INVITATION TO BID
Informal Bid
HVAC REPLACEMENT – Unit #3 City Hall
CITY OF GREENVILLE
NORTH CAROLINA

Find yourself in good company

RFP # 19-20-23

PRE-BID MEETING: TUESDAY, MARCH 17, 2020 @ 2:00 PM
CITY HALL
200 WEST 5TH STREET, GREENVILLE, NC

BIDS DUE: TUESDAY, MARCH 31, 2020 @ 2:00 PM
PUBLIC WORKS
1500 BEATTY STREET, GREENVILLE, NC 27834

CONTACT PERSONS:

QUESTIONS REGARDING THE BID PACKAGE:
Ms. Denisha Harris
Purchasing Manager
Telephone: (252) 329-4862
Email: dharris@greenvillenc.gov

QUESTIONS REGARDING THE SPECIFICATIONS:
Mr. Ross Peterson
Building and Grounds Supervisor
Telephone: (252) 329-4921
Email: rpeterson@greenvillenc.gov

CITY OF GREENVILLE
ADVERTISEMENT FOR PROPOSALS
"HVAC Replacement – Unit #3 City Hall"

The City of Greenville, NC is requesting proposals for the "HVAC Replacement – Unit #3 City Hall" located at the 200 West 5th Street, Greenville, NC. The scope of work shall include but is not limited to the removal of the existing rooftop Unit #3 condenser and air handler, installation of new condenser and air handler, all electrical and other associated items.

This is a turn-key project.

A mandatory pre-bid meeting and site visit will be held at City Hall located at 200 West 5th Street, Greenville, NC on Tuesday, March 17, 2019 @ 2:00 PM.

A site visit is mandatory that will be available following the pre-bid meeting and the alternate date for those that attend mandatory pre-bid will be Thursday, March 19, 2019 @ 2:00 PM, by emailing Ross Peterson at rpeterson@greenvillenc.gov.

Sealed proposals will be received by the City of Greenville until Tuesday, March 31, 2020 by 2:00 PM at the Public Works Reception Desk located at 1500 Beatty Street, Greenville, NC 27834.

Mailed bids must be delivered to 1500 Beatty Street, Greenville, NC 27834 on or before Tuesday March 31, 2020 @ 2:00 PM and addressed to Mr. Ross Peterson, Building and Grounds Supervisor, with the words *Bid Enclosed*, *HVAC Replacement – Unit #3 City Hall* on the outside of the mail carrier envelope. Bids received after the deadline will not be opened.

All bids will be marked with the date and time they are received by reception staff. Bids will NOT be opened and read aloud. Bids will be open and reviewed by city staff. A bid tabulation will be available upon request once the contract is awarded to the successful bidder.

The City of Greenville reserves the right to reject any or all bids, waive any informality and award contracts that appear to be in its best interest. The right is reserved to hold any or all proposals for a period of sixty (60) days from the bid opening thereof.

From the date of this advertisement until the date of opening the proposals, the plans and specifications of the proposed work and/or a complete description of the apparatus, supplies, materials or equipment are and will continue to be on file in the office of the City of Greenville Purchasing Manager, 201 W. 5th Street, Greenville, NC 27834, during regular business hours, and available to prospective bidders. Inquiries should be directed to the Purchasing Manager at the above address --- Telephone (252) 329-4862. Minority/Women owned business are encouraged to submit proposals.

INSTRUCTIONS TO BIDDERS

Proposal to Provide
HVAC Replacement – Unit #3 City Hall
200 West 5th Street, Greenville, NC 27834

1. **Contractor is to provide verification to the City that the company's employees are covered under worker's compensation insurance coverage.**

2. **It is expressly understood by the contractor offering a proposal after a written notice of award by the City, a purchase order will be required to be executed and will serve together with this proposal, these instructions, and any detailed specifications as the entire form of contract between the parties.**

3. **Each Contractor submitting a proposal is affirming that no official or employee of the City is directly or indirectly interested in this proposal for any reason of personal gain.**

4. **Sales taxes may be listed on the proposal, but as a separate item. No charge will be allowed for Federal Excise and Transportation Tax from which the City is exempt.**

5. **Questions regarding any procedure for submission of a proposal for the HVAC Replacement shall be directed by email to Ross Peterson, Building and Grounds Supervisor, @ rpeterson@greenvillenc.gov. Questions shall be submitted by 5:00 PM, Tuesday, March 24, 2020. Answers will be provided in an addendum and email to those that signed in at the pre-bid by 5:00 PM, Friday, March 27, 2020. If an addendum is provided it must be indicated by initialing on bid form. Addendums will be available on city web page.**

6. **If the Contractor is unable to provide a proposal for any reason, please send an email with an explanation to rpeterson@greenvillenc.gov.**

7. **By submitting a proposal for HVAC REPLACEMENT – Unit #3 City Hall, the Contractor attests that it is in compliance with all items listed in the bid/proposal instructions. Furthermore, the Contractor attests that the City of Greenville accepts no responsibility for any injuries to the firm's employees, while on City property performing their duties.**

8. **Contractor must comply with all OSHA requirements associated with the work within this contract.**

9. **It is expected that work would begin sometime in June. However, such starting date is subject to change based on time needed to finalize contract documents and lead time on equipment.**

10. **No work will be performed at any time without proper supervision. Names and experience of supervisors shall be provided.**

11. **Parking and staging areas for equipment and materials can be arranged on site during the pre-construction meeting conducted prior to the work starting.**

12. **Project will have to be performed over a weekend starting at 5:00pm Friday through 5:00am Monday morning. Unit must be fully operational and have building acclimated to set points by 6:00am Monday morning.**

13. **If a street closures is deemed necessary, a street closure permit must be filled out and approved by the City's traffic engineer. Any street closure will be coordinated with the Building and Grounds Supervisor.**

14. **The Contractor shall accompany a designated representative(s) of the City on inspections of work at any time during the contract period. The City reserves the right to make determinations as to whether service is performed satisfactorily. Deficiencies in work performance must be corrected immediately.**

SPECIFICATIONS

1.0 SCOPE:

The scope of work shall include, but is not limited to:

1.1 The Contractor shall provide all labor, equipment, crane, materials and insurance necessary to remove and replace rooftop Unit #3 condenser and air handler (80 ton split system) and all necessary work to complete installation per the attached equipment specifications and drawings document, labeled as Exhibit "B".

1.2 New rooftop unit shall be manufactured by Trane. No other manufacture will be accepted.

1.3 Include extended warranty of 10 years for compressor and heat exchanger parts as well as a 5 year parts, refrigerant and labor warranty.

1.4 Start up and commissioning shall be performed by Trane authorized representative.

1.5 The new air handler is shorter than the existing AHU. A custom adapter curb will be built by Trane so new AHU can sit on existing AHU curb. Contractor shall verify all dimensions.

1.6 All electrical and duct connections shall be included. Connections shall be water tight and insulated.

1.7 New condensing unit minimum circuit amps (MCA) and maximum over-current protection (MOP) are more than the existing unit. Verification from license electrical contractor is needed to determine if existing MCA and MOP will be compatible to new condensing unit. If not then pricing for new MCA and MOP shall be included in base bid.

1.8 Reconnections of high and low voltage power to condensing unit and AHU.

1.9 Third party vendor, Schneider, will be hired by the City to disconnect and reconnect Building Automation System control. Coordination of time line with Schneider will be done by contractor. Contractor will include Building and Grounds Supervisor in coordination.

1.10 Refrigerant lines shall be flushed.

1.11 Install new liquid and suction line filter drier shells and cores.

1.12 Install new refrigerant metering devices and cutoff valves.

1.13 Leak check refrigerant system and pull vacuum to factory recommended levels.

1.14 Insulation on refrigerant lines that need to be removed shall be reinsulated as to existing design

1.15 Install new PVC drain piping to existing roof drains. New PVC supports shall be provided.

1.16 Obtain all permits from the City of Greenville at no cost.

1.17 All areas of work shall be scheduled at least one (2) week in advance and be scheduled through the Building & Grounds Supervisor.

1.18 Cleanup and removal of all replacement units and debris at work site.

2.0 PAYMENT AND BID:

2.1 Bidders will comply with all local, state, and federal laws and ordinances governing said work including the Occupational Safety and Health Act of 1970.

2.2 By submitting a proposal, the firm is attesting that they are an Equal Opportunity Employer.

2.3 The City of Greenville has adopted an Affirmative Action Program. Firms submitting a proposal are attesting that they also have taken affirmative action to ensure equality of opportunity in all aspects of employment.

2.3 Minority and/or Women Business Enterprise (MWBE) Program

It is the policy of the City of Greenville to provide minorities and women equal opportunity for participating in all aspects of the City's contracting and procurement programs, including but not limited to, construction projects, supplies and materials purchases, and professional and personal service contracts. In accordance with this policy, the City has adopted a Minority and Women Business Enterprise (M/WBE) Plan and subsequent program, outlining verifiable goals.

The City has established a 10% Minority Business Enterprise (MBE) and 6% Women Business Enterprise (WBE) goal for the participation of MWBE firms in supplying goods and services for the completion of this project. All firms submitting bids agree to utilize minority and women-owned firms whenever possible.

Refer to Exhibit "C" for all Minority and/or Woman Business Enterprise (MWBE) requirements.

Questions regarding the City's M/WBE Program should be directed to Ferdinand Rouse in the M/WBE Office at (252) 329-4462.

2.5 The City of Greenville reserves the right to reject any and all bids, to waive any informalities and to accept the bid if seems most advantages to the City. Any bid submitted will be binding for sixty (60) days after the date of the bid opening.

2.6 Equal Employment Opportunity Clause

The City has adopted an Equal Employment Opportunity Clause, which is incorporated into all specifications, purchase orders, and contracts, whereby a vendor agrees not to discriminate against any employee or applicant for employment on the basis of race, color, religion, sex, national origin or ancestry. A copy of this clause may be obtained at the City Clerk's Office, City Hall, Greenville, NC. By submitting qualifications and/or proposals, the firm is attesting that they are an Equal Opportunity Employer. Federal law (Rehabilitation Act and ADA) prohibits handicapped discrimination by all governmental units. By submitting a proposal, the vendor is attesting to its policy of nondiscrimination regarding the handicapped.

2.7 Iran Divestment Act Certification:

The CONTRACTOR hereby certifies that, it is not on the Iran Final Divestment List created by the North Carolina State Treasurer pursuant to N.C.G.S. 147-86.58. The CONTRACTOR shall not utilize in the performance of the Agreement any subcontractor that is identified on the Iran Final Divestment List.

2.8 E-Verify Compliance:

The CONTRACTOR shall comply with the requirements of Article 2 of Chapter 64 of the North Carolina General Statues. Further if the CONTRACTOR utilizes a subcontractor, the CONTRACTOR shall require the subcontractor to comply with the requirements of Article 2 of Chapter 64 of the North Carolina General Statues. The CONTRACTOR represents that the CONTRACTOR and its subcontractors are in compliance with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes.

2.9 If necessary, the contractor must complete a new vendor application and associated documents as required upon acceptance of this contract.

2.10 The contractor will develop a lump sum bid; that will include, but is not limited to all work, equipment, parts, and labor specified herein.

3.0 WORKERS COMPENSATION AND INSURANCE:

3.1 The contractor must maintain during the life of this contract, Worker's Compensation Insurance for all employees working at the project site under this contract, or as otherwise required by North Carolina General Statutes.

3.2 The Contractor shall have in place for the life of this contract public liability and property damage insurance and shall protect the City of Greenville from claims for damage or personal injury, which may arise from operations under this contract. The amounts of such insurance shall not be less than $500,000 for injuries subject to the same limit per person and $1,000,000 for property damage or otherwise needed to protect the interests of the owner. The Contractor awarded this contract is to provide a Certificate of Insurance showing the City of Greenville named as an additionally insured on all coverage. All insurance must be maintained during the duration of the contract.

3.3 OTHER INSURANCE:

The contractor shall furnish such additional insurance as may be required by the General Statues of North Carolina, including motor vehicle insurance in amounts not less than statutory limits.

4.0 CANCELLATION:

4.1 Each certificate of insurance shall bear the provision that the policy cannot be altered or canceled in less than ten (10) days after mailing written notice to the assured of such alteration or cancellation, sent registered mail.

4.2 The contractor shall furnish the owner with satisfactory proof of insurance required before written approval of such insurance is granted by the owner.
Executed contract documents, insurance certifications, invoices and other information requested, are to be sent to:

Ross Peterson, Building and Grounds Supervisor
City of Greenville
1500 Beatty Street
Greenville, N.C. 27834
Email: rpeterson@greenvillenc.gov

5.0 DAMAGE TO CONTRACTORS PROPERTY:

5.1 The City of Greenville shall be under no obligation to replace or in any way compensate the contractor for fire, theft, vandalism or any other casualty, injury or damage to equipment or property belonging to the contractor while on City property.

5.2 The successful bidder agrees to indemnify or hold harmless the City of Greenville from and against any liability, loss, cost, damage suit, claim, or expense arising occurrence on the part of the successful bidder to include its officers, servants, agents or employees arising from its activities, operations, and performance of services while on City property and further agrees to release and discharge the City of Greenville and its Agents from all claims or liabilities arising from or caused by the successful bidder in fulfilling its obligations under this Agreement.

5.3 It is understood and agreed by the parties that the City of Greenville will assume no liability for damages, injury, or other loss to the successful bidder, its employees or property, tools or equipment, or to other persons or properties located on City facilities resulting from the successful bidder's activities and operations while performing those service enumerated herein. The successful bidder shall assume full and complete liability for any and all damages on City or private properties caused by or resulting from its activities, operations, and that of its employees, agents and officers.

6.0 ADDENDUM

6.1 Addendum: Any changes to the specifications will be issued as a written addendum. No oral statements, explanations, or commitments by whosoever shall be of any effect.

6.2 Amendment: The contract may be amended from time to time through written agreement by both parties.

7.0 REFERENCE INFORMATION

All bidders must provide a list of three (3) client references of similar work. The reference information must include the company's name, a contact person's name with his or her title and their telephone number. Contractor must provide the information below with their bid sheet. Contractor must be experienced in projects of similar construction.

1. Company name: _____

Contact person: _____

Title: _____ Phone No. _____

2. Company name:_____

Contact person: _____

Title: _____ Phone No. _____

3. Company name: _____

Contact person: _____

Title: _____ Phone No. _____

8.0 CONTRACTOR INFORMATION

Contractor must provide the information below with the bid sheet.

CITY OF GREENVILLE
NORTH CAROLINA
PROSPECTIVE CONTRACTOR DATA FORM

Company Name: _____

Address: _____

Phone Number: _____Mobile Phone Number: _____

Email: _____ Business Fax Number: _____

Tax ID# _____

NC General Contractors License#_____

Electrical Contractors License#_____

Corporation or Partnership: _____

Number of Years in Business: _____

CITY OF GREENVILLE
PUBLIC WORKS DEPARTMENT
REQUEST FOR BIDS

In compliance with the request for bids by the City of Greenville and subject to all conditions and specifications thereof, the undersigned offers and agrees to furnish all equipment, labor and work site clean-up as provided in the above mentioned specifications.

Description
HVAC Replacement – Unit #3 City Hall:

Lump Sum Bid Total

$_____

Bid reviewed, prepared and submitted by-

Company Name: _____ **Addenda Received:_____**

Signed: _____

Print Name:_____

Date: _____

EXHIBIT B

Submittal

Prepared For:
Ross Peterson
Building and Grounds Supervisor
City of Greenville

Job Name:
HVAC Replacement Unit-3 City Hall

Trane U.S. Inc. is pleased to provide the enclosed submittal for your review and approval.

Product Summary

Qty	Product
1	Performance Climate Changer (CSAA)
1	Air-Cooled Condensing Unit (Industrial))

David McDaniel
Trane U.S. Inc.
401 Kitty Hawk Drive
Morrisville, NC 27560-8271
Phone: (919) 781-0458
Cell: (919) 632-0080
Fax: (919) 781-9195

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Product performance and submittal data is valid for a period of 6 months from the date of submittal generation. If six months or more has elapsed between submittal generation and equipment release, the product performance and submittal data will need to be verified. It is the customer's responsibility to obtain such verification.

Table of Contents

Tag Data - Performance Climate Changer (CSAA) (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	AHU-3	1	80 Ton AHU	CSAA050UB

Product Data - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3

Unit level options
- Outdoor unit
- Unit size 50
- 6in. integral base frame
- UL listed unit
- Single metal handle - ganged latches
- 158.63 Unit length
- No seismic certification required

Controls and VFD/starter
- Supply fan VFD

Warranty
- Extended warranty
- Parts warranty - 2nd-5th year additional
- Labor warranty – 5 years

Pipe cabinet section
- No pipe cabinet

Air mixing section (Pos #1)
- Air mixing section
- Mixing box w/o filter
- Door- left side
- Back damper - parallel blade
- Front full face opening
- Right damper - high velocity parallel

Filter section (Pos #2)
- Filter
- Cartridge filter
- Door- left side
- Bag/cartridge filter frame
- 12in. cartridge - 95% eff - run set (Fld)
- 2" Pleated media - run set (Fld)

Coil section (Pos #3)
- Horizontal coil
- Extended medium
- Stainless steel drain pan
- Left side - drain connection
- Left side - coil supply
- Service panel opposite connection side
- Unit coil height
- Cooling coil
- Refrigerant
- Type "UF" coil
- 4 rows
- 120 fins per foot nominal fin spacing
- Aluminum fins

Delta flo H (Hi efficient)
Internally enhanced Cu .016 (0.406 mm)
1/2in. tube diameter (12.7 mm)
Stainless steel coil casing

Fan section (Pos #4)

Fan section
Supply fan
Door- left side
Outward swing
28in. diameter AF, H press
Front-top discharge
Left side drive
NEMA premium compliant ODP
Voltage 460/3
40 max applied hp
1800 RPM
Inverter balance with shaft grounding
Motor wiring conduit
VFD
Refer to mechanical specifications for footnote 4

Performance Data - Performance Climate Changer (CSAA)

Tags	**AHU-3**
Unit level options	
Position	
Length (in)	158.625
Width (in)	125.500
Height (in)	79.250
Rigging weight (lb)	5790.8
Installed weight (lb)	5790.8
Actual airflow (cfm)	25000
Unit elevation (ft)	0.00
Shipping split 1 weight (lb)	2593.2
Shipping split 2 weight (lb)	3197.7
Fan section	
Position	**#4**
Section length (in)	68.500
Section weight (lb)	3197.7
Fan airflow (cfm)	25000
Elevation (ft)	0.00
Overall ESP (in H2O)	3.600
Total static pressure (in H2O)	6.196
Fan pressure drop (in H2O)	3.600
Fan outlet velocity (ft/min)	2837
Speed (rpm)	1546
Total brake horsepower (hp)	35.485
Unit static efficiency (%)	68.81
Outlet area (sq ft)	8.81
Motor hertz (Hz)	60
Coil section	
Position	**#3**
Section length (in)	19.000
Section weight (lb)	867.7
Coil performance airflow (cfm)	25000
Unit airflow (cfm)	25000
Coil face area (sq ft)	49.05
Coil face velocity (ft/min)	510
Air pressure drop (in H2O)	0.586
Coil section pressure drop (in H2O)	0.586
Coil rigging weight (lb)	487.4
Top or single coil dry weight (lb)	243.7
Middle or bottom coil dry weight (lb)	243.7
Leaving dry bulb (F)	52.30
Leaving wet bulb (F)	51.34
Entering dry bulb (F)	77.30
Entering wet bulb (F)	64.40
Liquid temp entering TXV (F)	115.00
Saturated suction temperature (F)	42.00

Tags	**AHU-3**
Suction superheat (F)	8.00
Sensible capacity (MBh)	684.75
Total capacity (MBh)	950.41
Filter section	
Position	**#2**
Section length (in)	23.000
Section weight (lb)	568.9
Filter airflow (cfm)	25000
Filter area (sq ft)	50.00
Pre-filter area (sq ft)	50.00
Filter condition	Mid-life
Filter pressure drop (in H2O)	0.773
Prefilter pressure drop (in H2O)	0.649
Filter section pressure drop (in H2O)	1.423
Filter face velocity (ft/min)	500
Pre-filter face velocity (ft/min)	500
Air mixing section	
Position	**#1**
Section length (in)	48.000
Section weight (lb)	1156.5
Opening 1 back - airflow (cfm)	25000
Opening 1 front - airflow (cfm)	25000
Opening 1 right - airflow (cfm)	25000
Opening 1 back - area (sq ft)	18.59
Opening 1 front - area (sq ft)	58.43
Opening 1 right - area (sq ft)	12.32
Opening 1 back - face velocity (ft/min)	1345
Opening 1 right - face velocity (ft/min)	2030
Opening 1 back - pressure drop (in H2O)	0.319
Opening 1 right - pressure drop (in H2O)	0.369
Back hood pressure drop (in H2O)	0.268
Back hood area (sq ft)	30.71
Back inlet type	Unducted
Right side inlet type	Ducted
Greatest entry PD (in H2O)	0.587
Total mixing section pressure drop (in H2O)	0.587
Back total pressure drop (in H2O)	0.587
Right side total pressure drop (in H2O)	0.369

Mechanical Specifications - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3

GENERAL
Outdoor air handling units will be shipped with all openings covered to protect unit interior from in-transit debris.

