

# DN SERIES DOAS

## Shipping, Rigging, Hoisting, and Assembly Manual

DN2

DN3

DN5



Indoor Model DN2IN Shown



Outdoor Model DN3RT Shown

**⚠ WARNING****RISK OF DEATH OR SERIOUS INJURY**

Hoisting heavy equipment overhead is inherently dangerous. Failure to properly rig the DOAS for hoisting or the use of incorrect rigging equipment may result in the DOAS falling during hoisting.

Improper work procedures may result in death or serious injury to workers. Rigging, hoisting and assembly are to be performed by skilled and experienced personnel. OSHA-approved work guidelines are to be strictly followed.

Before proceeding with installation, read all instructions, verifying that all the parts are included.

The information in this manual is provided as a guideline and does not necessarily meet all local codes. It is the installer's responsibility to comply with all local codes and OSHA-approved safety practices.

**⚠ CAUTION**

It is the installers responsibility to select equipment, structures, and materials suitable to support the loads and substrates involved with installation. Secure the unit so it cannot fall or tip in the event of accident, structural failure, or earthquake. Do not store or stack items on the unit when installed.

**NOTICE**

This unit is for ventilating finished structures only. It is not to be used until after all construction has been completed and construction debris and dust are cleaned from the Occupied Space.

**IMPORTANT**

If this unit is installed in an area where it may draw air from a nearby fuel-burning device such as a gas furnace or water heater, verify that the air being extracted by the DOAS does not conflict with proper operation of the fuel-burning device.

**NOTICE****Risk of DAMAGE TO ENTHALPIC CORES**

Whenever working within the DOAS cabinet, protect the enthalpic cores from accidental damage. The core media is subject to damage from dropped tools or other foreign objects.

**NOTICE****Risk of DAMAGE TO DOAS CABINET**

Incorrect lifting can cause damage to the unit.

Do not lift joined unit by the 4 corner lifting lugs only. Secure lifting cables to the center lifting lugs also.

All lifting lugs provided must be used. Never lift the unit or modules from the top of the unit.

**NOTICE**

This unit is intended for general ventilating only. Do not use to exhaust hazardous or explosive materials and vapors. Do not connect this equipment to range hoods, fume hoods or collection systems for toxics.

**NOTICE**

This equipment is to be installed by following Industry Best Practices and all applicable codes. Any damage to components, assemblies, subassemblies or the cabinet which is caused by improper installation practices will void the warranty.



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## 1.0 OVERVIEW

A Dedicated Outdoor Air System, or DOAS, is a large air handling unit containing an energy recovery core, two fans and optional heating/cooling equipment. The walls, floor and roof are all double-wall sheet metal panels with foam insulation. It has a permanently attached base, equipped with lifting lugs. The base also has openings to permit use of a forklift with extended forks to lift the unit from either the sides or the ends.

RenewAire DOASs come in two different versions, either the Indoor Series or the Rooftop Series. Each series is available in three different sizes (DN2, DN3, DN5) but they may also be configured at the factory into a shorter unit with limited options.

Indoor Series includes:

DN2IN: 126" L x 60.75" W x 71.875" H  
 DN3IN: 147.875" L x 90.125" W x 71.875" H  
 DN5IN: 174" L x 103.75" W x 88.875" H

Rooftop Series includes:

DN2RT: 151.625" L x 76.625" W x 73.125" H  
 DN3RT: 174.875" L x 106.125" W x 75.125" H  
 DN5RT: 205.125" L x 126.375" W x 92.125" H

See the Center of Gravity drawings in Section 2.0 of this manual for unit weights and to see the approximate center of gravity for each unit.

See the submittal to verify the unit model, unit dimensions, and approximate unit weight.

The rooftop version is normally placed on a 14" high curb (ordered and delivered separately) or customer-provided equipment rails, while the indoor version may be placed on owner-provided supports. All units must generally be elevated above ground level in order to provide clearance for drain traps or water drainage.

## 2.0 SHIPPING/RECEIVING/HANDLING

All DOAS units are assembled at the factory and palletized for shipment via common carrier. The DOAS will be on one large pallet and needed accessories such as outdoor air hoods are factory-assembled and shipped on a separate pallet at the same time. Some small accessories may be packed and stored inside the DOAS itself. It is the customer's responsibility to coordinate delivery of the shipment and provide any needed equipment for off-loading and placement of the unit. It is the customer's/installer's responsibility to provide needed equipment and skilled/experienced personnel to off-load the DOAS.

Note that when the shipment is delivered, the shipment **MUST BE INSPECTED** for any shipping damage or missing items. If any damage is found or if items are missing, notify your RenewAire dealer before accepting the shipment. If damage is found, take digital pictures of the damage. All discrepancies must be noted on the Bill of Lading.

### 2.1 OFF-LOADING

The DOAS can be handled with a forklift or crane, depending on the unit size and method of shipment. A crane can be used to hoist a rooftop unit directly to its intended location. Indoor units can sometimes be placed directly on their supports if the building roof is not yet in place. In other cases, indoor units will require lateral ground movement. When lateral ground movement is required, provision must be made to place the unit on a hard, level surface. Do not pull the unit by its lifting lugs.



**NOTE:** Dimensions shown are approximate and are for units with 1" thick walls. For units with 2" thick walls or unit specific dimensions and weights see the unit submittal.

## 2.2 FORKLIFT USE

The DOAS unit base has openings in the sides and the ends for insertion of forklift forks. When a forklift is used to move or handle the DOAS, care must be taken to ensure that the forks extend all the way across the unit.

When lifting unit, forklift extensions must be used and a minimum length of 72" for DN2 and 96" for DN3 and DN5.

When lifting DOAS off the pallets:

- If entering from the side of the DOAS, ensure forks extend in far enough as to catch the furthest away stringer with fork extensions.
- If entering from the front of the unit, ensure forks extend all the way through the unit.

## 2.3 HOISTING

Note that RenewAire does not provide specific instructions for hoisting and moving the DOAS because all job sites are different and available handling equipment will vary. It is the rigger's responsibility to properly and safely move the DOAS.

### **WARNING**

#### **RISK OF DEATH OR SERIOUS INJURY**

Hoisting heavy equipment overhead is inherently dangerous. Failure to properly rig the DOAS for hoisting or the use of incorrect rigging equipment may result in the DOAS falling during hoisting.

Improper work procedures may result in death or serious injury to workers. Rigging, hoisting and assembly are to be performed by skilled and experienced personnel. OSHA-approved work guidelines are to be strictly followed.

Before proceeding with installation, read all instructions, verifying that all the parts are included.

The information in this manual is provided as a guideline and does not necessarily meet all local codes. It is the installer's responsibility to comply with all local codes and OSHA-approved safety practices.



**NOTE:** Whenever a unit is rigged for lifting, whether by means of a forklift or a crane, a test-lift should be performed. Raise the unit slightly and check all rigging and verify that the raised unit is LEVEL. If the rigging is coming into contact with the unit cabinet or if the unit is out of level, replace the unit and correct the rigging equipment.

- The unit comes equipped with base rail lifting lugs at the lower 4 corners and in the middle of the unit.
- Each lifting lug has a 2" diameter hole which will accommodate a 1.5" dia. schedule 40 steel pipe (not provided).
- Unit shall be lifted by cables (slings) attached to all of the lifting lugs.
- If cables or chains are used to lift the unit they must be the same length. Care should be taken not to damage the cabinet, dampers or roof.
- Adjustable spreader bars should be used to properly support the unit in order to distribute the load thus applying an even vertical lifting force to all of the lifting lugs. This will prevent structural damage to the unit.
- Provide additional blocking or covering as required.
- Secure hooks and cables at all lifting points.
- Take up slack in cables gradually as to avoid sudden movements as this may cause the unit to shift.
- Suspending the unit for an extended period of time is not recommended and it is advised to place the unit as soon as possible after lifting.
- Do not lift in high winds.
- RenewAire will not be responsible for any damage during the rigging, lifting, or installing of the DOAS.
- Refer to Center of Gravity drawings in Section 4.0 of this manual for approximate center of gravity and all corner weights.

Most deliveries and installations occur at the same time, meaning that the DOAS will be hoisted off the delivery truck and then go immediately to its final location. In these cases, the DOAS packing materials will be loosened or removed and the DOAS will be hoisted without any attached packing or shipping materials. If the DOAS must be stored for a period before placement in its final location, it may be preferable to leave the DOAS on its shipping pallet.

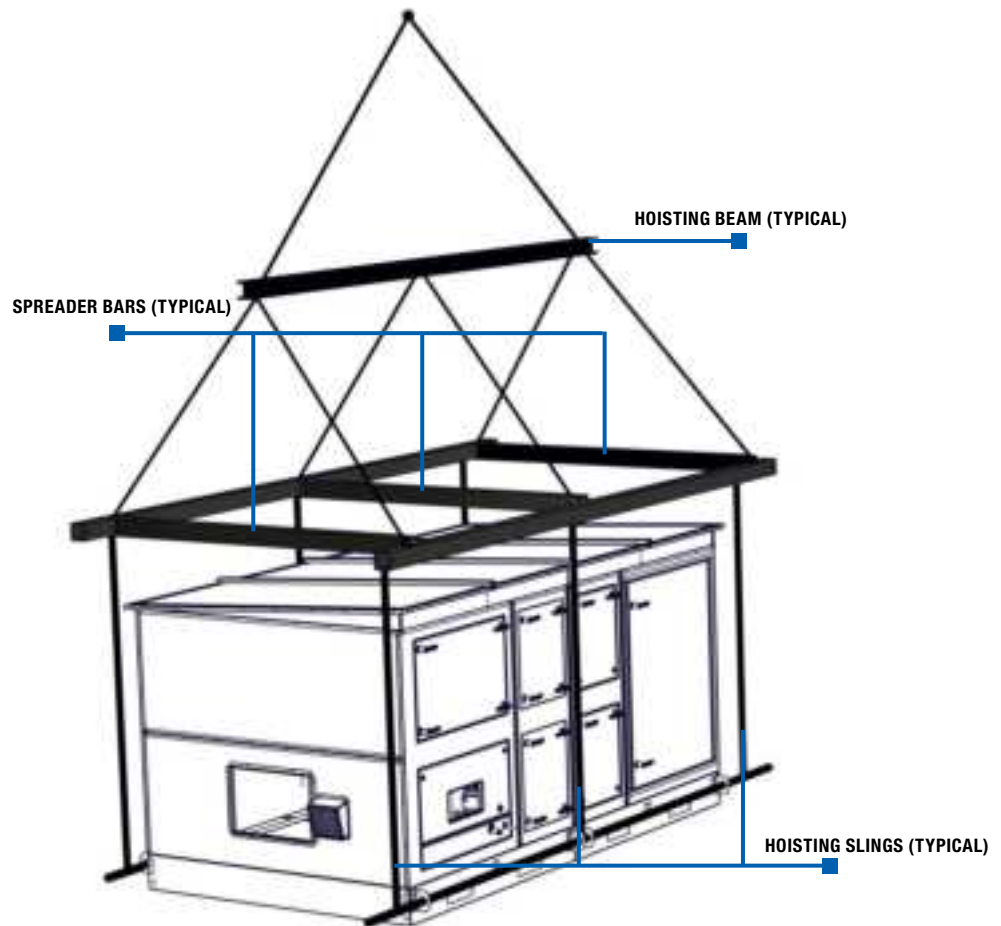


FIGURE 2.3.0 EXAMPLE OF MINIMUM HOISTING REQUIREMENTS

IT IS THE INSTALLING CONTRACTOR'S RESPONSIBILITY TO PROPERLY RIG AND HOIST THE UNIT. RENEWAIRE DOES NOT GIVE SPECIFIC INSTRUCTIONS FOR PROPER RIGGING BECAUSE ALL JOB SITES ARE DIFFERENT.

