BID NUMBER 10366

SOUTHERN UNIVERSITY AND A&M COLLEGE
BATON ROUGE CAMPUS

REQUEST FOR BID
Bid Number 10366
GREENHOUSE MODIFICATION
NOVEMBER 16, 2016-10:30 AM

Architect/Engineer Firm: Map Design Group, LLC
Merrel Porche, Jr., President
8282 Goodwood Blvd., Suite W-3
Baton Rouge, LA 70806
Email: map@mapgrp.com Phone225-757-4590 ext. 101 or 225-205-3050

DATE ADVERTISED (LAPAC):	**AUGUST 20, 2026**
THE ADVOCATE	
MANDATORY PRE—BID CONFERENCE AND SITE VISIT:	**OCTOBER 29, 2026 @ 10:30 AM**
LOCATION:	Physical Plant Department Benjamin H. Kraft Building 515 James L. Hunt Street Southern University Baton Rouge Campus 70813 Site Telephone No. 225-771-4741 or 225-771-6241
DEADLINE TO SUBMIT INQUIRIES:	**NOVEMBER 4, 2026 by 5:00 PM**
SUBMIT INQUIRIES TO:	**Linda Antoine** Email: linda_antoine@subr.edu
DEADLINE TO RESPOND TO INQUIRIES	**November 10, 2026 by 5:00 PM**

Note: Responses to inquiries/addenda are pasted on LAPAC (La State Procurement website) LAPAC website: https://wwwcfprd.doa.louisiana.gov/OSP/LaPAC/Agency/outMain.cfm
It is the responsibility of the vendor to check LAPAC for addenda.

DEADLINE TO SUBMIT BID:	**NOVEMBER 16, 2026 @ 10:30 AM**
SUBMIT BID TO:	Linda Antoine, Director Southern University Purchasing Department-P. O. Box 9534 or James L. Prestage Drive J. S. Clark Adm. Bldg. Annex, 1st Floor Baton Rouge, LA 70813 Telephone 225-771-2804 or 771-4587

As an alternative
Use link to submit bid online:
http://www.sus.edu/bidcertification
Note: Bid shall be delivered or uploaded to link no later than 10:30 AM on November 16, 2026

ADVERTISEMENT
REQUEST FOR BID
BID #50016-10366
GREENHOUSE MODIFICATION
SOUTHERN UNUVERSITY AND A&M COLLEGE
SOUTHERN UNIVERSITY AGRICULTURAL RESEARCH & EXTENSION CENTER
BATON ROUGE CAMPUS
MAP PROJECT NUMBER 10-256-12
BID OPENING DATE AND TIME: NOVEMBER 16, 2026 @ 10:30 AM

Sealed bids will be received by Southern University, Baton Rouge, Louisiana, in the Purchasing Department, 8100 James L. Prestage Drive, PO Box 9543, J. S. Clark Administration Building Annex, South Entrance, First Floor East, Baton Rouge, LA 70813. Bids will be opened and read aloud in a public meeting in the Southern University Purchasing Department.

MAIL, HAND-DELIVER OR ELECTRONIC SUBMITTAL TO PURCHASING DEPARTMENT NO LATER THAN 10:30 AM-ON NOVEMBER 16, 2026

Electronic submittal: Use link to submit bid online: http://www.sus.edu/bidcertification

Bidders are solely responsible for ensuring timely delivery of their bids. The Southern University Purchasing Department is not responsible for any delays caused by bidders' chosen means of delivery. Failure to meet the bid deadline submittal date and time shall result in rejection of bid.

Architect/Engineer Firm: Map Design Group, LLC
Merrel Porche, Jr., President
8282 Goodwood Blvd., Suite W-3
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Email: map@mapgrp.com
225-757-4590 ext. 101
225-205-3050

ALL BID SPECIFICATIONS AND ADDENDA CAN BE OBTAINED BY ACCESSING THE LA STATE PROCUREMENT WEBSITE
https://wwwcfprd.doa.louisiana.gov/osp/lapac/pubMain.cfm.
(Search by bid # 50016-10366)

We highly recommend registering your company with Louisiana State Procurement/LAPAC

Mandatory Pre-Bid Conference & Site Visit: October 29, 2026 @ 10:30 AM
Conference & Site Visit Location: Physical Plant Building (Southern University Baton Rouge Campus)
Physical Plant Department
Benjamin H. Kraft Building-515 James L. Hunt Street
Southern University Campus

Baton Rouge, LA 70813
Site Telephone No. 225-771-4741 or 225-771-6241

Participants shall be in attendance by 10:30 a.m. and sign sheet provided by the Purchasing Department.

Bidders must visit the site and be familiar with the local conditions under which the work is to be performed. No additional compensation will be granted because of unusual difficulties, which may be encountered in the execution of any portion of the work.

Inquiries will be accepted until November 4, 2026 by 10:30 AM. Inquiries shall be submitted to Linda Antoine at linda_antoine@subr.edu

Responses to inquiries will be posted on LAPAC-LA State Procurement website on November 10, 2026 by 5:00 PM

Any person requiring special accommodation should notify the Purchasing Office of the type(s) of accommodation required not less than seven (7) days before the bid opening date. Additional contact is Henry Thurman, Southern University Safety Department at henry_thurman@subr.edu or 225-771-2413 or 771-4741.

5% Security
All bids must be accompanied by bid security equal to **five (5%) percent of the sum of the base bid and all alternates if applicable** and must be in the form of a certified/official check, cashier's check or bid bond, made payable to Southern University and A & M College. Surety represents that it is listed on the current U.S. Department of the Treasury Financial Management Service list of approved bonding companies and that is listed thereon as approved for amount equal to or greater than the amount for which it obligates itself in this instrument. No bid bond indicating an obligation of less than five percent (5%) by any method is acceptable.

Performance & Payment Bond
Successful Proposer shall be required to furnish a performance (surety) bond. The amount will be determined during contract negotiations for the period the contract is in effect. The Bond should be made payable to Southern University. Any performance bond furnished shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the *Federal Register*, or by a Louisiana domiciled insurance company with at least an A-:VI rating or higher in the latest printing of the A.M. Best's Key Rating Guide or by an insurance company that is either domiciled in Louisiana or owned by Louisiana residents and is licensed to write surety bonds.

No surety or insurance company shall write a performance bond which is in excess of the amount indicated as approved by the U.S. Department of the Treasury Financial Management Service list or by a Louisiana domiciled insurance company with an A-:VI rating by A.M. Best up to a limit of 10 percent of policyholders' surplus as shown by

A.M. Best; companies authorized by this Paragraph who are not on the treasury list shall not write a performance bond when the penalty exceeds 15 percent of its capital and surplus, such capital and surplus being the amount by which the company's assets exceed its liabilities as reflected by the most recent financial statements filed by the company with the Department of Insurance.

In addition, any performance bond furnished shall be written by a surety or insurance company that is currently licensed or authorized to do business in the State of Louisiana. The bond must be received within twelve (12) working days from the date of notification.

Bidders shall include the following envelopes of choice: company's name, address, Louisiana contractor's license number, bid number, bid opening date and time.

Bids may be withdrawn by written, telegraphic fax notice or email and received at the address or email address designated in the Invitation to Bid prior to the time set for bid opening, as recorded by date stamp at the Purchasing Office. Bids received after closing time will be returned unopened. Evidence of authority to submit the bid shall be required in accordance with R.S. 38:2212(a)(1)(c) and/or R.S. 39:1594(c)(2)(d).

The Southern University System is a participant in the Louisiana for the Small Entrepreneurships Program (the Hudson Initiative) and the Louisiana Initiative for Veterans and Service-Connected Disabled Veterans-Owned Business Small Entrepreneurships. Bidders are encouraged to consider participation. A list of certified vendors and additional information can be obtained from website http://www.ledsmallbiz.com. Potential participants may also register at this website.

Any questions concerning bid documents, please contact Mary Jane Spruel, Assistant Director of Purchasing at (225) 771-2800 or email to maryjane_spruel@subr.edu and the Architect Firm.

No bid may be withdrawn for a period of forty-five (45) days after receipt of bids, except under the provisions of LA. R.S. 38:2214. Bidder is required to comply with provisions and requirements of LA R.S. 38:2212(B)(5).

The University reserves the right to reject all bids and to waive any informalities incidental thereto.

Bids shall be accepted from Contractors who are licensed under LA. R.S. 37:2150-2192 for the classification of 72000000 Building & Construction, 72130000 General Building Construction, 712136000 Commercial or Industrial Construction.

SOUTHERN UNIVERSITY & A&M COLLEGE
AN EQUAL OPPORTUNITY EMPLOYER
Linda A. Antoine, Director of Purchasing
DATE ADVERTISED
OCTOBER 20, 2026

LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: **Southern University and A&M College**
Post Office Box 9534
James J. Prestage Dr-J.S. Clark Adm. Bldg. Annex
Baton Rouge, LA 70813

BID FOR: Bid Number 50016-10366
PROJECT: Greenhouse Modification
MAP Project # 10-256-12
Baton Rouge Campus

The undersigned bidder hereby declares and represents that she/he: a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by: ***MAP Design Group, LLC***

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following **ADDENDA:** (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging) _____

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid" * but not alternates) the sum of:

_____ Dollars ($ _____)

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description. *N/A*

~~**Alternate No. 1** *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:~~
~~N/A _____ Dollars ($ _____)~~
~~**Alternate No. 2** *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:~~
~~N/A _____ Dollars ($ _____)~~
~~**Alternate No. 3** *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:~~
~~N/A _____ Dollars ($ _____)~~

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

_____

EMAIL _____

PHONE _____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

PRINT NAME OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER: _____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

DATE: _____

Completion Time: 180 days _____ Liquidated Damages: $350.00 per day

5% Bid Security: XX Yes (shall be included with bid)
(check here) _____ Bid Security included. Bid Security shall be total of 5% for base bid and alternates.
Successful bidder will be notified by letter to secure Performance and Payment Bond up to 100% of cost.
(check here) _____ Board Resolution

A CORPORATE RESOLUTION OR WRITTEN EVIDENCE of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5) or Secretary of State verification.
BID SECURITY(5%) in the form of a bid bond, certified check or cashier's check as prescribed by LA RS 38: 2218.A is attached to and made a part of this bid.
The Unit Price Form shall be used if the contract includes unit prices. *Otherwise it is not required and need not be included with the form.* The number of unit prices that may be included is not limited and additional sheets may be included if needed.

LOUISIANA UNIFORM PUBLIC WORK BID FORM
UNIT PRICE FORM

TO: **Southern University and A&M College**
Post Office Box 9534
James J. Prestage Dr-J. S. Clark Administration Bldg. Annex
Baton Rouge, LA 70813

BID FOR: Bid Number 10366

GREENHOUSE MODIFICATION

UNIT PRICES: This form shall be used for any and all work required by the Bidding Documents and described as unit prices. Amounts shall be stated in figures and only in figures.

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

Wording for "DESCRIPTION" is to be provided by the Owner.
All quantities are estimated. The contractor will be paid based upon actual quantities as verified by the Owner.

JOB SITE VISIT

PROJECT: GREENHOUSE MODIFICATION
BID NUMBER 50016-10366
MANDATORY SITE VISIT DATE: NOVEMBER 4, 2026 @ 10:30 AM
LATE ARRIVALS CANNOT PARTICIPATE IN THE BID PROCESS

It is the responsibility of the bidder to inspect job site verify any measurements and/or supplies needed prior to submitting a bid price on this project. Each bidder shall fully acquaint himself with conditions relating to construction and labor so that he may fully understand the facilities, difficulties and restrictions attending the execution of work under this contract. If vendor finds conditions that disagree with the physical layout as described in the bid, or any other features of the specifications that appear to be in error, same shall be noted on proposal. Failure to do so will be interpreted as specified. No consideration or allowance will be granted the Contractor for failure to visit the site or for any alleged misunderstanding of the materials to be furnished or the work to be done.

JOB SITE VISIT LOCATION:

Physical Plant Department
Benjamin H. Kraft Building
515 James L. Hunt Street
Southern University
Baton Rouge Campus
Site Telephone No. 225-771-4741 or 771-6241

The signed statement certifies the vendor's name listed below, has visited the proposed site and is familiar with all conditions surrounding fulfillment of the specifications for this project.

*COMPANY*_____

*BY*_____

*DATE*_____

Note: *Questions not answered at Site Visit or any additional questions shall be submitted in writing to the Director of Purchasing, Linda A. Antoine at linda_antoine@subr.edu.*

Note: Responses to inquiries/Addenda are posted on LAPAC (LA Procurement Website)

LA State Procurement website:
https://wwwcfprd.doa.louisiana.gov/OSP/LaPAC/Agency/outMain.cfm

It is the responsibility of the vendor to check LAPAC for addenda.

JOB SITE VERIFIED BY DESIGNATED SOUTHERN UNIVERSITY EMPLOYEE:

_____

SIGNATURE

This is not a state-required form, however return this sheet with bid for information purposes and for the Purchasing Department files

SOUTHERN UNIVERSITY AND A&M COLLEGE
BATON ROUGE CAMPUS
REQUEST FOR BID

PROJECT: *GREENHOUSE MODIFICATION*
LOCATION: *SU AG CENTER*
BATON ROUGE CAMPUS

BID DUE DATE AND TIME: NOVEMBER 16, 2026 @ 10:30 AM
BID # 50016-10366

Bids submitted are subject to provisions of but not limited to La.R.S.38:2212 Purchasing Rules and Regulations; Executive Orders; and the General Terms and Conditions, listed in this Invitation for Bid. Southern University reserves the right to award items separately, grouped or on an all or none basis and to reject any or all bids and waive any informalities.

BIDS MAY BE SENT BY MAIL, HAND-DELIVERED OR UPLOADEDTO:

Bids should be mailed to:
Southern University
Purchasing Department
Post Office Box 9534
Baton Rouge, Louisiana 70813

As an alternative, bids may be hand delivered to:
Southern University
Purchasing Department
1st Floor East-James L. Prestage Drive
J. S. Clark Administration Building
Baton Rouge, Louisiana 70813

As an alternative
Use link to submit bid online:
http://www.sus.edu/bidcertification

Note: Bid shall be delivered or uploaded to link no later than 10:30 AM on November 16, 2026

The Southern University Purchasing Department is not responsible for any delays caused by bidders' chosen means of delivery. Failure to meet the bid deadline submittal date and time shall result in rejection of bid.

MANDATORY PRE-BID CONFERENCE & SITE VISIT: OCTOBER 29, 2026 @ 10:30 AM

LOCATION: ***Physical Plant Department***
Benjamin H. Kraft Building
515 James L. Hunt Street
Southern University SUBR Campus
Site Telephone No. 225-771-4741or 225-771-6241

Deadlier to submit inquiries: November 4, 2026 by 5:00 PM
Deadline to respond to inquiries: November 10, 2026 by 5:00 PM

INQUIRIES:
No negotiations, decisions, or actions will be executed by any bidder as a result or any oral discussion with any University employee or State Consultant. Only those transactions which are in writing, sent to **Linda A. Antoine, Director of Purchasing, will be considered as valid.**
Send inquiries to linda_antoine@subr.edu

INSTRUCTIONS TO BIDDERS

1. **Bid Forms**
   All written bids, unless otherwise provided for, must be submitted on, and in accordance with forms provided and properly signed in ink. Bids submitted in the following manner will not be accepted:
   Bid containing no signature indicating intent to be bound

Document will be included with the successful vendor's contact.

(1) Bid filled out in pencil
(2) Bid not submitted on university standard forms
Bids must be received at the address specified in the Invitation for Bid prior to bid opening time to be considered.

2. **Envelope (if mailed)**
Bidders are requested to submit bid package in a sealed envelope of your choice that is clearly marked identifying the ***company's name, complete address, bid number, time, date of bid opening, and license number, if applicable.***
Bidder is responsible for means of delivery of bid.
Louisiana Contractors License Number shall be placed on the outside of the envelope.

3. **Standards of Quality**
Any product or service bid shall conform to all applicable federal, state and local laws, regulations and the specifications contained in the IFB. Unless otherwise specified in the IFB, any manufacturer's name, trade name, brand name, or catalog numbers used in the specifications is for the purpose of describing the quality level, performance and characteristics required. Bidder must specify the brand and model number of the product offered in his/her bid. Bids not specifying brand and model numbers will be considered as offering the exact product(s) specified in the IFB.

4. **Descriptive Information**
Bidders proposing an equivalent brand or model should submit information with bid (such as illustrations, descriptive literature, technical data) sufficient for the University to evaluate quality, suitability and compliance with the specifications in the IFB. Failure to submit descriptive information may cause bid to be rejected. Any change made to a manufacturer's published specification submitted for a product should be verifiable by the manufacturer. If item(s) bid do not fully comply with specifications (including brand and/or product number), bidder must state in what respect the item(s) deviate. Failure to note exceptions on the bid form will not relieve the successful bidder(s) from supplying the actual products requested.

5. ***INSURANCE:***
A current insurance certificate with Southern University as the certificate holder shall be sent to the Purchasing Department before starting project. Contractor will maintain insurance coverage until project is completed.

6. **Prices**
Unless otherwise specified by the Purchasing Department, bid prices must be complete, including transportation, prepaid by bidder to destination. In the event of extension errors, the unit price shall prevail.

7. **Payment Terms**
Payment is to be made within thirty (30) days after receipt of properly executed invoice, or delivery and acceptance, whichever is later. Delinquent payment penalties are governed by **L.R.S. 39:1695**.

8. **Deliveries**
Bids may be rejected if the delivery or completion time indicated is longer than that specified in the bid.

9. **Vendor Invoices**
Invoices or AIA payment form shall reference the Southern University purchase/release order number, vendor's packing list/delivery ticket, ticket number, shipping/delivery date, etc. Invoices are to be itemized and billed in accordance with the order and should show the amount of any prompt payment discount and submitted on the vendor's own invoice form. Invoices submitted by the vendor's supplier will not be accepted. Terms are net 30.

10. **Tax Information/State of Louisiana**
Vendor is responsible for including all applicable taxes in the bid prices. Southern University is exempt from all Louisiana state and local sales and use taxes. By accepting an award, resident and non-resident firms acknowledge their responsibility for the payment of all taxes duly accessed by the State of Louisiana and its political subdivisions for which they are liable, including but not limited to: franchise taxes, privilege taxes, sales taxes, use taxes, ad valorem taxes, etc. In accordance with Act Number 1029 of the 1991 Regular Session, effective September 1, 1991 state agencies will no longer be required to pay state sales tax.

11. **New Products**
Unless specifically called for, all products for purchases must be new (never previously used) and the current model and/or packaging. The manufacturer's standard warranty will apply unless otherwise specified in the IFB.

12. **Contract Cancellation**
Southern University has the right to cancel any contract, in accordance with Purchasing Rules and Regulations, for cause, including but not limited to, the following: (1) failure to deliver within time specified in the contract; (2) failure of the product or service to meet specifications, conform to sample quality or to be

Document will be included with the successful vendor's contact.

delivered in good condition;(3) misrepresentations by the contractor;(4) fraud, collusion, conspiracy or other unlawful means of obtaining any contract with the state; (5) conflict of contract provisions with constitutional or statutory provision of state or federal law; (6) any other breach of contract.

13. **AWARD AND EXECUTION OF CONTRACT:**
The owner shall incur no obligation to the contractor until the contract between the owner and contractor is duly executed. If the contractor is notified of the acceptance of the bid within thirty (30) days of the opening bid date, contractor agrees to execute and deliver to owner, Performance and Payment Bond and Certificate of Insurance, a copy of which is attached to the Contract Documents, within day indicated after notice from the Owner that the instrument is ready for signature.

14. **Fiscal Funding Clause (Renewal Contracts Only)**
In accordance with LA R.S.39:1615 (c) and (e), any contract entered into by the State of Louisiana and Southern University shall include the following Fiscal Funding Clause:
C. Termination due to unavailability of funds in succeeding years. When funds are not appropriated to support continuation of performance in a subsequent year of a multi-year contract, the contract for such subsequent year shall be terminated. When a contract is terminated under these conditions, no additional funds shall be paid to the contractor as a result of such action. **E.** With respect to all multi-year contracts, there shall be no provisions for a penalty to the state for the cancellation or early payment of the contract. The continuation of this contract is contingent upon the appropriation of funds to fulfill the requirements of the contract by legislature. All proposers should be aware that our legislative process is such that it is often impossible to give prior notice of the non-appropriation of funds.

15. **Default of Contactor**
Failure to deliver within the time specified in the bid will constitute a default and may cause cancellation of the contract. Where the state had determined the contractor to be in default, the state reserves the right to purchase any or all products or services covered by the contract on the open market and to charge the contractor with cost in excess of the contract price. Until such assessed charges have been paid, no subsequent bid from the defaulting contractor will be considered.

16. **Order of Priority**
In the event there is a conflict between the Instructions to Bidders, the General Terms and Conditions will govern.

17. **Applicable Law**
All contracts will be construed in accordance with and governed by the laws of Louisiana. Vendors shall follow applicable laws of the State of Louisiana and Federal Laws where applicable, to include licenses, fees and permits. Vendors are responsible for the cost of licenses, fees and permits.

18. **Certification of No Suspension or Debarment ($25,000 or more)**
By signing and submitting this bid, bidder certifies that its company, any subcontractors, or principals thereof, are not suspended or debarred under federal or state laws or regulations. A list of parties who have been suspended or debarred by federal agencies is maintained by the General Services Administration and can be viewed on the internet at www.sam.gov.
__X__Federal Funded **_Non-Federal Funded**

19. **E-VERIFY** (verification of employees)
Contractor acknowledges and agrees to comply with the provisions of La R.S. 38:2212.10 and federal law pertaining to E-Verify in the performance of services under this contract.

20. **Prohibited Contractual Arrangements**
Per Louisiana R.S. 42:1113.a, no public servant, or member of such public servant's immediate family, or legal entity in which he is a controlling interest shall bid on or enter into any contract, subcontract, or other transaction that is under the supervision or jurisdiction of the agency of such public servant. See statute for complete law, exclusions and provisions.

21. **Discriminatory Boycotts of Israel**
This section applies to procurements with a value of $100,000 or more and for vendors with five (5) or more employees
Prohibition of Discriminatory Boycotts of Israel
In accordance with R.S. 39:1602.1, for any contract for $100,000 or more and for any contractor with five or more employees, the Contractor certifies that neither it nor its subcontractors are engaged in a boycott of Israel, and that the Contractor and any subcontractors shall, for the duration of this contract, refrain from a boycott of Israel. The State reserves the right to terminate this contract if the Contractor, or any Subcontractor, engages in a boycott of Israel during the term of this contract.

22. **Prohibition of Companies That Discriminate Against Firearm and Ammunition Industries**

Document will be included with the successful vendor's contact.

In accordance with La. R.S. 39:1602.2, the following applies to any competitive sealed bids, competitive sealed proposals, or contract(s) with a value of $100,000 or more involving a for-profit company with at least fifty full-time employees:

Unless otherwise exempted by law, by submitting a response to this solicitation or entering into this contract, the Bidder, Proposer or Contractor certifies the following:

The company does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association based solely on the entity's or association's status as a firearm entity or firearm trade association;

The company will not discriminate against a firearm entity or firearm trade association during the term of the contract based solely on the entity's or association's status as a firearm entity or firearm trade association

23. **Mutual Indemnification**

Each party hereto agrees to indemnify, defend and hold the other, its officers, directors, agents and employees harmless from and against any and all losses, liabilities and claims, including reasonable attorney's fees arising out of or resulting from the willful act, fault, omission, or negligence of the indemnifying party or of its employees, contractors, or agents in performing its obligations under this agreement, provided however, that neither party hereto shall be liable to the other for any consequential damages arising out of its willful act, fault, omission, or negligence.

24. **Fair Labor Standards Act**

Contractor shall be in compliance with the **Fair Labor Standards Act 29 USC 201-6;** Establishes minimum wage, overtime pay, equal pay, recordkeeping, and child labor standards for employees or in the production of goods for interstate commerce. **By signing and submitting this bid, bidder certifies that its company, any subcontractors, or principals thereof** is in accordance with said compliance. **United States Department of Labor website: www.dol.gov/esa**

25. **Davis-Bacon Act ($2,000 or more)**

Contractor shall be in compliance with the **Davis-Bacon Act, 40 USC 276A-7;** ensures that laborers and mechanics employed pursuant to federally funded construction contracts, subcontracts and construction under Federal grants, will be paid wages as determined by the U.S. Secretary of Labor. **By signing and submitting this bid, bidder certifies that its company, any subcontractors, or principals thereof** is in accordance with said compliance. **United States Department of Labor website: www.dol.gov/esa**

__X__Federal Funded **____Non-Federal Funded**

26. **Small Business Entrepreneurship Programs**

The Southern University System is a participant in the Louisiana for the Small Entrepreneurships Program (the Hudson Initiative) and the Louisiana Initiative for Veterans and Service-Connected Disabled Veterans-Owned Business Small Entrepreneurships. Bidders are encouraged to consider participation. A list of certified vendors and additional information can be obtained from website http://www.ledsmallbiz.com. Potential participants may also register at this website. Businesses include minority and women.

27. **Public Works Projects (R.S. 38:2227)**

In accordance with the provisions of R.S. 38:2227; in awarding public works projects, any public entity is authorized to reject a proposal or bid, or not award the contract, to a business in which any individual with an ownership interest of ten percent (10%) or more, has been convicted, or has entered a plea of guilty or nolo contenere to any state felony or equivalent federal felony crime.

28. **Tobacco-Free Policy**

The use of tobacco products on any Southern University campus is prohibited by students, staff, faculty or visitors in all campus buildings, facilities, or property owned or leased by Southern University System and outside areas of the campus where non-smokers cannot avoid exposure to smoke; on campus grounds, facilities, or vehicles that are the property of the University; and at lectures, conferences, meetings, and social and cultural events held on school property or school grounds. The sale or free distribution of tobacco products, including merchandise on campus or at school events is prohibited.

29. **Equal Opportunity Employer**

Southern University and A&M College Systems of the State of Louisiana is an equal opportunity employer and looks to its contractors, sub-contractors, vendors, and suppliers to take affirmative action to effect this commitment in its operations. By submitting and signing this bid, the bidder certifies that he agrees to adhere to the mandates dictated by Title VI and VII of the Civil Rights Act of 1964, as amended; the Vietnam Era Veterans' Readjustment Assistance Act of 1974; Section 303 of the Rehabilitation Act of 1973; Section 202 of Executive Orderll24b,as amended; and the Americans with Disabilities Act of 1990. Bidder agrees that he will not discriminate in the rendering of services to and/or employment of individuals because of race, color, religion, sex, age, national origin, handicap, disability, veteran status, or any other non-merit factor. Bidder further agrees to keep informed of and comply with all Federal, State, and local laws, ordinances, and regulations which affect his employees or prospective employees. Any person who is a "Qualified Individual with a Disability" as defined by 42 USC 12131 of the American with Disabilities Act who has submitted a bid on this procurement and who desires to attend the bid opening, must notify this office in writing no later than seven (7) working days prior to the bid opening date of their need for special accommodations. If the requested accommodations cannot be reasonably provided, the individual will be so informed prior to the bid opening.

Document will be included with the successful vendor's contact.

30. **Code of Ethics**
The contractor acknowledges that Chapter 15 of Title 42 of the Louisiana Revised Statutes (R.S. 42:1101 et. seq., Code of Governmental Ethics) applies to the Contracting Party in the performance of services called for in this contract. The contractor agrees to immediately notify the state if potential violations of the Code of Governmental Ethics arise at any time during the term of this contract.

31. **Vendor Forms/SU Signature Authority**
The terms and conditions of the SU solicitation and purchase order/contract shall solely govern the purchase agreement, and shall not be amended by any vendor contract, form, etc. The University's chief procurement officer, or designee, is delegated sole authority to execute any vendor contracts, forms, etc. Departments are prohibited from signing any vendor forms.

32. **Prosecution of Work**
The work is to be done when Southern University is in operation. The contractor shall, therefore, plan the repairs and installation in specifications so as not to interfere with normal operations of the facility and shall exert effort to expedite completion of the work once it has started. It is intended that the work shall be done during normal working hours, however, should work require overtime (Saturday, Sunday and/or night working hours), the cost must be borne by the contractor at no extra compensation from the Owner (Southern University).

33. **On-Campus Attendance Requirements (COVID-19)**
The Center for Disease and Control (CDC) recommends social distancing and wearing of masks to prevent the spread of the Coronavirus (COVID19). Persons visiting Southern University are required to wear a mask/face covering and stay at least 6 feet between yourself and others, even when you wear a face covering.

34. **Termination of the Contract for Convenience**
The State/University may terminate the contract at any time by giving thirty (30) days written notice to the Contractor of such termination or negotiating with the Contractor an effective date. The Contractor shall be entitled to payment for deliverables in progress, to the extent work has been performed satisfactorily.

35. **Termination for Cause**
The State may terminate this Contract for cause based upon the failure of the Contractor to comply with the terms and/or conditions of the Contract; provided that the State shall give the Contractor written notice specifying the Contractor's failure. If within thirty (30) days after receipt of such notice, the Contractor shall not have either corrected such failure or thereafter proceeded diligently to complete such correction, then the State may, at its option, place the Contractor in default and the Contract shall terminate on the date specified in such notice. The Contractor may exercise any rights available to it under Louisiana law to terminate for cause upon the failure of the Owner to comply with the terms and conditions of this contract; provided that the Contractor shall give the State written notice specifying the State's failure and a reasonable opportunity for the Owner to cure the defect.

36. **Auditors**
It is hereby agreed that the Legislative Auditor of the State of Louisiana and/or the Office of the Governor, Division of Administration auditors shall have the option of auditing all accounts of contractor which relate to this contract.

37. **Awarded Products/Unauthorized Substitutions**
Only those awarded brands and numbers stated in the SU contract are approved for delivery, acceptance, and payment purposes. Any substitutions require prior approval of the Purchasing Office. Unauthorized product substitutions are subject to rejection at time of delivery, post-return at vendor's expense, and non-payment.

38. **Acceptance**
Upon written notice by the Owner, a Notice by Owner of Acceptance of Work will be executed and forwarded to the Contractor for recording with the Clerk of Court in the parish in which the work has been performed and shall furnish a clear Lien Certificate from the Clerk of Court (to the owner along with final invoice) forty-five (45) days after recordation of acceptance. Final payment of ten percent (10%) will be made at this time.

39. **Guarantee**
It is the intention of the specifications to secure a first-class permanent material and construction and to this end, Contractor will be held responsible for and must correct defects discovered in the work within one (1) year from acceptance. Should any materials or methods be called for, of such nature to render this guarantee impossible, written notice to this effect should be given Owner (Southern University) before signing contract and/or beginning of work; failure to do this will be construed as agreement to the strictest terms of the guarantee.

40. **Clean-Up**

Document will be included with the successful vendor's contact.

The Contractor will be directed during the progress of work to remove and properly dispose of the resultant and debris. Upon completion, Contractor shall remove all equipment, unused materials and debris and will leave the premises in a clean and first-class condition.

41. **Examination of Site**
Each bidder will visit the site of the proposed project and will fully acquaint himself with conditions relating to construction and labor so that he may fully understand the facilities, difficulties and restrictions attending the execution of work under this contract. No consideration or allowance will be granted the Contractor for failure to visit the site or for any alleged misunderstanding of the materials to be furnished or the work to be done.

42. ***Anti-Kickback Clause***
The Contractor hereby agrees to adhere to the mandate dictated by The Copeland "Anti-Kickback" ACT which provides that each Contractor or Subgrantee shall be prohibited from inducing, by any means, any person employed in the completion of work, to give up any part of the compensation to which he is otherwise entitled.

43. ***Clean Air Act***
The Contractor hereby agrees to adhere to the provisions which require compliance with all applicable standards, orders or requirements issued under Section 306 of the CLEAN AIR ACT which prohibits the use under non-exempt contracts, grants or loans of facilities included on the EPA list of Violating Facilities.

44. ***Clean Water Act***
The Contractor hereby agrees to adhere to the provisions which require compliance with all applicable standards, orders or requirements issued under Section 508 of the Clean Water Act which prohibits the use under non-exempt federal contracts, grants or loans of facilities included on the EPA list of Violating Facilities.

45. **Energy Policy and Conservation Act**
The Contractor hereby recognizes the mandatory standards and policies relating to energy efficiency which are contained in the State energy conservation plan issued in compliance with the Energy Policy and Conservation Act (P.L. 94-163).

46. ***Anti-Lobbying and Debarment Act***
The Contractor will be expected to comply with federal statutes in the Anti-Lobbying Act and The Debarment Act.

47. ***Signature Authority***
A CORPORATE RESOLUTION OR WRITTEN EVIDENCE OF THE AUTHORITY OF THE PERSON SIGNING THE BID FOR THE PUBLIC WORK AS PRESCRIBED BY LOUISIANA REVISED STATUTE 38:2212 (B)(5)
A copy of the applicable signature authority document/Board Resolution or LA Secretary of State Registration must be submitted with bid.

48. ***ADITIONAL REQUIREMENTS***

- ALL WORK SHALL BE IN ACCORDANCE WITH THE PLANS; THE PROJECT SPECIFICATIONS, AND HALL COMPLY WITH APPLICALBE LOCAL AND STATE BUILDING CODES AS WELL AS ANY AND ALL REGULATORY AGENCY REQUIREMENTS AND LAWS, INCLUDING BUT NOT LIMIOTED TO OSHA, ETC. GENERAL NOTES SHALL APPLY TO ALL DRAWINGS.
- CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT, IF APPLICABLE, OF ALL CONFLICTS OR DISCRENPENSIES PRESENTED IN THESE PLANS PRIOR TO THE START OF WORK.
- ALL WORK, WHETHER SHOWN OR IMPLIED, UNLESS SPECIFICALLY QUESTIONED, SHALL BE CONSIDERED UNDERSTOOD IN ALL RESPECTS BY THE GENERAL CONTRATOR AND WHO WILL BE RESPOSIBLE FOR ANY MISINTERPRETATIONS AND CONSEQUENCES THEREOF.
- ANY UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
- ENGINEER/ARCHITECT SHALL BE NOTIFIED IMMEDIATELY OF ALL IDENTIFIED EXISTING UTILITIES NOT INDENTIFIED IN THE PLANS.
- OWNER SHALL PROVIDE WATER FOR CLEANING OPERATIONS FROM ANY FIRE HYDRANT AT NO COST TO THE CONSULTANT.

49. **PUBLIC AWARENESS NOTICE – 192.616**

Southern University Baton Rouge owns and operates a master meter natural gas distribution system on the school campus. The gas system consists of an underground network of pipelines. The purpose of the gas system is to provide a reliable and safe economical source of energy for heating purposes. The pipeline system has the capacity to reliably deliver natural gas.

The hazards of natural gas are odorless, colorless, tasteless, lighter than air and can ignite and/or explode with tremendous force when mixed with the right amount of air.

Measures taken include:

- Adding odorant to the gas to give it that distinctive smell, like rotten eggs, to warn us of its presence.

Document will be included with the successful vendor's contact.

- Testing the odorant level each calendar quarter,
- Performing annual gas leakage surveys, and
- Conducting periodic pipeline patrols.

The following are signs that may indicate a gas leak:

- A hissing or roaring sound (caused by escaping gas)
- A patch of dead or discolored vegetation in an otherwise green setting along a pipeline route
- Blowing dirt, grass or leaves near a pipeline,
- Continuous bubbling in wet, flooded areas,
- A "gas small" like rotten eggs.

Anyone who may smell this odor or notice any unusual conditions on or near gas mains, vents, service lines, meter sets, or especially inside of a building should call the maintenance office immediately. If you smell a strong gas odor inside a building, notify everyone in the building to leave. Do not operate any switches or use the phone. Go a safe distance away upwind of the smell of the gas and call the maintenance office. With any gas leak protect life first, then property, then notify the maintenance office.

State and federal laws require excavators to notify LA One-Call 2 days before digging. If any excavation is planned, you must notify LA One-Call which will notify the Southern University to locate the gas lines.

To obtain additional information or report a gas related issue call Southern University Baton Rouge Maintenance Office. The Southern University Maintenance Office phone number is 225-771-4741. The LA One-Call Center phone number is 811.

Document will be included with the successful vendor's contact.

INSURANCE REQUIREMENTS

Southern University and A&M College
Greenhouse Modification
Bid 10366

The Contractor shall purchase and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, its agents, representatives, employees or subcontractors.

A. MINIMUM SCOPE AND LIMITS OF INSURANCE

1. **Workers Compensation**
   Workers Compensation insurance shall be in compliance with the Workers Compensation law of the State of the Contractor's headquarters. Employers Liability is included with a minimum limit of $1,000,000.00 per accident/per disease/per employee. If work is to be performed over water and involves maritime exposure, applicable LHWCA, Jones Act, or other maritime law coverage shall be included and the Employers Liability limit increased to a minimum of **$1,000,000. A.M. Best's insurance company rating requirement may be waived for workers compensation coverage only.**

2. **Commercial General Liability**
   Commercial General Liability insurance, including Personal and Advertising Injury Liability, shall have a minimum limit per occurrence of **$1,000,000 and a minimum general aggregate of $2,000,000.** The Insurance Services Office (ISO) Commercial General Liability occurrence coverage form CG 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. Claims-made form is unacceptable.

3. **Automobile Liability**
   Automobile Liability Insurance shall have a minimum combined single limit per occurrence of $1,000,000. ISO form number CA 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. This insurance shall include third-party bodily injury and property damage liability for owned, hired and non-owned automobiles.

B. DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductibles or self-insured retentions must be declared to and accepted by the Agency. The Contractor shall be responsible for all deductibles and self-insured retentions.

C. OTHER INSURANCE PROVISIONS

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability Coverage

   a. The Agency, its officers, agents, employees and volunteers shall be named as an additional insured as regards negligence by the contractor. ISO Form CG 20 10 (current form approved for use in Louisiana), or equivalent, is to be used when applicable. The coverage shall contain no special limitations on the scope of protection afforded to the Agency.

   b. The Contractor's insurance shall be primary as respects the Agency, its officers, agents, employees and volunteers. Any insurance or self-insurance maintained by the Agency shall be excess and non-contributory of the Contractor's insurance.

   c. Any failure of the Contractor to comply with reporting provisions of the policy shall not affect coverage provided to the Agency, its officers, agents, employees and volunteers.

   d. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the policy limits.

2. Workers Compensation and Employers Liability Coverage
   The insurer shall agree to waive all rights of subrogation against the Agency, its officers, agents, employees and volunteers for losses arising from work performed by the Contractor for the Agency.

3. All Coverage

   a. Coverage shall not be canceled, suspended, or voided by either party (the Contractor or the insurer) or reduced in coverage or in limits except after 30 days written notice has been given to the Agency. Ten-day written notice of cancellation is acceptable for non-payment of premium. Notifications shall comply with the standard cancellation provisions in the Contractor's policy.

   b. Neither the acceptance of the completed work nor the payment thereof shall release the Contractor from the obligations of the insurance requirements or indemnification agreement.

   c.

The insurance companies issuing the policies shall have no recourse against the Agency for payment of premiums or for assessments under any form of the policies.

d. Any failure of the Contractor to comply with reporting provisions of the policy shall not affect coverage provided to the Agency, its officers, agents, employees and volunteers.

D. ACCEPTABILITY OF INSURERS

All required insurance shall be provided by a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located. Insurance shall be placed with insurers with a A.M. Best's rating of **A-:VI or higher**. This rating requirement may be waived for workers compensation coverage only.

If at any time an insurer issuing any such policy does not meet the minimum A.M. Best rating, the Contractor shall obtain a policy with an insurer that meets the A.M. Best rating and shall submit another Certificate of Insurance as required in the contract.

E. VERIFICATION OF COVERAGE

Contractor shall furnish the Agency with Certificates of insurance reflecting proof of required coverage. The Certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The Certificates are to be received and approved by the Agency before work commences and upon any contract renewal thereafter.

In addition to the Certificates, Contractor shall submit the declarations page and the cancellation provision endorsement for each insurance policy. The Agency reserves the right to request complete certified copies of all required insurance policies at any time.

Upon failure of the Contractor to furnish, deliver and maintain such insurance as above provided, this contract, at the election of the Agency, may be suspended, discontinued or terminated. Failure of the Contractor to purchase and/or maintain any required insurance shall not relieve the Contractor from any liability or indemnification under the contract.

F. SUBCONTRACTORS

Contractor shall include all subcontractors as insureds under its policies OR shall be responsible for verifying and maintaining the Certificates provided by each subcontractor. Subcontractors shall be subject to all of the requirements stated herein. The Agency reserves the right to request copies of subcontractor's Certificates at any time.

G. WORKERS COMPENSATION INDEMNITY

In the event Contractor is not required to provide or elects not to provide workers compensation coverage, the parties hereby agree that Contractor, its owners, agents and employees will have no cause of action against, and will not assert a claim against, the State of Louisiana, its departments, agencies, agents and employees as an employer, whether pursuant to the Louisiana Workers Compensation Act or otherwise, under any circumstance. The parties also hereby agree that the State of Louisiana, its departments, agencies, agents and employees shall in no circumstance be, or considered as, the employer or statutory employer of Contractor, its owners, agents and employees. The parties further agree that Contractor is a wholly independent contractor and is exclusively responsible for its employees, owners, and agents. Contractor hereby agrees to protect, defend, indemnify and hold the State of Louisiana, its departments, agencies, agents and employees harmless from any such assertion or claim that may arise from the performance of this contract.

Maritime (Jones Act and LHWCA) needed when work is performed over navigable bodies of water

H. INDEMNIFICATION/HOLD HARMLESS AGREEMENT

Contractor agrees to protect, defend, indemnify, save, and hold harmless, the State of Louisiana, all State Departments, Agencies, Boards and Commissions, its officers, agents, servants, employees, and volunteers, from and against any and all claims, damages, expenses, and liability arising out of injury or death to any person or the damage, loss or destruction of any property which may occur, or in any way grow out of, any act or omission of Contractor, its agents, servants, and employees, or any and all costs, expenses and/or attorney fees incurred by Contractor as a result of any claims, demands, suits or causes of action, except those claims, demands, suits, or causes of action arising out of the negligence of the State of Louisiana, all State Departments, Agencies, Boards, Commissions, its officers, agents, servants, employees and volunteers.

Contractor agrees to investigate, handle, respond to, provide defense for and defend any such claims, demands, suits, or causes of action at its sole expense and agrees to bear all other costs and expenses related thereto, even if the claims, demands, suits, or causes of action are groundless, false or fraudulent.

Note: Successful bidder will be required to submit a certificate of insurance to Southern University as the certificate holder.
PO Box 9534-Baton Rouge, LA 70813

May, 2026

SPECIFICATIONS FOR:

SOUTHERN UNIVERSITY, BATON ROUGE, LOUISIANA

AGRICULTURAL RESEARCH & EXTENSION CENTER

GREENHOUSE MODIFICATION

PO NUMBER: P0085282

PREPARED BY:

MAP DESIGN GROUP, LLC
ARCHITECTS ENGINEERS
8282 GOODWOOD BLVD SUITE W-3
BATON ROUGE, LA 70806
P. 225-767-4590 E. MAP@MAPGRP.COM

MAP PROJECT NUMBER:

10-256-12



I certify as a licensed Professional Engineer that the information included in the report is complete and represents the conditions found during an on-site survey of the property to the best of my ability.

SET NUMBER: ____

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ADVERTISEMENT FOR BIDS

Sealed bids will be received for the State of Louisiana by the Division of Administration and shall be directed to the Office of Facility Planning and Control, 1201 North Third Street, Claiborne Office Building, Suite 7-160, Baton Rouge, Louisiana, 70802 or P.O. Box 94095, Baton Rouge, Louisiana, 70804-9095. The deadline for receipt of bids is 2:00 PM on _____, at which time bids will be opened and read aloud in a public meeting in the Claiborne Office Building, Conference Room 1-145.

The Office of Facility Planning and Control is currently closed to the public. Bidders wishing to hand-deliver a bid shall contact FPC at (225) 342-0820 from the lobby of the Claiborne Building prior to 1:45 pm on the specified date of bid opening. A representative of FPC will then meet with the bidder in the lobby to receive the bid. After 1:45 pm, bidders shall submit bids directly to room 1-145.
All persons attending the public bid opening are required to wear a mask/face covering upon entering the Claiborne Building.

ANY PERSON REQUIRING SPECIAL ACCOMMODATIONS SHALL NOTIFY FACILITY PLANNING AND CONTROL OF THE TYPE(S) OF ACCOMMODATION REQUIRED NOT LESS THAN SEVEN (7) DAYS BEFORE THE BID OPENING.

FOR: **Agricultural Research & Extension Center Fencing**
Southern University
Baton Rouge, Louisiana

PROJECT NUMBER: **P0085282**

Complete Bidding Documents for this project are available in electronic form. They may be obtained without charge and without deposit from **MAP Design Group, LLC, Merrel Porche, (225) 767-4590 ext. 202, merrel@mapgrp.com**. Printed copies are not available from the Designer but arrangements can be made to obtain them through most reprographic firms. Plan holders are responsible for their own reproduction costs.

Questions about this procedure shall be directed to the Designer at:

MAP Design Group, LLC
10988 N. Harrell's Ferry Rd., Ste. 10
Baton Rouge, LA 70816
Telephone: 225-767-4590
E-mail: map@mapgrp.com

All bids shall be accompanied by bid security in an amount of five percent (5.0%) of the sum of the base bid and all alternates. The form of this security shall be as stated in the Instructions to Bidders included in the Bid Documents for this project.

The successful Bidder shall be required to furnish a Performance and Payment Bond written as described in the Instructions to Bidders included in the Bid Documents for this project.

A PRE-BID CONFERENCE WILL BE HELD
at _____ on _____ at _____.

Bids shall be accepted from Contractors who are licensed under LA. R.S. 37:2150-2192 for the classification of _____ . Bidder is required to comply with provisions and requirements of LA R.S. 38:2212(B)(5). No bid may be withdrawn for a period of forty-five (45) days after receipt of bids, except under the provisions of LA. R.S. 38:2214.

The Owner reserves the right to reject any and all bids for just cause. In accordance with La. R.S. 38:2212(B)(1), the provisions and requirements of this Section and those stated in the bidding documents shall not be waived by any entity.

When this project is financed either partially or entirely with State Bonds or financed in whole or in part by federal or other funds which are not readily available at the time bids are received, the award of this Contract is contingent upon the granting of lines of credit, or the sale of bonds by the Bond Commission or the availability of federal or other funds. The State shall incur no obligation to the Contractor until the Contract Between Owner and Contractor is fully executed.

Facility Planning and Control is a participant in the Small Entrepreneurship (SE) Program (the Hudson Initiative) and the Veteran-Owned and Service-Connected Disabled Veteran-Owned (LaVet) Small Entrepreneurships Program. Bidders are encouraged to consider participation. Information is available from the Office of Facility Planning and Control or on its website at https://www.doa.la.gov/doa/fpc/.

STATE OF LOUISIANA
DIVISION OF ADMINISTRATION
FACILITY PLANNING AND CONTROL
ROGER HUSSER, DIRECTOR

INSTRUCTIONS TO BIDDERS

COMPLETION TIME:

The Bidder shall agree to fully complete the contract within (_____) consecutive calendar days, subject to such extensions as may be granted under Paragraph 8.3, in the General Conditions and the Supplementary Conditions, and acknowledges that this construction time will start on or before the date specified in the written "Notice to Proceed" from the Owner.

LIQUIDATED DAMAGES:

The Bidder shall agree to pay as Liquidated Damages the amount of (_____) Dollars ($_____) for each consecutive calendar day for which the work is not complete, beginning with the first day beyond the contract completion date stated on the "Notice to Proceed" or as amended by change order.

ARTICLE 1

DEFINITIONS

1.1 The Bid Documents include the following:

Advertisement for Bids
Instructions to Bidders
Bid Form
Bid Bond
General Conditions of the Contract for Construction,
AIA Document A201, 2017 Edition
Supplementary Conditions
Contract Between Owner and Contractor and Performance and Payment Bond
Affidavit
User Agency Documents (if applicable)
Change Order Form
Partial Occupancy Form
Recommendation of Acceptance
Asbestos Abatement (if applicable)
Other Documents (if applicable)
Specifications & Drawings
Addenda issued during the bid period and acknowledged in the Bid Form

1.2 All definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201 and the Supplementary Conditions are applicable to the Bid Documents.

1.3 Addenda are written and/or graphic instruments issued by the Architect prior to the opening of bids, which modify or interpret the Bid Documents by additions, deletions, clarifications, corrections and prior approvals.

1.4 A bid is a complete and properly signed proposal to do the work or designated portion thereof for the sums stipulated therein supported by data called for by the Bid Documents.

1.5 Base bid is the sum stated in the bid for which the Bidder offers to perform the work described as the base, to which work may be added, or deleted for sums stated in alternate bids.

1.6 An alternate bid (or alternate) is an amount stated in the bid to be added to the amount of the base bid if the corresponding change in project scope or materials or methods of construction described in the Bid Documents is accepted.

1.7 A Bidder is one who submits a bid for a prime Contract with the Owner for the work described in the Bid Documents.

1.8 A Sub-bidder is one who submits a bid to a Bidder for materials and/or labor for a portion of the work.

1.9 Where the word "Architect" is used in any of the documents, it shall refer to the Prime Designer of the project, regardless of discipline.

ARTICLE 2

PRE-BID CONFERENCE

2.1 A Pre-Bid Conference shall be held at least 10 days before the date for receipt for bids. The Architect shall coordinate the setting of the date, time and place for the Pre-Bid Conference with the User Agency and shall notify in writing the Owner and all who have received sets of the Bid Documents to

attend. The purpose of the Pre-Bid Conference is to familiarize Bidders with the requirements of the Project and the intent of the Bid Documents, and to receive comments and information from interested Bidders. If the Pre-Bid Conference is stated in the Advertisement for Bids to be a Mandatory Pre-Bid Conference, bids shall be accepted only from those bidders who attend the Pre-Bid Conference. Contractors who are not in attendance for the **entire** Pre-Bid Conference will be considered to have not attended.

2.2 Any revision of the Bid Documents made as a result of the Pre-Bid Conference shall not be valid unless included in an addendum.

ARTICLE 3

BIDDER'S REPRESENTATION

3.1 Each Bidder by making his bid represents that:

3.1.1 He has read and understands the Bid Documents and his bid is made in accordance therewith.

3.1.2 He has visited the site and has familiarized himself with the local conditions under which the work is to be performed.

3.1.3 His bid is based solely upon the materials, systems and equipment described in the Bid Documents as advertised and as modified by addenda.

3.1.4 His bid is not based on any verbal instructions contrary to the Bid Documents and addenda.

3.1.5 He is familiar with Code of Governmental Ethics requirement that prohibits public servants and/or their immediate family members from bidding on or entering into contracts; he is aware that the Designer and its principal owners are considered Public Servants under the Code of Governmental Ethics for the limited purposes and scope of the Design Contract with the State on this Project (see Ethics Board Advisory Opinion, No. 2009-378 and 2010-128); and neither he nor any principal of the Bidder with a controlling interest therein has an immediate family relationship with the Designer or any principal within the Designer's firm (see La. R.S. 42:1113). Any Bidder submitting a bid in violation of this clause shall be disqualified and any contract entered into in violation of this clause shall be null and void.

3.2 The Bidder must be fully qualified under any State or local licensing law for Contractors in effect at the time and at the location of the work before submitting his bid. In the State of Louisiana, Revised Statutes 37:2150, et seq. will be considered, if applicable.

The Contractor shall be responsible for determining that all of his Sub-bidders or prospective Subcontractors are duly licensed in accordance with law.

ARTICLE 4

BID DOCUMENTS

4.1 Copies

4.1.1 Bid Documents may be obtained from the Architect for a deposit as stated in the Advertisement for Bids. The deposit will be refunded as stated in the Advertisement for Bids. No deposits will be refunded on Bid Documents returned later than ten days after receipt of bids.

4.1.1.2 As an alternative method of distribution, the Designer may provide the Bid Documents in electronic format. They may be obtained without charge and without deposit as stated in the Advertisement for Bids.

4.1.1.2.1 If electronic distribution is available, printed copies will not be available from the Designer, but arrangements can be made to obtain them through most reprographic firms and/or plan rooms.

4.1.1.2.2 If electronic distribution is available, the reproduction cost on the first paper plan set acquired by bona fide prime bidders will be fully refunded by the Designer upon delivery of the documents to the Designer in good condition no later than ten days after receipt of bids.

4.1.1.2.3 If electronic distribution is available, all other plan holders are responsible for their own reproduction costs.

4.1.2 Complete sets of Bid Documents shall be used in preparing bids; neither the Owner nor the Architect assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bid Documents.

4.1.3 The Owner or Architect in making copies of the Bid Documents available on the above terms, do so only for the purpose of obtaining bids on the work and do not confer a license or grant for any other use.

4.2 Interpretation or Correction of Bid Documents

4.2.1 Bidders shall promptly notify the Architect of any ambiguity, inconsistency or error which they may discover upon examination of the Bid Documents or of the site and local conditions.

4.2.2 Bidders requiring clarification or interpretation of the Bid Documents shall make a written request to the Architect, to reach him at least seven days prior to the date for receipt of bids.

4.2.3 Any interpretation, correction or change of the Bid Documents will be made by addendum. Interpretations, corrections or changes of the Bid Documents made in any other manner will not be binding and Bidders shall not rely upon such interpretations, corrections and changes.

4.3 Substitutions

4.3.1 The materials, products and equipment described in the Bid Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. No substitutions shall be allowed after bids are received.

4.3.2 No substitution will be considered unless written request for approval has been submitted by the Proposer and has been received by the Architect at least seven (7) working days prior to the opening of bids. (La. R.S. 38:2295(C)) Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including model numbers, drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. It shall be the responsibility of the proposer to include in his proposal all changes required of the Bid Documents if the proposed product is used. Prior approval, if given, is contingent upon supplier being responsible for any costs which may be necessary to modify the space or facilities needed to accommodate the materials and equipment approved.

4.3.3 If the Architect approves any proposed substitution, such approval shall be set forth in an addendum. Bidders shall not rely upon approvals made in any other manner.

4.4 Addenda

4.4.1 Addenda will be transmitted to all who are known by the Architect to have received a complete set of Bid Documents.

4.4.2 Copies of addenda will be made available for inspection wherever Bid Documents are on file for that purpose.

4.4.3 Except as described herein, addenda shall not be issued within a period of seventy-two (72) hours prior to the advertised time for the opening of bids, excluding Saturdays, Sundays, and any other legal holidays. If the necessity arises of issuing an addendum modifying plans and specifications within the seventy-two (72) hour period prior to the advertised time for the opening of bids, then the opening of bids shall be extended at least seven but no more than twenty-one (21) working days, without the requirement of re-advertising. Facility Planning shall be consulted prior to issuance of such an addendum and shall approve such issuance. The revised time and date for the opening of bids shall be stated in the addendum.

4.4.4 Each Bidder shall ascertain from the Architect prior to submitting his bid that he has received all addenda issued, and he shall acknowledge their receipt on the Bid Form.

4.4.5 The Owner shall have the right to extend the bid date by up to (30) thirty days without the requirement of re-advertising. Any such extension shall be made by addendum issued by the Architect.

ARTICLE 5

BID PROCEDURE

5.1 Form and Style of Bids

5.1.1 Bids shall be submitted on the Louisiana Uniform Public Work Bid Form provided by the Architect for this project.

5.1.2 The Bidder shall ensure that all applicable blanks on the bid form are completely and accurately filled in.

5.1.3 Bid sums shall be expressed in both words and figures, and in case of discrepancy between the two, the written words shall govern.

5.1.4 Any interlineation, alteration or erasure must be initialed by the signer of the bid or his authorized representative.

5.1.5 Bidders are cautioned to complete all alternates should such be required in the Bid Form. Failure to submit alternate prices will render the bid non responsive and shall cause its rejection.

5.1.6 Bidders are cautioned to complete all unit prices should such be required in the Bid Form. Unit prices represent a price proposal to do a specified quantity and quality of work. Unit prices are incorporated into the base bid or alternates, as indicated on the Unit Price Form, but are not the sole components thereof.

5.1.7 Bidder shall make no additional stipulations on the Bid Form nor qualify his bid in any other manner.

5.1.8 Written evidence of the authority of the person signing the bid for the public work shall be submitted in accordance with La. R.S. 38:2212 (B)(5).

5.1.9 On any bid in excess of fifty thousand dollars ($50,000.00), the Contractor shall certify that he is licensed under La. R.S. 37: 2150-2173 and show his license number on the bid above his signature or his duly authorized representative.

5.2 Bid Security

5.2.1 No bid shall be considered or accepted unless the bid is accompanied by bid security in an amount of five percent (5.0%) of the base bid and all alternates.

The bid security shall be in the form of a certified check or cashier's check drawn on a bank insured by the Federal Deposit Insurance Corporation, or a Bid Bond written by a surety company licensed to do business in Louisiana and signed by the surety's agent or attorney-in-fact. The Bid Bond shall be written on the Facility Planning and Control Bid Bond Form, and the surety for the bond must meet the qualifications stated thereon. The Bid Bond shall include the legal name of the bidder be in favor of the State of Louisiana, Office of Facility Planning and Control, and shall be accompanied by appropriate power of attorney. The Bid Bond must be signed by both the bidder/principal and the surety in the space provided on the Facility Planning and Control Bid Bond Form. Failure by the bidder/principal or the surety to sign the bid bond shall result in the rejection of the bid.

Bid security furnished by the Contractor shall guarantee that the Contractor will, if awarded the work according to the terms of his proposal, enter into the Contract and furnish Performance and Payment Bonds as required by these Bid Documents, within fifteen (15) days after written notice that the instrument is ready for his signature.

Should the Bidder refuse to enter into such Contract or fail to furnish such bonds, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as penalty.

5.2.2 The Owner will have the right to retain the bid security of Bidders until either (a) the Contract has been executed and bonds have been furnished, or (b) the specified time has elapsed so that bids may be withdrawn, or (c) all bids have been rejected.

5.3 Submission of Bids

5.3.1 The Bid shall be sealed in an opaque envelope. The bid envelope shall be identified on the outside with the name of the project, and the name, address, and license number of the Bidder.
The envelope shall not contain multiple bid forms, and will be received until the time specified and at the place specified in the Advertisement for Bids. It shall be the specific responsibility of the Bidder to deliver his sealed bid to Facility Planning and Control Department at the appointed place and prior to the announced time for the opening of bids. Late delivery of a bid for any reason, including late

delivery by United States Mail, or express delivery, shall disqualify the bid.

If the bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "Bid Enclosed" on the face thereof. Such bids shall be sent by Registered or Certified Mail, Return Receipt Requested, addressed to:

Facility Planning and Control,
P. 0. Box 94095
Baton Rouge, Louisiana, 70804-9095.

Bids sent by express delivery shall be delivered to:

Facility Planning and Control
Suite 7-160
Claiborne Office Building
1201 North Third Street
Baton Rouge, Louisiana 70802

5.3.2 Bids shall be deposited at the designated location prior to the time on the date for receipt of bids indicated in the Advertisement for Bids, or any extension thereof made by addendum. Bids received after the time and date for receipt of bids will be returned unopened.

5.3.3 Bidder shall assume full responsibility for timely delivery at location designated for receipt of bids.

5.3.4 Oral, telephonic or telegraphic bids are invalid and shall not receive consideration. Owner shall not consider notations written on outside of bid envelope which have the effect of amending the bid. Written modifications enclosed in the bid envelope, and signed or initialed by the Contractor or his representative, shall be accepted.

5.4 Modification or Withdrawal of Bid

5.4.1 A bid may not be modified, withdrawn or canceled by the Bidder during the time stipulated in the Advertisement for Bids, for the period following the time and bid date designated for the receipt of bids, and Bidder so agrees in submitting his bid, except in accordance with R.S. 38:2214 which states, in part, "Bids containing patently obvious, unintentional, and substantial mechanical, clerical, or mathematical errors, or errors of unintentional omission of a substantial quantity of work, labor, material, or services made directly in the compilation of the bid, may be withdrawn by the contractor if clear and convincing sworn, written evidence of such errors is furnished to the public entity within forty-eight hours of the bid opening excluding Saturdays, Sundays, and legal holidays".

5.4.2 Prior to the time and date designated for receipt of bids, bids submitted early may be modified or withdrawn only by notice to the party receiving bids at the place and prior to the time designated for receipt of bids.

5.4.3 Withdrawn bids may be resubmitted up to the time designated for the receipt of bids provided that they are then fully in conformance with these Instructions to Bidders.

5.4.4 Bid Security shall be in an amount sufficient for the bid as modified or resubmitted.

5.5 Prohibition of Discriminatory Boycotts of Israel

By submitting a bid, the bidder certifies and agrees that the following information is correct:

In preparing its bid, the bidder has considered all proposals submitted from qualified, potential subcontractors and suppliers, and has not, in the solicitation, selection, or commercial treatment of any subcontractor or supplier, refused to transact or terminated business activities, or taken other actions intended to limit commercial relations, with a person or entity that is engaging in commercial transactions in Israel or Israel-controlled territories, with the specific intent to accomplish a boycott or divestment of Israel. The bidder has also not retaliated against any person or other entity for reporting such refusal, termination, or commercially limiting actions. The state reserves the right to reject any bid if this certification is subsequently determined to be false and to terminate any contract awarded based on such a false response.

ARTICLE 6

CONSIDERATION OF BIDS

6.1 Opening of Bids

6.1.1 The properly identified Bids received on time will be opened publicly and will be read aloud, and a tabulation abstract of the amounts of the base bids and alternates, if any, will be made available to Bidders.

6.2 Rejection of Bids

6.2.1 The Owner shall have the right to reject any or all bids and in particular to reject a bid not accompanied by any required bid security or data required by the Bid Documents or a bid in any way incomplete or irregular.

6.3 Acceptance of Bid

6.3.1 It is the intent of the Owner, if he accepts any alternates, to accept them in the order in which they are listed in the Bid Form. Determination of the Low Bidder shall be on the basis of the sum of the base bid and the alternates accepted. However, the Owner shall reserve the right to accept alternates in any order which does not affect determination of the Low Bidder.

ARTICLE 7

POST-BID INFORMATION

7.1 Submissions

7.1.1 At the Pre-Construction Conference, the Contractor shall submit the following information to the Architect.

7.1.1.1 A designation of the work to be performed by the Contractor with his own forces.

7.1.1.2 A breakdown of the Contract cost attributable to each item listed in the Schedule of Values Form (attached). No payments will be made to the Contractor until this is received.

7.1.1.3 The proprietary names and the suppliers of principal items or systems of material and equipment proposed for the work.

7.1.1.4 A list of names and business domiciles of all Subcontractors, manufacturers, suppliers or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the work. It is the preference of the Owner that, to the greatest extent possible or practical, the Contractor utilize Louisiana Subcontractors, manufacturers, suppliers and labor.

7.1.2 The General Contractor shall be responsible for actions or inactions of Subcontractors and/or material suppliers.

The General Contractor is totally responsible for any lost time or extra expense incurred due to a Subcontractor's or Material Supplier's failure to perform. Failure to perform includes, but is not limited to, a Subcontractor's financial failure, abandonment of the project, failure to make prompt delivery, or failure to do work up to standard. Under no circumstances shall the Owner mitigate the General Contractor's losses or reimburse the General Contractor for losses caused by these events.

7.1.3 The lowest responsive and responsible bidder shall submit to the Architect and the Owner within ten days after the bid opening a letter/letters from the manufacturer stating that the manufacturer will issue the roof system guarantee complying with the requirements of Facility Planning and Control based on the specified roof system and include the name of the applicator acceptable to the manufacturer at the highest level of certification for installing the specified roof system. This manufacturer shall be one that has received prior approval or is named in the specifications.

In accordance with La. R.S. 38:2227 [references La R.S. 38:2212(A)(3)(c)(ii), which has since been renumbered as La R.S. 38:2212(B)(3)], La. R.S. 38:2212.10 and La. R.S. 23:1726(B) the apparent low bidder on this project shall submit the completed Attestations Affidavit (Past Criminal Convictions of Bidders, Verification of Employees and Certification Regarding Unpaid Workers Compensation Insurance) form found within this bid package to Facility Planning and Control within 10 days <u>after</u> the opening of bids**.**

ARTICLE 8

PERFORMANCE AND PAYMENT BOND

8.1 Bond Required

8.1.1 The Contractor shall furnish and pay for a Performance and Payment Bond written by a company licensed to do business in Louisiana, which shall be signed by the surety's agent or attorney-in-fact, in an amount equal to 100% of the Contract amount. Surety must be listed currently on

the U. S. Department of Treasury Financial Management Service List (Treasury List) as approved for an amount equal to or greater than the contract amount, or must be an insurance company domiciled in Louisiana or owned by Louisiana residents. If surety is qualified other than by listing on the Treasury list, the contract amount may not exceed fifteen percent of policyholders' surplus as shown by surety's most recent financial statements filed with the Louisiana Department of Insurance and may not exceed the amount of $500,000. However, a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A. M. Best's Key Rating Guide shall not be subject to the $500,000 limitation, provided that the contract amount does not exceed ten percent of policyholders' surplus as shown in the latest A. M. Best's Key Rating Guide nor fifteen percent of policyholders' surplus as shown by surety's most recent financial statements filed with the Louisiana Department of Insurance. The Bond shall be signed by the surety's agent or attorney-in-fact. The Bond shall be in favor of the State of Louisiana, Office of Facility Planning and Control.

8.2 Time of Delivery and Form of Bond

8.2.1 The Bidder shall deliver the required bond to the Owner simultaneous with the execution of the Contract.

8.2.2 Bond shall be in the form furnished by Facility Planning and Control, entitled CONTRACT BETWEEN OWNER AND CONTRACTOR AND PERFORMANCE AND PAYMENT BOND, a copy of which is included in the Bid Documents.

8.2.3 The Bidder shall require the Attorney-in-Fact who executes the required bond on behalf of the surety to affix thereto a certified and current copy of his power of Attorney.

ARTICLE 9

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

9.1 Form to be Used

9.1.1 Form of the Contract to be used shall be furnished by Facility Planning and Control, an example of which is bound in the Bid Documents.

9.2 Award

9.2.1 After award of the Contract, the successful Bidder, if a corporation, shall furnish to the Owner the most current copy of a Disclosure of Ownership Affidavit on file with the Secretary of State.

9.2.2 In accordance with Louisiana Law, when the Contract is awarded, the successful Bidder shall, at the time of the signing of the Contract, execute the Non-Collusion Affidavit included in the Contract Documents

9.2.3 When this project is financed either partially or entirely with State Bonds, the award of this Contract is contingent upon the sale of bonds by the State Bond Commission. The State shall incur no obligation to the Contractor until the Contract Between Owner and Contractor is duly executed.

LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: Southern University, Baton Rouge, LA
Agricultural Research & Extension Center
P.O. Box 10010
Baton Rouge, LA 70813
(Owner to provide name and address of owner)

BID FOR: Agricultural Research & Extension Center Fencing
Southern University, Baton Rouge, LA
Project No: P0085282
(*Owner to provide name of project and other identifying information)*

The undersigned bidder hereby declares and represents that she/he: a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by: MAP Design Group, LLC and dated: _____
(Owner to provide name of entity preparing bidding documents.)

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following **ADDENDA:** (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging) _____ .

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid" * but not alternates) the sum of:

_____ Dollars ($ _____)

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

Alternate No. 1: *6' Industrial Aluminum Fence Panel Classic Spear Top*

_____ Dollars ($ _____)

Alternate No. 2: *6' Gate*

_____ Dollars ($ _____)

Alternate No. 3 *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:

Not Applicable Dollars ($ Not Applicable)

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

_____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

NAME OF AUTHORIZED SIGNATORY OF BIDDER: _____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER **: _____

DATE: _____

THE FOLLOWING ITEMS ARE TO BE INCLUDED WITH THE SUBMISSION OF THIS LOUISIANA UNIFORM PUBLIC WORK BID FORM:

* The Unit Price Form shall be used if the contract includes unit prices. Otherwise it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

**** A CORPORATE RESOLUTION OR WRITTEN EVIDENCE** of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5).

BID SECURITY in the form of a bid bond, certified check or cashier's check as prescribed by LA R.S. 38:2218(A) attached to and made a part of this bid.

LOUISIANA UNIFORM PUBLIC WORK BID FORM
UNIT PRICE FORM

TO: Southern University, Baton Rouge, Louisiana
Agricultural Research & Extension
P.O. Box 10010
Baton Rouge, LA 70813
(Owner to provide name and address of owner)

BID FOR: Agricultural Research &
Extension Center Fencing
Southern University, Baton Rouge, LA
Project No: P0085282
(*Owner to provide name of project and other identifying information)*

UNIT PRICES: This form shall be used for any and all work required by the Bidding Documents and described as unit prices. Amounts shall be stated in figures and only in figures.

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

Wording for "DESCRIPTION" is to be provided by the Owner.
All quantities are estimated. The contractor will be paid based upon actual quantities as verified by the Owner.

BID BOND

FOR

FACILITY PLANNING AND CONTROL PROJECTS

Date: _____

KNOW ALL MEN BY THESE PRESENTS:

That_____of_____, as Principal, and_____, as Surety, are held and firmly bound unto the State of Louisiana, Division of Administration, Office of Facility Planning and Control (Obligee), in the full and just sum of five (5%) percent of the total amount of this proposal, including all alternates, lawful money of the United States, for payment of which sum, well and truly be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally firmly by these presents.

Surety represents that it is listed on the current U. S. Department of the Treasury Financial Management Service list of approved bonding companies as approved for an amount equal to or greater that the amount for which it obligates itself in this instrument or that it is a Louisiana domiciled insurance company with at least an A - rating in the latest printing of the A. M. Best's Key Rating Guide. If surety qualifies by virtue of its Best's listing, the Bond amount may not exceed ten percent of policyholders' surplus as shown in the latest A. M. Best's Key Rating Guide.

Surety further represents that it is licensed to do business in the State of Louisiana and that this Bond is signed by surety's agent or attorney-in-fact. This Bid Bond is accompanied by appropriate power of attorney.

THE CONDITION OF THIS OBLIGATION IS SUCH that, whereas said Principal is herewith submitting its proposal to the Obligee on a Contract for:

_____

NOW, THEREFORE, if the said Contract be awarded to the Principal and the Principal shall, within such time as may be specified, enter into the Contract in writing and give a good and sufficient bond to secure the performance of the terms and conditions of the Contract with surety acceptable to the Obligee, then this obligation shall be void; otherwise this obligation shall become due and payable.

_____	_____
PRINCIPAL (BIDDER)	SURETY
BY:_____	BY:_____
AUTHORIZED OFFICER-OWNER-PARTNER	AGENT OR ATTORNEY-IN-FACT(SEAL)

AIA Document A201-1997

GENERAL CONDITIONS OF THE CONTRACT

An Original set of the General Conditions will be inserted herein in the final bid documents.

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions modify, change, delete from or add to the General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition. Where any Article of the General Conditions is modified or any Section, Paragraph, Subparagraph or Clause thereof is modified or deleted by these supplements, the unaltered provisions of that Section, Article, Paragraph, Subparagraph or Clause shall remain in effect.

Articles, Sections, Paragraphs, Subparagraphs or Clauses modified or deleted have the same numerical designation as those occurring in the General Conditions.

ARTICLE 1

GENERAL PROVISIONS

BASIC DEFINITIONS

1.1.1. The Contract Documents

In Section 1.1.1 delete the third sentence, and add the following sentence:
The Contract Documents shall include the Bid Documents as listed in the Instructions to Bidders and any modifications made thereto by addenda.

1.1.8 Initial Decision Maker

Delete all after the words, “shall not show partiality to the Owner or Contractor”.

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE [REFER TO *La R.S. 38:2317*]

1.5.1 Delete the first sentence of the paragraph.

1.5.1 In the third sentence: delete the remainder after the word “publication”.

1.7 DIGITAL DATA USE AND TRANSMISSION

In the first sentence after the words, “in digital form” delete “. The parties will use AIA Document E203 2013, Building Information Modeling and Digital Data Exhibit”.

1.8 BUILDING INFORMATION MODELS USE AND RELIANCE

Delete Section 1.8.

ARTICLE 2

OWNER

2.2 EVIDENCE OF THE OWNER’S FINANCIAL ARRANGEMENTS

Delete Section 2.2.

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.1 In the first sentence, delete: all before "the Owner shall secure…"

Delete Section 2.3.2 and substitute the following:

2.3.2 The term Architect, when used in the Contract Documents, shall mean the prime Designer (Architect, Engineer, or Landscape Architect), or his authorized representative, lawfully licensed to practice architecture, engineering, or landscape architecture in the State of Louisiana, identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number.

2.3.3 Delete the words: "to whom the Contractor has no reasonable objection and".

ARTICLE 3

CONTRACTOR

3.4 LABOR AND MATERIALS

3.4.2 Delete Section 3.4.2.

Delete Section 3.4.3 and substitute with the following:

3.4.3 Contractor and its employees, officers, agents, representatives, and Subcontractors shall conduct themselves in an appropriate and professional manner, in accordance with the Owner's requirements, at all times while working on the Project. Any such individual who behaves in an inappropriate manner or who engages in the use of inappropriate language or conduct while on Owner's property, as determined by the Owner, shall be removed from the Project at the Owner's request. Such individual shall not be permitted to return without the written permission of the Owner. The Owner shall not be responsible or liable to Contractor or any Subcontractor for any additional costs, expenses, losses, claims or damages incurred by Contractor or its Subcontractor as a result of the removal of an individual from the Owner's property pursuant to this Section. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

3.5 WARRANTY

3.5.2 Replace reference to "Section 9.8.4" with "Section 9.8.6".

3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS (La R.S. 40:1724[A])

3.7.1 Delete Section 3.7.1.

3.7.2 In Section 3.7.2, replace the word "public" with the word "State".

Delete Section 3.7.5 and substitute the following:

3.7.5 If, during the course of the Work, the Contractor discovers human remains, unmarked burial or archaeological sites, burial artifacts, or wetlands, which are not indicated in the Contract Documents, the Contractor shall follow all procedures mandated by State and Federal law, including but not limited to La R.S. 8:671 et seq., the Office of Coastal Protection and Restoration, and Sections 401 & 404 of the Federal Clean Water Act. Request for

adjustment of the Contract Sum and Contract Time arising from the existence of such remains or features shall be submitted in writing to the Owner pursuant to the Contract Documents.

3.8 ALLOWANCES

Delete Sections 3.8.1, 3.8.2, and 3.8.3 in their entirety and add the following new Section 3.8.1:

3.8.1 Allowances shall not be made on any of the Work.

3.9 SUPERINTENDENT

3.9.1 Add the following to the end of the paragraph:
Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES

3.10.1 Add the following: For projects with a contract sum greater than $1,000,000.00, the Contractor shall include with the schedule, for the Owner's and Architect's information, a network analysis to identify those tasks which are on the critical path, i.e., where any delay in the completion of these tasks will lengthen the project timescale, unless action is taken. A revised schedule shall be submitted with each Application and Certificate for Payment. No payment shall be made until this schedule is received.

3.10.3 In the first sentence, delete the word "general".

After the first sentence, add the following:
If the Work is not on schedule, as determined by the Architect, and the Contractor fails to take action to bring the Work on schedule, then the Contractor shall be deemed in default under this Contract and the progress of the Work shall be deemed unsatisfactory. Such default may be considered grounds for termination by the Owner for cause in accordance with Section 14.2.

Add the following Sections:

3.10.4 Add the following: Submittal by the contractor of a schedule or other documentation showing a completion date for his Work prior to the completion date stated in the contract shall not impose any obligation or responsibility on the Owner or Architect for the earlier completion date.

3.10.5 In the event the Owner employs a commissioning consultant, the Contractor shall cooperate fully in the commissioning process and shall require all subcontractors and others under his control to cooperate. The purpose of such services shall be to ensure that all systems perform correctly and interactively according to the provisions of the Contract Documents.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

Add the following: This requirement is of the essence of the contract. The Architect shall determine the value of these documents and this amount shall not be approved for payment to the Contractor until all of the listed documents are delivered to the Architect in good order, completely marked with field changes and otherwise complete in all aspects.

ARTICLE 4

ARCHITECT

4.2 ADMINISTRATION OF THE CONTRACT

4.2.1 In the first sentence, delete the phrase: "the date the Architect issues the final Certificate for Payment" and replace with the phrase "final payment is due, and with the Owner's concurrence, from time to time during the one year period for correction of Work described in Section 12.2."

4.2.2 In the first sentence, after the phrase: "become generally familiar with"; insert the following: "and to keep the Owner informed about".

In the first sentence, after the phrase "portion of the Work completed", insert the following: "to endeavor to guard the Owner against defects and deficiencies in the Work,"

4.2.4 In the first sentence, delete all after "The Owner and Contractor", and add the following "may communicate directly with each other, when deemed necessary by the Owner, and the Owner will notify the Architect of any decision."

4.2.10 Add the following sentence to the end of Section 4.2.10: There shall be no restriction on the Owner having a Representative.

4.2.11 Add the following sentence to the end of Section 4.2.11:

If no agreement is made concerning the time within which interpretation required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretation until 15 days after written request is made for them.

4.2.14 Insert the following sentence between the second and third sentences of Section 4.2.14:

If no agreement is made concerning the time within which interpretation required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretation until 15 days after written request is made for them.

ARTICLE 5

SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

Delete Section 5.2.1, and substitute the following:

5.2.1 Unless otherwise required by the Contract Documents, the Contractor shall furnish at the Pre-Construction Conference, to the Owner and the Architect, in writing, the names of the persons or entities (including those who are to furnish materials or equipment

fabricated to a special design) proposed for each of the principal portions of the Work. No Contractor payments shall be made until this information is received.

Delete Section 5.2.2, and substitute the following:

5.2.2 The Contractor shall be solely responsible for selection and performance of all subcontractors. The Contractor shall not be entitled to claims for additional time and/or an increase in the contract sum due to a problem with performance or nonperformance of a subcontractor.

Delete Sections 5.2.3 and 5.2.4 and substitute the following:

5.2.3 The Contractor shall notify the Architect and the Owner when a subcontractor is to be changed and substituted with another subcontractor.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

Delete Sections 5.4, 5.4.1, 5.4.2 and 5.4.3

ARTICLE 7

CHANGES IN THE WORK

7.1 GENERAL

Add the following Sections:

7.1.4 As part of the pre-construction conference submittals, the Contractor shall submit the following prior to the Contractor's initial request for payment:

7.1.4.1 Fixed job site overhead cost itemized with documentation to support daily rates.

7.1.4.2 Bond Premium Rate with supporting information from the General Contractor's carrier.

7.1.4.3 Labor Burden by trade for both Subcontractors and General Contractor. The Labor Burden shall be supported by the Worker's Compensation and Employer's Liability Insurance Policy Information Page. Provide for all trades.

7.1.4.4 Internal Rate Charges for all significant company owned equipment.

7.1.5 If the General Contractor fails to submit the aforementioned documentation as part of the pre-construction submittals, then pay applications shall not be processed until such time as the Owner receives this information.

7.2 CHANGE ORDERS

Delete Section 7.2.1, and substitute the following Sections:

7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, the Architect, and the Contractor issued after execution of the Contract, authorizing a change in the Work and/or an adjustment in the Contract Sum and/or the Contract Time.

The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time. Any reservation of rights, stipulation, or other modification made on the change order by the contractor shall have no effect.

7.2.2 "Cost of the Work" for the purpose of Change Orders shall be the eligible costs required to be incurred in performance of the Work and paid by the Contractor and Subcontractors which eligible costs shall be limited to:

7.2.2.1 Actual wages paid directly to labor personnel, with a labor burden markup exclusively limited to applicable payroll taxes, worker's compensation insurance, unemployment compensation, and social security taxes for those labor personnel performing the Work. Wages shall be the basic hourly labor rate paid an employee exclusive of fringe benefits or other employee costs. The labor burden percentage for the "Cost of the Work" is limited to categories listed herein. Employer-provided health insurance, fringe benefits, employee training (whether a requirement of employment or not), vacation pay, etc., are examples of ineligible labor burden costs which ***shall not*** be included, as these costs are already compensated by the Overhead and Profit markup.

Supervision shall not be included as a line item in the "Cost of the Work", except when the change results in a documented delay in the critical path, as described in Section 7.2.7.

7.2.2.2 Cost of all materials and supplies necessary and required to perform the Work, identifying each item and its individual cost, including taxes. Incidental consumables are not eligible costs and shall not be included.

7.2.2.3 Cost of each necessary piece of machinery and equipment required to perform the Work, identifying each item and its individual cost, including taxes. Incidental small tools of a specific trade (i.e., shovels, saws, hammers, air compressors, etc.,) and general use vehicles, such as pickup trucks even for moving items around the site, fuel for these general use vehicles, travel, lodging, and/or meals are not eligible and shall not be included.

7.2.2.4 Eligible Insurance costs shall be limited to documented increases in "Builder's Risk" insurance premium / costs only. Commercial General Liability, Automobile Liability, and all other required insurances, where referenced in the Contract shall be considered part of normal overhead. These costs are already compensated by the Overhead and Profit markup.

7.2.2.5 Cost for the General Contractor Performance and Payment Bond premium, where the documented cost of the premiums have been increased due to the Change Order.

7.2.3 Overhead and Profit - The Contractor and Subcontractor shall be due home office fixed overhead and profits on the Cost of the Work, but shall not exceed a total of 16% of the direct cost of any portion of Work.

The credit to the Owner resulting from a change in the Work shall be the sum of those items above, including overhead and profit. Where a change results in both credits to the Owner and extras to the Contractor for related items, overhead and profit shall be computed for

credits to the Owner and extras to the Contractor. The Owner shall receive full credit for the computed overhead and profit on credit change order items.

7.2.4 The cost to the Owner resulting from a change in the Work shall be the sum of: Cost of the Work (as defined at Section 7.2.2) and Overhead and Profit (as defined at Section 7.2.3), and shall be computed as follows:

7.2.4.1 When all of the Work is General Contractor Work; 8% markup on the Cost of the Work.

7.2.4.2 When the Work is all Subcontract Work; 8% markup on the Cost of the Work for Subcontractor's Overhead and Profit, plus 8% markup on the Cost of the Work, not including the Subcontractor's Overhead and Profit markup, for General Contractor's Overhead and Profit.

7.2.4.3 When the Work is a combination of General Contractor Work and Subcontract Work; that portion of the direct cost that is General Contract Work shall be computed per Section 7.2.4.1 and that portion of the direct cost that is Subcontract Work shall be computed per Section 7.2.4.2.

Premiums for the General Contractor's bond may be included, but after the markup is added to the Cost of the Work.
Premiums for the Subcontractor's Bond shall not be included.

7.2.4.4 Subcontract cost shall consist of the items in Section 7.2.2 above plus Overhead and Profit as defined in Section 7.2.3.

7.2.5 Before a Change Order is prepared, the Contractor shall prepare and deliver to the Architect the following information concerning the Cost of the Work, not subject to waiver, within a reasonable time after being notified to prepare said Change Order:

A detailed, itemized list of labor, material and equipment costs for the General Contractor's Work including quantities and unit costs for each item of labor, material and equipment.

An itemized list of labor, material and equipment costs for each Subcontractor's and/or Sub-Subcontractor's Work including quantities and unit costs for each item of labor, material and equipment.

7.2.6 After a Change Order has been approved, no future requests for extensions of time or additional cost shall be considered for that Change Order.

7.2.7 Extended fixed job-site costs are indirect costs that are necessary to support the work in the field. Examples of fixed job-site costs are field office rental, salaries of field office staff, field office utilities, and telephone.

Extended fixed job-site costs or equitable adjustment may be included in a Change Order due to a delay in the critical path, with the exception of weather related delays. In the event of a delay in the critical path, the Contractor shall submit all changes or adjustments to the Contract Time **within twenty-one (21) days** of the event giving rise to the delay. The Contractor shall submit documentation and justification for the adjustment by performing a

critical path analysis of its most recent schedule in use prior to the change, which shows an extension in critical path activities.

The Contractor shall notify the Architect in writing that the Contractor is making a claim for extended fixed job-site overhead as required by Section 15.1.2. The Contractor shall provide proof that the Contractor is unable to mitigate financial damages through Alternate Work within this Contract or replacement work. "Replacement Work" is that work which the Contractor is obligated to perform under any construction contract separate from this Contract. Reasonable proof shall be required by the Architect that the delays affected the Completion Date.

7.2.8 "Cost of the Work" whether General Contractor cost or Subcontractor cost shall not apply to the following:

7.2.8.1 Salaries or other compensation of the Contractor's personnel at the Contractor's principal office and branch offices.

7.2.8.2 Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the Work.

7.2.8.3 Overhead and general expenses of any kind or the cost of any item not specifically and expressly included above in Cost of the Work.

7.2.8.4 Cost of supervision refer to section 7.2.2.1, with exception as provided in Section 7.2.7.

7.2.9 When applicable as provided by the Contract, the cost to Owner for Change Orders shall be determined by quantities and unit prices. The quantity of any item shall be as submitted by the Contractor and approved by the Architect. Unit prices shall cover cost of Material, Labor, Equipment, Overhead and Profit.

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.3 In the first sentence after "following methods" insert: ", but not to exceed a specified amount".

7.3.4 From .1 of the list, delete all after "Costs of labor, including" and substitute the following "social security, old age and employment insurance, applicable payroll taxes, and workers' compensation insurance;"

Delete the following from .4 of the list: "permit fees,"

Delete Section 7.3.9 and substitute the following:

7.3.9 Pending final determination of the total costs of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs.

ARTICLE 8

TIME

8.1 DEFINITIONS

Add the following:

8.1.5 The Contract Time shall not be changed by the submission of a schedule that shows an early completion date unless specifically authorized by change order.