Installing contractor is responsible for long term storage in accordance with the Installation, Operation, and Maintenance manual (CLCH-SVX07B-EN).

Unit shall be UL and C-UL Listed.

Supply fans within the scope of AHRI Standard 430 shall be certified in accordance with AHRI Standard 430.

Unit sound performance data shall be provided using AHRI Standard 260 test methods and reported as sound power. Trane, in providing this program and data, does not certify or warrant NC levels. These levels are affected by factors specific to each application and/or installation and therefore unable to be predicted or certified by Trane. *Refer to product data for specific fan footnote references*.

- Footnote 4: Sound Power Levels are in accordance with AHRI 260.

Manufacturer provided VFDs shall be certified to AHRI Standard 1210 "Performance Rating of Variable Frequency Drives" to ensure documented and reliable VFD efficiency.

Unit Construction
Outdoor unit roofs shall incorporate a standing seam on the exterior to ensure a rigid roof construction and prevent water infiltration . Roof assembly shall overhang all walls by 1.5-inch minimum to prevent sheeting from roof to side panels . Rain gutters shall also be provided over all doors shorter than total unit height to direct rain away from the door assembly. Outdoor roofs shall be sloped, not less than 0.125 inches per foot, for water drainage. Where outdoor units are shipped in multiple sections, provide standing-seam joiners at each split with adhesive, hardware, and cover strips for field joining by the installing contractor.

All unit panels shall be 2" solid, double-wall construction to facilitate cleaning of unit interior. Unit panels shall be provided with a mid-span, no-through-metal, internal thermal break. Casing thermal performance shall be such that under 55°F supply air temperature and design conditions on the exterior of the unit of 81°F dry bulb and 73°F wet bulb, condensation shall not form on the casing exterior.

All outdoor AHU interior casing panels will be made of galvanized steel.

Unit Paint
External surface of unit casing will be coated with water-based polyurethane paint. Color to be standard "Slate Gray". Factory-painted units will be able to withstand a salt spray test in accordance with ASTM B117 for a minimum of 500 consecutive hours and shall meet the following requirements following the salt-spray test:
- Mean scribe creepage rating of at least 6 per ASTM D1654 procedure A
- Blister size no larger than #6 per ASTM D714

- Blister density no greater than Medium per ASTM D714
- No onset of red rust

Casing Deflection
The casing shall not exceed 0.0042 inch deflection per inch of panel span at 1.00 times design static pressure. Maximum design static shall not exceed +8 inches w.g. in all positive pressure sections and -8 inches w.g. in all negative pressure sections.

Floor Construction
The unit floor shall be of sufficient strength to support a 300.0 lb load during maintenance activities and shall deflect no more than 0.0042 inch per inch of panel span.

Unit base
Manufacturer to provide a full perimeter integral base frame for either ceiling suspension of units or to support and raise all sections of the unit for proper trapping. Indoor unit base frame will either be bolted construction or welded construction. All outdoor unit base frames shall be welded construction. For indoor units, refer to schedule for base height and construction type. Contractor will be responsible for providing a housekeeping pad when unit base frame is not of sufficient height to properly trap unit. Unit base frames not constructed of galvanized steel shall be chemically cleaned and coated with both a rust-inhibiting primer and finished coat of rust-inhibiting enamel. Unit base height to be included in total height required for proper trap height.

Insulation
Panel insulation shall provide a minimum thermal resistance (R) value of 13 ft²-h-ºF/Btu throughout the entire unit. Insulation shall completely fill the panel cavities in all directions so that no voids exist and settling of insulation is prevented. Panel insulation shall comply with NFPA 90A.

Drain Pan
In sections provided with a drain pan, the drain pan shall be designed in accordance with ASHRAE 62.1. To address indoor air quality (IAQ) the drain pan shall be sloped in two planes promoting positive drainage to eliminate stagnant water conditions. Drain pan shall be insulated, and of double wall construction. The outlet shall be the lowest point on the pan, and shall be of sufficient diameter to preclude drain pan overflow under normally expected operating conditions. All drain pans connections shall have a threaded connection, extending a minimum of 2-1/2" beyond the unit base, and shall be made from the same material as the drain pan. Drain pan located under a cooling coil shall be of sufficient size to collect all condensate produced from the coil.
Refer to Product Data for specific information on which sections are supplied with a drain pan, the drain pan material and connection location.

Access Door Construction
Access doors shall be 2" double wall construction. Interior and exterior door panels shall be of the same construction as the interior and exterior wall panels respectively. All doors shall be provided with a thermal break construction of door panel and door frame. Gasketing shall be provided around the full perimeter of the doors to prevent air leakage. Surface mounted handles shall be provided to allow quick access to the interior of the functional section and to prevent through cabinet penetrations that could likely weaken the casing leakage and thermal performance. Handle hardware shall be designed to prevent unintended closure. Access doors shall be hinged and removable for quick easy access. Hinges shall be interchangeable with the door handle hardware to allow for alternating door swing in the field to minimize access interference due to unforeseen job site obstructions. Door handle hardware shall be adjustable and visually indicate locking position of door latch external to the section. Door hinges shall be galvanized.

All doors shall be a minimum of 60" high when sufficient height is available or the maximum height allowed by the unit height.

Door handles shall be provided for each latching point of the door necessary to maintain the specified air leakage integrity of the unit. Optionally for indoor AHUs and as standard on outdoor AHUs, outward swing doors are provided with a single handle linked to multiple latching points. An optional shatterproof window shall be provided in access doors where indicated on the plans. Window shall either be single pane, or thermal dual pane, as defined on schedule. Window shall be capable of withstanding unit operating pressures and shall be safe for viewing UV-C lamps.
Refer to Product Data for specific information on which sections are supplied with an access door, the door location, a single handle and a window.

Field supplied Curb
Outdoor AHU is to be mounted on field-supplied specialty curb. Refer to the specialty curb manufacture"s installation requirements for any curb assembly, curb mounting to roof structure, or unit-to-curb attachment. For units requiring external piping cabinet(s), the specialty curb manufacturer is to also provide a curb for external pipe chase(s).

MIXING SECTION
A mixing section shall be provided to support the damper assembly for outdoor, return, and/or exhaust air.

Dampers
Dampers shall modulate the volume of outdoor, return, or exhaust air. The dampers shall be of double-skin airfoil design with metal, compressible jamb seals and flexible blade-edge seals on all blades. The blades shall rotate on stainless-steel sleeve bearings. The dampers shall be rated for a maximum leakage rate of 3 cfm/ft² at 1 in. w.g. complying with ASHRAE 90.1 maximum damper leakage. All leakage testing and pressure ratings shall be based on AMCA Standard 500-D. Dampers may be arranged in a parallel or opposed-blade configuration.

Inlet Hoods
Inlet hoods are provided on the outside air openings and equipped with high performance moisture eliminators to minimize water carryover from the outside into the unit casing. Eliminators also perform the function of a bird screen to prevent nesting.
Refer to the unit As-Built and Product Data section for specific information on which sections are supplied with inlet hood.

Dampers
Dampers shall modulate the volume of outdoor, return, or exhaust air. The dampers shall be of double-skin airfoil design with metal, compressible jamb seals and flexible blade-edge seals on all blades. The blades shall rotate on stainless-steel sleeve bearings. The dampers shall be rated for a maximum leakage rate of 3 cfm/ft² at 1 in. w.g. complying with ASHRAE 90.1 maximum damper leakage. All leakage testing and pressure ratings shall be based on AMCA Standard 500-D. Dampers may be arranged in a parallel or opposed-blade configuration.

FILTER SECTION
A section shall be provided to support the filter rack as indicated throughout the unit. Refer to Product Data and As-Built sections of the submittal for specific locations within each unit.

Primary Filters

Cartridge Filters
The filters shall be 12-inch cartridge filters constructed with a continuous sheet of fine-fiber media made into closely spaced pleats. The filters shall be capable of operating up to 625 fpm face velocity without loss of filter efficiency and holding capacity. The filters shall be sealed into a metal frame assembled in a rigid manner. A gasket material shall be installed on the metal header of the filter to prevent filter bypass where the metal headers meet on the side-access racks. All cartridge filters shall be furnished with a 2-inch prefilter to provide extended cartridge filter life. The manufacturer shall supply a side-access filter rack capable of holding cartridge filters and prefilters.

The cartridge filters shall have a MERV 15 rating when tested in accordance with the ANSI/ASHRAE Standard 52.2.

Prefilter Type
2-inch pleated media filters made with 100% synthetic fibers that are continuously laminated to a supported steel-wire grid with water repellent adhesive shall be provided. Filters shall be capable of operating up to 625 fpm face velocity without loss of filter efficiency and holding capacity. The filters shall have a MERV 8 rating when tested in accordance with the ANSI/ASHRAE Standard 52.2.

COIL SECTION WITH FACTORY INSTALLED COIL
The coil section shall be provided complete with coil and coil holding frame. The coils shall be installed such that headers and return bends are enclosed by unit casings. If two or more cooling coils are stacked in the unit, an intermediate drain pan shall be installed between each coil and be of the same material as the primary drain pan. Like the primary drain pan, the intermediate drain pan shall be designed being of sufficient size to collect all condensation produced from the coil and sloped to promote positive drainage to eliminate stagnant water conditions. The intermediate pan shall begin at the leading face of the water-producing device and be of sufficient length extending downstream to prevent condensate from passing through the air stream of the lower coil. Intermediate drain pan shall include downspouts to direct condensate to the primary drain pan. The outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition.

In lieu of a door, an easily removable service panel shall be provided in sections as specified, to facilitate access to unit for periodic servicing, or for removal and replacement of coils. Removal of service panel will not impact the structural integrity of the unit.

No casing penetrations supplied for hydronic drain and vents. If required, piping contractor will need to drill drain and vent penetrations using factory located features provided in coil panel.

Refrigerant Cooling Coils
The coils shall have aluminum fins and seamless copper tubes. The fins shall have collars drawn, belled, and firmly bonded to tubes by mechanical expansion of the tubes. Suction and liquid line connections shall extend to the unit exterior. The coil casing may be galvanized or stainless steel. Refer to the Product Data section of the submittal for the coil casing material.
The coils shall be proof-tested to 715 psig and leak-tested to 650 psig air pressure under water or equivalent tracer gas leak test. After testing, the inside of the coils shall be dried, all connections shall be sealed, and the coil shall be shipped with a charge of dry air or nitrogen.
Suction headers and liquid connections shall be constructed of copper tubing with connections penetrating unit casings to permit sweat connections to refrigerant lines. The coils shall have equalizing vertical distributors sized according to the capacities of the coils. Cooling coil performance is certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils

Certification Program which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory at www.ahridirectory.org. Heating performance for heat pump or condenser mode is not certified.

Refrigerant coil tubes are 1/2" [13mm] OD, 0.016" [0.406mm] thick, internally enhanced copper.

AF FAN SECTION

The fan type shall be provided as required for stable operation and optimum energy efficiency. The fan shall be a double-width, double-inlet, multiblade-type, airfoil (AF) fan. The fan shall be equipped with self-aligning, antifriction bearings with an L-50 life of 200,000 hours, as calculated per ANSI/AFBMA Standard 9. For any bearing requiring relubrication, the grease line shall be extended to the fan support bracket on the drive side. The fan shall be statically and dynamically balanced at the factory as a complete fan assembly (fan wheel, motor, drive, and belts). The fan shaft shall not exceed 75 percent of its first critical speed at any cataloged speed. Fan wheels shall be keyed to the fan shaft to prevent slipping. The fan shafts shall be solid steel. The fan section shall be provided with an access door on the drive side of the fan. Fan performance shall be certified as complying with AHRI Standard 430.

Fans that are selected with inverter balancing shall first be dynamically balanced at design RPM. The fans then will be checked in the factory from 25% to 100% of design RPM to insure they are operating within vibration tolerance specifications, and that there are no resonant frequency issues throughout this operating range. Inverter balancing that requires lockout frequencies inputted into a variable frequency drive to in order to bypass resonant frequencies shall not be acceptable. If supplied in this manner by the unit manufacturer, the contractor will be responsible for rebalancing in the field after unit installation. Fans selected with inverter balancing shall have a maintenance free grounding assembly installed on the fan motor to discharge both static and induced shaft currents to ground.

Drive Service Factor

The drives shall be constant speed with fixed-pitch sheaves. The drives shall be selected at a minimum 50 percent larger than the motor brake horsepower (1.5 service factor).

Motor Frame

The motor shall be mounted integral to the isolated fan assembly and furnished by the unit manufacturer. The motor is mounted inside the unit casing on an adjustable base to permit adjustment of drive belt tension (not applicable for direct drive plenum fans). The motor shall meet or exceed all NEMA Standards Publication MG 1 requirements and comply with NEMA Premium efficiency levels when applicable except for fractional horsepower motors which are not covered by the NEMA classification. The motor shall be T-frame, squirrel cage with size, type, and electrical characteristics as shown on the equipment schedule. Refer to the Product Data section for selected fan motors within each unit.

Two-Inch Spring Isolators

The fan and motor assembly (on sizes 10 to 120) shall be internally isolated from the unit casing with 2-inch (50.8 mm) deflection spring isolators, furnished and installed by the unit manufacturer. The isolation system shall be designed to resist loads produced by external forces, such as earthquakes, and conform to the current IBC seismic requirements.

Combination VFD / Disconnect

A combination Variable Frequency Drive (VFD) / disconnect shall be provided when variable air volume control is required for fan operation. Whether for single fan, dual fan, or fan array applications,

a single VFD shall be provide to ensure proper operation and to optimize operating life. Each VFD / disconnect shall be properly sized, factory mounted in a full metal enclosure, wired to the fan motor(s), and commissioned to facilitate temporary heating, cooling, ventilation, and/or timely completion of the project. VFD / disconnects shall include a circuit breaker disconnect with a through-the-door interlocking handle and shall be lockable. The VFD package shall also include:

a) Electronic manual speed control
b) Hand-Off-Auto (H-O-A) selector switch
c) Inlet fuses to provide maximum protection against inlet short circuit
d) Current limited stall prevention
e) Auto restart after momentary power loss
f) Speed search for starting into rotating motor
g) Anti-windmill w/DC injection before start
h) Phase-to-phase short circuit protection
i) Ground fault protection

Units with factory-mounted controls shall include power wiring from the VFD panel to the control system transformers, binary output on/off wiring, analog output-speed-signal wiring, and all interfacing wiring between the VFD and the direct digital controller.

The VFD shall be UL508C listed and CSA certified and conform to applicable NEMA, ICS, NFPA, & IEC standards.

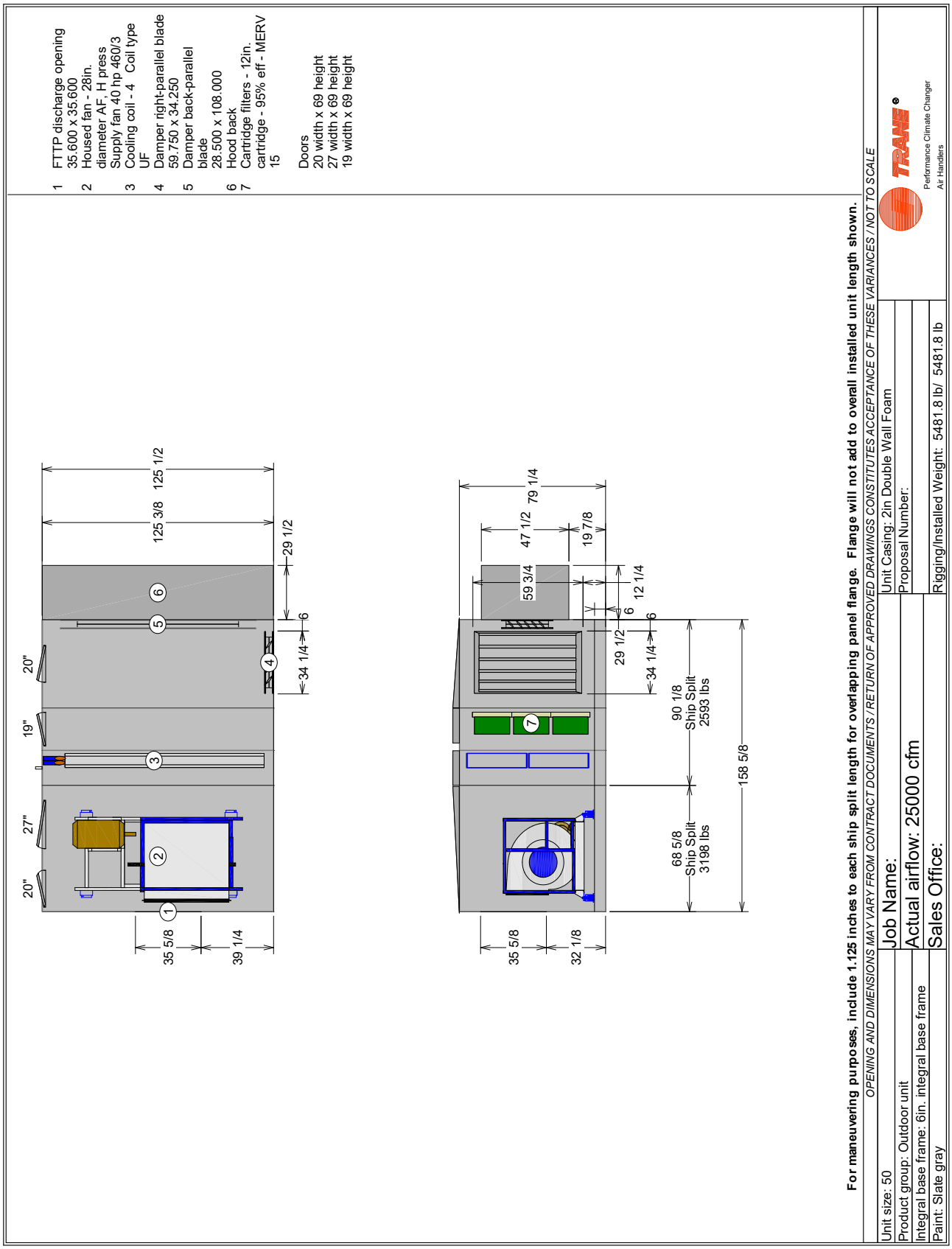
Motor Wiring Conduit
The fan motor wiring shall be factory-wired to the unit-mounted starter/disconnect, variable frequency drive, or external motor junction box within flexible metal conduit of adequate length so that the fan vibration isolation, if applicable, will not be restricted. Refer to the Product Data section for fans with motor wiring conduit.

Lifting Instructions
The air handling units must be rigged, lifted, and installed in strict accordance with the Installation, Operation, and Maintenance manual (CLCH-SVX07G-EN). The units are also to be installed in strict accordance with the specifications. Units may be shipped fully assembled or disassembled to the minimum functional section size in accordance with shipping and job site requirements.

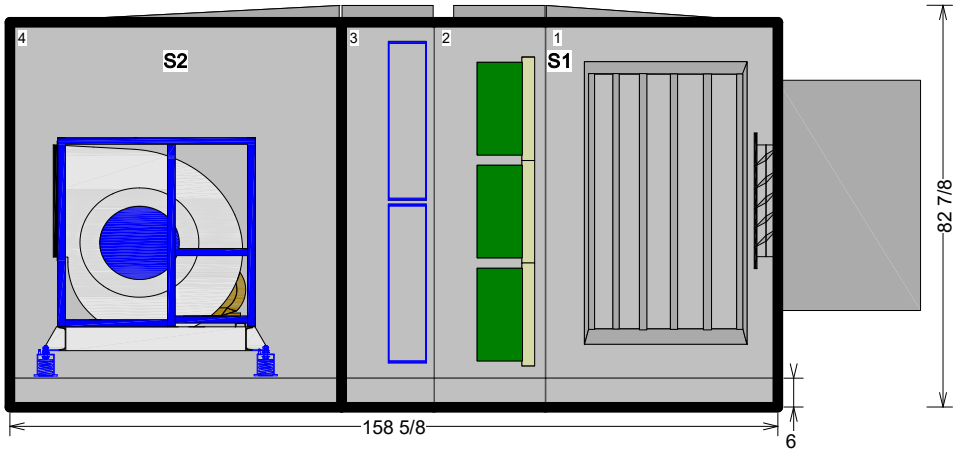
Outdoor units shall be shipped on 6" integral base frame for the purpose of mounting units on a roof curb or field-supplied pier support system. Refer to the Product Data section for type of the base frame provided (for roof curb or pier-mount).

All units will be shipped with an integral base frame designed with the necessary number of lift points for safe installation. All lifting lugs are to be utilized during lift. The lift points will be designed to accept standard rigging devices and be removable after installation. Units shipped in sections will have a minimum of four points of lift.