- All hoisting hardware must be properly load-rated. See Center of Gravity drawings in Section 4.0 of this manual.
- All lifting lugs must be used to properly support the unit during hoisting.
- All hoisting slings must provide uniform lift on each lifting lug.
- All hoisting slings must be completely vertical and cannot touch the cabinet during hoisting.
- Hoisting slings are to be attached to the lifting lugs with appropriate hardware such as shackles.

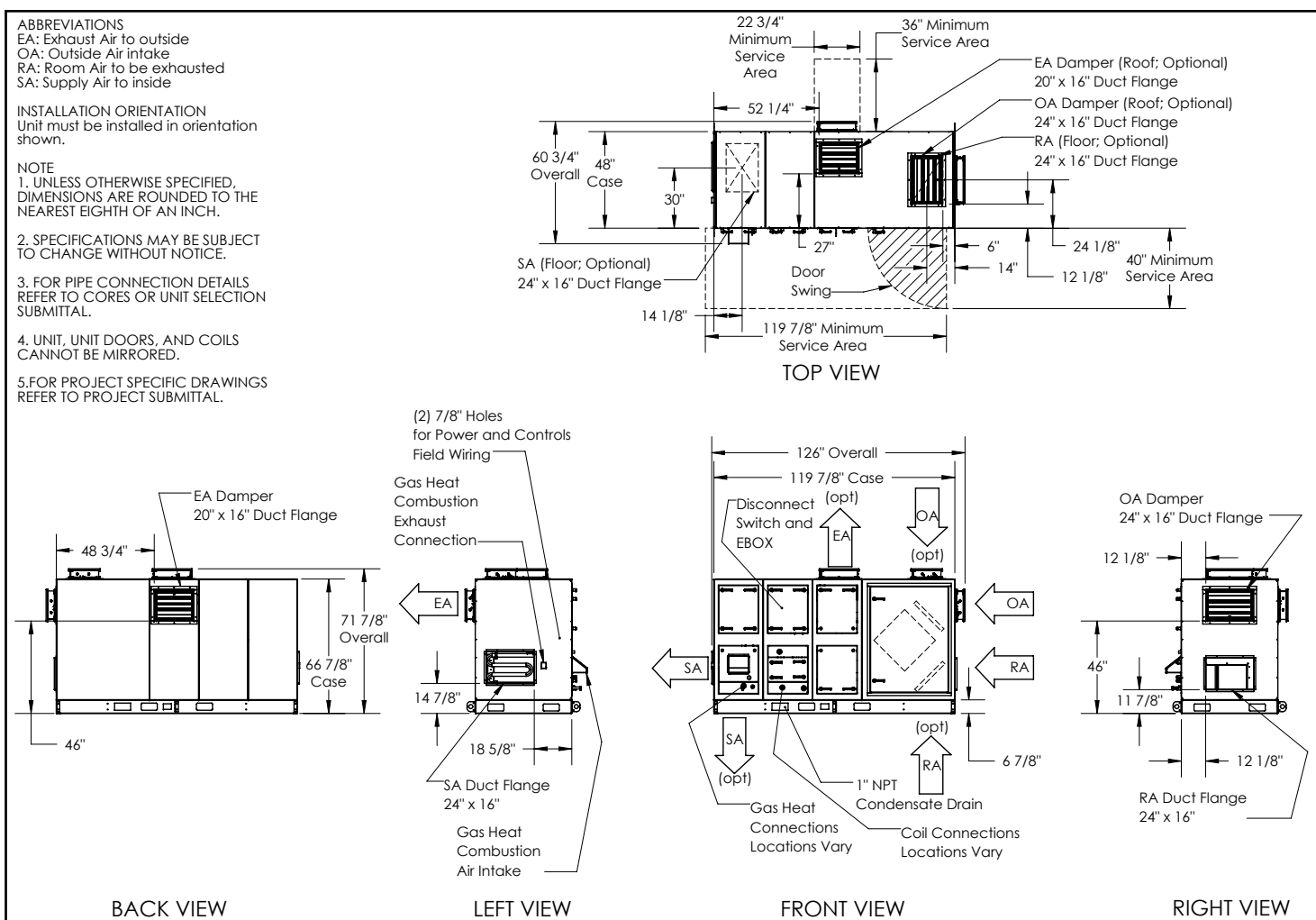
### IMPORTANT

Do not pull unit by lifting lugs. Handle the unit with a forklift or crane.

