

Order Plans @

MECHANICAL

GENERAL SPECIFICATIONS:
DIVISION 23 - MECHANICAL
PART 1 - GENERAL
CONDITIONS OF THE CONTRACT AND ARCHITECTURAL SECTIONS APPLY TO THIS SECTION.
1.01 DESCRIPTION
A. PROVIDE MATERIALS, EQUIPMENT, LABOR AND SERVICES NECESSARY FOR THE INSTALLATION AND PLACING INTO OPERATION, COMPLETE HEATING, VENTILATING, AIR-CONDITIONING, PLUMBING AND FIREPROTECTION SYSTEMS AS SPECIFIED AND SHOWN.
1.02 GENERAL REQUIREMENTS
A. EQUIPMENT AND SYSTEMS FURNISHED SHALL FIT IN AVAILABLE SPACE WITH ADEQUATE SPACE FOR OPERATION AND SERVICING. THE DRAWINGS ARE GENERALLY DIAGRAMMATIC. CONTRACTOR SHALL VERIFY EXACT CONDITIONS.
1.03 REFERENCES
A. FRI 202-040 - UNITARY AIR-CONDITIONING EQUIPMENT
B. ARI 276 - SOUND RATING OF OUTDOOR UNITARY EQUIPMENT
C. ASME B16.1 - CAST IRON PIPE FLANGES AND FLANGED FITTINGS
D. ASME B16.3 - MALLEABLE IRON THREADED FITTINGS
E. ASME B16.4 - CAST IRON THREADED FITTINGS
F. ASME B16.5 - PIPE FLANGES AND FLANGED FITTINGS
G. ASME B16.9 - FACTORY-MADE WROUGHT STEEL BUTTWELDING FITTINGS
H. ASME B16.11 - FORGED STEEL FITTINGS, SOCKET WELDED & THREADED
I. ASME B16.13 - CAST COPPER ALLOY SOLDER JOINT PRESSURE FITTINGS
J. ASME B16.21 - WROUGHT COPPER AND SOLDER PRESSURE FITTINGS
K. ASME B16.23 - BUTTWELDING ENDS
L. ASME B31.9 - BUILDING SERVICES PIPING
M. ASME B36.10 - WELDED AND SEAMLESS WROUGHT STEEL PIPE
N. ASTM A47 - MALLEABLE IRON CASTINGS
O. ASTM A53 - PIPE, STEEL, BLACK AND ZINC-COATED, WELDED, SEAMLESS
P. ASTM A74 - CAST IRON SOIL PIPE AND FITTINGS
Q. ASTM A90 - WEIGHT OF COATING ON GALVANIZED STEEL ARTICLES
R. ASTM A138 - ELECTRIC RESISTANCE WELDED STEEL PIPE
S. ASTM A234 - PIPING FITTINGS OF WROUGHT CARBON STEEL AND ALLOY
T. ASTM A527 - STEEL SHEET, HOT-DIP GALVANIZED, LOCK-FORMING
U. ASTM A553 - STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC-IRON
V. ASTM A795 - BLACK AND GALVANIZED WELDED AND SEAMLESS PIPE
W. ASTM B32 - SOLDER METAL
X. ASTM B88 - SEAMLESS COPPER WATER TUBE
Y. ASTM C24 - PERFORMED FLEXIBLE ELASTOMERIC CELLULAR THERMAL INSULATION
Z. ASTM C53 - STANDARD SPECIFICATION FOR MINERAL FIBER BLANKET
AA. ASTM C533 - STANDARD SPECIFICATION FOR MINERAL FIBER BLANKET
AB. ASTM C534 - RUBBER GASKETS FOR CAST IRON SOIL PIPE
AC. ASTM C912 - MINERAL FIBER BLOCK AND BOARD THERMAL INSULATION
AD. ASTM C921 - PROPERTIES OF JACKETING MATERIALS FOR THERMAL INSULATION
AE. ASTM D2854 - SOLVENT CEMENTS, P.V.C. PLASTIC PIPE AND FITTINGS
AF. ASTM D2965 - P.V.C. PLASTIC DRAIN, WASTE AND VENT PIPE AND FITTINGS
AG. ASTM D3585 - MAKING SOLVENT-CEMENTED JOINTS WITH P.V.C. PIPE
AH. NFPA 13 - INSTALLATION OF SPRINKLER SYSTEMS
AI. NFPA 99 - INSTALLATION OF AIR-CONDITIONING AND VENTILATING SYSTEMS
AJ. SMACNA - HVAC DUCT CONSTRUCTION STANDARDS
PART 2 - PRODUCTS
2.01 CONDENSATE DRAIN PIPING
A. COPPER TUBING ASTM B88, TYPE L, HARD DRAWN
B. FITTINGS: ASME B16.13, CAST COPPER ALLOY OR ASME B16.22, WROUGHT COPPER AND BRONZE
C. JOINTS: ASTM B32, SOLDER, GRADE 95TA
2.02 DUCTWORK
A. ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, AND SEALED IN ACCORDANCE WITH LATEST EDITION OF SMACNA HVAC DUCT CONSTRUCTION STANDARDS. DUCT SIZES ARE INSIDE CLEAR DIMENSIONS. OUTSIDE DIMENSION SHALL BE ADJUSTED FOR DUCT LINER.
