

MECHANICAL SPECIFICATIONS – GENERAL

1. GENERAL
1.1 GENERAL REQUIREMENTS
A. READ AND CONFORM TO:
.1 THE CONTRACT CCDC 2, STIPULATED PRICE CONTRACT AS AMENDED.
.2 DIVISION 1 REQUIREMENTS AND DOCUMENTS REFERRED TO THEREIN.
B. THE SPECIFICATIONS ARE INTEGRAL WITH THE DRAWINGS WHICH ACCOMPANY THEM, NEITHER IS TO BE USED ALONE. ANY ITEM OR SUBJECT OMITTED FROM ONE BUT IMPLIED IN THE OTHER IS FULLY AND PROPERLY REQUIRED.
C. WHEREVER DIFFERENCES OCCUR IN THE TENDER DOCUMENTS, THE MOST ONEROUS CONDITION GOVERNS. BASE THE BID ON THE COSTLIEST ARRANGEMENT.
D. ENSURE SUB-CONTRACTORS UNDERTAKING THE WORK PROVIDE A 50% PERFORMANCE BOND AND A 50% LABOUR AND MATERIALS PAYMENT BOND. IN ADDITION, ENSURE SUB-CONTRACTORS EMPLOYED TO UNDERTAKE ANY PART OF THE WORK THAT IS \$50,000.00 OR GREATER IN CONTRACT VALUE PROVIDE A 50% PERFORMANCE BOND AND A 50% LABOUR AND MATERIALS BOND TO THE PARTY THEY ARE IN CONTRACT WITH.
E. CONFORM TO THE LATEST EDITION OF ONTARIO BUILDING CODE (CSA STANDARDS), ONTARIO FIRE CODE, LOCAL & DISTRICT BYLAWS, REGULATIONS, & PUBLISHED ENGINEERING STANDARDS.
F. NOTIFY CONSULTANT UPON DISCOVERY OF CONDITIONS WHICH ADVERSELY AFFECT WORK OF THIS DIVISION. NO ALLOWANCE WILL BE MADE AFTER LETTING OF CONTRACT FOR ANY EXPENSES INCURRED THROUGH FAILURE TO DO SO.
G. ARRANGE AND PAY FOR PERMITS AND INSPECTIONS BY AUTHORITIES HAVING JURISDICTION, REQUIRED IN THE UNDERTAKING OF THIS DIVISION. MAKE MODIFICATIONS REQUIRED BY AUTHORITIES.
H. ALL TRADESMEN EMPLOYED ON THE PROJECT SHALL HOLD VALID TRADE CERTIFICATES/CLETS AND SHALL MAKE A COPY AVAILABLE FOR REVIEW BY THE CONSULTANT AND/OR OWNER WHEN REQUESTED.
1.2 SCOPE OF WORK
A. PRODUCTS AND METHODS MENTIONED OR SHOWN IN THE CONTRACT DOCUMENTS COMPLETE WITH INCIDENTALS NECESSARY FOR A COMPLETE OPERATING INSTALLATION. PROVIDE ALL TOOLS, EQUIPMENT AND SERVICES REQUIRED TO DO THE WORK.
B. SITE EXAMINE EXISTING CONDITIONS WHICH MAY AFFECT WORK OF THIS DIVISION. EXAMINE ALL CONTRACT DOCUMENTS IN CONJUNCTION WITH SITE EXAMINATION TO ENSURE THAT WORK OF THIS DIVISION MAY BE SATISFACTORILY COMPLETED.
C. DISCONNECTION AND REMOVAL OF VARIOUS MECHANICAL EQUIPMENT IN AREAS TO BE TURNED OVER TO THE OWNER.
D. DISCONNECTION AND MAKING SAFE OF VARIOUS MECHANICAL SYSTEMS AND EQUIPMENT IN AREAS TO BE DEMOLISHED AND/OR RENOVATED.
E. ISOLATE AND DRAIN (OR PIPE FREEZE IF DRAINING IS NOT FEASIBLE) SYSTEMS AS REQUIRED TO EFFECT DEMOLITION, RENOVATIONS, MODIFICATIONS AND/OR REPAIRS. DISCONNECT, CAP AND MAKE SAFE ALL MECHANICAL SERVICES TO THE BUILDING INCLUDING BUT NOT LIMITED TO SANITARY SEWERS(S), STORM SEWER(S), WATER SERVICE, NATURAL GAS SERVICE AND HOT WATER HEATING SYSTEMS.
F. ON COMPLETION OF RENOVATIONS, MODIFICATIONS AND/OR REPAIRS, TEST ENTIRE SYSTEM FOR LEAKS. REPORT REPAIRS OR REPLACEMENTS REQUIRED OF EXISTING EQUIPMENT, PIPING, FITTINGS OR DEVICES THAT ARE NOT INCLUDED IN CONTRACT TO CONSULTANT AND OWNER FOR INSTRUCTION. FLUSH, CLEAN AND REFILL RENOVATED SYSTEMS AS SPECIFIED FOR NEW.
G. BE RESPONSIBLE FOR THE EXCAVATION & BACKFILL NECESSARY FOR INSTALLATION OF UNDERGROUND WORK. EXCAVATE WITH SUITABLE MACHINERY OR BY HAND AS NECESSARY.
H. CUTTING AND PATCHING OF NEW OR EXISTING WORK.
I. IDENTIFICATION OF EQUIPMENT, PIPING, VALVES AND CONTROLLERS.
J. PERFORM START-UP AND COMPLETELY COMMISSION ALL EQUIPMENT AND SYSTEMS INSTALLED AND/OR MODIFIED UNDER THIS CONTRACT. COMMISSIONING WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE CONSULTANT PRIOR TO ACCEPTANCE OF THE WORK OR ANY PART THEREOF.
K. APPLY FOR & OBTAIN ALL PERMITS INCLUDING BUILDING PERMITS, & TSSA APPLICATIONS, LICENSES, AND CERTIFICATES NECESSARY FOR THE PERFORMANCE OF THE WORK. COORDINATE ALL WORK WITH BUILDING OFFICIALS & AUTHORITIES HAVING JURISDICTION.
L. TAKE SUCH MEASURES AND INCLUDE IN BID PRICE FOR THE PROPER PROTECTION OF EXISTING BUILDING AND ITS FINISHES AT ALL TIMES DURING ALTERATIONS AND CONSTRUCTION OF THE NEW ADDITION. COORDINATE THIS PROTECTIVE WORK WITH ALL TRADES.
M. VERIFY THE CORRECT OPERATION OF EACH EQUIPMENT ITEM PROVIDED AND/OR ALTERED IN EACH SYSTEM IN ACCORDANCE WITH THE OWNER'S APPROVAL PRIOR TO STARTING AND/OR RETURNING TO OPERATION.
1.3 SUBMITTALS
A. SHOP DRAWINGS: PREPARE AND SUBMIT TWO (2) COPIES OF SHOP DRAWINGS OF ALL EQUIPMENT ITEMS TO THE CONSULTANT FOR REVIEW. THE CONSULTANT WILL RETURN ONE COPY, MARKED WITH COMMENTS AND HIS REVIEW STAMP AS HE DEEMS APPROPRIATE.
.1 CLEARLY INDICATE MANUFACTURER'S AND SUPPLIER'S NAMES, MODEL NUMBERS, DETAILS OF CONNECTIONS, DIMENSIONS, CAPACITIES AND PERFORMANCE. PRIOR TO SUBMISSION CHECK AND CERTIFY AS CORRECT, SHOP DRAWINGS AND DATA SHEETS. DO NOT ORDER EQUIPMENT UNTIL A COPY OF THE SHOP DRAWINGS, REVIEWED BY CONSULTANT, HAS BEEN RETURNED TO CONTRACTOR.
.2 THE CONSULTANT WILL NOT REVIEW SHOP DRAWINGS THAT FAIL TO BEAR THE CONTRACTOR'S STAMP OF APPROVAL OR CERTIFICATION.
B. AS-BUILT RECORDS: BEFORE FINAL PAYMENT, SUBMIT TWO SETS OF AS-BUILTS DRAWINGS IN AUTOCAD FORMAT SHOWING ALL CHANGES & CONCEALED SERVICES DIMENSIONED.
C. REQUESTS FOR SHUT-DOWN: OBTAIN PERMISSION FOR SYSTEMS SHUT-DOWN AND/OR SERVICE INTERRUPTION FROM THE OWNER PRIOR TO DISRUPTION OF ANY SYSTEM OR SERVICE IN USE BY THE OWNER. EMPLOY THE OWNER'S STANDARD FORM OF REQUEST WHERE APPLICABLE.
D. REQUESTS FOR START-UP: OBTAIN PERMISSION FROM THE OWNER TO START-UP OR TO RETURN TO SERVICE ANY ITEM OF EQUIPMENT, SYSTEM OR SERVICE INSTALLED NEW OR PREVIOUSLY SHUT-DOWN.
E. WARRANTY: PROVIDE WRITTEN GUARANTEE FOR ALL NEW EQUIPMENT & WORKMANSHIP FOR ONE (1) YEAR FROM DATE OF SUBSTANTIAL COMPLETION, FIVE (5) YEARS FOR COMPRESSOR & HEAT EXCHANGER. DEFECTIVE PARTS REPAIRED OR REPLACED WITHOUT CHARGE.
2 COMMON WORK RESULTS
2.1 PIPING SPECIALTIES
A. CAST BRASS, PRESSURE, COPPER TO COPPER UNIONS SHALL BE USED WITH SEAMLESS COPPER TUBING SMALLER THAN 3" (75 MM).
B. DART TYPE, 125 LB. (60 KPA) BLACK MALLEABLE IRON UNIONS SHALL BE USED WITH ALL STEEL PIPE FOR PIPING 2-1/2" (65 MM) AND SMALLER.
C. PIPING SPECIALTIES INCLUDING BACKFLOW PREVENTERS, STRAINERS, VALVES ETC. SHALL BE LINE SIZE UNLESS INDICATED OTHERWISE ON DRAWINGS.
D. STRAINERS
.1 APPROVED MANUFACTURERS: SARCO SB, S.A. ARMSTRONG, CRANE, CONBRACO, COLTON
.2 IN COPPER TUBING: CLASS 250, WYE TYPE, BRONZE, SCREWED CONNECTION, WITH BLIND CAPS, AND 1/32" (0.8 MM) PERFORATED STAINLESS STEEL SCREEN.
.3 IN STEEL PIPING: 2" (50MM) AND SMALLER
.1 BODY AND COVER: SCREWED, LINE SIZE Y TYPE STRAINER, SEMI-STEEL CONFORMING TO ASTM A278-85, CLASS 30, COMPLETE WITH SCREWED BLIND CAP. PRIMARY SERVICE RATING OF 125 PSI @ 350 F (660 KPA @ 178 C). BODY SHALL HAVE SIDE DRAIN CONNECTION.
.2 SCREEN: PERFORATED TYPE 304 STAINLESS STEEL SERVICE
.1 WATER 1/32" (0.8 MM)
2.2 FIRE STOPPING COMPOUNDS
A. APPROVED MANUFACTURER: 3M PRODUCTS INDICATED.
B. OTHER ACCEPTABLE MANUFACTURERS OFFERING EQUIVALENT PRODUCTS: DOW CORNING, JOHN MANVILLE, HILTI FIRESTOP SYSTEMS
C. FIRE RATED SEALANTS: INTUMESCENT MATERIAL, SYNTHETIC ELASOMERS, CAPABLE OF EXPANDING UP TO 8 TO 10 TIMES WHEN EXPOSED TO TEMPERATURES OF 250°F (121°C) OR HIGHER. UL LISTED AND LABELLED.
2.3 NAMEPLATES
A. PROVIDE LAMINATED PLASTIC PLATES WITH BLACK FACE AND WHITE CENTRE OF MINIMUM SIZE 3-1/2" X 1-1/2" X 3/32" (90 X 40 X 2 MM) NOMINAL THICKNESS, ENGRAVED WITH 1/4" (6 MM) HIGH LETTERING. USE 1" (25 MM) LETTERING FOR MAJOR EQUIPMENT.
B. FASTEN NAMEPLATES SECURELY IN CONSPICUOUS PLACE. WHERE NAMEPLATES