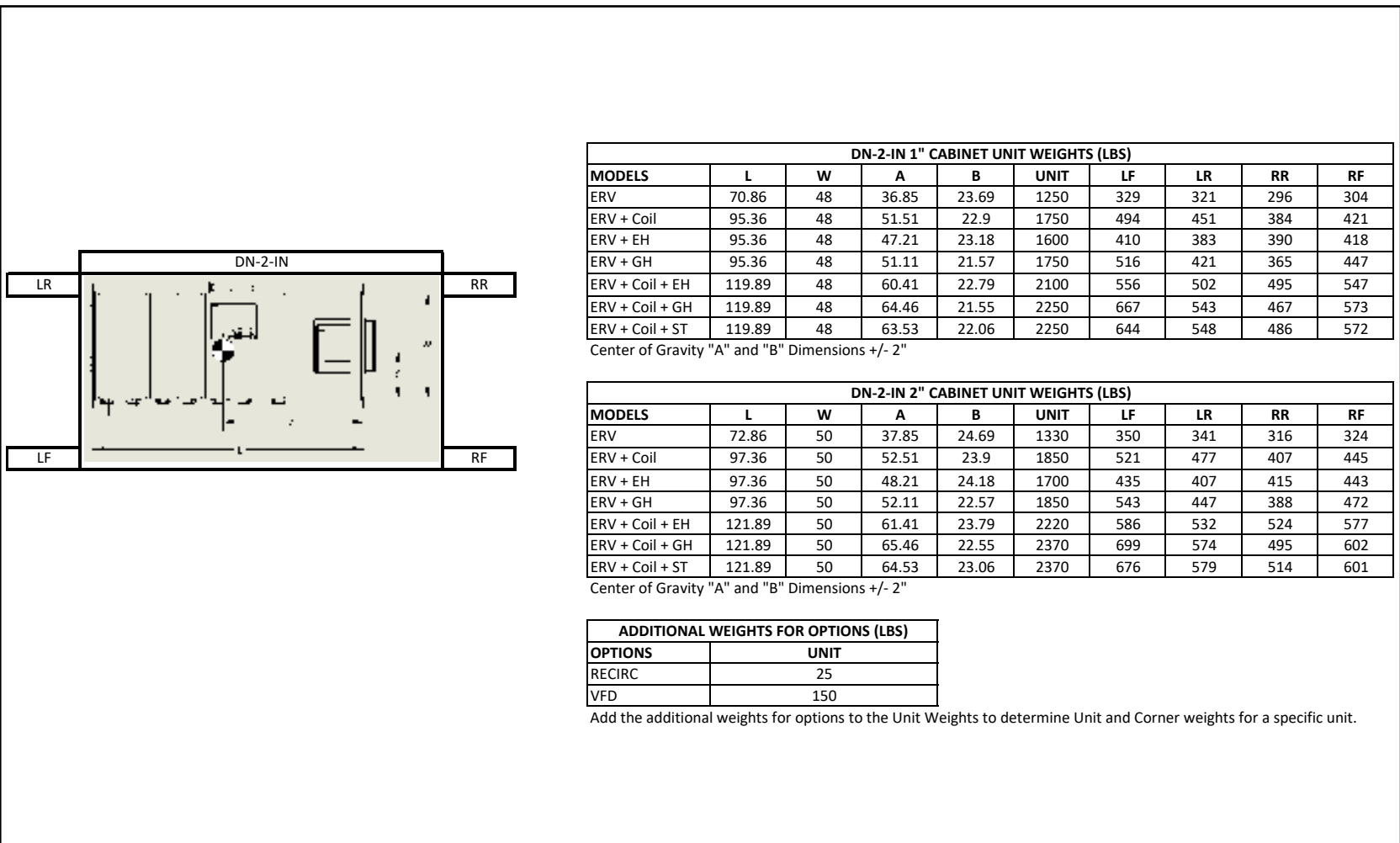


## 2.4 DN2IN DRAWINGS

## 2.4.1 DN2IN Dimensioned Drawing

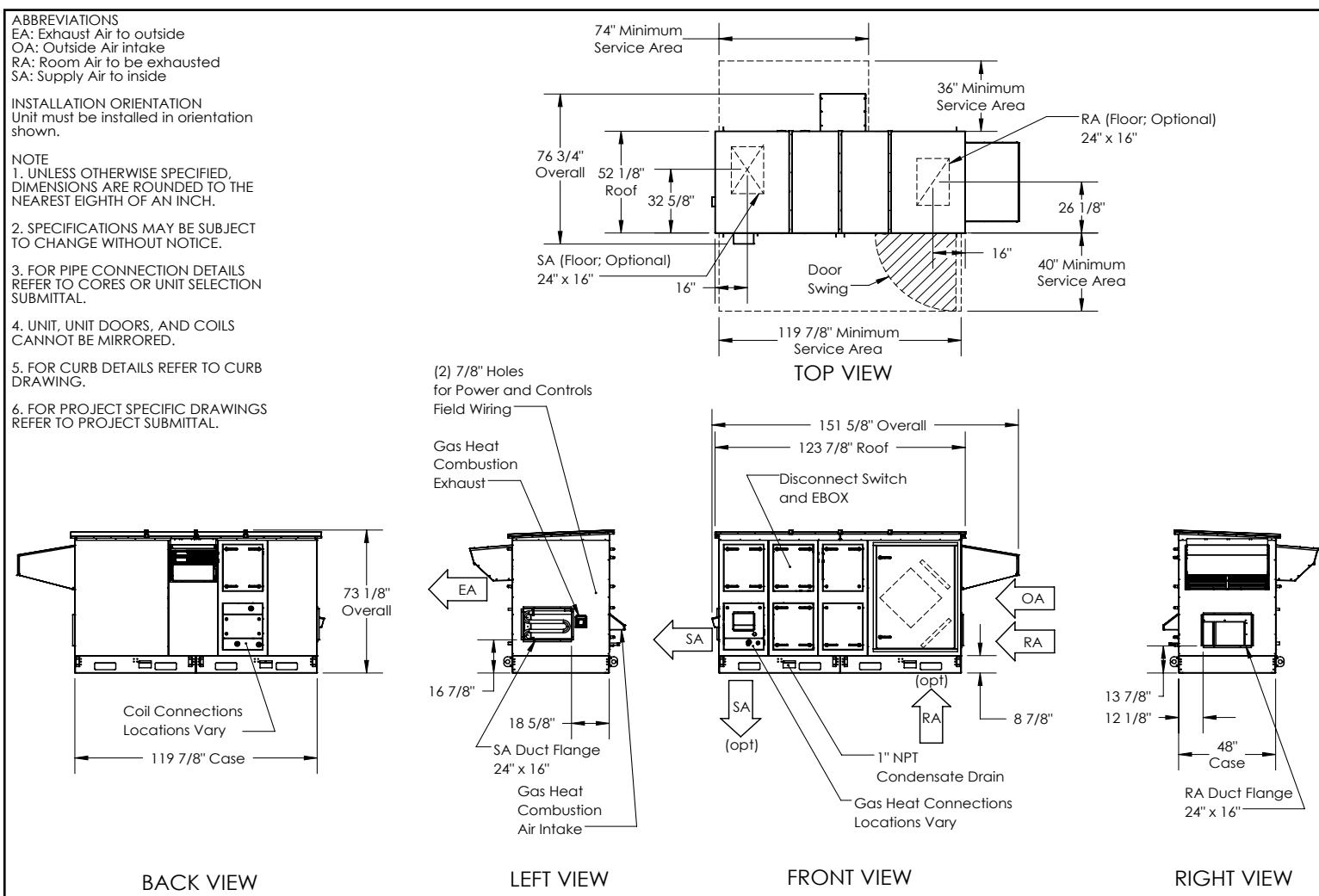


## 2.4.2 DN2IN Center of Gravity Drawing

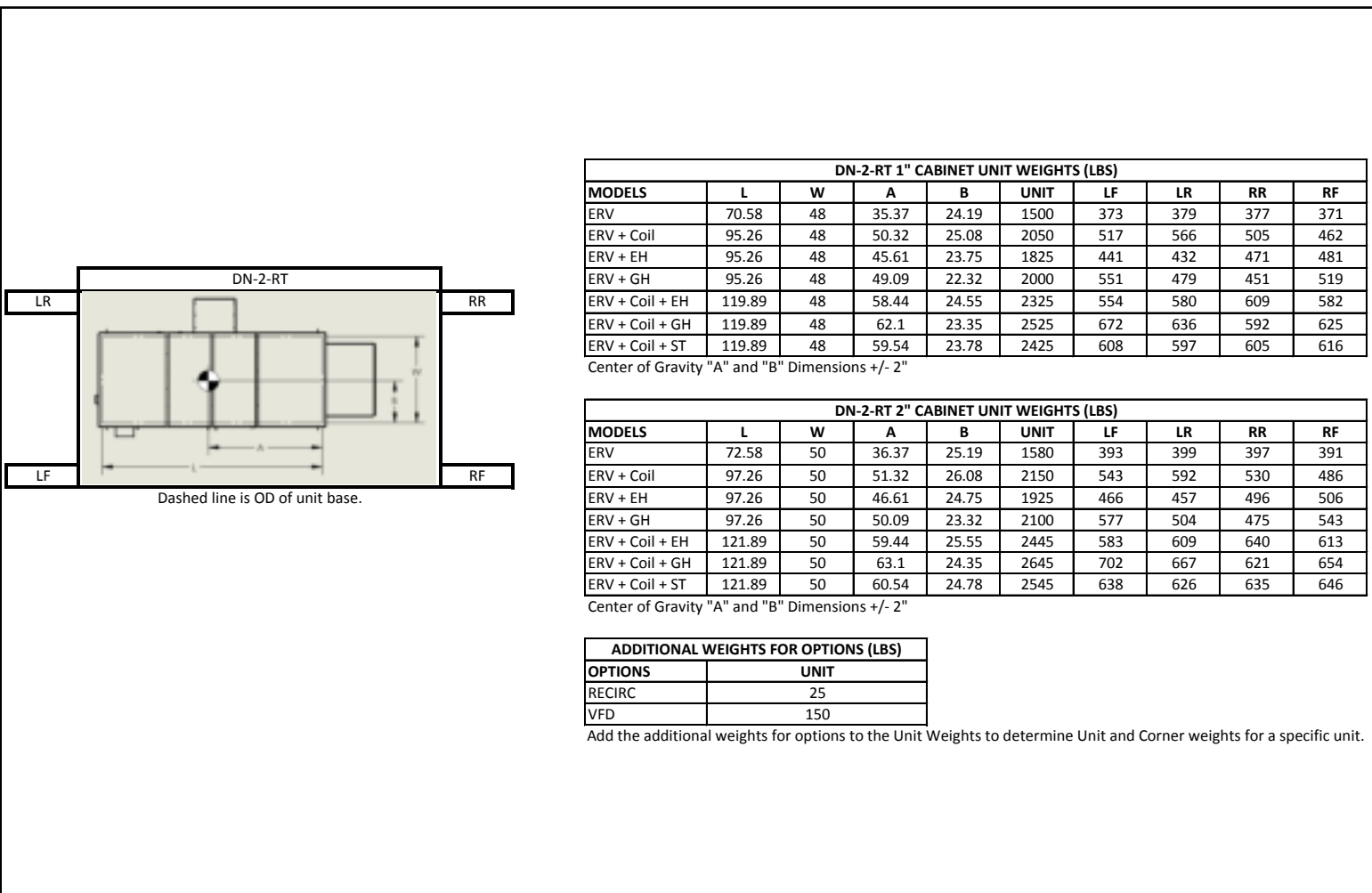


## 2.5 DN2RT DRAWINGS

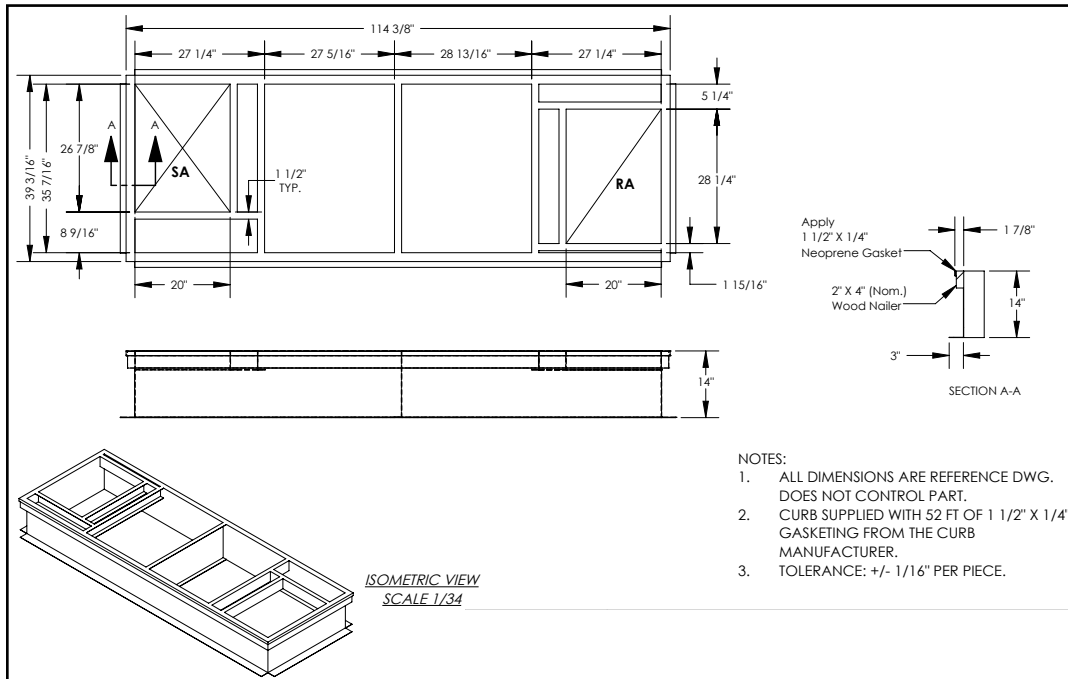
## 2.5.1 DN2RT Dimensioned Drawing



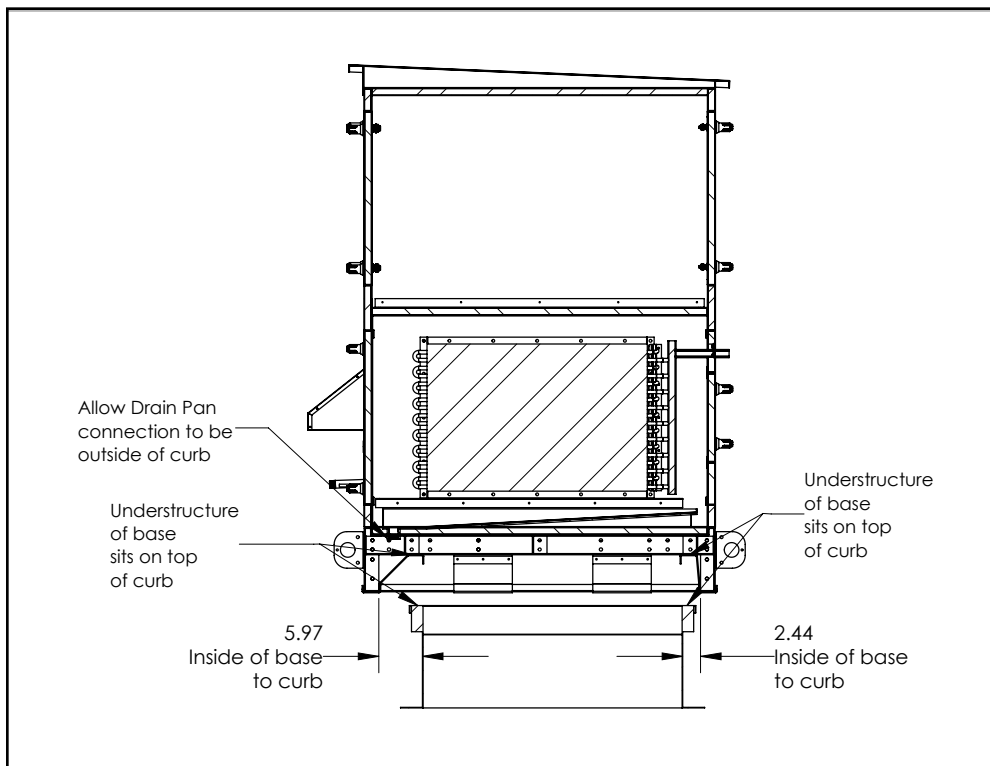
## 2.5.2 DN2RT Center of Gravity Drawing



