PROJECT MANUAL

BUILDING A
BARRON DRIVE
INSTITUTE, WV

GREENHOUSE ADDITION

FOR

WEST VIRGINIA STATE UNIVERSITY
RESEARCH & DEVELOPMENT CORPORATION
131 FERRELL HALL
INSTITUTE, WEST VIRGINIA

SEPTEMBER 11, 2020

Edward Tucker
ARCHITECTS, INC.

1401 Sixth Avenue
Huntington, West Virginia 25701
304.697.4990 telephone
304.697.4991 facsimile

STATE OF WEST VIRGINIA
REGISTERED ARCHITECT

NATHAN J. RANDOLPH
NO. 3635
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**Institute, WV**

### Greenhouse Addition

For  
**West Virginia State University**  
**Research & Development Corporation**  
**131 Ferrell Hall**  
**Institute, West Virginia**

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PROJECT DIRECTORY

BUILDING A
BARRON DRIVE
INSTITUTE, WV

GREENHOUSE ADDITION

FOR

WEST VIRGINIA STATE UNIVERSITY
RESEARCH & DEVELOPMENT CORPORATION
131 FERRELL HALL
INSTITUTE, WEST VIRGINIA

WEST VIRGINIA STATE UNIVERSITY
José U. Toledo, Ph.D.
Associate Vice President for Administration
West Virginia State University
Research and Public Service
131 Ferrell Hall
Institute, WV 25112
PHONE: 304-766-4290
EMAIL: toledoju@wvstateu.edu

ARCHITECT
EDWARD TUCKER ARCHITECTS, INC.
Nathan J. Randolph, AIA
1401 Sixth Avenue
Huntington, WV 25701
PHONE 304-697-4990
E-MAIL njr@etarch.com

CIVIL/LANDSCAPE ENGINEER
TERRADON CORPORATION
Greg Fox, LA (Land Development Manager)
401 Jacobson Drive
Poca, WV 25159
PHONE 800-755-8291
E-MAIL greg.fox@terradon.com
LEGAL ADVERTISEMENT

West Virginia State University Research and Development Corporation invites sealed Written Quotations to provide Work, including but not limited to labor, material, equipment, supplies, and transportation for:

BUILDING A
GREENHOUSE ADDITION
WEST VIRGINIA STATE UNIVERSITY
INSTITUTE, WEST VIRGINIA

All Quotations must be submitted in accordance with this Invitation to Submit a Written Quotation and the Construction Documents issued by Edward Tucker Architects, Inc.

Construction Documents may be obtained from for a refundable deposit of $150:

C&B Blueprint, Inc.
824 Sixth Avenue
Huntington, WV 25701-2618
(304) 525-2175
www.cbblueprint.com

The Project consists of the addition of a Greenhouse Complex that adjoins Building A located on Barron Drive in Institute, WV 25112. There are two bid packages that are being solicited: Bid Package #1 is for all materials delivered to the site necessary to construct the Greenhouses from the surface of the existing concrete slab as defined in the drawings and specifications. Bid Package #2 is for all labor to assemble the Greenhouses from the surface of the existing concrete slab as defined in the drawings and specifications. There is a single Bid Form where contractors may bid on one or both of the Bid Packages. Building A was formerly a part of the WV Division of Rehabilitative Services Complex, the property of which is now a part of the West Virginia State University campus. The building is currently vacant and unoccupied.

Work includes erecting of Greenhouse frames, drilled anchor bolts, transparent enclosure material, HVAC systems, controls, lighting, Unistrut, gutters, and all other materials designated in the drawings and specifications. Scope outside of these Bid Packages include final connections to domestic water, power, data, storm drainage, and sanitary sewer as that will be provided outside of this contract.

U.S. Department of Labor Davis Bacon wage rates apply. Bid Bond, Performance Bond, and Labor & Materials Payment Bond are required for this Project. Liquidated Damages in the amount of $300/day will be in effect. An onsite Pre-Bid meeting will occur on September 22 at 2:00pm. Sealed Quotations shall be received by the Architect located at 1401 Sixth Avenue, Huntington WV 25701 until 3:00 p.m. EST on September 28, 2020.
West Virginia State University Research and Development Corporation invites sealed Written Quotations to provide all Work, including but not limited to labor, material, equipment, supplies, and transportation for:

BUILDING A
GREENHOUSE ADDITION
WEST VIRGINIA STATE UNIVERSITY
INSTITUTE, WEST VIRGINIA

All Quotations must be submitted in accordance with this Invitation to Submit a Written Quotation and the Construction Documents issued by the Architect.

Construction Documents may be obtained from for a refundable deposit of $150:

C&B Blueprint, Inc.
824 Sixth Avenue
Huntington, WV 25701-2618
(304) 525-2175
www.cbblueprint.com

SCOPE OF WORK

The Project consists of the addition of a Greenhouse Complex that adjoins Building A located on Barron Drive in Institute, WV 25112. There are two bid packages that are being solicited: Bid Package #1 is for all materials delivered to the site necessary to construct the Greenhouses from the surface of the existing concrete slab as defined in the drawings and specifications. Bid Package #2 is for all labor to assemble the Greenhouses from the surface of the existing concrete slab as defined in the drawings and specifications. There is a single Bid Form where contractors may bid on one or both of the Bid Packages. Building A was formerly a part of the WV Division of Rehabilitative Services Complex, the property of which is now a part of the West Virginia State University campus. The building is currently vacant and unoccupied.

Work includes erecting of Greenhouse frames, drilled anchor bolts, transparent enclosure material, HVAC systems, controls, lighting, Unistrut, gutters, and all other materials designated in the drawings and specifications. Scope outside of these Bid Packages include final connections to domestic water, power, data, storm drainage, and sanitary sewer as that will be provided outside of this contract.
Technical questions concerning the Construction Documents should be directed to the Architect:

Nathan J. Randolph, AIA  
Edward Tucker Architects, Inc.  
1401 Sixth Avenue  
Huntington, West Virginia 25701  
304-697-4990

An onsite Pre-Bid meeting will occur on September 22 at 2:00pm.

Quotations shall be submitted on the Form of Proposal bound into the Project Manual.

Acknowledge receipt of each addendum in the space provided on the Form of Proposal or Quotation may be rejected.

A certified check in the amount of five percent (5%) of the total Bid, or a satisfactory Bid Bond furnished by a solvent surety company authorized to do business in the State of West Virginia in an amount equal to five percent (5%) of the total Bid, must be submitted by each Bidder with his Bid.

Sealed Quotations shall be received by the Architect at the following location until 3:00 p.m. EST on September 28, 2020. Quotations shall be delivered to:

Nathan J. Randolph, AIA  
Edward Tucker Architects, Inc.  
1401 Sixth Avenue  
Huntington, West Virginia 25701  
304-697-4990

Each Quotation shall be enclosed in a sealed, self-addressed, opaque envelope plainly marked:

SEAL QUOTATION

Proposal for:

BUILDING A GREENHOUSE ADDITION  
WEST VIRGINIA STATE UNIVERSITY
Contractor must be a registered vendor with the Purchasing Section of the West Virginia Department of Administration. Quotations will be rejected from any vendor not properly registered with the Purchasing Section prior to issuance of a Purchase Order.

West Virginia State Code §21-11-2 requires that all persons desiring to perform contractual work in this State must be duly licensed. The West Virginia Contractor Licensing Board is empowered to issue the Contractor License. Application for a Contractor License may be made by contacting the West Virginia Department of Labor, 1800 Washington Street East, Charleston, WV 25305, telephone 304-558-7890.

West Virginia State Code §21-11-11 requires any prospective Contractor to include the Contractor License number on their Quotation. The successful Contractor will be required to furnish a copy of their Contractor License prior to issuance of Purchase Order/ Contract.

To the extent allowed by West Virginia Code, the Owner reserves the right to waive any informality or irregularity in any Quotation or Quotations and to reject any or all Quotations in whole or in part; to reject any condition of the Quotation that is in any way inconsistent with the requirements, terms and conditions of the Construction Documents; or to reject a Quotation that is in any way incomplete or irregular.

Quotations may not be modified or withdrawn for a period of sixty (60) days after receipt of Quotations.

The successful Bidder will be required to execute a Contract, provide a Performance Bond and a Labor and Material Payment Bond for 100% of the contract award, comply with all of the rules and regulations of the West Virginia Workers’ Compensation Fund, and provide evidence of insurance coverage to the minimum limits required by the Contract Documents.

The successful Bidder and all Subcontractors shall pay workers no less than the minimum wage rates as determined by the U.S. Department of Labor – Davis-Bacon Act.

Any work performed or any material contracted for prior to receipt of the Owner’s written Notice to Proceed and/or Purchase Order shall be at the Bidder’s risk.

The Bidder, if successful and awarded a Contract, agrees that all Work is to be Substantially Complete within the time limitations stated in the Form of Proposal.

The Owner will suffer financial loss if the Work is not Substantially Complete within the Contract Time. For each calendar day of delay in achieving Substantial Completion, the Contractor shall be liable for and shall pay the Owner $500.00 per day, not as a penalty, but as liquidated damages. For each calendar day of delay in achieving Final Completion, the Contractor shall be liable for and shall pay half of the amount of liquidated damages stated above, plus any and all additional fees of the Architect and
the Architect’s consultants that may accrue. Allowances may be made for delays due to shortages of materials and/or energy resources, subject to proof by documentation, and also for delays due to strikes or other delays beyond the control of the Contractor. All delays and any claim for extension of the Contract Time must be properly documented in accordance with the Contract Documents by the Contractor.

END OF INVITATION TO SUBMIT A WRITTEN QUOTATION
Bidding Documents may be examined without charge at the following locations:

The West Virginia Higher Education Policy Commission  
1018 Kanawha Boulevard, East, Suite 700  
Charleston, West Virginia 25301

West Virginia State University  
Research & Development Corporation  
131 Ferrell Hall  
Institute, West Virginia 25112

Edward Tucker Architects, Inc.  
1401 Sixth Avenue  
Huntington, West Virginia 25701

Construction Employer’s Association of North Central West Virginia  
2794 White Hall Boulevard  
White Hall, West Virginia 26554

Ohio Valley Construction Employer’s Council  
21 Armory Drive  
Wheeling, West Virginia 26003

Contractor’s Association of West Virginia  
2114 Kanawha Boulevard, East  
Charleston, West Virginia 25311

Parkersburg-Marietta Contractor’s Association  
4424 – B Emerson Avenue  
Parkersburg, West Virginia 26104

Reed Construction Data  
Document Processing Center  
30 Technology Parkway S., Suite 500  
Norcross, Georgia 30092

McGraw-Hill Dodge Reports  
Attn: Scan Department  
3315 Central Avenue  
Hot Springs, Arkansas 71913-6138

Pittsburgh Builders Exchange  
1813 North Franklin Street  
Pittsburgh, PA 15233  
karen@pghbx.org

END OF DEPOSITORIES FOR BIDDING DOCUMENTS
Instructions to Bidders

for the following PROJECT:
(Name and location or address)
Demolition Package - F. Ray Power Building
Barron Drive
Institute, West Virginia 25112

THE OWNER:
(Name, legal status and address)
West Virginia State University Research & Development Corporation
131 Ferrell Hall
P.O. Box 1000
Institute, WV 25112-1000

THE ARCHITECT:
(Name, legal status and address)
Edward Tucker Architects, Inc.
1401 Sixth Avenue
Huntington, West Virginia 25701

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ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.
ARTICLE 1  DEFINITIONS
§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be 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 or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

ARTICLE 2  BIDDER'S REPRESENTATIONS
§ 2.1 The Bidder by making a Bid represents that:
§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder’s personal observations with the requirements of the proposed Contract Documents.

§ 2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

ARTICLE 3  BIDDING DOCUMENTS
§ 3.1 COPIES
§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder’s deposit will be refunded.
§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.

§ 3.1.3 Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

§ 3.1.4 The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS
§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

§ 3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

§ 3.3 SUBSTITUTIONS
§ 3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

§ 3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect’s decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.3 If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

§ 3.3.4 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 ADDENDA
§ 3.4.1 Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.
ARTICLE 4  BIDDING PROCEDURES
§ 4.1 PREPARATION OF BIDS
§ 4.1.1 Bids shall be submitted on the forms included with the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

§ 4.2 BID SECURITY
§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder agrees to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

§ 4.3 SUBMISSION OF BIDS
§ 4.3.1 All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

§ 4.3.3 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.4 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID
§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.
§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

§ 4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

§ 4.4.4 Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

ARTICLE 5 CONSIDERATION OF BIDS
§ 5.1 OPENING OF BIDS
At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

§ 5.2 REJECTION OF BIDS
The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

§ 5.3 ACCEPTANCE OF BID (AWARD)
§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner’s judgment, is in the Owner’s own best interests.

§ 5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION
§ 6.1 CONTRACTOR’S QUALIFICATION STATEMENT
Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305, Contractor’s Qualification Statement, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

§ 6.2 OWNER’S FINANCIAL CAPABILITY
The Owner shall, at the request of the Bidder to whom award of a Contract is under consideration and no later than seven days prior to the expiration of the time for withdrawal of Bids, furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner’s obligations under the Contract. Unless such reasonable evidence is furnished, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 SUBmittals
§ 6.3.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:
  .1 a designation of the Work to be performed with the Bidder’s own forces;
  .2 names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
  .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.
§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder in writing if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder’s option, (1) withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND
§ 7.1 BOND REQUIREMENTS
§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder’s usual sources.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 If the Owner requires that bonds be secured from other than the Bidder’s usual sources, changes in cost will be adjusted as provided in the Contract Documents.

§ 7.2 TIME OF DELIVERY AND FORM OF BONDS
§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR
Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.
FORM OF PROPOSAL

TO THE OWNER: West Virginia State University Research & Development Corporation
131 Ferrell Hall
Institute, WV 25112

PROJECT: BUILDING A GREENHOUSE ADDITION
Barron Drive, Institute, WV

West Virginia State University Research & Development Corporation

The undersigned, being familiar with and understanding the Contract Documents and also having examined the site and being familiar with conditions affecting the Project, hereby proposes to furnish all labor, material, equipment, supplies and transportation, and to perform all Work in accordance with the Contract Documents within the time set forth below for the sum of:

BID PACKAGE #1 – MATERIAL
LUMP SUM QUOTATION: ________________________________________  $ ___________________
(Amount to be shown in both words and numbers. In the event of a difference between the written amount and the number amount, the written amount shall prevail.)

BID PACKAGE #2 – LABOR
LUMP SUM QUOTATION: ________________________________________  $ ___________________
(Amount to be shown in both words and numbers. In the event of a difference between the written amount and the number amount, the written amount shall prevail.)

RESPECTFULLY SUBMITTED:

SIGNATURE: ______________________________________ ______  Date:  ______________
Signature in Ink

NAME: ___________________________________________ _
Please Type or Print

TITLE: ___________________________________________ _

FIRM NAME: ______________________________________ ______

FIRM ADDRESS:____________________________________ ________
____________________________________________

TELPHONE: ____________________________________________

CONTRACTOR’S:
LICENSE NO.: ______________________________________ ______
CONTRACTORS LICENSE

West Virginia Code 21-11-2 requires that all persons desiring to perform contractual work in West Virginia must be duly licensed. The West Virginia Contractors Licensing Board is empowered to issue the contractors license. Application for a contractor’s license may be made by contacting the West Virginia Department of Labor, 1800 Washington Street, East, Charleston, West Virginia 25305. Telephone: (304) 558-7890. West Virginia Code 21-11-11 requires any prospective Bidder to include the contractor’s license number on their Bid. The successful Bidder will be required to furnish a copy of their contractor’s license prior to issuance of a Purchase Order/Contract. Please complete and attach EXHIBIT A to Quotation.

ACCEPTANCE

This offer shall be open to acceptance and is irrevocable for sixty (60) days from the above date.

If this quotation is accepted by the Owner within the time period stated above, we will:

- Execute the Agreement no less than seven (7) calendar days of receipt of Notice of Award.
- Commence work within fourteen (14) calendar days after written Notice to Proceed of this bid.

CONTRACT TIME

If this Quotation is accepted, and a Contract is executed within the time limitations stated above, we will complete the work to reach Substantial Completion no more than one hundred fifty (150) calendar days from receipt of Notice to Proceed.

ADDENDA ACKNOWLEDGEMENT

The undersigned hereby acknowledge receipt of the following Addenda and has taken the information contained therein into full consideration in the formulation of this Quotation.

Addenda No. 1 ____________
Addenda No. 2 ____________
Addenda No. 3 ____________
Addenda No. 4 ____________
Addenda No. 5 ____________

Failure to acknowledge receipt of each Addendum may be cause for rejection of the Quotation.

SIGNATURE: _______________________________ DATE: ________________
Signature in Ink
CONTRACTOR LICENSE

West Virginia State Code §21-11-2 requires that all persons desiring to perform contractual work in this State must be duly licensed. The West Virginia Contractor Licensing Board is empowered to issue the Contractor License. Application for a Contractor License may be made by contacting the West Virginia Department of Labor, 1800 Washington Street, E., Charleston, West Virginia 25305, telephone: (304) 558-7890.

West Virginia State Code §21-11-11 requires any prospective bidder to include the Contractor License number on their bid.

Bidders to Complete:

Contractor’s Name ________________________________

Contractor License No. ________________________________

The successful bidder will be required to furnish a copy of their Contractor License prior to issuance of a Purchase Order/Contract.
BID BOND

KNOW ALL MEN BY THESE PRESENTS, That we, the undersigned, ____________________________

of ____________________________, as Principal, and ____________________________, a corporation organized and existing under the laws of the State of ____________________________ with its principal office in the City of ____________________________, as Surety, are held and firmly bound unto the State of West Virginia, as Obligee, in the penal sum of ____________________________ ($_________) for the payment of which, well and truly to be made, we jointly and severally bind ourselves, our heirs, administrators, executors, successors and assigns.

The Condition of the above obligation is such that whereas the Principal has submitted to the Purchasing Section of the Department of Administration a certain bid or proposal, attached hereto and made a part hereof, to enter into a contract in writing for ____________________________

NOW THEREFORE,

(a) if said bid shall be rejected, or
(b) if said bid shall be accepted and the Principal shall enter into a contract in accordance with the bid or proposal attached hereto and shall furnish any other bonds and insurance required by the bid or proposal, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be null and void, otherwise this obligation shall remain in full force and effect. It is expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for the value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Obligee may accept such bid, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be affixed hereunto and these presents to be signed by their proper officers, this
day of ____________________________, 20________

Principal Corporate Seal

__________________________________________
(Name of Principal)

By

__________________________________________
(Must be President or Vice President)

__________________________________________
(Title)

__________________________________________
(Name of Surety)

__________________________________________
Attorney-in-Fact

IMPORTANT – Surety executing bonds must be licensed in West Virginia to transact surety insurance. Raised corporate seals must be affixed, a power of attorney must be attached.
BID BOND PREPARATION INSTRUCTIONS

(A) WV State Agency
(Stated on Page 1 "Spending Unit")
Request for Quotation Number (upper right corner of page #1)

(C) Your Company Name

(D) City, Location of your Company

(E) State, Location of your Company

(F) Surety Corporate Name

(G) City, Location of Surety

(H) State, Location of Surety

(I) State of Surety Incorporation

(J) City of Surety Incorporation

(K) Minimum amount of acceptable bid bond is 5% of total bid. You may state "5% of bid" or a specific amount on this line in words.

(L) Amount of bond in figures

(M) Brief Description of scope of work

(N) Day of the month

(O) Month

(P) Year

(Q) Name of Corporation

(R) Raised Corporate Seal of Principal

(S) Signature of President or Vice President

(T) Title of person signing

(U) Raised Corporate Seal of Surety

(V) Corporate Name of Surety

(W) Signature of Attorney in Fact of the Surety

NOTE: Dated, Power of Attorney with Raised Surety Seal must accompany this bid bond.

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, That we, the undersigned,

as Principal, and

of

as Surety, are held and firmly bound unto The State of West Virginia, as Obligee, in the penal sum of

for the payment of which, well and truly to be made, we jointly and severally bind ourselves, our heirs, administrators, executors, successors and assigns.

The Condition of the above obligation is such that whereas the Principal has submitted to the Purchasing Section of the Department of Administration a certain bid or proposal, attached hereto and made a part hereof to enter into a contract in writing for

NOW THEREFORE,

(a) If said bid shall be rejected, or

(b) If said bid shall be accepted and the Principal shall enter into a contract in accordance with the bid or proposal attached hereto and shall furnish any other bonds and insurance required by the bid or proposal, and shall in all other respects perform the agreement created by the acceptance of said bid then this obligation shall be null and void, otherwise this obligation shall remain in full force and effect. It is expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of time within which the Obligee may accept such bid: and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be affixed hereto and these presents to be signed by their proper officers, this (N) day of (O), 20 (P).

Principal Corporate Seal

(R)

By

(S)

(Must be President or Vice President)

(T)

Title

Surety Corporate Seal

(U)

(Name of Surety)

(W)

Attorney-in-Fact

IMPORTANT - Surety executing bonds must be licensed in West Virginia to transact surety insurance. Raised Corporate Seals must be affixed and a Power of Attorney must be attached.
PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That _____________________________________________________________

(Contractor name, complete address including ZIP Code and legal title)

as Principal, hereinafter called Contractor, and

_______________________________________________________________

(Surety name and complete address including ZIP Code)

________________________, a corporation organized and existing under

the laws of the State of __________________________________ ,

as Surety, hereinafter called Surety, are held firmly bound unto

_______________________________________________________________

(Owner name, complete address including ZIP Code and legal title)

_______________________________________________________________

as Obligee, hereinafter called Owner, in the amount of

Dollars (_________________________ ), for the payment whereof Contractor and Surety bind

themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated

_______________________________________________________________

entered into a contract with Owner for

_______________________________________________________________

in accordance with drawings and specifications prepared by

_______________________________________________________________

which contract is by reference made a part hereof, and is hereinafter referred to as the CONTRACT.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if Contractor shall, promptly and faithfully Perform and CONTRACT,

then this obligation shall be null and void, otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the Owner.

Whenever Contractor shall be, and declared by Owner to be in default under the CONTRACT, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

1. Complete the CONTRACT in accordance with its terms and conditions, and

2. Shall save the Owner harmless from any claims, judgments, or liens arising from the Surety's failure to either remedy the default or to

complete the CONTRACT in accordance with its terms and conditions in a timely manner.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the successors of Owner.

Signed and sealed this * _______________________________ day of ______________________ 20 _________ .

Principal Raised Corporate Seal (MUST BE AFFIXED)

_______________________________________________________________ (Seal)

(Contractor Name)

BY: __________________________________________________________ (Seal)

(Must be President, Vice President, Owner, Partner, Manager or Member)

_______________________________________________________________ (Title)

Surety Raised Corporate Seal (MUST BE AFFIXED)

_______________________________________________________________ (Seal)

(Surety)

BY: __________________________________________________________ (Seal)

NOTE: Applicable sections of attached acknowledgments must be completed and returned as part of the bond.

NOTE: Raised Corporate Seals are mandatory.

Please attach Power of Attorney.

*Power of Attorney must be certified on this date or later.
ACKNOWLEDGMENTS

Acknowledgment by Principal if individual or Partnership

1. STATE OF

2. County of

3. I, , a Notary Public in and for the

4. county and state aforesaid, do hereby certify that

whose name is signed to the foregoing writing, has this day acknowledged the same before me in my said county.

5. Given under my hand this day of 20

6. Notary Seal

7. (Notary Public)

8. My commission expires on the day of 20

Acknowledgment by Principal if Corporation

9. STATE OF

10. County of

11. I, , a Notary Public in and for the

12. county and state aforesaid, do hereby certify that

13. who as, signed the foregoing writing for

14. a corporation,

has this day, in my said county, before me, acknowledged the said writing to be the act and deed of the said corporation.

15. Given under my hand this day of 20

16. Notary Seal

17. (Notary Public)

18. My commission expires on the day of 20

Acknowledgment by Surety

19. STATE OF

20. County of

21. I, , a Notary Public in and for the

22. county and state aforesaid, do hereby certify that

23. who as, signed the foregoing writing for

24. a corporation,

has this day, in my said county, before me, acknowledged the said writing to be the act and deed of the said corporation.

25. Given under my hand this day of 20

26. Notary Seal

27. (Notary Public)

28. My commission expires on the day of 20

APPROVED AS TO FORM PRIOR TO SIGNATURE

THIS DAY OF August 2009.

By: [Signature]

[Deputy Attorney General]
ACKNOWLEDGMENT PREPARATION INSTRUCTIONS

1. IF PRINCIPAL IS AN INDIVIDUAL OR PARTNERSHIP, HAVE NOTARY COMPLETE LINES (1) THROUGH (8).
2. IF PRINCIPAL IS A CORPORATION, HAVE NOTARY COMPLETE LINES (9) THROUGH (18).
3. SURETY MUST HAVE NOTARY COMPLETE LINES (19) THROUGH (28).
4. Notaries must:

ACKNOWLEDGMENT BY PRINCIPAL, IF INDIVIDUAL OR PARTNERSHIP

1. Enter name of State.
2. Enter name of County.
3. Enter name of Notary Public witnessing transactions.
4. Enter name of principal covered by bond if individual or partnership. (Must be Owner or General Partner of Sole Proprietorship or Partnership)
5. Notary enters date bond was witnessed. Must be the same as or later than signature date.
6. Affix Notary Seal.
7. Notary affixes his/her signature.
8. Notary enters commission expiration date.

ACKNOWLEDGMENT BY PRINCIPAL IF CORPORATION

9. Enter name of State.
10. Enter name of County.
11. Enter name of Notary Public witnessing transactions.
12. Enter name of Corporate Officer signing bond.
13. Enter Title of Corporate Officer signing bond. (Must be President or Vice President of Corporation; Manager or Managing Member of Limited Liability Company)
14. Enter name of Company or Corporation.
15. Notary enters date bond was witnessed. Must be the same as or later than signature date.
16. Affix notary Seal.
17. Notary affixes his/her signature.
18. Notary enters commission expiration date.

ACKNOWLEDGMENT BY SURETY

19. Enter name of State.
20. Enter name of County.
21. Enter name of Notary Public witnessing transactions.
22. Enter name of person having power of attorney to bind Surety Company.
23. Enter Title of person binding Surety Company.
24. Enter name of Insurance Company (Surety).
25. Notary enters date bond was witnessed. Must be the same as or later than signature date.
27. Notary affixes his/her signature.
28. Notary enters commission expiration date.

POWER OF ATTORNEY INSTRUCTIONS

Power of attorney for surety must be attached showing that it was in full force and effect on signature date indicated on the face of the bond. A raised corporate seal must also be affixed to the Power of Attorney form.

a. Name of attorney in fact must be listed.
b. Power of Attorney may not exceed imposed limitations.
c. Certificate date, the signature date of bond must be entered.
d. Signature of authorizing official must be affixed. (Signature may be facsimile).
e. Raised seal must be affixed.
LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

That ________________________________ (Contractor name, complete address including ZIP Code and legal title)

as Principal, hereinafter called Contractor, and

______________________________ (Surety name and complete address including ZIP Code)

______________________________ a corporation organized and existing under

the laws of the State of ________________________________, with its principal office in the City of ________________________________

as Surety, hereinafter called Surety, are held firmly bound unto ________________________________ (Owner name, complete address including ZIP Code and legal title)

______________________________ as Obligee, hereinafter called Owner, for the use and benefit of claimants as herein below defined in the amount of

______________________________ Dollars (______________________________),

for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated ________________________________, entered into a contract with Owner for

______________________________ in accordance with drawings and specifications prepared by ________________________________

which contract is by reference made a part hereof, and is hereinafter referred to as the CONTRACT.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if Contractor shall, well and truly perform the contract, and shall pay off, satisfy and discharge all claims of subcontractors, laborers, materialmen and all persons furnishing material or doing work pursuant to the CONTRACT and shall save Owner and its property harmless from any and all liability over and above the contract price thereof, between the Owner and the Contractor, for all of such labor and material, and shall fully pay off and discharge and secure the release of any and all mechanics liens which may be placed upon said property by any such subcontractor, laborer or materialman, then this obligation shall be null and void. Otherwise, it shall remain in full force and effect.

Signed and sealed this * ________________________________ day of ________________________________, 20 ________ .

Principal Raised Corporate Seal (MUST BE AFFIXED)

__________________________________________ (Seal)

(Contractor Name)

BY: ______________________________________ (Seal)

(Title)

(Surety)

BY: ______________________________________ (Seal)

Surety Raised Corporate Seal (MUST BE AFFIXED)

NOTE: Raised Corporate Seals are mandatory.
Please attach Power of Attorney.

NOTE: Applicable sections of attached acknowledgments must be completed and returned as part of the bond.

*Power of Attorney must be certified on this date or later.
ACKNOWLEDGMENTS

Acknowledgment by Principal if individual or Partnership

1. STATE OF

2. County of

3. I, , a Notary Public in and for the

4. county and state aforesaid, do hereby certify that

   whose name is signed to the foregoing writing, has this day acknowledged the same before me in my said county.