8.2 PROGRESS AND COMPLETION

Add to Section 8.2.1 the following:

Completion of the Work must be within the Time for Completion stated in the Agreement, subject to such extensions as may be granted under Section 8.3. The Contractor agrees to commence Work not later than fourteen (14) days after the transmittal date of Written Notice to Proceed from the Owner and to substantially complete the project within the time stated in the Contract. The Owner will suffer financial loss if the project is not substantially complete in the time set forth in the Contract Documents. The Contractor and the Contractor's Surety shall be liable for and shall pay to the Owner the sum stated in the Contract Documents as fixed, agreed and liquidated damages for each consecutive calendar day (Saturdays, Sundays and holidays included) of delay until the Work is substantially complete. The Owner shall be entitled to the sum stated in the Contract Documents. Such Liquidated Damages shall be withheld by the Owner from the amounts due the Contractor for progress payments.

Delete Section 8.2.2.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 In the first sentence after the words "Owner pending" delete the words "mediation and binding dispute resolution" and add the word "litigation", and delete the last word "determine" and add the following: "recommend, subject to Owner's approval of Change Order. If the claim is not made within the limits of Article 15, all rights for future claims for that month are waived."

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

Delete Section 9.1.2.

Delete Section 9.2 and substitute the following:

9.2 SCHEDULE OF VALUES

At the Pre-Construction Conference, the Contractor shall submit to the Owner and the Architect a Schedule of Values prepared as follows:

9.2.1 The attached Schedule of Values Format shall be used. If applicable, the cost of Work for each section listed under each division, shall be given. The cost for each section shall include Labor, Materials, Overhead and Profit.

9.2.2 The Total of all items shall equal the Total Contract Sum. This schedule, when approved by the Architect, shall be used as a basis for the Contractor's Applications for Payment and it may be used for determining the cost of the Work in deductive change orders, when a specific item of Work listed on the Schedule of Values is to be removed. Once the Schedule of Values is submitted at the Pre-Construction Conference, the schedule shall not be modified without approval from the Owner and Architect.

9.3 APPLICATIONS FOR PAYMENT

Delete Sections 9.3.1, 9.3.1.1, and 9.3.1.2 and substitute the following:

9.3.1 Monthly, the Contractor shall submit to the Architect a Facility Planning and Control – Application and Certification for Payment form, supported by any additional data substantiating the Contractor's right to payment as the Owner or the Architect may require. Application for Payment shall be submitted on or about the first of each month for the value of labor and materials incorporated into the Work and of materials, suitably stored, at the site as of the twenty-fifth day of the preceding month, less normal retainage as follows, per La R.S. 38:2248:

9.3.1.1 Projects with Contract price up to $500,000.00 – 10% of the Contract price.

9.3.1.2 Projects with Contract price of $500,000.00, or more – 5% of the Contract price.

9.3.1.3 No payment shall be made until the revised schedule required by Section 3.10.1 is received.

9.3.1.4 The normal retainage shall not be due the Contractor until after substantial completion and expiration of the forty-five day lien period and submission to the Architect of a clear lien certificate, consent of surety, and invoice for retainage.

Delete Section 9.3.2 and substitute the following:

9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. Payments for materials or equipment stored on the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, including applicable insurance.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Section 9.5.1.7: Delete the word "repeated".

Delete Section 9.5.4.

9.6 PROGRESS PAYMENTS

Delete Section 9.6.1 and substitute the following:

9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment within twenty days except for projects funded fully or in part by a Federal reimbursement

program. For such projects the Owner will make payment in a timely manner consistent with reimbursement.

9.6.2 Delete the phrase: "no later than seven days" from the first sentence.

After the end of the second sentence, add the following:

La R.S. 9:2784 (A) and (C) require a Contractor or Subcontractor to make payment due to each Subcontractor and supplier within fourteen (14) consecutive days of the receipt of payment from the Owner. If not paid, a penalty in the amount of ½ of 1% per day is due, up to a maximum of 15% from the expiration date until paid. The contractor or subcontractor, whichever is applicable, is solely responsible for payment of a penalty.

9.6.4 Delete the first two sentences of Section 9.6.4 and add the following to the end of the Section:

Pursuant to La. R.S. 38:2242 and La. R.S. 38:2242.2, when the Owner receives any claim of nonpayment arising out of the Contract, the Owner shall deduct 125% of such claim from the Contract Sum. The Contractor, or any interested party, may deposit security, in accordance with La. R.S. 38:2242.2, guaranteeing payment of the claim with the recorder of mortgages of the parish where the Work has been done. When the Owner receives original proof of such guarantee from the recorder of mortgages, the claim deduction will be added back to the Contract Sum.

Delete Section **9.7 FAILURE OF PAYMENT**.

Delete Section 9.8 and substitute the following:

9.8 SUBSTANTIAL COMPLETION

9.8.1 Substantial Completion is the stage in the progress of the Work when the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The Architect shall determine if the project is substantially complete in accordance with this Section.

9.8.2 When the Contractor considers that the Work is Substantially Complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

9.8.3 Upon receipt of the Contractor's list, the Architect shall make an inspection to determine whether the Work is substantially complete. A prerequisite to the Work being considered as substantially complete is the Owner's receipt of the executed Roofing Contractor's and Roofing Manufacturer's guarantees, where roofing Work is part of the Contract. Prior to inspection by the Architect, the Contractor shall notify the Architect that the project is ready for inspection by the State Fire Marshal's office. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use, the Contractor shall, before the Work can be considered as Substantially Complete, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

9.8.4 When the Architect determines that the project is Substantially Complete, he shall prepare a punch list of exceptions and the dollar value related thereto. The monetary value assigned to this list will be the sum of the cost estimate for each particular item of Work the Architect develops based on the mobilization, labor, material and equipment costs of correcting the item and shall be retained from the monies owed the contractor, above and beyond the standard lien retainage. The cost of these items shall be prepared in the same format as the schedule of values. At the end of the forty-five day lien period payment shall be approved for all punch list items completed up to that time. After that payment, none of the remaining funds shall be due the contractor until all punch list items are completed and are accepted by the Architect. If the dollar value of the punch list exceeds the amount of funds, less the retainage amount, in the remaining balance of the Contract, then the Project shall not be considered as substantially complete. If funds remaining are less than that required to complete the Work, the Contractor shall pay the difference.

9.8.5 When the preparation of the punch list is complete the Architect shall prepare a Recommendation of Acceptance incorporating the punch list and submit it to the Owner. Upon approval of the Recommendation of Acceptance, the Owner may issue a Notice of Acceptance of Building Contract which shall establish the Date of Substantial Completion. The Contractor shall record the Notice of Acceptance with the Clerk of Court in the Parish in which the Work has been performed. If the Notice of Acceptance has not been recorded seven (7) days after issuance, the Owner may record the Acceptance at the Contractor's expense. All additive change orders must be processed before issuance of the Recommendation of Acceptance. The Owner shall not be responsible for payment for any Work associated with change orders that is not incorporated into the contract at the time of the Recommendation of Acceptance.

9.8.6 Warranties required by the Contract Documents shall commence on the date of Acceptance of the Work unless otherwise agreed to in writing by the Owner and Contractor. Unless otherwise agreed to in writing by the Owner and Contractor, security, maintenance, heat, utilities, damage to the Work not covered by the punch list and insurance shall become the Owner's responsibility on the Date of Substantial Completion.

9.8.7 If all punch list items have not been completed by the end of the forty-five (45) day lien period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within forty-five (45) days after notification, the Surety has not completed the punch list, through no fault of the Architect or Owner, the Owner may, at his option, contract to have the balance of the Work completed and pay for such Work with the unpaid funds remaining in the Contract sum. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future state contracts. If the surety fails to complete the punch list within the stipulated time period, the Owner may not accept bonds submitted, in the future, by the surety.

9.9 PARTIAL OCCUPANCY OR USE

Delete Section 9.9.1 and substitute the following:

9.9.1 Partial Occupancy is that stage in the progress of the Work when a designated portion of the Work is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the designated portion of the Work for its intended use. The Owner may

occupy or use any substantially completed portion of the Work so designated by separate agreement with the Contractor and authorized by public authorities having jurisdiction over the Work. Such occupancy or use may commence provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers the designated portion substantially complete the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld.

9.10 FINAL COMPLETION AND FINAL PAYMENT

Delete Section 9.10.4 and replace with the following:

9.10.4 The making of final payment shall not constitute a waiver of Claims by the Owner for the following:

9.10.4.1 Claims, security interests, or encumbrances arising out of the Contract and unsettled;

9.10.4.2 failure of the Work to comply with the requirements of the Contract Documents irrespective of when such failure is discovered;

9.10.4.3 terms of special warranties required by the Contract Documents; or

9.10.4.4 audits performed by the Owner, after final payment.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.2 In the first sentence, between the words: "bearing on" and "safety", add the words: "the health and,"

10.3 HAZARDOUS MATERIALS

10.3.1 In the second sentence after (PCB) add: "or lead".

10.3.2 After the first sentence, delete all remaining sentences.

Add at the end: "The Contract time shall be extended appropriately."

Delete Section 10.4 and substitute the following:

10.4 EMERGENCIES

In an emergency affecting the safety of persons or property, the Contractor shall notify the Owner and Architect immediately of the emergency, simultaneously acting at his discretion to prevent damage, injury or loss. Any additional compensation or extension

of time claimed by the Contractor on account of emergency Work shall be determined as provided in Article 15 and Article 7.

ARTICLE 11

INSURANCE AND BONDS

AIA A101 – 2017 Exhibit A is not a part of these documents. Delete all of Sections 11.1, 11.2, 11.3, 11.4, and 11.5, and substitute the following:

INSURANCE REQUIREMENTS FOR NEW CONSTRUCTION, ADDITIONS AND RENOVATIONS

11.1 CONTRACTOR'S LIABILITY INSURANCE

The Contractor shall purchase and maintain without interruption for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by the Contractor, its agents, representatives, employees or subcontractors. The duration of the contract shall be from the inception of the contract until the date of final payment.

11.2 MINIMUM SCOPE AND LIMITS OF INSURANCE

11.2.1 Worker's Compensation

Worker's Compensation insurance shall be in compliance with the Worker's Compensa-tion law of the Contractor's headquarters. Employers Liability is included with a minimum limit of $1,000,000 per accident/per disease/per employee. If Work is to be performed over water and involves maritime exposure, applicable LHWCA, Jones Act or other maritime law coverage shall be included. A.M. Best's insurance company rating requirement may be waived for Worker's compensation coverage only.

11.2.2 Commercial General Liability

Commercial General Liability insurance, including Personal and Advertising Injury Liability and Products and Completed Operations Liability, shall have a minimum limit per occurrence based on the project value. The Insurance Services Office (ISO) Commercial General Liability occurrence coverage form CG 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. Claims-made form is unacceptable.

The aggregate loss limit must apply to each project. ISO form CG 25 03 (current form approved for use in Louisiana), or equivalent, shall also be submitted. The State project number, including part number, and project name shall be included on this endorsement.

COMBINED SINGLE LIMIT (CSL) PER OCCURRENCE

Type of Construction	**Projects up to $1,000,000**	**Projects over $1,000,000 up to $10,000,000**	**Projects over $10,000,000**
New Buildings:			
Each Occurrence			

Minimum Limit	$1,000,000	$2,000,000	$4,000,000
Per Project Aggregate	$2,000,000	$4,000,000	$8,000,000

Renovations: **The building(s) value for the Project is $1,719,942.00.**

Each Occurrence Minimum Limit	$1,000,000**	$2,000,000**	$4,000,000**
Per Project Aggregate	2 times per occur limit**	2 times per occur limit**	2 times per occur limit**

**While the minimum Combined Single Limit of $1,000,000 is required for any renovation, the limit is calculated by taking 10% of the building value and rounding it to the nearest $1,000,000 to get the insurance limit. Example: Renovation on a $33,000,000 building would have a calculated $3,000,000 combined single limit of coverage (33,000,000 times .10 = 3,300,000 and then rounding down to $3,000,000). If the calculated limit is less than the minimum limit listed in the above chart, then the amount needed is the minimum listed in the chart. Maximum per occurrence limit required is $10,000,000 regardless of building value. The per project aggregate limit is then calculated as twice the per occurrence limit.

11.2.3 Automobile Liability

Automobile Liability Insurance shall have a minimum combined single limit per occurrence of $1,000,000. ISO form number CA 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. This insurance shall include third-party bodily injury and property damage liability for owned, hired and non-owned automobiles.

11.2.4 Excess Umbrella

Excess Umbrella Insurance may be used to meet the minimum requirements for General Liability and Automobile Liability only.

11.2.5 Builder's Risk

11.2.5.1 Builder's Risk Insurance shall be in an amount equal to the amount of the construction contract including any amendments and shall be upon the entire Work included in the contract. The policy shall provide coverage equivalent to the ISO form number CP 10 20, Broad Form Causes of Loss (extended, if necessary, to include the perils of wind, earthquake, collapse, vandalism/malicious mischief, and theft, including theft of materials whether or not attached to any structure). The policy must include architects' and engineers' fees necessary to provide plans, specifications and supervision of Work for the repair and/or replacement of property damage caused by a covered peril, not to exceed 10% of the cost of the repair and/or replacement.

11.2.5.2 Flood coverage shall be provided by the Contractor on the first floor and below for all projects, except as otherwise noted. The builder's risk insurance policy, sub-limit for flood coverage shall not be less than ten percent (10%) of the total contract cost per occurrence. If flood is purchased as a separate policy, the limit shall be

ten percent (10%) of the total contract cost per occurrence (with a max of $500,000 if NFIP). Coverage for roofing projects shall **not** require flood coverage.

11.2.5.3 A Specialty Contractor may provide an installation floater in lieu of a Builder's Risk policy, with the similar coverage as the Builder's Risk policy, upon the system to be installed in an amount equal to the amount of the contract including any amendments. Flood coverage is not required.

11.2.5.4 The policy must include coverage for the Owner, Contractor and any subcontractors as their interests may appear.

11.2.6 Pollution Liability *(required when asbestos or other hazardous material abatement is included in the contract)*

Pollution Liability insurance, including gradual release as well as sudden and accidental, shall have a minimum limit of not less than $1,000,000 per claim. A claims-made form will be acceptable. A policy period inception date of no later than the first day of anticipated Work under this contract and an expiration date of no earlier than 30 days after anticipated completion of all Work under the contract shall be provided. There shall be an extended reporting period of at least 24 months, with full reinstatement of limits, from the expiration date of the policy if the policy is not renewed. The policy shall not be cancelled for any reason, except non-payment of premium.

11.2.7 Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and accepted by the Owner. The Contractor shall be responsible for all deductibles and self-insured retentions.

11.3 OTHER INSURANCE PROVISIONS

11.3.1 The policies are to contain, or be endorsed to contain, the following provisions:

11.3.1.1 Worker's Compensation and Employers Liability Coverage

11.3.1.1.1 To the fullest allowed by law, the insurer shall agree to waive all rights of subrogation against the Owner, its officers, agents, employees and volunteers for losses arising from Work performed by the Contractor for the Owner.

11.3.1.2 Commercial General Liability Coverage

11.3.1.2.1 The Owner, its officers, agents, employees and volunteers are to be added as additional insureds as respects liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor, premises owned, occupied or used by the Contractor. ISO Form CG 20 10 (for ongoing work) AND CG 20 37 (for completed work) (current forms approved for use in Louisiana), or equivalent, are to be used.

11.3.1.2.2 The Contractor's insurance shall be primary as respects the Owner, its officers, agents, employees and volunteers for any and all losses that occur under the contract. The coverage shall contain no special

limitations on the scope of protection afforded to the Owner, its officers, officials, employees or volunteers. Any insurance or self-insurance maintained by the Owner shall be excess and non-contributory of the Contractor's insurance.

11.3.1.3 Builder's Risk

The policy must include an endorsement providing the following:

In the event of a disagreement regarding a loss covered by this policy, which may also be covered by a State of Louisiana self-insurance or commercial property policy through the Office of Risk Management (ORM), Contractor and its insurer agree to follow the following procedure to establish coverage and/or the amount of loss:

Any party to a loss may make written demand for an appraisal of the matter in disagreement. Within 20 days of receipt of written demand, the Contractor's insurer and either ORM or its commercial insurance company shall each select a competent and impartial appraiser and notify the other of the appraiser selected. The two appraisers shall select a competent and impartial umpire. The appraisers shall then identify the policy or policies under which the loss is insured and, if necessary, state separately the value of the property and the amount of the loss that must be borne by each policy. If the two appraisers fail to agree, they shall submit their differences to the umpire. A written decision by any two shall determine the policy or policies and the amount of the loss. Each insurance company agrees that the decision of the appraisers and the umpire if involved shall be binding and final and that neither party will resort to litigation. Each of the two parties shall pay its chosen appraiser and bear the cost of the umpire equally.

11.3.1.4 All Coverages

11.3.1.4.1 All policies must be endorsed to require 30 days written notice of cancellation to the Agency. Ten-day written notice of cancellation is acceptable for non-payment of premium. Notifications shall comply with the standard cancellation provisions in the Contractor's policy. In addition, Contractor is required to notify Agency of policy cancellations or reductions in limits.

11.3.1.4.2 Neither the acceptance of the completed Work nor the payment thereof shall release the Contractor from the obligations of the insurance requirements or indemnification agreement.

11.3.1.4.3 The insurance companies issuing the policies shall have no recourse against the Owner for payment of premiums or for assessments under any form of the policies.

11.3.1.4.4 Any failure of the Contractor to comply with reporting provisions of the policy shall not affect coverage provided to the Owner, its officers, agents, employees and volunteers.

11.3.2 Acceptability of Insurers

All required insurance shall be provided by a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located. Insurance shall be placed with insurers with an A.M. Best's rating of **A-: VI or higher**. This rating requirement may be waived for Worker's compensation coverage only.

If at any time an insurer issuing any such policy does not meet the minimum A.M. Best rating, the Contractor shall obtain a policy with an insurer that meets the A.M. Best rating and shall submit another certificate of insurance within 30 days.

11.3.3 Verification of Coverage

Contractor shall furnish the Owner with Certificates of Insurance reflecting proof of required coverage. The Certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The Certificates are to be received and approved by the Owner before Work commences and upon any contract renewal or insurance policy renewal thereafter. The Certificate Holder must be listed as follows:

State of Louisiana
Name of Owner
Owner Address
City, State, Zip
Attn: Project # _____

The Owner reserves the right to request complete certified copies of all required insurance policies at any time.

Upon failure of the Contractor to furnish, deliver and maintain required insurance, this contract, at the election of the Agency, may be suspended, discontinued, or terminated. Failure of the Contractor to purchase and/or maintain any required insurance shall not relieve the Contractor from any liability or indemnification under the contract.

If the Contractor does not meet the insurance requirements at policy renewal, at the option of the Owner, payment to the Contractor may be withheld until the requirements have been met, OR the Owner may pay the renewal premium and withhold such payment from any monies due the Contractor, OR the contract may be suspended or terminated for cause.

11.3.4 Subcontractors

Contractor shall include all subcontractors as insureds under its policies OR shall be responsible for verifying and maintaining the certificates provided by each subcontractor. Subcontractors shall be subject to all of the requirements stated herein. The Owner reserves the right to request copies of subcontractor's certificates at any time.

If Contractor does not verify subcontractors' insurance as described above, Owner has the right to withhold payments to the Contractor until the requirements have been met.

11.3.5 Worker's Compensation Indemnity

In the event Contractor is not required to provide or elects not to provide Worker's compensation coverage, the parties hereby agree the Contractor, its Owners, agents and employees shall have no cause of action against, and shall not assert a claim against, the State of Louisiana, its departments, agencies, agents and employees as an employer,

whether pursuant to the Louisiana Worker's Compensation Act or otherwise, under any circumstance. The parties also hereby agree that the State of Louisiana, its departments, agencies, agents and employees shall in no circumstance be, or considered as, the employer or statutory employer of Contractor, its Owners, agents and employees. The parties further agree that Contractor is a wholly independent Contractor and is exclusively responsible for its employees, Owners, and agents. Contractor hereby agrees to protect, defend, indemnify and hold the State of Louisiana, its departments, agencies, agents and employees harmless from any such assertion or claim that may arise from the performance of this contract.

11.3.6 Indemnification/Hold Harmless Agreement

Contractor agrees to protect, defend, indemnify, save, and hold harmless, the State of Louisiana, all State Departments, Agencies, Boards and Commissions, its officers, agents, servants, employees and volunteers, from and against any and all claims, damages, expenses and liability arising out of injury or death to any person or the damage, loss or destruction of any property which may occur, or in any way grow out of, any act or omission of Contractor, its agents, servants and employees, or any and all costs, expenses and/or attorney fees incurred by Contractor as a result of any claims, demands, suits or causes of action, except those claims, demands, suits or causes of action arising out of the negligence of the State of Louisiana, all State Departments, Agencies, Boards, Commissions, its officers, agents, servants, employees and volunteers.

Contractor agrees to investigate, handle, respond to, provide defense for and defend any such claims, demands, suits or causes of action at its sole expense and agrees to bear all other costs and expenses related thereto, even if the claims, demands, suits, or causes of action are groundless, false or fraudulent. The State of Louisiana may, but is not required to, consult with the Contractor in the defense of claims, but this shall not affect the Contractor's responsibility for the handling and expenses of all claims.

11.4 PERFORMANCE AND PAYMENT BOND

11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

11.4.3 Recordation of Contract and Bond [La R.S. 38:2241 thru 38:2241.1]

The Owner shall record within thirty (30) days the Contract Between Owner and Contractor and Performance and Payment Bond with the Clerk of Court in the Parish in which the Work is to be performed.

ARTICLE 12

UNCOVERING AND CORRECTION OF WORK

12.2 CORRECTION OF WORK

12.2.1 Before Substantial Completion

At the end of the paragraph, add the following sentences:
"If the Contractor fails to correct Work identified as defective within a thirty (30) day period, through no fault of the Designer, the Owner may hold the Contractor in default. If the Owner finds the Contractor in default, the Surety shall be notified. If within thirty (30) days after notification, the Surety has not corrected the nonconforming Work, through no fault of the Architect or Owner, the Owner may contract to have nonconforming Work corrected and hold the Surety and Contractor responsible for the cost, including architectural fees and other indirect costs. If the Surety fails to correct the Work within the stipulated time period and fails to meet its obligation to pay the costs, the Owner may elect not to accept bonds submitted in the future by the Surety. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future state contracts.

12.2.2 After Substantial Completion

12.2.2.1 At the end of the paragraph delete the last sentence and add the following sentences:
"If the Contractor fails to correct nonconforming Work, or Work covered by warranties, within a thirty (30) day period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within thirty (30) days after notification, the Surety has not corrected the non-conforming or warranty Work, through no fault of the Architect or Owner, the Owner may contract to have the nonconforming or warranty Work corrected and hold the Surety responsible for the cost including architects fees and other indirect costs. Corrections by the Owner shall be in accordance with Section 2.4. If the Surety fails to correct the nonconforming or warranty Work within the stipulated time period and fails to meet its obligation to pay the costs, the Owner may not accept bonds submitted, in the future, by the Surety."

ARTICLE 13

MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

Delete all after the word "located".

13.2 SUCCESSORS AND ASSIGNS

13.2.1 In the second sentence, delete "Except as … 13.2.2"

Delete Section 13.2.2.

13.3 RIGHTS AND REMEDIES

Add the following Section 13.3.3:

13.3.3 The Nineteenth Judicial Court in and for the Parish of East Baton Rouge, State of Louisiana shall have sole jurisdiction and venue in any action brought under this contract.

13.4 TESTS AND INSPECTIONS

In Section 13.4.1, delete the second sentence and substitute the following:

The Contractor shall make arrangements for such tests, inspections and approvals with the Testing Laboratory provided by the Owner, and the Owner shall bear all related costs of tests, inspections and approvals.

Delete the last two sentences of Section 13.4.1.

13.5 INTEREST

Delete Section 13.5.

ARTICLE 14

TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

Delete Section 14.1.1.4.

In Section 14.1.3, after the word "profit," delete the words "on Work not executed" and substitute the following: "for Work completed prior to stoppage".

14.2 TERMINATION BY THE OWNER FOR CAUSE

Add the following Section:

14.2.1.5 failure to complete the punch list within the lien period as provided in 9.8.7.

14.2.3 Add the following sentence:

"Termination by the Owner shall not suspend assessment of liquidated damages against the Surety."

Add the following Section:

14.2.5 If an agreed sum of liquidated damages has been established, termination by the Owner under this Article shall not relieve the Contractor and/or Surety of his obligations under the liquidated damages provisions and the Contractor and/or Surety shall be liable to the Owner for per diem liquidated damages.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

In Section 14.4.3, delete all after "incurred by reason of the termination," and add "along with reasonable profit on the Work not executed."

ARTICLE 15

CLAIMS AND DISPUTES

15.1 CLAIMS

Delete Section 15.1.2, **Time Limit on Claims,** (See La R.S. 38:2189, and 38:2189.1).

15.1.3.1 Add the following to the end of the paragraph:
"A Reservation of Rights and similar stipulations shall not be recognized under this contract as having any effect. A party must make a claim as defined herein within the time limits provided."

15.1.4.2 In the first sentence of the Section, delete "Initial Decision Maker's" and replace with "Architect's". In the second sentence of the Section, delete "the decision of the Initial Decision Maker" and replace with: "his/her decision".

Delete Section 15.1.6.2 and substitute the following:

15.1.6.2 If adverse weather conditions are the basis for a claim for additional time, the Contractor shall document that weather conditions had an adverse effect on the scheduled construction. An increase in the contract time due to weather shall not be cause for an increase in the contract sum. At the end of each month, the Contractor shall make one Claim for any adverse weather days occurring within the month. The Claim must be accompanied by sufficient documentation evidencing the adverse days and the impact on construction. Failure to make such Claim within **twenty-one (21) days** from the last day of the month shall prohibit any future claims for adverse days for that month. No additional adverse weather days shall be granted after the original or extended contract completion date, except those adverse weather days associated with a National Weather Service named storm or federally declared weather related disaster directly affecting the project site.

Add the following Section:

15.1.6.3 The following are considered reasonably anticipated days of adverse weather on a monthly basis:

January	11 days	July	6 days
February	10 days	August	5 days
March	8 days	September	4 days
April	7 days	October	3 days
May	5 days	November	5 days
June	6 days	December	8 days

The Contractor shall ask for total adverse weather days. The Contractor's request shall be considered only for days over the allowable number of days stated above.

Note: Contract is on a calendar day basis.

15.2 INITIAL DECISION

15.2.1 In the second sentence, delete the word "will" and replace with: "shall always".

In the second sentence, delete the phrase: ", unless otherwise indicated in the Agreement."

In the third sentence, delete the word "mediation" and replace with: "litigation".

At the end of the third sentence, add: "arising prior to the date final payment is due".

Delete the fourth sentence.

15.2.5 In the middle of the first sentence, delete all after the phrase: "rejecting the Claim".

In the second sentence, delete the phrase: "and the Architect, if the Architect is not serving as the Initial Decision Maker,".

In the third sentence, delete all after: "binding on the parties" and add the following: "except that the Owner may reject the decision or suggest a compromise or both".

Delete Section 15.2.6.

Delete Section 15.2.6.1.

15.3 MEDIATION

Delete Section 15.3.

15.4 ARBITRATION

Delete Section 15.4.

FOR INFORMATION ONLY

This document will be prepared by Facility Planning & Control in the form appropriate for the project.

STATE OF LOUISIANA
PARISH OF **«PARISH_OF_PROJECT»**

CONTRACT BETWEEN OWNER AND CONTRACTOR
AND PERFORMANCE AND PAYMENT BOND

This agreement entered into this _____ day of _____, 2026, by **«Contractor»** hereinafter called the "Contractor", whose business address is **«Contractor_Address», «Contractor_City», «Contractor_State» «Contractor_Zip»**, and the State of Louisiana Division of Administration, herein represented by the contracting officer executing this contract, hereinafter called the "Owner".

Witnesseth that the Contractor and the Owner, in consideration of premises and the mutual covenants; consideration and agreement herein contained, agree as follows:

Statement of Work: The contractor shall furnish all labor and materials and perform all of the work required to build, construct and complete in a thorough and workmanlike manner:

«Project_Reference_1»
«Project_Reference_2»
«Project_Reference_3»
«Project_City», Louisiana
Project No.: «ProjectNo», «Part_No»«WBS»;
«Supplement_Project_No», Part «Supplement_Part_No»
(«Supplement_WBS»)(Supplement)
State ID No.: «StateID» Site Code: «SiteCode»

in strict accordance with Contract Documents prepared by:

«Designer»
«Designer_Address»
«Designer_City», «Designer_State» «Designer_Zip»

It is recognized by the parties herein that said Contract Documents including by way of example and not of limitation, the Drawings and Specifications dated **«Drawings_and_Specs_Date»**, Addenda number(s) **«Addenda_No»**, the Instruction to Bidders, Bid Form, General Conditions, Supplementary Conditions, any Addenda thereto, impose duties and obligations upon the parties herein, and said parties thereby agree that they shall be bound by said duties and obligations. For these purposes, all of the provisions contained in the aforementioned Construction Documents are incorporated herein by reference with the same force and effect as though said Construction Documents were herein set out in full.

Time for Completion: The work shall be commenced on a date to be specified in a written order of the Owner and shall be completed within **«Time_Completion_Days» («Time_Completion_Days»)** consecutive calendar days from and after the said date.

Liquidated Damages: Contractor shall be assessed Liquidated Damages in the amount of **«Liquidated_Damages_Cost_Per_Day»** per day for each consecutive calendar day which work is not complete beginning with the first day beyond the completion time.

Compensation to be paid to the Contractor: The Owner will pay and the Contractor will accept in full consideration for the performance of the contract the sum of **«Contract_Amount_Words» and No/100 Dollars («Contract_Amount_Numeral»)** which sum represents the **«Base_Bid_Only_or_Plus_Alternates»**

Taxes: Contractor hereby agrees that the responsibility for payment of taxes from the funds thus received under this Contract and/or legislative appropriation shall be contractor's obligation and identified under Federal tax identification number _____.

Performance and Payment Bond: To these presents personally came and intervened _____, herein acting for _____, a corporation organized and existing under the laws of the State of _____ _____, and duly authorized to transact business in the State of Louisiana, as surety, who declared that having taken cognizance of this contract and of the Construction Documents mentioned herein, he hereby in his capacity as its Attorney in Fact obligates his said company, as Surety for the said Contractor, unto the said Owner, up to the sum of **«Contract_Amount_Words» and No/100 Dollars («Contract_Amount_Numeral»)**. By issuance of this bond, the surety acknowledges they are in compliance with R.S. 38:2219.

The condition of this performance and payment bond shall be that should the Contractor herein not perform the contract in accordance with the terms and conditions hereof, or should said Contractor not fully indemnify and save harmless the Owner, from all cost and damages which he may suffer by said Contractor's non-performance or should said Contractor not pay all persons who have and fulfill obligations to perform labor and/or furnish materials in the prosecution of the work provided for herein, including by way of example workmen, laborers, mechanics, and furnishers of materials, machinery, equipment and fixtures, then said Surety agrees and is bound to so perform the contract and make said payment(s).

Provided, that any alterations which may be made in the terms of the contract or in the work to be done under it, or the giving by the Owner of any extensions of time for the performance of the contract, or any other forbearance on the part of either the Owner or the Contractor to the other shall not in any way release the Contractor or the Surety from their liability hereunder, notice to the Surety of any such alterations, extensions or other forbearance being hereby waived.

Contractor acknowledges and agrees to comply with the provisions of La. R.S. 38:2212.10 and federal law pertaining to E-Verify in the performance of services under this Contract.

It is hereby agreed that the Legislative Auditor of the State of Louisiana and/or the Office of the Governor, Division of Administration auditors shall have the option of auditing all accounts of contractor which relate to this contract.

The continuation of this contract is contingent upon the appropriation of funds to fulfill the requirements of the contract by the legislature. If the legislature fails to appropriate sufficient monies to provide for the continuation of the contract, or if such appropriation is reduced by the veto of the Governor or by any means provided in the appropriations act to prevent the total appropriation for the year from exceeding revenues for that year, or for any other lawful purpose, and the effect of such reduction is to provide insufficient monies for the continuation of the contract, the contract shall terminate on the date of the beginning of the first fiscal year for which funds are not appropriated.

The contractor agrees to abide by the requirements of the following as applicable: Title VI of the Civil Rights Act of 1964 and Title VII of the Civil Rights Act of 1964, as amended by the Equal Employment Opportunity Act of 1972, Federal Executive Order 11246 as amended, the Rehabilitation Act of 1973, as amended, the Vietnam Era Veteran's Readjustment Assistance Act of 1974, Title IX of the Education Amendments of 1972, the Age Discrimination Act of 1975, the Fair Housing Act of 1968 as amended, and contractor agrees to abide by the requirements of the Americans with Disabilities Act of 1990.

Contractor agrees not to discriminate in its employment practices, and will render services under this contract without regard to race, color, religion, sex, sexual orientation, national origin, veteran status, political affiliation, disability, or age in any matter relating to employment. Any act of discrimination committed by Contractor, or failure to comply with these statutory obligations when applicable shall be grounds for termination of this contract.

In accordance with R.S. 39:1602.1, effective May 22, 2018, for any contract for $100,000 or more and for any contractor with five or more employees, Contractor, or any Subcontractor, shall certify it is not engaging in a boycott of Israel, and shall, for the duration of this contract, refrain from a boycott of Israel. The State reserves the right to terminate this contract if the Contractor, or any Subcontractor, engages in a boycott of Israel during the term of the contract.

Contractor has a continuing obligation to disclose any suspensions or debarment by any government entity, including but not limited to General Services Administration (GSA). Failure to disclosed may constitute grounds for suspension and/or termination of the Contract and debarment from future Contracts.

Contractor, and each tier of Subcontractors, shall certify that it is not on the List of Parties Excluded from Federal Procurement or Nonprocurement Programs promulgated in accordance with E.O.s 12549 and 12689, "Debarment and Suspension," as set forth at 24 CFR part 24.

In Witness whereof, the parties hereto on the day and year first above written have executed this agreement in six (6) counterparts, each of which shall, without proof or accountancy for the other counterparts, be deemed an original thereof.

THUS DONE AND SIGNED at Baton Rouge, Louisiana, on the day, month, and year first written above.

WITNESSES:

STATE OF LOUISIANA
DIVISION OF ADMINISTRATION

FP&C Witness #1 Sign Here

BY: _____
Roger Husser
FP&C DIRECTOR

FP&C Witness #2 Sign Here

Contractor Witness #1 Sign Here

BY: _____
«CONTRACTOR»

Contractor Witness #2 Sign Here

SURETY:

Surety Witness #1 Sign Here

BY: _____
ATTORNEY IN FACT

Surety Witness #2 Sign Here

_____
ADDRESS

_____
TELEPHONE NUMBER

STATE OF LOUISIANA
PARISH OF **«PARISH_OF_CONTRACTOR»**

PROJECT NO.:«ProjectNo», «Part_No»«WBS»;
«Supplement_Project_No», Part
«Supplement_Part_No» («Supplement_WBS»)(Supplement)
NAME: «Project_Reference_1»
«Project_Reference_2»
«Project_Reference_3»
LOCATION: «Project_City»

NON-COLLUSION AFFIDAVIT

Before me, the undersigned authority, duly commissioned and qualified within and for the State and Parish aforesaid, personally came and appeared _____ representing **«Contractor»** who, being by me first duly sworn deposed and said that he has read this affidavit and does hereby agree under oath to comply with all provisions herein as follows:

PART I.

Section 2224 of Part II of Chapter 10 of Title 38 of the Louisiana Revised Statutes, as amended.

(1) That affiant employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for affiant; and

(2) That no part of the Contract price received by affiant was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the Contract, other than the payment of their normal compensation to persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project were in the regular course of their duties for affiant.

PART II.

Section 2190 of Part I of Chapter 10 of Title 38 of the Louisiana Revised Statutes, as amended.

That affiant, if an architect or engineer, or representative thereof, does not own a substantial financial interest, either directly or indirectly, in any corporation, firm, partnership, or other organization which supplies materials for the construction of a public work when the architect or engineer has performed architectural or engineering services, either directly or indirectly, in connection with the public work for which the materials are being supplied.

For the purposes of this Section, a "substantial financial interest" shall exclude any interest in stock being traded on the American Stock Exchange or the New York Stock Exchange.

That affiant, if subject to the provisions of this section, does hereby agree to be subject to the penalties involved for the violation of this section.

_____
AFFIANT

SWORN TO AND SUBSCRIBED BEFORE ME THIS _____ DAY OF _____, 2026.

_____
NOTARY

STATE OF LOUSIANA
PARISH OF East Baton Rouge

PROJECT NO. P0085282
NAME: Agricultural Research & Extension Center Greenhouse Modification
LOCATION: Southern University Baton Rouge, Louisiana

AFFIDAVIT

Before me, the undersigned authority, duly commissioned and qualified within and for the State and Parish aforesaid, personally came and appeared _____ representing Bani, Carville & Brown, AIA Architects Inc. who, being by me first duly sworn deposed and said that he has read this affidavit and does hereby agree under oath to comply with all provisions herein as follows:

PART I.

Section 2224 of Part II of Chapter 10 of Title 38 of the Louisiana Revised Statutes, as amended.

(1) That affiant employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties fro affiant; and

(2) That no part of the Contract price received by affiant was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the Contract, other than the payment of their normal compensation to persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project were in the regular course of their duties for affiant.

PART II.

Section 2190 of Part I of Chapter 10 of Title 38 of the Louisiana Revised Statutes, as amended.

That affiant, if an architect or engineer, or representative thereof, does not own a substantial financial interest, either directly or indirectly, in any corporation, firm, partnership, or other organization which supplies materials for the construction of a public work when the architect or engineer has performed architectural or engineering services, either directly or indirectly, in connection with the public work for which the materials are being supplied.

For the purposes of this Section, a "substantial financial interest" shall exclude any interest in stock being traded on the American Stock Exchange or the New York Stock Exchange.

That affiant, if subject to the provisions of this section, does hereby agree to be subject to the penalties involved for the violation of this section.

_____
AFFIANT

SWORN TO AND SUBSCRIBED BEFORE ME THIS ____ DAY OF _____, 2019

_____
NOTARY

Agricultural Research & Extension Center
Greenhouse Modification

P0085282

Name of Project **Project No.**

STATE OF Louisiana

PARISH OF East Baton Rouge

ATTESTATIONS AFFIDAVIT

Before me, the undersigned notary public, duly commissioned and qualified in and for the parish and state aforesaid, personally came and appeared Affiant, who after being duly sworn, attested as follows:

LA. R.S. 38:2227 PAST CRIMINAL CONVICTIONS OF BIDDERS

A. No sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes:

(a) Public bribery (R.S. 14:118)
(b) Corrupt influencing (R.S. 14:120)
(c) Extortion (R.S. 14:66)
(d) Money laundering (R.S. 14:230)

B. Within the past five years from the project bid date, no sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes, during the solicitation or execution of a contract or bid awarded pursuant to the provisions of Chapter 10 of Title 38 of the Louisiana Revised Statutes:

(a) Theft (R.S. 14:67)
(b) Identity Theft (R.S. 14:67.16)
(c) Theft of a business record (R.S.14:67.20)
(d) False accounting (R.S. 14:70)
(e) Issuing worthless checks (R.S. 14:71)
(f) Bank fraud (R.S. 14:71.1)
(g) Forgery (R.S. 14:72)
(h) Contractors; misapplication of payments (R.S. 14:202)
(i) Malfeasance in office (R.S. 14:134)

LA. R.S. 38:2212.10 Verification of Employees

A. At the time of bidding, Appearer is registered and participates in a status verification system to verify that all new hires in the state of Louisiana are legal citizens of the United States or are legal aliens.

B. If awarded the contract, Appearer shall continue, during the term of the contract, to utilize a status verification system to verify the legal status of all new employees in the state of Louisiana.

C. If awarded the contract, Appearer shall require all subcontractors to submit to it a sworn affidavit verifying compliance with Paragraphs (A) and (B) of this Subsection.

Name of Project **Project No.**

LA. R.S. 23:1726(B) Certification Regarding Unpaid Workers Compensation Insurance

A. R.S. 23:1726 prohibits any entity against whom an assessment under Part X of Chapter 11 of Title 23 of the Louisiana Revised Statutes of 1950 (Alternative Collection Procedures & Assessments) is in effect, and whose right to appeal that assessment is exhausted, from submitting a bid or proposal for or obtaining any contract pursuant to Chapter 10 of Title 38 of the Louisiana Revised Statutes of 1950 and Chapters 16 and 17 of Title 39 of the Louisiana Revised Statutes of 1950.

B. By signing this bid /proposal, Affiant certifies that no such assessment is in effect against the bidding / proposing entity.

NAME OF BIDDER **NAME OF AUTHORIZED SIGNATORY OF BIDDER**

DATE **TITLE OF AUTHORIZED SIGNATORY OF BIDDER**

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER/AFFIANT

Sworn to and subscribed before me by Affiant on the_____day of_____, 20___.

Notary Public

SCHEDULE OF VALUES

The Contractor is to use the following format. The total Contract Cost is to be itemized in each Subsection listed (as applicable)

DIVISION 01 – GENERAL REQUIREMENTS	Quantity	Cost
01 00 00 General Requirements		
01 32 50 Record drawings, Shop Drawings, Product Data, Samples and other submittals.		
	TOTAL	
DIVISION 02 – EXISTING CONDITIONS		
02 30 00 Subsurface Investigation		
02 41 00 Demolition		
	TOTAL	
DIVISION 03 – CONCRETE		
03 01 00 Maintenance of Concrete		
03 11 00 Concrete Forming		
03 15 00 Concrete Accessories		
03 20 00 Concrete Reinforcing		
03 30 00 Cast-In-Place concrete		
03 40 00 Precast Concrete		
03 50 00 Cast Decks & Underlayment		
	TOTAL	
DIVISION 04 – MASONRY		
04 01 00 Maintenance of Masonry		
04 05 13 Masonry Mortaring		
04 05 19 Masonry Anchorage & Reinforcing		
04 05 23 Masonry Accessories		
04 20 00 Unit Masonry		
	TOTAL	
05 05 23 Metal Fastenings		
05 10 00 Structural Metal Framing		
05 20 00 Metal Joists		
05 30 00 Metal Decking		
05 50 00 Metal Fabrications		
05 58 00 Formed Metal Fabrications		
	TOTAL	
DIVISION 06 – WOOD, PLASTICS, & COMPOSITES		
06 05 23 Fastening and Adhesives		
06 10 00 Rough Carpentry		
06 13 00 Heavy Timber		
06 17 00 Shop-fabricated Structural Wood		
06 20 00 Finish Carpentry		

DISISION 06 – WOOD, PLASTICS, &
COMPOSITES (CONTINUES)

06 40 00	Architectural Woodwork		
06 60 00	Plastic Fabrications		
06 80 00	Composite Fabrications		
		TOTAL	

DIVISION 07 – THERMAL AND MOISTURE
PROTECTION

07 10 00	Dampproofing and Waterproofing		
07 18 00	Traffic Coatings		
07 19 00	Water Repellents		
07 21 00	Thermal Insulation		
07 24 00	Exterior Insulation & Finish Systems		
07 25 00	Weather Barriers		
07 31 00	Shingles and Shakes		
07 32 00	Roof Tiles		
07 40 00	Roofing and Siding Panels		
07 50 00	Membrane Roofing		
07 60 00	Flashing and Sheet Metal		
07 61 00	Sheet Metal Roofing		
07 70 00	Roof & Wall Specialties and Accessories		
07 80 00	Fire and Smoke Protection		
07 90 00	Joint Protection		
07 95 00	Expansion Control		
		TOTAL	

DIVISION 08 – OPENINGS

08 11 00	Metal Doors and Frames		
08 14 00	Wood Doors		
08 15 00	Plastic Doors		
08 30 00	Specialty Doors and Frames		
08 41 00	Entrances and Storefronts		
08 44 00	Curtain Wall and Glazed Assemblies		
08 51 00	Metal Windows		
08 52 00	Wood Windows		
08 53 00	Plastic Windows		
08 56 00	Special Function Windows		
08 60 00	Roof Windows and Skylights		
08 70 00	Hardware		
08 80 00	Glazing		
08 90 00	Louvers and Vents		
		TOTAL	

DIVISION 09 – FINISHES

09 22 00	Supports for Plaster and Gypsum Board		
09 23 00	Gypsum Plastering		
09 24 00	Portland Cement Plastering		
09 29 00	Gypsum Board		
09 30 00	Tiling		
		SUB-TOTAL	

DIVISION 09 – FINISHES (CONTINUED)

09 50 00	Acoustical Ceilings		
09 54 00	Specialty Ceilings Quantity		
09 61 00	Flooring Treatment		
09 62 00	Specialty Flooring		
09 63 00	Masonry Flooring		
09 64 00	Wood Flooring		
09 65 00	Resilient Flooring		
09 66 00	Terrazzo Flooring		
09 68 00	Carpeting		
09 69 00	Access Flooring		
09 97 00	Wall Finishes		
09 91 00	Painting		
09 97 00	Special Coatings		
		TOTAL	

DIVISION 10 – SPECIALTIES

10 11 00	Visual Display Surfaces		
10 14 00	Signage		
10 21 00	Compartments and Cubicles		
10 22 00	Partitions		
10 26 00	Wall and Door Protection		
10 28 00	Toilet, Bath, and Laundry Accessories		
10 44 00	Fire Protection Specialties		
10 51 00	Lockers		
10 56 00	Storage Assemblies		
10 82 00	Grilles and Screens		
		TOTAL	

DIVISION 11 – EQUIPMENT

11 15 00	Security, Detention, and Banking Equipment		
11 19 00	Detention Equipment		
11 23 00	Commercial Laundry and Dry Cleaning Equipment		
11 26 00	Unit Kitchens		
11 27 00	Photographic Processing Equipment		
11 40 00	Foodservice Equipment		
11 51 00	Library Equipment		
11 52 00	Audio-Visual Equipment		
11 53 00	Laboratory Equipment		
11 61 00	Theater and Stage Equipment		
11 65 00	Athletic and Recreational Equipment		
11 70 00	Healthcare Equipment		
		TOTAL	

DIVISION 12 – FURNISHINGS

12 20 00	Window Treatments		
12 30 00	Casework		
12 40 00	Furnishings and Accessories		
12 50 00	Furniture		
		TOTAL	

DIVISION 13 –SPECIAL CONSTRUCTION

13 10 00	Special Facility Components		
13 34 00	Fabricated Engineered Structures		
13 49 00	Radiation Protection		
		TOTAL	

DIVISION 14 – CONVEYING EQUIPMENT

14 20 00	Elevators		
14 30 00	Escalators and Moving Walks		
14 40 00	Lifts		
14 80 00	Scaffolding		
		TOTAL	

DIVISION 21 – FIRE SUPPRESSION

21 10 00	Water-Based Fire-Suppression Systems Piping		
21 20 00	Fire-Extinguishing Systems		
21 30 00	Fire Pumps		
		TOTAL	

DIVISION 22 – PLUMBING

22 07 00	Plumbing Insulation		
22 11 00	Facility Water Distribution		
22 13 00	Facility Sanitary Sewerage		
22 14 00	Facility Storm Drainage		
22 30 00	Plumbing Equipment		
22 40 00	Plumbing Fixtures		
		TOTAL	

DIVISION 23 – HEATING, VENTILATING, & AIR-CONDITIONING

23 05 93	Testing, Adjusting, & Balancing for HVAC		
23 07 00	HVAC Insulation		
23 09 00	Instrumentation & Control for HVAC		
23 13 00	Facility Fuel-Storage Tanks		
23 20 00	HVAC Piping and Pumps		
23 30 00	HVAC Air Distribution		
23 40 00	HVAC Air Cleaning Devices		
23 50 00	Central Heating Equipment		
23 60 00	Central Cooling Equipment		
23 70 00	Central HVAC Equipment		
		TOTAL	

DIVISION 26 – ELECTRICAL

26 09 00	Instrumentation & Control for Electrical Systems		
26 10 00	Medium-Voltage Electrical Distribution		
26 20 00	Low-Voltage Electrical Transmission		
26 27 00	Low-Voltage Distribution Equipment		
26 30 00	Facility Electrical Power Generating & Storage Equipment		
26 40 00	Electrical and Cathodic Protection		
26 50 00	Lighting		
		TOTAL	

DIVISION 27 – COMMUNICATIONS

27 10 00	Structured Cabling		
27 20 00	Data Communications		
27 30 00	Voice Communications		
27 40 00	Audio-Video Communications		
27 50 00	Distributed Communications & Monitoring Systems		
		TOTAL	

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 10 00	Electronic Access Control & Intrusion Detection		
28 20 00	Electronic Surveillance		
28 30 00	Electronic Detection and Alarm		
28 40 00	Electronic Monitoring and Control		
		TOTAL	

DIVISION 31 – EARTHWORK

31 10 00	Site Clearing		
31 20 00	Earth Moving		
31 31 00	Soil Treatment		
31 32 00	Soil Stabilization		
31 40 00	Shoring and Underpinning		
31 50 00	Excavation Support and Protection		
31 60 00	Special Foundations and Load-Bearing Elements		
		TOTAL	

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 10 00	Bases, Ballasts, and Paving		
32 30 00	Site Improvements		
32 31 19	Decorative Metal Fences and gates		
32 90 00	Planting		
		TOTAL	

DIVISION 33 – UTILITIES

33 10 00	Water Utilities		
33 30 00	Sanitary Sewerage Utilities		
33 40 00	Storm Drainage Utilities		
33 50 00	Fuel Distribution Utilities		
33 60 00	Hydronic & Steam Energy Utilities		
33 70 00	Electrical Utilities		
33 80 00	Communications Utilities		
		TOTAL	

DIVISION 34 – TRANSPORTATION

34 00 00	Transportation		TOTAL

DIVISION 35 – WATERWAY AND MARINE CONSTRUCTIONS

35 00 00	Waterway and Marine construction		

TOTAL _____

DIVISION 40-43 – PROCESS EQUIPMENT

DIVISION 44 – POLLUTION CONTROL EQUIPMENT

44 40 00	Water Treatment Equipment	_____	_____
44 41 00	Packaged Water Treatment Plants	_____	_____
44 50 00	Solid Waste Control	_____	_____
		TOTAL	_____

DIVISION 45 – INDUSTRY SPECIFIC MANUFACTURING EQUIPMENT

DIVISION 48 – ELECTRICAL POWER GENERATION

48 10 00	Electrical Power Generation Equipment	_____	_____
48 70 00	Electrical Power Generation Testing	_____	_____
		TOTAL	_____

Facility Planning & Control

CHANGE ORDER

PROJECT NAME: _____ CHANGE ORDER No. _____

PROJECT NUMBER: _____ WBS No. _____ CONTRACT DATE: _____

CONTRACTOR: _____ CFMS / SRM No(s). _____

SITE CODE: STATE ID: NOTICE TO PROCEED DATE: _____

You are directed to make the following change(s) in this contract. Attach SUMMARY, BREAKDOWN and/or UNIT PRICE BREAKDOWN forms as required and give a brief description of the change(s) below.

The Original Contract Sum		
Total Changes by Previous Change Order(s)		
Current Contract Sum		
Contract Sum will be (increased) (decreased) (unchanged) by this Change Order		#REF!
New Contract Sum		**#REF!**
The Original Contract Completion Date and Contract Time.	Date: _	DAYS
Total Time extended by Previous Change Order(s)		DAYS
Contract Time will be (increased) (decreased) (unchanged) by this Change Order		DAYS
New Contract Completion Date & Revised Contract Time	Date: _	DAYS
Added Building Area		(Sq. Ft.)

***NOTE :** No additional increase in time or money will be considered for a Change Order item after it has been executed.*

RECOMMENDED	**ACCEPTED**	**APPROVED**
Designer's Name:	Contractor's Name:	Project Manager:
Address:	Address:	Facility Planning & Control
Email Address:	Email Address:	
By:	By:	By:
Date:	Date:	Date:

FACILITY PLANNING AND CONTROL USE ONLY

Classification	**Amount**	**Classification**	**Amount**
Omission (Type "O")*		**Miscellaneous (Type "M")**	
Error (Type "E")*		**Owner Requested (Type "R")**	

*See Section 5.4.3 of the Louisiana Capital Improvement Projects Procedure Manual for Design and Construction, 2006 Edition

Senior Manager/Assistant Director approval: _____

COMMENTS:

❖ **NOT FOR RECORDATION PURPOSES** ❖

Facility Planning & Control

RECOMMENDATION OF ACCEPTANCE

TO: SOUTHERN UNIVERSITY, BATON ROUGE
P.O. Box 10010
Baton Rouge, LA 70813

FROM: _____
_____
_____

Design Firm Name and Address

DATE: _____

PROJECT NAME: _____

PROJECT NUMBER: _____ WBS No. _____

SITE CODE: _____ STATE ID: _____ CFMS/SRM #: _____

CONTRACTOR: _____
_____

ORIGINAL CONTRACT AMOUNT: $_____

FINAL CONTRACT AMOUNT: $_____

FINAL BUILDING AREA (SQ. FEET): _____

I certify that, to the best of my knowledge and belief, this project is substantially complete in accordance with the Plans and Specifications to the point where it can be used for the purpose which was intended. It is recommended that it be accepted.

DATE OF ACCEPTANCE: _____

CONTRACT DATE OF COMPLETION: _____

NUMBER OF DAYS (OVERRUN) (UNDERRUN) (As of Acceptance Date) _____

LIQUIDATED DAMAGES PER DAY STIPULATED IN CONTRACT $_____

VALUE OF PUNCH LIST $_____ *(Attach punch list)*

Was part of project occupied prior to Acceptance?

PORTION OCCUPIED: *(Attach Partial Occupancy Forms)*

ROOF GUAR-MANUF: _____ START DATE: _____ END DATE:

ROOFER: _____ START DATE: _____ END DATE:

Signed: _____
DESIGNER

FOR USE OF PROJECT MANAGER:

Signed: _____
PROJECT MANAGER

c: User Agency

CERTIFICATE OF COMPLIANCE

with

Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines

TO: AGRICULTURAL RESEARCH & EXTENSION CENTER
P.O. Box 10010
Baton Rouge, LA 70813

FROM: MAP Design Group, LLC
8282 Goodwood Blvd W-3
Baton Rouge, LA 70806
Design Firm Name and Address

PROJECT NAME: AGRICULTURAL RESEARCH & EXTENSION CENTER GREENHOUSE MODIFICATION

PROJECT No.: P0085282

WBS No.: N/A

SITE CODE:_____ STATE ID: _____

DATE OF ACCEPTANCE: _____

I,_____certify that, to the best of my knowledge and belief, this project has been constructed in compliance with the Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines as reviewed by the fire marshal.

_____ Date: _____
Designer Signature

State of Louisiana
DIVISION OF ADMINISTRATION
Facility Planning and Control

CERTIFICATE OF COMPLIANCE
with
Louisiana Building Code for State Owned Buildings

TO: STATE OF LOUISIANA
DIVISION OF
ADMINISTRATION
OFFICE OF AGRICULTURAL CENTER
P.O. Box 10010
Baton Rouge, LA 70813

FROM: MAP Design Group, LLC
8282 Goodwood Blvd W-3
Baton Rouge, LA 70806
(Design Firm or Owner/User Name and Address)

PROJECT NAME: AGRICULTURAL RESEARCH & EXTENSION CENTER FENCING

PROJECT No.: P0085282

WBS No.: N/A

DATE OF ACCEPTANCE: _____

I,_____certify that, to the best of my knowledge and belief, this project has been constructed in compliance with the construction documents determined to be satisfactory by the State of Louisiana, Division of Administration, Office of Facility Planning and Control.

_____ Date: _____
(*Signature of Designer or Owner/User)*

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SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Requirements:

1. Section 012100 "Allowances" for procedures for using unit prices to adjust quantity allowances.

1.2 DEFINITIONS

A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

END OF SECTION 012200

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SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
2. Submit the schedule of values to Architect through Construction Manager at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Arrange schedule of values consistent with format of AIA Document G703 .
2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
3. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site.
4. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
5. Overhead Costs: Include total cost and proportionate share of general overhead and profit for each line item.
6. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
7. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

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1.3 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and Construction Manager and paid for by Owner.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Construction Manager will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Construction Manager by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.

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2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Products list (preliminary if not final).
5. Sustainable design action plans, including preliminary project materials cost data.
6. Schedule of unit prices.
7. Submittal schedule (preliminary if not final).
8. List of Contractor's staff assignments.
9. List of Contractor's principal consultants.
10. Copies of building permits.
11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
12. Initial progress report.
13. Report of preconstruction conference.
14. Certificates of insurance and insurance policies.
15. Performance and payment bonds.
16. Data needed to acquire Owner's insurance.

H. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706.
5. AIA Document G706A.
6. AIA Document G707.
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

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SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Digital project management procedures.
5. Project meetings.

B. Related Requirements:

1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
2. Section 019113 "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.2 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

1.3 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.

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3. Make adequate provisions to accommodate items scheduled for later installation.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.4 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
   a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
   b. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
2. Review: Architect will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.

C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

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1. File Preparation Format:
   a. DWG , Version , operating in Microsoft Windows operating system.
2. File Submittal Format: Submit or post coordination drawing files using PDF format.
3. BIM File Incorporation: Construction Manager will incorporate Contractor's coordination drawing files into BIM established for Project.
4. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
   a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
   b. Digital Data Software Program: Drawings are available in PDF Format .
   c. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Owner and Architect.

1.5 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Owner name.
2. Owner's Project number.
3. Name of Architect and Construction Manager.
4. Architect's Project number.
5. Date.
6. Name of Contractor.
7. RFI number, numbered sequentially.
8. RFI subject.
9. Specification Section number and title and related paragraphs, as appropriate.
10. Drawing number and detail references, as appropriate.
11. Field dimensions and conditions, as appropriate.
12. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
13. Contractor's signature.
14. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

C. RFI Forms: Form bound in Project Manual .

D. Architect's and Construction Manager's Action: Architect and Construction Manager will review each RFI, determine action required, and respond. Allow three days for Architect's response for

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each RFI. RFIs received by Architect or Construction Manager after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:
   a. Requests for approval of submittals.
   b. Requests for approval of substitutions.
   c. Requests for approval of Contractor's means and methods.
   d. Requests for coordination information already indicated in the Contract Documents.
   e. Requests for adjustments in the Contract Time or the Contract Sum.
   f. Requests for interpretation of Architect's actions on submittals.
   g. Incomplete RFIs or inaccurately prepared RFIs.
2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect or Construction Manager of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
   a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within five days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly . Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within three days if Contractor disagrees with response.

1.6 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Architect's Data Files Not Available: Architect will not provide Architect's CAD drawing digital data files for Contractor's use during construction.

B. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.

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3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.7 PROJECT MEETINGS

A. General: Construction Manager will schedule and conduct meetings and conferences at Project site unless otherwise indicated.

B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner , Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:
    a. Responsibilities and personnel assignments.
    b. Tentative construction schedule.
    c. Phasing.
    d. Critical work sequencing and long lead items.
    e. Designation of key personnel and their duties.
    f. Lines of communications.
    g. Use of web-based Project software.
    h. Procedures for processing field decisions and Change Orders.
    i. Procedures for RFIs.
    j. Procedures for testing and inspecting.
    k. Procedures for processing Applications for Payment.
    l. Distribution of the Contract Documents.
    m. Submittal procedures.
    n. Sustainable design requirements.
    o. Preparation of Record Documents.
    p. Use of the premises and existing building.
    q. Work restrictions.
    r. Working hours.
    s. Owner's occupancy requirements.
    t. Responsibility for temporary facilities and controls.
    u. Procedures for moisture and mold control.
    v. Procedures for disruptions and shutdowns.
    w. Construction waste management and recycling.
    x. Parking availability.
    y. Office, work, and storage areas.
    z. Equipment deliveries and priorities.
    aa. First aid.
    bb. Security.
    cc. Progress cleaning.
3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

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C. Progress Meetings: Construction Manager will conduct progress meetings at weekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner , Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
        1) Review schedule for next period.
    b. Review present and future needs of each entity present, including the following:
        1) Interface requirements.
        2) Sequence of operations.
        3) Resolution of BIM component conflicts.
        4) Status of submittals.
        5) Status of sustainable design documentation.
        6) Deliveries.
        7) Off-site fabrication.
        8) Access.
        9) Site use.
        10) Temporary facilities and controls.
        11) Progress cleaning.
        12) Quality and work standards.
        13) Status of correction of deficient items.
        14) Field observations.
        15) Status of RFIs.
        16) Status of Proposal Requests.
        17) Pending changes.
        18) Status of Change Orders.
        19) Pending claims and disputes.
        20) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

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SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Architect.
4. Name of Contractor.
5. Name of firm or entity that prepared submittal.
6. Names of subcontractor, manufacturer, and supplier.
7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
8. Submittal purpose and description.

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9. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
10. Drawing number and detail references, as appropriate.
11. Indication of full or partial submittal.
12. Location(s) where product is to be installed, as appropriate.
13. Signature of transmitter.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect and Construction Manager on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

1.5 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Email: Prepare submittals as PDF package, and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's Construction Manager's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect Construction Manager will advise Contractor when a submittal being processed must be delayed for coordination.
2. Resubmittal Review: Allow 3 days for review of each resubmittal.

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

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E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's and Construction Manager's action stamp.

1.6 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
    a. Manufacturer's catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
4. Submit Product Data before Shop Drawings, and before or concurrent with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    a. Schedules.

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
    a. Project name and submittal number.
    b. Generic description of Sample.
    c. Product name and name of manufacturer.
    d. Sample source.
    e. Number and title of applicable Specification Section.
    f. Specification paragraph number and generic name of each item.
3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

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a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect , through Construction Manager, will return submittal with options selected.

D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

G. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

H. Test and Research Reports:

1. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

1.7 ARCHITECT'S AND CONSTRUCTION MANAGER'S REVIEW

A. Action Submittals: Architect and Construction Manager will review each submittal, indicate corrections or revisions required , and return it.

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1. PDF Submittals: Architect and Construction Manager will indicate, via markup on each submittal, the appropriate action
   a. .

B. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect and Construction Manager.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Architect and Construction Manager will return without review submittals received from sources other than Contractor.

F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

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SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.2 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

1.3 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

1.4 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

A. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect , Construction Manager, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:

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1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- square tack and marker boards.
3. Drinking water and private toilet.
4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

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D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

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SECTION 015639 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

1.2 DEFINITIONS

A. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

B. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated .

1.3 ACTION SUBMITTALS

1.4 INFORMATIONAL SUBMITTALS

1.5 QUALITY ASSURANCE

1.6 FIELD CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Moving or parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

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PART 2 - PRODUCTS

2.1 MATERIALS

A. Backfill Soil: Stockpiled soil from location shown on Drawings of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.

1. Mixture: Well-blended mix of two parts stockpiled soil to one part planting soil .
2. Planting Soil: Planting soil as specified in Section 329115 "Soil Preparation (Performance Specification)."

B. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

3.2 PREPARATION

A. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

B. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.

1. Apply 4-inch uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches of tree trunks.
2. Install temporary root protection matting over mulch to the extent indicated.

C. Trunk Protection: Protect the trunk of each tree to remain as follows:

1. Install 2-by-6-inch wood planks around trunk at maximum 3 inches apart. Minimum three planks per tree. Band together with no less than three steel bands stapled to the planks to hold them securely in place.
   a. Height: 48 inches .
2. Wrap trunk with orange plastic construction fencing to 2 inches in thickness . Install 2-by-6-inch wood planks around trunk over wrap at maximum 3 inches apart. Minimum three

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planks per tree. Band together with no less than three steel bands stapled to the planks to hold them securely in place.

a. Height: 48 inches .

3. .
4. Trunk protection to remain in place no longer than 3 months . If construction exceeds timeframe indicated, inspect trunk protection at 3 month intervals and loosen if necessary.

3.3 PROTECTION ZONES

A. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect.

B. Maintain protection zones free of weeds and trash.

C. Maintain protection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.

3.4 ROOT PRUNING

A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
3. Cover exposed roots with burlap and water regularly.
4. Backfill as soon as possible according to requirements in Section 312000 "Earth Moving."

3.5 CROWN PRUNING

A. Prune branches that are affected by temporary and permanent construction. Prune branches as directed by arborist.

1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
3. Pruning Standards: Prune trees according to ANSI A300 (Part 1).

B. Cut branches with sharp pruning instruments; do not break or chop.

C. Do not paint or apply sealants to wounds.

D. Chip removed branches and dispose of off-site .

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3.6 REGRADING

A. Minor Fill within Protection Zone: Where existing grade is 6 inches or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

3.7 FIELD QUALITY CONTROL

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.8 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Architect.

1. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
2. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 2-inch uniform thickness to remain.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

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SECTION 015723 - TEMPORARY STORMWATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Temporary stormwater pollution controls.

1.2 STORMWATER POLLUTION PREVENTION PLAN

A. The Stormwater Pollution Prevention Plan (SWPPP) is part of the Contract Documents and is bound into this Project Manual.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1.4 INFORMATIONAL SUBMITTALS

A. Inspection reports.

1.5 QUALITY ASSURANCE

PART 2 - PRODUCTS

2.1 TEMPORARY STORMWATER POLLUTION CONTROLS

A. Provide temporary stormwater pollution controls as required by the SWPPP.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Conduct construction as required to comply with the SWPPP and that minimize possible contamination or pollution or other undesirable effects.

1. Inspect, repair, and maintain SWPPP controls during construction.

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a. Inspect all SWPPP controls not less than every seven days, and after each occurrence of a storm event, as outlined in the SWPPP.

END OF SECTION 015723

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SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous construction waste.
2. Recycling nonhazardous construction waste.

B. Related Requirements:

1. Section 011200 "Multiple Contract Summary" for coordination of responsibilities for waste management.
2. Section 042000 "Unit Masonry" for disposal requirements for masonry waste.
3. Section 044313.13 "Anchored Stone Masonry Veneer" for disposal requirements for excess stone and stone waste.
4. Section 044313.16 "Adhered Stone Masonry Veneer" for disposal requirements for excess stone and stone waste.
5. Section 311000 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.2 DEFINITIONS

A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.

C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner’s property.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

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1.3 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 7 days of date established for the Notice to Proceed .

1.4 INFORMATIONAL SUBMITTALS

A. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.5 QUALITY ASSURANCE

A. If including refrigerant recovery in this Section, retain first "Refrigerant Recovery Technician Qualifications" Paragraph below and delete second paragraph. Refrigerant Recovery Technician Qualifications: Type I certified by EPA-approved certification program.

1.6 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

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PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total nonhazardous solid waste generated by the Work. Facilitate recycling and salvage of materials

1. .

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute waste management plan to everyone concerned within three days of submittal return.
2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

E. Waste Management in Historic Zones or Areas: Transportation equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, by 12 inches or more.

3.2 SALVAGING DEMOLITION WASTE

A. Comply with requirements in Section 024116 "Structure Demolition" for salvaging demolition waste.

B. Salvaged Items for : Not permitted on Project site.

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C. Salvaged Items for Owner's Use:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

3.3 RECYCLING AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Owner .

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
   a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.4 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner’s property.

C. Burning: Do not burn waste materials.

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3.5 ATTACHMENTS

END OF SECTION 017419

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SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:

1. Final completion procedures.
2. Warranties.
3. Final cleaning.

B. Related Requirements:

1. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
2. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
3. Section 017900 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.2 ACTION SUBMITTALS

1.3 CLOSEOUT SUBMITTALS

A. Certificate of Insurance: For continuing coverage.

1.4 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:

1. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

1.5 LIST OF INCOMPLETE ITEMS

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

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1. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
2. Include the following information at the top of each page:
   a. Project name.
   b. Date.
   c. Name of Architect.
   d. Name of Contractor.
   e. Page number.
3. Submit list of incomplete items in the following format:
   a. MS Excel Electronic File: Architect will return annotated file.
   b. PDF Electronic File: Architect will return annotated file.

1.6 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

C. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

1. Submit by email to Architect.

D. Warranties in Paper Form:

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

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PART 3 - EXECUTION

3.1 FINAL CLEANING

A. Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
    b. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    c. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    d. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
    e. Vacuum and mop concrete.
    f. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    g. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    h. Remove labels that are not permanent.

C. Construction Waste Disposal: Comply with waste-disposal requirements in Section 015000 "Temporary Facilities and Controls."

END OF SECTION 017700

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SECTION 024116 - STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Salvaging items for reuse by Owner.

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.3 INFORMATIONAL SUBMITTALS

A. Predemolition photographs or video.

1.4 CLOSEOUT SUBMITTALS

1.5 QUALITY ASSURANCE

1.6 FIELD CONDITIONS

A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.

B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.

1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
    a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.

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C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before building demolition, Owner will remove the following items:
   a. N/A

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. On-site storage or sale of removed items or materials is not permitted.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

2.2 SOIL MATERIALS

A. Satisfactory Soils: Comply with requirements in Section 312000 "Earth Moving."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting demolition operations.

B. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

C. Inventory and record the condition of items to be removed and salvaged.

3.2 PREPARATION

A. Salvaged Items: Comply with the following:

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3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

3.4 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.

D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 015000 "Temporary Facilities and Controls."

1. Protect adjacent buildings and facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.

E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.5 CLEANING

A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."

B. Do not burn demolished materials.

C. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

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AMERICAN COOLAIR CORPORATION



Greenhouse Ventilation Systems

AMERICAN Coolair®

Farm Products Division

NBF
Greenhouse Fan



Economical, Practical, Effective

American Coolair's NBF fan provides the ideal solution to fresh air ventilation in most types of greenhouse buildings. NBF fans are built to give you years of heavy-duty trouble-free service. The rugged, belt driven construction operates in any position, has permanently lubricated ball bearings, and is available with single- or two-speed totally enclosed motors.

Coolair has developed a complete ventilation package by combining the NBF fan with an all aluminum shutter (Type LRW) and a heavy gauge galvanized steel wall housing (square box or slope) for exterior mounting, allowing a maximum of unobstructed interior space.

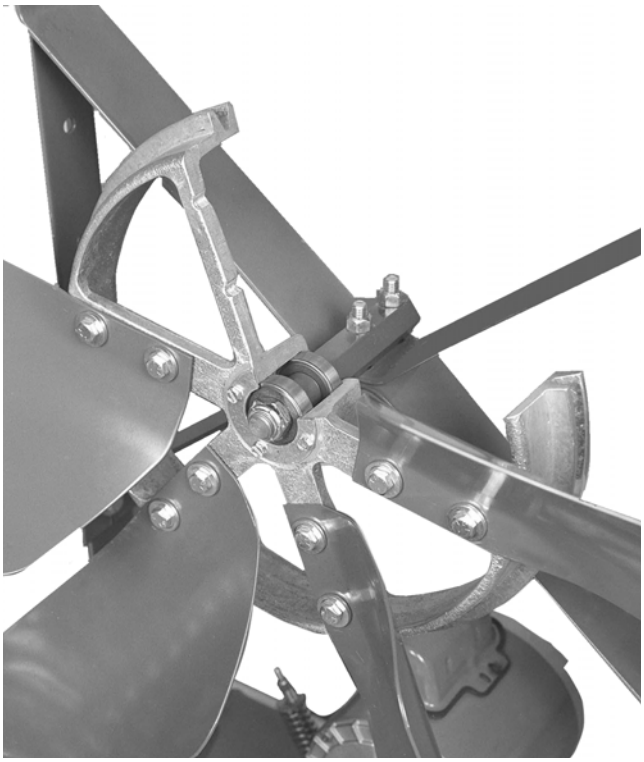
Basic Components

The fan panel is fabricated of heavy gauge steel and features an all-welded construction. The uprights which support the motor and propeller are formed from heavy gauge steel for maximum strength and rigidity.

Painted parts are coated with a thermosetting epoxy coating to provide a protective coating rated excellent for hardness, impact resistance, adhesion and chemical resistance.

Exclusive Drive Assembly

Our engineers have developed an innovative drive assembly for the NBF fan. Our use of quality materials and precise engineering techniques in constructing wheel assemblies assure you of years of quiet, trouble-free service. Power is applied through V-belts directly to the propeller with blade load concentrated directly over the bearings to eliminate overhung bearing load. The exclusive, time tested design has been widely acclaimed by engineers and users alike.



Performance and Efficiency

When economy is measured in terms of cubic feet of air per minute per dollar invested, the NBF wall fan exhaust unit is unsurpassed. American Coolair's Type NBF fan is today's best investment. Coolair uses only the most efficient totally enclosed ball bearing motors available.

PERFORMANCE RATINGS

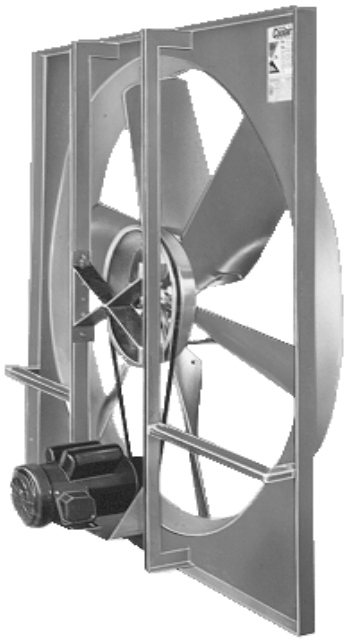
American Coolair Corporation certifies that the NBF fans shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and comply with the requirements of the AMCA Certified Ratings Program.

				CUBIC FEET PER MINUTE (CFM) AT STATIC PRESSURE									
Fan Model	Fan Size	Motor HP	Fan RPM	0" S.P.		.05" S.P.		.10" S.P.		.125" S.P.		.15" S.P.	
				CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
NBF24G	24	1/4	688	5,293	0.24	5,026	0.25	4,724	0.26	4,553	0.27	4,362	0.28
NBF24H		1/3	769	5,916	0.33	5,680	0.35	5,421	0.36	5,279	0.37	5,128	0.38
NBF24J		1/2	891	6,855	0.51	6,654	0.53	6,438	0.55	6,324	0.56	6,205	0.57
NBF24K		3/4	1042	8,017	0.83	7,846	0.84	7,574	0.86	7,574	0.87	7,478	0.88
NBF30G	30	1/4	491	7,205	0.24	6,625	0.25	5,997	0.27	5,648	0.27	5,239	0.28
NBF30H		1/3	531	7,792	0.29	7,258	0.32	6,690	0.33	6,386	0.34	6,056	0.34
NBF30J		1/2	641	9,406	0.52	8,968	0.54	8,512	0.56	8,276	0.57	8,034	0.58
NBF30K		3/4	739	10,845	0.80	10,466	0.83	10,076	0.85	9,877	0.86	9,674	0.87
NBF36H	36	1/3	447	9,735	0.29	9,007	0.32	8,241	0.34	7,773	0.36	7,103	0.38
NBF36J		1/2	524	11,411	0.47	10,793	0.51	10,160	0.54	9,832	0.55	9,477	0.56
NBF36K		3/4	615	13,393	0.75	12,868	0.80	12,334	0.84	12,063	0.86	11,790	0.87
NBF36L		1	692	15,070	1.07	14,604	1.12	14,132	1.18	13,894	1.20	13,654	1.22
NBF42J	42	1/2	371	13,948	0.46	12,986	0.49	11,525	0.53	10,797	0.54	10,159	0.56
NBF42K		3/4	430	16,166	0.71	15,372	0.75	14,318	0.79	13,625	0.81	12,938	0.83
NBF42L		1	492	18,497	1.07	17,821	1.11	17,009	1.15	16,513	1.18	15,932	1.20
NBF48J	48	1/2	307	16,740	0.49	15,278	0.52	13,371	0.54	12,370	0.54	11,062	0.56
NBF48K		3/4	358	19,521	0.77	18,315	0.82	16,814	0.84	15,964	0.85	15,121	0.85
NBF48L		1	380	20,721	0.92	19,597	0.97	18,238	1.00	17,456	1.01	16,652	1.01
NBFH48L		1	408	22,248	1.14	21,212	1.19	20,001	1.23	19,305	1.24	18,565	1.25
NBFA54L	54	1	374	23,911	1.06	22,693	1.11	21,283	1.16	20,480	1.18	19,618	1.20
NBFA54M		1 1/2	414	26,496	1.44	25,381	1.50	24,165	1.55	23,491	1.58	22,766	1.60
NBFA54N		2	446	28,515	1.80	27,512	1.86	26,412	1.92	25,814	1.95	25,178	1.97
NBF60L	60	1	281	26,569	0.89	24,816	0.95	22,568	1.00	21,081	1.02	19,370	1.05
NBF60M		1 1/2	323	30,514	1.35	29,053	1.42	27,299	1.48	26,263	1.50	25,065	1.53
NBF60N		2	365	34,512	1.94	33,216	2.02	31,756	2.09	30,941	2.13	30,048	2.16
NBF60P		3	414	39,145	2.84	38,016	2.92	36,784	3.01	36,119	3.05	35,414	3.09

Performance shown is for Installation Type A: free inlet, free outlet. Performance ratings do not include the effects of appurtenances (accessories). Power rating (BHP) does not include transmission losses. Bearing losses are included. Because of the cooling the motor receives from the moving air stream, motor loading beyond the nominal nameplate ratings on these American Coolair fans does not overheat the motor and is within NEMA recommended limits and motor service factor. It is not detrimental to the motor and is economically desirable.

AL

Aluminum Greenhouse Fan



American Coolair's AL all-aluminum fans are the answer to concerns about rust and corrosion in today's damp greenhouse environment. Combined with an aluminum wall housing, an aluminum shutter, and a vinyl coated wire guard, the AL fan will provide years of trouble-free and corrosion-free service.

AL fans feature all-welded angle frame construction for a rugged and durable unit. The fan panel has a deep spun orifice for maximum efficiency.

AL fans utilize Coolair's exclusive drive assembly used on our fans for over 80 years. The die-formed aluminum blades are bolted to a cast aluminum hub, which also serves as the fan pulley. Power is applied through V-belts directly to the propeller with the blade load concentrated directly over the fan bearings, thus eliminating overhung bearing load.

AL fans are available with single- or two-speed totally enclosed motors.

PERFORMANCE RATINGS

AMERICAN COOLAIR CORPORATION certifies that the performance data for the type AL wall fan models shown below are based on tests conducted in an accredited laboratory in accordance with ANSI/AMCA Standard 210-07.

				CUBIC FEET PER MINUTE (CFM) AT STATIC PRESSURE									
Fan Model	Fan Size	Motor HP	Fan RPM	0" S.P.		.05" S.P.		.10" S.P.		.125" S.P.		.15" S.P.	
				CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
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AL30K		3/4	739	10,845	0.80	10,466	0.83	10,076	0.85	9,877	0.86	9,674	0.87
AL36H	36	1/3	447	9,735	0.29	9,007	0.32	8,241	0.34	7,773	0.36	7,103	0.38
AL36J		1/2	524	11,411	0.47	10,793	0.51	10,160	0.54	9,832	0.55	9,477	0.56
AL36K		3/4	615	13,393	0.75	12,868	0.80	12,334	0.84	12,063	0.86	11,790	0.87
AL36L		1	692	15,070	1.07	14,604	1.12	14,132	1.18	13,894	1.20	13,654	1.22
AL42H	42	1/3	322	12,106	0.30	10,921	0.33	9,919	0.36	8,430	0.37	7,149	0.39
AL42J		1/2	371	13,948	0.46	12,986	0.49	11,525	0.53	10,797	0.54	10,159	0.56
AL42K		3/4	430	16,166	0.71	15,372	0.75	14,318	0.79	13,625	0.81	12,938	0.83
AL42L		1	492	18,497	1.07	17,821	1.11	17,009	1.15	16,513	1.18	15,932	1.20
AL48J	48	1/2	307	16,740	0.49	15,278	0.52	13,371	0.54	12,370	0.54	11,062	0.56
AL48K		3/4	358	19,521	0.77	18,315	0.82	16,814	0.84	15,964	0.85	15,121	0.85
AL48L		1	408	22,248	1.14	21,212	1.19	20,001	1.23	19,305	1.24	18,565	1.25
AL54L	54	1	374	23,911	1.06	22,693	1.11	21,283	1.16	20,480	1.18	19,618	1.20
AL54M		1 1/2	414	26,496	1.44	25,381	1.50	24,165	1.55	23,491	1.58	22,766	1.60

Accessories for AL and NBF Fans



GWH & WHA

Square Wall Housing

Coolair's GWH/WHA wall housing is an exterior unit to house the NBF/AL fan and the LRW shutter. The GWH is constructed of heavy gauge galvanized steel. The WHA is constructed of aluminum. Both can be attached to exterior walls to free the interior space from obstructions.

Housing Guards

1/2" x 1" wire guards come standard on all wall housings. Slope wall housings have a front guard, while the square wall housings have a rear guard. Shutter-side guards are also available.

GSWH & SWHA

Slope Wall Housing

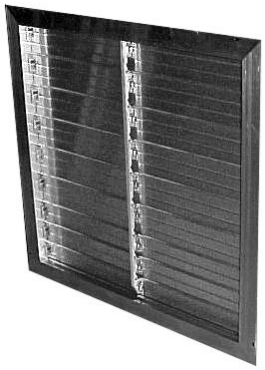
The *slope* wall housing allows the shutter to be placed on the intake side of the fan and eliminates the air turbulence that occurs with the shutter on the exhaust side of the fan. It also prevents the warm air from being lost through the metal wall housing to the outside cold air in cold climate conditions. The GSWH housing is constructed of galvanized steel for long, durable wear and low maintenance. The SWHA is constructed of aluminum for a rust resistant finish.



LRW

All Aluminum Shutter

The LRW Shutter is an all aluminum damper featuring an extruded aluminum frame with interlocking aluminum blades for maximum weather seal. Double panel shutters (LRW45 and larger) are constructed with a rigid 'T' section center member to prevent shutter blades from sticking. The LRW Shutter has nylon bearings on all movable linkage. A sturdy, extruded aluminum tie-bar is connected exactly on the blade centers. Double panel shutters feature dual tie-bars (one for each panel). The LRW Shutter can be gravity or motor operated.



LRW-E

Motorized Air Inlet Shutter

The LRW-E Air Inlet Shutter is designed to allow fresh air to enter the greenhouse as the fans at the opposite side/end of the building exhaust it. The LRW-E features a sturdy aluminum frame, aluminum blades, aluminum reinforcing brackets and nylon bearings on all movable linkage. The LRW-E Air Inlet Shutter is fully automatic and comes standard with a motor to automatically open and close the shutter blades.