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CANNOT BE MOUNTED ON COOL SURFACE, PROVIDE STANDOFFS.
C. IDENTIFY EQUIPMENT TYPE AND NUMBER AND SERVICE OF AREAS OR ZONE OF BUILDING SERVED.
D. FOR EACH ITEM OF EQUIPMENT WHICH MAY BE STARTED AUTOMATICALLY OR REMOTELY, ADD A RED LAMACOID PLATE, 2-1/2" X 9" (65 X 230 MM), REDDING: "WARNING, THIS EQUIPMENT IS AUTOMATICALLY CONTROLLED AND MAY START AT ANY TIME."
2.4 PRESSURE GAUGES
A. APPROVED MANUFACTURER: TERRICE MODEL 600C.
B. OTHER ACCEPTABLE MANUFACTURERS OFFERING EQUIVALENT PRODUCTS: WEISS, WINTER, MORRISON, TAYLOR.
C. GAUGE: 4-1/2" (115MM) DIAMETER BLACK CAST ALUMINUM, PHOSPHOR BRONZE BOURNION TUBE, ROTARY BRASS MOVEMENT, BRASS SOCKET, WITH FLOOR RECALIBRATION ADJUSTMENT, BLACK SCALE ON WHITE BACKGROUND, MID-SCALE ACCURACY: 1%, SCALE: PSI AND KPA
D. GAUGE COCK: TEE OR LEVER HANDLE, BRASS FOR MAXIMUM 150 PSI (1034 KPA).
E. NEEDLE VALVE: BRASS, 1/4" (6 MM) NPT FOR MINIMUM 150 PSI (1034 KPA).
F. PULSATION DAMPER: PRESSURE SNUBBER, BRASS WITH 1/4" (6 MM) CONNECTIONS.
G. SPYHON: STEEL, SCHEDULE 40, 1/4" (6 MM) ANGLE OR STRAIGHT PATTERN.
2.5 STEM TYPE THERMOMETERS
A. APPROVED MANUFACTURER: TERRICE MODEL B91403-1/2.
B. OTHER ACCEPTABLE MANUFACTURERS OFFERING EQUIVALENT PRODUCTS: WEISS MODEL 9V33-1/2, WINTER, MORRISON, TAYLOR.
C. THERMOMETER: 9" (230MM) SCALE, RED APPEARING THERMAL FLUID WITH BLACK FIGURES ON WHITE SCALE, CALIBRATED IN BOTH DEGREES F AND DEGREES C, ACCURACY TO ASTM E77 OF 2%, CLEAR GLASS LENS FRONT TUBE, CAST ALUMINUM CASE WITH ENAMEL FINISH, CAST ALUMINUM ADJUSTABLE JOINT WITH POSITIVE LOCKING DEVICE, 3/4" (20MM) NPT BRASS STEM.
D. ALL THERMOMETERS TO INCLUDE A SEPARABLE WELL.
E. SOCKET: BRASS SEPARABLE SOCKETS FOR THERMOMETER STEMS WITH OR WITHOUT EXTENSIONS AS REQUIRED, AND WITH CAP AND CHAIN.
F. FLANGE: 3" (75 MM) OUTSIDE DIAMETER REVERSIBLE FLANGE, DESIGNED TO FASTEN TO SHEET METAL AIR DUCTS, WITH BRASS PERFORATED STEM
2.6 SLEEVES
A. MATERIALS: MINIMUM SCHEDULE 20 GALVANIZED STEEL OR CAST IRON.
2.7 FLASHINGS AND COUNTER FLASHINGS
A. THALER OR EQUIVALENT MECHANICAL/ELECTRICAL FLASHINGS AS RECOMMENDED FOR SPECIFIC PURPOSE.
B. STAINLESS STEEL FINISHING SLEEVE, INTEGRAL DECK FLANGE AND EPDM SEAL.
2.8 PENETRATION SEALS
A. APPROVED MANUFACTURER: LINK-SEA OR EQUAL
B. MODULAR MECHANICAL TYPE, CONSISTING OF INTERLOCKING SYNTHETIC RUBBER LINKS SHAPED TO CONTINUOUSLY FILL THE ANNULAR SPACE BETWEEN THE PIPE AND WALL OPENING. LINKS SHALL BE LOOSELY ASSEMBLED WITH BOLTS TO FORM A CONTINUOUS RUBBER BELT AROUND THE PIPE WITH A PRESSURE PLATE UNDER EACH BOLT HEAD AND NUT.
2.9 ACCESS DOORS
A. STANDARD UNIVERSAL FLUSH
.1 MATERIAL: UPT TO 16" X 16" (400X400) 16 GAUGE MOUNTING FRAME, OVER 16" X 16" (400X400) 14 GAUGE DOOR, 16 GAUGE MOUNTING FRAME.
.2 HINGE: CONTINUOUS, CONCEALED.
.3 LATCH: STAINLESS STEEL SCREWDRIVER OPERATED CAM LATCH
.4 FINISH: STEEL: 5-STAGE IRON PHOSPHATE PREPARATION WITH PRIME COAT OF WHITE, ALKYD BAKING ENAMEL OR STAINLESS STEEL TYPE 304, NO. 4 SATIN POLISH.
.5 MANUFACTURERS: ACUDOR ACORN, CEB, MIFAB, CENDRES CONTOUR
B. RECESSED ACCESS DOOR
.1 MATERIAL: STEEL OR STAINLESS STEEL, 22 GAUGE DOOR, 22 GAUGE MOUNTING FRAME. DOOR -RECESSED 5/8"
.2 HINGE: CONTINUOUS, CONCEALED.
.3 LATCH: STAINLESS STEEL SCREWDRIVER OPERATED CAM LATCH
.4 FINISH: SATIN COAT STEEL
.5 MANUFACTURERS: ACUDOR ACORN, CEB, MIFAB, CENDRES CONTOUR
C. FIRE RATED
.1 ACCESS DOORS IN FIRE SEPARATIONS OR FIRE RATED ASSEMBLIES: ULC LABELLED. REFER TO ARCHITECTURAL DRAWINGS FOR RATINGS OF FIRE SEPARATIONS AND ASSEMBLIES. MINIMUM 12 GAUGE.
.2 HINGE: CONTINUOUS, CONCEALED.
.3 LATCH: STAINLESS STEEL SCREWDRIVER OPERATED CAM LATCH
.4 FINISH: STEEL: 5-STAGE IRON PHOSPHATE PREPARATION WITH PRIME COAT OF WHITE, ALKYD BAKING ENAMEL OR STAINLESS STEEL TYPE 304, NO. 4 SATIN POLISH.
.5 MANUFACTURERS: ACUDOR ACORN, CEB, MIFAB, CENDRES CONTOUR
3 SUPPORTS & ANCHORS
3.1 PIPE HANGERS AND SUPPORTS
A. APPROVED MANUFACTURERS: ANVIL, MYAT
B. PLUMBING PIPING – DRAIN, WASTE, AND VENT:
.1 CONFORM TO ASME B31.9.
.2 HANGERS FOR PIPE SIZES 1/2" TO 1-1/2" (15 TO 40 MM): MALLEABLE IRON, ADJUSTABLE SWIVEL, SPLIT RING.
.3 MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS.
.4 WALL SUPPORT FOR PIPE SIZES TO 3-1/4" (80 MM): CAST IRON HOOK.
.5 COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
C. PLUMBING PIPING – WATER:
.1 CONFORM TO ASME B31.9.
.2 HANGERS FOR PIPE SIZES 1/2" TO 1-1/2" (15 TO 40 MM): MALLEABLE IRON, ADJUSTABLE SWIVEL, SPLIT RING.
.3 MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS OR SPACERS AND HANGER RODS.
.4 WALL SUPPORT FOR PIPE SIZES 6" (150 MM) AND OVER: STEEL CHANNELS WITH WELDED SPACERS OR SPACERS AND HANGER RODS, CAST IRON ROLL.
.5 WALL SUPPORT FOR PIPE SIZES TO 3-1/4" (80 MM): CAST IRON HOOK.
.6 VERTICAL SUPPORT: STEEL RISER CLAMP.
.7 FLOOR SUPPORT FOR COLD PIPE: CAST IRON ADJUSTABLE PIPE SADDLE, LOCK NUT, NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.
.11 COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
D. HYDRONIC PIPING:
.1 CONFORM TO CSA B-51 AND ASME B31.9.
.2 HANGERS FOR PIPE SIZES 1/2" TO 1-1/2" (13 TO 38 MM): CARBON STEEL, ADJUSTABLE SWIVEL, SPLIT RING.
.3 HANGERS FOR COLD PIPE SIZES 2" (50 MM) AND OVER: CARBON STEEL, ADJUSTABLE, CLEVIS.
.4 HANGERS FOR HOT PIPE SIZES 2" TO 4" (50 TO 100 MM): CARBON STEEL, ADJUSTABLE, CLEVIS.
.5 MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS.
.6 FLOOR SUPPORT FOR COLD PIPE: CAST IRON ADJUSTABLE PIPE SADDLE, LOCK NUT, NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.
.7 COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
.13 COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
E. REFRIGERANT PIPING:
.1 CONFORM TO ASME B31.5.
.2 HANGERS FOR PIPE SIZES 1/2" TO 1-1/2" (13 TO 38 MM): CARBON STEEL, ADJUSTABLE SWIVEL, SPLIT RING.