As-Built - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3



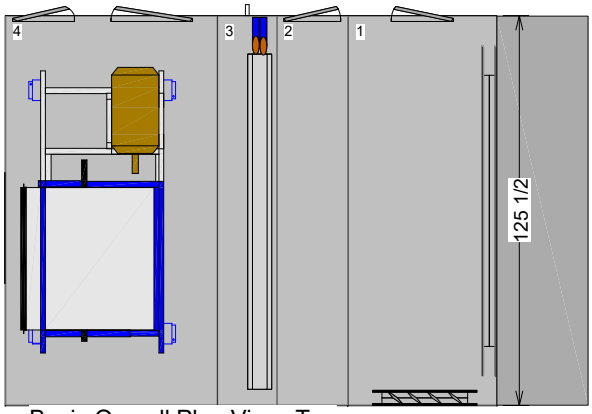
As-Built - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3



For maneuvering purposes, include 1.125 inches to each ship split length for overlapping panel flange. Flange will not add to overall installed unit length sh

Pos #	Module	Length	Weight
4	Fan section	68 5/8	3197.67
3	Coil section	19 1/8	558.72
2	Filter section	23	568.89
1	Air mixing section	48	1156.54

Installed Unit Weight 5481.82 lbs

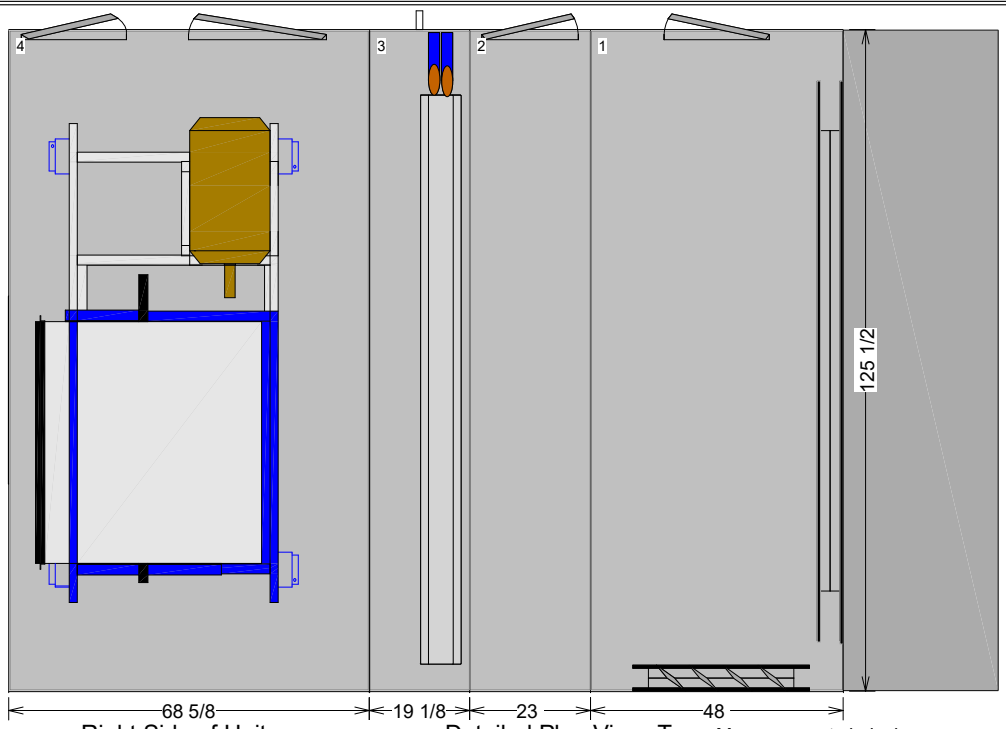


Basic Overall Plan View: Top - Measurements in inches

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

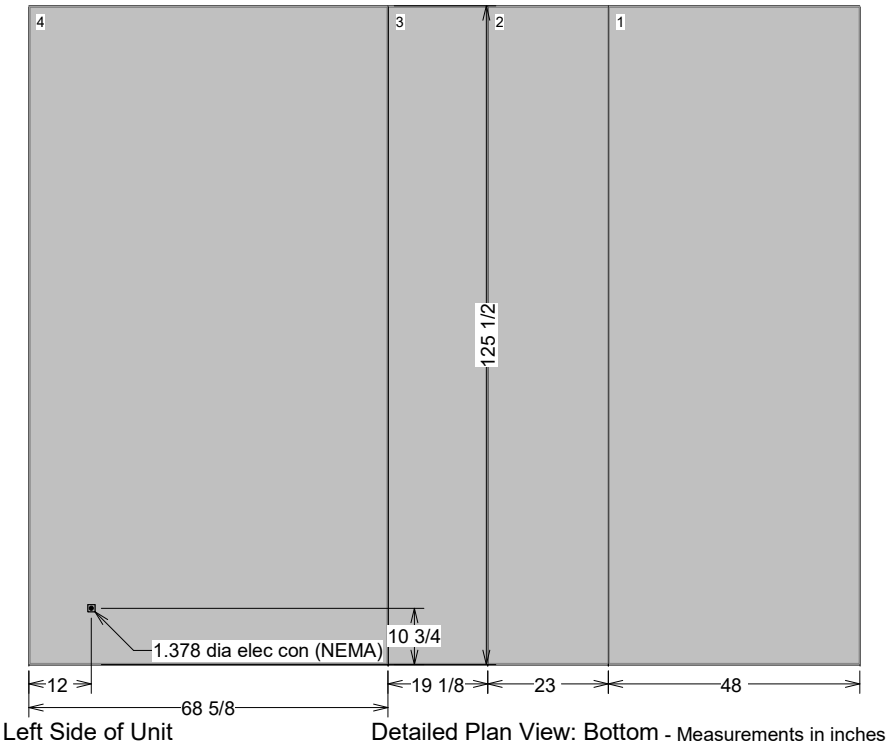
Unit size: 50	Job Name:	Unit Casing: 2in Double Wall Foam	TRANE® Performance Climate Changer Air Handlers
Product group: Outdoor unit	Actual airflow: 25000 cfm	Proposal Number:	
Integral base frame: 6in. integral base frame			
Paint: Slate gray	Sales Office:	Rigging/Installed Weight: 5481.8 lb/ 5481.8 lb	

As-Built - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3



Right Side of Unit

Detailed Plan View: Top - Measurements in inches



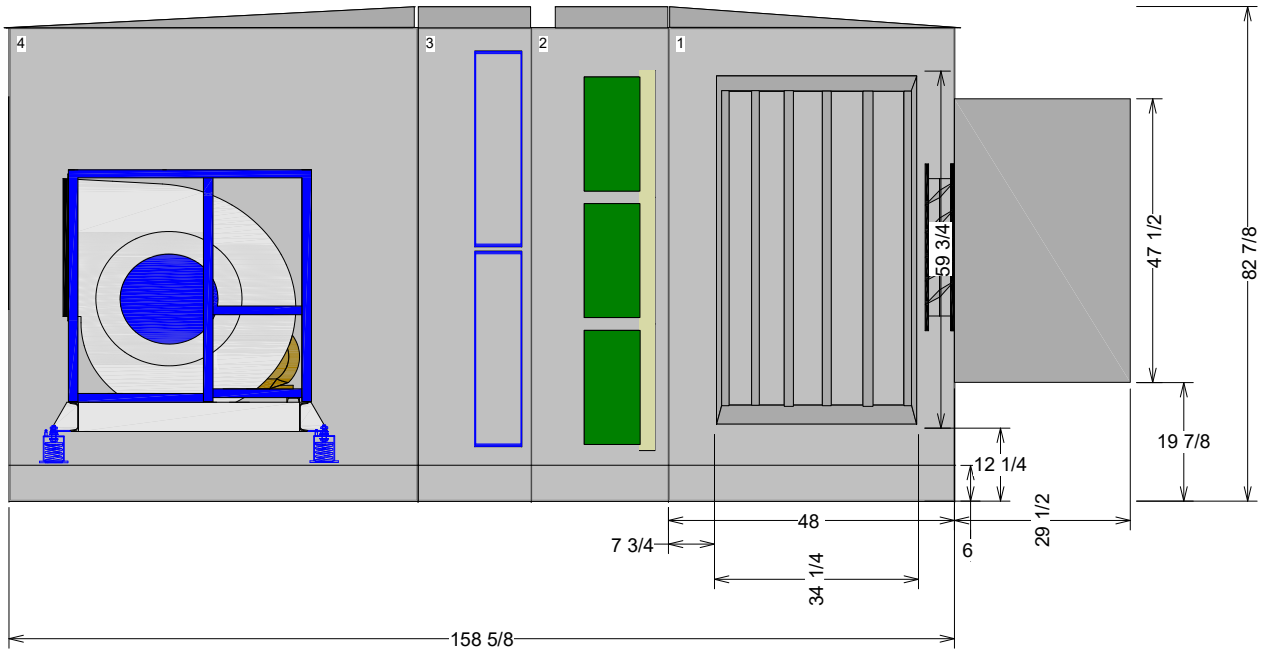
Left Side of Unit

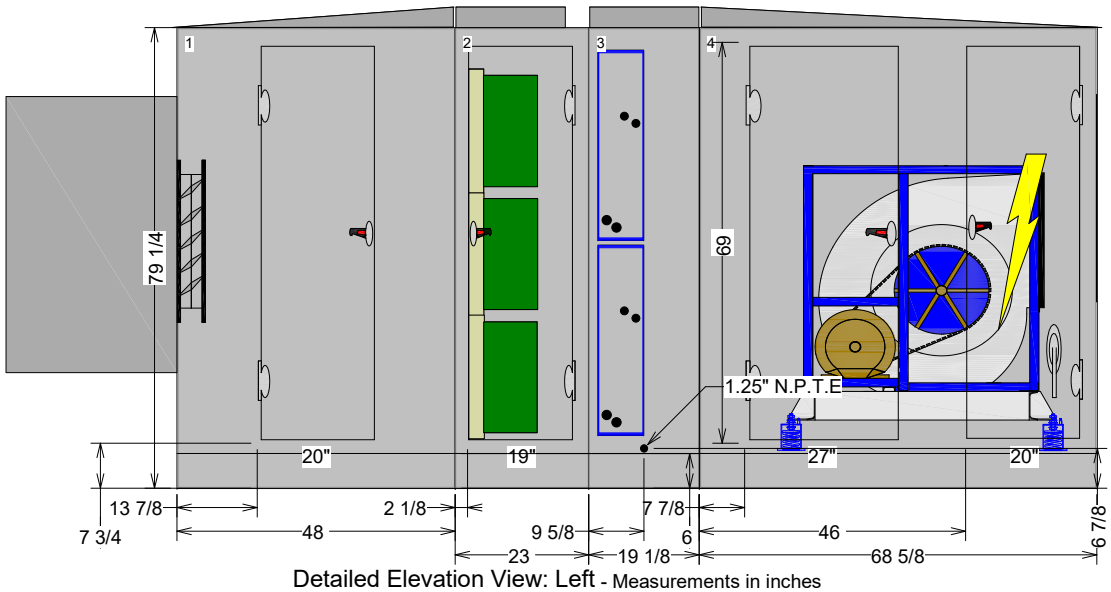
Detailed Plan View: Bottom - Measurements in inches

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 50	Job Name:	Unit Casing: 2in Double Wall Foam	TRANE® Performance Climate Changer Air Handlers
Product group: Outdoor unit	Actual airflow: 25000 cfm	Proposal Number:	
Integral base frame: 6in. integral base frame			
Paint: Slate gray	Sales Office:	Rigging/Installed Weight: 5481.8 lb/ 5481.8 lb	

As-Built - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3



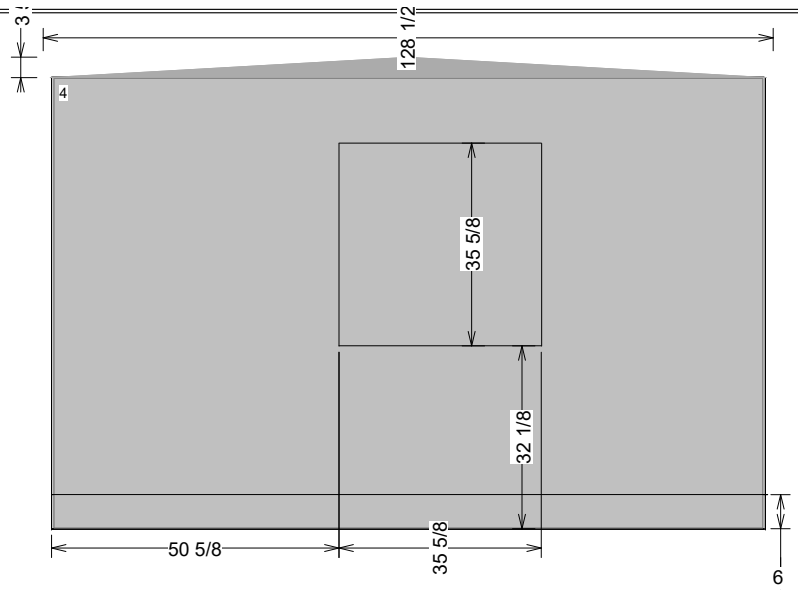


Detailed Elevation View: Left - Measurements in inches

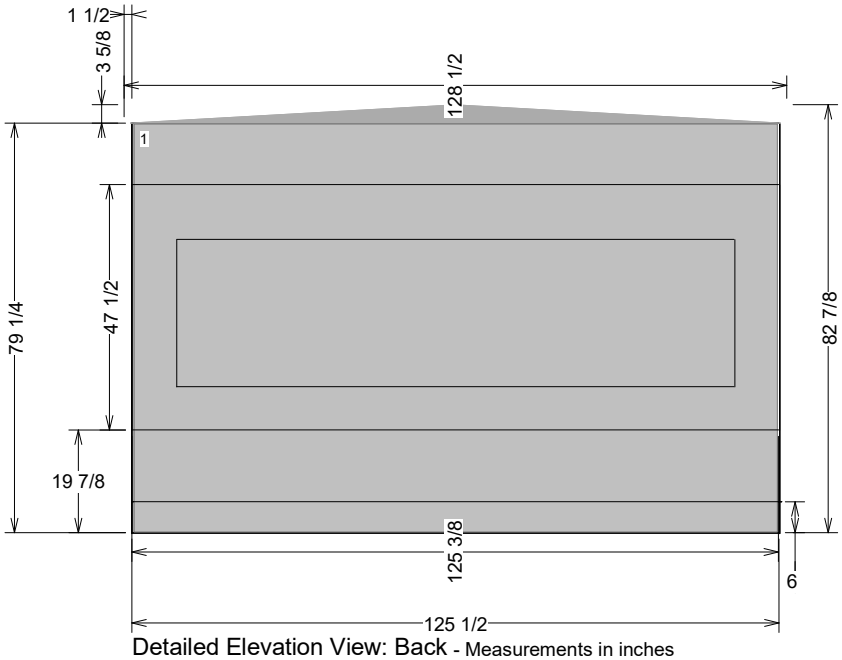
OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 50	Job Name:	Unit Casing: 2in Double Wall Foam	TRANE® Performance Climate Changer Air Handlers
Product group: Outdoor unit	Actual airflow: 25000 cfm	Proposal Number:	
Integral base frame: 6in. integral base frame			
Paint: Slate gray	Sales Office:	Rigging/Installed Weight: 5481.8 lb/ 5481.8 lb	

As-Built - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3



Detailed Elevation View: Front - Measurements in inches

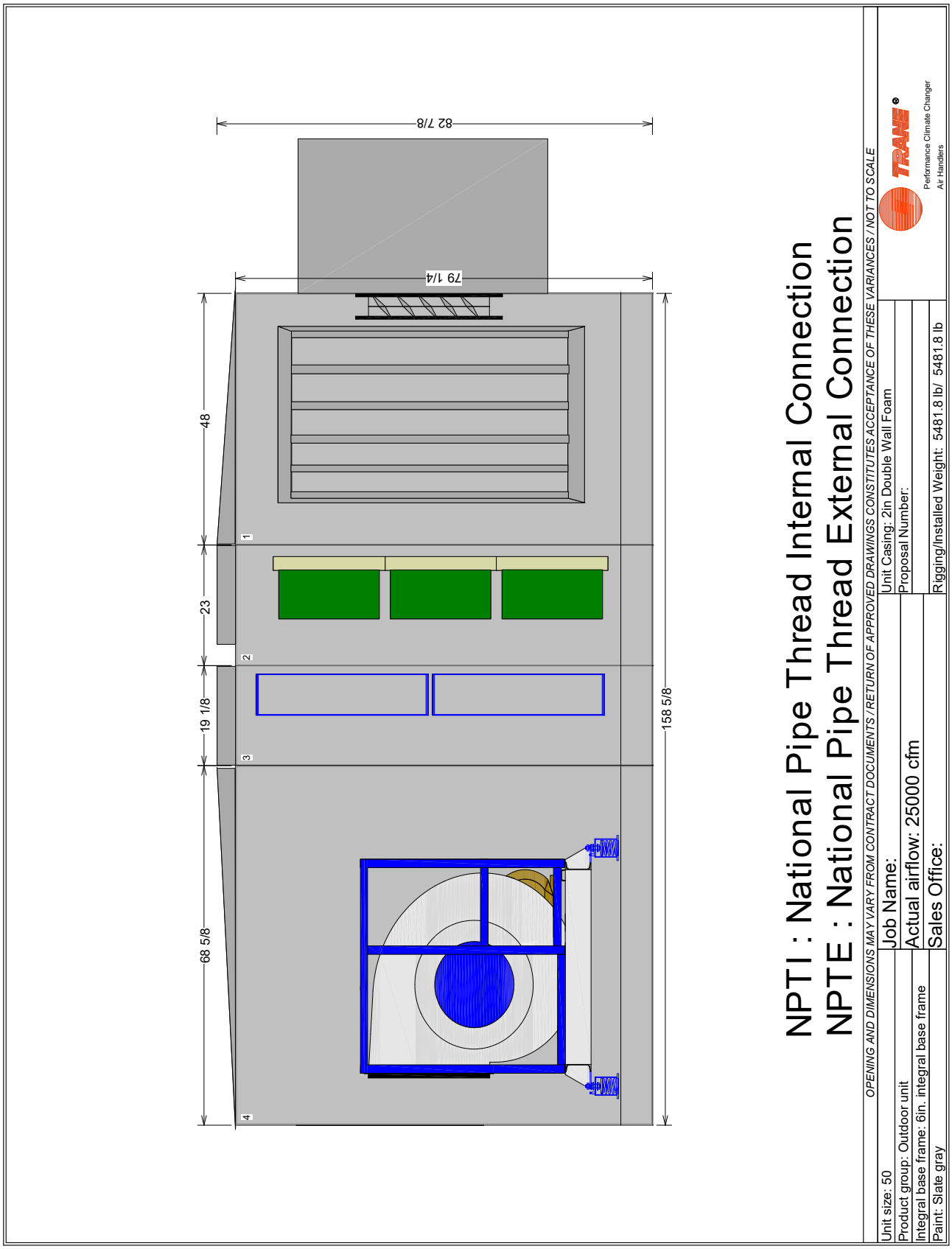


Detailed Elevation View: Back - Measurements in inches

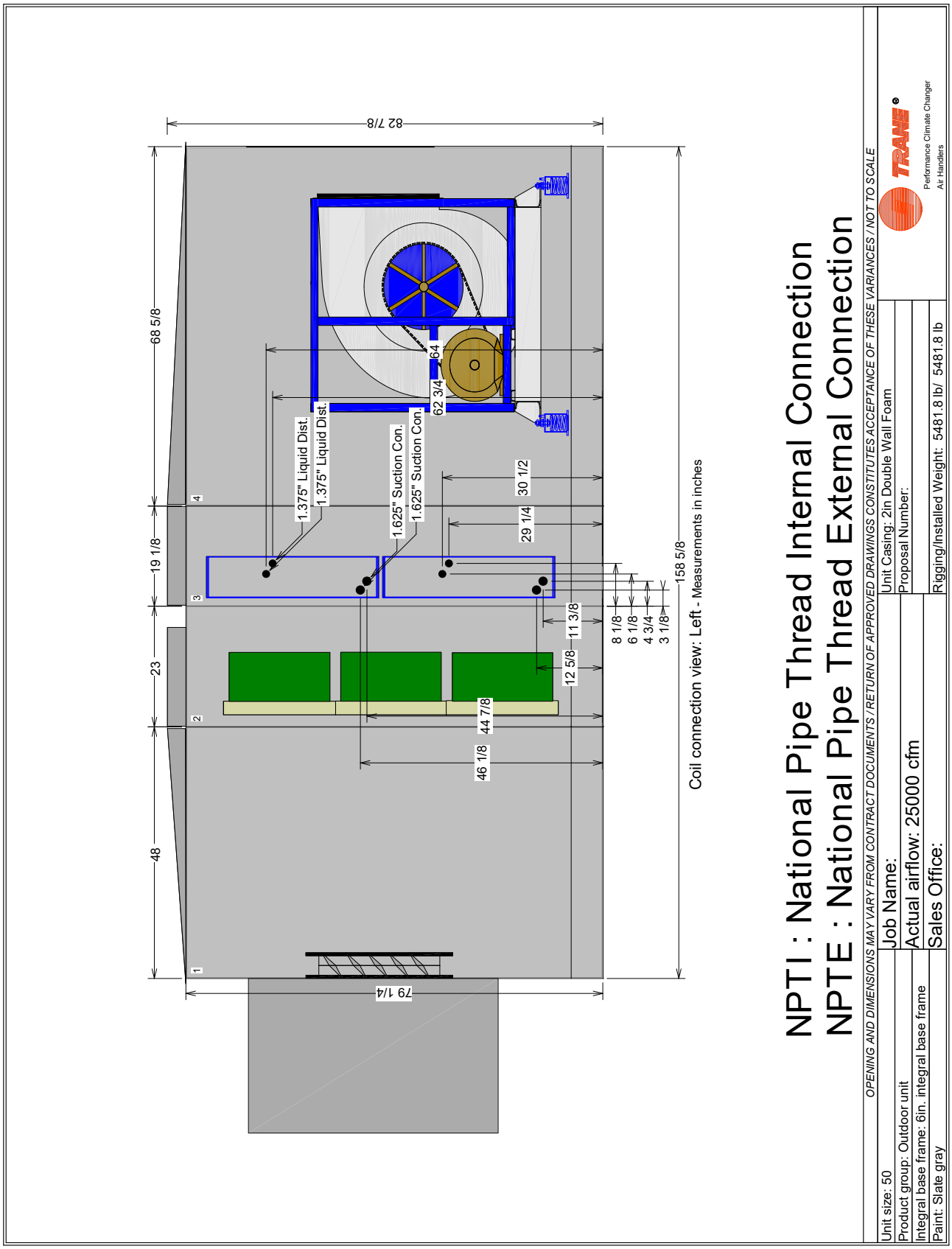
OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 50	Job Name:	Unit Casing: 2in Double Wall Foam	TRANE® Performance Climate Changer Air Handlers
Product group: Outdoor unit	Actual airflow: 25000 cfm	Proposal Number:	
Integral base frame: 6in. integral base frame			
Paint: Slate gray	Sales Office:	Rigging/Installed Weight: 5481.8 lb/ 5481.8 lb	

