

INSTALLATION AND MAINTENANCE MANUAL



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 GETTING STARTED

INTRODUCTION TO QDUCT®

Engineered for exterior applications, QDuct® Outdoor Pre-Insulated Duct System is constructed to withstand harsh weather conditions in all climates. QDuct® is fabricated from multiple layers of ridged thermoset phenolic insulation panels that are laminated together to form a composite interlocking duct system with redundant seals for industry leading low leakage & maximum energy efficiency. Each phenolic panel is both internally & externally lined with a thermally bonded embossed aluminum cladding providing sequential layers of fiber-free high-performance insulation and corrosion resistant ingress protection. QDuct®’s exterior can be topped with an optional sloped roof fabricated from impact resistant closed cell tapered insulation panels for prevention of water accumulation & increased thermal energy performance. Finally, QDuct® receives an external layer of an all-weather, low permeability, multi-layered aluminum laminate cladding for enhanced ingress protection from the elements.

INSTALLATION TOOLS

Contractor Provided Tools & Material	AQC Provided Tools & Material
Circular saw with 3” cut depth & 45° blade articulation	QDuct® Sealant
Utility knife with 3” minimum extendable blade	Foil Mastic Tape
Rubber Mallet	Tiger Connectors
Flat Bar	Cladding Squeegee
Level	Exterior connector cladding
Square	Blue support plank
Caulk Gun (power operated recommended)	
Safety Glasses	
Gloves	
Rubber finger tips	
Black permanent marker	
Cardboard or plywood	
Flashing metal	
Extra Cladding Squeegees	
Shop-Vac	
Lifting straps (2” minimum width)	

INSTALLATION TRAINING

As a free service, AQC Industries hosts online Installation training webinars. **The online Installation training webinar is prerequisite for all new installers prior to beginning the installation process.** Registration for Installation training webinar can be found at AQC’s website at the following link. <https://www.aqcind.com/qduct/qduct-installation/>

PRODUCTION SUBMITTALS

As part of the QDuct® system, AQC Industries will generate detailed production submittals including layout drawings, item lists, and item detail shop drawings. Once a production submittal has been received carefully review the layout drawing to ensure accuracy with required dimensions. Report any required changes back to AQC with the corresponding item numbers to be modified. In the event a partial release of the duct system is required, please return the production submittal to AQC as approved with comments, and indicate on the submittal which items are approved for release and which are still on hold.

RECEIVING DELIVERY

Installing Contractor is required to inspect all QDuct® products received at time of delivery to ensure there are no damaged or missing products. Damaged or missing products are to be recorded on transportation company's shipping documentation with delivery driver's signature. Installing contractor is required to report a written description of the damaged or missing products, the received shipping documentation with "Damaged" Indicated, along with photographic evidence of damaged products to AQC within 24 hours of received shipment.



HANDLING MATERIAL

When handling QDuct® take caution to prevent damage to the duct system & job site. All OSHA safety guidelines should be followed to assure a safe & successful installation.

- Ensure adequate manpower is available to carry duct segments.
- Lift, do not slide the duct when transporting.
- Support duct from bottom seams when lifting by hand.
- Do not carry duct at the end connections.
- Use approved lifting straps to cradle circumference of duct when hoisting.
- Do not hoist duct by the support mounting rail.
- Do not drop duct.

STORAGE

The QDuct® system is fully weatherized & rugged outdoor duct system, however unconnected QDuct® segments need additional protection prior to the installation of the system. Indoor storage is recommended for best protection from water and foreign matter.

INDOOR STORAGE

- Store products in manufacturer's original packaging until ready for installation.
- Store products in a clean & dry area.
- Store Sealant, Foil Tape, & cladding above 40°F and dry prior to installation.



OUTDOOR STORAGE

- Store products in manufacturer's original packaging until ready for installation.
- Store products off the ground clear of ground water and away from high traffic areas to prevent accidental damage.
- Cover products with weatherproof tarp to protect from wind, UV light, precipitation and other foreign matter.
- Ensure products are firmly secured to prevent damage by wind.
- Ensure Sealant, Foil Tape, & cladding have been stored above 40°F and dry location prior to installation.

SITE CONDITIONS & PREPARATION

Prior to beginning installation, the staging area and work site need to be properly prepared to assure a safe and successful install. Do not begin installation until roof substrates & supports have been properly prepared. Ensure work site is clear of obstructions to allow for safe handling of material during installation process.

- Lay down protective surfaces (cardboard, plywood, tarp, etc.) in the staging areas prior to removing duct from manufacturer’s original packaging.
- Ensure interior & exterior surfaces of product are clean of dirt, debris and moisture prior to installation.
- Ensure equipment connections, wall penetrations, and curb connections are prepared prior to installation.
- Do not install QDuct® in the rain or snow.
- Do not install QDuct® below 40°F. If installation below 40°F is required, contact AQC Industries for further assistance.



INSTALLATION

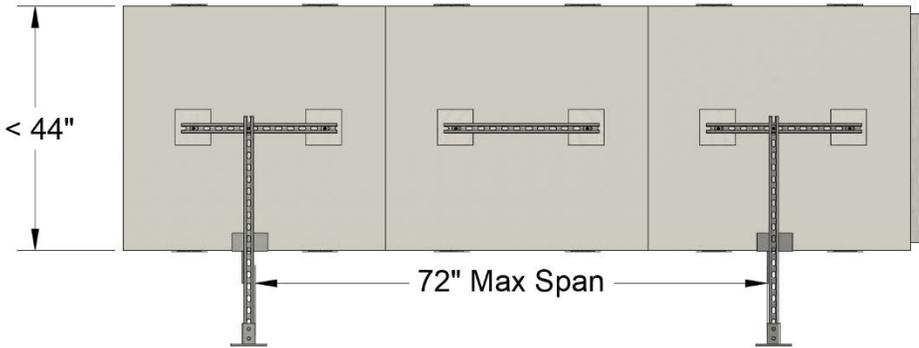
SUPPORTS

Supports and Hangers are the foundation of any duct system and adequate support is fundamental to ensure the integrity of the QDuct® system. AQC recommends that duct supports be used in compliance with SMACNA guidelines for “Phenolic Duct Construction Standards”, ANSI/SMACNA 022- 2015 as applicable for exterior ducting. Refer to engineer’s specifications for support stand design and roof attachment.

