BLUE DUCT™

Engineering Specifications

Division 23

Heating, Ventilating and Air Conditioning

AQC Industries

(October 7, 2011)

Proprietary & Confidential

TABLE OF CONTENT

PART 1 GENERAL

1.1. DESCRIPTION

A. THE BLUEDUCT® under slab ductwork

1. Ductwork include; elbows, pipe, diffusers, plenum, clamp & gasket, boots, saddle registers, caulk, water gauge test, adapters,

B. THE BLUEDUCT is classified as a HDPE Plastic ductwork material mixed with a safe gaseous blowing agent when manufacturing giving it a property of thick strong foam. All fittings are manufacture similarly through a roto-modeling process creating a very firm thermal structured material surrounding air flow.

C. System pressure range between -10" to + 52" w.g. pressure.

D. DEFINITIONS

1. SMACNA Standards as used in this specification means the HVAC Duct Construction Standards, Metal and Flexible.
2. Seal or Sealing: Low VOC caulk and no VOC gasket sealers with clamp system as well as flanged joints on commercial, to keep air leakage at duct joints, seams and connections to an acceptable minimum.
3. Duct Pressure Classification: SMACNA HVAC Duct Construction Standards, use same as metal and flexible.

E. RELATED WORK

F. Testing and Balancing of Air Flows: Section 23 05 93, TESTING, ADJUSTING, AND BALANCING FOR HVAC.

1.2. QUALITY ASSURANCE

A. Refer to article,

2009 International Residential Code® (IRC)

2009 International Mechanical Code® (IMC)

2009 IAPMO Uniform Mechanical Code® (IAPMO UMC)*

C. Duct System Construction and Installation:

1. Referenced SMACNA Standards acceptable quality.

D. Duct Sealing, Air Leakage Criteria, and Air Leakage Tests: Ducts shall be sealed as per duct sealing requirements of AQC Industries Instructions Manual and Air Duct Leakage Test for duct pressure shown on the same manual.

1.2. SUBMITTALS

A. Submit in accordance with Section 01 33 23. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

B. B. Manufacturer's Literature and Data Refer to THE BLUEDUCT Technical Summary :

2 Round duct construction details

a. Manufacturer's details for duct fittings
b. Ductwork components
c. Sealants and gaskets
d. Register sections
e. Installation instructions

3. Sound attenuators, including pressure drop and acoustic performance.
4. For clamps, follow manufacturer's installation instructions.
5. Instrument test fittings follow manufacturer's installation instructions
6. Details and design analysis of alternate or optional duct systems.

C. Coordination Drawings: Refer to article, SUBMITTALS, in Section 23 05

7. COMMON WORK RESULTS FOR HVAC AND STEAM GENERATION

1.3. APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. International Code Council Air Moving and Conditioning Association (AMCA):

No data

C. International Code Council Evaluation Service (ICC-ES):

1. ICC-PMG 1023.....Minimum Design Loads

D. American Society for Testing and Materials (ASTM):

D2412-96..... Standard Test Method for Determination of External Loading Characteristics

EPDM (ethylene propylene diene M-class rubber) Gasket use Standard Specification

D2000.....Standard Specification Thermal Properties

D2000.....Standard Specification Maximum Service Temperature, Air

D394..... Standard Specification Abrasion resistance

D624…..... Standard Specification Tensile Strength

E84-01.....Standard Test Method for Surface Burning Characteristics of Building Materials

High Density Polyethylene – HDPE

D1238…….. Standard Specification Melt Index

D1505……... Standard Specification Density

D638……. Standard Specification Tensile Strength

D790……. Standard Specification Flexural Modulus

D746……. Standard Specification Brittleness Temperature

D1693…….. Standard Specification Environmental Stress Crack Resistance

AIRTITE SEALANT block co-polymer adhesive sealant

D412…….Ultimate Tensile Strength

D1002……Shear Strength

D3807……Cleavage Peel Resistance

D2240……Durometer Hardness

MAXSEAL butyl rubber gasket (1/4” tape)

E84-01.....Standard Test Method for Surface Burning Characteristics of Building

E. American Architectural Manufacturers Association (AAMA)

MAXSEAL butyl rubber gasket (1/4” tape)

804.1-85……. Pass Standard Test Method [Technical Summary Section 3.2]

G. Underwriters Laboratories, Inc. (UL):

EPDM (ethylene propylene diene M-class rubber) Gasket

181-96.....UL Standard for Safety Factory-Made Air Ducts and Connectors

PART 2 PRODUCTS

2.1 DUCT MATERIAL AND SEALANTS

C. General Refer to Technical Summary 3.3 FITTINGS

D. Specified Size Refer to Technical Summary 3.3 FITTINGS

E. Optional Duct Materials:

Joint Sealing: Manufactures Duct Construction Standards.