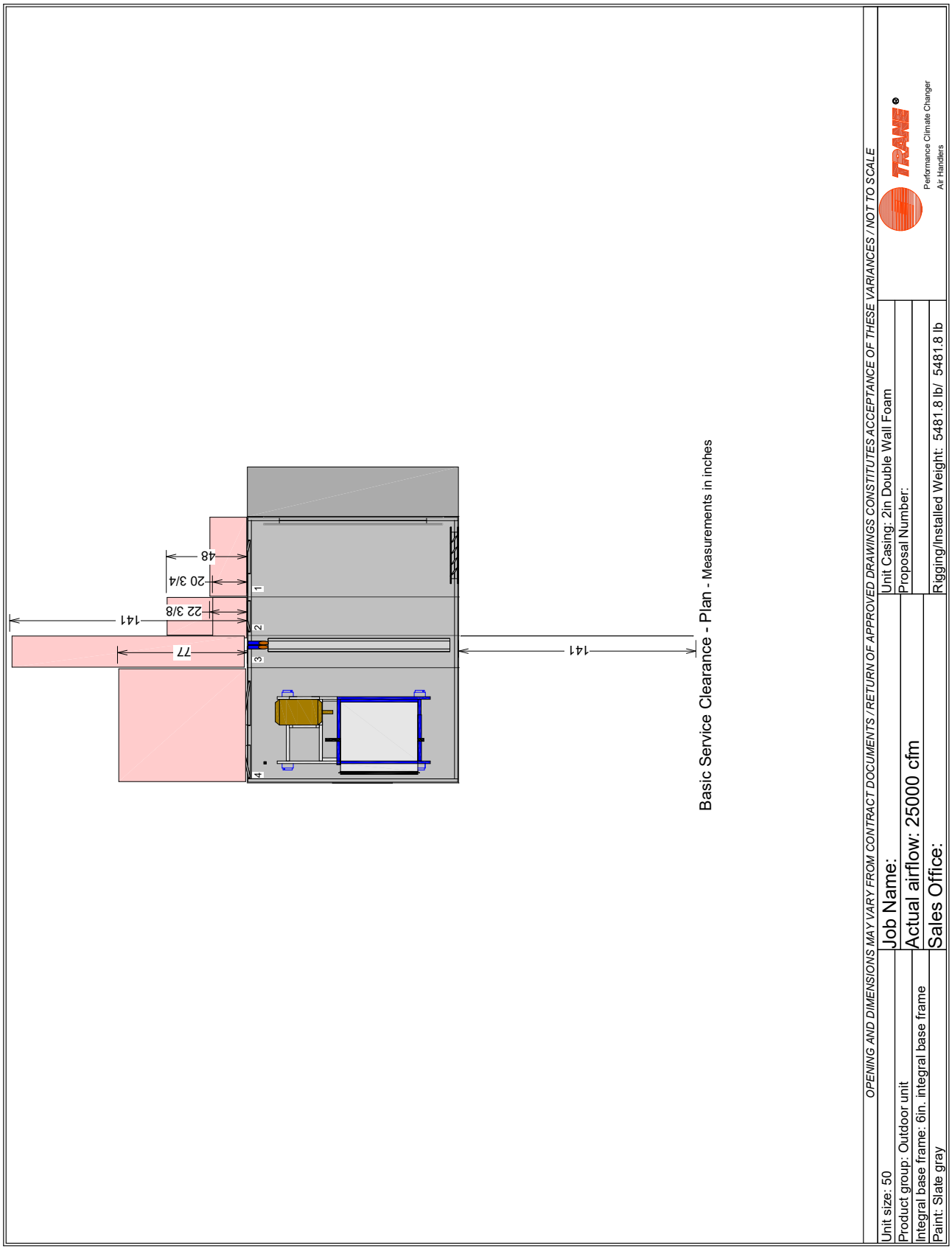
As-Built - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3



As-Built - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3

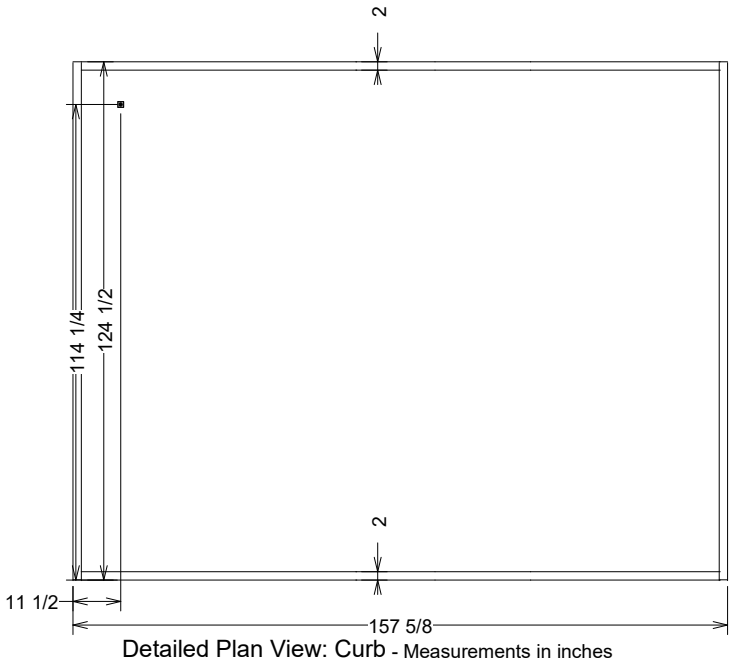


As-Built - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3



As-Built - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3

Roof curb details included are intended to show dimensions for mounting unit to "A" roof curb on a flat roof.
All special curb details such as isolation curbs, adapter curbs and pitched roof curbs are to be provided by others.

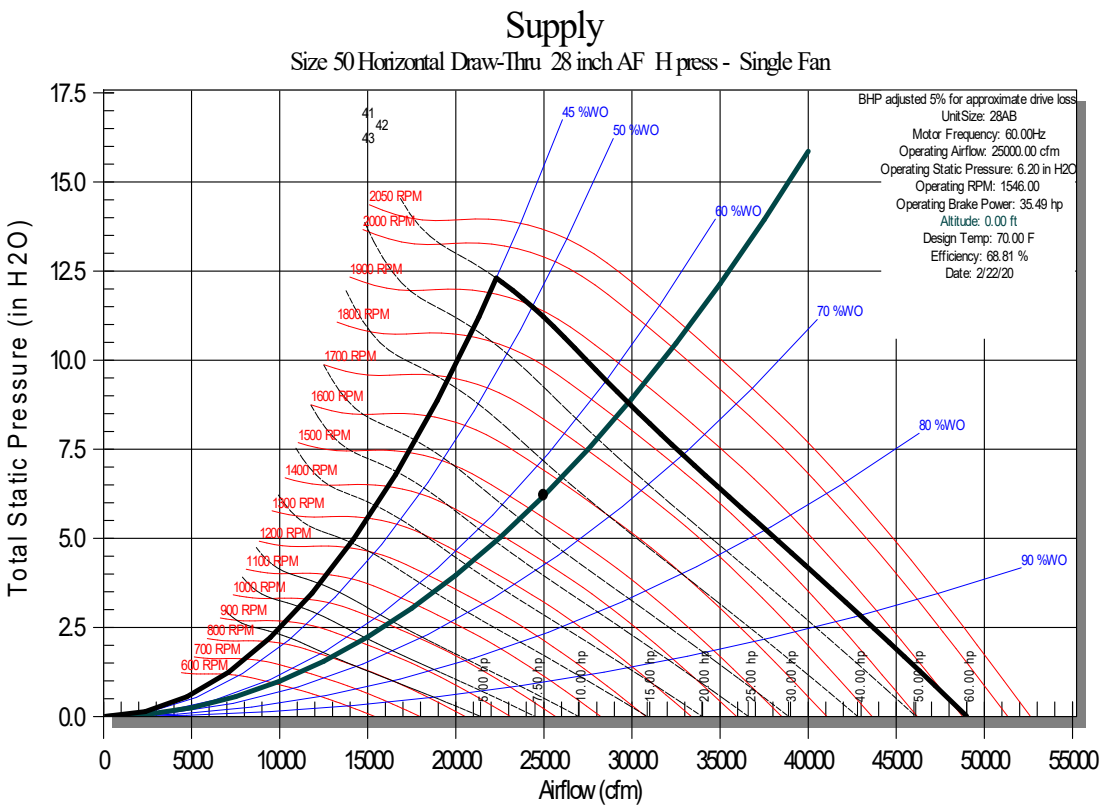


Detailed Plan View: Curb - Measurements in inches

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 50	Job Name:	Unit Casing: 2in Double Wall Foam	TRANE® Performance Climate Changer Air Handlers
Product group: Outdoor unit	Actual airflow: 25000 cfm	Proposal Number:	
Integral base frame: 6in. integral base frame			
Paint: Slate gray	Sales Office:	Rigging/Installed Weight: 5481.8 lb/ 5481.8 lb	

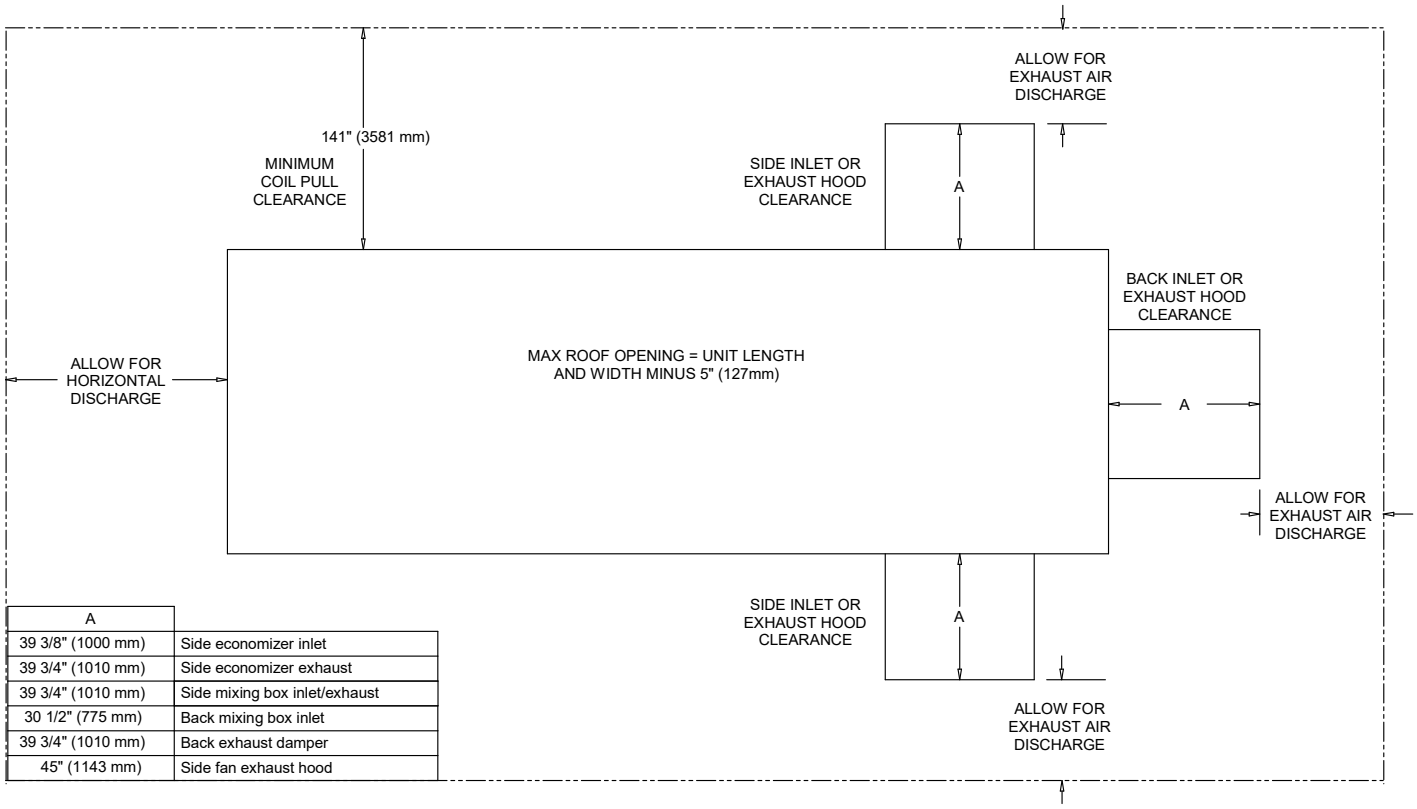
Fan Curve - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3



Size 50 Horizontal Draw-Thru 28 inch AF H press
Sound Power Levels are in accordance with AHRI 260.

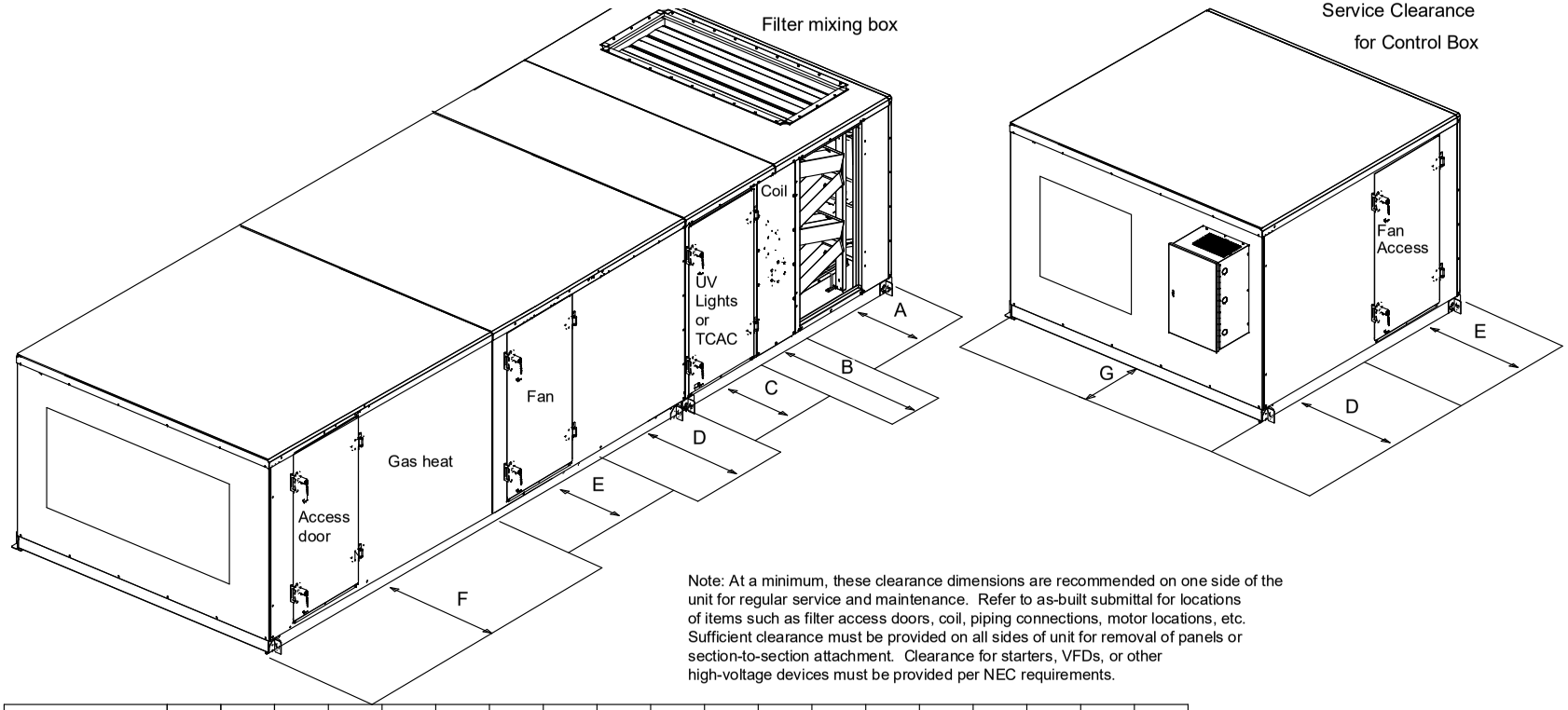
	63Hz	125Hz	250Hz	500Hz	1 kHz	2 kHz	4 kHz	8 kHz
Casing	93	88	89	78	74	69	56	51
Return	88	85	85	77	70	65	62	57
Supply Front	99	103	104	98	95	87	83	81
Outdoor	91	90	86	79	72	69	67	62

Accessory - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3



A	
39 3/8" (1000 mm)	Side economizer inlet
39 3/4" (1010 mm)	Side economizer exhaust
39 3/4" (1010 mm)	Side mixing box inlet/exhaust
30 1/2" (775 mm)	Back mixing box inlet
39 3/4" (1010 mm)	Back exhaust damper
45" (1143 mm)	Side fan exhaust hood

EXAMPLE UNIT - NOT CONFIGURED AS SELECTED.



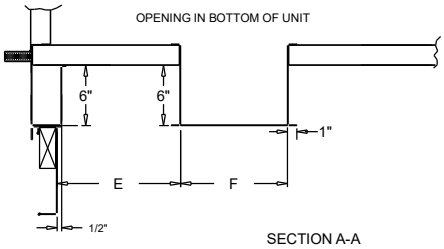
Note: At a minimum, these clearance dimensions are recommended on one side of the unit for regular service and maintenance. Refer to as-built submittal for locations of items such as filter access doors, coil, piping connections, motor locations, etc. Sufficient clearance must be provided on all sides of unit for removal of panels or section-to-section attachment. Clearance for starters, VFDs, or other high-voltage devices must be provided per NEC requirements.