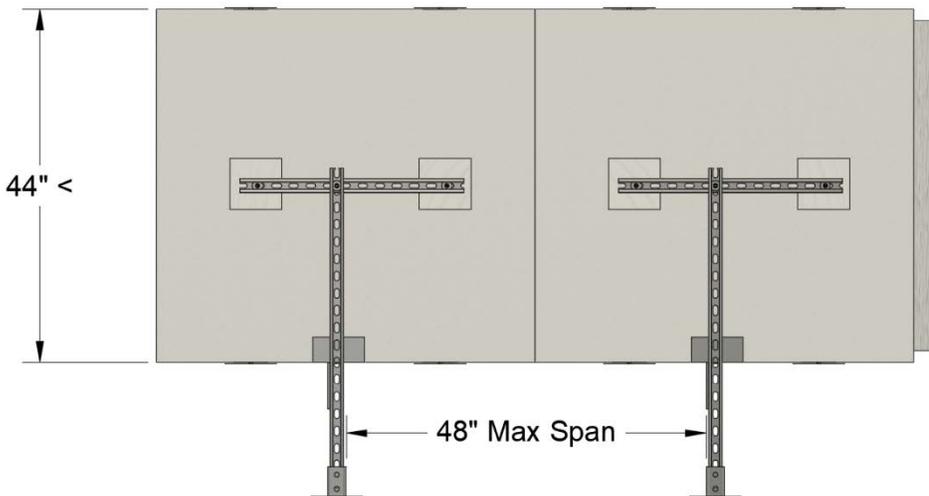
HORIZONTAL SUPPORT SPACING & CLEARANCE

AQC recommends that the minimum support height between the bottom of the duct and ground/ wall is 12”.

Duct Width or Depth less than 44” = Maximum Span 72”

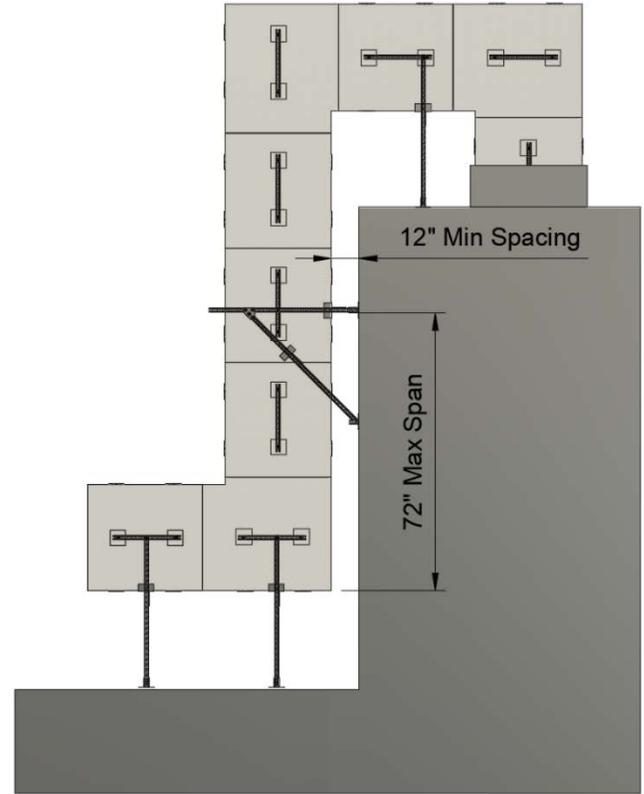


Duct Width or Depth greater than 44” = Maximum span 48”



VERTICAL SUPPORT SPACING

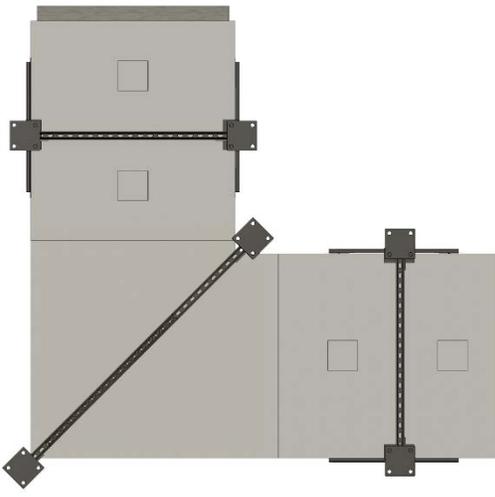
- For vertical “riser” sections with over 6’ of rise, AQC will install Unistrut support attachments to allow for anchoring to the wall.
- QDuct sections are to be supported a minimum of every 72” of vertical rise.
- AQC recommends a minimum spacing of 12” between walls and the exterior of the duct.



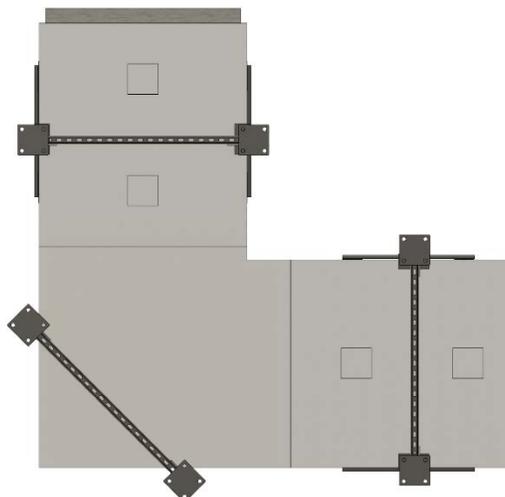
ELBOW SUPPORT PLACEMENT

- Support is required for all 90° elbows to support the extra weight caused by the turning vanes.
- There are multiple support variations that can be used to accomplish supporting elbows.
- Bottom of duct elbow support configurations are shown below.

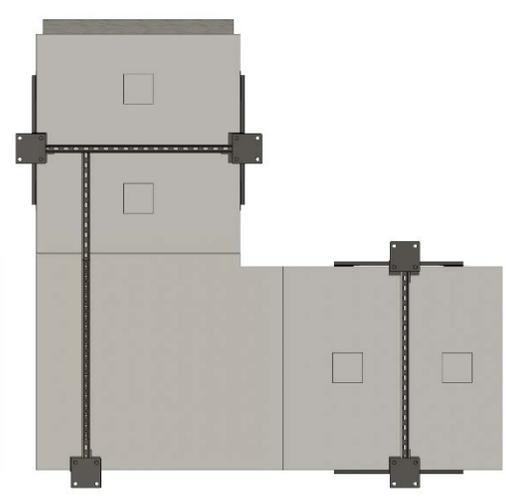
Option 1 (Recommended)



