

ISSUE: Certificate of Appropriateness for alterations

APPLICANT: Shana Edwards

LOCATION: Old and Historic Alexandria District
801 Wolfe Street

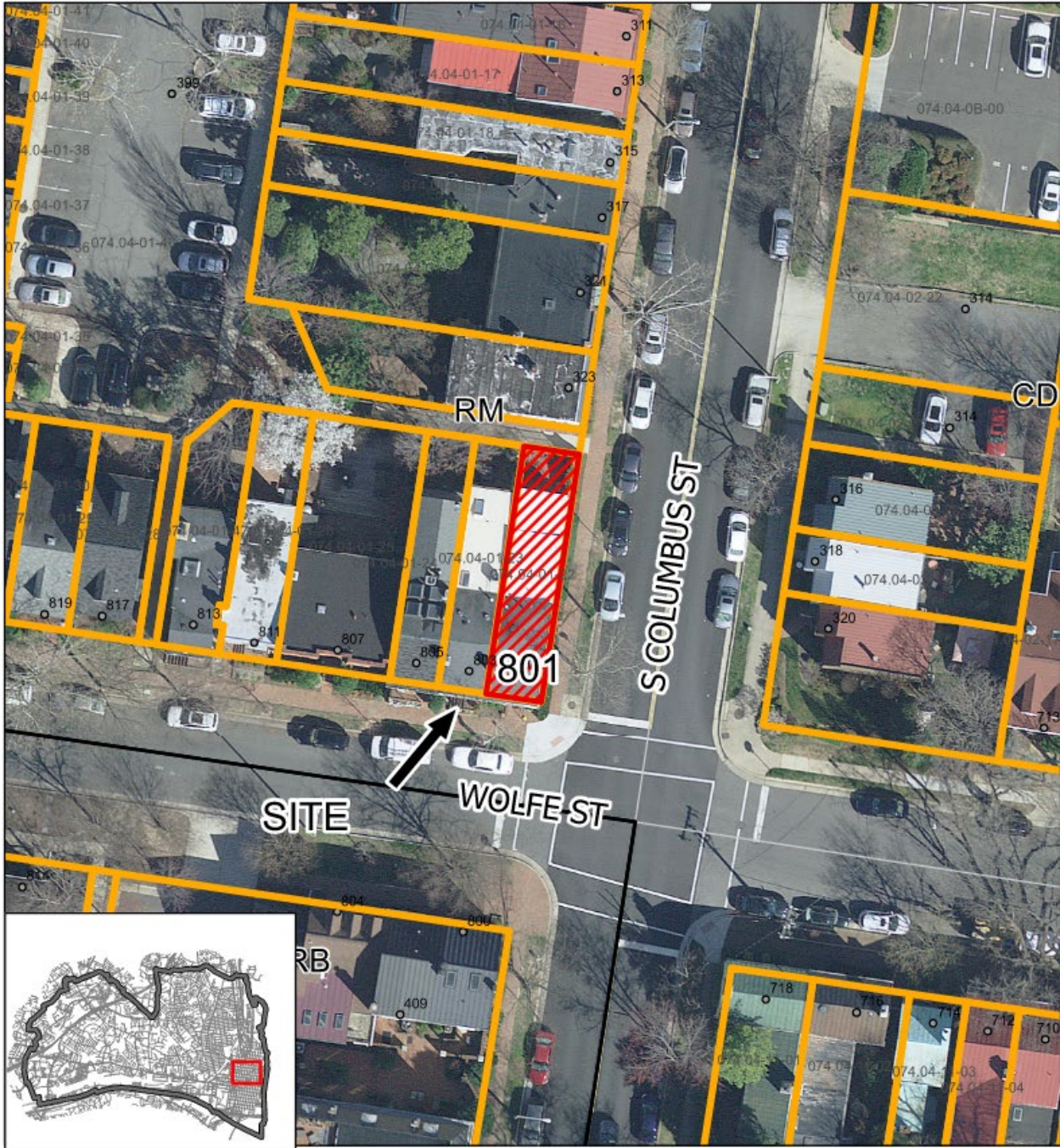
ZONE: RM/Residential Townhouse Zone


STAFF RECOMMENDATION

Staff recommends approval of the Certificate of Appropriateness.

