

Installation & Start-Up Manual Ovens

Class 8



- >> Safety
- >> Component Description
- >> Installation Onsite
- >> Oven Component Installation

This Installation Manual reviews an introduction, safety, component description, installation, maintenance and warranties of RTT's batch ovens.

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Revised August 2020

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1. General Notes

1.1 Introduction

Thank you for purchasing a RTT oven. Please read and understand this manual before using your oven and follow all of the safety instructions. Please be sure to keep this manual with your oven at all times.

This manual explains the assembly and routine maintenance of the RTT oven and covers the following product lines:

>> Batch Ovens – BO

The oven itself consist of a heater box unit, burner, recirculation fan(s) and ductwork, a working environment and exhaust fan(s) and ductwork.

The text contained in this manual is for the most current production models.

Equipment modifications from the original design and specifications are strictly prohibited. Modifications may compromise safe operation of the oven, subjecting users to serious injury or death and may void any remaining warranty.

This manual does not replace, nor does its use release the operator from observing all safety or operating limitations as well as any applicable federal, state, provincial or local regulations.

Only qualified personnel should perform the installation. Specifically, qualified personnel typically include equipment riggers, electricians, mechanical contractors and properly trained end user personnel.

1.2 Receiving, Unpacking, And Reporting Missing Items

Check for damage when receiving and unloading equipment. Note on Bill of Lading “FREIGHT DAMAGE”. Notify the RTT customer service department immediately of any damage.

Unpack all items and verify on the packing list within (10) days of receipt. Notify RTT customer service department of missing items and discrepancies immediately. RTT will not pay overnight freight on shorted items. If overnight freight is necessary, the buyer shall be accountable for freight cost.

For quality control, RTT's shipping department photographs all items as they are packed.

Per company policy, two independent checks are performed to verify each item against the packing list. If RTT determines that the reported shortage was checked off in our records, replacement parts will be shipped AND invoiced accordingly.

Items that can be shipped UPS usually take 1-3 days to receive, depending on distance. Items too large for UPS will ship via common freight. This shipping method typically takes from 1-5 days to reach the destination.

2. Safety




2.1 Safety Alert Symbol And Signal Words

Before assembling, operating or servicing the spray booth, you must read, understand and follow the instructions and safety warnings in this manual. Your spray booth may not be equipped with some of the optional equipment described in this manual.

NEVER ALLOW ANYONE TO OPERATE THIS EQUIPMENT WITHOUT PROPER TRAINING!

The safety information in this manual is denoted by the safety alert symbol: 

The level of risk is indicated by the following signal words:

 DANGER
DANGER - Indicates a hazardous situation, which, if not avoided, WILL result in death or serious injury.
 WARNING
WARNING - Indicates a hazardous situation, which, if not avoided, could result in death or serious injury.
 CAUTION
CAUTION - Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.
NOTICE
NOTICE - Indicates a situation that could result in damage to the equipment or other property.

Assembly Hazards

WARNING

Prevent serious injury or death.

Overriding a safety system may result in unsafe equipment, which may result in serious injury or death.

Do not override safety devices.

WARNING

Blade hazard. Keep hands clear of rotating parts.

Follow lockout procedure before servicing.

WARNING

Prevent serious injury or death.

Use adequate lifting devices to raise, move and install booth components.

WARNING

Prevent serious injury or death.

Electrical installations must be performed by qualified electricians.

Installation must conform to all national, local, and provincial codes and standards.

Operational Hazards

⚠ WARNING

Prevent serious injury or death.

Do not operate machine with guards and/or covers open or removed.

⚠ WARNING

Prevent serious injury or death.

Only trained and qualified personnel may operate booth.

⚠ WARNING

Prevent serious injury or death.

Never operate spray booth while under the influence of drugs, alcohol or while feeling ill.

⚠ WARNING

Prevent serious injury or death.

Always wear personal protective equipment (PPE) appropriate for job.

Read Material Safety Data Sheet for products used in spray booth.

⚠ WARNING

Shock hazard.

Only a qualified electrician may open electrical control cabinet.

Disconnect and lockout / tagout all power sources before adjusting, repairing, or cleaning booth.

Maintenance Hazards

⚠ WARNING

Prevent serious injury or death.

Disconnect and lockout / tagout all power sources before adjusting, repairing, or cleaning booth.

⚠ WARNING

Prevent serious injury or death.

Service, maintenance and adjustments must be performed by trained and qualified personnel.

⚠ WARNING

Burn hazard. Do not touch hot parts.

Allow to cool before servicing.

⚠ WARNING

Prevent serious injury or death.

Always wear personal protective equipment (PPE) appropriate for job.

Read Material Safety Data Sheet for products used in spray booth.

2.2 Safety Decals

DANGER	
	No smoking No open flames No sparks

RTT 100-488-0000 © 2019

DANGER
Electrical Shock Hazard
Disconnect electric before service.
More than one disconnect switch may be required to disconnect electric from equipment.
Equipment must be properly grounded.
Failure to follow these instructions can result in death or electrical shock.
<small>Printed in the USA</small>
DANGER
Risque de Choc Electrique
Débrancher le courant avant l'entretien.
Plus qu'un interrupteur de verrouillage peut être requis pour débrancher le courant électrique de cet appareil.
L'appareil doit être connecté à une source de courant reliée à la terre.
Le non-respect de ces instructions peut entraîner de la mort ou des chocs électriques.
<small>Imprimé aux E.-U.</small>

	DANGER
	Severe Injury Hazard
	Do not enter equipment while in operation. Equipment may start automatically.
	Do not operate with door open.
	Installation, operation and service must be done by a trained technician only.
	Failure to follow these instructions can result in death or injury.
	<small>Printed in the USA</small>
	DANGER
	Risque de Blessures Graves
	Ne pas entrer dans cet appareil pendant l'opération.
	Cet appareil peut démarrer automatiquement à tout moment.
	Ne pas opérer l'appareil avec la porte ouverte.
	L'installation, l'opération et l'entretien doit être effectués par un installateur éprouvé.
	Le non-respect de ces instructions peut entraîner de la mort ou des blessures.
	<small>Printed in the USA</small>

WARNING
Improper installation, adjustment, alteration, service or maintenance can result in death, injury or property damage. Read the Installation, Operation and Service Manual thoroughly before installing or servicing this equipment.
<i>Installation, modification, réglage ou maintenance incorrectes peuvent provoquer de la mort, des blessures ou des dégâts matériels. Lisez attentivement le manuel d'installation, d'opérations et d'entretien avant l'installation ou l'entretien de cet équipement.</i>
This heater must be installed in accordance with the manufacturer's instructions and local codes. In the absence of local codes, follow the National Fuel Gas Code, ANSI Z223.1 / NFPA 54 of the CAN/CSAB149 installation code.
Cet aérotherme doit être installé en accord avec les instructions du fabricant et les réglementations locales. S'il n'y a pas des réglementations locales, l'installation doit être en accord avec le Code National de Gaz de Carburant, ANSI Z223.1 / NFPA 54 ou le Code d'installation, CAN/CSA-B149.

WARNING
To protect you and others against death or serious injury, all applicable labels shown must be on the booth and must be legible.
If any of these labels are missing or cannot be read, contact your RTT for replacement labels.

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2.3 Safety Devices

This oven was designed with several safety devices used to protect the installation. Do not bypass or disconnect these safety devices during operation. These safety devices include, as a minimum, the following:

2.3.1. Safety Devices for Gas and Electric Ovens:

- > Motor Overloads
- > Air Proving Switches
- > Purge Timers
- > Powered Exhaust
- > Guards for Moving Parts
- > Explosion Relief Doors/Hatches
- > High Temperature Limit Switch

2.3.2. Additional Safety Devices for Gas Ovens:

- > Safety Shut Off Valve
- > High/Low Gas Pressure Switch
- > Combustion Safeguard System
- > Proof of Closure Switch

2.4 Maximum Solvent Content

This oven is designed to handle a limited amount of solvent per batch. Solvent levels in excess of the maximum allowed may create an explosive atmosphere in the oven. Operators should contact their managers if they do not know what portion of their load is solvent.

2.5 Paper, Wood and other Solid Combustibles

Do not load paper, wood or other solid combustibles without consulting RTT for appropriate safety measures that must be taken for these processes. There is a danger of fires and explosions resulting in property damage, personal injury or death.

2.6 Maintenance – Periodic and On-Demand

The operator has an important role in the proper maintenance of the oven. The operator should shut down the oven and immediately notify management if the odor of gas is present. The operator should immediately notify their supervisor of any changes in operating performance. The operator should NOT restart the oven if a high limit alarm exists. The operator should notify management and insure that the cause of the high limit trip is corrected before the oven is restarted.

2.7 Proper Housekeeping

In maintaining safe oven operation, it is important that proper housekeeping be performed at all times. Allowing varnish to build up in handling carts, for example, contributes to the maximum allowable solvent in the oven and could subsequently cause a fire or explosion. All drippings and combustible products should be cleaned regularly from handling carts and the oven interior. Certain applications cause flammable materials to accumulate in oven exhaust ducts. These items should be inspected and either cleaned or replaced as necessary.

2.8 Explosion Venting Doors and Hatches

Most ovens include explosion relief doors or hatches to allow the oven to vent itself in the case of an explosion. These hatches or doors should not be obstructed. Operators should not stand near these openings.

2.9 Belt Guards

This oven should not be operated if the guards over the moving parts have been removed. When purchased, all ovens include guards secured over all moving parts, i.e., conveyor belts and fan belts. Operators should turn off the oven and notify management if guards are not secured. Guards should be re-secured prior to returning the oven to operation.

2.10 High Voltage

This oven operates on voltages high enough to cause physical injury or death. Only qualified personnel should service the oven or open the control panels or junction boxes.

2.11 Maintain Unobstructed Airflow

In order to maintain a non-explosive atmosphere in the oven, it is important that the circulation and exhaust be unobstructed. Operators should load the oven in a manner that allows adequate air movement in the oven.

2.12 Fire Protection

In accordance with NFPA 86, “Ovens containing or processing sufficient combustible materials to sustain a fire shall be equipped with automatic sprinklers or water spray.” Consult NFPA 86 for supporting details. Contact your local fire control specialist for assistance.

3. Component Description

3.1 Compliance To Applicable Codes

This oven is designed to be in strict accordance with the National Fire Protection Association Standard Number 86, "Standard for Ovens and Furnaces."

3.2 Material Specifications

All oven panels are manufactured with a minimal gauge thickness of 20. The structural steel members are all manufactured to conform to ASTM A36.

3.3 General Description

3.3.1. Work Area

The work area is the area located between the doors, walls and roof where the parts to be preheated, dried or cured are placed. This parts or product in this area needs to maintain a minimal 1 foot clearance from oven components.

3.3.2. Heater/Burner Box

The Heater box unit is factory assembled and tested prior to shipping. This unit contains the burner units as well as any recirculation fan required. The main control panel as well as the gas train will be located on this unit for electrical and gas utility connections.

3.3.3. Recirculation Fan(s) and Ductwork

Recirculation fans are designed for the required static pressure and volume of air required for the designed amount of necessary air changes in the oven. The ductwork will need to be adjusted for even and uniform airflow throughout the oven's working area. Ductwork locations can be on the side wall or the roof of the oven. Heater boxes can be floor mounted or roof mounted depending on design.

3.3.4. Exhaust Fan(s) and Ductwork

Exhaust fans are designed to remove the necessary flow to maintain a hazard free environment. The ductwork shall not run with high restriction or horizontally. The exhaust fan is equipped with an air flow switch which monitors the operation state of the fan, stopping the operation of the burner if airflow is not present.

3.4. Exhaust Flow Rates

Air flow rates are calculated by using the coating in the operation as well as part load. The exhaust rates shall not be altered or slowed at any time. The oven will also require a purge time where the exhaust fan will remove a minimum of 4 times the oven volume of air before allowing the burner to light. Never place parts into the oven that were not in the ovens initial design as a hazardous environment can be created.

3.5. Control Panel

The oven will have a main control panel located on the heater box unit, and another remote panel for Human Machine Interface (HMI). Electrical schematics will be located in the main control panel along with drawings

for electrical installation and requirements. Field installed panels and electrical wiring must be installed by a licensed electrician. The cabinet that will house the controls is NEMA 12 rated. It is not suitable for installation in a Class 1, Division II or higher area. Refer to the NFPA 70 for electrical zoning requirements.

4. Installation Onsite

4.1 General

This manual is a guide for installing a variety of ovens. The assembly drawings enclosed are specific for the oven you have purchased. This drawing is an exploded isometric drawing showing the relationship of each panel or part to the next one. A packing list of all components is provided and must be used in addition to the drawing to identify all components.

All DAMAGES MUST be reported within 24 hours of receipt and a freight claim filed with the carrier.

4.2. Preliminary

RTT ovens are manufactured in accordance with the NFPA 86 standard for Ovens and Furnaces; however, local codes and regulations may apply to the installation and use of this product. All permits and approvals should be obtained prior to the installation and use of the oven.

- > Uncrate and inventory all oven components to ensure all of the parts are accounted for. Each component is numbered on the exploded view.
- > The floor surface of the oven must be non-combustible material of such character as to facilitate the safe cleaning and removal of residues.
- > The floor surface must be flat and level.
- > Mark the dimensional outline of oven on floor.
- > Follow the step-by-step instructions provided.

4.2.1. Recommended Oven Layout Tools

- > Chalk line or self-leveling 5-way laser
- > Tape measure
- > Marker
- > Framing square

Use the 3-4-5 method (Pythagorean Theorem) $A^2 + B^2 = C^2$ for a right triangle to layout and square the booth. C is the longest side (hypotenuse) and A and B are the two shorter legs. If a triangle has sides measuring 3, 4 and 5 feet (or any other unit), it must be a right triangle with a 90° angle between the short sides. You can multiply each number by the same amount and still use this method.

For example let's say that the booth width being installed is 9' I.D., use a multiplier of 3 to achieve the 9' I.D. working width of the booth for your first line (A²) and the right triangle will consist of the following dimensions:

- > $3 \times 3 = 9$ (first line A²)
- > $4 \times 3 = 12$ (second line B²)
- > $5 \times 3 = 15$ (third line C²) **4.2.2.**

Layout Steps

Step 1: Locate a building drawing showing the oven in the building.

Step 2: Locate a dimension shown from a reference point such as outside wall, pit, conveyor, building structure, other equipment, etc. to the inside dimension of the oven.

Step 3: Using a chalk line, mark that dimension at two points along a wall (reference point example) and snap a line on the floor.

Step 4: Locate the back of the oven and make a mark on the first line that was snapped for the first corner of the oven (I.D.), using 9' as the first line dimension (A² example) make another mark at 9' for the back wall of the oven.

Step 5: Using 12' as our second line dimension (B² example) make another mark at 12' from one of the corner markings of the back wall off of the first line snapped. When doing so, be sure to stay as square as possible. This is when a framing square comes in handy. Once marked, snap the second line.

Step 6: Using 15' as our third line dimension (C² example) mark and scribe an arc crossing the end of the second line snapped from the opposing corner marking of the back wall off of the first line snapped. This mark is now perfectly square to the back wall of the oven. Snap the third line between these two marks.

Step 7: Pull two points off of the third line and snap a fourth line marking the interior work area of the oven. Now that the square interior of the oven is complete, continue with the rest of the components such as exhaust ductwork penetrations to verify that all components are placed as planned without obstruction.

Step 8: Using a laser, verify building clearance, fan ductwork and heater box clearances.

Step 9: Using a laser, verify that the floor is level. Any area that will have more than a 1/4" gap will need to be shimmed.

Step 10: Double check the entire layout for accuracy and to prevent losing your layout, spray clear coat over it before beginning the oven installation.

4.2.3 Recommended Oven Installation Tools

- > Step ladders (4', 6' and 8')
- > Wrench and socket set (1/2", 9/16" and 3/4" most common)
- > Screw driver set
- > Allen wrench set
- > Hammer and Dead Blow
- > 4' Level

- > Caulk gun
- > Large knife for cutting insulation
- > Tape measure
- > Chalk line
- > Screw gun
- > Hammer drill (1/4" and 3/8" bits most common)
- > Locking C-Clamp
- > Saw for cutting angle, floor channel and trim
- > Welding machine

4.3 Planning Ahead

4.3.1. Oven Location

The oven should be located at or above grade on a level, non-combustible floor. Adequate space should be provided above the oven and on all sides to permit routine maintenance and inspection. A minimum of three feet clearance must be maintained between the oven and any combustible walls or ceiling. The explosion proof relief doors and hatches cannot be obstructed.

4.4 Oven Assembly Types

4.4.1. Factory Assembled Ovens

4.4.1.1. Removing Shipping Supports

Occasionally, temporary supports are built into the oven frame to provide reinforcement during shipping and handling if the oven is shipped assembled. Specifically, ovens with steel plate floors or those ovens without any floors usually have angle iron supports across the bottom of the doorways. After the oven has been located at the place of final installation, these supports should be cut out.

4.4.1.2. Leveling the Oven and Proper Door Operation

It is common when installing the oven for the doors to appear to be hinged improperly. It is especially deceiving when an oven has doors on both ends. The oven must be level for proper door operation. If its not level, place a shim under one corner of the oven frame. If the leveling improves with the shim, continue adding shims until the doors are level. Shims may be required on more than one door for those ovens with doors on both ends. See Section 5 for more information on leveling the doors.

4.4.1.3. Securing the Oven

Shipping brackets and floor mounts are attached to the sides of the oven at the base of the frame if the oven is shipped assembled. After the oven has been properly located and leveled, it should be anchored to the floor. If the oven has a steel plate floor, it may be desirable to secure the oven floor to the plant floor. When securing the floor to the cement flooring, it is important to only anchor one end.

4.4.2. Partially Assembled Factory Ovens

All ovens are tested at RTT prior to shipping. However, for shipping and handling purposes some ovens require final assembly at installation. Height restrictions in shipping and handling sometimes require that burner boxes be built removable and the oven cabin be shipped knocked-down. Width and depth restrictions sometimes require that the oven be built in sections. Occasionally, at the customer's request, the control panel might be built for remote installation.

4.4.2.1. Burner Box Assembly

The burner box houses the recirculation fans and the burner. The fan motors and air seals are also generally attached. If the oven has the burner box removed from the oven then the following steps are required for reassembly: Pick up the burner box using provided attachment points.

See Section 5 – Process 5 or 6 for more detailed instructions.