F. Approved joint connect such as MAXSEAL and screw down clamp will be used.

2.2 DUCT CONSTRUCTION AND INSTALLATION

A. Follow Manufacture Duct Installation Standards

B. Duct Pressure Class: // 500 Pa // 750 Pa // 1000 Pa // (2 inch // 3 inch // 4 inch //) W.G.

C. Seal Class: As shown on the drawings and in accordance with SMACNA HVAC Air Duct Leakage Test Manual.

PART 3 EXECUTIONS

3.1 INSTALLATION

3.2 DUCT LEAKAGE TEST AND REPAIR

1. Follow Manufacture Duct Installation Standards

3.3 OPERATION AND PERFORMANCE TESTS

1. Follow Manufacture Duct Installation Standards

REFERENCES AND DWG

A. Technical Summary Section 3.3 Fittings DWG and Dimension

DIVISION 23

23 00 00 HEATING, VENTILATING AND AIR CONDITIONING

23 05 00 UNDERGROUND DUCTWORK

23 05 10 All underground air ducts shall be THE BLUEDUCT integrally insulated underground ductwork constructed of polyethylene. Construction shall conform to 2009 International Mechanical Code (IMC).

23 05 20 All fittings, boots, and duct sections connectors should be constructed of Polyethylene material (as described above) in accordance with manufacture's specifications.

23 05 30 All joints shall be gasket and sealed with screws or clamps per manufactures instructions.

23 05 40 All underground duct shall be installed in accordance with the requirements of the State Building Code.

1. Saddles shall be cured in outside air and not permitted in otherwise publicly within the first two hours in occupied spaces
2. No piping grounding needed.

23 05 50 Shop Drawings are required for underground air ducts.

23 05 93 TESTING, ADJUSTING AND BALANCING FOR HVAC

1. Ductwork installations shall be pressure tested prior to connection to fans and prior to knockouts for final connections and after allowing 24 hours for sealing joint sealants to cure.
2. All tests should be done according to manufactures instructions testing procedures.
3. Knockouts for final connections recommend to be completed after sign-off by Commissioning Authority

23 07 00 HVAC Installation

23 07 19 00 Duct Installation

To ensure an air and water tight system, carefully adhere to the following instructions (please note that THE BLUEDUCT AIRTITE Sealant caulk must be used as directed). Tools Needed - Circular Saw, Chain Saw, Reciprocating Saw, or Jig Saw, Drill with 1/4" & 5/16" Hex Driver, Utility Knife, Caulking Gun

23 07 19 01 Trenching & Backfill

After the excavation has been made, no special bedding needs to be used for THE BLUEDUCT®. It can rest right on the ground, or be in sand or light aggregate. Pea gravel or sand (or the material taken from the trench, if equivalent) can be used to backfill. Spread the backfill material evenly around the duct making sure there are no gaps. Tamping in place is a recommended practice. No cement is needed to fill in around the duct, since the tamped fill holds the duct in place. THE BLUEDUCT® is resistant to any minerals or salt that may be in the backfilled soil. THE BLUEDUCT® will not "float" when backfilled to within 2" to the top of the duct. Concrete is then poured so that all "tie-down" work is eliminated.

CAUTION:

When backfilling or grading, care should be taken to not push heavy loads directly on the duct, nor should heavy equipment be allowed to run over the duct. It can be crushed under thoughtless abuse. AQC Industries is responsible for materials only. (See Warranty) AQC Industries is not responsible for design or installation of THE BLUEDUCT® products.