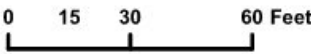

GENERAL NOTES TO THE APPLICANT

1. **APPEAL OF DECISION:** In accordance with the Zoning Ordinance, if the Board of Architectural Review denies or approves an application in whole or in part, the applicant or opponent may appeal the Board's decision to City Council on or before 14 days after the decision of the Board.
2. **COMPLIANCE WITH BAR POLICIES:** All materials must comply with the BAR's adopted policies unless otherwise specifically approved.
3. **BUILDING PERMITS:** Most projects approved by the Board of Architectural Review require the issuance of one or more construction permits by Department of Code Administration (including signs). The applicant is responsible for obtaining all necessary construction permits after receiving Board of Architectural Review approval. Contact Code Administration, Room 4200, City Hall, 703-746-4200 for further information.
4. **ISSUANCE OF CERTIFICATES OF APPROPRIATENESS AND PERMITS TO DEMOLISH:** Applicants must obtain a copy of the Certificate of Appropriateness or Permit to Demolish PRIOR to applying for a building permit. Contact BAR Staff, Room 2100, City Hall, 703-746-3833, or preservation@alexandriava.gov for further information.
5. **EXPIRATION OF APPROVALS NOTE:** In accordance with Sections 10-106(B), 10-206(B) and 10-307 of the Zoning Ordinance, any Board of Architectural Review approval will expire 12 months from the date of issuance if the work is not commenced and diligently and substantially pursued by the end of that 12-month period.
6. **HISTORIC PROPERTY TAX CREDITS:** Applicants performing extensive, certified rehabilitations of historic properties may separately be eligible for state and/or federal tax credits. Consult with the Virginia Department of Historic Resources (VDHR) prior to initiating any work to determine whether the proposed project may qualify for such credits.





BAR #2022-00108
801 Wolfe Street



I. APPLICANT'S PROPOSAL

The applicant requests a Certificate of Appropriateness to install screening around a new rooftop HVAC condensing unit at 801 Wolfe Street. The applicant proposes to screen the unit with a wood screen with horizontal boards painted white to match the trim color.

Site context

The subject property sits in middle of the 1100 Block of Prince Street on the south side. There is a public alley running behind the property from which the rear of the property is visible (Figure 3 and 4).

II. HISTORY

The two-story, two-bay masonry townhouse at 801 Wolfe Street dates from the **mid-19th century** but underwent substantial renovation during the redevelopment of the block as part of the DIP urban renewal project.

Staff could locate no previous BAR approvals for the subject property.

III. ANALYSIS

Section 6-403(B)(2) of the zoning ordinance states that “for buildings located within the Old and Historic Alexandria District... the Board of Architectural Review may, after public hearing, waive or modify the screening requirement of subsection (B)(1) of this section, if the Board finds such requirement to be architecturally inappropriate.” The applicant has elected to screen the new condenser – which will be somewhat visible due to the buildings corner location – instead of requesting a waiver of the screening. Staff has no objection and recommends approval of the application, as submitted.

STAFF

Stephanie Sample, Historic Preservation Planner, Planning & Zoning
Tony LaColla, AICP, Land Use Services Division Chief, Planning & Zoning

IV. CITY DEPARTMENT COMMENTS

Legend: C- code requirement R- recommendation S- suggestion F- finding

Zoning

F-1 Per section 6-403(B)(2), “for buildings located within the Old and Historic Alexandria District... the board of architectural review may, after public hearing, waive or modify the screening requirement of subsection (B)(1) of this section, if the board finds such requirement to be architecturally inappropriate.”

F-2 The proposed AC unit and screening comply with zoning.

Code Administration

- F-1 The review by Code Administration is a preliminary review only. Once the applicant has filed for a building permit, code requirements will be based upon the building permit plans. If there are any questions, the applicant may contact Lei Fei, Plan Reviewer at lei.fei@alexandriava.gov
- F-2 The following comments are for BAR case review only. The plans are required to be submitted to permit center for review prior to the issuance of the permit.