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.3 HANGERS FOR PIPE SIZES 2" (50 MM) AND OVER: CARBON STEEL, ADJUSTABLE, CLEVIS.
.4 MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS.
.5 WALL SUPPORT FOR PIPE SIZES TO 3" (75 MM): CAST IRON HOOK.
.6 WALL SUPPORT FOR PIPE SIZES 4" (100 MM) AND OVER: WELDED STEEL BRACKET AND WROUGHT STEEL CLAMP.
.7 VERTICAL SUPPORT: STEEL RISER CLAMP.
.8 FLOOR SUPPORT: CAST IRON ADJUSTABLE PIPE SADDLE, LOCK NUT, NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.
.9 COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
3.2 ACCESSORIES
A. HANGER RODS: GALVANIZED, CARBON STEEL CONTINUOUS THREADED.
B. INSERTS: MALLEABLE IRON CASE OF GALVANIZED STEEL SHELL AND EXPANDER PLUG FOR THREADED CONNECTION WITH LATERAL ADJUSTMENT, TOP SLOT FOR REINFORCING RODS, LUGS FOR ATTACHING TO FORMS; SIZE INSERTS TO SUIT THREADED HANGER ROD.
3.3 EQUIPMENT ROOF CURBS
A. FABRICATION: WELDED 0.05" (1.2 MM) GALVANIZED STEEL SHELL AND BASE, MITRED 3" (75 MM) CANT, VARIABLE STEP TO MATCH ROOF INSULATION, FACTORY INSTALLED WOOD NAILER.
3.4 ROOFTOP PIPE/DUCT SUPPORTS
A. ACCEPTABLE MANUFACTURERS: PORTABLE PIPE HANGERS, INC, UNISTRUT
B. PRE-ENGINEERED PIPE/DUCT SUPPORT SYSTEM INCLUDING:
.1 BASES: WEATHER RESISTANT AND UV RADIATION RESISTANT WITH SEISMIC ATTACHMENTS
.2 FRAMES: 1-5/8" (41.3MM) STRUT OR 1-7/8" (47.6MM) STRUT, FABRICATED OF STEEL TO ASTM A570, GRADE 33. ROLL FORMED OF 12-GAUGE (2.7MM THICK) STEEL INTO 3-SIDED OR TUBULAR SHAPE.
.3 PIPE SUPPORTS AND HANGERS: CONFORM TO MSS SP-58 AND MSS SP-69, FABRICATED OF CARBON STEEL, SINGLE ROLLER SUPPORTS FOR PIPING SUBJECT TO EXPANSION AND CONTRACTION.
.4 FINISHES:
.1 PLASTICS AS MOULDED WITH UV RADIATION PROTECTION.
.2 METAL SURFACES HOT DIP GALVANIZED FREE OF ROUGHNESS, WHISKERS, UNSIGHTLY SPANGLES, ICICLES, RUNS, BARBS, SAGS, DROPLETS AND OTHER SURFACE BLEMISHES. GALVANIZING SHALL CONFORM TO ASTM A123 FOR TUBING AND TO ASTM A153 FOR HARDWARE AND ACCESSORIES.
3.5 PIPE HANGER SPACING:
PIPE SIZE (IN) ROD DIAMETER (IN) SUPPORT SPACING (FT)
STEEL PIPE COPPER TUBE
1/2 3/8 7 6
3/4 3/8 7 6
1 3/8 7 6
1-1/4 3/8 7 6
1-1/2 3/8 9 8
2 3/8 10 9
3.6 DUCT HANGER SPACING:
DUCT SIZES (LARGEST SIDE) ANGLE SIZE ROD SIZE SPACING
UP TO 30" 1" X 1" X 1/8" 1/4" DIAMETER 10 FT
31" TO 42" 1-1/2" X 1-1/2" X 1/8" 1/4" DIAMETER 10 FT
43" TO 60" 1-1/2" X 1-1/2" X 1/8" 3/8" DIAMETER 10 FT
61" TO 84" 2" X 2" 1/8" 3/8" DIAMETER 8 FT