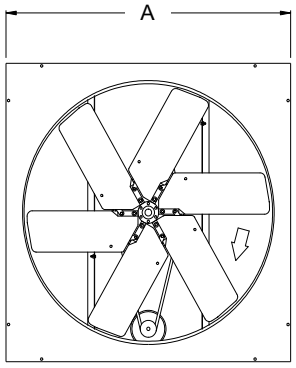


Air Inlet Shutter Model	Air Flow Capacity (CFM)	Required Opening Dimensions	Overall Dimensions Including Flange
LRW16E	1,000	16 1/2 x 16 1/2	19 1/4 x 19 1/4
LRW21E	1,800	21 1/2 x 21 1/2	24 1/4 x 24 1/4
LRW27E	3,000	27 1/2 x 27 1/2	30 1/4 x 30 1/4
LRW33E	4,500	33 1/2 x 33 1/2	36 1/4 x 36 1/4
LRW39E	6,300	39 1/2 x 39 1/2	42 1/4 x 42 1/4
LRW45E	8,400	45 1/2 x 45 1/2	48 1/4 x 48 1/4
LRW51E	10,700	51 1/2 x 51 1/2	54 1/4 x 54 1/4
LRW57E	13,400	57 1/2 x 57 1/2	60 1/4 x 60 1/4
LRW66E	18,000	66 1/2 x 66 1/2	69 1/4 x 69 1/4
LRW4515E	2,800	45 1/2 x 15 1/2	48 1/4 x 18 1/4
LRW4527E	5,000	45 1/2 x 27 1/2	48 1/4 x 30 1/4
LRW6015E	3,700	60 1/2 x 15 1/2	63 1/4 x 18 1/4
LRW6024E	6,000	60 1/2 x 24 1/2	63 1/4 x 27 1/4
LRW6036E	8,900	60 1/2 x 36 1/2	63 1/4 x 39 1/4

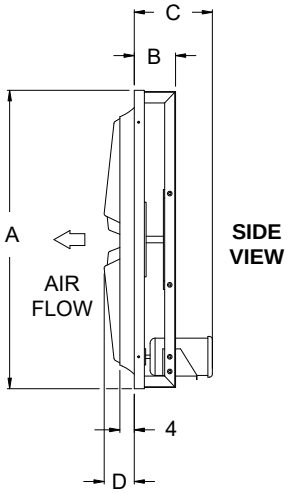
Drawings and Dimensions

NBF & AL Fans

Fan Model	A	B	C	D
NBF/AL24	32	5 1/8	12 1/2	5
NBF/AL30	38	5 1/8	12 1/2	5 1/8
NBF/AL36	44	5 1/8	13 1/4	5 1/4
NBF/AL42	50	5 1/8	13 1/4	5 7/8
NBF/AL48	56	5 1/8	13 1/4	6 1/4
NBFA/AL54	62	5 1/8	13 1/4	6 1/2
NBF60	68	6 1/8	18	6



FRONT VIEW



SIDE VIEW

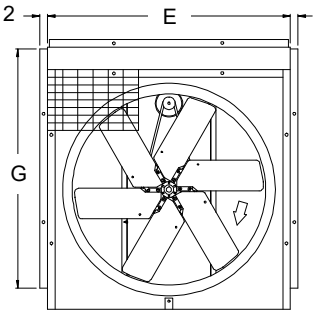
GSWH & SWHA Slope Wall Housing

Size	E	F	G	H	J
24	32 3/8	37 11/16	32 11/16	23 7/8	29 1/16
30	38 3/8	44 1/2	38 3/4	23	29 1/16
36	44 3/8	50 5/16	44 13/16	22 1/2	29 9/16
42	50 3/8	56 5/16	50 15/16	21 3/4	29 11/16
48	56 3/8	62 3/8	57	21 5/8	30 1/2
54	62 3/8	68 11/16	63 1/16	22 3/4	32 9/16
60	68 1/4	74 1/4	69 1/8	22 1/4	33

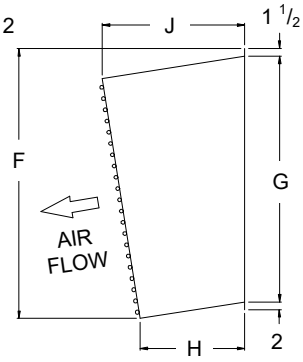
Rough Opening for GSWH & SWHA Housings:

Add 1/2" to 'E' for Width — For 4" Wall: Add 1 1/4" to 'G' for Height

For 2" Wall: Add 3/4" to 'G' for Height — For 6" Wall: Add 1 1/2" to 'G' for Height

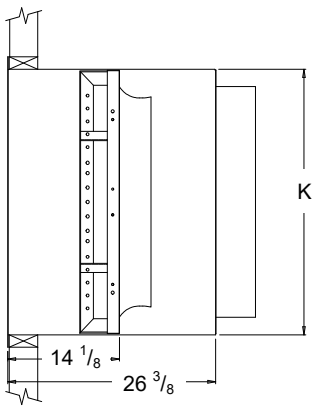


FRONT VIEW



SIDE VIEW

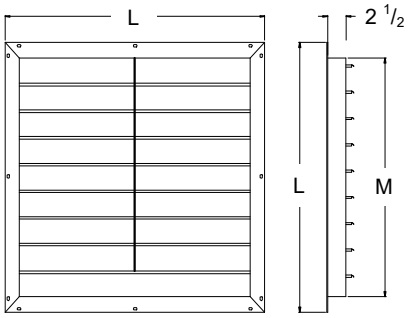
GWH & WHA Square Wall Housing



Size	K
24	32 3/8
30	38 3/8
36	44 3/8
42	50 3/8
48	56 3/8
54	62 3/8

For rough opening, add 1/2" to 'K'

LRW Shutter



Shutter Model	L O.D.	M I.D.
LRW27	30 1/4	27
LRW33	36 1/4	33
LRW39	42 1/4	39
LRW45	48 1/4	45
LRW51	54 1/4	51
LRW57	60 1/4	57
LRW66	69 1/4	66

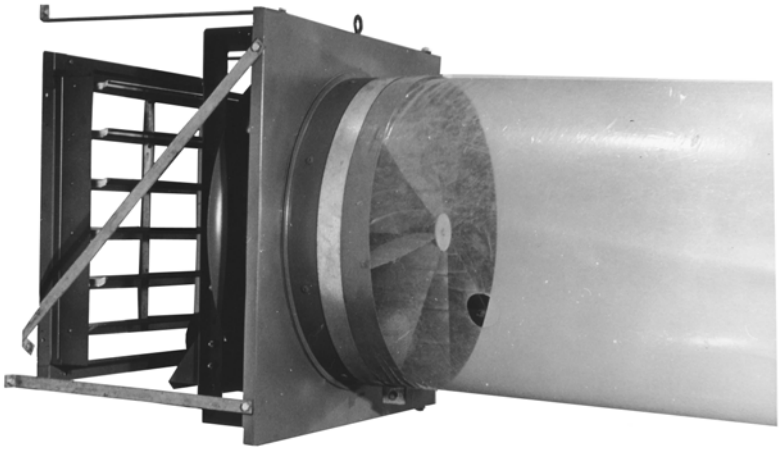
For rough opening, add 1/2" to 'M'

Power Tube Fans

PTF
Power Tube Fan

In controlled environments where a precise tempering of air is critical to production, American Coolair offers the PTF Power Tube fan. The PTF fan, with its companion polyethylene Power Tube, is specially designed to make up air lost to exhaust fans while at the same time provide low velocity tempering and mixing of air.

Constructed of heavy gauge steel, the PTF fan is offered in sizes from 12 to 30 inches. The 12 and 18 inch fans are direct drive units. The 24 and 30 inch fans are belt driven and incorporate the Coolair exclusive static shaft design used on the Coolair Type NBF and AL fans.



PERFORMANCE RATINGS (Power Tube included)

Model	Fan Size	Motor HP	Drive Type	Fan RPM	System CFM *	Motorized Shutter Model	Framed Opening
PTFA12F17	12	1/6	Direct	1,725	1,250	LRW16E	17” x 17”
PTFA18H16	18	1/3	Direct	1,625	3,650	LRW21E	22” x 22”
PTFB24H	24	1/3	Belt	784	4,850	LRW27E	28” x 28”
PTFB30J	30	1/2	Belt	627	7,550	LRW33E	34” x 34”
PTFB30L	30	1	Belt	815	10,450	LRW33E	34” x 34”

Power Tube

Manufactured from polyethylene tubing with UV inhibitor, the Power Tube is custom punched to suit your particular requirements. The Power Tube is clear so as not to obscure vision or light in your facility. Coolair Power Tube hangers are designed to be easily installed — just slide the hanger into position on the tubing, and clip onto a suspended wire. The Tube Hanger also supports the tube when the fan is not in use, allowing for unrestricted view and normal air movement. The Coolair Power Tube is a methodically researched product designed to meet the ventilation needs of the industry with traditional American Coolair quality.

Tube Hanger Spacing	
12” Tube	8 ft
18” Tube	8 ft
24” Tube	5 ft
30” Tube	5 ft

Power Tube Selection Chart

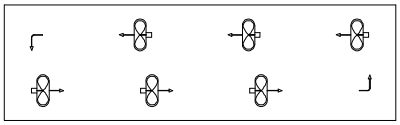
(Tube Length in feet)

For PTFA12F17		For PTFA18H16		For PTFB24H		For PTFB30J		For PTFB30L	
Model	**Tube Length**	**Model**	**Tube Length**	**Model**	**Tube Length**	**Model**	**Tube Length**	**Model**	**Tube Length**
2BJS	10 - 16	8DJR	20 - 24	4DJS	30 - 36	3EKM	60 - 72	31EKJ	60 - 72
2BKK	17 - 21	8DKK	25 - 31	4DKK	37 - 44	3EKP	73 - 87	31EKL	73 - 88
2BKM	22 - 27	8DKM	32 - 39	4DKM	45 - 54	3EKR	88 - 105	31EKN	89 - 107
2BKR	28 - 35	8DKQ	40 - 48	4DKP	55 - 65	3ELL	106 - 126	31EKQ	108 - 130
2AKQ	36 - 45	8DLJ	49 - 58	4DKS	66 - 79	3ELP	127 - 150	31ELJ	131 - 158
2ALK	46 - 58	8DLN	59 - 70	4DLM	80 - 96	3CKP	151 - 178	31ELN	159 - 189
2ALQ	59 - 74	8BKP	71 - 85	4BKP	97 - 116	3CKS	179 - 212	31CKQ	190 - 224
2AMK	75 - 93	8BLJ	86 - 103	4BKS	117 - 138	3CLQ	213 - 250	31CLJ	225 - 268
2AMN	94 - 115	8BLN	104 - 125	4BLL	139 - 166	3AKO	251 - 296	31CLM	269 - 316
		8BLS	126 - 149	4BLQ	167 - 199	3ALL	297 - 345	31CLQ	317 - 367
		8ALN	150- 178	4ALL	200 - 238	3ALO	346 - 380	31FLK	368 - 425
		8ALR	179 - 210	4ALP	239 - 280	3ALQ	381 - 410	31FLN	426 - 475

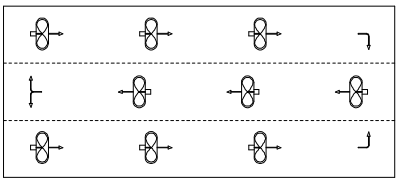
Circulator Fans

In greenhouses, proper air circulation helps plants grow better by increasing the amount of carbon dioxide at the plant level and reducing condensation on plant surfaces, reducing the risk of disease. Eliminate air stratification, reduce condensation, and eliminate hot and cold spots effectively and economically with American Coolair BK and FH fans. These fans feature aluminum propellers directly mounted to totally enclosed motors, steel guards that comply with OSHA standards, and cord sets that plug into standard 115 volt electrical outlets.

In general, the amount of circulation airflow needed is 2-1/2 to 3 CFM per square foot of floor space. Use the fans whenever the house exhaust fan system is not operating at full capacity. Circulator fans should be installed above the top of the crops to be cooled, but should be no closer than 1' from the roof. Use the figures to the right to determine the best fan layout for any type of building.



Typical Fan Placement - Individual House



Typical Fan Placement - Multiple-Gutter House

FH
Horizontal Air Fan



Type FH Horizontal Air Fans feature heavy gauge galvanized steel motor mounts, fan guards, and fan casing to provide the durability and corrosion resistance needed for greenhouse environments. Each FH fan comes with a chain mounting kit.

Model	Fan Size	Motor HP	Voltage	Fan RPM	CFM
FH18B11	18	1/15	115	1,100	2,000
FH18G11	18	1/4	115	1,050	3,500

BK
Basket Fan



Type BK Basket Fans feature coated steel wire guards. Each BK fan comes with a rafter hanging kit designed to easily mount to a "2-by" wooden beam or up to 2-1/8" metal tubing as standard. The standard mounting kit features 2-axis pivot adjustment to allow for precise vertical and horizontal orientation. Wall and ceiling mounting brackets, as well as chain kits, are also available to install the fans virtually anywhere in the building.

Model	Fan Size	Motor HP	Voltage	Fan RPM	CFM
BK18B11	18	1/15	115	1,075	2,310
BK18G11	18	1/4	115	1,125	3,130
BK20B11	20	1/15	115	1,075	2,960
BK20G11	20	1/4	115	1,125	3,880

Hobby Greenhouse Fans



CDP/WS
Exhaust Fan

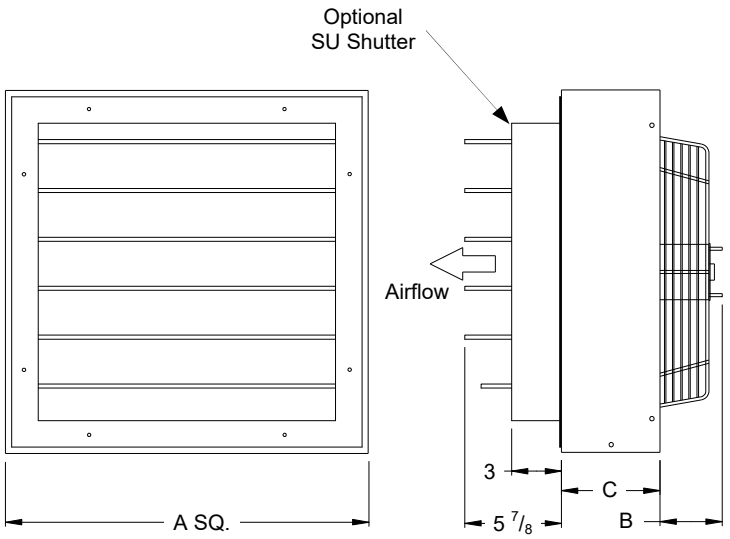
CDP/WS fans are engineered for minimal maintenance and efficient, economical operation. Designed to exhaust relatively low volumes of air from smaller buildings, these fans are well suited for the Hobby Greenhouse.

Each CDP/WS fan features an aluminum propeller which mounts directly to the motor shaft. Motors are permanently lubricated and totally enclosed. A welded steel wire inlet guard is standard on all models. An optional speed controller accessory allows the motor speed to be varied to achieve performances from 50% to 100% of catalog ratings.

The CDP/WS is shipped with the fan already mounted in a galvanized steel wall sleeve for quick and easy installation. Combined with the optional aluminum Type SU shutter and optional mounting flanges, the CDP/WS is a complete Hobby Greenhouse fan package.

Fan Model	Fan Size	Motor HP	Fan RPM	CFM at Static Pressure		Shutter Model
				0”	1/10”	
CDP/WS7B17	7	1/20	1725	333	263	SU7-8
CDP/WS8B17	8	1/20	1675	530	458	SU7-8
CDP/WS10B15	10	1/20	1560	793	706	SU10-12
CDP/WS14B15	14	1/20	1450	1,144	1,028	SU14-16
CDP/WS16G11	16	1/4	1140	2,388	2,243	SU14-16
CDP/WS18G10	18	1/4	1060	3,281	2,932	SU18-20





FRONT VIEW **SIDE VIEW**

	Dimensions in Inches			
Fan Size	**A**	**B**	**C**	**Wall Opening**
7-8	14 1/4	5	5 9/16	15
10	18 1/4	5	6 1/16	19
14	22 1/4	5	6 1/16	23
16	22 1/4	7 1/2	6 1/16	23
18	26 1/4	7 1/2	6 1/16	27

Evaporative Cooling Systems

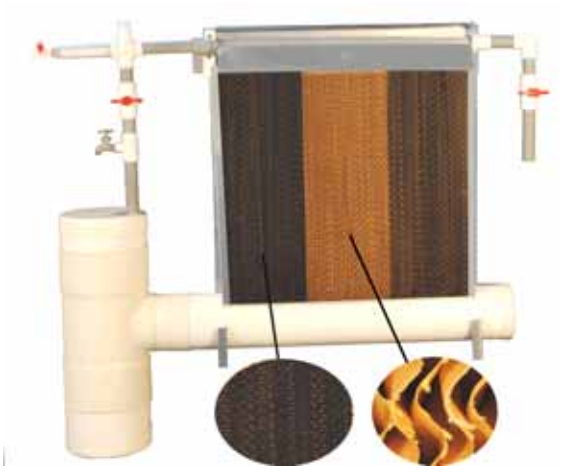
Evaporative Cooling in Concept

To counter periods of extreme temperature that affect in-house environments and therefore production, Coolair Evaporative Cooling Pad Systems are used with outstanding success. When large quantities of air are pulled through Evaporative Cooling Pads that are saturated with water, a substantial cooling effect is realized due to the evaporation of that water. Used in conjunction with Coolair fans, a temperature reduction of 10-25 degrees is commonplace. Suited for virtually all geographic locations, the Coolair Evaporative Cooling System delivers the greatest economic benefits to areas where higher temperatures during longer periods of time are normal.

The Evaporative Cooling Pad

Evaporative Cooling Pads (Evap Pads) are a product developed for horticultural and agricultural cooling applications. Evap Pads are made of a specially formulated cellulose paper, impregnated with insoluble anti-rot salts, stiffening saturants and wetting agents. Evap Pads have a cross fluted configuration that provides maximum cooling when warm air passes through the wet Evap Pad material.

- Evap Pads will not sag, rot or develop holes.
- With proper care and maintenance, Evap Pads will last for 5 years or more.
- There is no carry-over of water droplets to enter the house.
- Aesthetic appearance of Evap Pads compliments modern buildings.



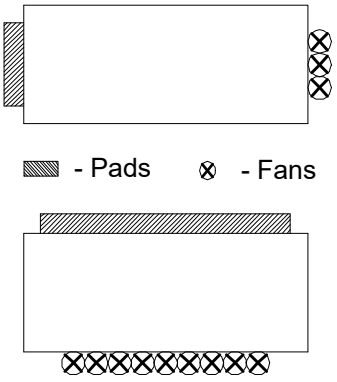
Edge-Coated Pad **Standard Pad**

Evap Pads are 4” or 6” thick, and 12” or 24” wide with height increments every 12” from 24” to 72”. The Evap Pads are positioned adjacent to each other to form a continuous surface of the required height and length. In addition to the standard Evap Pad, Edge-coated pads, which help reduce algae growth or build-up, are also available.

All 6” Evap Pads and 4” Evap Pads up to 48” tall are self-supporting, and do not require wire baskets or other supporting materials. The pads are held in place by component parts of the system. Tall pad supports are required on 4” pad systems over 4’ tall. Standard Evaporative Cooling Systems are available from 2’ to 6’ tall in lengths up to 110’. Systems up to 12’ tall are available with American Coolair’s ‘Doublestack’ Evap Pad Cooling System.

System Design

For greenhouse applications, the Coolair Evap Pad is most effective when the system is centered on the plants to be cooled. Specific placement should be such that the upper portion of the pad itself is on the same level as the top of the crop to be cooled.



An important consideration for the placement of pads in a building is the prevailing wind direction during the summer months. Pads should be placed on the same side as the prevailing winds with fan installation on the opposite side.

For system designs to suit the specific needs for your type of building and atmospheric conditions, you may wish to consult your American Coolair representative. However, as a general guide, you can use the following system recommendations to insure proper cooling in your building:

For 4” pad systems: Use 1 sq. ft. of pad per 250 CFM.
For 6” pad systems: Use 1 sq. ft. of pad per 400 CFM.

Example: A building has 6 fans that produce 20,000 CFM each for a total of 120,000 CFM through the building.

4” systems — 120,000 ÷ 250 = 480 sq. ft. of pad required.
6” systems — 120,000 ÷ 400 = 300 sq. ft. of pad required.

Evaporative Cooling Systems

PVC

- System length 5’ to 110’ - System height 2’ to 6’
- Completely self-contained
- PVC trough and sump included
- Available in Standard Top (system includes pipe cover/ spray deflector) or Open Top (for easy access to distribution pipe) designs
- Multiple pump designs available. For longer systems, consult your American Coolair representative.



Aluminum

- System length 5’ to 100’ - System height 2’ to 6’
- Ideal when large amounts of cooling is needed.
- Extruded aluminum trough
- Aluminum pipe cover/ spray deflector
- Multiple pump designs available. For longer systems, consult your American Coolair representative.



Pump and Sump

The pumps are sized for the system to supply at least 1/2 gallon of water per minute per linear foot of pad system. The integral PVC sump and trough hold an adequate water supply for systems up to 110’ long and 6’ high.

Pump and Sump

The pumps are sized for the system to supply at least 1/2 gallon of water per minute per linear foot of pad system. The sump should be purchased locally and be sized for at least 3/4 gallon capacity per square foot of pad area.

Doublestack

The Doublestack Evap Pad Cooling System features the Open Top distribution system, and is available in system heights from 7’ to 12’. The Doublestack System includes rigid pad supports that completely bear the weight of the upper Evap Pads, keeping them securely in place. This prevents the weight of the upper pads from causing the lower pads to sag.

‘Modular’ Doublestack systems are available in lengths up to 60’ and come standard with a PVC water return trough and PVC sump. ‘Tank’ systems are available from 50’ to 100’ in length and require a separate sump tank (to be purchased locally).



Water Distribution System

The water distribution systems for the PVC, Aluminum, and Doublestack designs feature PVC pipe with metered outlet holes, water return trough, water filter, an automatic supply valve, and a volume control valve. All systems also include top and bottom pad support material, water distribution pipe cover (except for Open Top systems), and all necessary fasteners.



Motors and Controllers



Motors

American Coolair provides dependable, energy efficient motors to drive our fans. These totally enclosed motors are available in 1/20 to 3 horsepower sizes. Motors have been tested at maximum brake horsepower conditions and operate within standard allowable NEMA temperature limits. All motors carry the motor manufacturer's full warranty.

A19 Thermostat

- Single stage, single pole
- Temperature range 30° - 110°F
- Controls motors up to 1 HP





T109 Thermostat

- Two stage, single pole
- NEMA 4X weatherproof box
- Temperature range 30° - 110°F
- Controls 2-speed motors up to 3/4 HP
- 3°F separation between stages.



T16 Thermostat

- Single stage, single pole
- NEMA 4X weatherproof box
- Temperature range 30° - 110°F
- Controls motors up to 1 HP

WARNING

If these ventilation products are used in agricultural structures to support life where failure of the ventilation could result in loss or injury, the user must provide an adequate back-up ventilation system and a failure alarm system. The user must accept the risk of such loss or injury from failure of the ventilation system.

Limited Warranty

In the sale of its products, American Coolair Corporation agrees to correct, by repairs or replacement, any defects in workmanship or material that may develop under proper and normal use during the period of one year from the date of shipment from the factory. Any product or part proving, upon American Coolair's examination, to be defective during limited warranty period will be repaired or replaced, at American Coolair's option, f.o.b. factory, without charge. Deterioration or wear caused by chemicals, abrasive action or excessive heat shall not constitute defects. Motors are guaranteed only to the extent of the manufacturer's warranty. American Coolair's limited warranty does not apply to any of its products or parts that have been subject to accidental damage, misuse by the user, unauthorized modifications, improper installation or electrical wiring, or lack of proper lubrication or other service requirements as established by American Coolair. Repairs or replacements provided under the above terms shall constitute fulfillment of all American Coolair's obligations with respect to limited warranty. THE LIMITED WARRANTY STATED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, STATUTORY OR IMPLIED, INCLUDING WITHOUT LIMITATION THAT OF MERCHANTABILITY AND FITNESS. NO LIABILITY FOR REINSTALLATION COST OR FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY NATURE IS ASSUMED OR SHALL BE IMPOSED UPON AMERICAN COOLAIR.

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Form No. 910-11-16 (January, 2010)

Warranty Summary Sheet

The table below is intended as a summary of Modine's limited warranty coverage on building HVAC products. Please see Modine's Commercial Warranty for a full description of our limited warranty policy. For replacement parts and warranty claims, please contact your local Modine Authorized Distributor. If you are unsure who to contact, click on Where to Buy to find your local Modine Factory Representative.

For timely and accurate service, please be sure to provide the full model and serial numbers of the equipment for which the warranty parts are needed. Digital photos of the installed unit along with the serial plate are also useful to confirm the equipment was properly applied, installed and operated.

Heat exchangers, burners, coils, compressors and explosion-proof motors must be returned to the factory for inspection. Your Modine Authorized Distributor will confirm the proper disposition of all parts covered under warranty.

Product Warranty Coverage

Product	Heat Exchangers	Coils	Burners	Compressors	Sheet Metal	Other Parts & Components
Gas-Fired Unit Heater	10 Years (Primary & Secondary) Only SS HX eligible for warranty in high humidity applications.	n/a	1 Year	n/a	1 Year	2 Years (1 year warranty in high humidity applications.)
Infrared (low intensity)	5 Years (Tubes)	n/a	2 Years	n/a	1 Year	2 Years
Infrared (high intensity)	1 Year	n/a	1 Year	n/a	1 Year	2 Years
Steam / Hot Water / Cabinet Unit Heater / Electric	n/a	1 Year	n/a	n/a	1 Year	2 Years
Unit Ventilators, Convectors, Fin/Tube	n/a	1 Year	n/a	n/a	1 Year	2 Years
Oil-Fired	1 Year	n/a	5 Years	n/a	1 Year	2 Years
Indirect Gas-Fired Furnaces & System Units	1 Year	1 Year	1 Year	n/a	1 Year	2 Years
Direct-Fired	n/a	n/a	1 Year	n/a	1 Year	2 Years
Cassettes	n/a	1 Year	n/a	n/a	1 Year	2 Years
Condensing Units (Cassettes)	n/a	1 Year	n/a	5 Years	1 Year	5 Years
Packaged Ventilation/ DOAS Units	10 Years	1 Year	1 Year	2 Years	1 Year	2 Years
School Room SPVU Products	n/a	1 Year	n/a	1 Year	1 Year	2 Years
Geothermal-Residential (G-series)	n/a	10 Years	n/a	10 Years	10 Years	10 Years
Geothermal-Commercial (E-series)	n/a	1 Year	n/a	1 Year	1 Year	2 Years

*NOTE: Modine reserves the right to request additional information and/or return of products or components at any time as part of the warranty investigation and claim process.

Warranty is replacement of parts for Defects in Materials and Workmanship ONLY. This warranty is void if the input to the product exceeds the rated input as indicated on the product serial plate by more than 5% on gas-fired and oil-fired units, or if the product in the judgment of SELLER has been installed in a corrosive atmosphere, or subjected to corrosive fluids or gases, been subjected to misuse, negligence, accident, excessive thermal shock, excessive humidity, physical damage, impact, abrasion, unauthorized alterations, or operation contrary to SELLER'S printed instructions, or if the serial number has been altered, defaced or removed. See published warranty for details.

All service parts carry a 90 day warranty

MODINE

6-560.9
5H0801050000

October, 2019

INSTALLATION AND SERVICE MANUAL
power vented gas-fired unit heaters
model PTP and BTP



C ETL LISTED US
Intertek

All models approved for use in California by the CEC and in Massachusetts. Unit heater is certified for non-residential applications.

FOR YOUR SAFETY

The use and storage of gasoline or other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.

IMPORTANT

The use of this manual is specifically intended for a qualified installation and service agency. All installation and service of these units must be performed by a qualified installation and service agency.

Inspection on Arrival

1. Inspect unit upon arrival. In case of damage, report it immediately to transportation company and your local Modine sales representative.
2. Check rating plate on unit to verify that power supply meets available electric power at the point of installation.
3. Inspect unit upon arrival for conformance with description of product ordered (including specifications where applicable).

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⚠ WARNING

1. **Improper installation, adjustment, alteration, service, or maintenance can cause property damage, injury, or death, and could cause exposure to substances which have been determined by various state agencies to cause cancer, birth defects, or other reproductive harm. Read the installation, operating, and maintenance instructions thoroughly before installing or servicing this equipment.**
2. **Do not locate ANY gas-fired units in areas where chlorinated, halogenated, or acidic vapors are present in the atmosphere. These substances can cause premature heat exchanger failure due to corrosion, which can cause property damage, serious injury, or death.**

FOR YOUR SAFETY

WHAT TO DO IF YOU SMELL GAS:

1. **Open windows.**
2. **Do not try to light any appliance.**
3. **Do not touch any electrical switch; do not use any phone in your building.**
4. **Extinguish any open flame.**
5. **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. If you can not reach your gas supplier, call your fire department.**

THIS MANUAL IS THE PROPERTY OF THE OWNER.
PLEASE BE SURE TO LEAVE IT WITH THE OWNER WHEN YOU LEAVE THE JOB.

SPECIAL PRECAUTIONS

SPECIAL PRECAUTIONS

THE INSTALLATION AND MAINTENANCE INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED TO PROVIDE SAFE, EFFICIENT AND TROUBLE-FREE OPERATION. IN ADDITION, PARTICULAR CARE MUST BE EXERCISED REGARDING THE SPECIAL PRECAUTIONS LISTED BELOW. FAILURE TO PROPERLY ADDRESS THESE CRITICAL AREAS COULD RESULT IN PROPERTY DAMAGE OR LOSS, PERSONAL INJURY, OR DEATH. THESE INSTRUCTIONS ARE SUBJECT TO ANY MORE RESTRICTIVE LOCAL OR NATIONAL CODES.

HAZARD INTENSITY LEVELS

1. **DANGER:** Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.
2. **WARNING:** Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.
3. **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.
4. **IMPORTANT:** Indicates a situation which, if not avoided, MAY result in a potential safety concern.

⚠ DANGER

Appliances must not be installed where they may be exposed to a potentially explosive or flammable atmosphere.

⚠ WARNING

1. Gas fired heating equipment must be vented - do not operate unvented.
2. A built-in power exhauster is provided - additional external power exhausters are not required or permitted.
3. If an existing heater is being replaced, it may be necessary to resize the venting systems. Improperly sized venting systems can result in vent gas leakage or the formation of condensate. Refer to the National Fuel Gas Code ANSI Z223.1 (NFPA 54) or CSA B149.1 - latest edition. Failure to follow these instructions can result in injury or death.
4. Under no circumstances should two sections of double wall vent pipe be joined together within one horizontal vent system due to the inability to verify complete seal of inner pipes.
5. All field gas piping must be pressure/leak tested prior to operation. Never use an open flame. Use a soap solution or equivalent for testing.
6. Gas pressure to appliance controls must never exceed 14" W.C. (1/2 psi).
7. To reduce the opportunity for condensation, the minimum sea level input to the appliance, as indicated on the serial plate, must not be less than 5% below the rated input, or 5% below the minimum rated input of dual rated units.
8. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
9. All appliances must be wired strictly in accordance with wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
10. Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 105°C.
11. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than the rated voltage.

⚠ WARNING

12. When servicing or repairing this equipment, use only factory-approved service replacement parts. A complete replacements parts list may be obtained by contacting the factory. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.

⚠ CAUTION

1. All literature shipped with this unit should be kept for future use for servicing or service diagnostics. Do not discard any literature shipped with this unit.
2. Consult piping, electrical, and venting instructions in this manual before final installation.
3. Do not attach ductwork, air filters, or polytubes to any propeller unit heater.
4. Clearances to combustible materials are critical. Be sure to follow all listed requirements.
5. Heaters are designed for use in heating applications with ambient startup temperatures between -40°F and 90°F, and ambient operating temperatures between 40°F and 90°F.
6. Do not install unit outdoors.
7. In garages or other sections of aircraft hangars such as offices and shops that communicate with areas used for servicing or storage, keep the bottom of the unit at least 7' above the floor unless the unit is properly guarded to provide user protection from moving parts. In parking garages, the unit must be installed in accordance with the standard for parking structures ANSI/NFPA 88A - latest edition, and in repair garages the standard for repair garages NFPA 30A - latest edition (formerly NFPA 88B). In Canada, installation of heaters in airplane hangars must be in accordance with the requirements of the enforcing authority, and in public garages in accordance with the current CSA-B149 codes.
8. In aircraft hangars, keep the bottom of the unit at least 10' from the highest surface of the wings or engine enclosure of the highest aircraft housed in the hangars and in accordance with the requirements of the enforcing authority and/or NFPA 409 - latest edition.
9. Installation of units in high humidity or salt water atmospheres will cause accelerated corrosion, resulting in a reduction of the normal life of the units.
10. Do not install units below 7' measured from the bottom of the unit to the floor in commercial applications (unless unit is properly guarded to provide user protection from moving parts).
11. Be sure no obstructions block air intake and discharge of unit heaters.
12. The minimum distance from combustible material is based on the combustible material surface not exceeding 160°F. Clearance from the top of the unit may be required to be greater then the minimum specified if heat damage, other than fire, may occur to materials above the unit heater at the temperature described.
13. Allow 18" of clearance at rear (or 12" beyond end of motor at rear of unit, whichever is greater) and access side to provide ample air for proper operation of fan.
14. Installation must conform with local building codes or in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) - latest edition. In Canada installation must be in accordance with CSA-B149.1.

SPECIAL PRECAUTIONS / SI (METRIC) CONVERSION FACTORS

⚠ CAUTION

15. Purging of air from gas supply line should be performed as described in the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) - latest edition. In Canada, installation must be in accordance with CSA-B149.1.
16. When leak testing the gas supply piping system, the appliance and its combination gas control must be isolated during any pressure testing in excess of 14" W.C. (1/2 psi).
17. The unit should be isolated from the gas supply piping system by closing its field installed manual shut-off valve. This manual shut-off valve should be located within 6' of the heater.
18. Turn off all gas before installing appliance.
19. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not less than 5% below the rated voltage.
20. Check the gas inlet pressure at the unit upstream of the combination gas control. The inlet pressure should be 6-7" W.C. on natural gas or 11-14" W.C. on propane. If inlet pressure is too high, install an additional pressure regulator upstream of the combination gas control.
21. Service or repair of this equipment must be performed by a qualified service agency.
22. Do not attempt to reuse any mechanical or electronic ignition controller which has been wet. Replace defective controller.

IMPORTANT

1. To prevent premature heat exchanger failure, do not locate ANY gas-fired appliances in areas where corrosive vapors (i.e. chlorinated, halogenated, or acidic) are present in the atmosphere.
2. To prevent premature heat exchanger failure, the input to the appliance as indicated on the serial plate, must not exceed the rated input by more than 5%.
3. Start-up and adjustment procedures must be performed by a qualified service agency.

BEFORE YOU BEGIN

⚠ CAUTION

1. All literature shipped with this unit should be kept for future use for servicing or service diagnostics. Leave manual with the owner. Do not discard any literature shipped with this unit.
2. Consult piping, electrical, and venting instructions in this manual before final installation.
3. Do not attach ductwork, air filters, or polytubes to any propeller unit heater.

In the U.S., the installation of these units must comply with the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) - latest edition and other applicable local building codes. In Canada, the installation of these units must comply with local plumbing or waste water codes and other applicable codes and with the current code CSA-B149.1.

1. All installation and service of these units must be performed by a qualified installation and service agency only as defined in ANSI Z223.1 (NFPA 54) - latest edition or in Canada by a licensed gas fitter.
2. This unit is certified with the controls furnished. For replacements parts, please order according to the replacement parts list on serial plate. Always know your model and serial numbers. Modine reserves the right to substitute other authorized controls as replacements.
3. Unit is balanced for correct performance. Do not alter fan or operate motors at speeds below what is shown in this manual.
4. Information on controls is supplied separately.
5. The same burner is used for natural and propane gas.

SI (Metric) Conversion Factors

To Convert	Multiply By	To Obtain
"W.C.	0.249	kPa
°F	(°F-32) x 5/9	°C
BTU	1.06	kJ
Btu/ft^3	37.3	kJ/m^3
Btu/hr	0.000293	kW
CFH (ft^3/hr)	0.000472	m^3/min
CFH (ft^3/hr)	0.00000787	m^3/s
CFM (ft^3/min)	0.0283	m^3/min
CFM (ft^3/min)	0.000472	m^3/s
feet	0.305	m
Gal/Hr.	0.00379	m^3/hr
Gal/Hr.	3.79	l/hr
gallons	3.79	l
Horsepower	746	W
inches	25.4	mm
pound	0.454	kg
psig	6.89	kPa
psig	27.7	"W.C.

UNIT LOCATION

DANGER

Appliances must not be installed where they may be exposed to a potentially explosive or flammable atmosphere.

CAUTION

1. Clearances to combustible materials are critical. Be sure to follow all listed requirements.
2. Heaters are designed for use in heating applications with ambient startup temperatures between -40°F and 90°F, and ambient operating temperatures between 40°F and 90°F.
3. Do not install unit outdoors.
4. In garages or other sections of aircraft hangars such as offices and shops that communicate with areas used for servicing or storage, keep the bottom of the unit at least 7' above the floor unless the unit is properly guarded. In parking garages, the unit must be installed in accordance with the standard for parking structures ANSI/NFPA 88A - latest edition, and in repair garages the standard for repair garages NFPA 30A - latest edition (formerly NFPA 88B). In Canada, installation of heaters in airplane hangars must be in accordance with the requirements of the enforcing authority, and in public garages in accordance with the current CSA-B149 codes.
5. In aircraft hangars, keep the bottom of the unit at least 10' from the highest surface of the wings or engine enclosure of the highest aircraft housed in the hangars and in accordance with the requirements of the enforcing authority and/or NFPA 409 - latest edition.
6. Installation of units in high humidity or salt water atmospheres will cause accelerated corrosion resulting in a reduction of the normal life of the units.

IMPORTANT

To prevent premature heat exchanger failure, do not locate ANY gas-fired appliances in areas where corrosive vapors (i.e. chlorinated, halogenated or acidic) are present in the atmosphere.

Location Recommendations

1. When locating the heater, consider general space and heating requirements, availability of gas and electrical supply, and proximity to vent locations.
2. When locating units, it is important to consider that the exhaust vent piping must be connected to the outside atmosphere. Maximum equivalent vent lengths are listed in “Section A - General Instruction - All Units” of the Venting instructions.
3. Be sure the structural support at the unit location site is adequate to support the unit's weight. Refer to page 17 for unit weights. For proper operation the unit must be installed in a level horizontal position.
4. Do not install units in locations where the flue products can be drawn into the adjacent building openings such as windows, fresh air intakes, etc.
5. Be sure that the minimum clearances to combustible materials and recommended service clearances are maintained. Units are designed for installation with the minimum clearances as shown in Figure 4.1 and Table 4.1.

Figure 4.1 - Combustible Material and Service Clearances

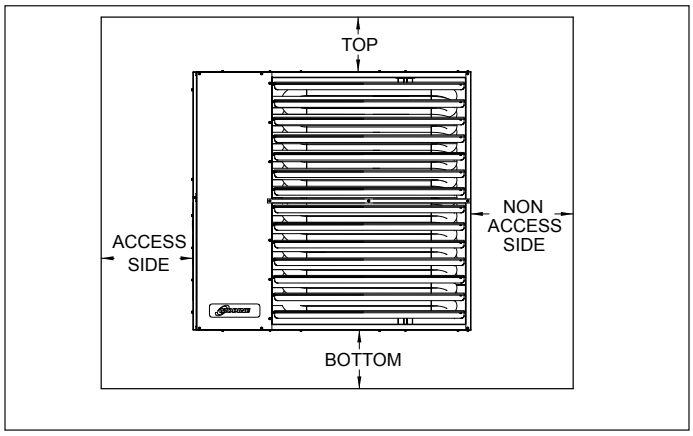


Table 4.1 - Clearances

Unit Side	Clearance To Combustible Materials	Recommended Service Clearance
Top and Bottom	6"	18"
Access Side	6"	18"
Non-Access Side	6"	18"
Rear	18"	18"
Vent Connector	6"	18"

6. Do not install units in locations where gas ignition system is exposed to water spray, rain, or dripping water.
7. Mounting height (measured from bottom of unit) at which unit heaters are installed is critical. Refer to mounting height and heat throw data on page 15 of this manual. The maximum mounting height for any unit is that height above which the unit will not deliver heated air to the floor.

Combustion Air Requirements

The National Fuel Gas Code defines an “unconfined space” as a space whose volume is greater than 50 cubic feet per 1,000 Btu/Hr input of the installed appliance(s). A confined space is 50 cubic feet or less per 1,000 Btu/Hr input of the installed appliance(s).

Units installed in tightly sealed buildings or confined spaces must be provided with 2 permanent openings - 1 near the top and 1 near the bottom of the confined space. Each opening should have a free area of not less than one square inch per 1,000 Btu/Hr of the total input rating of all units in the confined space, freely communicating with interior areas that have adequate infiltration from the outside.

For further details on supplying combustion air to a confined (tightly sealed) space or unconfined space, see the National Fuel Gas Code ANSI Z223.1 (NFPA 54) or CSA-B149.1 Installation Code - latest edition.

Sound and Vibration Levels

All standard mechanical equipment generates some sound and vibration that may require attenuation. Libraries, private offices and hospital facilities will require more attenuation, and in such cases, an acoustical consultant may be retained to assist in the application. Locating the equipment away from the critical area is desirable within ducting limitations. Generally, a unit should be located within 15' of a primary support beam. Smaller deflections typically result in reduced vibration and noise transmission.

UNIT MOUNTING

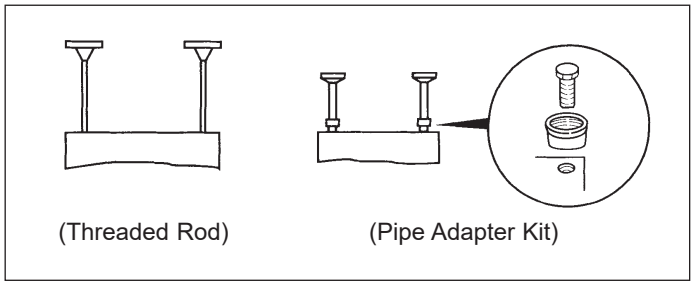
⚠ CAUTION

1. Do not install units below 7' measured from the bottom of the unit to the floor in commercial applications (unless unit is properly guarded to provide user protection from moving parts).
2. Be sure no obstructions block air intake and discharge of unit heaters.
3. The minimum distance from combustible material is based on the combustible material surface not exceeding 160°F. Clearance from the top of the unit may be required to be greater than the minimum specified if heat damage, other than fire, may occur to materials above the unit heater at the temperature described.
4. Allow 18" clearance at rear (or 12" beyond end of motor at rear of unit, whichever is greater) and access side to provide ample air for proper operation of fan.

1. Be sure the means of suspension is adequate to support the weight of the unit (see page 17 for unit weights).
2. For proper operation, the unit must be installed in a level horizontal position.
3. Clearances to combustibles as specified in Table 4.1 must be strictly maintained.
4. All standard units are shipped fully boxed. Larger units are also supplied with skid supports on the bottom of the box. The larger units may be lifted from the bottom by means of a fork lift or other lifting device only if the shipping support skids are left in place and the forks support the whole depth of the unit. If the unit must be lifted from the bottom for final installation without the carton in place, be sure to properly support the unit over its entire length and width to prevent damage. When lifting units, make sure the load is balanced.
5. Propeller models have 4 mounting holes.The units can be mounted with 3/8"-16 threaded rod as follows:
   - On each piece of threaded rod used, screw a nut a distance of about 1" onto the end of the threaded rods that will be screwed into the unit heater.
   - Place a washer over the end of the threaded rod and screw the threaded rod into the unit heater weld nuts on the top of the heater at least 5 turns, and no more than 10 turns. Tighten the nut first installed onto the threaded rod to prevent the rod from turning.
   - Drill holes into a steel channel or angle iron at the same center-line dimensions as the heater that is being installed. The steel channels or angle iron pieces need to span and be fastened to appropriate structural members.
   - Cut the threaded rods to the preferred length, place them through the holes in the steel channel or angle iron and secure with washers and lock nuts or lock washers and nuts. A double nut arrangement can be used here instead of at the unit heater (a double nut can be used both places but is not required).
   - Do not install standard unit heaters above the maximum mounting height shown in Table 21.1 and 21.2

   NOTE: A pipe hanger adapter kit, shown in Figure 5.1 is available as an accessory. One kit consists of drilled 3/4" IPS pipe caps and 3/8"-16 x 1-1/2" capscrews to facilitate threaded pipe suspension.

Figure 5.1 - Unit Heater Suspension Methods



⚠ WARNING

1. Gas fired heating equipment must be vented - do not operate unvented.
2. A built-in power exhauster is provided - additional external power exhausters are not required or permitted.
3. If an existing heater is being replaced, it may be necessary to resize the venting systems. Improperly sized venting systems can result in vent gas leakage or the formation of condensate. Refer to the National Fuel Gas Code ANSI Z223.1 (NFPA 54) or CSA B149.1 - latest edition. Failure to follow these instructions can result in serious injury or death.
4. Under no circumstances should 2 sections of double wall vent pipe be joined together within 1 horizontal vent system due to the inability to verify complete seal of inner pipes.

⚠ CAUTION

Installation must conform with local building codes or in the absence of local codes, with Part 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) - latest edition. In Canada installation must be in accordance with CSA B149.1.

Model PTP and BTP unit heaters must be vented with the proper passageway as described in these instructions to convey flue gases from the unit or the vent connector to the outside atmosphere.

The venting instructions are organized in sections, based on installation type. The sections are identified as follows:

Instructions	Applicable Installation Instructions by Vent System Type
A	General Instructions for **ALL** Installations
B	**VERTICAL CATEGORY I** vent systems ①
C	**HORIZONTAL CATEGORY III** vent systems ①

① The differences between Vertical and Horizontal vent systems will be identified in "Section A - General Instructions - All Units".

Section A - General Instructions - All Units

A1. If the unit heater being installed is replacing existing equipment and using the existing vent system from that equipment, inspect the venting system for proper size and horizontal pitch, as required in the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) or CSA B149.1 Installation Code - latest edition and these instructions. Determine that there is no blockage or restriction, leakage, corrosion and other deficiencies, which could cause an unsafe condition.

A2. The vent pipe should be galvanized steel or other suitable corrosion-resistant material. Follow the National Fuel Gas Code for minimum thickness of vent material. The minimum thickness for connectors varies depending on the pipe diameter. Do not vent unit with PVC or other forms of plastic venting material.

A3. All heaters come with a factory installed vent adapter for attaching the vent pipe to the heater (see Table 6.1). Attach the vent pipe to the adapter with 3-corrosion resistant screws. (Drill pilot holes through the vent pipe and adapter prior to screwing in place). Vent pipe must not be smaller than the connector size.

A4. Refer to Table 6.1 for total minimum and maximum vent lengths, making the system as straight as possible. The equivalent length of a 90° elbow is 5 feet for 4 inch diameter and 7 feet for 6 inch diameter.

Table 6.1 - Vent Pipe Diameters, Transitions, and Total Equivalent Vent Pipe Lengths for Horizontal Venting Systems

Model Size	Vent Pipe Diameter	Equivalent Vent Length	
		Minimum	Maximum
150	4"	3'	50'
175-200	4"	3'	70'
250-400	6"	3'	70'

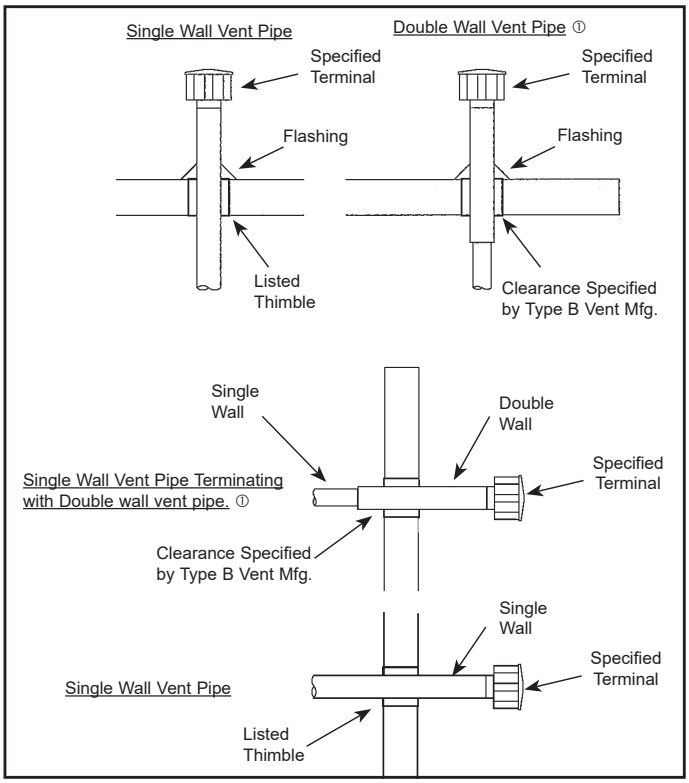
A5. Horizontal sections of vent pipe are to be installed with an upward or downward slope from the appliance of 1/4 inch per foot and suspended securely from overhead structures at points not greater than 3' apart.

A6. Fasten individual lengths of vent together with at least 3 corrosion-resistant sheet metal screws.

A7. Keep single wall vent pipe at least 6" from combustible materials. For double wall vent pipe, follow the vent pipe manufacturer's clearances to combustibles. The minimum distance from combustible materials is based on the combustible material surface not exceeding 160°F. Clearance from the vent pipe (or the top of the unit) may be required to be greater than 6" if heat damage other than fire could result (such as material distortion or discoloration).

A8. Avoid venting through unheated space when possible. When venting does pass through an unheated space or if the unit is installed in an environment that promotes condensation, insulate runs greater than 5' to minimize condensation. Inspect for leakage prior to insulating and use insulation that is noncombustible with a rating of not less than 400°F. Install a tee fitting at the low point of the vent system and provide a drip leg with a clean out cap as shown in Figure 8.1.

Figure 6.1 - Venting Through Combustible Roof or Wall



① See Instruction A12 for attaching single wall pipe to double wall pipe

INSTALLATION - VENTING

A9. When the vent passes through a combustible INTERIOR wall or floor, a metal thimble 4" greater than the vent diameter is necessary. If there is 6' or more of vent pipe in the open space between the appliance and where the vent pipe passes through the wall or floor, the thimble need only be 2" greater than the diameter of the vent pipe. If a thimble is not used, all combustible material must be cut away to provide 6" of clearance. Where authorities have jurisdiction, Type B vent may be used for the last section of vent pipe to maintain clearance to combustibles while passing through wall or floor (see Figure 6.1). Any material used to close the opening must be noncombustible.

A10. All seams and joints of the single wall pipe must be sealed with metallic tape or silastic suitable for temperatures up to 400°F. Wrap the tape 2 full turns around the vent pipe. One continuous section of double wall vent pipe may be used within the vent system to pass through the wall to a listed vent cap. Refer to instruction A11 in "Section A – General Instructions – All Units" for attaching double wall pipe to single wall pipe.

A11. The following are General Instructions for Double Wall (Type B) Terminal Pipe Installation:

How to attach a single wall vent terminal to double wall (Type B) vent pipe:

1. Look for the "flow" arrow on the vent pipe.
2. Slide the vent terminal inside the exhaust end of the double wall vent pipe.
3. Drill 3 holes through the pipe and the vent terminal. Using 3/4" long sheet metal screws, attach the cap to the pipe. Do not overtighten.

How to connect a single wall vent system to a double wall (Type B) vent pipe:

1. Slide the single wall pipe inside the inner wall of the double wall pipe.
2. Drill 3 holes through both walls of the single and double wall vent pipes. Using 3/4" sheet metal screws, attach the 2 pieces of pipe. Do not overtighten.
3. The gap between the single and double wall pipe must be sealed but it is not necessary to fill the full volume of the annular area. To seal, run a large bead of 400°F silastic around the gap.

A12. Vent termination clearances must be maintained:

Table 7.1 - Vent Termination Clearances

Structure	Minimum Clearances for Vent Terminal Location
Forced air inlet within 10 feet	3 feet above
Combustion air inlet of another appliance	6 feet all directions
Door, window, gravity air inlet, or any building opening	4 feet horizontal and below 1 foot above
Electric meter, gas meter, gas regulator, and relief equipment ①	4 feet horizontal (U.S.) 6 feet horizontal (Canada)
Gas regulator ①	3 feet horizontal (U.S.) 6 feet horizontal (Canada)
Adjoining building or parapet wall	6 feet all directions
Adjacent public walkways	7 feet all directions
Grade (ground level)	3 feet above

① Do not terminate the vent directly above a gas meter or regulator.

A13. Do NOT vent this appliance into a masonry chimney.

A14. Do NOT use dampers or other devices in the vent or combustion air pipes.

A15. The venting system must be exclusive to a single appliance and no other appliance is allowed to be vented into it.

A16. Precautions must be taken to prevent degradation of building materials by flue products.

A17. Single wall vent pipe must not pass through any unoccupied attic, inside wall, concealed space, or floor.

A18. Uninsulated single wall vent pipe must not be used outdoors for venting appliances in regions where the 99% winter design temperature is below 32°F.

A19. The vent terminal must be:

Table 7.2 - Vent Terminals

Model Size	Modine PN
150-200	5H0722850001
250-400	5H0722850002

A20. In addition to following these eneral Instructions, specific instructions for Vertical Category I or Horizontal Category III vent systems must also be followed. The following outlines the differences:

Table 7.3 - ANSI Unit Heater Venting Requirements

Category	Description	Venting Requirements
I	Negative vent pressure Non-condensing	Follow standard venting requirements.
II	Negative vent pressure Condensing	Condensate must be drained.
III	Positive vent pressure Non-condensing	Vent must be gas tight.
IV	Positive vent pressure Condensing	Vent must be liquid and gas tight. Condensate must be drained.

Note: Vent connectors serving Category I appliances shall not be connected into any portion of mechanical draft systems operating under positive pressure.

Vertical Category I Vent

- Vertical vent systems terminate vertically (up) (an example is shown in Figure 8.1).
- The horizontal portion of the vent run cannot exceed 75% of the vertical rise (Example: If the vent height is 10', the horizontal portion of the vent system cannot exceed 7.5').
- The vent terminates a minimum of 5' above the vent connector on the unit.
- If the vent system to be installed meets ALL these criteria (an example is shown in Figure 8.1), proceed to "Section B - Vertical Vent System Installation". For all other cases, proceed to the next section for Horizontal Category III Vent System Determination:

Horizontal Category III Vent

- Horizontal vent systems terminate horizontally (sideways) (an example is shown in Figure 9.2).
- A vent system that terminates vertically but has a horizontal run that exceeds 75% of the vertical rise is considered horizontal.
- Horizontal vent configurations are Category III. Additional requirements are covered in "Section C - Horizontal Category III Vent System Installation".

INSTALLATION - VENTING

Section B – Vertical Vent System Installation

B1. This section applies to vertically vented Category I vent systems and is in addition to “Section A – General Instructions – All Units”.

B2. Vertical vent systems terminate vertically, and must be sized in accordance with the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) - latest edition.

B3. The horizontal portion of the vent run cannot exceed 75% of the vertical rise (Example: If the vent height is 10', the horizontal portion of the vent system cannot exceed 7.5').

B4. It is recommended to install a tee with drip leg and clean out cap as shown in Figure 8.1.

B5. The vent terminates a minimum of 5' above the vent connector on the unit.

B6. All vertically vented heaters that are Category I must be connected to a vent complying with a recognized standard, with a material acceptable to the authority having jurisdiction. Venting into a masonry chimney is not permitted. Refer to the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) - latest edition for instructions on common venting.

B7. Use a listed vent terminal to reduce down drafts and moisture in the vent.

B8. Double wall vent pipe is recommended, although single wall can be used if the requirements of the National Fuel Gas Code are followed.

B9. Vertical vents must terminate a minimum horizontal and vertical distance from roof lines and adjacent walls or obstructions. These minimum distances are outlined as follows (based on National Fuel Gas Code requirements for vents with diameters less than 12"):

- For **double wall** vent pipe and **8' or greater** horizontal distance to any vertical wall or similar obstruction, the vent must terminate above the roof in accordance with Figure 8.1 and Table 8.1.
- For **double wall** vent pipe and **less than 8'** horizontal distance to any vertical wall or similar obstruction, the vent must terminate at least 2' above the highest point where it passes through a roof of a building and at least 2' higher than any portion of a building within a horizontal distance of 10' (see Figure 8.1).

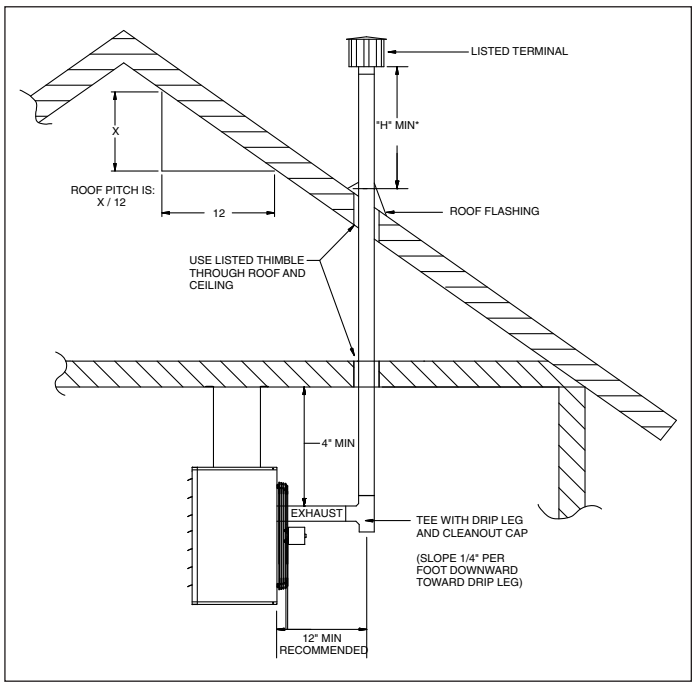
Table 8.1 - Minimum Height from Roof to Lowest Discharge Opening

Rise X (in)	Roof Pitch	Min Height H (ft) ①
0-6	Flat to 6/12	1.00
6-7	6/12 to 7/12	1.25
7-8	7/12 to 8/12	1.50
8-9	8/12 to 9/12	2.00
9-10	9/12 to 10/12	2.50
10-11	10/12 to 11/12	3.25
11-12	11/12 to 12/12	4.00
12-14	12/12 to 14/12	5.00
14-16	14/12 to 16/12	6.00
16-18	16/12 to 18/12	7.00
18-20	18/12 to 20/12	7.50
20-21	20/12 to 21/12	8.00

① Size according to expected snow depth.

- For **single wall** vent pipe and 10' or greater horizontal distance to any portion of a building, the vent must terminate at least 2' above the highest point where it passes through a roof of a building and at least 2' higher than any portion of a building within a horizontal distance of 10'.
- For **single wall** vent pipe and less than 10' horizontal distance to any portion of a building, the vent must terminate at least 2' higher than any portion of that building.

Figure 8.1 - Vertical Category I Vent System



INSTALLATION - VENTING

Section C – Horizontal, Category III Vent System Installation

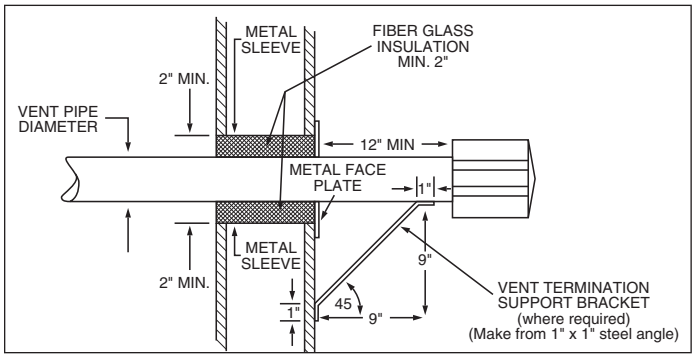
C1. This section applies to horizontally vented Category III vent systems and is in addition to “Section A – General Instructions – All Units”.

C2. Horizontal vent systems terminate horizontally (sideways).

C3. Seal all seams and joints of un-gasketed single wall pipe with metal tape or Silastic suitable for temperatures up to 400°F. Wrap the tape 2 full turns around the vent pipe. For single wall vent systems, 1 continuous section of double wall vent pipe may be used within the vent system to pass through the wall to a listed vent cap. Under no circumstances should 2 sections of double wall vent pipe be joined together within 1 horizontal vent system due to the inability to verify complete seal of inner pipes. Category III vent systems listed by a nationally recognized agency and matching the diameters specified may be used. Different brands of vent pipe materials may not be intermixed. Refer to instruction A10 in “Section A – General Instructions – All Units” for attaching double wall pipe to single wall pipe.

C4. All horizontal Category III vents must be terminated with a listed vent cap. The cap must terminate a minimum distance of 12" beyond the exterior wall surface as shown in Figure 9.2. The vent must be supported as shown in Figure 9.1. Precautions must be taken to prevent degradation of building materials by flue products.

Figure 9.1 - Exhaust Vent Construction Through Combustible Walls and Support Bracket

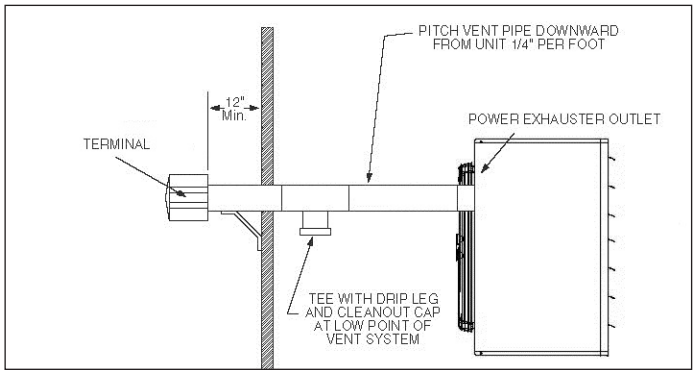


C5. When condensation may be a problem, the vent system shall not terminate over public walkways or over an area where condensate or vapor could create a nuisance or hazard or could be detrimental to the operation of regulators, relief openings, or other equipment.

C6. The venting system must be exclusive to a single unit, and no other unit is allowed to be vented into it.

C7. When vented horizontally, maintain a 1/4" per foot rise away from the heater and place a drip leg with clean out near the unit as shown in Figure 9.2. Where local authorities have jurisdiction, a 1/4" per foot downward slope is acceptable with a drip leg and clean out near the exit of the vent as shown in Figure 9.2, or allow the condensate to drip out the end.

Figure 9.2 - Horizontal Venting



C8. For a vent termination located under an eave, the distance of the overhang must not exceed 24". The clearance to combustibles above the exterior vent must be maintained at a minimum of 12". Consult the National Fuel Gas Code for additional requirements for eaves that have ventilation openings.

C9. Once venting is complete, proceed to the section titled “Installation – Gas Connections”.

GAS CONNECTIONS

⚠ WARNING

1. All field gas piping must be pressure/leak tested prior to operation. Never use an open flame. Use a soap solution or equivalent for testing.
2. Gas pressure to appliance controls must never exceed 14" W.C. (1/2 psi).
3. To reduce the opportunity for condensation, the minimum sea level input to the appliance, as indicated on the serial plate, must not be less than 5% below the rated input, or 5% below the minimum rated input of dual rated units.

⚠ CAUTION

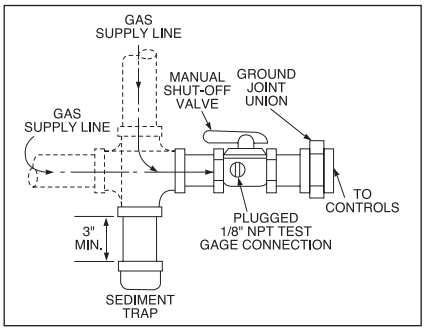
1. Purging of air from gas lines should be performed as described in the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) - latest edition or in Canada CSA-B149 codes.
2. When leak testing the gas supply piping system, the appliance and its combination gas control must be isolated during any pressure testing in excess of 14" W.C. (1/2 psi).
3. The unit should be isolated from the gas supply piping system by closing its field installed manual shut-off valve. This manual shut-off valve should be located within 6' of the heater.
4. Turn off all gas before installing appliance.

IMPORTANT

To prevent premature heat exchanger failure, the input to the appliance, as indicated on the serial plate, must not exceed the rated input by more than 5%.

1. Installation of piping must conform with local building codes, or in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) - latest Edition. In Canada, installation must be in accordance with CSA-B149.1.
2. Piping to units should conform with local and national requirements for type and volume of gas handled, and pressure drop allowed in the line. Refer to Table 10.1 to determine the cubic feet per hour (CFH) for the type of gas and size of unit to be installed. Using this CFH value and the length of pipe necessary, determine the pipe diameter from Table 10.2. Where several units are served by the same main, the total capacity, CFH and length of main must be considered. Avoid pipe sizes smaller than 1/2". Table 10.2 allows for a 0.3" W.C. pressure drop in the supply pressure from the building main to the unit. The inlet pressure to the unit must be 6-7" W.C. for natural gas and 11-14" W.C. for propane gas. When sizing the inlet gas pipe diameter, make sure that the unit supply pressure can be met after the 0.3" W.C. has been subtracted. If the 0.3" W.C. pressure drop is too high, refer to the Gas Engineer's Handbook for other gas pipe capacities.
3. Install a ground joint union with brass seat and a manual shut-off valve adjacent to the unit for emergency shut-off and easy servicing of controls, including a 1/8" NPT plugged tapping accessible for test gauge connection (see Figure 10.1).
4. Use two wrenches when connecting field piping to units.
5. Provide a sediment trap before each unit in the line where low spots cannot be avoided (see Figure 10.1).
6. When Pressure/Leak testing, pressures above 14" W.C. (1/2 psi), close the field installed shut-off valve, disconnect the appliance and its combination gas control from the gas supply line, and plug the supply line before testing. When testing pressures 14" W.C. (1/2 psi) or below, close the manual shut-off valve on the appliance before testing.

Figure 10.1 - Recommended Sediment Trap/Manual Shut-off Valve Installation - Side or Bottom Gas Connection ①



① Manual shut-off valve is in the "OFF" position when handle is perpendicular to pipe.

Table 10.1 - Sea Level Manifold Pressure & Gas Consumption

		Natural	Propane	
Model Size	**Manifold Pressure ("W.C.):**	3.5	10	**# of Orifices**
150	CFH	142.9	60.0	6
	Gal/Hr.Propane	n/a	1.6	
	Orifice Drill Size	42	53	
175	CFH	166.7	70.0	7
	Gal/Hr.Propane	n/a	1.9	
	Orifice Drill Size	42	53	
200	CFH	190.5	80.0	7
	Gal/Hr.Propane	n/a	2.2	
	Orifice Drill Size	38	52	
250	CFH	238.1	100.0	9
	Gal/Hr.Propane	n/a	2.7	
	Orifice Drill Size	39	1.55mm	
300	CFH	285.7	120.0	9
	Gal/Hr.Propane	n/a	3.3	
	Orifice Drill Size	36	51	
350	CFH	333.3	140.0	12
	Gal/Hr.Propane	n/a	3.8	
	Orifice Drill Size	38	52	
400	CFH	381.0	160.0	12
	Gal/Hr.Propane	n/a	4.4	
	Orifice Drill Size	36	51	

Table 10.2 - Gas Pipe Capacities - Natural Gas ① ②

Pipe Length (ft)	**Natural Gas**					
	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
10	132	278	520	1050	1600	3050
20	92	190	350	730	1100	2100
30	73	152	285	590	890	1650
40	63	130	245	500	760	1450
50	56	115	215	440	670	1270
60	50	105	195	400	610	1150
70	46	96	180	370	560	1050
80	43	90	170	350	530	930
100	38	79	150	305	460	870
125	34	72	130	275	410	780
150	31	64	120	250	380	710

① Capacities in Cubic Feet per Hour through Schedule 40 pipe with maximum 0.3" W.C. pressure drop with up to 14" W.C. gas pressure. Specific gravity is 0.60 for Natural gas and 1.50 for Propane gas.

② For Pipe Capacity with Propane Gas, divide Natural gas capacity by 1.6. Example: What is the Propane gas pipe capacity for 60 feet of 1-1/4" pipe? The Natural gas capacity is 400 CFH. Divide by 1.6 to get 250 CFH for Propane gas.

HIGH ALTITUDE ACCESSORY KIT

Modine's gas-fired equipment standard input ratings are certified by ETL. For elevations above 2,000', ANSI Z223.1 requires ratings be reduced 4 percent for each 1,000'. above sea level. For units in Canada, CSA requires that ratings be reduced 10 percent at elevations above 2,000'. The high altitude adjustment instructions and pressure switch kits listed in this manual are for use with units that will be installed over 2,000'. These methods and kits comply with both ANSI Z223.1 and CSA requirements.

If a unit is to be installed at higher elevations AND converted from natural gas to propane gas operation, a propane conversion kit must be used in conjunction with the pressure adjustment methods and pressure switch kits listed herein. For the selection and installation instructions for propane conversion kits, please see the latest revision of Modine Manual 75-515.

Selection of the Proper Pressure and Kit

To determine the proper manifold pressure at altitude and if required, the proper combustion air pressure switch kit, the full model number of the heater, the fuel to be used, and the altitude the unit will be installed at must be known. Refer to the unit serial plate or carton label to obtain the necessary information about the unit.

After obtaining this information, refer to the gas pressure and selection charts shown in Tables 11.1 through 11.3. The pressure charts are differentiated by elevation, fuel type, and country the product is being installed in. The selection charts are differentiated by product type, altitude and fuel type. **If converting from natural gas to propane gas and operation at high altitude, both a propane conversion kit and a pressure switch kit must be used (if applicable).** Selection charts include the proper kit suffix, when required.

Manifold Pressure Adjustment

The inlet pressure to the unit must be confirmed to be within acceptable limits (6-7" W.C. for natural gas and 11-14" W.C. for propane gas) before opening the shutoff valve or the combination gas valve may be damaged.

Heaters for use with **natural gas** have gas valves that need to be feild set at 3.5" W.C. manifold pressure at 7.0" W.C. inlet pressure.

Units for use with **propane gas** need to be feild set for 10.0" W.C. manifold pressure at 14.0" W.C. inlet pressure.

Installation above 2,000' elevation requires adjustment of the manifold pressure as described.

Derated BTU Content Gas and Manifold Pressure Calculation

Some utility companies may derate the BTU content (heating value) of the gas provided at altitude to a value other than 1,050 BTU/ft^3 for natural gas or 2,500 BTU/ft^3 for propane gas to allow certain heating appliances to be used with no manifold pressure adjustments. For this reason it is necessary that the supplying utility be contacted for detailed information about the gas type and BTU content (heating value) before operating any heater. Tables 11.1 and 11.2 show the standard derated heating values (4% per 1,000' of elevation in the USA and 10% between 2,001' and 4,500' elevation in Canada) of natural and propane gases at various altitudes. If the utility is supplying gas with heating values as shown in Tables 11.1 and 11.2, the manifold pressure should be set to 3.5" W.C for natural gas and 10.0" W.C. for propane gas.

NOTE: Only the high fire gas pressure need be adjusted, low fire gas pressure should remain the same.

Table 11.1 - Natural Gas Heating Values at Altitude ①③④

Altitude (ft)	Gas Heating Values at Altitude (BTU/ft^3)	
	USA	Canada
0-2,000	1,050	1,050
2,001-3,000	929	945
3,001-4,000	892	
4,001-4,500	874	
4,501-5,000	856	856
5,001-6,000	822	822
6,001-7,000	789	789
7,001-8,000	757	757
8,001-9,000	727	727
9,001-10,000	698	698

Table 11.2 - Propane Gas Heating Values at Altitude ②③④

Altitude (ft)	Gas Heating Values at Altitude (BTU/ft^3)	
	USA	Canada
0-2,000	2,500	2,500
2,001-3,000	2,212	2,250
3,001-4,000	2,123	
4,001-4,500	2,080	
4,501-5,000	2,038	2,038
5,001-6,000	1,957	1,957
6,001-7,000	1,879	1,879
7,001-8,000	1,803	1,803
8,001-9,000	1,731	1,731
9,001-10,000	1,662	1,662

① Values shown are for 3.5" W.C. manifold pressure, for other BTU content values (available from local utility) use Equation 12.1 to calculate manifold pressure.
② Values shown are for 10.0" W.C. manifold pressure, for other BTU content values (available from local utility) use Equation 12.1 to calculate manifold pressure.
③ When installed at altitudes above 2,000', a pressure switch may need to be changed. Refer to Table 11.3 to determine if a switch change is required.
④ Gas heating values are derated 4% per 1,000' of elevation in the USA and 10% between 2,000' and 4,500' elevation in Canada in accordance with ANSI Z223.1 and CSA-B149, respectively.

Table 11.3 - High Altitude Kits for PTP and BTP①

Model Size	Details	U.S.A. and Canada				
		0-2,000 ft	2,001-4,500 ft	4,501-5,500 ft	5,501-6,500 ft	6,501-7,500 ft
150-250	Kit Suffix	Not Required	Label Only	Label Only	Label Only	Label Only
	Item Code					
300	Kit Suffix	Not Required	Label Only	Label Only	0008	0008
	Item Code				68412	68412
350	Kit Suffix	Not Required	Label Only	Label Only	Label Only	Label Only
	Item Code					
400	Kit Suffix	Not Required	0009	0009	0009	0009
	Item Code		68413	68413	68413	68413

① For Label Only kits, Modine part number 5H0807146005 is required to be filled out and attached to the unit by the installer. Please contact the local Modine representative at 1.866.828.4328 (HEAT).

INSTALLATION - HIGH ALTITUDE ACCESSORY KIT

If the heating value of the gas being supplied is different than the values shown in Tables 11.1 and 11.2, use the following equation to determine the appropriate manifold pressure for the altitude and gas heating value being supplied.

Equation 12.1 - Manifold Pressure for Derated Gas

$$MP_{ACT} = \left(\frac{BTU_{TBL}}{BTU_{ACT}}\right)^2 \times MP_{SL}$$

WHERE:

MP_{ACT} = **Manifold Pressure (in. W.C.) at Altitude** – Manifold pressure setting for the heater being installed

BTU_{TBL} = **BTU/ft³ Content of Gas** – Obtained from Tables 11.1 or 11.2 (whichever is applicable)

BTU_{ACT} = **BTU/ft³ Content of Gas** – Obtained from the local utility company

MP_{SL} = **Manifold Pressure (in. W.C.), at Sea Level** – Use 3.5" W.C. for Natural Gas and 10.0" W.C. for propane gas

NOTE: Only the primary manifold pressure should be adjusted on units equipped with two-stage or modulating gas controls. No adjustments to the low fire manifold pressure are necessary on these units.

INSTALLATION - ELECTRICAL CONNECTIONS

ELECTRICAL CONNECTIONS

⚠ WARNING

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All appliances must be wired strictly in accordance with wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 105°C.
4. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than rated voltage.

⚠ CAUTION

Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.

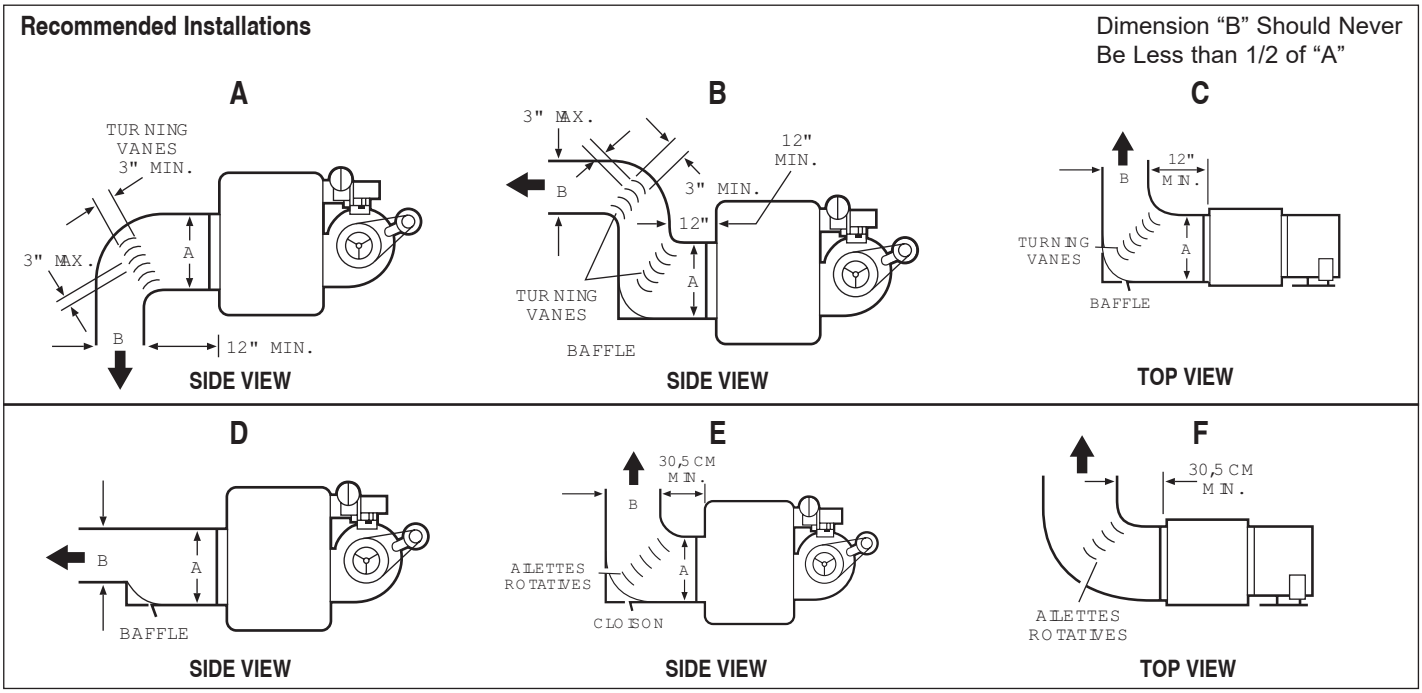
1. Installation of wiring must conform with local building codes, or in the absence of local codes, with the National Electric Code ANSI/NFPA 70 - Latest Edition. Unit must be electrically grounded in conformance to this code. In Canada, wiring must comply with CSA C22.1, Part 1, Electrical Code.
2. Two copies of the unit wiring diagram are provided with each unit. One is located in the side access control compartment and the other is supplied in the literature packet. Refer to this diagram for all wiring connections.
3. Make sure all multi-voltage components (motors, transformers, etc.) are wired in accordance with the power supply voltage.
4. The power supply to the unit must be protected with a fused or circuit breaker switch.
5. The power supply must be within 5 percent of the voltage rating and each phase must be balanced within 2 percent of each other. If not, advise the utility company.
6. External electrical service connections that must be installed include:
   a. Supply power connection (115, 208, 230, 460, or 575 volts).
   b. Connection of thermostats, or any other accessory control devices that may be supplied (24 volts).

NOTE: All units with supply voltage 208V and greater must use a field installed step-down transformer, available as a separate accessory. Refer to Table 13.1 for additional information on the required transformer.

7. Refer to Figure 17.1 for the side access control compartment location.
8. All supply power electrical connections are made in the side access control compartment of the unit. The low voltage (thermostat and accessory control devices) can be wired to the terminals in the side access control compartment. Refer to the wiring diagram for the terminal location of all low voltage wiring.

INSTALLATION WITH DUCTWORK

Figure 14.1- Typical Duct & Airflow Installation



IMPORTANT

Do not attempt to attach ductwork of any kind to propeller models.

When installing the heater, always follow good duct design practices for even distribution of the air across the heat exchanger. Recommended layouts are shown in Figure 14.1. When installing blower units with ductwork the following must be done.

1. **Provide uniform air distribution over the heat exchanger.** Use turning vanes where required (see Figure 14.1).
2. Provide removable access panels in the ductwork on the downstream side of the unit heater. These openings should be large enough to view smoke or reflect light inside the casing to indicate leaks in the heat exchanger and to check for hot spots on exchanger due to poor air distribution or lack of sufficient air.
3. If ductwork is connected to the rear of the unit use Modine blower enclosure kit or if using field designed enclosure maintain dimensions of blower enclosure as shown on page 23.

Additional Requirements for Installation of Blower Models (model BTP)

Determining Blower Speed

The drive assembly and motor on gas-fired blower unit heaters with motors 2HP and below are factory assembled. 3HP and larger motors are shipped loose to prevent shipping damage. The adjustable motor sheave has been pre-set to permit operation of this unit under average conditions of air flow and without any external static pressure. The motor sheave should be adjusted as required when the unit is to be operated at other than average air flows and/or with external static pressures. Adjustment must always be within the performance range shown on page 22 and the temperature rise range shown on the unit's rating plate.

To determine the proper blower speed and motor sheave turns open, the conditions under which the unit is to operate must be known. If the blower unit is to be used without duct work or filters, the only criteria for determining the motor sheave turns open and blower speed is the amount of air to be delivered. The performance tables for blower models are shown on pages 18 and 19. As an example, a model BTP 350 unit, operating with no external static pressure, that is, no duct work, filters, etc., and is to deliver an air volume of 6481 cfm (cfm = cubic feet of air per minute) requires that the unit be supplied with a 5 hp motor, a -207 drive, and the drive sheave must be set at 2.5 turns open to achieve a blower speed of 960 rpm (see performance table for units with or without blower enclosure, page 19). See "Blower Adjustments" on page 16 for setting of drive pulley turns open.

If a blower unit is to be used with ductwork or filters, etc., the total external static pressure under which the unit is to operate, and the required air flow must be known before the unit can be properly adjusted.

If Modine filters are used, the expected pressure loss through the filters is included in the performance data on page 17. If filters or ductwork are to be used with the unit, and they are not supplied by Modine, the design engineer or installing contractor must determine the pressure loss for the externally added devices or ductwork to arrive at the total external static pressure under which the unit is to operate.

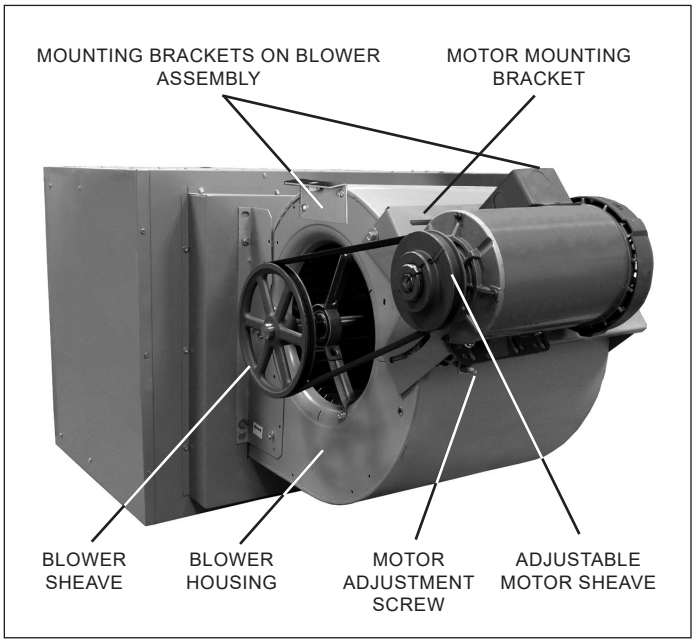
Once the total static pressure and the required air flow are known, the operating speed of the blower can be determined and the correct motor sheave adjustments made. As an example, a model BTP 350 is to be used with a Modine supplied blower enclosure and Modine supplied filters attached to ductwork. The unit is to move 6481 cfm of air flow against an external static pressure of 0.2" W.C. Also, 0.2" W.C. must be added for the filter pressure drop for a total of 0.4" W.C. total pressure drop. Entering the performance table on page 18 for a BTP 350, at 6481 cfm and 0.4" W.C. static pressure, it is seen that the unit will require a 5 hp motor using a -207 drive, and the motor sheave should be set at .5 turns open to achieve a blower speed of 1050 rpm. You can see this example differs from similar conditions in paragraph 2 by the number of turns open and a higher rpm, which is needed to overcome the added external static pressure from the filters.

INSTALLATION

To Install

1. Remove and discard the motor tie down strap and the shipping block beneath the motor adjustment screw (not used on all models.)
2. For 3 and 5 HP motors, affix sheave to the motor shaft and install motor on the motor mounting bracket. Install belt on blower and motor sheaves.

Figure 15.1 - Blower Model



3. Adjust motor adjusting screw for a belt deflection of approximately 3/4" with 5 pounds of force applied midway between the sheaves (refer to Figure 16.3). Since the belt tension will decrease dramatically after an initial run-in period, it is necessary to periodically re-check the tension. Excessive tension will cause bearing wear and noise.
4. The blower bearings are lubricated for life; however, before initial unit operation the blower shaft should be lubricated at the bearings with SAE 20 oil. This will reduce initial friction and start the plastic lubricant flowing.
5. Make electrical connections according to the wiring diagram.
6. Check rotation of the blower. Motor should be in clockwise rotation when facing motor pulley. If rotation is incorrect, correction should be made by interchanging wiring within the motor. See wiring diagram on the motor.
7. The actual current draw of the motor should be determined. Under no condition should the current draw exceed that shown on the motor rating plate.
8. It is the installer's responsibility to adjust the motor sheave to provide the specified blower performance as listed on pages 18 & 19 for blower settings different from the factory set performance. The drive number on the unit may be identified by referring to the Power Code number on the serial plate of the unit (see page 27 for model number nomenclature) and matching that number with those shown on page 17. From the listing, the drive number can be determined.

Blower Adjustments

Following electrical connections, check blower rotation to assure blow-through heating. If necessary interchange wiring to reverse blower rotation. Start fan motor and check blower sheave RPM with a hand-held or strobe-type tachometer. RPM should check out with the speeds listed in performance data shown on pages 18 and 19. A single-speed motor with an adjustable motor sheave is supplied with these units. If blower fan speed changes are required, adjust motor sheave as follows:

NOTE: Do not fire unit until blower adjustment has been made or unit may cycle on limit (overheat) control.

1. **Shut-off power before making blower speed adjustments.** Refer to "Determining Blower Speed" on page 15 and to "Performance Data" on pages 18 and 19 to determine proper blower RPM.
2. Loosen belt and take belt off of motor sheave.
3. Loosen set screw on outer side of adjustable motor sheave (see Figure 15.2).
4. To reduce the speed of the blower, turn outer side of motor sheave counterclockwise.
5. To increase the speed of the blower, turn outer side of motor sheave clockwise.
6. Retighten motor sheave set screw, replace belt and retighten motor base. Adjust motor adjusting screw such that there is 3/4" belt deflection when pressed with 5 pounds of force midway between the blower and motor sheaves (see Figure 15.3). Since the belt tension will decrease dramatically after an initial run-in period, it is necessary to periodically re-check the tension to assure continual proper belt adjustment.
7. Check to make certain motor sheave and blower sheave are aligned. Re-align if necessary.
8. Re-check blower speed after adjustment.
9. Check motor amps. Do not exceed amps shown on motor nameplate. Slow blower if necessary.
10. Check air temperature rise across unit. Check temperature rise against values shown in performance tables on pages 18 and 19 to assure actual desired air flow is being achieved.
11. If adjustments are required, recheck motor amps after final blower speed adjustment.