4.4.2.2. Exhaust Fan Assembly

The exhaust fan assembly includes the exhaust blower, motor, air flow switch and intake ductwork. If the exhaust fan has been removed from the oven, the following steps are required for reassembly:

1. Pick up the exhaust fan assembly using a forklift or overhead means.
2. Attach the exhaust kit to the top of the oven using the provided hardware. The exhaust kit is located over the large diameter hole. Reference the detailed drawings for exact location.
3. Reattach the electric wires from the kit. The exhaust kit requires 2 separate electrical connections; one for the motor and the other for the air flow switch.
4. Reconnect any air tubes that have been disconnected.

4.4.2.3. Remote Control Panel Attachment

Due to shipping or handling limitations, the remote control panel is sometimes removed. The remote control panel generally includes all controls that the operator must use on a daily basis, such as any temperature controls, start/stop switches, batch timer. The main control panel will contain the motor starters, the flame safety and the electrical service disconnect.

If the remote mounted control panel was removed, then the following steps are required for re-installation:

1. Mount the remote panel back to the brackets
2. Reconnect all wiring into the terminal blocks.

4.4.3. Unassembled Ovens

Completely unassembled ovens will come from the factory on pallets and crates. Aside from the Heater Box, Exhaust Fan Kit and Product Doors the oven is entirely field assembled.

Reference Section 5, Oven Component Installation for installation of these types of ovens

4.5. Connecting Utilities

Installation of the oven requires the connection of utilities. All ovens require electric service for powering the motors and controlling the oven. All gas ovens require the connection of gas service. Almost all ovens require the connection of an exhaust stack. Ovens with a dry chemical fire suppression system require that the end user contact a local fire control specialist for fire control system activation.

4.5.1. Electric Service

Each Oven has one single point of connection; this connection is located in the main control panel that is located on the heater box unit.

It is imperative that the electrical service be adequately sized for the usage of the oven. All electrical work should be done by a licensed electrician and per the National Electric Code and NFPA 70.

The detailed drawing package as well as the approval package will address the requirements for the oven.

4.5.2. Gas Service

In order to operate properly, the oven requires a specific inlet gas pressure. RTT ovens are designed to operate on a gas supply pressure maximum of 5 PSI. Do not exceed this gas pressure or gas train damage will result. An additional positive shut-off regulator located prior to the oven gas train is typically required to provide the appropriate gas pressure. A qualified mechanical contractor should be able to size the gas lines and regulators accordingly.

If using LP/Propane as the fuel source the burner will need to be checked prior to connection to ensure the burner is rated for LP gas. If this is noted on the detailed drawings then the burner will be LP from the factory. If not noted or noted as Natural Gas DO NOT use the burner with LP gas.

Eclipse Burner will have a model number located on a metal tag on the burner (not the blower).

Model will be AH22.0###-AAN or AH22.0###-AAP

N= Natural Gas P=LP/Propane

4.6. Exhaust Stack Installation

Any oven that is fueled by gas and any oven that is used to process a product that contains flammable volatiles or combustible material must include a powered exhaust fan. Exhaust stack is not provided with the oven but purchased separately. If ductwork was not sent with your oven, you must contact a local mechanical contractor or supplier for the appropriate ductwork.

4.6.1. Exhaust Stack Type

The type of stack required varies with exhaust temperature and the mechanical specifications of the building in which it is installed. Consult your local building and equipment authority for the relevant building code. In order to meet NFPA Standard 211 for Chimneys, Vents and Solid Fuel Burning Appliances a positive pressure stack rated for the applicable temperature is required.

4.6.2. Stack Termination (NFPA 211 - Section 4)

A metal chimney for an oven operating up to 500°F should extend at least three feet above the highest point where it passes through the roof and at least two feet above any portion of the building within ten feet laterally. For those ovens operating at temperatures greater than 500°F but less than 900°F, the chimney should extend at least ten feet above the highest point where it passes through the roof and at least ten feet above any portion of the building within 25 feet laterally.

4.6.3. Stack Clearances (NFPA 211 - Section 4)

A metal chimney should have a clearance of not less than 24” from any wooden construction or combustible material. A metal chimney shall have a clearance no less than 2” from any non-combustible structure. A metal chimney erected on the outside of a building shall not be installed any closer than 24” to any door, window or walkway. Consult NFPA 211, Section 4 for details on installation of a chimney through any story of a building or a combustible roof.

4.6.4. General Requirements

The exhaust fan static restriction was calculated using 20-foot tall, straight vertical exhaust stacks with no bends or turns. Any bends or turns in the exhaust stack may restrict the exhaust, causing a reduction in the maximum gallons of solvent that the oven can safely handle. Ensure that the oven was designed to operate with the needed ductwork configuration onsite before operating the oven.

5. Oven Component Installation

This section will cover a detailed step by step of the different components needed to be installed to make build an assembled oven. The following information is broken down by section:

- > Process 1 – Floor Assembly
- > Process 2 – Wall Assembly
 - 2(a) – Ovens WITHOUT Internal Support Structure
 - 2(b) – Ovens WITH Internal Support Structure
- > Process 3 – Door Jamb and Door Header Assembly
- > Process 4 - Roof Assembly
- > Process 5 – Heater Box Installation (Floor Mounted)
- > Process 6 – Heater Box Installation (Roof Mounted)
- > Process 7 – Flashing Walls and Roof
- > Process 8 – Recirculation Ductwork Installation
- > Process 9 – Product Door Opening Support Structure Assembly
- > Process 10 – Product Door Assembly

- > Process 11 – Door Seal Configuration and Assembly
- > Process 12 – Door Latch and Handle Installation
- > Process 13 – Exhaust Fan Kit Installation
- > Process 14 – Return Air Screen Installation

Process 1 – Base Channel and Floor Assembly

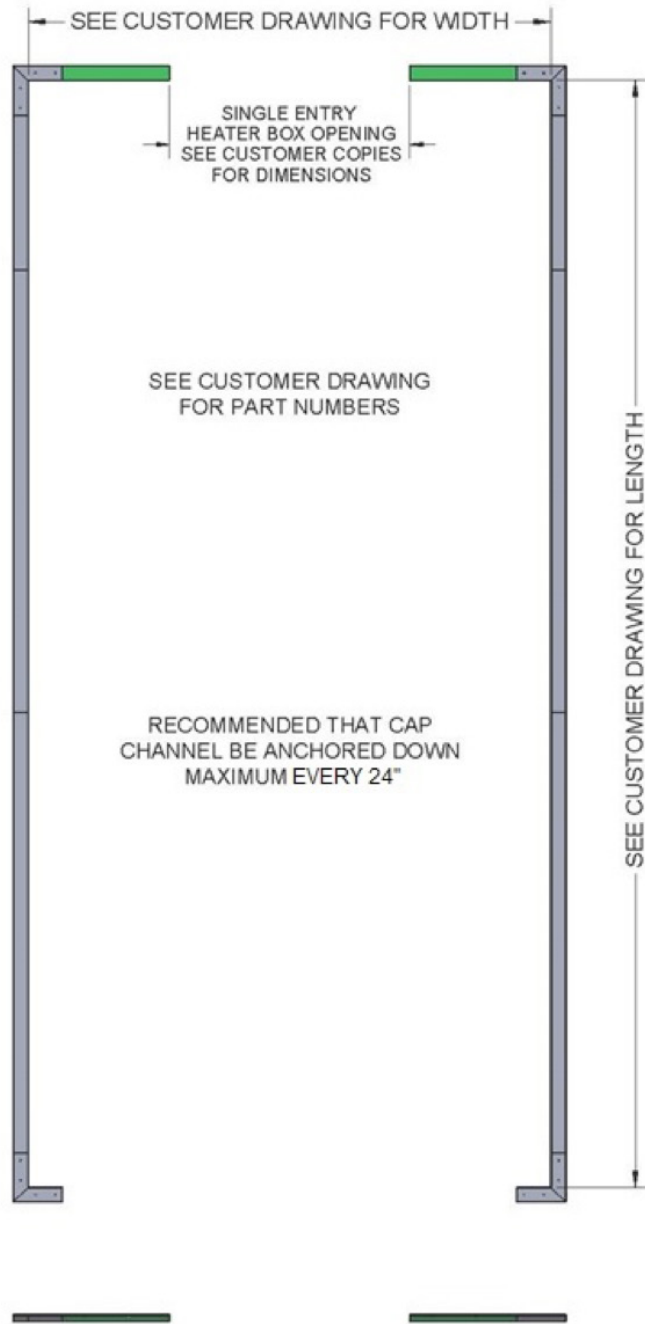
Step 1 - Layout Base Channel

- a) Using the layout lines created from process 4.2.2 lay the base channel components to the outside of the line. Reference Figure 1
- b) It may be necessary to cut the base channel to fit the length and width of the oven.
- c) Ensure that any gaps in base channel are correctly spaced for door openings or heater box locations.
- d) Once all base channel has been arranged appropriately use ¼” pin anchors (not provided) to anchor the base channel. It is recommended to anchor each end of every piece and not to span more than 24” between anchor points.

Step 2 - Optional ¼” Mild Steel Flooring

- a) If the oven was provided with a ¼” plate steel flooring cover, lay the plates per Figure 2.
- b) The plating should have a ½” gap to the side wall base channel to allow for expansion of the plate without buckling.
- c) The plating should also have a 1” gap to end wall base channel to allow for expansion.
- d) There is no need for a gap in between the plate metal pieces.
- e) It is recommended that the plates be stitch welded together with a minimal ¾” weld every 24”.
- f) It is recommended that the plate floor be anchored to the cement across the center of the oven ONLY. This will allow for the plate floor to expand without buckling.
- g) The anchors can be welded and ground smooth to not interfere with cart casters as well as eliminate trip hazards.

FIGURE 1




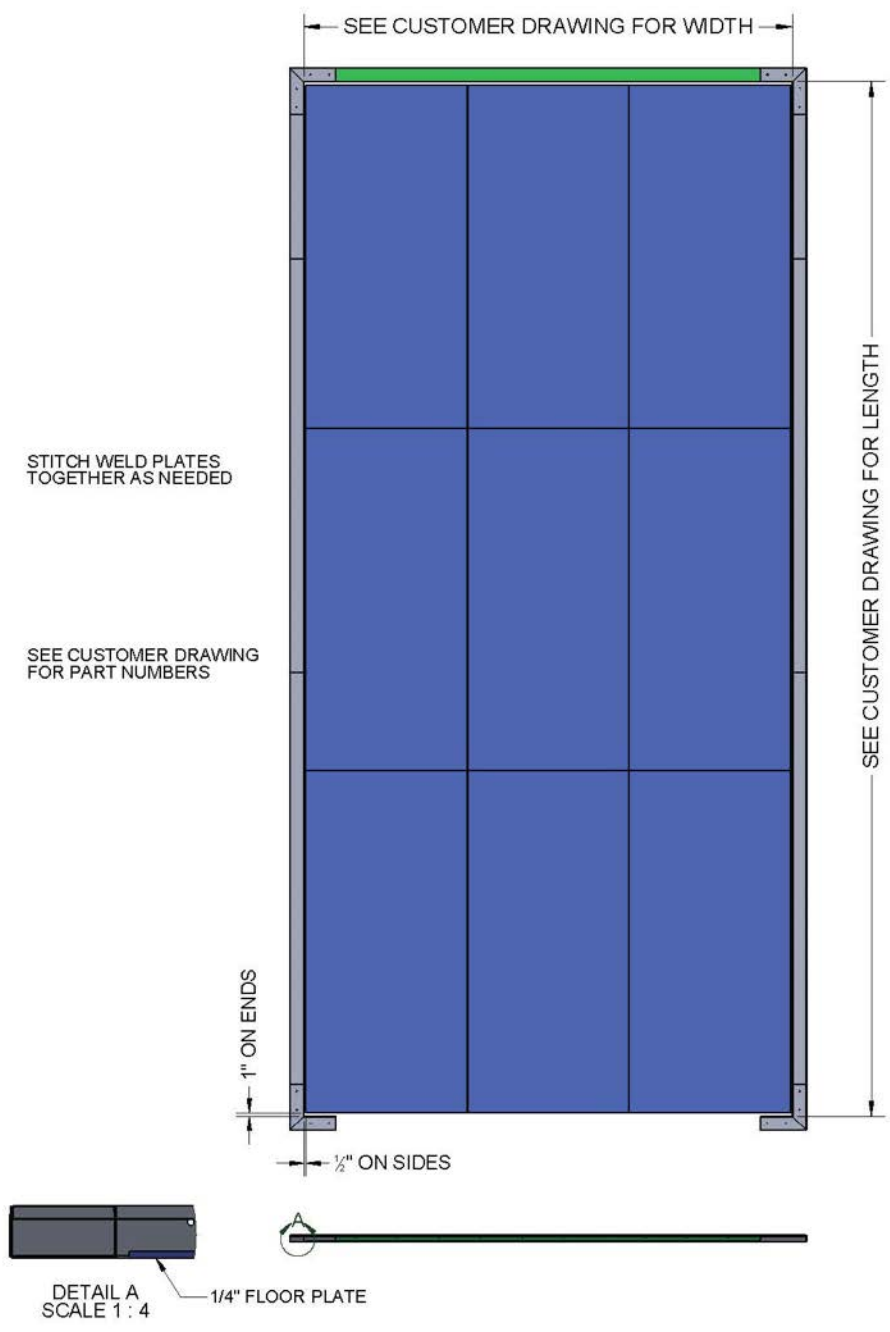
CAP CHANNEL FOR DOUBLE ENTRY
 FOR SINGLE ENTRY

FIGURE 2



FOR DOUBLE ENTRY WITH OPTIONAL 1/4" FLOOR PLATE

■ SINGLE ENTRY OPTION

Process 2(a) – Wall Assembly (Ovens WITHOUT Internal Support Structure)

Step 1 - Preparing the insulated panels to be erected

- a) Insulating the panel channels
 - i) Fill the male side of the panel with the 2” strip insulation as well as the top and bottom channel
 - ii) DO NOT insulate the female channel at this time

Step 2 - Erect the first panel located at the corner that is a Female – Female configuration (See Drawing Packet for Item Number)

- a) Once panel is vertical and in the correct position apply two stitch screws through the cap channel thru-holes to the bottom of the panel to secure it into place
 - i) Ensure that the panel is plumb before fastening

Step 3 - Before the next panel can be installed a bead of cement will need to be applied to the inside of the female channel. Reference Figure 3

Step 4 - Erect the panel that is orientated 90° to the side wall panel that was first erected. (See Drawing Packet for Item Number)

- a) Once panel is vertical and in the correct position apply two stitch screws to the bottom of the panel to secure it into place
 - i) Ensure that the panel is plumb before fastening

Step 5 - A piece of the T-7 angle trim will need to be cut to length per the drawing packet.

- a) Once cut apply a bead of cement to each leg of the angle that will contact the insulated panels per Figure 4
- b) Fasten the T-7 trim to the insulated panels using the stitch screws provided starting at the bottom and working to the top alternating from one leg to the other.

Step 6 - Once a sturdy corner has been established the erection of the remaining side wall panels can be completed repeating the above steps as necessary.

NOTE: Ensure that the panels are plumb after installing each one and that they are resting completely down inside of the base channel.

Step 7 - When side walls are completed the T-7 trim that runs the length of the wall at the top of the panels needs to be installed. See Figure 5

- a) The T-7 trim may need to be cut to length or multiple pieces may be required
- b) It is recommended that the ends of the T-7 trim be mitered on a 45° angle. Reference Figure 5

Step 8 - Fasten the T-7 trim using the stitch screws provided starting on one end and working towards the other.

Process 2(b) – Wall Assembly (Ovens WITH Internal Support Structure)

Step 1 - Erecting the internal support structure

- a) Using the Drawing Packet supplied with the oven, locate the positioning of the vertical columns.
- b) The columns will need to be positioned in the exact location required and the back of the column will rest against the inside of the base channel.
- c) Anchor the columns to the floor with 4-1/2" x 1/2" wedge anchors (not supplied).
- d) Attach the horizontal beams to the columns per the drawing packet with the supplied 1/2" hardware.
- e) The T-7 trim will need to be welded to the top of the beams for the side wall and end wall connections. Reference Figure 6
 - > Ensure that the columns are plumb before welding the T-7 to the beams
 - > The T-7 trim may need to be cut to length depending on the oven sizing

Step 2 - Preparing the insulated panels to be erected

- a) Insulating the panel channels
 - > Fill the male side of the panel with the 2" strip insulation as well as the top and bottom channel
 - > DO NOT insulate the female channel at this time

Step 3 - Erect the first panel located at the corner that is a Female – Female configuration (See Drawing Packet for Item Number)

- a) Once panel is vertical and in the correct position apply two stitch screws through the cap channel thru-holes to the bottom of the panel to secure it into place
 - > Ensure that the panel is plumb before fastening
- b) Apply a 3/8" bead of cement to top of the panel where it will connect to the T-7 trim before fastening to the top of the panel with stitch screws

Step 4 - Before the next panel can be installed a bead of cement will need to be applied to the inside of the female channel. Reference Figure 3

Step 5 - Repeat the above steps until all of the wall panels have been erected

NOTE: Ensure that the panels are plumb after installing each one and that they are resting completely down inside of the base channel.