## 2.5.3 DN2RT Full-Sized Curb Drawing

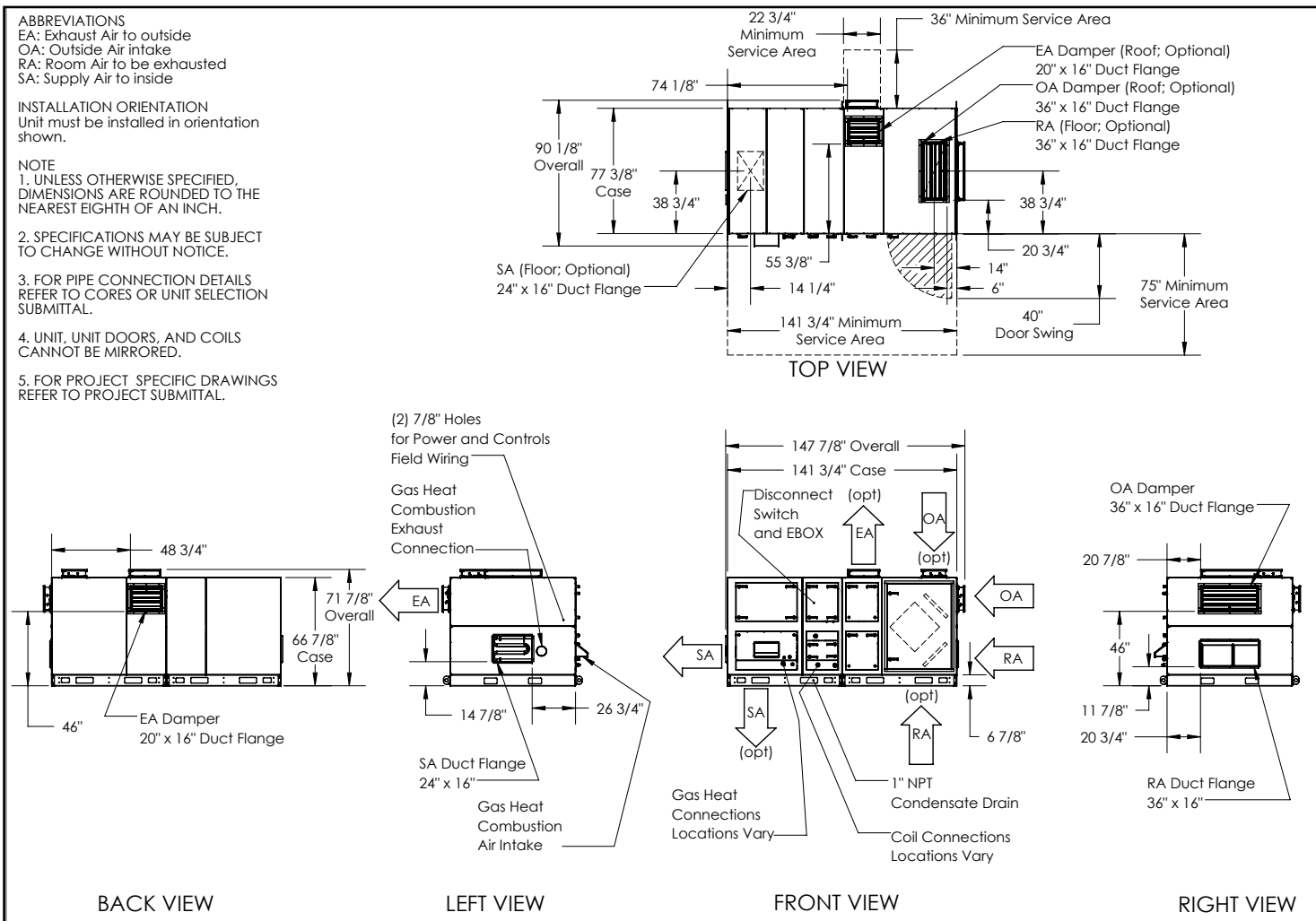


## 2.5.4 DN2RT Curb Mounting Drawing

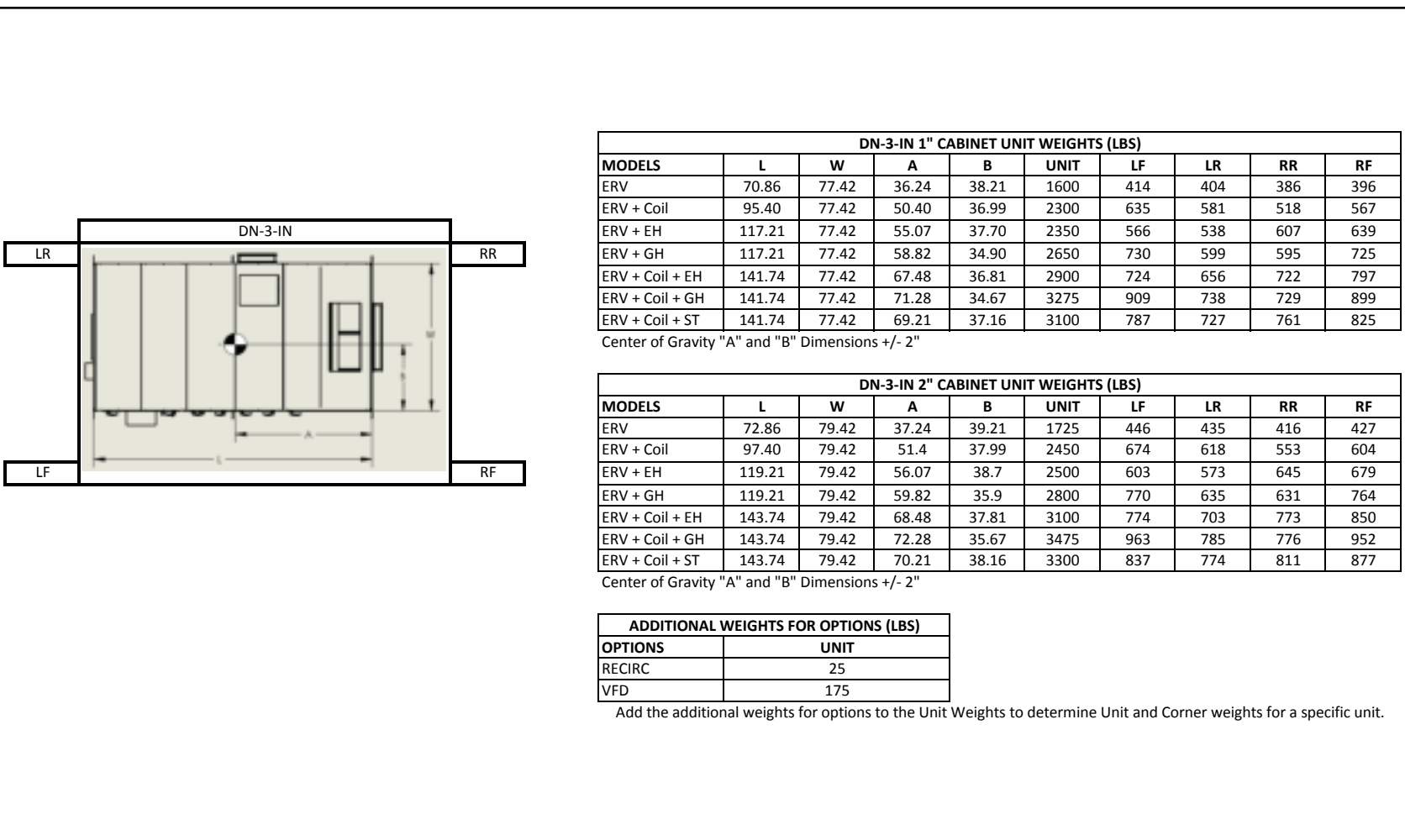


## 2.6 DN3IN DRAWINGS

## 2.6.1 DN3IN Dimensioned Drawing



## 2.6.2 DN3IN Center of Gravity Drawing



## 2.7 DN3RT DRAWINGS

## 2.7.1 DN3RT Dimensioned Drawing

**ABBREVIATIONS**  
 EA: Exhaust Air to outside  
 OA: Outside Air intake  
 RA: Room Air to be exhausted  
 SA: Supply Air to inside

**INSTALLATION ORIENTATION**  
 Unit must be installed in orientation shown.

**NOTE**

1. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE ROUNDED TO THE NEAREST EIGHTH OF AN INCH.

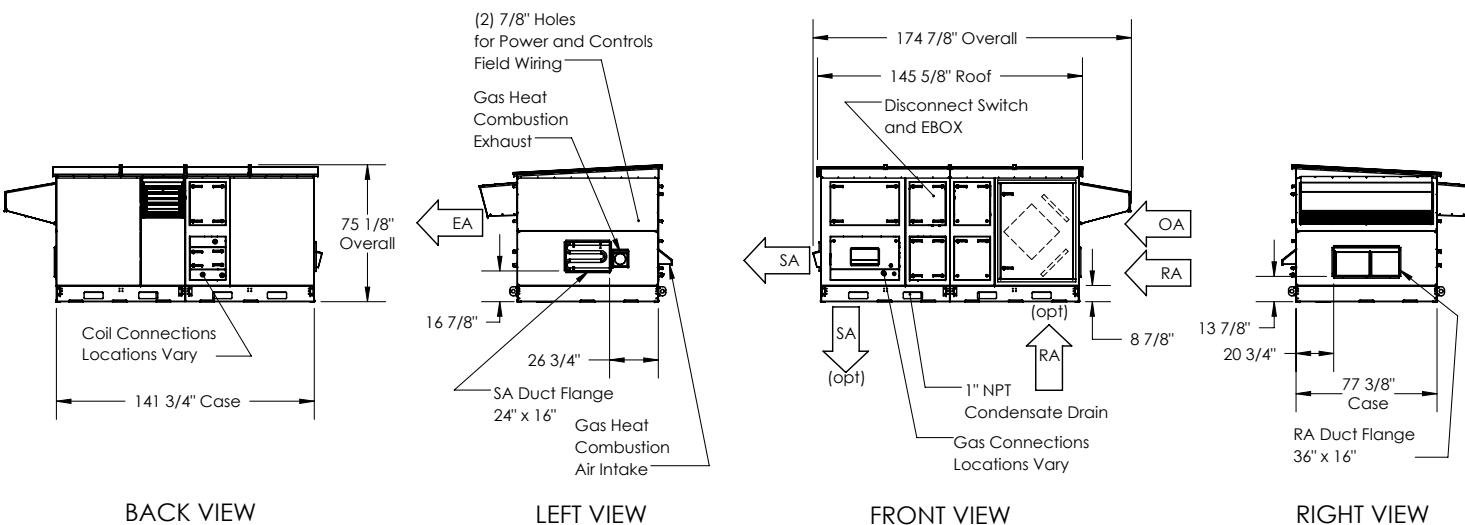
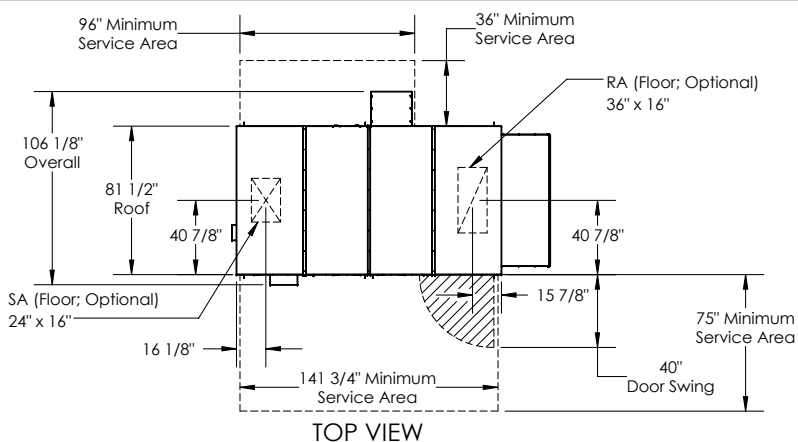
2. SPECIFICATIONS MAY BE SUBJECT TO CHANGE WITHOUT NOTICE.