Component	3	4	6	8	10	12	14	17	21	25	30	35	40	50	57	66	80	100	120
A (filter)	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	52	56	58	58
B (coil, humidifier)	48	59	59	66	77	82	87	87	95	95	109	115	128	141	141	156	156	170	197
B (staggered coil)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	67	67	76	80	88	96	96	105	105	113	129
C (UV Lights)	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	52	56	58	58
C (TCAC)	43	59	59	63	75	81	83	83	58	58	83	75	83	83	83	83	83	75	83
D (External Starter, VFD, LV box or Overload box)	61	61	61	61	61	61	61	61	64	64	64	64	64	64	64	64	64	64	64
D (Internal Starter or VFD)	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
E (fan)	48	48	48	48	51	54	58	61	60	66	66	66	70	77	77	93	93	101	101
F (Gas Heat Ext Vestible)	N/A	N/A	89	90	108	100	100	105	115	115	118	136	140	156	156	170	179	180	N/A
F (Gas Heat Int Vestible)	N/A	N/A	56	63	74	79	84	84	92	92	106	112	125	138	138	153	153	167	194

Component	All Sizes
G (Side mount LV box)	36
G (Front mount LV box)	13

Accessory - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3

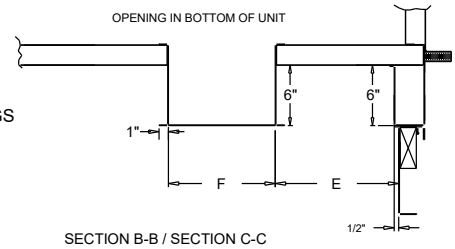
RELATIONSHIP OF CURB TO UNIT AS-BUILT



SECTION A-A

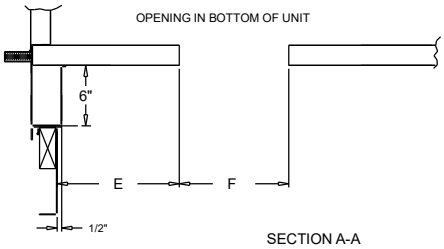
SUPPLY FAN OR DISCHARGE PLENUM (SEE NOTE 1)

RECTANGULAR OPENINGS



SECTION B-B / SECTION C-C

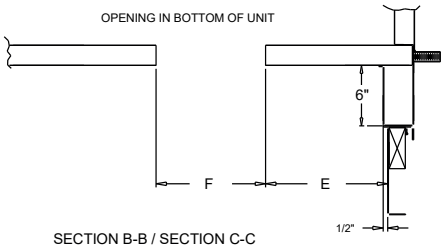
MIX BOX, RETURN FAN OR EXHAUST FAN SECTION (SEE NOTE 1)



SECTION A-A

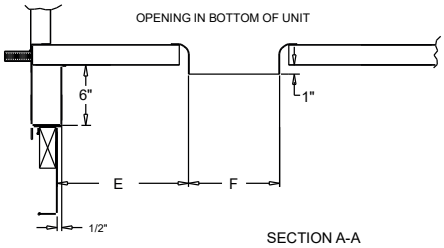
SUPPLY FAN OR DISCHARGE PLENUM (SEE NOTE 1)

ROUND OPENINGS



SECTION B-B / SECTION C-C

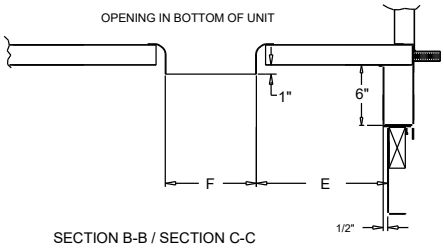
MIX BOX, RETURN FAN OR EXHAUST FAN SECTION (SEE NOTE 1)



SECTION A-A

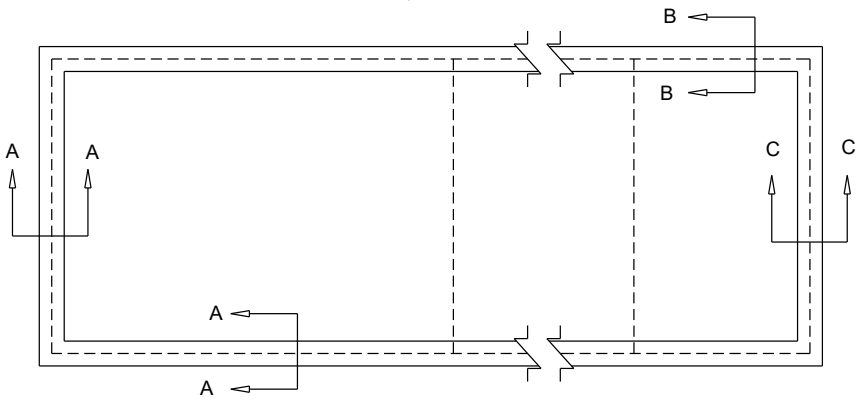
SUPPLY FAN OR DISCHARGE PLENUM (SEE NOTE 1)

BELLMOUTH OPENINGS



SECTION B-B / SECTION C-C

MIX BOX, RETURN FAN OR EXHAUST FAN SECTION (SEE NOTE 1)

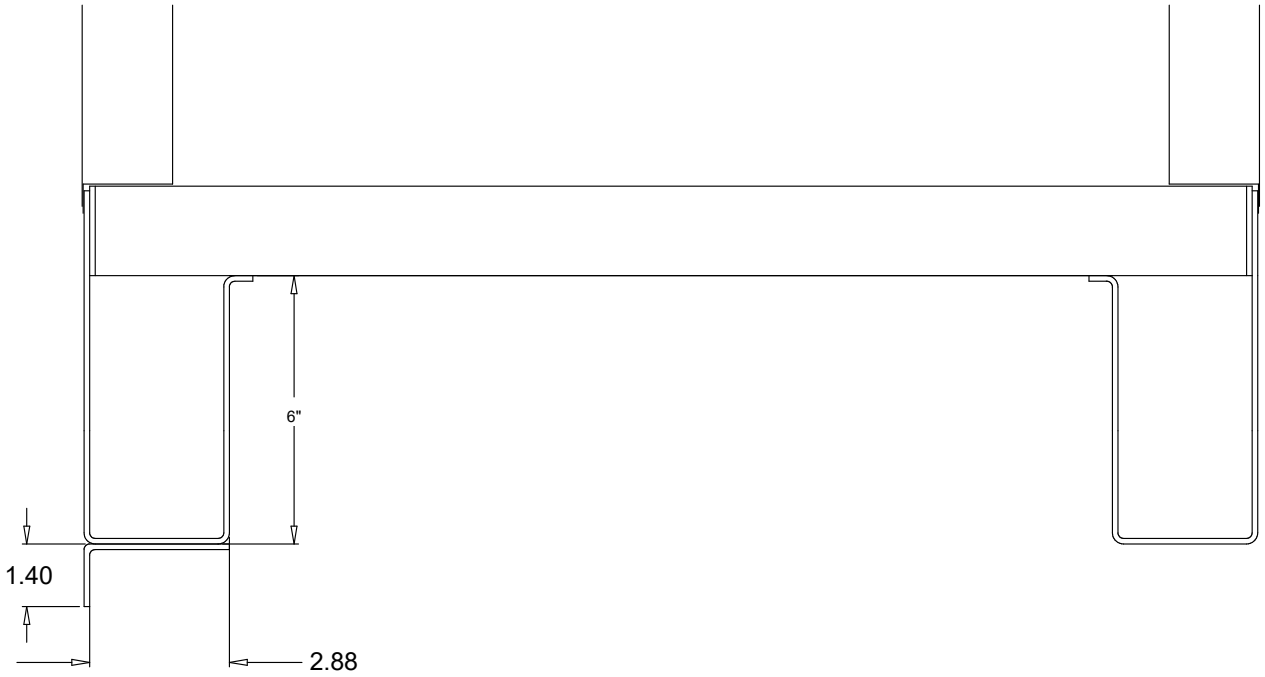


NOTE:

1. E and F are representative of dimensions on the accessory as-built used to locate opening(s) in the roof surface.

Accessory - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3

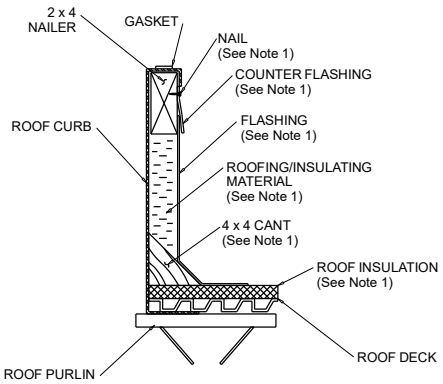
Base Detail

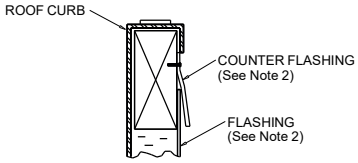


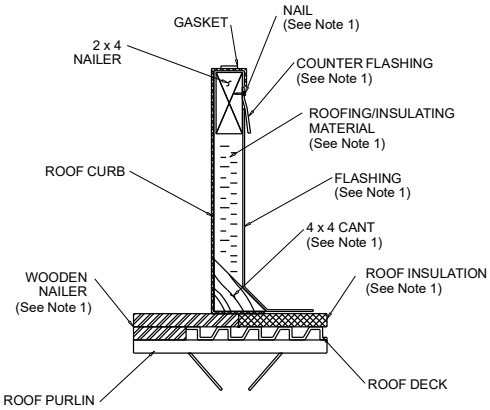
Accessory - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3

Recommendation for Roof Curb Installation

Refer to Performance IOM for specific installation instructions





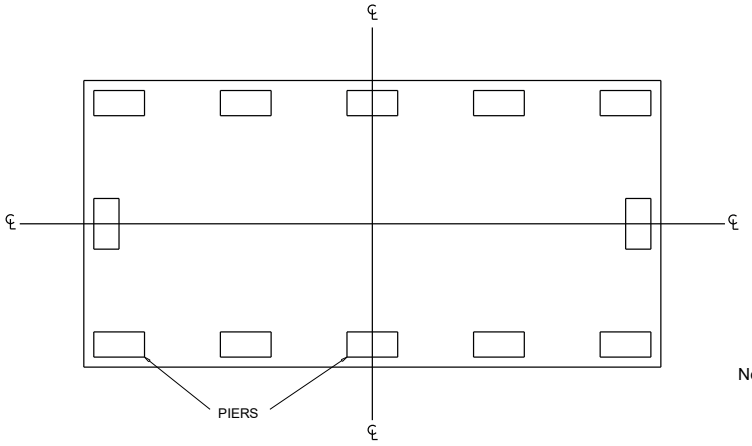


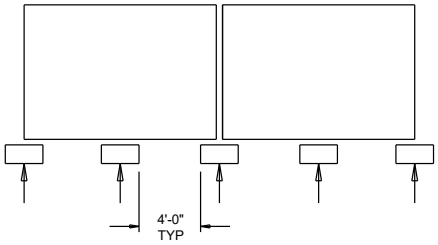
Note:

1. Materials to attach roof curb to roof are to be supplied by the installer.
2. Flashing or counter flashing should not come to or over top of curb.
3. Roof curb must be mechanically fastened to roof surface.

Recommendation for Pier Mounting

Refer to Performance IOM for specific installation instructions

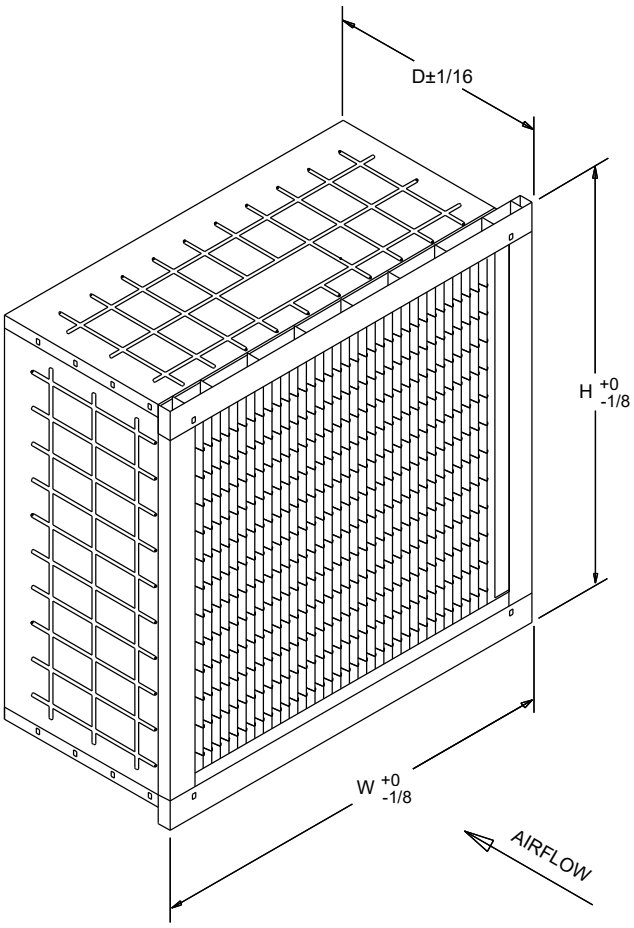


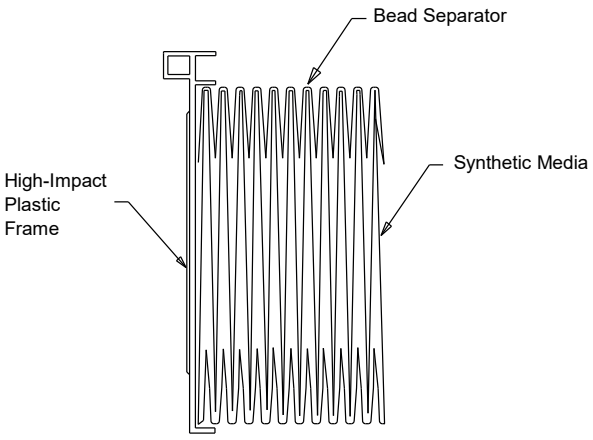


Note:

1. Pier supports should be inside 3" (3 - 50) or 4" (57 - 120) flat of unit base. Unit cannot be supported by unit base drip leg.
2. Piers beneath shipping splits must be structurally sound to support the weight of the unit.

Accessory - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3





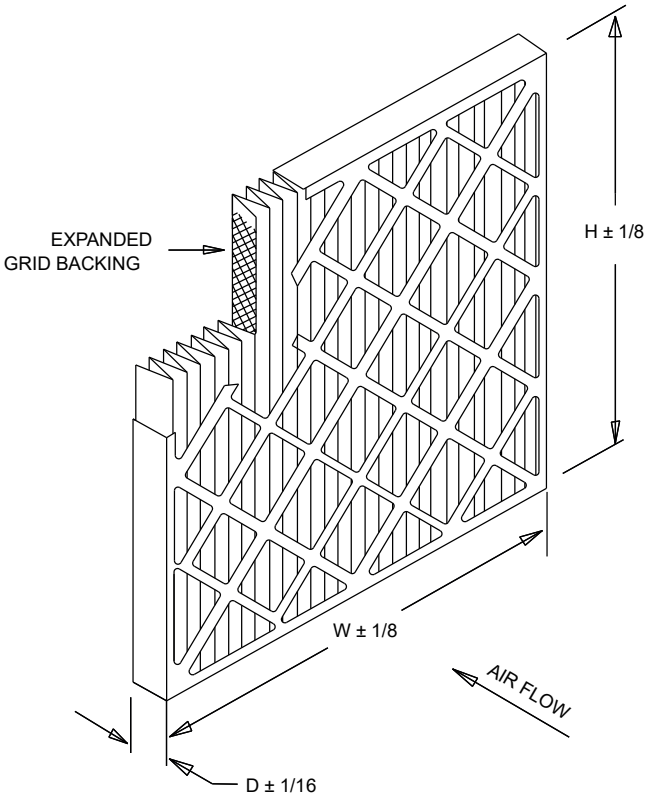
Filter Cross Section

MODEL NUMBER	NOMINAL SIZE (INCHES) HXWXD	ACTUAL SIZE (INCHES) HXWXD	RATED AIR FLOW (CFM)	INITIAL RESISTANCE (IN. w.G.)	MEDIA AREA (SQUARE FEET)	MERV RATING
LG-904	24X24X12	23-3/8X23-3/8X11-1/2	2000	.34	101.5	15
LG-915	20X24X12	19-3/8X23-3/8X11-1/2	1650	.34	83.0	15
LG-913	20X20X12	19-3/8X19-3/8X11-1/2	1400	.34	67.7	15
LG-903	12X24X12	11-3/8X23-3/8X11-1/2	1000	.34	46.1	15
LG-604	24X24X12	23-3/8X23-3/8X11-1/2	2000	.34	101.5	11
LG-615	20X24X12	19-3/8X23-3/8X11-1/2	1650	.34	83.0	11
LG-613	20X20X12	19-3/8X19-3/8X11-1/2	1400	.34	67.7	11
LG-603	12X24X12	11-3/8X23-3/8X11-1/2	1000	.34	46.1	11

USTANDARD CONSTRUCTION
1. 100 % Synthetic Media
2. Bead Separator Packs
3. High-Impact Plastic Frame Panels
4. Foamed Hot Melt Sealant
5. Reverse Air Flow Option Available
   See MKT-B-00542

UNOTES
1. Testing per ASHRAE 52.2-1999
2. Final Resistance: 1.5" W.G.
3. Rated Velocity - 500 FPM
4. Maximum Operating Temperature: 140 deg. F
5. Class 1 Filter per UL Standard 900
6. Special Sizes Not Available

Accessory - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3

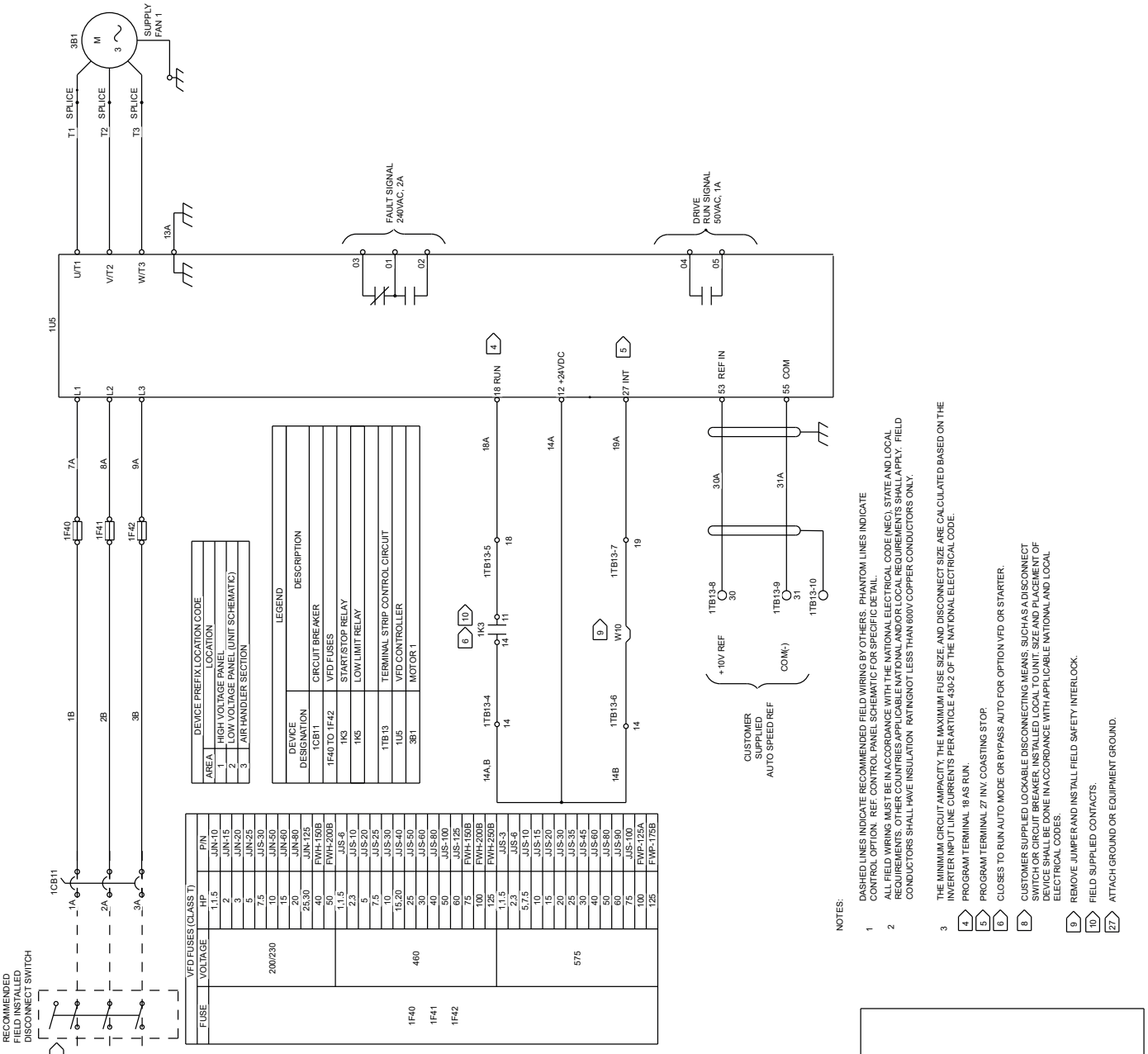


STANDARD CONSTRUCTION
1. 100 % Synthetic White Un-Dyed Media
2. 10.0 Pleats Per Foot
3. Expanded Metal Pleat Supports
4. Moisture Resistant Beverage Board Frame
5. Double Wall Frame

NOTES
1. MERV 8-A Per ASHRAE 52.2-2007 Appendix J.
2. Final Resistance: 1/0" W.G.
3. Rated Velocity: 500 FPM
4. Class 2 Filter Per U.L. Standard 900
5. Maximum Operating Temperature: 225 DEG. F