B. INCREASE DUCT SIZES OR PROVIDE 45 DEGREE LATERAL WYE TAKEOFFS UNLESS OTHERWISE INDICATED. PROVIDE TURNING VANES ON RECTANGULAR SUPPLY ELBOWS.
C. GALVANIZED STEEL SHALL BE ASTM A525 AND ASTM A527 GALVANIZED STEEL SHEET, LOCK-FORMING QUALITY, HAVING G60 ZINC COATING IN CONFORMANCE WITH ASTM A525.
D. ROUND DUCT MATERIAL THICKNESS: 28 GAUGE UP TO 8 INCHES, 26 GAUGE FOR 9 INCHES TO 14 INCHES DIAMETER.
E. RECTANGULAR DUCT MATERIAL THICKNESS: 28 GAUGE UP TO 12 INCHES, 26 GAUGE FOR 13 INCHES TO 36 INCHES.
F. HANGER SUPPORTS FOR RECTANGULAR SHEET METAL DUCTWORK SHALL BE TRAPEZOIDAL HANGER SUPPORTS ACCORDING TO SMACNA STANDARDS.
G. DUCTWORK LOCATED EXTERIOR TO THE BUILDING AND INSTALLED WITH INSULATION SHALL BE SEALED WITH SEALANT: PROVIDE 2" (MINIMUM R-8) THICK, 3 LB DENSITY FIBER INSULATION. DUCTWORK THAT IS EXTERIOR TO THE BUILDING, INSULATE WITH 2" (MINIMUM R-8) THICK FIBER INSULATION AND PROVIDE MINIMUM 20 GAUGE ALUMINUM SHEET.
2.03 FLEXIBLE DUCTWORK
A. TWO PLY ALUMINIZED FOIL FIBER SUPPORTED BY METALLIC WOUND STEEL WIRE FIBERGLASS INSULATION, FIBERGLASS FIBER INSULATION, POLYESTER FIBER INSULATION AT 10 INCHES W.G. NEGATIVE.
B. PROVIDE FLEXMASTER OR APPROXIMATELY EQUAL FLEXIBLE DUCTWORK. FLEXIBLE DUCTWORK SHALL BE LISTED UNDER DIVISION 23 AND CLASSIFIED AS FIBERGLASS INSULATION, R-8, 3/4 LB DENSITY FIBER INSULATION. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL BE INSTALLED WITH SUPPORTS TO PREVENT SAGGING AND BULGING.
2.04 AIR DEVICES
A. REGISTERS, GRILLES AND DIFFUSERS SHALL BE SHOWN IN SIZES SHOWN ON DRAWINGS. PROVIDE DAMPERS AND OTHER ACCESSORIES. AIR DEVICES SHALL BE SPECIFIED MANUFACTURER AND MODEL.
B. ALL AIR DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. ALL SHALL WITH AN AIRTIGHT CONNECTION TO DUCTWORK. INSTALL PLUMB, LEVEL AND PARALLEL WITH BUILDING WALLS. ADJUST POSITION, NECESSARY TO CONFORM WITH ARCHITECTURAL DETAILS, SYMMETRY OR LIGHTING ARRANGEMENT.
