Provide flexible connections in all ductwork systems (supply, return, and exhaust) connected to air handling units, fans, and other equipment which require vibration isolation. Flexible connections shall be provided at the point of connection to the equipment unless otherwise noted.

Unless otherwise noted, all ductwork is overhead, light to the underside of the structure, with space for insulation and below any required piping.

Runs of flexible duct shall not exceed 4'-0". Flexible duct shall not be used as an elbow. Provide sheet metal elbow at diffuser neck where tap is not out of the bottom of the supply main. Refer to details.

All ductwork shall be coordinated with all trades involved. Offsets in ducts, including divided ducts and transitions around obstructions, shall be provided at no additional cost to the Owner.

Provide access doors in ductwork to provide access for all smoke detectors, fire dampers, smoke dampers, volume dampers, humidifiers, coils, and other items located in the ductwork which require service and/or inspection.

Smoke detectors shall be furnished by Unit Manufacturer and wired by the Electrical Contractor. The Mechanical Contractor shall be responsible for mounting the smoke detector in ductwork as shown on the drawings and in accordance with Manufacturer's printed instructions.

See specifications for ductwork gauges, bracing, hangers, and other requirements.

Contractor shall not locate any duct or piping directly over any electrical panels, switchgear, transformer, etc. Coordinate locations of ducts and piping with the Electrical Contractor to avoid these conflicts.

Provide volume dampers upstream of all air inlets/outlets unless otherwise noted.

Provide companion opposed blade volume dampers with all diffusers mounted in drywall ceilings. Do not provide companion volume dampers with diffusers mounted in lay-in tile ceilings. Provide manual volume dampers in the branch ducts serving diffusers located above lay-in tile ceilings.

Diffusers, registers, and grilles mounted in drywall ceilings shall have plaster frames.

Unless otherwise noted all ductwork above ceilings shall be insulated with 1 1/2" ductwrap. Ductwrap shall be 1.5 lb. Density.

Install volume damper at each branch takeoff from main supply ducts.

Mechanical Contractor shall furnish and install a 3"x3"x 3/8" steel angle frame around each rooftop unit roof opening. Field weld frames to top of joists. Refer to Mechanical Detail Sheets for additional equipment requirements.

### RELATED CONTROLS:

Unless otherwise noted, locate all room thermostats and humidistats 4'-0" (centerline) above finish floor. Notify the Engineer of any rooms where the above location cannot be maintained or where there is a question on location.

### RELATED ELECTRICAL AND PLUMBING:

Unless otherwise noted all low voltage wiring (24 volts) shall be provided and installed by the Mechanical Contractor. This includes fans, radiant heaters, rooftop units, etc.

Unless otherwise noted line voltage wiring (120 volts or greater) shall be provided and installed by the Electrical Contractor.

All control wire and conduit shall comply with the National Electric Code (NEC) and Division 16 of the specifications.

Refer to electrical and plumbing drawings for additional coordination with these drawings.

### APPEARANCE:

All equipment should be installed with great regard to a neat finished product.

Whenever possible, wiring should be routed in such a way as to minimize visibility.

Piping should be tight to structure whenever possible, and orthogonal.

Eliminate the need for condensate pumps if possible.

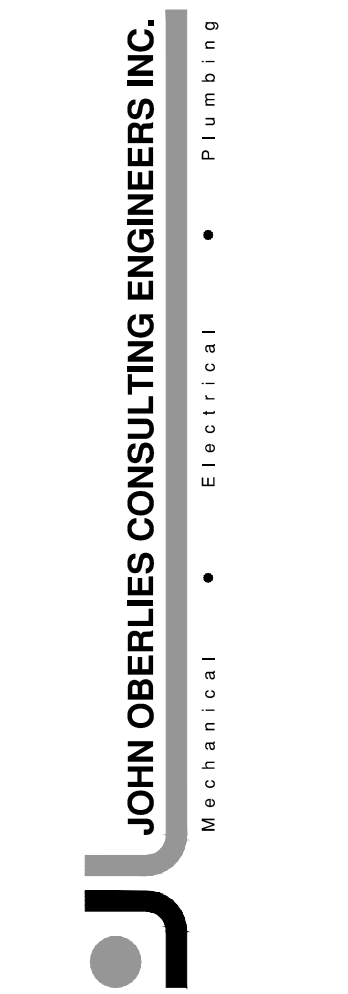
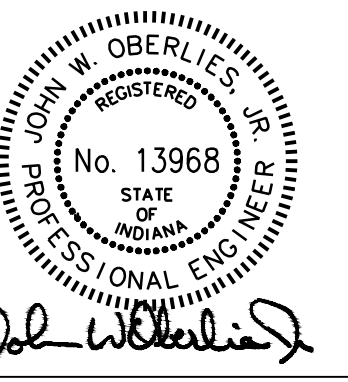
Contact the Engineer prior to installing any equipment that will not be able to be installed in a neat, first class manner, consistent with the Manufacturer's installation instructions.

### RELATED GENERAL CONSTRUCTION:

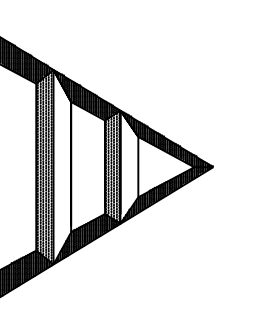
Unless otherwise noted flashing of roof openings will be done by the General Contractor. Deliver exhaust fan curb to General Contractor for installation. Contact General Contractor to coordinate this portion of the work.

### SUBSTITUTIONS:

Cost of any changes required by this, or other trades, due to substitution of equipment other than the basis of design, shall be included in the Mechanical Contractor's proposal.



Proposed Dialysis Clinic for:  
**NOBLESVILLE EXPANSION**  
 165 Sheridan Road  
 Noblesville, IN 46060



This is the place where a disclaimer statement can be placed.

Drafted By: NAS

Checked By: JWO

Date Drawn: 07/20/10

Project #: 028012

REV #	DATE	REVISION DESCRIPTION
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X/XX/XX		

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