5. Given under my hand this day of

6. Notary Seal 7:

   (Notary Public)

8. My commission expires on the day of

Acknowledgment by Principal if Corporation

9. STATE OF

10. County of

11. I, , a Notary Public in and for the

12. county and state aforesaid, do hereby certify that

13. who as, signed the foregoing writing for

14. a corporation,

   has this day, in my said county, before me, acknowledged the said writing to be the act and deed of the said corporation.

15. Given under my hand this day of

16. Notary Seal 17:

   (Notary Public)

18. My commission expires on the day of

Acknowledgment by Surety

19. STATE OF

20. County of

21. I, , a Notary Public in and for the

22. county and state aforesaid, do hereby certify that

23. who as, signed the foregoing writing for

24. a corporation,

   has this day, in my said county, before me, acknowledged the said writing to be the act and deed of the said corporation.

25. Given under my hand this day of

26. Notary Seal 27:

   (Notary Public)

28. My commission expires on the day of

APPROVED AS TO FORM PRIOR TO SIGNATURE

THIS 20th DAY OF August 2009.

By [Signature]

[Seal]

[Title]
ACKNOWLEDGMENT PREPARATION INSTRUCTIONS

1. IF PRINCIPAL IS AN INDIVIDUAL OR PARTNERSHIP, HAVE NOTARY COMPLETE LINES (1) THROUGH (8).
2. IF PRINCIPAL IS A CORPORATION, HAVE NOTARY COMPLETE LINES (9) through (18).
3. SURETY MUST HAVE NOTARY COMPLETE LINES (19) through (28).
4. Notaries must:

ACKNOWLEDGMENT BY PRINCIPAL, IF INDIVIDUAL OR PARTNERSHIP

1. Enter name of State.
2. Enter name of County.
3. Enter name of Notary Public witnessing transactions.
4. Enter name of principal covered by bond if individual or partnership. (Must be Owner or General Partner of Sole Proprietorship or Partnership)
5. Notary enters date bond was witnessed. Must be the same as or later than signature date.
6. Affix Notary Seal.
7. Notary affixes his/her signature.
8. Notary enters commission expiration date.

ACKNOWLEDGMENT BY PRINCIPAL IF CORPORATION

9. Enter name of State.
10. Enter name of County.
11. Enter name of Notary Public witnessing transactions.
12. Enter name of Corporate Officer signing bond.
13. Enter Title of Corporate Officer signing bond. (Must be President or Vice President of Corporation; Manager or Managing Member of Limited Liability Company)
14. Enter name of Company or Corporation.
15. Notary enters date bond was witnessed. Must be the same as or later than signature date.
16. Affix notary Seal.
17. Notary affixes his/her signature.
18. Notary enters commission expiration date.

ACKNOWLEDGMENT BY SURETY

19. Enter name of State.
20. Enter name of County.
21. Enter name of Notary Public witnessing transactions.
22. Enter name of person having power of attorney to bind Surety Company.
23. Enter Title of person binding Surety Company.
24. Enter name of Insurance Company (Surety).
25. Notary enters date bond was witnessed. Must be the same as or later than signature date.
27. Notary affixes his/her signature.
28. Notary enters commission expiration date.

POWER OF ATTORNEY INSTRUCTIONS

Power of attorney for surety must be attached showing that it was in full force and effect on signature date indicated on the face of the bond. A raised corporate seal must also be affixed to the Power of Attorney form.

a. Name of attorney in fact must be listed.
b. Power of Attorney may not exceed imposed limitations.
c. Certificate date, the signature date of bond must be entered.
d. Signature of authorizing official must be affixed. (Signature may be facsimile).
e. Raised seal must be affixed.
THE CONTRACT FORMS LISTED BELOW ARE DEFINED IN THE GENERAL CONDITIONS AND HAVE THE SAME MEANINGS ASSIGNED TO THEM AS IN THE GENERAL CONDITIONS. THEY SHALL BE USED FOR THIS PROJECT AS IF BOUND HEREIN.

STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR
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(AIA DOCUMENT G706-1994) ........................................................................ 1
CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS (AIA DOCUMENT G706A-1994) .... 1
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CONSTRUCTION CHANGE DIRECTIVE (AIA DOCUMENT G714-2001) ...................... 1

END OF CONTRACT FORMS
**AIA® Document A201™ – 2017**

**General Conditions of the Contract for Construction**

for the following PROJECT:
*(Name and location or address)*

Barboursville Branch Library
Barboursville, West Virginia 25504

**THE OWNER:**
*(Name, legal status and address)*
Cabell County Public Library
455 Ninth Street Plaza
Huntington, West Virginia 25701

**THE ARCHITECT:**
*(Name, legal status and address)*
Edward Tucker Architects, Inc.
1401 Sixth Avenue
Huntington, West Virginia 25701

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14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES
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ARTICLE 1 GENERAL PROVISIONS
§ 1.1 Basic Definitions
§ 1.1.1 The Contract Documents
The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor’s bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract
The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect’s consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect’s consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect’s duties.

§ 1.1.3 The Work
The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor’s obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project
The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings
The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications
The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service
Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect’s consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker
The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents
§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.
§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties’ intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization
Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation
In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service
§ 1.5.1 The Architect and the Architect’s consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submitall or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect’s or Architect’s consultants’ reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect’s consultants.

§ 1.6 Notice
§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission
The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance
Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document
G202™—2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party’s sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner’s approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner’s authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic’s lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner’s interest therein.

§ 2.2 Evidence of the Owner’s Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner’s obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner’s obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner’s ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor’s request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days’ notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.
§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner’s control and relevant to the Contractor’s performance of the Work with reasonable promptness after receiving the Contractor’s written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner’s Right to Stop the Work
If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner’s Right to Carry Out the Work
If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner’s expenses and compensation for the Architect’s additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR
§ 3.1 General
§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor’s authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect’s administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor
§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.
§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor’s review is made in the Contractor’s capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor’s notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures
§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor’s best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor’s proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor’s employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials
§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.
§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor’s employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty
§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor’s warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes
The Contractor shall pay sales, consumer use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws
§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions
If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor’s cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect’s determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.
§ 3.8 Allowances
§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,
.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
.2 Contractor’s costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor’s costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent
§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner’s consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor’s Construction and Submittal Schedules
§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner’s and Architect’s information a Contractor’s construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect’s approval. The Architect’s approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor’s construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site
The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and
§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect’s approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect’s approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect’s approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor’s responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely
upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional’s written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor’s design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site
The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching
§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up
§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor’s tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work
The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights
The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.
§ 3.18 Indemnification
§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect’s consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers’ compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT
§ 4.1 General
§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract
§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner’s representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor’s rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications
The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect’s services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect’s consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.
§ 4.2.5 Based on the Architect’s evaluations of the Contractor’s Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor’s submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect’s action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect’s professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect’s review of the Contractor’s submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect’s review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect’s approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner’s review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect’s responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect’s decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.
ARTICLE 5 SUBCONTRACTORS
§ 5.1 Definitions
§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-contractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-contractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-contractor or an authorized representative of the Sub-contractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work
§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor’s Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations
By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor’s Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts
§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

1. assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

2. assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.
When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor’s rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor’s compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor’s obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner’s Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term “Separate Contractor(s)” shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner’s own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term “Contractor” in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner’s own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner’s own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor’s construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor’s Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor’s Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner’s or Separate Contractor’s completed or partially completed construction is fit and proper to receive the Contractor’s Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor’s delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor’s delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.
§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner’s Right to Clean Up
If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7  CHANGES IN THE WORK
§ 7.1 General
§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders
§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:
   .1 The change in the Work;
   .2 The amount of the adjustment, if any, in the Contract Sum; and
   .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives
§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
   .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
   .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
   .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
   .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

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.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers’ compensation insurance, and other employee costs approved by the Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor’s agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor’s agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect’s professional judgment, to be reasonably justified. The Architect’s interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work
The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect’s order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect’s order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME
§ 8.1 Definitions
§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.
§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion
§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time
§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor’s control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION
§ 9.1 Contract Sum
§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values
Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s subsequent Applications for Payment.

§ 9.3 Applications for Payment
§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor’s right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.
§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 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. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner’s title to such materials and equipment or otherwise protect the Owner’s interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor’s knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment
§ 9.4.1 The Architect will, within seven days after receipt of the Contractor’s Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect’s reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect’s reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect’s evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect’s knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor’s right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification
§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect’s opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect’s opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

1. defective Work not remedied;
2. third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
3. failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid
balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect’s decision regarding a Certificate for Payment under Section 9.5.1, in
whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously
withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option,
issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make
payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by
joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application
for Payment.

§ 9.6 Progress Payments
§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and
within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner,
the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the
Contractor on account of the Subcontractor’s portion of the Work. The Contractor shall, by appropriate agreement
with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of
completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account
of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid
Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor
fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and
suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation
to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor’s payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2,
9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner
shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum,
payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be
held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both,
under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require
money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary
liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of
punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall
defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney’s fees and
litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any
tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If
approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against
which the lien or other claim for payment has been asserted.
§ 9.7 Failure of Payment
If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor’s Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days’ notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion
§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, 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 will make an inspection to determine whether the Work or designated portion thereof is substantially complete. 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 or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, 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 Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use
§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, 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 a 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. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.
§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor’s notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect’s knowledge, information and belief, and on the basis of the Architect’s on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect’s final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor’s being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner’s property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers’ warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys’ fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

.1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
.2 failure of the Work to comply with the requirements of the Contract Documents;
.3 terms of special warranties required by the Contract Documents; or
.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to...
employees on the Work and other persons who may be affected thereby;

the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and

other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor’s obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor’s organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor’s superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor’s notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will
promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect’s consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor’s fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner’s fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies
In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor’s discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS
§ 11.1 Contractor’s Insurance and Bonds
§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect’s consultants shall be named as additional insureds under the Contractor’s commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 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.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor’s Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or
expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner’s Insurance
§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner’s Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation
§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect’s consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect’s consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.
§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance
The Owner, at the Owner’s option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner’s property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner’s property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss
§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK
§ 12.1 Uncovering of Work
§ 12.1.1 If a portion of the Work is covered contrary to the Architect’s request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect’s examination and be replaced at the Contractor’s expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor’s expense.

§ 12.2 Correction of Work
§ 12.2.1 Before Substantial Completion
The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect’s services and expenses made necessary thereby, shall be at the Contractor’s expense.

§ 12.2.2 After Substantial Completion
§ 12.2.2.1 In addition to the Contractor’s obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during
that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor’s correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor’s liability with respect to the Contractor’s obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work
If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS
§ 13.1 Governing Law
The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction’s choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns
§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner’s rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies
§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.
§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner’s expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect’s services and expenses, shall be at the Contractor’s expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.
§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days’ notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner’s obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days’ notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause
 § 14.2.1 The Owner may terminate the Contract if the Contractor
 .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
 .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
 .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
 .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor’s surety, if any, seven days’ notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:
 .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
 .2 Accept assignment of subcontracts pursuant to Section 5.4; and
 .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect’s services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience
 § 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent
 .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
 .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience
 § 14.4.1 The Owner may, at any time, terminate the Contract for the Owner’s convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner’s convenience, the Contractor shall
 .1 cease operations as directed by the Owner in the notice;
.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner’s convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition
A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims
The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims
§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance
§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker’s decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost
If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time
§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor’s Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.
§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for CONSEQUENTIAL DAMAGES
The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party’s termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision
§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker’s sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner’s expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.
§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor’s default, the Owner may, but is not obligated to, notify the surety and request the surety’s assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic’s lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation
§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator’s fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration
§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.
§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder
§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.
State of West Virginia

Supplementary Conditions to AIA Document A201-2017
General Conditions of the Contract for Construction

The following Supplementary Conditions modify the General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

Order of Precedence: The documents contained in the contract to which this document has been attached shall be interpreted in the following order of precedence:

First Priority – Documents developed by the State or agency and utilized to provide public notice of the solicitation, along with other general terms and conditions shall be first in priority.

Second Priority – This document "Supplementary Conditions to the AIA Document A201-2017 General Conditions of the Contract for Construction" shall be second in priority.

Third Priority – all other AIA documents including, but not limited to, the AIA Document A201-2017 General Conditions of the Contract for Construction and the A101-2017 Standard Form of Agreement Between Owner and Contractor (when utilized) shall be third or lower in priority.

ARTICLE 1
GENERAL PROVISIONS

Add the following Section to Article 1:

§1.05 PARTY RELATIONS

§1.05 The Owner and their consultants, the Architect and their Consultants, and the Contractor and their Subcontractors agree to proceed with the Work on the basis of mutual trust, good faith and fair dealing.

§1.1 BASIC DEFINITIONS

§1.1.1 THE CONTRACT DOCUMENTS

§1.1.1 Delete the last sentence of this Section and substitute the following:

The Contract Documents also include the Bidding Documents (Advertisement or Invitation to Bid, Request for Quotations/Bids, Instructions to Bidders, Form of Proposal, Bid Bond and Sample Forms), Performance Bond, Payment Bond, Maintenance Bond (if applicable), Certificates of Insurance, Special Provisions For Disadvantaged and Women Business Enterprise Utilization (if bound herein).

§1.1.2 THE CONTRACT

§1.1.2 Make the following changes to Section 1.1.2:

In the last sentence, insert "and the Contractor" after "The Architect" and delete "the Architect's" and insert "their respective".

§1.2 Correlation and Intent of Contract Documents

§1.2.1 In the second sentence, remove "any law" and insert "West Virginia law or any applicable federal law". In the last sentence, remove "by law" and insert "West Virginia law or any applicable federal law".

§1.7 Digital Data Use and Transmission

§1.7 Delete the last sentence of this section in its entirety.

§1.8 Building Information Models Use and Reliance

§ 1.8 Remove this section in its entirety and replace it with the following:

"Any use of, or reliance on, all or a portion of a building information model must be approved in advance by Owner and will only be permitted if the Parties have agreed upon and executed written documents to memorialize protocols governing the use of, and reliance on, the information contained in the model."

Effective Date: October 1, 2018
ARTICLE 2
OWNER

§2.1 GENERAL

§2.1.1 Add the following after the last sentence:

Notwithstanding the foregoing, the parties understand that since Owner is a government entity, change orders will often require approval by entities in addition to owner. When owner is a state agency, those entities may include, but are not limited to, the West Virginia Attorney General’s Office and the West Virginia Purchasing Division. Additionally, approval may be required by agencies providing project funding, including but not limited to, West Virginia School Building Authority and agencies of the United States federal government.

§2.1.2 Delete Section 2.1.2 in its entirety.

§2.1 Add the following Section to 2.1:

§2.1.3 The Owner and the agency funding the project reserve the right to maintain a full time or part time project representative (sometimes referred to as the “Clerk of the Works”) at the project site who will keep the Owner informed of the progress and quality of the Work and responsibilities. The Contractor shall cooperate and assist the Clerk of the Works in the performance of his/her duties. The Clerk of the Works will not interfere with or be responsible for the Contractor’s supervision and direction of the Work, and the Contractor’s means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work. The Clerk of the Works may facilitate communications between the Owner, Architect, and Contractor but has no authority to make decisions for the Owner, approve modifications to the Contract Documents, the Contract Time, or Contract Sum. Additionally, Contractor is not permitted to rely on or consider decisions made by the Clerk of the Works on behalf of Owner.

§2.2 Evidence of the Owner’s Financial Arrangements: Delete §2.2 and all of its subsections in its entirety.

§2.3 Information and Services Required of Owner

§2.3.2 Make the following changes to Section 2.3.2:

In first sentence, delete the period and add ", when required pursuant to West Virginia Code §30-12-1 et seq." Add the following sentence at the end of Section 2.3.2: "If the Owner does not retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located, the Owner will appoint an individual to assume the role and obligations of the Architect pursuant to this Agreement."

§2.3.3 Delete this section in its entirety.

§2.3.4 Delete the last sentence of Section 2.3.4 and substitute the following:

The Contractor shall confirm the locations of each utility. If the Owner has provided geotechnical and other tests to determine subsurface conditions, the Owner will provide such documents to the Contractor; the Contractor acknowledges that it will make no claims for any subsurface or any other conditions revealed by these tests.

ARTICLE 3
CONTRACTOR

§3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§3.2.2 Add the following sentence to the end of Section 3.2.2:

Claims by Contractor resulting from its failure to familiarize itself with the site shall be deemed waived. Additionally, by submitting a bid or otherwise entering into this contract, Contractor acknowledges that it has reviewed and understands the contract documents and the work required by those documents. Any claims arising from Contractor’s failure to review and understand the contract documents shall be deemed waived.

§3.2.3 Delete Section 3.2.3 in its entirety and substitute the following:

§3.2.3 The Contractor acknowledges its continuing duty to review and evaluate the Construction Documents during performance of its services and shall immediately notify the Owner and the Architect about any problems, conflicts, defects, deficiencies, inconsistencies or omissions it discovers in or between the Construction Documents, and variances it discovers between the Construction Documents and applicable laws, statutes, building codes, rules and regulations.

§ 3.2.4 Add the following clauses to Section 3.2.4:

§3.2.4.1 If the Contractor performs any Work which it knows or should have known involves a recognized problem, conflict, defect, deficiency, inconsistency or omission in the Construction Documents, or a variance between the Construction Documents and requirements of applicable laws, statutes, building codes, rules and regulations, without notifying the Owner and the Architect prior to receiving written authorization from the Architect to proceed, the Contractor shall be responsible for the consequences of such performance.

§3.2.4.2 Before ordering any materials or doing any Work, the Contractor and Subcontractors shall verify all measurements at the site and shall be responsible for the correctness of same. Discrepancies shall be reported in writing to the Architect prior to proceeding with the Work. No extra charge or compensation will be
§3.8 ALLOWANCES

§3.8.3 Make the following change to Section 3.8.3:

§3.8.3 Delete "with reasonable promptness" and insert "in sufficient time to avoid delay in the Work."

Add the following Section to 3.8:

§3.8.4 The Contractor shall promptly submit to the Owner an itemized account of any expenditure by the Contractor of the Contract allowance in sufficient detail to allow the Owner to properly account for such expenditure.

§3.9 SUPERINTENDENT/PROJECT MANAGER

§3.9.1 Add the following sentence to the end of Section 3.9.1:

The Contractor may also employ a competent project manager.

§3.9.2 Make the following changes to Section 3.9.2:

In the first sentence, add "and project manager, if applicable" after "superintendent." In the second sentence, add "or project manager, if applicable," after "superintendent."

§3.9.3 Make the following changes to Section 3.9.3:

In the first sentence, add "or project manager, if applicable," after "superintendent." In the second sentence, add "or project manager, if applicable," after "superintendent."

§3.9 Add the following Section to 3.9:

§3.9.4 The Owner shall have the right, at any time, to direct a change in the Contractor's representatives if their performance is deemed unsatisfactory.

§3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§3.10.1 Make the following changes to Section 3.10.1:

In the first sentence, delete the word "promptly" and substitute "by the earliest reasonable date."

Add the following sentence to the end of Section 3.10.1: "The Contractor shall submit an updated construction schedule with each payment application, unless waived by the Owner."

Add the following Sections to 3.10:

§3.10.4 At any time after the first thirty (30) days of the Contract Time, if it is found that the project is two (2) weeks or more behind schedule, beyond approved time extensions, or if at any time during
the last thirty (30) days of the scheduled Contract Time the Contractor is one (1) week or more behind schedule, the Contractor shall immediately submit a plan to the Owner describing how the Work will be placed back on schedule within the remaining Contract Time.

§3.10 If the Owner and the Architect determine that the performance of the Work during any stage of the construction schedule last approved by the Owner has not progressed or reached the level of completion required by the Contract Documents, the Owner will have the right to order the Contractor to take corrective measures (hereinafter referred to collectively as Extraordinary Measures) necessary to expedite the progress of the Work, including, without limitation: (1) working additional shifts or overtime; (2) supplying additional manpower, equipment and facilities; and (3) other similar measures. Such Extraordinary Measures shall continue until the progress of the Work complies with the last approved construction schedule. The Owner's right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor's compliance with the construction schedule after allowing for approved extensions of Contract Time as provided elsewhere in this Agreement. The Contractor is not entitled to an adjustment in the Contract Sum in connection with any Extraordinary Measures required by the Owner. The Owner may exercise its rights under this Section as frequently as the Owner deems necessary to ensure that the Contractor's performance of the Work will comply with the construction schedule.

§3.11 DOCUMENTS AND SAMPLES AT THE SITE

§3.11 Insert the following sentence at the end of Section 3.11:

The Contractor's compliance with this Section 3.11 shall be a condition precedent to any obligation of the Owner to make Final Payment pursuant to this Agreement.

§3.15 CLEANING UP

§3.15.2 Delete Section 3.15.2 in its entirety and substitute the following:

§3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and may withhold such reasonable costs as necessary for the fulfillment of the Contractor's obligation under this Section 3.15. If the reasonable costs of such cleaning exceed the Contract Sum then due the Contractor, the Contractor shall reimburse the Owner the difference within thirty (30) consecutive calendar days of the Owner's written request.

Any materials, tools, supplies, or other personal property left by the Contractor shall be deemed abandoned property and the Owner shall have no obligation to hold or store the property on behalf of Contractor and may dispose of the abandoned property as if it were property of the State of West Virginia. Provided however, that prior to treating property as abandoned and disposing of it, Owner must first provide Contractor with 10 days notice of its intent to do so. If any materials, tools, supplies or other personal property belong to a subcontractor, then Contractor is obligated to communicate this notice to its subcontractor immediately.

§3.15 Add the following Section to 3.15:

§3.15.3 In order to achieve Substantial Completion, as defined by Section 9.8, for any portion of the Work, the Contractor must have the area where the Work is located fully cleaned and all materials and/or debris removed from site. The Certificate of Substantial Completion will not be issued until the Contractor has met this obligation.

ARTICLE 4
ARCHITECT

§4.1 GENERAL

§4.2 ADMINISTRATION OF THE CONTRACT

§4.2 Make the following changes to Section 4.2:

§4.2.1 In the first sentence of Section 4.2.1 after the word Architect add "or, unless otherwise indicated by the Owner,"

§4.2.2 In the first sentence of Section 4.2.2 strike the word "generally."

§4.2.3 In the first sentence of Section 4.2.3 strike the word "reasonably."

§4.2.5 Add the following sentence at the end of Section 4.2.5:

The Architect upon receipt of an Application for Payment from the Contractor shall either review and certify such amounts due for payment or return such Application for Payment to the Contractor for correction(s) within five (5) consecutive business days of receipt.

§4.2.7 Delete the first sentence of Section 4.2.7 and substitute the following:

The Architect will review and approve, or take other appropriate action upon, the Contractor’s submittals such as Shop Drawings, Product Data and Samples for the purpose of checking for conformance with the Contract Documents.

Modify the second to last sentence by removing it in its entirety and replacing it with the following: The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures, unless the Architect has established the required construction means, methods, techniques, sequences, or procedures, or the Contract Documents require such approval.
§4.2.8 Make the following change to Section 4.2.8:

In the first sentence, after the word Architect add ", in consultation with the Owner,\".

ARTICLE 5
SUBCONTRACTORS

§5.2 Award of Subcontracts and Other Contracts for Portions of Work

§5.2.1 Add the following sentence to Section 5.2.1.

This provision in no way limits the Contractor's legal obligations to report subcontractors and labor/material suppliers under W. Va. Code § 5-22-1(f) and obtain approval under W. Va. Code § 5-22-1(g) prior to any subcontractor substitution.

§5.4 Contingent Assignment of Subcontracts: This section is removed in its entirety and replaced with the following:

§5.4 Emergency Contracts with Subcontractors:

In the event that the general contractor fails to fulfill its contractual obligations and the performance bond has failed to provide an adequate remedy, Owner has the right to execute emergency contracts with subcontractors to ensure continuation of the work, provided that doing so is in compliance with the laws, rules, and procedures governing emergency contracting authority for Owner, and the emergency contract terms comply with all other applicable laws, rules, and procedures.

ARTICLE 7
CHANGES IN THE WORK

§7.1 General

§7.1.2. In Section 7.1.2. remove the word "alone" and insert "with approval by the Owner."

§7.2 CHANGE ORDERS

§7.2 Add the following Section to 7.2:

§7.2.2 A written Change Order as defined under 7.2.1 above constitutes a final settlement of all matters relating to the change in the Work which is the subject of the Change Order, including, but not limited to, general conditions, all direct or indirect costs associated with such change and any and all adjustment to the Contract Sum and Contract Time. The parties also understand and agree that if Owner is a state agency, change orders may require approval by entities in addition to Owner. Those entities may include, but are not limited to, the West Virginia Purchasing Division, and the West Virginia Attorney General's Office. Owner and Contractor must discuss the change order approval requirements prior to executing this agreement.

Add the following section to § 7.2

§7.2.3. Allowance for Overhead and Profit: Contractor's overhead and profit for a change order issued under this Article included in the total cost to the Owner shall not exceed based on the following schedule:

.1 For the Contractor, for any Work performed by the Contractor's own forces, fifteen percent (15%) of the cost.

.2 For the Contractor, for Work performed by the Contractor's Subcontractor, ten percent (10%) of the amount due the Subcontractor.

.3 For each Subcontractor or Sub-Subcontractor involved, for any Work performed by that Subcontractor's own forces, fifteen percent (15%) of the cost.

.4. For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, ten percent (10%) of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.7. Estimated labor hours shall include hours only for those workmen and working foremen directly involved in performing the Change Order work. Supervision above the level of working foremen (such as general foremen, superintendent, project manager, etc.) is considered to be included in the allowance for Overhead and Profit. Hand tools are defined as equipment with a value of $1,000 or less. For Contractor owned equipment, the "bare" equipment rental rates allowed to be used for pricing Change Order proposals shall be not more than the monthly rate listed in the most current publication of The AED Green Book divided by 176 to arrive at a maximum hourly rate to be applied to the hours the equipment is used performing the Change Order work.

.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, material, equipment and Subcontractors. Details to be submitted will include detailed line item estimates showing detailed materials quantity take-offs, material prices by item and related labor hour pricing information and extensions (by line item or by drawing as applicable.) Where major cost items are Subcontracts, they shall also be itemized as prescribed above. In no case will a change involving over $10,000 be approved without such an itemization.

.7 Local Business and Occupation Taxes, if applicable, shall be calculated on the cost of the Work, overhead and profit.
.8 Overhead and profit shall not be calculated on changes in the Work involving unit prices. Unit prices are to have overhead and profit included in the price quoted.

.9 Under no circumstances is Contractor permitted to charge for the passage of time (often referred to as general conditions or winter conditions) without an identified, itemized, and concretely provable cost borne by Contractor. Contractor has a duty to mitigate costs during a delay period to the fullest extent possible and Contractor will not be paid for costs that could have been mitigated. Calculating a daily delay rate without properly identifying, itemizing, and proving actual, unmitigable costs, is prohibited. Contractor understands and accepts that it has the responsibility to prove that costs could not be mitigated prior to submitting a request for payment.

§7.3 CONSTRUCTION CHANGE DIRECTIVES

§7.3.4 Make the following change in Section 7.3.4:

In the fourth line of the first sentence, delete the words "an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount" and substitute "an allowance for overhead and profit in accordance with clauses 7.3.11.1 through 7.3.11.9 below."

§7.3.7 Delete the word "recorded" and replace it with "processed".

§7.3.9 Delete Section 7.3.9 in its entirety and substitute the following:

§7.3.9 Pending final determination of the total cost 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 provided these amounts have been added to the Contract by Change Order and a purchase order has been issued for the Change Order.

§7.3.10 Add the following sentence to the end of Section 7.3.10:

The Parties will utilize their best efforts to issue a change order within 60 days of agreement being reached, but failure to do so will not give rise to grounds for contract cancellation, penalties, or any other cause of action.

Add the following Section to 7.3:

§7.3.11 In Section 7.3.7, the allowance for overhead and profit for a change directive issued under this Article included in the total cost to the Owner shall not exceed the following schedule:

.1 For the Contractor, for any Work performed by the Contractor's own forces, fifteen percent (15%) of the cost.

.2 For the Contractor, for Work performed by the Contractor's Subcontractor, ten percent (10%) of the amount due the Subcontractor.

.3 For each Subcontractor or Sub-Subcontractor involved, for any Work performed by that Subcontractor's own forces, fifteen percent (15%) of the cost.

.4 For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, ten percent (10%) of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.7. Estimated labor hours shall include hours only for those workers and working foremen directly involved in performing the Change Order work. Supervision above the level of working foremen (such as general foremen, superintendents, project manager, etc.) is considered to be included in the allowance for Overhead and Profit. Hand tools are defined as equipment with a value of $1,000 or less. For Contractor owned equipment, the "bare" equipment rental rates allowed to be used for pricing Change Order proposals shall be not more than the monthly rate listed in the most current publication of The AED Green Book divided by 176 to arrive at a maximum hourly rate to be applied to the hours the equipment is used performing the Change Order work.