MODEL NUMBER	NOMINAL SIZE IN. W X H X D	ACTUAL SIZE IN. W X H X D	RATED AIR FLOW CFM	INITIAL RESISTANCE IN. W.G.	MEDIA AREA SQ. FT.
MX40-STD2-217	10 X 20 X 2	9-1/2 X 19-1/2 X 1-3/4	700	0.29	4.7
MX40-STD2-220	12 X 20 X 2	11-1/2 X 19-1/2 X 1-3/4	840	0.29	5.5
MX40-STD2-210	12 X 24 X 2	11-3/8 X 23-3/8 X 1-3/4	1000	0.29	6.2
MX40-STD2-239	14 X 20 X 2	13-1/2 X 19-1/2 X 1-3/4	980	0.29	5.7
MX40-2TD2-241	14 X 25 X 2	13-1/2 X 24-1/2 X 1-3/4	1220	0.29	7.1
MX40-STD2-245	15 X 20 X 2	14-1/2 X 19-1/2 X 1-3/4	1050	0.29	6.2
MX40-STD2-201	16 X 20 X 2	15-1/2 X 19-1/2 X 1-3/4	1120	0.29	6.7
MX40-STD2-216	16 X 24 X 2	15-3/8 X 23-3/8 X 1-3/4	1340	0.29	8.0
MX40-STD2-202	16 X 24 X 2	15-1/2 X 24-1/2 X 1-3/4	1400	0.29	8.0
MX40-STD2-280	15 X 20 X 2	17-1/2 X 19-1/2 X 1-3/4	1250	0.29	7.8
MX40-STD2-212	18 X 24 X 2	17-3/8 X 23-3/8 X 1-3/4	1500	0.29	9.3
MX40-STD2-285	18 X 25 X 2	17-1/2 X 24-1/2 X 1-3/4	1570	0.29	9.7
MX40-STD2-203	20 X 20 X 2	19-1/2 X 19-1/2 X 1-3/4	1400	0.29	8.3
MX40-STD2-211	20 X 24 X 2	19-3/8 X 23-3/8 X 1-3/4	1670	0.29	9.9
MX40-STD2-204	20 X 25 X 2	19-1/2 X 24-1/2 X 1-3/4	1750	0.29	10.3
MX40-STD2-205	24 X 24 X 2	23-3/8 X 23-3/8 X 1-3/4	2000	0.29	11.7
MX40-STD2-225	25 X 25 X 2	24-1/2 X 24-1/2 X 1-3/4	2170	0.29	13.6

Accessory - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-3



DEVICE PREFIX LOCATION CODE	
AREA	LOCATION
1	HIGH VOLTAGE PANEL
2	LOW VOLTAGE PANEL (UNIT SCHEMATIC)
3	AIR HANDLER SECTION

LEGEND	
DEVICE DESIGNATION	DESCRIPTION
1CB11	CIRCUIT BREAKER
1F40 TO 1F42	VFD FUSES
1K3	START/STOP RELAY
1K5	LOW LIMIT RELAY
1TB13	TERMINAL STRIP CONTROL CIRCUIT
1U5	VFD CONTROLLER
3B1	MOTOR 1

VFD FUSES (CLASS T)			
FUSE	VOLTAGE	HP	P/N
1F40 1F41 1F42	200/230	1,1.5	JJN-10
		2	JJN-15
		3	JJN-20
		5	JJN-25
		7.5	JJS-30
		10	JJN-50
		15	JJN-60
		20	JJN-80
		25,30	JJN-125
		40	FWH-150B
		50	FWH-200B
	460	1,1.5	JJS-6
		2,3	JJS-10
		5	JJS-20
		7.5	JJS-25
		10	JJS-30
		15,20	JJS-40
		25	JJS-50
		30	JJS-60
		40	JJS-80
		50	JJS-100
		60	JJS-125
		75	FWH-150B
		100	FWH-200B
		125	FWH-250B
	575	1,1.5	JJS-3
		2,3	JJS-6
		5,7.5	JJS-10
		10	JJS-15
		15	JJS-20
		20	JJS-30
		25	JJS-35
		30	JJS-45
		40	JJS-60
		50	JJS-80
		60	JJS-90
		75	JJS-100
		100	FWP-125A
		125	FWP-175B

⚠ WARNING

HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE, REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE.

FAILURE TO DO THE ABOVE BEFORE SERVICING COULD RESULT IN DEATH OR SERIOUS INJURY.

⚠ AVERTISSEMENT

TENSION DANGEREUSE!

COUPER TOUTES LES TENSIONS ET OUVRIR LES SECTIONNEURS À DISTANCE, PUIS SUIVRE LES PROCÉDURES DE VERROUILLAGE ET DES ÉTIQUETTES AVANT TOUTE INTERVENTION . VÉRIFIER QUE TOUS LES CONDENSATEURS DES MOTEURS SONT DÉCHARGÉS. DANS LE CAS D'UNITÉS COMPORTANT DES ENTRAÎNEMENTS À VITESSE VARIABLE, SE REPORTER AUX INSTRUCTIONS DE L'ENTRAÎNEMENT POUR DÉCHARGER LES CONDENSATEURS.

NE PAS RESPECTER CES MESURES DE PRÉCAUTION PEUT ENTRAÎNER DES BLESSURES GRAVES POUVANT ÊTRE MORTELLES.

⚠ ADVERTENCIA

¡VOLTAJE PELIGROSO!

DESCONECTE TODA LA ENERGÍA ELÉCTRICA, INCLUSO LAS DESCONEXIONES REMOTAS Y SIGA LOS PROCEDIMIENTOS DE CIERRE Y ETIQUETADO ANTES DE PROCEDER AL SERVICIO. ASEGÚRESE DE QUE TODOS LOS CAPACITORES DEL MOTOR HAYAN DESCARGADO EL VOLTAJE ALMACENADO. PARA LAS UNIDADES CON EJE DE DIRECCIÓN DE VELOCIDAD VARIABLE, CONSULTE LAS INSTRUCCIONES PARA LA DESCARGA DEL CONDENSADOR.

EL NO REALIZAR LO ANTERIORMENTE INDICADO, PODRÍA OCASIONAR LA MUERTE O SERIAS LESIONES PERSONALES.

CAUTION

USE COPPER CONDUCTORS ONLY!

UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

ATTENTION

N'UTILISER QUE DES CONDUCTEURS EN CUIVRE!

LES BORNES DE L'UNITÉ NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS.

L'UTILISATION DE TOUT AUTRE CONDUCTEUR PEUT ENDOMMAGER L'ÉQUIPEMENT.

PRECAUCIÓN

¡UTILICE ÚNICAMENTE CONDUCTORES DE COBRE!

LAS TERMINALES DE LA UNIDAD NO ESTÁN DISEÑADAS PARA ACEPTAR OTROS TIPOS DE CONDUCTORES.

SI NO LO HACE, PUEDE OCASIONAR DAÑO AL EQUIPO.

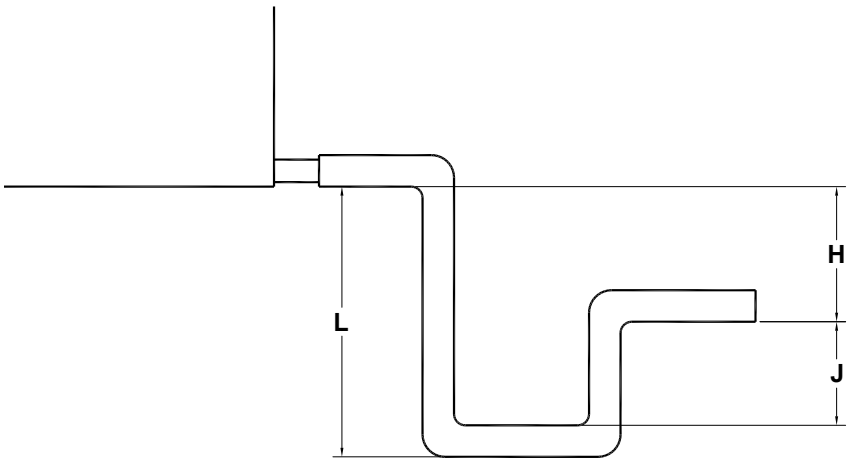
NOTES:

1. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. PHANTOM LINES INDICATE CONTROL OPTION. REF. CONTROL PANEL SCHEMATIC FOR SPECIFIC DETAIL.
2. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC), STATE AND LOCAL REQUIREMENTS. OTHER COUNTRIES APPLICABLE NATIONAL AND/OR LOCAL REQUIREMENTS SHALL APPLY. FIELD CONDUCTORS SHALL HAVE INSULATION RATINGNOT LESS THAN 600V COPPER CONDUCTORS ONLY.
3. THE MINIMUM CIRCUIT AMPACITY THE MAXIMUM FUSE SIZE, AND DISCONNECT SIZE ARE CALCULATED BASED ON THE INVERTER INPUT LINE CURRENTS PER ARTICLE 430-2 OF THE NATIONAL ELECTRICAL CODE.

4. PROGRAM TERMINAL 18 AS RUN.
5. PROGRAM TERMINAL 27 INV. COASTING STOP.
6. CLOSES TO RUN AUTO MODE OR BYPASS AUTO FOR OPTION VFD OR STARTER.
8. CUSTOMER SUPPLIED LOCKABLE DISCONNECTING MEANS, SUCH AS A DISCONNECT SWITCH OR CIRCUIT BREAKER. INSTALLED LOCAL TO UNIT. SIZE AND PLACEMENT OF DEVICE SHALL BE DONE IN ACCORDANCE WITH APPLICABLE NATIONAL AND LOCAL ELECTRICAL CODES.
9. REMOVE JUMPER AND INSTALL FIELD SAFETY INTERLOCK.
10. FIELD SUPPLIED CONTACTS.
27. ATTACH GROUND OR EQUIPMENT GROUND.

10136

Accessory - Performance Climate Changer (CSAA)
Trap Schedule
Item: A1 Qty: 1 Tag(s): AHU-3



Drain pan trapping for section under negative pressure

L = H + **J** + pipe diameter where:
H = 1 inch for each inch of negative pressure (loaded filters) plus 1 inch
J = ½ **H**

Drain pan trapping for section under positive pressure

L = H + **J** + pipe diameter where:
H = 1/2 inch (minimum)
J = ½ inch plus the unit positive static pressure at coil discharge (loaded filters)

Unit Tag(s)	Unit Size	Entering Ext. Static Pressure (in H2O)	Discharge Ext. Static Pressure (in H2O)	Drain pan Section Location	Recommended Trap Dimensions[1]			Selected Baserail Height (in)[1]
					H (in)	J (in)	L (in)	
AHU-3[2]	Unit size 50	1.800	1.800	Coil section [3]	6.173	3.086	10.509	6.000

[1] To ensure proper condensate trapping the field installed housekeeping pad height is the responsibility of the contractor.
[2] The external static pressure used for fan selection was assumed to be divided 50% to entering duct external static pressure and 50% discharge external static pressure.

Accessory - Performance Climate Changer (CSAA)
Filter Schedule
Item: A1 Qty: 1 Tag(s): AHU-3

Unit Tag(s)	Unit Size	Filter Location	Filter Arrangement	Filter Depth	Filter Type	MERV Rating	Filter Quantity	Filter Size
AHU-3	Unit size 50	Filter section [2]	Cartridge filter	Bag/cartridge filter frame	2" Pleated media - run set	MERV 8	5 10	12in.x24in. 24in.x24in.
					12in. cartridge - 95% eff - run set	MERV 15	5 10	12in.x24in. 24in.x24in.

Field Wiring - Performance Climate Changer (CSAA)
MCA MOP Schedule
Item: A1 Qty: 1 Tag(s): AHU-3

Unit Tag(s)	Circuit	Circuit Description	Voltage/Phase/Hz	MCA (A)	MOP (A)
AHU-3	1	Supply fan motor(s)	460/3/60	65.00	110.00

Tag Data - Air-Cooled Condensing Units (Industrial)) (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
B1	CU-3	1	80 Ton Air-Cooled Condensing Unit	RAUJC804B

Product Data - Air-Cooled Condensing Units (Industrial))
Item: B1 Qty: 1 Tag(s): CU-3

Standard Unit
Condenser: Air-cooled
R-410A refrigerant
80 Ton Unit
460 Volt 60 Hertz 3 Phase
No system control
Low ambient control via dampers
cULus Approval
Suction service valves
Hot gas bypass valve
Spring isolators (unit) (Fld)
Non-fused disconnect switch
5 Year All Parts Warranty
5 Year Refrigerant Warranty
5 Year Labor Warranty
10 Year Compressor Parts Warranty

Performance Data - Air-Cooled Condensing Units (Industrial))

Tags	CU-3
Compressor power (kW)	95.00
Cond fan motor power (kW)	7.04
Total power (Cond only) (kW)	102.04
EER @ AHRI (Cond only) (EER)	11.0
Min circuit ampacity (A)	174.00
Max overcurrent protection (A)	200.00
Recommended dual element (A)	175.00
Compressor 1 RLA (A)	25.40
Compressor 1 count (Each)	6.00
Compressor 2 RLA (A)	0.00
Compressor 2 count (Each)	0.00
Condenser motor FLA (A)	1.80
Condenser motor count (Each)	8.00
Suction line size horz-od/circuit	2-1/8 in.
Suction line size vert-od/circuit	2-1/8 in.
Liquid line size-od/circuit	1-1/8 in.
Refrigerant type	R410a
Max operating weight (lb)	5783.0

Mechanical Specifications - Air-Cooled Condensing Units (Industrial))
Item: B1 Qty: 1 Tag(s): CU-3

General - R410
All air-cooled condensing units shall have scroll compressors and are factory assembled and wired. Each unit shall ship from the factory with a nitrogen holding charge. Units shall be constructed of 14-gauge welded galvanized steel frame with 14 and 16-gauge galvanized steel panels and access doors. Unit surface shall be phosphatized and finished with an air-dry paint. Air-dry paint finish shall withstand a minimum of 625-consecutive-hour salt spray application in accordance with standard ASTM B117.

Compressor - R-410A
Trane 3-D Scroll compressors have simple mechanical design with only three (3) major moving parts. Scroll type compression provides inherently low vibration. 3-D compressors provide a completely enclosed compression chamber with no leakage paths. The compressor is suction gas cooled, direct drive, 3600 RPM hermetic motors. The Scroll compressor includes a centrifugal oil pump, oil level sight glass, and an oil charging valve.

Refrigerant Management - R-410A
Split systems can have significantly more refrigerant than packaged systems and thus require controls to reliably manage this excess refrigerant. Each compressor shall have crankcase heaters installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles. Additionally, the condensing unit shall have controls to initiate Refrigerant Isolation at system shut down on each refrigerant circuit. To be operational, the refrigerant Isolation cycle requires a field-installed isolation solenoid valve on the common liquid line near the evaporator.

Note: Under extreme conditions, R-410A refrigerant can present special challenges with piping and system design. Whenever refrigerant line set lengths approach 150 equivalent feet and/or design ambient temperature exceeds 115 degrees F, contact your Trane Account Executive to review application requirements.

Condenser Fan and Motors - R-410A
Vertical discharge direct-drive fans are statically and dynamically balanced. Fan motors are three-phase with permanently lubricated ball bearings, built-in current and thermal overload protection.

Microchannel Condenser Coil -l R410A
Condenser coils are dual circuit having an all Aluminum Microchannel design. The coils are burst tested and leak tested. Factory installed liquid line service valves are standard.

Refrigerant Circuit - R410A
Each unit has two independent refrigeration circuits with 3 compressors per circuit piped in parallel. Six step capacity control is accomplished through compressor cycling.

Unit Control - R410A
Factory-provided 115-volt control circuit includes fusing and control power transformer. The unit is wired with magnetic contactors for compressor and condenser motors. Three-leg circuit breakers are used for overload and short circuit protections. The unit also has high/low pressure cutouts. Charge isolation, reset relay and anti-recycle compressor timer is provided. Across- the- line start is standard.

No System Control - R410A
No System Control provides a terminal strip for step control provided by others. The system provides internal 3 minute fixed on and 5 minute fixed off time delays and compressor contactors. The system temperature ¿step¿ controller must be field provided and installed.

Note: For No Controls units with system temperature ¿step¿ controllers provided by others, the controller must include 5 minute on/off interstage timers to coordinate with the units fixed on/off time delay relays.

Low Ambient Control - R410A
Low ambient option extends unit operation from 40 F to 0 F [4.5 to -17.8 C] by utilizing an external damper assembly for head pressure control.

Hot Gas Bypass Valve R-410A
Hot gas bypass valves will be shipped with the unit for field installation (Model: Sporlan, SHGBE-8)**.**
Note: For 40T to 120T, No Control and CV systems; 2 valves will need be field installed (1 per circuit) to enable use of lead/lag. For all other systems, 1 valve will need to be field installed.

Spring Isolators - R410A
Steel spring vibration isolators are supplied, for field installation under the unit, to reduce transmission of vibration to building structure and adjacent areas.

Suction Service Valves - R410A
This valve is provided in order to isolate the compressor for servicing. This valve is a refrigerant shut off valve.

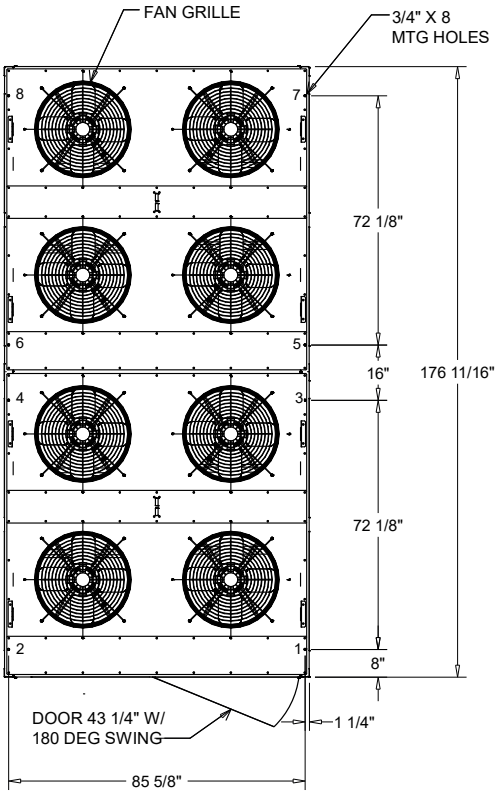
Disconnect non fused - R410A
This switch is non-fused and is located inside the unit control box. An external handle allows power disconnection without having to open the control box door.

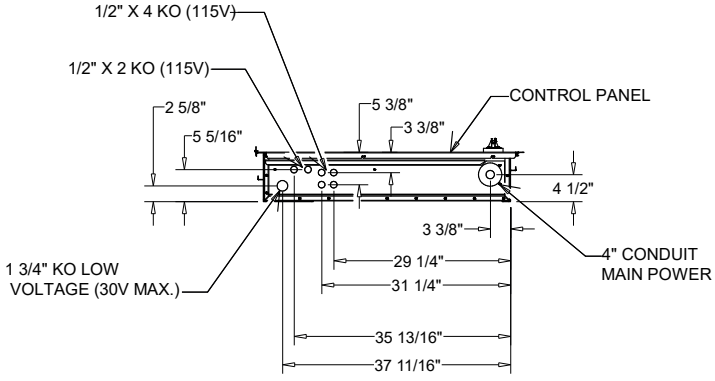
Field Installed; 15% Bleed Valve TXV
Installation shall require use of 15% bleed, Thermal Expansion Valves. Valves shall be field supplied and field installed. Quantity and size shall be determined by the application.

Note: Liquid line solenoids are required for all applications. *Trim solenoids cannot be used.*

Unit Dimensions - Air-Cooled Condensing Units (Industrial))
Item: B1 Qty: 1 Tag(s): CU-3

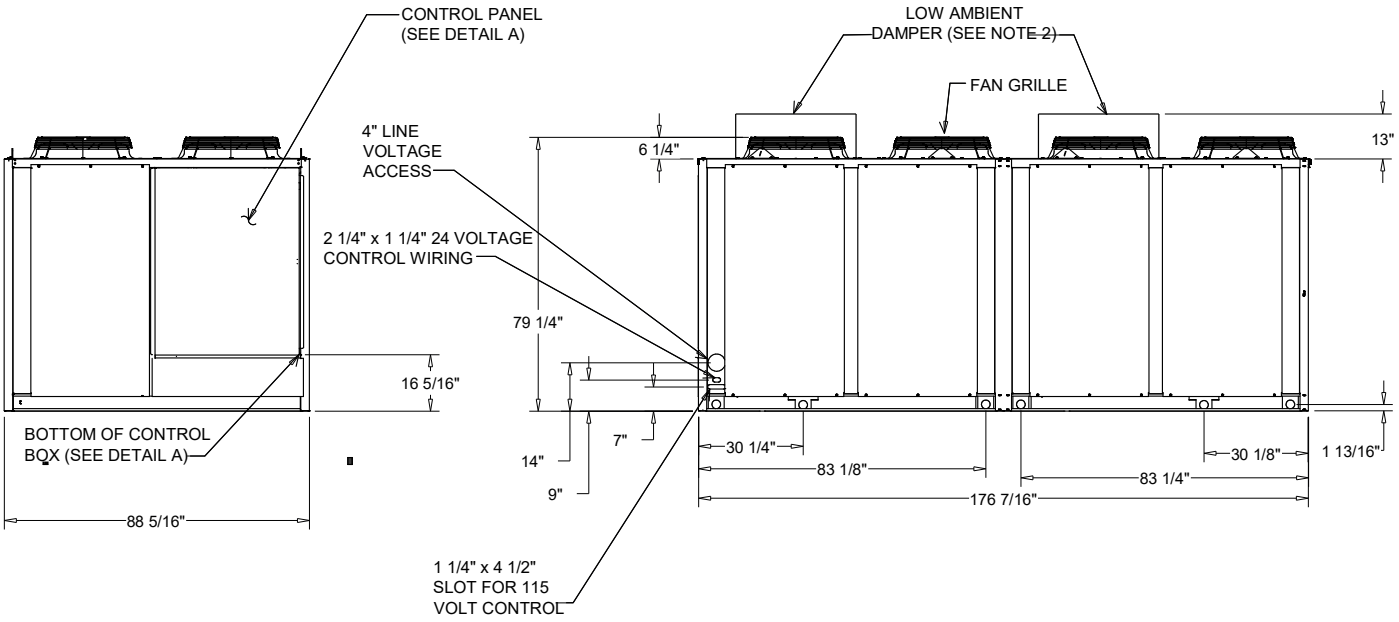
NOTES:
1. SEE CONNECTION DRAWING FOR CONNECTION LOCATION AND SIZES.
2. LOW AMBIENT DAMPER ONLY COMES WITH SELECTED UNIT .