3. FOR PIPE CONNECTION DETAILS REFER TO CORES OR UNIT SELECTION SUBMITTAL.

4. UNIT, UNIT DOORS, AND COILS CANNOT BE MIRRORED.

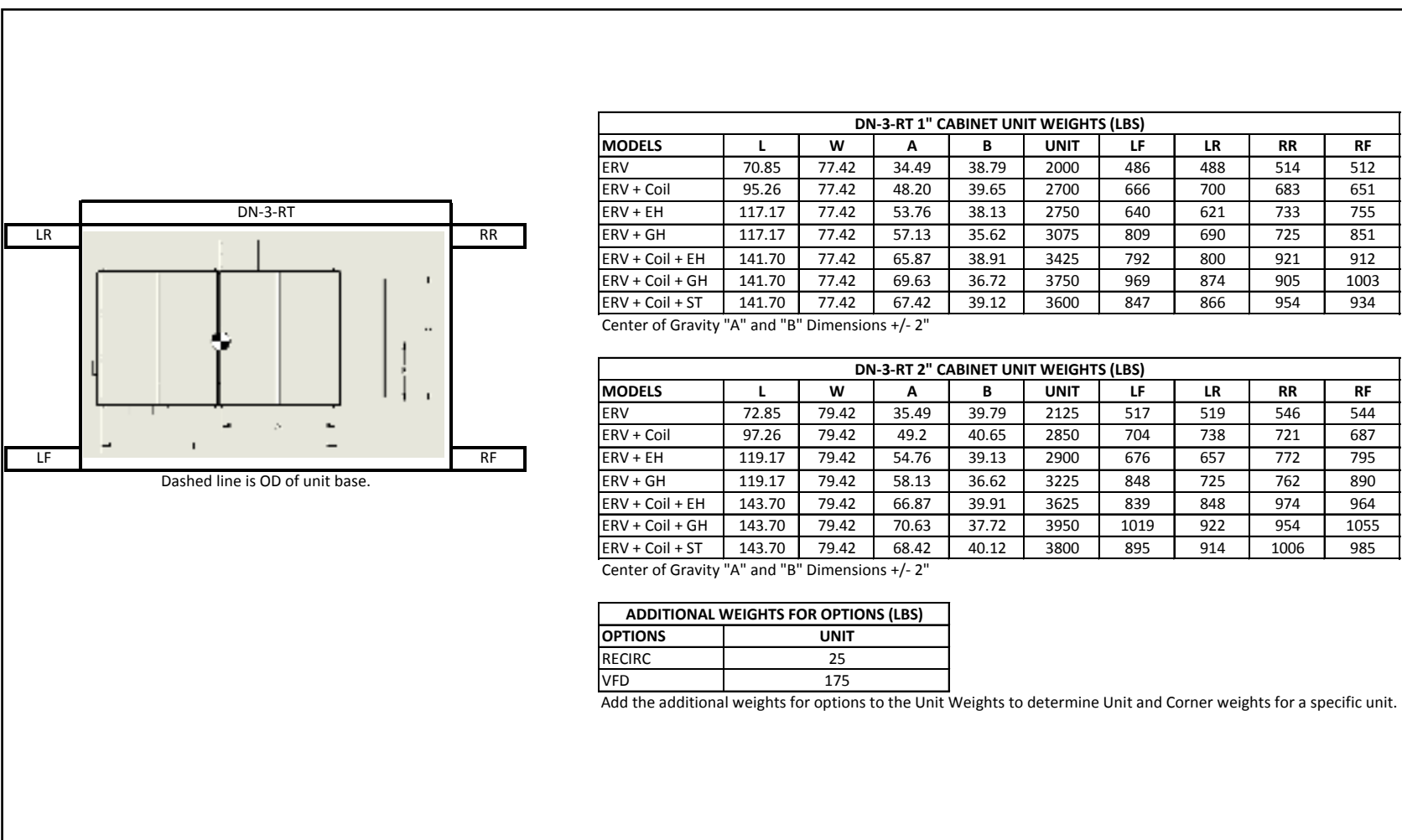
5. FOR CURB DETAILS REFER TO CURB DRAWING.

6. FOR PROJECT SPECIFIC DRAWINGS REFER TO PROJECT SUBMITTAL.

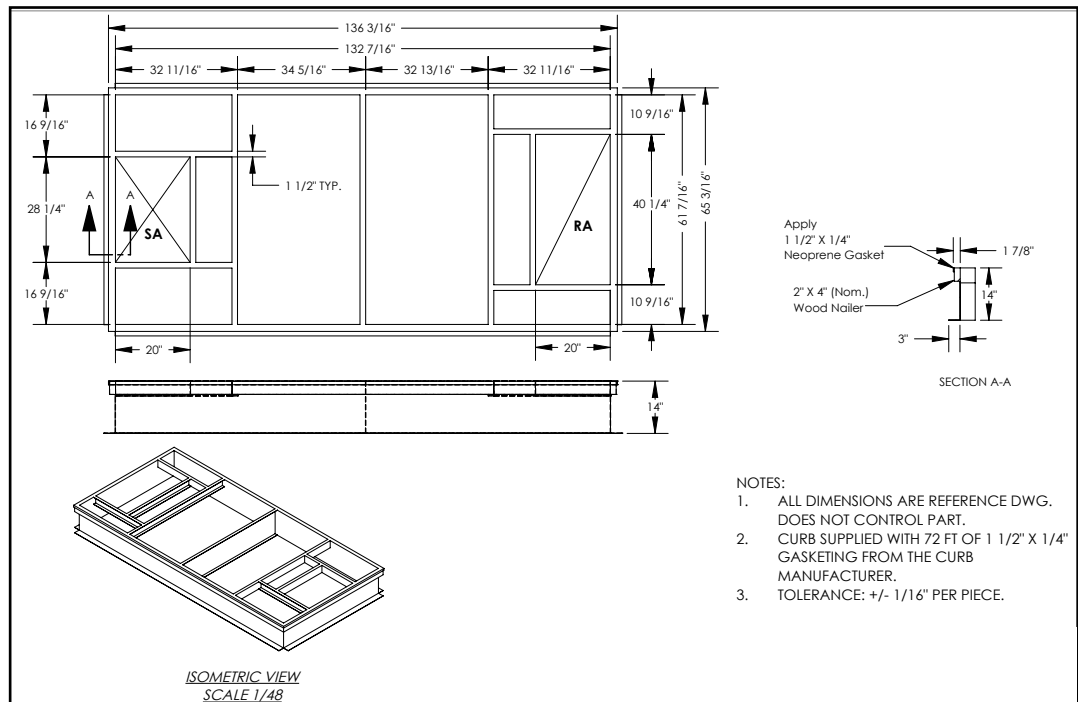




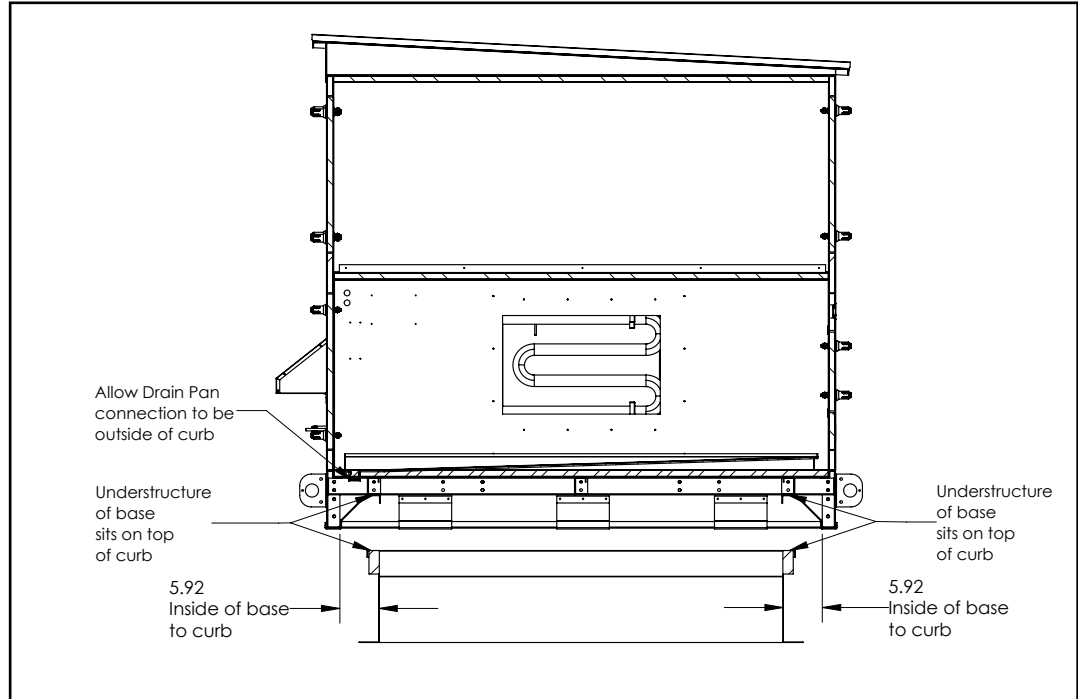
## 2.7.2 DN3RT Center of Gravity Drawing