.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, material, equipment and Subcontractors. Details to be submitted will include detailed line item estimates showing detailed materials quantity take-offs, material prices by item and related labor hour pricing information and extensions (by line item or by drawing as applicable.) Where major cost items are Subcontracts, they shall also be itemized as prescribed above. In no case will a change involving over $10,000 be approved without such an itemization.

.7 Local Business and Occupation Taxes, if applicable, shall be calculated on the cost of the Work, overhead and profit.

.8 Overhead and profit shall not be calculated on changes in the Work involving unit prices. Unit prices are to have overhead and profit included in the price quoted.

.9 Under no circumstances is Contractor permitted to charge for the passage of time (often referred to as general conditions or winter conditions) without an identified, itemized, and concretely provable cost borne by Contractor. Contractor has a duty to mitigate costs during a delay period to the fullest extent possible and Contractor will not be paid for costs that could have been mitigated. Calculating a daily delay rate

Effective Date: October 1, 2018
§7.4 Minor Changes in Work. Insert the following sentence at the end of section 7.4:

"Contractor may request that Architect provide written confirmation that Owner has agreed to the minor change, and if requested, Architect will provide it."

§8.3 DELAYS AND EXTENSIONS OF TIME

§8.3.1 In the first sentence, delete "unusual delay in deliveries," and add "unmitigatable costs attributable to" before the words "adverse weather conditions."

ARTICLE 9
PAYMENTS AND COMPLETION

§9.1 Contract Sum

§9.1.2 Add the following sentence to the end of section 9.1.2:

"Any equitable adjustment of unit prices must be processed as a change order to the contract."

§9.2 SCHEDULE OF VALUES

§9.2 Make the following changes to Section 9.2:

In the first sentence add "and the Owner" after the first reference to the Architect. In the second sentence add "or the Owner" after Architect. Remove the last sentence in its entirety and replace it with the following:

"Any changes to the schedule of values shall be submitted to the Architect and the Owner and supported by such data to substantiate its accuracy as the Architect or owner may require. This schedule, unless objected to by the Architect or the Owner, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment."

§9.3 APPLICATIONS FOR PAYMENT

§9.3 Make the following changes to Section 9.3:

§9.3.1 In the first sentence add "and the Owner" after the first reference to the Architect and add "and other required documents" after the words "schedule of values."

§9.3.1.1 Delete clause 9.3.1.1 in its entirety and substitute the following:

§9.3.1.1 Such applications may include requests for payment on account of changes in the Work authorized by Construction Change Directives and Change Orders only after a purchase order has been issued for the Work affected.

§9.3.1 Add the following clauses to Section 9.3.1:

§9.3.1.3 Until the Work is fifty percent (50%) complete, the Owner will withhold as retainage 10% of the amount due the Contractor on account of progress payments. At the time the Work is fifty percent (50%) complete and thereafter, if the manner of completion of the Work and its progress are and remain satisfactory to the Owner and Architect, and in the absence of other good and sufficient reasons, the Architect will, on presentation by the Contractor of Consent of Surety, authorize any remaining partial payments to be paid in full.

§9.3.1.4 The full Contract retainage may be reinstated if the manner of completion of the Work and its progress do not remain satisfactory to the Owner and Architect, if the Surety withholds its consent, or for other good and sufficient reasons.

§9.4 CERTIFICATES FOR PAYMENT

§9.4.1 After the phrase "in the full amount of the Application for Payment," insert the phrase "less any retainage withheld pursuant to section 9.3.1.3, ."
§9.8.5 Add the following clause to Section 9.8.5:

§9.8.5.1 The payment of retainage shall be sufficient to increase the total payments to ninety-five percent (95%) for the Work or designated portion thereof being accepted as Substantially Complete, less any amounts as the Architect shall determine for any Work that is not complete, not in accordance with the Contract Documents, or for unsettled claims.

§9.10 FINAL COMPLETION AND FINAL PAYMENT

§9.10.1 Add the following to the end of Section 9.10.1:

If Architect is required to perform more than one inspection under this subsection, Contractor shall be responsible for paying the Owner for the cost of the additional inspection, which will be paid by Owner to Architect, at the hourly rate established in the contract between Owner and Architect.

§9.10.2 Make the following changes in Section 9.10.2:

In the first sentence, delete "for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner)."

Add the following clause to Section 9.10.2:

§9.10.2.1 Before final payment is due the Contractor, all applicable State and local taxes must be paid. If requested by the Owner, the Contractor shall present evidence that payment or satisfaction of all such tax obligations has been made.

§9.10.3 Add the following clause to Section 9.10.3:

9.10.3.1 Unless and to the extent final completion is delayed through no fault of the Contractor as provided in Section 9.10.3, the Owner shall be under no obligation to increase payments above ninety-five percent (95%) until final completion of the Work is Certified by the Architect.

§9.10.4 Make the following changes in Section 9.10.4:

In the first sentence, delete the word "the" and replace it with "Unless and until the Contractor makes a subsequent Claim against the Owner, the".

Add the following as the last sentence. "Neither the Owner's offer of a final payment nor its acceptance by the Contractor shall legally prevent or limit the Owner's right to assert any and all counterclaims in litigation filed by the Contractor as allowed in section 15.1.8."

Add the following Sections to Article 9:

§9.11 LIQUIDATED DAMAGES

§9.11.1 The Owner will suffer financial loss if the Work is not Substantially Complete within the Contract Time as defined in Article 8, and if final completion is not achieved within the specified time frame following Substantial Completion. As liquidated damages, and not as a penalty, the Contractor and the Contractor's surety shall be liable for and shall pay the Owner the sum(s) stated in this Agreement and/or purchase order.

§9.11.2 Allowances may be made for delays due to shortages of materials and/or energy resources, subject to proof by documentation, and also for delays due to strikes or other delays beyond the control of the Contractor. All delays and any claim for extension of Contract Time must be properly documented in accordance with Section 15.1.5 by the Contractor and must be made within the time limits stated in Section 15.1.2.

ARTICLE 10
PROTECTION OF PERSONS AND PROPERTY

§10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

§10.2.8 Make the following changes to Section 10.2.8:

In the first sentence, delete "within a reasonable time not exceeding 21 days" and substitute "immediately".

§10.3 HAZARDOUS MATERIALS

§10.3.3 Delete Section 10.3.3 in its entirety.

ARTICLE 11
INSURANCE AND BONDS

§11.1 CONTRACTOR'S LIABILITY INSURANCE

§11.1.2 Add the following to the end of §11.1.2:

At a minimum the Contract shall provide, at the Contractor's Expense:

§11.1.2.1. a Performance Bond and a Labor and Material Payment Bond for 100% of the Contract Sum and, if applicable, a two-year roofing Maintenance Bond for the full value of the roofing system.

§11.1.2.2 An attorney-in-fact who executes the bonds on behalf of the surety shall affix thereto a certified and current copy of power of attorney.
§11.2 Owner’s Insurance Delete section 11.2 in its entirety.

§11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

§11.4 Section 11.4 is deleted in its entirety.

§11.5.1 Make the following changes in Section 11.5.1:

In the first sentence, substitute "Contractor" for "Owner" each time the latter word appears.

§11.5.2 Delete Section 11.5.2 in its entirety and substitute the following:

§11.5.2 Prior to settlement of insured loss, the Contractor shall notify the parties of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The parties shall have 14 days from the receipt of notice to object. If no objection is made, the Contractor shall proceed as proposed and allocate the settlement accordingly. If such objection is made, the dispute shall be resolved as provided in Section 15.4. The Contractor, in that case, shall make settlement with insurers in accordance with directions of the Court. If distribution of the insurance proceeds as directed by the Court is required, the Court will direct such distribution. Any work to repair the damage will be incorporated into the contract as a change order.

ARTICLE 13
MISCELLANEOUS PROVISIONS

§13.4 TESTS AND INSPECTIONS

§13.4.1 Remove the phrase “so require” and insert in its place “prohibit delegation of the test to Contractor”

§13.6 INTEREST

§13.6 Delete Section 13.5 in its entirety and substitute the following:

Notwithstanding any other provision in the Contract Documents, West Virginia Code does not authorize the payment of interest on late payments. Accordingly, interest charges for late payment are prohibited.

Add the following Sections to Article 13:

§13.6 WORKERS COMPENSATION

The Contractor shall provide proof of compliance with West Virginia Worker's Compensation laws and regulations.

§13.7 CONTRACTOR'S LICENSE

§13.7.1 West Virginia Code §21-11-2 requires that all persons desiring to perform contractual work in West Virginia shall be duly licensed. The West Virginia Contractor's Licensing Board is empowered to issue a contractor's license.

§13.7.2 West Virginia Code §21-11-11 requires any prospective Bidder to include the Bidder's contractor's license number on its Bid. The successful Bidder will be required to furnish a copy of its contractor's license in a classification appropriate to the Work prior to issuance of a purchase order/contract.

ARTICLE 14
TERMINATION OR SUSPENSION OF THE CONTRACT

§14.1 TERMINATION BY THE CONTRACTOR

§14.1.1 Make the following changes in Section 14.1.1:

At the end of clause 14.1.1.3 delete "; or" and insert a period.

Delete clause 14.1.1.4 in its entirety.

§14.1.3 Delete Section 14.1.3 in its entirety and substitute the following:

§14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exist, the Contractor may, upon seven days written notice to the Owner and Architect, terminate the Contract. In such event, the Contractor shall be paid for all Work performed in accordance with the Contract Documents, for reasonable and proven termination expenses and a reasonable allowance for overhead and profit. However, such payment, exclusive of termination expenses, shall not exceed the Contract Sum as reduced by other payments made to the Contractor and further reduced by the value of Work as yet not completed. The Contractor shall be entitled to reasonable overhead, but not profit, on Work not performed.

§14.2 TERMINATION BY THE OWNER FOR CAUSE

§14.2.4 Delete Section 14.2.4 in its entirety and substitute the following:

§14.2.4 If the unpaid balance of the Contract Sum exceeds the cost of finishing the Work, including compensation for the Architect’s services and expenses made necessary thereby, and other
§14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§14.4.1 Delete Section 14.4.1 in its entirety and substitute the following:

§14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause upon thirty days written notice.

§14.4.3 Delete Section 14.4.3 in its entirety and substitute the following:

§14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment from the Owner on the same basis provided in Section 14.1.3 above.

Add the following Section to Article 14:

§14.5 FISCAL YEAR FUNDING

§14.5 Work performed under this Contract is to continue in the succeeding fiscal year contingent upon funds being appropriated by the Legislature for this Work. In the event funds are not appropriated for this Work, this Contract becomes of no effect and is null and void after June 30.

ARTICLE 15
CLAIMS AND DISPUTES

§15.1 Claims

§15.1.2 TIME LIMITS ON CLAIMS

§15.1.2 Delete Section 15.1.2 in its entirety and substitute the following:

Any applicable statute of limitations shall be in accordance with West Virginia Code.

§15.1.3 NOTICE OF CLAIMS Add the following to § 15.1.3:

§15.1.3.3 All claims, and notice of claims that require an increase in contract time, contract scope, or contract sum must be made in writing.

§ 15.1.8 is added to the Contract as follows:

§ 15.1.8 Counterclaims – In the event that Contractor makes a claim, Owner reserves the right to make a counterclaim and will not be barred from doing so even if final payment has been made.

§15.2 INITIAL DECISION

§15.2.1 In the third sentence of Section 15.2.1, insert "or litigation" following the word "mediation" and remove the phrase "binding dispute resolution" and replace it with "or litigation".

§15.2.5 Delete the last sentence in Section 15.2.5 and substitute the following:

Approval or rejection of a claim by the Initial Decision Maker shall be final and binding on the parties unless it is pursued further by either party in accordance with Section 15.2.6.

§15.2.6 Make the following change to clause 15.2.6.1:

In the last sentence, delete "or pursue binding dispute resolution proceedings."

§15.2.8 Delete Section 15.2.8 in its entirety.

§15.3 MEDIATION

§15.3.1 Delete "binding dispute resolution" and substitute "litigation in a court of competent jurisdiction."

§15.3.2 Delete Section 15.3.2 in its entirety and substitute the following:

§15.3.2 The parties shall endeavor to resolve their Claims by non-binding mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement.

§ 15.3.3 Remove section 15.3.3 in its entirety

§15.4 ARBITRATION

§15.4 Delete Section 15.4 in its entirety and substitute the following:

§15.4 SETTLEMENT OF CLAIMS

§15.4.1 The Constitution of West Virginia grants the State sovereign immunity from any and all Claims against the public treasury. This immunity applies and is extended to all agencies of the State, including the Owner. It shall be in full force and effect as it relates to this Contract. The West Virginia Legislature, recognizing that certain Claims against the State may constitute a moral obligation of the State and should be heard, has established the West Virginia Claims Commission for this purpose. The Parties understand that this sovereign immunity and the Constitution of the
State of West Virginia prohibit the State and Owner, from entering into binding arbitration. Notwithstanding any provision to the contrary in the Contract Documents, all references to arbitration, regardless of whether they are included in the AIA Document A201-2017 or another related document are hereby deleted and all Claims of the Contractor for monetary relief, and only of the Contractor, arising out of or related to this Contract shall be decided by the West Virginia Claims Commission. The following Sections have been rewritten to bring them into conformance with the foregoing.

§15.4.2 Claims by the Owner may be brought against the Contractor in the Circuit Court of Kanawha County, West Virginia, or in any other court that has jurisdiction, as the Owner may elect.

§15.4.3 Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Sections 15.1.6, 9.10.4 and 9.10.5, shall, within 30 days after submission of the decision by the Initial Decision Maker, be settled for the Contractor by the West Virginia Claims Commission or, for the Owner, by the Circuit Court of Kanawha County or any other court of jurisdiction as the Owner may elect.

§15.4.4 Notice of such action shall be filed in writing with the other party to the Contract, and a copy of such notice shall be filed with the Initial Decision Maker and the Architect, if applicable.

§15.4.5 During court proceedings, the Owner and the Contractor shall comply with Section 15.1.3.

§15.4.6 Claims shall be made within the time limits specified in Section 15.2.6.1.

§15.4.7 The party filing a Claim must assert in the demand all Claims then known to that party on which action is permitted.

Add the following Article:

ARTICLE 16
EQUAL OPPORTUNITY

§16.1 COMPLIANCE WITH REGULATIONS UNDER TITLE VI OF THE FEDERAL CIVIL RIGHTS ACT OF 1964 AND EXECUTIVE ORDER 65-2 BY THE GOVERNOR OF WEST VIRGINIA DATED DECEMBER 15, 1965

§16.1.1 The Contractor agrees that it will comply with Title VI of the Federal Civil Rights Act of 1964 (P.L. 88352) and the regulations of the State of West Virginia, to the end that no person in the State, or in the United States, shall on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or otherwise subjected to discrimination under any program or activity for which the Contractor receives any recompense or other consideration of value, either directly or indirectly from the State; and HEREBY GIVES ASSURANCE THAT it will immediately take any measures necessary to effectuate this Agreement.

§16.1.2 If any real property or structure thereon is provided or improved, this assurance shall obligate the Contractor, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which any State payment is extended or for another purpose involving the provision of similar services or benefits. If any other goods or services are so provided, this assurance shall obligate the Contractor for the period during which it supplies such goods or services.

§16.1.3 The Contractor recognizes and agrees that such right to provide property, goods or services to the State will be extended in reliance on the representations and agreements made in assurance, and that the State shall have the right to seek judicial enforcement of this assurance. This is binding on the Contractor, its successors, transferee, and assignee, or any authorized person on behalf of the Contractor.
Any provisions of the Contract Documents that conflict with these Supplementary Conditions shall be null and void unless they have been approved in writing by the applicable State purchasing officer and the Attorney General, and are clearly identified as such in the bid documents.

The Owner and Contractor hereby agree to the full performance of the covenants contained herein.

IN WITNESS WHEREOF, the Owner and Contractor have entered into this Agreement as of the effective date as stated in the A101-2017 (when utilized) or other Contract Documents.

Owner:  
By:  
Title:  
Date:  

Contractor:  
By:  
Title:  
Date:  

This Supplementary Conditions to AIA Document A201-2017, General Conditions of the Contract for Construction, has been approved as to form on this 20th day of February, 2019, by the West Virginia Attorney General’s office as indicated in the signature line below. Any modification of this document is void unless expressly approved in writing by the West Virginia Attorney General’s Office.

PATRICK MORRISEY, ATTORNEY GENERAL

BY:  
DEPUTY ATTORNEY GENERAL
PART 1 GENERAL

1.01 PROJECT

A. Project Name: Building A Greenhouse Addition
B. Owner Name: West Virginia State University Research and Development Corporation.
C. Architect's Name: Edward Tucker Architects, Inc.
D. The Project consists of the addition of a Greenhouse Complex that adjoins Building A located on Barron Drive in Institute, WV 25112. There are two bid packages that are being solicited: Bid Package #1 is for all materials delivered to the site necessary to construct the Greenhouses from the surface of the existing concrete slab as defined in the drawings and specifications. Bid Package #2 is for all labor to assemble the Greenhouses from the surface of the existing concrete slab as defined in the drawings and specifications. There is a single Bid Form where contractors may bid on one or both of the Bid Packages. Building A was formerly a part of the WV Division of Rehabilitative Services Complex, the property of which is now a part of the West Virginia State University campus. The building is currently vacant and unoccupied.
E. The approximate Project area is 8,400 sq. ft.
F. Work includes erecting of Greenhouse frames, drilled anchor bolts, transparent enclosure material, HVAC systems, controls, lighting, Unistrut, gutters, and all other materials designated in the drawings and specifications. Scope outside of these Bid Packages include final connections to domestic water, power, data, storm drainage, and sanitary sewer as that will be provided outside of this contract.
G. Hazardous materials testing has been performed by the Owner's consultant Astar Abatement Inc. who had prepared a report that is available as a Reference Document if requested. That Abatement work has been completed by Astar.

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in the Contract Forms section of the Project Manual.

1.03 OWNER OCCUPANCY

A. Owner intends to occupy the Project only after full renovations have been completed. The work of this Contract is preparatory to renovation of the building.

1.04 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.
B. Provide access to and from site as required by law and by Owner:
C. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
D. Limit shutdown of utility services to other buildings and facilities to no more than 2 hours at a time, arranged at least 72 hours in advance with Owner.
1. Prevent accidental disruption of utility services to other facilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Procedures for preparation and submittal of applications for progress payments.

1.02 SCHEDULE OF VALUES
A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
B. Forms filled out by hand will not be accepted.
C. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
D. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization and bonds and insurance.
   1. For Contracts less than $100,000, line items may be combined to simplify break-down of costs.
E. Revise schedule to list approved Change Orders, with each Application For Payment.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS
A. Payment Period: Submit at intervals stipulated in the Agreement.
B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
C. Forms filled out by hand will not be accepted.
D. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.
E. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   4. Previous Applications.
   5. Work in Place and Stored Materials under this Application.
   6. Authorized Change Orders.
   7. Total Completed and Stored to Date of Application.
   8. Percentage of Completion.
   10. Retainage.
F. Execute certification by signature of authorized officer.
G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.
H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.
I. Submit three copies of each Application for Payment.
J. Include the following with the application:
   1. Transmittal letter as specified for Submittals in Section 01 30 00.
K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.
1.04 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.

B. The Architect/Engineer will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on AIA Form G710.

C. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.

D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change. Contractor shall prepare and submit a fixed price quotation within 14 days.

E. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00.

F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

G. Substantiation of Costs: Provide full information required for evaluation.
   1. On request, provide the following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2. Support each claim for additional costs with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.
      c. Time records and wage rates paid.
      d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
   3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

K. Promptly enter changes in Project Record Documents.

1.05 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
1. Procedures identified in the General and Supplemental Conditions of the Contract.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Site mobilization meeting.
   B. Submittals for review, information, and project closeout.
   C. Submittal procedures.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION
3.01 SITE MOBILIZATION MEETING
   A. Owner will schedule meeting at the Project site prior to Contractor occupancy.
   B. Attendance Required:
      1. Contractor.
      2. Owner.
      3. Architect.
      4. Contractor's Superintendent.
   C. Agenda:
      1. Use of premises by Owner and Contractor.
      2. Owner's requirements.
      3. Construction facilities and controls provided by Owner.
      4. Temporary utilities provided by Owner.
      5. Security and housekeeping procedures.
      7. Application for payment procedures.
      8. Procedures for maintaining record documents.
      9. Inspection and acceptance of equipment put into service during construction period.
   D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS
   A. Schedule and administer meetings throughout progress of the Work at maximum bi-monthly intervals.
   B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
   C. Attendance Required:
      1. Contractor.
      2. Owner.
      3. Architect.
      4. Contractor's Superintendent.
      5. Major Subcontractors.
   D. Agenda:
      1. Review minutes of previous meetings.
      2. Review of Work progress.
      3. Field observations, problems, and decisions.
      4. Identification of problems that impede, or will impede, planned progress.
      5. Review of submittals schedule and status of submittals.
      6. Maintenance of progress schedule.
      7. Corrective measures to regain projected schedules.
      8. Planned progress during succeeding work period.
9. Coordination of projected progress.
10. Maintenance of quality and work standards.
11. Effect of proposed changes on progress schedule and coordination.
12. Other business relating to Work.

E. Record minutes and distribute copies within seven days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SUBMITTALS FOR REVIEW
A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.
B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
C. Samples will be reviewed only for aesthetic, color, or finish selection.
D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.04 SUBMITTALS FOR INFORMATION
A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.
B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.05 SUBMITTALS FOR PROJECT CLOSEOUT
A. Submit Correction Punch List for Substantial Completion.
B. Submit Final Correction Punch List for Substantial Completion.
C. When the following are specified in individual sections, submit them at project closeout:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Other types as indicated.
D. Submit for Owner's benefit during and after project completion.

3.06 NUMBER OF COPIES OF SUBMITTALS
A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
B. Extra Copies at Project Closeout: See Section 01 78 00.

3.07 SUBMITTAL PROCEDURES
A. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
   2. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.
B. Transmit each submittal with a copy of approved submittal form.
C. Sequentially number the transmittal form. Revise submittals with original number and a
sequential alphabetic suffix.
D. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number,
and specification section number, as appropriate on each copy.
E. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of
Products required, field dimensions, adjacent construction Work, and coordination of
information is in accordance with the requirements of the Work and Contract Documents.
F. Schedule submittals to expedite the Project, and coordinate submission of related items.
G. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
H. Identify variations from Contract Documents and Product or system limitations that may be
detrimental to successful performance of the completed Work.
I. When revised for resubmission, identify all changes made since previous submission.
J. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to
comply with requirements.
   1. Include Owner's representative in distribution of reviewed submittals if requested by
      Owner.
K. Submittals not requested will not be recognized or processed.

END OF SECTION
SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Temporary telecommunications services.
   B. Temporary sanitary facilities.
   C. Temporary Controls: Barriers and enclosures.
   D. Security requirements.
   E. Vehicular access and parking.
   F. Waste removal facilities and services.

1.02 TEMPORARY UTILITIES
   A. Owner will provide the following:
      1. Electrical power, consisting of permanent electrical power located at the adjacent Agriculture Research Extension Building.
      2. Water, consisting of permanent service located at the adjacent Agriculture Research Extension Building.
   B. Other existing facilities have been vandalized and/or removed and therefore may not be used.
   C. Cost or use charges for temporary facilities will be paid for by Owner and shall not be included in the Contract Sum. Allow subcontractors to use temporary services and facilities without cost.
   D. Not Used
      1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
      2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
   F. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
   G. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
      1. Keep temporary services and facilities clean and neat.
      2. Relocate temporary services and facilities as required by progress of the Work.

1.03 TELECOMMUNICATIONS SERVICES
   A. Telecommunications services shall include:
      1. Mobile telephone: Superintendent shall maintain reliable mobile telephone service. No field office or telephone land line is required at the site for this project.

1.04 TEMPORARY SANITARY FACILITIES
   A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
   B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS
   A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public and to protect existing facilities and adjacent properties from damage from construction operations.
   B. Provide barricades and covered walkways required by governing authorities for public rights-of-way.
   C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
D. Traffic Controls: Comply with WVDOH and West Virginia State University requirements and specifications. Coordinate all work with University personnel prior to commencing operations in or near public rights-of-way.

1.06 EXTERIOR ENCLOSURES
   A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for future temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.07 SECURITY
   A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
   B. Coordinate with Owner's security program.

1.08 VEHICULAR ACCESS AND PARKING
   A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
   B. Coordinate access and haul routes with governing authorities and Owner.
   C. Provide and maintain access to fire hydrants, free of obstructions.
   D. Existing parking areas designated by Owner may be used for limited construction parking.

1.09 WASTE REMOVAL
   A. Use waste removal facilities and services as required to maintain the site in clean and orderly condition.
   B. Provide containers with lids. Remove trash from site as required to keep disposal area clean and orderly.
   C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
   D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.10 SUPERVISION
   A. Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
   B. Protect from damage caused by freezing temperatures and similar elements. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
   C. 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.
   D. See Supplementary and General Conditions of the Contract for other information related to supervision and worker behavior.

1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS
   A. Temporary electrical service is to remain in place after Substantial Completion of the Project.
      1. Review electrical service connections, disconnect(s) locations, etc. with Owner's representative at Substantial Completion.
   B. Clean and repair damage caused by installation or use of temporary work.
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Examination, preparation, and general installation procedures.
   B. Cleaning and protection.
   C. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 RELATED REQUIREMENTS
   A. Section 01 10 00 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
   B. Section 01 30 00 - Administrative Requirements: Submittals procedures, Electronic document submittal service.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

1.05 PROJECT CONDITIONS
   A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
   B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
      1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
      2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
   C. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

1.06 COORDINATION
   A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
   B. Notify affected utility companies and comply with their requirements.
   C. Coordinate completion and clean-up of work of separate sections.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
   B. Verify that demolition is complete in alterations areas and areas are ready for installation of new work.
   C. Examine and verify specific conditions described in individual specification sections.
   D. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work,
assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

### 3.02 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of work constitutes acceptance of existing conditions.

B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
   1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.

C. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

D. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

E. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

F. Comply with all other applicable requirements of this section.

### 3.03 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

### 3.04 FINAL CLEANING

A. Execute final cleaning after Substantial Completion but before making final application for payment.

B. Use cleaning materials that are nonhazardous.

C. Clean debris from roofs, gutters, downspouts, and drainage systems of new or renovated areas, or areas affected by construction.

D. Clean site; sweep paved areas, rake clean landscaped surfaces.

E. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

### 3.05 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect and Owner.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION
**Matterhorn- Peaked Roof Greenhouse**

**SPECIFICATIONS**

**STRUCTURE & FRAME WORK**

- The greenhouse package, as hereafter specified, is “Matterhorn, Peaked Roof Greenhouse” as manufactured by Rimol Greenhouse Systems, Hooksett, NH, phone: (603-629-9004), complete with systems and equipment as herein specified. The greenhouse structure shall be of the following dimensions:
  - Overall Size: Four bays. Two bays 24’ w x 156’ long. Two bays 24’ w x 12’ long.
  - Gutter Height: Approximately 14 feet.
  - Roof Pitch: 6/12.
- Stamped Engineered Drawings will be required and included. Importance factor, Ground Snow Load, Wind Load & Exposure will be per the local building codes.
  - Importance factor 1
  - Ground Snow Load 20 PSF
  - Wind Load 115 MPH
  - Exposure B
- All steel shall be of Allied 50/55 Gatorshield galvanized steel or equivalent in the gauges specified by item. All steel shall be Allied 50/55 or equivalent, manufactured in accordance with ASTM-A513.
- The greenhouse shall come complete with all hardware, installation instructions and drawings.
- **The columns shall be 12 feet apart and shall be 4” x 4”, 11 gauge galvanized steel.**
  - Each column shall plated and epoxy anchored with ½” galvanized threaded rod.
  - The trusses shall be bolt together design on 12 feet centers. All truss components are to be precut and predrilled for assembly.
  - Truss top chords shall be 2” square steel 11 gauge galvanized steel.
  - Truss bottom chords shall be 2” square steel 15 gauge galvanized steel.
  - Truss web members shall be 1 ½” square 16 gauge galvanized steel.
  - Each truss shall have two extra strength members.
  - There shall be 8 purlins per greenhouse bay roof consisting of 2” square, 15 gauge galvanized steel tubing, plus one truss top chord of 2”. Roof purlins are to be precut, swaged and predrilled.
- The gutter shall consist of 14 gauge galvanized steel.
- There shall be frame work for twelve end walls consisting of 2”, 15 gauge galvanized square tubing with all hardware.
- There shall be frame work for three exterior side walls consisting of 2”, 15 gauge galvanized square tubing with all hardware.
- Internal bracing shall consist of knee bracing, X-bracing, and/or W-bracing.
- Layout of greenhouses will include an enclosed and climate controlled Head House shared access area between the four individual growing areas.