DETAIL A

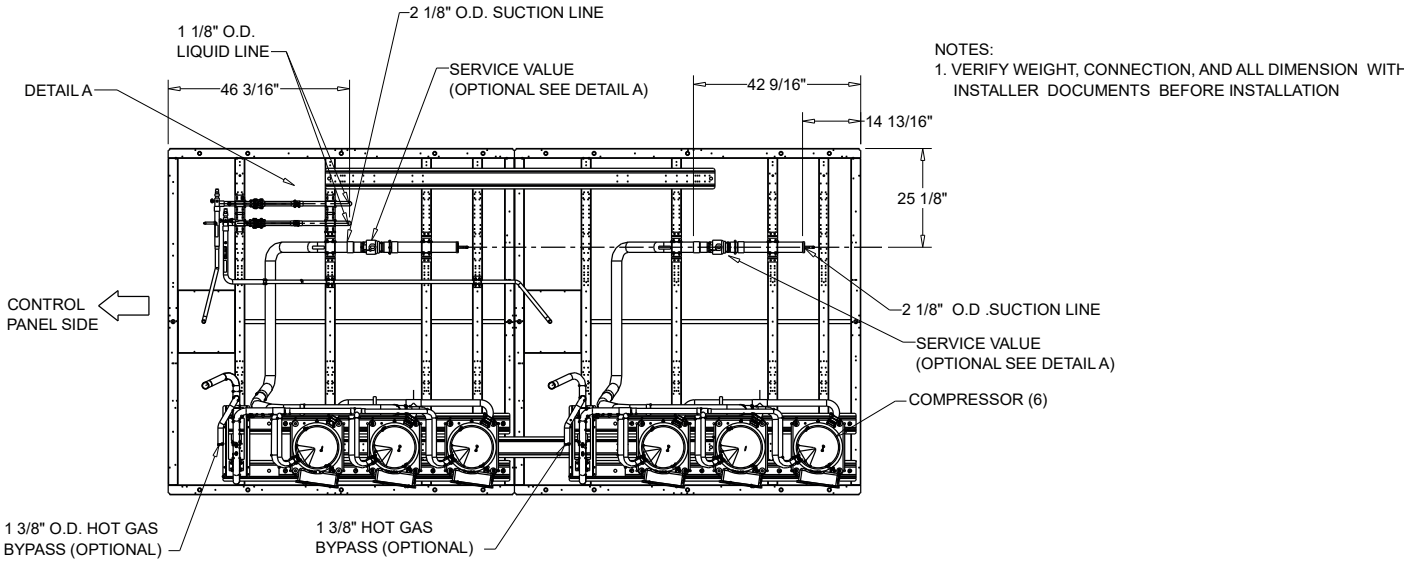
DIMENSIONAL DETAIL



80 TON UNIT

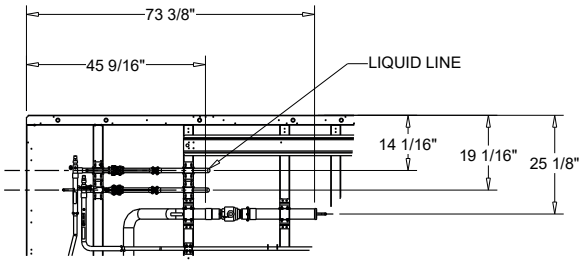
DIMENSIONAL DRAWING

Unit Dimensions - Air-Cooled Condensing Units (Industrial))
Item: B1 Qty: 1 Tag(s): CU-3



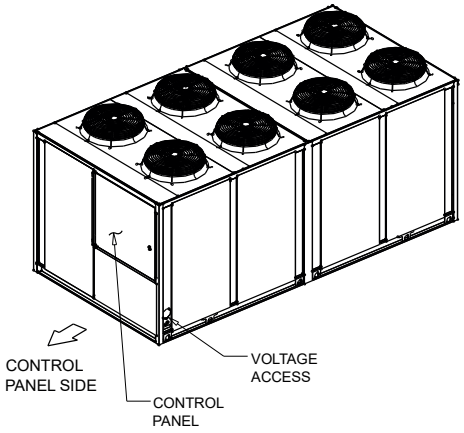
PLAN VIEW OF UNIT

CONNECTION DRAWING



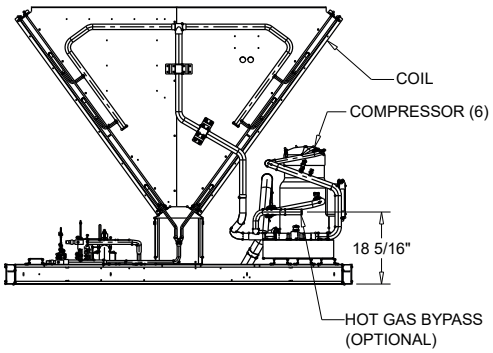
DETAIL A

DETAIL DRAWING



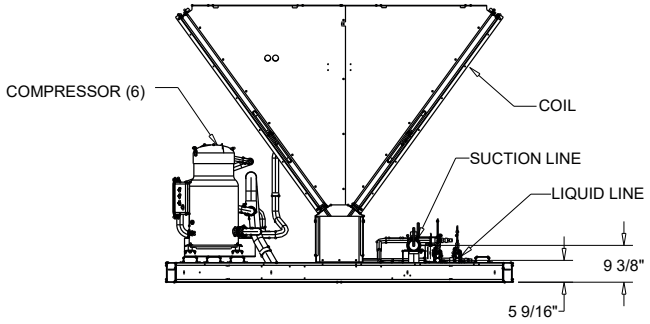
ORIENTATION VIEW OF UNIT

ISOMETRIC DRAWING



CONTROL PANEL SIDE VIEW OF UNIT

CONNECTION DRAWING



LEFT VIEW OF UNIT

CONNECTION DRAWING

80 TON UNIT

DIMENSIONAL CONNECTION DRAWING

Unit Dimensions - Air-Cooled Condensing Units (Industrial))
Item: B1 Qty: 1 Tag(s): CU-3

GENERAL ELECTRICAL DATA

GENERAL

Tonnage / kW:	80
Unit Operating Voltage Range:	414-506
Unit Primary Voltage:	460
Unit Hertz:	60
Unit Phase:	3
Minimum Circuit Ampacity: (3)	174.00 A
Maximum Overcurrent Protection Device: (2)	200.00 A
Recommended Dual Element Fuse: (4)	200.00 A

OUTDOOR MOTOR

Number:	8
Horsepower:	1.0
Motor Speed (rpm):	1,140
Outdoor Motor Full Load amps:	1.8
Outdoor Motor Locked Rotor amps:	9.0

COMPRESSOR

	Circuit A1/A2 - Circuit B1/B2 - Circuit C1/C2
Tons (ea):	15.0/15.0 - 15.0/15.0 - 15.0/15.0
Compressor Rated Load Amps (ea):	25.4/25.4 - 25.4/25.4 - 25.4/25.4
Locked Rotor Amps (ea):	160.0/160.0 - 160.0/160.0 - 160.0/160.0

REFRIGERANT OPERATING CHARGRE (Cond Only, per Circuit)

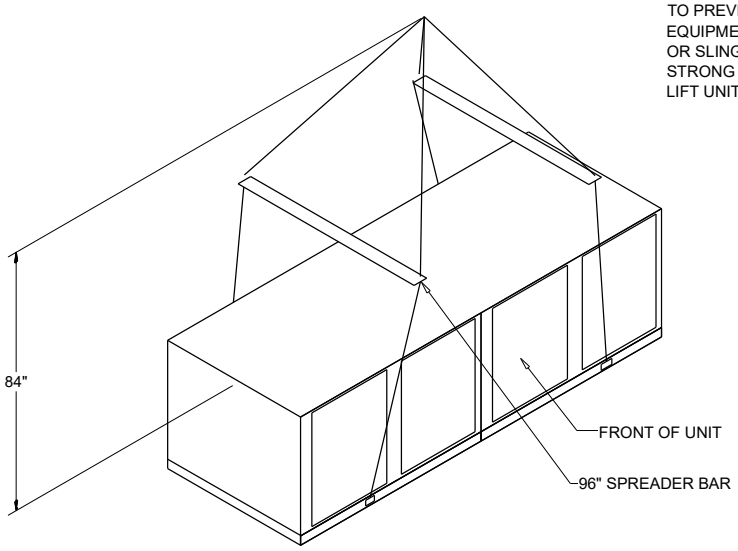
Type:	R-410A
Number of Circuits:	2
Condenser Storage Capacity:	47.1 lb
Refrigerant Operating Charge (Condensert Only):	57.1 lb

Notes:

1. Electrical data is for each individual motor.
2. Maximum overcurrent protection permitted by nec 440-22 is 225 percent of largest compressor motor rla plus the remaining motor rla and fla values.
3. Minimum circuit ampacity is 125 percent of the largest compressor motor rla plus the remaining motor rla and fla values.
4. Recommended dual element fuse size is 150 percent of the largest compressor motor rla plus the remaining motor rla and fla values.
5. Local codes may take precedence.
6. Electrical data is pulled from TOPSS (performance engine). If data is missing please check TOPSS.

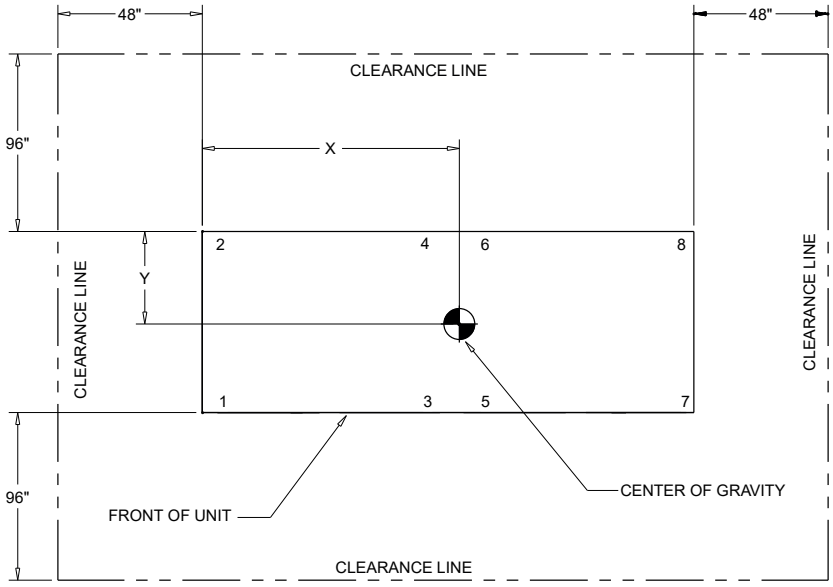
Weight, Clearance & Rigging Diagram - Air-Cooled Condensing Units (Industrial))
Item: B1 Qty: 1 Tag(s): CU-3

WARNING
TO PREVENT INJURY OR DEATH AND POSSIBLE EQUIPMENT DAMAGE, DO NOT USE CHAIN (CABLES) OR SLINGS EXCEPT AS SHOWN AND USE CABLES STRONG ENOUGH TO SUPPORT UNIT WEIGHT. TEST LIFT UNIT TO ENSURE PROPER BALANCE AND RIGGING.



80 - 120 RIGGING

WEIGHT AND RIGGING



WARNING!
TO PREVENT INJURY OR DEATH AND POSSIBLE EQUIPMENT DAMAGE, DO NOT USE CHAIN (CABLES) OR SLINGS EXCEPT AS SHOWN AND USE CABLES STRONG ENOUGH TO SUPPORT UNIT WEIGHT. TEST LIFT UNIT TO ENSURE PROPER BALANCE AND RIGGING.

WEIGHTS AND LOAD POINTS

TONNAGE:	80
SHIPPING:	4870.0 lb
OPERATING:	4940.0 lb
LOAD POINTS 1 :	798.3 lb
LOAD POINTS 2 :	462.1 lb
LOAD POINTS 3 :	786.7 lb
LOAD POINTS 4 :	450.5 lb
LOAD POINTS 5 :	785.1 lb
LOAD POINTS 6 :	448.9 lb
LOAD POINTS 7 :	772.4 lb
LOAD POINTS 8 :	436.1 lb

*ALL WEIGHTS ARE APPROXIMATE

CENTER OF GRAVITY

X:	86"
Y:	55 13/16"

ADD WEIGHTS

TO SHIPPING WEIGHT: (4)
TO OPERATING WEIGHT: (4)

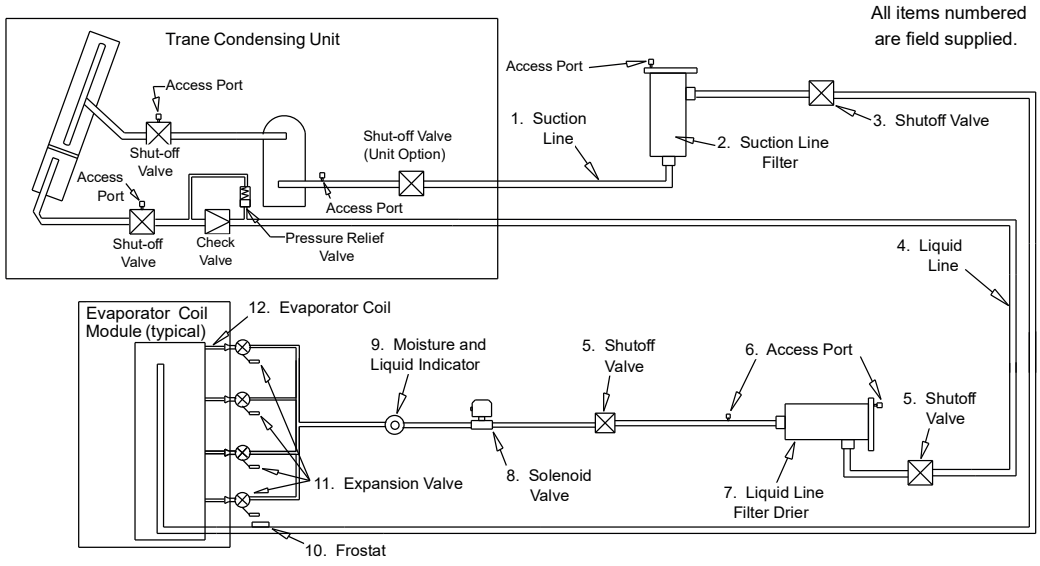
NOTES:
1. OPERATING WEIGHT INCLUDES REFRIGERANT, OIL AND WATER.
2. SHIPPING WEIGHT INCLUDES REFRIGERANT AND OIL CHARGES
3. THE ACTUAL WEIGHT IS SHOWN ON THE NAMEPLATE. WEIGHT SHOWN REPRESENT TYPICAL SHIPPING AND OPERATING WEIGHTS FOR THE UNIT SELECTED.
4. ADD WEIGHT TO TOTAL WEIGHT OF UNIT
5. IF UNITS IS INSTALLED IN A WELL, THE DEPTH OF THE WELL MUST NOT EXCEED THE TOP HEIGHT OF THE UNIT. THE TOP OF THE UNIT MUST HAVE UNRESTRICTED AIRFLOW. PLEASE REFERENCE RECOMMENDED CLEARANCES.

80 - 120 TON CENTER OF GRAVITY AND CLEARANCES

WEIGHT AND RIGGING

Field Wiring - Air-Cooled Condensing Units (Industrial))
Item: B1 Qty: 1 Tag(s): CU-3

Required Components for One of Two Identical Refrigerant Circuits



Suction Line

1. Interconnected Tubing (Suction line) - 80 ton 2 1/8" O.D. and 100-120 ton 2 5/8" O.D. Horizontal.
2 1/8" O.D. Vertical - maximum of 50 feet if condenser is above evaporator (If risers are more than 50 feet, the application must be reviewed by Trane)

2. Suction Line - Filter Drier 1/ckt suction filter should be the replaceable-core type, and a clean core should be installed after the system is cleaned up.

3. Shut-Off Valve 2 - Manual ball valves.

LIQUID LINE

4. Interconnected Tubing (Liquid Line) - 1 1/8" O.D. Horizontal
1 1/8" O.D. Vertical - Refer to applications guide SS-APG012 - EN for vertical & horizontal piping limitations.

5. Shut-Off Valve - 2 Manual ball valves for 625" tubing

6. Access Port - Port used to determine suction pressure. This port is usually a Schraeder valve with a core.

7. Liquid Line - Filter Drier 1/ckt liquid filter should be the replaceable-core type, and a clean core should be installed after the system is cleaned up.

8. Solenoid Valves - Liquid line requires a field supplied and installed isolation solenoid valve within 10 feet of the evaporator. The suggested solenoid uses a 120-volt service and requires code-compliant wiring to the RAUJ condensing unit.
Note: Trim solenoids cannot be used. They are not compatible with Microchannel condenser coils.

9. Moisture and Liquid Indicator - One moisture-indicating sight glass is to be installed in the main liquid line

Field Wiring - Air-Cooled Condensing Units (Industrial))
Item: B1 Qty: 1 Tag(s): CU-3

10. Frostat (Not Required) - The control is mechanically attached to the outside of the refrigerant line, near the evaporator, and wired to the unit control panel. See application guide SS-APG012 - EN for selection information.

11. Expansion Valves - See application guide SS-APG012-EN for selecting quantity and size.
Note: Units with Microchannel condenser coils applied with DX systems will require 30 percent bleed valves for the 20-60T units and 15 percent bleed valves for the 80-120T (shown below). Those with BPHE can use standard non-bleed valves referenced in SS-APG012-EN.

Expansion Valves for 80-120T MCHE (15 Percent Bleed)

REFRIGERANT	MANUFACTURER	MIN.	MAX.	MODEL NUMBER	TRANE PART
R-410A	SPORLSN	2.0	2.5	ERZE-1-1/2-ZGA (BP/15)	N/A
R-410A	SPORLSN	2.5	3.0	ERZE-2-ZGA (BP/15)	N/A
R-410A	SPORLSN	3.0	4.5	ERZE-3-ZGA (BP/15)	N/A
R-410A	SPORLSN	4.0	6.0	ERZE-4-ZGA (BP/15)	N/A
R-410A	SPORLSN	5.0	7.5	ERZE-5-ZGA (BP/15)	VAL10579
R-410A	SPORLSN	6.0	9.0	ERZE-6-ZGA (BP/15)	VAL10580
R-410A	SPORLSN	7.0	12.0	ERZE-8-ZGA (BP/15)	VAL10581
R-410A	SPORLSN	9.5	15.5	ERZE-12-1/2-ZGA (BP/15)	VAL10582
R-410A	SPORLSN	12.5	19.0	ERIZE-15-ZGA (BP/15)	VAL10583
R-410A	SPORLSN	15.0	25.0	OZE-20-ZGA (BP/15)	VAL10584
R-410A	SPORLSN	19.5	30.0	OZE-25-ZGA (BP/15)	VAL10585
R-410A	SPORLSN	23.5	45.0	OZE-35-ZGA (BP/15)	VAL10586
R-410A	SPORLSN	35.0	68.0	OZE-50-ZGA (BP/15)	VAL10587
R-410A	SPORLSN	52.5	70.0	OZE-60-ZGA (BP/15)	VAL10588

(1) Ton per distributor, choose the valve that matches the evap coil circuit capacity that it serves.
(2) Provide and install one expansion valve per distributor.

Refrigerant Charge and Maximum Line Length

Total interconnecting line length (per circuit)	50 ft	100 ft	150 ft
Condenser and line set approx. refrigerant charge (per circuit) - evaporator charge not included	N/A	N/A	N/A

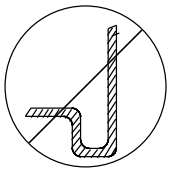
If total interconnecting line length is more than 150 ft, the application must be reviewed by Trane.

**Contact product support for information on refrigeration components and piping application assistance.
***Data in table is pulled from TOPSS selection. If N/A is present, please refer to unit IOM.