2.7.3 DN3RT Full-Size Curb Drawing

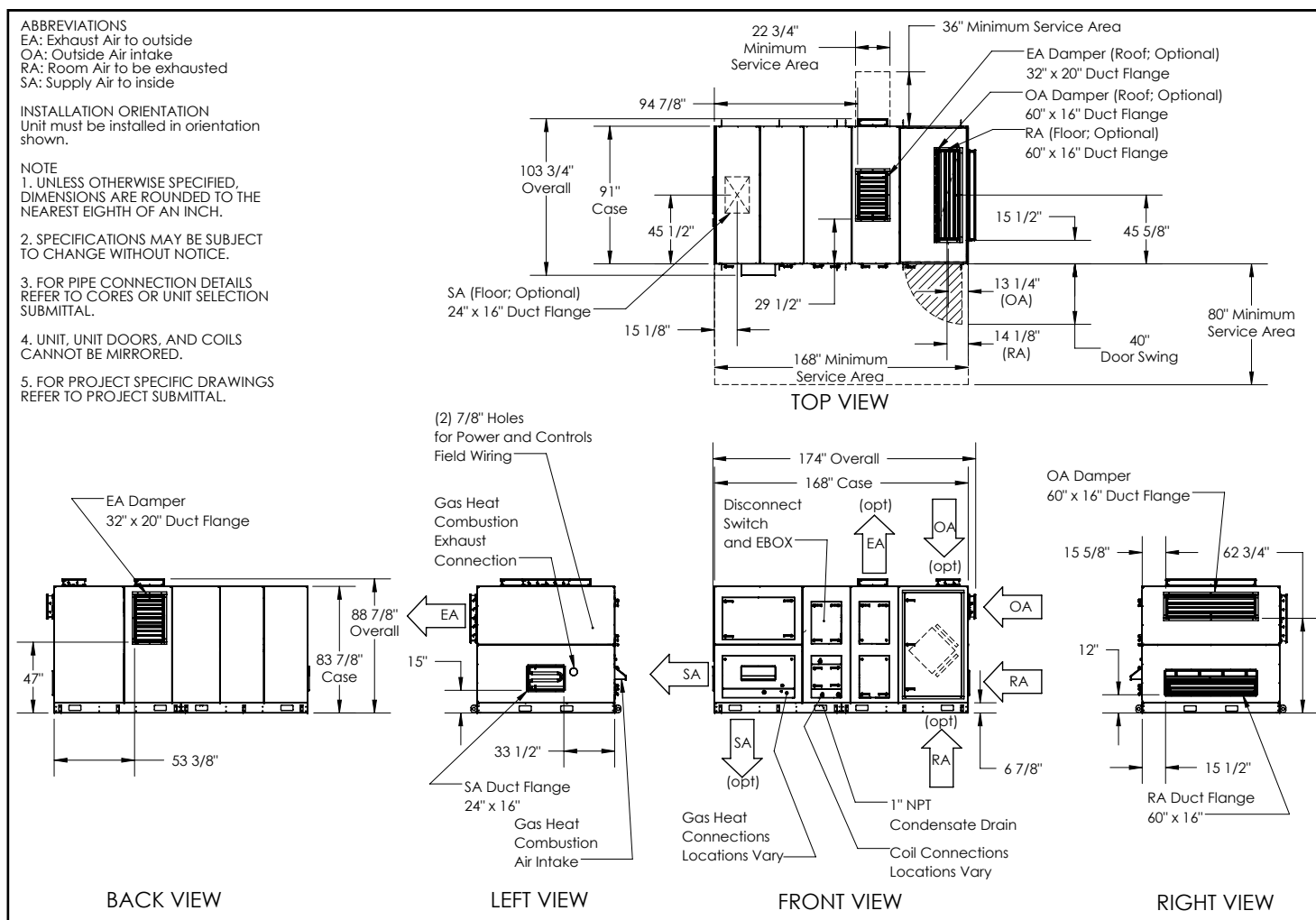


2.7.4 DN3RT Curb Mounting Drawing

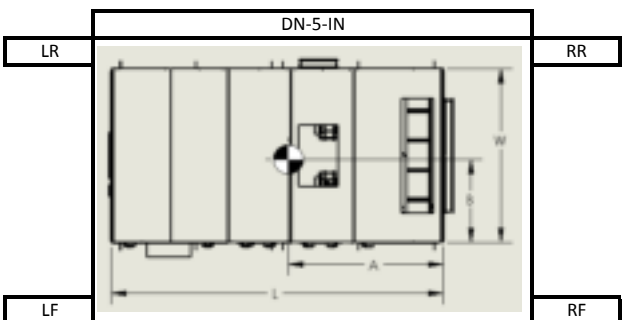


## 2.8 DN5IN DRAWINGS

## 2.8.1 DN5IN Dimensioned Drawing



## 2.8.2 DN5IN Center of Gravity Drawing



| DN-5-IN 1" CABINET UNIT WEIGHTS (LBS) |        |    |       |       |      |      |     |      |      |
|---------------------------------------|--------|----|-------|-------|------|------|-----|------|------|
| MODELS                                | L      | W  | A     | B     | UNIT | LF   | LR  | RR   | RF   |
| ERV                                   | 78.04  | 91 | 39.23 | 44.51 | 2600 | 668  | 639 | 632  | 661  |
| ERV + Coil                            | 109.78 | 91 | 53.08 | 44.58 | 3300 | 814  | 782 | 835  | 869  |
| ERV + EH                              | 136.26 | 91 | 61.09 | 44.29 | 3550 | 817  | 775 | 953  | 1005 |
| ERV + GH                              | 136.26 | 91 | 63.72 | 43.38 | 3800 | 930  | 847 | 964  | 1059 |
| ERV + Coil + EH                       | 168.00 | 91 | 74.54 | 44.25 | 4250 | 969  | 917 | 1150 | 1215 |
| ERV + Coil + GH                       | 168.00 | 91 | 78.46 | 43.4  | 4450 | 1087 | 991 | 1131 | 1241 |
| ERV + Coil + ST                       | 168.00 | 91 | 74.33 | 44.43 | 4300 | 974  | 929 | 1171 | 1227 |

Center of Gravity "A" and "B" Dimensions +/- 2"

| DN-5-IN 2" CABINET UNIT WEIGHTS (LBS) |        |    |       |       |      |      |      |      |      |
|---------------------------------------|--------|----|-------|-------|------|------|------|------|------|
| MODELS                                | L      | W  | A     | B     | UNIT | LF   | LR   | RR   | RF   |
| ERV                                   | 80.04  | 93 | 40.23 | 45.51 | 2725 | 699  | 670  | 663  | 692  |
| ERV + Coil                            | 111.78 | 93 | 54.08 | 45.58 | 3450 | 851  | 818  | 873  | 908  |
| ERV + EH                              | 138.26 | 93 | 62.09 | 45.29 | 3700 | 852  | 809  | 993  | 1046 |
| ERV + GH                              | 138.26 | 93 | 64.72 | 44.38 | 3950 | 967  | 882  | 1003 | 1098 |
| ERV + Coil + EH                       | 170.00 | 93 | 75.54 | 45.25 | 4450 | 1015 | 962  | 1203 | 1270 |
| ERV + Coil + GH                       | 170.00 | 93 | 79.46 | 44.4  | 4650 | 1136 | 1038 | 1182 | 1294 |
| ERV + Coil + ST                       | 170.00 | 93 | 75.33 | 45.43 | 4500 | 1020 | 974  | 1224 | 1282 |

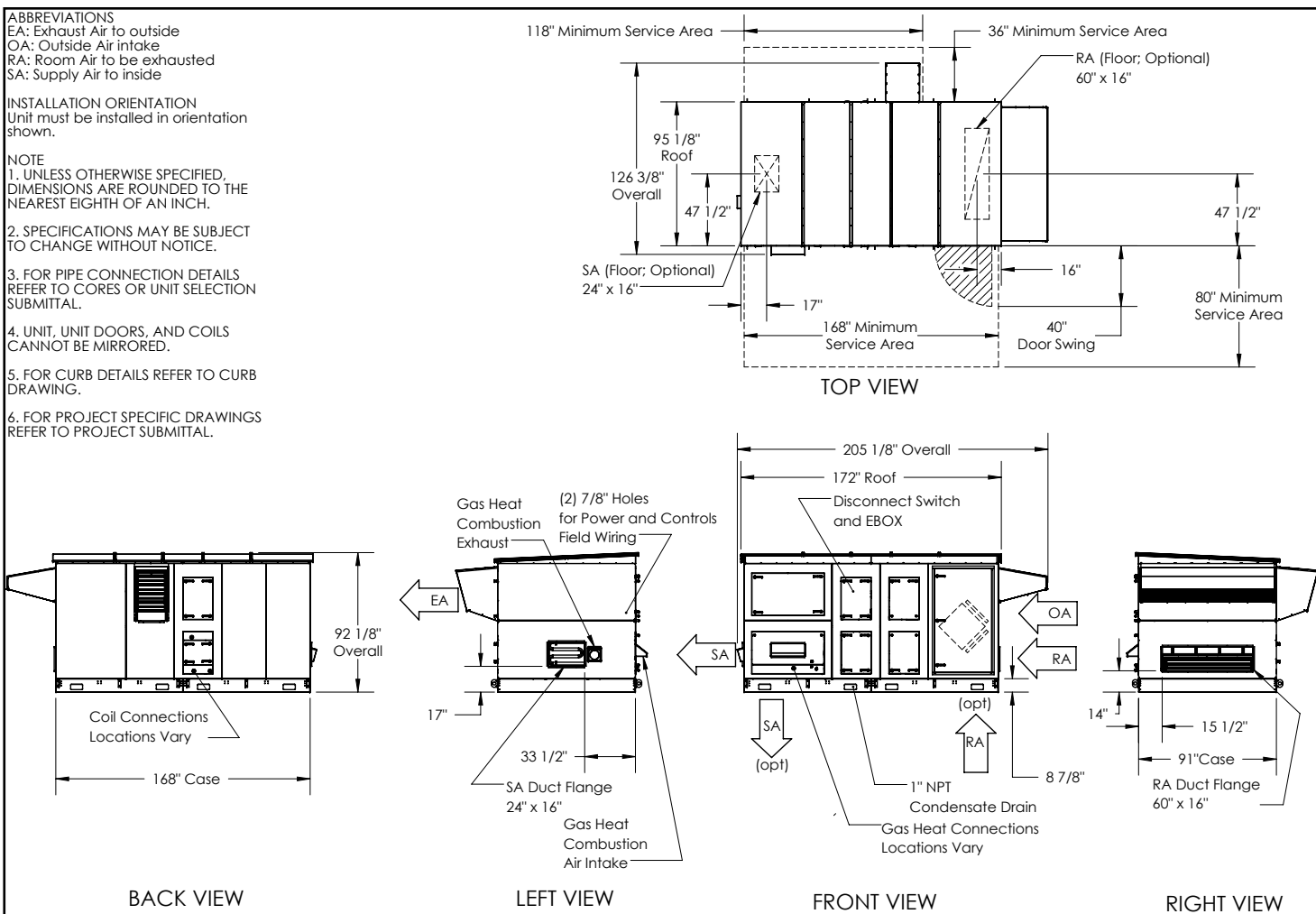
Center of Gravity "A" and "B" Dimensions +/- 2"

| ADDITIONAL WEIGHTS FOR OPTIONS (LBS) |      |
|--------------------------------------|------|
| OPTIONS                              | UNIT |
| RECIRC                               | 50   |
| VFD                                  | 340  |