**DOORS**

- There shall be eleven sets of double-hung aluminum framed doors with welded frames that are 8’x8’, with a top panel of tempered glass and a lower panel of acrylic. Doors shall prehung, and include seals, hardware and locks.
POLYCARBONATE & GLAZING MATERIALS

- The roof and walls shall consist of 8 mm thick, clear double wall polycarbonate with a 15 year warranty on the material against yellowing.
- The impact resistance of the 8 mm double wall polycarbonate shall be able to withstand an impact resistance of 16 lbs. dropped 25 feet on the panel with no breakage.
- The 8 mm double-wall polycarbonate shall maintain its mechanical properties over a temperature range of -40 degrees to 250 degrees.
- The 8 mm double wall polycarbonate shall conform to ASTM-D635 and ASTM-E84 for flame spread and smoke developed.
- All glazing attachment materials shall consist of aluminum extrusions and include all hardware and fasteners.
- Roof panels shall be continuous lengths.

GLASS GLAZING MATERIALS

- Glass shall be ¼” thick and tempered.
- Clear acrylic is to be used where glass is called for, but is impractical – for instance, around exhaust fans.
- Aluminum extrusions with neoprene chords shall be used to secure glass and to transition it to PC where needed.

HEATING SYSTEM

- High efficiency Natural gas furnaces shall be supplied to provide 350K BTU of heat in each of the 96’ bays, 175K BTU heat in each of the 48’ bays, and 175K BTU heat in the corridor.
- All heaters shall include vent pipes, installation kits and all installation hardware.
- All installation, operation, and warranty information shall be provided with the heater and controls.
- There shall be twenty-four 20” horizontal air flow fans, with variable speed controls.
- There shall be four 60” ceiling fans.

COOLING & VENTILATION SYSTEMS

- The cooling and ventilation systems shall consist of:
  - (1) Double Ridge Vent on each bay, divided into three sections each. One 96' long, one 12' long and one 48' long, continuous for each of those lengths. The stand-alone 12' long bays will each have one Double Ridge Vent, 12' long and continuous for its whole length.
  - Each Ridge Vent shall have one dual output Ridge Vent Motor with adapters and limit switches.
● Each ridge vent motor will have the capability to be actuated independently.
● Each production bay shall have two to three exhaust fans and intake shutter system capable of providing a minimum of 32K cfm per bay.
● Each production bay shall have an evaporative cooling system at least 6’x15’x6” and include 6” thick pads, troughs, sumps, pumps and plumbing capable of delivering at least ½ gallon of water per linear foot of pad.
● The inlet side of the evaporative pad shall be covered with motorized shutters.

ENERGY & SHADE CURTAIN

● Each zone will have a Push –Pull Energy Curtain System (Two 24’x48’ systems and Two 24’x96’ systems):
● Design shall be Slope Flat Slope for better airflow and utilization of trusses for hanging baskets or equipment.
● One Zone Shade / Heat Retention curtain system per bay traveling truss to truss in 12’ increments including seals.
● Leading edge to be 19mm tubing/aluminum profile.
● Operating system to utilize positive drive rack and pinion system, commonly called a push/pull system. The system to include heavy-duty steel drive rack with steel drive shaft. Drive motor to be located in the approximate center of each zone.
● The shade/energy curtain fabric to be supported by stainless steel lines running from one gable end of the greenhouse to the other. The fabric is to sit on top of these lines to open/close. Billow retention lines to be located above the fabric to prevent damage to the fabric from flow of air of roof venting.
● Shade / Heat retention fabric consists of an aluminum and polyester material designed for years of trouble-free use, it has a shade factor of 50% and an energy savings of 50%.
● Fabric is Fire-retardant
● System to be controlled with automated environmental controls.

LIGHTS

● There shall be three full-length rows of lights per bay, spaced and designed to deliver 312 Photosynthetic Photon Flux Density with a Uniformity ratio of 0.85.
● Lights shall include 600w Duo LED lamps, S4 spectrum, 100-277v, 50k hour lifespan, dimmable, with wet location fixtures.
● Lights shall be wired for 208v electricity and include 8' chords with plugs.

ENVIRONMENTAL CONTROLS

● Temperature and humidity will be controlled with a multi-unit Link 4 IGROW 1800 computerized control system.
● Custom contactor panels, NEMA4 enclosures, 24v power supplies and electrical drawings shall be included.
● iDrives shall be provided as needed for all motors and drives.
● The IGROW will come with remote-capable software and connections for linking to a laptop, cellphone, or desktop computer. Dedicated station is not included
- Environmental control system shall control all heating, cooling, ventilation, and dimmable lights.
- Ridge vents shall operate independently and have incremental opening.
- A weather station shall be included with sensors for indoor/outdoor temperatures, wind speed, solar light availability, and rain. Including a 50’ cable.
- GOLD protection plan shall be included for emergency after hours support, 4 sessions Phone/Web Training, E-mail & screen sharing support. Replacement of defective hardware within 1 business day with complimentary next day air shipping, major firmware & software upgrade. This package is renewable on an annual basis, via Link 4, for a maximum of 5 years.
- SITE VISIT (Includes Startup support, completing a post installation checklist, Controller Programming and setup, and training. Up to 8 hours on site including travel costs). - UP TO 8 HOURS ON SITE INCLUDES TRAVEL COSTS.

BENCHES

- Benches shall be 4’w x 10’l x 30” tall, with frames of 1.315 round steel 17 gauge galvanized steel, with 6 legs per bench and shall include feet.
- Bench tops shall be 13 gauge raised galvanized expanded steel
- All bench top corners shall be reinforced and protected.
- Bench top frames allow installation with or without perimeter lip.

Misc.

- Concrete, electrical, and plumbing are not included in this bid.
- Installation is not included.
- Freight is included.
GREENHOUSE ENVIRONMENTAL CONTROL SYSTEM SPECIFICATION

PART 1 - GENERAL
These specifications are stating the minimum requirements for the iGrow 1800 Greenhouse Environmental control system hardware and software.

1.1 SCOPE OF WORK
Work consists in supplying, but not limited to, the following items:
   A. A dedicated greenhouse control system.
   B. Controllers, computer, accessories and communication links described in the document.
   C. Complete software package applicable to controlling the specialized greenhouse environments described herein.
   D. Environments described herein.
   E. The on-site configuration and start-up of the system.
   F. Required coordination with the electrical contractor responsible for doing the installation.
   G. Training sessions for the users.
   H. Remote diagnostic capabilities and service.

1.2 MANUFACTURER’S QUALIFICATIONS
Link4 is a firm regularly engaged in manufacturing and installation support of environmental control systems for greenhouses.

1.3 WARRANTY
A system including all hardware and software components shall be warranted for a period of one year following the date of final acceptance of work. Any manufacturing defects occurring during that period shall be corrected at the manufacturer’s expense.
All applicable software as detailed in this specification shall be updated by the computer supplier free of charge for a minimum of one year after a system acceptance. Supplier has the responsibility of keeping the Owner aware of any software upgrade made commercially available.

1.4 DRAWINGS
The drawings shall include, but not be limited to, the following:
   A. Layout of control components
   B. Schematic diagrams connecting all iGrow 1800 controllers to electrical panels per data gathered in communication with the customer.

PART 2 – PRODUCTS
SYSTEM DESCRIPTION
A. The control system is to be designed with the objective of regulating the environment, collecting, processing, and displaying data. All functions described herein shall be accessible through a host computer.
B. If an external weather station is purchased and attached to the control system, the control system shall integrate external weather conditions with those measurements made within the various facility compartments to activate control mechanisms for maintenance of the selected optimum environmental conditions.
C. Control system shall consist of a network of locally programmable controllers with individual LCD displays and touch pad keyboard as well as a host computer. Programming shall be done either at the controller or at the host computer. Changes made at either the field programmable controller or the host computer will automatically be transferred to the other unit. Host computer shall display real time sensor data graphically and shall have extensive history and graphing capability.
D. Host computer functionality requires the purchase of Link4’s LinkConn1800 Windows based software. Not all system functionality can be set through the LCD display and touchpad. If LinkConn1800 software and a host computer is not available, that functionality will not be available.

E. Once programmed, control system shall operate with full capability even when the host computer is turned off. When the host computer is turned on and the software is loaded, the communications with the remote controllers shall be established and the history data files shall sync and record data. Data not recorded while PC was turned off shall be recoverable with a menu selection button in the PC software.

F. Manual overrides, at the controller, shall be provided for all control points to allow for ON-AUTO-OFF modes. Manual override usage discouraged switch setting is not recorded anywhere. This may cause possible future confusion about the state of the equipment.

2.2 HOST INTERFACE SOFTWARE (LinkConn1800)

A. Software includes but is not limited to, the following items:
   a. User access control with multiple User IDs with differentiated access control for every zone.
   b. Allowing for multiple users to simultaneously access the control system and edit their own control parameters.
   c. Full graphing and report capabilities e.g. graphing all inputs and outputs on the same chart.
   d. Allowing up to 128 conditional controls, where user created variables are allowed for flexible controls.
   e. Overall display of status of all measured facility data by zone.
   f. Graphic display in real time of user selectable sensors, equipment status or stages.
   g. Comprehensive alarm display for all compartments with time, data and description. Real time alarm display.
   h. Parameter changes at the host will be automatically transferred to the appropriate field controller.
   i. Parameter changes made at the field controller (s) will be automatically transferred to the host computer.
   j. Frequency of data storage at the controller and host computer is user selectable based on storage limitations. Data storage limits are entirely defined by available storage space and data consumption rates.

2.3 FIELD PROGRAMMABLE CONTROLLERS

A. Physical Characteristics
   a. Cabinet shall be either 16”x14”x8” or 24”x24”x8” (LxWxH), NEMA 4 White Steel Enclosure depending on equipment requirements.
      i. Constructed for wall mounting
      ii. The iGrow 1800 will be integrated into the enclosure mounted on a swing out panel providing access to power supplies and interface devices.

   b. Controller shall provide at least one local HMI (Human Machine Interface) for each zone.
      i. Four line, 20 characters per line LCD backlit graphical display with the following capabilities:
         1. Displays current readings for all sensors and temperature/humidity setpoints
         2. Displays real time date and time.
3. Displays status for control outputs and overrides.
   ii. Touch keypad (7 keys)
      1. Allows for local modification of many controller settings.
      2. All local settings modifications are automatically synchronized with PC software interface.
         a. Real Time Clock with Battery Back-up.
         b. Status display updated every 2 seconds.

B. Controller Inputs
   a. Eight analog inputs
   b. Eleven digital inputs
   c. Two sensor serial inputs.

C. Controller Outputs
   a. Twelve relay outputs each with manual override switches and LED status lights.
   b. Mechanical interlock jumpers for relay pairs
   c. Bus jumpers for wet contact outputs (e.g. 24 VAC)
   d. Any of the relays can be used in pairs for proportional control of vents, curtains, or heat or cooling valves.
   e. Two relay outputs for interface with an external alarm unit

D. Serial Ports
   a. Four serial communication channels.

E. Expansion Capabilities
   a. Controller shall be expandable within a compartment by adding up to (6) 4 Output expansion boards and up to three (3) expansion controllers for a maximum of 144 outputs.
   b. Expansion controllers will automatically receive setpoint and other pertinent data from the compartment’s master controller
   c. Controller shall be expandable within a compartment by adding up to (6) 2 Output analog expansion boards capable of outputting 0-10v.
      i. Analog boards have a current sink capability of 20 milliamps @ 2 volts.
      ii. Analog boards have a voltage range of 0-10.3 volts.
   d. Up to 6 total expansion boards are available per controller. They can be added in any combination of 2 output analog or 4 output boards.

F. Control Features
   a. Up to six user definable heating and six user definable cooling stages
   b. Up to four user definable temperature and humidity setpoint sets per day
   c. Ramp time options for each temp setpoint
   d. Astronomical clock time window adjustment option
   e. Up to three dehumidification states
   f. Heat boost option
   g. “Smart Cool” anticipatory control option
   h. Humidification control
   i. Manual scheduled overrides on all output modules
   j. Manual scheduled overrides for all stages of cooling and heating
k. Alarms (Hi and Low Temp)
l. Software sensor calibration
m. Deadband control to avoid frequent cycling of equipment.
n. Vent Control
   i. Wind/rain override including wind direction based decision making if optional weather station is purchased
   ii. Dehumidification/humidification override
   iii. Outside temperature control option
   iv. Vent position measuring capability
o. Curtain Control
   i. Shading and/or energy control
   ii. Energy blanket shock protection
   iii. Dehumidification/humidification override
p. Irrigation Control
   i. Light accumulation
   ii. Scheduled (i.e. irrigate at 8 am)
   iii. Misting (cycling) control (i.e. run irrigation for 5 seconds every 5 minutes)
   iv. Moisture Sensor
   v. Optional VPD (Vapor Pressure Deficit) Canopy Sensor and VPD irrigation Control
q. Minimum of four micro-zones for heating and cooling
r. Heat Valve with circulation pump control and shock protection
s. HID light control with independent threshold per light bank (Supplemental or Scheduled)
t. DLI Day Light Integral Supplement lighting based on total of Light to be supplied each day
u. CO2 control with threshold subject to light conditions, time-of-day and temperature state.
v. On screen help files

2.4 ZONE SENSORS
   A. Temperature sensor
      Solid state digital temperature: Operational range: -40° C to + 123.8° C
      Resolution: 0.1° C
   B. Humidity sensor
      Solid state digital humidity: Accuracy: ±2% from 10% to 90% RH. Resolution: 0.1 %RH. Response time (63%) in slow moving air: 4 seconds.
   C. Optional ADISM Communicating Sensor Providing Temperature, Humidity, Light, CO2.
   D. Optional exterior weather station with the following:
      A. Wind Direction Sensor.
      B. Wind Speed (Anemometer) Sensor.
      C. Light Level Sensor (Solar).
      D. Temperature Sensor, solid state digital.
      E. Precipitation Sensor.

2.5 CONTACTOR PANELS
   A. The system will be integrated with a contactor panel in the same enclosure as described in 2.3.A.
   B. The contactor panels will have the number of contactors necessary to control the equipment in your facility.
   C. All contactors shall have the following minimum specifications:
      a. 3 pole.
      b. 22 amp.
      c. 50/60Hz rated frequency.
      d. 690V rated operation and insulation voltage.
e. 6kV rated impulse withstand voltage.
f. | AC-1 Thermal Current | kW | 2.5 |
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D. The panel shall include a circuit breaker and transformer, as required.
E. Locking handles shall be provided on cabinet doors.
F. All panels shall carry UL508A certification.
G. Manufacturer is responsible for proper rating and sizing of electrical components for the equipment being controlled.

**PART 3 – EXECUTION**

### 3.1 HIGH VOLTAGE AND MECHANICAL INSTALLATION

A. The electrical contractor shall be responsible for the physical mounting of all computerized control panels and contactor panels as detailed on the electrical drawings.
B. The electrical contractor shall furnish and install conduits and power wiring for the controlled systems in each environment. This includes conduits for the sensor and communication wires, if required.
C. The electrical contractor shall be responsible for the load wiring and load terminations in the contactor panel.
D. The electrical contractor shall be responsible for the limit switch wiring to the vent and curtain motors.
E. The electrical contractor shall be responsible for the control wiring from the contactor panel to the computerized control panels.
F. The electrical contractor shall be responsible for installing the sensors and wiring them to the computerized control panels. The electrical contractor shall install the sensor wiring in such a way as to avoid electrical interference from power lines and other sources of interference, such as lighting ballasts.
G. The electrical contractor shall be responsible for installing the communication wires and the final connections for the control and sensor wiring in the computerized control panels.

### 3.2 TRAINING

A. The manufacturer shall provide 1 free 2-hour screen sharing training session at the end-users request.
B. Optional additional screen sharing sessions are available as part of a subscription Gold Service Package.
C. Optional additional on site visits for training or commissioning are available.

### 3.4 CUSTOMER SUPPORT

A. The greenhouse controls contractor shall furnish toll free telephone support of the systems provided for three years after the date of acceptance by the owner.
B. 24/7 call service is available with as part of a subscription Gold Service Package.
TECHNICAL DATA SHEET

PRODUCT: Policarb® 8mm twin wall

PRODUCT CODE 2124

Specifications

DESCRIPTION: Polycarbonate twin wall sheet
THICKNESS: 8mm
STRUCTURE: 2 wall
WIDTH: 48” and 72”
WEIGHT: 1500G/m²
UV PROTECTION: Protected on one side
THERMAL TRANSMITTANCE: 3.3 W/M²K or U-value .58
R-VALUE: 1.724
LIGHT TRANSMISSION: 81%
PAR LIGHT TRANSMISSION: 79%
SHGC: 82
SHADING COEFFICIENT: 0.94
HAZE: 100%
WARRANTY: Gallina USA 10 year warranty applies
FIRE RATING: ASTM E84 Class A
West Virginia State University
West Virginia State University
West Virginia State University

- Double Ridge Vent
- 4' x 8' Double Hung Doors
- Exhaust Fans
- 156' x 48'

RIMOL Greenhouse Systems
Thank you for allowing us to assist you with selecting appropriate lighting for your project.

The following pages contain your customized lighting layout based on your unique structure, crop and region. Detailed product information and technical support are readily available to give you a complete lighting solution that is easy to comprehend, efficient, and designed to match your needs.

The Difference

- **Experience**: PARsource offers over 28 years of experience as a recognized leader in the field of horticultural lighting.
- **Versatility**: Our work with commercial growers, universities and research facilities has made us the authority for lighting projects in both greenhouses and indoor farm settings.
- **Dependability**: PARsource’s parent company, Hydrofarm, LLC, has been in business for over 40 years providing a broad range of horticultural products. With warehouses and distribution partnerships throughout North America and abroad, we offer support before and after purchase.
- **Innovation**: We’re proud to have developed some of the most advanced lighting systems available. We also continue to support, refine, and build on a range of traditional solutions.
Your lighting layout and system recommendations have been developed to meet PPFD, uniformity, spectrum and efficacy/budgetary objectives per the information and requirements you provided to PARsource with your lighting request.

- **Eav** on your layout is the average PPFD, Photosynthetic Photon Flux Density, your plants are calculated to receive at a specified elevation. It is the average “µmols” (or µmol/m²/s) the proposed lighting array is calculated to provide over the growing area indicated.

- **Uniformity**, expressed in your layout as **u₀**, is a ratio of the relative consistency of the lighting array’s output as designed and calculated. The closer to 1.0 the number, the more uniform the light is being delivered. With each lighting layout we strive to optimize uniformity along with PPFD whenever possible. However, structural dimensions and other limitations may present issues at times.

- **Spectrum** is a key factor in developing your lighting layout to meet your specific crop needs. Based on your requirements, we select systems with the correct spectrum mix (PAR and PBAR) to promote appropriate growth, flowering, photoperiod control, and more.

- **Efficacy and budgetary considerations** are two separate factors, but they can be related when deciding what type of lighting best suits your needs. Efficacy is the efficiency of a lighting fixture based on light output versus input power. Budgetary concerns are a matter of practicality, ROI, and annual operating costs. We are here to assist you with working through these considerations.

Contact your sales consultant or PARsource direct at 855.727.5483 or sales@parsource.com for further assistance with your lighting recommendation and any questions that you may have.
Greenhouse 1 and 2- 96' x 24' / Floor plan

![Floor Plan]

Scale 1 : 210

<table>
<thead>
<tr>
<th>#</th>
<th>Quantity</th>
<th>System Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42</td>
<td>PTB5600LS4</td>
<td>PHOTOBIO® T Duo LED Lighting System, 600W, 100-277V (240V req)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spectrum</th>
<th>NEMA Plug</th>
<th>N-15PD</th>
</tr>
</thead>
<tbody>
<tr>
<td>S4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**System Placement (per drawing as oriented above)**

<table>
<thead>
<tr>
<th>1st row from Left wall</th>
<th>7'</th>
<th>Spacing Left to Right</th>
<th>6.538'</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st row from Bottom wall</td>
<td>5'</td>
<td>Spacing Bottom to Top</td>
<td>7.0'</td>
</tr>
<tr>
<td>Mounting Height (at mount)</td>
<td>10'</td>
<td>System Orientation</td>
<td>L to R</td>
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</tbody>
</table>

**Parameters**

<table>
<thead>
<tr>
<th>Lighting Calculation Grid Height</th>
<th>5'</th>
<th>Wall Reflectivity (indoor)</th>
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</thead>
<tbody>
<tr>
<td>Average PPFD Requested</td>
<td></td>
<td>Quality (avg umol/m2/s)</td>
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</table>

**Calculated Results**

<table>
<thead>
<tr>
<th>PPFD at Grid From Lighting</th>
<th>312 (avg umol/m2/s) - based on operating all lights at 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Winter DLI (greenhouse)</td>
<td>10 (avg moles per day) US DLI map, Clemson Univ-Korcynski, Logan &amp; Faust</td>
</tr>
<tr>
<td>DLI Provided by Array (12 hour)</td>
<td>13.4 (moles per day)</td>
</tr>
<tr>
<td>DLI Provided by Array (18 hour)</td>
<td>20.1 (moles per day)</td>
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</tbody>
</table>

The values shown in this report are a result of precision calculations based on precisely positioned luminaires in a fixed relationship to each other and to the area under examination. In practice, the values may vary due to tolerances on luminaires, luminaire positioning, reflection or other structural properties and electrical supply.
Greenhouse 1 and 2- 96’ x 24’ / Calculation Grid 1 / Value Chart (E, Perpendicular)

Grid: 44 x 11 Points

Not all calculated values could be displayed.

Position of surface in room:
Marked point: (6.500 ft, 2.000 ft, 5.000 ft)
Greenhouse 3 and 4 - 48' x 24' / Floor plan

<table>
<thead>
<tr>
<th>#</th>
<th>Quantity</th>
<th>System Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21</td>
<td>PTB5600LS4</td>
<td>PHOTOBIO^T Duo LED Lighting System, 600W, 100-277V (240V req)</td>
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</table>

<table>
<thead>
<tr>
<th>System Placement (per drawing as oriented above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st row from Left wall</td>
</tr>
<tr>
<td>1st row from Bottom wall</td>
</tr>
<tr>
<td>Mounting Height (at mount)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting Calculation Grid Height</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calculated Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPFD at Grid From Lighting</td>
</tr>
<tr>
<td>Regional Winter DLI (greenhouse)</td>
</tr>
<tr>
<td>DLI Provided by Array (12 hour)</td>
</tr>
<tr>
<td>DLI Provided by Array (18 hour)</td>
</tr>
</tbody>
</table>

The values shown in this report are a result of precision calculations based on precisely positioned luminaires in a fixed relationship to each other and to the area under examination. In practice, the values may vary due to tolerances on luminaires, luminaire positioning, reflection or other structural properties and electrical supply.
Greenhouse 3 and 4- 48' x 24' / Calculation Grid 1 / Value Chart (E, Perpendicular)

Position of surface in room:
Marked point: (6.000 ft, 2.000 ft, 5.000 ft)

Grid: 21 x 11 Points

<table>
<thead>
<tr>
<th>E_{av}</th>
<th>E_{min}</th>
<th>E_{max}</th>
<th>u_0</th>
<th>E_{min} / E_{max}</th>
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<tbody>
<tr>
<td>318</td>
<td>273</td>
<td>362</td>
<td>0.86</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Values in umols, Scale 1 : 88
ECONOMICAL, PRACTICAL, EFFECTIVE

American Coolair's Type NBF fan provides the solution to fresh air ventilation in most types of farm buildings. Type 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 system for farm use combining the Type NBF fan with a Type LRW all aluminum shutter and heavy gauge galvanized steel wall housing (square box or slope) for exterior mounting, allowing a maximum of unobstructed interior space.

EXCLUSIVE DRIVE ASSEMBLY

Our engineers have developed an innovative drive assembly for the Type NBF fan. 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. Our use of quality materials and precise engineering techniques in constructing wheel assemblies assure you of years of quiet, trouble-free service.

BASIC COMPONENTS

Both the fan panel and the uprights which support the motor and propeller are formed from heavy-gauge steel for maximum strength and rigidity. The propeller is composed of a heavy cast wheel with six die formed blades individually mounted.

Painted parts are coated with a thermosetting epoxy coating to provide a protective coating rated excellent for hardness, impact resistance, adhesion and chemical resistance.

PERFORMANCE AND EFFICIENCY

When economy is measured in terms of cubic feet of air per minute per dollar invested, the Type NBF wall exhaust fan 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. Motors up through 1 horsepower are resilient base.

TYPE FWH (SQUARE BOX) WALL HOUSING

Coolair's FWH wall housing is an exterior unit to house the Type NBF fan and the Type LRW shutter. The shutter is mounted on the discharge. The FWH wall housing is constructed of heavy gauge galvanized steel and is attached to the exterior walls.

TYPE SWH (SLOPE) WALL HOUSING

The slope wall housing allows the shutter to be placed on the intake side of the fan and eliminates air turbulence that occurs with the shutter on the down-wind side of the fan. Locating the shutter on the inlet prevents the warm air from being lost through the metal wall housing to the outside cold air in cold climate conditions. The slope wall housing is constructed of galvanized steel for long, durable wear and low maintenance.

TYPE SWHCE (SLOPE) WALL COLLAR WITH CONE

The SWHCE package provides the ultimate in energy efficiency with the addition of a discharge cone to the slope housing. The discharge cone minimizes exhaust air turbulence, yielding more airflow at lower power levels. Both the housing and discharge cone are constructed of durable galvanized steel. Like the SWH package, the SWHCE's aluminum inlet shutter prevents heat loss in cold climate conditions.
PERFORMANCE RATINGS

AMERICAN COOLAIR CORPORATION certifies that the performance data for the type NBF wall fan models shown below are based on tests conducted in an accredited laboratory in accordance with ANSI/AMCA Standard 210-07.

NBF Fan, SWH Slope Wall Housing, Inlet Shutter & Discharge Guard

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>NMBF36J</td>
<td>36</td>
<td>1/2</td>
<td>524</td>
<td>22.7</td>
<td>16,590</td>
<td>30.9</td>
<td>136</td>
</tr>
<tr>
<td>NMBF36L</td>
<td>36</td>
<td>1/2</td>
<td>615</td>
<td>23.4</td>
<td>19,759</td>
<td>31.4</td>
<td>205</td>
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<tr>
<td>NMBF48L</td>
<td>48</td>
<td>3/4</td>
<td>490</td>
<td>23.4</td>
<td>21,620</td>
<td>32.9</td>
<td>435</td>
</tr>
<tr>
<td>NMBF48N</td>
<td>48</td>
<td>1/2</td>
<td>428</td>
<td>25,040</td>
<td>24,360</td>
<td>32.9</td>
<td>111</td>
</tr>
<tr>
<td>NMBF48N</td>
<td>48</td>
<td>3/4</td>
<td>414</td>
<td>27,720</td>
<td>26,560</td>
<td>32.9</td>
<td>145</td>
</tr>
<tr>
<td>NMBF60M</td>
<td>54</td>
<td>1/2</td>
<td>325</td>
<td>30,360</td>
<td>33,010</td>
<td>32.9</td>
<td>285</td>
</tr>
<tr>
<td>NMBF60N</td>
<td>54</td>
<td>1/2</td>
<td>365</td>
<td>30,860</td>
<td>33,510</td>
<td>32.9</td>
<td>285</td>
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<tr>
<td>NMBF60P</td>
<td>54</td>
<td>1/2</td>
<td>414</td>
<td>34,000</td>
<td>36,700</td>
<td>32.9</td>
<td>365</td>
</tr>
</tbody>
</table>

AMERICAN COOLAIR CORPORATION certifies that the performance data for the type NBF circulator fan models shown below is based on tests conducted in an accredited laboratory in accordance with ANSI/AMCA Standard 230-99.

NBF Circulator Fan

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>NBF36J</td>
<td>36</td>
<td>1/2</td>
<td>524</td>
<td>22.7</td>
<td>16,590</td>
<td>30.9</td>
<td>136</td>
</tr>
<tr>
<td>NBF36L</td>
<td>36</td>
<td>1/2</td>
<td>615</td>
<td>23.4</td>
<td>19,759</td>
<td>31.4</td>
<td>205</td>
</tr>
<tr>
<td>NBF48L</td>
<td>48</td>
<td>3/4</td>
<td>490</td>
<td>23.4</td>
<td>21,620</td>
<td>32.9</td>
<td>435</td>
</tr>
<tr>
<td>NBF48N</td>
<td>48</td>
<td>1/2</td>
<td>428</td>
<td>25,040</td>
<td>24,360</td>
<td>32.9</td>
<td>111</td>
</tr>
<tr>
<td>NBF48N</td>
<td>48</td>
<td>3/4</td>
<td>414</td>
<td>27,720</td>
<td>26,560</td>
<td>32.9</td>
<td>145</td>
</tr>
<tr>
<td>NBF60M</td>
<td>54</td>
<td>1/2</td>
<td>325</td>
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<tr>
<td>NBF60N</td>
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<td>1/2</td>
<td>365</td>
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<td>33,510</td>
<td>32.9</td>
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<td>NBF60P</td>
<td>54</td>
<td>1/2</td>
<td>414</td>
<td>34,000</td>
<td>36,700</td>
<td>32.9</td>
<td>365</td>
</tr>
</tbody>
</table>
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.

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 poultry or livestock applications, the preferable pad location would be at the end of the building opposite the fans (Designs ‘A’ & ‘C’). The air should be drawn the length of the building except in cases when the resulting air velocity would surpass the comfort level of the animals confined. In these instances, pad placement is recommended on both ends of the house with the fans installed on both sides of the middle (Designs ‘E’ & ‘F’). Design ‘B’ shows a typical ‘broiler’ poultry house while Design ‘D’ shows a typical dairy installation.