Figure 15.2 - Motor Sheave Adjustment

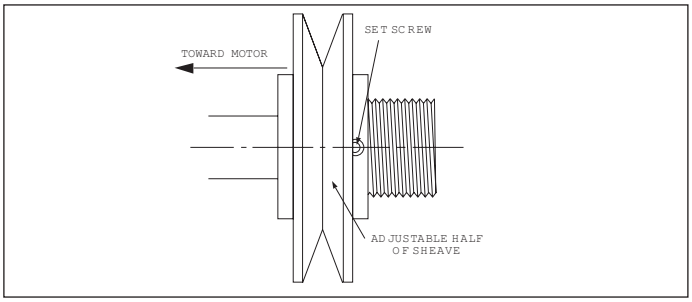
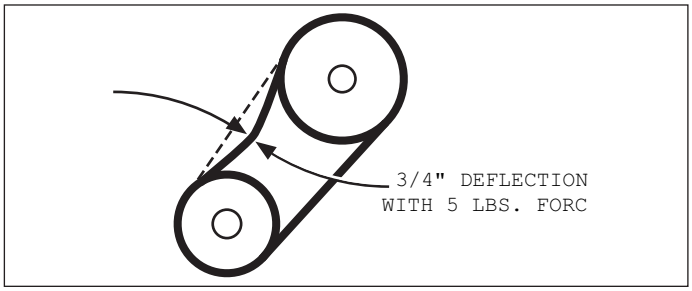


Figure 15.3 - Belt Tension Adjustment



BLOWER PERFORMANCE DATA - MODEL BTP

Table 16.1 - Power Code Description - Blower Model BTP - ①

Power Code	Voltage	Phase	BTP150		BTP175		BTP200		BTP250		BTP300		BTP350		BTP400	
			HP	Drive	HP	Drive	HP	Drive	HP	Drive	HP	Drive	HP	Drive	HP	Drive
01	115	1	1/4	230	-	-	-	-	-	-	-	-	-	-	-	-
02	115/230	1	1/3	230	1/3	238	1/2	233	1/2	204	1	240	1 1/2	250	1 1/2	247
08	208-230/460	3	1/3	230	1/3	238	1/2	233	1/2	204	1	257	1 1/2	251	1 1/2	248
11	575	3	1/3	231	1/3	239	1/2	233	1/2	204	1	257	1 1/2	251	1 1/2	248
13	115/230	1	1/3	232	1/2	229	1	229	1	241	1	241	1 1/2	247	-	-
19	208-230/460	3	1/3	232	1/2	229	1	259	1	258	1	258	1 1/2	248	2	177
22	575	3	1/3	233	1/2	229	1	259	1	258	1	258	1 1/2	248	2	177
24	115/230	1	1/2	229	1	175	1	175	1.5	23	1 1/2	243	1 1/2	252	-	-
30	208-230/460	3	1/2	229	1	253	1	253	1.5	177	1 1/2	244	1 1/2	180	3	246
33	575	3	1/2	229	1	253	1	253	1.5	177	1 1/2	244	1 1/2	180	3	246
35	115/230	1	1	175	1 1/2	237	1 1/2	235	-	-	1 1/2	23	-	-	-	-
41	208-230/460	3	1	253	1 1/2	234	1 1/2	236	2	180	1 1/2	177	2	177	5	245
44	575	3	1	253	1 1/2	234	1 1/2	236	2	180	1 1/2	177	2	177	5	245
52	208-230/460	3	-	-	-	-	-	-	-	-	2	177	2	180	-	-
55	575	3	-	-	-	-	-	-	-	-	2	177	2	180	-	-
63	208-230/460	3	-	-	-	-	-	-	-	-	3	112	3	246	-	-
66	575	3	-	-	-	-	-	-	-	-	3	112	3	246	-	-
74	208-230/460	3	-	-	-	-	-	-	-	-	-	-	5	245	-	-
77	575	3	-	-	-	-	-	-	-	-	-	-	5	245	-	-

① For selection of correct power code, refer to the tables on pages 17-18.

Table 16.2 - Filter Static Pressure Drop ②

	BTP150	BTP175	BTP200	BTP250	BTP300	BTP350	BTP400
Filter Static ("W.C.)	0.1	0.2	0.1	0.2	0.2	0.2	0.2

② For blower units with enclosure and filter, add the following static pressures to the static pressure determined by the system designer for total external static pressure.

BLOWER PERFORMANCE DATA - MODEL BTP

Table 17.1 - Blower Model BTP 150-250 (40-55°F temp rise for 250 size unit) - ① ② ③

				External Static Pressure ("W.C.)																							
				0.0			0.1			0.2			0.3			0.4			0.5			0.6			0.7			
Model Size	ATR	CFM	HP	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	HP
150	40	2778	1	573	175	4.5	615	175	4.0	658	175	3.0	699	175	2.5	738	175	1.5	775	175	1.0	810	175	0.5	-	-	-	1
	45	2469	1/2	510	229	4.0	558	229	3.0	606	-	-	650	-	-	692	-	-	731	-	-	769	-	-	806	-	-	1/2
			1		-	-		175	4.5		175	4.0		175	3.0		175	2.5		175	2.0		175	1.0		175	0.5	1
	50	2222	1/3	460	232	4.0	513	-	-	565	-	-	612	-	-	656	-	-	699	-	-	739	-	-	779	-	-	1/3
					230	1.0		-	-		-	-		-	-		-	-		-	-		-	-		-	-	
			1/2		229	5.0		229	4.0		229	3.0		229	2.0		-	-		-	-		-	-		-	-	1/2
			1		-	-		-	-		175	4.5		175	4.0		175	3.0		175	2.5		175	1.5		175	1.0	1
	55	2020	1/4②	418	230	2.5	477	-	-	532	-	-	582	-	-	629	-	-	674	-	-	717	-	-	759	-	-	1/4
			1/3		232	5.0		232	3.5		232	2.0		-	-		-	-		-	-		-	-		-	-	1/3
					230	2.5		230	0.5		-	-		-	-		-	-		-	-		-	-		-	-	
			1/2		-	-		229	5.0		229	3.5		229	2.5		229	1.5		229	1.0		-	-		-	-	1/2
			1		-	-		-	-		175	5.0		175	4.5		175	3.5		175	3.0		175	2.0		175	1.0	1
	60	1852	1/4②	384	230	3.5	448	230	1.5	506	-	-	559	-	-	609	-	-	656	-	-	701	-	-	741	-	-	1/4
			1/3		-	-		232	4.0		232	2.5		232	1.5		-	-		-	-		-	-		-	-	1/3
					230	3.5		230	1.5		230	0.0		-	-		-	-		-	-		-	-		-	-	
			1/2		-	-		-	-		229	4.0		229	3.0		229	2.0		229	1.0		229	0.5		-	-	1/2
			1		-	-		-	-		-	-		175	5.0		175	4.0		175	3.0		175	2.5		175	1.5	1
	65	1709	1/4②	354	230	4.0	423	230	2.0	485	230	0.5	540	-	-	592	-	-	642	-	-	690	-	-	735	-	-	1/4
			1/3		230	4.0		232	4.5		232	3.0		232	2.0		232	1.0		-	-		-	-		-	-	1/3
			1/2		-	-		-	-		229	4.5		229	3.5		229	2.5		229	1.5		229	0.5		-	-	1/2
			1		-	-		-	-		-	-		175	5.0		175	4.0		175	3.5		175	2.5		175	1.5	1
	70	1587	1/4②	329	230	5.0	403	230	3.0	467	230	1.0	525	-	-	580	-	-	635	-	-	680	-	-	722	-	-	1/4
			1/3		230	5.0		232	5.0		232	3.5		232	2.5		232	1.0		232	0.0		-	-		-	-	1/3
			1/2		-	-		-	-		229	5.0		229	4.0		229	2.5		229	1.5		229	0.5		229	0.0	1/2
			1		-	-		-	-		-	-		-	-		175	4.5		175	3.5		175	2.5		175	2.0	1
175	40	3241	1	625	175	3.5	655	175	3.0	690	175	2.5	727	-	-	764	-	-	799	-	-	834	-	-	866	-	-	1
			1-1/2		-	-		-	-		-	-		237	5.0		237	4.5		237	3.5		237	2.5		237	2.0	1-1/2
	45	2881	1	555	175	5.0	589	175	4.5	630	175	3.5	672	175	3.0	712	175	2.0	750	175	1.5	786	-	-	821	-	-	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		237	4.5		237	4.0		237	3.0	1-1/2
	50	2593	1/2	500	229	4.5	538	229	3.5	584	-	-	630	-	-	673	-	-	713	-	-	751	-	-	788	-	-	1/2
			1		-	-		175	5.0		175	4.5		175	3.5		175	3.0		175	2.0		175	1.5		175	0.5	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		-	-		237	4.5		237	4.0	1-1/2
	55	2357	1/3	454	238	2.5	497	-	-	548	-	-	597	-	-	642	-	-	684	-	-	724	-	-	763	-	-	1/3
			1/2		229	5.0		229	4.5		229	3.5		229	2.5		-	-		-	-		-	-		-	-	1/2
			1		-	-		-	-		175	5.0		175	4.0		175	3.5		175	2.5		175	2.0		175	1.0	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		-	-		237	5.0		237	4.5	1-1/2
	60	2160	1/3	416	238	4.0	464	238	2.5	520	-	-	571	-	-	618	-	-	662	-	-	705	-	-	745	-	-	1/3
			1/2		-	-		229	5.0		229	4.0		229	3.0		229	2.0		229	1.0		-	-		-	-	1/2
			1		-	-		-	-		-	-		175	4.5		175	4.0		175	3.0		175	2.0		175	1.5	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		-	-		-	-		237	4.5	1-1/2
	65	1994	1/3	384	238	4.5	438	238	3.0	497	238	1.5	550	238	0.0	599	-	-	645	-	-	690	-	-	733	-	-	1/3
			1/2		-	-		-	-		229	4.5		229	3.5		229	2.5		229	1.5		229	0.5		-	-	1/2
			1		-	-		-	-		-	-		175	5.0		175	4.0		175	3.5		175	2.5		175	1.5	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		-	-		-	-		237	5.0	1-1/2
	70	1852	1/3	356	238	5.0	415	238	3.5	477	238	2.0	533	238	0.5	584	-	-	632	-	-	678	-	-	728	-	-	1/3
			1/2		-	-		-	-		229	5.0		229	3.5		229	2.5		229	1.5		229	1.0		-	-	1/2
			1		-	-		-	-		-	-		-	-		175	4.5		175	3.5		175	3.0		175	2.0	1
200	40	3704	1-1/2	715	235	3.5	741	235	2.5	770	235	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/2
	45	3292	1	635	175	3.5	665	175	3.0	698	-	-	735	-	-	772	-	-	807	-	-	841	-	-	873	-	-	1
					229	1.5		229	1.0		-	-		-	-		-	-		-	-		-	-		-	-	
			1-1/2		235	5.0		235	3.0		235	4.0		235	3.0		235	2.0		235	1.0		235	0.0		-	-	1-1/2
	50	2963	1	571	175	4.5	604	175	4.0	643	175	3.5	684	175	2.5	723	175	2.0	761	175	1.5	797	-	-	831	-	-	1
					229	3.0		229	2.5		229	1.5		229	0.5		229	0.0		-	-		-	-		-	-	
			1-1/2		-	-		-	-		235	5.0		235	4.0		235	3.0		235	2.0		235	1.5		235	0.5	1-1/2
	55	2694	1/2	519	233	2.5	556	-	-	600	-	-	644	-	-	686	-	-	725	-	-	763	-	-	799	-	-	1/2
			1		-	-		175	5.0		175	4.0		175	3.5		175	2.5		175	2.0		175	1.0		175	0.5	1
					229	4.0		229	3.0		229	2.5		229	1.5		229	0.5		229	0.0		-	-		-	-	
			1-1/2		-	-		-	-		-	-		235	5.0		235	4.0		235	3.0		235	2.0		235	1.0	1-1/2
	60	2469	1/2	475	233	2.5	516	233	2.5	565	233	1.5	612	-	-	656	-	-	697	-	-	736	-	-	774	-	-	1/2
			1		-	-		-	-		175	4.5		175	4.0		175	3.0		175	2.5		175	1.5		175	1.0	1
					229	5.0		229	4.0		229	3.0		229	2.0		229	1.0		229	0.5		-	-		-	-	
			1-1/2		-	-		-	-		-	-		-	-		235	5.0		235	4.0		235	3.0		235	2.0	1-1/2
	65	2279	1/2	439	233	4.5	484	233	3.5	537	233	2.0	586	233	1.0	632	233	0.0	675	-	-	716	-	-	756	-	-	1/2
			1		-	-		-	-		175	5.0		175	4.5		175	3.5		175	2.5		175	2.0		175	1.5	1
					-	-		229	4.5		229	3.5		229	2.5		229	1.5		229	1.0		229	0.0		-	-	
			1-1/2		-	-		-	-		-	-		-	-		-	-		235	4.5		235	3.5		235	2.5	1-1/2
	70	2116	1/2	407	233	5.0	457	233	4.0	513	233	2.5	565	233	1.5	612	233	0.5	657	-	-	700	-	-	742	-	-	1/2
			1		-	-		-	-		-	-		175	4.5		175	4.0		175	3.0		175	2.5		175	1.5	1
					-	-		229	5.0		229	4.0		229	3.0		229	2.0		229	1.0		229	0.5		-	-	
			1-1/2		-	-		-	-		-	-		-	-		-	-		235	5.0		235	3.5		235	2.5	1-1/2
250	40	4630	1-1/2	542	23	4.5	569	23	4.0	599	23	3.0	629	-	-	658	-	-	688	-	-	716	-	-	744	-	-	1-1/2
			2		-	-		-	-		180	4.5		180	4.0		180	3.0		180	2.0		180	1.5		180	0.5	2
	45	4115	1	482	241	3.5	513	241	2.5	546	-	-	580	-	-	613	-	-	645	-	-	675	-	-	704	-	-	1
			1-1/2		-	-		-	-		23	4.5		23	3.5		23	2.5		23	1.5		23	0.5		-	-	1-1/2
			2		-	-		-	-		-	-		180	5.0		180	4.5		180	3.5		180	2.5		180	1.5	2
	50	3704	1	433	241	4.5	468	241	3.5	506	241	3.0	543	241	2.0	578	241	1.0	612	-	-	644	-	-	674	-	-	1
			1-1/2		-	-		-	-		-	-		23	4.5		23	3.5		23	2.5		23	1.5		23	0.5	1-1/2
			2		-	-		-	-		-	-		-	-		180	5.0		180	4.5		180	3.5		180	2.5	2
	55	3367	1/2	394	204	3.0	432	-	-	474	-	-	513	-	-	551	-	-	586	-	-	620	-	-	652	-	-	1/2
			1		241	5.0		241	4.5		241	3.5		241	2.5		241	1.5		241	1.0		241	0.0		-	-	1
			1-1/2		-	-		-	-		-	-		-	-		23	4.5		23	3.5		23	2.0		23	1.0	1-1/2
			2		-	-		-	-		-	-		-	-		-	-		180	5.0		180	4.0		180	3.0	2

Table 17.2 - Alternate Drives for 208-230/460V 3 Ph, 1 HP Motors

Model	1 HP Drive Listed		1 HP Drive for 230/460V
BTP150	175	=	253
BTP175	175	=	253
BTP200	175	=	253
	229	=	259
BTP250	241	=	258

Table 17.3 - Alternate Drives for 208-230/460V 3 Ph, 1-1/2 HP Motors

Model	1-1/2 HP Drive Listed		1-1/2 HP Drive for 230/460V
BTP150	-	=	-
BTP175	237	=	234
BTP200	235	=	236
BTP250	23	=	177

Table 17.4 - Alternate Drives for 575V

Model	Drive for Under 575V		Drive for 575V
BTP150	175	=	253
	230	=	231
	232	=	233
BTP175	175	=	253
	237	=	234
	238	=	239
BTP200	175	=	253
	229	=	259
	235	=	236
BTP250	23	=	177
	241	=	258

① Outputs shown are for elevations up to 2000'. For elevations over 2000', output needs to be reduced 4% for each 1000' above sea level. (Does not apply in Canada - see rating plate).

② Sheave turns open are approximate. For proper operation, check blower rpm.

③ For 230/460V (1 HP and 1-1/2 HP) or 575V selections, see Tables 18.2, 3, & 4 for the corrected drive number.

BLOWER PERFORMANCE DATA - MODEL BTP

Table 18.1 - Blower Model BTP 250-400 (60-70°F temp rise for 250 size unit) - ①②③

				External Static Pressure ("W.C.)																							
				0.0			0.1			0.2			0.3			0.4			0.5			0.6			0.7			
Model Size	ATR	CFM	HP	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	HP
250	60	3086	1/2	360	204	4.0	403	204	3.0	448	204	1.5	490	-	-	530	-	-	566	-	-	601	-	-	635	-	-	1/2
			1		-	-		241	5.0		241	4.0		241	3.0		241	2.0		241	1.5		241	0.5		241	0.0	1
			1-1/2		-	-		-	-		-	-		-	-		23	5.0		23	4.0		23	3.0		23	2.0	1-1/2
			2		-	-		-	-		-	-		-	-		-	-		-	-		180	4.5		180	2.5	2
	65	2849	1/2	332	204	4.5	379	204	3.5	427	204	2.0	471	204	1.0	512	-	-	550	-	-	587	-	-	622	-	-	1/2
			1		-	-		-	-		241	4.5		241	3.5		241	2.5		241	1.5		241	1.0		241	0.0	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		23	4.5		23	3.5		23	2.0	1-1/2
			2		-	-		-	-		-	-		-	-		-	-		-	-		180	5.0		180	4.0	2
	70	2646	1/2	308	204	5.0	359	204	4.5	410	204	2.5	456	204	1.5	498	204	0.5	538	-	-	576	-	-	613	-	-	1/2
			1		-	-		-	-		241	5.0		241	4.0		241	3.0		241	2.0		241	1.0		241	0.5	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		23	5.0		23	3.5		23	2.5	1-1/2
			2		-	-		-	-		-	-		-	-		-	-		-	-		180	5.0		180	4.5	2
300	40	5556	3	650	112	3.0	673	112	2.5	697	112	2.0	721	112	1.0	746	112	0.5	771	112	0.0	-	-	-	-	-	-	3
					177	1.5		177	0.5		177	0.0		-	-		-	-		-	-	-	-	-	-	-	-	
	45	4938	2	578	177	3.5	604	177	3.0	631	177	2.0	659	177	1.0	687	177	0.0	715	-	-	742	-	-	768	-	-	2
			3		112	5.0		112	4.5		112	3.5		112	3.0		112	2.0		112	1.5		112	0.5		112	0.0	3
	50	4444	1-1/2	520	23	5.0	549	23	4.5	580	23	3.5	611	23	2.5	642	23	1.5	672	177	0.5	701	177	0.0	729	177	0.0	1-1/2
			2		243	2.5		243	1.5		243	0.0		-	-		-	-		-	-		-	-		-	-	2
			3		-	-		-	-		112	5.0		112	4.5		112	3.5		112	2.5		112	1.5		112	1.0	3
	55	4040	1	473	241	3.5	505	241	3.0	538	241	2.0	573	-	-	606	-	-	638	-	-	669	-	-	698	-	-	1
					240	2.0		240	1.5		240	0.5		-	-		-	-		-	-		-	-		-	-	
			1-1/2		-	-		-	-		23	5.0		23	3.5		23	2.5		23	1.5		23	0.5		23	0.0	1-1/2
			2		243	4.0		243	3.0		243	1.5		243	0.5		243	0.0		-	-		-	-		-	-	
			3		-	-		-	-		-	-		-	-		112	4.5		112	3.5		112	2.5		112	2.0	3
	60	3704	1	433	241	4.5	468	241	3.5	506	241	3.0	543	241	2.0	578	241	1.0	612	-	-	644	-	-	674	-	-	1
					240	3.0		240	2.5		240	1.5		-	-		-	-		-	-		-	-		-	-	
			1-1/2		-	-		-	-		-	-		23	4.5		23	3.5		23	2.5		23	1.5		23	0.5	1-1/2
					243	5.0		243	4.5		243	3.0		243	1.5		243	0.5		-	-		-	-		-	-	
			3		-	-		-	-		-	-		-	-		112	5.0		112	4.5		112	3.5		112	2.5	3
	65	3419	1	400	241	5.0	438	241	4.5	478	241	3.5	518	241	2.5	555	241	1.5	590	241	0.5	623	241	0.0	655	-	-	1
					240	4.0		240	3.0		240	2.0		240	1.0		240	0.0		-	-		-	-		-	-	
			1-1/2		-	-		-	-		-	-		-	-		23	4.0		23	3.0		23	2.0		23	1.0	1-1/2
					-	-		243	5.0		243	4.0		243	2.5		243	1.0		243	0.0		-	-		-	-	
			3		-	-		-	-		-	-		-	-		-	-		112	5.0		112	4.0		112	3.0	3
	70	3175	1	-	-	-		241	5.0		241	4.0		241	3.0		241	2.0		241	1.0		241	0.5		-	-	1
				371	240	5.0		240	4.0		240	2.5		240	1.5		240	0.5		-	-		-	-		-	-	
			1-1/2	-	-	-	412	-	-	456	-	-	497	-	-	536	23	5.0	572	23	4.0	607	23	2.5	640	23	1.5	1-1/2
				-	-	-		-	-		243	5.0		243	3.5		243	2.0		243	0.5		243	0.0		-	-	
			3	-	-	-		-	-		-	-		-	-		-	-		-	-		112	4.5		112	3.5	3
350	40	6481	5	721	245	3.0	739	245	3.0	757	245	2.5	777	245	2.0	797	245	1.0	817	245	0.5	838	245	0.0	860	245	0.0	5
	45	5761	3	643	246	3.5	662	246	1.0	684	246	2.5	706	246	1.5	729	246	1.0	753	246	0.0	777			801			3
			5		245	5.0		245	5.0		245	4.0		245	3.5		245	3.0		245	2.5		245	2.0		245	1.0	5
	50	5185	2	579	180	5.0	602	180	4.5	626	180	4.0	651	180	3.0	678	-	-	705	-	-	731	-	-	757	-	-	2
					177	3.5		177	3.0		177	2.0		177	1.0		-	-		-	-		-	-		-	-	
			3		-	-		-	-		-	-		-	-		246	2.5		246	1.5		246	1.0		246	0.0	3
			5		-	-		-	-		-	-		245	5.0		245	4.5		245	3.5		245	3.0		245	2.5	5
	55	4714	1-1/2	528	247	3.5	553	247	3.0	580	247	2.0	608	-	-	638	-	-	667	-	-	696	-	-	724	-	-	1-1/2
					250	0.5		250	0.0		252	5.0		-	-		-	-		-	-		-	-		-	-	
			2		-	-		-	-		-	-		180	4.5		180	3.5		180	2.5		180	2.0		180	1.0	2
					177	5.0		177	4.5		177	3.5		177	2.5		177	1.5		177	1.0		177	0.0		177	0.0	
			5		-	-		-	-		-	-		-	-		245	5.0		245	4.5		245	4.0		245	3.0	5
	60	4321	1-1/2	484	247	5.0	512	247	4.0	542	247	3.0	574	247	2.0	606	247	1.0	637	247	0.0	668	-	-	697	-	-	1-1/2
					250	2.5		250	1.0		250	0.0		252	5.0		252	4.5		252	3.5		252	2.5		-	-	
			2		-	-		-	-		-	-		-	-		-	-		-	-		-	-		180	2.0	2
					-	-		-	-		177	4.5		177	3.5		177	2.5		177	1.5		177	0.5		177	0.0	
			5		-	-		-	-		-	-		-	-		-	-		245	5.0		245	4.5		245	4.0	5
	65	3989	1-1/2	448	250	4.0	478	250	2.5	511	250	1.0	546	250	0.0	580	252	5.0	614	252	4.5	645	252	3.5	676	252	2.5	1-1/2
					-	-		247	5.0		247	4.0		247	3.0		247	2.0		247	0.5		247	0.0		-	-	
			2		-	-		-	-		-	-		177	4.5		177	3.5		177	2.5		177	1.5		177	0.5	2
			5		-	-		-	-		-	-		-	-		-	-		-	-		245	5.0		245	4.5	5
	70	3704	1-1/2	416	250	5.0	449	250	4.0	485	250	2.5	523	250	1.0	559	-	-	594	252	5.0	627	252	4.0	658	252	3.0	1-1/2
					-	-		-	-		247	5.0		247	4.0		247	2.5		247	1.5		247	0.0		-	-	
			2		-	-		-	-		-	-		-	-		177	4.0		177	3.0		177	2.0		177	1.0	2
			5		-	-		-	-		-	-		-	-		-	-		-	-		-	-		245	5.0	5
400	40	7407	5	823	245	0.5	838	245	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
	45	6584	5	733	245	3.0	750	245	2.5	768	245	2.0	787	245	1.5	807	245	1.0	827	245	0.5	847	245	0.0	868	245	0.0	5
	50	5926	3	660	246	3.0	680	246	2.5	700	246	1.5	722	246	1.0	744	246	0.5	767	-	-	791	-	-	814	-	-	3
			5		245	5.0		245	4.5		245	3.5		245	3.0		245	2.5		245	2.0		245	1.5		245	0.5	5
	55	5387	2	601	177	3.0	623	177	2.0	646	-	-	670	-	-	696	-	-	721	-	-	747	-	-	772	-	-	2
			3		246	4.5		246	4.0		246	3.5		246	2.5		246	2.0		246	1.0		246	0.5		-	-	3
			5		-	-		-	-		245	5.0		245	4.5		245	4.0		245	3.0		245	2.5		245	2.0	5
	60	4938	1-1/2	552	247	3.0	576	-	-	601	-	-	629	-	-	656	-	-	685	-	-	712	-	-	740	-	-	1-1/2
			2		177	4.5		177	3.5		177	3.0		177	2.0		177	1.0		177	0.0		-	-		-	-	2
			3		-	-		246	5.0		246	4.5		246	4.0		246	3.0		246	2.0		246	1.5		246	0.5	3
			5		-	-		-	-		-	-		-	-		245	5.0		245	4.0		245	3.5		245	2.5	5
	65	4558	1-1/2	510	247	4.5	536	247	3.5	565	247	2.5	594	247	1.0	625	247	0.5	655	-	-	684	-	-	713	-	-	1-1/2
			2		-	-		177	5.0		177	4.0		177	3.0		177	2.0		177	1.0		177	0.0		177	0.0	2
			3		-	-		-	-		-	-		246	5.0		246	4.0		246	3.0		246	2.0		246	1.5	3
			5		-	-		-	-		-	-		-	-		245	5.0		245	4.0		245	4.0		245	3.5	5
	70	4233	1-1/2	475	247	5.0	503	247	4.5	534	247	3.5	566	247	2.5	599	247	1.0	631	247	0.0	662	-	-	691	-	-	1-1/2
			2		-	-		-	-		177	5.0		177	4.0		177	3.0		177	2.0		177	1.0		177	0.0	2
			3		-	-		-	-		-	-		-	-		246	4.5		246	3.5		246	3.0		246	2.0	3
			5		-	-		-	-		-	-		-	-		-	-		-	-		245	4.5		245	4.0	5

Table 18.2 - Alternate Drives for 208-230/460V 3 Ph, 1 HP Motors

Model	1 HP Drive Listed		1 HP Drive for 230/460V
BTP300	240	=	257
	241	=	258
BTP350	-	=	-
BTP400	-	=	-

Table 18.3 - Alternate Drives for 208-230/460V 3 Ph, 1-1/2 HP Motors

Model	1-1/2 HP Drive Listed		1-1/2 HP Drive for 230/460V
BTP300	23	=	177
	243	=	244
BTP350	247	=	248
	250	=	251
	252	=	180
BTP400	247	=	248
	250	=	251
	252	=	180

Table 18.4 - Alternate Drives for 575V

Model	Drive for Under 575V		Drive for 575V
BTP300	23	=	177
	240	=	257
	243	=	244
BTP350	247	=	248
	250	=	251
	252	=	180
BTP400	247	=	248

① Outputs shown are for elevations up to 2000'. For elevations over 2000', output needs to be reduced 4% for each 1000' above sea level. (Does not apply in Canada - see rating plate).

② Sheave turns open are approximate. For proper operation, check blower rpm.

③ For 230/460V (1 HP and 1-1/2 HP) or 575V selections, see Tables 19.2, 3, & 4 for the corrected drive number.

OPERATION

Prior to Operation

IMPORTANT

1. To prevent premature heat exchanger failure, the input to the appliance as indicated on the serial plate, must not exceed the rated input by more than 5%.
2. Start-up and adjustment procedures must be performed by a qualified service agency.

Although this unit has been assembled and fire-tested at the factory, the following pre-operational procedures should be performed to assure proper on-site operation:

1. Turn off power to the unit at the disconnect switch. Check that fuses or circuit breakers are in place and sized correctly. Turn all hand gas valves to the “OFF” position.
2. Remove the side control access panel.
3. Check that the supply voltage matches the unit supply voltage listed on the Model Identification plate. Verify that all wiring is secure and properly protected. Trace circuits to insure that the unit has been wired according to the wiring diagram. If installed at altitudes above 2,000' and the high altitude kit includes a combustion air proving switch, replace the switch in the unit with the switch provided in the kit. Take care to ensure that the tubing and electrical connections are securely fastened.
4. Check to insure that the venting system is installed correctly and free from obstructions. Before you start use the following steps to verify that the venting system is adequately sized:
   a. Seal any unused openings in the venting system.
   b. Inspect the venting system for proper size and horizontal pitch, as required in the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) or CSA B149.1 Installation Code - latest edition and these instructions. Determine that there is no blockage or restriction, leakage, corrosion, or other deficiencies, which could cause an unsafe condition.
   c. Insofar as practical, close all building doors and windows and all doors between the space in which the appliance(s) connected to the venting system is (are) located and other spaces of the building. Turn on clothes dryers and any exhaust fans such as range hoods and bathroom exhausts, so they shall operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
   d. Follow the lighting instructions. Place the appliance being inspected in operation. Adjust thermostat so that the appliance will operate continuously.
   e. After it has been determined that each appliance connected to the venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas-burning appliance to their previous conditions of use.
   f. If improper venting is observed during any of the above tests, the venting system must be corrected.
5. Check to see that there are no obstructions to the intake and discharge of the unit.
6. Check fan clearance. Fan should not contact casing when spun by hand.
7. Check to make sure that all filters are in place and that they are installed properly according to direction of air flow (if applicable).
8. Perform a visual inspection of the unit to make sure no damage has occurred during installation. Check to ensure all fasteners are in place and the burner openings are properly aligned with the heat exchanger tubes and that the gas orifices are centered in the burner inspirator tube opening.
9. Check that all horizontal deflector blades are open a minimum of 30° as measured from vertical.
10. Turn on power to the unit at the disconnect switch.
11. Check the thermostat, ignition control, gas valve, and supply fan blower motor for electrical operation. If these do not function, recheck the wiring diagram.
12. Check the motor speed (rpm).
13. Check the motor voltage.
14. Check the motor amp draw to make sure it does not exceed the motor nameplate rating.
15. Recheck the gas supply pressure at the field installed manual shut-off valve. The minimum inlet pressure should be 6" W.C. on natural gas and 11" W.C. on propane gas. The maximum inlet pressure for either gas is 14" W.C. If inlet pressure exceeds 14" W.C., a gas pressure regulator must be added upstream of the combination gas valve.
16. Open the field installed manual gas shut-off valve.
17. Place the manual main gas valve on the combination gas valve in the “On” position. Call for heat with the thermostat.
18. Check to make sure that the main gas valve opens. Check the manifold gas pressure (See “Main Gas Adjustment”) while the supply fan blower is operating.
19. Check to insure that gas controls sequence properly (see “Control Operating Sequence”). If you are not familiar with the unit’s controls (i.e. combination gas control), refer to the control manufacturer’s literature supplied with the unit.
20. Once proper operation of the unit has been verified, remove any jumper wires that were required for testing.
21. Replace the side control access panel.
22. If installed at altitudes above 2,000', affix label included with high altitude kit and fill in all fields with a permanent marker.

Main Burner Adjustment

The gas pressure regulator (integral to the combination gas control) is adjusted at the factory for average gas conditions. It is important that gas be supplied to the unit heater in accordance with the input rating on the serial plate. Actual input should be checked and necessary adjustments made after the unit heater is installed. Over-firing, a result of too high an input, reduces the life of the appliance and increases maintenance. Under no circumstances should the input exceed that shown on the serial plate.

Measuring the manifold pressure is done at the outlet pressure tap of the gas valve.

To Adjust the Manifold Pressure

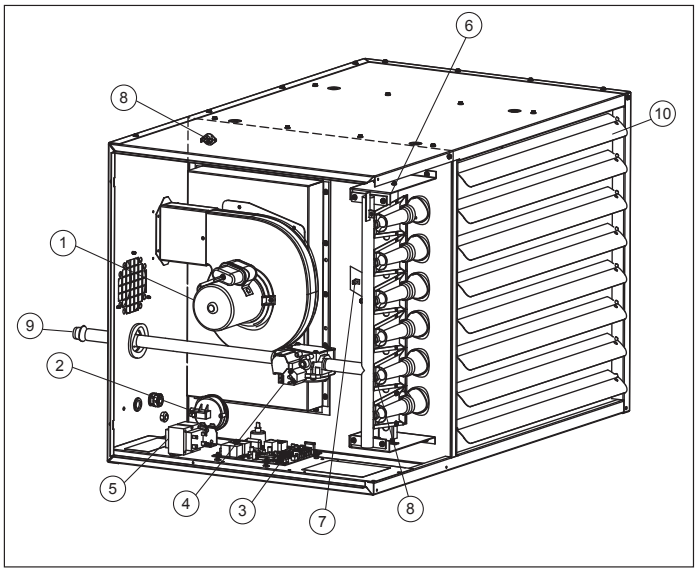
1. Move the field installed manual shut-off valve to the “OFF” position.
2. Remove the 1/8" pipe plug from the outlet pressure tap on the gas valve and attach a water manometer of “U” tube type which is at least 12" high.
3. Move the field installed manual gas shut-off valve to the “ON” position.
4. Create a high-fire call for heat from the thermostat.
5. Refer to Table 10.1 to determine the correct high fire manifold pressure for the gas type of the unit. Pressures at 0-2,000' elevation are 3.5" W.C. for natural gas, 10" W.C. for propane gas, for elevations above 2,000' refer to the instructions in “Gas Connections - High Altitude Accessory Kit” on page 11. Adjust the main gas pressure regulator spring to achieve the proper manifold pressure (for location, see the combination gas control literature supplied with unit).
6. After adjustment, move the field installed manual shut-off valve to the “OFF” position and replace the 1/8" pipe plug.
7. After the plug is in place, move the field installed manual shut-off valve to the “ON” position and recheck pipe plugs for gas leaks with soap solution.

CONTROL OPERATING SEQUENCE / UNIT COMPONENTS

CONTROL OPERATING SEQUENCE

Upon a call for heat from the thermostat, power is supplied to the power exhauster motor. The unit will go through a purge period and then the direct spark igniter will be energized. At the same time, the main valve in the combination control valve will open to allow gas to flow to the burners. If the fan motor has not already started it will start shortly. If a flame is not sensed within 7 seconds for any reason the main valve will close and there will be a short purge period before ignition is tried again. If the flame is not sensed after four tries there will be at least a one hour wait before ignition is tried again.

Figure 20.1 - Major Gas, Electrical Service, Safety and Other Components



1. Power Exhauster
2. Pressure Switch
3. Integrated Direct Spark Control Board
4. Combination Gas Control
5. Control Transformer
6. Flame Sensor (hidden)
7. Auto Reset Limit Control (hidden)
8. Direct Spark Igniter (hidden)
9. Gas Pipe Connection
10. Horizontal Air Deflector Blades

Table 20.2 - Gas Controls - All Models

Control System Description	Gas Type	Control Code	Control Voltage	Service Voltage
Single-Stage, Direct Spark Ignition, 100% Shut-off with Continuous Retry Utilizes a single-stage combination gas control with ignition control. Gas is lit with a direct spark igniter on call for heat.	Natural	11	24V	115V
	Propane	21		
Two-Stage, Direct Spark Ignition, 100% Shut-off with Continuous Retry Utilizes a two-stage combination gas control with built-in ignition control. Firing rate is 100% and 50% of full rated input. Gas is lit with a direct spark igniter on call for heat.	Natural	12		
	Propane	22		

GENERAL PERFORMANCE DATA - MODELS PTP & BTP

Table 21.1 - Propeller Unit Model PTP General Performance Data

	Model PTP Sizes						
	150	**175**	**200**	**250**	**300**	**350**	**400**
Btu/Hr Input ①	150,000	175,000	200,000	250,000	300,000	350,000	400,000
Btu/Hr Ouput ①	123,000	143,500	164,000	205,000	246,000	287,000	328,000
Entering Airflow (CFM) @ 70°F	2140	2725	2870	3995	4545	5280	5995
Outlet Velocity (FPM)	711	607	643	721	824	748	851
Air Temp. Rise (°F)	53	48	52	47	50	50	51
Max. Mounting Height (Ft.) ②	15	14	15	18	19	18	21
Heat Throw (Ft.) @ Max Mtg Ht ②	51	50	53	62	69	65	74
Motor Type ③	PSC	PSC	PSC	PSC	PSC	PSC	PSC
Motor HP	1/6	1/6	1/3	1/3	1/2	1/2	3/4
Motor RPM	1075	1075	1075	1075	1075	1125	1125

Table 21.2 - Blower Unit Model BTP General Performance Data

	Model BTP Sizes																				
	150			**175**			**200**			**250**			**300**			**350**			**400**		
Btu/Hr Input ①	150,000			175,000			200,000			250,000			300,000			350,000			400,000		
Btu/Hr Ouput ①	123,000			143,500			164,000			205,000			246,000			287,000			328,000		
Entering Airflow (CFM) @ 70°F	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High
	1587	2020	2778	1852	2357	3241	2116	2694	3704	2646	3367	4630	3175	4040	5556	3704	4714	6481	4233	5387	7407
Outlet Velocity (FPM)	543	674	903	428	531	711	489	607	813	497	617	826	596	740	991	543	674	903	621	770	1032
Air Temp. Rise (°F)	70	55	40	70	55	40	70	55	40	70	55	40	70	55	40	70	55	40	70	55	40
Max. Mounting Height (Ft.) ②	9	13	21	8	11	18	9	13	21	10	14	22	11	16	26	11	16	25	12	18	29
Heat Throw (Ft.) (@ Max Mtg Ht)	33	47	75	28	40	65	32	46	74	34	48	78	40	58	94	39	55	89	44	63	102

① Ratings shown are for elevations up to 2,000'. For elevations above 2,000', ratings should be reduced at the rate of 4% for each 1,000' above sea level (in Canada see rating plate.) Reduction of ratings requires use of a high altitude kit.

② Data taken at 55°F air temperature rise. At 65°F ambient and unit fired at full-rated input. Mounting height as measured from bottom of unit, and without deflector hoods. For units equipped with deflector hoods, see page 23.

PERFORMANCE DATA - DEFLECTOR HOODS

Figure 22.1 - 30°, 60°, and 90° Downward Deflector Hoods

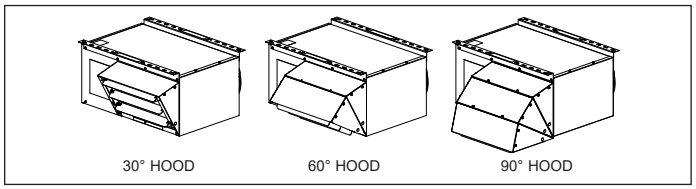


Figure 23.2 - 30° and 60° Throw/Floor Coverage

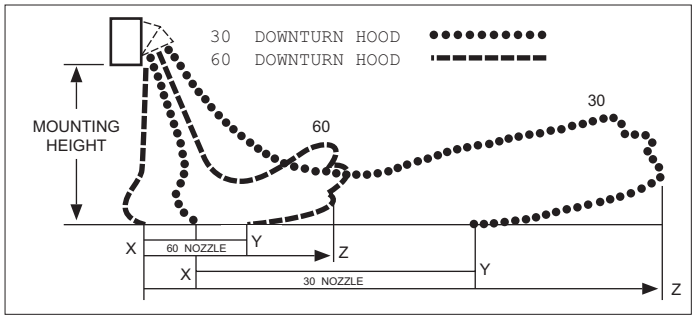


Table 22.1 - Deflector Hood General Performance Data - Model BTP

Model Size	Airflow	Temp Rise	Mounting Height	Blade Angle	30° Hood			60° Hood			90° Hood
					X	Y	Z	X	Y	Z	S
	(cfm)	(°F)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
150	2020	55	8	57	13	29	40	0	31	42	21
			10	48	12	28	38	0	28	39	19
			12	37	10	25	35	0	25	34	17
			14	21	8	21	30	0	19	27	16
			15	10	7	19	27	0	12	18	15
175	2357	55	8	51	11	24	33	0	25	34	17
			10	39	9	22	31	0	22	30	15
			12	22	7	19	26	0	17	23	14
			13	2	5	14	21	0	10	14	13
200	2694	55	8	57	13	29	39	0	30	41	20
			10	47	12	27	37	0	28	38	18
			12	35	10	25	34	0	24	33	17
			14	18	7	20	29	0	18	25	15
			15	2	5	16	24	0	11	16	15
250	3367	55	8	59	14	31	42	0	32	44	22
			10	50	13	29	40	0	30	41	20
			12	39	11	27	37	0	27	37	18
			14	25	9	23	33	0	22	30	17
			15	15	7	20	29	0	18	25	16
300	4040	55	8	64	17	37	51	0	40	54	29
			10	57	16	36	50	0	38	52	26
			12	50	15	35	48	0	36	49	23
			14	41	13	33	45	0	33	45	22
			16	30	12	30	41	0	28	39	20
			18	14	9	24	35	0	21	29	19
350	4714	55	8	63	16	36	49	0	37	51	27
			10	55	15	34	47	0	36	49	24
			12	47	14	33	45	0	33	46	22
			14	37	12	30	42	0	30	41	20
			16	25	10	27	38	0	25	34	19
			18	2	6	20	29	0	13	19	18
400	5387	55	8	67	19	41	56	0	44	60	32
			10	60	18	40	55	0	42	58	29
			12	53	17	39	53	0	40	55	26
			14	46	15	37	51	0	37	51	25
			16	37	14	34	48	0	34	47	23
			18	26	12	31	43	0	29	40	22
			20	8	8	23	34	0	20	28	21

Note: Refer to Figures 23.2 through 23.3.

Figure 22.3 - 90° Hood Throw/Floor Coverage

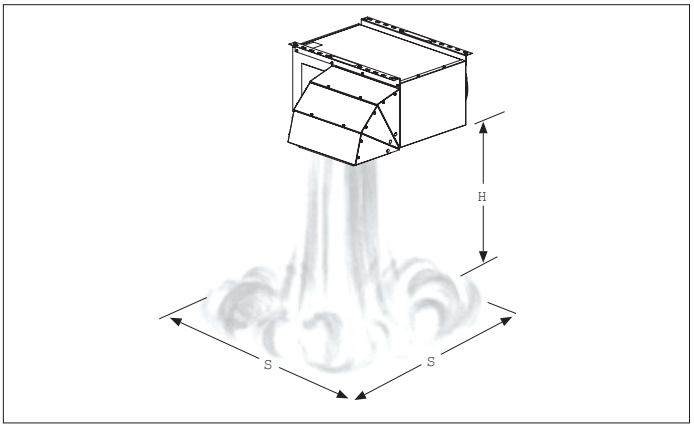


Table 22.2 - Deflector Hood General Performance Data - Model PTP

Model Size	Airflow	Temp Rise	Mounting Height	Blade Angle	30° Hood			60° Hood			90° Hood
					X	Y	Z	X	Y	Z	S
	(cfm)	(°F)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
150	2139	53	8	60	15	32	44	0	34	47	24
			10	52	13	31	42	0	32	44	21
			12	42	12	29	40	0	29	40	19
			14	30	10	26	36	0	25	34	18
			16	9	7	20	29	0	17	24	17
175	2726	48	8	60	14	32	43	0	33	46	23
			10	51	13	30	42	0	31	43	21
			12	41	12	28	39	0	28	39	19
			14	29	10	25	35	0	24	33	17
			16	8	6	17	26	0	15	21	16
200	2780	52	8	59	14	30	42	0	32	44	22
			10	49	12	29	40	0	30	41	19
			12	39	11	27	37	0	26	36	18
			14	24	9	23	33	0	21	30	16
250	3994	47	8	66	19	41	56	0	43	59	32
			10	60	18	40	54	0	42	57	29
			12	53	17	38	53	0	40	54	26
			14	46	15	36	50	0	37	51	24
			16	37	14	34	47	0	33	46	23
			18	26	12	31	43	0	28	40	21
			20	8	7	22	32	0	19	26	20
300	4543	50	8	69	22	45	62	0	48	66	37
			10	63	21	44	61	0	47	64	33
			12	57	19	43	59	0	45	62	30
			14	51	18	42	57	0	43	59	28
			16	44	17	40	55	0	40	55	26
			18	35	15	37	52	0	36	50	25
			20	25	13	33	47	0	31	43	24
			22	9	8	25	37	0	21	30	23
350	5278	50	8	68	20	43	58	0	45	62	34
			10	61	19	42	57	0	44	60	31
			12	55	18	40	55	0	42	58	28
			14	48	17	39	53	0	40	54	26
			16	40	15	37	51	0	36	50	24
			18	31	13	34	47	0	32	44	23
			20	17	10	29	41	0	25	35	22
			21	2	7	23	34	0	18	26	21
400	5995	51	8	70	24	49	66	0	52	71	41
			10	65	22	48	65	0	51	69	37
			12	59	21	47	64	0	49	67	34
			14	54	20	45	62	0	47	64	31
			16	47	19	44	60	0	44	61	29
			18	40	17	41	57	0	41	57	28
			20	32	15	38	54	0	37	51	26
			22	21	13	34	48	0	31	43	25
			23	13	11	31	44	0	26	37	24

Note: Refer to Figures 23.2 through 23.3.

DIMENSIONAL DATA - MODEL PTP AND BTP

Propeller Units - Model PTP

Figure 23.1 - Dimensional Drawings

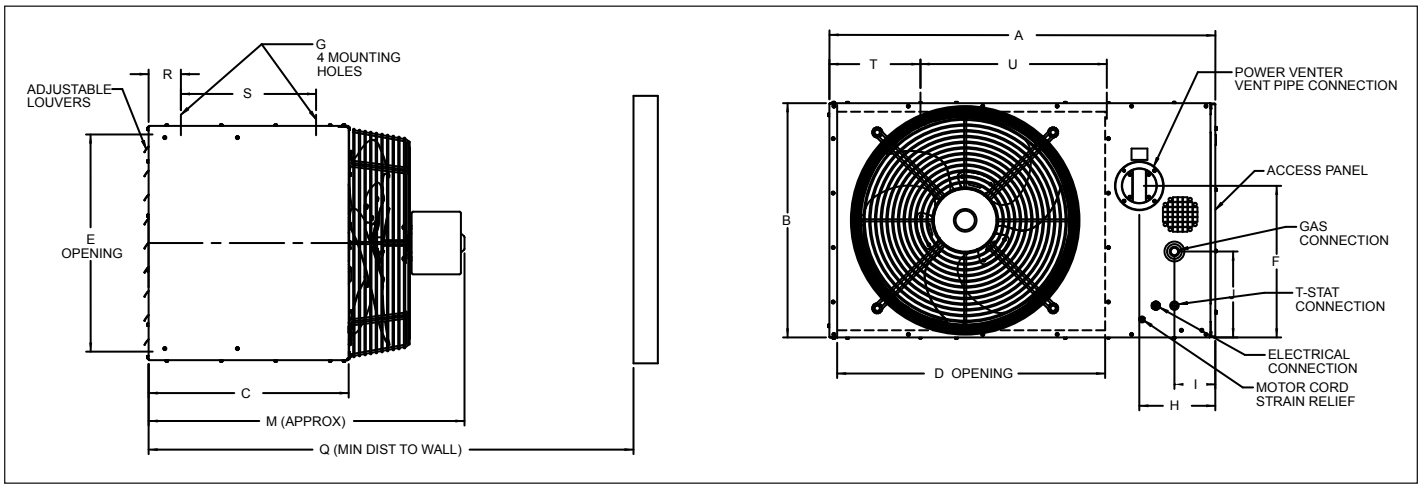


Table 23.1 - Dimensions (inches) - PTP ①

Models	PTP150	PTP175	PTP200	PTP250	PTP300	PTP350	PTP400
A	35.53	42.53	42.53	42.53	42.53	42.53	42.53
B	23.06	25.81	25.81	31.31	31.31	39.56	39.56
C	22.05	22.05	22.05	22.05	22.05	22.05	22.05
D	22.52	29.52	29.52	29.52	29.52	29.52	29.52
E	21.18	23.93	23.93	24.46	24.46	32.71	32.71
F	15.33	16.70	16.70	19.45	19.45	23.58	23.58
G (Mounting Hole) ②	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16
H	8.37	8.37	8.37	8.37	8.37	8.37	8.37
I	4.50	4.50	4.50	4.50	4.50	4.50	4.50
M	31.79	32.83	34.43	33.83	33.83	34.83	34.83
Q ③	43.79	44.83	46.43	45.83	45.83	46.83	46.83
R	3.56	3.56	3.56	3.56	3.56	3.56	3.56
S	14.90	14.90	14.90	14.90	14.90	14.90	14.90
T	10.00	10.00	10.00	10.00	10.00	10.00	10.00
U	13.54	20.53	20.53	20.53	20.53	20.53	20.53
Gas Connection	1/2	1/2	1/2	3/4	3/4	3/4	3/4
Vent Connector Size	4"	4"	4"	6"	6"	6"	6"
Fan Diameter	20.00	22.00	22.00	22.00	22.00	24.00	26.13
Approx. Shipping Weight (lbs.)	165	210	220	265	270	310	320

① Do not use propeller units with duct work.
② Listed is the hole diameter and threads per inch to accept threaded rod.
③ Dimension equals overall plus 12".

DIMENSIONAL DATA - MODEL BTP

Blower Units - Model BTP

Figure 24.1 - Dimensional Drawings

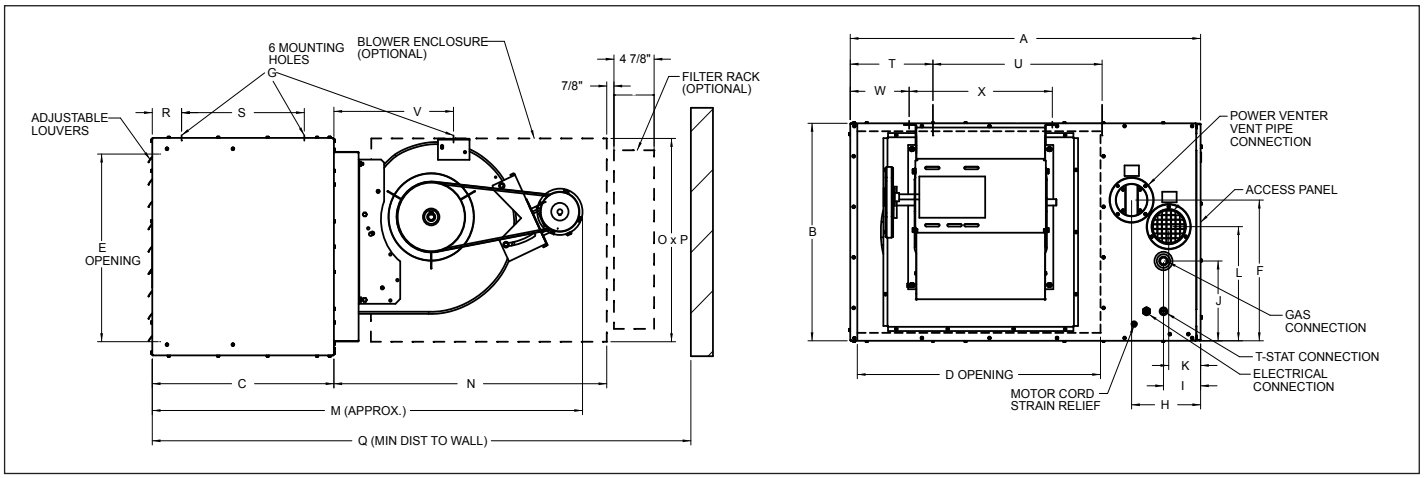


Table 24.1 - Dimensions (inches) - BTP

Models	BTP150	BTP175	BTP200	BTP250	BTP300	BTP350	BTP400
A	35.53	42.53	42.53	42.53	42.53	42.53	42.53
B	23.06	25.81	25.81	31.31	31.31	39.56	39.56
C	22.05	22.05	22.05	22.05	22.05	22.05	22.05
D	22.52	29.52	29.52	29.52	29.52	29.52	29.52
E	21.18	23.93	23.93	24.46	24.46	32.17	32.17
F	15.33	16.70	16.70	19.45	19.45	23.58	23.58
G (Mounting Hole) ①	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16
H	8.37	8.37	8.37	8.37	8.37	8.37	8.37
I	4.50	4.50	4.50	4.50	4.50	4.50	4.50
J	8.09	9.47	9.47	6.72	6.72	10.84	10.84
K	3.87	3.87	3.87	5.20	5.20	5.20	5.20
L	12.17	13.55	13.55	12.66	12.66	16.78	16.78
M ②	52.25	52.19	52.19	58.88	58.88	58.88	58.88
N	33.18	33.90	33.90	39.88	39.88	39.88	39.88
O	23.90	24.13	24.13	27.04	27.04	28.57	28.57
P	24.77	24.52	24.52	27.19	27.19	28.28	28.28
Q (w/Blower Encl & Filter Rack)	73.04	73.70	73.70	79.68	79.68	79.68	79.68
Q (w/o Blower Encl & Filter Rack)	64.25	64.19	64.19	70.88	70.88	70.88	70.88
R	3.56	3.56	3.56	3.56	3.56	3.56	3.56
S	14.90	14.90	14.90	14.90	14.90	14.90	14.90
T	10.00	10.00	10.00	10.00	10.00	10.00	10.00
U	13.54	20.53	20.53	20.53	20.53	20.53	20.53
V	14.52	14.52	14.52	18.04	18.04	18.00	18.00
W	3.27	7.15	7.15	4.77	4.77	5.24	5.24
X	17.38	17.38	17.38	20.38	20.38	20.38	20.38
Gas Connection	1/2	1/2	1/2	3/4	3/4	3/4	3/4
Vent Connector Size	4"	4"	4"	6"	6"	6"	6"
Blower	12-12	12-12	12-12	15-15	15-15	15-15	15-15
Approx. Shipping Weight (lbs.)	220	275	280	340	345	395	405

① Listed is the hole diameter and threads per inch to accept threaded rod.
② This is an approximate dimension for standard motors, allow 3" for sheave and optional motors.

SERVICE / MAINTENANCE / TROUBLESHOOTING

⚠ WARNING

When servicing or repairing this equipment, use only factory-approved service replacement parts. A complete replacement parts list may be obtained by contacting the factory. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.

⚠ CAUTION

1. Service or repair of this equipment must be performed by a qualified service agency.
2. Do not attempt to reuse any mechanical or electrical controllers which have been wet. Replace defective controller.

NOTE: To check most of the Possible Remedies in the troubleshooting guide listed in Table 25.1, refer to the applicable sections of the manual.

General Maintenance

The unit and venting system must be checked once a year by a qualified service technician.

All installation and service of these units must be performed by a qualified installation and service agency.

Before any service, BE SURE TO TURN OFF GAS AT THE MANUAL SHUT-OFF VALVE AHEAD OF THE COMBINATION GAS CONTROL AND TURN OFF ALL ELECTRIC POWER TO THE HEATER.

1. Service air moving components annually.
   a. Check fan for fit on motor shaft and for damage to blades.
2. Keep unit free from dust, dirt, grease, and foreign matter, paying particular attention to:
   a. Combustion air inlets.
   b. Burners and burner orifices. Turn off gas ahead of the combination gas control and shut off electric power to the heater. Remove the access panel, open the union on the gas line, and disconnect the igniter and sensor wires. Remove the screws that attach the burner tray to the header plate and remove the burner tray and manifold assembly from the heater. Carefully clean the burners with a wire brush or other suitable means. Replace any damaged or deteriorating burners or orifices. Install the burner assembly back onto the header, making certain that all screws, pipes and electrical connections are tight.

CAUTION: Be careful when handling the igniter and flame sensor.

3. Inspect the flame sensor and igniter for deterioration and/or cracks.
4. Verify that the burners are touching each other at the carryover points. This will ensure flame carryover from burner to burner.
   a. Clean exterior of heat exchanger tubes.
   b. Fan blades.
5. Check wiring for possible loose connections.
6. The gas valves and piping should be checked annually for general cleanliness and tightness. The gas controls should be checked to insure that the unit is operating properly. See control instruction sheets furnished separately with the unit heater.
7. The power exhaust motor bearings have been lubricated for long life and do not require additional lubrication. In dirty atmospheres, it may be desirable to clean the motors and blower housing and blow out the cooling air passages of the motor with compressed air.
8. Perform periodic cleaning of inlet and vent terminal screens.

Table 25.1- Troubleshooting

TROUBLE	POSSIBLE CAUSE	POSSIBLE REMEDY
Unit does nothing	1. Power supply is off 2. No 24V power to thermostat 3. Thermostat malfunction 4. LED flashes 5. Blown fuse on control board 6. Defective control	1. Turn on main power 2 a. Check control transformer b. If failed transformer - check thermostat wire gage and length 3 a. Verify wire connections to R&W terminals only b. Check / replace thermostat 4. Check LED flash code 5. Replace fuse 6. Replace control
LED light off or flashing	1. Blown fuse on control board 2. Multiple causes	1. Replace fuse 2. Control board LED flash codes vary with control type. A decal is installed in the unit giving a brief description of the applicable codes for your heater. For more detail, see the control board data sheet included with the unit.
Unit starts but does not ignite	1. Main gas is off 2. Air in gas line 3. Main or manifold gas pressure 4. Check gas valve switch	1. Open manual gas valve 2. Purge gas line 3. Set gas pressures per manual instructions 4. Set gas valve switch to "ON" position
Unit goes through cycle but the burners go out in less then 10 seconds	1. Reversed main power polarity 2. Unit not grounded 3. Flame not sensed	1. Black wire - HOT, White wire - NEUTRAL, Green wire - GROUND 2. Ground unit and verify quality of ground connection 3. Check flame sensor probe and connection
Air circulating fan inoperable	1. Loose connections 2. Defective control board 3. Defective fan motor	1. Check all connections 2. Check control board data sheet and function 3. Check fan motor

MODEL & SERIAL NUMBER / REPLACEMENT PARTS

Figure 26.1 - Model Number Designations (Remove access cover to locate)

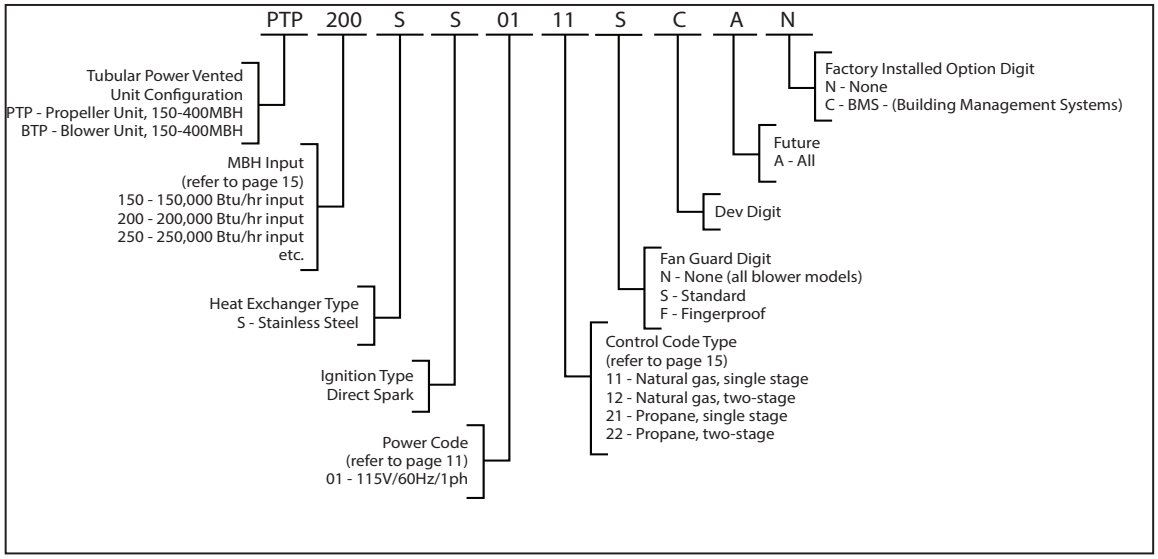
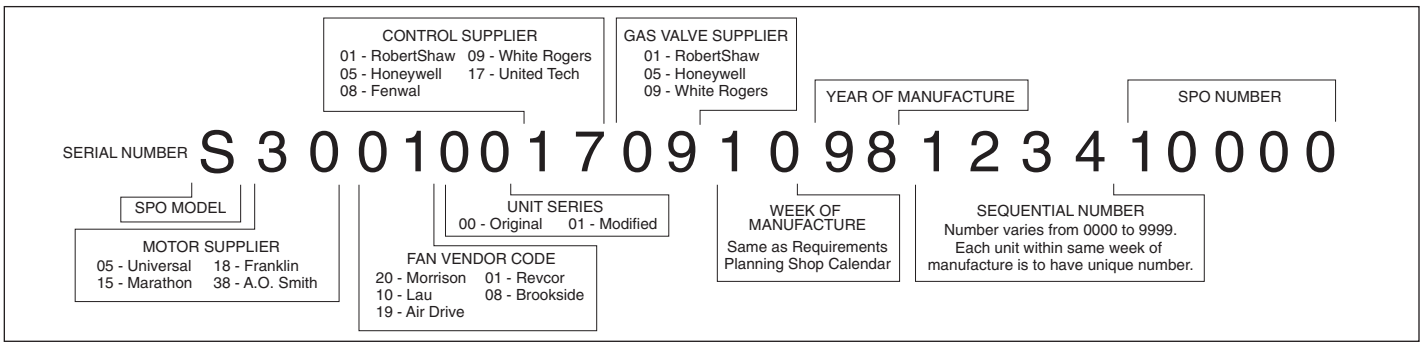


Figure 26.2 - Serial Number Designations (Remove access cover to locate)



Replacement Parts

When requesting parts please contact your local representative. Please have full model and serial number available. If you require assistance in locating your representative, please call the number located on the back page.

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COMMERCIAL WARRANTY

Seller warrants its products to be free from defects in material and workmanship, EXCLUSIVE, HOWEVER, of failures attributable to the use of materials substituted under emergency conditions for materials normally employed. This warranty covers replacement of any parts furnished from the factory of Seller, but does not cover labor of any kind and materials not furnished by Seller, or any charges for any such labor or materials, whether such labor, materials or charges thereon are due to replacement of parts, adjustments, repairs, or any other work done. This warranty does not apply to any equipment which shall have been repaired or altered outside the factory of Seller in any way so as, in the judgment of Seller, to affect its stability, nor which has been subjected to misuse, negligence, or operating conditions in excess of those for which such equipment was designed. This warranty does not cover the effects of physical or chemical properties of water or steam or other liquids or gases used in the equipment.

BUYER AGREES THAT SELLER'S WARRANTY OF ITS PRODUCTS TO BE FREE FROM DEFECT IN MATERIAL AND WORKMANSHIP, AS LIMITED HEREIN, SHALL BE IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, WHETHER ARISING FROM LAW, COURSE OF DEALING, USAGE OF TRADE, OR OTHERWISE, **THERE ARE NO OTHER WARRANTIES, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE, WHICH EXTEND BEYOND THE PRODUCT DESCRIPTION CONFIRMED BY BUYER AND SELLER AS OF THE DATE OF FINAL AGREEMENT.**

This warranty is void if the input to the product exceeds the rated input as indicated on the product serial plate by more than 5% on gas-fired and oil-fired units, or if the product in the judgment of SELLER has been installed in a corrosive atmosphere, or subjected to corrosive fluids or gases, been subjected to misuse, negligence, accident, excessive thermal shock, excessive humidity, physical damage, impact, abrasion, unauthorized alterations, or operation contrary to SELLER'S printed instructions, or if the serial number has been altered, defaced or removed.

BUYER AGREES THAT IN NO EVENT WILL SELLER BE LIABLE FOR COSTS OF PROCESSING, LOST PROFITS, INJURY TO GOODWILL, OR ANY OTHER CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND RESULTING FROM THE ORDER OR USE OF ITS PRODUCT, WHETHER ARISING FROM BREACH OF WARRANTY, NONCONFORMITY TO ORDERED SPECIFICATIONS, DELAY IN DELIVERY, OR ANY LOSS SUSTAINED BY THE BUYER.

BUYER'S REMEDY FOR BREACH OF WARRANTY, EXCLUSIVE OF ALL OTHER REMEDIES PROVIDED BY LAW, IS LIMITED TO REPAIR OR REPLACEMENT AT THE FACTORY OF SELLER, ANY COMPONENT WHICH SHALL, WITHIN THE APPLICABLE WARRANTY PERIOD DEFINED HEREIN AND UPON PRIOR WRITTEN APPROVAL, BE RETURNED TO SELLER WITH TRANSPORTATION CHARGES PREPAID AND WHICH THE EXAMINATION OF SELLER SHALL DISCLOSE TO HAVE BEEN DEFECTIVE; EXCEPT THAT WHEN THE PRODUCT IS TO BE USED BY BUYER AS A COMPONENT PART OF EQUIPMENT MANUFACTURED BY BUYER, BUYER'S REMEDY FOR BREACH, AS LIMITED HEREIN, SHALL BE LIMITED TO ONE YEAR FROM DATE OF SHIPMENT FROM SELLER. FOR GAS-FIRED PRODUCTS INSTALLED IN HIGH HUMIDITY APPLICATIONS AND UTILIZING STAINLESS STEEL HEAT EXCHANGERS, BUYER'S REMEDY FOR BREACH, AS LIMITED HEREIN, SHALL BE LIMITED TO TEN YEARS FROM DATE OF SHIPMENT FROM SELLER.

These warranties are issued only to the original owner-user and cannot be transferred or assigned. No provision is made in these warranties for any labor allowance or field labor participation. Seller will not honor any expenses incurred in its behalf with regard to repairs to any of Seller's products. No credit shall be issued for any defective part returned without proper written authorization (including, but not limited to, model number, serial number, date of failure, etc.) and freight prepaid.

OPTIONAL SUPPLEMENTAL WARRANTY

Provided a supplemental warranty has been purchased, Seller extends the warranty herein for an additional four (4) years on certain compressors. Provided a supplemental warranty has been purchased, Seller extends the warranty herein for an additional four (4) years or nine (9) years on certain heat exchangers.

EXCLUSION OF CONSUMABLES & CONDITIONS BEYOND SELLER'S CONTROL

This warranty shall not be applicable to any of the following items: refrigerant gas, belts, filters, fuses and other items consumed or worn out by normal wear and tear or conditions beyond Seller's control, including (without limitation as to generality) polluted or contaminated or foreign matter contained in the air or water utilized for heat exchanger (condenser) cooling or if the failure of the part is caused by improper air or water supply, or improper or incorrect sizing of power supply.

Component Applicable Models	**"APPLICABLE WARRANTY PERIOD"**
Heat Exchangers Gas-Fired Units	TEN YEARS FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN TEN YEARS FROM DATE OF RESALE BY BUYER OR ANY OTHER USER, WITHIN TEN YEARS FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN ONE HUNDRED TWENTY-SIX MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST
Heat Exchangers Low Intensity Infrared Units **Compressors** Condensing Units for Cassettes	FIVE YEARS FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN FIVE YEARS FROM DATE OF RESALE BY BUYER OR ANY OTHER USER, WITHIN FIVE YEARS FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN SIXTY-SIX MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST
Burners Low Intensity Infrared Units **Other** Components excluding Heat Exchangers, Coils, Condensers, Burners, Sheet Metal	TWO YEARS FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN TWO YEARS FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN THIRTY MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST
Heat Exchangers/Coils Indoor and Outdoor Duct Furnaces and System Units, Steam/Hot Water Units, Oil-Fired Units, Electric Units, Cassettes, Vertical Unit Ventilators, Geothermal Units **Compressors** Vertical Unit Ventilators, Geothermal Units **Burners** High Intensity Infrared Units **Sheet Metal Parts** All Products	ONE YEAR FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN ONE YEAR FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN EIGHTEEN MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST

As Modine Manufacturing Company has a continuous product improvement program, it reserves the right to change design and specifications without notice.

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GARANTIE COMMERCIALE

Le vendeur garantit ses produits contre tout défaut de matériel ou de fabrication, SAUF si la défaillance est imputable à un remplacement de matériel en cas d'urgence causé par l'indisponibilité du matériel normalement utilisé. Cette garantie couvre le remplacement de toute pièce fournie par l'usine du Vendeur, mais ne couvre pas la main-d'œuvre et les matériels non fournis par le Vendeur, de même que tous les frais pour lesdits main-d'œuvre et matériels, que cette main-d'œuvre, ces matériels ou ces frais soient dus au remplacement de pièces, réglages, réparations ou toute autre travail effectué. Cette garantie ne s'applique à aucun équipement qui a été réparé ou altéré en dehors de l'usine du Vendeur de telle manière à compromettre sa stabilité, selon le Vendeur, ou a été soumis à une utilisation abusive, une négligence ou des conditions d'utilisation non conformes à celles pour lesquelles cet équipement a été conçu. Cette garantie ne couvre pas les effets dus aux propriétés physiques ou chimiques de la vapeur, de l'eau ou d'autres liquides ou gaz utilisés dans l'équipement.

L'ACHETEUR RECONNAÎT QUE LA GARANTIE DU VENDEUR À L'ÉGARD DES DÉFAUTS DE FABRICATION OU DE MATIÈRES, AVEC LES LIMITATIONS ÉNONCÉES ICI, TIENT LIEU ET EXCLUT TOUTE AUTRE FORME DE GARANTIE, TANT EXPRESSE QU'IMPLICITE, QU'ELLE DÉCOULE DE LA LOI, DE RAPPORTS D'AFFAIRES, DES PRATIQUES COMMERCIALES USUELLES OU AUTRES, ET QU'IL NE BÉNÉFICIE PAS D'AUTRES GARANTIES, NOTAMMENT DE QUALITÉ MARCHANDE OU D'APTITUDE À UN USAGE PARTICULIER, AU-**DELÀ DE LA DESCRIPTION DU PRODUIT CONFIRMÉE PAR L'ACHETEUR ET LE VENDEUR À LA DATE DE L'ACCORD FINAL.**

Cette garantie est nulle et non avenue si l'alimentation du produit dépasse l'alimentation nominale indiquée sur la plaque de série du produit de plus de 5 % pour les modèles au gaz et au mazout, ou si, selon le VENDEUR, le produit a été installé dans une atmosphère corrosive ou a été soumis à des fluides ou gaz corrosifs, soumis à des conditions telles que utilisation abusive, négligence, accident, choc thermique excessif, humidité excessive, dégâts physiques, impact, abrasion, altérations non autorisées ou utilisation contraire aux instructions imprimées du VENDEUR, ou si le numéro de série a été altéré, rendu invisible ou retiré.

L'ACHETEUR CONVIENT QU'EN AUCUN CAS LE VENDEUR NE SERA RESPONSABLE DES COÛTS DE TRAITEMENT, DES PERTES DE REVENUS, DES PERTES D'ACHALANDAGE, OU AUTRES DOMMAGES INDIRECTS OU CONSÉCUTIFS, DÉCOULANT DE LA COMMANDE OU DE L'UTILISATION DE SES PRODUITS, QU'ILS SOIENT LE RÉSULTAT DU NON-RESPECT DES CLAUSES DE GARANTIE, D'UNE NON-CONFORMITÉ AUX SPÉCIFICATIONS DE COMMANDE, DE RETARDS DE LIVRAISON OU DE TOUTE AUTRE PERTE SUBIE PAR L'ACHETEUR.

LE RECOURS DE L'ACHETEUR EN CAS DE DÉFAILLANCE SOUS GARANTIE, À L'EXCLUSION DE TOUS LES REMÈDES PRÉVUS PAR LA LOI, EST LIMITÉ À LA RÉPARATION OU AU REMPLACEMENT DANS UN ÉTABLISSEMENT DU VENDEUR DE TOUT COMPOSANT QUI, AU COURS DE LA PÉRIODE DE GARANTIE APPLICABLE DÉFINIE EN CECI ET AVEC AUTORISATION ÉCRITE PRÉALABLE, SERA RETOURNÉ EN PORT PAYÉ AU VENDEUR, DANS LA MESURE OÙ L'INSPECTION FAITE PAR LE VENDEUR PERMET DE CONCLURE QUE LEDIT PRODUIT EST DÉFECTUEUX, SAUF SI LE PRODUIT EST DESTINÉ À ÊTRE INCORPORÉ PAR L'ACHETEUR DANS UN COMPOSANT DE L'ÉQUIPEMENT FABRIQUÉ PAR LUI, AUQUEL CAS, LA DURÉE DE L'OBLIGATION DU VENDEUR, AVEC LES LIMITATIONS ÉNONCÉES CI-DESSUS, SERA LIMITÉE À UN AN À COMPTER DE LA DATE D'EXPÉDITION PAR LE VENDEUR. POUR LES PRODUITS AU GAZ INSTALLÉS DANS UNE FORTE HUMIDITÉ, LES APPLICATIONS ET UTILISANT DES ÉCHANGEURS THERMIQUES EN INOX, LE RECOURS DE L'ACHETEUR EN CAS DE VIOLATION DE GARANTIE, TEL QUE LIMITÉ EN CECI, SERA LIMITÉ À DIX ANS À PARTIR DE LA DATE D'EXPÉDITION DE L'USINE DU VENDEUR.

Ces garanties sont données uniquement au propriétaire-utilisateur initial et ne sont pas cessibles ou assignables. Aucune disposition n'est prévue dans ces garanties pour la main-d'œuvre ou la participation de main-d'œuvre sur site. Le Vendeur ne remboursera pas les frais encourus en son nom pour des réparations effectuées sur l'un de ses produits, quel qu'il soit. Aucun crédit ne sera fait pour toute pièce défectueuse retournée sans autorisation écrite (y compris, mais sans s'y limiter, numéro de modèle, numéro de série, date de la panne, etc.) et sans port prépayé.

GARANTIE SUPPLÉMENTAIRE EN OPTION

Sous réserve de l'achat d'une garantie supplémentaire, le vendeur prolonge la garantie fournie en ceci de quatre (4) années supplémentaires pour certains compresseurs. Sous réserve de l'achat d'une garantie supplémentaire, le vendeur étend la garantie en ceci à quatre (4) ou neuf (9) années supplémentaires sur certains échangeurs thermiques.

EXCLUSION DE CONSOMMABLES ET CONDITIONS AU-DELÀ DU CONTRÔLE DU VENDEUR

Cette garantie ne s'applique pas aux articles suivants : gaz frigorigène, courroies, filtres, fusibles et autres articles consommés ou normalement usés ou conditions au-delà du contrôle du Vendeur, y compris (sans limitation quant à sa généralité) corps étranger, pollution ou contamination dans l'air ou l'eau utilisés pour le refroidissement de l'échangeur thermique (condenseur) ou si la panne de la pièce est causée par une alimentation en air ou en eau inadéquate ou un tuyau d'alimentation de taille inadéquate ou incorrect.

Composant Modèles applicables	**« PÉRIODE DE GARANTIE APPLICABLE »**
Échangeurs de chaleur Appareils de chauffage au gaz	DIX ANS À PARTIR DE LA DATE DE PREMIER USAGE BÉNÉFICIAIRE PAR L'ACHETEUR OU TOUT AUTRE UTILISATEUR, DIX ANS À PARTIR DE LA DATE DE REVENTE PAR L'ACHETEUR OU TOUT AUTRE UTILISATEUR, DIX ANS À PARTIR DE LA DATE DE REVENTE PAR L'ACHETEUR À L'ÉTAT INCHANGÉ OU CENT-VINGT-SIX MOIS À PARTIR DE LA DATE D'EXPÉDITION DE L'USINE DU VENDEUR, SELON LA PREMIÈRE DE CES ÉCHÉANCES.
Échangeurs de chaleur Modèles infrarouges de faible intensité **Compresseurs** Condenseurs pour cassettes	CINQ ANS À PARTIR DE LA DATE DE PREMIER USAGE BÉNÉFICIAIRE PAR L'ACHETEUR OU TOUT AUTRE UTILISATEUR, CINQ ANS À PARTIR DE LA DATE DE REVENTE PAR L'ACHETEUR OU TOUT AUTRE UTILISATEUR, CINQ ANS À PARTIR DE LA DATE DE REVENTE PAR L'ACHETEUR À L'ÉTAT INCHANGÉ OU SOIXANTE-SIX MOIS À PARTIR DE LA DATE D'EXPÉDITION DE L'USINE DU VENDEUR, SELON LA PREMIÈRE DE CES ÉCHÉANCES.
Brûleurs Modèles infrarouges de faible intensité **Autres** Composants sauf les échangeurs thermiques, serpentins, condenseurs, brûleurs, tôle	DEUX ANS À PARTIR DE LA DATE DE PREMIER USAGE BÉNÉFICIAIRE PAR L'ACHETEUR OU TOUT AUTRE UTILISATEUR, DEUX ANS À PARTIR DE LA DATE DE REVENTE PAR L'ACHETEUR À L'ÉTAT INCHANGÉ OU TRENTE MOIS À PARTIR DE LA DATE D'EXPÉDITION DE L'USINE DU VENDEUR, SELON LA PREMIÈRE DE CES ÉCHÉANCES.
Échangeurs thermiques/serpentins Systèmes et chaudières canalisés d'intérieur et d'extérieur, modèles à vapeur/eau chaude, modèles au mazout, modèles électriques, cassettes, ventilateurs verticaux, appareils géothermiques **Compresseurs** Ventilateurs verticaux, appareil géothermiques **Brûleurs** Modèles infrarouges de haute intensité **Pièces en tôle** Tous les produits	UN AN À PARTIR DE LA DATE DE PREMIER USAGE BÉNÉFICIAIRE PAR L'ACHETEUR OU TOUT AUTRE UTILISATEUR, UN AN À PARTIR DE LA DATE DE REVENTE PAR L'ACHETEUR À L'ÉTAT INCHANGÉ OU DIX-HUIT MOIS À PARTIR DE LA DATE D'EXPÉDITION DE L'USINE DU VENDEUR, SELON LA PREMIÈRE DE CES ÉCHÉANCES.

Comme la Modine Manufacturing Company a un programme d'amélioration permanente de ses produits, elle se réserve le droit de modifier la conception et les caractéristiques techniques sans préavis.

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PAGE VIERGE

NUMÉRO DE SÉRIE ET DE MODÈLE ET PIÈCES DE RECHANGE

Figure 26.1 - Composition du numéro de modèle (ouvrir le panneau d'accès)

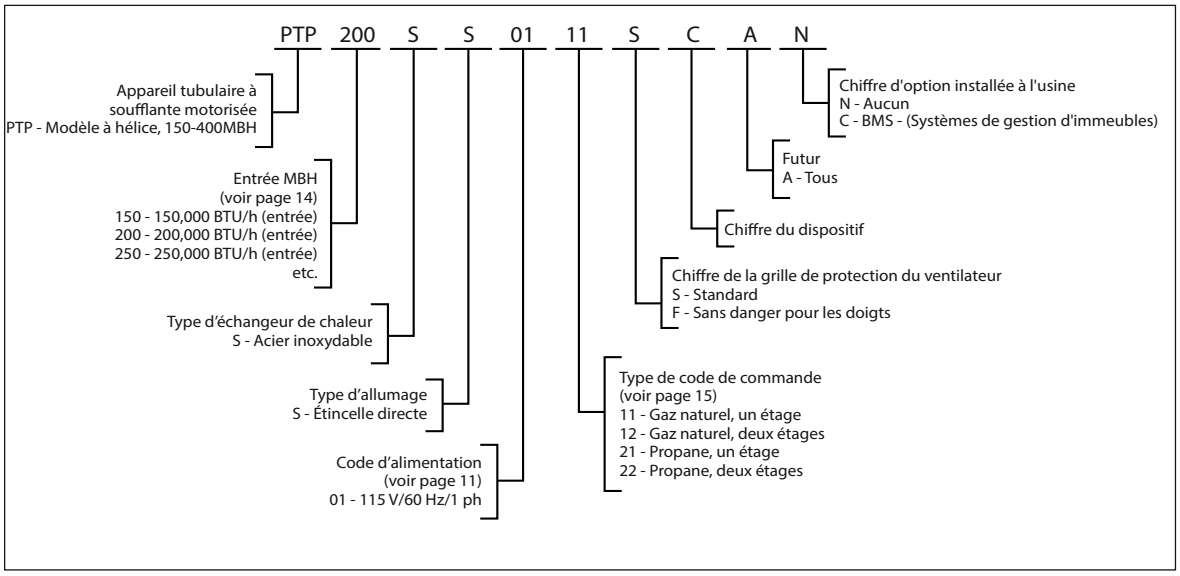
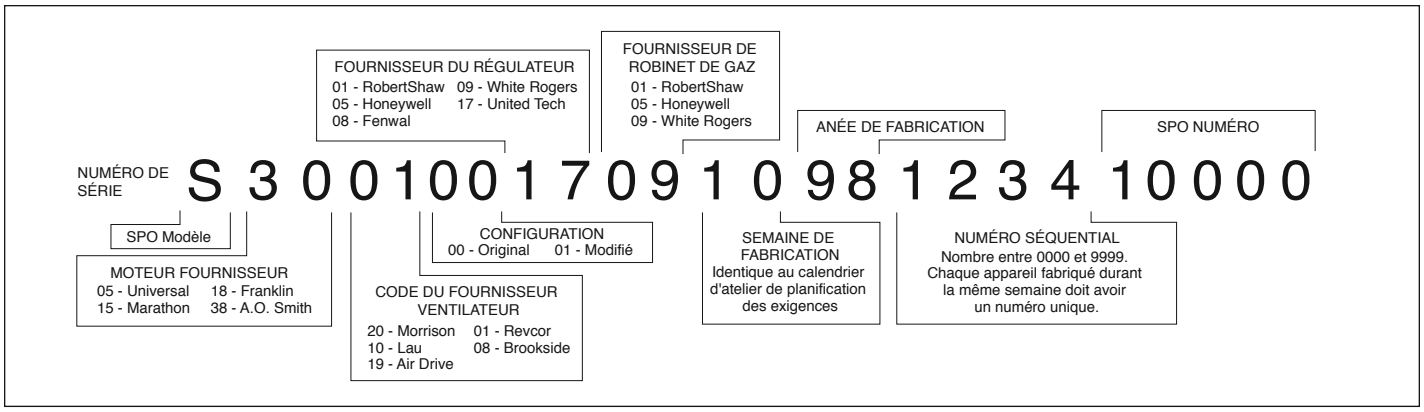


Figure 26.2 - Composition du numéro de série (retirez le panneau d'accès)



Pièces de rechange

Pour commander des pièces, adressez-vous à votre représentant local Vous aurez besoin du numéro de modèle complet et du numéro de série. Si vous avez besoin d'aide pour localiser votre représentant, appelez au numéro qui figure sur la dernière page du manuel.

⚠ AVERTISSEMENT

Pour l'entretien et les réparations de cet appareil, utilisez uniquement des pièces d'origine certifiées. Pour la liste complète des pièces de rechange, adressez-vous au fabricant. Le numéro de modèle complet, le numéro de série et l'adresse du fabricant figurent sur la plaque signalétique fixée à l'appareil. Toute substitution de pièce ou de commande non approuvée par le fabricant sera aux risques du propriétaire.

⚠ ATTENTION

1. L'entretien et les réparations de l'appareil doivent être confiés à un centre de SAV qualifié.
2. Ne tentez pas de réutiliser un contrôleur mécanique ou électronique qui a été mouillé. Remplacez tout contrôleur défectueux.

REMARQUE : Pour essayer la plupart des Solutions possibles suggérées dans le tableau de dépannage 25.1, reportez-vous aux sections correspondantes du manuel.

Maintenance générale

L'appareil et le système d'évacuation des gaz doivent être vérifiés une fois par an par un technicien d'entretien qualifié.

Toutes les opérations d'installation et d'entretien doivent être confiées à une entreprise qualifiée.

Avant toute intervention d'entretien, assurez-vous de fermer le robinet d'arrêt manuel, SITUÉ EN AMONT DU RÉGULATEUR DE GAZ COMBINÉ, ET COUPEZ L'ALIMENTATION ÉLECTRIQUE DE L'APPAREIL.

1. Entretien annuel des composants de transport de l'air.
   a. Vérifiez que l'hélice du ventilateur est bien fixée sur l'arbre du moteur et que ses pales ne sont pas endommagées.
2. L'appareil doit être nettoyé de toute accumulation de poussière, saleté, graisse et matières étrangères, avec une attention particulière portée aux éléments suivants :
   a. Entrées d'air de combustion.
   b. Brûleurs et leurs orifices calibrés. Fermez le gaz en amont du régulateur combiné et coupez l'alimentation électrique de l'appareil. Retirez le panneau d'accès, ouvrez le raccord union de la conduite de gaz et déconnectez les fils de l'allumeur et du détecteur. Enlevez les vis qui retiennent le plateau des brûleurs sur la plaque de tête et sortez le plateau des brûleurs et l'ensemble collecteur. Nettoyez soigneusement les brûleurs avec une brosse métallique ou un moyen similaire. Remplacez tout brûleur ou orifice calibré endommagé ou présentant des signes de détérioration. Réinstallez l'ensemble de brûleurs sur la plaque de tête en vous assurant de bien serrer les vis, les raccords et les connexions électriques.

   ATTENTION : Manipulez l'allumeur et le détecteur de flamme avec précaution.
1. Inspectez le détecteur de flamme et l'allumeur en recherchant les détériorations et les fissures.
2. Vérifiez que les brûleurs se touchent aux points de transmission. Ces points assurent la transmission de la flamme d'un brûleur à l'autre.
   c. Nettoyez l'extérieur des tubes de l'échangeur.
   d. Pales du ventilateur.
3. Assurez-vous qu'il n'y a pas de connexions desserrées.
4. La propreté générale et l'étanchéité des robinets et des tuyauteries de gaz doivent être vérifiées chaque année. Les commandes de gaz doivent être vérifiées afin de s'assurer que l'appareil fonctionne bien. Lisez les instructions d'entretien séparées, fournies avec l'appareil.
5. Les roulements du moteur d'extraction sont lubrifiés à vie et ne nécessitent aucun graissage supplémentaire. Si l'atmosphère est poussiéreuse, il faudra peut-être nettoyer l'intérieur des moteurs et les carters de soufflerie en dirigeant un jet d'air comprimé dans les passages de refroidissement du moteur.
6. Les filtres à toile métallique d'entrée et de sortie doivent être périodiquement nettoyés.