Option 2

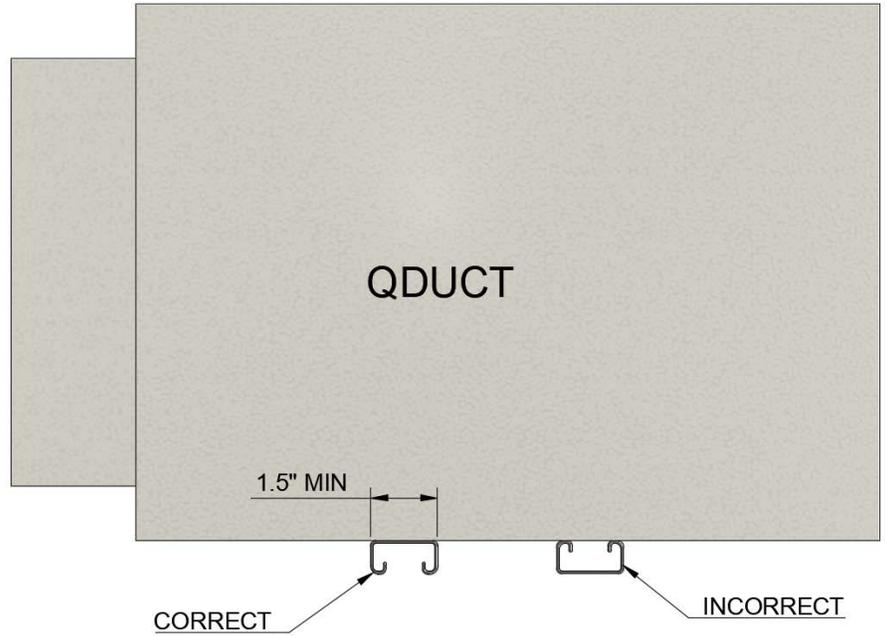


Option 3



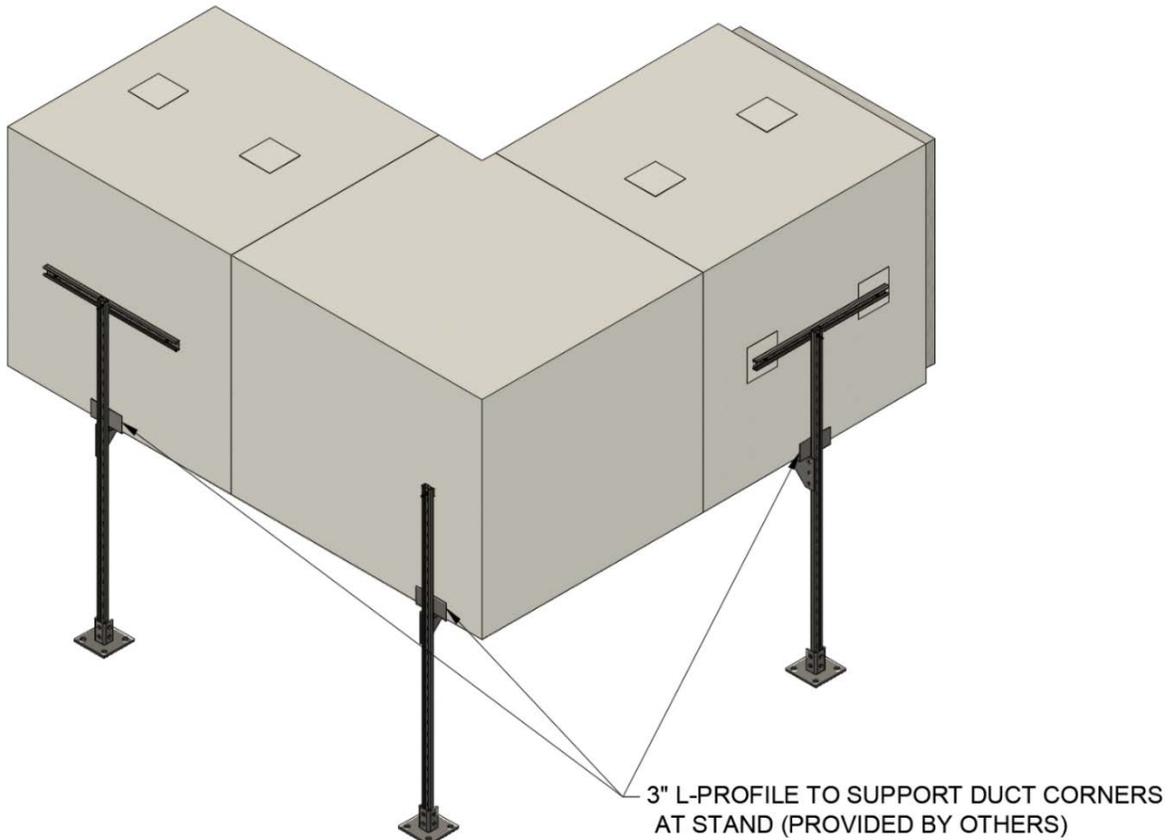
SUPPORT RAIL WIDTH

- Supports rails must be wide enough to adequately support the ducts weight without causing indentation into the external panel of the duct.
- Ensure flat side of Unistrut or C-Channel support is facing upwards to provide adequate surface area to support the duct.



CORNER SUPPORTS

- 3"x3" L Profile (22 GA Angle Iron) are to be used to protect the duct at the lower corners that rest on the support beam.