FIGURE 3

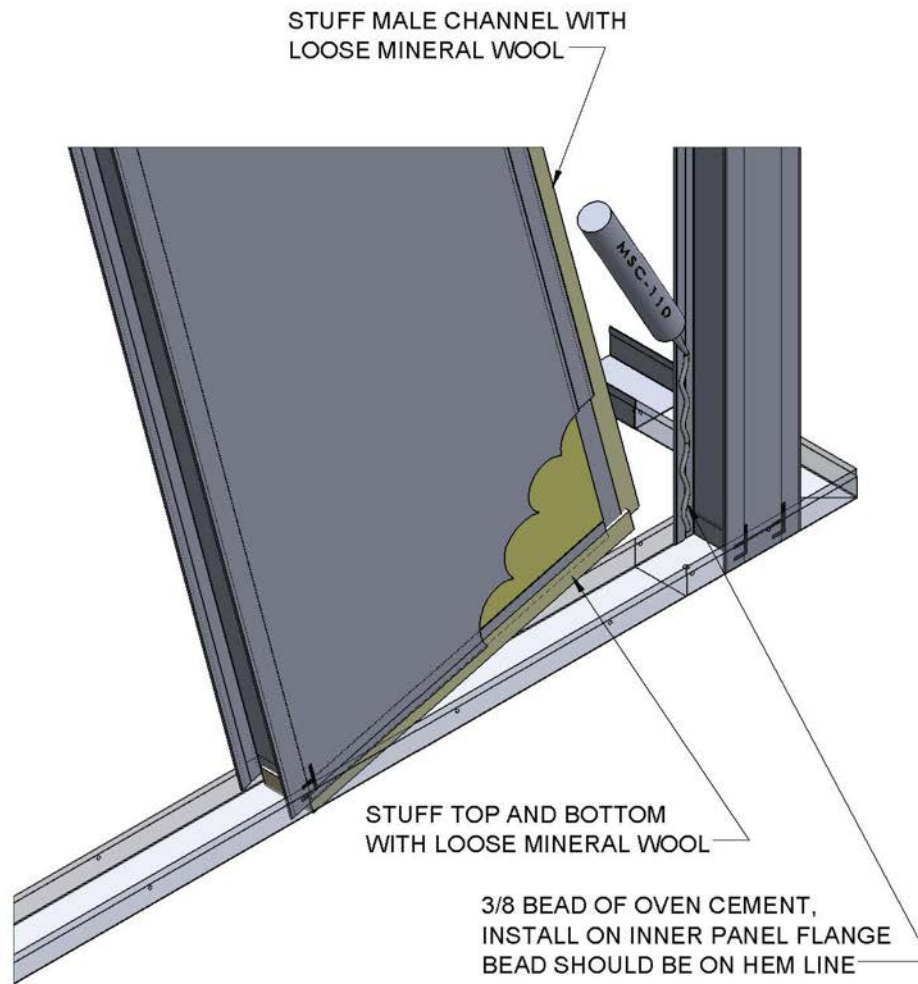
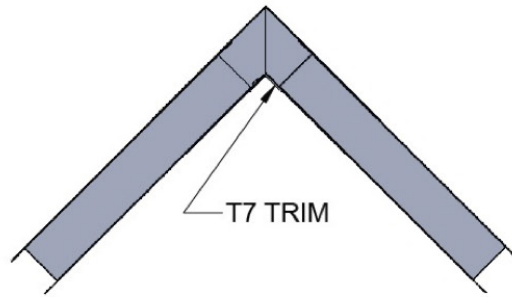
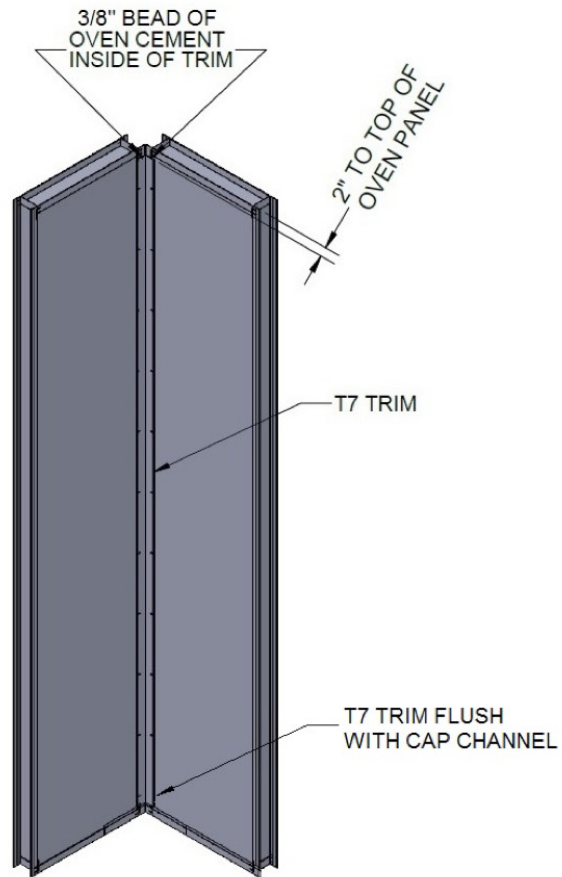


FIGURE 4



PLAN VIEW



INSIDE OVEN

FIGURE 5

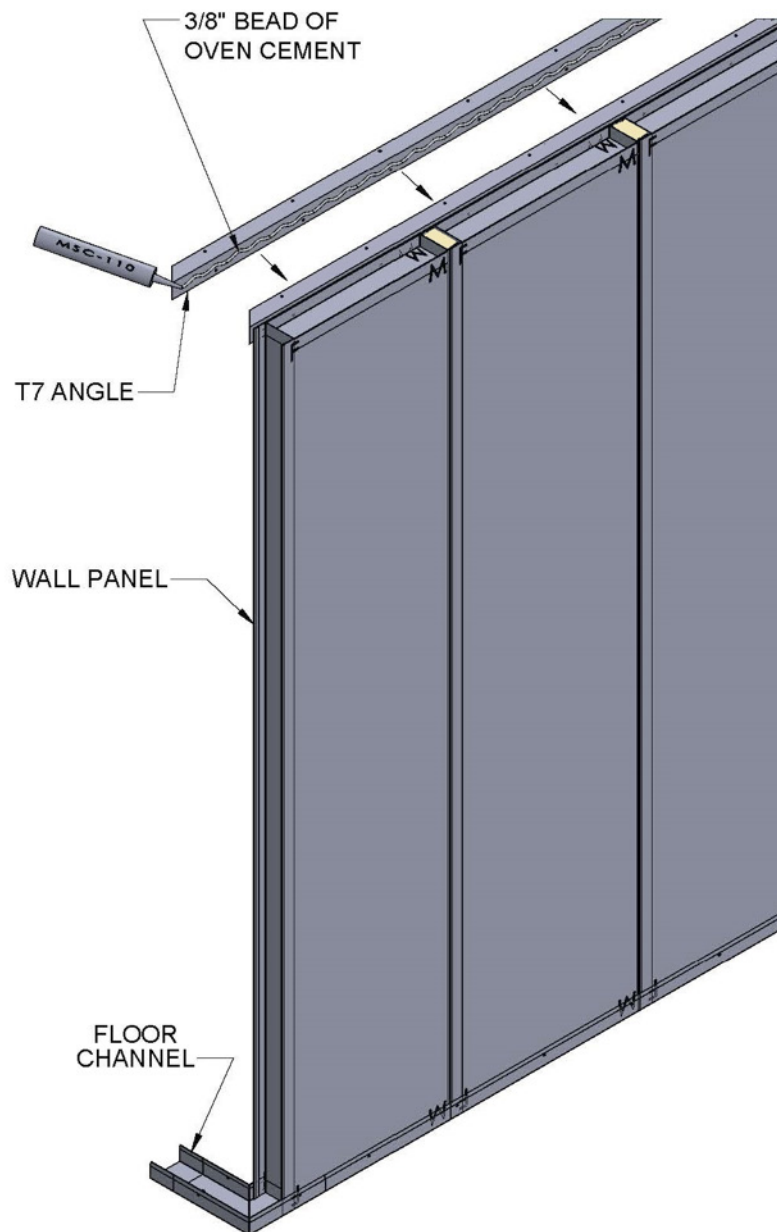
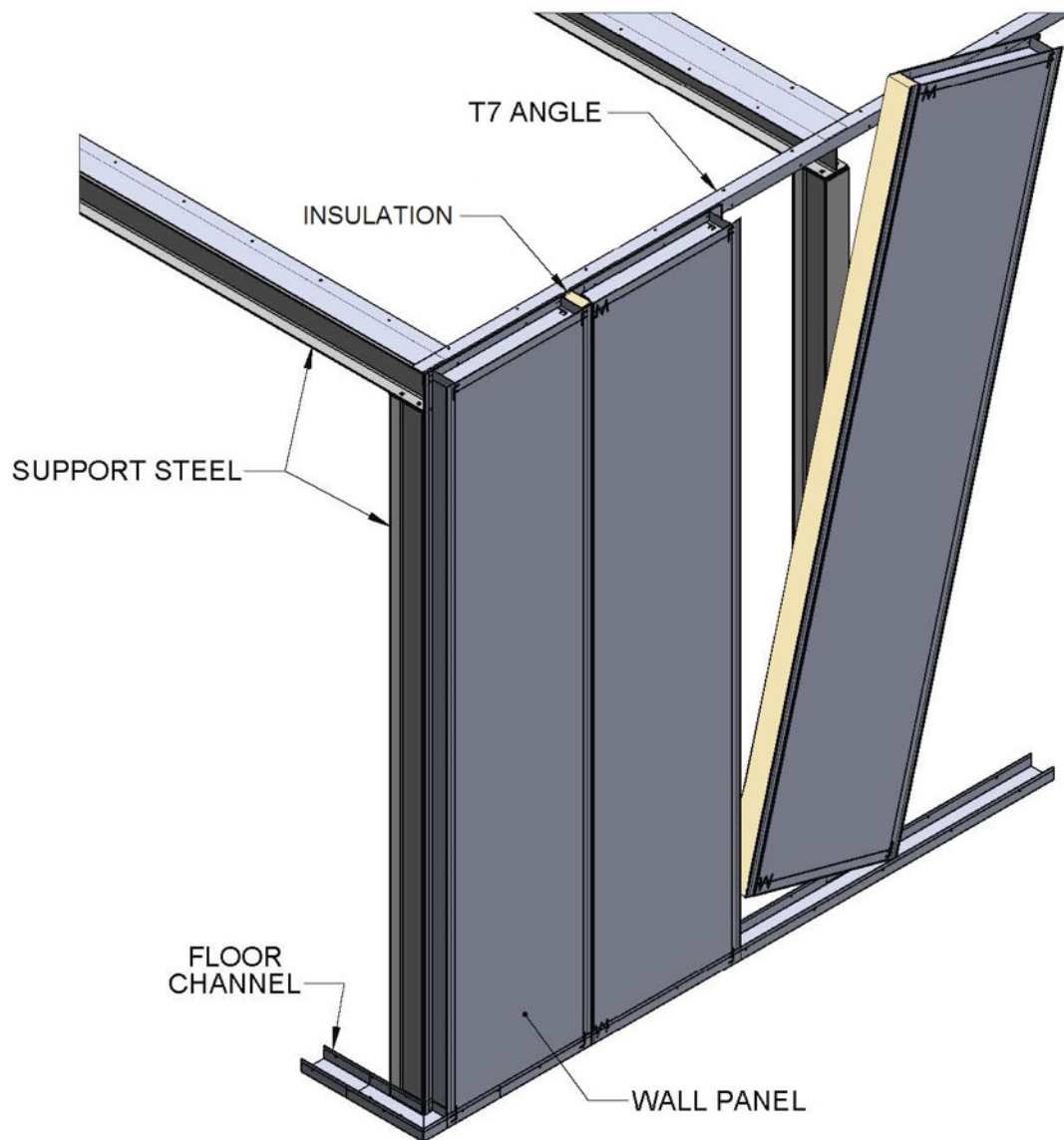


FIGURE 6



Process 3 – Door Jamb and Door Header Assembly

Step 1 - Installation of Door Jambs on Frontal Panel. Reference Figure 7

- a) To install the door jambs to the panels first the male channel of the insulated panel must have strip insulation installed.
- b) Install the door jamb until the male channel is completely inside the door jamb.
- c) Fasten the door jamb to the panel using the provided stitch screws starting on one end and working towards the other. Do this process for both sides of the door jamb.

Step 2 - Installation of Door Header

- a) Before lifting the door header into place, make a mark on the door jamb for the location of the bottom of the door jamb. This measurement can be retrieved from the drawing packet provided.
 - > A small piece of angle can be temporarily tack welded into place at this location to aid in the installation of the door header by creating a ledge for it to rest.
- b) When door header has been lifted into place make sure that the front of the door header is flush to the outside of the door jamb. Reference Figure 7.
- c) Tack the door header in place (DO NOT weld solid)
- d) Check door framing for square and plumb. Reference Figure 8.
- e) Once square and plumb weld the door header in solid making sure the opening stays square and plumb.

NOTE: Adjustments made with the door header to create a square opening may not actually be enough. It may be necessary to use spacers under the door jambs in order to square the opening. This is only necessary if the cement floor is not level across the width of the opening.

Step 3 - Installation of T-7 to Door Header (Ovens WITHOUT Internal Structure)

- a) Once door header has been mounted attach the T-7 trim to top inside of the door header. Reference Figure 9 and Figure 10.