Transportation and Environmental Services

CONDITIONS

- R-1 The building permit must be approved and issued prior to the issuance of any permit for demolition, if a separate demolition permit is required. (T&ES)
- R-2 Applicant shall be responsible for repairs to the adjacent city right-of-way if damaged during construction activity. (T&ES)
- R-3 No permanent structure may be constructed over any existing private and/or public utility easements. It is the responsibility of the applicant to identify any and all existing easements on the plan. (T&ES)

FINDINGS:

- F-1 After review of the information provided, an approved grading plan is not required at this time. Please note that if any changes are made to the plan it is suggested that T&ES be included in the review. (T&ES)
- F-2 If the alley located at the rear of the parcel is to be used at any point of the construction process the following will be required:
For a Public Alley - The applicant shall contact T&ES, Construction Permitting & Inspections at (703) 746-4035 to discuss any permits and accommodation requirements that will be required.
For a Private Alley - The applicant must provide proof, in the form of an affidavit at a minimum, from owner of the alley granting permission of use. (T&ES)

CODE REQUIREMENTS

- C-1 The applicant shall comply with the City of Alexandria's Solid Waste Control, Title 5, Chapter 1, which sets forth the requirements for the recycling of materials (Sec. 5-1-99). (T&ES)
- C-2 The applicant shall comply with the City of Alexandria's Noise Control Code, Title 11, Chapter 5, which sets the maximum permissible noise level as measured at the property line. (T&ES)

- C-3 Roof, surface and sub-surface drains be connected to the public storm sewer system, if available, by continuous underground pipe. Where storm sewer is not available applicant must provide a design to mitigate impact of stormwater drainage onto adjacent properties and to the satisfaction of the Director of Transportation & Environmental Services. (Sec.5-6-224) (T&ES)
- C-4 All secondary utilities serving this site shall be placed underground. (Sec. 5-3-3) (T&ES)
- C-5 Any work within the right-of-way requires a separate permit from T&ES. (Sec. 5-2) (T&ES)
- C-6 All improvements to the city right-of-way such as curbing, sidewalk, driveway aprons, etc. must be city standard design. (Sec. 5-2-1) (T&ES)

Alexandria Archaeology

- F-1 No archaeological oversight will be necessary for this undertaking.

V. ATTACHMENTS

- 1 – Application Materials*
- 2 – Supplemental Materials*

ADDRESS OF PROJECT: 801 Wolfe st Alexandria VA 22314DISTRICT: ☒ Old & Historic Alexandria ☐ Parker - Gray ☐ 100 Year Old BuildingTAX MAP AND PARCEL: 074.04-01-22 ZONING: RMAPPLICATION FOR: *(Please check all that apply)*☒ CERTIFICATE OF APPROPRIATENESS☐ PERMIT TO MOVE, REMOVE, ENCAPSULATE OR DEMOLISH
(Required if more than 25 square feet of a structure is to be demolished/impacted)☐ WAIVER OF VISION CLEARANCE REQUIREMENT and/or YARD REQUIREMENTS IN A VISION
CLEARANCE AREA *(Section 7-802, Alexandria 1992 Zoning Ordinance)*WAIVER OF ROOFTOP HVAC SCREENING REQUIREMENT
*(Section 6-403(B)(3), Alexandria 1992 Zoning Ordinance)*Applicant: ☐ Property Owner ☒ Business *(Please provide business name & contact person)*Name: Amentec Services LLCAddress: 4542 Talmadge CtCity: Annandale State: VA Zip: 22003Phone: 703 880-4827 E-mail: office@amentecservices.comAuthorized Agent *(if applicable)*: ☐ Attorney ☐ Architect ☒ ContractorName: Ivan Mendoza - Maria Patino Phone: 703 880-4827E-mail: office@amentecservices

Legal Property Owner:

Name: Shana EdwardsAddress: 801 Wolfe stCity: Alexandria State: VA Zip: 22314Phone: 619 629 5875 E-mail: shana-b-edwards@gmail.com

- ☐ Yes ☒ No Is there an historic preservation easement on this property?
- ☐ Yes ☒ No If yes, has the easement holder agreed to the proposed alterations?
- ☒ Yes ☐ No Is there a homeowner's association for this property?
- ☒ Yes ☐ No If yes, has the homeowner's association approved the proposed alterations?

If you answered yes to any of the above, please attach a copy of the letter approving the project.