HVAC SPECIFICATIONS

1 HVAC HYDRONIC PIPING
1.1 HYDRONIC PIPING – GENERAL:
A. KEEP OPEN ENDS OF PIPE FREE FROM SCALE AND DIRT. PROTECT OPEN ENDS WITH TEMPORARY PLUGS OR CAPS. AFTER COMPLETION, FILL, CLEAN, AND TREAT SYSTEMS.
B. PROVIDE NON-CONDUCTING DIELECTRIC CONNECTIONS WHENEVER JOINTING DISSIMILAR METALS IN OPEN SYSTEMS.
C. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS. HANGERS AND SUPPORTS LOCATED IN CRAWL SPACES, PIPE SHAFTS, AND SUSPENDED CEILING SPACES ARE NOT CONSIDERED EXPOSED.
D. AIR VENTS SHALL BE SELECTED TO SUIT THE SYSTEM OPERATING PRESSURES AND SHALL BE AUTOMATIC AND COMPLETE WITH ISOLATING VALVES.
E. PIPE ALL DISCHARGE FROM TEMPERATURE & PRESSURE SAFETY RELIEF VALVES TO A POINT OF SAFE DISCHARGE DIRECTLY INTO A FLOOR DRAIN, HUB DRAIN OR SAFE OUTDOOR LOCATION.
F. AUTOMATIC FEED VALVES: PROVIDE AUTOMATIC FEED VALVE ON THE COLD WATER MAKE-UP LINE TO EACH NEW HOT WATER HEATING SYSTEM.
G. TEST LIQUID HEAT TRANSFER PIPING HYDROSTATICALLY AT NOT LESS THAN 150% OF OPERATING PRESSURE OR NOT LESS THAN 125 PSI (860 KPA) WHICHEVER IS THE GREATER. TEST PERIOD SHALL BE NOT LESS THAN SIX (6) HOURS DURATION DURING WHICH TIME EACH JOINT SHALL BE INSPECTED, GIVEN A SHEAR TAP WITH A HAMMER AND CHECKED FOR LEAKS.
1.2 VALVES – GENERAL
A. CONFORM TO REQUIREMENTS OF ANSI, ASTM, ASME, AND APPLICABLE MSS STANDARDS.
B. MANUFACTURER'S NAME AND PRESSURE RATING CLEARLY MARKED ON BODY TO MSS-SP-25.
C. VALID CRN (CANADIAN REGISTRATION NUMBER) REQUIRED FOR EACH VALVE.
D. MATERIALS:
.1 BRONZE: ASTM B62 OR B61 AS APPLICABLE
.2 BRASS: ASTM B283 C3770
.3 CAST IRON: ASTM A126 CLASS B
E. END CONNECTIONS:
.1 THREADED ENDS: ANSI B1.20.1
.2 FLANGED ENDS: ANSI B16.1 (CLASS 125), ANSI B16.5
.3 FACE-TO-FACE DIMENSIONS: ANSI B16.10
F. DESIGN AND TESTING:
.1 BRONZE GATE & CHECK VALVES: MSS-SP-80
.2 BALL VALVES: MSS-SP-110
.3 CAST IRON GATE VALVES: MSS-SP-70
.4 CAST IRON GLOBE VALVES: MSS-SP-85
.5 CAST IRON CHECK: MSS-SP-71
.6 BUTTERFLY VALVES: MSS-SP-67
G. ACCEPTABLE MANUFACTURERS: KITZ, CRANE, JENKINS, CONBRACO, NIBCO
1.3 HYDRONIC SYSTEMS TO 150 PSIG, ABOVE GROUND
A. NOMINAL OPERATING PRESSURE 125 PSIG
B. DESIGN PRESSURE 150 PSIG
C. TEST PRESSURE 225 PSIG
D. DESIGN TEMPERATURE 350°F
E. CORROSION ALLOWANCE 0.0625 IN.
F. STEEL PIPE ASTM A53 GR.B ERW OR ASTM A106 GR.B SMLS, SCH 40
G. JOINTS, 2" AND SMALLER SCREWED
H. SCREWED FITTINGS 150 LB. MALLEABLE IRON
I. UNIONS CL.150, ASTM A-47 MALLEABLE IRON, ASTM A-153 GALVANIZED, ANSI B2.1 THREADS.
J. JOINTS 2-1/2" AND LARGER WELDED, WITH FLANGES AT CONNECTIONS TO EQUIPMENT
K. BUTT WELD FITTINGS ASTM A234 GR. WFB
L. FLANGES ASTM A105, CLASS 150, RAISED FACE, WELD NECK OR SLIP ON
M. BOLTS ASTM A307 C.S. BOLTS, SO. HEAD; ASTM A563 NUTS, HEX HEAD
N. GASKETS 1/16" (1.6 MM) THICK PREFORMED, NON-ASBESTOS GRAPHITE FIBRE.
O. COPPER TUBING 2" AND SMALLER ASTM B88, TYPE L, HARD DRAWN.
P. JOINTS: SOLDER, LEAD FREE, ASTM B32, 95-5 WITH ANTIMONY, FOR TIN AND SILVER, WITH MELTING RANGE 220°C TO 280°C.
Q. FITTINGS: ASME B16.18, CAST BRASS, OR ASME B16.22, SOLDER WROUGHT COPPER
R. DIELECTRIC UNIONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER.
S. VALVES, 2" AND SMALLER: ASTM A105
.1 GATE VALVES (ISOLATING) 300 PSIG NON-SHOCK WOG, ASTM B62 BRONZE BODY, SOLID WEDGE DISC, RISING STEM, BRONZE TRIM, THREADED ENDS, KITZ #25
.2 GLOBE VALVES (THROTTLING) 300 PSIG NON-SHOCK WOG, ASTM B62 BRONZE BODY, COMPOSITION (TEFLON) DISC, RISING STEM, BRONZE TRIM, THREADED ENDS, KITZ #09
.3 CHECK VALVES (BACKFLOW) 300 PSIG NON-SHOCK WOG, ASTM B62 BRONZE BODY, Y-PATTERN HORIZONTAL, SWING TYPE DISC, THREADED ENDS, KITZ #29
.4 BALL VALVES (DRAIN) 800 PSIG NON-SHOCK WOG, FORGED BRASS, 2-PIECE, CHROME BALL AND STEM, FULL PORT, BLOW-OUT PROOF PIPE SEATS & STEM, LEVER HANDLE, THREADED ENDS, KITZ #68AC.
T. PROVIDE STEM EXTENSIONS FOR INSULATED PIPING.
U. PROVIDE GEAR OPERATOR AND CHAIN ON VALVES INSTALLED ABOVE 10-FT AFF.
V. STRAINERS, 2" AND SMALLER CLASS 250, 400 PSIG WOG, CAST IRON BODY, Y-PATTERN, SCREWED CAP AND ENDS, A167 304 STAINLESS STEEL SCREEN WITH 1/32" PERFORATIONS. MUELLER STEAM 11M.
W. STRAINERS, 2-1/2" AND LARGER CLASS 250 PSIG NON-SHOCK WOG, CAST IRON, Y-PATTERN, BOLTED FLANGE COVER, BLOW-OUT PLUG, A167 304 STAINLESS STEEL SCREEN WITH 1/32" PERFORATIONS, FLANGED ENDS, MUELLER STEAM 752.
1.4 CIRCUIT BALANCING VALVES
A. CIRCUIT BALANCING VALVES: 2" (50 MM) AND SMALLER
.1 SCREWED CONNECTION, GLOBE STYLE DESIGN, NONFERROUS, PRESSURE DIE-CAST, NONPOROUS METAL, COPPER ALLOY. EACH VALVE SHALL BE SUCH THAT WHEN INSTALLED IN ANY DIRECTION, IT WILL NOT AFFECT FLOW MEASUREMENT.
.2 VALVES SHALL PROVIDE THE FOLLOWING FUNCTIONS:
.1 PREISE FLOW MEASUREMENT.
.2 PRECISION FLOW BALANCING.
.3 POSITIVE SHUT OFF WITH NO DRIP SEAT AND TEFLON DISC.
.4 DRAIN CONNECTION WITH PROTECTIVE CAP.
.5 VALVES SHALL HAVE FOUR 360° ADJUSTMENT TURNS OF HANDWHEEL FOR MAXIMUM VERNIER-TYPE SETTING WITH "HIDDEN MEMORY" FEATURE TO PROGRAM THE VALVE WITH PRECISION TAMPER-PROOF BALANCING SETTING.
.6 VALVES SHALL BE SHIPPED IN A 4.5 R FACTOR POLYURETHANE CONTAINER THAT SHALL BE USED AS INSULATION AFTER VALVE IS INSTALLED.
.7 PROVIDE VALVES SUITABLE FOR MAXIMUM WORKING PRESSURE OF 250 PSI (1720 KPA) AND MAXIMUM OPERATING TEMPERATURE OF 250°F (121°C).
.8 ACCEPTABLE PRODUCTS: S.A. ARMSTRONG CRV I INDICATED OR TOUR & ANDERSON STA-D OR NEWMAN HATTERSLEY.
2 HVAC DUCT INSULATION
2.1 GLASS FIBRE, FLEXIBLE
A. MANUFACTURER: CERTAINEED SOFT TOUCH AND WIDE WRAP
B. OTHER ACCEPTABLE MANUFACTURERS: JOHNS MANVILLE MICROLITE.
C. INSULATION: ASTM C553; ASTM C1290, CAN 51.11-92, ASTM C1136, NFPA