FIGURE 7

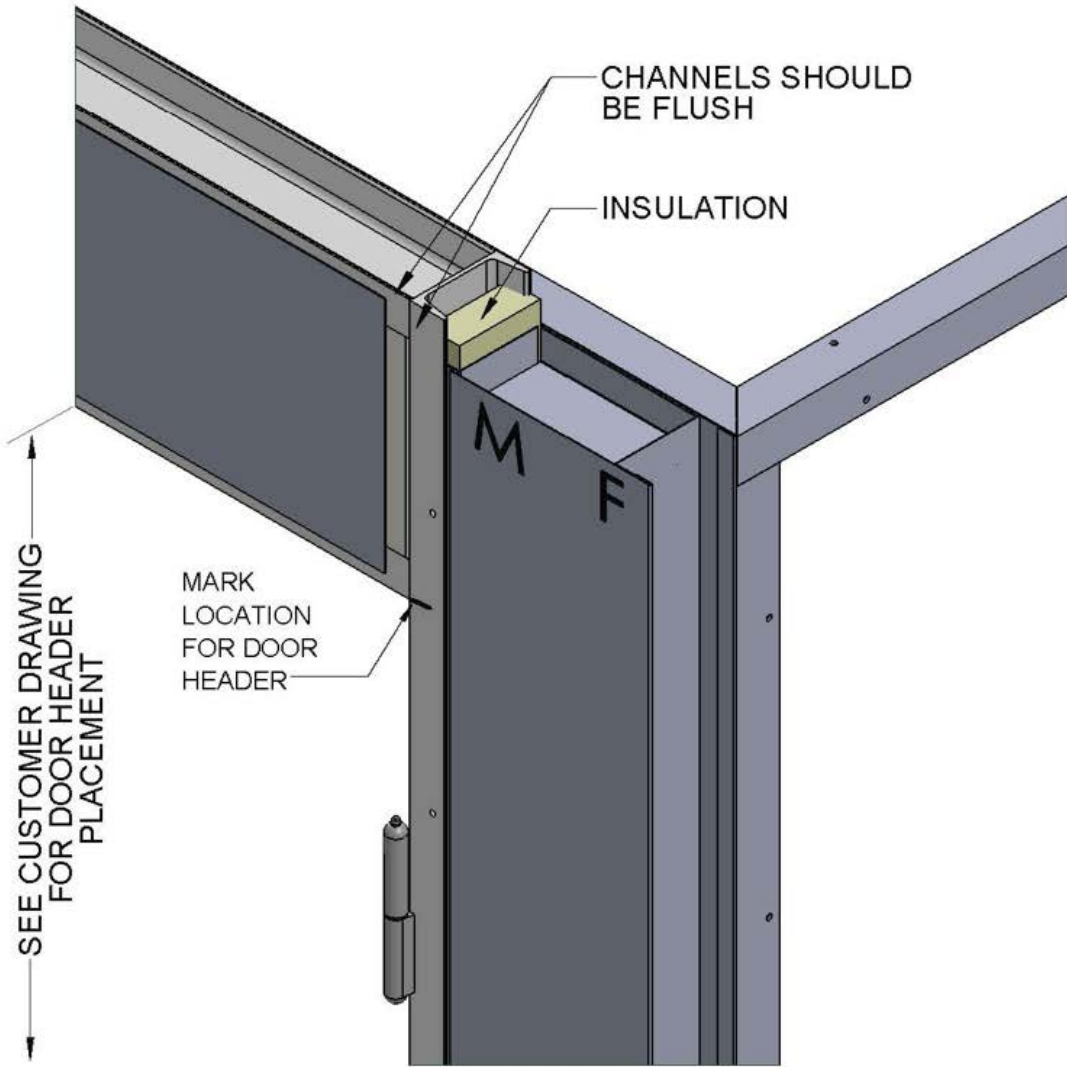


FIGURE 8

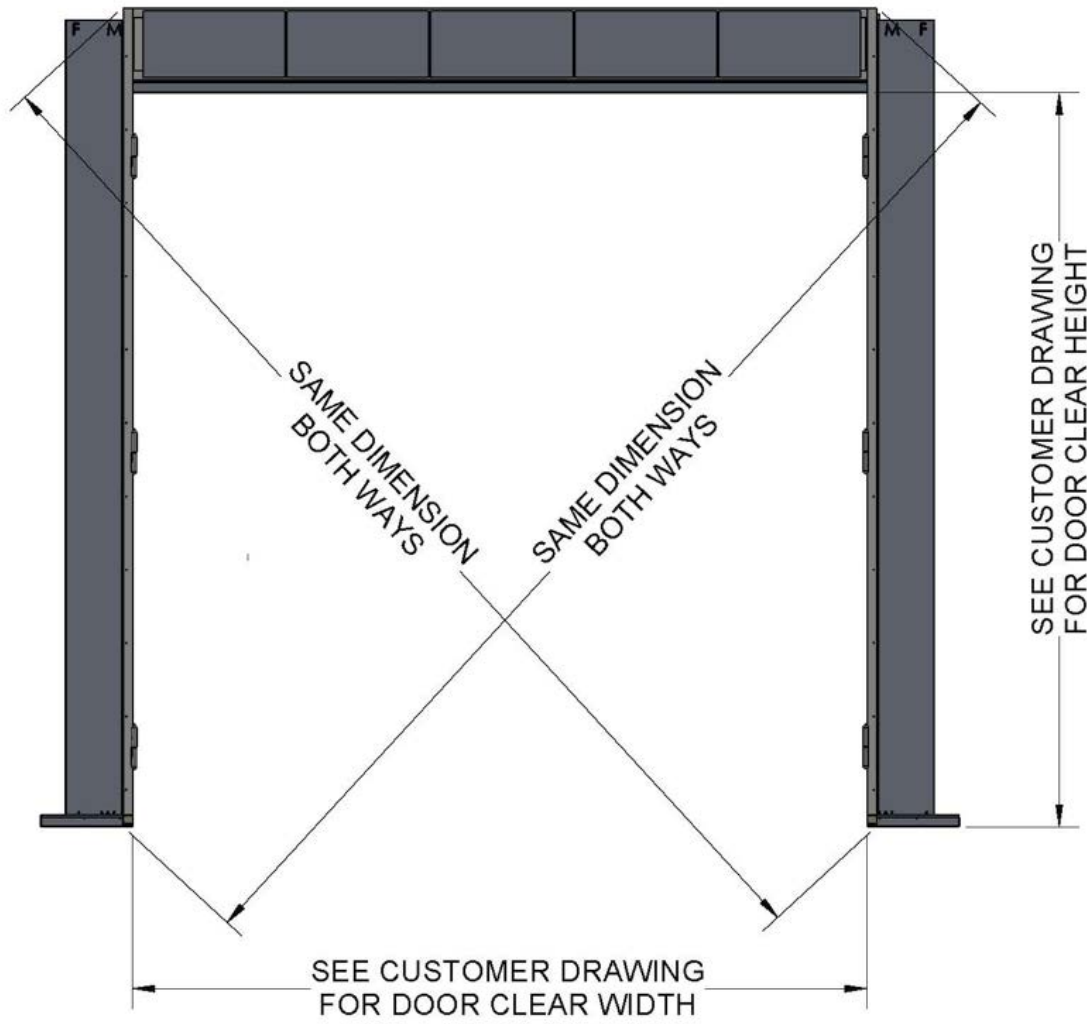
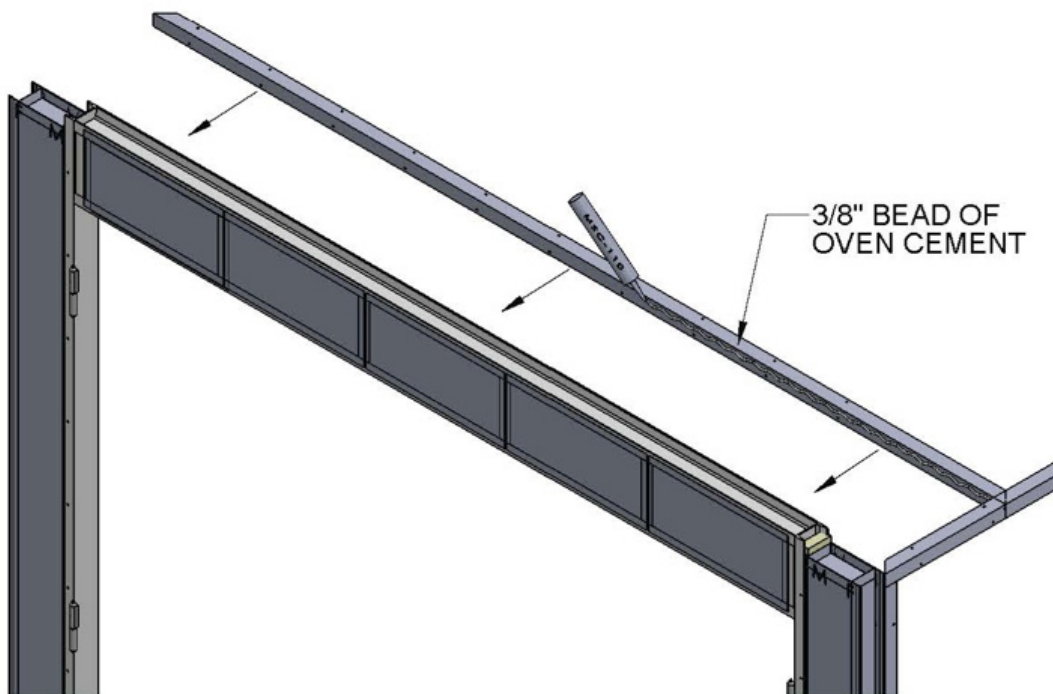


FIGURE 9



Process 4 – Roof Assembly

Step 1 - Preparing the insulated panels to be erected

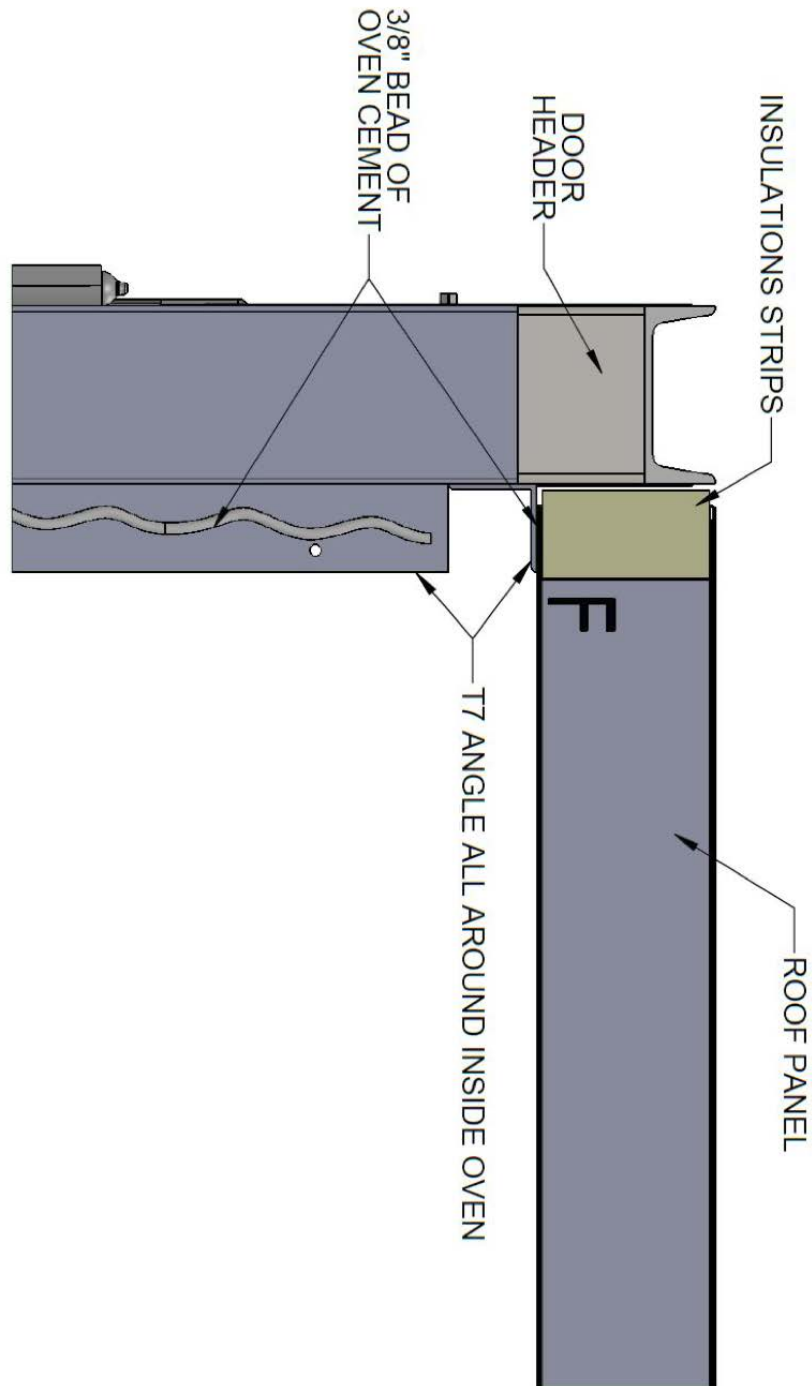
- a) Insulating the panel channels
 - > Fill the male side of the panel with the 2” strip insulation as well as the top and bottom channel
 - > DO NOT insulate the female channel at this time

Step 2 - Installing the Roof Panels - Reference Figure 10

- a) Begin the roof installation by placing in the Female – Female panel. See drawing packet for item number.
- b) Install strip insulation in the female channel that will be mating to the door header.
- c) Run a 3/8” bead of oven cement on the T-7 angle.
- d) Set the panel per the drawing packet and fasten into position using the stitch screws provided.
- e) Follow the same procedures as the oven walls until the roof has been installed per the drawing packet.

NOTE: Some ovens may require the need to have explosion relief areas in the roof of the oven. Fastening the roof panels to the T-7 trim MUST be AVOIDED as the panels need the ability to lift in the event of an explosion.

FIGURE 10



Process 5 – Heater Box Installation (Floor Mounted)

Step 1 - Opening for Heater Box

- a) Make sure that the Female Channels of the heater box opening are insulated with strip insulation.
- b) Once insulated install the cap channel so that the panels are flashed off and insulated. Fasten ONLY the inside flange with the stitch screws provided. Reference Figure 12.
- c) Double Check opening dimension to the dimensions of the heater to ensure the heater box will be able to slide into the opening.
- d) Make any adjustments required so that the opening is larger than the heater box.

Step 2 - Installing the Heater Box

- a) Move the heater box into position so that it can be slid into the opening in the wall panels
- b) Before sliding into place run a 3/8” bead of cement on the contact side of the mating angle located on the sides of the heater box. Reference Figure 11.
- c) Slide heater box into opening. Ensure that the oven mating angle makes solid contact over the entire length of the flange.
- d) Fasten the angle to the to the oven wall using the stitch screws provided. Note: It may be necessary to use the galvanized Tek screws in order to pull the angle tight to the panel wall.

FIGURE 10

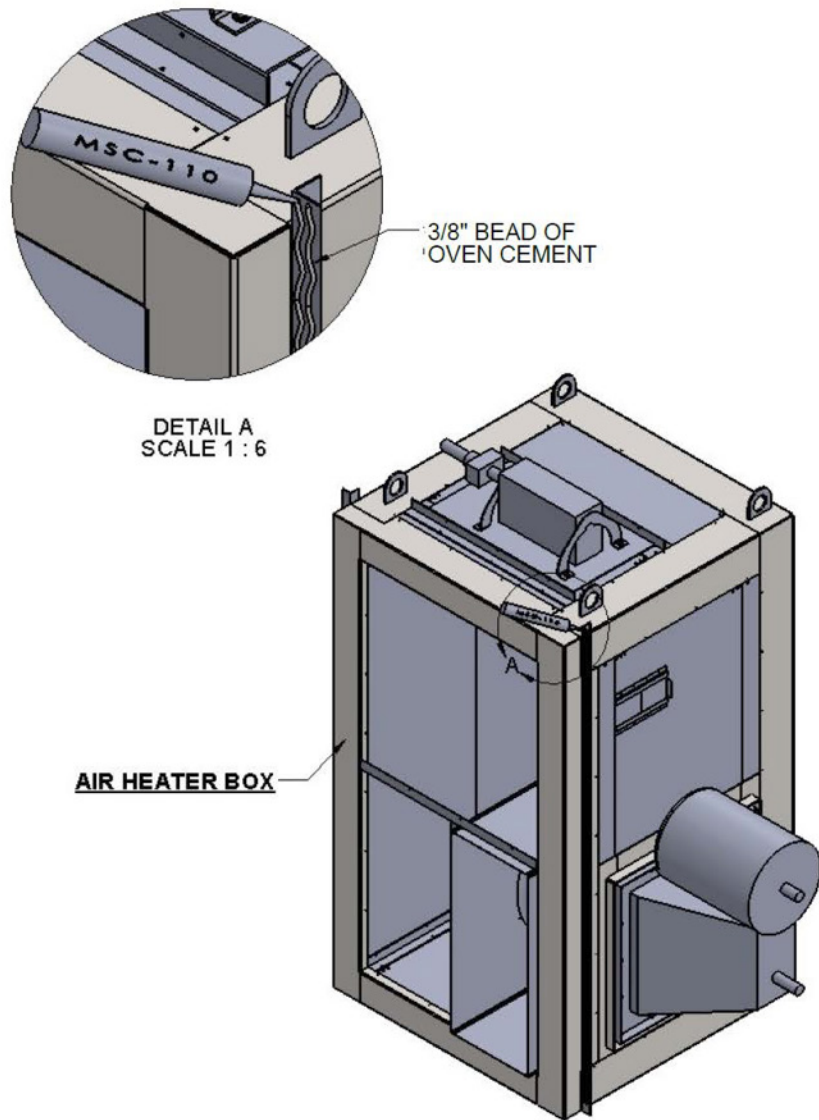
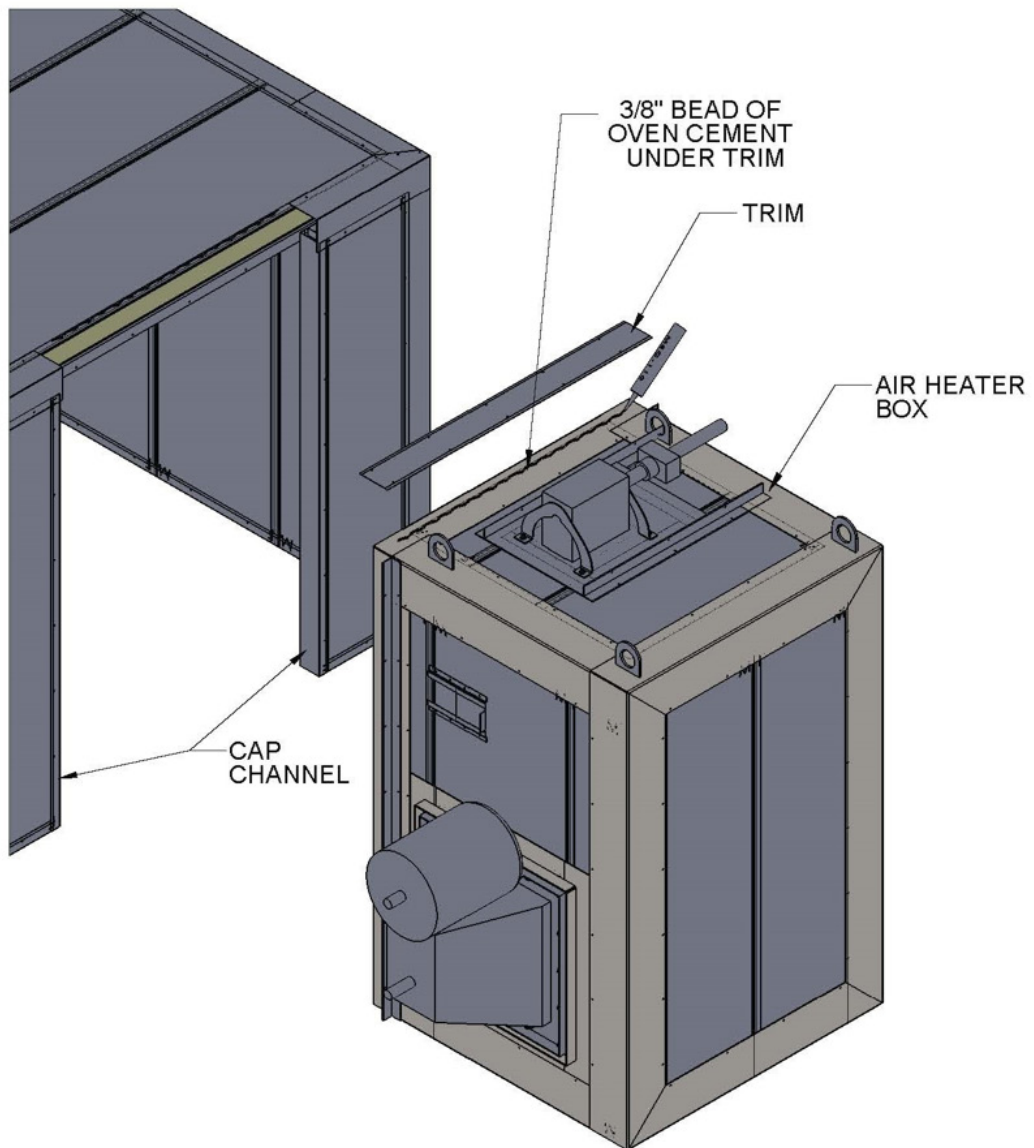


FIGURE 12



Process 6 – Heater Box Installation (Roof Mounted)

Step 1 - Trim the Discharge and Return Openings

- a) Insulate any open area of panel that does not have strip insulation installed.
- b) Once all voids are insulated cut the cap channel to fit into the opening and insulate it Reference Figure 13.

Step 2 - Installing the External Support Structure for the Heater Box

- a) Per the drawing packet, locate the position of the vertical C-channel members.
- b) Ensure the channels are plumb and fasten into place using the stitch screws provided. Reference Figure 14.
- c) Place the horizontal channel members into position and fasten with the supplied ½” hardware.
- d) Run a 3/8” bead of cement around the perimeter of where the heater box will rest once in position. Reference Figure 13.
- e) Lift heater box into position and bolt to the external structure per Figure 14.

The discharge ductwork will extend through the roof opening into the inside of the oven roof.