Tableau 25.1 - Dépannage

SYMPTÔMES	CAUSE POSSIBLE	SOLUTION POSSIBLE
L'appareil ne fait rien	1. Pas d'alimentation électrique 2. Pas de courant 24 V au thermostat 3. Thermostat défectueux 4. La diode clignote 5. Fusible grillé sur la carte contrôleur 6. Contrôleur défectueux	1. Mettez l'alimentation principale sous tension 2. a. Vérifiez le transformateur de commande b. Si le transfo est grillé - vérifiez le calibre et la longueur des fils du thermostat 3. a. Vérifiez les connexions des bornes R et W seulement b. Vérifiez / remplacez le thermostat 4. Vérifiez le code de clignotement de la diode 5. Remplacez le fusible 6. Remplacez le contrôleur
DEL éteinte ou clignotante	1. Fusible grillé sur la carte contrôleur 2. Causes multiples	1. Remplacez le fusible 2. Code de clignotement DEL de la carte contrôleur varie avec le type de contrôleur. Un décalque est installé sur l'appareil avec la description des codes applicables pour l'appareil de chauffage. Pour plus de détails, consultez la fiche technique de la carte contrôleur, qui est fournie avec ce manuel.
L'appareil démarre mais le gaz ne s'allume pas	1. Gaz principal fermé 2. Poche d'air dans le tuyau 3. Pression conduite principale ou collecteur 4. Vérifiez le robinet d'arrêt manuel.	1. Ouvrez le robinet d'arrêt manuel. 2. Purgez le tuyau de gaz. 3. Réglez les pressions de gaz selon les instructions du manuel 4. Ouvrez le robinet d'arrêt de gaz.
Le cycle d'allumage se déroule normalement mais les brûleurs s'éteignent en moins de 10 secondes	1. Branchement du secteur électrique inversé 2. L'appareil n'est pas à la terre 3. Flamme non détectée	1. Fil noir = PHASE, fil blanc = NEUTRE, fil vert = TERRE 2. Rectifiez la mise à la terre et mesurez sa résistance. 3. Vérifiez la sonde et les connexions du détecteur
Ventilateur de circulation d'air défectueux	1. Connexions mal serrées 2. Carte contrôleur défectueuse 3. Moteur soufflante défectueux	1. Vérifiez toutes les connexions 2. Vérifiez la feuille technique de la carte contrôleur et son fonctionnement 3. Vérifiez le moteur soufflante

DIMENSIONS – MODÈLE BTP

Modèles à soufflante – Modèle BTP

Figure 24.1 - Plans cotés

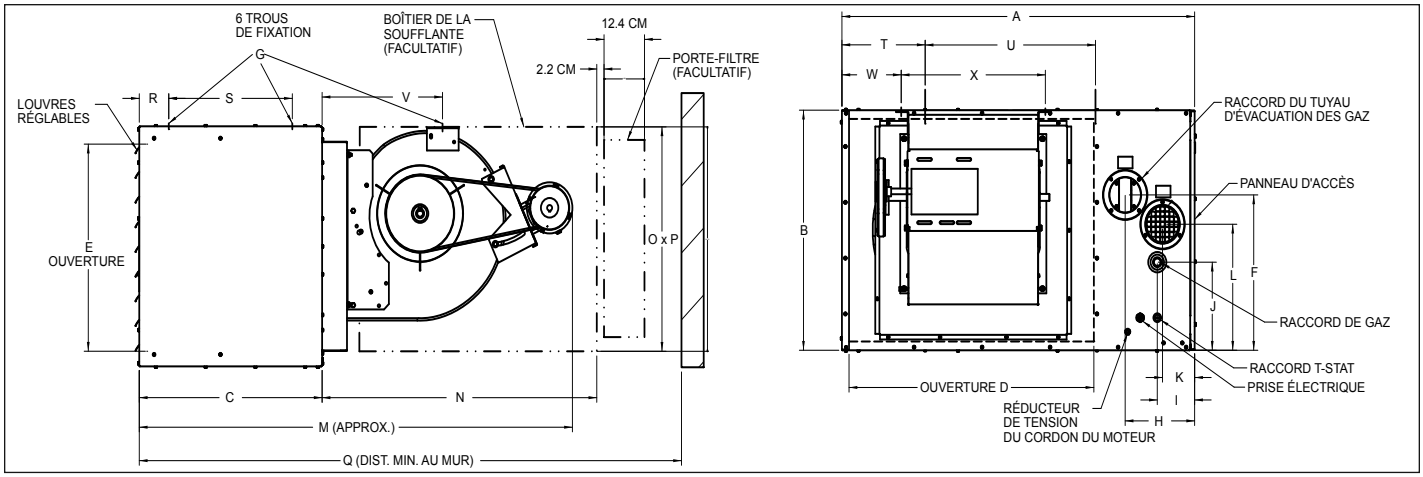


Tableau 24.2 - dimensions (pouces) – BTP

Modèles	*BTP150*	*BTP175*	*BTP200*	*BTP250*	*BTP300*	*BTP350*	*BTP400*
A	35,53	42,53	42,53	42,53	42,53	42,53	42,53
B	23,06	25,81	25,81	31,31	31,31	39,56	39,56
C	22,05	22,05	22,05	22,05	22,05	22,05	22,05
D	22,52	29,52	29,52	29,52	29,52	29,52	29,52
E	21,18	23,93	23,93	24,46	24,46	32,17	37,17
F	15,33	16,70	16,70	19,45	19,45	23,58	23,58
G (trou de montage) ①	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16
H	8,37	8,37	8,37	8,37	8,37	8,37	8,37
I	4,50	4,50	4,50	4,50	4,50	4,50	4,50
J	8,09	9,47	9,47	6,72	6,72	10,84	10,84
K	3,87	3,87	3,87	5,20	5,20	5,20	5,20
L	12,17	13,55	13,55	12,66	12,66	16,78	16,78
M ②	52,25	52,19	52,19	58,88	58,88	58,88	58,88
N	33,18	33,90	33,90	39,88	39,88	39,88	39,88
O	23,90	24,13	24,13	27,04	27,04	28,57	28,57
P	24,77	24,52	24,52	27,19	27,19	28,28	28,28
Q (avec boîtier de souffl. et porte-filtre)	73,04	73,70	73,70	79,68	79,68	79,68	79,68
Q (sans boîtier de souffl. et porte-filtre)	64,25	64,19	64,19	70,88	70,88	70,88	70,88
R	3,56	3,56	3,56	3,56	3,56	3,56	3,56
S	14,90	14,90	14,90	14,90	14,90	14,90	14,90
T	10	10	10	10	10	10	10
U	13,54	20,53	20,53	20,53	20,53	20,53	20,53
V	14,52	14,52	14,52	18,04	18,04	18	18
W	3,27	7,15	7,15	4,77	4,77	5,24	5,24
X	17,38	17,38	17,38	20,38	20,38	20,38	20,38
Raccordement de gaz	1/2	1/2	1/2	3/4	3/4	3/4	3/4
taille du connecteur d'évacuation des gaz	4 po	4 po	4 po	6 po	6 po	6 po	6 po
Soufflante	12-12	12-12	12-12	15-15	15-15	15-15	15-15
Poids d'expédition approximatif (lb)	220	275	280	340	345	395	405

① Le diamètre de trou et les filets par pouce pour accepter la tige filetée sont indiqués.

② Dimension approximative pour tous les moteurs de série; comptez 7,5 cm pour les moteurs à roue à gorge et en option.

DIMENSIONS – MODÈLE PTP

Modèles à hélice - Modèle PTP

Figure 23.1 - Plans cotés

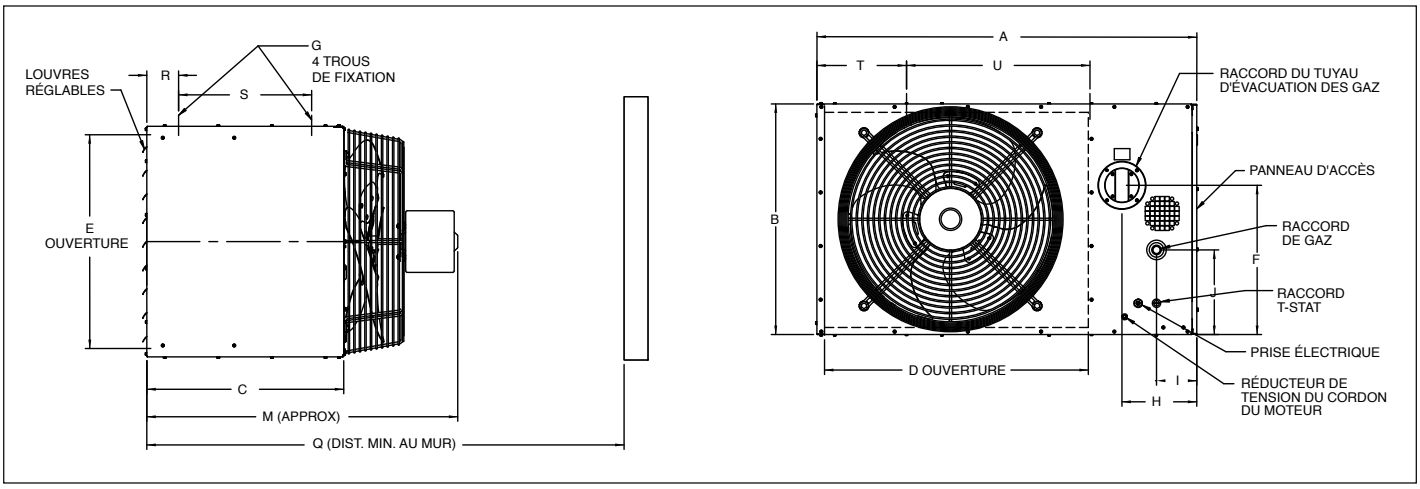


Tableau 23.2 - Dimensions (pouces) - PTP ①

Modèles	PTP150	PTP175	PTP200	PTP250	PTP300	PTP350	PTP400
A	35,53	42,53	42,53	42,53	42,53	42,53	42,53
B	23,06	25,81	25,81	31,31	31,31	39,56	39,56
C	22,05	22,05	22,05	22,05	22,05	22,05	22,05
D	22,52	29,52	29,52	29,52	29,52	29,52	29,52
E	21,18	23,93	23,93	24.46	24,46	32,71	32,71
F	15,33	16,70	16,70	19,45	19,45	23,58	23,58
G (trou de montage) ②	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16
H	8,37	8,37	8,37	8,37	8,37	8,37	8,37
I	4,50	4,50	4,50	4,50	4,50	4,50	4,50
M	31,79	32,83	34,43	33,83	33,83	34,83	34,83
Q ③	43,79	44,83	46,43	45,83	45,83	46,83	46,83
R	3,56	3,56	3,56	3,56	3,56	3,56	3,56
S	14,90	14,90	14,90	14,90	14,90	14,90	14,90
T	10	10	10	10	10	10	10
U	13,54	20,53	20,53	20,53	20,53	20,53	20,53
Raccordement de gaz	1/2	1/2	1/2	3/4	3/4	3/4	3/4
Dimension du conduit de raccordement	4 po	4 po	4 po	6 po	6 po	6 po	6 po
Diamètre de ventilateur	20	22	22	22	22	24	26,13
Poids d'expédition approximatif (lb)	165	210	220	265	270	310	320

① N'utilisez pas les modèles à hélice avec des gaines.② Le diamètre de trou et les filets par pouce pour accepter la tige filetée sont indiqués.

③ Dimension égale hors-tout plus 30,5 cm.

DONNÉES DE PERFORMANCE – HOTTES DE DÉFLEXION

Figure 23.1 - Hottes de déflexion vers le bas à 30°, 60° et 90°

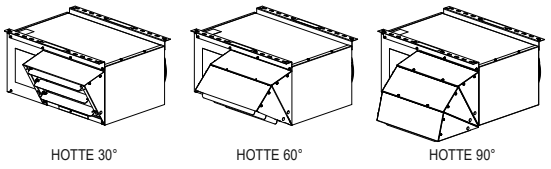


Figure 22.2 - Couverture du sol/portée à 30° et 60°

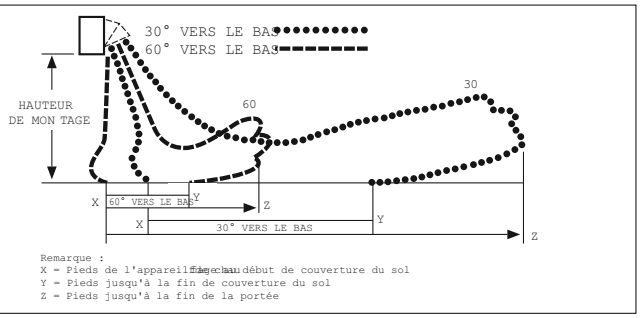


Tableau 23.1 - Données de performance générale de la hotte de déflexion - Modèle BTP

Taille de modèle	Débit d'air	Hausse de temp.	Hauteur de montage	Angle de lame	Hotte 30°			Hotte 60°			Hotte 90°
					X	Y	Z	X	Y	Z	S
	(CFM)	(°F)	(pi)	(°)	(pi)	(pi)	(pi)	(pi)	(pi)	(pi)	(pi)
150	2020	55	8	57	13	29	40	0	31	42	21
			10	48	12	28	38	0	28	39	19
			12	37	10	25	35	0	25	34	17
			14	21	8	21	30	0	19	27	16
			15	10	7	19	27	0	12	18	15
175	2357	55	8	51	11	24	33	0	25	34	17
			10	39	9	22	31	0	22	30	15
			12	22	7	19	26	0	17	23	14
			13	2	5	14	21	0	10	14	13
200	2694	55	8	57	13	29	39	0	30	41	20
			10	47	12	27	37	0	28	38	18
			12	35	10	25	34	0	24	33	17
			14	18	7	20	29	0	18	25	15
			15	2	5	16	24	0	11	16	15
250	3367	55	8	59	14	31	42	0	32	44	22
			10	50	13	29	40	0	30	41	20
			12	39	11	27	37	0	27	37	18
			14	25	9	23	33	0	22	30	17
			15	15	7	20	29	0	18	25	16
300	4040	55	8	64	17	37	51	0	40	54	29
			10	57	16	36	50	0	38	52	26
			12	50	15	35	48	0	36	49	23
			14	41	13	33	45	0	33	45	22
			16	30	12	30	41	0	28	39	20
			18	14	9	24	35	0	21	29	19
350	4714	55	8	63	16	36	49	0	37	51	27
			10	55	15	34	47	0	36	49	24
			12	47	14	33	45	0	33	46	22
			14	37	12	30	42	0	30	41	20
			16	25	10	27	38	0	25	34	19
			18	2	6	20	29	0	13	19	18
400	5387	55	8	67	19	41	56	0	44	60	32
			10	60	18	40	55	0	42	58	29
			12	53	17	39	53	0	40	55	26
			14	46	15	37	51	0	37	51	25
			16	37	14	34	48	0	34	47	23
			18	26	12	31	43	0	29	40	22
			20	8	8	23	34	0	20	28	21

Remarque : Reportez-vous aux figures 23.2 et 23.3.

Figure 23.3 - Portée/couverture du sol avec hotte à 90°

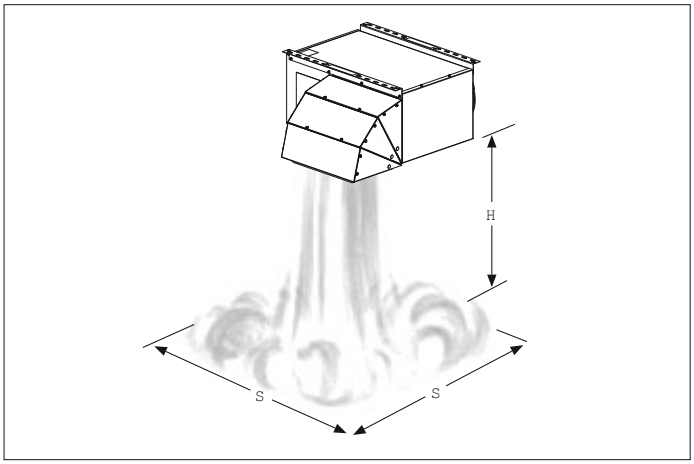


Tableau 23.2 - Données de performance générale de la hotte de déflexion - Modèle PTP

Taille de modèle	Débit d'air	Hausse de temp.	Hauteur de montage	Angle de lame	Hotte 30°			Hotte 60°			Hotte 90°
					X	Y	Z	X	Y	Z	S
	(CFM)	(°F)	(pi)	(°)	(pi)	(pi)	(pi)	(pi)	(pi)	(pi)	(pi)
150	2139	53	8	60	15	32	44	0	34	47	24
			10	52	13	31	42	0	32	44	21
			12	42	12	29	40	0	29	40	19
			14	30	10	26	36	0	25	34	18
			16	9	7	20	29	0	17	24	17
175	2726	48	8	60	14	32	43	0	33	46	23
			10	51	13	30	42	0	31	43	21
			12	41	12	28	39	0	28	39	19
			14	29	10	25	35	0	24	33	17
			16	8	6	17	26	0	15	21	16
200	2780	52	8	59	14	30	42	0	32	44	22
			10	49	12	29	40	0	30	41	19
			12	39	11	27	37	0	26	36	18
			14	24	9	23	33	0	21	30	16
250	3994	47	8	66	19	41	56	0	43	59	32
			10	60	18	40	54	0	42	57	29
			12	53	17	38	53	0	40	54	26
			14	46	15	36	50	0	37	51	24
			16	37	14	34	47	0	33	46	23
			18	26	12	31	43	0	28	40	21
			20	8	7	22	32	0	19	26	20
300	4543	50	8	69	22	45	62	0	48	66	37
			10	63	21	44	61	0	47	64	33
			12	57	19	43	59	0	45	62	30
			14	51	18	42	57	0	43	59	28
			16	44	17	40	55	0	40	55	26
			18	35	15	37	52	0	36	50	25
			20	25	13	33	47	0	31	43	24
			22	9	8	25	37	0	21	30	23
350	5278	50	8	68	20	43	58	0	45	62	34
			10	61	19	42	57	0	44	60	31
			12	55	18	40	55	0	42	58	28
			14	48	17	39	53	0	40	54	26
			16	40	15	37	51	0	36	50	24
			18	31	13	34	47	0	32	44	23
			20	17	10	29	41	0	25	35	22
			21	2	7	23	34	0	18	26	21
400	5995	51	8	70	24	49	66	0	52	71	41
			10	65	22	48	65	0	51	69	37
			12	59	21	47	64	0	49	67	34
			14	54	20	45	62	0	47	64	31
			16	47	19	44	60	0	44	61	29
			18	40	17	41	57	0	41	57	28
			20	32	15	38	54	0	37	51	26
			22	21	13	34	48	0	31	43	25
			23	13	11	31	44	0	26	37	24

Remarque : Reportez-vous aux figures 23.2 et 23.3.

DONNÉES DE PERFORMANCE GÉNÉRALE – MODÈLES PTP ET BTP

Tableau 21.1 - Données de performance générale du modèle PTP à soufflante

	Tailles de modèle PTP						
	150	***175***	***200***	***250***	***300***	***350***	***400***
Apport calorifique BTU/h ①	150 000	175 000	200 000	250 000	300 000	350 000	400 000
Chaleur produite BTU/h ①	123 000	143 500	164 000	205 000	246 000	287 000	328 000
Air entrant (pi³/min) à 70 °F	2140	2725	2870	3995	4545	5280	5995
Vitesse de sortie (pi/min)	711	607	643	721	824	748	851
Augmentation temp. air (°F)	53	48	52	47	50	50	51
Hauteur max. de montage (pi) ②	15	14	15	18	19	18	21
Portée thermique (pi) à haut. max. de montage ②	51	50	53	62	69	65	74
Type de moteur ③	PSC	PSC	PSC	PSC	PSC	PSC	PSC
Puissance moteur	1/6	1/6	1/3	1/3	1/2	1/2	3/4
Régime moteur (tr/min)	1075	1075	1075	1075	1075	1125	1125

Tableau 21.2 - Données de performance générale du modèle BTP à soufflante

	Modèle BTP Tailles																				
	150			**175**			**200**			**250**			**300**			**350**			**400**		
Apport calorifique BTU/h ①	150,000			175,000			200,000			250,000			300,000			350,000			400,000		
Chaleur produite BTU/h ①	123,000			143,500			164,000			205,000			246,000			287,000			328,000		
Air entrant (CFM)	Faible	Milieu	Haute	Faible	Milieu	Haute	Faible	Milieu	Haute	Faible	Milieu	Haute	Faible	Milieu	Haute	Faible	Milieu	Haute	Faible	Milieu	Haute
	1587	2020	2778	1852	2357	3241	2116	2694	3704	2646	3367	4630	3175	4040	5556	3704	4714	6481	4233	5387	7407
Vitesse de sortie (pi/min)	543	674	903	428	531	711	489	607	813	497	617	826	596	740	991	543	674	903	621	770	1032
Augmentation temp. air (°F)	70	55	40	70	55	40	70	55	40	70	55	40	70	55	40	70	55	40	70	55	40
Hauteur max. de montage (pi) ②	9	13	21	8	11	18	9	13	21	10	14	22	11	16	26	11	16	25	12	18	29
Portée thermique (pi) à haut. max. de montage	33	47	75	28	40	65	32	46	74	34	48	78	40	58	94	39	55	89	44	63	102

① Les valeurs nominales indiquées correspondent à une altitude de 609 m maximum. Au-delà, elles doivent être réduites de 4 % tous les 300 m au-dessus du niveau de la mer. (Au Canada, consultez la plaque signalétique.) La réduction des valeurs nominales exige l'utilisation d'un ensemble pour haute altitude.

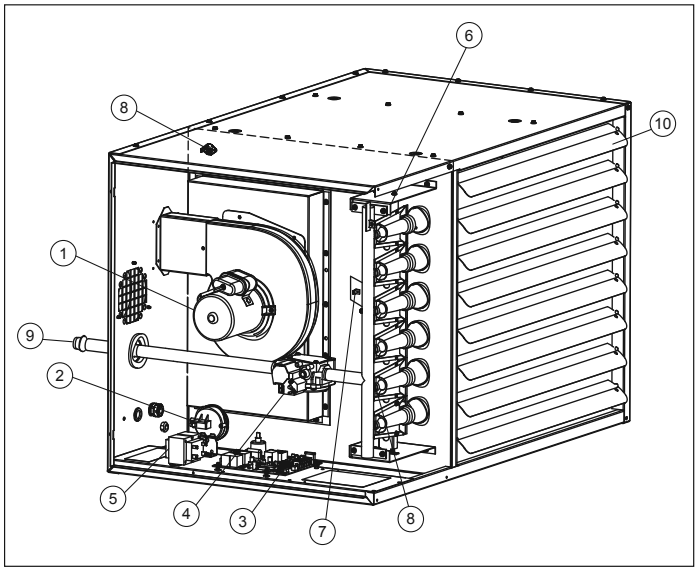
② Données relevées à une hausse de température de l'air de 12 °C. À une température ambiante de 18 °C, avec l'appareil à entrée nominale maximum. Hauteur de montage mesurée du bas de l'appareil et sans hottes de déflexion. Pour les appareils équipés de hottes de déflexion, voir page 23.

SÉQUENCE FONCTIONNELLE DE SYSTÈME DE COMMANDE

SÉQUENCE FONCTIONNELLE DE SYSTÈME DE COMMANDE

Lorsque le thermostat détecte une demande de chaleur, le moteur de la soufflante d'extraction démarre. L'appareil effectue un cycle de purge avant que l'allumeur direct par étincelle soit mis sous tension. En même temps, la soupape principale du régulateur combiné s'ouvre pour laisser le gaz passer vers les brûleurs. Si le moteur du ventilateur ne tourne pas encore, il démarrera peu après. Si une flamme n'est pas détectée dans les 7 secondes qui suivent pour une raison quelconque, le robinet principal se fermera et il y aura une courte période de purge avant toute nouvelle tentative d'allumage. Si une flamme n'est pas détectée après quatre tentatives, il s'écoule au moins une heure avant une nouvelle tentative d'allumage.

Figure 20.1 - Principaux composants des circuits de gaz, électriques, de sécurité et autres



1. Extracteur
2. Pressostat
3. Tableau de commande à allumage direct par étincelle intégré
4. Commande de gaz mixte
5. Transformateur du contrôleur
6. Détecteur de flamme (caché)
7. Limiteur à réarmement automatique (caché)
8. Allumeur direct à étincelles (caché)
9. Tuyau de raccordement au gaz
10. Lames de déflecteur d'air horizontales

Tableau 20.2 - Commandes de gaz - Tous les modèles

Description du système de commande	Type de gaz	Code contrôleur	Tension de commande	Tension de service
Allumage direct par étincelle mono-étagé, arrêt 100 % avec essais continus **Utilise** un régulateur de gaz combiné monophasé avec commande d'allumage. Le gaz est enflammé par un allumeur direct à étincelles lorsqu'il y a demande de chaleur.	Naturel	11	24 V	115 V
	Propane	21		
Allumeur direct à étincelles, deux étages, arrêt 100 %, allumage continu Utilise un régulateur de gaz à deux étages avec contrôleur d'allumage intégré. Le taux d'allumage est de 100 % et de 50 % du plein régime nominal. Le gaz est enflammé par un allumeur direct à étincelles lorsqu'il y a demande de chaleur.	Naturel	12		
	Propane	22		

INSTALLATION – FONCTIONNEMENT

MISE EN SERVICE

Avant la mise en service

IMPORTANT

1. Pour éviter une défaillance prématurée de l'échangeur de chaleur, l'apport calorifique du gaz utilisé ne doit pas excéder de plus de 5 % la valeur nominale inscrite sur la plaque signalétique de l'appareil.
2. Les procédures de démarrage et de réglage doivent être confiées à un centre de SAV qualifié.

Bien que l'appareil ait été assemblé et testé à chaud en usine, il est recommandé d'effectuer les vérifications préopérationnelles suivantes pour vous assurer que tout fonctionne normalement après l'installation.

1. Isolez l'appareil de toute alimentation électrique en ouvrant le sectionneur. Vérifiez que les disjoncteurs ou les fusibles sont en place et d'un calibre approprié. Fermez tous les robinets d'arrêt de gaz.
2. Ouvrez le panneau d'accès aux commandes sur le côté de l'appareil.
3. Vérifiez que la tension du secteur correspond à la tension nominale de l'appareil inscrite sur la plaque signalétique. Assurez-vous que tous les câblages sont bien fixés et convenablement protégés. Suivez chaque circuit pour vous assurer qu'il est conforme au schéma de câblage. Si l'appareil est installé à plus de 2000 pieds et que l'ensemble pour haute altitude inclut un interrupteur de contrôle d'air de combustion, remplacez l'interrupteur de l'appareil par celui fourni dans l'ensemble. Assurez-vous que le tube et les branchements électriques sont solidement fixés.
4. Vérifiez que le système d'évacuation des gaz est correctement installé et n'est pas obstrué. Avant de commencer, suivez les étapes suivantes afin de vous assurer que le système d'évacuation est correctement dimensionné :
   a. Obturez toutes les ouvertures inutiles du système d'évacuation.
   b. Inspectez le système d'évacuation pour vérifier que les diamètres et la pente des tuyaux sont conformes aux normes ANSI Z223.1 (NFPA 54) ou au Code d'installation CSA B149.1, dernière édition, et aux présentes instructions. Déterminez s'il n'y a pas d'obstructions, de restriction, de fuite, de corrosion ou d'autres défectuosités pouvant créer un risque.
   c. Dans la mesure du possible, fermez toutes les portes et fenêtres du bâtiment, ainsi que les portes de communication entre les espaces dans lesquels se trouvent le ou les appareils reliés au système d'évacuation, et les autres zones du bâtiment. Mettez en marche au régime maximum les sécheuses de linge et tous les ventilateurs, comme les hottes aspirantes, les ventilateurs de salle de bains, etc. Ne faites pas fonctionner la ventilation d'été. Fermez les registres des foyers.
   d. Suivez les instructions d'allumage. Faites fonctionner l'appareil à inspecter. Réglez le thermostat de manière que l'appareil chauffe en continu.
   e. Après avoir déterminé que chaque appareil relié au système d'évacuation fonctionne correctement dans les conditions décrites ci-dessus, remettez les portes et les fenêtres, les ventilateurs, les registres de cheminée et tout autre appareil au gaz dans leurs états antérieurs.
   f. Si les essais révèlent un mauvais fonctionnement du système d'évacuation, il faut prendre les mesures correctives nécessaires.
5. Vérifiez qu'il n'y a pas d'obstacles devant la prise d'air et la sortie d'air chaud.
6. Vérifiez que le ventilateur est libre. Le ventilateur doit tourner librement à la main sans rien toucher.
7. Vérifiez que tous les filtres sont en place et correctement installés en respectant la direction de l'air (s'il y a lieu).
8. Effectuez une inspection visuelle de l'appareil et assurez-vous qu'il n'a pas été endommagé au cours de l'installation. Assurez-vous que toutes les attaches sont en place et que les orifices du brûleur sont correctement alignés sur les tubes de l'échangeur de chaleur et que les orifices à gaz sont centrés sur l'ouverture du tube inspirateur du brûleur.
9. Assurez-vous que les lames des persiennes sont ouvertes d'au moins 30° mesurés par rapport à la verticale.
10. Mettez l'appareil sous tension au niveau du sectionneur.
11. Vérifiez le thermostat, l'allumeur, le robinet de gaz, puis mettez la soufflante sous tension. Si le fonctionnement n'est pas normal, revérifiez avec le schéma de câblage.
12. Vérifiez le régime moteur (tr/min).
13. Vérifiez la tension du moteur.
14. Mesurez le courant d'appel du moteur et comparez-le à l'intensité nominale de la plaque signalétique.
15. Revérifiez la pression d'arrivée de gaz au niveau du robinet d'arrêt manuel installé sur site. La pression d'entrée de l'appareil doit être de 6 po C.E. pour le gaz naturel ou de 11 po C.E. pour le propane. La pression maximum d'arrivée pour l'un ou l'autre gaz est de 14 po C.E. Si la pression d'arrivée dépasse cette valeur, il faudra ajouter un détendeur en amont du robinet de gaz mixte.
16. Ouvrez le robinet d'arrêt de gaz manuel installé sur site.
17. Tournez le robinet manuel du régulateur combiné à la position « ON ». Réglez le thermostat pour créer un appel thermique.
18. Assurez-vous que la vanne générale de gaz s'ouvre. Vérifiez la pression au collecteur de gaz (voir Réglage principal du gaz) avec la soufflante en marche.
19. Assurez-vous que les commandes de gaz s'activent dans l'ordre (voir « Séquence de fonctionnement des commandes »). Si vous n'êtes pas familier avec ces commandes (régulateur de gaz combiné), lisez la documentation du fabricant du système de régulation, qui est livrée avec l'appareil.
20. Quand vous vous êtes assuré que l'appareil fonctionne normalement, retirez tous les fils volants utilisés pour les essais.
21. Remettez en place le panneau d'accès aux commandes sur le côté de l'appareil.
22. Si l'appareil est installé à plus de 2000 pieds, collez l'étiquette incluse dans l'ensemble pour haute altitude et remplissez tous les champs au feutre indélébile.

Réglage du brûleur principal

Le régulateur de pression du gaz (à l'intérieur du régulateur combiné) a été réglé en usine pour des caractéristiques moyennes de gaz. Il est essentiel que l'alimentation du brûleur soit conforme aux conditions indiquées sur la plaque signalétique. Ces conditions doivent être vérifiées et les réglages nécessaires, effectués après l'installation de l'appareil. Une puissance calorifique excessive se traduira par une surchauffe permanente réduisant la durée de vie de l'appareil et entraînant des besoins d'entretien accrus. L'entrée ne doit en aucun cas dépasser celle indiquée sur la plaque de série.

La pression du collecteur de gaz doit être mesurée au raccord installé à côté du robinet d'arrêt.

Pour régler la pression du collecteur de gaz

1. Tournez le robinet d'arrêt manuel installé sur site sur Arrêt.
2. Retirez le bouchon du raccord 1/8 po pour brancher un manomètre à tube en U dont les branches ont une hauteur d'au moins 30 cm (12 po).
3. Tournez le robinet d'arrêt de gaz manuel installé sur site sur position Marche.
4. Créez un appel thermique pour feu élevé à partir du thermostat.
5. Consultez le tableau 10.1 pour déterminer la pression nominale au collecteur principal pour le type d'appareil. Les pressions entre 0 et 2000 pieds d'altitude sont de 3,5 po C.E. pour le gaz naturel, 10 po C.E. pour le propane; à plus de 2000 pi, reportez-vous aux instructions de raccordement au gaz – Ensemble d'accessoires pour haute altitude à la page 11. Réglez le ressort du régulateur principal pour qu'il délivre le gaz à la pression correcte (pour savoir comme régler, consultez le manuel du régulateur fourni avec l'appareil).
6. Après ce réglage, fermez le robinet d'arrêt manuel et revissez le bouchon du raccord de 1/8 po.
7. Ensuite, rouvrez le robinet d'arrêt manuel installé sur site et assurez-vous à nouveau que les bouchons du tuyau ne fuient pas avec de l'eau savonneuse.

DONNÉES DE PERFORMANCE DE LA SOUFFLANTE – MODÈLE BTP

Tableau 18.1 - Modèle à soufflante BTP 250-400 (hausse de température de 15 à 21 °C pour la taille 250) ① ② ③

				Pression statique externe (po C.E.)																											
				0			0,1			0,2			0,3			0,4			0,5			0,6			0,7						
Taille de modèle	ATR	CFM	HP	Régime (tr/min)	Entraine-ment	Tours	Régime (tr/min)	Entraine-ment	Tours	Régime (tr/min)	Entraine-ment	Tours	Régime (tr/min)	Entraine-ment	Tours	Régime (tr/min)	Entraine-ment	Tours	Régime (tr/min)	Entraine-ment	Tours	Régime (tr/min)	Entraine-ment	Tours	Régime (tr/min)	Entraine-ment	Tours	HP			
250	60	3086	1/2		204	4		204	3		204	1,5		-	-		-	-		-	-		-	-		-	-		1/2		
			1		-	-		241	5		241	4		241	3		241	2		241	1,5		241	0,5		241	0		1		
			1-1/2	360	-	-	403	-	-	448	-	-	490	-	-	530	23	5	566	23	4	601	23	3	635	23	2		1-1/2		
			2		-	-		-	-		-	-		-	-		-	-		-	-		180	4,5		180	2,5		2		
	65	2849	1/2		204	4,5		204	3,5		204	2		204	1		-	-		-	-		-	-		-	-		1/2		
			1		-	-		-	-		241	4,5		241	3,5		241	2,5		241	1,5		241	1		241	0		1		
			1-1/2	332	-	-	379	-	-	427	-	-	471	-	-	512	-	-	550	23	4,5	587	23	3,5	622	23	2		1-1/2		
			2		-	-		-	-		-	-		-	-		-	-		-	-		180	5		180	4		2		
	70	2646	1/2		204	5		204	4,5		204	2,5		204	1,5		204	0,5		-	-		-	-		-	-		1/2		
			1		-	-		-	-		241	5		241	4		241	3		241	2		241	1		241	0,5		1		
			1-1/2	308	-	-	359	-	-	410	-	-	456	-	-	498	-	-	538	23	5	576	23	3,5	613	23	2,5		1-1/2		
			2		-	-		-	-		-	-		-	-		-	-		-	-		180	5		180	4,5		2		
300	40	5556	3	650	112	3	673	112	2,5	697	112	2	721	112	1	746	112	0,5	771	112	0	-	-	-	-	-	-	3			
					177	1,5		177	0,5		177	0		-	-		-	-		-	-	-	-	-	-	-	-				
	45	4938	2	578	177	3,5	604	177	3	631	177	2	659	177	1	687	177	0	715	-	-	742	-	-	768	-	-	2			
			3		112	5		112	4,5		112	3,5		112	3		112	2		112	1,5		112	0,5		112	0		3		
	50	4444	1-1/2	520	23	5	549	23	4,5	580	23	3,5	611	23	2,5	642	23	1,5	672	177	0,5	701	177	0	729	177	0	1-1/2			
					243	2,5		243	1,5		243	0		-	-		-	-		-	-		-	-		-	-				
			3		-	-		-	-		112	5		112	4,5		112	3,5		112	2,5		112	1,5		112	1		3		
	55	4040	1	473	241	3,5	505	241	3	538	241	2	573	-	-	606	-	-	638	-	-	669	-	-	698	-	-	1			
					240	2		240	1,5		240	0,5		-	-		-	-		-	-		-	-		-	-				
			1-1/2		-	-		-	-		23	5		23	3,5		23	2,5		23	1,5		23	0,5		23	0	1-1/2			
					243	4		243	3		243	1,5		243	0,5		243	0		-	-		-	-		-	-				
			3		-	-		-	-		-	-		-	-		112	4,5		112	3,5		112	2,5		112	2		3		
	60	3704	1	433	241	4,5	468	241	3,5	506	241	3	543	241	2	578	241	1	612	-	-	644	-	-	674	-	-	1			
					240	3		240	2,5		240	1,5		-	-		-	-		-	-		-	-		-	-				
			1-1/2		-	-		-	-		-	-		23	4,5		23	3,5		23	2,5		23	1,5		23	0,5	1-1/2			
					243	5		243	4,5		243	3		243	1,5		243	0,5		-	-		-	-		-	-				
			3		-	-		-	-		-	-		-	-		112	5		112	4,5		112	3,5		112	2,5		3		
	65	3419	1	400	241	5	438	241	4,5	478	241	3,5	518	241	2,5	555	241	1,5	590	241	0,5	623	241	0	655	-	-	1			
					240	4		240	3		240	2		240	1		240	0		-	-		-	-		-	-				
			1-1/2		-	-		-	-		-	-		-	-		23	4		23	3		23	2		23	1	1-1/2			
					-	-		243	5		243	4		243	2,5		243	1		243	0		-	-		-	-				
			3		-	-		-	-		-	-		-	-		-	-		112	5		112	4		112	3		3		
	70	3175	1	-	-	-		241	5		241	4		241	3		241	2		241	1		241	0,5		-	-		1		
				371	240	5		240	4		240	2,5		240	1,5		240	0,5		-	-		-	-		-	-				
			1-1/2	-	-	-	412	-	-	456	-	-	497	-	-	536	23	5	572	23	4	607	23	2,5	640	23	1,5		1-1/2		
				-	-	-		-	-		243	5		243	3,5		243	2		243	0,5		243	0		-	-				
			3	-	-	-		-	-		-	-		-	-		-	-		-	-		112	4,5		112	3,5		3		
350	40	6481	5	721	245	3	739	245	3	757	245	2,5	777	245	2	797	245	1	817	245	0,5	838	245	0	860	245	0	5			
	45	5761	3	643	246	3,5	662	246	1	684	246	2,5	706	246	1,5	729	246	1	753	246	0	777			801			3			
			5		245	5		245	5		245	4		245	3,5		245	3		245	2,5		245	2		245	1		5		
	50	5185	2	579	180	5	602	180	4,5	626	180	4	651	180	3	678	-	-	705	-	-	731	-	-	757	-	-	2			
					177	3,5		177	3		177	2		177	1		-	-		-	-		-	-		-	-				
			3		-	-		-	-		-	-		-	-		246	2,5		246	1,5		246	1		246	0		3		
			5		-	-		-	-		-	-		245	5		245	4,5		245	3,5		245	3		245	2,5		5		
	55	4714	1-1/2	528	247	3,5	553	247	3	580	247	2	608	-	-	638	-	-	667	-	-	696	-	-	724	-	-	1-1/2			
					250	0,5		250	0		252	5		-	-		-	-		-	-		-	-		-	-				
			2		-	-		-	-		-	-		180	4,5		180	3,5		180	2,5		180	2		180	1		2		
					177	5		177	4,5		177	3,5		177	2,5		177	1,5		177	1		177	0		177	0				
			5		-	-		-	-		-	-		-	-		245	5		245	4,5		245	4		245	3		5		
	60	4321	1-1/2	484	247	5	512	247	4	542	247	3	574	247	2	606	247	1	637	247	0	668	-	-	697	-	-	1-1/2			
					250	2,5		250	1		250	0		252	5		252	4,5		252	3,5		252	2,5		-	-				
			2		-	-		-	-		-	-		-	-		-	-		-	-		-	-		180	2		2		
					-	-		-	-		177	4,5		177	3,5		177	2,5		177	1,5		177	0,5		177	0				
			5		-	-		-	-		-	-		-	-		-	-		245	5		245	4,5		245	4		5		
	65	3989	1-1/2	448	250	4	478	250	2,5	511	250	1	546	250	0	580	252	5	614	252	4,5	645	252	3,5	676	252	2,5	1-1/2			
					-	-		247	5		247	4		247	3		247	2		247	0,5		247	0		-	-				
			2		-	-		-	-		-	-		177	4,5		177	3,5		177	2,5		177	1,5		177	0,5		2		
			5		-	-		-	-		-	-		-	-		-	-		-	-		245	5		245	4,5		5		
	70	3704	1-1/2	416	250	5	449	250	4	485	250	2,5	523	250	1	559	-	-	594	252	5	627	252	4	658	252	3	1-1/2			
					-	-		-	-		247	5		247	4		247	2,5		247	1,5		247	0		-	-				
			2		-	-		-	-		-	-		-	-		177	4		177	3		177	2		177	1		2		
			5		-	-		-	-		-	-		-	-		-	-		-	-		-	-		245	5		5		
400	40	7407	5	823	245	0,5	838	245	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5			
	45	6584	5	733	245	3	750	245	2,5	768	245	2	787	245	1,5	807	245	1	827	245	0,5	847	245	0	868	245	0	5			
	50	5926	3	660	246	3	680	246	2,5	700	246	1,5	722	246	1	744	246	0,5	767	-	-	791	-	-	814	-	-	3			
			5		245	5		245	4,5		245	3,5		245	3		245	2,5		245	2		245	1,5		245	0,5		5		
	55	5387	2	601	177	3	623	177	2	646	-	-	670	-	-	696	-	-	721	-	-	747	-	-	772	-	-	2			
			3		246	4,5		246	4		246	3,5		246	2,5		246	2		246	1		246	0,5		-	-		3		
			5		-	-		-	-		245	5		245	4,5		245	4		245	3		245	2,5		245	2		5		
	60	4938	1-1/2	552	247	3	576	-	-	601	-	-	629	-	-	656	-	-	685	-	-	712	-	-	740	-	-	1-1/2			
			2		177	4,5		177	3,5		177	3		177	2		177	1		177	0		-	-		-	-	2			
			3		-	-		246	5		246	4,5		246	4		246	3		246	2		246	1,5		246	0,5	3			
			5		-	-		-	-		-	-		-	-		245	5		245	4		245	3,5		245	2,5	5			
	65	4558	1-1/2	510	247	4,5	536	247	3,5	565	247	2,5	594	247	1	625	247	0,5	655	-	-	684	-	-	713	-	-	1-1/2			
			2		-	-		177	5		177	4		177	3		177	2		177	1		177	0		177	0	2			
			3		-	-		-	-		-	-		246	5		246	4		246	3		246	2		246	1,5	3			
			5		-	-		-	-		-	-		-	-		-	-		245	5		245	4		245	3,5	5			
	70	4233	1-1/2	475	247	5	503	247	4,5	534	247	3,5	566	247	2,5	599	247	1	631	247	0	662	-	-	691	-	-	1-1/2			
			2		-	-		-	-		177	5		177	4		177	3		177	2		177	1		177	0	2			
			3		-	-		-	-		-	-		-	-		246	4,5		246	3,5		246	3		246	2	3			
			5		-	-		-	-		-	-		-	-		-	-		-	-		245	4,5		245	4	5			

Tableau 18.2 - Autres entraînements pour moteurs 208-230/460 V, 3 ph, 1 HP

Modèle	Entraînement 1 HP listé		Entraînement 1 HP pour 230/460 V
BTP300	240	=	257
	241	=	258
BTP350	-	=	-
BTP400	-	=	-

Tableau 18.3 - Autres entraînements pour moteurs 208-230/460 V, 3 ph, 1-1/2 HP

Modèle	Entraînement 1-1/2 HP listé		Entraînement 1-1/2 HP pour 230/460 V
BTP300	23	=	177
	243	=	244
BTP350	247	=	248
	250	=	251
	252	=	180
BTP400	247	=	248
	250	=	251
	252	=	180

Tableau 18.4 - Autres entraînements pour 575 V

Modèle	Entraînement pour moins de 575 V		Entraînement pour 575 V
BTP300	23	=	177
	240	=	257
	243	=	244
BTP350	247	=	248
	250	=	251
	252	=	180
BTP400	247	=	248

① Les sorties correspondent à une altitude de 609 m maximum. Au-delà, la sortie doit être réduite de 4 % tous les 300 m au-dessus du niveau de la mer. (Ne s'applique pas au Canada – voir la plaque signalétique.).

② Les régimes d'ouverture de la roue à gorge sont approximatifs. Pour un fonctionnement correct, vérifiez le régime de la soufflante.

③ Pour les sélections 230/460 V (1 HP et 1-1/2 HP) ou 575 V, voir dans les tableaux 19.2, 3 et 4 le numéro d'entraînement corrigé.

DONNÉES DE PERFORMANCE DE LA SOUFFLANTE – MODÈLE BTP

Tableau 171 - Modèle à soufflante BTP 150-250 (hausse de température de 4 à 12 °C pour la taille 250) ① ② ③

				Pression statique externe (po C.E.)																										
				0			0,1			0,2			0,3			0,4			0,5			0,6			0,7				
Taille de modèle	ATR	CFM	HP	Régime (tr/min)	Entraînement	Tours	Régime (tr/min)	Entraînement	Tours	Régime (tr/min)	Entraînement	Tours	Régime (tr/min)	Entraînement	Tours	Régime (tr/min)	Entraînement	Tours	Régime (tr/min)	Entraînement	Tours	Régime (tr/min)	Entraînement	Tours	Régime (tr/min)	Entraînement	Tours	HP
150	40	2778	1	573	175	4,5	615	175	4	658	175	3	699	175	2,5	738	175	1,5	775	175	1	810	175	0,5	-	-	-	1
	45	2469	1/2	510	229	4	558	229	3	606	-	-	650	-	-	692	-	-	731	-	-	769	-	-	806	-	-	1/2
			1		-	-		175	4,5		175	4		175	3		175	2,5		175	2		175	1		175	0,5	1
	50	2222	1/3	460	232	4	513	-	-	565	-	-	612	-	-	656	-	-	699	-	-	739	-	-	779	-	-	1/3
					230	1		-	-		-	-		-	-		-	-		-	-		-	-		-	-	
			1/2		229	5		229	4		229	3		229	2		-	-		-	-		-	-		-	-	1/2
			1		-	-		-	-		175	4,5		175	4		175	3		175	2,5		175	1,5		175	1	1
	55	2020	1/4②	418	230	2,5	477	-	-	532	-	-	582	-	-	629	-	-	674	-	-	717	-	-	759	-	-	1/4
			1/3		232	5		232	3,5		232	2		-	-		-	-		-	-		-	-		-	-	1/3
					230	2,5		230	0,5		-	-		-	-		-	-		-	-		-	-		-	-	
			1/2		-	-		229	5		229	3,5		229	2,5		229	1,5		229	1		-	-		-	-	1/2
			1		-	-		-	-		175	5		175	4,5		175	3,5		175	3		175	2		175	1	1
	60	1852	1/4②	384	230	3,5	448	230	1,5	506	-	-	559	-	-	609	-	-	656	-	-	701	-	-	741	-	-	1/4
			1/3		-	-		232	4		232	2,5		232	1,5		-	-		-	-		-	-		-	-	1/3
					230	3,5		230	1,5		230	0		-	-		-	-		-	-		-	-		-	-	
			1/2		-	-		-	-		229	4		229	3		229	2		229	1		229	0,5		-	-	1/2
			1		-	-		-	-		-	-		175	5		175	4		175	3		175	2,5		175	1,5	1
	65	1709	1/4②	354	230	4	423	230	2	485	230	0,5	540	-	-	592	-	-	642	-	-	690	-	-	735	-	-	1/4
			1/3		230	4		232	4,5		232	3		232	2		232	1		-	-		-	-		-	-	1/3
			1/2		-	-		-	-		229	4,5		229	3,5		229	2,5		229	1,5		229	0,5		-	-	1/2
			1		-	-		-	-		-	-		175	5		175	4		175	3,5		175	2,5		175	1,5	1
	70	1587	1/4②	329	230	5	403	230	3	467	230	1	525	-	-	580	-	-	635	-	-	680	-	-	722	-	-	1/4
			1/3		230	5		232	5		232	3,5		232	2,5		232	1		232	0		-	-		-	-	1/3
			1/2		-	-		-	-		229	5		229	4		229	2,5		229	1,5		229	0,5		229	0	1/2
			1		-	-		-	-		-	-		-	-		175	4,5		175	3,5		175	2,5		175	2	1
175	40	3241	1	625	175	3,5	655	175	3	690	175	2,5	727	-	-	764	-	-	799	-	-	834	-	-	866	-	-	1
			1-1/2		-	-		-	-		-	-		237	5		237	4,5		237	3,5		237	2,5		237	2	1-1/2
	45	2881	1	555	175	5	589	175	4,5	630	175	3,5	672	175	3	712	175	2	750	175	1,5	786	-	-	821	-	-	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		237	4,5		237	4		237	3	1-1/2
			1/2		229	4,5		229	3,5		-	-		-	-		-	-		-	-		-	-		-	-	1/2
	50	2593	1	500	-	-	538	175	5	584	175	4,5	630	175	3,5	673	175	3	713	175	2	751	175	1,5	788	175	0,5	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		-	-		237	4,5		237	4	1-1/2
	55	2357	1/3	454	238	2,5	497	-	-	548	-	-	597	-	-	642	-	-	684	-	-	724	-	-	763	-	-	1/3
			1/2		229	5		229	4,5		229	3,5		229	2,5		-	-		-	-		-	-		-	-	1/2
			1		-	-		-	-		175	5		175	4		175	3,5		175	2,5		175	2		175	1	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		-	-		237	5		237	4,5	1-1/2
	60	2160	1/3	416	238	4	464	238	2,5	520	-	-	571	-	-	618	-	-	662	-	-	705	-	-	745	-	-	1/3
			1/2		-	-		229	5		229	4		229	3		229	2		229	1		-	-		-	-	1/2
			1		-	-		-	-		-	-		175	4,5		175	4		175	3		175	2		175	1,5	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		-	-		-	-		237	4,5	1-1/2
	65	1994	1/3	384	238	4,5	438	238	3	497	238	1,5	550	238	0	599	-	-	645	-	-	690	-	-	733	-	-	1/3
			1/2		-	-		-	-		229	4,5		229	3,5		229	2,5		229	1,5		229	0,5		-	-	1/2
			1		-	-		-	-		-	-		175	5		175	4		175	3,5		175	2,5		175	1,5	1
			1-1/2		-	-		-	-		-	-		-	-		-	-		-	-		-	-		237	5	1-1/2
	70	1852	1/3	356	238	5	415	238	3,5	477	238	2	533	238	0,5	584	-	-	632	-	-	678	-	-	728	-	-	1/3
			1/2		-	-		-	-		229	5		229	3,5		229	2,5		229	1,5		229	1		-	-	1/2
			1		-	-		-	-		-	-		-	-		175	4,5		175	3,5		175	3		175	2	1
200	40	3704	1-1/2	715	235	3,5	741	235	2,5	770	235	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/2
	45	3292	1	635	175	3,5	665	175	3	698	-	-	735	-	-	772	-	-	807	-	-	841	-	-	873	-	-	1
					229	1,5		229	1		-	-		-	-		-	-		-	-		-	-		-	-	
			1-1/2		235	5		235	3		235	4		235	3		235	2		235	1		235	0		-	-	1-1/2
	50	2963	1	571	175	4,5	604	175	4	643	175	3,5	684	175	2,5	723	175	2	761	175	1,5	797	-	-	831	-	-	1
					229	3		229	2,5		229	1,5		229	0,5		229	0		-	-		-	-		-	-	
			1-1/2		-	-		-	-		235	5		235	4		235	3		235	2		235	1,5		235	0,5	1-1/2
	55	2694	1/2	519	233	2,5	556	-	-	600	-	-	644	-	-	686	-	-	725	-	-	763	-	-	799	-	-	1/2
			1		-	-		175	5		175	4		175	3,5		175	2,5		175	2		175	1		175	0,5	1
					229	4		229	3		229	2,5		229	1,5		229	0,5		229	0		-	-		-	-	
			1-1/2		-	-		-	-		-	-		235	5		235	4		235	3		235	2		235	1	1-1/2
	60	2469	1/2	475	233	2,5	516	233	2,5	565	233	1,5	612	-	-	656	-	-	697	-	-	736	-	-	774	-	-	1/2
			1		-	-		-	-		175	4,5		175	4		175	3		175	2,5		175	1,5		175	1	1
					229	5		229	4		229	3		229	2		229	1		229	0,5		-	-		-	-	
			1-1/2		-	-		-	-		-	-		-	-		235	5		235	4		235	3		235	2	1-1/2
	65	2279	1/2	439	233	4,5	484	233	3,5	537	233	2	586	233	1	632	233	0	675	-	-	716	-	-	756	-	-	1/2
			1		-	-		-	-		175	5		175	4,5		175	3,5		175	2,5		175	2		175	1,5	1
					-	-		229	4,5		229	3,5		229	2,5		229	1,5		229	1		229	0		-	-	
			1-1/2		-	-		-	-		-	-		-	-		-	-		235	4,5		235	3,5		235	2,5	1-1/2
	70	2116	1/2	407	233	5	457	233	4	513	233	2,5	565	233	1,5	612	233	0,5	657	-	-	700	-	-	742	-	-	1/2
			1		-	-		-	-		-	-		175	4,5		175	4		175	3		175	2,5		175	1,5	1
					-	-		229	5		229	4		229	3		229	2		229	1		229	0,5		-	-	
			1-1/2		-	-		-	-		-	-		-	-		-	-		235	5		235	3,5		235	2,5	1-1/2
250	40	4630	1-1/2	542	23	4,5	569	23	4	599	23	3	629	-	-	658	-	-	688	-	-	716	-	-	744	-	-	1-1/2
			2		-	-		-	-		180	4,5		180	4		180	3		180	2		180	1,5		180	0,5	2
	45	4115	1	482	241	3,5	513	241	2,5	546	-	-	580	-	-	613	-	-	645	-	-	675	-	-	704	-	-	1
			1-1/2		-	-		-	-		23	4,5		23	3,5		23	2,5		23	1,5		23	0,5		-	-	1-1/2
			2		-	-		-	-		-	-		180	5		180	4,5		180	3,5		180	2,5		180	1,5	2
	50	3704	1	433	241	4,5	468	241	3,5	506	241	3	543	241	2	578	241	1	612	-	-	644	-	-	674	-	-	1
			1-1/2		-	-		-	-		-	-		23	4,5		23	3,5		23	2,5		23	1,5		23	0,5	1-1/2
			2		-	-		-	-		-	-		-	-		180	5		180	4,5		180	3,5		180	2,5	2
	55	3367	1/2	394	204	3	432	-	-	474	-	-	513	-	-	551	-	-	586	-	-	620	-	-	652	-	-	1/2
			1		241	5		241	4,5		241	3,5		241	2,5		241	1,5		241	1		241	0		-	-	1
			1-1/2		-	-		-	-		-	-		-	-		23	4,5		23	3,5		23	2		23	1	1-1/2
			2		-	-		-	-		-	-		-	-		-	-		180	5		180	4		180	3	2

Tableau 17.2 - Autres entraînements pour moteurs 208-230/460 V, 3 ph, 1 HP

Modèle	Entraînement 1 HP listé		Entraînement 1 HP pour 230/460 V
BTP150	175	=	253
BTP175	175	=	253
BTP200	175	=	253
	229	=	259
BTP250	241	=	258

Tableau 17.3 - Autres entraînements pour moteurs 208-230/460 V, 3 ph, 1-1/2 HP

Modèle	Entraînement 1-1/2 HP listé		Entraînement 1-1/2 HP pour 230/460 V
BTP150	-	=	-
BTP175	237	=	234
BTP200	235	=	236
BTP250	23	=	177

Tableau 17.4 - Autres entraînements pour 575 V

Modèle	Entraînement pour moins de 575 V		Entraînement pour 575 V
BTP150	175	=	253
	230	=	231
	232	=	233
BTP175	175	=	253
	237	=	234
	238	=	239
BTP200	175	=	253
	229	=	259
	235	=	236
BTP250	23	=	177
	241	=	258

① Les sorties correspondent à une altitude de 609 m maximum. Au-delà, la sortie doit être réduite de 4 % tous les 300 m au-dessus du niveau de la mer. (Ne s'applique pas au Canada – voir la plaque signalétique.).

② Les régimes d'ouverture de la roue à gorge sont approximatifs. Pour un fonctionnement correct, vérifiez le régime de la soufflante.

③ Pour les sélections 230/460 V (1 HP et 1-1/2 HP) ou 575 V, voir dans les tableaux 18.2, 3 et 4 le numéro d'entraînement corrigé.

DONNÉES DE PERFORMANCE DE LA SOUFFLANTE – MODÈLE BTP

Tableau 16.1 - Description du code d'alimentation - Modèle à soufflante BTP - ①

			BTP150		*BTP175*		*BTP200*		*BTP250*		*BTP300*		*BTP350*		*BTP400*	
Code d'alimentation	*Tension*	*Phase*	*HP*	*Entraîne-ment*	*HP*	*Entraîne-ment*	*HP*	*Entraîne-ment*	*HP*	*Entraîne-ment*	*HP*	*Entraîne-ment*	*HP*	*Entraîne-ment*	*HP*	*Entraîne-ment*
01	115	1	1/4	230	-	-	-	-	-	-	-	-	-	-	-	-
02	115/230	1	1/3	230	1/3	238	1/2	233	1/2	204	1	240	1 1/2	250	1 1/2	247
08	208-230/460	3	1/3	230	1/3	238	1/2	233	1/2	204	1	257	1 1/2	251	1 1/2	248
11	575	3	1/3	231	1/3	239	1/2	233	1/2	204	1	257	1 1/2	251	1 1/2	248
13	115/230	1	1/3	232	1/2	229	1	229	1	241	1	241	1 1/2	247	-	-
19	208-230/460	3	1/3	232	1/2	229	1	259	1	258	1	258	1 1/2	248	2	177
22	575	3	1/3	233	1/2	229	1	259	1	258	1	258	1 1/2	248	2	177
24	115/230	1	1/2	229	1	175	1	175	1,5	23	1 1/2	243	1 1/2	252	-	-
30	208-230/460	3	1/2	229	1	253	1	253	1,5	177	1 1/2	244	1 1/2	180	3	246
33	575	3	1/2	229	1	253	1	253	1,5	177	1 1/2	244	1 1/2	180	3	246
35	115/230	1	1	175	1 1/2	237	1 1/2	235	-	-	1 1/2	23	-	-	-	-
41	208-230/460	3	1	253	1 1/2	234	1 1/2	236	2	180	1 1/2	177	2	177	5	245
44	575	3	1	253	1 1/2	234	1 1/2	236	2	180	1 1/2	177	2	177	5	245
52	208-230/460	3	-	-	-	-	-	-	-	-	2	177	2	180	-	-
55	575	3	-	-	-	-	-	-	-	-	2	177	2	180	-	-
63	208-230/460	3	-	-	-	-	-	-	-	-	3	112	3	246	-	-
66	575	3	-	-	-	-	-	-	-	-	3	112	3	246	-	-
74	208-230/460	3	-	-	-	-	-	-	-	-	-	-	5	245	-	-
77	575	3	-	-	-	-	-	-	-	-	-	-	5	245	-	-

① Pour sélectionner le code d'alimentation correct, reportez-vous aux tableaux des pages 18-19.

Tableau 16.2 - Chute de pression statique dans le filtre ②

	BTP150	*BTP175*	*BTP200*	*BTP250*	*BTP300*	*BTP350*	*BTP400*
Pression statique dans le filtre (po C.E.)	0,1	0,2	0,1	0,2	0,2	0,2	0,2

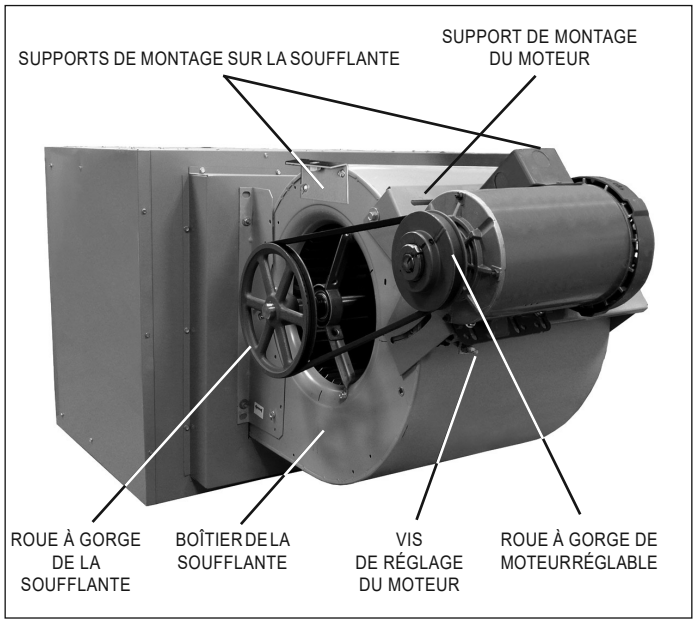
② Pour les modèles à soufflante avec boîtier et filtre, ajoutez les pressions statiques suivantes à la pression statique déterminée par le concepteur du système pour obtenir la pression statique externe totale.

INSTALLATION

Procédure d'installation

1. Retirez et jetez la sangle d'attache du moteur, ainsi que la cale d'expédition située sous la vis de réglage du moteur (pas sur tous les modèles.)
2. Pour les moteurs de 3 et 5 HP, montez la roue à gorge sur l'arbre moteur, puis installez le moteur sur le support de montage. Installez la courroie sur la soufflante et les roues à gorge du moteur.

Figure 15.1 - Modèle à soufflante



3. Ajustez la vis de réglage du moteur pour obtenir une déviation de courroie de 19 mm environ avec application de 2,2 kg de force à mi-distance entre les roues à gorge (figure 15.3). Comme la tension de la courroie diminue sensiblement après une période de rodage initiale, il est nécessaire de revérifier périodiquement la tension. Une tension excessive engendrera l'usure des roulements et du bruit.
4. Les roulements de la soufflante sont lubrifiés à vie; toutefois, avant la mise en marche initiale de l'appareil, l'arbre de la soufflante devrait être lubrifié au niveau des roulements avec de l'huile SAE 20. Cela permettra de réduire la friction initiale et d'amorcer l'écoulement du lubrifiant plastique.
5. Établissez les branchements électriques conformément au diagramme de câblage.
6. Vérifiez la rotation de la soufflante. Le moteur doit tourner dans le sens des aiguilles d'une montre lorsque vous vous trouvez face à la poulie du moteur. Si la rotation est incorrecte, corrigez-la en inversant les fils dans le moteur. Reportez-vous au diagramme de câblage sur le moteur.
7. L'appel de courant réel du moteur doit être déterminé. Il ne doit en aucun cas dépasser celui qui apparaît sur la plaque signalétique du moteur.
8. Il incombe à l'installateur de régler la roue à gorge du moteur pour fournir la performance de soufflante indiquée aux pages 18 et 19 pour les soufflantes dont le réglage ne correspond pas à la performance définie à l'usine. Le numéro d'entraînement sur l'appareil pourra être identifié en se reportant au numéro « Power Code » sur la plaque signalétique de l'appareil (voir la nomenclature des numéros de modèle page 27) et en faisant correspondre ce numéro à ceux de la page 18. Vous pourrez déduire le numéro d'entraînement de la liste.

Réglage de la soufflante

Après les branchements électriques, vérifiez la rotation de la soufflante pour garantir le chauffage soufflé. Au besoin, intervertissez les fils pour inverser la rotation de la soufflante. Démarrez le moteur du ventilateur et vérifiez le régime de la roue à gorge de la soufflante à l'aide d'un tachymètre manuel ou stroboscopique. Le régime doit correspondre aux régimes indiqués sous Données de performance, aux pages 18 et 19. Un moteur à une vitesse à roue à gorge réglable est fourni avec ces appareils. Si une modification du régime du ventilateur de la soufflante est requis, ajustez comme suit la roue à gorge du moteur :

REMARQUE : N'allumez pas l'appareil tant que la soufflante n'est pas réglée; cela pourrait causer une surchauffe.

1. ***Coupez l'alimentation avant d'effectuer les réglages de régime de la soufflante.*** Pour déterminer le régime de soufflante adéquat, reportez-vous à « Détermination du régime de la soufflante », page 15 et aux données de performance des pages 18 et 19.
2. Détendez la courroie et retirez-la de la roue à gorge du moteur.
3. Desserrez la vis de calage sur l'extérieur de la roue à gorge du moteur (figure 15.2).
4. Pour réduire le régime de la soufflante, tournez l'extérieur de la roue à gorge du moteur dans le sens inverse des aiguilles d'une montre.
5. Pour l'augmenter, tournez dans le sens des aiguilles d'une montre.
6. Resserrez la vis de calage de la roue à gorge du moteur, remettez la courroie, puis resserrez l'assise du moteur. Ajustez la vis de réglage du moteur de sorte à obtenir une déviation de courroie de 3/4 po avec application de 5 livres de force à mi-distance entre les roues à gorge de la soufflante et du moteur (figure 15.3). Comme la tension de la courroie diminue sensiblement après une période de rodage initiale, il est nécessaire de revérifier périodiquement la tension pour garantir le réglage correct permanent de la courroie.
7. Assurez-vous que les roues à gorge sont alignées. Réalignez-les au besoin.
8. Revérifiez le régime de la soufflante après réglage.
9. Vérifiez l'intensité du moteur. Ne dépassez pas l'intensité indiquée sur la plaque signalétique du moteur. Ralentissez la soufflante au besoin.
10. Vérifiez l'augmentation de la température de l'air à travers l'appareil. Comparez-la aux valeurs des tableaux des performances, pages 18 et 19, pour garantir la circulation d'air réelle souhaitée.
11. Si des réglages s'imposent, revérifiez l'intensité du moteur après le réglage final du régime de la soufflante.

Figure 15.2 - Réglage de la roue à gorge du moteur

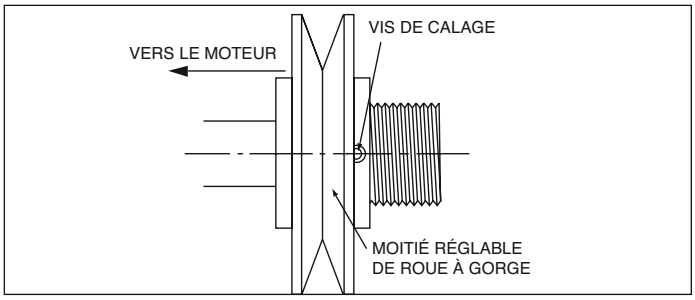
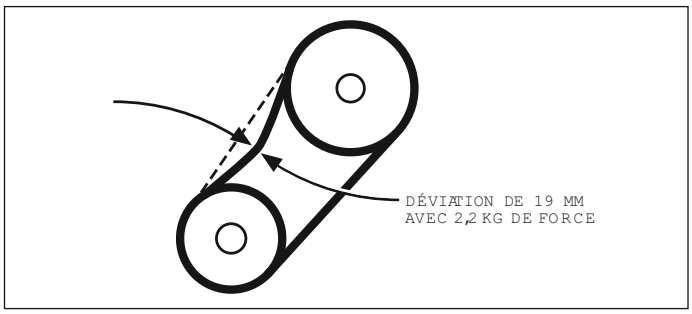
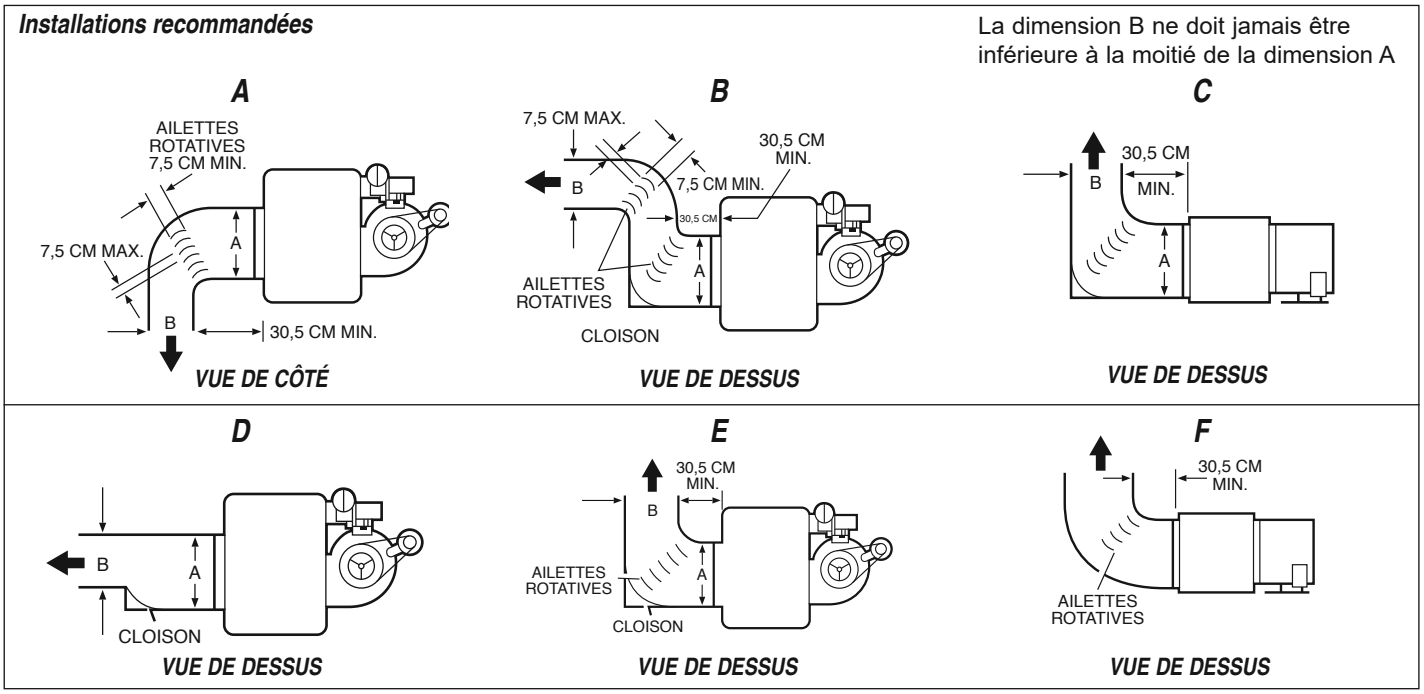


Figure 15.3 - Réglage de tension de la courroie



INSTALLATION AVEC DES GAINES

Figure 14.1 - Installation typique avec gaines et circulation d'air



IMPORTANT

N'essayez pas d'attacher des gaines quelconques aux modèles à hélice.

Lors de l'installation de l'appareil de chauffage, suivez toujours les bonnes pratiques de conception de réseau de gaine pour obtenir la distribution uniforme de l'air à travers l'échangeur de chaleur. Les configurations recommandées apparaissent à la figure 14.1. Lorsque vous installez des appareils à soufflante avec des gaines, vous devez procéder comme suit.

1. ***Assurez une distribution d'air uniforme sur l'échangeur thermique.*** Utilisez les ailettes rotatives en cas de besoin (figure 14.1).
2. Fournissez des panneaux d'accès amovibles dans les gaines côté aval de l'appareil de chauffage. Ces ouvertures doivent être assez grandes pour permettre de voir de la fumée ou de réfléchir la lumière à l'intérieur afin d'indiquer des fuites dans l'échangeur de chaleur et de vérifier les points chauds sur l'échangeur causés par une mauvaise répartition de l'air ou un manque d'air.
3. Si les gaines sont connectées à l'arrière de l'appareil, utilisez l'ensemble du boîtier de soufflante Modine ou, si vous utilisez un boîtier conçu sur site, maintenez les dimensions du boîtier de la soufflante aux dimensions indiquées à la page 23.

Exigences supplémentaires pour l'installation de modèles à soufflante (modèle BTP)

Détermination du régime de la soufflante

L'entraînement et le moteur des appareils de chauffage au gaz à soufflante de 2 HP maximum sont assemblés à l'usine. Les moteurs 3 HP et supérieurs sont expédiés non assemblés pour éviter les dommages en cours d'expédition. La roue à gorge réglable du moteur a été préréglée pour permettre le fonctionnement de cet appareil dans des conditions moyennes de circulation de l'air et sans pression statique externe. La roue à gorge du moteur doit être réglée au besoin quand l'appareil doit fonctionner avec des débits d'air et/ou des pressions statiques externes non moyens. Le réglage doit toujours se situer dans la plage de performance indiquée à la page 22 et la plage de montée de température indiquée sur la plaque signalétique de l'appareil.

Pour déterminer le régime correct de la soufflante et de l'ouverture de la roue à gorge du moteur, les conditions d'exploitation de l'appareil doivent être connues. Si l'appareil à soufflante doit être utilisé sans gaines ou filtres, le seul critère de détermination du réglage d'ouverture de la roue à gorge du moteur et du régime de la soufflante est le volume d'air à délivrer. Les tableaux des performances pour les modèles de soufflante apparaissent aux pages 18 et 19. Par exemple, un modèle BTP 350, fonctionnant sans pression statique externe à savoir, sans gaines, filtres, etc., et qui doit administrer un volume d'air de 6481 pi³/min (pi³/min = pieds cubes d'air par minute) exige une alimentation avec un moteur de 5 HP, un entraînement -207 et la roue à gorge de l'entraînement doit être réglée à 2,5 tours pour atteindre un régime de soufflante de 960 tr/min (pour les modèles avec ou sans soufflante, voir le tableau des performances, page 19). Pour le réglage des tours de poulie d'entraînement, reportez-vous à la section « Réglage de la soufflante », page 16.

Si un appareil à soufflante doit être utilisé avec des gaines ou des filtres, etc., la pression statique externe totale à laquelle l'appareil doit fonctionner et le débit d'air requis doivent être connus avant que l'appareil puisse être correctement réglé.

Si des filtres Modine sont utilisés, la perte de pression prévue à travers les filtres est fournie parmi les données de performance, à la page 18. Si des filtres ou des gaines doivent être utilisées avec l'appareil et qu'elles ne sont pas fournies par Modine, l'ingénieur-concepteur ou le sous-traitant chargé de l'installation devra déterminer la perte de pression pour que les appareils externes ajoutés ou les gaines arrivent à la pression statique externe totale à laquelle l'appareil doit fonctionner.

Une fois la pression statique totale et le débit d'air requis connus, le régime d'exploitation de la soufflante pourra être déterminé et les réglages de la roue à gorge du moteur correctement effectués. Par exemple, un modèle BTP 350 doit être utilisé avec un boîtier de soufflante et des filtres fournis par Modine attachés aux gaines. L'appareil doit déplacer 6481 pi³/min d'air par rapport à une pression statique externe de 0,2 po C.E. De plus, 0,2 po C.E. doivent être ajoutés à la chute de pression dans le filtre, pour un total de 0,4 po C.E. de chute de pression. À l'entrée du tableau des performances, page 18, pour un BTP 350, à 6481 pi³/min et 0,4 po C.E de pression statique, on observe que l'appareil exigera un moteur de 5 HP utilisant un entraînement -207 et que la roue à gorge du moteur devrait être réglée à 0,5 tours pour donner un régime de soufflante égal à 1050 tr/min. Vous pouvez voir que cet exemple est différent de conditions similaires au paragraphe 2 sur le plan du nombre de tours et d'un régime supérieur, tous deux nécessaires pour surmonter la pression statique supplémentaire des filtres.

INSTALLATION – BRANCHEMENTS ÉLECTRIQUES

RACCORDEMENTS ÉLECTRIQUES

⚠ AVERTISSEMENT

1. Débranchez l'alimentation avant d'effectuer des branchements pour éviter tout risque d'électrocution et d'endommagement de l'appareil.
2. Tous les branchements et câblages doivent être faits en stricte conformité avec le schéma fourni avec l'appareil. Tout câblage différent de celui du schéma peut créer des risques de dommages matériels ou de blessures.
3. Tout câblage usine d'origine exigeant un remplacement doit être remplacé par un câble d'indice thermique nominal de 105 °C.
4. Assurez-vous que la tension d'alimentation n'est pas supérieure de plus de 5 % à la tension nominale inscrite sur la plaque de l'appareil.

⚠ ATTENTION

Vérifiez que la tension d'alimentation n'est pas inférieure de plus de 5 % à la tension nominale inscrite sur la plaque de l'appareil.

1. L'installation du câblage doit être conforme aux codes locaux du bâtiment ou, en l'absence de codes locaux, au Code électrique national ANSI/NFPA 70, dernière édition. Conformément à ce code, l'appareil doit être mis à la terre. Au Canada, le câblage doit être conforme à CSA C22.1, Partie 1, Code électrique.
2. Deux exemplaires du diagramme de câblage de l'appareil sont fournis avec chaque appareil. L'un se situe dans le compartiment de commande accessible par le côté et l'autre est fourni dans le paquet de documentation. Reportez-vous à ce diagramme pour tous les branchements de câbles.
3. Assurez-vous que tous les composants multi-tension (moteurs, transformateurs, etc.) sont câblés conformément à la tension secteur.
4. L'alimentation de l'appareil doit être protégée par un interrupteur à fusible ou coupe-circuit.
5. L'alimentation doit se trouver à ±5 % de la tension nominale et les phases doivent être équilibrées à ±2 % les unes des autres. Sinon, prévenez le fournisseur d'électricité.
6. Les branchements électriques externes à installer incluent
   a. Branchement de l'alimentation secteur (115, 208, 230, 460 ou 575 volts).
   b. Branchement des thermostats ou de tout autre appareil de commande d'accessoire pouvant être fourni (24 volts).

REMARQUE : Tous les appareils affichant une tension nominale de 208 V et plus doivent utiliser un transformateur abaisseur installé sur site, offert comme accessoire séparé. Pour des informations supplémentaires sur le transformateur requis, reportez-vous au tableau 13.1.

7. Pour l'emplacement du compartiment de commande accessible par le côté, reportez-vous à la figure 17.1.
8. Tous les branchements électriques secteur sont établis dans le compartiment de commande accessible par le côté. La basse tension (dispositifs de commande des thermostats et des accessoires) peut être câblée aux bornes dans le compartiment de commande accessible par le côté. Pour l'emplacement des bornes de tous les câbles à basse tension, reportez-vous au diagramme de câblage.

INSTALLATION – ENSEMBLE D'ACCESSOIRES POUR HAUTE ALTITUDE

Si la valeur de chauffage du gaz fourni est différente des valeurs des tableaux 11.1 et 11.2, utilisez l'équation suivante pour déterminer la pression appropriée au collecteur pour l'altitude et la valeur de chauffage du gaz fourni.

Équation 12.1 - Pression au collecteur pour valeur nominale de gaz réduite

$$MP_{ACT} = \left(\frac{BTU_{TBL}}{BTU_{ACT}}\right)^2 \times MP_{SL}$$

OÙ :

MP_{ACT} = **Pression au collecteur (po C.E.) en altitude** – Réglage de pression de gaz pour l'appareil de chauffage installé

BTU_{TBL} = **Teneur du gaz en BTU/pi³** – Tiré du tableau 13.1 ou 13.2 (selon le cas)

BTU_{ACT} = **Teneur du gaz en BTU/pi³** – Obtenu auprès du fournisseur de gaz local

MP_{SL} = **Pression au collecteur (po C.E.), au niveau de la mer** – Utilisez 3,5 po C.E. pour le gaz naturel et 10 po C.E. pour le propane

REMARQUE : Seule la pression au collecteur primaire doit être réglée sur les appareils équipés de commandes de gaz à deux étages ou modulation. Aucun réglage de pression au collecteur à feu bas n'est nécessaire sur ces appareils.

INSTALLATION – ENSEMBLE D'ACCESSOIRES POUR HAUTE ALTITUDE

ENSEMBLE D'ACCESSOIRES POUR HAUTE ALTITUDE

Les valeurs nominales d'entrée standard des appareils au gaz de Modine sont certifiés par ETL. À plus de 2000 pieds, la norme ANSI Z223.1 exige la réduction des valeurs nominales de 4 % tous les 1000 pieds au-dessus du niveau de la mer. Au Canada, l'ACNOR exige la réduction des valeurs nominales de 10 % à plus de 2000 pieds d'altitude. Les instructions de réglage en haute altitude et les ensembles de pressostat listés dans ce manuel concernent les appareils qui seront installés à plus de 2000 pieds. Ces méthodes et ensembles sont conformes aux exigences ANSI Z223.1 et ACNOR.

Si un appareil doit être installé à plus haute altitude ET converti d'un service gaz naturel à gaz propane, un ensemble de conversion au propane doit être utilisé avec les méthodes de réglage de pression et les ensembles de pressostat listés dans ce manuel. Pour les instructions de sélection et d'installation pour les ensembles de conversion au propane, consultez la toute dernière version du manuel Modine 75-515.

Sélection de la pression et de l'ensemble corrects

Pour déterminer la pression de collecteur correcte en altitude et si nécessaire, l'ensemble de pressostat d'air de combustion correct, le numéro de modèle complet de l'appareil de chauffage, le combustible à utiliser et l'altitude à laquelle l'appareil sera installé doivent être connus. Pour obtenir les renseignements nécessaires sur l'appareil, consultez la plaque du numéro de série.

Une fois en possession de ces informations, consultez les tableaux de pressions de gaz et de sélection aux tableaux 11.1 à 11.3. Les tableaux de pression sont divisés par altitude, type de combustible et pays d'installation du produit. Les tableaux de sélection sont divisés par type de produit, altitude et type de combustible. **Dans le cas d'une conversion du gaz naturel au propane et d'une utilisation à haute altitude, un ensemble de conversion au propane et un ensemble de pressostat devra être utilisé (le cas échéant).** Les tableaux de sélection incluent le suffixe d'ensemble adéquat, si nécessaire.

Régler de pression au collecteur

La pression d'arrivée dans l'appareil doit être confirmée dans les limites acceptables (6 à 7 po C.E. pour le gaz naturel et 11 à 14 po C.E. pour le gaz propane) avant d'ouvrir le robinet d'arrêt, faute de quoi le robinet de gaz mixte risque d'être endommagé.

Les appareils de chauffage pour utilisation avec du gaz naturel ont des vannes à gaz qui doivent être réglées à une pression de sortie de 3,5 "à 7,0". pression d'entrée

Les unités à utiliser avec du gaz propane doivent être réglées pour une pression de collecteur de 10,0 "C à 14,0" C. pression d'entrée

Une installation à plus de 2000 pieds d'altitude exige le réglage de la pression au collecteur comme décrit.

Gaz à valeur de chauffage diminuée et calcul de pression au collecteur

Certains fournisseurs de gaz pourront réduire la teneur en BTU (valeur de chauffage) du gaz fournie en altitude à une autre valeur que 1050 BTU/pi^3 pour le gaz naturel ou 2500 BTU/pi^3 pour le propane pour permettre l'utilisation de certains appareils de chauffage sans régler la pression au collecteur. C'est pourquoi il est nécessaire de contacter le fournisseur de gaz pour en savoir plus sur le type de gaz et la teneur en BTU (valeur de chauffage) avant d'utiliser un appareil de chauffage. Les tableaux 11.1 et 11.2 indiquent les valeurs de chauffage diminuées standard (4 % pour 1000 pieds d'altitude aux États-Unis et 10 % entre 2001 et 4500 pieds d'altitude au Canada) des gaz naturel et propane à différentes altitudes. Si le fournisseur livre du gaz avec des valeurs de chauffage comme indiqué aux tableaux 11.1 et 11.2, la pression au collecteur doit être réglée à 3,5 po C.E. pour le gaz naturel et à 10 po C.E. pour le propane.

REMARQUE : Seule la pression de gaz à feu fort doit être ajustée, la pression de gaz à feu bas doit rester la même.

Tableau 11.1 - Valeurs de chauffage du gaz naturel selon l'altitude ①③④

Altitude (pi)	Valeur de chauffage du gaz selon l'altitude (BTU/pi^3)	
	É.-U.	Canada
0 à 2000	1050	1050
2001 à 3000	929	945
3001 à 4000	892	
4001 à 4500	874	
4501 à 5000	856	856
5001 à 6000	822	822
6001 à 7000	789	789
7001 à 8000	757	757
8001 à 9000	727	727
9001 à 10 000	698	698

Tableau 11.2 - Valeurs de chauffage du gaz propane selon l'altitude ②③④

Altitude (pi)	Valeur de chauffage du gaz selon l'altitude (BTU/pi^3)	
	É.-U.	Canada
0 à 2000	2500	2500
2001 à 3000	2212	2250
3001 à 4000	2123	
4001 à 4500	2080	
4501 à 5000	2038	2038
5001 à 6000	1957	1957
6001 à 7000	1879	1879
7001 à 8000	1803	1803
8001 à 9000	1731	1731
9001 à 10 000	1662	1662

① Les valeurs indiquées correspondent à une pression au collecteur de 10 po C.E.; pour les autres valeurs de teneur en BTU (disponibles auprès de votre fournisseur local), utilisez l'équation 12.1 pour calculer la pression au collecteur.
② Les valeurs indiquées correspondent à une pression au collecteur de 10 po C.E.; pour les autres valeurs de teneur en BTU (disponibles auprès de votre fournisseur local), utilisez l'équation 12.1 pour calculer la pression au collecteur.
③ Si l'appareil est installé à plus de 2000 pieds, vous devrez peut-être remplacer un pressostat. Reportez-vous au tableau 11.3 pour voir si un changement de pressostat est nécessaire.
④ Les valeurs nominales de chauffage du gaz sont réduites de 4 % tous les 1000 pieds d'altitude aux États-Unis et de 10 % entre 2000 et 4500 pieds d'altitude au Canada, conformément aux normes ANSI Z223.1 et ACNOR-B149, respectivement.

