1 GENERAL

1.1 REFERENCES

.1 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).

.2 American Society for Testing and Materials (ASTM).
- .1 ASTM A 653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process. (Metric).

.3 Department of Justice Canada (Jus).
- .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- .2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
- .1 Material Safety Data Sheets (MSDS).

.5 Sheet Metal Air Conditioning Contractors' National Association (SMACNA).
- .1 SMACNA HVAC Duct Construction Standards, Metal and Flexible, 05
- .2 SMACNA HVAC Air Duct Leakage Test Manual, 2nd Edition 2012.
- .3 SMACNA IAQ Guideline for Occupied Buildings under Construction, 2nd Edition 2007.

1.2 SUBMITTALS

.1 Submit shop drawings and product data in accordance with Section 01 00 10 – General Instructions.

.2 Product Data: submit WHMIS MSDS – in accordance with Section 01 00 10– General Instructions for the following:
- .1 Sealants.
- .2 Tape.
- .3 Proprietary joints.
- .4 Fittings.

1.3 QUALITY ASSURANCE

.1 Certification of Ratings:
- .1 Catalogue or published ratings to 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.

2 PRODUCTS

2.1 DUCTWORK

.1 Material:

- .1 Galvanized steel with Z90 designation zinc coating lock forming quality: to ASTM A 653/A653M.
- .2 Thickness: to SMACNA.

.2 Construction – round.

- .1 Ducts: factory fabricated, spiral wound, with matching fittings and specials to SMACNA.
- .2 Transverse joints up to 900mm: slip type with tape and sealants.
- .3 Transverse joints over 900mm: Vanstone.
- .4 Fittings:
  - .1 Elbows: smooth radius five -piece (for 90 degrees) three-piece (for 45 degrees). Centreline radius: 1.5 x diameter.
  - .2 Branches: conical transition with conical branch at 45 degrees and 45 degrees elbow.

.3 Construction – rectangular:

- .1 Ducts: to SMACNA.
- .2 Transverse joints: proprietary duct joints SMACNA seal Class A .
- .3 Fittings:
  - .1 Elbows: smooth radius; centreline radius 1.5 x width of duct. No vanes.
  - .2 Branches: with conical branch at 45 degrees and 45 degrees elbow.

.4 Firestopping:

- .1 50 x 50 x 3 mm retaining angles around duct, on both sides of fire separation.
- .2 Firestopping material must not distort duct.

2.2 SEAL CLASSIFICATION

.1 Classification as follows:

Maximum Pressure Pa	SMACNA Seal Class
2500	A
1500	A
1000	A
750	A

.2 Seal classification:

- .1 Class A: longitudinal seams, transverse joints, duct wall penetrations and connections made airtight with sealant and tape.

2.3 **SEALANT**

.1 Oil resistant, water-borne polymer type flame resistant high velocity duct sealing compound.

2.4 **TAPE**

.1 Polyvinyl treated, open weave fibre glass, 50mm wide.

2.5 **HANGERS AND SUPPORTS**

.1 Hangers and Supports: in accordance with Section 23 05 29 – Hangers and Supports for HVAC Piping Equipment.

.1 Band hangers: use on round and oval ducts up to 200mm diameter, of same material as duct but next sheet metal thickness heavier than duct.

.2 Trapeze hangers: ducts over 200mm diameter or longest side, to SMACNA.

.3 Hangers: black steel angle with black steel rods to SMACNA.

.4 Upper hanger attachments:

.1 For concrete: manufactured concrete inserts.

3 **EXECUTION**

3.1 **GENERAL**

.1 Do work in accordance with SMACNA

.2 Do not break continuity of insulation vapour barrier with hangers or rods.

.1 Insulate band hangers 100 mm beyond insulated duct

.3 Install breakaway joints in ductwork on sides of fire separation.

.4 Ensure installation of fire stopping does not distort duct.

3.2 **HANGERS**

.1 Band hangers: install in accordance with SMACNA.

.2 Angle hangers: complete with locking nuts and washers.

.3 Hanger spacing: in accordance with SMACNA.

3.3 **SEALING AND TAPING**

.1 Apply sealant in accordance with SMACNA and to manufacturer's recommendations.

.2 Bed tape in sealant and recoat with minimum of one coat of sealant to manufacturer's recommendations.

3.4 **LEAKAGE TESTS**

.1 In accordance with SMACNA HVAC Duct Leakage Test Manual.

.2 Perform leakage tests in sections.

.3 Perform trial leakage tests, as instructed to demonstrate workmanship.

.4 Do not install additional ductwork until trial tests have been achieved.

.5 Test section minimum of 30 m long with not less than three branch takeoffs and two 90 degrees elbows.

.6 Complete tests before performing insulation or concealment Work.