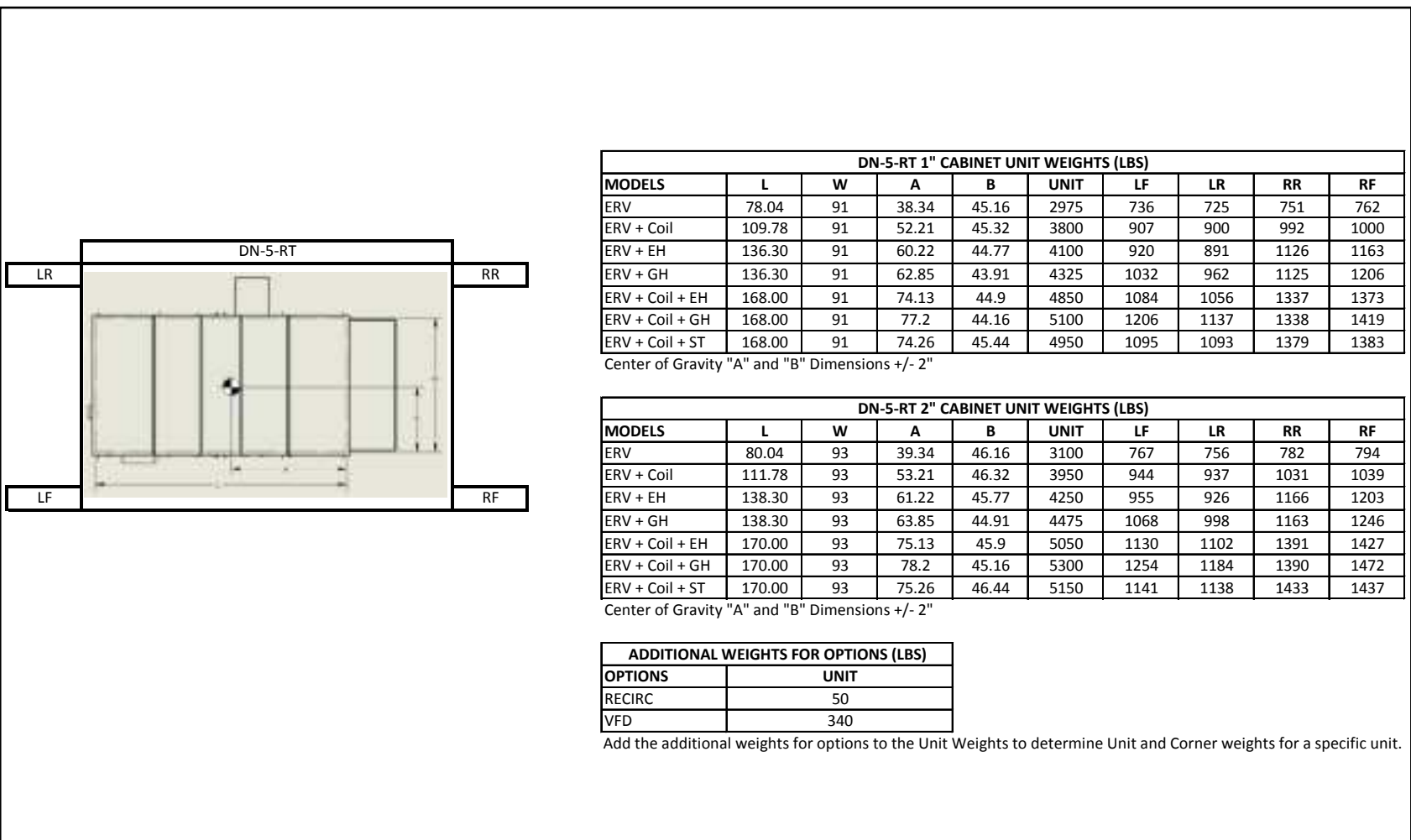
Add the additional weights for options to the Unit Weights to determine Unit and Corner weights for a specific unit.

## 2.9 DN5RT DRAWINGS

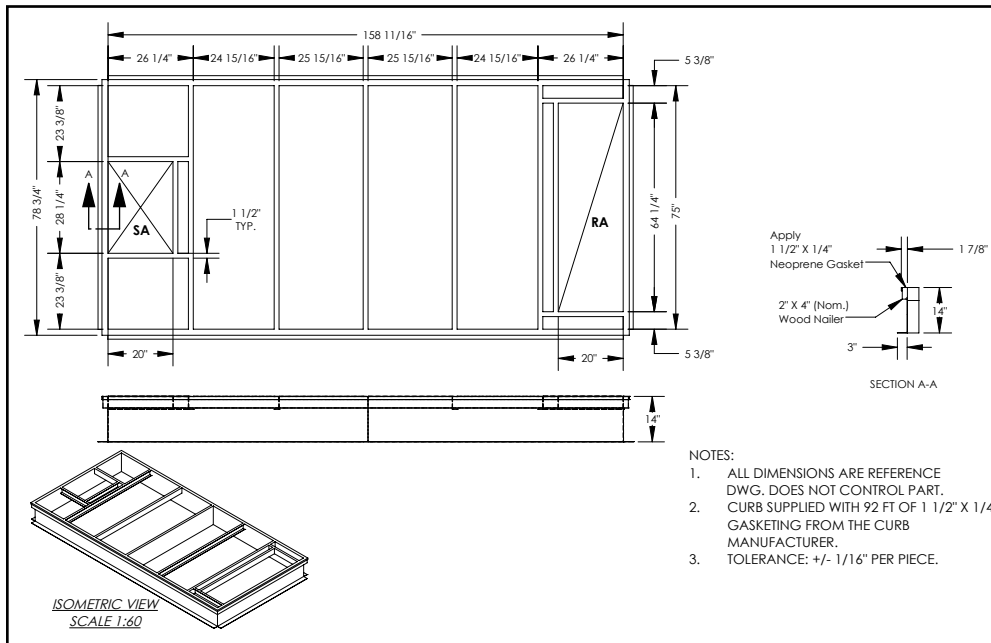
## 2.9.1 DN5RT Dimensioned Drawing



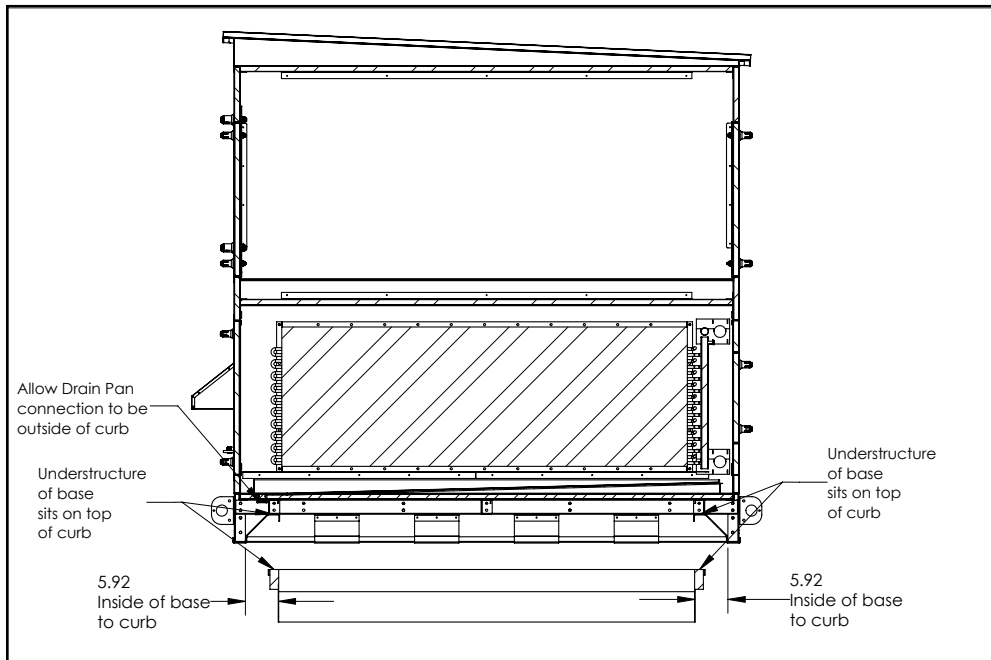
## 2.9.2 DN5RT Center of Gravity Drawing



## 2.9.3 DN5RT Full-Size Curb Drawing



## 2.9.4 DN5RT Curb Mounting Drawing



### 3.0 INSTALLATION PREPARATION

#### 3.1 DRAIN TRAP PREPARATION

Note that the DOAS IOM has instructions for fabrication of drain traps. For ease of installation, RenewAire suggests that the condensate drain elbow and horizontal drain pipe be installed before the unit is set in its final position.

#### 3.2 UNIT STORAGE

In those cases where a DOAS must be stored prior to placement in its final location, it must be properly supported on a firm, level base. The unit must not be racked, which may result in the doors and access panels binding and not working properly. Units must be covered with protective tarps to prevent water and/or dirt from entering the unit through the duct openings. The DOAS must not be used for storage of construction or installation supplies, and materials must not be placed on or against the unit during storage. All doors and access panels are to be secured.

#### 3.3 ROOFTOP CURBS

Rooftop curbs are ordered and delivered separately. They are to be assembled in accordance with the instructions furnished with the curb. When locating the position for a curb, verify that all required unit clearances are being met by checking the dimensioned drawings provided in Section 2.0 of this manual. Curbs are to be leveled from the underside in order to provide a continuous, level bearing surface for the DOAS. If a curb is placed on a rooftop above supporting structural members, shims must be placed beneath the curb at the locations of all the structural members in order to properly transfer and distribute the load on the building. In addition, shims must be placed at all lifting lug locations and not more than four feet apart, to include the ends of the unit. After proper shimming, the bearing surface (top) of the curb must be within 1/8" of level in any four-foot distance. The most critical level is front-to-back at the drain pan. After the curb has been placed and leveled, foam gasketing provided with the curb is to be installed on the top surface of the curb, following the instructions provided with the curb.

#### 3.4 CURB CLIPS

RenewAire offers optional curb clip kits for the DN-Series. The Curb Clip Kits are designed for winds up to 90 MPH. The available curb clip kits include clips and hardware. Clips must be installed per the instructions before the DN unit is placed on the curb, using the supplied hardware. For further information on curb clip kits used with DN-Series units *see the DN Curb Clip Installation Manual*.