Table 11.3 - Ensembles haute altitude pour PTP/BTP ①

Taille de modèle	Détails	États-Unis et Canada				
		0 à 2000 pi	2,001 à 4,500 pi	4501 à 5500 pi	5,501 à 6,500 pi	6,501 à 7,500 pi
150-250	Suffixe d'ensemble	Non requis	Étiquette seulement	Étiquette seulement	Étiquette seulement	Étiquette seulement
	Code d'article					
300	Suffixe d'ensemble	Non requis	Étiquette seulement	Étiquette seulement	0008	0008
	Code d'article				68412	68412
350	Suffixe d'ensemble	Non requis	Étiquette seulement	Étiquette seulement	Étiquette seulement	Étiquette seulement
	Code d'article					
400	Suffixe d'ensemble	Non requis	0009	0009	0009	0009
	Code d'article		68413	68413	68413	68413

① Pour les kits d'étiquette uniquement, le numéro de pièce Modine 5H0807146005 doit être rempli et attaché à l'unité par l'installateur. Veuillez contacter le représentant local de Modine au 1.866.828.4328 (HEAT).

① Pour les ensembles Étiquette seulement, le numéro de référence Modine 5H0807146005 doit être inscrit et attaché à l'appareil par l'installateur. Contactez le représentant Modine local au 1.866.828.4328 (HEAT).

INSTALLATION – RACCORDEMENTS DE GAZ

RACCORDEMENTS DE GAZ

⚠ AVERTISSEMENT

1. Toutes les tuyauteries de gaz extérieures doivent être soumises à des essais de pression et d'étanchéité avant la mise en marche. Ne recherchez jamais les fuites avec une flamme nue. Utilisez plutôt de l'eau savonneuse ou un produit équivalent.
2. La pression de gaz au régulateur de l'appareil ne doit jamais dépasser 14 po C.E. (1/2 psi).
3. Pour réduire les risques de condensation, le pouvoir calorifique minimum du gaz (au niveau de la mer) ne doit pas être inférieur de plus de 5 % à la valeur minimale nominale figurant sur la plaque signalétique de l'appareil ou de 5 % à la valeur la plus basse des appareils à double alimentation.

⚠ ATTENTION

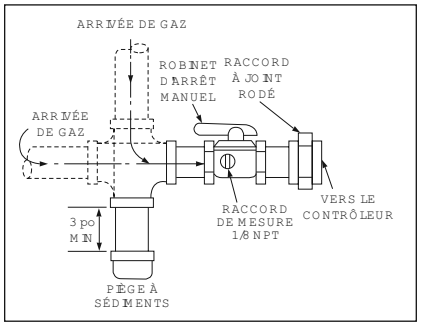
1. La purge de l'air des tuyauteries de gaz doit se faire selon la procédure ANSI Z223.1 (NFPA 54) – dernière édition ou aux codes CSA B149 pour le Canada.
2. Pour l'essai d'étanchéité des tuyauteries d'alimentation en gaz, l'appareil et son régulateur de gaz combiné doivent être isolés pour tout essai fait à une pression dépassant 14 po C.E. (1/2 psi).
3. L'appareil devrait être isolé de la conduite d'alimentation en gaz par la fermeture d'un robinet d'arrêt manuel posé à l'installation. Ce robinet d'arrêt doit être dans un rayon de 6 pi autour de l'appareil.
4. Fermez l'arrivée générale de gaz avant d'installer l'appareil.

IMPORTANT

Pour éviter une défaillance prématurée de l'échangeur de chaleur, l'apport calorifique du gaz utilisé ne doit pas excéder de plus de 5 % la valeur nominale inscrite sur la plaque signalétique de l'appareil.

1. L'installation doit se faire conformément aux codes locaux de la construction ou, à défaut de tels codes, conformément au National Fuel Gas Code, ANSI Z223.1 (NFPA 54), dernière édition. Au Canada, l'installation doit se faire conformément à la norme CSA B149.1. .
2. Les tuyauteries doivent être conformes aux exigences locales et nationales pour le type et le volume de gaz, ainsi que les pertes de charge admissibles dans les conduites. Voir le tableau 10.1 pour déterminer les débits (pieds cubes/heure), le type de gaz et la capacité de l'appareil à installer. À partir de la valeur du débit et de la longueur de tuyau nécessaire, déterminez le diamètre de tuyau en consultant le tableau 10.2. Si plusieurs appareils de chauffage sont desservis par la même conduite principale, il faut tenir compte de la capacité totale, du débit total et de la longueur totale. N'utilisez pas de tuyau plus petit que 13 mm ou 1/2 po. Le tableau 10.2 est établi pour une perte de charge de 0,3 po C.E. entre la conduite principale du bâtiment et l'appareil de chauffage. La pression du gaz à l'entrée de l'appareil doit être de 6 à 7 po C.E. et de 11 à 14 po C.E. pour le propane. En déterminant le diamètre de la conduite d'alimentation, il faut s'assurer que ces pressions seront respectées à l'entrée de l'appareil malgré la perte de charge de 0,3 po C.E. admise dans la tuyauterie. Si une perte de charge de 0,3 po C.E. est excessive, consultez le manuel Gas Engineer's Handbook pour déterminer la section des tuyaux de gaz.
3. Installez un raccord union à joint rodé avec un siège en laiton et un robinet d'arrêt manuel adjacent à l'appareil pour les arrêts manuels d'urgence et l'entretien des commandes, comportant un raccord 1/8 po NPT avec bouchon obturateur, pour pouvoir brancher un manomètre (figure 10.1).
4. Utilisez deux clés pour raccorder la tuyauterie du site aux appareils.
5. Ajoutez un collecteur de sédiments en amont de chaque appareil et dans la tuyauterie s'il n'est pas possible d'éviter les points bas (figure 10.1).
6. Si des essais de pression et d'étanchéité doivent être faits à plus de 14 po C.E. (1/2 psi), fermez le robinet d'arrêt installé sur site, déconnectez l'appareil et sa commande de gaz mixte de l'arrivée de gaz et bouchez l'arrivée de gaz avant le test. Lorsque vous testez des pressions de 14 po C.E. (1/2 psi) ou inférieures, fermez le robinet d'arrêt manuel sur l'appareil avant d'effectuer le test.

Figure 10.1 - Installation recommandée : piège à sédiments et robinet d'arrêt manuel – pour un raccordement latéral ou par le bas ①



① En position OFF, la manette du robinet d'arrêt de gaz doit être perpendiculaire au tuyau.

Tableau 10.1 - Pression au collecteur et consommation de gaz au niveau de la mer

		Naturel	Propane	
Taille de modèle	**Pression au collecteur (po C.E.) :**	3,5	10	**Nbre d'orifices**
150	pi cubes/h	142,9	60	6
	gal/h propane	sans objet	1,6	
	Diam. foret pour orifice	42	53	
175	pi cubes/h	166,7	70	7
	gal/h propane	sans objet	1,9	
	Diam. foret pour orifice	42	53	
200	pi cubes/h	190,5	80	7
	gal/h propane	sans objet	2,2	
	Diam. foret pour orifice	38	52	
250	pi cubes/h	238,1	100	9
	gal/h propane	sans objet	2,7	
	Diam. foret pour orifice	39	1,55 mm	
300	pi cubes/h	285,7	120	9
	gal/h propane	sans objet	3,3	
	Diam. foret pour orifice	36	51	
350	pi cubes/h	333,3	140	12
	gal/h propane	sans objet	3,8	
	Diam. foret pour orifice	38	52	
400	pi cubes/h	381	160	12
	gal/h propane	sans objet	4,4	
	Diam. foret pour orifice	36	51	

Tableau 10.2 - Capacités de gaz - Gaz naturel ① ②

Longueur de tuyau (pi)	Gaz naturel					
	1/2 po	3/4 po	1 po	1-1/4 po	1-1/2 po	2 po
10	132	278	520	1050	1600	3050
20	92	190	350	730	1100	2100
30	73	152	285	590	890	1650
40	63	130	245	500	760	1450
50	56	115	215	440	670	1270
60	50	105	195	400	610	1150
70	46	96	180	370	560	1050
80	43	90	170	350	530	930
100	38	79	150	305	460	870
125	34	72	130	275	410	780
150	31	64	120	250	380	710

① Capacités en pieds cubes par heure dans des tuyaux de nomenclature 40 avec une chute de pression maximum de 0,3 po C.E. avec une pression gazeuse de 14 po C.E. La densité est de 0,60 pour le gaz naturel et de 1,50 pour le propane.② Pour obtenir la capacité de tuyaux contenant du propane, divisez la capacité pour le gaz naturel par 1,6. Exemple : quelle est la capacité d'un tuyau à propane de 60 pi x 1-1/4 po? Sa capacité pour le gaz naturel est de 400 pi³/h. Divisez cette valeur par 1,6 pour obtenir 250 pi³/h pour le propane.

INSTALLATION – ÉVACUATION

Section C – Installation des systèmes d'évacuation horizontale de catégorie III.

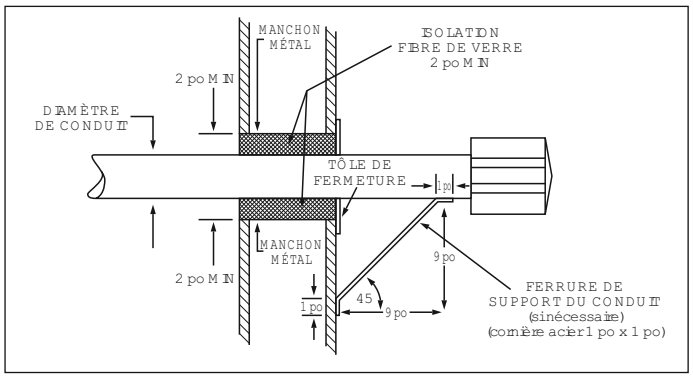
C1. Cette section s'applique aux systèmes d'évacuation horizontale de catégorie III et complète les prescriptions de la section A – Instructions générales – Tous modèles.

C2. Conduit horizontal débouchant horizontalement (sur le côté du bâtiment).

C3 Sceller toutes les coutures et les joints des tuyaux à paroi simple non étanches avec du ruban métallique ou Silastic pour des températures allant jusqu'à 205 °C (400 °F). Pour les systèmes d'évacuation à simple paroi, une section continue de tuyau d'évacuation à double paroi peut être utilisée dans le système d'évacuation pour la traversée du mur jusqu'au chapeau d'évacuation listé. Il est interdit d'accoupler deux longueurs de tuyau à double paroi dans une même installation d'évacuation horizontale à cause de l'impossibilité de vérifier l'étanchéité des raccords du tuyau intérieur. Les systèmes de ventilation de catégorie III énumérés par une agence reconnue à l'échelle nationale et correspondant aux diamètres spécifiés peuvent être utilisés. Différentes marques de tuyau matériaux de ventilation peuvent ne pas être mélangées. Voir le point A10 de la section A – Instructions générales – Tous modèles pour les transitions entre double paroi et simple paroi.

C4. Tous les systèmes d'évacuation horizontale de catégorie III doivent être terminés avec un chapeau de cheminée listé. Le chapeau doit se terminer à une distance minimum de 12 po au-delà de la surface du mur extérieur, comme illustré à la figure 9.2. La cheminée doit être soutenue, comme illustré à la figure 9.1. Des précautions doivent être prises pour éviter la dégradation des matériaux de couverture par les produits de combustion.

Figure 9.1 - Construction d'une traversée à travers une paroi combustible et support de cheminée

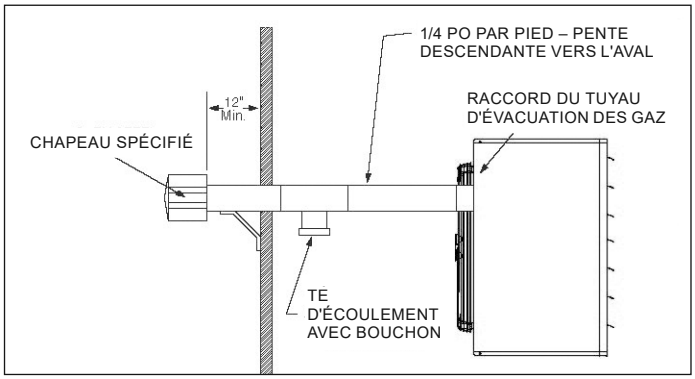


C5. Si la condensation risque d'être un problème, le système d'évacuation ne doit pas déboucher au-dessus d'une voie publique ou d'une zone où le condensat ou la vapeur pourrait créer une nuisance ou un danger, ou pourrait affecter le fonctionnement de régulateurs ou d'évents, ou autres équipements.

C6. Le système d'évacuation ne doit pas desservir plus d'un appareil de chauffage et ne doit pas servir à d'autres fins.

C7. Pour une évacuation horizontale, il faut maintenir une pente montante de 21 mm par mètre (1/4 po par pied) vers l'aval et placer un té d'égouttement avec bouchon de nettoyage, comme illustré à la figure 9.2. Sous réserve de l'accord des autorités locales, une pente de 21 mm par mètre (1/4 po par pied) vers l'aval est acceptable avec un té d'égouttement avec bouchon de nettoyage près de la sortie, comme illustré à la figure 9.2, ou encore un écoulement direct du condensat au bout du tuyau.

Figure 9.2 - Ventilation horizontale



C8. Dans le cas d'un chapeau de cheminée situé sous un avant-toit, la distance du porte-à-faux ne doit pas dépasser 61 cm (24 po). Les dégagements par rapport aux surfaces combustibles d'un conduit d'évacuation extérieur doivent être de 30 cm (12 po) au minimum. Consultez le National Fuel Gas Code pour les exigences additionnelles relatives aux avant-toits ayant des ouvertures de ventilation.

C9. Une fois l'installation du système d'évacuation terminée, passez à la section intitulée « Installation – Raccordements de gaz ».

INSTALLATION – ÉVACUATION

Section B - Installation des systèmes d'évacuation verticale

B1. Cette section s'applique aux systèmes d'évacuation verticale de catégorie I et complète les prescriptions de la section A – Instructions générales – Tous modèles.

B2. Les systèmes à évacuation verticale se terminent verticalement et leurs dimensions doivent être conformes au National Fuel Gas Code, ANSI Z223.1 (NFPA 54) – dernière édition.

B3. La partie horizontale du conduit ne doit pas dépasser 75 % de la hauteur verticale (exemple : Si la hauteur est 3 m (10 pi), la partie horizontale ne doit pas dépasser 2,3 m (7,5 pi).

B4. Il est recommandé de toujours poser un té dont la branche verticale munie d'un bouchon servira à collecter les liquides, comme sur la figure 8.1.

B5. Le niveau de l'orifice de sortie doit être à au moins 1,5 m (5 pi) au-dessus du raccord de l'appareil.

B6. Tous les appareils de chauffage à évacuation verticale de catégorie I doivent être raccordés à un système d'évacuation conforme à une norme reconnue, doublée d'un matériau intérieur approuvé par l'autorité compétente. L'évacuation vers une cheminée en maçonnerie n'est pas permise. Pour les instructions d'évacuation commune, reportez-vous au National Fuel Gas Code, ANSI Z223.1 (NFPA 54) – dernière édition.

B7. Utilisez un chapeau de cheminée approuvé pour réduire le refoulement de tirage et l'entrée d'eau de pluie dans le tuyau.

B8. Il est recommandé d'utiliser des tuyaux à double paroi, bien que les tuyaux à simple paroi soient permis si les prescriptions du National Fuel Gas Code sont observées.

B9. Les conduits verticaux doivent se terminer à des distances horizontales et verticales minimales des lignes de toiture et des murs ou obstacles adjacents. Ces distances minimales sont les suivantes (selon les exigences du National Fuel Gas Code pour des diamètres de conduit inférieures à 12 po) :

- Pour des conduits d'évacuation **à double paroi** et une distance horizontale **de 8 pi ou plus** de tout mur vertical ou obstacle similaire, le conduit doit se terminer au-dessus du toit, conformément à la figure 8.1 et au tableau 8.1.
- Pour des conduits d'évacuation **à double paroi** et une distance horizontale **de moins de 8 pi** de tout mur vertical ou obstacle similaire, le conduit doit se terminer à au moins 2 pi au-dessus du point le plus haut de sa traversée du toit et à au moins 2 pi au-dessus de toute partie horizontale du bâtiment dans un rayon de 10 pi (voir la figure 8.1).

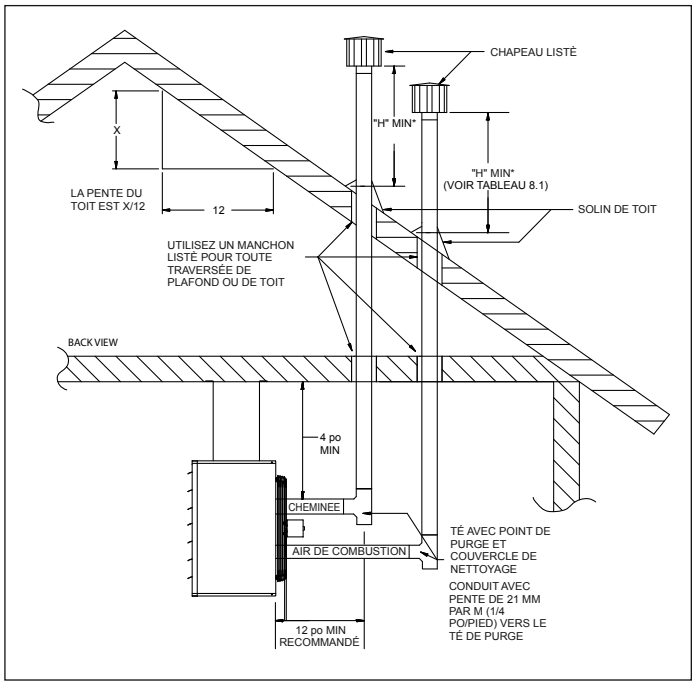
Tableau 8.1 - Hauteur minimale de l'orifice de sortie le plus bas au-dessus du toit

Hauteur X (po)	Pente du toit	Hauteur min. H (pi) ①
0-6	Plat à 6/12	1
6-7	6/12 à 7/12	1,25
7-8	7/12 à 8/12	1,50
8-9	8/12 à 9/12	2
9-10	9/12 à 10/12	2,50
10-11	10/12 à 11/12	3,25
11-12	11/12 à 12/12	4
12-14	12/12 à 14/12	5
14-16	14/12 à 16/12	6
16-18	16/12 à 18/12	7
18-20	18/12 à 20/12	7,50
20-21	20/12 à 21/12	8

① Il faut tenir compte de la couche de neige prévisible.

- Pour des conduits d'évacuation **à simple paroi** débouchant à une distance horizontale de 10 pi ou plus d'une partie quelconque d'un bâtiment, le conduit doit se prolonger sur au moins 2 pi au-dessus du point le plus haut où le conduit sort du toit et à 2 pi au-dessus de toute partie du bâtiment située dans un rayon horizontal de 10 pi.
- Pour **des conduits** d'évacuation à simple paroi débouchant à moins de 10 pi horizontalement de toute partie du bâtiment, le conduit doit se terminer à 2 pi au-dessus de ladite partie.

Figure 8.1 - Système de ventilation verticale de catégorie I



INSTALLATION – ÉVACUATION

A9. Si le tuyau traverse une cloison ou un plancher INTÉRIEUR combustible, la traversée doit être munie d'un manchon métallique ayant un diamètre de 10 cm (4 po) de plus que le tuyau. Si le tuyau situé entre l'appareil et la traversée du mur ou du plancher a une longueur supérieure à 1,8 m (6 pi), le manchon peut avoir un diamètre de 5 cm (2 po) seulement de plus que le tuyau. S'il n'y a pas de manchon de traversée, tous les matériaux combustibles doivent être découpés pour assurer un dégagement d'au moins 15 cm (6 po) tout autour du tuyau. Sous réserve de l'accord des autorités compétentes locales, une évacuation de type B peut être utilisée comme dernier tronçon du conduit d'évacuation pour maintenir une distance par rapport aux combustibles lors du passage à travers le mur ou le plancher. Voir la figure 6.1 Tout matériau utilisé pour boucher cette ouverture doit être incombustible.

A10. Toutes les rivures et tous les joints des tuyaux à simple paroi doivent être scellés avec du ruban métallique ou Silastic certifié pour 204 °C (400 °F). Le ruban doit être enroulé deux fois autour du tuyau. Une section continue de tuyau d'évacuation à double paroi peut être utilisée dans le système d'évacuation pour la traversée du mur jusqu'à un chapeau d'évacuation listé. Voir le point A11 de la section A – Instructions générales – Tous modèles pour les transitions entre double paroi et simple paroi.

A11. Instructions générales pour l'installation du tuyau de chapeau à double paroi (type B) :

Raccordement d'un chapeau de cheminée à paroi simple à un tuyau d'évacuation à double paroi (type B) :

1. Recherchez la flèche « de sens » sur le tuyau d'évacuation.
2. Fixez le chapeau de cheminée à l'extrémité du tuyau d'évacuation à double paroi.
3. Percez (3) avant-trous à travers le tuyau et le chapeau de cheminée. Utilisez des vis à tôle de 3/4 po pour fixer le chapeau au tuyau. Ne serrez pas trop.

Comment fixer un tuyau d'évacuation à paroi simple à un tuyau de cheminée à double paroi (type B) :

1. Enfoncez le tuyau à simple paroi dans la paroi interne du tuyau à double paroi.
2. Percez trois avant-trous à travers les deux épaisseurs des tuyaux. Utilisez des vis à tôle de 3/4 po pour fixer les deux tuyaux. Ne serrez pas trop.
3. L'espace annulaire entre les tuyaux à double et à simple paroi doit être scellé, mais il n'est pas nécessaire de remplir tout le volume. Pour fermer l'ouverture annulaire, appliquez un large boudin de Silastic 400 °F (205 °C).

A12. Les dégagements doivent être maintenus jusqu'à la sortie du conduit d'évacuation :

Tableau 7.1 - Information concernant les dégagements des conduits d'évacuation

Structure	Dégagements minimum pour le conduit d'évacuation
Prise d'air forcé à moins de 10 pi	3 pi au-dessus
Prise d'air de combustion d'un autre appareil	6 pi toutes directions
Porte, fenêtre, prise d'air libre ou autre ouverture du bâtiment	4 pi horizontalement ou en dessous 1 pi au-dessus
Compteur électrique, compteur à gaz, régulateur de gaz ou évent ①	4 pi horizontalement (É.-U.) 6 pi horizontalement (Canada)
Régulateur de gaz ①	3 pi horizontalement (É.-U.) 6 pi horizontalement (Canada)
Mur ou parapet de bâtiment adjacent	6 pi toutes directions
Passage public adjacent	7 pi toutes directions
Niveau du sol	3 pi au-dessus

① L'évent ne doit pas déboucher au-dessus d'un compteur ou d'un régulateur de gaz.

A13. Cet appareil ne doit PAS être relié à une cheminée en maçonnerie.

A14. N'utilisez PAS de registres ni d'autres accessoires dans les conduits d'évacuation ou d'air de combustion.

A15. Le système d'évacuation doit être exclusif à un seul appareil et aucun autre appareil ne doit être ventilé par son truchement.

A16. Des précautions doivent être prises pour éviter la dégradation des matériaux de couverture par les produits de combustion.

A17. Un tuyau d'évacuation à simple paroi ne doit pas traverser un grenier inoccupé, une cloison, un vide de construction ou un plancher.

A18. Dans les régions où la température d'hiver utilisée pour le calcul à 99 % est inférieure à 0 °C (32 °F), il n'est pas permis d'utiliser des tuyaux simples pour l'évacuation à l'extérieur des gaz de combustion.

A19. Le chapeau de cheminée doit être :

Tableau 7.2 - Chapeaux de cheminée

Taille de modèle	Réf. Modine
150-200	5H0722850001
250-400	5H0722850001

A20. En plus de ces instructions générales, il convient d'observer les instructions particulières données pour les systèmes d'évacuation des types vertical catégorie I ou horizontal catégorie III. Les différences sont mises en évidence ci-dessous :

Tableau 7.3 - Exigences ANSI pour les conduits d'évacuation des appareils de chauffage

Catégorie	Description	Exigences d'évacuation
I	Pression d'évacuation négative sans condensation	Suivez les exigences d'évacuation standard.
II	Pression d'évacuation négative avec condensation	Le condensat doit pouvoir s'égoutter.
III	Pression d'évacuation positive sans condensation	Le conduit d'évacuation doit être étanche aux gaz.
IV	Pression d'évacuation positive avec condensation	Le tuyau d'évacuation doit être étanche aux liquides et aux gaz. Le condensat doit pouvoir s'égoutter.

Remarque : Les tuyaux de raccordement desservant des appareils de catégorie I ne doivent pas être reliés à une partie d'un système d'évacuation à tirage mécanique fonctionnant avec une pression positive.

Évacuation verticale catégorie I

- Conduit vertical débouchant verticalement (vers le haut) (exemple à la figure 8.1).
- La partie horizontale du circuit ne doit pas dépasser 75 % de la hauteur verticale (Exemple : Si la hauteur est 3 m (10 pi), la partie horizontale ne doit pas dépasser 2,3 m (7,5 pi).
- Le niveau de la sortie du système d'évacuation doit être à au moins 1,5 m (5 pi) au-dessus du raccord de l'appareil.
- Si le système d'évacuation respecte TOUTES ces exigences (voir l'exemple de la figure 8.1), passez à la section B – Installation des systèmes d'évacuation verticale. Dans tous les autres cas, passez à la section suivante « Détermination du système d'évacuation horizontal Catégorie III ».

Évacuation horizontale de catégorie III

- Conduit horizontal débouchant horizontalement (sur le côté du bâtiment) (exemple à la figure 9.2).
- Un système d'évacuation qui se termine verticalement, mais comporte une partie horizontale de plus de 75 % de sa hauteur verticale est considéré comme horizontal.
- Les configurations d'évacuation horizontales appartiennent à la catégorie III. Des exigences supplémentaires sont traitées à la Section C – Installation de système d'évacuation horizontale de catégorie III.

⚠ AVERTISSEMENT

1. Un système d'évacuation est obligatoire pour les appareils de chauffage au gaz – ne les faites jamais fonctionner sans évacuation des gaz.
2. Un extracteur intégré assure la circulation des gaz – il est inutile ou interdit d'installer un dispositif d'extraction externe supplémentaire.
3. Si un appareil de chauffage existant est remplacé, vous devrez peut-être redimensionner les systèmes d'évacuation des gaz. Un système de ventilation de diamètre insuffisant peut causer des refoulements de gaz brûlés ou la formation de condensat. Reportez-vous au National Fuel Gas Code ANSI Z223.1 (NFPA 54) ou à la dernière édition de la norme CSA B149.1. Le non-respect de ces instructions peut se solder par des blessures graves, voire mortelles.
4. Il est interdit d'accoupler deux longueurs de tuyau à double paroi dans une même installation d'évacuation horizontale à cause de l'impossibilité de vérifier l'étanchéité des raccords du tuyau intérieur.

⚠ ATTENTION

L'installation doit se faire conformément aux codes locaux de la construction ou, à défaut de tels codes, conformément à la Partie 7 « Venting of Equipment » du National Fuel Gas Code, ANSI Z223.1 (NFPA 54) – dernière édition. Au Canada, l'installation doit se faire conformément à la norme CSA B149.1.

Le circuit d'évacuation du modèle PTP doit être conforme aux descriptions des présentes instructions pour conduire les gaz de combustion de l'appareil ou de son raccord de sortie vers l'atmosphère extérieure.

Les instructions d'évacuation sont organisées en sections, selon le type d'installation. Ces sections sont identifiées de la manière suivante :

Instructions	Instructions d'installation par type de système d'évacuation
A	Instructions générales applicables à **TOUTES** les installations
B	**Systèmes d'évacuation VERTICALE CATÉGORIE I** ①
C	**Systèmes d'évacuation HORIZONTALE CATÉGORIE III** ①

① Les différences entre les systèmes verticaux et horizontaux seront identifiées à la « Section A – Instructions générales – tous modèles ».

Section A - Instructions générales - Tous modèles

A1. Si l'appareil que vous installez remplace un équipement existant et utilise le même système d'évacuation, inspectez le système d'évacuation pour vérifier que les diamètres et la pente des tuyaux sont conformes aux exigences du National Fuel Gas Code ANSI Z223.1 (NFPA 54) ou du code d'installation CSA B149.1, dernière édition, et aux présentes instructions. Déterminez s'il n'y a pas d'obstructions, de restriction, de fuite, de corrosion ou d'autres défectuosités pouvant créer un risque.

A2. Le tuyau d'évacuation des gaz doit être un tuyau en acier galvanisé ou autre matière résistant bien à la corrosion. L'épaisseur minimale du conduit d'évacuation est spécifiée dans le National Fuel Gas Code. L'épaisseur minimale des raccords dépend du diamètre du tuyau. N'utilisez jamais des tuyaux de cheminée en PVC ou autres types de plastique.

A3. Tous les appareils de chauffage sont fournis avec un adaptateur d'évacuation installé en usine permettant d'attacher le tuyau d'évacuation à l'appareil de chauffage (tableau 6.1). Attachez le tuyau d'évacuation des gaz à l'adaptateur à l'aide de 3 vis résistant à la corrosion. (Percez des avant-trous à travers le tuyau d'évacuation et l'adaptateur avant de visser.) Le tuyau d'évacuation des gaz ne doit pas être d'un diamètre inférieur à celui du connecteur.

A4. Pour les longueurs totales minimales et maximales des tuyaux afin de rendre le système le plus rectiligne possible, consultez le tableau 6.1. La longueur équivalente d'un coude de 90° est de 1,5 m (5 pi) pour 10 cm (4 po) de diamètre et de 2,1 m (7 pi) pour 15,2 cm (6 po) de diamètre.

Tableau 6.1 - Diamètres de tuyau d'évacuation, transitions et longueurs de tuyau d'évacuation équivalentes totales pour les systèmes d'évacuation horizontaux

Taille de modèle	Diamètre de conduit d'évacuation	Longueur de tuyau d'évacuation équivalente	
		Minimum	Maximum
150	4 po	3 pi	50 pi
175-200	4 po	3 pi	70 pi
250-400	6 po	3 pi	70 pi

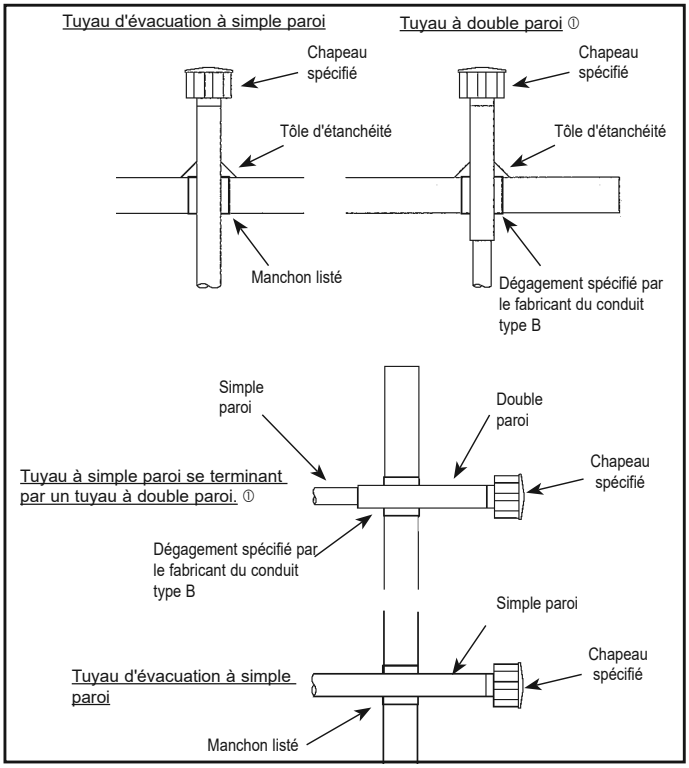
A5. Les sections horizontales du tuyau d'évent doivent être installées avec une pente ascendante ou descendante de l'appareil de 1/4 de pouce par pied et doivent être suspendues de manière sécurisée à des structures suspendues à des points ne dépassant pas 3 pi.

A6. Les tuyaux doivent être fixés les uns aux autres par au moins 3 vis à tôle anticorrosion.

A7. Les tuyaux à simple paroi doivent être éloignés d'au moins 15 cm (6 po) des surfaces combustibles. Pour des tuyaux à double paroi, suivez les instructions du fabricant en matière de dégagement. La distance minimum des matières combustibles dépend de la température de surface de la matière combustible ne devant pas dépasser 71 °C. Il est possible que la distance par rapport au tuyau de ventilation (ou au haut de l'appareil) doive être augmentée à plus de 15 cm (6 po) si la chaleur risque de causer des dommages autres que le feu (comme des déformations ou une altération de couleur).

A8. Évitez de faire passer le conduit à travers un espace non chauffé, dans la mesure du possible. Si le tuyau traverse un espace non chauffé ou si l'appareil est installé dans un environnement propice à la condensation, il faudra isoler toute longueur de tuyau de plus de 1,5 m (5 pi) afin de minimiser la condensation. Assurez-vous qu'il n'y a pas de fuites et utilisez un isolant non combustible avec un indice non inférieur à 204 °C (400 °F). Installez un raccord en té au point bas du système de ventilation et fournissez un collecteur de condensats avec un bouchon de nettoyage, comme illustré à la figure 8.1.

Figure 6.1 - Cheminée traversant un mur ou un toit combustible



① Consultez les instructions A12 pour savoir comment attacher un tuyau à simple paroi à un tuyau à double paroi.

MONTAGE DE L'APPAREIL

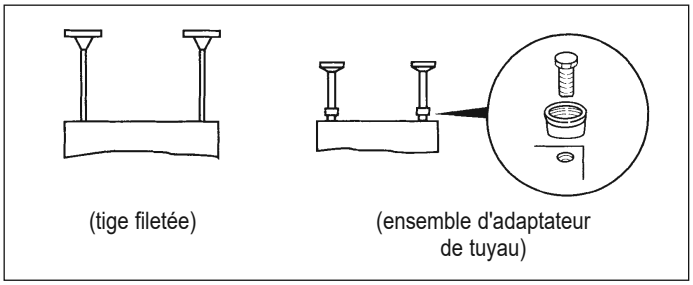
⚠ ATTENTION

1. N'installez pas les appareils à moins de 7 pi (distance mesurée entre le bas de l'appareil et le sol dans les applications commerciales), sauf s'ils sont équipés de barrières adéquates pour protéger l'utilisateur des composants en mouvement.
2. Vérifiez qu'il n'y a pas d'obstacle devant la prise d'air et la sortie d'air chaud.
3. La distance minimum des matériaux combustibles dépend de la température de surface du matériau combustible ne dépassant pas 160 °F. Au-dessus de l'appareil, il faudra peut-être laisser un dégagement supérieur au minimum spécifié si des matériaux placés au-dessus de l'appareil à la température indiquée risquent de subir des dommages thermiques, autres que le feu.
4. Prévoyez un dégagement de 18 po à l'arrière (ou de 12 po au-delà de l'extrémité du moteur, à l'arrière de l'appareil, selon la plus grande des deux valeurs), et du côté de la porte d'accès pour assurer assez d'air au bon fonctionnement du ventilateur.

1. Assurez-vous que les pièces de suspension peuvent supporter le poids de l'appareil (voir la page 17 pour les poids).
2. Pour bien fonctionner, l'appareil doit être installé à l'horizontale.
3. Les distances aux matériaux combustibles comme spécifié au tableau 4.1 doivent être strictement maintenues.
4. Tous les modèles de série sont expédiés en boîte. Les modèles de taille supérieure sont également fournis avec une plate-forme de soutien au fond de la boîte. Les plus grands modèles pourront être soulevés par en dessous à l'aide d'un chariot élévateur à fourches ou d'un autre appareil de levage, uniquement si la plate-forme de soutien reste en place et que les fourches soutiennent l'appareil sur toute sa profondeur. Si l'appareil doit être soulevé par en dessous pour l'installation finale sans le carton en place, veillez à soutenir correctement l'appareil sur toute sa longueur et sa largeur pour éviter de l'endommager. Lorsque vous soulevez les appareils, assurez-vous que la charge est équilibrée.
5. Les modèles à hélice ont quatre trous de montage. Les modèles peuvent être montés avec une tige filetée de 3/8 po-16 comme suit :
   - Sur chaque section de tige filetée utilisée, vissez un écrou sur une distance de 1 po environ sur l'extrémité des tiges filetées qui seront vissées sur l'appareil de chauffage.
   - Placez une rondelle sur l'extrémité de la tige filetée et vissez la tige filetée sur les écrous à souder de l'appareil de chauffage sur le dessus de l'appareil de chauffage en donnant 5 tours minimum, mais pas plus de 10. Serrez le premier écrou installé sur la tige filetée pour éviter la rotation de la tige.
   - Percez des trous dans un canal en acier ou une cornière aux mêmes dimensions de ligne centrale que l'appareil de chauffage en cours d'installation. Les canaux en acier ou cornières devront être attachés aux éléments de structure appropriés.
   - Coupez les tiges filetées à la longueur voulue, enfilez-les dans les trous du canal en acier ou de la cornière, puis fixez par des rondelles et des contre-écrous ou des rondelles d'arrêt et des écrous. Une configuration à double écrou peut être utilisée ici plutôt qu'au niveau de l'appareil de chauffage (un double écrou peut être utilisé aux deux endroits, mais ce n'est pas une obligation).
   - N'installez pas les appareils de chauffage de série au-dessus de la hauteur d'installation maximum indiquée au tableau 21.1 et 21.2

   REMARQUE : Un kit d'adaptateur pour suspension de tuyau, illustré à la figure 5.3, est fourni. disponible en accessoire. Un kit comprend des trous de 3/4 " Bouchons de tuyaux IPS et vis à tête 3/8 "- 16 x 1-3 / 4" pour la facilité tube de suspension fileté.

Figure 5.1 - Méthodes de suspension des appareils de chauffage



EMPLACEMENT D'INSTALLATION

EMPLACEMENT D'INSTALLATION

⚠ DANGER

Les appareils ne doivent pas être installés à un endroit où ils risquent d'être exposés à une atmosphère potentiellement explosive ou inflammable.

⚠ ATTENTION

1. Les dégagements aux matériaux combustibles sont essentiels. Assurez-vous de suivre toutes les exigences mentionnées.
2. Les appareils de chauffage sont conçus pour être utilisés dans des applications où la température ambiante de départ est comprise entre -40 et 90 °F et la température ambiante de fonctionnement entre 40 et 90 °F.
3. L'appareil n'est pas conçu pour être installé à l'extérieur.
4. Dans les garages ou dans certaines parties des hangars d'aviation, comme les bureaux et les ateliers qui communiquent avec des endroits réservés à l'entretien ou à l'entreposage, le bas de l'appareil doit être placé à au moins 7 pi du sol, sauf si des protections adéquates sont installées pour protéger convenablement l'appareil. Dans les stationnements, l'appareil doit être installé conformément à la norme relative aux structures de stationnement ANSI/NFPA 88A (dernière édition), et dans les garages de réparation, conformément à la norme NFPA 30A (dernière édition) (ex-NFPA 88B). Au Canada, l'installation d'appareils de chauffage dans des hangars d'aviation doit être effectuée conformément aux exigences de l'autorité de réglementation et, dans les garages publics, conformément aux codes courants CSA B149.
5. Dans un hangar d'aviation, le bas de l'appareil doit être à au moins 10 pi au-dessus de la plus haute surface des ailes ou d'un capot moteur, pour l'avion le plus haut que le hangar accueille et doit respecter les prescriptions de l'autorité de réglementation et/ou de la norme NFPA 409 – dernière édition.
6. Si l'appareil est installé dans un environnement très humide ou salin, il sera soumis à une corrosion accélérée qui réduira sa durée de vie normale.

IMPORTANT

Pour éviter la panne prématurée de l'échangeur de chaleur, ne placez AUCUN appareil à gaz à des endroits où des vapeurs corrosives (chlorées, halogénées ou acides) sont présentes.

Recommandations pour le choix de l'emplacement

1. Les facteurs à considérer pour le choix de l'emplacement de l'appareil de chauffage sont les distances prescrites et les besoins de chauffage, l'endroit où se trouve l'arrivée du gaz et l'entrée électrique, ainsi que la proximité des conduits d'évacuation.
2. Lors du choix de l'emplacement d'installation, il est important de prendre en considération le raccordement de la tuyauterie d'évacuation vers l'atmosphère extérieure. Les longueurs de tuyauterie d'évacuation équivalentes maximums apparaissent à « Section A – Instructions générales – tous modèles » des instructions d'évacuation des gaz.
3. Assurez-vous que le support de l'appareil est assez solide pour porter son poids. Pour les poids, reportez-vous à la page 18. Pour bien fonctionner, l'appareil doit être installé à l'horizontale.
4. N'installez pas l'appareil à un endroit où ses gaz brûlés pourraient être aspirés à l'intérieur d'un édifice voisin par une fenêtre, une prise d'air frais, etc.
5. Veillez à respecter les distances minimums des matériaux combustibles et les dégagements recommandés pour maintenance. Les distances d'installation et les dégagements minimums sont indiqués à la figure 4.1 et au tableau 4.1.

Figure 4.1 - Matières combustibles et dégagements

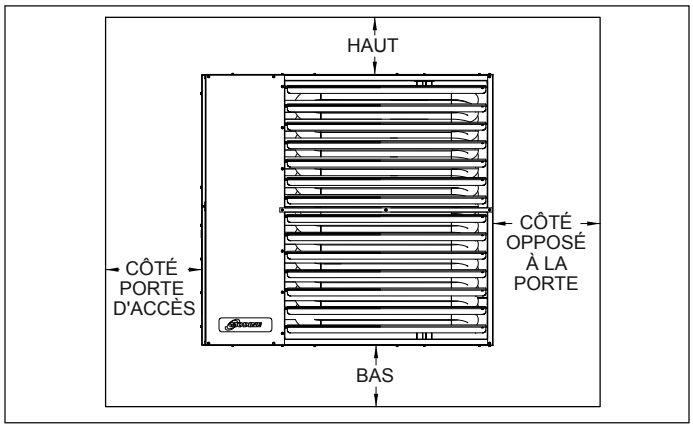


Tableau 4.1 - Dégagements

Côté appareil	Distance minimum des matières combustibles	Dégagement recommandé pour la maintenance
Haut et bas	6 po	18 po
Côté porte d'accès	6 po	18 po
Côté opposé à la porte	6 po	18 po
Arrière	18 po	18 po
Raccord évacuation	6 po	18 po

6. N'installez pas les appareils à un endroit où le système d'allumage au gaz serait exposé à un brouillard d'eau, à la pluie ou à un goutte-à-goutte.
7. La hauteur de montage (mesurée du bas de l'appareil) est un aspect critique de l'installation. Pour les hauteurs de montage et les portées de chauffage, reportez-vous à la page 15 de ce manuel. La hauteur de montage maximale est le niveau pour lequel l'air chaud de l'appareil n'atteint plus le plancher.

Exigences en matière d'air de combustion

Le National Fuel Gas Code définit un « espace clos » comme un espace dont le volume est supérieur à 1,41 mètre cube (50 pieds cubes) par débit calorifique de 1000 BTU/h de l'appareil ou des appareils installés. Un espace offrant un volume de moins de 1,41 mètre cube (50 pieds cubes) par tranche de 1000 BTU/h de puissance calorifique installée est considéré comme un espace clos.

Pour les appareils installés dans des bâtiments hermétiquement fermés ou des espaces confinés, deux ouvertures permanentes doivent être prévues – une près du haut de l'espace confiné, l'autre près du bas. Chaque ouverture doit avoir un espace libre d'au moins 6,45 cm² (1 po²) par tranche de 1000 BTU/h de puissance calorifique totale de tous les appareils qui se trouvent dans un espace confiné, et doit communiquer librement avec les zones intérieures, lesquelles doivent avoir une infiltration adéquate de l'extérieur.

Pour des détails sur l'apport d'air de combustion dans un espace confiné (hermétiquement fermé) ou non confiné, consultez le National Fuel Gas Code ANSI Z223.1 (NFPA 54) ou le code d'installation CSA B149.1, dernière édition.

Niveaux sonores et de vibrations

Tout équipement mécanique standard génère bruit et vibrations pouvant exiger une atténuation. Les bibliothèques, les bureaux privés et les hôpitaux exigent une atténuation acoustique supplémentaire, et dans ce cas, un consultant en acoustique devra être engagé pour vous faciliter la tâche. L'éloignement de l'équipement de la zone critique est souhaitable dans les limites imposées par les gaines. Généralement, l'appareil doit être placé dans un rayon de 4,5 m d'un bras support principal. De légères déviations diminueront généralement la transmission de vibrations et de bruit.

PRÉCAUTIONS PARTICULIÈRES / FACTEURS DE CONVERSION SI (SYSTÈME MÉTRIQUE) / EMPLACEMENT D'INSTALLATION

⚠ ATTENTION

15. La purge de l'air des tuyauteries de gaz doit se faire selon la procédure ANSI Z223.1 (NFPA 54) de la dernière édition du National Fuel Gas Code. Au Canada, l'installation doit se faire selon le code CSA B149.1.
16. Pour l'essai d'étanchéité des tuyauteries d'alimentation en gaz, l'appareil et son régulateur de gaz combiné doivent être isolés pour tout essai fait à une pression dépassant 14 po C.E. (1/2 psi).
17. L'appareil devrait être isolé de la conduite d'alimentation en gaz par la fermeture d'un robinet d'arrêt manuel posé à l'installation. Ce robinet d'arrêt doit être dans un rayon de 6 pi autour de l'appareil.
18. Fermez l'arrivée générale de gaz avant d'installer l'appareil.
19. Vérifiez que la tension d'alimentation inscrite sur la plaque de l'appareil est inférieure de moins de 5 % à la tension nominale.
20. Mesurez la pression d'entrée du gaz en amont du régulateur de gaz combiné. La pression d'entrée de l'appareil doit être de 6 à 7 po C.E. pour le gaz naturel ou de 13 à 14 po C.E. pour le propane. Si la pression d'entrée est trop élevée, installez un détendeur supplémentaire en amont du régulateur de gaz combiné.
21. L'entretien et les réparations de l'appareil doivent être confiés à un centre de SAV qualifié.
22. N'essayez pas de réutiliser un contrôleur d'allumage mécanique ou électronique qui a été mouillé. Remplacez tout contrôleur défectueux.

IMPORTANT

1. Pour éviter la panne prématurée de l'échangeur de chaleur, ne placez AUCUN appareil à gaz à des endroits où des vapeurs corrosives (chlorées, halogénées ou acides) sont présentes dans l'atmosphère.
2. Pour éviter une défaillance prématurée de l'échangeur de chaleur, l'apport calorifique du gaz utilisé ne doit pas excéder de plus de 5 % la valeur nominale inscrite sur la plaque signalétique de l'appareil.
3. Les procédures de démarrage et de réglage doivent être confiées à un centre de SAV qualifié.

AVANT DE COMMENCER

⚠ ATTENTION

1. Toute la documentation livrée avec l'appareil doit être conservée pour référence lors des opérations d'entretien et de diagnostic des pannes. Laissez le manuel au propriétaire. Ne jetez aucune documentation fournie avec cet appareil.
2. Étudiez les instructions en matière de tuyauterie, de câblage électrique et d'évacuation des gaz de ce manuel avant d'effectuer l'installation finale.
3. Ne raccordez pas les gaines, les filtres à air ou les faisceaux de tubes à un aérotherme.

Aux États-Unis, l'installation de ces appareils doit se faire conformément au code « National Fuel Gas Code », ANSI Z223.1, dernière édition (NFPA 54) et aux autres codes du bâtiment locaux applicables. Au Canada, l'installation de ces appareils doit se faire conformément aux codes locaux de la plomberie et des eaux usées, et aux autres codes applicables, ainsi qu'à la version courante du code CSA B149.

1. Toutes les opérations d'installation et d'entretien de ces appareils doivent uniquement être confiées à une entreprise qualifiée, telle que définie dans la dernière édition de la norme ANSI Z223.1 (NFPA 54) ou, au Canada, par un installateur de gaz certifié.
2. Cet appareil est listé avec le système de commande fourni. Veuillez commander les pièces de rechange d'après la liste de pièces qui se trouve sur la plaque signalétique. Ayez toujours à portée de la main les numéros de modèle et de série. Modine se réserve le droit de substituer d'autres commandes listées comme pièces de rechange.
3. L'appareil est équilibré pour un fonctionnement correct. N'altérez pas le ventilateur et ne faites pas tourner les moteurs à des régimes inférieurs à ce qui est stipulé dans ce manuel.
4. La documentation sur les organes de régulation est fournie séparément.
5. Le même brûleur convient pour le gaz naturel et pour le propane.

Facteurs de conversion SI (système métrique)

Pour convertir	Multipliez par	Pour obtenir
po C.E.	0,249	kPa
°F	(°F-32) x 5/9	°C
BTU	1,06	kJ
BTU/pi^3	37,3	kJ/m^3
BTU/h	0,000293	kW/h
CFH (pi^3/h)	0,000472	m^3/min
CFH (pi^3/h)	0,00000787	m^3/s
CFM (pi^3/min)	0,0283	m^3/min
CFM (pi^3/min)	0,000472	m^3/s
pied	0,305	m
Gal/h	0,00379	m ^{3} /h
Gal/h	3,79	l/h
gallons	3,79	l
cheval-vapeur	746	W
pouces	25,4	mm
livre	0,454	kg
psig	6,89	kPa
psig	27,7	po C.E.

PRÉCAUTIONS PARTICULIÈRES

PRÉCAUTIONS PARTICULIÈRES

LES INSTRUCTIONS D'INSTALLATION ET D'ENTRETIEN DE CE MANUEL DOIVENT

ÊTRE RESPECTÉES POUR ASSURER UN FONCTIONNEMENT SÉCURITAIRE, EFFICACE ET SANS PROBLÈMES. IL CONVIENT ÉGALEMENT DE RESPECTER RIGOUREUSEMENT LES PRÉCAUTIONS PARTICULIÈRES INDIQUÉES CI-APRÈS. LA NON-CONFORMITÉ À CES PRÉCAUTIONS PRIMORDIALES PEUT CAUSER DES DOMMAGES MATÉRIELS OU DES PERTES, DES BLESSURES OU LA MORT. CES INSTRUCTIONS SONT DONNÉES SOUS RÉSERVE DE DISPOSITIONS PLUS RESTRICTIVES DANS LES CODES LOCAUX OU NATIONAUX.

HIÉRARCHIE DES NIVEAUX DE RISQUES

1. **DANGER :** Indique un danger imminent qui, s'il n'est pas évité, entraînera INÉVITABLEMENT des blessures graves, voire mortelles.
2. **AVERTISSEMENT:** Indique un danger potentiel qui, s'il n'est pas évité, POURRAIT engendrer des blessures graves, voire mortelles.
3. **ATTENTION :** Indique un danger potentiel qui, s'il n'est pas évité, PEUT engendrer des blessures mineures ou modérées.
4. **IMPORTANT :** Indique une situation qui, si elle n'est pas évitée, PEUT poser un problème de sécurité.

⚠ DANGER

Les appareils ne doivent pas être installés à un endroit où ils risquent d'être exposés à une atmosphère potentiellement explosive ou inflammable.

⚠ AVERTISSEMENT

1. Un système d'évacuation est obligatoire pour les appareils de chauffage au gaz – ne les faites jamais fonctionner sans évacuation des gaz.
2. Un extracteur intégré assure la circulation des gaz – il est inutile ou interdit d'installer un dispositif d'extraction externe supplémentaire.
3. Si un appareil de chauffage existant est remplacé, vous devrez peut-être redimensionner les systèmes d'évacuation des gaz. Un système de ventilation de diamètre insuffisant peut causer des refoulements de gaz brûlés ou la formation de condensat. Reportez-vous au National Fuel Gas Code ANSI Z223.1 (NFPA 54) ou à la dernière édition de la norme CSA B149.1. Le non-respect de ces instructions peut avoir des conséquences graves ou mortelles.
4. Il est interdit d'accoupler deux longueurs de tuyau à double paroi dans une même installation d'évacuation horizontale à cause de l'impossibilité de vérifier l'étanchéité des raccords du tuyau intérieur.
5. Toutes les tuyauteries de gaz extérieures doivent être soumises à des essais de pression et d'étanchéité avant la mise en marche. Ne recherchez jamais les fuites avec une flamme nue. Utilisez plutôt de l'eau savonneuse ou un produit équivalent.
6. La pression de gaz au régulateur de l'appareil ne doit jamais dépasser 14 po C.E. (1/2 psi).
7. Pour réduire les risques de condensation, le pouvoir calorifique minimum du gaz (au niveau de la mer) ne doit pas être inférieur de plus de 5 % à la valeur minimale nominale figurant sur la plaque signalétique de l'appareil ou de 5 % à la valeur la plus basse des appareils à double alimentation.
8. Débranchez l'alimentation électrique avant de faire les connexions pour éviter les décharges électriques et les dommages à l'équipement.
9. Tous les branchements et câblages doivent être faits en stricte conformité avec le schéma fourni avec l'appareil. Tout câblage différent de celui du schéma peut créer des risques de dommages matériels ou de blessures.
10. Tout câblage usine d'origine exigeant un remplacement doit être remplacé par un câble d'indice thermique nominal de 105 °C.
11. Assurez-vous que la tension d'alimentation n'est pas supérieure de plus de 5 % à la tension nominale inscrite sur la plaque de l'appareil.

⚠ AVERTISSEMENT

12. Pour l'entretien et les réparations de cet appareil, n'utilisez que des pièces approuvées par le fabricant. Pour la liste complète des pièces de rechange, adressez-vous au fabricant. Le numéro de modèle complet, le numéro de série et l'adresse du fabricant figurent sur la plaque signalétique fixée à l'appareil. Toute substitution de pièce ou de commande non approuvée par le fabricant sera aux risques du propriétaire.

⚠ ATTENTION

1. Toute la documentation livrée avec l'appareil doit être conservée pour référence lors des opérations d'entretien et de diagnostic des pannes. Ne jetez aucune documentation fournie avec cet appareil.
2. Étudiez les instructions en matière de tuyauterie, de câblage électrique et d'évacuation des gaz de ce manuel avant d'effectuer l'installation finale.
3. Ne raccordez pas les gaines, les filtres à air ou les faisceaux de tubes à un aérotherme.
4. Les dégagements par rapport aux matériaux combustibles adjacents sont essentiels. Assurez-vous de respecter toutes les exigences mentionnées.
5. Les appareils de chauffage sont conçus pour être utilisés dans des applications où la température ambiante de départ est comprise entre -40 et 90 °F et la température ambiante de fonctionnement entre 40 et 90 °F.
6. L'appareil n'est pas conçu pour être installé à l'extérieur.
7. Dans les garages ou dans d'autres sections des hangars d'aéronefs, comme les bureaux et les ateliers qui communiquent avec des endroits réservés à l'entretien ou à l'entreposage, le bas de l'appareil doit être placé à au moins 2,13 m (7 pi) du sol, sauf si vous installez aussi des protections adéquates pour éviter les contacts avec des pièces mobiles. Dans les stationnements, l'appareil doit être installé conformément à la norme relative aux structures de stationnement ANSI/NFPA 88A (dernière édition), et dans les garages de réparation, conformément à la norme NFPA 30A (dernière édition) (ex-NFPA 88B). Au Canada, l'installation d'appareils de chauffage dans des hangars d'aviation doit être effectuée conformément aux exigences de l'autorité de réglementation et, dans les garages publics, conformément aux codes courants CSA B149.
8. Dans un hangar d'aviation, le bas de l'appareil doit être à au moins 10 pi au-dessus de la plus haute surface des ailes ou d'un capot moteur, pour l'avion le plus haut que le hangar accueille et doit respecter les prescriptions de l'autorité de réglementation et/ou de la norme NFPA 409, dernière édition.
9. Si l'appareil est installé dans un environnement très humide ou salin, il sera soumis à une corrosion accélérée qui réduira sa durée de vie normale.
10. N'installez pas les appareils à moins de 7 pi (distance mesurée entre le bas de l'appareil et le sol dans les applications commerciales), sauf s'ils sont équipés de barrières adéquates pour protéger l'utilisateur des composants en mouvement.
11. Vérifiez qu'il n'y a pas d'obstacle devant la prise d'air et la sortie d'air chaud.
12. La distance minimum des matières combustibles dépend de la température de surface de la matière combustible ne devant pas dépasser 71 °C. Au-dessus de l'appareil, il faudra peut-être laisser un dégagement supérieur au minimum spécifié si des matériaux placés au-dessus de l'appareil à la température indiquée risquent de subir des dommages thermiques, autres que le feu.
13. Prévoyez un dégagement de 18 po à l'arrière (ou de 12 po au-delà de l'extrémité du moteur, à l'arrière de l'appareil, selon la plus grande des deux valeurs), et du côté de la porte d'accès pour assurer assez d'air au bon fonctionnement du ventilateur.
14. L'installation doit se faire conformément aux codes locaux de la construction ou, à défaut de tels codes, conformément au National Fuel Gas Code, ANSI Z223.1 (NFPA 54), dernière édition. Au Canada, l'installation doit se faire conformément à la norme CSA B149.1.

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Octobre, 2019

MANUEL D'INSTALLATION ET DE MAINTENANCE
appareils de chauffage alimentés au gaz à ventilation électrique
Modèle PTP et BTP



Intertek

Tous les modèles approuvés pour une utilisation en Californie par le CEC et au Massachusetts. L'appareil de chauffage est certifié pour les applications non résidentielles.

⚠ AVERTISSEMENT

1. Une installation, des réglages, des modifications ou un entretien inappropriés peuvent causer des dommages matériels, des blessures ou la mort, ainsi que l'exposition à des substances reconnues par divers organismes officiels comme causant des cancers, des malformations congénitales ou des anomalies du système reproducteur. Lisez attentivement les instructions d'installation, d'utilisation et d'entretien avant d'installer ou d'entretenir cet appareil.

2. AUCUN appareil fonctionnant au gaz ne devrait être installé dans des locaux dont l'atmosphère contient des vapeurs chlorées, halogénées ou acides. Ces substances peuvent causer une défaillance prématurée de l'échangeur de chaleur, en raison de la corrosion, laquelle peut provoquer des dommages matériels, des blessures graves ou même la mort.

POUR VOTRE SÉCURITÉ

SI VOUS SENTEZ UNE ODEUR DE GAZ :

1. **Ouvrez les fenêtres.**
2. **Ne tentez d'allumer aucun autre appareil.**
3. **Ne touchez pas aux interrupteurs électriques et n'utilisez aucun téléphone dans votre édifice.**
4. **Éteignez toute flamme nue.**
5. **Appelez immédiatement votre compagnie de gaz depuis le téléphone d'un voisin. Suivez les instructions de la compagnie de gaz. Si vous ne pouvez pas contacter votre compagnie de gaz, appelez les pompiers.**

POUR VOTRE SÉCURITÉ

L'utilisation et le stockage d'essence ou d'autres vapeurs et liquides inflammables dans des récipients ouverts à proximité de cet appareil sont dangereux.

IMPORTANT

Ce manuel est spécifiquement destiné au personnel d'une entreprise d'installation et d'entretien qualifiée. Toutes les opérations d'installation et d'entretien doivent être confiées à une entreprise qualifiée.

Inspection à la réception

1. Inspectez l'appareil à la livraison. Signalez immédiatement tout dommage au transporteur et avisez le représentant commercial local de Modine.
2. Vérifiez la plaque signalétique pour déterminer si les caractéristiques de l'appareil correspondent au secteur électrique disponible au point d'installation.
3. Inspectez l'appareil à la réception pour vous assurer qu'il est conforme à la description du produit commandé (y compris aux spécifications, s'il y a lieu).

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CE MANUEL DOIT ÊTRE REMIS AU PROPRIÉTAIRE DE L'INSTALLATION. N'OUBLIEZ PAS DE LE LAISSER AU PROPRIÉTAIRE EN QUITTANT LE CHANTIER.

Seed®

Greenhouse Environmental Control Specification

WADSWORTH Control Systems | 1.800.821.5829 wadsworthcontrols.com

1. Furnish and install a Wadsworth Control Systems, Inc. multiple zone greenhouse environmental control system utilizing touch screen capability for ease of use.
2. The computerized control system shall be housed in a corrosion resistant, gasketed cabinet.
3. The cabinet shall have a built in polycarbonate window for quick view of the main screen.
4. The cabinet shall have a key locked door with ability to access wiring behind the touchscreen for electrical hookup.
5. An industrialized 7" touchscreen.
    a. The screen shall be backlit with white LED for easy viewing in dark locations. Brightness shall support good viewing in sunlight.
    b. Touchscreen power supply (TPS) with transformer, RS-485 terminals, and cutoff switch.
    c. Supported connections:
        i. Connection to the I/O modules through built-in RS-485 port.
        ii. Internet connectivity is possible through an RJ-45 connector of 10/100/1000 Mbps Ethernet connector.
    d. Operating environmental conditions:
        i. Temperature: 32 °F - 104 °F (0 °C - 40 °C).
        ii. Relative humidity: 10 % - 90 % non-condensing.
6. A graphical user interface (GUI).
    a. Main screen showing each greenhouse zone sensor readings and color indication for active heating, cooling, or setpoint behavior.
    b. Main screen showing weather data including picture identification of current conditions.
    c. Direct access to each zones equipment list and live data from the main page.
    d. Unlimited user-definable time periods per zone.
    e. User-definable alarm groupings, allowing any type of alarm to log, display a popup, and/or trigger the Alarm relay. Ability to monitor: high/low sensor readings, power failure, network disconnect, and fire.
    f. Unlimited user-definable schedules and influences for custom equipment responses.
    g. User-configurable sensor types for greenhouse environmental analysis. Sensor types include: 0-5 VDC, 4-20 mA, 0-5 VDC pulse counter, and self-generating 0-5 VDC signals.
    h. Equipment state evaluation every one (1) second. Sensor state evaluation at least every five (5) seconds.
    i. All data written to internal hard drive.
    j. Data charting and user-selectable data sets with equipment run status overlay, zooming and panning.
    k. Weather station data is visible on screens with expandable dropdown.
    l. Zone data is visible on all screens pertaining to that individual zone.
7. Contactor panel.
    a. UL recognized contactor panel in a NEMA rated enclosure.
    b. Input/Output module.
        i. Power is 24VAC/DC – 1A.
        ii. Two communication ports support RS-485. Lightning protection for each port.
        iii. Inputs:
            1. Eight (8) analog input channels with 12-bit resolution and overvoltage protection.
            2. One (1) isolated digital input channel.
        iv. Outputs:
            1. Twelve (12) output channels capable of providing 24VAC at 120mA for relay activation.
            2. One (1) dedicated alarm relay to signal alarm condition.
            3. Two (2) 0-10VDC analog output channels capable of sourcing 50mA.
        v. Settings for the I/O module are stored on non-volatile EEPROM memory.
        vi. Real time clock for keeping accurate time and date.

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vii. Indicating lights for each power source and communication activity.

c. Twelve (12) DPDT relays for controlling equipment per I/O module.
d. Override switches for easy override control for each output relay.
e. Contactors as required per users equipment.

Designed and Built in the USA

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Seed®

IP Networking Specification



WADSWORTH Control Systems | 1.800.821.5829 wadsworthcontrols.com

- Seed
  - Minimum Requirements
  - Recommended Requirements
  - Ports and Protocols
    - Inter-Controller Communication
    - Automatic Network Time
    - Online Software Updates
    - Misc Ports
  - Security
- Sphere
  - Ports and Protocols
    - Seed-Sphere Communication
  - Security
- Integrations
  - Cloud
  - BACnet
  - Predictive Weather

1 Seed

In order for two or more Seed controllers to communicate with each other, they must be connected to an internal, fast ethernet network using Cat 5e or better cabling. All controllers must be on the same Ethernet subnet. Each controller needs their own IPv4 address that either has a DHCP reservation or is a static address out of the normal DHCP address pool. Wireless networking and cross subnet connections are not supported.

Seed Controllers utilize TCP Websockets to communicate with each other. Each controller needs routes to each other controller. These routes need to allow TCP Websocket connections and communication on port 15541.

1.1 Minimum Requirements

- A Fast ethernet switch/router with one free port for each Seed Controller.
- Cat 5e cable ran between each Seed Controller and the Fast ethernet switch/router.
- One unique IPv4 address on the same subnet for each Seed Controller. This can either a DHCP reservation or a static address outside of the DHCP address pool.

1.2 Recommended Requirements

- A Gigabit ethernet switch with one free port for each Seed Controller.
- Cat6 cable ran between each Seed Controller and the Gigabit ethernet switch/router.
- One unique, DHCP reserved IPv4 address on the same subnet for each Seed Controller.
- Dedicated physical or virtual network that prioritizes Seed traffic.

1.3 Ports and Protocols

1.3.1 Inter-Controller Communication

- 15541 - Websocket (TCP)

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    - Required for sharing Seed ControllerNet data.

1.3.2 Automatic Network Time

- ntp.ubuntu.com
    - Required if using automatic network time (recommended).

1.3.3 Online Software Updates

- https://d19brfjohm5mn8.cloudfront.net
    - For Teguar variant running Seed >= 2.01.
    - Stable branch.
- https://d1unxfujnl5koz.cloudfront.net
    - For Teguar variant running Seed >= 2.01.
    - Beta branch.
- https://dwia4hzx2ar42.cloudfront.net
    - For Nimble variant running Seed >= 2.00.
    - Official branch.
- https://8ii910jvb5.execute-api.us-east-1.amazonaws.com
    - Anonymous Seed metadata uploads.

1.3.4 Misc Ports

- 8080 - System monitoring information
    - Displays anonymous system performance data, such as temperatures and processor loads.
- 55541 - Wadsworth SSH access
    - Troubleshooting access that requires a special password.
    - Can be disabled using the Recovery Utility.

1.4 Security

Local data transmitted between Seed controllers is encrypted starting in v2.01.11.

None of the data stored on a Seed controller is encrypted.

In order to limit access to a Seed controller, enable User Authentication in Advanced Menu > System Settings > Security. Security can be further enhance by placing all Seed controllers on their own network / VLAN and limiting what other devices are allowed to connect to that network.

2 Sphere

In order for Sphere to communicate with a Seed controller, the device running Sphere must be on the same IPv4 subnet as the controller. If the device running Sphere is on WiFi, the WiFi network must allow that device to access the IPv4 Ethernet subnet that the Seed controllers are on.

Sphere utilizes TCP Websockets to communicate with Seed controllers. The device it is running on must have routes to each Seed controller that it needs to communicate with. These routes must allow TCP Websocket connections and communication on port 25541.

2.1 Ports and Protocols

2.1.1 Seed-Sphere Communication

- 25541 - Websocket (TCP)
  - Port that Seed listens on to accept Sphere connections.
  - Required for Sphere to connect to a Seed controller.

2.2 Security

Data transmitted between a Seed controller and Sphere is encrypted started in v2.01.11.

3 Integrations

3.1 Cloud

Seed and Sphere also have the ability to connect remotely via the Wadsworth Cloud, a paid monthly subscription service. To connect to the Wadsworth Cloud, access to the following is needed:

- https://www.wadsworth.cloud
  - Seed synchronization, Sphere access, and frontend website gateway for managing a Cloud account.
- Port 443 Websocket (TCP)
  - Data between Seed/Sphere and the Cloud is transmitted over standard HTTPS Websocket port 443.

Cloud connections, both from Seed and Sphere, are encrypted using secure websockets. All stored Cloud data is also encrypted.

3.2 BACnet

Seed allows for BACnet read-only integration starting in v2.01.13. Sensor values, equipment states, setpoints, and alarms can be communicated between Seed controllers and BACnet routers on the same subnet.

- Port 47808 (UDP)
  - Used for read-only BACnet IP data transmission.

3.3 Predictive Weather

Seed can obtain a predictive weather forecast to proactively close outside-facing equipment like vents and fans. Controllers must have access to the external internet for this to operate. Only GPS coordinates are shared with the predictive weather provider.

- https://customer-api.open-meteo.com

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Seed



Seed is a remarkable touchscreen climate control with a user interface that makes managing complex growing environments child's play. Engineered for power; designed for ease.

Find out more

WADSWORTH
Control Systems



Seed

Climate control with accessibility and power

Seed combines the accessibility of an intuitive touchscreen interface with the expansive power of the Seed I/O input and output system, providing exact information at a glance.

BENEFITS

- Improve the yield and quality of your crop
- Increase labor and energy efficiency
- Intuitive interface accommodates beginners and experts

FEATURES

- Graphic interface provides extensive information at a glance
- Advanced humidity control
- Zone screen displays comprehensive information for each zone including:
  - Current sensor and equipment status
  - Displays explanation for equipment status including anticipated changes
  - Select view to display equipment response based on temperature or humidity
  - Quick access to graphs, setpoints and equipment settings
  - Bulk override allows user to quickly turn on or off multiple equipments
  - Zone profiles save settings for seasonal or crop transitions
- Individual alarms for each sensor
- Graph data can be viewed from weeks to minutes and any thing in-between
- View any zone at your facility, from any Seed control
- Zones in alarm are easily identified on the home screen
- View outside weather data
- Background reflects day, night, rain or snow conditions
- Adjust settings, limits, overrides and view status on individual equipment screen

NEW IN VERSION 2

- Browser-style navigation for quick access
- Easily adjust settings using sliders or direct entry
- HE Anderson Fertigation Interface
  - Configure zone-specific recipes and schedules
- Customize which zones are displayed and sensor readings within each zone
- User Profiles with three different levels of access
- User tracking system logs who made changes and when
- Influences mode allows custom equipment responses specific to your needs
- Custom programmed to include all your equipment
- View and adjust settings from the app, Sphere software or at the control
- Sensor Pools Screen allows calculated responses involving of multiple sensors including:
  - Vapor Pressure Deficit (VPD), Daily Light Integral (DLI), Wet Bulb Dry Bulb Relative Humidity
  - Allows for averaging multiple sensors over time

"Seed is so easy to use – it's plug and play."

— John McMahon, Schuyler Greens

WADSWORTH
Control Systems



Seed Sphere

Make your Seed control more powerful than ever. Seed Sphere expands Seed's capabilities and gives you a better way to see your growing world.

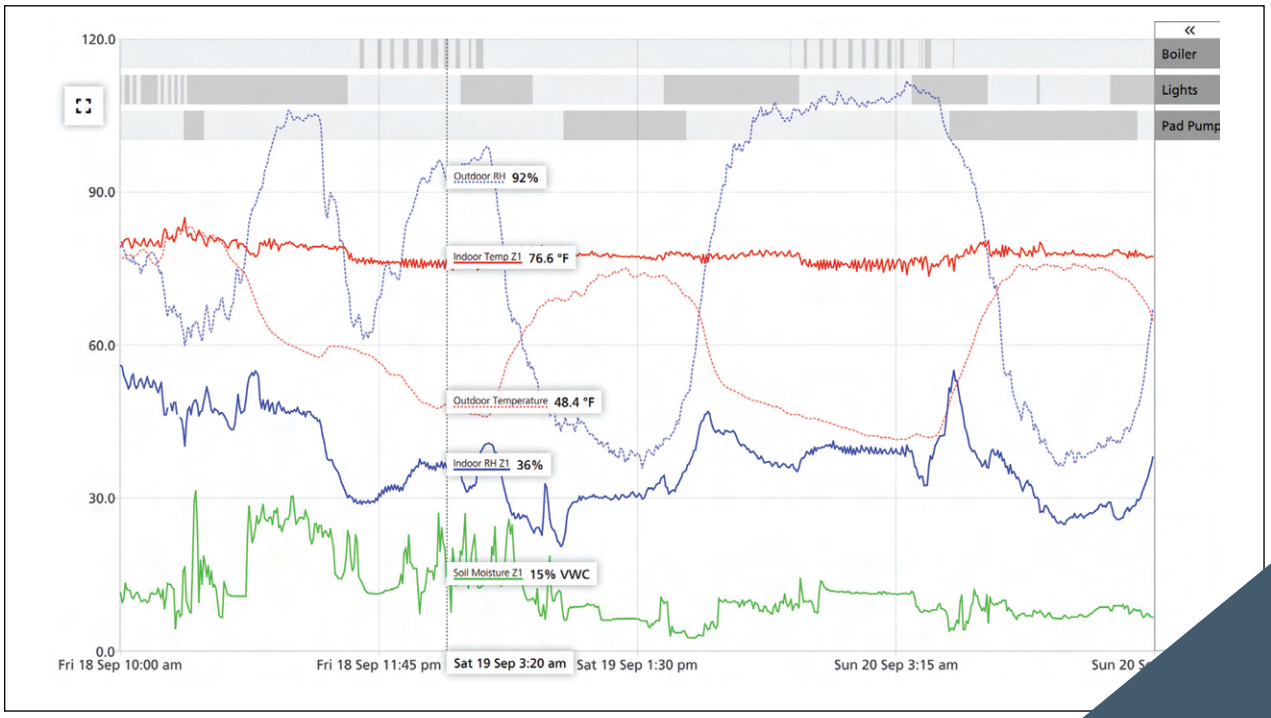
> *"I am impressed with how tightly Seed can control equipment. Wadsworth has very specific, dialed-in abilities to manage the crop"*
>
> *— Anthony Brach, Local Roots*

FEATURES

- View and change any setting using Sphere and your Mac or PC
- Back up and restore your Seed control's settings
- Enhanced graphing functionality including:
  - Quick Reports (User saved reports for easy access)
  - Ability to analyze all zones, sensors, equipment on one graph
- Export data to Excel or CSV, database, or any analysis tool
- Create multiple zone profiles for seasonal changes
- Live data readings
- Customizable alarm notifications

Requirements: Mac OSX or Windows 10 (4-bit)

QUICK REPORTS



WADSWORTH
Control Systems



Seed I/O

Flexible, strong and supportive: The perfect partner

The key to Seed's adaptability is Seed I/O. Sensors send readings to the Seed control, which sends directives to equipment based on user settings. Sensors communicate with Seed I/O inputs, equipment communicates with outputs.

> *"People think greenhouse growers don't think about the weather but it's important to review the graphs and see how the environment is responding to outside conditions."*
>
> *— John McMahon, Schuyler Greens*

FEATURES

- Ports can be assigned to any zone
- Add additional Seed I/Os after the project has been installed
- Pre-wired for easy installation
- Flexible options to meet your needs:
  Seed I/O comes in a variety of sizes and configurations
- 0-10v connections
- Lightning protection on both RS485 ports
- Overvoltage protection on all sensor inputs
- Toggle switches for manual override.
- Certified
  - Professionally designed UL Certified Industrial Control Panels
  - NEMA 4 enclosures
- Sensors
  - Temperature and humidity aspirator
  - Weather station with PAR light sensor, wind speed and direction, outdoor temperature and humidity and precipitation.
  - Temperature Probes for Boiler Supply/Return, Chiller Supply/Return, Slab/Water, Soil or Bench temperatures
  - Soil moisture
  - pH/EC & Dissolved oxygen sensors
  - CO2 & CO sensors
  - Wet bulb/Dry Bulb Relative Humidity
  - VPD & DLI Calculations
  - Light Sensors – Full Spectrum PAR

WADSWORTH
Control Systems

Wadsworth.Cloud

Bring the power of Seed control home

FEATURES

- Access the app on your iOS, Android or computer for quick and easy changes to your settings
- Continually saves your settings
- Historical data is backed up to the Cloud
- Manage multiple sites – great for consultants
- Subscription based
- Select snapshot schedules and number of users to suit your needs
- No third-party software required
- Real time alarm notifications
- System disconnect alert if your site loses connection to the Cloud
- Cloud access user management: control who can access remotely
- Track changes to settings made remotely by users

"The Cloud has been an incredible tool that gives me full access anywhere I go. Not only have I been able to make adjustments while away from work, but I've also been able to see conditions and ensure all systems are working during blizzards when our roads are closed and I can't get to the school. We've even been able to detect power outages and empty propane tanks before it was too late!"

— Eric Sawatzke
West Central Area ISD
Agriculture Instructor



Find out more

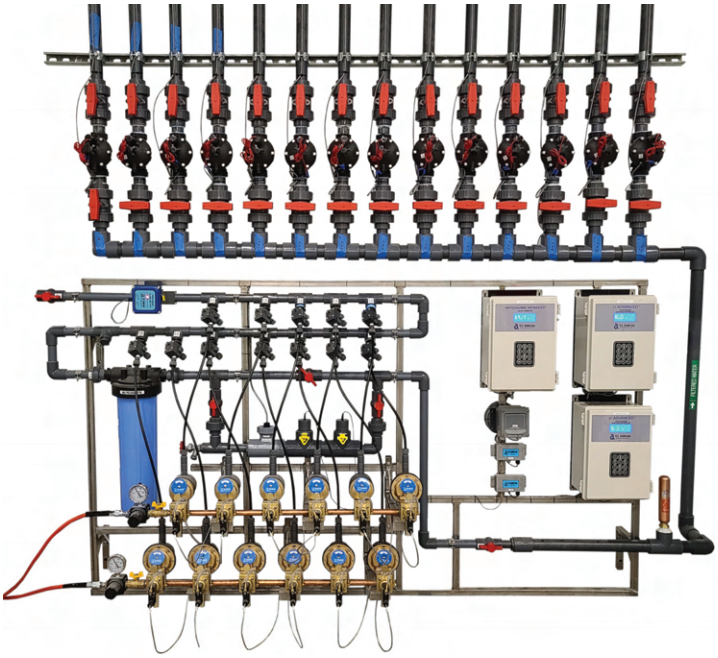
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WADSWORTH
Control Systems

Fertigation

Dynamic Duo

Wadsworth is teaming up with H.E. Anderson to simplify your crop management. Seed®, Wadsworth's innovative touchscreen control now has the capability to manage fertigation needs with Anderson's J+ Advanced Ratio:Feeder® Controller.



H.E.Anderson COMPANY
www.heanderson.com

FEATURES

- Option to connect one or multiple fertigation systems to Seed
- Valve grouping allows linking multiple valves into a variety of groups using programming
- Create unlimited recipes, including notes
- Trigger irrigation events based on a schedule, time, VPD, accumulated light, soil moisture or a combination
- Ability to run off a Fill Tank. Can be linked to irrigation for continuous topping off with a specific nutrient recipe.
- Flush valve linking allows flushing lines after an irrigation/fertigation event, reducing bio-film
- Pulse irrigation allows the grower to add pauses during irrigation events to reduce runoff
- Contact us about upgrading your existing system

WADSWORTH
Control Systems



Sensors

Seed never sleeps

More information gives Seed more power and you more control. Sensors add value to your Seed control as constant monitoring guides greenhouse climate management. The result is improved crop yield and quality, reduced energy consumption and lower environmental impact. Sensors reduce microclimates, improve pest management effectiveness and result in a consistent crop.

> *"This is the most intuitive control I've ever seen. It speaks to my generation."*
>
> — *Andy Sack*

OPTIONS

Use your equipment to its maximum potential by responding to a variety of data sets.

- Temperature – Readings inside and outside the greenhouse provide rapid measurements
- Humidity – Relative humidity readings from indoors and outside the greenhouse allow the controller to make informed decisions about how to regulate humidity
- Exclusive to Seed – high humidity sensor. Perfect for propagation of any high humidity environment with an operating range of 0-100%.
- Anemometer and wind direction – Measures wind speed and direction and data is used to determine when to open and close vents.
- Light PAR – Modulating lights – use PAR sensor at crop level to check amount of light received from the sun – and modulate lights up or down in intensity to provide proper micromole level for the crop. Reduces energy usage of the light as well as your cooling system.
- Precipitation – Combined with temperature sensor to protect structure from heavy snows, informs venting decisions
- CO2 (carbon dioxide) – Essential component of photosynthesis. Needs to be monitored for alarm conditions
- PH (acidity and alkalinity); EC (electrical conductivity); DO (dissolved oxygen) – Used in all mediums including aquaponics and deep water culture for logging, monitoring and alarms.
- Barometric Pressure – Keeps pathogens out or butterflies in by using fans to maintain a positive/negative pressure in zone.
- Soil Moisture – Irrigation trigger or, backup trigger to keep the crop from wilting
- CO (carbon monoxide) – Monitors boiler rooms for alarm status

External sensors – Wadsworth's Weather Station configured to meet your needs with temperature, humidity, wind speed and direction, and light readings. protecting the structure, from wind, poor outside conditions, vacuum and wind, if really cold, but also really cloudy, use sensor to cover crop and turn on grow lights.
Use lights as heat and use curtain to maintain temp.

Find out more

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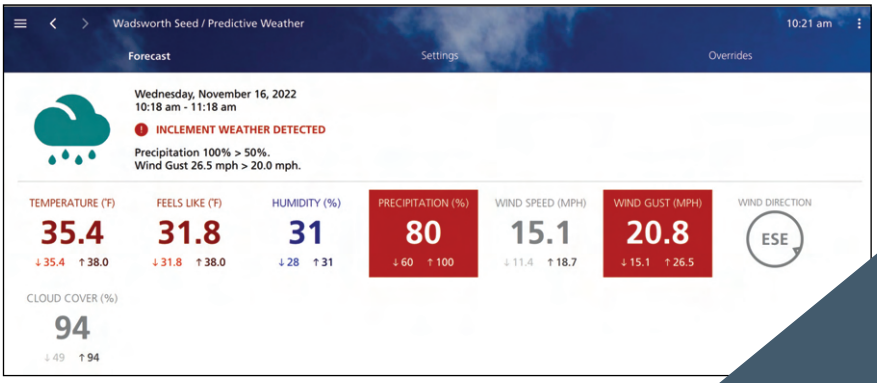
Predictive Weather

You may not be able to see into the future, but we can. Our Predictive Weather subscription makes certain your Seed control knows the storm is coming before it arrives, allowing time for equipment to make needed adjustments to protect your structure and crop. Whether you're onsite or not, Seed has your back.

> *"Predictive Weather is a great system. The basic features are streamlined and easy to learn. We wanted more control, so we added the ability to have continued airflow on the downwind side of the structure during strong winds."*
>
> *— Tyler Whitley*
> *Head Grower, Station 10*
> *Bonnie Plants*

BENEFITS AND FEATURES

- Uses an enterprise-grade weather service for accurate and reliable forecasting
- Accesses the local forecast—based on latitude/longitude—for upcoming inclement weather
- Proactively close vents, turn off fans, and adjusts other outdoor-facing equipment when inclement weather is detected
- Reacts to anticipated shifts in temperature, humidity, precipitation, wind speed, wind gusts, and cloud cover
- Backup and supplement for an on-site Weather Station, including alarm activation when needed
- Requires external internet access
- Allows you to define time span of forecast
- Alarms
  - If forecast is unavailable
  - Specific alarm for inclement weather
- Requires wadsworth cloud



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WADSWORTH
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Soil Analyzer

Introducing the Soil Analyzer, an advanced soil sensor that's a game changer for all growers.

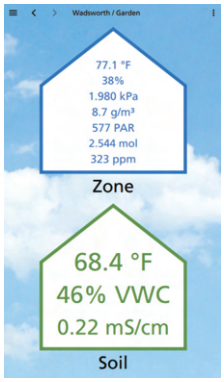


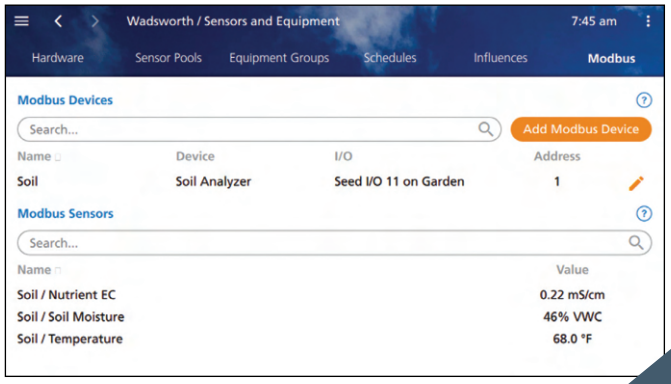
BENEFITS

- Reads soil temperature, moisture, and electrical conductivity (EC)
- Create sensor alarms to protect your plants from unforseen events
  - Temperature, soil moisture, and EC
- Sensor data can be graphed for analysis
- Adjust watering frequency and duration with the soil moisture sensor
- Monitor root zone temperature to optimize floor or bench heat settings
- View EC trends to fine tune nutrient recipes
- Readings can be pooled with other sensors, associated to equipment, used in influences, and more
- Probes connect to second com port and don't require additional sensor inputs
- Multiple Soil Analyzers can be connected through a network

REQUIREMENTS

- Seed V2 v2.01.13 or greater
- Seed I/O firmware V 3.02 with available com port
- 24VDC 0.25A power





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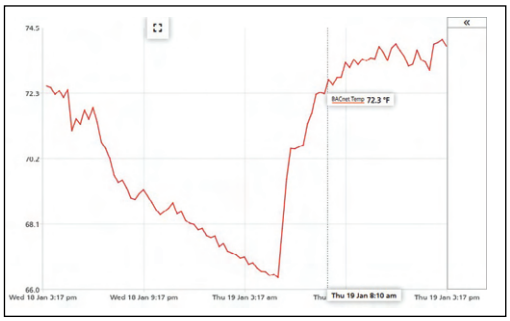
BACnet *Read-Only*

Seed and BACnet devices can now exchange information allowing you to view multiple sources through a single interface.