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. Designs ‘A’ and ‘D’ show typical greenhouse installations.

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.

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.

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.

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 sump should be purchased locally and be sized for at least 3/4 gallon capacity per square foot of pad area.
**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 fulfilment 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 KIND IS ASSUMED OR SHALL BE IMPOSED UPON AMERICAN COOLAIR.
PTB5600LS4 / PTB6600HS4

PHOTOBIO-T DUO LED, 600W, 100–277V
PHOTOBIO-T DUO LED, 600W, 277–480V

S4 SPECTRUM

PHOTOBIO® T Duo LED Top Light can be applied indoors or in greenhouse environments. The fixture’s industry leading PHOTO•PRO Photon Regulating Optics deliver more light to canopy using less energy. PHOTO•LOC Light Output Control enables real-time control through any 0–10v signal. Independent light bars can be angled outward at 0°, 10°, and 20° to adjust the coverage or produce asymmetric light distribution to ensure light is not being wasted on walls or aisles. High efficiency, long lifetime, maintenance free, together means lower cost of ownership.

System Overview

<table>
<thead>
<tr>
<th>Model</th>
<th>PTB5600LS4 / PTB6600HS4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixture Type</td>
<td>High Efficiency Horticultural LED</td>
</tr>
<tr>
<td>Spectrum</td>
<td>S4</td>
</tr>
<tr>
<td>Photon Flux (PAR 400–700 nm)</td>
<td>1460 µmol/s</td>
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<tr>
<td>Photon Flux (PBAR 280–800 nm)</td>
<td>1500 µmol/s</td>
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<tr>
<td>Input Power (W)</td>
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<tr>
<td>Efficacy (280–800 nm)</td>
<td>2.5 µmol/J</td>
</tr>
<tr>
<td>Input Voltage Range</td>
<td>100–277V Auto Recognition</td>
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<tr>
<td>Lifetime</td>
<td>Q90: &gt; 50,000hr</td>
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<tr>
<td>Optics</td>
<td>PHOTO•PRO Photon Regulating Optics</td>
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<tr>
<td>Dimmable</td>
<td>PHOTO•LOC Light Output Control (0–10V)</td>
</tr>
<tr>
<td>Driver</td>
<td>Output Compensating IP67 Driver</td>
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<td>Operating Environment</td>
<td>Wet Location</td>
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<tr>
<td>Ingress Protection Rating</td>
<td>IP65</td>
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<td>Warranty Period</td>
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Electrical Specifications

<table>
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<th>Model(s)</th>
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</tr>
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<tbody>
<tr>
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<tr>
<td>Input Voltage Range</td>
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<tr>
<td>Max Voltage Range</td>
<td>90–305V / 250–528V</td>
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<tr>
<td>Power Factor</td>
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<tr>
<td>Frequency</td>
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</table>

Input Amperage Reference

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<th>120V</th>
<th>208V</th>
<th>277V</th>
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<tbody>
<tr>
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<tr>
<td>Max Amperage</td>
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<td>2.38</td>
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<td>Voltage Input</td>
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<tr>
<td>Typical Amperage</td>
<td>1.73</td>
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<tr>
<td>Max Amperage</td>
<td>1.90</td>
<td>1.65</td>
<td>1.38</td>
</tr>
</tbody>
</table>

Operating Conditions

| Rated Operating Temperature | 77°F/25°C |
| Minimum Operating Temperature | -4°F/-20°C |
| Maximum Operating Temperature | 104°F/40°C |
| Operating Environment | Wet Location |
| Ingress Protection Rating | IP65 |

Photosynthetic Photon Intensity Distribution

S4 Spectrum: Provides highly efficient full spectrum with a healthy red-to-blue ratio to drive photosynthesis. Light energy between 500–599nm, previously thought wasted, penetrates deeper into the plant canopy promoting photomorphogenic responses. High color rendering “white” light aids to rapidly identify potential threats to your crop and provides superior working conditions and safety for personnel. Ideal for both flowering and vegetative production.
PTB5600LS4 / PTB6600HS4
PHOTOBIO-T DUO LED, 600W, 100–277V
PHOTOBIO-T DUO LED, 600W, 277–480V
S4 SPECTRUM

Driver Specifications
- Microprocessor Control: Yes
- Open Circuit Protection: Yes
- Short Circuit Protection: Yes
- Overtemperature Protection: Yes
- Over/Undervoltage Protection: Yes
- Over/Undervoltage Indicator: Yes
- Output Compensation: Yes
- IP Rated 0–10V: Yes
- Internal EMI Suppression: Yes
- Wieland RST Male AC Input: Yes

Safety Certifications
- Certification Mark: ETL & CE
- Conforms to UL 1598: Yes
- Conforms to CSA C22.2 # 250.0: Yes
- Compliant to OOI UL 8800: Yes
- FCC Commercial: Yes
- FCC Residential: Yes

Cable Harnesses
Specific 8’ black Wieland female cable harness sold separately based on facility requirements.

CHW883020W 18AWG w/277V Locking Plug, L7-15P
CHW883025W 18AWG w/347V Locking Plug, L24-20P
CHW843010W 18AWG w/110-120V Plug, 5-15P

CHW863015W 18AWG w/208-240V Plug, 6-15P
CHW863000W 18AWG w/No Plug (bare whip)

Mechanical Specification
- Dimensions (L x W x H): 1200 x 500 x 110 mm / 47.24” x 19.69” x 4.33”
- Net Weight: 12.15 kg / 26.79 Lb
- Thermal Management: Passive
- Material: Aluminum, Glass, PC, Stainless Steel

Operation Notes
For use with a generator, line conditioning equipment to control input voltage must be used in order to avoid damage to fixture. Product is not designed to use with residential power strip. Failure to observe these warnings will result in void of warranty. Contact us for more information. Clean lens with a damp microfiber cloth.

WARNING – POSSIBLE RISK OF INJURY TO EYES AND SKIN
Hazardous optical UV, HEV, and IR radiation may be emitted from the light source. Always wear personal protective equipment ensuring complete shielding of skin and eyes. Avoid prolonged exposure and looking directly at light source.

Dimensions (inch)
- 47.24”
- 24.69”
- 15.75”
- 9.72”
- 45.35”
- 2.36”
- 2.87”
- 19.69”
- 6.09”

PHOTOBIO
Empowered by Hydrofarm
With four decades of experience, we know energy curtains. Our PowerPull™ Energy Screen systems are individually engineered to provide the perfect solution for your needs. You can reduce energy costs by up to 40%, improve crop quality and lower water usage all at the same time.

**Benefits**

- Highly durable and virtually maintenance free
- Provides heat retention in winter, cooling in summer
- Up to 40% in energy savings
- More uniform temperatures enhance temperature, humidity and light control
- Improves crop quality
- Reduces watering
- Cools 10° to 15° F
- Shading provides comfort for customers and staff
- Retains heat at night when 80% of heating occurs
- Reduces plant stress

**Features**

- We are the only manufacturer to offer a complete system, including the drive unit and control box
- Your system is custom engineered
- Positive drive rack and pinion system means no cables to adjust
- Fabric glides between stationary stainless steel lines
- Steady, moderate pace of system allows you to regulate cold air spill
- Built-in safety limits protect your system
- Durable fabric resists UV, heat and chemicals
- Small bundle size ensures minimal shade when the system is open
- Fully sealed around perimeter when covered
- Flexible design allows for easy installation for new construction and retrofitting

To find out more call 800.821.5829, email sales@wadsworthcontrols.com or visit www.wadsworthcontrols.com
We installed both of our curtain systems ourselves, one 7-years ago, and one 3-years ago. Each is 120' square coverage, and both are still taut. The clips are a good system. The curtains save on our heating bill and keep the heat lower to the ground, near the plants, where it should be.

**We were tempted by another curtain system.** But we didn’t want to risk it. We have a long relationship with Wadsworth, and we knew we could trust them to deliver a great system. I’m happy we went with Wadsworth – they take care of us.

**Brian Prange**  
Prange Greenhouses  
Wisconsin

**Vince Beal**  
Bell Nursery  
Maryland

---

**To find out more**  
call 800.821.5829, email sales@wadsworthcontrols.com  
or visit www.wadsworthcontrols.com
EZ-Breeze HAF Basket Fan

J&D Manufacturing’s EZ-Breeze HAF Fan is a high-efficiency air circulator that effectively cools people, plants, animals and industrial equipment. The EZ-Breeze reduces condensation, dries animal litter and bedding, controls insects, and creates a uniform temperature throughout your building to reduce heating costs.

Features

- Available in 12", 16", 20" and 24"
- Includes hot dip galvanized mounting bracket with u-bolts and nuts
- Aluminum propeller designed to reduce ambient noise levels while maintaining maximum circulation requirements
- Efficient variable speed motors (requires separate variable speed control to adjust fan speed)
- Corrosion resistant, white powder coated fan guards meet OSHA 1910.212(a)(5) requirements
- Fan ships completely assembled
- Attached 10’ cord with 3-prong plug pre-wired for 115 volts
- Totally enclosed, maintenance-free, direct drive high-efficiency motors have completely sealed ball bearings, are UL/CUL recognized, and are covered by a Two Year Warranty
- For additional cooling, use with our misting/fogging product line

<table>
<thead>
<tr>
<th>Part#</th>
<th>Size</th>
<th>HP</th>
<th>Volts</th>
<th>Amps**</th>
<th>Hz*</th>
<th>Ph</th>
<th>Spd</th>
<th>FPM</th>
<th>Thrust (lbf)</th>
<th>Thrust Eff. Ratio</th>
<th>kW</th>
<th>RPM</th>
<th>Thrust CFM</th>
<th>Thrust CFM/ Watt</th>
<th>Cord</th>
<th>Blade</th>
<th>Included Bracket</th>
<th>Test #</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDB12G</td>
<td>12”</td>
<td>1/6</td>
<td>115</td>
<td>1.0</td>
<td>60</td>
<td>1</td>
<td>1/Var^</td>
<td>565</td>
<td>0.84</td>
<td>7.2</td>
<td>.117</td>
<td>1,695</td>
<td>1,030</td>
<td>8.8</td>
<td>10’</td>
<td>3-Blk</td>
<td>VRSBR736-U</td>
<td>C09006</td>
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<tr>
<td>VDB16G</td>
<td>16”</td>
<td>1/6</td>
<td>115</td>
<td>1.0</td>
<td>60</td>
<td>1</td>
<td>1/Var^</td>
<td>805</td>
<td>1.17</td>
<td>11.7</td>
<td>.100</td>
<td>1,719</td>
<td>1,620</td>
<td>16.2</td>
<td>10’</td>
<td>3-Blk</td>
<td>VRSBR736-U</td>
<td>C09007</td>
</tr>
<tr>
<td>VDB20G</td>
<td>20”</td>
<td>1/6</td>
<td>115</td>
<td>1.0</td>
<td>60</td>
<td>1</td>
<td>1/Var^</td>
<td>575</td>
<td>0.80</td>
<td>7.9</td>
<td>.102</td>
<td>1,715</td>
<td>1,680</td>
<td>16.5</td>
<td>10’</td>
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<td>VRSBR8-U</td>
<td>C09008</td>
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<tr>
<td>VDB203G</td>
<td>20”</td>
<td>1/2</td>
<td>115</td>
<td>3.5</td>
<td>60</td>
<td>1</td>
<td>1/Var^</td>
<td>870</td>
<td>3.19</td>
<td>8.7</td>
<td>.367</td>
<td>1,685</td>
<td>3,340</td>
<td>9.1</td>
<td>9’</td>
<td>3-Blk</td>
<td>VRSBR8-U</td>
<td>N/A</td>
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<tr>
<td>VDB24G</td>
<td>24”</td>
<td>1/2</td>
<td>115</td>
<td>3.5</td>
<td>60</td>
<td>1</td>
<td>1/Var^</td>
<td>940</td>
<td>3.09</td>
<td>8.0</td>
<td>.384</td>
<td>1,680</td>
<td>3,920</td>
<td>10.2</td>
<td>10’</td>
<td>3-Blk</td>
<td>VRSBR5-U</td>
<td>N/A</td>
</tr>
<tr>
<td>VDB242G</td>
<td>24”</td>
<td>1/2</td>
<td>115</td>
<td>4.8</td>
<td>60</td>
<td>1</td>
<td>1/Var^</td>
<td>1,150</td>
<td>5.79</td>
<td>11.6</td>
<td>.498</td>
<td>1,709</td>
<td>5,370</td>
<td>10.8</td>
<td>10’</td>
<td>3-Blk</td>
<td>VRSBR5-U</td>
<td>N/A</td>
</tr>
</tbody>
</table>

All EZ-Breeze HAF fans are direct drive, have white guards, and include standard bracket hardware.

- All units are Direct Drive and include the corresponding hot dip galvanized standard flag mount bracket with hardware.
- ** Amp information as documented on motor name plate
- * These units come pre-wired for 115 Volts (electrician may rewire for 230 Volts)
- ^ For 50 Hz compatibility data please contact J&D Manufacturing

**Bold red text is data based on testing performed by an accredited lab using ANSI/AMCA Standard 230-12.

Due to our continual effort to provide the best products available and adhere to market conditions; literature, products, prices and availability are subject to change without notice.
May 28, 2003

E.I.M.P. dott. Gallina S.r.l.
St. Carignano 104
10040 La Loogia (Torino)
Italy

Attention: Mr. Dario Gallina

EXECUTIVE SUMMARY OF INTERTEK REPORT NO. 3033484, 3033484(b), AND 3041325

Test Standard

ASTM E84-01, Standard Test Methods for Surface Burning Characteristics of Materials

Material Tested

The material tested was selected, prepared, and submitted by the client. It consisted of four different thickness and configurations of cellular polycarbonate panels measuring 20-1/2 in. wide by 96 in. long. There were three panels of each type. The thickness and configuration are as follows:

1) 6 mm, 2 layers
2) 8 mm, 2 layers
3) 10 mm, 2 layers
4) 16 mm, 3 layers

Conclusions

The samples of cellular polycarbonate panels, submitted by E.I.M.P. dott Gallina S.r.l., exhibited the following flame spread characteristics when tested in accordance with ASTM E84-01, Standard Test Method for Surface Burning Characteristics of Materials.

<table>
<thead>
<tr>
<th>Samples with a Flame Spread Rating of 25 and Under</th>
<th>Flame Spread Classification</th>
<th>Smoked Developed Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 mm, 2 layer polycarbonate panel</td>
<td>5</td>
<td>85</td>
</tr>
<tr>
<td>8 mm, 2 layer polycarbonate panel</td>
<td>10</td>
<td>120</td>
</tr>
<tr>
<td>10 mm, 2 layer polycarbonate panel</td>
<td>25</td>
<td>135</td>
</tr>
<tr>
<td>16 mm, 3 layer polycarbonate panel</td>
<td>20</td>
<td>115</td>
</tr>
</tbody>
</table>

INTERTEK TESTING SERVICES NA LTD.

GP/bjm

Greg Philip
Technologist
COMMERCIAL/INDUSTRIAL HEATERS
RESIDENTIAL GARAGE HEATERS

FUEL
- Natural Gas
- Propane
- Fuel Oil

CAPACITIES
- 25 - 1,200 MBH
- 80% - 93% Thermal Efficiency
- 380 - 16,750 CFM

AIR DELIVERY
- Propeller Fan
- Centrifugal Blower (Ductable)

Visit www.ReznorHVAC.com for more information.

Form C-UH-0516
BACKGROUND
Reznor was founded in 1888 to manufacture the “Reznor” reflector heater, which used a luminous flame gas burner developed by George Reznor. This technological breakthrough was an immediate success and hastened the expansion of gas heating in residential and commercial applications. Technological development and innovation have been the hallmark of Reznor products through the years. The development of the forced air gas unit heater, the modular Thermocore® heat exchanger, and the high-efficiency, V3® Series unit heaters have kept Reznor products at the forefront of technological advances in commercial and industrial gas heating. As a result of this pioneering role in the heating, makeup air, and ventilating equipment field, the products offered today are the most advanced in engineering design to satisfy a wide variety of applications.

FACILITIES
Reznor heaters were first manufactured and sold in Mercer, Pennsylvania (70 miles north of Pittsburgh) in 1888. Over the years, the company has grown and expanded. Today, with sales worldwide, Reznor products are being manufactured at facilities throughout North America and Europe.

PRODUCT SCOPE
Well-equipped engineering laboratories for both product development and testing can be found at many of the manufacturing sites. All domestic lab sites are agency approved.

Reznor Products include a complete line of heating, makeup air and ventilating systems, using gas, oil, hot water/steam, or electric heat sources. Reznor heater catalogs are designed to aid the engineer, architect or contractor in specifying the correct equipment for all standard and special applications. Complete data is presented on unit heaters, duct furnaces, infrared heaters, makeup air systems, pre-engineered custom-designed systems, and evaporative cooling modules. Consult your local Reznor Sales Representative for further assistance in specifying Reznor Equipment for your specific application.

SERVICES
Product service requirements are handled through contractors and/or distributors, with backup from local representatives and factory-based service team. Replacement parts inventories for both warranty and non-warranty requirements are maintained at service centers throughout the country and at the manufacturing facilities.

For the Reznor Representative in your area call 800-695-1901.
For installations where dirt, dust, and other air borne contamination is present in the indoor environment, it is recommended to use separated combustion units (UDAS, UDPS). These models use air from outside the space for combustion. This will help reduce the build up of contaminants on the burner which would affect the combustion process. Refer to the installation manuals for recommended frequency of maintenance and cleaning.

IMPORTANT: Specifications are subject to change without notice. This guide is intended to provide specifications and technical information only. This guide is not intended to be an instruction manual. When installing heating and ventilating equipment, you must check and conform to all local and national building codes. Improper installation of heating and ventilating equipment could be dangerous. Consult manufacturer’s installation manual for instructions and important warnings.
Reznor® V3 Series Model UEAS gas-fired, high efficiency, separated combustion unit heaters are available in 4 sizes ranging from 131,000 to 305,000 BTUH gas input. Heaters are designed for up to 93% thermal efficiency and are approved for installation in the United States and Canada by ETL.

Reznor V3 Series unit heaters have a refreshing appearance with a glossy white cabinet finish and less visible hardware. Each size cabinet is easily suspended from 4 suspension points. The low voltage terminal strip on the outside of the cabinet makes connecting control wiring easy with no panels to remove. The addition of a “G” terminal to the low voltage strip, along with the new design of the circuit board, allows for fan only operation (without adding relays). All units have a factory installed gas line nipple to the exterior of the cabinet for easy gas service connection. The MacroChannel® secondary heat exchanger has a 1/2” PVC pipe for attaching a coupling for ease of installation and cleaning of the required condensate drain. A 4” PVC cleanout cap that is drilled and tapped for a 1/2” NPT fitting is furnished with the heater for attaching the vent condensate drain.

The preeminent new internal feature is the TCore® high efficiency heat exchanger and single burner combustion system. Other standard features include a single-stage gas valve, multi-try direct spark ignition with timed lockout, pressure switch to verify vent flow, venter motor, aluminum venter wheel with housing, resiliently isolated axial fan and motor assembly, a high temperature limit control, interlock door switch, and a built-in disconnect switch. Operation is controlled through an integrated circuit board. The circuit board monitors heater operation and has LED diagnostic indicator lights to identify abnormalities in control functions.

The 1st ever separated combustion system in the commercial/industrial heating industry was introduced on a Reznor heater in the 1960s, and that proven technology is continued in this new separated combustion product. Model UEAS separated combustion units require installation of a specially designed combustion air/vent system including the unique concentric adapter box that allows for only one building penetration for both the vent and combustion air.

The V3 Series unit heaters are designed to provide all the features you expect in a Reznor heater plus improved efficiency, easier installation, and a new look — both inside and out. Look for the unique white unit with no visible front and bottom hardware, deep red louvers, black side handle, and angled corner to know you have a genuine Reznor heater.

### Standard Features

- Up to 93% Thermal efficient
- 50-60°F temperature rise range
- Arranged for use with natural gas (propane conversion kit included with unit)
- TCore® 409 stainless steel primary heat exchanger with extruded aluminum MacroChannel secondary heat exchanger (patent pending)
- Patented single burner combustion system including a one-piece burner assembly
- 115/1/60 Supply voltage
- 115 Volt open fan motor with internal overload protection
- Transformer for 24-volt controls
- Integrated circuit board with diagnostic indicator lights
- Multi-try direct ignition with timed lockout
- Fan relay (included on the circuit board)
- Single-stage natural gas valve
- Vibration/noise isolated fan motor
- Sealed control compartment houses all electrical components
- 48 frame, ball bearing, PSC venter motor
- 4-point Suspension
- Built-in disconnect switch (20A @ 115V Rating)
- External terminal strip for 24-volt wiring
- Sealed junction box for supply wiring
- External gas connection
- Fully gasketed door panel with safety door switch
- Full fan guard — engineered for safety
- Improved cabinet design with less visible hardware
- Totally enclosed fan motor (115 V only)

### Optional Features - Factory Installed

- NOTE: Model UEAS should not be used in applications where space temperature is set below 45°F.

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Form RZ-C-UH (Version H) Page 2
ACCESSORIES - FIELD INSTALLED

- Horizontal or vertical combustion air/vent kit including concentric adapter
- Thermostat
- Thermostat guard with locking cover
- Vertical louvers
- Downturn nozzle kits
- Manual shutoff valves

* Selection of either a horizontal or vertical combustion air/vent kit is required.

**TECHNICAL DATA**

Model UEAS

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>130</th>
<th>180</th>
<th>260</th>
<th>310</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT HEATING CAPACITY (BTUH)</td>
<td>131,000</td>
<td>175,000</td>
<td>260,000</td>
<td>305,000</td>
</tr>
<tr>
<td>(KWH)</td>
<td>38.4</td>
<td>51.2</td>
<td>76.1</td>
<td>89.3</td>
</tr>
<tr>
<td>THERMAL EFFICIENCY</td>
<td>93%</td>
<td>91%</td>
<td>92%</td>
<td>91%</td>
</tr>
<tr>
<td>OUTPUT HEATING CAPACITY (BTUH)</td>
<td>121,830</td>
<td>159,250</td>
<td>239,200</td>
<td>277,550</td>
</tr>
<tr>
<td>(KWH)</td>
<td>35.7</td>
<td>46.6</td>
<td>70.0</td>
<td>81.3</td>
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<tr>
<td>GAS CONNECTION (INCHES)</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>NATURAL</td>
<td>1/2</td>
<td>1/2</td>
<td>3/4</td>
<td>3/4</td>
</tr>
<tr>
<td>PROPANE</td>
<td>1/2</td>
<td>1/2</td>
<td>3/4</td>
<td>3/4</td>
</tr>
<tr>
<td>VENT CONNECTION DIAMETER (INCHES)</td>
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<td>6</td>
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<tr>
<td>COMBUSTION AIR INLET DIAMETER (INCHES)</td>
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<td>CONTROL AMPS (24 - VOLT)</td>
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<td>1.0</td>
<td>1.0</td>
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<tr>
<td>FULL-LOAD AMPS (115V)</td>
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<td>10</td>
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<tr>
<td>MAXIMUM OVER CURRENT PROTECTION (115V)</td>
<td>15</td>
<td>15</td>
<td>20</td>
<td>20</td>
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<tr>
<td>NORMAL POWER CONSUMPTION (WATTS)</td>
<td>657</td>
<td>657</td>
<td>1020</td>
<td>1020</td>
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<td>DISCHARGE AIR TEMPERATURE RISE (°F)</td>
<td>50</td>
<td>60</td>
<td>60</td>
<td>60</td>
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<tr>
<td>AIR VOLUME (CFM)</td>
<td>2256</td>
<td>2458</td>
<td>4430</td>
<td>4283</td>
</tr>
<tr>
<td>(M³/MINUTE)</td>
<td>63.9</td>
<td>69.6</td>
<td>125.4</td>
<td>121.3</td>
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<tr>
<td>DISCHARGE AIR OPENING AREA (FT.)</td>
<td>2.56</td>
<td>2.56</td>
<td>4.79</td>
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<tr>
<td>OUTLET VELOCITY (FPM)</td>
<td>883</td>
<td>962</td>
<td>924</td>
<td>894</td>
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<tr>
<td>(M/MINUTE)</td>
<td>269</td>
<td>293</td>
<td>282</td>
<td>272</td>
</tr>
<tr>
<td>FAN MOTOR HP</td>
<td>1/4</td>
<td>1/4</td>
<td>1/2</td>
<td>1/2</td>
</tr>
<tr>
<td>STANDARD</td>
<td>1/4</td>
<td>1/4</td>
<td>1/2</td>
<td>1/2</td>
</tr>
<tr>
<td>OPTIONAL ENCLOSED</td>
<td>1/4</td>
<td>1/4</td>
<td>1/2</td>
<td>1/2</td>
</tr>
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<td>FAN MOTOR RPM</td>
<td>1050</td>
<td>1050</td>
<td>1050</td>
<td>1050</td>
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<tr>
<td>FAN DIAMETER (IN.)</td>
<td>18</td>
<td>18</td>
<td>24</td>
<td>24</td>
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<tr>
<td>APPROXIMATE CONDENSATE PER HOUR (Gallons/Liters)</td>
<td>1/3.8</td>
<td>1/3.8</td>
<td>2/7.6</td>
<td>2/7.6</td>
</tr>
<tr>
<td>APPROXIMATE NET WEIGHT (LBS/KG)</td>
<td>230/104</td>
<td>245/111</td>
<td>380/163</td>
<td>395/179</td>
</tr>
<tr>
<td>APPROXIMATE SHIP WEIGHT (LBS/KG)</td>
<td>255/116</td>
<td>270/122</td>
<td>385/175</td>
<td>420/190</td>
</tr>
</tbody>
</table>

* Output capacities shown are for units installed at elevations up to 2,000 ft. (600M).
* Sizes shown are for gas connection to a single-stage gas valve, not gas supply line size.
* MOP = 2.25 x largest motor FLA + remaining load. Answer is rounded down to the next size of commercially available circuit breaker or fuse.
* All other information in this table is based on a heater equipped with standard 115 Volt open fan motor.

**HOW IT WORKS**

Following is a diagram showing the air flow patterns for Model UEAS. Thin arrows show air flow from combustion air intake, across the burner, through primary and secondary heat exchangers and out exhaust vent. Larger arrows show air flow across the heat exchanger to provide heat to the space.
**DIMENSIONS**

Model UEAS

±1/16" (2mm)

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>M</th>
<th>N</th>
<th>P</th>
<th>R</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>260, 310</td>
<td>34 1/8</td>
<td>40 15/16</td>
<td>30 1/16</td>
<td>13 15/16</td>
<td>1 3/8</td>
<td>27 11/16</td>
<td>53 5/16</td>
<td>44</td>
<td>14 7/32</td>
<td>9 3/32</td>
<td>5 1/16</td>
<td>18 15/16</td>
<td>7 3/4</td>
<td>1 3/8</td>
</tr>
</tbody>
</table>

**CLEARANCES**

Clearances required from combustible material unless otherwise noted.

<table>
<thead>
<tr>
<th>Top</th>
<th>Flue Connector</th>
<th>Access Panel</th>
<th>Non-Access Side</th>
<th>Bottom</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>inches (mm)</td>
<td>inches (mm)</td>
<td>inches (mm)</td>
<td>inches (mm)</td>
<td>inches (mm)</td>
<td>inches (mm)</td>
</tr>
<tr>
<td>4 (102)</td>
<td>6 (152)</td>
<td>18 (457)</td>
<td>2 (51)</td>
<td>1 (25)</td>
<td>18 (457)</td>
</tr>
</tbody>
</table>

* Access Panel clearance required for access to controls for service.
* Bottom clearance to combustible. Heater should be suspended a minimum of 5 feet (1.5M) above the floor.
* Rear clearance required for air flow. Clearance should be measured from the fan motor.
DESCRIPTION

Reznor® V3 Series Model UDAS gas-fired separated combustion unit heaters are available in 14 sizes ranging from 30,000 to 400,000 BTUH gas input. All sizes are approved for commercial/industrial installations. Sizes 30-125 carry an additional approval for use in attached residential garage/workshop application. Model UDAS heaters are designed for 82-83% thermal efficiency and are approved for installation in the United States and Canada by the Canadian Standards Association (CSA).

Reznor® V3 Series unit heaters have a refreshing new appearance with a glossy white cabinet finish and less visible hardware. Each size cabinet is easily suspended from either 2 or 4 suspension points. Or, an optional hanger kit for Sizes 30-125 allows for ceiling mounting. The low voltage terminal strip on the outside of the cabinet makes connecting control wiring easy with no panels to remove. The addition of a “G” terminal to the low voltage strip, along with the new design of the circuit board, allows for fan only operation (without adding relays). All units have a factory installed gas line nipple to the exterior of the cabinet for easy gas service connection.