NATURE OF PROPOSED WORK: *Please check all that apply*

NEW CONSTRUCTION

EXTERIOR ALTERATION: *Please check all that apply.*

- | | | | |
|--------------------------------------|---|---|-----------------------------------|
| <input type="checkbox"/> awning | <input type="checkbox"/> fence, gate or garden wall | <input checked="" type="checkbox"/> HVAC equipment | <input type="checkbox"/> shutters |
| <input type="checkbox"/> doors | <input type="checkbox"/> windows | <input type="checkbox"/> siding | <input type="checkbox"/> shed |
| <input type="checkbox"/> lighting | <input type="checkbox"/> pergola/trellis | <input type="checkbox"/> painting unpainted masonry | |
| <input type="checkbox"/> other _____ | | | |
- ☐ ADDITION
- ☐ DEMOLITION/ENCAPSULATION
- ☐ SIGNAGE

DESCRIPTION OF PROPOSED WORK: *Please describe the proposed work in detail (Additional pages may be attached).*

We propose to install a HVAC condensing unit Carrier 2.5 Ton on the back west side on the roof. The unit dimension are $31\frac{3}{16} \times 31\frac{3}{16} \times 31\frac{3}{16}$. Customer/owner of the house propose to build a white wooden box or fence around the unit given that the house is a painted brick home.

SUBMITTAL REQUIREMENTS:

Items listed below comprise the **minimum supporting materials** for BAR applications. Staff may request additional information during application review. Please refer to the relevant section of the *Design Guidelines* for further information on appropriate treatments.

Applicants must use the checklist below to ensure the application is complete. Include all information and material that are necessary to thoroughly describe the project. Incomplete applications will delay the docketing of the application for review. Pre-application meetings are required for all proposed additions. All applicants are encouraged to meet with staff prior to submission of a completed application.

Electronic copies of submission materials should be submitted whenever possible.

Demolition/Encapsulation : *All applicants requesting 25 square feet or more of demolition/encapsulation must complete this section. Check N/A if an item in this section does not apply to your project.*

- N/A
- ☐ ☒ Survey plat showing the extent of the proposed demolition/encapsulation.
- ☐ ☒ Existing elevation drawings clearly showing all elements proposed for demolition/encapsulation.
- ☐ ☒ Clear and labeled photographs of all elevations of the building if the entire structure is proposed to be demolished.
- ☐ ☒ Description of the reason for demolition/encapsulation.
- ☐ ☒ Description of the alternatives to demolition/encapsulation and why such alternatives are not considered feasible.

Additions & New Construction: Drawings must be to scale and should not exceed 11" x 17" unless approved by staff. All plans must be folded and collated into 3 complete 8 1/2" x 11" sets. Additional copies may be requested by staff for large-scale development projects or projects fronting Washington Street. Check N/A if an item in this section does not apply to your project.

- ☐ ☒ N/A Scaled survey plat showing dimensions of lot and location of existing building and other structures on the lot, location of proposed structure or addition, dimensions of existing structure(s), proposed addition or new construction, and all exterior, ground and roof mounted equipment.
- ☐ ☒ N/A FAR & Open Space calculation form.
- ☐ ☒ N/A Clear and labeled photographs of the site, surrounding properties and existing structures, if applicable.
- ☐ ☒ N/A Existing elevations must be scaled and include dimensions.
- ☐ ☒ N/A Proposed elevations must be scaled and include dimensions. Include the relationship to adjacent structures in plan and elevations.
- ☐ ☒ N/A Materials and colors to be used must be specified and delineated on the drawings. Actual samples may be provided or required.
- ☒ ☐ Manufacturer's specifications for materials to include, but not limited to: roofing, siding, windows, doors, lighting, fencing, HVAC equipment and walls.
- ☐ ☒ N/A For development site plan projects, a model showing mass relationships to adjacent properties and structures.

Signs & Awnings: One sign per building under one square foot does not require BAR approval unless illuminated. All other signs including window signs require BAR approval. Check N/A if an item in this section does not apply to your project.

- ☐ ☒ N/A Linear feet of building: Front: _____ Secondary front (if corner lot): _____
- ☐ ☒ N/A Square feet of existing signs to remain: _____
- ☐ ☒ N/A Photograph of building showing existing conditions.
- ☐ ☒ N/A Dimensioned drawings of proposed sign identifying materials, color, lettering style and text.
- ☐ ☒ N/A Location of sign (show exact location on building including the height above sidewalk).
- ☐ ☒ N/A Means of attachment (drawing or manufacturer's cut sheet of bracket if applicable).
- ☐ ☒ N/A Description of lighting (if applicable). Include manufacturer's cut sheet for any new lighting fixtures and information detailing how it will be attached to the building's facade.