DUCTWORK ACCESSORIES
PROVIDE FLEXIBLE DUCT CONNECTIONS AT DUCT CONNECTIONS TO EACH FAN OR AIR HANDLER. CONNECTOR SHALL BE UL LISTED FIRE RETARDANT NEOPRENE COATED WOVEN GLASS FIBER TO NFPA 99 CONSTRUCTION SHALL BE 3" WITH DUCT SUPPORTED TO ACHIEVE 1" OF SLACK. BOLLUMS CONTROL DAMPERS FABRICATED PER SMACNA STANDARDS.
2.05 DUCT INSULATION
A. INSULATION: SUPPLY DUCT WRAP FLEXIBLE
1. MANUFACTURER: OWENS-CORNING MODEL TYPE TV
2. OTHER ACCEPTABLE MANUFACTURERS OFFERING EQUIVALENT PRODUCTS:
A. MANVILLE
3. INSULATION: ASTM C533, FLEXIBLE, NONCOMBUSTIBLE BLANKET
A. K VALUE: ASTM C518, 0.31 AT 75 DEGREES F
B. MAXIMUM SERVICE TEMPERATURE: 250 DEGREES F
C. MAXIMUM MOISTURE ABSORPTION: 0.20 PERCENT BY VOLUME
4. VAPOR BARRIER JACKET
A. KRAFT PAPER WITH GLASS FIBER YARN AND BONDED TO ALUMINIZED FILM
B. MOISTURE VAPOR TRANSMISSION: ASTM E96, 0.02 PERM
C. SECURE WITH PRESSURE SENSITIVE TAPE
5. VAPOR BARRIER TAPE: KRAFT PAPER REINFORCED WITH GLASS FIBER YARN AND BONDED TO ALUMINIZED FILM, WITH PRESSURE SENSITIVE RUBBER BASED ADHESIVE
6. PROVIDE R-8 INSULATION WRAP ON RIGID ROUND, CONCEALED, SUPPLY AND RETURN AIR DUCTS. PROVIDE R-8 INTERNAL DUCT LINER ON EXPOSED RECTANGULAR SUPPLY AND RETURN AIR DUCT DROPS FOR THE FIRST 10'-0" FOR SOUND ATTENUATION. DUCT SIZES ON MECHANICAL PLANS INDICATE CLEAR INSIDE AIRFLOW DIMENSIONS, INCREASE SHEET METAL SIZES ACCORDINGLY.
B. JACKETS
1. CANVAS JACKET: UL LISTED FABRIC: ASTM C921, 6 OZ/80 YD, PLAIN WEAVE COTTON TREATED WITH DILUTE FIRE RETARDANT LAGGING ADHESIVE
C. GLASS FIBER RETURN DUCT LINER, FLEXIBLE
1. INSULATION: ASTM C1071, FLEXIBLE, NONCOMBUSTIBLE BLANKET WITH FIRE RESISTANT POLYVINYL ACETATE POLYMER IMPREGNATED SURFACE AND EDGE COAT. ALL LINERS SHALL BE COATED WITH AN ANTIMICROBIAL AGENT
A. K VALUE: ASTM C1071, 0.31 AT 75 DEGREES F
B. MAXIMUM SERVICE TEMPERATURE: 250 DEGREES F
C. MAXIMUM VELOCITY ON COATED AIR SIDE: 5.00 FPM
D. MINIMUM NOISE REDUCTION CRITERIA: ASTM C1071, 2 INCH THICKNESS
2. ADHESIVE: WATERPROOF, ASTM E192 FIRE-RETARDANT TYPE
A. LINER FASTENERS: GALVANIZED STEEL, SELF-ADHESIVE PAD IMPACT APPLIED WITH INTEGRAL HEAD
D. INSULATION RATINGS
1. FLAME SPREAD SHALL BE 25 OR LESS IN ACCORDANCE WITH ASTM E84
2. SMOKE DEVELOPED SHALL BE 50 OR LESS IN ACCORDANCE WITH ASTM E84
E. DUCT INSULATION SCHEDULE
EXPOSED SUPPLY/RETURN DUCT-DUCT LINER FOR FIRST 10'-0"
2. CONCEALED SUPPLY/RETURN DUCT-FLEXIBLE DUCT WRAP
3. EXHAUST DUCT UNINSULATED
2.07 CONTROLS
A. GUARANTEE: THE CONTROLS SHALL BE FREE OF DEFECTS IN WORKMANSHIP AND MATERIAL UNDER NORMAL USE AND SERVICE, AND SHALL BE REPLACED AT NO ADDITIONAL COST TO OWNER FOR A PERIOD OF 12 MONTHS AFTER FINAL ACCEPTANCE.