HVAC SPECIFICATIONS

90A, ASTM E84, ASTM E136.
.1 'KSI' VALUE : ASTM C518, 0.039 AT 24 °C (0.27 @ 75.2 °F)
.2 MAXIMUM SERVICE TEMPERATURE: 121 °C (250 °F).
.3 MAXIMUM MOISTURE ABSORPTION: ASTM C1104; <5% BY WEIGHT.
.4 MAXIMUM FLAME SPREAD INDEX: 25
.5 MAXIMUM SMOKE DEV INDEX: 50
D. VAPOUR BARRIER JACKET:
.1 KRAFT PAPER WITH GLASS FIBRE YARN AND BONDED TO ALUMINIZED FILM. (FSK)
.2 KRAFT PAPER REINFORCED WITH GLASS FIBRE YARN AND BONDED TO WHITE METALIZED POLYPROPYLENE
.3 MOISTURE VAPOUR TRANSMISSION: ASTM E96; 0.02 PERM.
.4 SECURE WITH PRESSURE SENSITIVE TAPE.
E. VAPOUR BARRIER TAPE:
.1 KRAFT PAPER REINFORCED WITH GLASS FIBRE YARN AND BONDED TO ALUMINIZED FILM, WITH PRESSURE SENSITIVE RUBBER BASED ADHESIVE.
F. OUTDOOR VAPOUR BARRIER MASTIC:
.1 VINYL EMULSION TYPE ACRYLIC OR MASTIC, COMPATIBLE WITH INSULATION, BLACK COLOUR.
G. TIE WIRE: ANNEALED STEEL, 1/16" (1.5 MM).
2.2 GLASS FIBRE, RIGID
A. MANUFACTURER: CERTAINEED CERTAPOR BOARD.
B. OTHER ACCEPTABLE MANUFACTURERS: JOHNS MANVILLE 800 SERIES SPIN-GLASS
C. INSULATION: ASTM C612; RIGID, NONCOMBUSTIBLE BLANKET.
.1 'KSI' VALUE : ASTM C518, 0.25 BTU-in/hr-Sq-Ft-F AT 75 F (0.036 W/M-C AT 24 C).
.2 MAXIMUM SERVICE TEMPERATURE: 250 °F (121 °C).
.3 MAXIMUM MOISTURE ABSORPTION: ASTM C1104; <5% BY WEIGHT.
D. VAPOUR BARRIER JACKET:
.1 KRAFT PAPER WITH GLASS FIBRE YARN AND BONDED TO ALUMINIZED FILM.
.2 MOISTURE VAPOUR TRANSMISSION: ASTM E96; 0.04 PERM.
.3 SECURE WITH PRESSURE SENSITIVE TAPE.
2.3 DUCT INSULATION
A. INSULATE NEW OR ALTERED DUCTWORK AND RE-INSULATE EXISTING DUCTWORK WHERE INSULATION HAS BEEN REMOVED OR DAMAGED AS FOLLOWS:
SERVICE INSULATION TYPE THICKNESS
AIR SUPPLY – RECTANGULAR RIGID 1"
AIR SUPPLY – ROUND FLEXIBLE 1"
EXHAUST WITHIN 6' OF OUTSIDE – RECTANGULAR RIGID 3"
EXHAUST WITHIN 6' OF OUTSIDE – ROUND FLEXIBLE 3"
FRESH AIR INTAKE – RECTANGULAR RIGID 3"
FRESH AIR INTAKE – ROUND FLEXIBLE 3"
3. HVAC PIPING INSULATION
3.1 GLASS FIBRE
A. APPROVED MANUFACTURERS: JOHNSMANVILLE MICRO-LOK
B. OTHER ACCEPTABLE MANUFACTURERS OFFERING EQUIVALENT PRODUCTS: OWENS CORING FIBERGLASS, CERTAINEED CRIMPWRAP.
C. INSULATION: ASTM C547; ASTM C411, ASTM C356 ASTM E84, ASTM D774, NFPA 259.
.1 'KSI' VALUE : 0.23 BTU-in/hr-Sq-Ft-F AT 75°F, 0.33 W/m-C AT 24 °C
.2 MINIMUM SERVICE TEMPERATURE: 0°F (-18°C).
.3 MAXIMUM SERVICE TEMPERATURE: 850°F (454°C).
.4 MAXIMUM MOISTURE ABSORPTION: <5% BY WEIGHT.
D. VAPOUR BARRIER JACKET
.1 ASTM C136 TYPE I, WHITE KRAFT PAPER REINFORCED WITH GLASS FIBRE YARN AND BONDED TO ALUMINIZED FILM.
.2 MOISTURE VAPOUR TRANSMISSION: ASTM E96; 0.02 PERM.
.3 SECURE WITH SELF SEALING LONGITUDINAL LAPS AND BUTT STRIPS.
.4 SECURE WITH OUTWARD CLINCH EXPANDING STAPLES AND VAPOUR BARRIER MASTIC
E. TIE WIRE: 1.3 MM STAINLESS STEEL WITH TWISTED ENDS ON MAXIMUM 12" (300 MM) CENTRES
F. VAPOUR BARRIER LAP ADHESIVE
.1 COMPATIBLE WITH INSULATION.
G. INSULATING CEMENT/MASTIC
.1 ASTM C195; HYDRAULIC SETTING ON MINERAL WOOL, VOC CONTENT NOT TO EXCEED 80 G/L.
H. FIBROUS GLASS FABRIC
.1 CLOTH: UNTREATED, 9 OZ/SQ YD (305 G/SQ M) WEIGHT.
.2 BLANKET: 1.0 LB/CU FT (16 KG/CU M) DENSITY.
I. INDOOR VAPOUR BARRIER FINISH
.1 VINYL EMULSION TYPE ACRYLIC, COMPATIBLE WITH INSULATION, WHITE COLOUR, VOC CONTENT NOT TO EXCEED 250 G/L.
J. OUTDOOR VAPOUR BARRIER MASTIC
.1 VINYL EMULSION TYPE ACRYLIC, COMPATIBLE WITH INSULATION, WHITE COLOUR.
K. INSULATING CEMENT
.1 ASTM C449, VOC CONTENT NOT TO EXCEED 80 G/L.
3.2 JACKETS
A. PVC PLASTIC
.1 JACKET: ONE PIECE MOULDED TYPE FITTING COVERS AND SHEET MATERIAL.
.2 ASTM E84, ASTM D1784, UL1 S102-M88.
.3 MAXIMUM SERVICE TEMPERATURE: 151°F (66°C).
.4 FINISH: GLOSS.
.5 MAXIMUM FLAME SPREAD: ASTM E84; 25 OR LESS.
.6 MAXIMUM SMOKE DEVELOPED: ASTM E84; 50 OR LESS.
.7 THICKNESS: 20 MIL (0.4 MM) MINIMUM, 30 MIL (0.8 MM) MINIMUM FOR OUTDOOR USE.
.8 COLOUR: STANDARD OFF-WHITE
.9 COVERING ADHESIVE MASTIC
.1 COMPATIBLE WITH INSULATION, MAXIMUM VOC CONTENT OF 50 G/L
.9 APPROVED MANUFACTURER: CEEL-00 300 SERIES, ZESTON PVC
B. ALUMINUM JACKET: ASTM E84. (APPLY TO ALL EXTERIOR PIPING ONLY)
.1 THICKNESS: ASTM C1729 REQUIREMENTS FOR RIGID AND NON-RIGID INSULATION FINISH.
.2 FINISH: SMOOTH PLAIN MILL FINISH.
.3 JOINING: LONGITUDINAL SLIP JOINTS AND 2" (50 MM) LAPS.
.4 FITTINGS: 0.02" (0.40 MM) THICK DIE SHAPED FITTING COVERS WITH FACTORY ATTACHED PROTECTIVE LINER.
.5 METAL JACKET BANDS: 3/8" (10 MM) WIDE; 0.01" (0.38 MM) THICK ALUMINUM.
3.3 PIPE INSULATION
A. INSULATE NEW OR ALTERED PIPING WITH RIGID PIPE INSULATION AND RE-INSULATE EXISTING PIPING WHERE INSULATION HAS BEEN REMOVED OR DAMAGED AS FOLLOWS:
RIGID PIPE INSULATION
SERVICE OPERATING TEMP.(°F) PIPE DIAMETER IN. THK. IN.
HYDRONIC HEATING (HOT WATER & GLYCOL/WATER) 105 TO 140 1-1/4 AND SMALLER 1
1-1/2 & LARGER 1-1/2
141 TO 200 1-1/4 AND SMALLER 1-1/2
1-1/2 & LARGER 2

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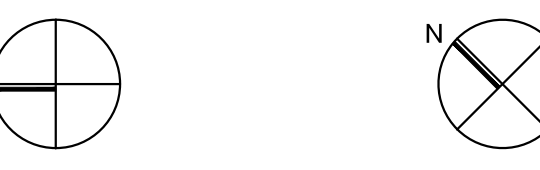
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Table with 2 columns: SERVICE, INSULATION TYPE THICKNESS. Rows include AIR SUPPLY, EXHAUST, FRESH AIR INTAKE.



Key Plan N.T.S.



Project North True North

Table with 3 columns: No., Revisions, Date. Contains revision history for the drawing.

General Contractor shall check and verify all dimensions and report all errors and omissions to the Architect. Do not scale the drawings. Drawings shall not be used for construction purposes until issued by the Architect for construction.

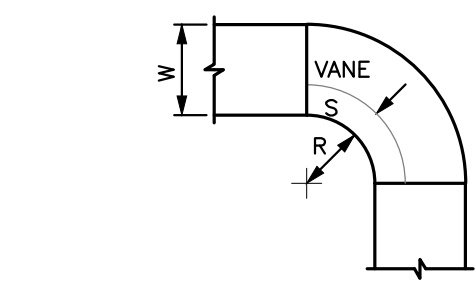
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Scale: AS NOTED Date: 05/01/2023

Drawn by: C.M. Checked by: W.D.

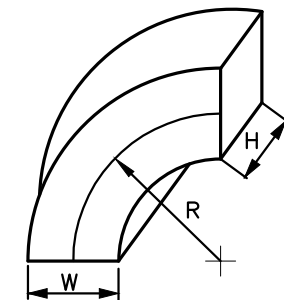
Job No. Drawing No.

2215A M002

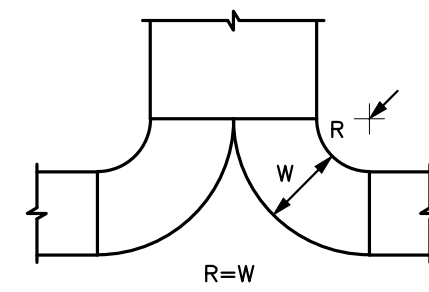


IF 'R' IS LESS THAN 'W'
'S' = 1/3 W

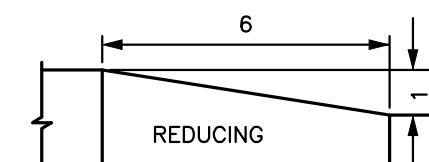
SHORT RADIUS ELBOW - DESIGNATED E3



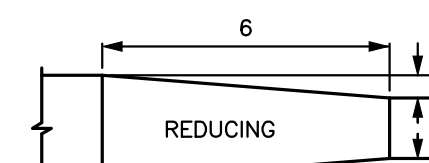
FULL RADIUS RECTANGULAR ELBOW -
SMACNA 14-10 G ELBOW-DESIGNATED E1



FULL RADIUS TEE - DESIGNATED T1



TRANSITION ONE SIDE



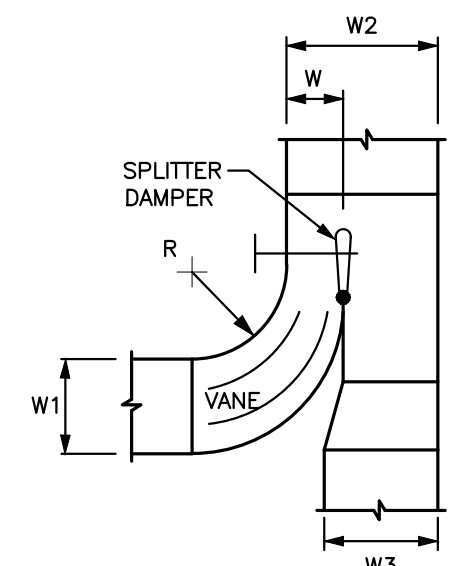
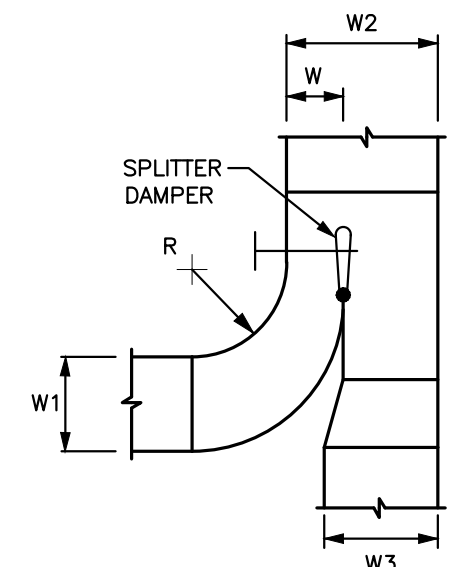
TRANSITION BOTH SIDES

1. ALL ELBOWS GREATER THAN 30° TO HAVE 1/16" SINGLE THICKNESS TURNING VANES ON CENTRE.
2. ALL ELBOWS TO HAVE A 45° OR RADIUS THROAT. 90° THROAT IS NOT ACCEPTABLE HIGH LOSS.
3. ALL TURNING VANES ARE TO BE ADJUSTED SO THAT THE TRAILING EDGE ARE TANGENT TO THE AIR STREAM. SMACNA FIG.5-15
4. DOUBLE THICKNESS TURNING VANES THAT REDUCE THE DUCT AREA MAY NOT BE USED.

