

### 1 AIR DEVICE CONNECTION

NO SCALE

FOR MORE INFORMATION, SEE AIR DEVICE SCHEDULE SHEET THIS SHEET.  
THIS DETAIL SHOWS TYPICAL AIR DEVICE INSTALLATIONS.  
SIZE THE RUNOUT TO THE AIR DEVICE THE SAME SIZE AS THE AIR DEVICE INLET AND RUN USING ROUND SPIRAL LOCK SEAM GALVANIZED DUCT AND FLEXIBLE DUCT, AS SHOWN.  
NORMALLY RUN HORIZONTAL DUCTWORK HIGH AS POSSIBLE, TIGHT TO BOTTOM OF BUILDING STRUCTURE.  
DUCT EXTERNAL AND DIFFUSER BACK PAN INSULATION AND DUCT LINING NOT SHOWN FOR CLARITY. SEE THE SPECIFICATIONS FOR DUCT INSULATION AND LINING REQUIREMENTS.  
NOT ALL DUCT SUPPORTS SHOWN. PROVIDE ALL DUCT SUPPORTS SIZED AND AS REQUIRED BY SMACNA AND AS SHOWN HEREIN.  
AT ALL ANCHOR POINTS TO BUILDING STRUCTURE, PROVIDE ANCHORS AS CONCRETE DRILL ANCHORS, BEAM CLAMPS, LAG SCREWS, ETC. OR AS SPECIFIED BY THE ARCHITECT. POWDER ACTUATED ANCHORS NOT ACCEPTABLE FOR WORK IN EXISTING BUILDINGS.

- 1 MAIN, OR BRANCH DUCT.
- 2 STRAP DUCT HANGERS, TYPICAL. INSTALL AS REQUIRED BY SMACNA. ANCHOR FROM BUILDING STRUCTURE.
- 3 SIDE TAKEOFF FITTING WITH DAMPER. FITTINGS SHALL HAVE SMACNA 45 DEGREE BRANCH TAKEOFF ENTRANCES, ALLOW MOUNTING TO RECTANGULAR DUCT THE SAME HEIGHT AS THE ROUND DUCT CONNECTION WITH MOUNTING FLANGE. USE OF SPIN-INS NOT ACCEPTABLE.
- 4 SCREW SIDE TAKEOFF FITTING TO DUCT AT EACH CORNER AND SIX INCH ON CENTER. SEAL SIDE TAKEOFF FITTING TO DUCT AIR TIGHT USING ADHESIVE GASKET AND HIGH PRESSURE DUCT SEALER. EXTERNALLY INSULATE SIDE TAKE OFF FITTING.
- 5 ROUND EXTERNALLY INSULATED GALVANIZED SHEET METAL DUCT WITH SPIRAL LOCK BEAMS (HARD DUCT). USE LONG RADIUS ELBOWS AT EACH CHANGE OF DIRECTION. LIMIT THE TOTAL ANGLE OF THE CHANGES IN DIRECTION TO A MAXIMUM OF 180 DEGREES.
- 6 IN ADDITION TO THE NORMAL ROUND DUCT SUPPORTS AS REQUIRED BY SMACNA, PROVIDE DUCT STRAP HANGERS ON EACH SIDE OF THE FLEXIBLE DUCT.
- 7 MAKE ALL FLEXIBLE DUCT CONNECTIONS TO HARD DUCT USING STAINLESS STEEL SCREW CLAMPING BANDS AND SEAL AIR TIGHT WITH HIGH PRESSURE DUCT SEALER. SEAL FLEXIBLE DUCT VAPOR BARRIER TO HARD DUCT AND/OR ADJACENT INSULATION. NO EXPOSED FIBERGLASS SHALL BE VISIBLE.
- 8 SIX (6) FOOT MAXIMUM SECTION OF FLEXIBLE DUCT WITH MINIMAL BENDS OR TURNS. LIMIT THE TOTAL ANGLE OF THE CHANGES IN DIRECTION TO A MAXIMUM OF 120 DEGREES.
- 9 PROVIDE SIX-INCH LONG SADDLE SUPPORTS FOR FLEXIBLE DUCT AS REQUIRED TO PREVENT SAGGING AND AT CHANGES IN DIRECTION.
- 10 HARD LONG RADIUS ELBOW - CONNECT TO VERTICAL DUCT OR AIR DEVICE NECK AS REQUIRED.
- 11 HARD VERTICAL DUCT, LENGTH AS REQUIRED.
- 12 AIR DEVICE - SUPPLY AIR DIFFUSERS. SEE AIR DEVICE SCHEDULE.
- 13 AT THE FOUR CORNERS OF THE AIR DEVICE, SUPPORT THE LAY-IN CEILING GRID USING CEILING SUPPORT WIRE, ANCHORED TO BUILDING STRUCTURE.
- 14 ANCHOR TO BUILDING STRUCTURE.
- 15 LAY-IN CEILING.
- 16 LAY-IN CEILING T-BARS.
- 17 BUILDING STRUCTURE.