Alterations: Check N/A if an item in this section does not apply to your project.

- ☐ ☒ N/A Clear and labeled photographs of the site, especially the area being impacted by the alterations, all sides of the building and any pertinent details.
- ☐ ☒ Manufacturer's specifications for materials to include, but not limited to: roofing, siding, windows, doors, lighting, fencing, HVAC equipment and walls.
- ☐ ☒ N/A Drawings accurately representing the changes to the proposed structure, including materials and overall dimensions. Drawings must be to scale.
- ☐ ☒ An official survey plat showing the proposed locations of HVAC units, fences, and sheds.
- ☐ ☒ N/A Historic elevations or photographs should accompany any request to return a structure to an earlier appearance.

ALL APPLICATIONS: *Please read and check that you have read and understand the following items:*

- ☒ I have submitted a filing fee with this application. (Checks should be made payable to the City of Alexandria. Please contact staff for assistance in determining the appropriate fee.)
- ☒ I understand the notice requirements and will return a copy of the three respective notice forms to BAR staff at least five days prior to the hearing. If I am unsure to whom I should send notice I will contact Planning and Zoning staff for assistance in identifying adjacent parcels.
- ☒ I, the applicant, or an authorized representative will be present at the public hearing.
- ☒ I understand that any revisions to this initial application submission (including applications deferred for restudy) must be accompanied by the BAR Supplemental form and 3 sets of revised materials.

The undersigned hereby attests that all of the information herein provided including the site plan, building elevations, prospective drawings of the project, and written descriptive information are true, correct and accurate. The undersigned further understands that, should such information be found incorrect, any action taken by the Board based on such information may be invalidated. The undersigned also hereby grants the City of Alexandria permission to post placard notice as required by Article XI, Division A, Section 11-301(B) of the 1992 Alexandria City Zoning Ordinance, on the property which is the subject of this application. The undersigned also hereby authorizes the City staff and members of the BAR to inspect this site as necessary in the course of research and evaluating the application. The applicant, if other than the property owner, also attests that he/she has obtained permission from the property owner to make this application.

APPLICANT OR AUTHORIZED AGENT:

Signature: _____

Printed Name: Mana PatinoDate: 3/12/22

OWNERSHIP AND DISCLOSURE STATEMENT

Use additional sheets if necessary

1. Applicant. State the name, address and percent of ownership of any person or entity owning an interest in the applicant, unless the entity is a corporation or partnership, in which case identify each owner of more than three percent. The term ownership interest shall include any legal or equitable interest held at the time of the application in the real property which is the subject of the application.

Name	Address	Percent of Ownership
1. Shana B. Edwards, Esq.	801 Wolfe Street	Sole Owner in Fee Simple
2. United Bank	PO Box 2373 Charleston WV 25328	Absolute mortgage Lender
3.		

2. Property. State the name, address and percent of ownership of any person or entity owning an interest in the property located at __*801 Wolfe St_____(address), unless the entity is a corporation or partnership, in which case identify each owner of more than three percent. The term ownership interest shall include any legal or equitable interest held at the time of the application in the real property which is the subject of the application.

Name	Address	Percent of Ownership
1. Shana B. Edwards, Esq.	801 Wolfe Street	Sole Owner in Fee Simple Absolute
2. United Bank	PO Box 2373 Charleston, WV 25328	Mortgage Lender
3.		

3. Business or Financial Relationships. Each person or entity listed above (1 and 2), with an ownership interest in the applicant or in the subject property is required to disclose any business or financial relationship, as defined by Section 11-350 of the Zoning Ordinance, existing at the time of this application, or within the 12-month period prior to the submission of this application with any member of the Alexandria City Council, Planning Commission, Board of Zoning Appeals or either Boards of Architectural Review.


Name of person or entity	Relationship as defined by Section 11-350 of the Zoning Ordinance	Member of the Approving Body (i.e. City Council, Planning Commission, etc.)
1. None to disclose by S. Edwards		
2.		
3.		

NOTE: Business or financial relationships of the type described in Sec. 11-350 that arise after the filing of this application and before each public hearing must be disclosed prior to the public hearings.