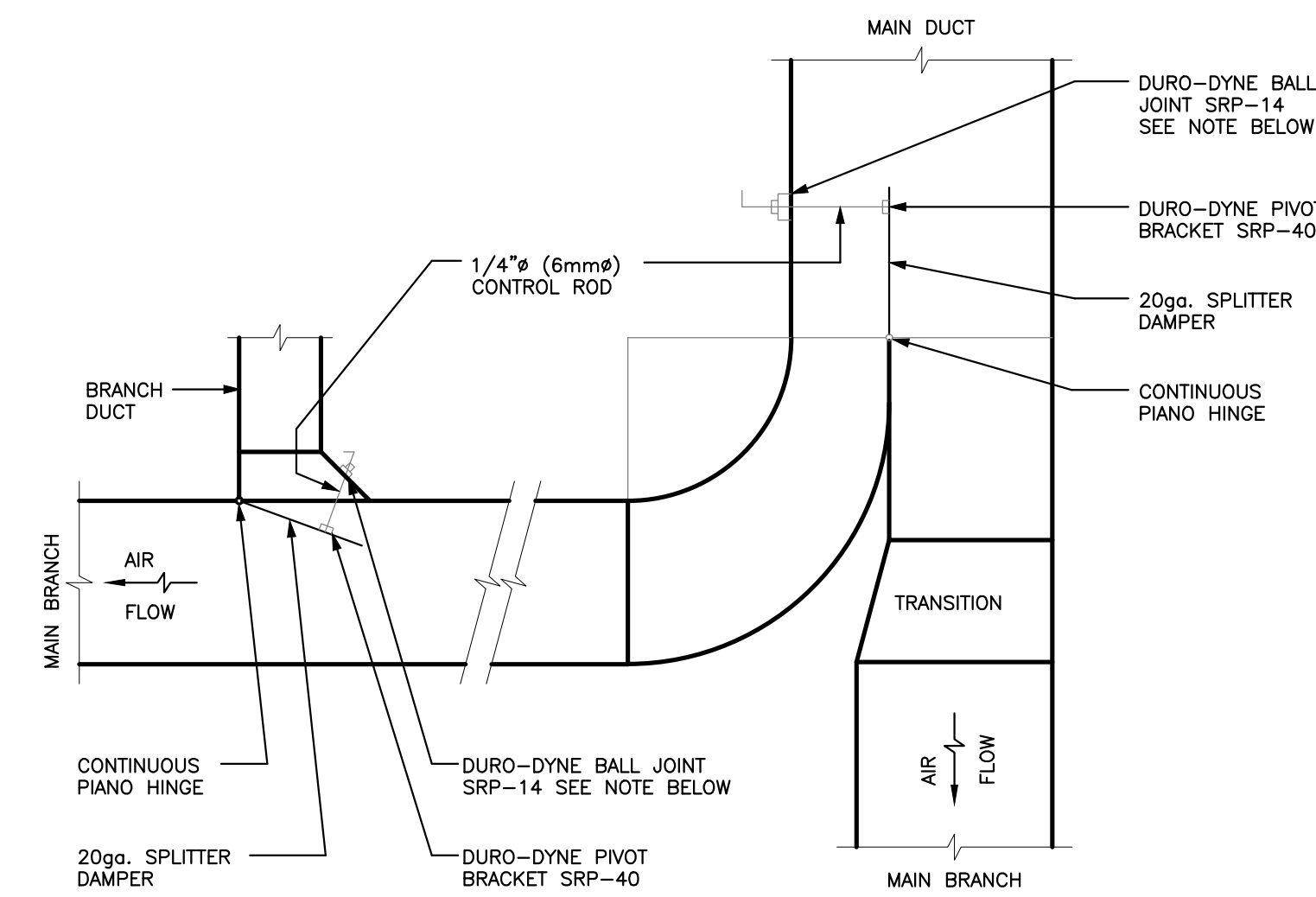
MITRED RECTANGULAR ELBOW -
SMACNA 14-10 D ELBOW-DESIGNATED E2

DUCT CONSTRUCTION NOTES:

1. ALL DUCTS AND FITTINGS TO BE CONSTRUCT FABRICATED TO SMACNA H.V.A.C. SYSTEMS DUCT DESIGN 1990 THIRD EDITION LOW FITTING LOSS PRACTICE.
2. TRANSITIONS SHALL NOT EXCEED 20° AT VELOCITIES ABOVE 1000/PM.
3. R/W EXCEEDING 1.0 SHALL BE USED IN ALL OPEN AREAS.



BRANCH DUCT - DESIGNATED W2

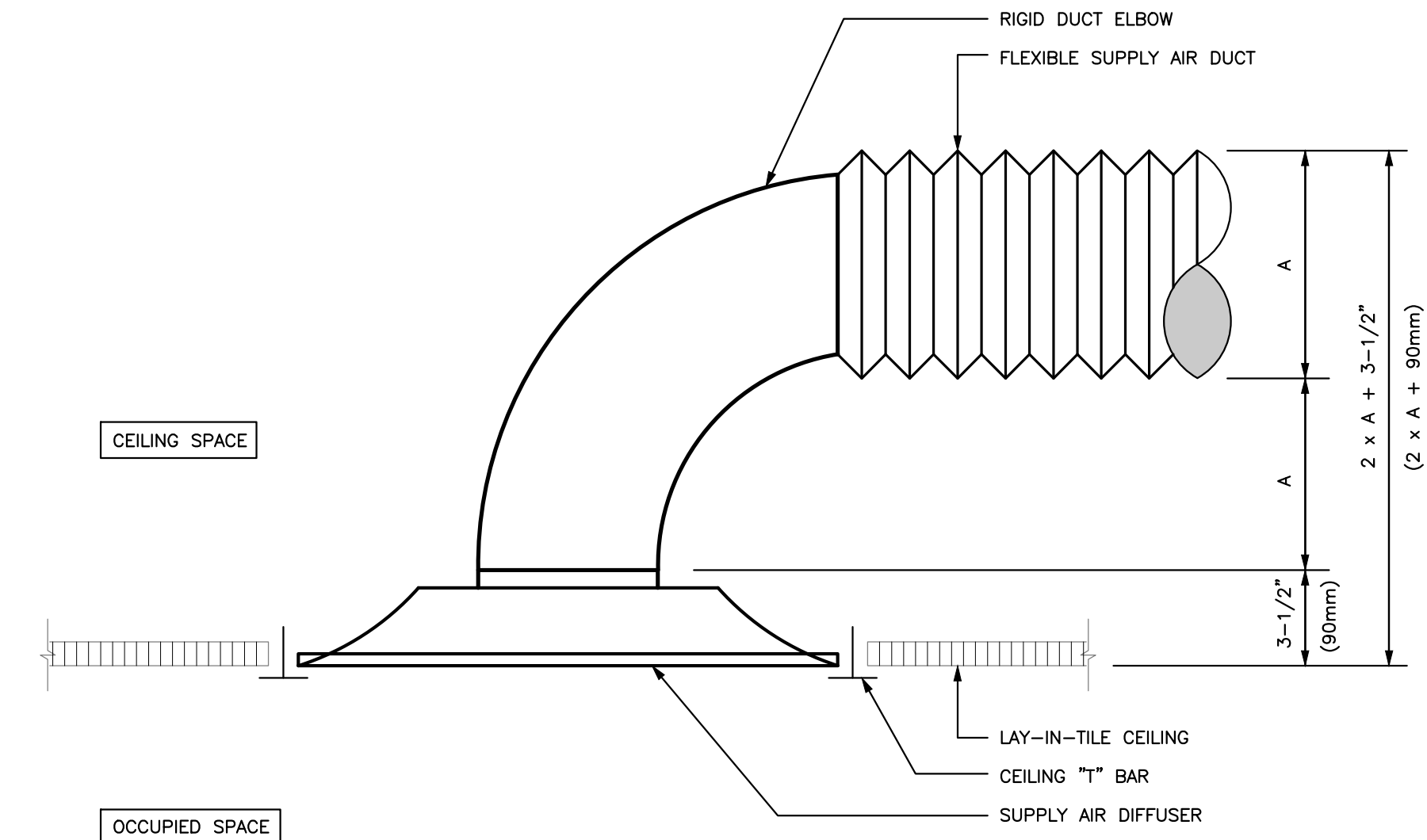


- NOTE:
- DUCT DEPTH UP TO 24"(600mm)
1 CONTROL ROD AND BALL JOINT REQUIRED
 - DUCT DEPTH OVER 24"(600mm)
2 CONTROL ROD AND BALL JOINTS REQUIRED

HARDWARE SHOWN IS DURO-DYNE (SEE SPECIFICATIONS FOR ALTERNATIVES)

TYPICAL DUCT CONNECTION

N.T.S.