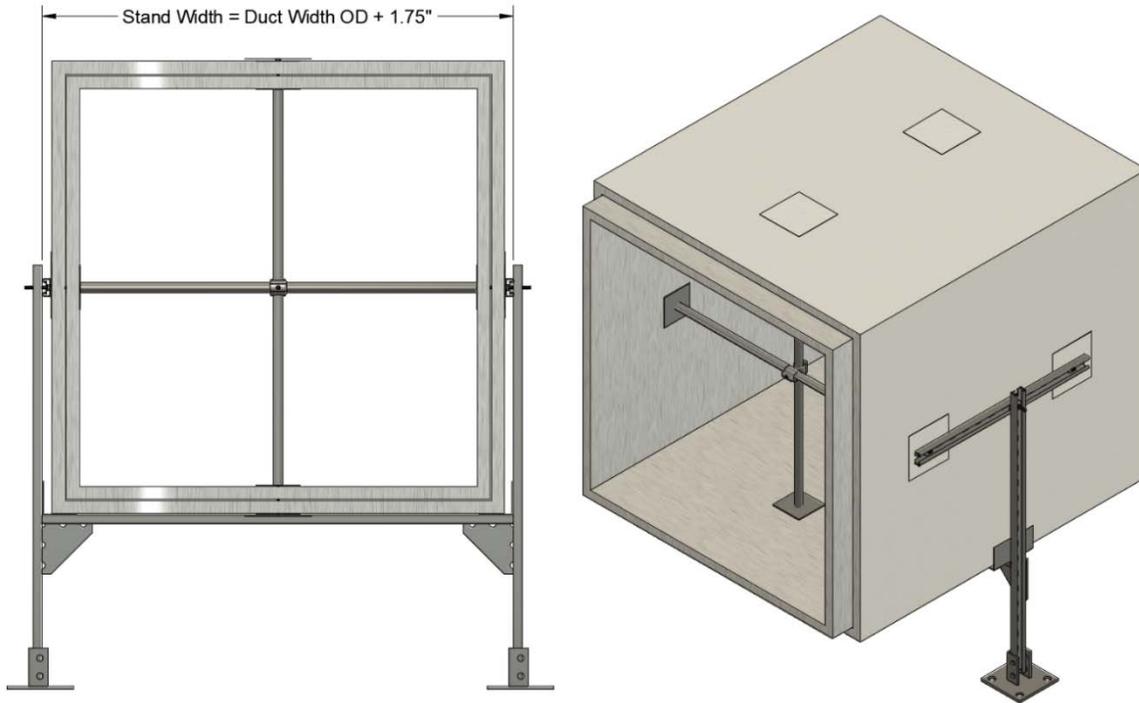


SUPPORT ATTACHMENT OPTIONS

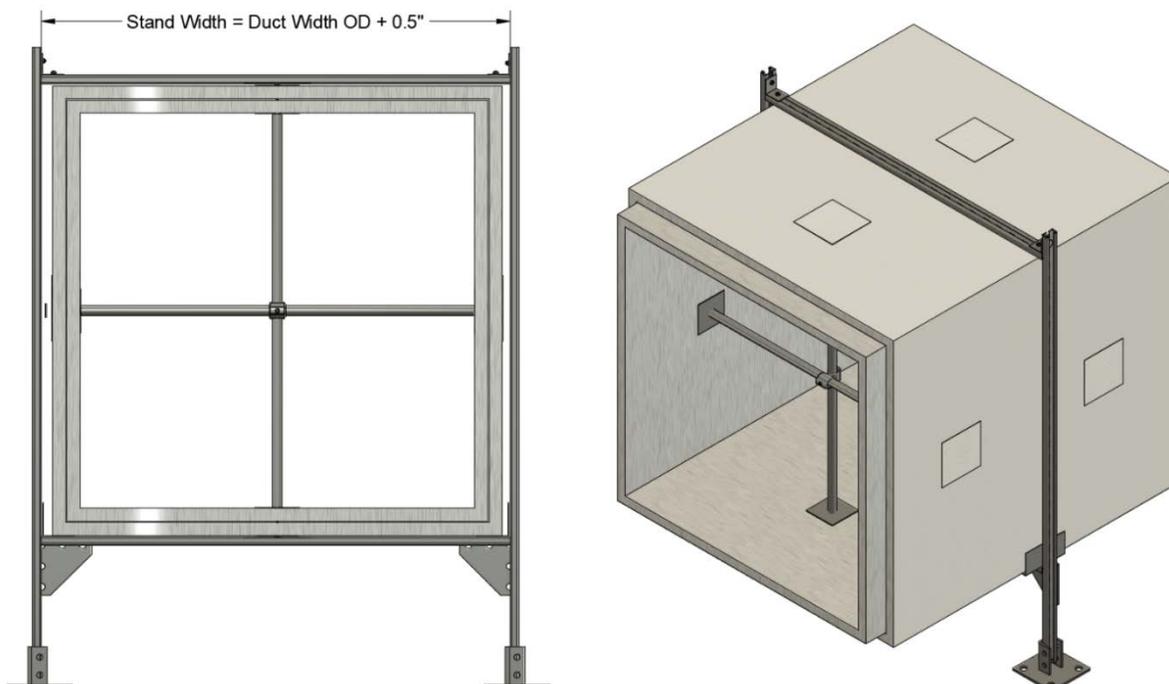
Support stands should be connected directly to the QDuct® Unistrut support mounts or supports should fully enclose (bottom, left side, right side and top) around the external walls of the duct.

- Supports should never be secured to the QDuct® system using screws, pins or other methods that would penetrate the external jacket of the Q Duct system.

UNISTRUT SUPPORT ATTACHMENT



FULLY ENCLOSED SUPPORT ATTACHMENT



INSTALLATION ORDER

AQC recommends starting installation from the Unit onward. This allows for installation of the largest items first and smallest items last.

Recommended Installation Order

1. Joining QDuct® to Unit
2. Joining QDuct® sections
3. Joining tap connections
4. Joining End of Run connections
 - a. Equipment Connections
 - b. Curb Connections
 - c. Wall Connections

To aid the installation process, each QDuct® system is shipped with a layout drawing and an item list.

- The layout drawing is numbered for each item. Each item receives a label on the interior of the duct displaying its corresponding size and item number.
- Reference the item number on the interior of the duct with the numbered layout drawing.

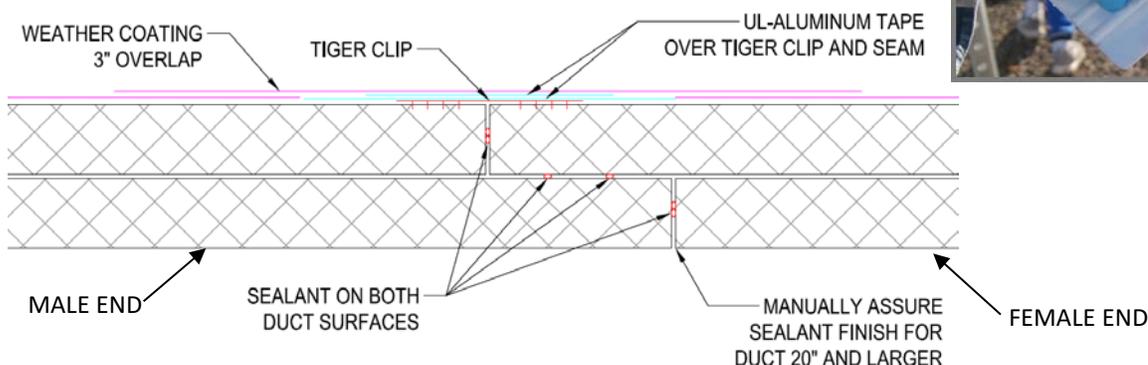
Once an installation order has been determined begin unpackaging and placing duct into the staging area.