As the applicant or the applicant's authorized agent, I hereby attest to the best of my ability that the information provided above is true and correct.

4/5/22
Date

Manal Patino
Printed Name


Signature

LINE TYPES:

——— BOUNDARY LINE
 ——— EASEMENT
 ——— DRIVEWAY/ROAD
 - - - FENCING
 ——— OVERHEAD WIRE
 ——— STRUCTURE

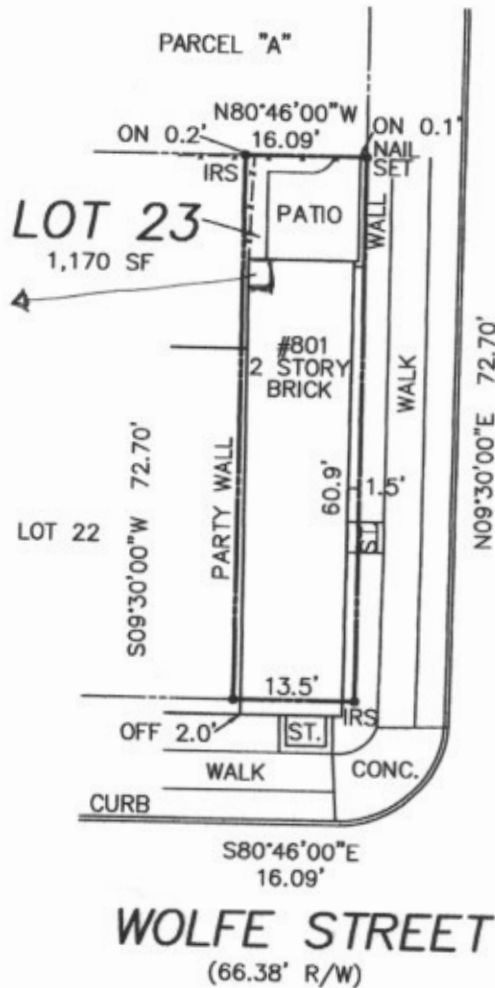
LEGEND:

ADW-ASPHALT DRIVEWAY
 A/C-AIR CONDITIONING
 A/W-AREAWAY
 B.E.-BASEMENT ENTRANCE
 BF- BOLT FOUND
 BO- BOLLARD
 BRL-BUILDING RESTRICTION LINE
 CDW-CONCRETE DRIVEWAY
 CO-CLEANOUT
 CONC.-CONCRETE

F.E.-FIRE ESCAPE
 FOS-FIBER OPTICS UTILITY BOX
 ER-ELECTRICAL RISER
 GDW-GRAVEL DRIVEWAY
 GEN-GENERATOR
 IPF-IRON PIPE FOUND
 IRS- IRON ROD SET
 IRF-IRON ROD FOUND
 MH-MANHOLE
 PAD-CONCRETE PAD

PP-POWER POLE
 R/W-RIGHT OF WAY
 SMH-SANITARY MANHOLE
 ST.-STOOP
 TELE-TELEPHONE PEDESTAL
 TR/TRANS-TRANSFORMER
 WM-WATER METER
 WV-WATER VALVE
 W.W.-WINDOW WELL

New outdoor unit location on the roof



LOCATION SURVEY

LOT 23 BLOCK 11

DIP URBAN RENEWAL PROJECT
CITY OF ALEXANDRIA, VIRGINIA

SCALE 1"=20' DATE 10-06-21



- 1.) NO TITLE REPORT FURNISHED.
- 2.) FENCE LOCATIONS, IF SHOWN, ARE APPROXIMATE AND DO NOT CERTIFY AS TO OWNERSHIP.
- 3.) PLAT SUBJECT TO RESTRICTIONS OF RECORD.

MERESTONE LAND SURVEYING PLLC

LAND SURVEYING & G.P.S. SERVICES

MERESTONE LAND SURVEYING PLLC
 1229 GARRISONVILLE ROAD SUITE 105 STAFFORD, VA 22556
 (540)752-9197 FAX (540)752-9198











801 Wolfe Street:

The wooden box to enclosed the outdoor unit on the roof will be painted the same color of the house (white) and the measurements will be 33w x 33d x 32h.