The preeminent new internal feature is the T\textsuperscript{core}® heat exchanger and single burner combustion system. Other standard features include a single-stage gas valve, multi-try direct spark ignition with timed lockout, pressure switch to verify vent flow, resiliently isolated venter motor, venter wheel with improved housing, resiliently isolated axial fan and motor assembly, a high temperature limit control, interlock door switch, and a built-in disconnect switch. Sizes 30-125 also include a flame rollout safety switch. Operation is controlled through an integrated circuit board. The circuit board monitors heater operation and has LED diagnostic indicator lights to identify abnormalities in control functions.

The 1\textsuperscript{st} ever separated combustion system in the commercial/industrial heating industry was introduced on a Reznor heater in the 1960s, and that proven technology is continued in this new separated combustion product. Model UDAS separated combustion units require installation of a specially designed combustion air/vent system including the unique concentric adapter box that allows for only one building penetration for both the vent and combustion air.

The new V3 Series unit heaters are designed to provide all the features you expect in a Reznor heater plus improved efficiency, easier installation, and a new look ~ both inside and out. Look for the unique white unit with no visible front and bottom hardware, deep red louvers, black side handle, and angled corner to know you have a genuine Reznor heater.

STANDARD FEATURES

- Sizes 30-400 certified for commercial/industrial heating application
- Sizes 30-125 carry an additional approval for use in residential garage/workshop heating applications
- 82-83% Thermal efficient ~ TOP in its class!
- 50-60°F Rise range
- T\textsuperscript{core}® titanium stabilized aluminized steel heat exchanger
- Patented single burner combustion system including a one-piece burner assembly
- 115/160 Supply voltage
- 115 Volt open fan motor with internal overload protection
- Transformer for 24-volt controls
- Integrated circuit board with diagnostic indicator lights
- Multi-try direct ignition with timed lockout
- Fan relay (included on the circuit board)
- Single-stage natural gas valve (field adjustable for operation to 9,000 ft. elevation \(^{\text{1}}\))
- Vibration/noise isolated fan and venter motors
- Sealed control compartment houses all electrical components
- 2-pt and 4-pt Suspension ~ standard on all sizes
- Built-in disconnect switch (20A @ 115V Rating)
- External terminal strip for 24-volt wiring
- Sealed junction box for supply wiring
- External gas connection
- Fully gasketed door panel with safety door switch
- Full fan guard ~ engineered for safety
- Improved cabinet design with less visible hardware

\(^{\text{1}}\) U.S. Patent No. 6,889,686.
OPTIONAL FEATURES - FACTORY INSTALLED

- Single-stage, propane gas valve (field adjustable for operation to 9,000 ft. elevation)
- Two-stage natural gas or propane gas valve - Sizes 60-400
- 409 or 316 Stainless steel heat exchangers
- Totally enclosed fan motor (Sizes 30-250, 115V only)
- Horizontal or Vertical Combustion AirVent Kit including concentric adapter
- Thermostat
- Thermostat guard with locking cover
- Vertical louvers
- Downturn nozzle kits
- Gas conversion kits (natural and propane)
- Primary/secondary controls for zoning up to six units
- Ceiling suspension kit - Sizes 30-125
- Hanger kits for 1” pipe
- Stepdown transformer (for 208/115, 230/115 or 460/115 supply voltage)
- Manual shutoff valves

* Pressure switch change required for installations above 6,000 ft.
* Selection of either a horizontal or vertical combustion air/vent kit is required.
* CSA rating for altitudes to 2000 ft.
* Size shown is for gas connection to a single stage gas valve, not supply line size.
* Smaller and/or larger vent and combustion air pipe diameters may be allowed; refer to the Venting Installation Manual for Separated Combustion Units, Form I-V-SC. If vent diameter is different from vent connection, reducers/enlargers will be field-required.
* MOP = 2.25 x largest motor FLA + remaining load. Answer is rounded down to the next size of commercially available circuit breaker or fuse.
* All other information in this table is based on a heater equipped with a standard 115 volt open fan motor.

TECHNICAL DATA

Model UDAS

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DIMENSIONS

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CLEARANCE FROM COMBUSTIBLES

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* Access Panel clearance is required for service clearance to controls.
* Suspend the heater so that the bottom is a minimum of 5' (1.5M) above the floor.
* Rear clearance is required for air movement. Rear clearance should be measured from the fan motor.

Refer to Reznor web site www.RezSpec.com for venting/inlet air requirements for Reznor Separated Combustion Units

Form RZ-C-UH (Version H) Page 7
### DESCRIPTION

Reznor® V3 Series Model UDAP gas-fired unit heaters are available in 14 sizes ranging from 30,000 to 400,000 BTUH gas input. All sizes are approved for commercial/industrial installations. Sizes 30-125 carry an additional approval for use in attached residential garage/workshop application. Model UDAP heaters are designed for 82-83% thermal efficiency and are approved for installation in the United States and Canada by the Canadian Standards Association (CSA).

Reznor® V3 Series unit heaters have a refreshing new appearance with a glossy white cabinet finish and less visible hardware. Each size cabinet is easily suspended from either 2 or 4 suspension points. Or, an optional hanger kit for Sizes 30-125 allows for ceiling mounting. The low voltage terminal strip on the outside of the cabinet makes connecting control wiring easy with no panels to remove. The addition of a “G” terminal to the strip, along with the new design of the circuit board, allows for fan only operation (without adding relays). All units have a factory installed gas line nipple to the exterior of the cabinet for easy gas service connection.

The preeminent new internal feature is the T\textsuperscript{core}2 heat exchanger and single burner combustion system. Other standard features include a single-stage gas valve, multi-try direct spark ignition with timed lockout, pressure switch to verify vent flow, resiliently isolated venter motor, venter wheel with improved housing, resiliently isolated axial fan and motor assembly, and a high temperature limit control. Sizes 30-125 also include a flame rollout safety switch. Operation is controlled through an integrated circuit board. The circuit board monitors heater operation and has LED diagnostic indicator lights to identify abnormalities in control functions.

The V3 Series unit heaters are designed to provide all the features you expect in a Reznor heater plus improved efficiency, easier installation, and a new look — both inside and out. Look for the unique white unit with no visible front and bottom hardware, deep red louvers, black side handle, and angled corner to know you have a genuine Reznor heater.

### STANDARD FEATURES

- Sizes 30-400 certified for commercial/industrial heating application
- Sizes 30-125 carry an additional approval for use in residential garage/workshop heating applications
- 82-83% Thermal efficient — TOP in its class!
- 50-60°F Rise range
- T\textsuperscript{core}2 titanium stabilized aluminized steel heat exchanger
- Patented single burner combustion system including a one-piece burner assembly
- 115/1/60 Supply voltage
- 115 Volt open fan motor with internal overload protection
- Transformer for 24-volt controls
- Integrated circuit board with diagnostic indicator lights
- Multi-try direct spark ignition with timed lockout
- Fan relay (included on the circuit board)
- Single-stage natural gas valve (field adjustable for operation to 9,000 ft. elevation *)
- Vibration/noise isolated fan and venter motors — designed for low noise operation
- 2-pt and 4-pt Suspension — standard on all sizes
- External terminal strip for 24-volt wiring
- External gas connection
- Full fan guard — engineered for safety
- Improved cabinet design with less visible hardware

### OPTIONAL FEATURES - FACTORY INSTALLED

- Single-stage, propane gas valve (field adjustable for operation to 9,000 ft. elevation *)
- Two-stage natural gas or propane gas valve — Sizes 60-400
- 409 or 316 Stainless steel heat exchangers
- Totally enclosed fan motor (Sizes 30-250, 115V only)
- Common venting with other gravity vented Category I appliance(s) (Sizes 30-100)

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* U.S. Patent No. 6,889,686.
* Pressure switch change required for installations above 6,000 ft.
### TECHNICAL DATA

**Model UDAP**

<table>
<thead>
<tr>
<th>Size</th>
<th>30</th>
<th>45</th>
<th>60</th>
<th>75</th>
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<td><strong>Air Volume CFM</strong></td>
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<td>616</td>
<td>770</td>
<td>668</td>
<td>763</td>
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<td>877</td>
<td>1003</td>
<td>820</td>
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<td><strong>Sound Level dba @ 15 ft</strong></td>
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<td>40</td>
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<td><strong>Approximate Net Weight lbs</strong></td>
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<td>92</td>
<td>98</td>
<td>122</td>
<td>133</td>
<td>139</td>
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</table>

- For installations where dirt, dust, and other air borne contamination is present in the indoor environment, it is recommended to use separated combustion units (Model UDAS). These models use air from outside the space for combustion. This will help reduce the build up of contaminates on the burner which would affect the combustion process. Refer to the Installation manuals for recommended frequency of maintenance and cleaning.

- CSA rating for altitudes to 2000 ft.
- Size shown is for gas connection to a single stage gas valve, not supply line size.
- Smaller or larger vent pipe diameters may be allowed; refer to the Venting Installation Manual, Form I-V-PV. If vent diameter is different from vent connection, reducer/enlargers will be field-required.
- MOP = 2.25 x largest motor FLA + remaining load. Answer is rounded down to the next size of commercially available circuit breaker or fuse.
- All other information in this table is based on a heater equipped with a standard 115 volt open fan motor.
DIMENSIONS

Model UDAP

±1/16" (2mm)

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
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<td>25 5/8</td>
<td>10</td>
<td>13</td>
<td>13/16</td>
<td>26</td>
<td>21 9/16</td>
<td>5 3/16</td>
<td>6 1/2</td>
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<tr>
<td>60</td>
<td>15 1/8</td>
<td>25 5/8</td>
<td>13</td>
<td>13</td>
<td>13/16</td>
<td>27</td>
<td>21 9/16</td>
<td>7 7/8</td>
<td>6 1/2</td>
<td>5 1/2</td>
<td>3 7/8</td>
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<td>11/16</td>
<td>4 5/16</td>
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<tr>
<td>75</td>
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<td>13/16</td>
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<td>21 9/16</td>
<td>7 7/8</td>
<td>6 1/2</td>
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<tr>
<td>100</td>
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<td>25 5/8</td>
<td>21</td>
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<td>6 1/2</td>
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<td>11/16</td>
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<tr>
<td>300, 350, 400</td>
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<td>1 3/8</td>
<td>8 3/16</td>
<td>22 3/16</td>
<td>16 10/16</td>
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CLEARANCES FROM COMBUSTIBLES

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<tr>
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<th>Top Connectors</th>
<th>Access Panel</th>
<th>Non-Access Side</th>
<th>Bottom</th>
<th>Rear</th>
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<tr>
<td>30-125</td>
<td>1 25 mm</td>
<td>6 152 mm</td>
<td>18 457 mm</td>
<td>1 25</td>
<td>1 25</td>
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<tr>
<td>150-400</td>
<td>4 102 mm</td>
<td>6 152 mm</td>
<td>18 457 mm</td>
<td>2 51</td>
<td>1 25</td>
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</tbody>
</table>

Access Panel clearance is required for service clearance to controls.

Rear clearance is required for air movement. Rear clearance should be measured from the fan motor.
Reznor® V3 Series Model UDBS gas-fired separated combustion unit heaters are available in 14 sizes ranging from 30,000 to 400,000 BTUH gas input. Model UDBS heaters are designed for 82-83% thermal efficiency and are approved for commercial/industrial installations in the United States and Canada by the Canadian Standards Association (CSA).

Reznor V3 Series unit heaters have a refreshing new appearance with a glossy white cabinet finish and less visible hardware. Each size cabinet is easily suspended from four suspension points. The low voltage terminal strip on the outside of the cabinet makes connecting control wiring easy with no panels to remove. The addition of a “G” terminal to the low voltage strip, along with the new design of the circuit board, allows for blower only operation (without adding relays). All units have a factory installed gas line nipple to the exterior of the cabinet for easy gas service connection.

The preeminent new internal feature is the Tcore² heat exchanger and single burner combustion system. Other standard features include a single-stage gas valve, multi-try direct spark ignition with timed lockout, pressure switch to verify vent flow, resiliently isolated venter motor, venter wheel with improved housing, a high temperature limit control, interlock door switch, and a built-in disconnect switch. Sizes 30-125 are equipped with a centrifugal blower and direct drive motor with multispeed taps. Sizes 30 and 45 are capable of handling up to .5” w.c. of external static pressure; Sizes 60-125 will handle up to .75” w.c. of external static pressure. Sizes 150-400 are equipped with a centrifugal blower with an adjustable belt drive and motor. All units are designed for use with optional 30° and 60° downturn nozzles with horizontal and vertical louvers. Operation is controlled through an integrated circuit board. The circuit board monitors heater operation and has LED diagnostic indicator lights to identify abnormalities in control functions.

The 1st ever separated combustion system in the commercial/industrial heating industry was introduced on a Reznor heater in the 1960s, and that proven technology is continued in this new separated combustion product. Model UDBS separated combustion units require installation of a specially designed combustion air/vent system including the unique concentric adapter box that allows for only one building penetration for both the vent and combustion air.

The V3 Series unit heaters are designed to provide all the features you expect in a Reznor heater plus improved efficiency, easier installation, and a new look ~ both inside and out. Look for the unique white unit with no visible front and bottom hardware, deep red louvers, black side handle, and angled corner to know you have a genuine Reznor heater.

**Certified for commercial/industrial heating applications**
**82-83% Thermal efficient ~ TOP in its class!**
**45-75°F Rise range - Sizes 30-350 50-80°F Rise range - Size 400**
**Tcore² titanium stabilized aluminized steel heat exchanger**
**Patented A single burner combustion system including a one-piece burner assembly**
**115/1/60 Supply voltage**
**115 Volt open dripproof blower motor with internal overload protection - Sizes 30-125**
**115 Volt open dripproof blower motor with internal overloads and definite purpose motor contactor - Sizes 150-400**
**Direct drive blower with multispeed taps - Sizes 30-125**
**Adjustable belt drive blower - Sizes 150-400**
**Transformer for 24-volt controls**
**Integrated circuit board with diagnostic indicator lights**
**Blower relay (included on the circuit board)**
**Multi-try direct spark ignition with timed lockout**
**Single-stage natural gas valve (field adjustable for operation to 9,000 ft. elevation - )**
**Vibration/isolate venter motors**
**Sealed compartment houses all electrical components**
**4-pt Suspension**
**Built-in disconnect switch - Sizes 30-125, 20A@115V rating; Sizes 150-400 30A@115V rating**
**External terminal strip for 24-volt wiring**
**Sealed junction box for supply wiring**
**External gas connection**
**Fully gasketed door panel with safety door switch**
**Improved cabinet design with less visible hardware**

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A U.S. Patent No. 6,889,686

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CSA 2.6b

ANSI Z83.8b

CQS
### TECHNICAL DATA

**Model UDBS**

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<tbody>
<tr>
<td>Input Heating Capacity BTUH</td>
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<td>45,000</td>
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<td>1265</td>
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<td>M³/min</td>
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</table>

* CSA rating for altitudes to 2000 ft.
* Size shown is for gas connection to a single stage gas valve, not supply line size.
* Selection of either a horizontal or vertical combustion air/vent kit is required.

For installations where dirt, dust, and other air borne contamination is present in the indoor environment, it is recommended to use separated combustion units (Model UDBS). These models use air from outside the space for combustion. This will help reduce the build up of contaminants on the burner which would affect the combustion process. Refer to the installation manuals for recommended frequency of maintenance and cleaning.
**NOTES:**

* Sizes 150-400 - Dimension E varies with motor selection and belt adjustment.
** Dimensions H and K are the heater suspension points.

### CLEARANCES FROM COMBUSTIBLES

<table>
<thead>
<tr>
<th>Size</th>
<th>Top Access Panel</th>
<th>Flue Connector</th>
<th>Non-Access Side Bottom</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inches (mm)</td>
<td>inches (mm)</td>
<td>inches (mm)</td>
<td>inches (mm)</td>
</tr>
<tr>
<td>30-125</td>
<td>6 (152)</td>
<td>6 (152)</td>
<td>18 (457)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>150-400</td>
<td>14 (356)</td>
<td>18 (457)</td>
<td>24 (610)</td>
<td>18 (457)</td>
</tr>
</tbody>
</table>

* Access Panel clearance is required for service clearance to controls.
** Suspend the heater so that the bottom is a minimum of 6 (152) above the floor.
** Rear clearance is measured from the back of the blower.

Refer to Reznor web site [www.RezSpec.com](http://www.RezSpec.com) for venting/inlet air requirements for Reznor Separated Combustion Units

**TOP VIEW**

3/8" - 16 Female Thread - four suspension points in Hanger Bars

**FRONT VIEW**

3/8" - 16 Female Thread - four suspension points in Hanger Bars

**RIGHT SIDE VIEW**

(Access Panel)

**REAR VIEW**

Direct Drive Blower attached to the Cabinet - Sizes 30-75

Direct Drive Blower with Blower Back on the Cabinet - Sizes 100-125

Belt Drive Blower with Blower Back on the Cabinet - Sizes 150-400
Reznor® V3 Series Model UDBP gas-fired unit heaters are available in 14 sizes ranging from 30,000 to 400,000 BTUH gas input. Model UDBP heaters are designed for 82-83% thermal efficiency and are approved for commercial/industrial installations in the United States and Canada by the Canadian Standards Association (CSA).

Reznor V3 Series unit heaters have a refreshing new appearance with a glossy white cabinet finish and less visible hardware. Each size cabinet is easily suspended from four suspension points. The low voltage terminal strip on the outside of the cabinet makes connecting control wiring easy with no panels to remove. The addition of a “G” terminal to the strip, along with the new design of the circuit board, allows for blower only operation (without adding relays). All units have a factory installed gas line nipple to the exterior of the cabinet for easy gas service connection.

The preeminent new internal feature is the T\textsuperscript{Core}\textsuperscript{2} heat exchanger and single burner combustion system. Other standard features include a single-stage gas valve, multi-try direct spark ignition with timed lockout, pressure switch to verify vent flow, resiliently isolated venter motor, venter wheel with improved housing, and a high temperature limit control. Sizes 30-125 are equipped with a centrifugal blower and direct drive motor with multi-speed taps. Sizes 30 and 45 are capable of handling up to .5” w.c. of external static pressure; Sizes 60-125 will handle up to .75” w.c. of external static pressure. Sizes 150-400 are equipped with a centrifugal blower with an adjustable belt drive and motor. All units are designed for use with optional 30° and 60° downturn nozzles with horizontal and vertical louveres. Operation is controlled through an integrated circuit board. The circuit board monitors heater operation and has LED diagnostic indicator lights to identify abnormalities in control functions.

The V3 Series unit heaters are designed to provide all the features you expect in a Reznor heater plus improved efficiency, easier installation, and a new look — both inside and out. Look for the unique white unit with no visible front and bottom hardware, deep red louveres, black side handle, and angled corner to know you have a genuine Reznor heater.

### STANDARD FEATURES
- Certified for commercial/industrial heating applications
- 82-83% Thermal efficient — **TOP in its class!**
- 45-75°F Rise range - Sizes 30-350 50-80°F Rise range - Size 400
- T\textsuperscript{Core}\textsuperscript{2} titanium stabilized aluminized steel heat exchanger
- Patented \textsuperscript{4} single burner combustion system including a one-piece burner assembly
- 115/1/60 Supply voltage
- 115 Volt open drip-proof blower motor with internal overload protection - Sizes 30-125
- 115 Volt open drip-proof blower motor with internal overloads and definite purpose motor contactor - Sizes 150-400
- Direct drive blower with multispread taps - Sizes 30-125
- Adjustable belt drive blower - Sizes 150-400
- Transformer for 24-volt controls
- Integrated circuit board with diagnostic indicator lights
- Blower relay (included on the circuit board)
- Multi-try direct spark ignition with timed lockout
- Single-stage natural gas valve (field adjustable for operation to 9,000 ft. elevation \textsuperscript{5})
- Vibration/noise isolated venter motors — **designed for low noise operation**
- 4-pt Suspension
- External terminal strip for 24-volt wiring
- External gas connection
- Improved cabinet design with less visible hardware

### OPTIONAL FEATURES - FACTORY INSTALLED
- Equipped for propane gas
- Single-stage, propane gas valve (field adjustable for operation to 9,000 ft. elevation \textsuperscript{6})
- Two-stage natural gas or propane gas valve - Sizes 60-400
- 409 or 316 Stainless steel heat exchangers
- 208, 230, 480, and 575 Three phase voltage - Sizes 150-400 (step down transformer shipped separate for field installation for 480 and 575 units)
- Adjustable belt drive and motor for up to .5” w.c. of external static pressure - Sizes 150-400
- Totally enclosed blower motor - Sizes 150-400
- Belt and blower guards

\textsuperscript{4} U.S. Patent No. 6,889,686.
\textsuperscript{5} Pressure switch change required for installations above 6,000 ft.
- Vent cap
- Thermostat
- Thermostat guard with locking cover
- Vertical louvers
- Downturn nozzle (30° or 60° deflection, with and without vertical louvers)
- Gas conversion kits (natural and propane)
- High altitude kits (above 6,000 ft. to 9,000 ft.)
- Primary/secondary controls for zoning up to six units
- Duct flange
- Polytube adapters
- Blower and belt guards
- Hanger kits for 1" pipe
- Stepdown transformer (for 208/115, 230/115 or 460/115 supply voltage) - Sizes 30-125
- Manual shutoff valves

**TECHNICAL DATA**

Model UDBP

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<td>9 X 6</td>
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<td>41</td>
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</table>

- CSA rating for altitudes to 2000 ft.
- Size shown is for gas connection to a single stage gas valve, not supply line size.
- Smaller or larger vent pipe diameters may be allowed; refer to the Venting Installation Manual, Form I-UD-V-PV. If vent diameter is different from vent connection, reducer/enlargers will be field-required.
- MOP = 2.25 x largest motor FLA + remaining load. Answer is rounded down to the next size of commercially available circuit breaker or fuse.
### CLEARANCES FROM COMBUSTIBLES

<table>
<thead>
<tr>
<th>Size</th>
<th>Top</th>
<th>Flue Connector</th>
<th>Access Panel</th>
<th>Non-Access</th>
<th>Bottom</th>
<th>Rear</th>
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<td>inches (mm)</td>
<td>inches (mm)</td>
<td>inches (mm)</td>
<td>inches (mm)</td>
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</tr>
<tr>
<td>30-125</td>
<td>6 (152)</td>
<td>6 (152)</td>
<td>18 (457)</td>
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<td>150-400</td>
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<td>24 (610)</td>
<td>1 (25)</td>
<td>18 (457)</td>
</tr>
</tbody>
</table>

* Access Panel clearance is required for service clearance to controls.
* \(^*\) Non-access side clearance is from side of the heater cabinet.
* Rear clearance is measured from the back of the blower.

**NOTES:**

* Sizes 150-400 - Dimension E varies with motor selection and belt adjustment.
* Dimensions H and K are the heater suspension points.

---

**COMBUSTIBLES**

Model UDBP

±1/16" (2mm)

**DIMENSIONS**

**Model UDBP**

**DIMENSIONS**

Rear clearance is measured from the back of the blower.

Access Panel clearance is required for service clearance to controls.

<table>
<thead>
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<th>Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<th>H</th>
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<td>13 13/16</td>
<td>13</td>
<td>17 7/8</td>
<td>36 1/8</td>
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</table>

Form RZ-C-UH (Version H) Page 16
Gas-Fires, Gravity-Vented, Fan-Type Unit Heater for Commercial/Industrial Use

WARNING: Gas-fired appliances are not designed for use in hazardous atmospheres containing flammable vapors or combustible dust, or atmospheres containing chlorinated or halogenated hydrocarbons.

Installations in public garages or airplane hangars are permitted when in accordance with ANSI Z223.1 and NFPA 54 Codes or CAN1-B149 Codes and enforcing authorities.

REZNOR® Series 100, Model F gas-fired, gravity-vented unit heaters are designed for 80% thermal efficiency and are designed for use with natural or propane gas, as specified, in sizes from 25,000 to 400,000 BTUH gas input.

Model F unit heaters are designed for ceiling suspension with a propeller fan for air delivery.

A terminal strip connector facilitates field connection to a remote 24-volt thermostat for automatic operation. Each unit is provided with a fan control and all required limit safety controls, including an energy cutoff (ECO) device and a blocked vent switch.

These units are approved for installation in The United States and Canada by the Canadian Standards Association (CSA).

NOTE: When installing gravity vented appliances check local and state codes for requirements. Some states require the addition of spark pilot Option AH2 or AH3.

---

**STANDARD FEATURES**

- Orifices for natural gas
- Aluminized steel heat exchanger
- Aluminized steel burner rack with stainless steel insert
- Spark ignited, intermittent safety pilot with electronic flame supervision
- Single-stage combination gas valve (field adjustable for high altitude operation)
- 115V/160 supply voltage
- 115 volt fan motor with internal overload protection
- Fan and limit safety controls
- Energy cutoff (ECO) device
- Blocked vent shutoff system
- 24-volt control voltage transformer
- Individually adjustable horizontal louvers
- Full safety fan guard
- Terminal strip connector for 24-volt field wiring
- Convenient bottom burner access
- 2-point 3/8"-16 threaded hanger connections
- Horizontal/vertical vent outlet

**OPTIONAL FEATURES - FACTORY INSTALLED**

- Equipped for propane gas
- E-3 (409) stainless steel heat exchanger and burner
- Two-stage gas control (50% low fire) - Sizes 75-400
- Spark ignited, intermittent safety pilot with electronic flame supervision with timed lockout (timed lockout is required for propane gas)
- Manual summer/winter switch
- Burner air shutters
- 208/230 single phase supply voltage
- 220/240 volt/50 Hertz electrical operation
- Totally enclosed 115V motor
- Low ambient fan control relay

**OPTIONAL FEATURES - FIELD INSTALLED**

- Power vent
- Vertical louvers
- Downturn air nozzle, 25-65° or 50-90° variable air deflector range (includes 4-point suspension kit)
- Thermostat and relay kits
- Air recirculation kits
- Manual summer/winter switch
- Multiple heater control
- 4-point suspension kit
- Unit-mounted thermostat bracket
- Step down transformer 230/115 or 460/115
- Burner air shutters
- Low ambient fan control relay kit
- Hanger kit to suspend from 1" pipe (2 or 4 point suspension)
- Single-stage and two-stage thermostats
- Thermostat guard with locking cover
- Manual shutoff valve and union
- Gas conversion kit

**NOTE:** Not certified for residential use.

---

The Energy Policy Act of 2005 mandated that beginning August of 2008, no Gravity Vented Unit Heaters may be sold without an Intermittent Ignition Device (No Standing Pilot- Spark Ignition Only) AND, (either an automatic shutoff vent damper or a power vent exhaust). Your state may have already enacted this restriction in their local codes. Please take note of this when placing orders for gravity vented units.

---

NOTE: Regulated combination redundant gas valve consists of combination pilot solenoid valve, electric gas valve, pilot filter, pressure regulator, pilot shutoff, and manual shutoff, all in one body. Gas supply pressure must not exceed 0.5 psi (8 oz. or 14" w.c.). Minimum inlet pressure for natural gas is 5" w.c.; minimum inlet pressure for propane gas is 11" w.c.
## TECHNICAL DATA

Model F

### Size 25 50 75 100 125

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<th>Size</th>
<th>Heating Input - BTUH (kW)</th>
<th>Thermal Output - BTUH (80%)</th>
<th>Vent Outlet Diameter</th>
<th>Gas Connection - Natural Gas</th>
<th>Control Amps (24-volt)</th>
<th>Full-Load Amps (115 volt)</th>
<th>Normal Consumption (watts)</th>
<th>Normal Consumption (watts)</th>
<th>Motor HP</th>
<th>Motor RPM</th>
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### Additional Information

- For U.S. installations, ratings for altitudes to 2000 ft. Above 2000 ft, derate by 4% for each 1000 ft. above sea level.
- For Canadian installations, ratings for altitudes to 2000 ft. High altitude units (2001-4500 ft.) are derated by 10% of maximum input.
- Gas connection for propane is 1/2" for all sizes. Sizes shown are for gas connection to a single-stage gas valve; NOT gas supply line size.
- Additional mounting heights shown later in this catalog.
- All other information in this table is based on a heater equipped with a standard 115v motor. (The standard motor for a Model 25 is an enclosed motor; all other standard motors are open motors. Optional enclosed motors are available in 115v only.)

---

Form RZ-C-UH (Version H) Page 18
### Dimensions

**Model F**

±1/16” (2mm)

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#### Clearances from Combustibles

**Required Clearances (inches)**

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<td>(975)</td>
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Units, bottom clearance exceeding 12” minimum is not required but may be desirable.

---

**Suspension Notes:**

1) Use dimension "G" for 2-point suspension and "E" and "F" for 4-point suspension.
2) Factory equipped with 2-point suspension; 4-point is optional.

---

**Clearances from Combustibles**

**Required Clearances (inches)**

**Model F**

±1/16” (2mm)

**Units, bottom clearance exceeding 12” minimum is not required but may be desirable.**

---

**Suspension Notes:**

1) Use dimension "G" for 2-point suspension and "E" and "F" for 4-point suspension.
2) Factory equipped with 2-point suspension; 4-point is optional.
Gas-Fired, Gravity-Vented, Blower-Type Unit Heater for Commercial/Industrial Use

WARNING: Gas-fired appliances are not designed for use in hazardous atmospheres containing flammable vapors or combustible dust, or atmospheres containing chlorinated or halogenated hydrocarbons.