Seed can read external BACnet devices, and BACnet devices can view the controller's s ensors and equipment. Seed and BACnet devices must be on a shared network.

- Seed uses BACnet IP to communicate with other devices
- View properties of any BACnet device on the network
- Graph data from BACnet Analog/Binary Inputs and Outputs
- Use a BACnet sensor as a sensor in Seed
- View Seed's sensors, equipment, and setpoints over BACnet
- Receive Seed alarms over BACnet
- Integrates with building management systems (BMS)

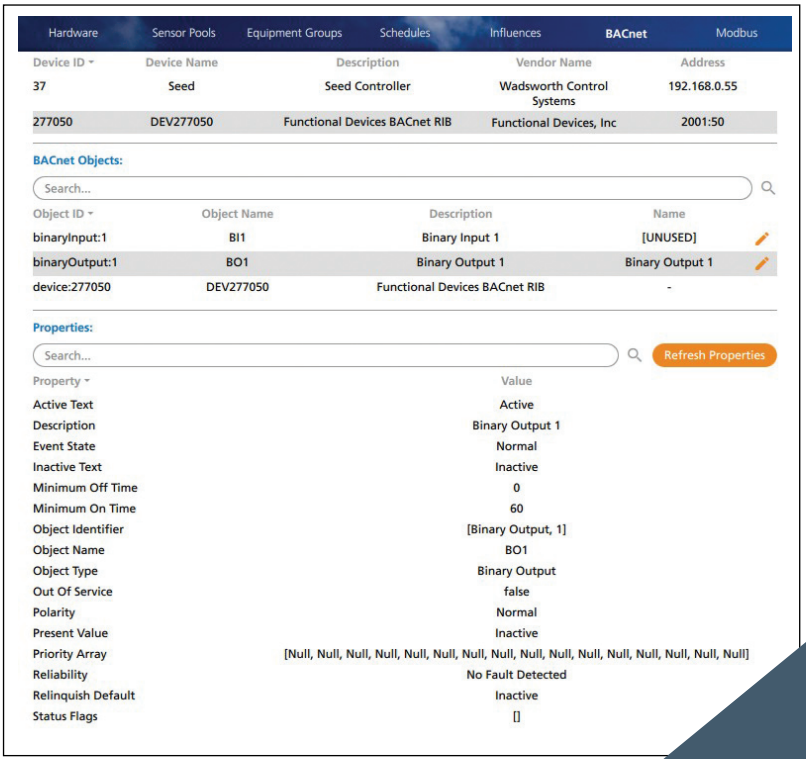
Graph of external BACnet temperature sensor



- BACnet devices can be mapped into Seed:
  - Analog Input -> Sensors
  - Binary Input -> Detector
  - Analog Output -> Modulating or 2 Relay Equipment
  - Binary Output -> 1 Relay Equipment

- Seed can be mapped to BACnet devices:
  - Sensors and Sensor Pools -> Analog Input
  - Detectors -> Binary Input
  - 1 Relay Equipment -> Binary Output
  - 2 Relay and Modulating Equipment -> Analog Output
  - Active Setpoints -> Analog Value
  - Alarms -> Multi State Inputs
  - Alarm Groups -> Notification Class

External BACnet binary output



Hardware | Sensor Pools | Equipment Groups | Schedules | Influences | **BACnet** | Modbus

Device ID	Device Name	Description	Vendor Name	Address
37	Seed	Seed Controller	Wadsworth Control Systems	192.168.0.55
277050	DEV277050	Functional Devices BACnet RIB	Functional Devices, Inc	2001:50

BACnet Objects:

Search...

Object ID	Object Name	Description	Name
binaryInput:1	BI1	Binary Input 1	[UNUSED]
binaryOutput:1	BO1	Binary Output 1	Binary Output 1
device:277050	DEV277050	Functional Devices BACnet RIB	-

Properties:

Search... Refresh Properties

Property	Value
Active Text	Active
Description	Binary Output 1
Event State	Normal
Inactive Text	Inactive
Minimum Off Time	0
Minimum On Time	60
Object Identifier	[Binary Output, 1]
Object Name	BO1
Object Type	Binary Output
Out Of Service	false
Polarity	Normal
Present Value	Inactive
Priority Array	[Null, Null, Null, Null, Null, Null, Null, Null, Null, Null, Null, Null, Null, Null, Null, Null]
Reliability	No Fault Detected
Relinquish Default	Inactive
Status Flags	[]

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Seed Configuration

Sphere



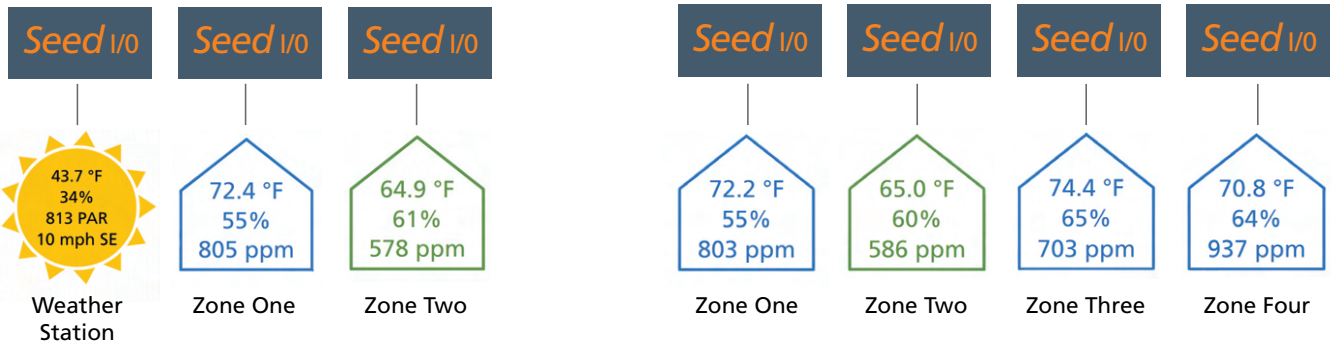
Wadsworth.Cloud





Router





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WADSWORTH
Control Systems

ThermaGlas

Multiwall Structured Polycarbonate Sheets



Applications

- Greenhouses
- Garden centers
- Other agricultural covering applications

ThermaGlas® Multi-wall Polycarbonate Sheet is designed and engineered specifically for commercial greenhouse use. ThermaGlas products are available in 4-foot or 6-foot widths in clear, or with specially formulated colors and tints. ThermaGlas offers 99.5% UV protection.

The multiwall design and light weight of the sheet enables a reduction in the cost of the supporting structure. Shatterproof polycarbonate coupled with integrated UV resistant co-extruded layer yields long service periods backed up by a 10 year limited warranty.

The cellular multi-layer structure reduces heating costs in winter while minimizing excessive heat in summer. A special coating on the bottom side eliminates condensation dripping. ThermaGlas blocks ultraviolet rays that burn plants and living tissues, and transmits only beneficial radiation.

Thermaglas

- 
-
- 

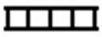
Features

- Superb thermal insulation—saves energy
- Impact resistance—virtually unbreakable
- Light weight

- Weather and UV resistant
- Low flammability (available with CC1 rating)

- Easy to work with and install using ordinary tools
- Rigid, yet capable of cold-forming to an arch
- Wide service temperature range
- 10-year limited warranty
- Available in 47-1/4″ , 48″ , 71-1/4″ and 72″ widths

Availability

Dimensions										
Product	Thickness		Rib Spacing		Standard Widths		Weight		Lengths	Colors
	mm	in.	mm	in.	mm	in.	g/m2	psf	ft.	
Twin-Wall 	4	5/32	6	~1/4	1200 1220 1810 1830 2100(1)	47.25 48 71.25 72 82.68(1)	777	0.16	24' in stock. Available up to 39' (3)	Clear Opal Bronze Solar Control
	6	1/4	6	~1/4			1300	0.27		
	8						1500	0.35		
	10						1700	0.35		
Triple-Wall 	8(1)						1700	0.35	24' in stock. Available up to 39' (2)	Clear Opal Bronze Solar Control
	10(1)						1990	0.41		
	16				1200	47.25	2670	0.55		

[1]2100mm (82.68″) wide panels not available in all thicknesses
[2]Please note that panels longer than 20′ are not recommended due to expansion and contractions and also may require a longer lead time and additional freight surcharges.

Technical Specifications

Dimensions										
Product	Thickness		Rib Spacing		Standard Widths		Weight		Lengths	Colors
	mm	in.	mm	in.	mm	in.	g/m^2	psf	ft.	

Dimensions										
Twin-Wall	4	5/32	6	~1/4	1200 1220 1810 1830 2100(1)	47.25 48 71.25 72 82.68(1)	777	0.16	24' in stock. Available up to 39' (3)	Clear Opal Bronze Solar Control
	6	1/4	6	~1/4			1300	0.27		
	8	5/16	10	~3/8			1500	0.35		
	10	3/8	10	~3/8			1700	0.35		
Triple-Wall	8[1]	5/16	20	~13/16			1700	0.35	24' in stock. Available up to 39' (2)	Clear Opal Bronze Solar Control
	10[1]	3/8	20	~13/16			1990	0.41		
	16	5/8	20	~13/16	1200	47.25	2670	0.55		

[1]2100mm (82.68″) wide panels not available in all thicknesses.

[2] Please note that panels longer than 20′ are not recommended due to expansion and contractions and also may require a longer lead time and additional freight surcharges.

Thermal		Value		Test Method
No. of Layers	Panel Thickness	R-Factor	U-Factor	
Twin-Wall	4mm	1.49	0.67	ASTM C-177
	6mm	1.62	0.62	
	8mm	1.72	0.58	
	10mm	1.89	0.53	
Triple-Wall	8mm	1.99	0.50	
	10mm	2.08	0.47	
	16mm	2.36	0.42	
Optimal Service Temperature Range		-40° F to +248° F (-40° C to ± 120° C)		ASTM D-648
Maximum Service Temperature		270° F (132° C)		
Minimum Service Temperature		- 103° F (-75° C)		
Heat Deflection Temperature (Load: 264 PS)		275° F		

Thermal	Value	Test Method
VICAT Softening Temperature (Load: 2.2 lb.)	300° F	ASTM D-1525
Coefficient of Linear Thermal Expansion	3.6 x 10(5)in./in.°F	ASTM D-696
Thermal Conductivity (BTU-in/hr-ft2- °F)	1.45	ASTM C-177

Mechanical		
Tensile Strength At Yield (0.4 in./min.)	9,400 psi	ASTM D-638
Tensile Strength At Break (0.4 in./min.)	8,800 psi	
Elongation At Yield (0.4 in./min.)	6%	
Elongation At Break (0.4 in./min.)	> 90%	
Tensile Modulus of Elasticity (0.4 in./min.)	350,000 psi	
Flexural Modulus (0.052 in./min.)	380,000 psi	ASTM D-790
Flexural Strength At Yield	14,500 psi	ASTM D-790
Rockwell Hardness	118 R Scale	ASTM D-785
Density	75 lb/ft(3)	ASTM D-792
Specific Gravity	1.2 g/cc	ASTM D-792

Optical								
Property	Test Method	Panel Thickness	Clear		White Opal		Gray	
			Twin Wall	Triple Wall	Twin Wall	Triple Wall	Twin Wall	Triple Wall
PAR Light Transmission (see next page for more information about PAR Light)	ASTM D-1003	4mm	82%		30		35%	
		6mm	80%		20		35%	
		8mm	80%	76%	45%	45%	35%	35%
		10mm	79%	76%	30%	45%	35%	35%

Optical					
		16mm	76%	35%	35%
Refractive Index	ASTM D-542	All thicknesses	1.59		
Yellowness Index	ASTM D-1925	All thicknesses	< 1		

Fire / Ignition / Smoke	Value	Test Method
Flammability Rating	CC1 †	ASTM D-635-74
Self Ignition	1000°F	ASTM D1929
Flash Ignition	930°F	ASTM D1929
Smoke Density (%)	8.6%	ASTM D2843
Smoke Developed	350 (Class A)	ASTM E-84
Flame Spread	15 (Class A)	ASTM E-84
Vertical Burning	UL94-5VA	UL94-1998

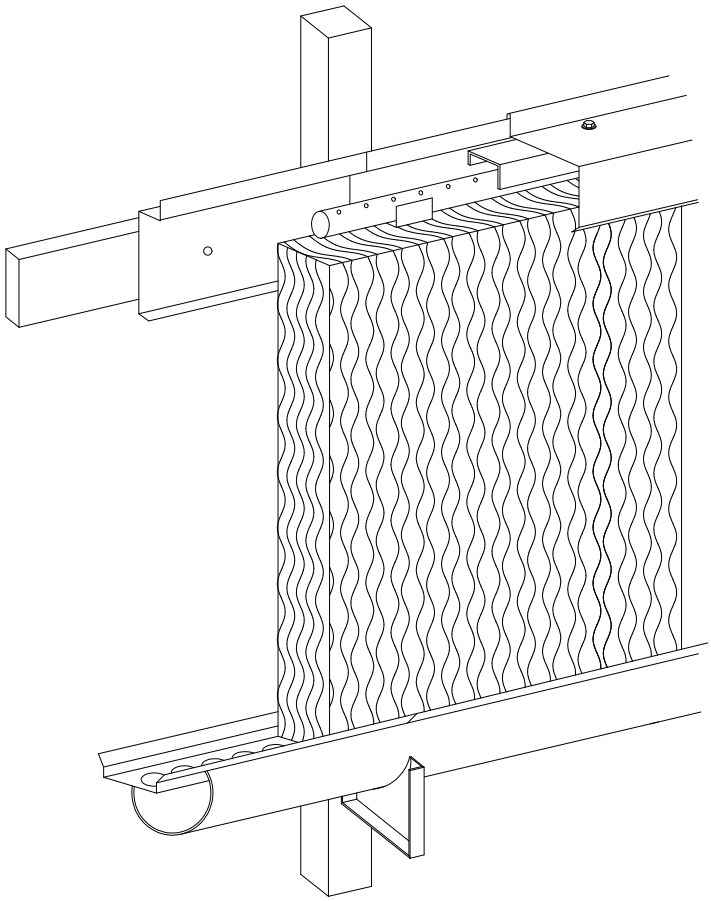
INSTALLATION AND OPERATION INSTRUCTIONS

FOR AMERICAN COOLAIR'S

STANDARD (COVERED) TOP PVC

AND

OPEN TOP PVC
EVAP-PAD COOLING SYSTEMS



AMERICAN Coolair®

AMERICAN COOLAIR CORPORATION
P.O. BOX 2300 Jacksonville, FL 32203
Phone: 904-389-3646 FAX: 904-387-3449

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These instructions can be found at www.coolair.com.

Please read instruction manual completely before starting construction.

I. CONCEPT OF EVAPORATIVE COOLING

To offset periods of extreme temperature that affect in-house environments, and therefore production, Coolair evaporative cooling systems are used with outstanding success. The benefits of evaporative pad cooling are obtained by moving large quantities of air through water-saturated pads. The resulting evaporation of water will lower the air temperature 10 to 25 degrees. This method of cooling can provide dependable relief from heat stresses in periods of hot weather. Suited for all geographic locations, a Coolair Evap-Pad System delivers the greatest economic benefits in areas where higher temperatures during longer periods of time are normal.

II. RECOMMENDED TOOLS

The following is a list of tools needed for the installation of your Coolair Evap-Pad System.

Tape Measure	Hack Saw
Chalk Line	Jigsaw or Circular Saw
Level	Tin Snips
Drill with 5/32” Bit and 7/8” Bit (or Hole Saw)	3/8” and 5/16” Sockets and Drive
2” Hole Saw (for Submersible Systems)	2-1/2” Hole Saw (for Centrifugal Systems)
Caulk Gun	1-1/2” or larger PVC Pipe Cutter (recommended)

III. PARTS LIST

A. Your Coolair Evap-Pad System consists of:

1. A water distribution and return system complete with the correct number of the following parts: (Quantity of some parts depends on size of system.)

1-1/2” PVC Distribution Pipe	PVC Pipe Cement
1-1/2” PVC Pipe	Distribution Pipe Supports
1-1/2” PVC Ball Valve	Spray Deflectors
1-1/2” PVC 90° Elbow	Covers
8” PVC Trough Pipe	Back Plates
8” PVC Trough End Cap	End Caps
12” x 12” x 8” PVC Sump Tee (60” long)	Trough Hangers
12” PVC Sump End Caps	Various Fasteners
Pad Spacers (for 4” thick systems only)	Drip Pans
Pad Retainers (for 4” thick 5’ and 6’ systems only)	
Drip Pan Extension (Appendix B)	

2. A Plumbing Kit that consists of the following accessories:

1/2” Brass Float Valve	Float Valve Fasteners
1/4” x 4” Threaded Float Rod	4” x 5” Oval Float
3/4” Hose Adaptor	1-1/2” Couplings
1-1/2” Ball Valve	1-1/2” In-Line Filter with End Cap
1-1/2” x 1-1/2” x 3/4” Tee	3/4” Hose Bibb
Threaded Pump Adapters	Adaptaflex Grommet (centrifugal pumps only)

3. A Center Mounting Kit (for systems 30’ and longer without Brownout Light Kit only) with the following PVC accessories:

8” x 8” x 8” Tee	1-1/2” 90° Elbow
8” Trough End Cap	1-1/2” 45° Elbow
1-1/2” x 1-1/2” x 1-1/2” Tee	1-1/2” Ball Valve

4. A Header Kit (for systems 55’ and longer) with the following PVC parts:

1-1/2” PVC Pipe	1-1/2” 90° Elbows
1-1/2” x 1-1/2” x 1-1/2” Tees	1-1/2” Couplings
Pipe Support Brackets	Cable Ties

5. Evaporative Cooling Pads

6. Sump Pump

Note: Depending on type of system, not all parts may be used.

B. Parts required for the Evap-Pad System, but that are not supplied by Coolair consist of:

1. Framing Materials

2. Water Supply to Float Valve

IV. PAD LOCATION IN BUILDING

For greenhouse applications, the pads' midpoint should be centered on the crops to be cooled. The pads should be located on one end of the building and the fans on the other end, except in wide greenhouses where the pads should be on one side and the fans on the opposite side.

For poultry or livestock applications, the top of the pads should be at the highest level at which cooling is desired. The pads should be located on one end of the building except in cases where the resulting air velocity exceeds the comfort level for the animals being housed. In these cases, the pads should be on both sides at both ends of the house, with the fans on both sides in the middle. See Figure 1.

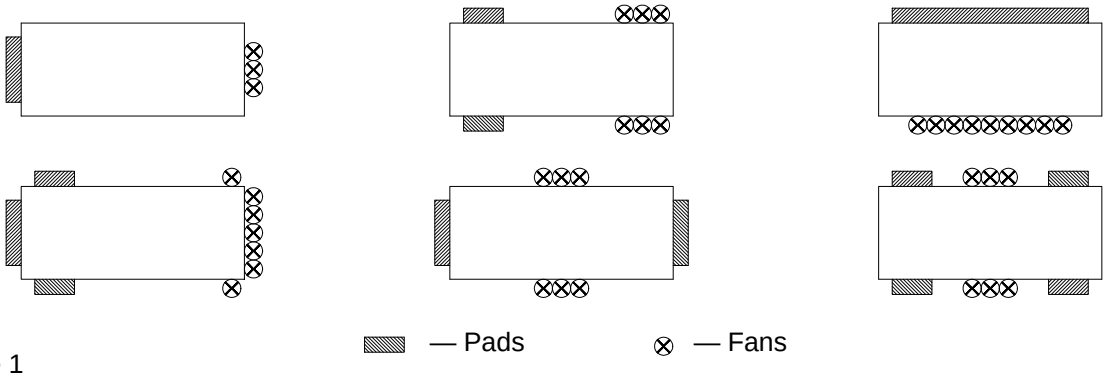


Figure 1

Many other designs are acceptable. Contact your Coolair representative for recommendations.

V. INSTALLATION PROCEDURES

The desired opening should be the ordered pad height plus 1". For example, if you ordered a 45' system which is 5' tall, then your opening would be 45' x 61". See Figure 2. This opening should have 4 x 4 vertical stringers on 5 foot centers, and a minimum 2 x 6 horizontal upper stringer, all made of water-resistant wood. When fastened to a metal building or greenhouse, the opening should be framed with angle or Z support of sufficient strength to support a maximum of 35 pounds per linear foot of pad with 4" pad or 45 pounds per linear foot of pad for 6" pad systems. There should be a minimum of 6" clearance from the top of the upper stringer to any obstruction that would hinder the removal of the pipe cover to perform routine maintenance such as clearing clogged holes in the pipe. There must also be a minimum of 6" below the opening for proper installation of the collection trough. Also, the sump must sit a minimum of 20" below the opening. For systems 5' to 25' long, the sump will be located at the end of the system. For systems 30' to 110' long, the sump will be located at the center of the system. NOTE: for systems using the *Brown Out* light control kit, the sump will be located at the end of the system for all lengths. For standard systems 55' or longer and Brown Out systems 30' and longer, a header pipe must be used — See Figures 20 - 22 on Pages 16 & 17.

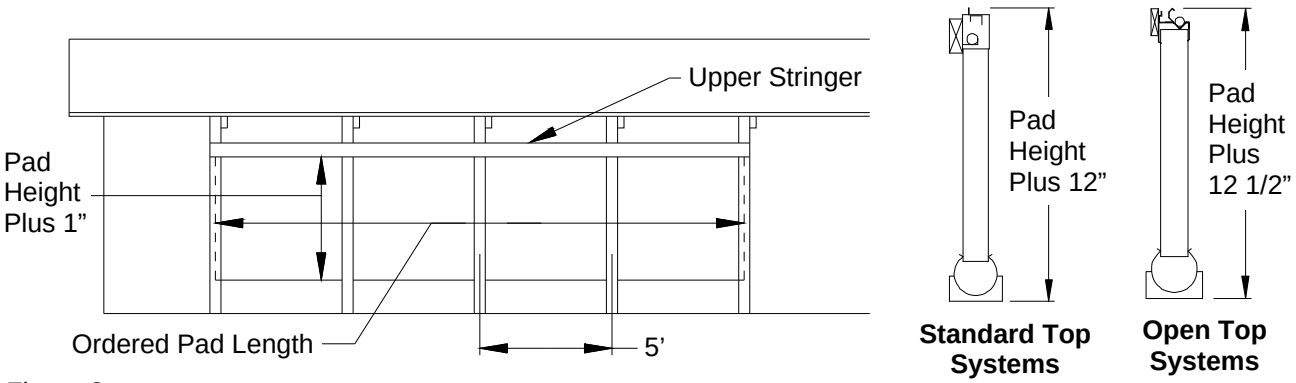


Figure 2

A. INSTALLATION OF VERTICAL STRINGERS

To properly support the Evap-Pad System, vertical 4 x 4 stringers should be installed in the opening. These stringers should be placed at both ends of the system, and centered every 5 feet along the opening. Stringers should be securely fastened (preferably to the roof trusses) at the top and firmly seated in the ground (or otherwise supported) at the bottom. For systems using the *Brown Out* light control kit, additional vertical stringer stubs must be installed in between the stringers as shown in Figure 3.

B. INSTALLATION OF UPPER STRINGER AND TROUGH HANGERS

Locate the Evap-Pad System vertically as determined by the specific use of the system. The bottom of the upper stringer should be located flush with the top of the opening. Once the stringer location has been determined, mark this position on one of the end vertical stringers. Then, locate a corresponding level point on the opposite end stringer. Use the chalk line to mark all remaining stringers, and install the upper stringer. Next, measure down from the bottom of the upper stringer the system pad height plus 1", and mark this point on both end stringers. These points should be at the same height as the bottom of the opening. Again, mark each stringer with the chalk line. Place the trough hanger on each stringer so that the top of the hanger is on the chalk line. Mark the locations of the holes in the hanger and drill pilot holes. Install a trough hanger on each vertical stringer (and each stringer stub, if applicable) using the rubber grommeted lag bolts. See Figure 3.

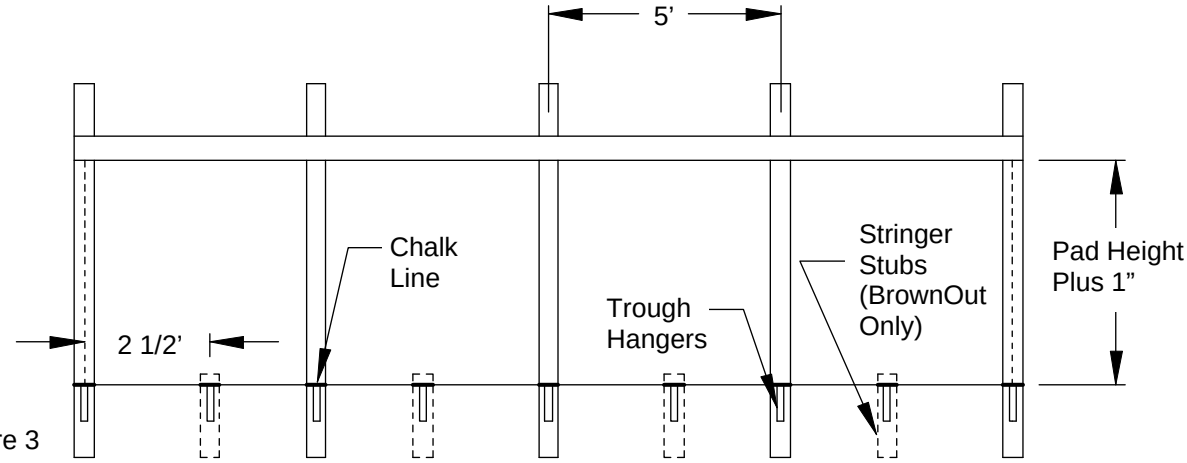
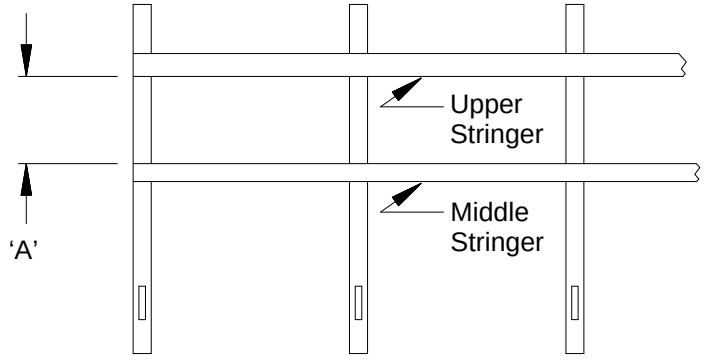


Figure 3

C. INSTALLATION OF THE MIDDLE STRINGER

When 5, 6, 7 or 8 foot pads are used, it may be necessary to install a 1 x 4 middle stringer. This stringer should parallel the upper stringer. All 7' and 8' systems require a middle stringer, but only the 5' and 6' systems with 4" pads require a middle stringer. Figure 4 shows the position of the top of this stringer with respect to the bottom of the upper stringer.



Pad Thickness	Pad Height 'A'	5'	6'	7'	8'
	4"	25"	31"	31"	43"
	6"	N/A	N/A	31"	43"

Figure 4

D. TROUGH CONSTRUCTION

For systems 5’ to 25’ long (and Brown Out systems 5’ to 110’) — The sump will be located at the end of the system. Using the PVC cement, glue all the 8” pipe sections together, including the additional 5 ft length of 8” PVC found in the Sump Kit. Apply the cement about 1-3 inches wide around the standard end of each length of pipe, and slip it about 3-4 inches into the “bell” end of the next pipe. **Let all sections of the pipe dry thoroughly**. Next, measure a length of this pipe equal to the system length plus about 18” - 30”. This will be the length of the trough. (Actual trough length will depend on the location of the sump.) Before cutting the pipe to length, check the location of the trough joints against the position of the trough hangers to make sure they do not coincide. If they do, change the location of the cut marks. Using a saw, cut off the excess pipe and discard. Now glue the 8” pipe cap onto the end of the pipe opposite the sump end. Place the trough on the trough hangers so that the open end faces the proposed sump location. The end cap on the opposite end should clear the last hanger.

For systems 30’ to 110’ long — The sump will be located in the center of the system, assuring an adequate water supply throughout the entire system. Equal lengths of 8” pipe will be glued on each side of the 8” tee. Note that there is an additional 5’ length of PVC that may be found in the Sump Kit. Using the PVC cement, glue the 8” pipe sections together and to the 8” tee. Apply the cement about 1-3 inches wide around the standard end of each length of pipe, and slip it about 3-4 inches into the “bell” end of the next pipe. **Let all sections of the pipe dry thoroughly**. Next, measure a length of this pipe equal to the system length plus about 18”. This will be the length of the trough. Before cutting the pipe to length, check the location of the trough joints and the tee against the position of the trough hangers to make sure they do not coincide. If they do, change the location of the cut marks. Using a saw, cut off the excess pipe. Save it to connect the 8” tee to the sump. Now glue the 8” pipe caps onto the ends of the 8” pipes. Place the trough on the trough hangers so that the open end of the tee faces the proposed center sump location. The end caps on the 8” pipes should clear the end trough hangers.

NOTE: All cemented pipe joints must be thoroughly cured (dry and hard) before performing the next step.

Next, two slots will need to be cut in the pipe. Mark a chalk line that is the exact length of the system along the length of the pipe. This line should be aligned with the wall opening. Using a jig saw or circular saw, cut along this line, making sure not to cut beyond either end of the mark. Locate the position of the next slot by measuring circumferentially along the outside of the pipe. The second slot will be of the same length, parallel to the first and located 7-5/8” away from the first. Measure and mark the second slot with the chalk line and cut the second slot like the first. When cutting the slots, it may be easiest to rotate the pipe so that the slot line is on the top. Finish making the trough opening by marking a line connecting the ends of the slots and cut with a saw. Remove the cut out piece of PVC and deburr the entire pipe. Make sure to remove all PVC chips from the trough when finished. Figure 5 shows the trough.

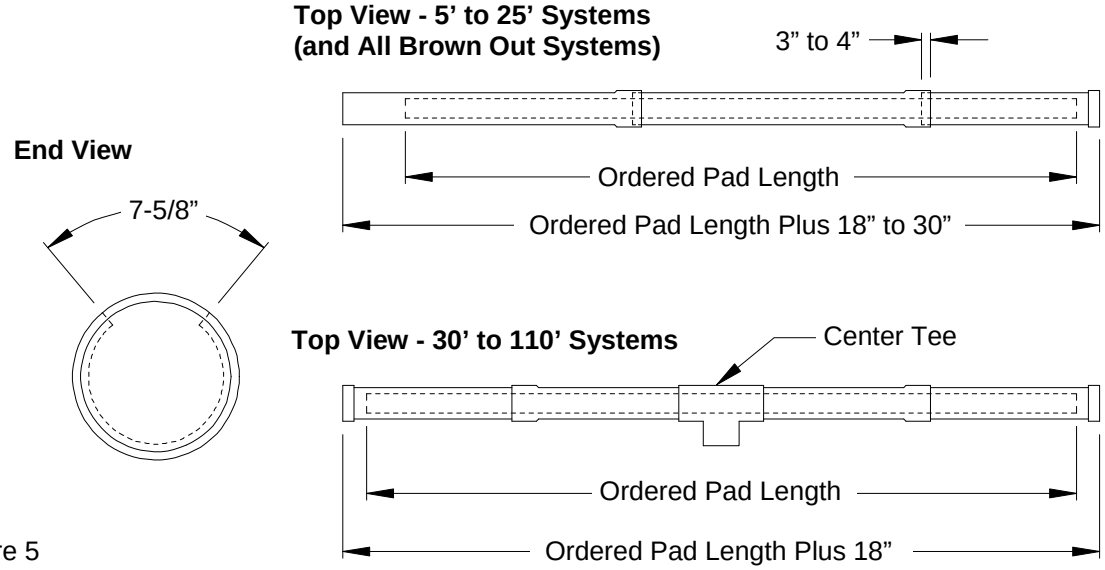


Figure 5

E. SUMP CONSTRUCTION

The sump consists of a 60” long tee. It is generally recommended to use the full length of the tee as a sump. Glue one of the 12” PVC end caps to the longer 12” section. **Do not glue the other end cap to the upper piece**, as it will be necessary to remove this cap for inspection and maintenance of the sump. When the sump is properly placed, the 8” tee section should be level and in line with the trough.

Next, the float valve must be installed. First, adjust the float valve rod joint so that the rod receptacle is just below horizontal when the valve is closed as shown in Figure 6A. Next, locate the centerline of the 8” section of the tee and mark a point 3-3/4” above this centerline. Using a 7/8” drill bit, drill a hole centered on this point, and deburr. Insert the float valve by pushing the threaded end from the inside of the tee out. Fasten the valve using the washer and nut provided. Thread the oval float onto the 4” float rod, and then thread the rod/float into the valve. A 3/4” garden hose adaptor is included, and may be fastened onto the threaded end of the valve, if desired.

To insure that the water level in the trough never reaches the bottom of the pads, it will be necessary to drill an overflow hole in the tee. Using the 7/8” bit, mark and drill a hole in the tee centered at 1-13/16” up from the centerline of the 8” section of the tee. Figure 6 shows the sump hole locations. If you are using a bit that is not 7/8” in diameter, make sure the bottom of the overflow hole is exactly 1-3/8” up from the centerline of the 8” section of the tee. After all holes have been drilled, deburr them, and make sure to remove all PVC chips from the inside of the sump.

Now, place the sump in position so that its 8” tee section is exactly aligned with the trough (for end sump systems) or with the 8” x 8” x 8” tee (for center sump systems). For a center sump system, use the piece of 8” pipe cut from the trough to connect the sump tee to the trough tee. Apply PVC cement to the end of the trough (and the connector piece for a center sump), and slide the pieces together. Make sure the opening in the trough is level and aligned with the wall opening when the cement dries.

After the sump and trough have been assembled, you will need to create an air-tight seal between the stringers and the trough. This may be done by installing a 1 X 2 on top of the trough hangers between the trough and the stringers. Once this is done, caulk the seam between the 1 X 2 and the trough. See Figure 7.

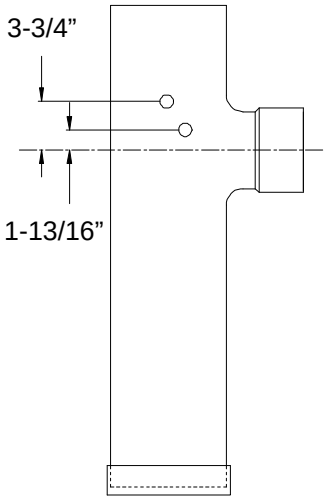


Figure 6

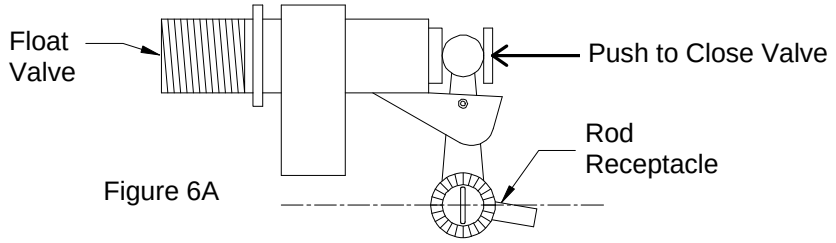


Figure 6A

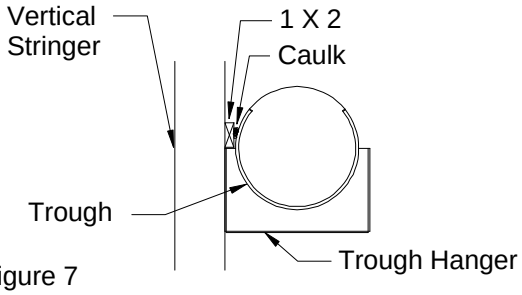


Figure 7

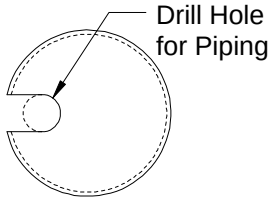


Figure 8

To allow for piping into and out of the sump, a slot must be made in the remaining 12” PVC end cap. For centrifugal systems, drill a 2” diameter hole in the cap near the edge. For submersible systems, drill a hole just large enough for the supply hose. Then with a jigsaw or hack saw, cut from the edges of this hole radially out of the cap. See Figure 8.

NOTE: Instructions 'F' through 'I' (with the **CT** label) on Pages 8 - 10 refer to **Covered Top Systems** only. If you are installing an **Open Top System**, please skip to Page 11 where the Open Top installation continues with Instruction 'J.'

F. (**CT**) INSTALLATION OF THE PIPE COVER BACK PLATE AND PIPE SUPPORT

For ease of installation, mark a point 1-1/2" up from the bottom of the upper stringer. Do this at both ends of the system. Next, mark a chalk line through the two points. This indicates the location of the pipe cover back plate mounting holes. Sight through the pre-punched mounting holes in the back plate and line up the chalk line through them. This puts the support at the correct mounting height. Secure in place using the rubber grommeted lag bolts. See Figure 9.

Install the pipe support brackets on the pipe cover back plate using the holes provided in the center of each 5' length of back plate. Install the pipe cover back plate and pipe supports for the entire length of the system. Caulk the joints between all back plates and any unused holes in the back plates to help prevent water leaking to the stringer.

G. (**CT**) INSTALLATION OF THE DISTRIBUTION PIPE

Note: **If you are installing the Evap-Pad System on the inside of your building, refer now to Appendix A on Page 19.**

To install the pipe, place a 10 foot section on top of the pipe support with the metered holes pointing at approximately the 1 o'clock position for standard installation when viewed from the end. This position is necessary to provide proper water distribution. Figure 10 shows the proper positioning of the distribution pipe. Continue joining pipe sections together, placing the standard end of one pipe into the "bell" end of the next. The connections do not need to be cemented, but should be pushed together tightly. For center pump systems, a 1-1/2" x 1-1/2" x 1-1/2" tee needs to be put into the middle of the system. Position the tee so that the open end is horizontal, facing away from the pipe cover back plate. See Figure 18 or 20 for piping details.

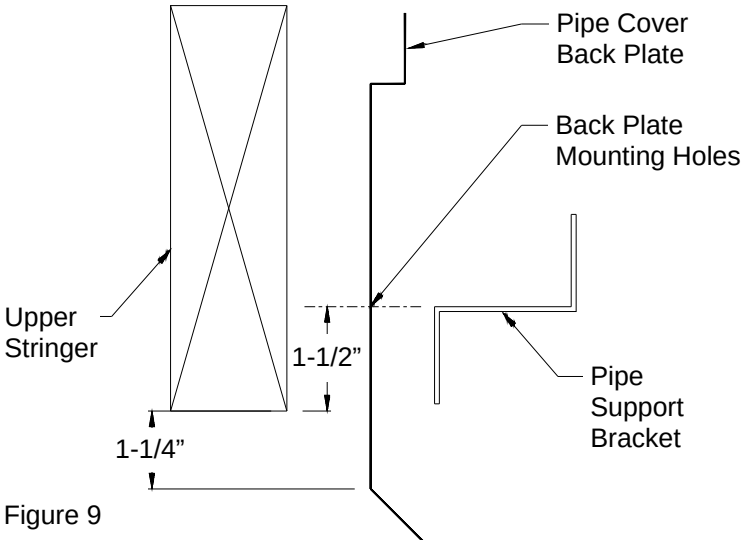


Figure 9

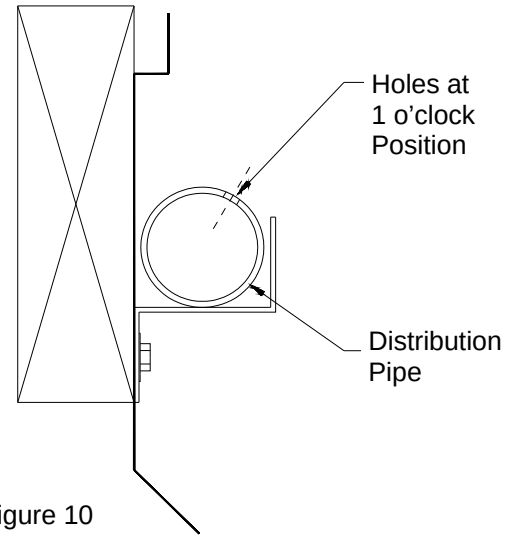


Figure 10

I. DRIP PAN AND PAD INSTALLATION - See Appendix B for Drip Pan with Extended Lip

The evaporative cooling pads can now be placed onto the assembled trough. First, place the 5' drip pan sections the length of the trough. The drip pans will act as a seat for the pads. When using 4" pads, it will be necessary to use the pad spacers to insure a secure fit. To do this, place the pad in the drip pan, sliding it to the rear of the pan. Then, insert the spacers in front of the pad. See Figure 11.

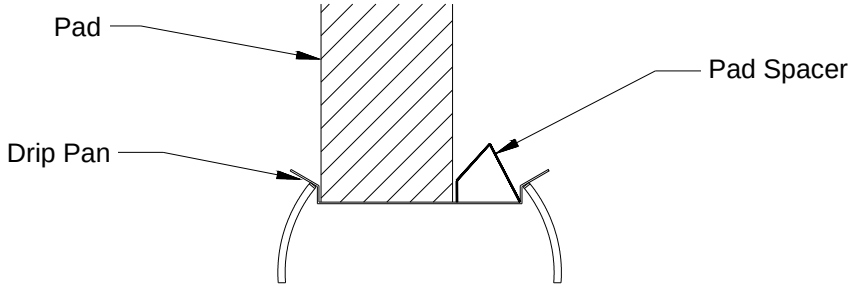


Figure 11

If the system is 5 or 6 feet tall and 4” thick, a pad retainer is used to prevent the pads from bowing. Place a pad into position on the drip pan. Set the U-shaped end of the pad retainer over the middle stringer. Next, slide it onto the pad. Now install the next pad and install another pad retainer. Continue until the system is complete. See Figure 12.

For systems 7 to 10 feet tall, please refer to Coolair’s *Double Stack PVC Systems* brochure (Form 940-46) and installation instructions (Form 940-56).

Table 1

Pad Size	'B'
4"	1-3/8"
6"	2-1/4"

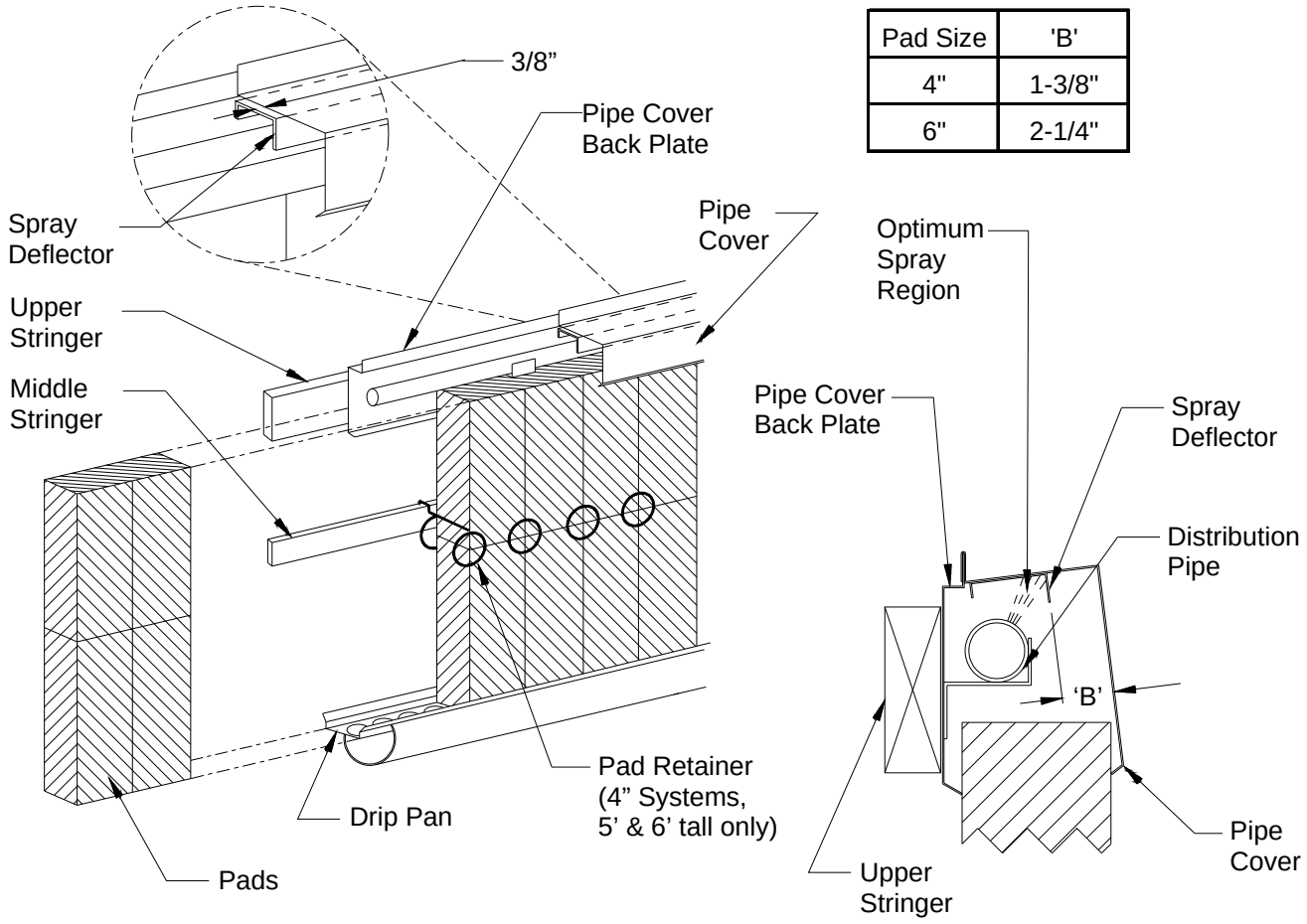


Figure 12

Note: For installation on the inside of a building, the spray deflector should be rotated 180° so that the long leg of the channel is on the side toward the upper stringer, opposite of what is shown. See Appendix A, Figure A2. Also, see Appendix A, Table A1 for appropriate ‘B’ dimensions.

I. (**CT**) PIPE COVER INSTALLATIONS

In the pipe distribution parts kit you will find channel shaped 5' pieces of aluminum. These are the full length spray deflectors to be fastened on to the pipe covers. Fasten these spray deflectors on the pipe cover with the self-drilling screws provided (see Table 1 or A1 for dimensions). The spray deflectors lap the joint of the pipe cover 3/8" to prevent leakage at the joint as well as to direct the water onto the center of the pad. Figure 12 shows this configuration. The pipe covers are installed by slipping them onto the top flange of the back plate. For center pump systems, it will be necessary to notch a slot in the front of the center pipe cover to allow piping from the sump to be connected to the tee in the distribution pipe. See Figure 14 or 16 for details.

Next, the end caps are to be installed. Two different sets of end caps are supplied. Use the pair that has the pre-punched 2-5/16" diameter holes nearest the mounting flange. They mount flush with the end of both the back plates and the pipe covers; one end cap at each end of the system. Put the distribution pipe through the end caps and secure them to the upper stringer using rubber grommeted lag bolts. The end caps may be trimmed if desired. Caulk the opening in the end caps to prevent water from leaking out the end.

NOTE: Skip to Page 14, Instruction 'P' to continue installation.

NOTE: Instructions 'J' through 'O' (with the **OT** label) on Pages 11 - 13 refer to **Open Top Systems** only. If you are installing an **Covered Top System**, please refer to Page 8 for system installation instructions

J. (**OT**) INSTALLATION OF THE BACK PLATES AND PIPE SUPPORTS

For ease of installation, mark a point 1-1/2" up from the bottom of the upper stringer. Do this at both ends of the system. Next, mark a chalk line through the two points. This indicates the location of the back plate mounting holes. Sight through the 6 pre-punched mounting holes in each back plate and line up the chalk line through them. This puts the back plate and pipe support at the correct mounting height. Secure in place using the rubber grommeted lag bolts. See Figure 13. Caulk the joints between all back plates to help prevent water leaking to the stringer.

The pipe supports can now be installed onto the back plates. Use the pipe supports shown in Figure 13. All holes are pre-punched. The two pipe supports on the very ends of the system mount so that they are flush with the end of the first and last back plates. The remainder of the pipe supports are to be installed so that they span each joint where the back plates butt up to each other. Secure in place using the rubber grommeted lag bolts. Caulk any unused holes in the back plates to help prevent water leaking to the stringer.

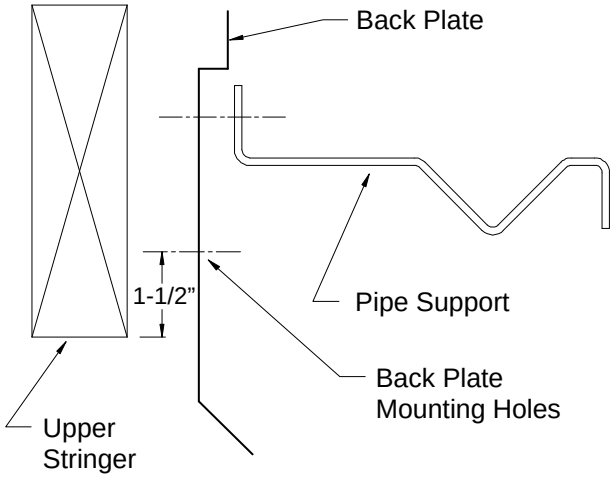


Figure 13

K. (**OT**) INSTALLATION OF THE SPRAY DEFLECTOR ASSEMBLIES AND JOINT COVERS

Next, the spray deflector assemblies are to be mounted to the top of the pipe supports. Each end of a spray deflector assembly overlaps one half of the pipe support that it attaches to, except at the ends of the system, where the entire pipe support is overlapped. Use the 1/4" bolts and nuts provided, but do not tighten the hardware yet. At each joint where the spray deflector assemblies butt up to one another, a joint cover will be installed. With the spray deflector hardware loose, slightly lift up two adjacent spray deflector assemblies and slip a joint cover under them, nesting the joint cover on the inside of the two spray deflector assemblies. See Figure 14. Repeat for all of the joints and then tighten the hardware securely.

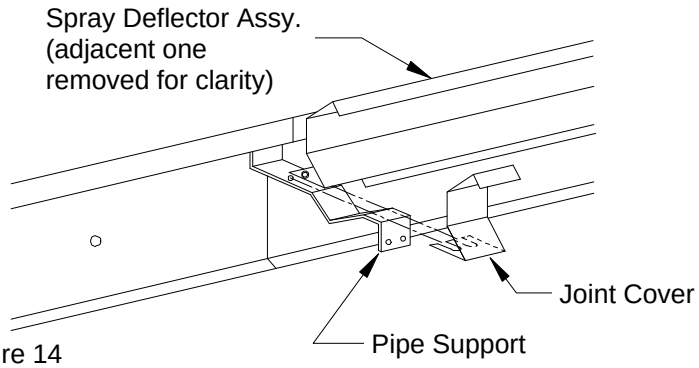


Figure 14

L. (**OT**) INSTALLATION OF THE DISTRIBUTION PIPE

To install the pipe, place a 10 foot section on top of the pipe support with the metered holes pointing at the 11 o'clock position when viewed from the end. This position is necessary to provide proper water distribution. Figure 15 shows the proper positioning of the distribution pipe. Continue joining pipe sections together, placing the standard end of one pipe into the “bell” end of the next. The connections do not need to be cemented, but should be pushed together tightly. For center pump systems, a 1-1/2” x 1-1/2” x 1-1/2” tee needs to be put into the middle of the system. It will need to angle up at 45° to clear the front cover. See Figure 18 or 20 for piping details.

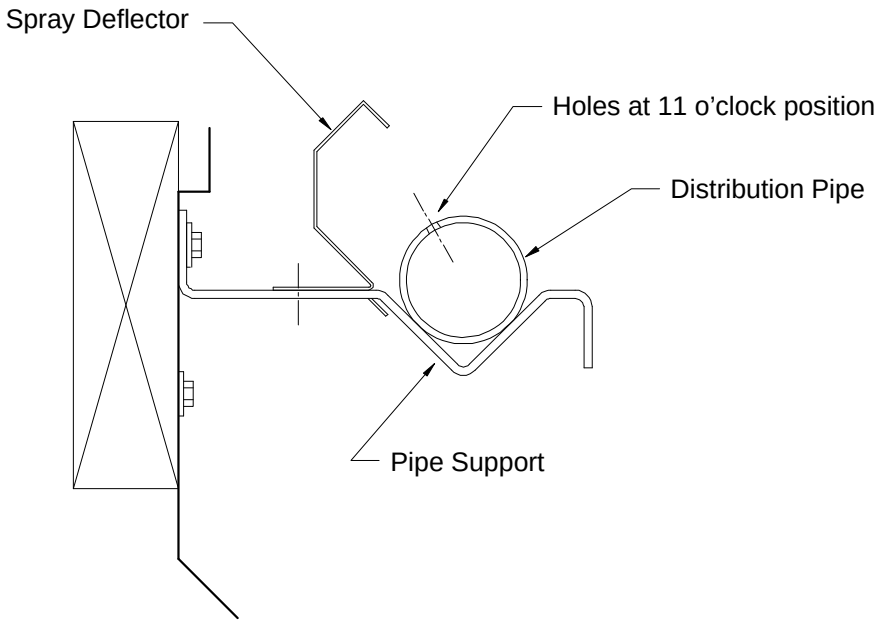


Figure 15

M. (**OT**) INSTALLATION OF THE DRIP PANS AND EVAPORATIVE PADS - See Appendix B for Drip Pan with Extended Lip

The evaporative cooling pads can now be placed onto the assembled trough. First, place the 5’ drip pan sections the length of the trough. The drip pans will act as a seat for the pads.

If the system is 6 feet high or shorter, just place the pads onto the drip pans, sliding the pads up against one another.

If the system is 7 or 8 feet tall, a pad retainer is used at each intersection of four pads to prevent them from separating. Place a bottom pad (4 ft. tall) into position on the drip pan. Next, set the top pad on top of the bottom pad. Slip a pad retainer onto the middle stringer and slide it over the joint of the two pads. Now install two more pads, sliding them into the rings of the already installed pad retainer. Repeat this procedure for the entire length of the system. See Figure 16.

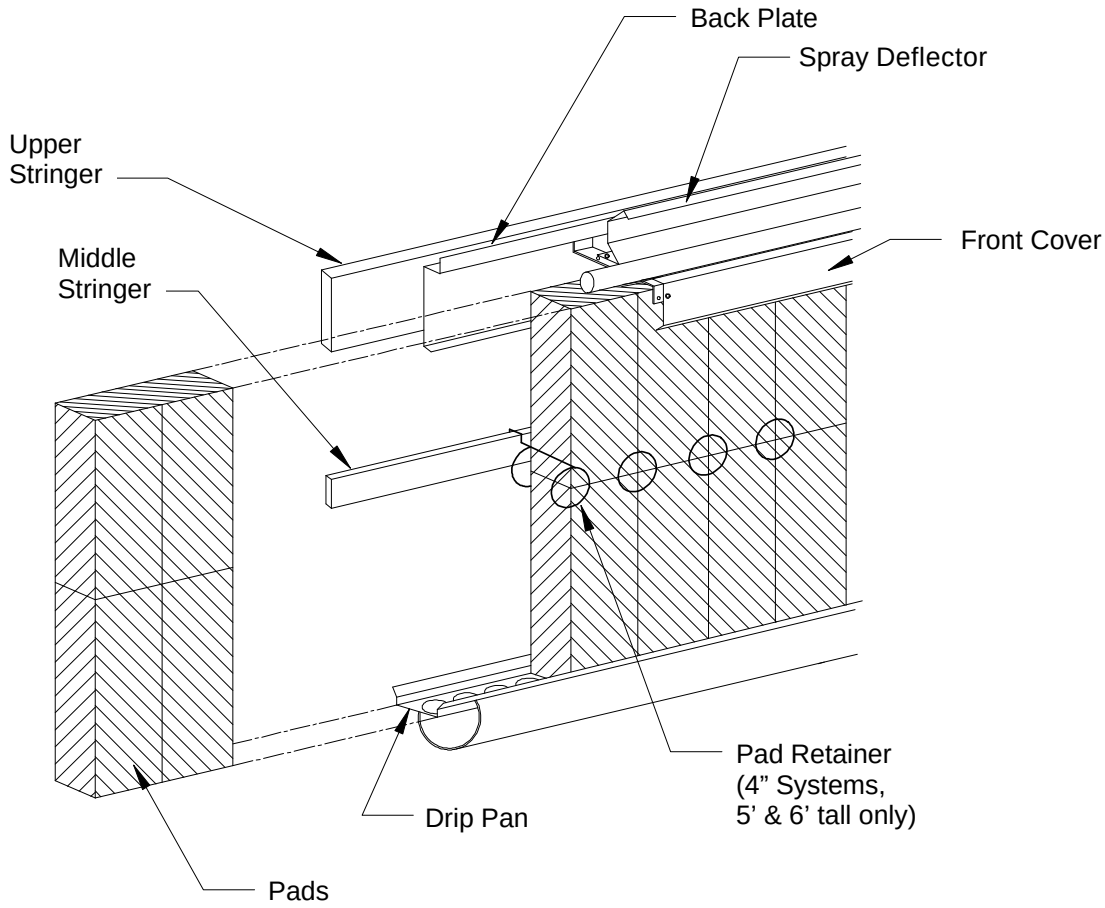


Figure 16

N. (**OT**) INSTALLATION OF THE FRONT COVERS

After the evaporative pads have been set in place, the front covers need to be installed. Each end of the front cover overlaps one half of the pipe support that it attaches to. Use the stainless steel self-tapping screws provided to mount the front covers to the pipe supports. See Figure 16.

O. (**OT**) INSTALLATION OF THE END CAPS

Next, the end caps are to be installed. Two different sets of end caps are supplied. Use the pair that has the pre-punched 2-5/16” diameter holes farthest away from the mounting flange. They mount flush with the end of both the back plates and the spray deflectors; one end cap at each end of the system. Put the distribution pipe through the end caps and secure them to the upper stringer using rubber grommeted lag bolts. The end caps may be trimmed if desired. Caulk the opening in the end caps to prevent water from leaking out the end.

P. INSTALLING THE PUMP AND PIPING

Pump:
Operation and maintenance instructions are included with each pump. For submersible pumps, position the pump at the bottom of the sump so that the discharge pipe is near the edge of the sump. If a centrifugal pump is used, an additional 2-1/2" hole will need to be drilled in the sump to provide for an intake pipe for the pump. This hole should be located near the bottom of the section of 12" PVC pipe below the tee, and should be aligned with the intake opening of the pump. Once the hole is drilled and deburred, place the Adaptaflex rubber grommet (found in the plumbing kit) in the hole. Using the length of 1-1/2" PVC pipe that is to be attached to the pump intake, lubricate one end with soap, and insert it through the Adaptaflex grommet. The pipe should protrude at least 3" into the 12" PVC sump. The other end of this pipe should be attached to the pump intake via a threaded adaptor. See Figures 19 through 22.

Piping:
Use the pipe configuration recommended in Figure 17 or 18 (Submersible Pump Systems) or Figure 19 or 20 (Centrifugal Pump Systems) for an adequate supply of water for the system. For systems using the Brown Out kits, use the pipe configuration recommended in Figure 17, Figure 21, or Figure 22, depending on system length. Glue all PVC fittings in the water distribution system from the pump to the In-Line Filter. Be sure to note the direction of water flow through the filter before gluing the system together. Also, glue the end 90° elbow(s) and the end ball valve(s). DO NOT glue the distribution pipes, as they may need to be removed for cleaning and maintenance. Once all of the piping is in place, glue the filter end cap in place.

Once all piping (including the water supply hose connection) has been completed, place the remaining PVC cap on the sump, and cover any remaining openings in the cap to prevent the entry of debris or animals into the sump.

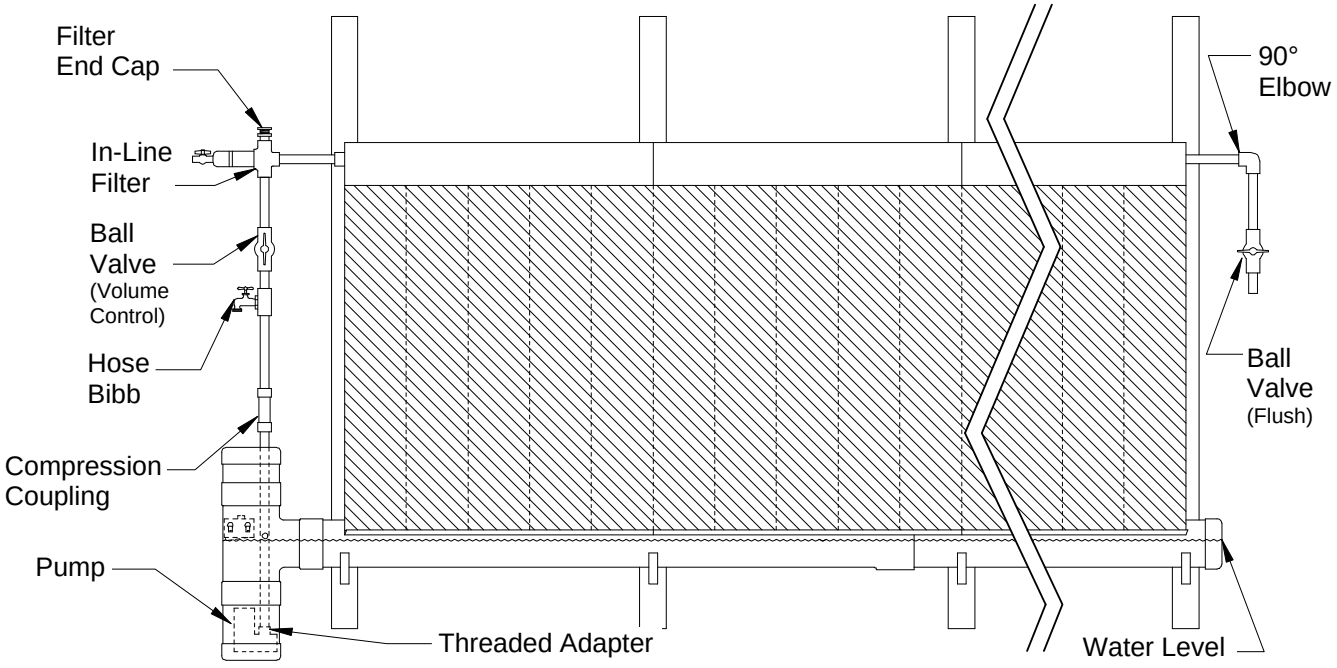


Figure 17 — **5' to 25' Submersible Pump System (Including Brown Out Systems)**

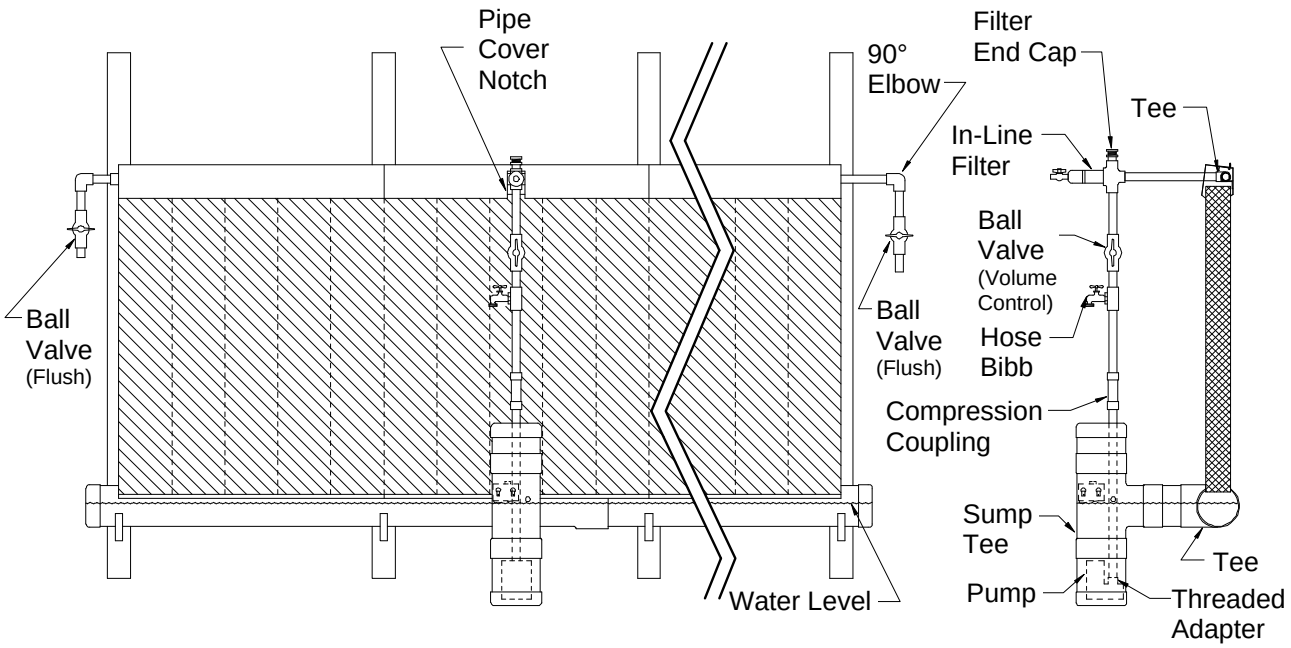


Figure 18 — **30’ to 50’ Submersible Pump System**

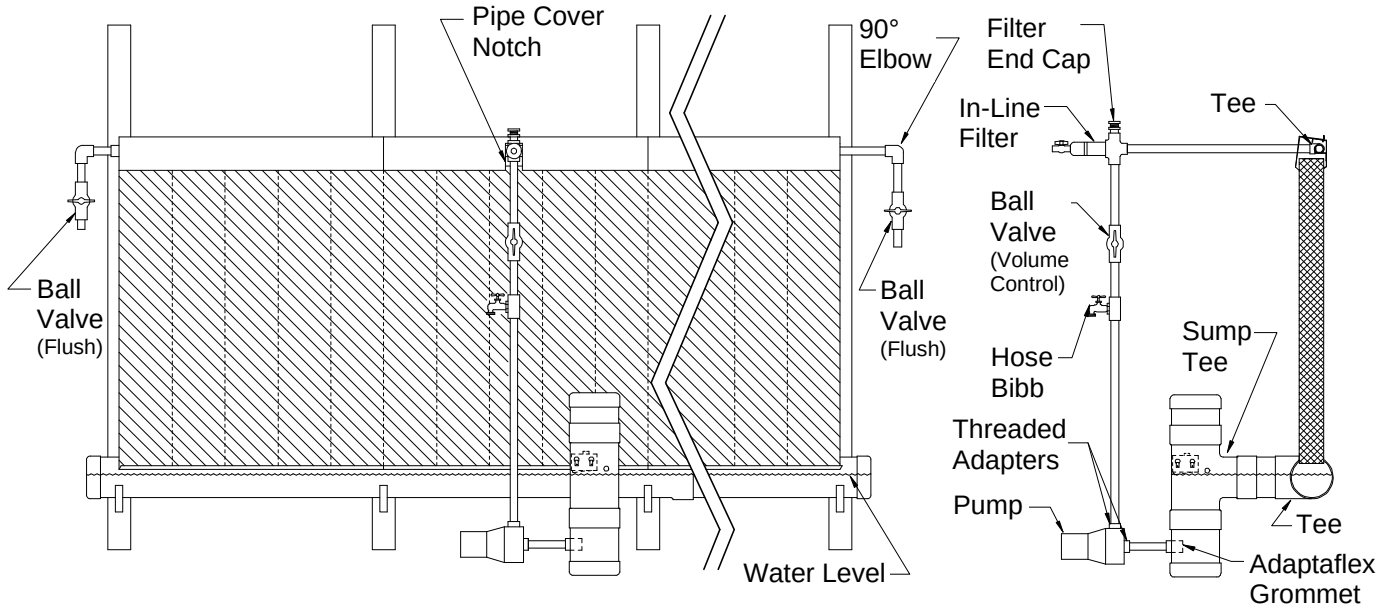
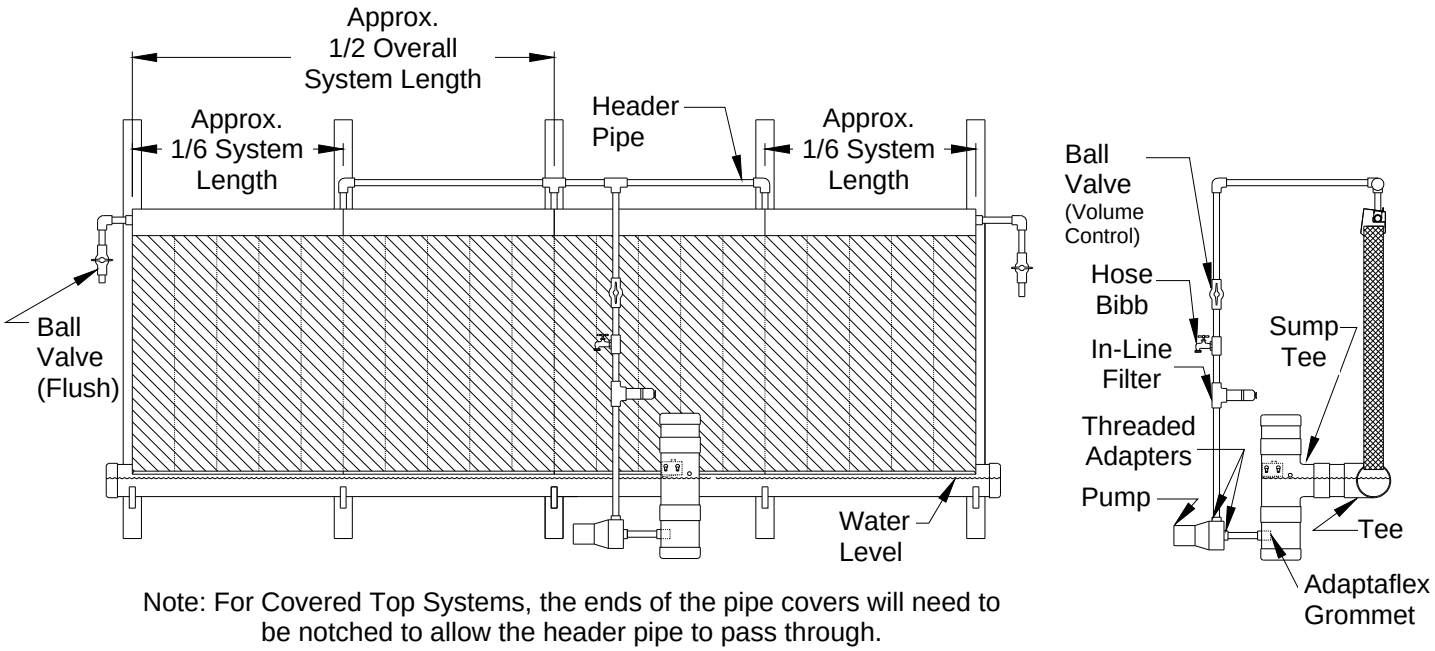
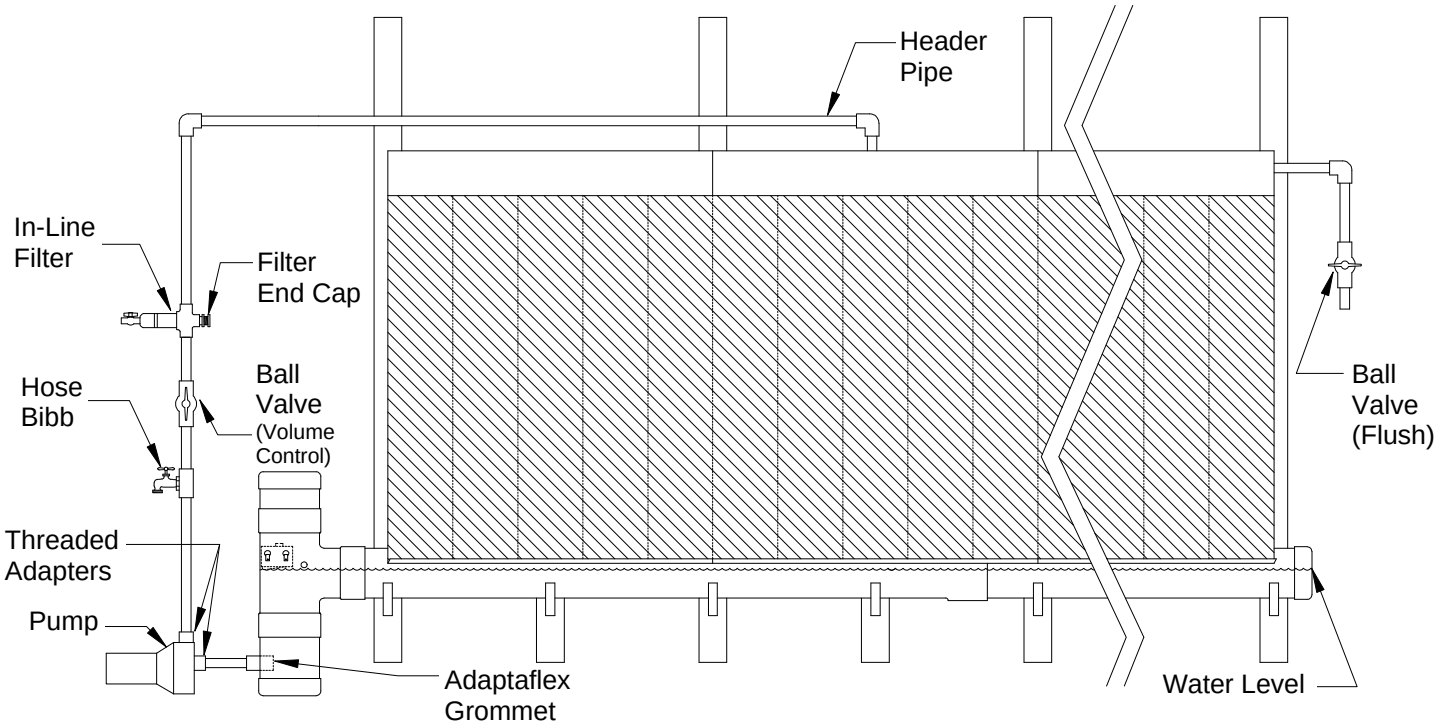


Figure 19 — **30’ to 50’ Centrifugal Pump System**



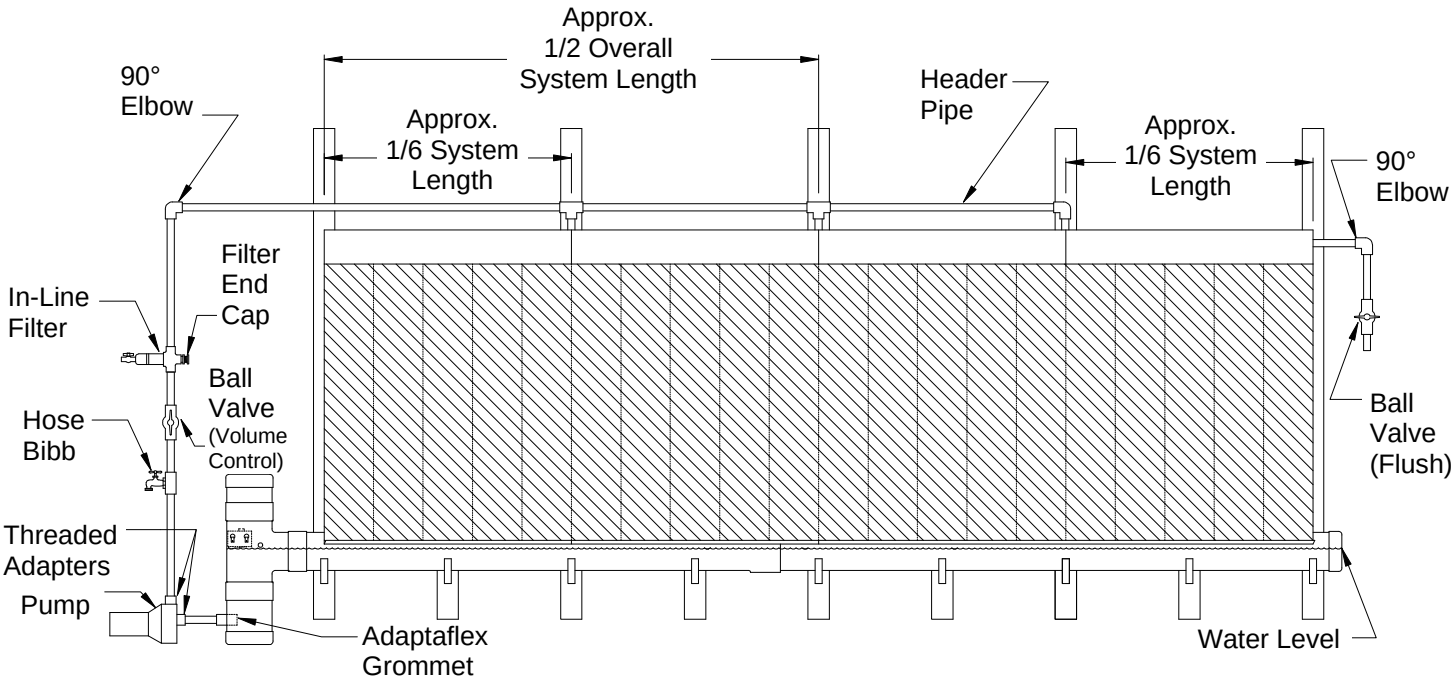
Note: For Covered Top Systems, the ends of the pipe covers will need to be notched to allow the header pipe to pass through.

Figure 20 — **55’ to 110’ Centrifugal Pump System and 55’ to 70’ Submersible Pump System**



Note: For Covered Top Systems, the ends of the pipe covers will need to be notched to allow the header pipe to pass through.

Figure 21 — **30’ to 50’ Centrifugal Pump System with Brown Out Kit**



Note: For Covered Top Systems, the ends of the pipe covers will need to be notched to allow the header pipe to pass through.

Figure 22 — **55' to 110' Centrifugal Pump System with Brown Out Kit**

VI. SYSTEM START-UP PROCEDURE

After installing the entire evaporative pad system, begin the initial start-up procedure by turning on the water supply to the float valve and allowing the sump and trough to fill with water until the float valve closes. The water level should be about 1" below the drip pan. If the water level is lower, or if water begins spilling out of the overflow hole in the sump before the float valve shuts off the water supply, reposition the float by adjusting the float valve rod joint until the water reaches the desired height. Next, open all ball valves. Turn the pump on and let it run to flush out any debris that has accumulated in the system. After the system has been thoroughly flushed, turn the pump off and close the ball valve(s) at the end(s) of the system. Again, allow the sump and trough to fill until the float valve closes. Then, turn the pump on and remove the last pipe cover. The water should be squirting up 3-4 inches from the distribution pipe. Adjust the water flow using the first ball valve until the proper flow is achieved. Check the complete length of the distribution pipe to be sure that none of the holes are clogged. Use a piece of wire to clear any clogged holes. Replace the pipe cover and allow the system to begin saturating.

To insure that you are getting the best performance from your system, check to be sure that the entire pad is getting wet. Also, make sure that the pads fit tight, not allowing any air to leak around them.

When first starting the system, it sometimes takes several hours of operation for the pads to become completely wet. However, on each subsequent start, the pads should wet in a few minutes. Complete pad wetting may also be a problem due to dust accumulation after the pads have been dry for several months.

The initial wetting can be aided by spraying water on the pad with a garden hose as well as flooding the pads with excess water for the first hour. After the pads become wet the first time, turn the water down by use of the first ball valve until the water comes down the pad in a soaking action and not a stream flooding down the pad.

To get the optimum performance from your Evap-Pad System, make sure that all openings in the system have been properly sealed, and that all of the air entering through the house opening passes through the pads. Any air that leaks into the system around the pads or through unsealed openings will not be properly cooled, and will cause less air to move through the pads.

VII. OPERATING INSTRUCTIONS

1. The pads are very durable and will last 5 or 6 years if properly maintained. When the water is circulated and evaporated, the mineral content of the remaining water gets higher. To keep the mineral content within workable levels, 5% to 10% of the circulated water must be bled off through the hose bibb. When mineral deposits are observed on the pad, increase the amount of bleed off.

2. The pH of the recirculated water must be maintained between 6 and 9. A pH of 7 is neutral. A pH above 9 or below 6 will drastically reduce the life of the pad.

3. Algae growth and water bacteria in the pads must be controlled. The pads are treated with a fungus resistant additive, but this does not completely prevent algae growth. Treat the water with any of the chlorine algaecides (Calcium Hypoclorinates) used for swimming pools, such as HTH or Pace. Tablet forms of these algaecides are the most economical and best to use in the sump for slow release. Maintain the sump water for recirculation at 1 ppm (part per million) chlorine. If a chlorine smell is present, too much has been added. If any algae grows, tablets need to be added. Water pH and chlorine levels should be checked weekly. Kits for testing pH and chlorine may be purchased at any swimming pool supply store. The life of your pad depends on its proper maintenance. Do not use copper sulfate in the system as it will corrode the pump and other metal parts of the system.

4. Clean the filter at least once a week, more often if foreign materials are present in the water system.

5. Flush pipe distribution system at least once a month. This is done by opening both ball valves while the pump is running and allowing water to flow through and out of the system.

6. Regulate your ventilation system so that the pad system is turned off while all the fans are still running. This will pull air through the pads after the water is turned off, allowing them to dry properly and killing any algae spores. Do not keep the pads wet around the clock as this will make the pads soft.

7. When the evaporative pad system is operating, check the pads for dry spots. When dry spots are observed, remove the pipe cover and check the holes in the pipe. Clean any stopped up holes with a wire until adequate water flows from each hole.

8. DO NOT FLOW EXCESSIVE WATER ON THE PAD. The pads are more efficient if they have just enough water to keep them wet, but not a stream of water cascading down the pad.

9. Drain and clean the sump as necessary to remove any dirt or trash that it may have accumulated.

10. At the end of the evaporative cooling season, drain the pump, sump and pipe system to avoid freezing damage in cold weather. If the pump cannot be completely drained, put anti-freeze in it.

APPENDIX A

INSTRUCTIONS FOR INSTALLING AMERICAN COOLAIR'S EVAP-PAD COOLING SYSTEM ON THE INSIDE OF A BUILDING

For installation of the Evap-Pad Cooling System on the inside of the building to be cooled (e.i. air will be drawn from the stringer side across the pads), use the following instructions in addition to those in the rest of this form.

1) When installing the distribution pipe (Part V., Section H.), the sections of pipe should be positioned so that the metered holes point straight up at the 12 o'clock position, **not** the 1 o'clock position. See Figure A1.

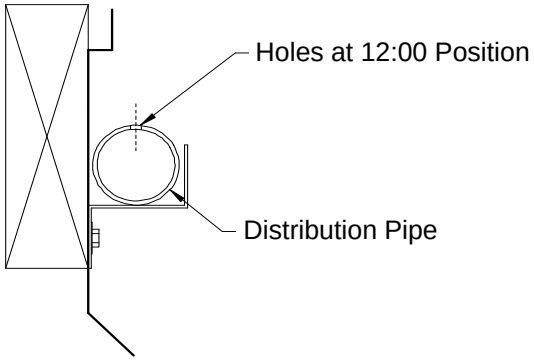


Figure A1

2) When installing the pipe cover spray deflector (Part V., Section J.), position the spray deflector so that the longer leg of the channel is nearest the pipe cover back plate. Using the dimensions in Table 1 below, fasten the spray deflector to the pipe cover with the self-drilling screws provided. See Figure 2.