B. SERVICE: CONTRACTOR SHALL PROVIDE ANY SERVICE INCIDENTAL TO PROPER PERFORMANCE OF THE CONTROLS FOR A PERIOD OF ONE YEAR.
C. THE CONTRACTOR SHALL PLACE CONTROLS IN OPERATING CONDITION SUBJECT TO THE APPROVAL OF THE OWNER.
D. PROGRAMMABLE SENSORS: REFER TO DRAWINGS FOR MANUFACTURER AND MODEL
E. INSTALL IN ACCORDANCE WITH REQUIREMENTS OF AUTHORITY HAVING JURISDICTION AND HEATING/COOLING UNIT MANUFACTURER RECOMMENDATIONS.
2.08 FLASHING
A. FLASH EQUIPMENT CURBS WITH 26 GAUGE GALVANIZED STEEL, COUNTER FLASH WITH 22 GAUGE GALVANIZED STEEL. SEAL WATER-TIGHT. ATTACH COUNTER FLASHING TO MECHANICAL EQUIPMENT AND LAP BASE FLASHING ON ROOF CURBS. FLATTEN AND SOLDER JOINTS.

2.09 EQUIPMENT CURBS
ARCHITECTURAL SPECIFICATIONS SUPERCEDE THIS SECTION
WELDED 18 GAUGE GALVANIZED STEEL SHELL AND BASE, MITERED 3 INCH CANT, VARIABLE SLOPE TO MATCH ROOF, MINIMUM HEIGHT 14 INCHES, 1-1/2 INCH THICK INSULATION, FACTORY INSTALLED WOOD MILLER MILLER IF REQUIRED FOR ROOFING MATERIAL.
DIMENSIONS PER EQUIPMENT MANUFACTURER.
2.10 DUCTLESS SPLIT SYSTEM AIR CONDITIONING UNITS, TRANE BASIS OF DESIGN
A. MANUFACTURER/MODEL: REFER TO DRAWINGS.
B. UNITS SHALL BE UL LISTED
C. PERFORMANCE: AHRI 340 360 OR 385 AS STATED ON DRAWINGS.
D. EACH UNIT SHALL BE PROVIDED WITH FACTORY INSTALLED 24 VOLT CONTROL SYSTEM. RESIDENT CONTROL ALGORITHMS SHALL MAKE ALL COOLING, DEHUMIDIFICATION AND/OR VENTILATING DECISIONS IN RESPONSE TO ELECTRONIC SIGNALS FROM SPACE HUMIDITY AND TEMPERATURE PRIMARY ZONE SENSOR LOCATED IN MANAGER OFFICE. PRIMARY ZONE SENSORS SHALL BE PROGRAMMABLE WITH NIGHT SETBACK AND SYSTEM MALFUNCTION LIGHTS. REFER TO SHEET M01 EQUIPMENT SCHEDULES.
E. UNITS SHALL MEET AHRI 770 SOUND PERFORMANCE AS STATED IN MANUFACTURER PRODUCT DATA.
2.11 EXHAUST FANS
A. MANUFACTURER/MODEL: REFER TO DRAWINGS.
B. OTHER ACCEPTABLE MANUFACTURERS OFFERING EQUIVALENT PRODUCTS:
1. JCM
2. COOK
3. FENE
C. PERFORMANCE: REFER TO DRAWINGS.
D. PERFORMANCE RATING: CONFORM TO AMCA 21D.
E. SOUND RATING: AMCA 201, TESTED TO AMCA 200.
F. FABRICATION: CONFORM TO AMCA 99.
G. ACCESSORIES: REFER TO DRAWINGS.
2.12 KITCHEN EXHAUST AIR SYSTEMS
A. PROVIDE KITCHEN HOOD EXHAUST FAN AS MANUFACTURED BY CAPTIVE AIRE AS SCHEDULED ON THE DRAWINGS. COMPLETE WITH EXHAUST FAN DESIGNED FOR GREASE APPLICATIONS. HEAVY GAUGE ALUMINUM HOUSINGS, ALUMINUM CENTRIFUGAL FAN WHEELS, HEAT BAFFLE, BELT DRIVE MOTORS WITH INTEGRAL THERMAL OVERLOAD PROTECTION, DISCONNECT SWITCH IN HOUSING, PREWIRED CONTROL CENTER, AND ACCESSORIES REQUIRED TO MEET OR EXCEED NFPA-96 REQUIREMENTS FOR COMMERCIAL KITCHEN INSTALLATIONS.