Installations in public garages or airplane hangars are permitted when in accordance with ANSI Z223.1 and NFPA 54 Codes or CAN1-B149 Codes and enforcing authorities.

DESCRIPTION

Reznor® Series 100, Model B gas-fired gravity-vented unit heaters are designed for 80% thermal efficiency and are designed for use with natural or propane gas, as specified, in sizes from 25,000 to 400,000 BTUH gas Input.

Model B unit heaters are designed for ceiling suspension with a centrifugal blower for air delivery. Sizes 25-100 are equipped with a direct drive blower motor with multi-speed taps capable of handling up to .50" w.c. of external static pressure. Sizes 125-400 are standardly equipped with a blower using an adjustable belt drive and motor capable of handling external static pressure up to .25" w.c. Optional motors and drives are available to increase the blower capability to handle up to .50" w.c. of external static pressure.

A terminal strip connector facilitates field connection to a remote 24-volt thermostat for automatic operation. Each unit is provided with a fan control and all required limit safety controls, including an energy cutoff (ECO) device and a blocked vent switch.

These units are approved for installation in The United States and Canada by the Canadian Standards Association (CSA). Canadian units require the selection of a totally enclosed motor. (An open motor may be selected for a heater to be installed in Canada only when the heater will be equipped with a Reznor® field-installed blower cabinet.)

NOTE: When installing gravity vented appliances check local and state codes for requirements. Some states require the addition of spark pilot Option AH2 or AH3.

STANDARD FEATURES

- Orifices for natural gas
- Aluminized steel heat exchanger
- Aluminized steel burner rack with stainless steel insert
- Spark ignited, intermittent safety pilot with electronic flame supervision
- Single-stage combination gas valve (field adjustable for high altitude operation)
- 115/1/60 supply voltage - Sizes 25-300
- 230/1/60 supply voltage - Size 400
- ODP motor with internal overload (U.S. installations)
- Totally enclosed blower motor (Canadian installations)
- Motor contactor - Sizes 300 and 400
- Direct drive blower with multi-speed taps - Sizes 25-100
- Adjustable belt drive blower - Sizes 125 - 400
- Fan and limit safety controls
- Blocked vent shutoff system
- Energy cutoff (ECO) device
- 24-volt control voltage transformer
- Horizontal/Vertical vent outlet
- Horizontal louvers or Duct adapter
- Terminal strip connector for 24-volt field wiring
- Convenient bottom burner access
- 4-point 3/8"-16 threaded hanger connections

OPTIONAL FEATURES - FACTORY INSTALLED

- Equipped for propane gas
- E-3 (409) stainless steel heat exchanger and burner
- Two-stage gas control (50% low fire) - Sizes 75-400
- Spark ignited, intermittent safety pilot with electronic flame supervision with timed lockout (timed lockout is required for propane gas)
- Burner air shutters
- 208/230 single phase supply voltage - Sizes 125-400
- 208/230 three phase supply voltage - Sizes 125-400
- 460 three phase supply voltage - Sizes 125-400
- 575 three phase supply voltage - Sizes 125-400
- Alternate motor HP and drive - Sizes 125-400
- Totally enclosed blower motor - Sizes 125-400

NOTE: Regulated combination redundant gas valve consists of combination pilot solenoid valve, electric gas valve, pilot filter, pressure regulator, pilot shutoff, and manual shutoff, all in one body. Gas supply pressure must not exceed 0.5 psi (8 oz, or 14" w.c.). Minimum inlet pressure for natural gas is 5" w.c.; minimum inlet pressure for propane gas is 11" w.c.
### TECHNICAL DATA

**Model B**

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<tr>
<td>Heating Input - BTUH (kW)</td>
<td>20,000 (5.9)</td>
<td>40,000 (11.7)</td>
<td>60,000 (17.6)</td>
<td>80,000 (23.4)</td>
<td>100,000 (29.3)</td>
</tr>
<tr>
<td>Vent Outlet Diameter</td>
<td>4&quot; Rd</td>
<td>4&quot; Rd</td>
<td>5&quot; Oval</td>
<td>6&quot; Oval</td>
<td>7&quot; Oval</td>
</tr>
<tr>
<td>Gas Connection - Natural Gas</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Control Amps (24-volt)</td>
<td>0.33</td>
<td>0.33</td>
<td>0.33</td>
<td>0.33</td>
<td>0.33</td>
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<tr>
<td>Full-Load Amps (115 volt)</td>
<td>2.9</td>
<td>2.9</td>
<td>5.3</td>
<td>5.3</td>
<td>6</td>
</tr>
<tr>
<td>Normal Consumption (watts) - (60°F rise and .25&quot; w.c. ESP)</td>
<td>140</td>
<td>175</td>
<td>340</td>
<td>430</td>
<td>500</td>
</tr>
<tr>
<td>Maximum Air Volume - CFM (M^3/hr)</td>
<td>1/6</td>
<td>1/6</td>
<td>1/3</td>
<td>1/3</td>
<td>1/3</td>
</tr>
<tr>
<td>Standard Motor Horsepower</td>
<td>0.23</td>
<td>0.23</td>
<td>0.23</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Blower Size (inches)</td>
<td>9x6</td>
<td>9x6</td>
<td>9x6</td>
<td>9x9</td>
<td>10x10</td>
</tr>
<tr>
<td>Approximate Net Wt - lbs (kg)</td>
<td>93 (42)</td>
<td>100 (45)</td>
<td>114 (52)</td>
<td>126 (57)</td>
<td>176 (80)</td>
</tr>
<tr>
<td>Approximate Shipping Wt - lbs (kg)</td>
<td>193 (88)</td>
<td>206 (93)</td>
<td>229 (104)</td>
<td>241 (109)</td>
<td>318 (144)</td>
</tr>
</tbody>
</table>

### Other Specifications

- **For U.S. installations, ratings for altitudes to 2000 ft. Above 2000 ft., derate by 4% for each 1000 ft. above sea level.**
- **For Canadian installations, ratings for altitudes to 2000 ft. High altitude units (2001-4500 ft.) are derated by 10% of maximum input.**
- **Gas connection for propane is 1/2" for all sizes. Sizes shown are for gas connection to a single-stage gas valve; NOT gas supply line size.**
**CLEARANCES FROM COMBUSTIBLES**

**Required Clearances**

| Top & Flue Connector | 6" |
| Sides | 18" |
| Bottom | 12" |

*(when supplied with optional downturn nozzle, bottom clearance is 42") For service purposes, in standard units, bottom clearance exceeding 12" minimum is not required, but may be desirable.

**Rear**

For service purposes the back of the unit must have 24" clearance.

**Filters for Optional Blower Cabinet**

<table>
<thead>
<tr>
<th>Size</th>
<th>Qty</th>
<th>Filter Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-125</td>
<td>1</td>
<td>20x20</td>
</tr>
<tr>
<td>165-200</td>
<td>1</td>
<td>16x25</td>
</tr>
<tr>
<td>250-300</td>
<td>2</td>
<td>16x20</td>
</tr>
<tr>
<td>400</td>
<td>2</td>
<td>16x25</td>
</tr>
</tbody>
</table>

1" or 2" permanent filters
The Model OH Series oil-fired unit heaters is available in inputs of 118,000, 173,000, and 229,000 BTUH with 82% efficiency output. These completely packaged unit heaters burn No. 2 fuel oil.

Model OH heaters are equipped with a propeller fan. The fan is enclosed in an OSHA-type full safety fan guard.

All units feature a low-stress, 18 gauge steel exchanger and a heavy, 13 gauge combustion chamber with large, easily accessible, service panels. The oil burner assembly has a pressure-atomizing gun type burner that provides excellent flame retention and an integral fuel pump. The burner has an electric spark ignition system with an electronic cad-cell flame safety system with manual reset. All models have a flame observation port.

Standard features include fan and limit controls. The fan control prevents circulation of cold air at start-up and provides heat dissipation while the unit is hot after the burner shuts off. The safety limit control provides unit protection from high temperature caused by an airflow restriction or motor failure. All units are wired for 115 volt, 60 Hz power supply and can be controlled with a 24V thermostat.

Model OH oil-fired unit heaters are UL Listed for the United States, and are approved for installation in Canada by the Canadian Standards Association (CSA).

NOTE: Not certified for residential use.

- Full automatic, thermostatically controlled operation
- Low stress, 18 gauge steel heat exchanger
- Heavy, 13 gauge steel combustion chamber
- 115/1/60 supply voltage
- 24-volt control voltage
- Atomizing power burner with single-stage fuel pump
- Electric spark ignition with cad-cell flame safety system
- Fan and limit safety controls
- Toggle disconnect switch
- Propeller fan
- Full safety fan guard
- Totally enclosed, permanently lubricated PSC motor with internal overload protection
- Built-in burner service tray
- Large easily accessible service panels for combustion chamber and heat exchanger maintenance
- Observation port
- Individually adjustable horizontal louvers
- 4-point suspension (1/2" threaded connectors)

A UL Listed (or equivalent) oil supply tank must be used with Reznor® oil-fired heaters. Model OT-250 fuel tank is available from Reznor.

- UL Listed
- 250 gallon capacity
- Bench top

For additional information, refer to Options and Accessories Section.
Draft Regulator Requirement - ALL Model OH installations require a draft regulator (barometric draft control device) in the vent.

- Model OH with a CSA Label - A draft regulator is factory-supplied and must be installed.
- Model OH with a UL Label - a Factory-supplied draft regulator is available as an option (Option BV2 or DB1). Either the optional draft regulator or a field supplied, UL-approved draft regulator must be installed.

CLEARANCE: An 18" clearance is required from the top of the draft control to a combustible ceiling.

Form RZ-C-UH (Version H) Page 24
Model LDAP

All Model LDAP high bay packaged heaters are design certified by ETL for use in industrial and commercial installations.

These heaters must be installed in accordance with local building codes. In the absence of local codes, in the United States, the heater must be installed in accordance with the National Fuel Gas Code, ANSI Z223.1. A Canadian installation must be in accordance with the CSA B149 Installation Codes.

Reznor® Model LDAP Series Packaged Downflow Heaters are available in three sizes - 400 MBH, 800 MBH, and 1200 MBH. Model LDAP 400 has one heat section; Model LDAP 800 has two heat sections; and Model LDAP 1200 has three heat sections. All Model LDAP heaters are 83% thermal efficient for use with either natural or propane gas.

Each heat section features the Reznor TCore2 heat exchanger and single burner combustion system. Other features include a single-stage gas valve, multi-try direct spark ignition with timed lockout, pressure switch to verify venter flow, resiliently isolated venter motor, resiliently isolated axial fan and motor assembly, a high temperature limit control, a destratification fan control, and a built-in disconnect switch. Operation is controlled through an integrated circuit board. The circuit board monitors heater operation and has LED diagnostic indicator lights to identify abnormalities in control functions.

Cabinet has four suspension points for hanging or may be wall mounted. Designed for ease of installation with an external 24-volt terminal strip and gas line connection.

Model LDAP heaters are certified by the ETL Testing Agency for commercial and industrial installations in United States and Canada.

**DESCRIPTION**

Reznor® Model LDAP Series Packaged Downflow Heaters are available in three sizes - 400 MBH, 800 MBH, and 1200 MBH. Model LDAP 400 has one heat section; Model LDAP 800 has two heat sections; and Model LDAP 1200 has three heat sections. All Model LDAP heaters are 83% thermal efficient for use with either natural or propane gas.

Each heat section features the Reznor TCore2 heat exchanger and single burner combustion system. Other features include a single-stage gas valve, multi-try direct spark ignition with timed lockout, pressure switch to verify venter flow, resiliently isolated venter motor, resiliently isolated axial fan and motor assembly, a high temperature limit control, a destratification fan control, and a built-in disconnect switch. Operation is controlled through an integrated circuit board. The circuit board monitors heater operation and has LED diagnostic indicator lights to identify abnormalities in control functions.

Cabinet has four suspension points for hanging or may be wall mounted. Designed for ease of installation with an external 24-volt terminal strip and gas line connection.

Model LDAP heaters are certified by the ETL Testing Agency for commercial and industrial installations in United States and Canada.

**STANDARD FEATURES**

- 83% Thermal efficient
- 55°F Temperature rise range
- Patented* combustion system
- Titanium stabilized aluminized steel heat exchanger(s)
- 208 or 230 Single phase supply voltage
- Open fan motor(s) with internal overload protection
- Transformer for 24-volt controls
- Integrated circuit board(s) with diagnostic indicator lights
- Multi-try direct ignition with timed lockout
- Single-stage natural gas valve (field adjustable for operation to 10,000 ft / 3,045M elevation)
- Destratification adjustable fan control (air economizer)
- High temperature limit controls
- Vibration/noise isolated fan and venter motors
- 4-point Suspension
- Built-in disconnect switch
- External terminal strip for 24-volt wiring
- External gas connection
- Full fan guard(s)
- Ready for field connection to Building Automation Systems

**OPTIONAL FEATURES - FACTORY INSTALLED**

- Single-stage, propane gas valve (field adjustable to 10,000 ft / 3045M elevation)
- Two-stage natural or propane gas valve - Size 400 only
- 409 Stainless steel heat exchanger(s)

**OPTIONAL FEATURES - FIELD INSTALLED**

- Manual Shutoff Valve
- Multiple Heater Control
- High Altitude Adjustment Kit (above 6,000 ft./1,830 M)
- 4-Way Louvers
- Multiple Position Discharge Nozzles
- Vent Cap
- 1” Pipe Coupling (Swivel) Hanger Kit
- Thermostats

* U.S. Patent No. 6,889,686
### TECHNICAL DATA

<table>
<thead>
<tr>
<th>Model LDAP Size</th>
<th>400</th>
<th>800</th>
<th>1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Heating Capacity (btuh)</td>
<td>400,000 (117.1)</td>
<td>800,000 (234.2)</td>
<td>1,200,000 (351.4)</td>
</tr>
<tr>
<td>Thermal Efficiency (%)</td>
<td>83</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>Output Heating Capacity (btuh)</td>
<td>332,000 (97.2)</td>
<td>664,000 (194.4)</td>
<td>996,000 (291.6)</td>
</tr>
<tr>
<td>Gas Connection (inches)</td>
<td>1</td>
<td>1-1/4</td>
<td>1-1/4</td>
</tr>
<tr>
<td>Vent Connection Diameter (inches)</td>
<td>6</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Control Amps (24 volt)</td>
<td>1.0</td>
<td>2.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Full Load Amps (208 volt)</td>
<td>5.6</td>
<td>13.6</td>
<td>19.4</td>
</tr>
<tr>
<td>Full Load Amps (230 volt)</td>
<td>5.5</td>
<td>12.8</td>
<td>18.5</td>
</tr>
<tr>
<td>Normal Power Consumption @ 208V (watts)</td>
<td>1150</td>
<td>2448</td>
<td>3730</td>
</tr>
<tr>
<td>Normal Power Consumption @ 230V (watts)</td>
<td>1230</td>
<td>2597</td>
<td>3959</td>
</tr>
<tr>
<td>Discharge Air Temperature Rise (°F)</td>
<td>55</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Air Volume (cfm)</td>
<td>5,589 (158)</td>
<td>11,178 (317)</td>
<td>16,788 (475)</td>
</tr>
<tr>
<td>Discharge Air Opening Area (ft²)</td>
<td>3.67 (0.34)</td>
<td>7.35 (0.68)</td>
<td>11.02 (1.02)</td>
</tr>
<tr>
<td>Outlet Velocity (Destratification @ Medium Speed) (fpm)</td>
<td>4,650 (132)</td>
<td>9,300 (263)</td>
<td>13,950 (395)</td>
</tr>
<tr>
<td>Outlet Velocity (Destratification @ Low Speed) (fpm)</td>
<td>1266 (386)</td>
<td>1266 (386)</td>
<td>1266 (386)</td>
</tr>
<tr>
<td>Air Volume (Destratification @ Low Speed) (cfm)</td>
<td>3,250 (92)</td>
<td>6,500 (184)</td>
<td>9,750 (276)</td>
</tr>
<tr>
<td>Outlet Velocity (Destratification @ Low Speed) (fpm)</td>
<td>885 (270)</td>
<td>885 (270)</td>
<td>885 (270)</td>
</tr>
<tr>
<td>Fan Motor HP (Qty)</td>
<td>1 (1)</td>
<td>1 (2)</td>
<td>1 (3)</td>
</tr>
<tr>
<td>Fan Motor RPM</td>
<td>1050</td>
<td>1050</td>
<td>1050</td>
</tr>
<tr>
<td>Fan Diameter (inches)</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Approximate Net Weight (lbs)</td>
<td>375 (170)</td>
<td>805 (365)</td>
<td>1195 (542)</td>
</tr>
<tr>
<td>Approximate Ship Weight (lbs)</td>
<td>672 (305)</td>
<td>1309 (594)</td>
<td>1847 (838)</td>
</tr>
</tbody>
</table>

### CLEARANCES

<table>
<thead>
<tr>
<th>Size</th>
<th>Top A</th>
<th>Flue Connector</th>
<th>Front (Access Panel)</th>
<th>Rear</th>
<th>Disconnect Side</th>
<th>Side</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inches</td>
<td>mm</td>
<td>inches</td>
<td>mm</td>
<td>inches</td>
<td>mm</td>
<td>inches</td>
</tr>
<tr>
<td>400</td>
<td>12</td>
<td>(305)</td>
<td>6</td>
<td>(152)</td>
<td>18</td>
<td>(457)</td>
<td>2</td>
</tr>
<tr>
<td>800</td>
<td>12</td>
<td>(305)</td>
<td>6</td>
<td>(152)</td>
<td>18</td>
<td>(457)</td>
<td>2</td>
</tr>
<tr>
<td>1200</td>
<td>12</td>
<td>(305)</td>
<td>6</td>
<td>(152)</td>
<td>18</td>
<td>(457)</td>
<td>2</td>
</tr>
</tbody>
</table>

* Top clearance on size 400 measured from fan motor. Top clearance on sizes 800 and 1200 measured from flue collector.

### DIMENSIONS

**Model LDAP 400**

![Diagram of Model LDAP 400](image)

More dimensions shown on following pages
Model LDAP 1200 is illustrated. Model LDAP 800 has two heat sections. Model LDAP 800 is the same as the layout shown without the middle section.

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>46</td>
<td>69</td>
</tr>
<tr>
<td>mm</td>
<td>(1,168)</td>
<td>(1,753)</td>
</tr>
<tr>
<td>1200</td>
<td>80</td>
<td>103 3/4</td>
</tr>
<tr>
<td>mm</td>
<td>(2,032)</td>
<td>(2,635)</td>
</tr>
</tbody>
</table>

**Dimensions for Optional Air Discharge Nozzle Shown in Accessory Section**

**Form RZ-C-UH (Version H) Page 27**
- Height measured from the floor to the bottom of the unit heater.
- Point where heated air from the heater reaches the floor.
- Point where heated air tends to rise from the floor.
- Point where the air velocity drops below 50 feet per minute (1524 mm/sec).

### Throw/Floor Coverage

<table>
<thead>
<tr>
<th>Size</th>
<th>30</th>
<th>45</th>
<th>60</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td>X</td>
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<td>Z</td>
<td>X</td>
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<tr>
<td>Mounting Height</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>14</td>
<td>30</td>
<td>-21°</td>
<td>7</td>
<td>16</td>
<td>46</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>13</td>
<td>26</td>
<td>-39°</td>
<td>9</td>
<td>16</td>
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<tr>
<td>10</td>
<td>6</td>
<td>11</td>
<td>22</td>
<td>-52°</td>
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<td>15</td>
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<td>12</td>
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<td>22</td>
<td>-55°</td>
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<tr>
<td>14</td>
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<td>9</td>
<td>23</td>
<td>-57°</td>
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<td>16</td>
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<tr>
<td>Size</td>
<td>175</td>
<td>200</td>
<td>225</td>
<td>250</td>
<td>300</td>
<td>350</td>
<td>400</td>
</tr>
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<td>Z</td>
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<td>Y</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Dimension in feet

- Applies to both Model UDAS and Model UDAP

### Dimension in metric

<table>
<thead>
<tr>
<th>Size</th>
<th>30</th>
<th>45</th>
<th>60</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>Y</td>
<td>Z</td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td>X</td>
</tr>
<tr>
<td>Mounting Height</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>1.8</td>
<td>4.3</td>
<td>9.1</td>
<td>-21°</td>
<td>2.3</td>
<td>4.9</td>
<td>12.2</td>
</tr>
<tr>
<td>2.4</td>
<td>2.1</td>
<td>4.0</td>
<td>9.1</td>
<td>-34°</td>
<td>2.7</td>
<td>4.9</td>
<td>13.3</td>
</tr>
<tr>
<td>3.0</td>
<td>1.8</td>
<td>3.4</td>
<td>6.7</td>
<td>-52°</td>
<td>2.7</td>
<td>4.6</td>
<td>10.1</td>
</tr>
<tr>
<td>3.7</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2.4</td>
<td>3.7</td>
<td>8.2</td>
</tr>
<tr>
<td>4.3</td>
<td>--</td>
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<td>11.6</td>
</tr>
<tr>
<td>5.5</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>3.4</td>
<td>5.2</td>
</tr>
</tbody>
</table>

### Louver Angle

Louver angle listed in the table is relative to the top of the unit heater.
### Dimension in feet

#### Low Speed

<table>
<thead>
<tr>
<th>Size</th>
<th>30</th>
<th>45</th>
<th>60</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
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<tbody>
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<td>Y</td>
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<tr>
<td></td>
<td>Angle</td>
<td>Angle</td>
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</tr>
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### Form RZ-C-UH (Version H) Page 29
### Dimension in metric

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#### With Downturn Nozzle with 25-45° Range of Air Deflection (30° Nozzle)

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</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td>X</td>
</tr>
<tr>
<td>3.0</td>
<td>3.0</td>
<td>6.7</td>
<td>8.5</td>
<td>3.0</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>3.7</td>
<td>4.7</td>
<td>7.9</td>
<td>3.7</td>
<td>8.6</td>
<td>13.1</td>
<td>3.0</td>
</tr>
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<td>4.3</td>
<td>4.9</td>
<td>6.7</td>
<td>4.6</td>
<td>11.6</td>
<td>23.5</td>
<td>4.0</td>
</tr>
<tr>
<td>4.9</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>6.1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>6.7</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

#### With Downturn Nozzle with 50-90° Range of Air Deflection (60° Nozzle)

<table>
<thead>
<tr>
<th>Mounting Height</th>
<th>F125</th>
<th>F165</th>
<th>F200</th>
<th>F250</th>
<th>F300</th>
<th>F400</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td>X</td>
</tr>
<tr>
<td>3.7</td>
<td>0.0</td>
<td>2.4</td>
<td>6.1</td>
<td>0.0</td>
<td>2.4</td>
<td>6.7</td>
</tr>
<tr>
<td>4.9</td>
<td>0.0</td>
<td>3.0</td>
<td>5.5</td>
<td>0.0</td>
<td>3.0</td>
<td>7.0</td>
</tr>
<tr>
<td>6.1</td>
<td>0.0</td>
<td>4.3</td>
<td>4.9</td>
<td>0.0</td>
<td>4.3</td>
<td>5.5</td>
</tr>
<tr>
<td>7.3</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>8.8</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>11.0</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

---

With Standard Horizontal Louvers

- Provides maximum heat utilization.
- Spot heating is required, choose outlet and mounting height giving coverage to floor. Mounting close to the ceiling provides maximum heat utilization.

With Downturn Nozzle

- Spot heating is effective as indicated when ceiling height above heater is not over 4 ft. For higher mounting height or where spot heating is required, choose outlet and mounting height giving coverage to floor.

Data based on 80°F entering air and 60°F rise through the unit. Standard louvers set at maximum deflection effective as indicated when ceiling height above heater is not over 4 ft. For higher mounting height or where spot heating is required, choose outlet and mounting height giving coverage to floor. Mounting close to the ceiling provides maximum heat utilization.
### KEY:
- **A** = Throw
- **B** = Spread (Side to side coverage with standard louvers)
- **H** = Mounting Height

### NOTES:
- Data based on 80°F entering air temperature and 60°F rise through the unit. Standard horizontal louver set for maximum down deflection. Table and drawing show approximate floor coverage at various mounting heights. **NOTE** that throw "A" and sideward spread "B" are increased as mounting height is reduced, due to floor bounce effect. Conversely the floor coverage reduces as mounting height increases. Horizontal louvers can be used to spread throw area "A" forward from the heater, and vertical louvers can be used to increase sideward spread "B". Vertical louvers set at maximum deflection will increase spread "B" approximately 10 feet, but will reduce maximum mounting height 4 feet. **EXAMPLE:** B200 at 20 ft. mounting height with standard louver setting gives a floor coverage of "A" = 24' x "B" = 26'. Using vertical louvers set at maximum sideward spread, the maximum mounting height would be 16 feet, and the floor coverage would be "A" = 26' and "B" = 28' plus 10' or 38'.

### Applies to Model LDAP (in heat mode)

**Notes:**
- "Z" is the point where the air velocity drops below 50 feet (15.2M) per minute.
- Throws listed are with standard louvers facing one direction and fully open.
- Throw pattern changes with louver angle, 2-way louver direction, and/or optional 4-way louvers.

### Table 1: Throw/Floor Coverage (cont'd)

<table>
<thead>
<tr>
<th>Blower Model</th>
<th>CFM</th>
<th>Mounting Height - H</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12 ft</td>
</tr>
<tr>
<td>125</td>
<td>1545</td>
<td>A</td>
</tr>
<tr>
<td>165</td>
<td>2090</td>
<td>B</td>
</tr>
<tr>
<td>200</td>
<td>2470</td>
<td>A</td>
</tr>
<tr>
<td>250</td>
<td>2930</td>
<td>A</td>
</tr>
<tr>
<td>300</td>
<td>3719</td>
<td>A</td>
</tr>
<tr>
<td>400</td>
<td>4950</td>
<td>A</td>
</tr>
</tbody>
</table>

### Table 2: Mounting Height - H

<table>
<thead>
<tr>
<th>Blower Model</th>
<th>M³/hr</th>
<th>Mounting Height - H</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3.7M</td>
</tr>
<tr>
<td>125</td>
<td>2625</td>
<td>A</td>
</tr>
<tr>
<td>165</td>
<td>3551</td>
<td>A</td>
</tr>
<tr>
<td>200</td>
<td>4196</td>
<td>A</td>
</tr>
<tr>
<td>250</td>
<td>5250</td>
<td>A</td>
</tr>
<tr>
<td>300</td>
<td>6303</td>
<td>A</td>
</tr>
<tr>
<td>400</td>
<td>8410</td>
<td>A</td>
</tr>
</tbody>
</table>

### Diagram:

1. Throw with Standard Louvers
2. Throw with 30° Nozzle
3. Throw with 60° Nozzle

**Form RZ-C-UH (Version H) Page 32**
### Sound Data

#### Sound (in dBA) for Models UDAP and UDAS at various distances.

<table>
<thead>
<tr>
<th>Size</th>
<th>5 Feet</th>
<th>10 Feet</th>
<th>15 Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.5 meters</td>
<td>3.0 meters</td>
<td>4.6 meters</td>
</tr>
<tr>
<td>30</td>
<td>59</td>
<td>47</td>
<td>40</td>
</tr>
<tr>
<td>45</td>
<td>59</td>
<td>47</td>
<td>40</td>
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<tr>
<td>60</td>
<td>59</td>
<td>47</td>
<td>40</td>
</tr>
<tr>
<td>75</td>
<td>69</td>
<td>55</td>
<td>49</td>
</tr>
<tr>
<td>100</td>
<td>N/A</td>
<td>58</td>
<td>54</td>
</tr>
<tr>
<td>125</td>
<td>N/A</td>
<td>59</td>
<td>55</td>
</tr>
<tr>
<td>150</td>
<td>N/A</td>
<td>55</td>
<td>51</td>
</tr>
<tr>
<td>175</td>
<td>N/A</td>
<td>55</td>
<td>52</td>
</tr>
<tr>
<td>200</td>
<td>N/A</td>
<td>56</td>
<td>53</td>
</tr>
<tr>
<td>225</td>
<td>N/A</td>
<td>59</td>
<td>56</td>
</tr>
<tr>
<td>250</td>
<td>N/A</td>
<td>59</td>
<td>56</td>
</tr>
<tr>
<td>300</td>
<td>N/A</td>
<td>62</td>
<td>59</td>
</tr>
<tr>
<td>350</td>
<td>N/A</td>
<td>64</td>
<td>61</td>
</tr>
<tr>
<td>400</td>
<td>N/A</td>
<td>65</td>
<td>62</td>
</tr>
</tbody>
</table>

#### Sound (in dBA) for Models UDBP and UDBS at a distance of 15 feet (4.6 meters).

**Blower Speed**

<table>
<thead>
<tr>
<th>Size</th>
<th>30</th>
<th>45</th>
<th>60</th>
<th>75</th>
<th>100</th>
<th>125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>57</td>
<td>50</td>
<td>59</td>
<td>60</td>
<td>59</td>
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<tr>
<td>Medium</td>
<td>58</td>
<td>53</td>
<td>62</td>
<td>63</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>High</td>
<td>60</td>
<td>57</td>
<td>64</td>
<td>64</td>
<td>66</td>
<td>66</td>
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</table>

#### Temperature Rise

<table>
<thead>
<tr>
<th>Size</th>
<th>150</th>
<th>175</th>
<th>200</th>
<th>225</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td>75°F (24°C)</td>
<td>51</td>
<td>56</td>
<td>58</td>
<td>61</td>
<td>63</td>
<td>64</td>
<td>65</td>
<td>67</td>
</tr>
<tr>
<td>60°F (16°C)</td>
<td>56</td>
<td>59</td>
<td>62</td>
<td>63</td>
<td>66</td>
<td>70</td>
<td>72</td>
<td>71</td>
</tr>
<tr>
<td>45°F (7°C)</td>
<td>62</td>
<td>69</td>
<td>71</td>
<td>71</td>
<td>75</td>
<td>76</td>
<td>78</td>
<td>79</td>
</tr>
</tbody>
</table>

*Note: The temperature rises of the Model 400 are 80°F (27°C), 70°F (21°C), and 50°F (10°C).*

#### Sound for Model LDAP at various distances.

<table>
<thead>
<tr>
<th>Size</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>db</td>
<td>µbar</td>
<td>db</td>
<td>µbar</td>
<td>db</td>
</tr>
<tr>
<td>400</td>
<td>69</td>
<td>0.058</td>
<td>65</td>
<td>0.037</td>
<td>62</td>
</tr>
<tr>
<td>800</td>
<td>72</td>
<td>0.080</td>
<td>68</td>
<td>0.051</td>
<td>65</td>
</tr>
<tr>
<td>1200</td>
<td>74</td>
<td>0.100</td>
<td>70</td>
<td>0.064</td>
<td>67</td>
</tr>
</tbody>
</table>

µbar = microbar

Pa = Pascal
**BLOWER CHARTS**
Models UDBP and UDBS

Blower Chart for Sizes 150 - 400

Standard motor and drive shown shaded.