### 2 TYPICAL VAV BOX CONNECTION

NO SCALE

VAV BOX CONNECTION DETAIL.  
FOR MORE INFORMATION, SEE VAV BOX SCHEDULE SHEET MXX  
THIS DETAIL SHOWS TYPICAL VAV INSTALLATIONS, OTHER INSTALLATIONS SIMILAR.  
SIZE THE RUNOUT TO THE VAV BOX THE SAME SIZE AS THE VAV BOX INLET AND RUN USING ROUND SPIRAL LOCK SEAM GALVANIZED DUCT.

- 1 MAIN SUPPLY DUCT
- 2 SIDE TAKEOFF FITTING WITH NO DAMPER. FITTINGS SHALL HAVE SMACNA 45 DEGREE BRANCH TAKEOFF ENTRANCES, ALLOW MOUNTING TO RECTANGULAR DUCT THE SAME HEIGHT AS THE ROUND DUCT CONNECTION AND HAVE MOUNTING FLANGE. USE SPIN-INS NOT ACCEPTABLE.
- 3 ON THE INTAKE SIDE OF THE VAV BOX, AT EVERY CHANGE OF DIRECTION, INSTALL LONG RADIUS ELBOWS. LIMIT THE TOTAL ANGLE OF THE CHANGES IN DIRECTION TO A MAXIMUM OF 180 DEGREES.
- 4 EACH VAV BOX SHALL HAVE A STRAIGHT RUN OF FIVE DUCT DIAMETERS UPSTREAM OF THE BOX, AS SHOWN.
- 5 VAV BOX - SEE VAV BOX SCHEDULE. SUPPORT THE BOX FROM THE STRUCTURE USING FOUR (4) 1/4 INCH ALL-THREAD RODS AND NEOPRENE ISOLATORS, ONE SUPPORT ROD AT EACH CORNER.
- 6 RECTANGULAR TO ROUND REDUCER. SIZE INLET FOR FULL SIZE OF VAV BOX INLET. SIZE OUTLET FOR ROUND DUCT, SIZE AS SHOWN ON THE DRAWINGS.
- 7 2 FOOT MAXIMUM SECTION OF FLEXIBLE DUCT WITH NO BENDS OR TURNS. MAKE ALL FLEXIBLE DUCT CONNECTIONS TO HARD DUCT USING STAINLESS STEEL SCREW CLAMPING BANDS AND SEALED AIR TIGHT WITH HIGH PRESSURE DUCT SEALER. SEAL FLEXIBLE DUCT VAPOR BARRIER TO HARD DUCT AND/OR ADJACENT INSULATION. NO EXPOSED FIBERGLASS SHALL BE VISIBLE.
- 8 SIZE ROUND DUCT AS SHOWN ON THE DRAWINGS. TYPICAL OF ALL ROUND DUCT SUPPLIES. INDEPENDENTLY SUPPORT THE DOWNSTEAM DUCT FROM THE BUILDING STRUCTURE.
- 9 6 INCH FLEXIBLE CONNECTION. FULL SIZE OF THE VAV BOX OUTLET.
- 10 SIZE RECTANGULAR DUCT AS SHOWN ON THE DRAWINGS. TYPICAL OF ALL RECTANGULAR DUCT SUPPLIES. INDEPENDENTLY SUPPORT THE DOWNSTEAM DUCT FROM THE BUILDING STRUCTURE.
- 11 PROVIDE 42 INCH WORKING CLEARANCES ACCESS IN FRONT ELECTRIC HEATER HINGED DOOR AS PER N.E.C.
- 12 INSULATION ON VAV RUNOUT AND SUPPLY DUCT NOT SHOWN FOR CLARITY. SEE SPECIFICATIONS AND DRAWINGS FOR INSULATION REQUIREMENTS.
- 13 VAV BOX CONTROL BOX