03/03/22

Ref: MEC2022-00189.

Good morning:

Please find attached the pictures where we are proposing to install the outdoor unit upon approval, we used the empty box to show where it will go.

Thank you very much,

Maria

AMERITEC SERVICES

#HVAC

4542 Talmadge Ct

Annandale VA 22003

703 880-4827 (Annandale Office)

703 574-3335 (Chantilly Office)

703 880-4837 (Fax)

703 868-2674 (Ivan Sr.)

office@ameritecservices.com

<https://www.ameritecservicesllc.com>

24ACC4
Comfort™ 14 Air Conditioner
with Puron® Refrigerant
1–1/2 to 5 Nominal Tons



Product Data



Comfort
SERIES

Carrier's Air Conditioners with Puron® refrigerant provide a collection of features unmatched by any other family of equipment. The 24ACC4 has been designed utilizing Carrier's Puron refrigerant. The environmentally sound refrigerant allows you to make a responsible decision in the protection of the earth's ozone layer.

INDUSTRY LEADING FEATURES / BENEFITS

Efficiency

- 14.0 SEER / 11.0 – 13.5 EER (based on tested combination)
- Microtube Technology™ refrigeration system

Reliability

- Puron® refrigerant
- Scroll compressor
- Internal pressure relief valve
- Internal thermal overload
- Filter drier

Durability

WeatherArmor™ protection package:

- Solid, durable sheet metal construction
- Dense wire coil guard

Applications

- Long-line – up to 250 feet (76.20 m) total equivalent length, up to 200 feet (60.96 m) condenser above evaporator, or up to 80 ft. (24.38 m) evaporator above condenser (See Longline Guide for more information.)
- Low ambient (down to –20°F/–28.9°C) with accessory kit

NOTE: Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory (www.ahridirectory.org) for the most up-to-date ratings information.

DIMENSIONS - ENGLISH

UNIT	SERIES	ELECTRICAL CHARACTERISTICS				A	B	C	D	E	F	G	K	L	M	N	P	OPERATING WEIGHT (LBS)	SHIPPING WEIGHT (LBS)	SHIPPING DIMENSIONS (L x W x H)
24ACC418	0	X	0	0	0	23 1/8"	24 13/16"	3 3/4"	3/4"	4 7/16"	18 1/16"	7 13/16"	2 13/16"	1/2"	13"	11 1/8"	10 1/4"	123	134	25 1/4" X 25 1/4" X 27 3/16"
24ACC424	0	X	0	0	0	25 3/4"	25"	3 3/4"	3/4"	4 7/16"	21 1/4"	9 1/8"	2 13/16"	1/2"	13 5/8"	12 1/8"	9 7/8"	119	140	27 7/8" X 27 7/8" X 32 9/16"
24ACC430	0	X	0	0	0	31 3/16"	31 13/16"	3 3/4"	3/4"	6 9/16"	24 11/16"	9 1/8"	2 13/16"	1/2"	16 1/8"	15 1/16"	12 5/8"	151	186	33 3/8" X 33 3/8" X 34"
24ACC436	0	X	0	0	0	31 3/16"	24 13/16"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	15 9/16"	16 1/2"	10 1/4"	134	151	33 3/8" X 33 3/8" X 27 3/16"
24ACC442	0	X	0	0	0	31 3/16"	39 1/8"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	16 1/8"	16 11/16"	14"	192	232	33 3/8" X 33 3/8" X 40 5/8"
24ACC448	0	X	0	0	0	31 3/16"	28 7/16"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	16 3/16"	16 1/4"	10 1/4"	182	200	33 3/8" X 33 3/8" X 30 5/8"
24ACC460	0	X	0	0	0	31 3/16"	31 13/16"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	15 1/2"	16"	10 7/8"	197	218	33 3/8" X 33 3/8" X 34"