- Sort items by determined installation order in the staging area.
- Only remove items from manufacturer's original packaging that can be installed during the same day.
- If installation is not completed by end of work day, cover ends of installed duct to prevent intrusion of water or foreign matter into system.

JOINING

MALE-FEMALE INTERLOCKING CONNECTION

1. Prep the edges to be joined by rounding down the connecting edges of the male and female ends to provide a slight bevel upon initial contact when joining the pieces. This will help guide the pieces together.



- Apply sealant to both the Male and Female joints. Sealant shall be applied to both the internal duct layer and the external duct layer. Additional beads of sealant must be applied around the entire circumference of both internal 3" interlocking surfaces. Ensure sealant maintains a continuous bead width of at least 3/8".



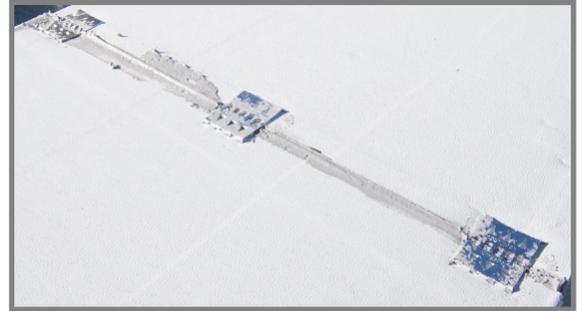
- Firmly press and hold the interlocking Male-Female connection together. A properly sealed joint will ooze a small amount of sealant around the entire circumference on both the internal and external walls of the duct. Apply additional sealant to fill any observed voids at the connection. Continue to apply pressure until all tiger connectors have been firmly seated into the connection.



- With a rubber mallet, tap the tiger connector clips into the duct to join the two sections. Ensure to align the tiger connector clip so that the center of the clip evenly straddles the connection seam. Tiger connector spacing shall be a maximum of 12" between clips on each seam and within 3" of every corner. Smooth additional sealant that has oozed out of the joint with a finger or sealant tool, pushing the sealant into the connection seam as it is being smoothed.



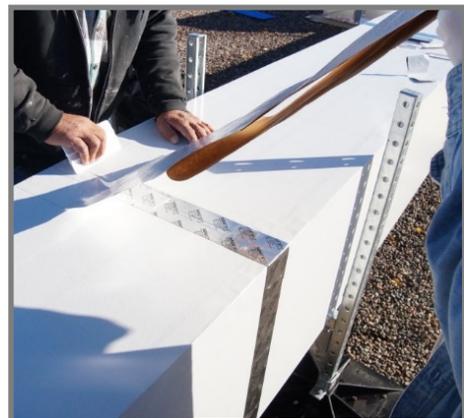
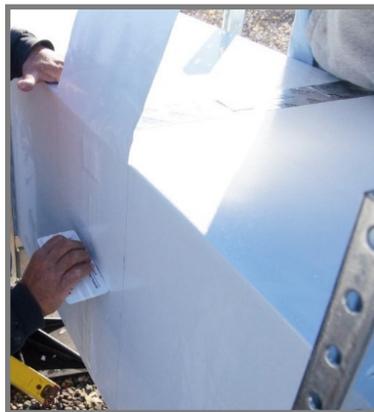
- Apply the foil mastic tape over the tiger clips and exterior of the duct joint. Ensure the tape is centered over the duct joint and fully covers the inserted tiger connectors. Use a squeegee to smooth and apply force to applied foil tape, properly adhered taped will show embossed texture from underneath.



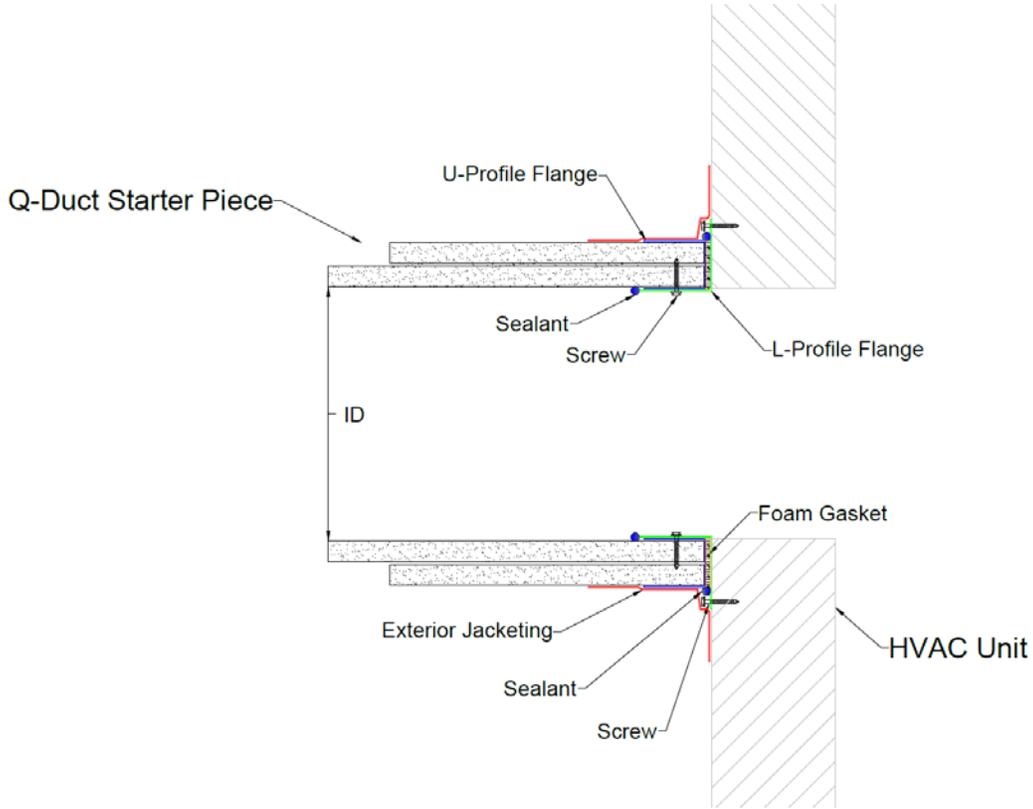
- Run a finger or squeegee across the joint on the interior of the duct to seal and smooth the excess caulk. Add more caulk as necessary to fill the joint. If it is necessary to crawl inside the duct utilize the blue plastic board to disperse weight and prevent the interior of the duct from becoming damaged. Ensure the duct is properly supported underneath before placing any weight on the duct. On inaccessible interior joints, use extra caulk before making the connection to ensure a sufficient seal is achieved.