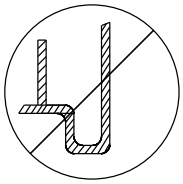
Installation Guidelines

Suction Line Piping

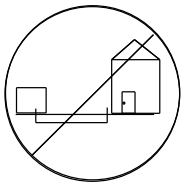
1. Do not use suction line traps.



2. Do not use double risers.



3. Avoid putting suction lines underground.



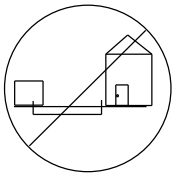
4. Route suction lines as short and direct as possible.
5. Slope suction line away from the condensing unit 1" for every 10 ft.
6. Insulate suction line.
7. The suction filter should be located as close to the compressors as possible.

Field Wiring - Air-Cooled Condensing Units (Industrial))
Item: B1 Qty: 1 Tag(s): CU-3

Required Components for One of Two Identical Refrigerant Circuits Continued

Liquid Line Piping

1. Avoid putting liquid lines underground.



2. Route liquid lines as short and direct as possible.
3. Slope liquid line away from the condensing unit 1" for every 10 ft.
4. Only insulate liquid lines that pass through heated areas.
5. Wire solenoid valve per field connection diagram
6. The liquid line filter drier should be as close to the solenoid valve as possible.

Evaporator Piping

1. Install TXV directly to unit liquid connection.
2. Locate TXV bulb midway between 90F bends on top of suction tube as shown.
3. Secure bulb to tube with the two clamps provided by the manufacturer and insulate bulb.
4. Install the TXV equalizer line close to & downstream of the bulb, on top of the horizontal suction line.
5. Install frostat per kit instructions on the suction line as close to the evaporator as possible.

See SS-APG012-EN for proper DX evaporator piping details.

Field Wiring - Air-Cooled Condensing Units (Industrial))
Item: B1 Qty: 1 Tag(s): CU-3

CUSTOMER WIRE SELECTION TABLE		
POWER WIRE SELECTION TO MAIN TERMINAL BLOCK (1TB1)		
TERMINAL BLOCK SIZE		CONNECTOR WIRE RANGE
310 AMP		(1) #6 -- 350 MCM
CONTROL WIRE SELECTION		
WIRE GUAGE	OHMS PER 12000"	MAX WIRE LENGTH
18 AWG	8	6000"
16 AWG	5	12000"
14 AWG	3	24000"
12 AWG	2	36000"
SHIELDED WIRE TABLE		
WIRE GUAGE		MAX WIRE LENGTH
16 AWG		6000"
14 AWG		12000"

NOTES:

1. All wiring and components shown dashed to be supplied and installed by customer in accordance\n with loc
2. All wiring to be N.E.C. class 1 unless otherwise specified.
3. CAUTION - Do not run low voltage wire (30 volts maximum) in conduit or raceway with\n higher voltage wi
4. Maximum solenoid ratings are 72 VA inrush/30 VA sealed.
5. Maximum ratings are 240 VA inrush/40 VA sealed.
6. Minimum ratings are 250 VA inrush/125 VA sealed.
7. 6 step controller minimum ratings are - N. O. contacts = 150 VA inrush/75 VA sealed;\n N. C. contacts = 80
8. Suggested system control switch (6S2) is Cutler Hammer 7562k5 2pdt toggle switch or equivalent.

⚠ WARNING
HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

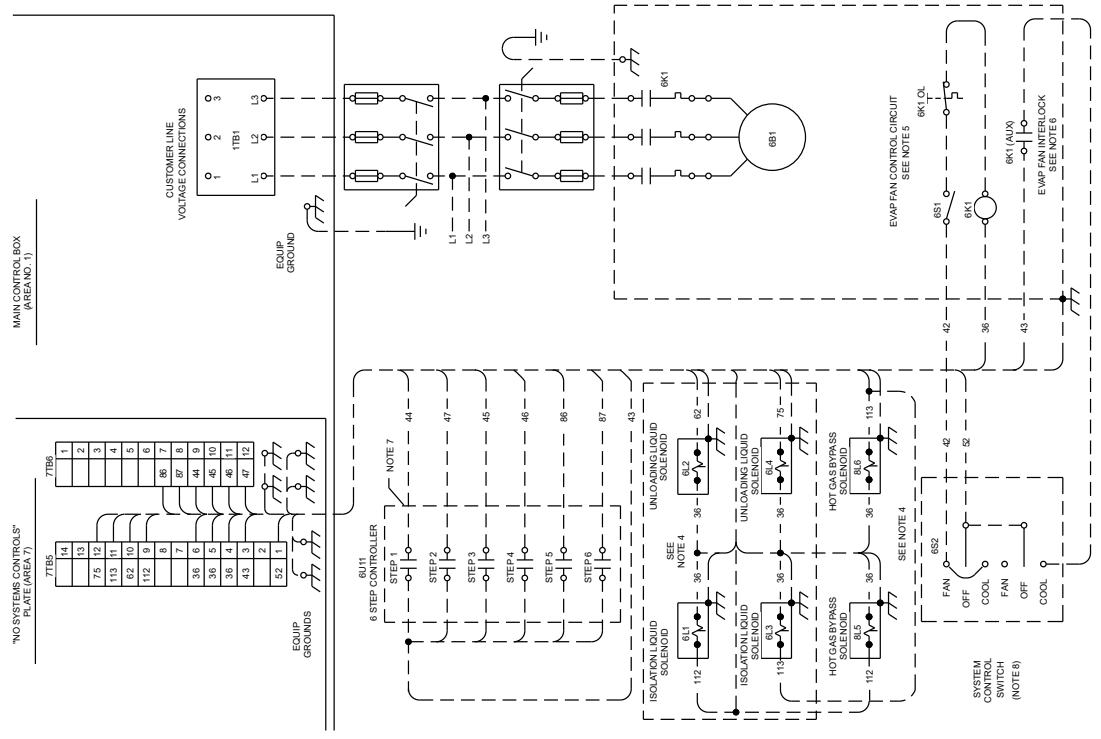
⚠ AVERTISSEMENT
VOLTAGE HASARDEUX!

DECONNECTEZ TOUTES LES SOURCES ELECTRIQUES INCLUANT LES DISJONCTEURS SITUES A DISTANCE AVANT D'EFFECTUER L'ENTRETIEN.

FAUTE DE DECONNECTER LA SOURCE ELECTRIQUE AVANT D'EFFECTUER L'ENTRETIEN PEUT ENTRAINER DES BLESSURES CORPORELLES SEVERES OU LA MORT.

⚠ CAUTION
USE COPPER CONDUCTORS ONLY! UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

IMPORTANT!
DO NOT ENERGIZE UNIT UNTIL CHECK-OUT AND START-UP PROCEDURE HAS BEEN COMPLETED



Field Installed Options - Part/Order Number Summary
This is a report to help you locate field installed options that arrive at the jobsite. This report provides part or order numbers for each field installed option, and references it to a specific product tag. It is NOT intended as a bill of material for the job.

Product Family - Performance Climate Changer (CSAA)

Item	Tag(s)	Qty	Description	Model Number
A1	AHU-3	1	80 Ton AHU	CSAA050UB

Field Installed Option Description	Part/Ordering Number
12in. cartridge - 95% eff - run set	
2" Pleated media - run set	

Product Family - Air-Cooled Condensing Units (Industrial))

Item	Tag(s)	Qty	Description	Model Number
B1	CU-3	1	80 Ton Air-Cooled Condensing Unit	RAUJC804B

Field Installed Option Description	Part/Ordering Number
Spring isolators (unit)	

City of Greenville/Greenville Utilities Commission
Minority and Women Business Enterprise (MWBE) Program

City of Greenville
Construction Guidelines and Affidavits
$100,000 and above

These instructions shall be included with each bid solicitation.

City of Greenville/Greenville Utilities Commission
Minority and Women Business Enterprise Program

$100,000 and Construction Guidelines for MWBE Participants

Policy Statement

It is the policy of the City of Greenville and Greenville Utilities Commission to provide minorities and women equal opportunity for participating in all aspects of the City's and Utilities' contracting and procurement programs, including but not limited to, construction projects, supplies and materials purchases, and professional and personal service contracts.

Goals and Good Faith Efforts

Bidders responding to this solicitation shall comply with the MWBE program by making Good Faith Efforts to achieve the following aspiration goals for participation.

	CITY	
	MBE	**WBE**
Construction This goal includes Construction Manager at Risk.	10%	6%

Bidders shall submit MWBE information with their bids on the forms provided. This information will be subject to verification by the City prior to contract award. **As of July 1, 2009, contractors, subcontractors, suppliers, service providers, or MWBE members of joint ventures intended to satisfy City MWBE goals shall be certified by the NC Office of Historically Underutilized Businesses (NC HUB) only.** Firms qualifying as "WBE" for City's goals must be designated as a "women-owned business" by the HUB Office. Firms qualifying as "MBE" for the City's goals must be certified in one of the other categories (i.e.: Black, Hispanic, Asian American, American Indian, Disabled, or Socially and Economically Disadvantaged). Those firms who are certified as both a "WBE" and "MBE" may only satisfy the "MBE" requirement. **Each goal must be met separately. Exceeding one goal does not satisfy requirements for the other.** A complete database of NC HUB certified firms may be found at http://www.doa.nc.gov/hub/. An internal database of firms who have expressed interest to do business with the City and GUC is available at www.greenvillenc.gov. However, the HUB status of these firms must be verified by the HUB database. The City shall accept NCDOT certified firms on federally funded projects only. Please note: A contractor may utilize any firm desired. However, for participation purposes, all MWBE vendors who wish to do business *as a minority or female* must be certified by NC HUB.

The Bidder shall make good faith efforts to encourage participation of MWBEs prior to submission of bids in order to be considered as a responsive bidder. Bidders are cautioned that even though their submittal indicates they will meet the MWBE goal, they should document their good faith efforts and be prepared to submit this information, if requested.

The MWBE's listed by the Contractor on the **Identification of Minority/Women Business Participation** which are determined by the City to be certified shall perform the work and supply the materials for which they are listed unless the Contractors receive prior authorization from the City to perform the work with other forces or to obtain materials from other sources. If a contractor is proposing to perform all elements of the work with his own forces, he must be prepared to document evidence satisfactory to the owner of similar government contracts where he has self-performed.

The Contractor shall enter into and supply copies of fully executed subcontracts with each MWBE or supply signed Letter(s) of Intent to the Project Manager after award of contract and prior to Notice to Proceed. Any amendments to subcontracts shall be submitted to the Project Manager prior to execution.

Instructions

The Bidder shall provide with the bid the following documentation:

☐ Identification of Minority/Women Business Participation
(if participation is zero, please mark zero—Blank forms will be considered nonresponsive)

☐ Affidavit A (if subcontracting)

OR

☐ Identification of Minority/Women Business Participation
(if participation is zero, please mark zero—Blank forms will be considered nonresponsive)

☐ Affidavit B (if self-performing; must attest that bidder does not customarily subcontract work on this type of project—includes supplies and materials)

Within 72 hours or 3 business days after notification of being the apparent low bidder who is subcontracting anything must provide the following information:

☐ Affidavit C (if aspirational goals are met or are exceeded)

OR

☐ Affidavit D (if aspirational goals are not met)

After award of contract and prior to issuance of notice to proceed:

☐ Letter(s) of Intent or Executed Contracts

****With each pay request, the prime contractors will submit the Proof of Payment Certification, listing payments made to MWBE subcontractors.**

*****If a change is needed in MWBE Participation, submit a Request to Change MWBE Participation Form. Good Faith Efforts to substitute with another MWBE contractor must be demonstrated.**

Minimum Compliance Requirements:

All written statements, affidavits, or intentions made by the Bidder shall become a part of the agreement between the Contractor and the City for performance of contracts. Failure to comply with any of these statements, affidavits or intentions or with the minority business guidelines shall constitute a breach of the contract. A finding by the City that any information submitted (either prior to award of the contract or during the performance of the contract) is inaccurate, false, or incomplete, shall also constitute a breach of the contract. Any such breach may result in termination of the contract in accordance with the termination provisions contained in the contract. It shall be solely at the option of the City whether to terminate the contract for breach or not. In determining whether a contractor has made Good Faith Efforts, the CITY will evaluate all efforts made by the Contractor and will determine compliance in regard to quantity, intensity, and results of these efforts.

Identification of Minority/Women Business Participation

I,_____,
(Name of Bidder)
do hereby certify that on this project, we will use the following minority/women business enterprises as construction subcontractors, vendors, suppliers or providers of professional services.

Firm Name, Address and Phone #	Work type	*MWBE Category

*MWBE categories: Black, African American (**B**), Hispanic, Latino (**L**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**S**) Disabled (**D**)

If you will not be utilizing MWBE contractors, please certify by entering zero "0"

The total value of MBE business contracting will be ($)_____.

The total value of WBE business contracting will be ($)_____.

City of Greenville AFFIDAVIT A – Listing of Good Faith Efforts

County of _____

(Name of Bidder)

Affidavit of _____

_____

_____

I have made a good faith effort to comply under the following areas checked:

Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive. (1 NC Administrative Code 30 I.0101)

- ❑ **1 – (10 pts)** Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.
- ❑ **2 --(10 pts)** Made the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bids are due.
- ❑ **3** – **(15 pts)** Broken down or combined elements of work into economically feasible units to facilitate minority participation.
- ❑ **4 – (10 pts)** Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- ❑ **5** – **(10 pts)** Attended prebid meetings scheduled by the public owner.
- ❑ **6** – **(20 pts)** Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
- ❑ **7 – (15 pts)** Negotiated in good faith with interested minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
- ❑ **8** – **(25 pts)** Provided assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
- ❑ **9** – **(20 pts)** Negotiated joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
- ❑ **10 - (20 pts)** Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the Identification of Minority/Women Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d) Failure to abide by this statutory provision will constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of the minority/women business commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of_____, County of_____

Subscribed and sworn to before me this _____day of_____20___

Notary Public_____

My commission expires _____

City of Greenville --AFFIDAVIT B-- Intent to Perform Contract with Own Workforce.

County of _____

Affidavit of _____

_____

_____

_____

(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the _____

_____contract.

(Name of Project)

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform all elements of the work on this project with his/her own current work forces; and

The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date:_____Name of Authorized Officer:_____

Signature:_____

SEAL

Title:_____

State of _____, County of_____

Subscribed and sworn to before me this _____day of _____20___

Notary Public _____

My commission expires_____

City of Greenville - AFFIDAVIT C - Portion of the Work to be Performed by MWBE Firms

County of _____

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the portion of the work to be executed by MWBE businesses as defined in GS143-128.2(g) and the COG/CITY MWBE Plan sec. III is equal to or greater than 16% of the bidders total contract price, then the bidder must complete this affidavit. This affidavit shall be provided by the apparent lowest responsible, responsive bidder within **72 hours** after notification of being low bidder.

Affidavit of _____ I do hereby certify that on the
(Name of Bidder)

_____
(Project Name)

Project ID#_____ Amount of Bid $_____

I will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises and a minimum of _____% of the total dollar amount of the contract with women business enterprises. Minority/women businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below.

Attach additional sheets if required

Name and Phone Number	*MWBE Category	Work description	Dollar Value

*Minority categories: Black, African American (**B**), Hispanic or Latino (**L**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**S**) Disabled (**D**)

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with MWBE Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

SEAL

Signature:_____

Title:_____

State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____ 20_____

Notary Public_____

My commission expires_____

City of Greenville AFFIDAVIT D – Good Faith Efforts

County of _____

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the goal of 16% participation by minority/women business **is not** achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts:

Affidavit of _____I do hereby certify that on the
(Name of Bidder)

(Project Name)

Project ID#_____Amount of Bid $_____

I will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises and a minimum of % ~~of the to~~tal dollar amount of the contract with women business enterprises. Minority/women businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. (Attach additional sheets if required)

Name and Phone Number	*MWBE Category	Work description	Dollar Value

*Minority categories: Black, African American (**B**), Hispanic or Latino (**L**), Asian American (**A**) American Indian (**I**),Female (**F**) Socially and Economically Disadvantaged (**S**) Disabled (**D**)

Examples of documentation required to demonstrate the Bidder's good faith efforts to meet the goals set forth in these provisions include, but are not necessarily limited to, the following:

A. Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.

B. Copies of quotes or responses received from each firm responding to the solicitation.

C. A telephone log of follow-up calls to each firm sent a solicitation.

D. For subcontracts where a minority business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.

E. Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.

F. Copy of pre-bid roster.

G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.

H. Letter detailing reasons for rejection of minority business due to lack of qualification.

I. Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive bidder.

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with MWBE Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of _____, County of _____
Subscribed and sworn to before me this _____day of _____20_____
Notary Public_____
My commission expires _____

LETTER OF INTENT
MWBE Subcontractor Performance

Please submit this form or executed subcontracts with MWBE firms after award of contract and prior to issuance of notice to proceed.

PROJECT: _____
(Project Name)

TO: _____
(Name of Prime Bidder/Architect)

The undersigned intends to perform work in connection with the above project as a:

____Minority Business Enterprise _____Women Business Enterprise

The MWBE status of the undersigned is certified the NC Office of Historically Underutilized Businesses (required). ___ Yes ___ No

The undersigned is prepared to perform the following described work or provide materials or services in connection with the above project at the following dollar amount:

Work/Materials/Service Provided	Dollar Amount of Contract	Projected Start Date	Projected End Date

_____
(Date)

_____ _____
(Address) (Name & Phone No. of MWBE Firm)

_____ _____
(Name & Title of Authorized Representative of MWBE) (Signature of Authorized Representative of MWBE)

REQUEST TO CHANGE MWBE PARTICIPATION

(Submit changes only if notified as apparent lowest bidder, continuing through project completion)

Project: _____

Bidder or Prime Contractor: _____

Name & Title of Authorized Representative: _____

Address: _____ **Phone #:** _____

_____ **Email Address:** _____

Total Contract Amount (including approved change orders or amendments): $_____

Name of subcontractor: _____

Good or service provided: _____

Proposed Action:

___Replace subcontractor
___Perform work with own forces

For the above actions, you must provide one of the following reasons (Please check applicable reason):

___ The listed MBE/WBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract.

___The listed MBE/WBE is bankrupt or insolvent.

___The listed MBE/WBE fails or refuses to perform his/her subcontract or furnish the listed materials.

___The work performed by the listed subcontractor is unsatisfactory according to industry standards and is not in accordance with the plans and specifications; or the subcontractor is substantially delaying or disrupting the progress of the work.

If replacing subcontractor:

Name of replacement subcontractor: _____

The MWBE status of the contractor is certified by the NC Office of Historically Underutilized Businesses (required). ___Yes ___No

Dollar amount of original contract $_____

Dollar amount of amended contract $ _____

Other Proposed Action:

___Increase total dollar amount of work
___Decrease total dollar amount of work
___Add additional subcontractor
___Other

Please describe reason for requested action: _____

_____

If adding additional subcontractor:*

The MWBE status of the contractor is certified by the NC Office of Historically Underutilized Businesses (required).___Yes ___No

**Please attach Letter of Intent or executed contract document*

Dollar amount of original contract $_____

Dollar amount of amended contract $ _____

Interoffice Use Only:

Approval __Y __N

Date_____

Signature

Proof of Payment Certification

MWBE Contractors, Suppliers, Service Providers

Pay Application No. _____

Purchase Order No. _____

Project Name: _____

Prime Contractor: _____

Current Contract Amount (including change orders): $_____

Requested Payment Amount for this Period: $_____

Is this the final payment? ___Yes ___No

Firm Name	MWBE Category*	Total Amount Paid from this Pay Request	Total Contract Amount (including changes)	Total Amount Remaining

*Minority categories: Black, African American (**B**), Hispanic or Latino (**L**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**S**) Disabled (**D**)

Date:_____ Certified By:_____

Name

_____

Title

_____

Signature

EXHIBIT D

STATE OF NORTH CAROLINA

AFFIDAVIT

CITY OF GREENVILLE

****

I, _____(the individual attesting below), being duly authorized by and on behalf of

_____ (the entity bidding on project hereinafter "Employer") after first being duly

sworn hereby swears or affirms as follows:

1. Employer understands that E-Verify is the federal E-Verify program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law in accordance with NCGS §64-25(5).

2. Employer understands that Employers Must Use E-Verify. Each employer, after hiring an employee to work in the United States, shall verify the work authorization of the employee through E-Verify in accordance with NCGS§64-26(a).

3. Employer is a person, business entity, or other organization that transacts business in this State and that employs 25 or more employees in this State. (mark Yes or No)

a. YES _____, or

b. NO _____

4. Employer's subcontractors comply with E-Verify, and if Employer is the winning bidder on this project Employer will ensure compliance with E-Verify by any subcontractors subsequently hired by Employer.

This ____ day of _____, 20____.

_____

Signature of Affiant
Print or Type Name: _____

State of North Carolina City of Greenville

Signed and sworn to (or affirmed) before me, this the _____

day of _____, 20____.

My Commission Expires:

_____

Notary Public

(Affix Official/Notarial Seal)