FIGURE 13

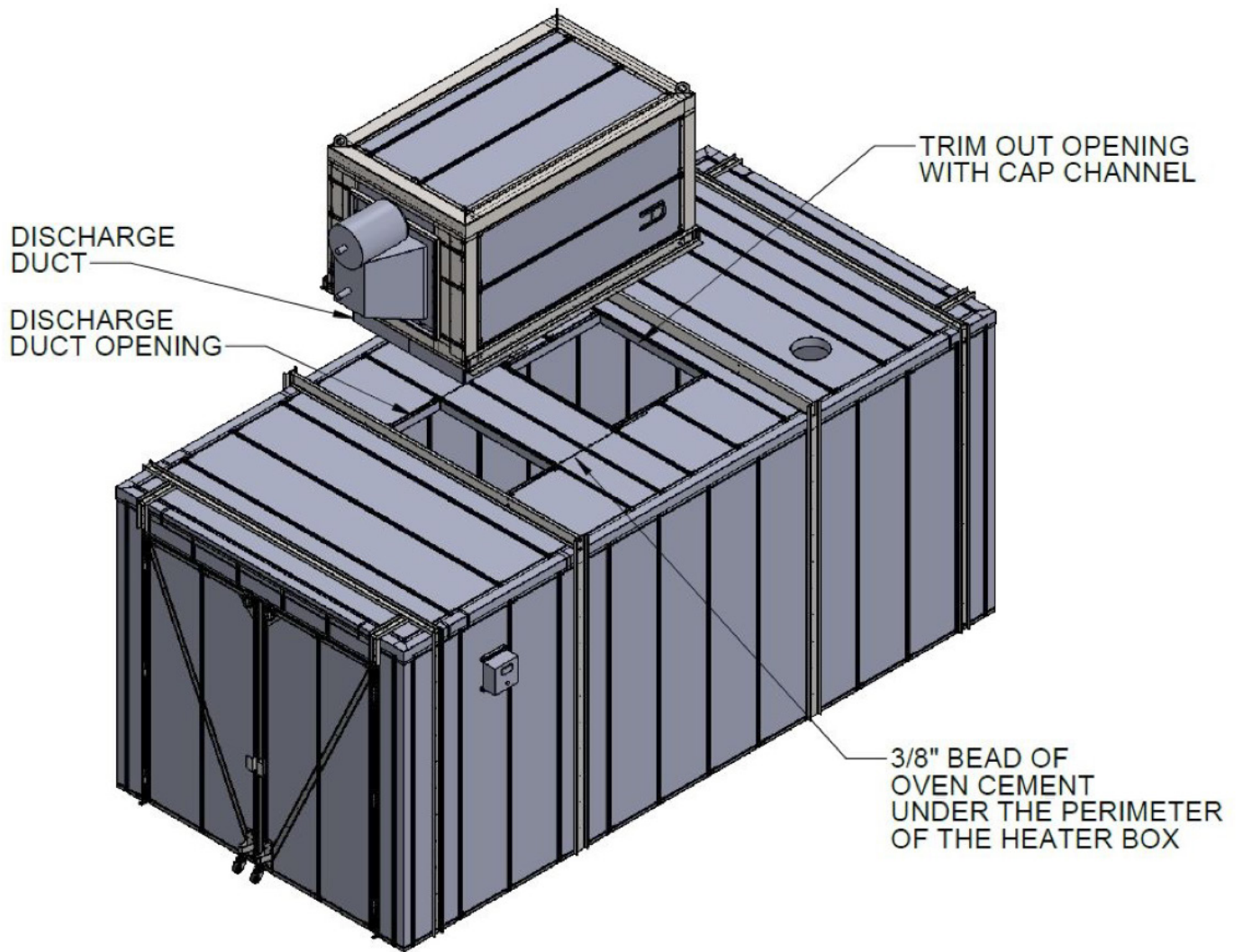
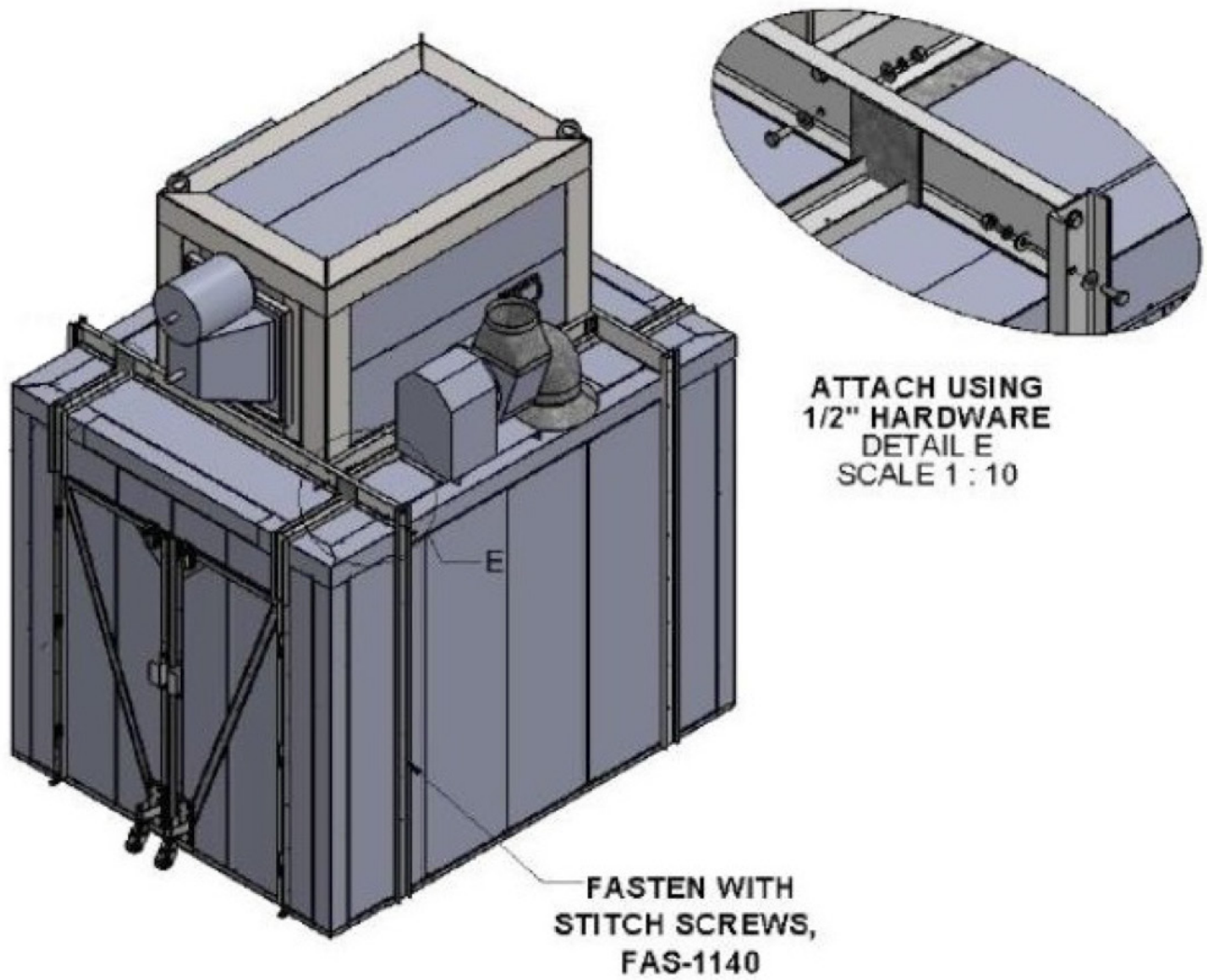


FIGURE 14



Process 7 – Flashing Walls and Roof

Step 1 - Installation of Interior Flashing

- a) Each vertical corner of the oven should have T-7 angle in the fastened to the panels (unless oven has internal structural support).
- b) Each of these angles should be welded to the T-7 angle across the roof to wall connections as well as to the base channel.
- c) Any opening or exposed insulation will need to be flashed with the correct trim pieces. (See drawing packet for more information.)

Step 2 - Installation of Exterior Trim - Walls

- a) Prior to installing the trim the open corner MUST be filled completely with strip insulation. This will take multiple layers. Reference Figure 15.
- b) Install vertical corner trim on the corners of the oven.
- c) It may be necessary to cut this trim to length or use multiple pieces. (trim overlapped by 1” when using multiple pieces.)
- d) Run the trim from the floor level to be flush with the top of the roof panel.
- e) Fasten the trim only on one side at the bottom.
- f) Using a level work your way up the trim making sure to stay plumb and maintaining a square corner.
- g) Once one side is completely fastened repeat the process for the other side of the trim.
- h) Repeat until all vertical trim pieces have been installed.

Step 3 - Installation of Exterior Trim – Roof

- a) As with the walls ensure that the open corner is completely filled with strip insulation. Reference Figure 16.
- b) Measure the corner trim piece to get the length of one of the flanges.
- c) Measure down the vertical trim already installed and mark that dimension, repeat on the opposite corner.
- d) Snap a chalk line between these marks. This will serve as a guide location for the roof corner trim pieces.
- e) This is only required on the wall side of the trim.
- f) Begin with the 90° corner piece; fasten the vertical side of the trim with the provided stitch screws so that the edge of the trim is on the chalk line.
- g) Work from one end of the piece to the other.
- h) Take a level and place on top of the horizontal flange, when positioned to the level fasten the top of the trim piece to the roof panels.

Process 7 – Flashing Walls and Roof

- i) Repeat on all corners
- j) Take a straight piece of corner trim and overlap the corner piece by 1” and fasten the wall side with stitch screws along the chalk line
- k) Continue with more straight trim until you have reached the next corner, it will be necessary to cut the last trim piece to fit with the 1” required overlap.
- l) Once all trim is fastened to the walls take a level on the horizontal flange of the corner trim and level as it is fastened to the roof panels.
- m) Repeat around entire oven.
- n) If the oven uses a Floor Mounted Heater box a flat piece of trim is used (see drawing packet for details) over the top of the heater box and oven roof. Reference Figure 12.

FIGURE 15

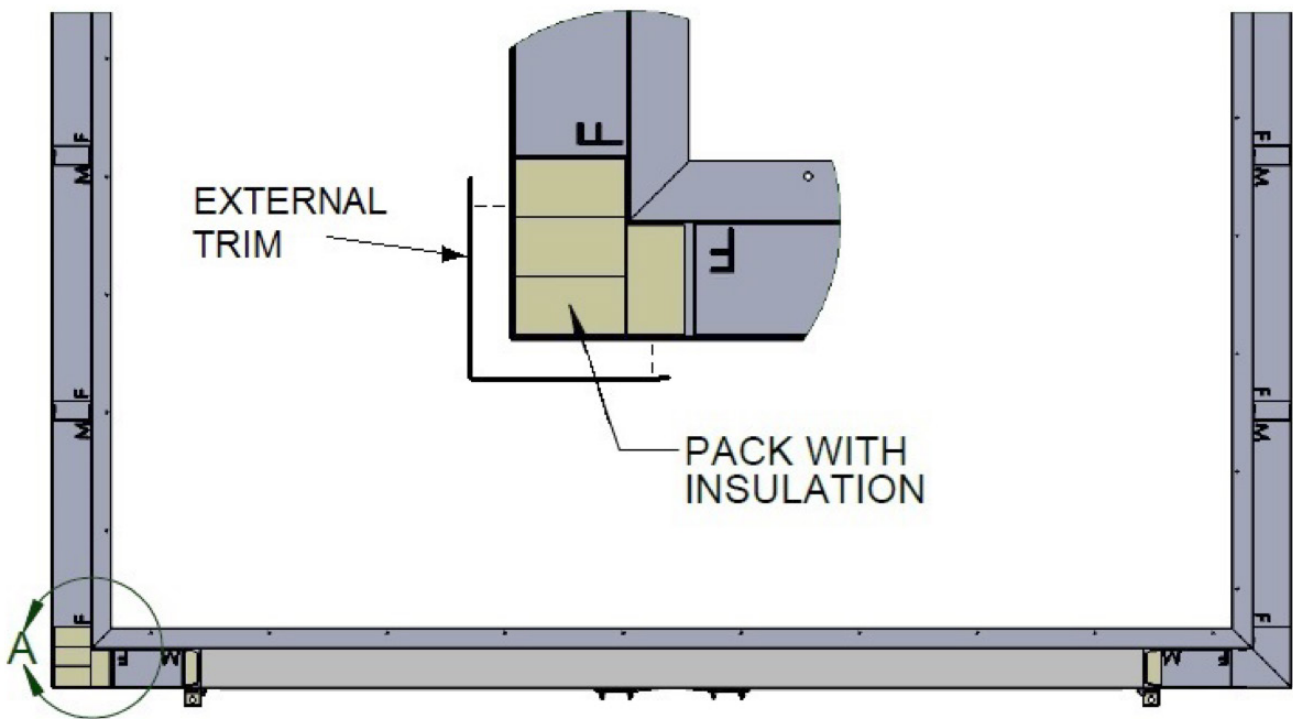
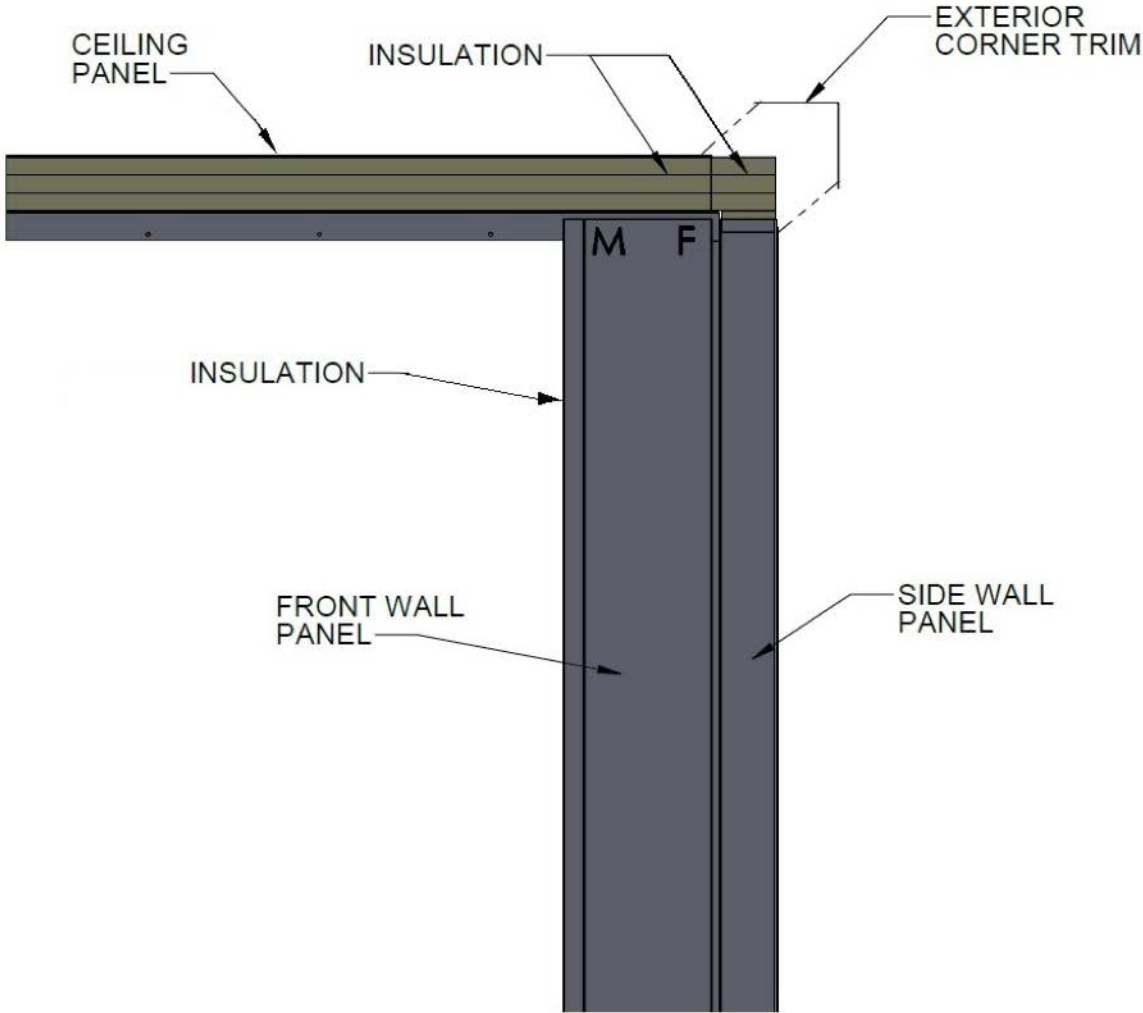


FIGURE 16



FRONT VIEW

Process 8 - Recirculation Ductwork Installation

Step 1 - Assembly of the Recirculation Ductwork – Reference Figure 17

(Reference Drawing Packet for Item Details)

- a) Take one of the 90° broke pieces and slip a corner clip into the duct mate flange located on the end with the ½” 90° flange.
- b) Take the appropriate mate to the piece and slip the corner angles that were just installing into the duct mate flanges that have the Pittsburgh seamed edge.
- c) Set the ½” flange into the Pittsburgh seam completely. It may be necessary to tap with a hammer to set into position.
- d) Once the flange is completely set into the seam, starting on the end near the corner clip, fold the seam over the top of the flange with a hammer or air hammer for about 2-3 inches.
- e) Move to the opposite end of the seam and repeat step (d).
- f) Locate the center of the seam and repeat step (d).
- g) Now the entire seam must be rolled over the edge of the flange while ensuring the flange is completely set into the Pittsburgh seam.
- h) Repeat steps (a) through (g) for the opposite corner of the ductwork section.

Step 2 - Installation of Recirculation Ductwork – Floor Mounted Heater Box

Skip to Step 3 for Roof Mounted Heater Box

- a) Prior to ductwork installation some flashing pieces must be in place reference Figure 29 for these items.
- b) Install the transition ductwork located in front of the heater box Reference Figure 18.
- c) The ductwork piece must be attached to the heater box using the Tek screws provided around the air discharge ductwork.
 - > Maximum spacing between screws will be 10 inches.
 - > Ductwork transition should be 6 inches above the floor.
 - > Ensure the transition duct is level before fastening.
- d) Securely fasten the top of the transition duct to the rear wall using the angle brackets – Reference Drawing Packet for details.

Process 8 – Recirculation Ductwork Installation

- e) Beginning on either side of the transition duct begin to install the recirculation ductwork against the side wall of the oven – Reference Drawing Packet for item selection.
 - > Reference Figure 19
 - > Note that there is a protruding slip edge on one end of the recirculation ductwork, this slip edge must go towards the direct of airflow (to the fan) and will be OUTSIDE of the ductwork connection.
 - > Failure to ensure the edge is outside of the ductwork will result in air escaping the ductwork along the wall and possibly penetrating the panel seams causing leakage.
- f) Cut and attach pieces of T-7 trim where needed on each section of ductwork - Reference Drawing Packet for details.

Step 3 - Installation of Recirculation Ductwork – **Double Entry Ovens** Reference Figure 20

Skip Step if Floor Mounted Heater Box.

- a) Install the overhead transition ductwork under the heater box.
 - > Cut T-7 trim angles to fit the discharge duct dimensions.
 - > Use this trim to attach the transition duct to the discharge duct as well as the oven roof.
- b) Securely fasten the top of the transition duct to the roof using the angle brackets – Reference Drawing Packet for details.
- c) Beginning on either side of the transition duct begin attaching the transfer duct work vertically down the wall.
 - > The transfer ductwork may not be against the wall but temporarily hanging from the transition duct.
- d) Beginning on either side of the transfer duct begin to install the recirculation ductwork against the side wall of the oven – Reference Drawing Packet for item selection.
 - > Note that there is a protruding slip edge on one end of the recirculation ductwork, this slip edge must go towards the direct of airflow (to the fan) and will be OUTSIDE of the ductwork connection.
 - > Failure to ensure the edge is outside of the ductwork will result in air escaping the ductwork along the wall and possibly penetrating the panel seams causing leakage.
- e) Cut and attach pieces of T-7 trim where needed on each section of ductwork - Reference Drawing Packet for details.