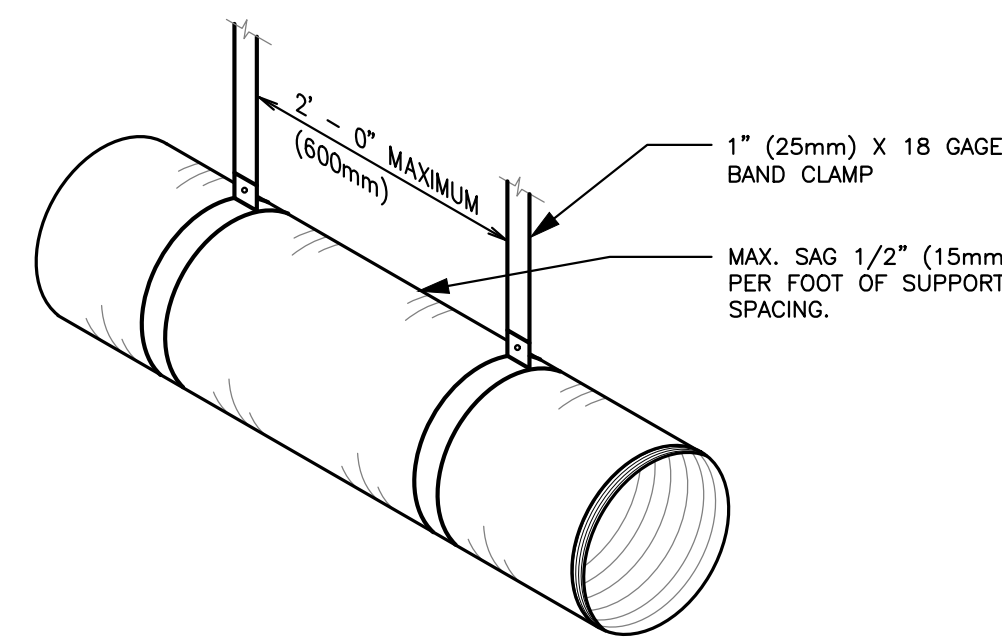


RIGID DUCT ELBOW DIFFUSER DETAIL

N.T.S.

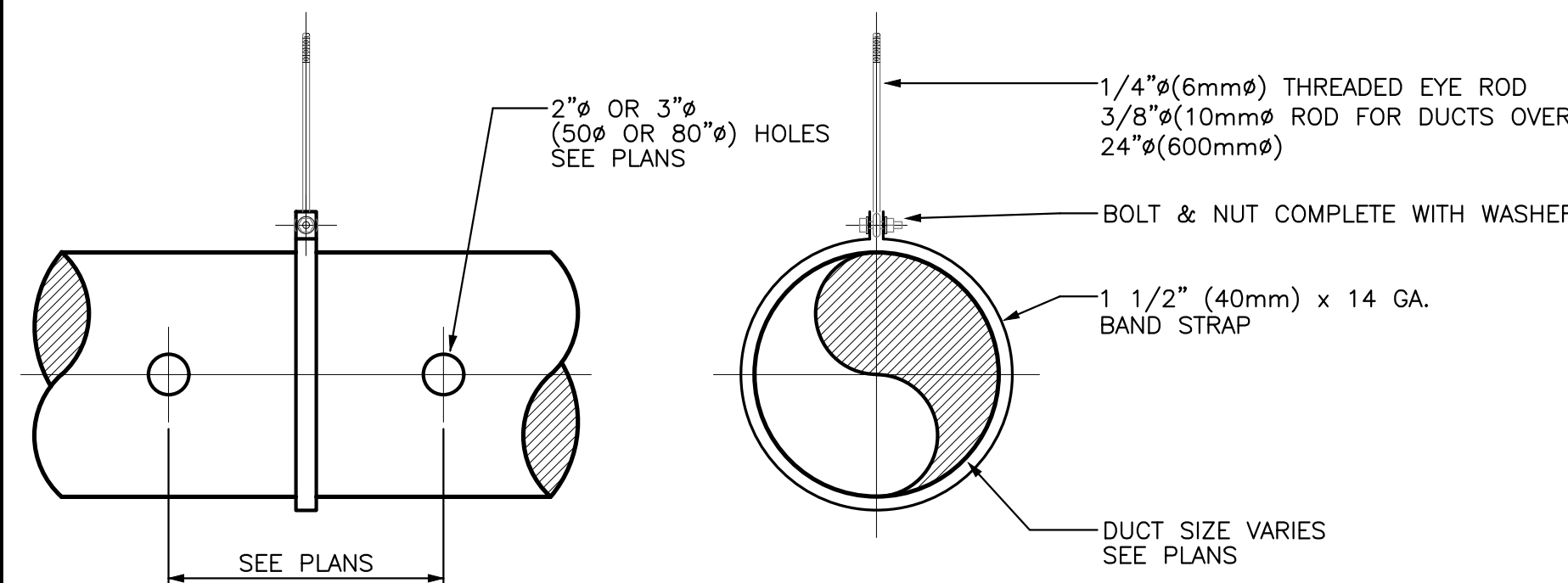
SQUARE, RADIUS ELBOW AND TRANSITION FITTINGS

N.T.S.



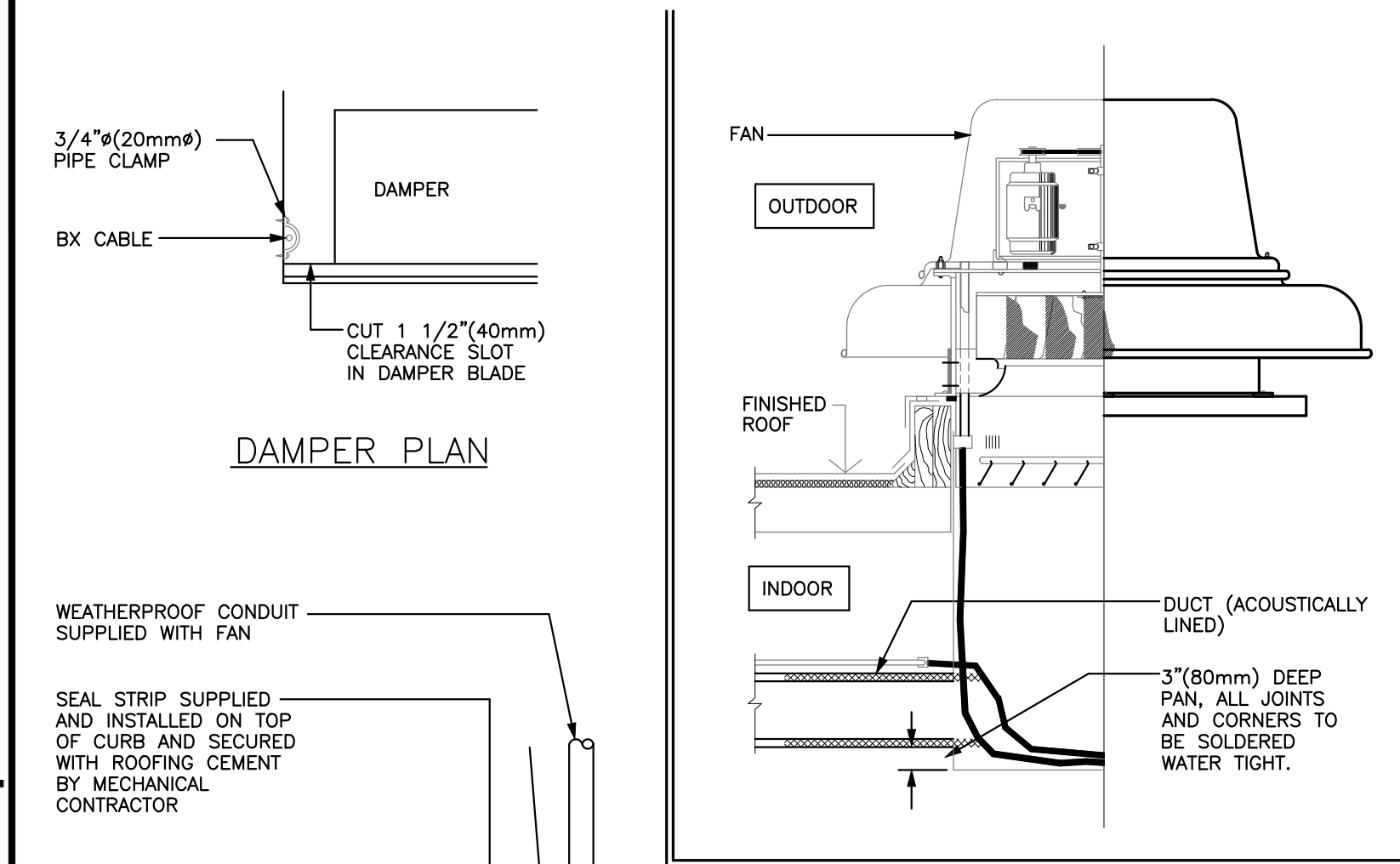
FLEXIBLE DUCT SUPPORT DETAIL

N.T.S.



DETAIL - SPIRAL DUCT SUPPORT

N.T.S.