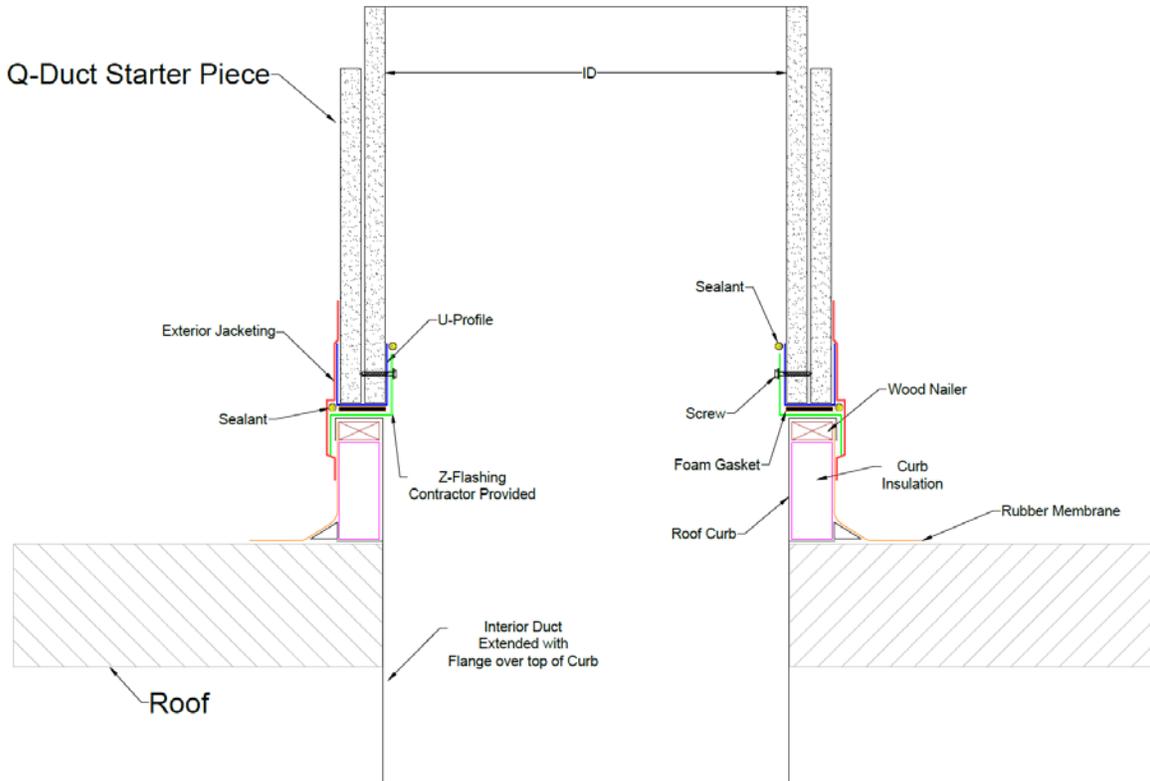
7. Apply the exterior cladding over the tape, tiger connectors, and duct joint. From the supplied exterior cladding roll, cut two strips for both the exterior width & depth of the duct plus an additional 12". (2x Width+12", 2x Depth+12", 4 Strips in total). Ensure the cladding strip is centered over the connection seam and provide at least 6" of overlap onto the adjacent sides of the duct. Apply cladding strips in the order of bottom, sides, top. This ensures all overlapping seems are facing down to maximize water shedding. Do not have overlapping cladding seems on top of duct. With a squeegee, apply heavy pressure to smooth and adhere the cladding to the exterior of the duct. Run the squeegee along every seam to ensure the edges are tightly adhered.