B. PROVIDE DUCTS LOCATED INTERIOR OF SPACE CONNECTING TYPE I EXHAUST HOODS TO EXHAUST FANS MADE OF 18 GAUGE COLD ROLLED STEEL OR 18 GAUGE STAINLESS STEEL CONTINUOUSLY WELDED JOINTS AND CLEAN-OUT DOORS. PROVIDE TRANSITION AT EXHAUST CONNECTIONS TO FAN WITH OPENING SIZE EQUAL TO OR GREATER THAN THE VENTURI OPENING OF THE FAN INLET. PROVIDE GASKET AT FLANGED CONNECTIONS TO FAN RATE FOR 1500 FPM GREASE APPLICATIONS. ENCLOSE DUCT IN FIREPROOF ENCLOSURE PER APPROVED MECHANICAL CODE OR, IF APPROVED BY LOCAL CODE OFFICIAL, IN FIRE RATED ENCLOSURE. INSULATION SHALL BE MINIMUM TWO-HOUR RATED DUCT WRAP INSULATION FOR TYPE I HOOD GREASE EXHAUST DUCT APPLICATIONS. INSULATION SHALL BE FLEXIBLE WRAP ENCLOSURE RATED FOR MINIMUM 2000 F AND FOR ZERO CLEARANCE TO COMBUSTIBLE MATERIALS. INSULATION SHALL BE NON-MINERAL WOOL PASSIVE. LONGER DUCTS SHALL BE MANUFACTURED OR ALL SIDES WITH ALUMINUM FOIL INSULATION SHEETS MANUFACTURED BY CERTAINTED, THERMAL CERAMICS, UNFAX, OR SLOPE DUCT BACKWARDS WITH MINIMUM OF 1/4" PER LINEAL FOOT.
C. PROVIDE EXHAUST HOODS BY CAPTIVE AIRE AS SCHEDULED ON THE DRAWINGS. HOODS SHALL BE ISO APPROVED AND UL CERTIFIED FOR AIR QUALITIES SHOWN ON DRAWINGS AND IN CONFORMANCE WITH MANUFACTURER'S DATA. PROVIDE MANUFACTURER'S PART NUMBER AND VERIFICATION CERTIFICATE AS PART OF THE DRAWING SUBMIT. CONFORM WITH NFPA BULLETIN 96 AND STANDARD 710 CONSTRUCTION OF 18 GAUGE UNLESS STEEL WITH WELDS POLISHED TO SMALL CONTAIN FULL LENGTH STAINLESS STEEL FILTER HOLDER WELDED TO HOOD TRAP AND UL LISTED. STAINLESS STEEL FILTERS INSTALLED AT 45 DEGREE FROM HORIZONTAL. PROVIDE VAPOR PROOF INCANDESCENT LIGHTS AND CONTROL PANEL WITH FLO LIGHTS AND SWITCHES. FAN AND LIGHTS HOOD PACKAGE SHALL INCLUDE CONTROL PANEL AT WALL AND STAINLESS STEEL CLOSURE PANELS AT TOP OF HOOD TO FINISH CEILING.
D. PROVIDE AS MANUFACTURED BY CAPTIVE AIRE AS SCHEDULED ON THE DRAWINGS. WET CHEMICAL TYPE FIRE EXTINGUISHING SYSTEM. REACH HOODS AS SCHEDULED ON DRAWINGS COMPLETE WITH HOOD NOZZLES, HOOD CYLINDERS, PIPING, ETC. AND ACCESSORIES TO PROVIDE AN APPROVED OPERATING SYSTEM. PROVIDE MANUAL FULL STATION(S) AT LOCATIONS SHOWN ON THE DRAWINGS. SYSTEM SHALL BE IN FULL CONFORMANCE WITH NFPA-96 MECHANICAL GAS SHUT-OFF VALVE, PROVIDED BY CAPTIVE AIRE, TO SHUT OFF FUEL OR POWER DURING COOKING EQUIPMENT UPON DETECTION OF FIRE. VALVE SHALL HAVE A CLEARLY IDENTIFIED FIRE EXTINGUISHER.