FIGURE 17

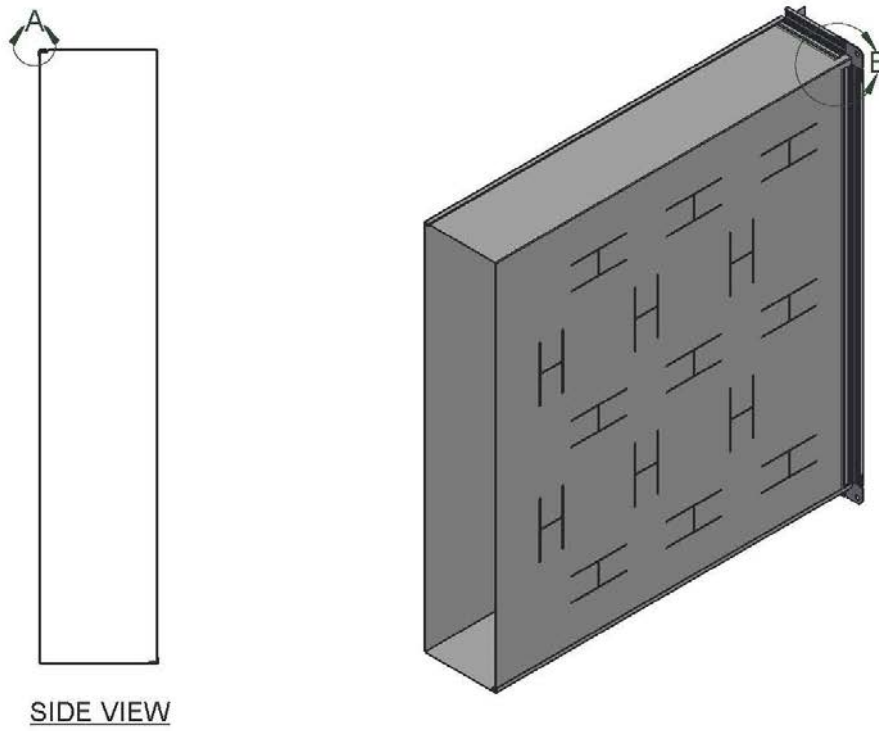
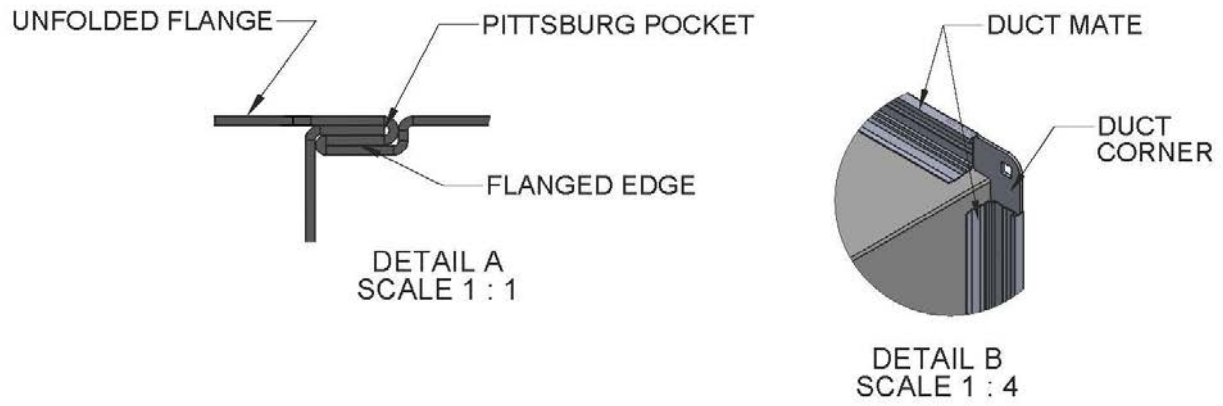


FIGURE 18

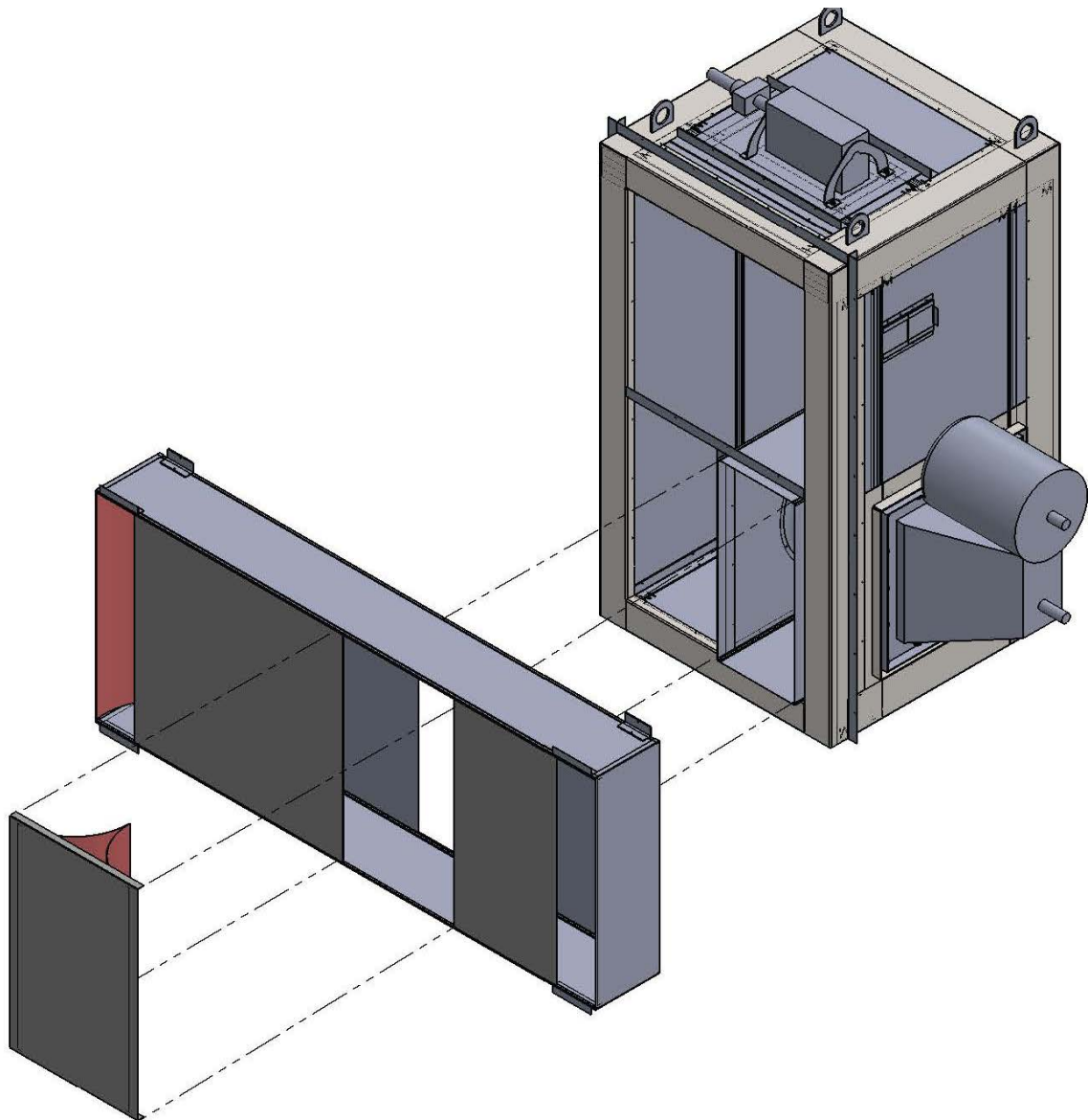


FIGURE 19

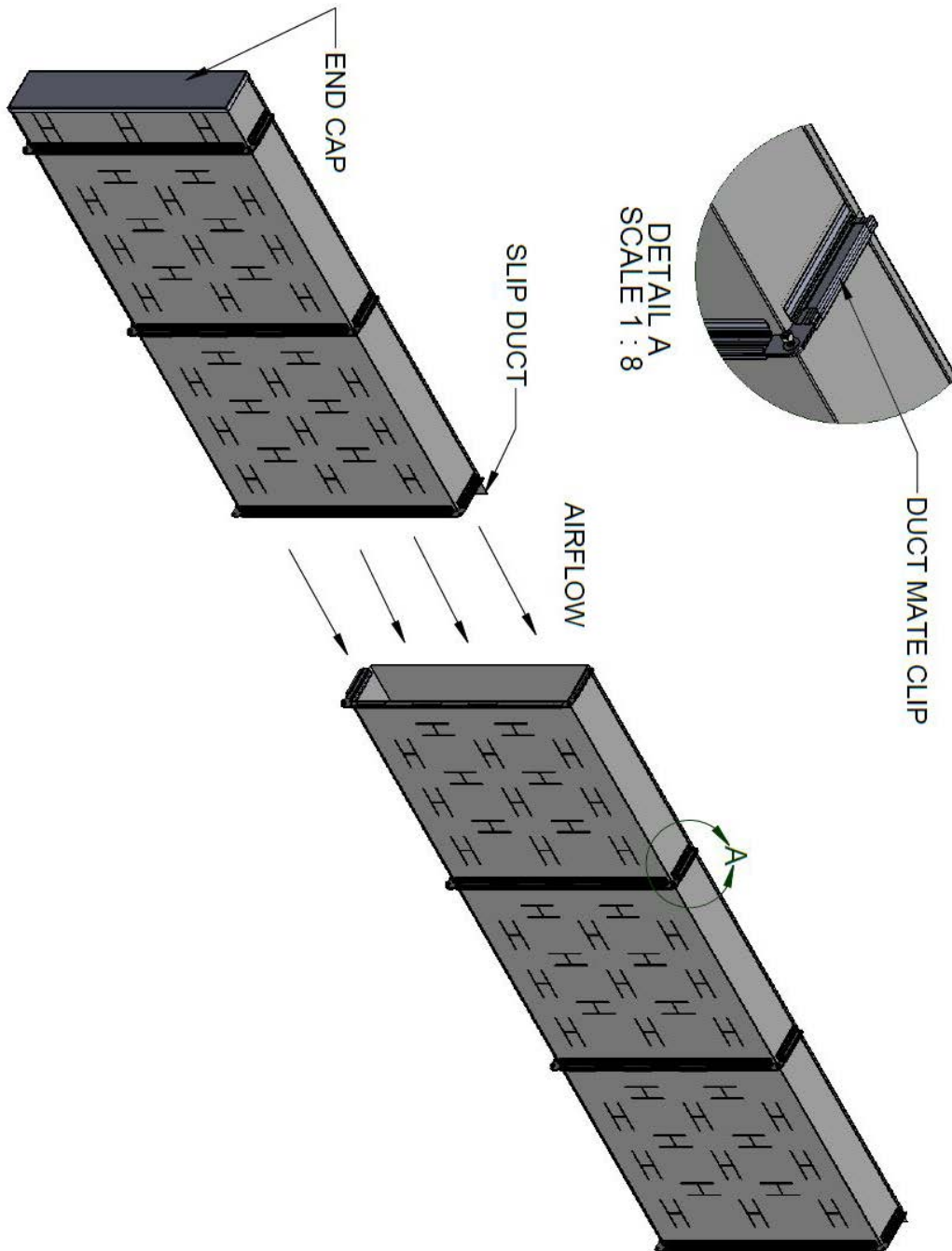
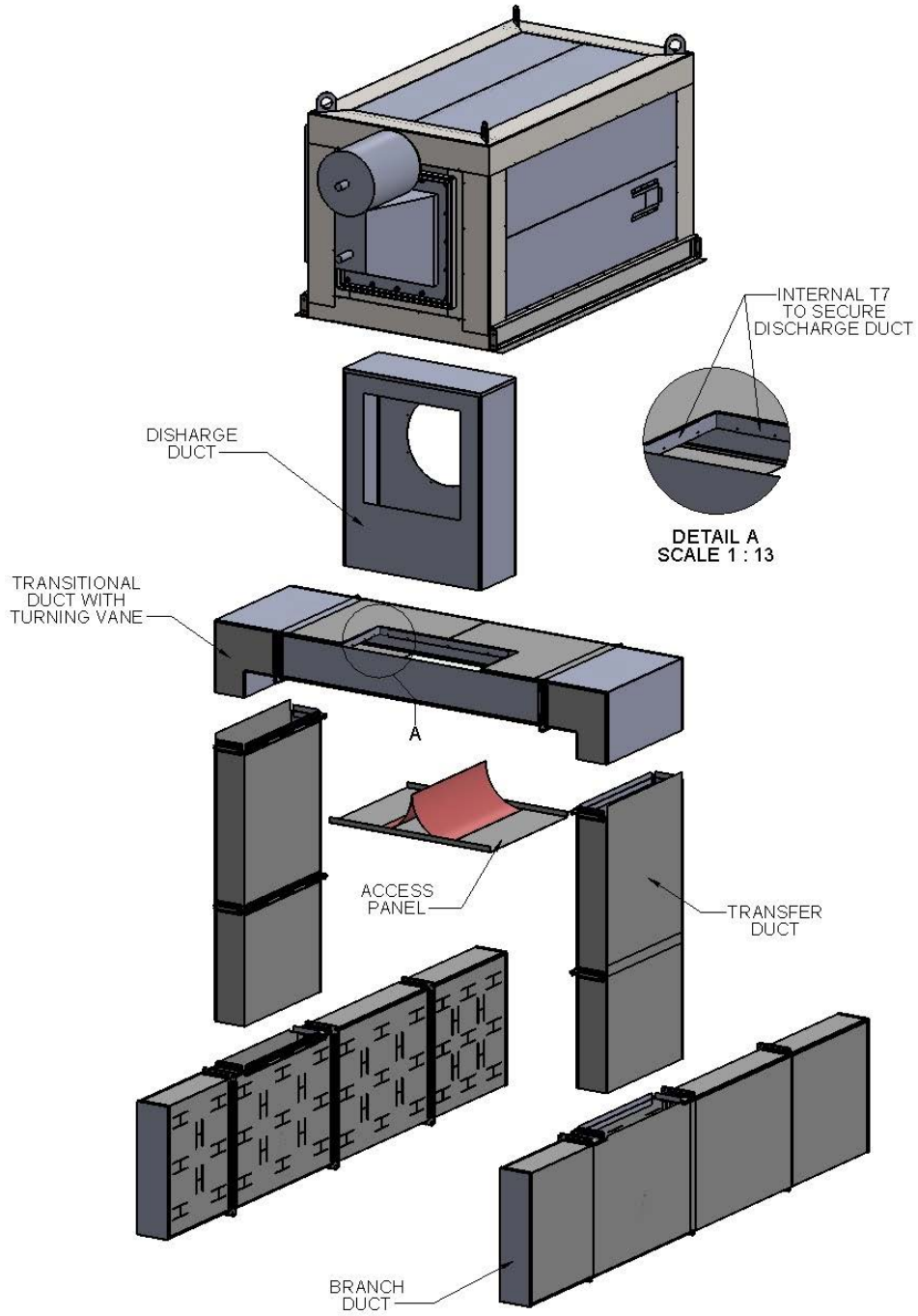


FIGURE 20



Process 9 - Product Door Opening Support Structure Assembly

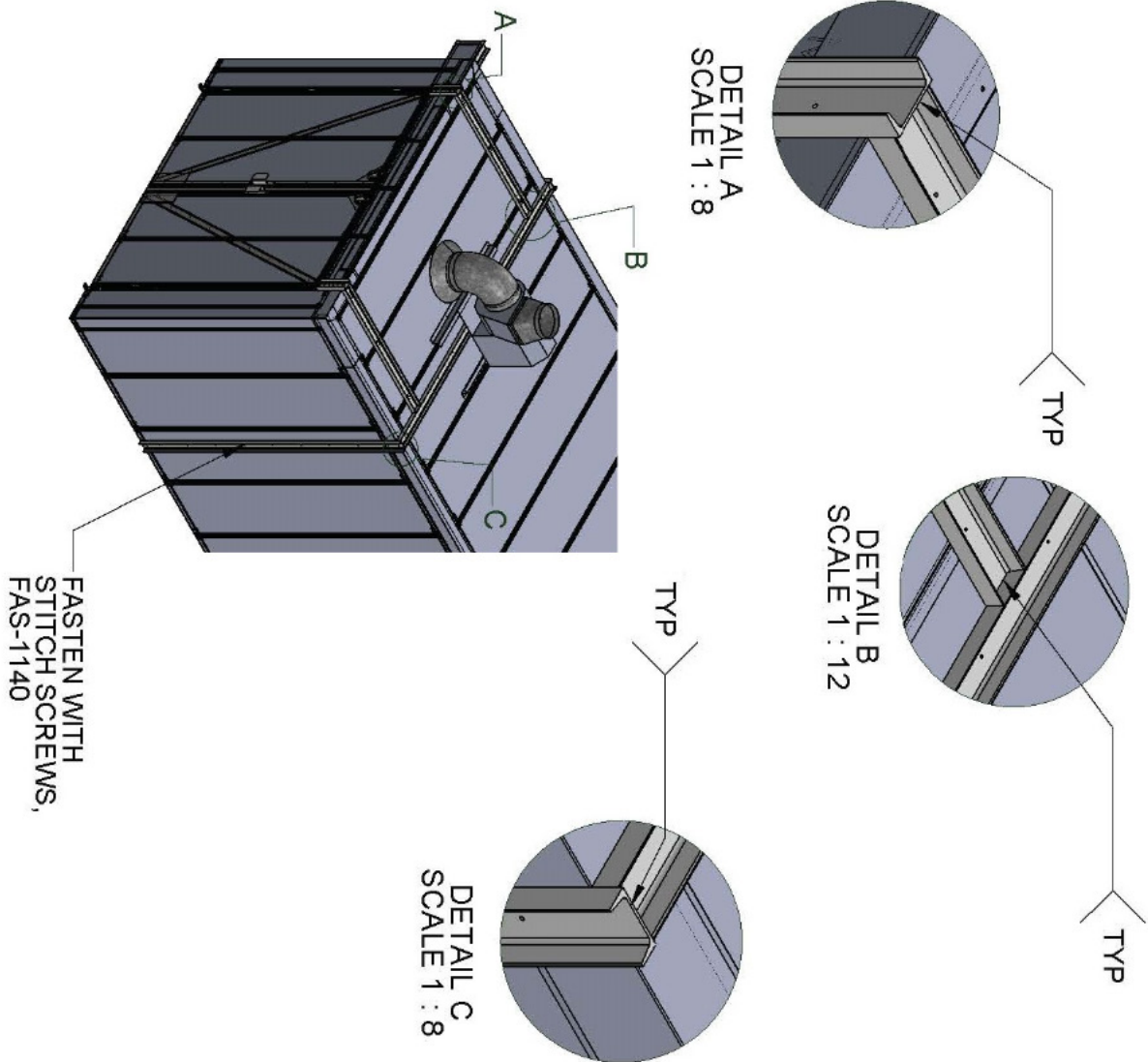
Step 1 - Prior to mounting the doors the door opening support structure must be installed.