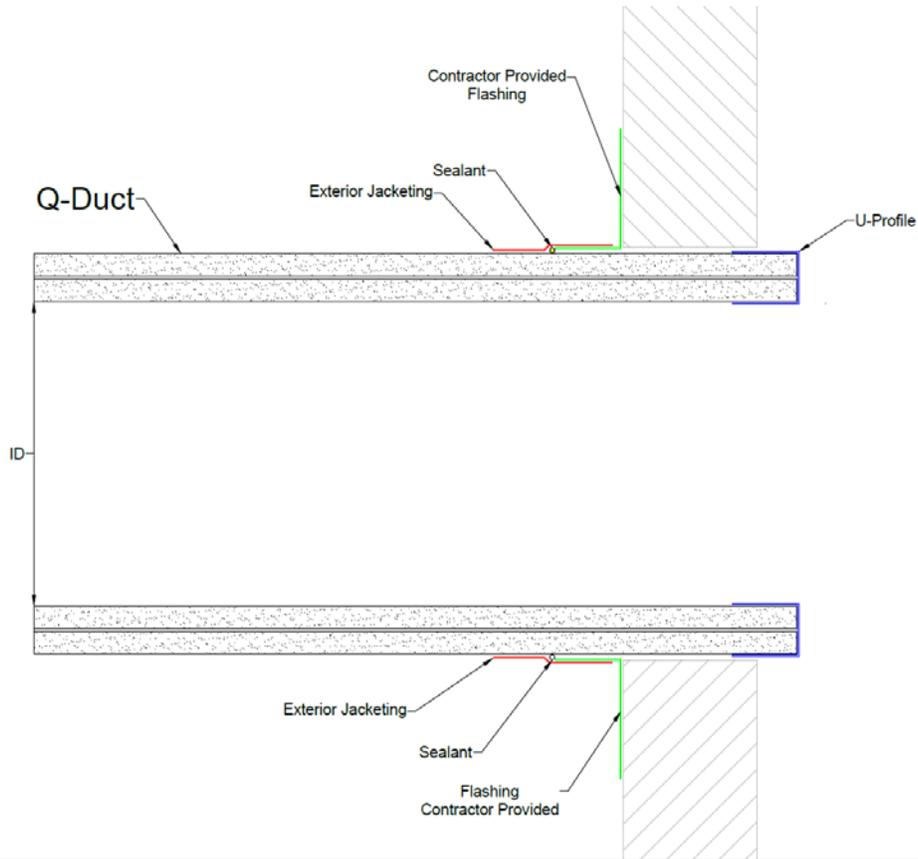
UNIT & EQUIPMENT CONNECTIONS



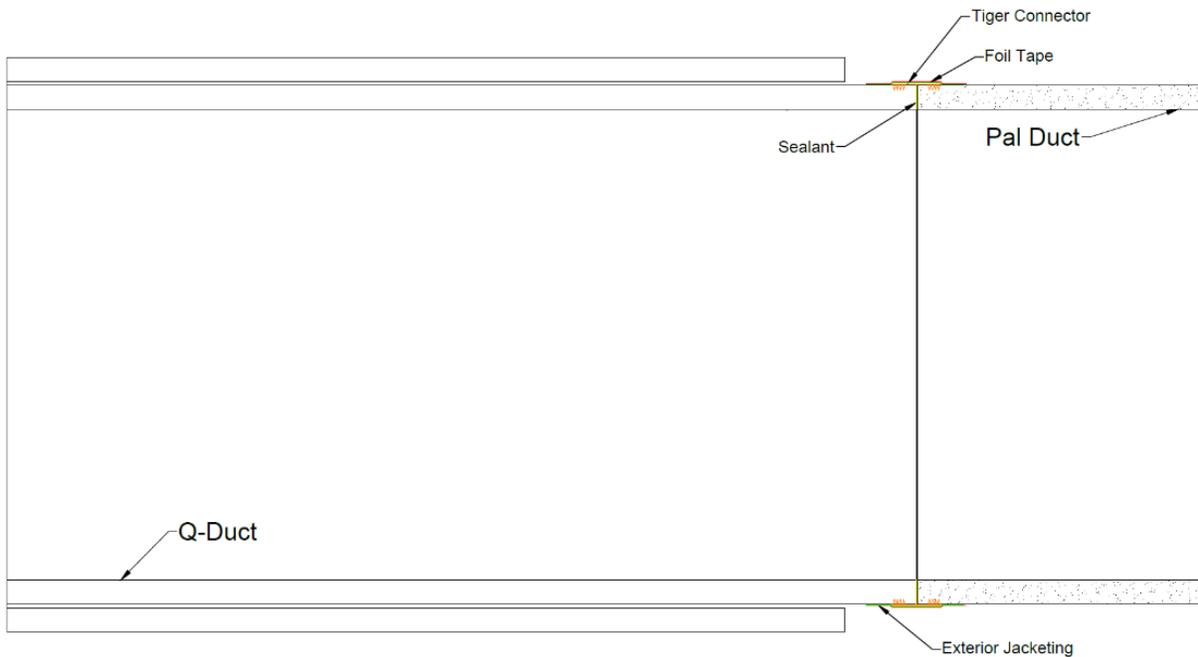
CURB CONNECTION



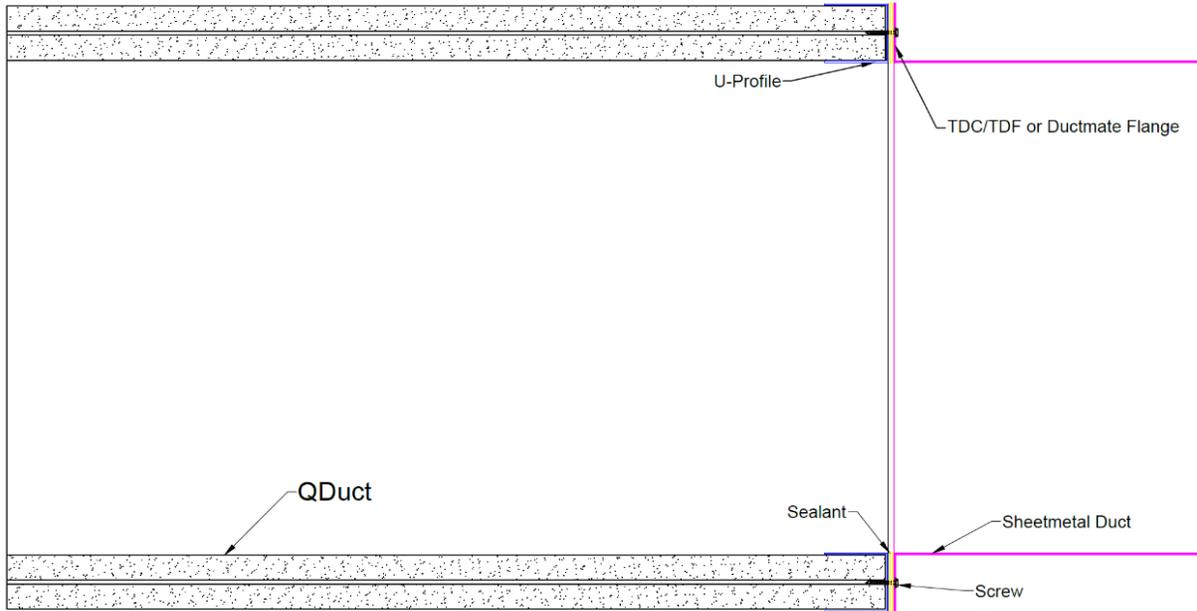
WALL CONNECTION



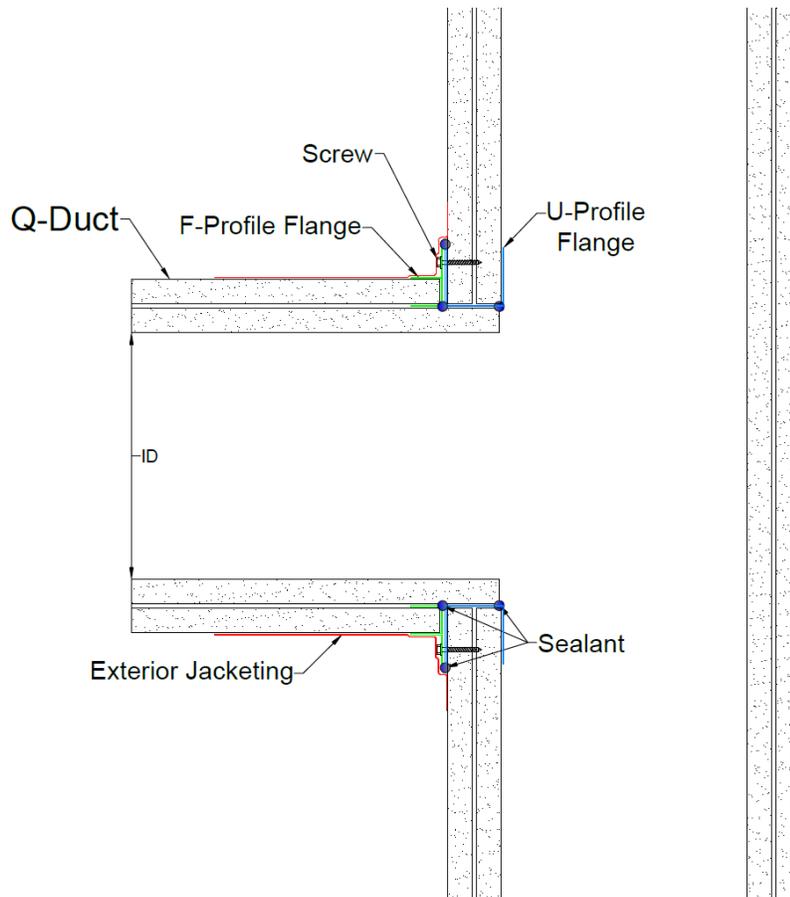
PALDUCT CONNECTION



TDC/TDF DUCT CONNECTION



TAP CONNECTION



FIELD MODIFICATIONS

MODIFYING QDUCT® LENGTHS

When making length adjustments in the field, AQC recommends to cut from the male connection (Protruding Inner layer). Add 3" to this measurement from the female end for your new male connection end and cut the duct off. Cut the exterior panel off 3" back from the new end by setting the circular saw blade depth to 1-1/8". Slide a long thin blade between the panels to loosen the adhesive attaching the panels together. Carefully peel off the outer layer to make a new male end. Apply sealant to any cuts or punctures into the internal insulation. Apply foil mastic tape to all exposed internal insulation faces and the cut edges. Apply a small bead of caulk along the joint between the outer and inner panel layers.

POST INSTALLATION

COMMISSIONING & PRESSURE TESTING

If pressure testing is required by the specifying engineer, test QDuct® system in accordance with SMACNA HVAC Air Duct Leakage Test Manual on at least 10% of the total installed duct area. A properly installed QDuct® system is capable of achieving SMACNA Air leakage Class 1. Do not test QDuct® system above design pressure class. Over pressurization may cause damage to the duct system and will void the warranty. After a minimum of 24 hours has passed since the last sealed connection was made, the system can be tested to 1" static pressure for 5 minutes. The QDuct® Sealant must fully cure (requires 3 days) if a higher static pressure is required. AQC recommends to wait a minimum of 72 hours from making the last sealed connection to start up the HVAC unit. Never exceed 7in WG of static pressure while testing.

PAINTING

The QDuct system can be custom field painted. Please consult with the project Architect and your preferred painting professional for color selection and paint recommendations. For best energy performance AQC Industries does not recommend painting the exterior cladding of QDuct®. This is due to the standard color, polar white, is already optimized to maximize thermal reflectivity and reduce thermal absorption.

MAINTENANCE

All mechanical system require maintenance to ensure the performance and longevity of the system. AQC recommends a visual inspection of the system at least once annually. Inspect the unit connections, wall connections, and curb connections for leaks into the QDuct® system. Inspect the QDuct® system exterior for punctures, air pockets, or damaged caused by vandalism or severe weather. The QDuct® system is specifically designed for quick and easy repairs in the event of damage. For small punctures & dents, clean the cladding around the damaged area with isopropyl alcohol.

Apply QDuct® sealant into the puncture or dent and allow 5 minutes to cure. Cover the sealant with a foil mastic tape and use a squeegee to firmly apply pressure to the tape. Cut to size a patch of cladding, (ensure patch is at least 6"x6") and apply over top of the foil mastic tape. Use a squeegee to firmly apply pressure to the cladding and run squeegee along seams to ensure the cladding is properly adhered.

 WARRANTY

AQC INDUSTRIES LIMITED WARRANTY IN GENERAL