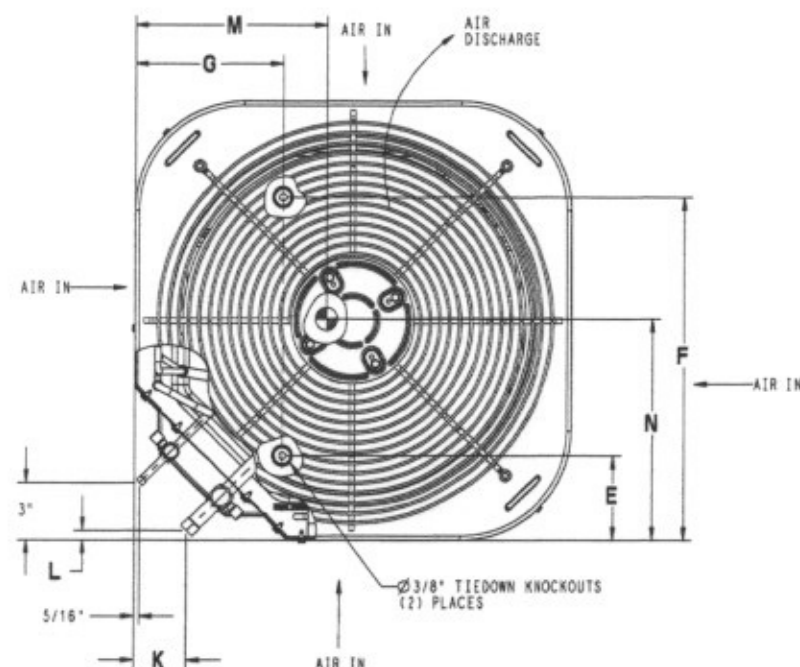
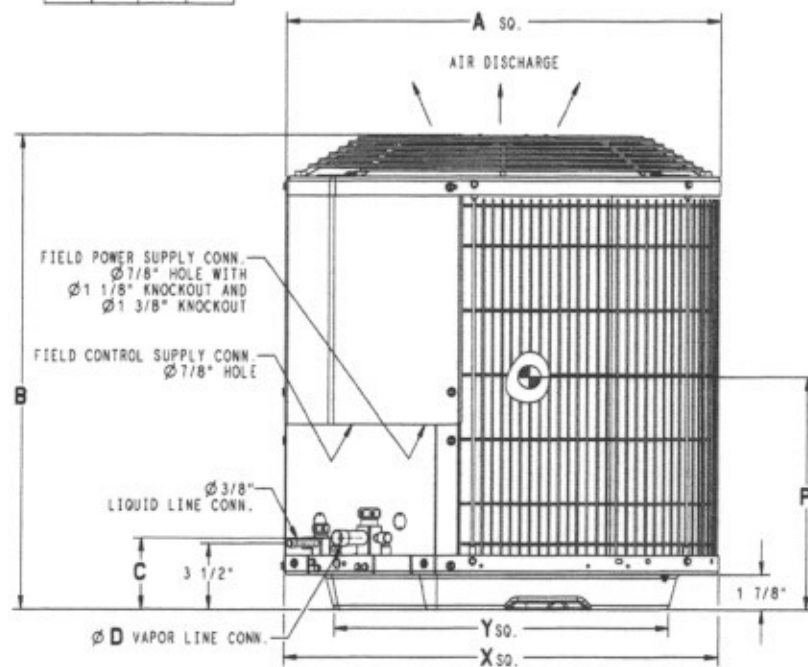
208-230-60

230-60

208/230-360

460-360

X = YES
0 = NO



UNIT SIZE	X" MIN GROUND MOUNTING PAD APPLICATION DIMENSIONS	Y" MIN ROOF-TOP MOUNTING PAD APPLICATION DIMENSIONS
18	23 1/8"	17 3/4"
24	25 3/4"	20 7/16"
30, 36, 42, 48, 60	31 3/16"	23"
	35"	26 3/4"

When installing, allow sufficient space for airflow clearance, wiring, refrigerant piping, and service. Allow 24 in. (609.6 mm) clearance to service end of unit and 48 in. (1219.2 mm) above unit. For proper airflow, a 6-in. (152.4 mm) clearance on 1 side of unit and 12-in. (304.8 mm) on all remaining sides must be maintained. Maintain a distance of 24 in. (609.6 mm) between units or 18 in. (457.2 mm) if no overhang within 12 ft. (3.66 m) Position so water, snow, or ice from roof or eaves cannot fall directly on unit.

NOTE: 18" (457.2 mm) clearance option described above is approved for outdoor units with wire grille coil guard only. Units with louver panels require 24" (609.6 mm) between units.

On rooftop applications, locate unit at least 6 in. (152.4 mm) above roof surface.