- a) Locate the channel members required – Reference the Drawing Packet.
- b) Using the Drawing Packet locate the channels in the correct location.

Step 2 - Securing the structure to the oven– Reference Figure 21

- a) Fasten the channels to the insulated panels by using the stitch screws provided with the oven.
- b) Once all channels have been fastened to the panels the butted connections must be field welded to complete the connects.
- c) Any anchor plates will also need to be anchored to the floor.

FIGURE 21



Process 10 - Product Door Assembly

Step 1 - Hanging the Product Doors

- d) Ensure that the door jambs have been anchored and the door opening is square and plumb before attempting to hang the doors.
- e) The door hinges have already been located and welded into position from the factory.
- f) Locate the proper door leaf per the Drawing Packet.
 - > The barrel hinge on the door will be open to the bottom of the door.
- g) Stand the door leaf and lift onto the barrel hinge pins.
 - > Ensure there is a brass bushing on the barrel pin before door installation.

Process 11 – Door Seal Configuration and Assembly

Step 1 - Installing the Tadpole gasket on the Product Doors

- a) All gasket material is located on the product doors and not the oven structure.
- b) All gasket material should be located to the inside of the oven and on the nearest connecting edge to the inside of the oven.
- c) The tadpole gasket material is located around the perimeter of each door section and another on the center door stop where the door swing sections meet – Reference Figure 22, Figure 23 and Figure 24.
- d) The gasket material is held in place by using the hold down strips and the provided Tek screws – Reference Figure 22, Figure 23 and Figure 24.
- e) The flat gasket is used across the inside bottom edge of the product door and should drag the floor – Reference Figure 22.

FIGURE 22

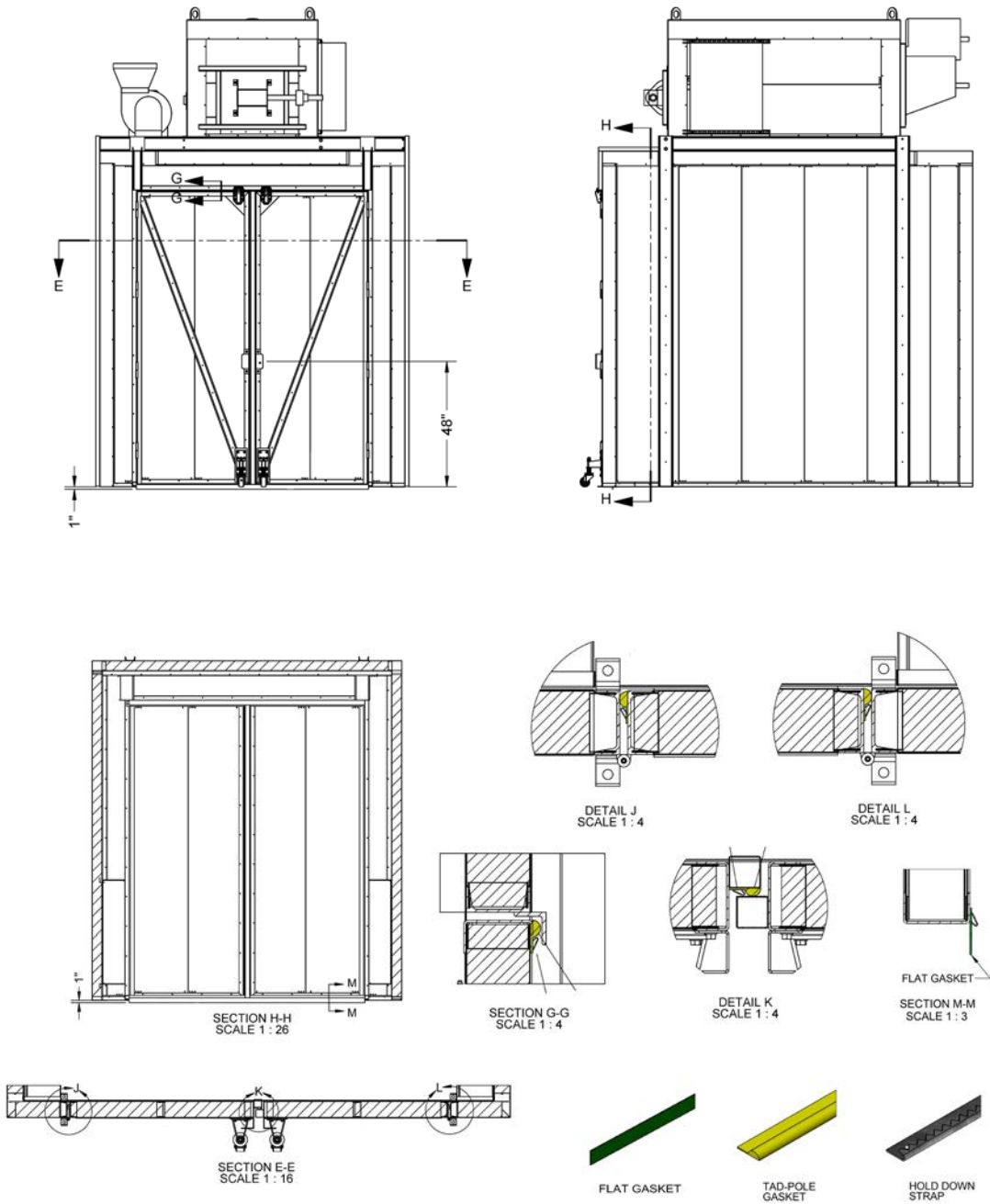


FIGURE 23

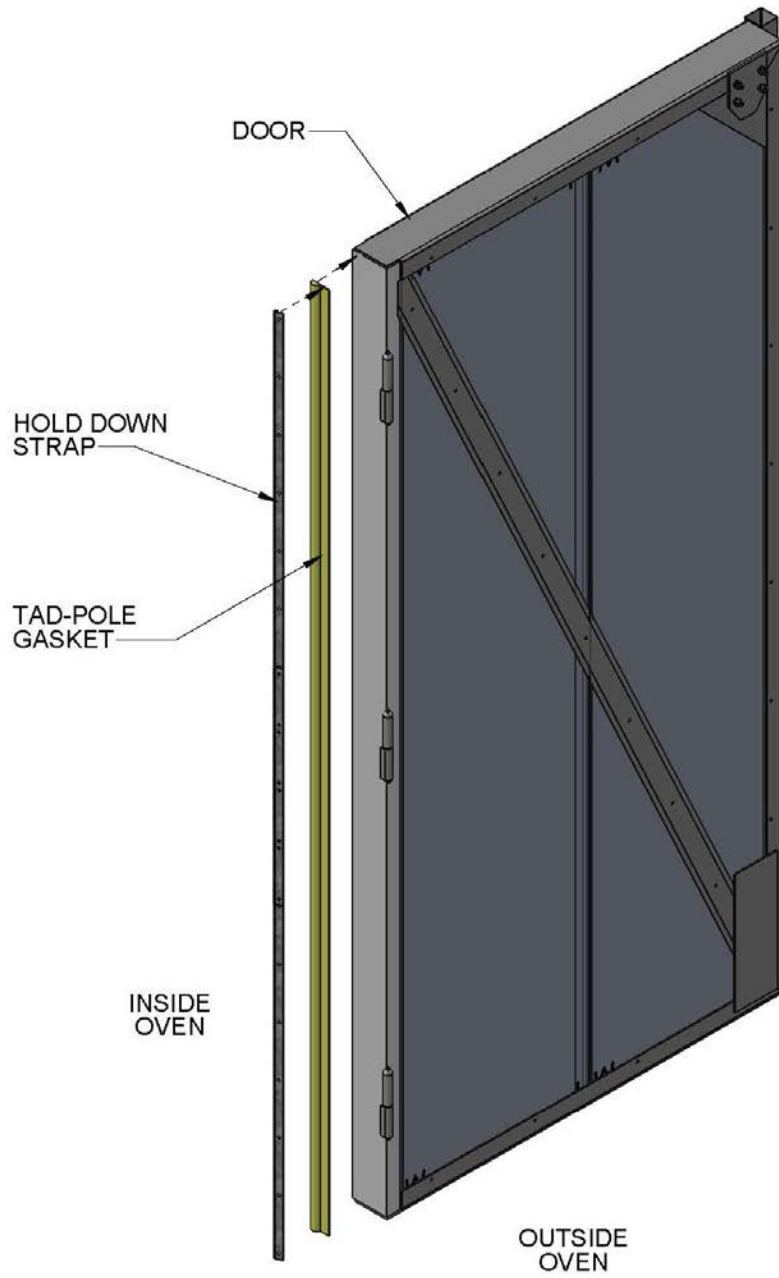
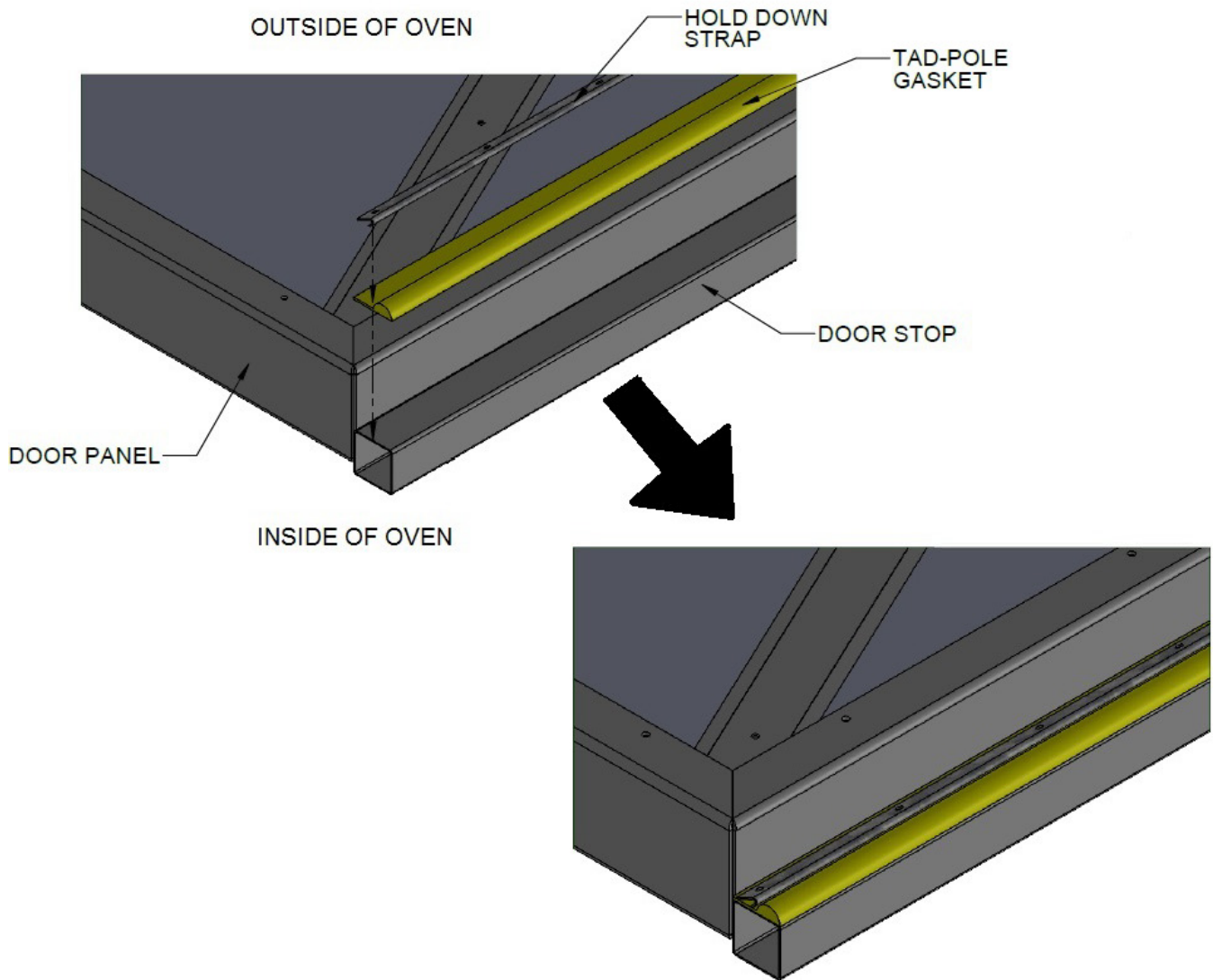


FIGURE 24



Process 12 – Door Latch and Handle Installation

Step 1 - Installing the Door Latches

- a) The Product Door has a bolt plate that is used to hold the latch.
 - > The latch will extend past the doors edge.
- b) The keeper should have a spacer attached to the back with bolts.
- c) The spacer must be field welded into position once the keeper and latch have been aligned – Reference Figure 25.
- d) The latch and the keeper should be in contact with each other with the cam latch in contact with the roller on the keeper.

Step 2 - Installing the Door Handles

- a) The door handles are attached to the doors by using the provided large ½” Tek screws.
- b) Locate the mounting position of the handles by following Figure 26.
- c) Handles should always be mounted to the cap channel structure that encapsulates the insulated panels, never the insulated panels themselves.

FIGURE 25

LATCH PLATE 2 1/4" FROM OUTSIDE EDGE
KEEPER PLATE IN LINE WITH LATCH PLATE

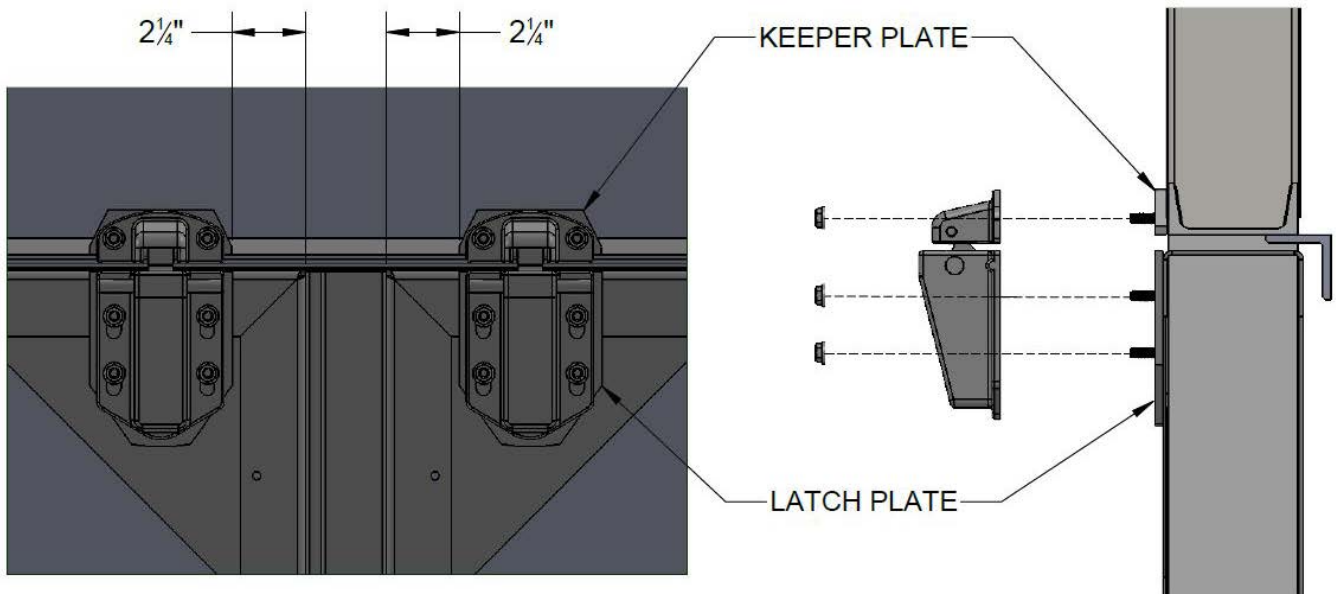
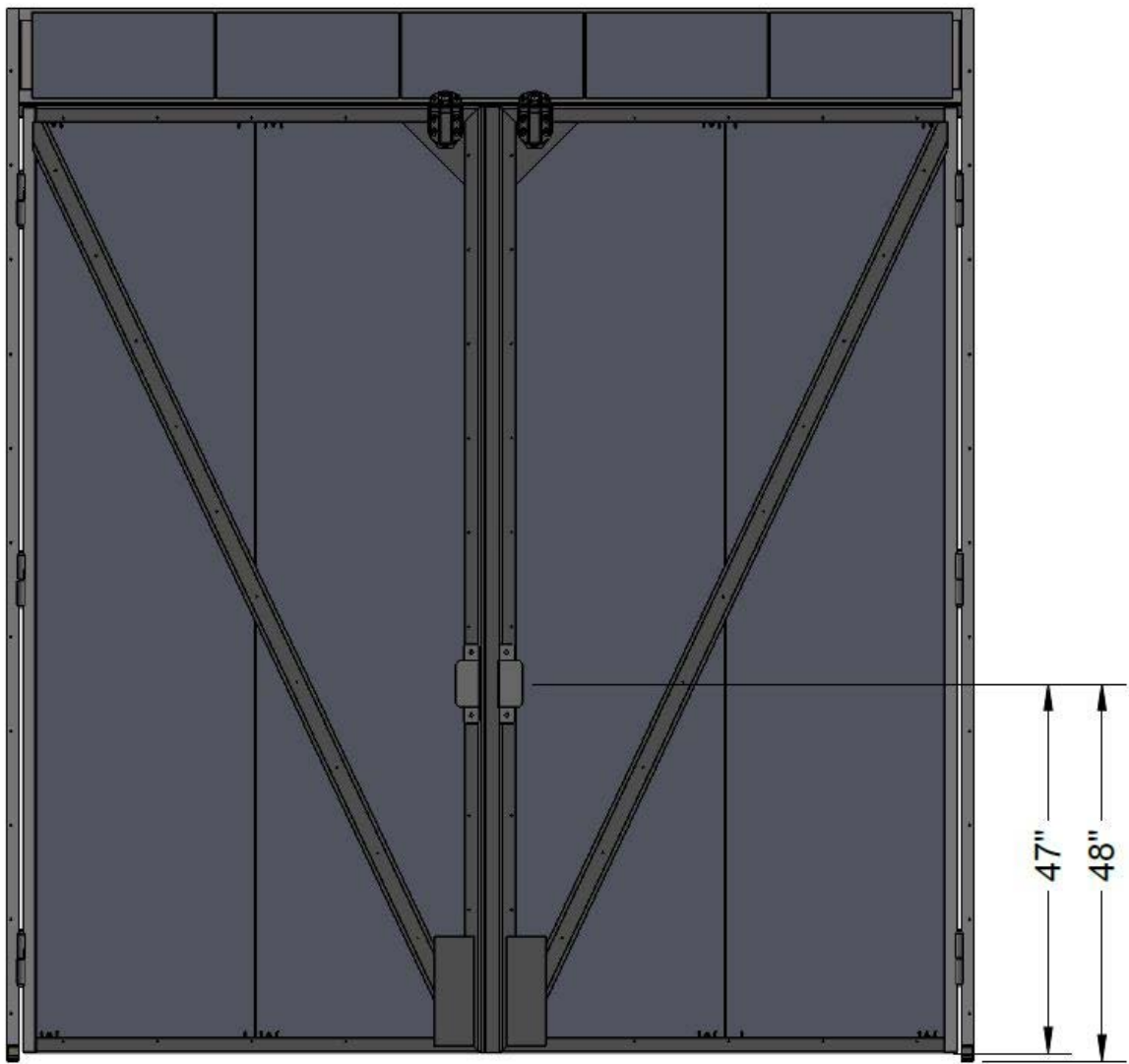