DAMPER PLAN

WEATHERPROOF CONDUIT SUPPLIED WITH FAN

FAN SKIRT

GRAVEL

ROOF INSULATION

METAL DECK

RIGID CONDUIT

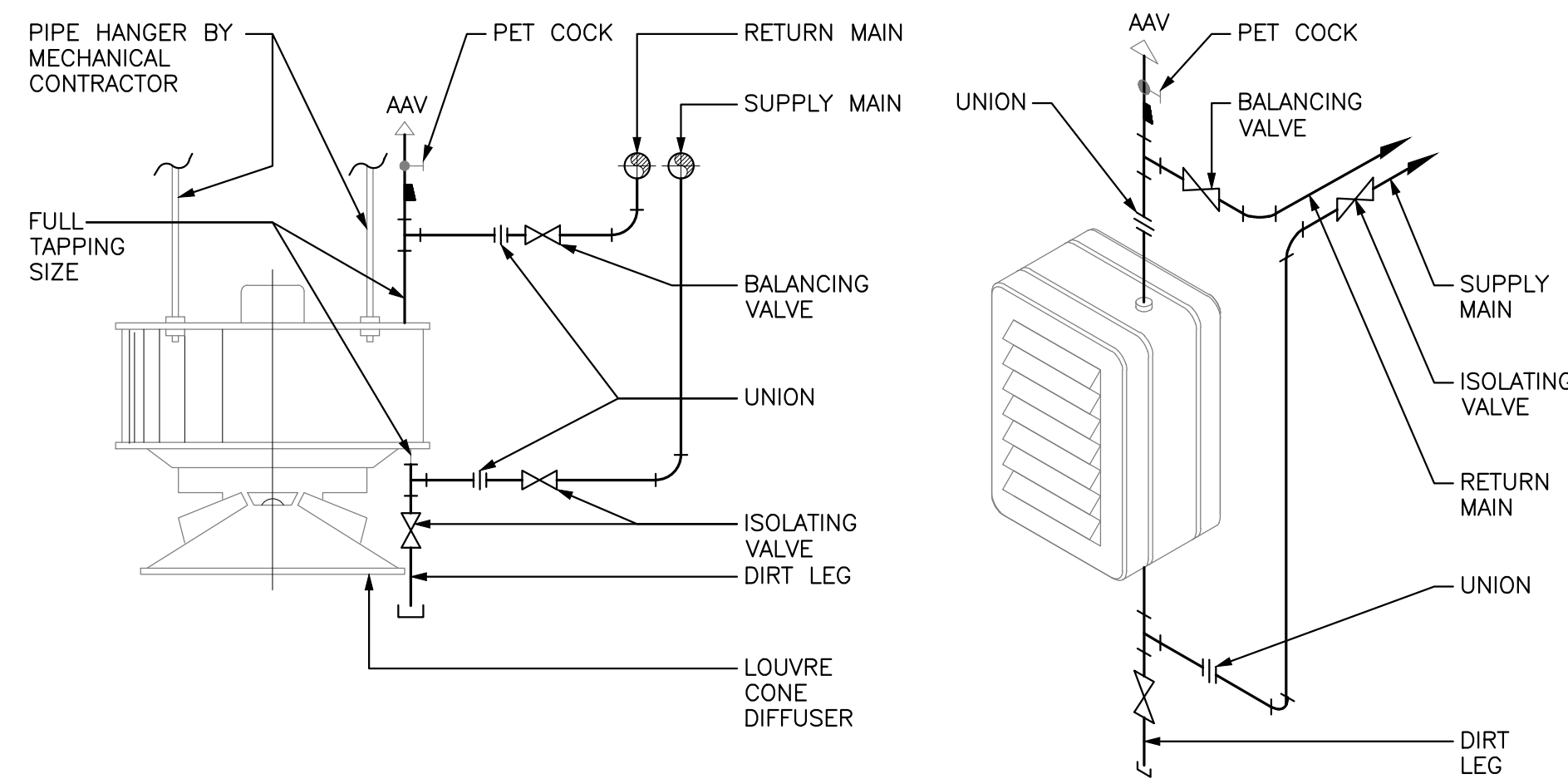
DUCT

SEAL GAP BETWEEN CONDUIT AND DUCT

NOTE: UNIT TO BE INSTALLED SO THAT CONDUIT TO MOTOR IS DIRECTLY OVER CABLE CLEARANCE SLOT IN DAMPER.

TYPICAL CURB MOUNTED FAN INSTALLATION

N.T.S.



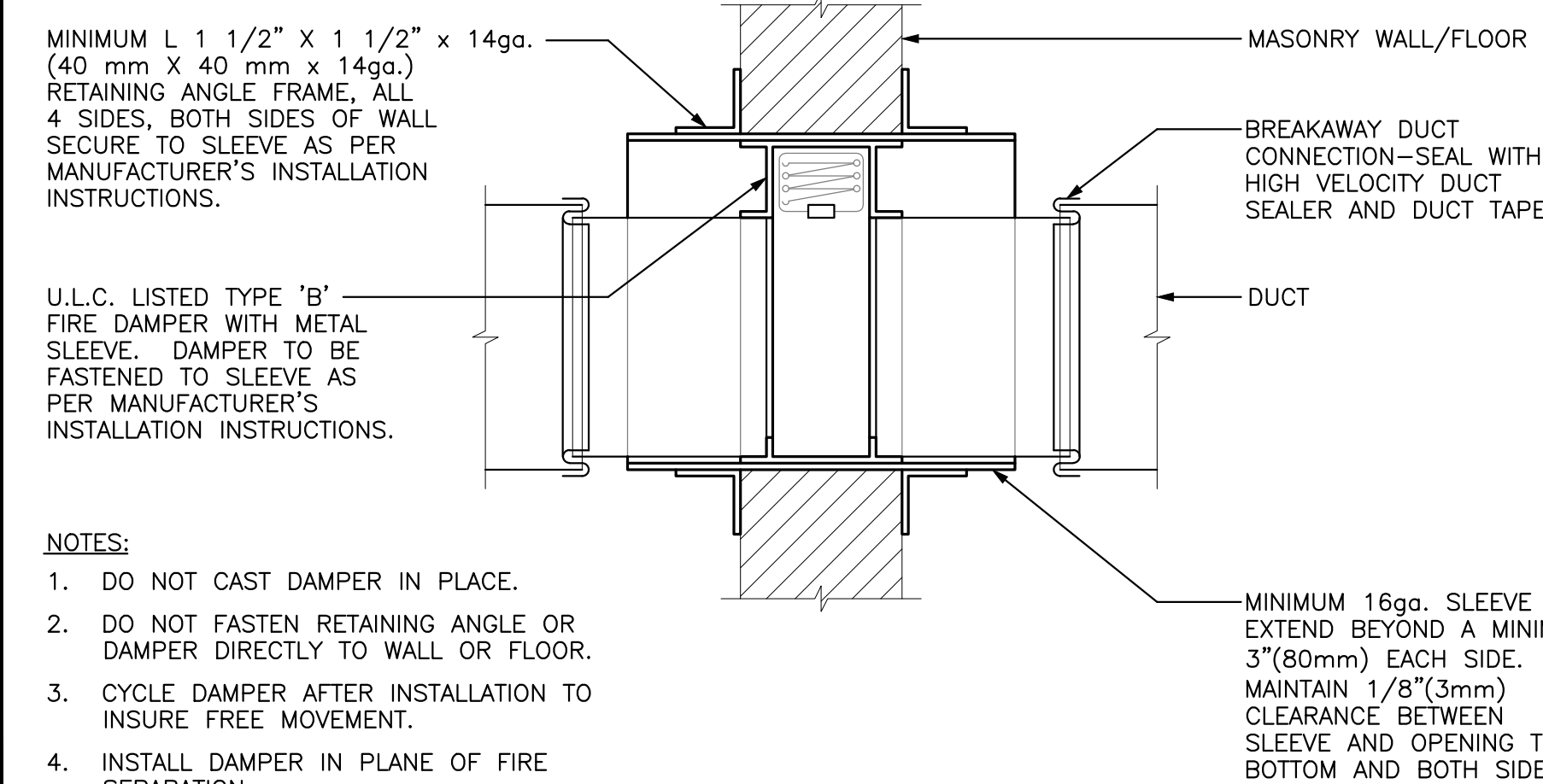
PROJECTION TYPE

NOTE: PIPE SIZES AS PER MECHANICAL DRAWING

HORIZONTAL TYPE

TYPICAL HOT WATER UNIT HEATER - PIPING DETAIL

N.T.S.



MINIMUM L 1 1/2" X 1 1/2" X 14ga. (40 mm X 40 mm x 14ga.) RETAINING ANGLE FRAME, ALL 4 SIDES. BOTH SIDES OF WALL SECURE TO SLEEVE AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

U.L.C. LISTED TYPE 'B' FIRE DAMPER WITH METAL SLEEVE. DAMPER TO BE FASTENED TO SLEEVE AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

NOTES:

1. DO NOT CAST DAMPER IN PLACE.
2. DO NOT FASTEN RETAINING ANGLE OR DAMPER DIRECTLY TO WALL OR FLOOR.
3. CYCLE DAMPER AFTER INSTALLATION TO INSURE FREE MOVEMENT.
4. INSTALL DAMPER IN PLANE OF FIRE SEPARATION

MASONRY WALL/FLOOR

BREAKAWAY DUCT CONNECTION-SEAL WITH HIGH VELOCITY DUCT SEALER AND DUCT TAPE

DUCT

MINIMUM 16ga. SLEEVE TO EXTEND BEYOND A MINIMUM 3"(80mm) EACH SIDE. MAINTAIN 1/8"(3mm) CLEARANCE BETWEEN SLEEVE AND OPENING TOP, BOTTOM AND BOTH SIDES.

DETAIL OF FIRE DAMPER IN MASONRY WALL

N.T.S.

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Key Plan N.T.S.



Project North True North

No.	Revisions	Date
2.	Issued for Bids / Permit	2023 03 10
1.	Issued for Bids	2023 02 08
No.	Issue	Date

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Drawing Title:
MECHANICAL
DETAILS

Scale: - Date: 05/01/2023

Drawn by: C.M. Checked by: W.D.

Job No. Drawing No.

2215A M301