### 3 GRADE MOUNTED ACCU

NO SCALE

- 1 THERMAL EXPANSION VALVE
- 2 SIGHT GLASS
- 3 INSULATION OVER TXV BULB
- 4 INSULATED SUCTION LINE
- 5 LONG RADIUS ELBOWS (TYP)
- 6 INTERIOR WALL
- 7 FILTER/DRYER
- 8 LIQUID LINE
- 9 CONTROL WIRING
- 10 EXTERIOR WALL
- 11 MOUNTING FLANGE
- 12 PIPING ENTRANCE ENCLOSURE
- 13 SERVICE VALVE WITH SERVICE PORT (TYP)
- 14 SUPPORT PIPING FROM CONCRETE SLEEPERS
- 15 CONCRETE PAD SEE ARCHITECTURAL DRAWINGS

THIS DETAIL IS TYPICAL OF THE REFRIGERANT PIPING INSTALLATION.  
SUBMIT REFRIGERANT PIPING LAYOUT SHOP DRAWINGS FOR EACH SYSTEM, REVIEWED AND APPROVED BY THE COMPRESSOR MANUFACTURER IN WRITING. SHOW ALL FILTERS, DRYERS, SIGHT-GLASSES, VALVES, ETC. AS REQUIRED BY THE COMPRESSOR MANUFACTURER.  
PROVIDE FIELD INSTALLED LIQUID AND SUCTION REFRIGERANT PIPING.  
DUE TO THE PROJECT CONDITIONS, LINE SETS NOT ALLOWED.  
KEEP THE EXTERIOR REFRIGERANT PIPING TO A MINIMUM.  
INSULATE THE SUCTION LINE WITH 1" THICK CLOSE CELLED ELASTOMERIC INSULATION INSTALLED PER THE MANUFACTURER'S REQUIREMENTS.  
PAINT EXTERIOR INSULATION WITH TWO COATS PAINT AS REQUIRED BY THE INSULATION MANUFACTURER.  
AFTER PAINTING THE INSULATION, RUN THE CONTROL WIRING FROM THE FURNACE OR FAN COIL TO THE ACCU(S), STRAPPED TO THE SUCTION PIPING, TAKING CARE NOT TO CRUSH THE INSULATION. USE 20 MIL WATERPROOF AND UV PROTECTED PVC TAPE, 2 INCH WIDE, USING A MINIMUM OF FOUR TURNS AROUND THE PIPE. PROVIDE TAPE COMPATIBLE WITH THE INSULATION.  
COMPLETELY COVER THE INSULATION AND CONTROL WIRING WITH 22 GAUGE GALVANIZED STEEL METAL SERVICE JACKET ROLLED TO THE SHAPE OF THE PIPE AND INSULATION, SECURELY ATTACHED TO THE PIPING. ORIENT THE SERVICE JACKETS TO SHED WATER.  
RUN ALL PIPING SQUARE TO BUILDING.  
SUPPORT EXTERIOR PIPING ON CONCRETE SLEEPERS, WITH THE PIPE BOTTOM, 6 INCHES ABOVE FINISHED GRADE. PROVIDE SLEEPERS WITHIN ONE FOOT OF EACH CHANGE IN DIRECTION AND EVERY FOUR FOOT INCREMENT. CONSTRUCT FROM CONCRETE WITH WIRE MESH REINFORCING. PROVIDE 4" WIDE GALVANIZED STEEL INSULATION SADDLES AT EACH SUPPORT POINT.  
SUPPORT INTERIOR PIPING FROM THE BUILDING STRUCTURE USING COPPER OR PVC COATING HANGERS. SUPPORT REFRIGERANT PIPING 4 FOOT ON CENTER AND WITHIN ONE FOOT OF EACH CHANGE OF DIRECTION. PROVIDE 4" WIDE INSULATION SADDLES.  
PROVIDE A HEAVY DUTY REFRIGERANT PIPING ENTRANCE ENCLOSURE AND SLEEVE. ENCLOSURE SHALL BE APPROXIMATELY 8 INCHES SQUARE AND 12 INCHES DEEP WITH OPEN REAR (INTERIOR OF BUILDING). PUNCH HOLES IN THE BOTTOM PIPE ENTRANCE LARGE ENOUGH TO ACCOMMODATE THE PIPES, INSULATION, AND CONTROL WIRING. CONSTRUCT ENCLOSURE FROM 1/8 GAUGE STEEL WITH WELDED JOINTS AND SEAMS. PROVIDE 2x2x3/16 INCH FULL LENGTH OF THE ENCLOSURE. ANGLE IRON MOUNTING FLANGE TOP AND SIDES WELDED TO ENCLOSURE. PRE-DRILL TWO MOUNTING HOLES IN EACH ANGLE. HOT DIP GALVANIZE THE ENTIRE ENCLOSURE AFTER FABRICATION.  
MOUNT THE ENCLOSURE WATER TIGHT TO THE EXTERIOR WALL WITH SILICONE CAULKING, SEALING ALL JOINTS AND CRACKS. BED THE ANGLES IN SILICONE CAULK. ANCHOR THE ENCLOSURE TO THE WALL AS DIRECTED BY THE ARCHITECT USING STAINLESS STEEL TAMPERPROOF THROUGH BOLTS AND BACK UP PLATES. SEE THE ARCHITECTURAL DOCUMENTS FOR MORE INFORMATION.  
ONCE THE PIPING IS RUN THROUGHOUT THE ENCLOSURE, PACK IT WITH FIBERGLASS AND SEAL THE PIPE OPENINGS WATERTIGHT WITH HEAVY BEAD OF SILICONE CAULKING.  
IN THE INTERIOR OF THE BUILDINGS, RUN ALL REFRIGERANT PIPING IN THE WALL AND CEILING CAVITIES BETWEEN THE STUDS AND JOISTS. WHERE POSSIBLE RUN THE REFRIGERANT PIPING PARALLEL TO STUDS AND JOISTS. WHERE THE PIPING HAS TO RUN PERPENDICULAR TO THE STUDS AND JOISTS, RUN THE PIPING THROUGH THE CENTER OF THE STUD OR JOIST. DRILL HOLES SLIGHTLY LARGER THAN THE PIPE, ONLY. INSULATE THE SUCTION LINE TO BOTH SIDES OF THE WOOD, ONLY. RUN INSULATION CONTINUOUSLY THROUGH METAL STUDS.  
DO NOT CUT ANY STRUCTURAL MEMBERS OF ANY KIND.  
LOCATE THE SIGHT GLASS FOR CONVENIENT VIEWING FROM A/C CLOSET DOOR.