FIGURE 26



Process 13 – Exhaust Fan Kit Installation

Step 1 - Installing the Exhaust Fan

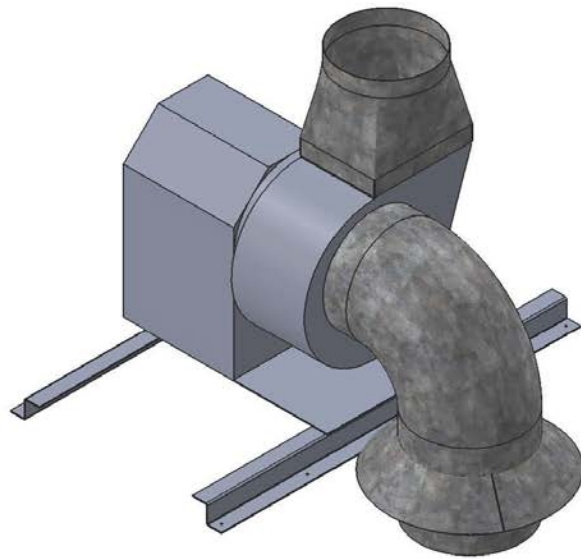
- a) The exhaust fan and intake ductwork have been assembled in the factory along with the required airflow switches and tubing.
- b) The Fan will be located at the opening in the oven roof – Reference Drawing Packet for details.
- c) Ensure that the collar ring is installed to sit directly on top of the roof panel to deflect any heat transfer from the opening – Reference Figure 27.
- d) The fan can be rotated around the opening to help in the elimination of off-sets required in the exhaust ductwork if required.

Step 2 - Installing the Exhaust Ductwork – (If provided by CEFS)

- a) Assemble the ductwork sections.
 - > The ductwork sections will need to be joined together by compressing the Acme seams together Figure 28.
- b) Install the ductwork section by placing the first section on the square to round already installed on the exhaust fan and secure with the Tek screws provided.

Install the ductwork with the crimped edge pointing in the direction of the airflow and secure with the TeK screws provided.

FIGURE 27



EXHAUST FAN

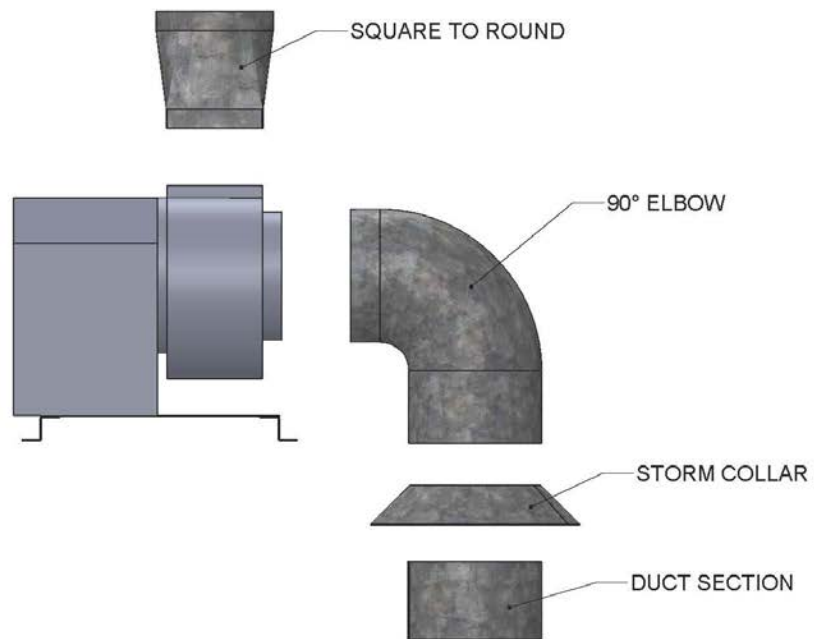
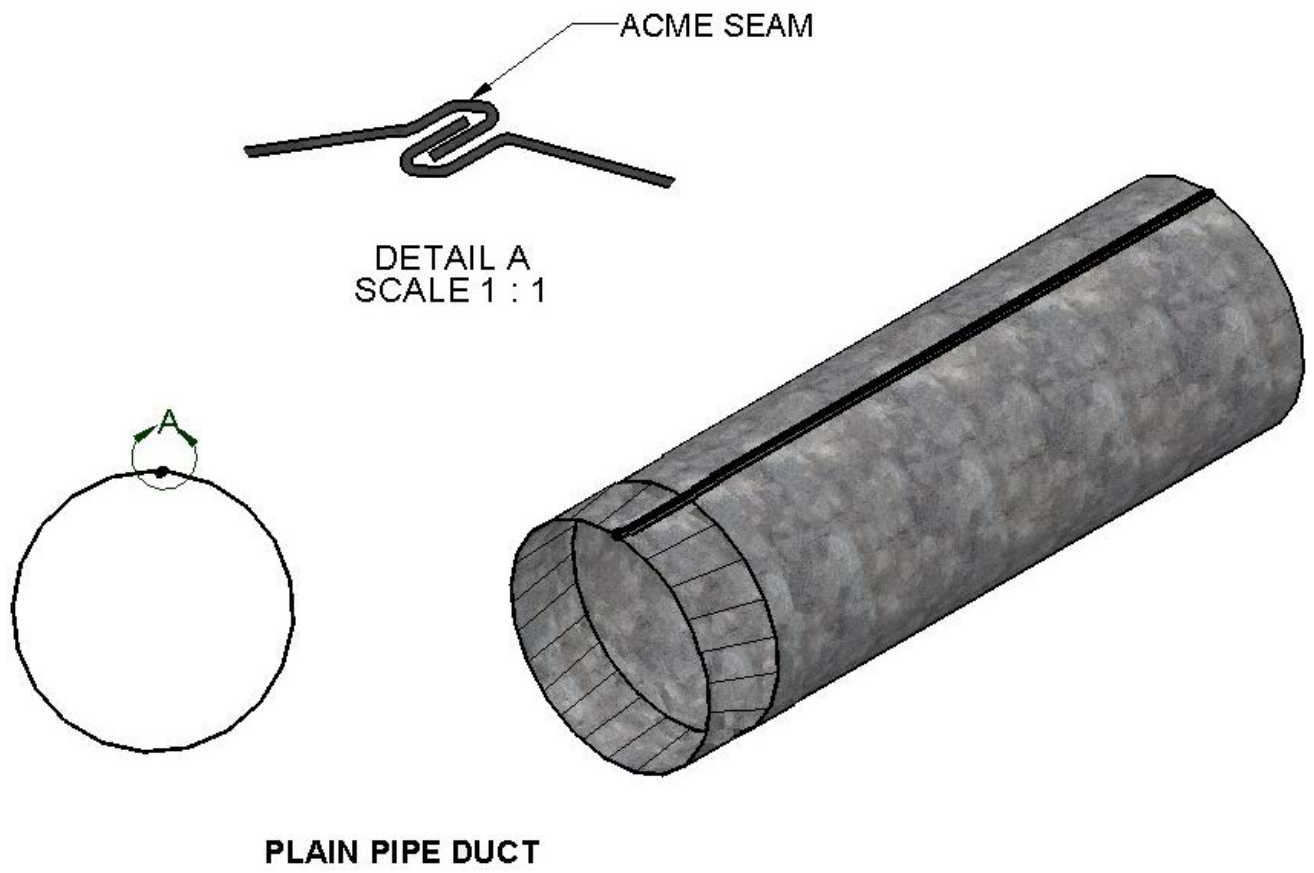


FIGURE 28

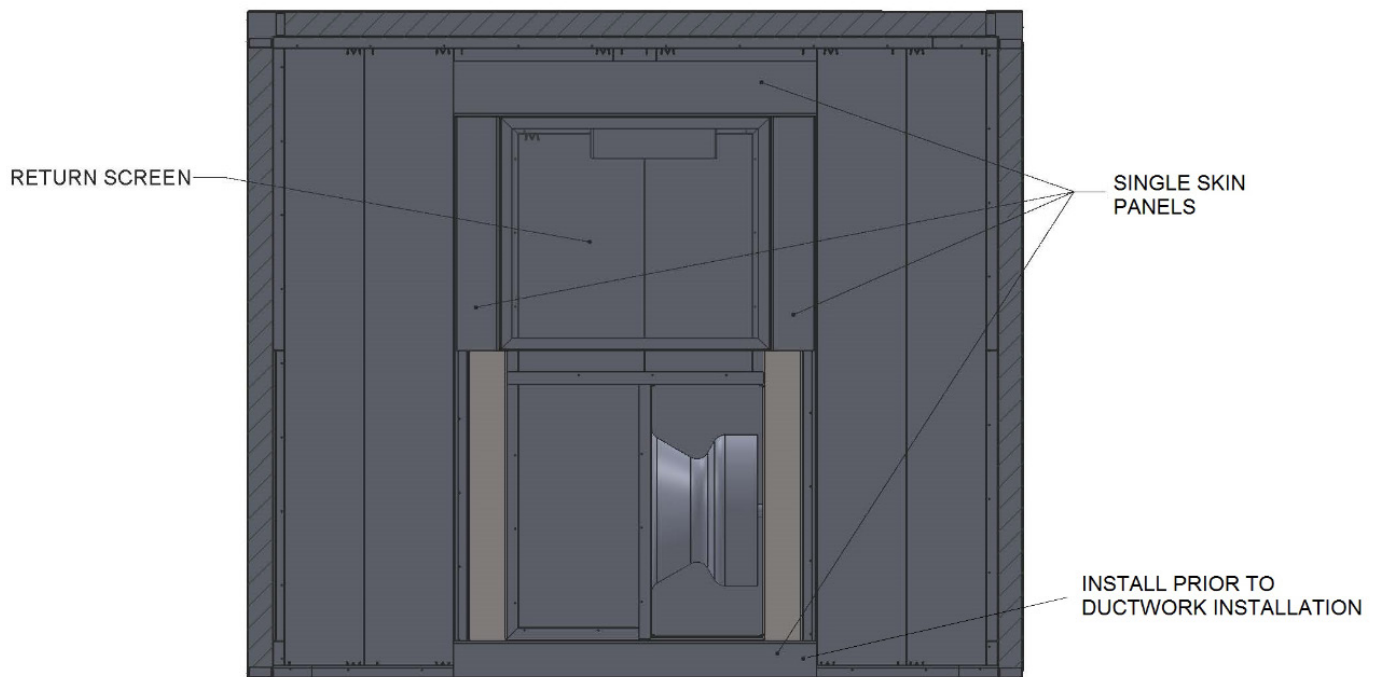


Process 14 – Return Air Screen Installation

Step 1 - Place expanded metal frame on the filler panels, per Figure

29 **Step 2** - Secure into position with the provided Tek screws .

FIGURE 29



INSIDE OVEN LOOKING AT THE HEATER BOX

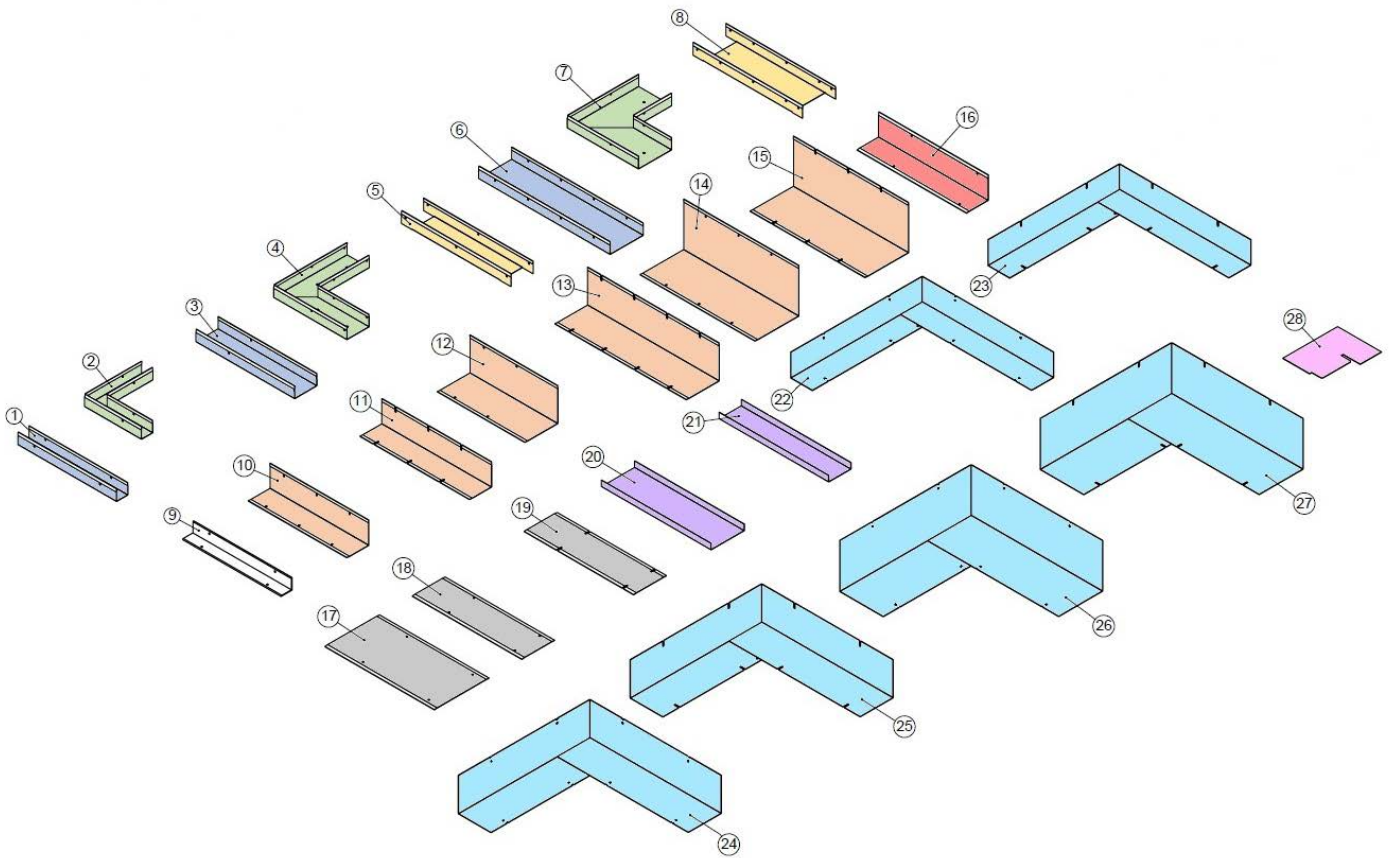
6. APPENDIX

6.1. Trim Details

Colored rows show same design just different sizes of that trim design:

Item Number	Part Number	Description
1	T1	CAP CHANNEL FOR 2" THK PANELS
2	T1-CORNER	2" CAP CORNER TRIM
3	T3	CAP CHANNEL FOR 4" THK PANELS
4	T3-CORNER	4" CAP CORNER TRIM
5	T3-H	NOTCHED CAP CHANNEL FOR 4" THK PANELS
6	T5	CAP CHANNEL FOR 6" THK PANELS
7	T5-CORNER	6" CAP CORNER TRIM
8	T5-H	NOTCHED CAP CHANNEL FOR 6" THK PANELS
9	T7	INTERNAL/SUPPORT TRIM
10	T8	EXTERNAL TRIM FOR 2" PANELS
11	T8S *	EXTERNAL EXPLOSION TRIM FOR 2" PANELS *
12	T9	EXTERNAL TRIM FOR 4" PANELS
13	T9S *	EXTERNAL EXPLOSION TRIM FOR 4" PANELS *
14	T10	EXTERNAL TRIM FOR 6" PANELS
15	T10S *	EXTERNAL EXPLOSION TRIM FOR 6" PANELS *
16	T11	REVERSE TRIM
17	T14	FLAT TRIM FOR 6" PANELS
18	T15	FLAT TRIM FOR 2" OR 4" PANELS
19	T15S *	EXPLOSION FLAT TRIM FOR 2" OR 4" PANELS *
20	T16	CAP CHANNEL FOR 6" THK PANELS - NO HOLES
21	T17	CAP CHANNEL FOR 4" THK PANELS - NO HOLES
22	T24	4" EXTERIOR CORNER TRIM
23	T24S *	4" EXTERIOR CORNER EXPLOSION TRIM *
24	T25	6" EXTERIOR CORNER TRIM
25	T25S *	6" EXTERIOR CORNER EXPLOSION TRIM *
26	T26	6" EXTERIOR CORNER TRIM
27	T26S *	6" EXTERIOR CORNER EXPLOSION TRIM *
28	T31	W6X9 FLASHING

*EXPLOSION RELIEF TRIM = SLOTTED



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