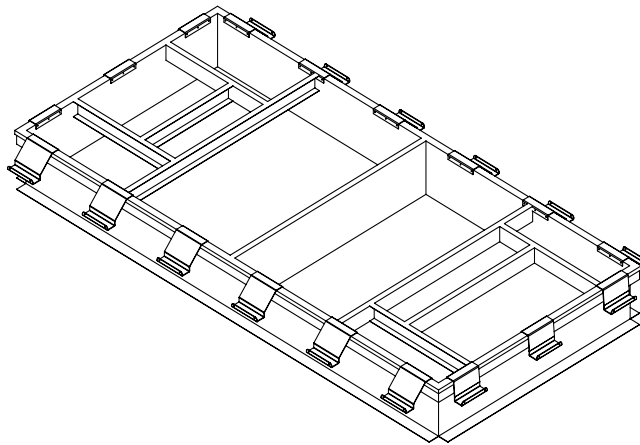


FIGURE 3.4.0 CURB CLIPS TYPICAL INSTALLATION



### 3.5 EQUIPMENT RAILS

A variety of equipment mounting rails are commercially available. They may be used on rooftops or for indoor unit installations. Equipment rails, as specified and provided by others, must be sized to provide proper support for the DOAS. When locating the positions for equipment rails, verify that all required unit clearances are being met by checking the dimensioned drawings provided in Section 2.0 of this manual. They should be leveled from beneath each rail so the bearing surface (top) of each rail is within 1/8" of level in any four-foot distance. Equipment rails should also be sized to provide direct bearing support on building structural members.

### 3.6 PRE-POSITION DUCTWORK

Some rooftop DOAS units have ductwork connected directly to the underside of the DOAS. After the curb or equipment rails are placed, verify if any ductwork is to be connected thus. If any ductwork is to be connected to the underside of the DOAS, pre-position the ductwork and install any needed gasketing on the connecting surfaces. Lower the duct so that it does not interfere with movement and placement of the DOAS.

### 3.7 LATERAL GROUND MOVEMENT

In those cases where a DOAS must be placed on the ground and then moved laterally to its final position, it is the installer's responsibility to properly support and safely move the unit. RenewAire does not provide specific instructions for lateral movement because all job sites differ. A variety of equipment moving tools are commonly available. It is often preferable to have the DOAS mounted on its pallet during lateral movements, which provides better support for the unit and may facilitate the use of a forklift.

### 3.8 UNIT PLACEMENT

The unit should be hoisted into position directly above the curb or its intended location and lowered straight down onto its bearing surface. If the unit is being placed on a RenewAire curb, foam gasketing is to have been applied to the bearing surfaces. The foam gasketing can be damaged by lateral adjustments.

#### CAUTION

It is the installers responsibility to select equipment, structures, and materials suitable to support the loads and substrates involved with installation. Secure the unit so it cannot fall or tip in the event of accident, structural failure, or earthquake. Do not store or stack items on the unit when installed.

### 3.9 INSTALLATION OF HOODS

Rooftop units (RT models) have weatherhoods that are assembled at the factory and shipped on a separate pallet for field installation. See instructions/figures below.

Installation of the hoods is normally performed after all rigging and hoisting is completed because of the chance of damage to the hoods by the rigging equipment.

All weatherhoods have a flange on the top rear that must be inserted behind the roof panel overhang. To install any hood, remove the factory-installed roof edge screws and keep them for re-use.

#### 3.9.1 Outside Air Hood

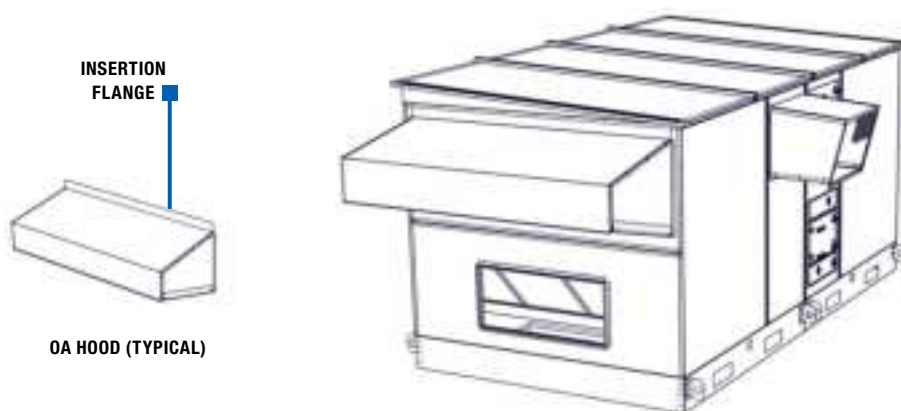


FIGURE 3.9.0 OUTSIDE AIR HOOD (TYPICAL)

Slide the top flange of the OA hood beneath the roof panel side trim. Reinstall the screws at the top of the roof flange and then install screws along the sides and lower edge of the hood.

#### 3.9.2 Exhaust Air Hood

Slide the top flange of the EA hood beneath the roof panel back trim. Reinstall the screws at the top of the hood flange and then install screws along the sides and bottom edge of the hood.

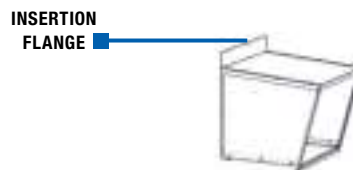


FIGURE 3.9.1 EXHAUST AIR HOOD (TYPICAL)

### 3.10 UTILITY AND MECHANICAL CONNECTIONS

Utility and mechanical connections are made after the unit is placed and any hoods installed. Any structural alterations necessary for installation must comply with all applicable building, health, and safety code requirements. When cutting or drilling into a wall or ceiling do not damage electrical wiring or other hidden utilities.

Rooftop and Indoor units have a label on the left end of the unit indicating location for field supplied entry of high voltage power and low voltage control wiring. Wiring penetrations other than in designated locations must be made according to local code.

Indoor units with coils have connections out the front of the unit. Rooftop units with direct expansion refrigerant coils have connections out the back of the unit. Rooftop units with fluid (water) coils have connection at the back of the unit but inside the unit. An area at the back of the unit is available for piping penetrations through the unit floor and curb. See the illustration on the following page for a representation of the penetration location. Penetration must be made in accordance with local code. Do not damage electrical wiring or other hidden utilities or structures.

Units with gas heat have connections out the front of the unit.

For additional information see *DN Series DOAS Indoor Installation, Operation and Maintenance Manual*, and *DN Series DOAS Rooftop Installation, Operation and Maintenance Manual*.

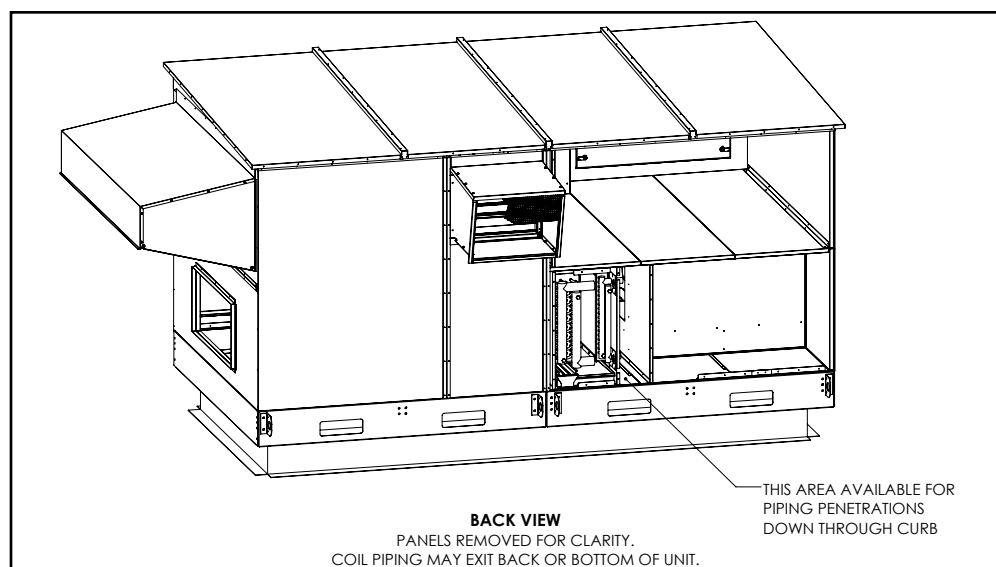


FIGURE 3.10.0 PIPING PENETRATIONS DRAWING A

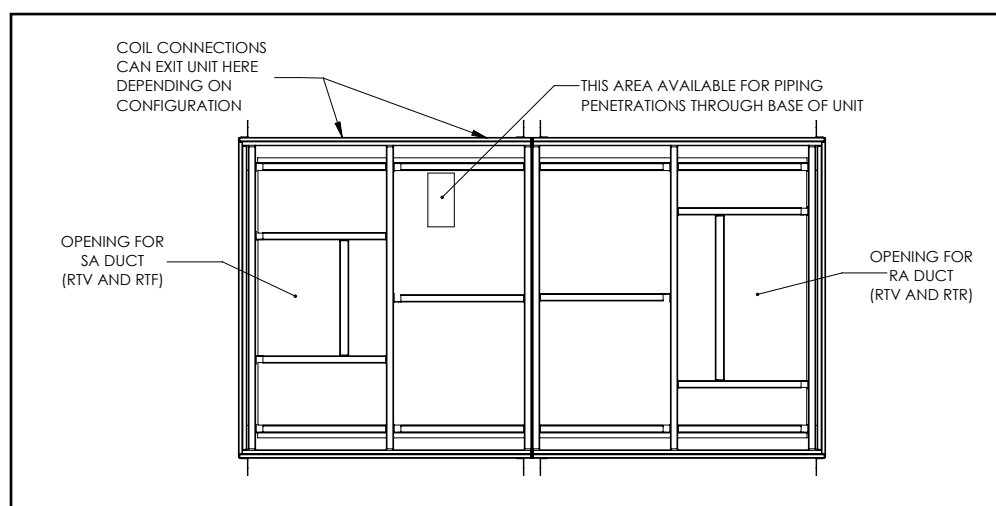


FIGURE 3.10.1 PIPING PENETRATIONS DRAWING B



## About RenewAir

For over 40 years, **RenewAir** has been a pioneer in enhancing indoor air quality (IAQ) in commercial and residential buildings of every size. This is achieved while maximizing sustainability through our fifth-generation, static-plate, enthalpic-core **Energy Recovery Ventilators (ERVs)** that optimize energy efficiency, lower capital costs via load reduction and decrease operational expenses by minimizing equipment needs, resulting in significant energy savings. Our ERVs are competitively priced, simple to install, easy to use and maintain and have a quick payback. They also enjoy the industry's best warranty with the lowest claims due to long-term reliability derived from innovative design practices, expert workmanship and **Quick Response Manufacturing (QRM)**.

As the pioneer of static-plate core technology in North America, RenewAir is the largest ERV producer in the USA. We're **committed to sustainable manufacturing** and lessening our environmental footprint, and to that end our Waunakee, WI plant is 100% powered by wind turbines. The facility is also one of the few buildings worldwide to be LEED® Gold and Green Globes certified, as well as having achieved ENERGY STAR Building status. In 2010, RenewAir joined the Soler & Palau (S&P) Ventilation Group in order to provide direct access to the latest in energy-efficient air-moving technologies. For more information, visit: [renewaire.com](http://renewaire.com)

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