E. PROVIDE TYPE I GREASE HOOD EXHAUST DUCTWORK OF MINIMUM 18 GAUGE COLD ROLLED STEEL OR 18 GA. STAINLESS STEEL WITH LIQUID TIGHT WELDS OR AS NOTED ON PLANS ZERO CLEARANCE UL LISTED PREFABRICATED ROUND GREASE DUCT WITH ACCESS PANELS FOR GREASE CLEANING AS REQUIRED BY NFPA AND LOCAL CODES. SLOPE DUCT BACK TOWARDS HOOD AT MINIMUM OF 1/4" PER LINEAL FOOT MAINTAINING 18" CLEARANCE TO COMBUSTIBLE MATERIALS WHERE REQUIRED. INSTALL GREASE DUCTS IN AN APPROVED FIRE-RATED ENCLOSURE SEPARATED FROM THE EXHAUST DUCT BY A MINIMUM OF 2" AND MAXIMUM 12" VENTILATED ENCLOSURE TO THE OUTSIDE AIR IF REQUIRED BY CODE, AS AN OPTION, IF APPROVED BY LOCAL CODES, PROVIDE AN APPROVED WRAP SYSTEM IN LIEU OF THE RATED DUCT ENCLOSURE SYSTEM. DUCT WRAP SYSTEM SHALL MEET UL REQUIREMENTS FOR GREASE DUCT ENCLOSURES.
2.14 PROVIDE TYPE I EXHAUST DUCTWORK OF MINIMUM 22 GAUGE ALUMINUM OR 24 GAUGE STAINLESS STEEL WITH JOINTS ON TOP OR SIDES OF DUCT. SEALED WITH WATER RESISTANT MASTIC. PITCH TYPE I DUCTWORK AT MINIMUM 1/8 INCH PER FOOT BACK TOWARD HOOD.
PART 3 - INSTALLATION
3.01 TESTING, ADJUSTING AND BALANCING:
A. TESTING AND BALANCING SHALL BE PERFORMED BY AN INDEPENDENT, AABC OR NERB CERTIFIED AIR BALANCE CONTRACTOR.
B. PROVIDE INSTRUMENTS REQUIRED FOR TESTING, ADJUSTING, AND BALANCING WORKS. ALL INSTRUMENTS SHALL BE RECENTLY TESTED AND CALIBRATED.
C. VERIFY THAT SYSTEMS ARE COMPLETE AND OPERABLE BEFORE COMMENCING WORK.
D. ADJUST AIR HANDLING AND DISTRIBUTION SYSTEMS TO PROVIDE REQUIRED OR DESIGN SUPPLY AND RETURN AIR QUANTITIES.
E. SUBMIT FIELD REPORTS: REPORT DEFECTS AND DEFICIENCIES NOTED DURING PERFORMANCE OF SERVICES WHICH PREVENT SYSTEM BALANCE.
F. SUBMIT DRAFT COPIES OF REPORT TO THE MALL MANAGEMENT FOR REVIEW AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF PROJECT. PROVIDE FINAL COPIES FOR ARCHITECT/ENGINEER AND FOR INCLUSION IN OPERATING AND MAINTENANCE MANUALS. PROVIDE 2 COPIES OF FINAL CERTIFIED REPORT TO BUILDING OWNER.
28 A FINAL REPORT FOR THE TESTING AND ADJUSTING OF ALL NEW SYSTEMS SHALL BE COMPLETED PRIOR TO FINAL APPROVAL BY THE FIELD INSPECTOR. THIS REPORT SHALL BE SIGNED BY THE INDIVIDUAL RESPONSIBLE FOR PERFORMING THESE SERVICES.
28 AN OPERATIONS & SERVICE MANUAL SHALL BE PROVIDED TO THE OWNER OR REPRESENTATIVE AND TO THE FIELD INSPECTOR AT THE TIME OF FINAL INSPECTION.