23 07 19 02 Cutting Pipe

a) Clamp (with screws), Gasket & Drill
b) Included on the 6", 8" & 10" Clamp are three 3" aggressive stainless screws
c) Included on the 12", 14", 16" & 18" Clamp are eight 3" aggressive stainless steel screws
d) All Pipe and Fittings 18" and under are manufactured with male ends. Commercial pipe is flanged.
e) Cut using a Circular Saw or Chain Saw. Trim all edges as necessary. Place two sections of pipe (or pipe and fitting) end to end. MAXSEAL wrap MAXSEAL around pipe with your thumb, apply pressure to overlap. This will provide an airtight and water resistant seal. Note: To prevent clamp damage from occurring during installation make sure the clamp and gasket temperature is between 32º and 100º Fahrenheit. Place the clamp around the gasket, lining up the clamp with the gasket. Tighten the clamp screws with the drill torque set at 15. (Tightening the screws too fast may cause galling). If more pressure is needed to create a seal you can tighten appropriately. Clamps do not have to meet each other to be air tight.
f) Connecting 6" through 18" pipe and fittings; Peel off wrap, Tack half around, Tack down with pressure, Slide over clamp
g) Flange 20" through 36" pipes and fittings are sealed with two beads caulk and secured with 12 (3"x 5/16) Bolts and washers. Follow manufacture installation instructions.
    1. *Special care should be taken with the large diameter ducts. Temporary interior bracing or exterior bridging (over the duct) is required when equipment has to drive over the pipe. Backfilling and tamping should be done without damage to the ducts.

23 07 19 03 Cutting Pipe Installation of Saddle

a) Center the saddle on top of the pipe at your chosen location for your air supply register and trace around with a Sharpie. Use a template to provide a quick & easy guide for cutting the pipe.
b) Using the Sharpie outline as a pattern, draw another line 1 ½" inside first outline. Cut out inner drawing and remove any loose material from inside the pipe.
c) Use a ¼" bead of caulk on saddle and pipe surfaces.
d) Set the saddle on plumb and level.
e) Apply the screws provided in the locations pre-marked on the saddle. All the screws must be used to provide the seal.
f) Caulk around the saddle after the screws have been applied.
g) Once the concrete has been poured, cut off the protruding caps and install 4"x12" floor register.

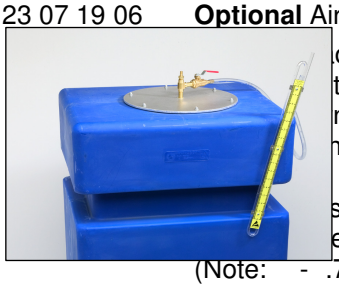
23 07 19 04 Installing an Inline Tee

a) Locate the desired register location. Plumb and level the Inline Tee and connect to your pipe using a clamp and gasket. See Instructions "Connecting the Pipe and Fittings". After the concrete is poured, cut off the protruding caps and install 4"x12" registers.

23 07 19 05 Installing the Offset Foot Boot

a) The Offset Footer Boot allows you to use the A.K. Duct underground system with wall registers (verses floor registers). Wall registers may be cut as much as 8" above the floor and can be used in a basement outside wall that is framed with 2x4 or 2x6" OC, or in the slab application. Above the ground registers and plenum provide added security against water seepage into the duct system due to backed up plumbing systems or minor flooding.
b) Locate the desired register location. Plumb and level the Offset Footer Boot and connect to your pipe using a clamp. Instructions "Connecting the Pipe and Fittings" Mark and Cut an opening to fit your wall register.

23 07 19 06 **Optional** Air Test Assembly



d of caulk under the air test plate.
test kit over existing hole in top of plenum.
n using screws provided. Caulk around
not using plenum attach air test plate to end
the same pressure test. Allow caulking to
s prior to testing.
e gauge to 1.5" W.C. on the manometer. (Note: - .75" and +.75 is 1.5" of W.C. pressure). System will hold 1.5" of W.C. for 5 minutes.

23 07 19 07 Installing the Plenum

a) To ensure easy installation, the THE BLUEDUCT® Plenum is constructed as a complete unit. Dig a hole in the appropriate location and insert the plenum. Mark the take-off location and cut your holes at the desired elevation. Each 4"x 12" Boot is a legal clean out. Pipe does not need to be sloped back to the Plenum. If a water problem should occur, drill a hole in the side of the protruding Plenum. (8" above the concrete) and use a shop-vac to remove any water. You can then place a rubber plumbing test plug in the hole according to the size drilled. Nothing else has to be done with the plenum until after the floor has been poured.

b) Mark the furnace opening and cut the plenum Use a template to provide a quick & easy guide for cutting the plenum. Place gasket around hole and adhere plenum to furnace. Cut to fit your furnace supply

23 30 00 HVAC AIR DISTRIBUTION

23 31 00 HVAC Duct and Casing

23 31 16 Nonmetal Ducts

1. *REFER to 23 05, 07*

23 31 16.18 HDPE DUCTS - *CATEGORY DOES NOT EXIST*

1. *CATEGORY DOES NOT EXIST, this is under application*

23 31 19 HVAC Casing

23 33 00 Air Duct Accessories

23 33 13 Dampers