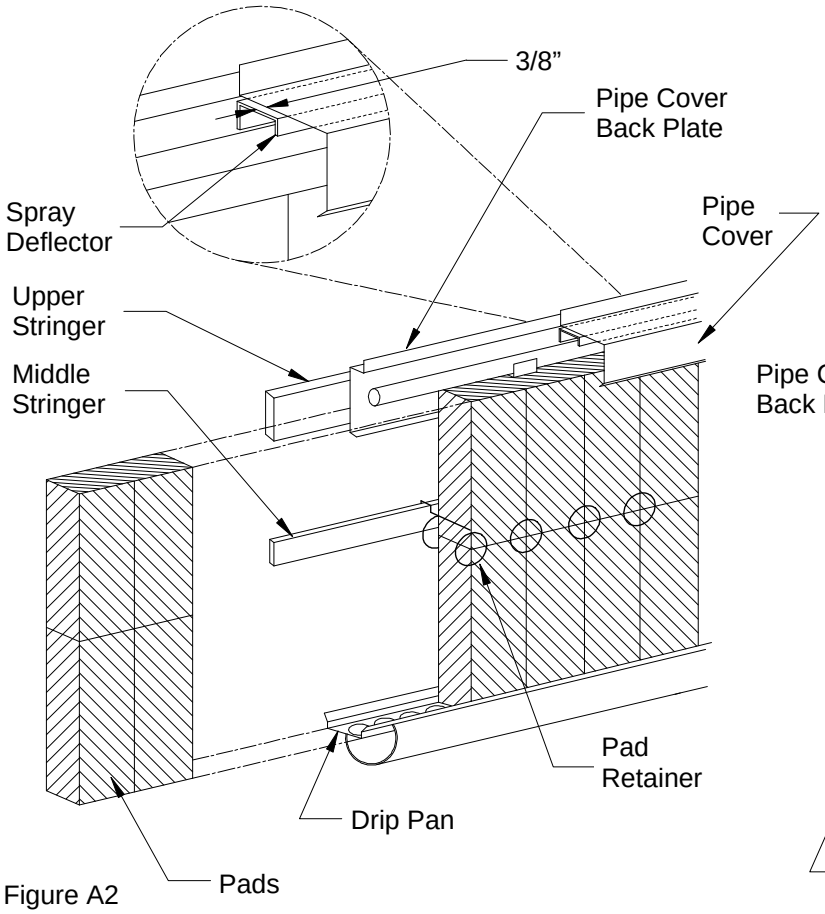
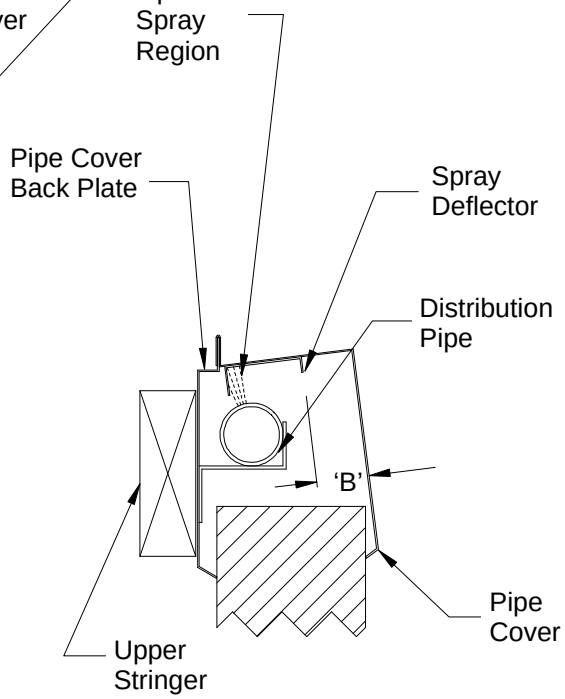


Figure A2

Table A1

Pad Size	'B'
4"	1-9/16"
6"	3-1/4"



APPENDIX B

INSTRUCTIONS FOR INSTALLING AMERICAN COOLAIR'S EVAP-PAD COOLING SYSTEM DRIP PAN WITH THE EXTENDED LIP (Available with 6" Open Top System Only)

A. INSTALLATION OF VERTICAL STRINGERS

To properly support the Evap-Pad System, vertical 4 x 4 stringers should be installed in the opening. These stringers should be placed at both ends of the system, and centered every 5 feet along the opening. Stringers should be securely fastened (preferably to the roof trusses) at the top and firmly seated in the ground (or otherwise supported) at the bottom.

B. INSTALLATION OF PLYWOOD, UPPER STRINGER, TROUGH HANGERS AND DRIP PAN EXTENSION

Locate the Evap-Pad System vertically as determined by the specific use of the system. The bottom of the plywood and upper stringer should be located flush with the top of the system opening See Figure B1. Once the plywood and stringer locations have been determined, mark this position on one of the end vertical members. Then, locate a corresponding level point on the opposite end vertical member. Use the chalk line to mark all remaining members, first install the ¾" plywood and then install the 2 X 6 Upper Stringer See Figure B2. Next, measure down from the bottom of the upper stringer the system pad height minus 2.75", and mark this point on both vertical members at each end. These points should be at the same height as the bottom of the opening. Again, mark each vertical member with the chalk line. Place the ¾" plywood so that the top of the plywood is on the chalk line. Install the plywood. To install trough hangers measure down 3-3/4" on the bottom plywood piece (or Pad Height plus 1" from the bottom of the Upper Stringer) See Figures B1 & B3. Mark the plywood with a chalk line. Place the trough hanger on the plywood at each vertical member so that the top of the hanger is on the chalk line. Mark the locations of the holes in the hanger and drill pilot holes. Install a trough hanger on each vertical member using the rubber grommeted lag bolts. See Figure B3. Now, fasten the drip pan extension to the drip pan using 5, #10-16 x 3/4" self-drilling screws. See Figure B4.

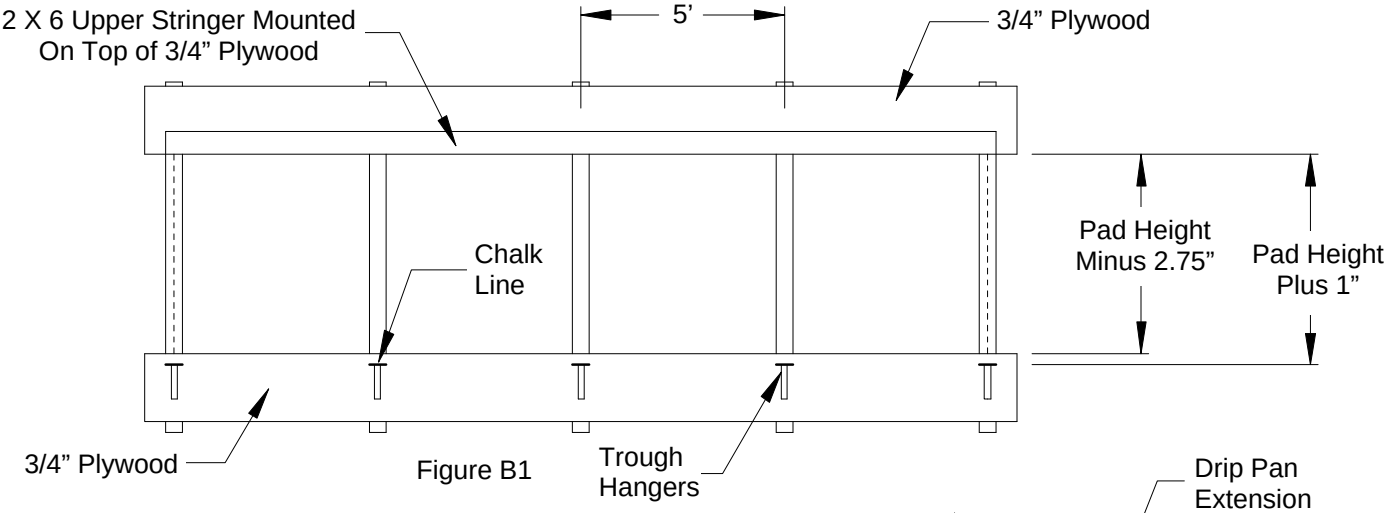


Figure B1

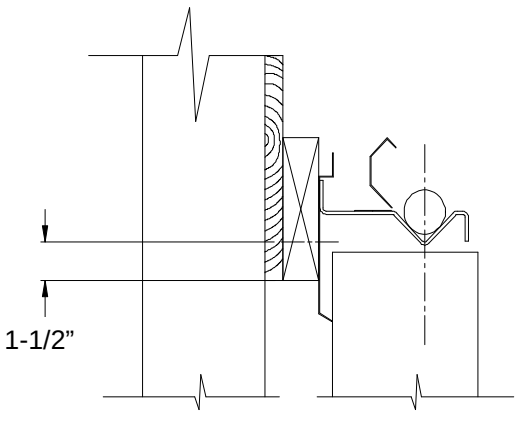


Figure B2 Top of System

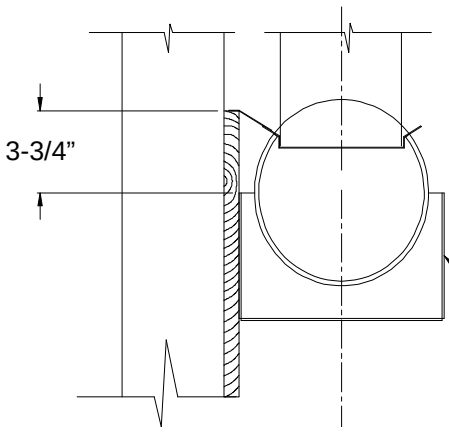


Figure B3 Bottom of System

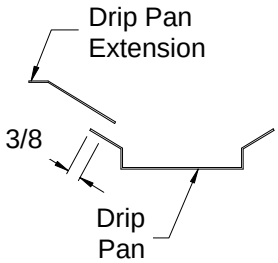
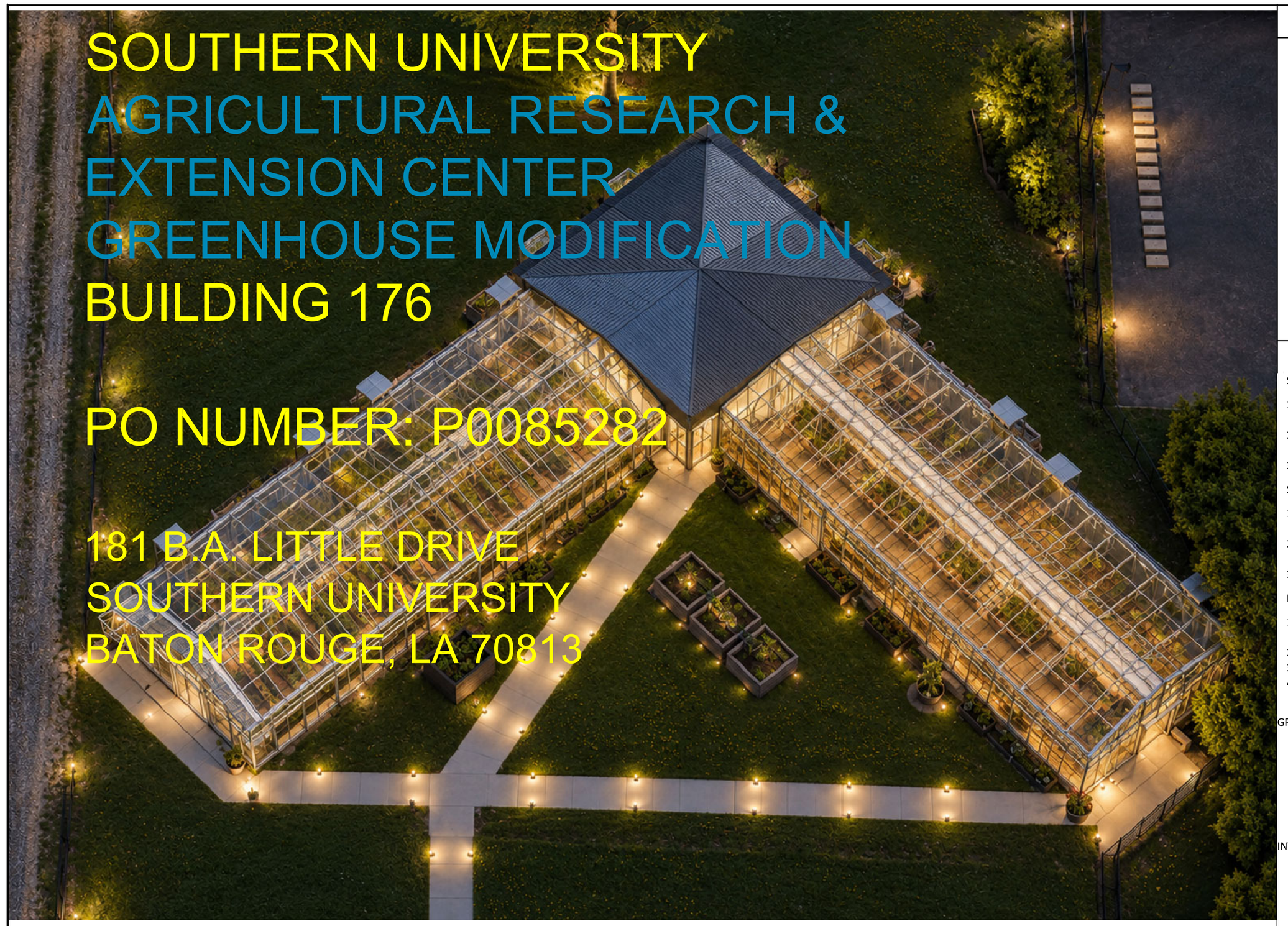


Figure B4

SOUTHERN UNIVERSITY
AGRICULTURAL RESEARCH & EXTENSION CENTER
GREENHOUSE MODIFICATION
BUILDING 176



PO NUMBER: P0085282

181 B.A. LITTLE DRIVE
SOUTHERN UNIVERSITY
BATON ROUGE, LA 70813

JUNE 8, 2026
BID DOCUMENT

INDEX OF DRAWINGS:

GENERAL

G100 —— TITLE SHEET

A100 —— SITE AND SCOPE OF WORK
A101 —— DEMO PLAN
A102 —— FLOOR PLAN AND EXISTING FACADE
A103 —— EXISTING TRUSS AND ROOF AND JOIST
A104 —— R PANEL DETAIL AND SPECIFICATION
M100 —— RCP AND MECHANICAL PLAN
E100 —— ELECTRICAL PLAN

SCOPE OF WORK

SITE PREPARATION AND DEMOLITION

1. REMMOVE ALL DETERIORATED AND NONFUNCTIONAL COMPONENTS WITHIN THE GREENHOUSE STRUCTURE
2. PROPERLY DISPOSE OF WASTE MATERIALS IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS
3. PREPARE THE SITE TO ALLOW FOR SAFE AND EFFICIENT CONSTRUCTION ACTIVITIES

STRUCTURAL RENOVATIONS

1. REPAIR OR REPLACE DAMAGED FRAMING MEMBERS, FOUNDATIONS, AND SUPPORT STRUCTURES AS NEEDED
2. REINFORCE ROOF AND WALL SYSTEMS TO ENSURE STRUCTURAL STABILITY AND COMPLIANCE WITH CURRENT BUILDING CODES
3. INSTALL NEW DOORS, WINDOWS, AND ACCESS POINTS WHERE NECESSARY

MECHANICAL, ELECTRICAL, AND PLUMBING (MEP) SYSTEMS

1. UPGRADE GREENHOUSE VENTILATION AND CLIMATE CONTROL SYSTEMS, INCLUDING FANS, LOUVERS, AND EXHAUST SYSTEMS
2. INSTALL NEW PLUMBING CONNECTIONS FOR IRRIGATION AND DRAINAGE SYSTEMS
3. DESIGN AC FOR CLASSROOM
4. PROVIDE ENERGY-EFFICIENT ELECTRICAL UPGRADES, INCLUDING LIGHTING AND POWER DISTRIBUTION

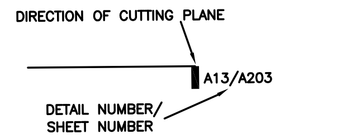
GREENHOUSE SYSTEMS AND EQUIPMENT

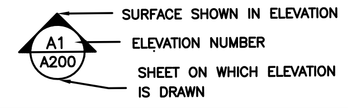
1. REPLACE GLAZING PANELS, SEALS, AND WEATHERPROOFING FOR OPTIMAL ENERGY EFFICIENCY AND DURABLITY
2. INSTALL AUTOMATED IRRIGATION AND MISTING SYSTEMS FOR RESEARCH AND PLANT GROWTH REQUIREMENTS.
3. INCORPORATE SHADING SYSTEMS AND TEMPERATURE REGULATION MECHANISMS TO SUPPORT AGRICULTURAL RESEARCH

INTERIOR MODIFICATIONS

1. PROVIDE NEW FINISHES, WORKSTATIONS, AND STORAGE AREAS TO ACCOMMODATE STAFF AND STUDENTS
2. ENSURE ADA-COMPLIANT PATHWAYS AND ACCESS WITHIN THE GREENHOUSE
3. COORDINATE LAYOUT MODIFICATIONS TO IMPROVE WORKFLOW AND SAFETY

DRAFTING LEGEND



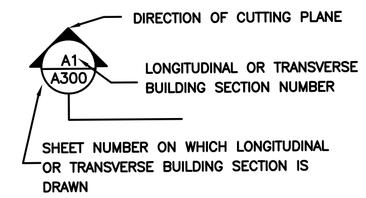


000 DOOR MARK

8 WINDOW MARK

AA STOREFRONT MARK

1 CONSTRUCTION NOTES
FOR ANY INFORMATION TO BE CONVEYE WHICH IS REPETITIVE OR SPACE AVAILABLE PROHIBITS A WRITTEN DESCRIPTION OF AN ITEM



SITE LOCATION



PROFESSIONAL OF RECORD:

MAP DESIGN GROUP, LLC
8282 GOODWOOD BLVD SUITE W-3
BATON ROUGE, LA 70806
P. 225-767-4590 E. MAP@MAPGRP.COM

SUBCONTRACTORS:

MAP Project NO: 10.256.12

Seal:



GOVERNING CODES

2015 INTERNATIONAL BUILDING CODE
2015 INTERNATIONAL MECHANICAL CODE
2015 INTERNATIONAL PLUMBING CODE
2014 NATIONAL ELECTRICAL CODE
2012 NFPA 101, LIFE SAFETY CODE
2012 CABO-ANSI 117.1
2012 AMERICANS WITH DISABILITY ACT
2015 INTERNATIONAL FIRE CODE
2012 PRIVATE SEWAGE DISPOSAL CODE
2015 FUEL GAS CODE
2015 INTERNATIONAL ENERGY CONSERVATION CODE
2015 PROPERTY MAINTENANCE CODE
2012 NFPA 13R
2012 NFPA 20
2012 NFPA 70
2012 NFPA 72
2012 NFPA 90

HATCH LEGEND:

DENOTES THE REMOVAL OF EXISTING BUILDING IN ENTIRETY, ROOF, STRUCTURE, INTERIOR WALLS, AND SLAB.

DENOTES THE REMOVAL OF EXISTING SIDEWALK

DENOTES THE REMOVAL OF EXISTING ELECTRICAL LINE

DENOTES THE REMOVAL OF EXISTING GAS LINE

DENOTES THE REMOVAL OF EXISTING STORM LINE

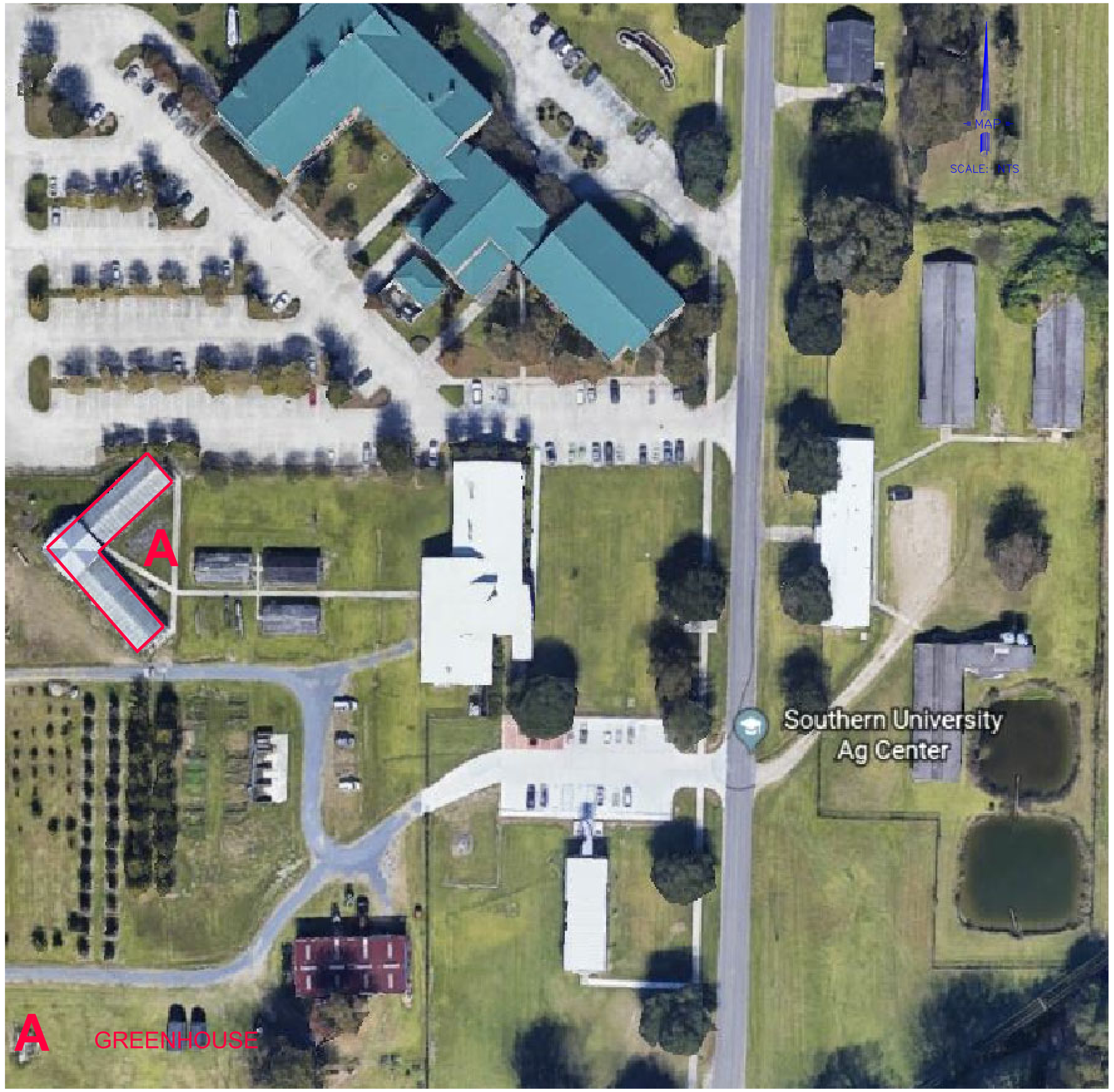
DENOTES THE REMOVAL OF EXISTING WATER LINE

DENOTES THE REMOVAL OF EXISTING SEWER LINE

DENOTES THE REMOVAL OF EXISTING COMMUNICATIONS LINE

1 SITE PLAN - BLG 176 GREENHOUSE

SCALE: 1/32" = 1'-0"



SITE PREPARATION AND DEMOLITION

1. REMOVE ALL DETERIORATED AND NONFUNCTIONAL COMPONENTS WITHIN THE GREENHOUSE STRUCTURE.
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3. COORDINATE LAYOUT MODIFICATIONS TO IMPROVE WORKFLOW AND SAFETY.

DENVER L. TERRANCE
Reg. No. 7790
STATE OF LOUISIANA
REGISTERED ARCHITECT

MAP DESIGN GROUP, LLC
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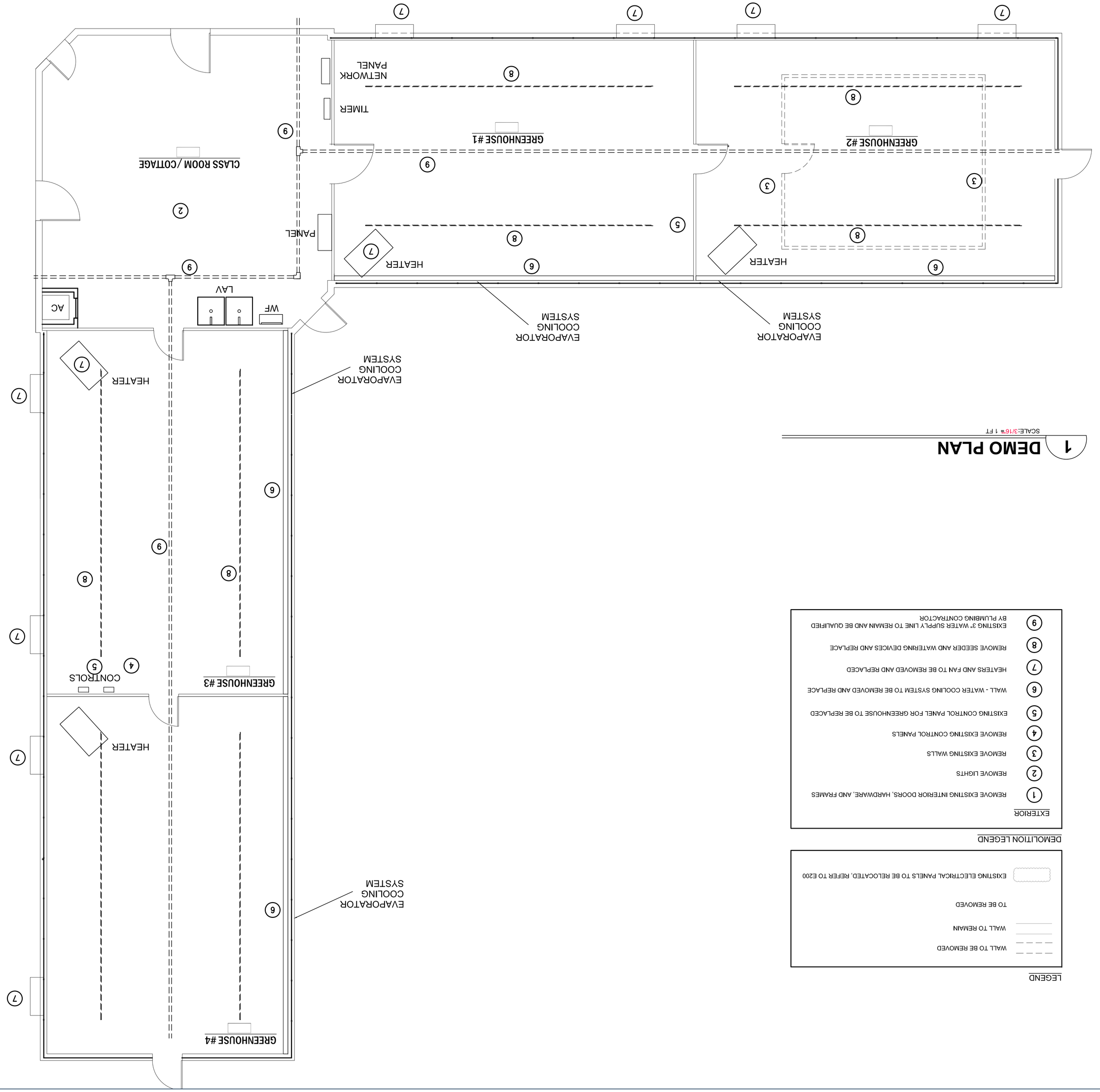
PROJECT:
REMODEL AND REPAIR EX. GREENHOUSE
FOR
SOUTHERN UNIVERSITY - AG DEPT.
181 B.A. LITTLE DRIVE
BATON ROUGE, LA 70813

06-01-26

Sheet Title:
SITE PLAN AND SCOPE OF WORK

MAP Job No:	10-256-12
SCALE:	1 FT= 3/16"
DRAWN:	MAP
CHECK BY:	MAP
DATE:	05/30/26

A100



1 DEMO PLAN

SCALE: 3/16" = 1 FT

LEGEND

	WALL TO BE REMOVED
	WALL TO REMAIN
	TO BE REMOVED
	EXISTING ELECTRICAL PANELS TO BE RELOCATED. REFER TO E200

DEMOLITION LEGEND

EXTERIOR

1. REMOVE EXISTING INTERIOR DOORS, HARDWARE, AND FRAMES
2. REMOVE LIGHTS
3. REMOVE EXISTING WALLS
4. REMOVE EXISTING CONTROL PANELS
5. EXISTING CONTROL PANEL FOR GREENHOUSE TO BE REPLACED
6. WALL - WATER COOLING SYSTEM TO BE REMOVED AND REPLACE
7. HEATERS AND FAN TO BE REMOVED AND REPLACED
8. REMOVE SEEDER AND WATERING DEVICES AND REPLACE
9. EXISTING 3" WATER SUPPLY LINE TO REMAIN AND BE QUALIFIED BY PLUMBING CONTRACTOR

DEMOLITION NOTES

GENERAL

1. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND COORDINATE NEW WORK. CONTRACTOR SHALL NOTIFY THE ARCHITECT IF THE EXISTING CONDITIONS INDICATED IN THESE DRAWING DO NOT MATCH THE ACTUAL FIELD CONDITIONS.
2. REMOVE AND DISPOSE OF ALL DEBRIS IN A LEGAL MANNER AS REQUIRED.
3. CONTRACTOR SHALL DEMO AND REMOVE THE ITEMS LISTED. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS WHILE REMOVING ITEMS TO BE SALVAGED AS TO NOT DAMAGE SURROUNDING AREA. IF SURROUNDING AREA IS DAMAGED BEYOND REPAIR, THE CONTRACTOR SHALL REPLACE TO MATCH EXISTING.
4. COORDINATE WITH MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS AS NEEDED TO DETERMINE THE AMOUNT OF CUTTING, PATCHING, REPAIR AND REPLACEMENT WORK REQUIRED TO COMPLETE ASSOCIATED WORK.
5. CONTRACTOR SHALL PROVIDE ALL SAFETY MEASURES NEEDED TO PROTECT OCCUPANTS OF THE BUILDING AND ADJACENT STRUCTURES DURING THE RENOVATION. COORDINATE ACCESS TO THE BUILDING AND STAGE AREAS WITH THE OWNER. DO NOT BLOCK MEANS OF EGRESS FROM OCCUPIED ROOMS AND / OR BUILDINGS. SAFETY MEASURES INCLUDE: (I.E. BARRICADES, TEMPORARY FENCING, PROTECTIVE PLYWOOD TUNNELS, ETC.)

STRUCTURAL

1. EXISTING CONCRETE FOUNDATIONS, SIDEWALKS
2. ALL DEMOLITION SHALL BE COORDINATED IN A MANNER THAT DOES NOT DAMAGE OR COMPROMISE THE STRUCTURAL INTEGRITY OF THE EXISTING CONCRETE FOUNDATION OF BUILDING WITHIN THE SCOPE OF WORK.
3. DEMO ALL WALLS, DOORS, CABINETS, EXISTING GREENHOUSE PANELS

ELECTRICAL

1. COORDINATE WITH LOCAL POWER COMPANY TO DISCONNECT BUILDINGS MAIN POWER SOURCE.
2. DEMO ALL FURNISHED CONTROLS
3. DEMO ALL LIGHTING IN CLASS ROOM
4. EXISTING PANELS TO REMAIN

MECHANICAL

1. NO MECHANICAL WORK
2. EXISTING HVAC TO BE REUSED WHERE POSSIBLE. THIS INCLUDES ALL DUCTWORK, CONTROLS, ETC.

TELECOMMUNICATIONS/ DATA

1. EXISTING TELEPHONE EXCHANGE BOXES AND BELOW GRADE SERVICE LINES TO REMAIN.
2. COORDINATE WITH LOCAL TELEPHONE COMPANY AS NEEDED TO DISCONNECT UNIT TELEPHONE LINES FROM EXISTING EXCHANGE BOXES AS NEEDED.

REGISTERED ARCHITECT
STATE OF LOUISIANA
DENVER L. TERRANCE
Reg. No. 7190

PROJECT:
REMODEL AND REPAIR EX. GREENHOUSE
FOR
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MAP DESIGN GROUP, LLC
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MAP Job No.	10-256-12
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CHECKED:	MAP
DATE:	05/30/26

Sheet Title:
DEMO PLAN

06-01-26

A101

1 FLOOR PLAN - GREENHOUSE

SCALE: 1/8" = 1'-0"





2 EXISTING FACADES TO GREENHOUSE

SCALE: AS SHOWN



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x	x	xxx

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REMODEL AND REPAIR EX. GREENHOUSE
FOR
SOUTHERN UNIVERSITY - AG DEPT.
181 B.A. LITTLE DRIVE
BATON ROUGE, LA 70813

DENVER L. TERRANCE
Reg. No. 7790
STATE OF LOUISIANA
REGISTERED ARCHITECT

06-01-26

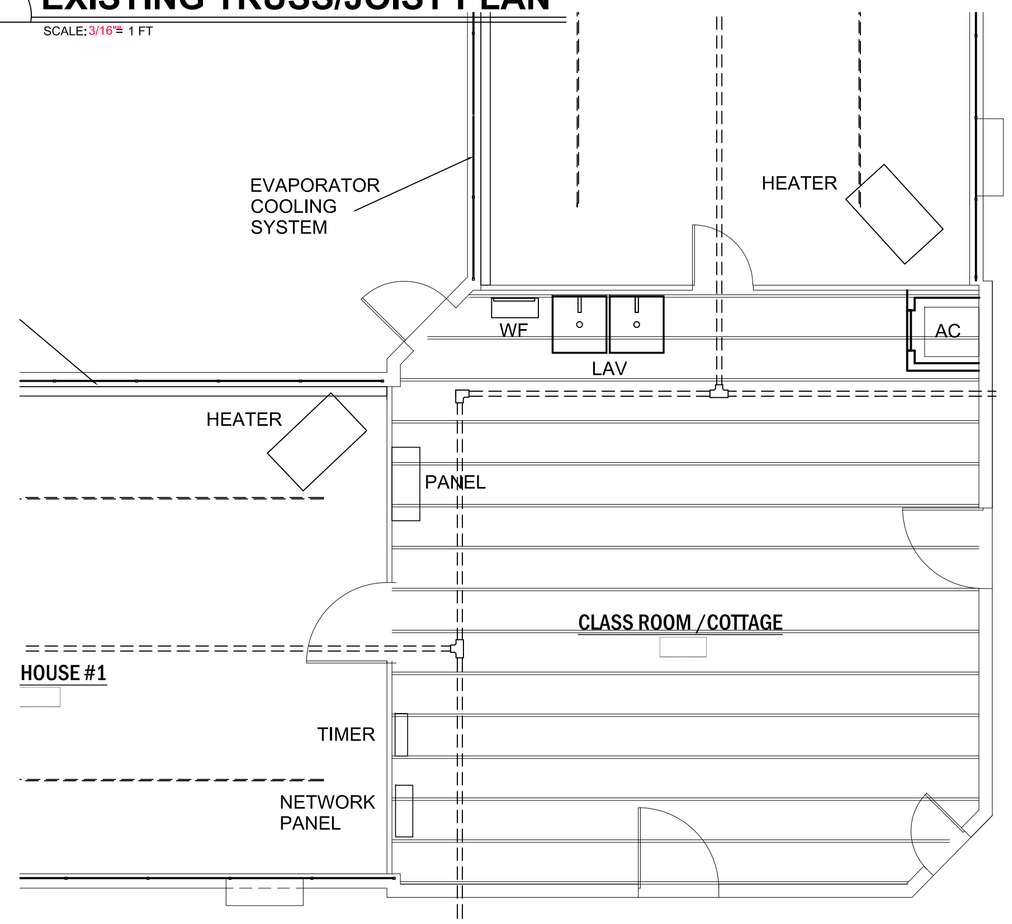
Sheet Title:
FLOOR PLAN AND EXISTING FACADES

MAP Job No:	10-256-12
SCALE:	1 FT= 3/16"
DRAWN:	MAP
CHECK BY:	MAP
DATE:	05/30/26

A102

1 EXISTING TRUSS/JOIST PLAN

SCALE: 3/16"= 1 FT



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REMODEL AND REPAIR EX. GREENHOUSE
FOR
SOUTHERN UNIVERSITY - AG DEPT.
181 B.A. LITTLE DRIVE
BATON ROUGE, LA 70813

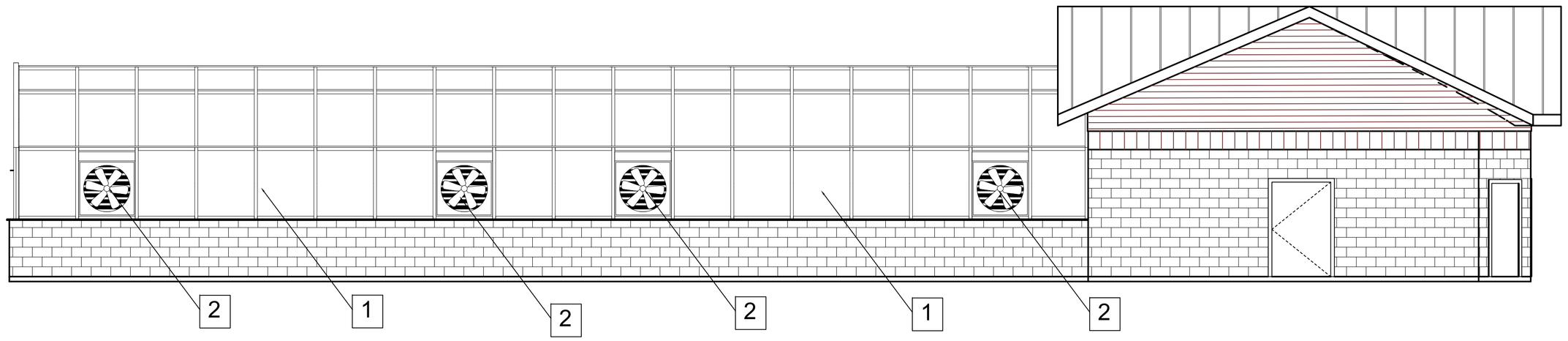
DENVER L. TERRANCE
Reg. No. 7790
STATE OF LOUISIANA
REGISTERED ARCHITECT

06-01-26

Sheet Title:
EXISTING ROOF TRUSS AND JOIST PLAN

MAP Job No:	10-256-12
SCALE:	1 FT= 3/16"
DRAWN:	MAP
CHECKED:	MAP
DATE:	05/30/26

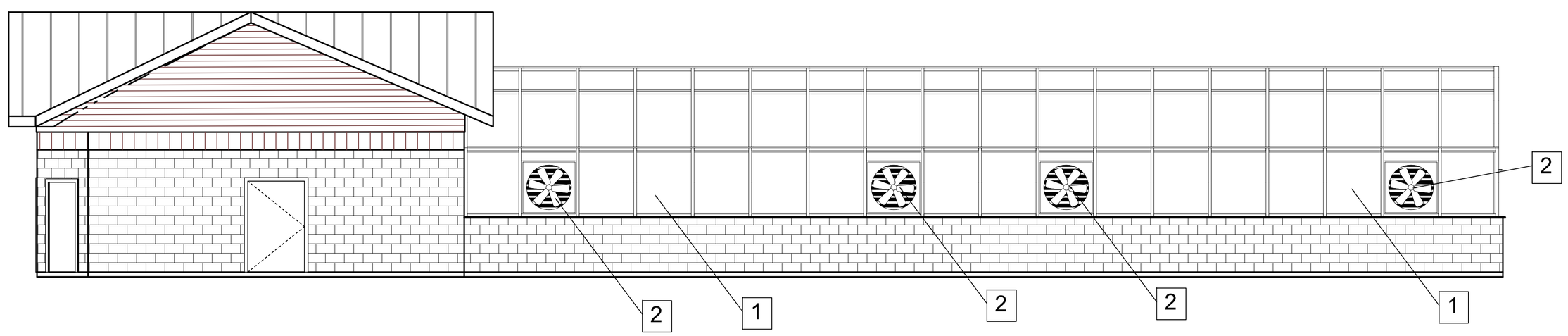
A103



1 LEFT SIDE GREENHOUSE 1 & 2

SCALE: 3/16"= 1 FT





1 LIFE SAFETY 1ST FLOOR

SCALE: 3/16"= 1 FT



DENVER L. TERRANCE
Reg. No. 7790
STATE OF LOUISIANA
REGISTERED ARCHITECT

2021 INTERNATIONAL BUILDING CODE (IBC)
SOUTHERN YELLOW PINE #2 LUMBER SPECIES

EXTERIOR FINISH KEY

EX. CINDER BLOCK TO REMAIN

EXTERIOR FINISH KEY

1. NEW 16MM TRIPLE-WALL POLYCARBONATE
2. MAL36LE1231 36" BD, Exhuast Fan
3. EXISTING CINDER BLOCK TO BE PRESSURE WASH AND CLEANED

ELEVATION NOTES

ALL PLUMBING AND MECHANICAL VENTS TO BE LOCATED CLOSE TOGETHER WITH IN THE ATTIC SPACE WHEN POSSIBLE TO MINIMIZE THE NUMBER OF ROOF PENETRATIONS. ALL PLUMBING AND MECHANICAL VENTS WHICH APPEAR ABOVE THE ROOF TO BE LOCATED AWAY FROM ANY PROMINENT VIEW. NO VENTS TO BE ALLOWED ON THE FRONT ROOF. ALL METAL AND PVC VENTS AND PENETRATIONS TO BE PRIMED AND PAINTED TO CLOSELY MATCH THE ROOF COLOR.

G.C. TO LOCATE UTILITY METERS AWAY FROM ANY PROMINENT VIEW. UTILITY METERS TO BE LOCATED AS CLOSE TO GRADE AS POSSIBLE TO MINIMIZE THE VISUAL IMPACT OF THE METERS.

GUTTER AND DOWNSPOUNTS ARE NOT DRAWN ON THE ELEVATIONS. G.C. TO VERIFY EXISTING TOPOGRAPHIC GRADES AND LOCATE DOWN SPOUTS TOWARDS FRONT AND REAR OF HOUSE BASED ON TOPOGRAPHIC CONDITIONS TO ALLOW POSITIVE DRAINAGE AWAY FROM THE HOUSE. G.C. TO OBTAIN OWNER APPROVAL OF ALL DOWN SPOUT LOCATIONS.

MAP DESIGN GROUP, LLC
8282 GOODWOOD BLVD SUITE W-3
BATON ROUGE, LA 70806
P. 225-767-4590 E. MAP@MAPGRP.COM

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x	x	xxx

PROJECT:
REMODEL AND REPAIR EX. GREENHOUSE
FOR
SOUTHERN UNIVERSITY - AG DEPT.
181 B.A. LITTLE DRIVE
BATON ROUGE, LA 70813

06-01-26

Sheet Title:
FACADE

MAP Job No:	10-256-12
SCALE:	1 FT= 3/16"
DRAWN:	MAP
CHECK BY:	MAP
DATE:	05/30/26

A200

1 REFLECTIVE CEILING

SCALE: 3/16" = 1 FT

CEILING PLAN LEGEND

CEILING TYPE

CEILING TYPE DESIGNATION — X | 10'-0" (CEILING HEIGHT)

CEILING TYPE 'A' 2'x2' ACT

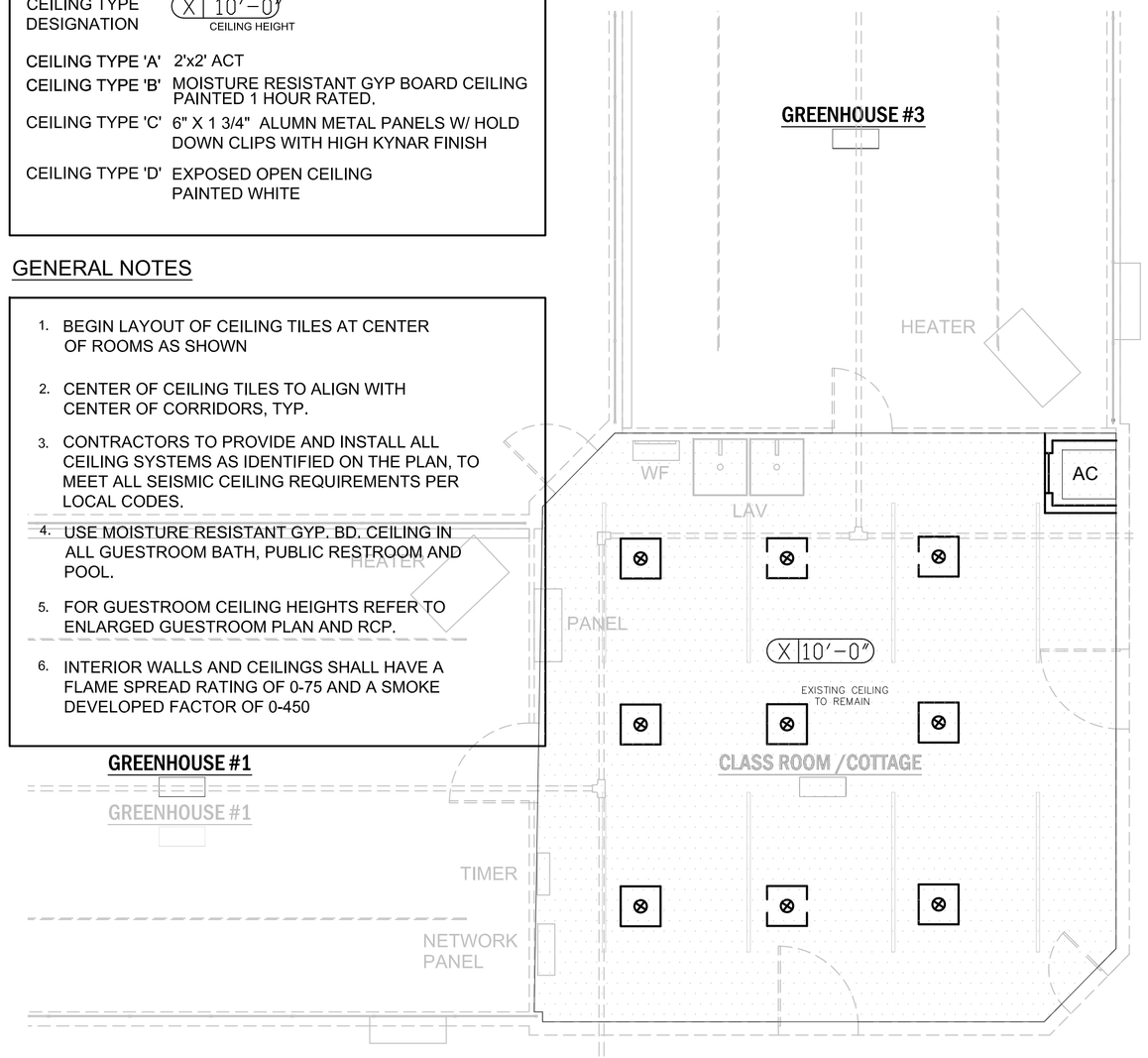
CEILING TYPE 'B' MOISTURE RESISTANT GYP BOARD CEILING PAINTED 1 HOUR RATED.

CEILING TYPE 'C' 6" X 1 3/4" ALUMN METAL PANELS W/ HOLD DOWN CLIPS WITH HIGH KYNAR FINISH

CEILING TYPE 'D' EXPOSED OPEN CEILING PAINTED WHITE

GENERAL NOTES

1. BEGIN LAYOUT OF CEILING TILES AT CENTER OF ROOMS AS SHOWN
2. CENTER OF CEILING TILES TO ALIGN WITH CENTER OF CORRIDORS, TYP.
3. CONTRACTORS TO PROVIDE AND INSTALL ALL CEILING SYSTEMS AS IDENTIFIED ON THE PLAN, TO MEET ALL SEISMIC CEILING REQUIREMENTS PER LOCAL CODES.
4. USE MOISTURE RESISTANT GYP. BD. CEILING IN ALL GUESTROOM BATH, PUBLIC RESTROOM AND POOL.
5. FOR GUESTROOM CEILING HEIGHTS REFER TO ENLARGED GUESTROOM PLAN AND RCP.
6. INTERIOR WALLS AND CEILINGS SHALL HAVE A FLAME SPREAD RATING OF 0-75 AND A SMOKE DEVELOPED FACTOR OF 0-450

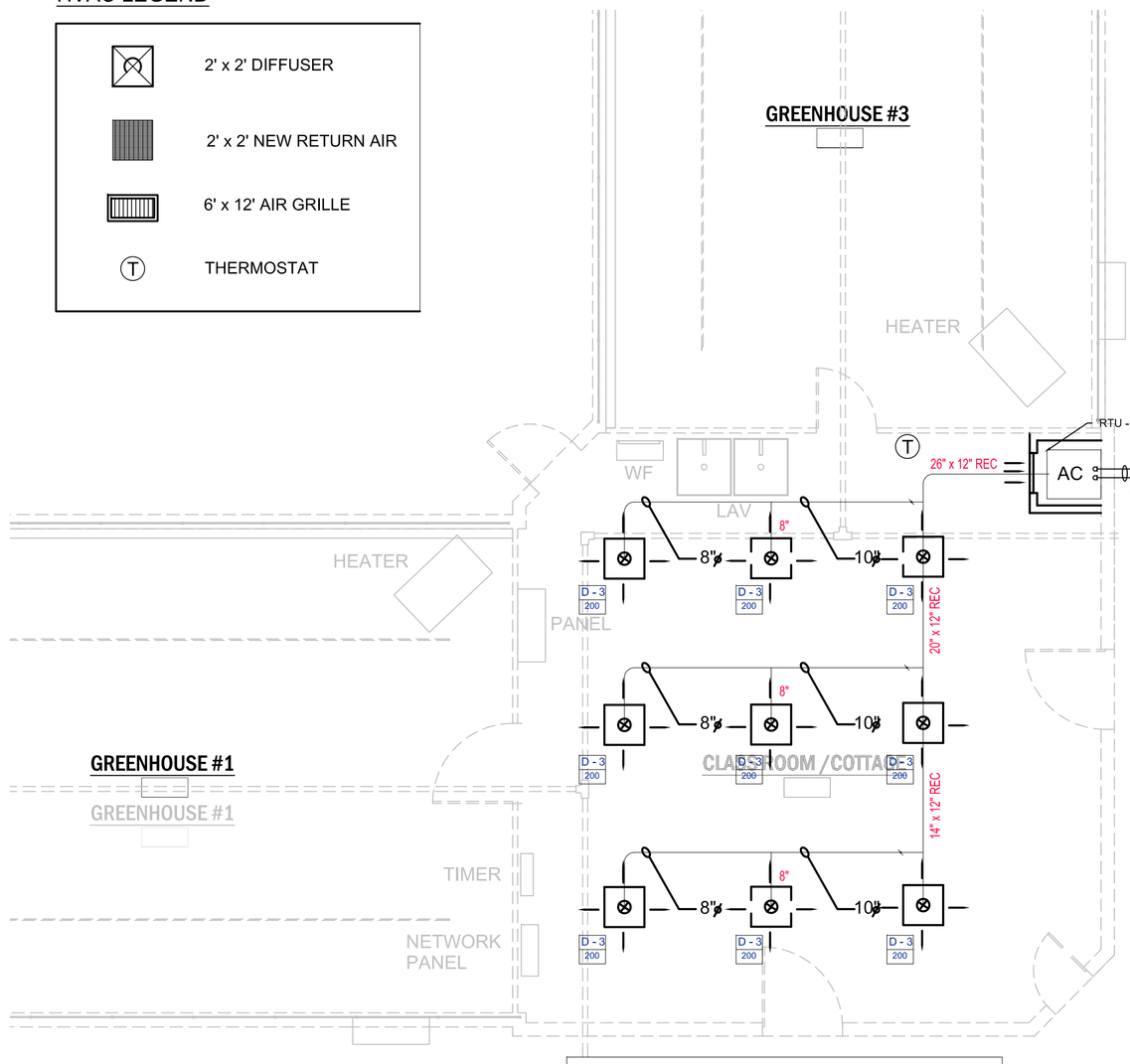


2 CLASSROOM - MECHANICAL

SCALE: 3/16" = 1 FT

HVAC LEGEND

- 2' x 2' DIFFUSER
- 2' x 2' NEW RETURN AIR
- 6' x 12' AIR GRILLE
- (T) THERMOSTAT



REFRIGERANT LIQUIED AND SUCTION LINES SIZED PER MANUFACTOR

MOTORIZED DAMPER INTERLOCKED TO OPEN / CLOSE WHEN FAN IS ENERGIZED / DENERGIZED.

CONTRACTOR SHALL COORDINATE THE INSTALLATION OF LIGHTING FIXTURES WITH THE EXISTING MECHANICAL SYSTEM TO ENSURE PROPER INTEGRATION AND FUNCTIONALITY.

SPLIT-SYSTEM AIR-HANDLING UNIT SCHEDULE

	5 TON
EVAPORATOR SECTION	
INDOOR FCU	AHU-3
DIMENSIONS	96" X 40" X 30"
SERVICE	CLASS ROOM
LOCATION	ATTIC
WEIGHT	200
MANUFACTURER	DAIKIN
MODEL NO.	CAH
FAN DATA	
10 TOTAL SUPPLY CFM	1640
OUTSIDE CFM	700
EXTERNAL STATIC PRESSURE	0.75
COOLING COIL DATA	
CFM OVER COIL	1750
MAX. FACE VELOCITY (FPM)	400
SENSIBLE BTUH COOLING	54,654
REFRIGERANT	R-410a
ELECTRICAL HEATING COIL DATA	
CFM OVER COIL	1750
MINIMUM HEATING KW	15
MINIMUM STAGES OF HEATING	4
ELECTRICAL DATA	480/3/60
VOLTS/PH/HZ	
ELECTRICAL	
VOLTS/ PH / HZ	480 / 3 / 60
MCA	50
MOCP	60
AIR-COOLED CONDENSER	
DESIGNATION	
MAX ALLOWABLE DIMENSIONS (L" X W X H)	36" X 36" X 42"
SERVES	AHU - 03
AMBIENT TEMPERATURE	105°
MANUFACTURER	DAIKIN
MODEL NUMBER	DX13

2021 IECC - ENERGY EFFICIENCY: MECHANICAL

HVAC REQUIREMENTS:

- SYSTEM EQUIPPED WITH A PROGRAMMABLE THERMOSTAT.
- DUCTS MINIMUM R-8 INSULATION
- DUCT LEAKAGE TEST REQUIRED:
  - ROUGH IN WITH OUT AIR HANDLER 4.0 CUBIC FEET PER MINUTE PER SF
  - ROUGH IN TEST 6.0 CUBIC FEET PER MINUTE PER 100SF
  - POST CONSTRUCTION TEST 8.0 CUBIC FEET PER MINUTE PER 100SF
- HEATING AND COOLING SYSTEM SIZED WITH ACCA MANUAL J, S, AND D, (DEFERRED SUBMITTAL).
- NEW SYSTEMS MINIMUM 15 SEER.

NOTES:
1. FURNISH AIR HANDLING UNITS WITH THERMIDISTAT, INITIAL TEMPERATURE AND HUMIDITY SETPOINTS SHALL BE 72°F/50%RH.
2. ALL AIR HANDLERS SHALL REQUIRE SINGLE POINT POWER CONNECTION.
3. AIR HANDLING UNITS SHALL BE FURNISHED WITH GPS BI POLAR IONIZATION UNIT, INTERLOCK WITH FAN OPERATION.
4. COORDINATE REQUIRED ELECTRICAL SERVICE WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING EQUIPMENT.
5. CONTRACTOR SHALL FURNISH TWO SETS OF FILTERS FOR EACH AIR HANDLING UNIT TO OWNER.
6. PROVIDE AND INSTALL 20 GAUGE GALV. SHEET METAL EMERGENCY DRAIN PAN AT EACH AIR HANDLER. SEAL LIQUID TIGHT WITH INSIDE COATED WITH TWO (2) COATS OF TRUCK BED COATING. PAN SHALL BE 4" HIGH AND EXTEND 6" BEYOND PERIMETER OF UNIT. PROVIDE AND INSTALL WITH FLOAT SWITCH WIRED FOR UNIT SHUT DOWN. PROVIDE DRAIN LINE (VALVED CLOSED) TO EXTERIOR WALL, TERMINATE AT EXTERIOR 6" AFG.
7. PROVIDE MOTORIZED DAMPER IN FRESH AIR DUCT. MOTORIZED DAMPERS SHALL BE INTERLOCKED WITH HEAT PUMP COMPRESSOR OPERATION.
8. PROVIDE LOW AMBIENT OPTION ON ALL OUTDOOR UNITS.
9. PROVIDE RUBBER VIBRATION ISOLATION PADS BELOW ALL OUTDOOR UNITS. ALL OUTDOOR UNITS SHALL BE SET ON 4" THICK REINFORCED CONCRETE PAD, SEAL ALL PENETRATIONS THROUGH EXTERIOR WALL WEATHER TIGHT.

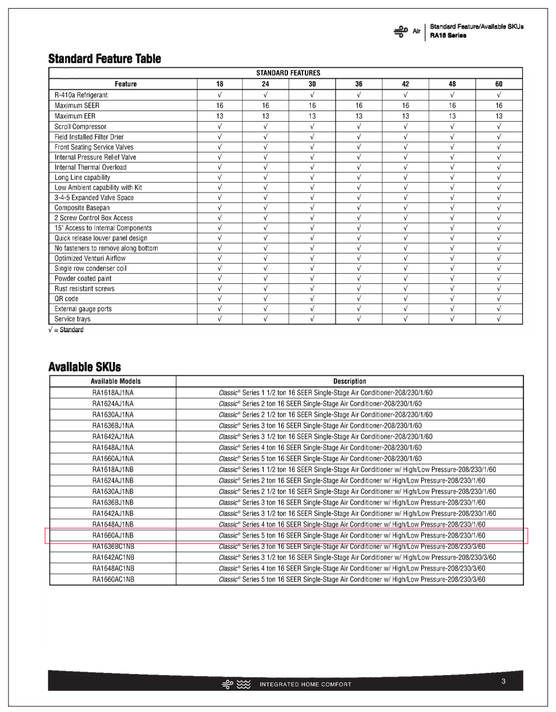
CEILING DIFFUSER SCHEDULE

MARK	DIFFUSER SIZE	NECK SIZE	CFM RANGE	CONSTRUCTION MATERIAL	FINISH	REMARKS
D-1	24"X24"	6"Ø	0-95	ALUMINUM	WHITE	TITUS TDC, PRICE, NAILOR OR EQUAL
D-2	24"X24"	8"Ø	100-190	ALUMINUM	WHITE	TITUS TDC, PRICE, NAILOR OR EQUAL
D-3	24"X24"	10"Ø	195-305	ALUMINUM	WHITE	TITUS TDC, PRICE, NAILOR OR EQUAL
D-4	24"X24"	12"Ø	310-400	ALUMINUM	WHITE	TITUS TDC, PRICE, NAILOR OR EQUAL
D-5	12"X12"	6"Ø	0-105	ALUMINUM	WHITE	TITUS TDC, PRICE, NAILOR OR EQUAL WITH BEVELED FRAME

NOTES:
1. FURNISH AND INSTALL ALL DIFFUSERS WITH OPPOSED BLADE DAMPERS.
2. BACK SIDE OF DIFFUSER SHALL BE INSULATED SAME AS DUCTWORK.
3. ALL DIFFUSERS ON PLANS SHALL BE FOUR WAY DIFFUSERS UNLESS OTHERWISE NOTED.

2 AC DETAILS

SCALE: 3/16" = 1 FT



Air | Standard Feature/Available SKUs
RA16 Series

Standard Feature Table

STANDARD FEATURES							
Feature	18	24	30	36	42	48	60
R-410a Refrigerant	√	√	√	√	√	√	√
Maximum SEER	16	16	15	16	16	16	16
Maximum EER	13	13	13	13	13	13	13
Scroll Compressor	√	√	√	√	√	√	√
Field Installed Filter Drier	√	√	√	√	√	√	√
Front Seating Service Valves	√	√	√	√	√	√	√
Internal Pressure Relief Valve	√	√	√	√	√	√	√
Internal Thermal Overload	√	√	√	√	√	√	√
Long Line capability	√	√	√	√	√	√	√
Low Ambient capability with Kit	√	√	√	√	√	√	√
3/4-in Expanded Valve Space	√	√	√	√	√	√	√
Composite Basepan	√	√	√	√	√	√	√
2 Screw Control Box Access	√	√	√	√	√	√	√
10" Access to Internal Components	√	√	√	√	√	√	√
Quick release louver panel design	√	√	√	√	√	√	√
No fasteners to remove along bottom	√	√	√	√	√	√	√
Optimized Vented Airflow	√	√	√	√	√	√	√
Single row condenser coil	√	√	√	√	√	√	√
Powder coated paint	√	√	√	√	√	√	√
Rust resistant screws	√	√	√	√	√	√	√
QR cords	√	√	√	√	√	√	√
External gauge ports	√	√	√	√	√	√	√
Service trays	√	√	√	√	√	√	√

√ = Standard

Available SKUs

Available Models	Description
RA1518AJ1AA	Classic® Series 1 1/2 ton 16 SEER Single-Stage Air Conditioner-208/230/1/60
RA1524AJ1AA	Classic® Series 2 ton 16 SEER Single-Stage Air Conditioner-208/230/1/60
RA1530AJ1AA	Classic® Series 2 1/2 ton 16 SEER Single-Stage Air Conditioner-208/230/1/60
RA1536AJ1AA	Classic® Series 3 ton 16 SEER Single-Stage Air Conditioner-208/230/1/60
RA1542AJ1AA	Classic® Series 3 1/2 ton 16 SEER Single-Stage Air Conditioner-208/230/1/60
RA1548AJ1AA	Classic® Series 4 ton 16 SEER Single-Stage Air Conditioner-208/230/1/60
RA1560AJ1AA	Classic® Series 5 ton 16 SEER Single-Stage Air Conditioner-208/230/1/60
RA1518AJ1BB	Classic® Series 1 1/2 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/1/60
RA1524AJ1BB	Classic® Series 2 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/1/60
RA1530AJ1BB	Classic® Series 2 1/2 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/1/60
RA1536AJ1BB	Classic® Series 3 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/1/60
RA1542AJ1BB	Classic® Series 3 1/2 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/1/60
RA1548AJ1BB	Classic® Series 4 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/1/60
RA1560AJ1BB	Classic® Series 5 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/1/60
RA1536BC1SS	Classic® Series 3 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/3/60
RA1542AC1SS	Classic® Series 3 1/2 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/3/60
RA1548AC1SS	Classic® Series 4 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/3/60
RA1560AC1SS	Classic® Series 5 ton 16 SEER Single-Stage Air Conditioner w/ HighLow Pressure-208/230/3/60

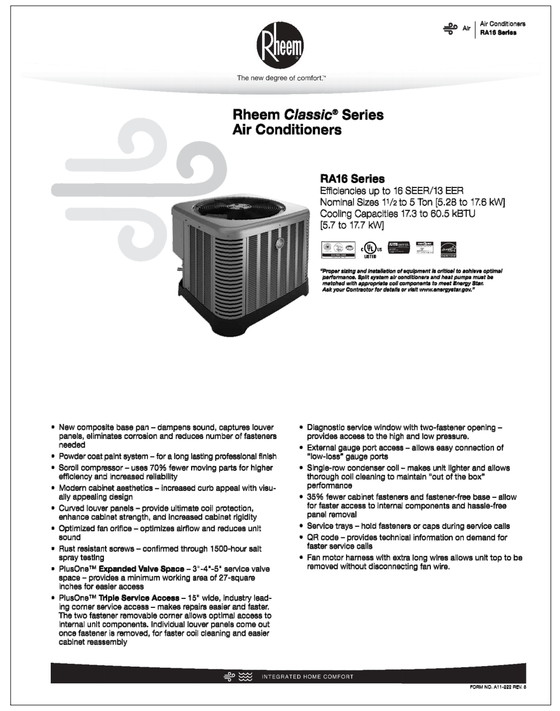


Air | Engineering Features
RH1T/RH2T Series

Engineering Features
RH1T/RH2T- Series

- This most compact unit design available, all standard heat air handler models only 42"to 57 inches [1079 to 1448 mm] high.
- Attractive pre-painted cabinet exterior.
- Rugged wall steel cabinet construction, designed for added strength and versatility.
- 1" [1" foil faced insulation mechanically retained in blower compartment for excellent thermal and sound performance.
- Four lug blower motor mount.
- Blower housing with controls, motor and blower. Slide out design for service and maintenance convenience.
- Traditional open wire element design for heat applications.
- Field convertible for vertical downflow, horizontal left hand or right hand air supply.
- 3 combustible floor base accessories fit all model sizes when required for downflow installations on combustible floors.
- Indoor coil design provides low air side pressure drop, high performance and extremely compact size.
- Expansion valve on indoor coil provides for operation with air conditioning or heat pump using the same coils.
- Coils are constructed of aluminum fins bonded to internally grooved aluminum tubing.
- Coils are tested at the factory with an extensive refrigerant leak check.
- Coils have copper sweat refrigerant connections.
- Coils utilize chatleff metering device connections.
- Molded polymer corrosion resistant condensate drain pan is provided on all indoor coils.
- Supply duct flanges provided as standard on air handler cabinet.
- Provisions for field electrical, connections available from either side or top of the air handler cabinet.
- Connection point for high voltage wiring is inside the air handler cabinet. Low voltage connection is made on the outside of the air handler cabinet.
- Electrical knockouts are provided for power connection to cabinet. Indoor may pull desired hole size up to 2 inches [51 mm] for 1½ inch [38 mm] conduit.
- Front refrigerant and drain connections.

[ ] Designates Metric Conversions



Air | Air Conditioners
RA16 Series

The new degree of comfort.™

Rheem *Classic*® Series Air Conditioners

RA16 Series
Efficiencies up to 16 SEER/13 EER
Nominal Sizes 1½ to 5 Ton [5.28 to 17.6 kW]
Cooling Capacities 17,3 to 60,5 kBTU [5.7 to 17.7 kW]

Proper sizing and installation of equipment is critical to achieve optimal performance. Ask your Contractor for assistance or refer to the Air Conditioning Contractors of America web site at www.acca.org. Look for the ENERGY STAR® mark. Ask your Contractor for details or visit www.energystar.gov.

- New composite base pan – dampens sound, captures louver panels, eliminates corrosion and reduces number of fasteners needed
- Powder coat paint system – for a long lasting professional finish
- Bond compressor – uses 70% fewer moving parts for higher efficiency and increased reliability
- Modern cabinet aesthetics – increased curb appeal with visually appealing design
- Curved louver panels – provide ultimate coil protection, enhance cabinet strength, and increased cabinet rigidity
- Optimized fan orifice – optimizes airflow and reduces unit sound
- Rust resistant screws – confirmed through 1500-hour salt spray testing
- RuaOne™ **Expanded Valve Space** – 3"-4"-5" service valve space – provides a minimum working area of 27 square inches for easier access
- RuaOne™ **Triple Service Access** – 10" wide, industry leading corner service access – makes repairs easier and faster. The two fastener removable corner allows optimal access to internal unit components, individual louver panels come out once fastener is removed, for faster coil cleaning and easier cabinet reassembly
- Diagnostic service window with two-fastener opening – provides access to the high and low pressure.
- External gauge port access – allows easy connection of "low-loss" gauge ports
- Single-row condenser coil – makes unit lighter and allows thorough coil cleaning to maintain "out of the box" performance
- 39% fewer cabinet fasteners and fastener-free base – allow for faster access to internal components and hassle-free panel removal
- Service trays – hold fasteners or caps during service calls
- QR code – provides technical information on demand for faster service calls
- Fan motor harness with extra long wires allows unit top to be removed without disconnecting fan wire.

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NO.	REVISION DATE	DESCRIPTION
x	x	xxx

PROJECT:
REMODEL AND REPAIR EX. GREENHOUSE
FOR
SOUTHERN UNIVERSITY - AG DEPT.
181 B.A. LITTLE DRIVE
BATON ROUGE, LA 70813

DENNIS L. TERRENCE
No. 34
REGISTERED
PROFESSIONAL
ENGINEER
STATE OF LOUISIANA

06-01-26

Sheet Title:
RCP PLAN AND MECHANICAL PLAN

MAP Job No:	10-256-12
SCALE:	1 FT= 3/16"
DRAWN:	MAP
CHECK BY:	MAP
DATE:	05/30/26

M100

1 MECHANICAL NOTES

SCALE: 3/16" = 1 FT

MECHANICAL NOTES

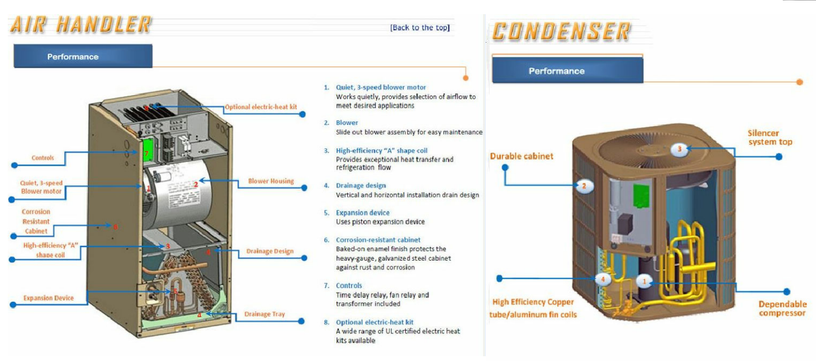
GENERAL

THE FOLLOWING IS A BRIEF DESCRIPTION OF WORK SPECIFIC TO CERTAIN ASPECTS OF THIS PROJECT. THIS IS NOT INTENDED TO BE A COMPREHENSIVE SUMMARY OF WORK. PROSPECTIVE BIDDERS/CONTRACTORS SHALL REVIEW ALL CONSTRUCTION DRAWINGS, SPECIFICATIONS AND SITE CONDITIONS AND MAKE ALLOWANCES FOR ALL WORK INCLUDED HEREIN AND ANY ADDITIONAL WORK REQUIRED TO COMPLETE THIS PROJECT. MEANS AND METHODS FOR THE PROPER INSTALLATION OF THIS WORK IS STRICTLY THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND HIS SUB-CONTRACTORS.

1. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE ROUTING OF ALL DUCTWORK WITH THE STRUCTURE AND OTHER TRADES AS CONDITIONS ALLOW. RE-ROUTE DUCTWORK AS NECESSARY TO AVOID CONFLICT. TRANSITION UP/DOWN TO AVOID OTHER TRADES AS NECESSARY.
2. INSTALL AT EACH DUCT TAKEOFF AN ADJUSTABLE VOLUME DAMPER IN AN ACCESSIBLE LOCATION.
3. CONTRACTOR SHALL COORDINATE SPACE REQUIREMENTS AND SERVICE CLEARANCES FOR ALL EQUIPMENT PRIOR TO SUBMITTING SHOP DRAWINGS. NO EQUIPMENT SHALL BE BID ON (WHETHER OR NOT RECEIVING PRIOR APPROVAL) IF IT DOES NOT FIT IN SPACE PROVIDED.
4. MECHANICAL CONTRACTOR SHALL PROCURE THE SERVICES OF AN INDEPENDENT AABC, TABB OR NEBB CERTIFIED TEST AND BALANCE AGENCY. TAB AGENCY SHALL PERFORM AN INITIAL SMOKE/PRESSURE LEAK TEST ON ALL DUCTWORK ONCE ALL SHEET METAL DUCTWORK HAS BEEN INSTALLED. A FINAL BALANCE REPORT OF ALL HVAC SYSTEMS (INCLUDING SUPPLY/RETURN TRAVERSES) AND EXHAUST FANS SHALL BE PROVIDED TO ARCHITECT/ENGINEER UPON COMPLETION OF PROJECT. ALL REPORTS SHALL MEET AABC/NEBB STANDARDS. REFER TO SPECIFICATIONS FOR COMPLETE TEST AND BALANCE REQUIREMENTS.
5. WHERE DUCTS ARE CROSSING EACH OTHER, CONTRACTOR SHALL ASSUME AN UPWARD AND DOWNWARD TRANSITION AS REQUIRED BETWEEN STRUCTURAL MEMBERS AS REQUIRED FOR AVAILABLE CEILING SPACE. NO EXTRA WILL BE GIVEN FOR THESE TRANSITIONS.
6. CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL DEVICES (THERMOSTATS, SENSORS, ETC.) WITH THE ARCHITECT AND OWNER PRIOR TO INSTALLATION. MOUNT EACH THERMOSTAT AT A HEIGHT OF 48" AFF TO CENTER LINE OF CONTROLLER. THERMOSTATS SHALL BE PROGRAMMABLE AND SHALL HAVE TEMPERATURE AND HUMIDITY SETPOINT ADJUSTMENT. CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL 24V AND 120V CONTROL POWER INCLUDING CONTROL PANELS. COORDINATE WITH ELECTRICAL CONTRACTOR FOR LOCATION OF NEAREST AVAILABLE CIRCUIT FROM WHICH TO TAP CONTROL POWER.
7. ALL EQUIPMENT, DAMPERS, ETC, LOCATED ABOVE CEILING SHALL BE INSTALLED AT A HEIGHT ACCESSIBLE FOR BALANCING AND/OR SERVICE.
8. COORDINATE THE EXACT PLACEMENT OF ALL CEILING MOUNTED DIFFUSERS AND GRILLES WITH THE CEILING, LIGHTS AND ANY OTHER CEILING MOUNTED EQUIPMENT.
9. TRANSITION SUPPLY AND RETURN DUCTWORK TO FANS AND AIR HANDLING UNITS WITH SMOOTH TRANSITIONS PER SMACNA STANDARDS AS NECESSARY DUCTWORK CONNECTIONS TO EQUIPMENT SHALL BE MADE WITH FLEXIBLE CONNECTIONS.
9. COORDINATE FRESH AIR INLETS WITH EXHAUST OUTLETS AND PLUMBING VENTS TO MAINTAIN A 10'-0" MINIMUM SEPARATION.

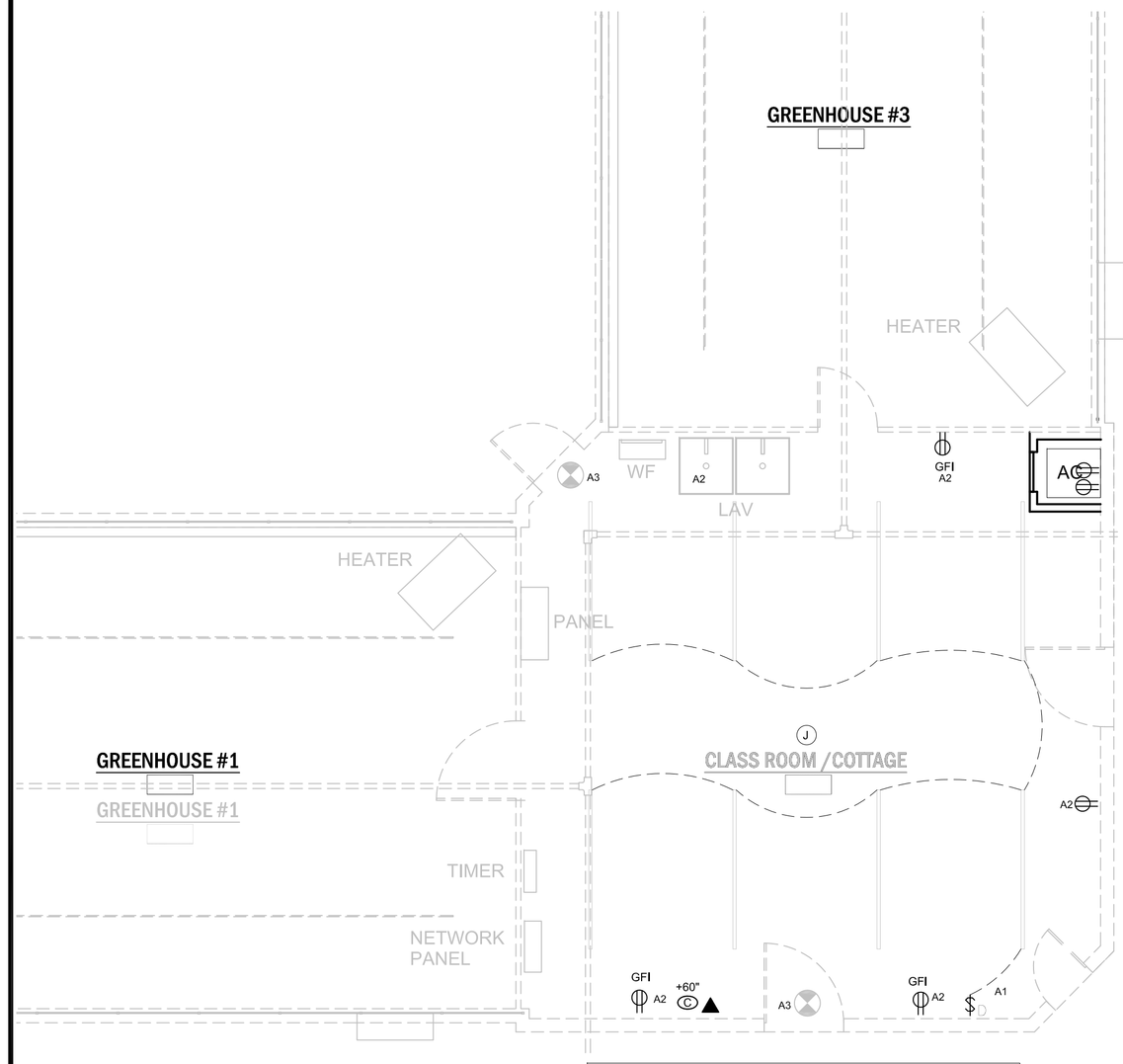
MECHANICAL DEMOLITION

1. KEEP ALL EXTERIOR A/C CONDENSER UNITS AND SECURITY CAGES.
2. EXISTING HVAC TO BE REUSED WHERE POSSIBLE. THIS INCLUDES ALL DUCTWORK, CONTROLS. ETC.
3. EXISTING UNUSED OR ABANDONED EXTERIOR PENETRATIONS SHOULD BE SEALED WEATHER TIGHT, COORDINATE WITH OWNER.
4. CONTRACTOR SHALL VERIFY ALL EXISTING STRUCTURAL CONDITIONS PRIOR TO FABRICATING NEW DUCTWORK. MODIFY AS REQUIRED TO ACCOMMODATE EXISTING STRUCTURE.

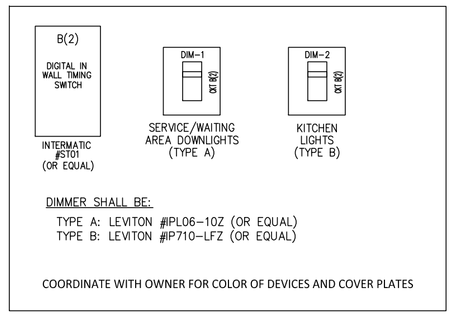


2 CLASSROOM - ELECTRICAL

SCALE: 3/16" = 1 FT



CONTRACTOR SHALL COORDINATE THE INSTALLATION OF LIGHTING FIXTURES WITH THE EXISTING MECHANICAL SYSTEM TO ENSURE PROPER INTEGRATION AND FUNCTIONALITY.



2 LIGHT FIXTURE SWITCHING STATION DETAIL (SWITCHBANK)

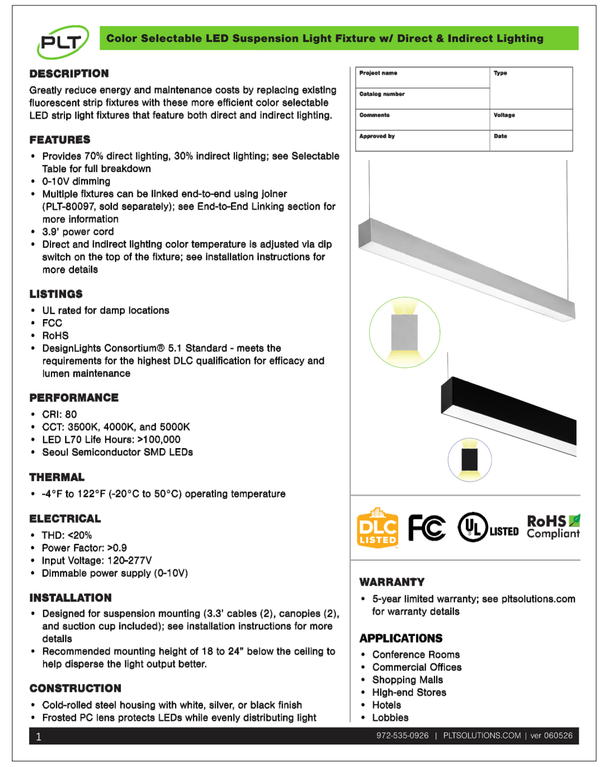
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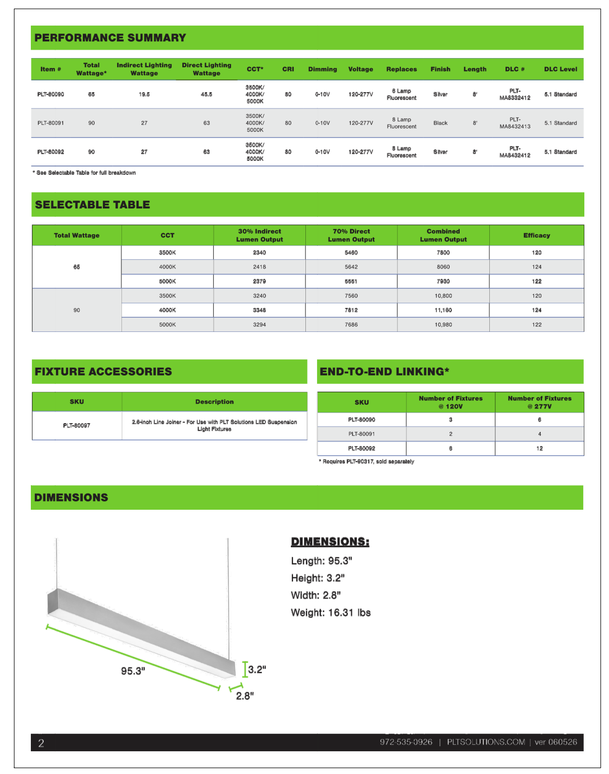
GFCI PROTECTION NOTE

ALL 125/V SINGLE PHASE / 15-20 AMP RECEPTACLES WITHIN NON-DWELLING KITCHEN SHALL BE PROVIDED WITH GFI PROTECTION [NEC 210.8(B)(2)]

GENERAL ELETRICAL NOTES:

1. ALL ELEC. WORK TO BE INSTALLED ACCORDANCE TO PROVISIONS SET FORTH IN THE N.E.C. AND / OR STATE AND LOCAL ORDINANCE.
2. ALL 125VOLT, SINGLE PHASE, 15- AND 20- A RECEPTACLES INSTALLED IN DWELLING UNIT KITCHENS SHALL HAVE GFCI PROTECTION WHERE THE RECEPTACLES ARE INSTALLED TO SERVE THE COUNTERTOP SURFACES. (NEC 210.8(A))
3. ALL WIRING SHALL BE IN CONDUIT, EMT OR RIGID FLEXIBLE CONDUIT MAY ONLY BE USED FOR FINAL CONNECTIONS FROM OUTLET BOXES TO LIGHT FIXTURES, MOTORS, APPLIANCES, ETC, MAXIMUM LENGTH 6 FEET.
4. IT'S THE ELECTRICAL CONTRACTORS RESPONSIBILITY TO BALANCE ALL CIRCUITS BETWEEN THE PHASES OF THE SYSTEM, REGARDLESS OF CIRCUITS INDICATED.
5. IN PUBLIC AREAS BATTERY PACKS FOR EXIT AND EMERGENCY LIGHTS MUST BE REMOTE OR RECESSED. ALL EMERGENCY AND EXIT LIGHTING TO BE ON UNSWITCHED CIRCUIT. PAINT EXPOSED SURFACE TO MATCH ADJACENT FINISH
6. ALL PENETRATIONS IN FIRE RATED WALL ASSEMBLIES SHALL BE SEALED WITH UL LISTED FIRE STOPPING MATERIAL.
7. SWITCHES AND LIGHTING FIXTURES TO BE SELECTED BY THE OWNER.
8. COORDINATE WITH THE MECHANICAL CONTRACTOR FOR THE INSTALLATION OF DIFFUSERS AND GRILLES TO ENSURE PROPER ALIGNMENT AND INTEGRATION WITH THE LIGHTING FIXTURES.
9. PROVIDE A SECURITY SYSTEM AS PER OWNER'S SPECIFICATION. CONTACT OWNER PRIOR TO BIDDING FOR PACKAGE REQ'MTS.





REFLECTED CEILING PLAN LEGEND

- LT1 — 2'x4' LED LIGHT LAY-IN FIXTURE
- LT2 — 2'x2' LED LIGHT LAY-IN FIXTURE
- LT3 — RECESSED LED CAN LIGHT FIXTURE.
- 8 ft. Color Selectable Architectural LED Linear Fixture - Up/Down Light - 8060 Total Lumens - Silver
- EXIT LIGHT
- EMERGENCY LIGHTING

ELECTRICAL LEGEND

POWER LEGEND

- $3/D — THREE-WAY DIMMER SWITCH
- $ — SINGLE POLE SWITCH
- $D — SINGLE POLE DIMMER SWITCH
- $M — SWITCH WITH MOTION SENSOR
- SPECIAL-PURPOSE OUTLET
- DUPLEX RECEPTACLE
- QUADRAPEX RECEPTACLE
- WP/GFI — WATER PROOF GFI DUPLEX RECEPTACLE
- GFI — GFI DUPLEX RECEPTACLE
- WP/SOF GFI — SOFFIT MOUNTED WATER PROOF GFI DUPLEX RECEPTACLE
- CM — CEILING MOUNTED DUPLEX RECEPTACLE
- AC — ABOVE COUNTER MOUNTED GFI DUPLEX RECEPTACLE
- UC — UNDER COUNTER MOUNTED GFI DUPLEX RECEPTACLE
- FLOOR MOUNTED DUPLEX RECEPTACLE
- GFI — FLOOR MOUNTED GFI DUPLEX RECEPTACLE
- 220 RECEPTACLE
- DIRECT CIRCUIT
- SAFETY SWITCH
- PANEL BOARD
- SB — LIGHTING CONTROL SWITCHBANK
- J — WIRED JUNCTION BOX

AUXILLARY

- TELEPHONE
- C — CABLE
- CAT 6
- 50 KW SURGE PROTECTOR

MAP DESIGN GROUP, LLC
8282 GOODWOOD BLVD SUITE W-3
BATON ROUGE, LA 70806
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NO.	REVISION DATE	DESCRIPTION
x	x	xxx

PROJECT:
REMODEL AND REPAIR EX. GREENHOUSE
FOR
SOUTHERN UNIVERSITY - AG DEPT.
181 B.A. LITTLE DRIVE
BATON ROUGE, LA 70813



06-01-26

Sheet Title:
ELECTRICAL PLAN

MAP Job No:	10-256-12
SCALE:	1 FT= 3/16"
DRAWN:	MAP
CHECK BY:	MAP
DATE:	05/30/26

E100