3.02 GUARANTEE
A. THE CONTRACTOR SHALL PROVIDE SPECIFIED EQUIPMENT WARRANTIES AND GENERAL WARRANTY AS STATED IN ARCHITECTURAL SECTIONS. THE CONTRACTOR SHALL REPLACE OR REPAIR AT NO COST ALL DEFECTIVE MATERIAL AND WORKMANSHIP DURING THE WARRANTY PERIOD.
3.03 INSTRUCTIONS
A. THE CONTRACTOR SHALL INSTRUCT THE OWNER AND PROVIDE MANUALS FOR PROPER OPERATION AND MAINTENANCE OF THE EQUIPMENT. PROVIDE INITIAL 3 MONTH SUPPLY OF FILTERS OR OTHER COMPONENTS REPLACED DURING REGULAR MAINTENANCE.
3.04 GENERAL INSTALLATION:
A. ROUTE PIPING AND DUCTWORK IN ORDERLY MANNER AND MAINTAIN GRADIENT. ROUTE PARALLEL AND PERPENDICULAR TO WALLS. INSTALL TO MAINTAIN HEAD ROOM. GROUP WHENEVER PRACTICAL AT COMMON ELEVATIONS.
B. PROVIDE CLEARANCES FROM STRUCTURE AND OTHER EQUIPMENT FOR INSTALLATION OF INSULATION, EQUIPMENT CLEARANCES AND ACCESS TO VALVES AND DAMPERS.
C. PROVIDE ACCESS PANELS FOR VALVES AND DAMPERS THAT ARE ENCLOSED IN WALLS OR CEILING.
D. PROVIDE DIELECTRIC UNIONS WHEN JOINING DISSIMILAR METALS.

PART 4 VIBRATION ISOLATORS
4.01 OPEN SPRING ISOLATORS
A. SPRING ISOLATORS
1. FOR EXTERIOR AND HUMID AREAS: PROVIDE HOT DIPPED GALVANIZED HOUSINGS AND NEOPRENE COATED SPRINGS.
B. CODE: COLOR CODE SPRINGS FOR LOAD CARRYING CAPACITY.
2. SPRINGS: MINIMUM HORIZONTAL STIFFNESS EQUAL TO 75 PERCENT VERTICAL STIFFNESS, WITH WORKING DEFLECTION BETWEEN 0.3 AND 0.8 OF MAXIMUM DEFLECTION.
3. SPRING MOUNTS: PROVIDE WITH LEVELLING DEVICES, MINIMUM 0.25 INCH THICK NEOPRENE SOUND PADS, AND ZINC CHROMATE PLATED HARDWARE FOR NEOPRENE PAD ISOLATORS.
C. RESTRAINT SPRING ISOLATORS
1. SPRING ISOLATORS:
A. FOR EXTERIOR AND HUMID AREAS: PROVIDE HOT DIPPED GALVANIZED HOUSINGS AND NEOPRENE COATED SPRINGS.
B. CODE: COLOR CODE SPRINGS FOR LOAD CARRYING CAPACITY.
2. TYPE: CLOSED SPRING MOUNT WITH TOP AND BOTTOM HOUSING SEPARATED WITH NEOPRENE RUBBER BUILDERS.
3. SPRINGS: MINIMUM HORIZONTAL STIFFNESS EQUAL TO 75 PERCENT VERTICAL STIFFNESS, WITH WORKING DEFLECTION BETWEEN 0.3 AND 0.8 OF MAXIMUM DEFLECTION.
4. HOUSINGS: INCORPORATE NEOPRENE ISOLATION PAD MEETING REQUIREMENTS FOR NEOPRENE PAD ISOLATORS.
5. SPRING MOUNTS: PROVIDE WITH LEVELLING DEVICES, MINIMUM 0.25 INCH THICK NEOPRENE SOUND PADS, AND ZINC CHROMATE PLATED HARDWARE FOR NEOPRENE PAD ISOLATORS.
6. RESTRAINT: PROVIDE HEAVY MOUNTING FRAME AND LIMIT STOPS.
D. CLOSED SPRING ISOLATORS:
1. SPRING ISOLATORS:
A. FOR EXTERIOR AND HUMID AREAS: PROVIDE HOT DIPPED GALVANIZED HOUSINGS AND NEOPRENE COATED SPRINGS.
B. CODE: COLOR CODE SPRINGS FOR LOAD CARRYING CAPACITY.
2. TYPE: CLOSED SPRING MOUNT WITH TOP AND BOTTOM HOUSING SEPARATED WITH NEOPRENE RUBBER BUILDERS.
3. SPRINGS: MINIMUM HORIZONTAL STIFFNESS EQUAL TO 75 PERCENT VERTICAL STIFFNESS, WITH WORKING DEFLECTION BETWEEN 0.3 AND 0.8 OF MAXIMUM DEFLECTION.