AQC Industries (AQC) warrants QDuct® Products sold either directly or through its resellers (representatives and distributors) in accordance with the limited warranty set forth in this document (the Limited Warranty). Except as expressly provided in the Limited Warranty, AQC makes no representation or warranty of any kind, express or implied, with respect to QDuct® Product, whether as to merchantability, fitness for a particular purpose, warranties arising from course of dealing or usage or trade or any other matter.

AQC does not install QDuct® Products and has no responsibility or obligation with respect to installation. AQC DISCLAIMS ALL WARRANTIES RELATED TO INSTALLATION OF QDuct® PRODUCTS. AQC offers webinar based QDuct® Installation Training Certification to installing contractors at no charge and recommends this training prior to installing the QDuct® Product.

AQC INDUSTRIES LIMITED WARRANTY

AQC Industries (AQC) warrants that in normal and contemplated use and service, QDuct® Products shall be free from defects in manufacturing materials and workmanship for a period of ten (10) years from the date of manufacture set forth on each of QDuct® Products (the Limited Warranty). The Limited Warranty shall only be applicable if AQC is given prompt written notice specifying the nature of the warranty claim within the applicable warranty period.

Upon confirmation by AQC that a QDuct® Product proves to be defective in manufacturing, materials or workmanship, the exclusive remedy shall be for AQC to, at its option, repair or replace the defective QDuct® Product or issue a credit or refund. The Limited Warranty does not extend to any QDuct® product subjected to misuse, accident, or alteration. This Limited Warranty does not extend to improper installation.

This Limited Warranty does not cover any loss caused by accidents or careless handling of a QDuct® Product. This Limited Warranty does not apply to any QDuct® Product which has been damaged in transit, abused, altered, modified, used in a manner not originally intended, or used. This Limited Warranty does not cover any QDuct® Product that has been installed in a manner not consistent with the QDuct® Product instructions.

The Limited Warranty set forth above is the only warranty AQC makes for QDuct® Products and is in lieu of all warranties express, implied or statutory, including, without limitation, warranties of merchantability, fitness for a particular purpose and infringement, and warranties arising from course of dealing, usage of trade or otherwise. THE REMEDIES SET FORTH IN THIS LIMITED WARRANTY ARE THE ONLY REMEDIES AVAILABLE TO ANY PERSON CLAIMING FOR BREACH OF WARRANTY OR FOR ANY DAMAGES OF ANY KIND OR NATURE. AQC SHALL NOT HAVE ANY OTHER LIABILITY OF ANY DESCRIPTION, WHETHER ARISING OUT OF WARRANTY (INCLUDING ANY IMPLIED WARRANTIES) OR ANY OTHER CONTRACT, NEGLIGENCE, TORT OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, COST FOR REMOVAL OF DEFECTIVE PRODUCT, COST FOR INSTALLATION OF ANY REPLACEMENT PRODUCT, COMMERCIAL LOSS FROM ANY CAUSE, BUSINESS INTERRUPTION OF ANY NATURE, LOSS OF PROFITS OR ANY OTHER CONSEQUENTIAL LOSS OR DAMAGE, EVEN IF AQC SHALL HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH LOSS OR DAMAGE.

In the event any implied warranties (including, but not limited to the implied warranties of merchantability and fitness for a particular purpose) are found to exist, such warranties are limited (i) in duration to the period of the limited warranties set forth in this Limited Warranty, and (ii) in amount to the total amount paid to AQC for the product in question.