

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).
 - .2 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM A 480/A 480M-Latest Edition, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.
 - .2 ASTM A 635/A 635M-Latest Edition, Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Carbon, Hot Rolled.
 - .3 ASTM A 653/A 653M-Latest Edition, Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 - .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
 - .4 National Fire Protection Association (NFPA).
 - .1 NFPA 90A-Latest Edition, Standard for the Installation of Air-Conditioning and Ventilating Systems.
 - .2 NFPA 90B-Latest Edition, Standard for the Installation of Warm Air Heating and Air-Conditioning Systems.
 - .3 NFPA 96-Latest Edition, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
 - .5 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
 - .1 SMACNA HVAC Duct Construction Standards - Metal and Flexible.
 - .2 SMACNA HVAC Air Duct Leakage Test Manual.
 - .3 IAQ Guideline for Occupied Buildings Under Construction.
-

- 1.1 REFERENCES (Cont'd) .6 Transport Canada (TC).
.1 Transportation of Dangerous Goods Act (TDGA).
- 1.2 ACTION AND INFORMATIONAL SUBMITTALS .1 Submit shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures.
- 1.3 QUALITY ASSURANCE .1 Certification of Ratings:
.1 Catalogue or published ratings shall be those obtained from tests carried out by manufacturer or independent testing agency signifying adherence to codes and standards.
.2 Health and Safety:
.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
.3 Indoor Air Quality (IAQ) Management Plan.
.1 During construction meet or exceed the requirements of SMACNA IAQ Guideline for Occupied Buildings under Construction.
- 1.4 DELIVERY, STORAGE AND HANDLING .1 Protect on site stored or installed absorptive material from moisture damage.
.2 Waste Management and Disposal:
.1 Separate waste materials for reuse and recycling.
.2 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
-

PART 2 - PRODUCTS

- 2.1 SEAL CLASSIFICATION .1 Classification as follows:
500 C
.2 Seal classification:
.1 Class C: transverse joints and connections made air tight with gaskets sealant tape or combination thereof. Longitudinal seams and joints.
.3 Exhaust ductwork from kitchen to be all welded steel construction to match existing.
- 2.2 SEALANT .1 Tape: polyvinyl treated, open weave fibreglass tape, 50 mm wide.
- 2.3 TAPE .1 Tape: polyvinyl treated, open weave fiberglass tape, 50 mm wide.
- 2.4 DUCT LEAKAGE .1 In accordance with SMACNA HVAC Air Duct Leakage Test Manual.
- 2.5 FITTINGS .1 Fabrication: to SMACNA.
.2 Radiused elbows.
.1 Rectangular: Centreline radius: 1.5 times width of duct.
.2 Round: Centreline radius: 1.5 times diameter.
.3 Branches:
.1 Rectangular main and branch: with radius on branch 1.5 times width of duct 45 degrees entry on branch.
.2 Round main and branch: enter main duct at 45 degrees.
-

- 2.5 FITTINGS
(Cont'd)
- .3 Branches: (Cont'd)
 - .3 Provide volume control damper in branch duct near connection to main duct.
 - .4 Transitions:
 - .1 Diverging: 20 degrees maximum included angle.
 - .2 Converging: 30degrees maximum included angle.
 - .5 Offsets:
 - .1 Short radiused elbows.
 - .6 Obstruction deflectors: maintain full cross-sectional area.
 - .1 Maximum included angles: as for transitions.
- 2.6 FIRE STOPPING
- .1 Retaining angles around duct, on both sides of fire separation in accordance with Section 07 84 00 - Firestopping.
 - .2 Fire stopping material and installation must not distort duct.
- 2.7 GALVANIZED STEEL
- .1 Lock forming quality: to ASTM A 653/A 653M, Z90 zinc coating.
 - .2 Thickness, fabrication and reinforcement: to ASHRAE SMACNA.
 - .3 Joints: to SMACNA.
- 2.8 KITCHEN EXHAUST SYSTEMS
- .1 Construct in accordance with NFPA 96.
 - .2 Material: black steel sheet, all welded.
 - .3 Thickness: not less than 1.37 mm, match existing exhaust duct thickness.
 - .4 Fabrication: as indicated.
-

2.8 KITCHEN EXHAUST SYSTEMS (Cont'd) .5 Reinforcement: in accordance with SMACNA.

2.9 HANGERS AND SUPPORTS .1 Hangers and Supports: in accordance with Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.

.1 Strap hangers: of same material as duct but next sheet metal thickness heavier than duct.

.1 Maximum size duct supported by strap hanger: 500.

.2 Hanger configuration: to SMACNA.

.3 Hangers: black galvanized steel angle with galvanized steel rods to SMACNA following table:

Duct Size (mm)	Angle Size (mm)	Rod Size (mm)
up to 750	25 x 25 x 3	6
751 to 1050	40 x 40 x 3	6
1051 to 1500	40 x 40 x 3	10
1501 to 2100	50 x 50 x 3	10
2101 to 2400	50 x 50 x 5	10
2401 and over	50 x 50 x 6	10

.4 Upper hanger attachments:

.1 For concrete: manufactured concrete inserts.

.2 For steel joist: manufactured joist clamp.

.3 For steel beams: manufactured beam clamps:

PART 3 - EXECUTION

- 3.1 GENERAL
- .1 Do work in accordance with SMACNA as indicated.
 - .2 Do not break continuity of insulation vapour barrier with hangers or rods.
 - .1 Insulate strap hangers 100 mm beyond insulated duct Ensure diffuser is fully seated.
 - .3 Support risers in accordance with SMACNA.
 - .4 Install breakaway joints in ductwork on sides of fire separation.
 - .5 Install proprietary manufactured flanged duct joints in accordance with manufacturer's instructions.
 - .6 Manufacture duct in lengths and diameter to accommodate installation of acoustic duct lining.

- 3.2 HANGERS
- .1 Strap hangers: install in accordance with SMACNA.
 - .2 Angle hangers: complete with locking nuts and washers.
 - .3 Hanger spacing: in accordance with ASHRAE SMACNA as follows:

Duct Size	Spacing
(mm)	(mm)
to 1500	3000
1501 and over	2500

3.3 KITCHEN EXHAUST SYSTEMS .1 Install to NFPA 96 and as indicated.

3.4 SEALING AND TAPING .1 Apply sealant to outside of joint to manufacturer's recommendations.
.2 Bed tape in sealant and recoat with minimum of one coat of sealant to manufacturers recommendations.

3.5 LEAKAGE TESTS .1 In accordance with SMACNA HVAC Duct Leakage Test Manual.
.2 Do leakage tests in sections.
.3 Make trial leakage tests as instructed to demonstrate workmanship.
.4 Do not install additional ductwork until trial test has been passed.
.5 Complete test before performance insulation or concealment Work.