4. HOUSINGS: INCORPORATE NEOPRENE ISOLATION PAD MEETING REQUIREMENTS FOR NEOPRENE PAD ISOLATORS.
5. SPRING MOUNTS: PROVIDE WITH LEVELLING DEVICES, MINIMUM 0.25 INCH THICK NEOPRENE SOUND PADS, AND ZINC CHROMATE PLATED HARDWARE FOR NEOPRENE PAD ISOLATORS.
6. RESTRAINT: PROVIDE HEAVY MOUNTING FRAME AND LIMIT STOPS.
E. RESTRAINT CLOSED SPRING ISOLATORS:
1. SPRING ISOLATOR:
A. FOR EXTERIOR AND HUMID AREAS: PROVIDE HOT DIPPED GALVANIZED HOUSINGS AND NEOPRENE COATED SPRINGS.
B. CODE: COLOR CODE SPRINGS FOR LOAD CARRYING CAPACITY.
2. TYPE: CLOSED SPRING MOUNT WITH TOP AND BOTTOM HOUSING SEPARATED WITH NEOPRENE RUBBER BUILDERS.
3. SPRINGS: MINIMUM HORIZONTAL STIFFNESS EQUAL TO 75 PERCENT VERTICAL STIFFNESS, WITH WORKING DEFLECTION BETWEEN 0.3 AND 0.8 OF MAXIMUM DEFLECTION.
4. HOUSINGS: INCORPORATE NEOPRENE ISOLATION PAD MEETING REQUIREMENTS FOR NEOPRENE PAD ISOLATORS.
5. SPRING MOUNTS: PROVIDE WITH LEVELLING DEVICES, MINIMUM 0.25 INCH THICK NEOPRENE SOUND PADS, AND ZINC CHROMATE PLATED HARDWARE FOR NEOPRENE PAD ISOLATORS.
6. RESTRAINT: PROVIDE HEAVY MOUNTING FRAME AND LIMIT STOPS.
F. SPRING HANGER:
1. SPRING ISOLATORS:
A. FOR EXTERIOR AND HUMID AREAS: PROVIDE HOT DIPPED GALVANIZED HOUSINGS AND NEOPRENE COATED SPRINGS.
B. CODE: COLOR CODE SPRINGS FOR LOAD CARRYING CAPACITY.
2. SPRINGS: MINIMUM HORIZONTAL STIFFNESS EQUAL TO 75 PERCENT VERTICAL STIFFNESS, WITH WORKING DEFLECTION BETWEEN 0.3 AND 0.8 OF MAXIMUM DEFLECTION.
3. HOUSINGS: INCORPORATE NEOPRENE ISOLATION PAD MEETING REQUIREMENTS FOR NEOPRENE PAD ISOLATORS.
4. MISALIGNMENT: CAPABLE OF 20 DEGREE HANGER ROD MISALIGNMENT.
G. NEOPRENE PAD ISOLATORS:
A. 30 DIAMETER
B. MINIMUM 1/2 INCH THICK
C. MAXIMUM LOADING 40 PSI
D. HEIGHT OF RIBS SHALL NOT EXCEED 0.7 TIMES WIDTH.
2. CONFIGURATION: SINGLE LAYER 1/2 INCH THICK WAFFLE PADS BONDED EACH SIDE OF 1/4 INCH THICK STEEL PLATE.
H. RUBBER MOUNT OR HANGER: MOLDED RUBBER DESIGNED FOR 5 INCHES (13MM) DEFLECTION.
I. GLASS FIBER PADS: NEOPRENE JACKETED PRE-COMPRESSED MOLDED GLASS FIBER.
END OF DIVISION 23 SPECIFICATIONS.



project no. | KRKKS0003

owner



project info

CONCORD NORTH CAROLINA

issue dates

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MECHANICAL SPECIFICATIONS

M001