### 4 PIPE TRENCH

NO SCALE

GENERAL NOTES:  
FILL TRENCH WITH COMPACTED LAYERS OF CLEAN RIVER SAND. REMOVE ANY LARGE ROCKS, WOOD, DEBRIS, BRANCHES, ROOTS, LIMBS, ETC. BEFORE COMPACTING.  
REMOVE ROOTS, LARGE ROCKS AND DEBRIS, ETC. FROM TRENCH AREA AND ANY THAT PROJECT INTO TRENCHING.  
CONTRACTOR SHALL DETERMINE PROPER PIPE ELEVATIONS AND FALL. SLOPE BOTTOM OF TRENCH.

SPECIFIC NOTES:

- 1 UNDISTURBED EARTH
- 2 CHILLED WATER, STORM DRAIN AND/OR SANITARY SEWER, CHILLED WATER PIPING TO BE BURIED IN MINIMUM OF 36" BELOW GRADE.
- 3 COMPACTED BEDDING RIVER SAND.
- 4 DISTANCE BETWEEN PIPES, IF REQUIRED, LARGEST DIAMETER OF PIPE RUN IN TRENCH, BUT NOT LESS THEN 12 INCHES.
- 5 DISTANCE BETWEEN PIPE(S) AND TRENCH WALL, ONE HALF LARGEST DIAMETER OF PIPE RUN IN TRENCH, BUT NOT LESS THEN 6 INCHES.
- 6 COMPACTED FIRST FILL LAYER. COMPACT USING TOOL WITH FOOT WIDTH LESS THEN THE DIAMETER OF THE SMALLEST PIPE.
- 7 DISTANCE OF BEDDING AND FIRST FILL LAYER, LARGEST DIAMETER OF PIPE RUN IN TRENCH, BUT NOT LESS THEN 12 INCHES.
- 8 EQUAL NUMBER OF COMPACTED LIFTS, EACH LIFT SHALL HAVE A MAXIMUM OF 12 INCHES COMPACTED DEPTH. PROVIDE THE PROPER NUMBER OF LIFTS FOR PROPER PIPE COVERAGE, ELEVATION, AND SLOPE.
- 9 FINISH GRADE MATERIAL - COORDINATE LAYOUT, DEPTH, MATERIAL, ETC. WITH OTHER DIVISIONS OF THE WORK.