<table>
<thead>
<tr>
<th>UDBP and UDBS</th>
<th>TEMP RISE °F</th>
<th>CFM</th>
<th>Nozzle Option with Louvers</th>
<th>EXTERNAL Static Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30°</td>
<td>60°</td>
<td>0°</td>
<td>.25°</td>
</tr>
<tr>
<td>150</td>
<td>45°</td>
<td>2562</td>
<td>730 .43 730 .43 730 .43</td>
<td>320 .55 730 840</td>
</tr>
<tr>
<td>60°</td>
<td>2562</td>
<td>520  .25 520 .25 520 .25</td>
<td>125  .55 520 845</td>
<td></td>
</tr>
<tr>
<td>75°</td>
<td>1573</td>
<td>455  .17 405 .17 405 .17</td>
<td>- - - - - - - - - - - -</td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>45°</td>
<td>2989</td>
<td>910 .68 910 .68 910 .68</td>
<td>960 .88 910 1055</td>
</tr>
<tr>
<td>60°</td>
<td>2242</td>
<td>660  .44 660 .44 660 .44</td>
<td>775  .51 660 865</td>
<td></td>
</tr>
<tr>
<td>75°</td>
<td>1793</td>
<td>545  .28 545 .28 545 .28</td>
<td>665  .38 545 780</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>45°</td>
<td>3416</td>
<td>1020 .68 1020 .68 1020 .68</td>
<td>1030  .83 1020</td>
</tr>
<tr>
<td>60°</td>
<td>2562</td>
<td>730  .49 730 .49 730 .49</td>
<td>1090  .88 730 1160</td>
<td></td>
</tr>
<tr>
<td>75°</td>
<td>2049</td>
<td>600  .34 600 .34 600 .34</td>
<td>830  .51 600 1230</td>
<td></td>
</tr>
<tr>
<td>225</td>
<td>45°</td>
<td>3843</td>
<td>740  1.05 740 1.05 740 1.05</td>
<td>910  1.22 740 1100</td>
</tr>
<tr>
<td>60°</td>
<td>2882</td>
<td>530  .60 530 1.73 530 1.60</td>
<td>660  1.73 530 865</td>
<td></td>
</tr>
<tr>
<td>75°</td>
<td>2306</td>
<td>430  .42 430 1.43 430 1.43</td>
<td>545  1.34 430 790</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>45°</td>
<td>5123</td>
<td>990  1.30 990 1.30 990 1.30</td>
<td>960  1.49 990 1100</td>
</tr>
<tr>
<td>60°</td>
<td>3202</td>
<td>660  .73 660 1.73 660 1.73</td>
<td>775  1.08 660 935</td>
<td></td>
</tr>
<tr>
<td>75°</td>
<td>2625</td>
<td>570  .56 570 1.57 570 1.56</td>
<td>660  1.57 570 865</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>45°</td>
<td>3843</td>
<td>735  1.29 735 1.29 735 1.29</td>
<td>795  1.49 735 1030</td>
</tr>
<tr>
<td>60°</td>
<td>3074</td>
<td>600  .95 600 1.95 600 1.95</td>
<td>830  1.51 600 1230</td>
<td></td>
</tr>
<tr>
<td>75°</td>
<td>2989</td>
<td>910  1.68 910 1.68 910 1.68</td>
<td>960  1.88 910 1230</td>
<td></td>
</tr>
<tr>
<td>350</td>
<td>45°</td>
<td>6185</td>
<td>1040  2.56 1040 2.56 1040 2.56</td>
<td>1075  3.24 1040</td>
</tr>
<tr>
<td>60°</td>
<td>4392</td>
<td>790  1.98 790 1.98 790 1.98</td>
<td>875  2.17 790 1070</td>
<td></td>
</tr>
<tr>
<td>75°</td>
<td>4100</td>
<td>675  1.76 675 1.76 675 1.76</td>
<td>750  1.99 675 1100</td>
<td></td>
</tr>
</tbody>
</table>

Model B with Belt Drive Motor

Model B unit heaters are designed to handle up to .5" w.c. of static pressure with temperature rises as shown from 45°F to 75°F. The following chart indicates the CFM, the motor HP, and the optional drive required to achieve the desired temperature rise with external pressures from 0 to .5" w.c.

**Drive Option Key (see chart on next page):**

- **AM:** The “AM” drive will provide the selected CFM and temperature rise when installed with the total external static pressure listed but **MAY** require field-adjustment of the blower speed (CFM). Check the temperature rise and the motor amps. If adjustment is needed, follow "Blower Speed Adjustment" instructions in the heater installation manual.

- **STD:** The standard drive as set at the factory provides the selected CFM and temperature rise when installed with the external static pressure listed.

- **STD:** The standard drive will provide the selected CFM and temperature rise when installed with the external static pressure listed but **REQUIRES** field-adjustment of the blower speed (CFM). Follow the "Blower Speed Adjustment" instructions in the heater installation manual.

**NOTES:**
1. Sizes 50-100 do not show a standard drive because they have a standard direct drive blower motor.
2. If the unit includes an optional blower cabinet, see the chart below for pressure drop information.

---

**Model B with Belt Drive Motor**

Model B unit heaters are designed to handle up to .5" w.c. of static pressure with temperature rises as shown from 45°F to 75°F. The following chart indicates the CFM, the motor HP, and the optional drive required to achieve the desired temperature rise with external pressures from 0 to .5" w.c.

**Drive Option Key (see chart on next page):**

- **AM:** The “AM” drive will provide the selected CFM and temperature rise when installed with the total external static pressure listed but **MAY** require field-adjustment of the blower speed (CFM). Check the temperature rise and the motor amps. If adjustment is needed, follow "Blower Speed Adjustment" instructions in the heater installation manual.

- **STD:** The standard drive as set at the factory provides the selected CFM and temperature rise when installed with the external static pressure listed.

- **STD:** The standard drive will provide the selected CFM and temperature rise when installed with the total external static pressure listed but **REQUIRES** field-adjustment of the blower speed (CFM). Follow the "Blower Speed Adjustment" instructions in the heater installation manual.

---

**NOTES:**
1. Sizes 50-100 do not show a standard drive because they have a standard direct drive blower motor.
2. If the unit includes an optional blower cabinet, see the chart below for pressure drop information.

---

**Model B with Belt Drive Motor**

Model B unit heaters are designed to handle up to .5" w.c. of static pressure with temperature rises as shown from 45°F to 75°F. The following chart indicates the CFM, the motor HP, and the optional drive required to achieve the desired temperature rise with external pressures from 0 to .5" w.c.

**Drive Option Key (see chart on next page):**

- **AM:** The “AM” drive will provide the selected CFM and temperature rise when installed with the total external static pressure listed but **MAY** require field-adjustment of the blower speed (CFM). Check the temperature rise and the motor amps. If adjustment is needed, follow "Blower Speed Adjustment" instructions in the heater installation manual.

- **STD:** The standard drive as set at the factory provides the selected CFM and temperature rise when installed with the external static pressure listed.

- **STD:** The standard drive will provide the selected CFM and temperature rise when installed with the total external static pressure listed but **REQUIRES** field-adjustment of the blower speed (CFM). Follow the "Blower Speed Adjustment" instructions in the heater installation manual.

---

**NOTES:**
1. Sizes 50-100 do not show a standard drive because they have a standard direct drive blower motor.
2. If the unit includes an optional blower cabinet, see the chart below for pressure drop information.
<table>
<thead>
<tr>
<th>Model</th>
<th>Temp Rise °F</th>
<th>CFM</th>
<th>0</th>
<th>0.1</th>
<th>0.2</th>
<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
<th>0.6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Drive HP</td>
<td>Drive HP</td>
<td>Drive HP</td>
<td>Drive HP</td>
<td>Drive HP</td>
<td>Drive HP</td>
<td>Drive HP</td>
</tr>
<tr>
<td>Size 125</td>
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<td>75</td>
<td>AM4 1/3</td>
<td>AM4 1/3</td>
<td>STD 1/3</td>
<td>STD 1/3</td>
<td>AM7 1/3</td>
<td>AM8 1/3</td>
<td>AM9 1/3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>70</td>
<td>STD 1/3</td>
<td>STD 1/3</td>
<td>STD 1/3</td>
<td>AM7 1/3</td>
<td>AM8 1/3</td>
<td>AM9 1/3</td>
<td>AM10 1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60</td>
<td>STD 1/3</td>
<td>STD 1/3</td>
<td>AM7 1/3</td>
<td>AM8 1/3</td>
<td>AM9 1/2</td>
<td>AM10 1/2</td>
<td>AM11 3/4</td>
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<td>AM7 1/2</td>
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<td>AM11 3/4</td>
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<td>AM7 1/2</td>
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Installation Procedures

WARNING: Gas-fired appliances are not designed for use in hazardous atmospheres containing flammable vapors or combustible dust, or atmospheres containing chlorinated or halogenated hydrocarbons.

Installations in public garages or airplane hangars are permitted when in accordance with ANSI Z223.1 and NFPA 54 codes or CAN1-B149 and enforcing authorities.

FOR YOUR SAFETY

What to do if you smell gas:
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, immediately call your fire department.

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WARNING: Improper installation, adjustment, alteration, service, or maintenance can cause property damage, injury, or death. Read the installation, operation, and maintenance instructions thoroughly before installing or servicing this equipment.

Requirements for installation vary depending on the model of heater and the type of installation. Follow the manufacturer's instructions and comply with all applicable codes.

Some venting requirements that apply to specific gas-fired models are shown on the following pages.

Pilot, Gas Control, and Air Control Descriptions Gas-Fired Unit Heaters

PILOT IGNITION SYSTEMS
- Intermittent Spark Pilot: Automatic lighting of pilot with an electronic spark on a call for heat. Pilot gas flow is shut off between heat cycles. Approved for use in the United States with the natural gas supply only on indoor and outdoor units.
- Direct Spark Ignition with Timed Lockout. Automatic lighting of the burner with an electronic spark on a call for heat by the thermostat. There is no pilot. Trial for ignition is ten seconds after which, if flame is not sensed, the unit tries for ignition again. If ignition is not proven after three attempts the unit will lockout and then automatically retry after a one hour down period (Models UDAP, UDAS, UDBP, UDBS, LDAP, & UEAS Only).

GAS CONTROL SYSTEMS
- Single Stage: Single-stage gas valve which cycles on at 100% fire on a call for heat.
- Two-Stage: Two stage gas valve which fires at 100% or 50% on Models F & B; 100% or 70% on Models UDAP, UDAS, UDBP & UDBS, as required by a remote two-stage thermostat. (Note: Two-Stage gas valve not available on Models F & B [sizes 25 & 50 MBH] or Models UDAP, UDAS, UDBP & UDBS [sizes 30 & 45 MBH]).

AIR CONTROL SYSTEMS
- Air Recirculation Kit (Single-stage units only): First stage control of thermostat energizes unit fan to recirculate warm stratified ceiling air. Second stage control of thermostat opens single-stage gas valve.
- Special Air Recirculation Kit (Single-stage units only): Same as the basic kit, with the addition of a manual summer switch on thermostat for summer fan operation.

OPTIONAL POWER VENTING OF GRAVITY VENTED UNITS, Increases Seasonal Efficiency - Models F and B

Use only the Reznor® power venter designed for the particular model and size of heater.

Understand the operation before installing. When a venter is used with a heater, the room thermostat turns the venter on and off, and the venter turns the gas controls on and off. When the space calls for heat, the room thermostat contacts close the circuit which starts the venter. When the venter starts, air from the venter blower closes an air switch that is built into the venter.

Closing of the air flow switch sends an electric current to the burner controls, opening the gas valve and sending gas to the burners. When the thermostat is satisfied, the thermostat turns off the venter and the gas controls. As the venter blower stops, the airflow switch resets to the open position.
The Indoor Air Economizer Feature on Model LDAP provides “free” heat. Here’s how it works...

**Step 1:** Wall mounted thermostat calls for heat.

**Step 2:** Down discharge Model LDAP directs heating to the floor. As George Reznor used to say, “Because we live on the floor, not on the ceiling.”

**Step 3:** Thermostat setting is reached, shutting off heater. Heated air naturally rises.

**Step 4:** Instead of heat remaining at the ceiling or escaping through the roof, a monitor (separate from the wall mounted thermostat) on Model LDAP senses the buildup of heat at the ceiling. This monitor triggers the fans at a slower speed to destratify the air and send “free” heat back to the floor.

Another benefit of Model LDAP: Using the fan(s) in the summer can improve working conditions by alleviating stagnant air conditions and creating a cooling effect for the occupants.

### Suspending the Heater

**Ceiling Suspension**

**WARNINGS:** Check the supporting structure to be used to verify that it has sufficient load-carrying capacity to support the weight of the heater. Suspend the heater only from the threaded nut retainers or with a manufacturer provided kit. Do NOT suspend from the heater cabinet.

See dimensional drawings for hanger locations, and install the ½”-13 spring nuts in the strut that is attached to the top of the unit. Comply with the requirements shown below when using threaded rod. If ordered with swivel connectors for 1” pipe, Option CK10, attach the swivels to the spring nuts according to illustration shown below and suspend with 1” pipe.

Locate the hardware kit shipped with the heater. The kit contains spring nuts, hex nuts, “U”-shape fittings, and lock washers for suspending the heater. It also includes louvers and the compression springs needed to install them.

When the heater is lifted for suspension, support the bottom of the heater with the crate bottom. If the bottom is not supported, damage could occur. After hanging or mounting, verify that any screws used for holding shipping brackets were reinstalled in the cabinet.

**WARNING:** All heaters must be level for proper operation. Do not place or add additional weight to the suspended heater.

### Wall Mounting

**Guidelines for Wall Mounting Model LDAP Heaters**

- Mounting is the responsibility of the installer. Verify that the supporting structure has sufficient load-carrying capacity to support the weight.
- Prior to installation, be sure that the method of support is in agreement with all local building codes. Check for service platform requirements.
- Maintain a minimum of 2” (51mm) clearance from the discharge air openings to structural supports. Additional clearance will be required if an optional nozzle is to be field installed.
- Determining the need for installing vibration or noise isolation is the responsibility of the installer.
- To prevent potential movement, field-supplied angles must be placed around the perimeter of the heater to anchor it to the structural supports.
- Structural supports must be placed as shown to prevent damage to the heater.
- All structural supports must be noncombustible materials.
Optional Polytube Outlet Adapter - Apply to Models UDBP/UDBS

Description
The optional polytube adapter is designed to adapt suspended Model UDBP and UDBS blower type unit heaters for use with polytube ductwork. Directly in line with the heater discharge, the adapter is installed on the front of the heater and is equipped with a collar for attaching the field-supplied polytube.

The most common application of polytube ductwork for distribution of tempered air is in greenhouses. Polytubes are also used in industrial buildings to improve operating efficiency by recovering stratified air and reducing the need for complete area heating.

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<th>Size</th>
<th>CFM at 60°F Temp Rise</th>
<th>Polytube Diameter (inches)</th>
<th>Approximate Free Area (square inches)</th>
<th>Suggested Hole Sizes and Locations</th>
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*Required direct drive blower speed.
Optional Polytube Outlet Adapter - Apply to Model B

Description

The optional outlet nozzle is designed to allow the attachment of polytube-type air distribution for use in greenhouse and industrial buildings. Outlet on suspended heater may be either above, below, or directly in line with the heater discharge. A kit is available to floor mount the heater with outlet below the heater discharge (see illustration). Model B standard blower and drive are designed to handle rated CFM at .25 w.c. ESP, and will inflate a 24" tube up to 150 ft. long. See table for proper free area, minimum number of holes and sizes. Units may be used for greenhouse heating and ventilating or in industrial applications requiring high mounting heights or spot heating by means of polytube distribution.

The total open or free area of the polytube is important. Polytube suppliers have a great deal of flexibility in placement and sizing of holes. Too small of a free area will cause overheating. Excessive open area may not permit the tube to inflate. See the table below for a guide in hole size and location. Spacing and hole size may be varied, but free area must not be less than shown for the heater being installed.

Greenhouse Application - For greenhouse use, the number of units required is generally based on an airflow volume of 1-1/2 to 2 CFM per square foot of house floor area. Depending on the heat loss requirements of the house type, location, and desired temperature above ambient, the ventilation requirements determine the number of distribution systems required and the heat loss determines the BTUH heater size required. As a general rule, a single system will serve a maximum house width of 30 ft. and a length of 150 ft.

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</table>

CAUTION: To prevent overheating of the blower unit heater and to ensure correct air distribution, the minimum hole area must be provided as shown in the table for each size. If more holes are used, do not exceed 1.25 times the minimum area shown to ensure proper tube inflation.

Conversion Table:

<table>
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<tr>
<th>Diameter of the Hole (inches)</th>
<th>Area of the Hole (square inches)</th>
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<tr>
<td>2</td>
<td>3.14</td>
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<tr>
<td>1-7/8</td>
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<tr>
<td>1-1/2</td>
<td>1.76</td>
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</tbody>
</table>
Model OT Oil Tank - Apply to Models OH

DESCRIPTION

The Model OT250 fuel tank is a 250 gallon, single-wall, indoor, UL-listed fuel oil tank. Oil tanks often eliminate needed work and storage space, but the Model OT-250 oil tank is designed with a work bench top that allows the tank itself to be used as a work area. The tank has a large (12-1/2 sq. ft.) work surface with 2” side and rear retainer lips and 3” legs for “toe space”.

Tank construction is of 12 gauge carbon steel with all welded seams. The painted exterior coordinates with Reznor® oil-fired heaters.

The Reznor® OT-250 fuel tank is also engineered to facilitate installation. The support legs provide convenient space for forklift handling. Each tank has the following connection ports — 2” supply; 2” gauge; 2” vent; 4” emergency vent; and 1” drain. Each port has heavy duty forged threads.

Model OT-250 tank is UL listed to UL142 Standard.

OPTIONS/ACCESSORIES - Field Installed

- Heater stand for Model OT tank used with Model OH heater only

IMPORTANT: On fan Models UDAP, UDAS, UEAS and F, do not use optional vertical louvers in combination with a nozzle with 50-90° range of air deflection.

DIMENSIONS - Model OT Fuel Tank

Model OH Oil Heater

Heater Stand (Option ST1)

Model OT-250 Oil Tank
Model LDAP Discharge Air Options

Installing Louvers

After the unit is suspended/mounted, install the air directional louvers or optional nozzle. If an optional nozzle is being installed, follow the instructions included with the nozzle. If a nozzle is not being used, install the louvers in the discharge opening(s).

Louvers and springs are in the hardware kit shipped with the heater.

Before actually installing the louvers, note the louver curve and determine how the louvers should be positioned to provide the optimal throw pattern. Opening is square so louvers may be installed in any direction. Louvers may be installed with the curve all the same direction (either way) or the right half one way and left the other as illustrated above.

1) With the wider section of the louver facing out of the heater, place one of the compression springs over the tab on the notched end of a louver. The end of the louver with the spring will fit in any direction in the square opening. How the louver turns depends on which end of the louver is inserted first.

2) Depending on the throw pattern selected, push the louver tab with the spring into a hole in the discharge opening and insert the louver tab on the other end into the corresponding hole on the opposite side.

3) Airflow direction depends on how the louvers are installed (see illustration above).

Louver Installation Instructions

Option CD32 consists of additional louvers that are installed perpendicular to the standard individually adjustable louvers. By installing the optional perpendicular louvers, the two sets of louvers can be adjusted to direct airflow in any of the four directions, enabling the installer to select and increase or decrease the coverage area.

Option CD57 is a 30° angle discharge nozzle. Option CD58 is a 60° angle discharge nozzle. Option CD59 is a 30° angle discharge nozzle with 4-way louvers. A nozzle may be installed at each discharge air opening in any direction. NOTE: Do not install 4-way louvers with a 60° nozzle.

Nozzles should be attached after the unit is suspended. Follow the installation instructions in the nozzle package.

Standard louvers are installed in the nozzle opening as shown in the photo on the left.
Reznor Separated Combustion Systems

Following is an overall description of Separated Combustion Systems as it relates to Models UDAS and UDBS. For more specific separated combustion venting information, especially as it relates to Model UEAS, please see the appropriate installation manual.

The manufacturer of Reznor heating equipment, for years, has pioneered in separated combustion system technology, eliminating “open flame” combustion problems. This has resulted in a complete line of Reznor products using the separated combustion principle-

- air for combustion is mechanically induced from outside the building, preventing dirt, lint, dust or other contaminants in the indoor atmosphere from entering the burner and combustion zone of the furnace,
- the air flow is metered to provide optimum and efficient combustion that is unaffected by negative building pressure or wind,
- after combustion, the air is exhausted back to the outdoor atmosphere.

Reznor separated combustion products provide all of the benefits while requiring only one building penetration. See the venting illustrations below.

Use only approved vent terminals. No other venting arrangements are approved or certified for use with Models UDAS, UDBS or UEAS heaters. Either the horizontal vent/combustion air terminal kit (Option CC6 or Option CC14) or the vertical vent/combustion air terminal kit (Option CC2) is required.

Refer to Venting Installation Manual Form I-UD-V-SC for Models UDAS and UDBS; Form I-UEAS for Model UEAS. Or contact your Reznor Representative at 800-695-1901 for more detailed information.

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### Vertical Venting of Separated Combustion Unit through Roof

- See the illustration to the right for a typical installation of one vertical vent terminal and concentric adapter. If vertical vent (Option CC2) is selected, a vertical vent terminal/combustion-air inlet assembly is provided.

  NOTE: Illustration for typical installation example only. Vent terminals may vary based on heater size and model.

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### Horizontal Venting of Separated Combustion Unit through Wall

- See the illustration to the right for a typical installation of a single horizontal vent terminal and concentric adapter. When Option CC6 is ordered, one horizontal vent terminal/combustion air inlet assembly is provided.

  NOTE: Illustration for typical installation example only. Vent terminals may vary based on heater size and model.

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### Residential Garage - Horizontal Venting of Separated Combustion Unit through Wall

(Models UDAS and UDBS Only)

Option CC14, the Compact, Aesthetic, Concentric Vent/Combustion Air, Horizontal Vent Kit is for use with Model UDAS and UDBS in sizes 30, 45, 60, and 75.

The most common use for these vent kit is for Model UDAS for residential garage installations. This option allows a homeowner to vent out a side wall and avoid the unsightly 18” to 36” exhaust vent. This attractive vent kit preserves the home’s exterior appearance.

For more information, contact your Reznor Representative at 800-695-1901, or see the instruction manual Form I-UDAS/UDBS-ASC.

NOTE: Siding trim is field-supplied by contractor to match home appearance.
Reznor RezPro® Toolbox Software

UNIT HEATER SELECTION HELP

Reznor now offers unit heaters with three different levels of efficiency. How can you tell which one is right for your climate and your pocketbook?

Now you can compare different Reznor Unit Heaters and get specific energy savings and return on investment results for your specific area.

Here’s how it works: When you open RezPro Toolbox, select the Heat Load button as indicated by the arrow in the illustration to the right.

HEAT LOAD CALCULATOR

The Heat Load Calculator window (right) will prompt you for all the important data such as building size, insulation value, equipment type, fuel, etc.

When you hit the CALCULATE button you will see the Selector Outputs window (below right). This will show the equipment requirements for your building. The Building Heat Loss shown for the selected application is 465.82 MBH (as indicated by the arrow).
To determine the energy consumption of various unit heaters, select the Energy Analyzer button on the Toolbox screen as indicated by the arrow (right).

The Energy Analyzer screen (bottom right) opens. Select the appropriate data as shown:

1. City: For this example we have selected Memphis, Tennessee. The Elevation is automatically assigned. You’ll also need to select the Design Load. (BTU Required based on the heat loss)

2. Thermostat Program: You can specify a weekday/weekend, no program, or create your own thermostat program. For this example we have selected a weekday/weekend program.

3. Unit1: You can compare the energy usage of two different types of unit heaters. For this example we have selected the very high efficiency Model UEAS260 as Unit 1

4. Unit 2: We have selected standard efficiency Model F300 as Unit 2.

5. Energy Costs: You can enter current or future projected energy costs for electricity and natural gas or propane.

When you Run the program the Output values are automatically filled in.

The result of this program is that you will need 2 Model UEAS260 or F300 units to properly heat this building (1.944 and 1.938 respectively).

6. The annual energy costs for gas and electricity have both been calculated and the result is Model UEAS260 will save over $1,400 per year.

As mentioned, this example was run for Memphis, TN. Energy savings in colder climates will be more dramatic.

Reznor RezPro Toolbox software is free to any registered user of the Reznor website. Registration is free. Your information isn’t sold to third parties. And you don’t get inundated with spam.

Once you have registered, go to the software section of the website. You will need to request a password from your Reznor Representative. Or you can request a Toolbox CD from your representative. You can reach them by calling 800-695-1901.

We recommend that you maintain this software on a computer with internet access so that current weather and Reznor Product data can be uploaded as needed.
Sample Specifications
Model UEAS

GAS-FIRED, SEPARATED COMBUSTION UNIT HEATERS

Provide (90%+) high-efficiency, separated-combustion, power vented, condensing, gas-fired unit heaters manufactured as Reznor® brand units. The unit shall be designed for use in a building with negative pressures up to 0.15 "w.c. and for use in building where a non-explosive atmosphere exists that is dust laden and/or contains mildly corrosive fumes.

Fuel

Each of the 4 sizes in the Model UEAS series shall be equipped for use with natural gas with propane conversion kit shipped with each unit. Gas connection shall be external to the cabinet.

Heat Exchanger

The heater shall be equipped with a multi-cell, 4 pass serpentine style steel primary heat exchanger. Primary heat exchanger tubes shall be press fabricated of 409 stainless steel. The heater shall also be equipped with an extruded aluminum MacroChannel secondary heat exchanger. Secondary heat exchanger shall have a PVC condensate drain connection. All heat exchangers shall be fabricated with no welding or brazing, only tool pressed mechanical joints. All heat exchanger cells shall be designed with an aerodynamic cross section to provide maximum airflow.

Burner

The units shall incorporate a single, one piece burner assembly with a single orifice. The burner shall have a continuous wound close pressed stainless steel ribbon separating the flame from the burner interior. All units shall have a single venturi tube and orifice supplying fuel to a one-piece burner housing. Each heat exchanger cell shall use balanced draft induction to maintain optimum flame control.

Controls

Controls shall include a single-stage gas valve; direct spark multi-try ignition with electronic flame supervision with timed lockout integrally controlled via a printed circuit control board. The control board shall also incorporate diagnostic lights, DIP switches for fan overrun settings, and a relay for fan only operation. All units shall be equipped with a safety limit switch.

Combustion Air and Venting

The unit shall have a factory-installed power venter device to draw combustion air from outside of the building. The outside air shall enter the unit through a factory-installed round inlet air terminal on the rear of the heater. The control compartment shall be sealed and the access door shall be gasketed to prevent dirt, lint, dust, or other contaminants present in the heated space from entering the unit. The control compartment door shall be equipped with a safety interlock switch to prevent operation when the door is open.

The combustion air supply pipe and flue exhaust pipe shall be run in parallel from the heater to a factory supplied concentric adapter assembly, which allows for a single wall or roof penetration, to the (horizontal) (vertical) air inlet and vent terminal. A 4" PVC clean out cap drilled and tapped for attaching a vent condensate drain is included with the vent/combustion air kit.

The combustion air/venting system shall include a vibration isolated power venter motor and wheel assembly and a combustion air pressure switch.

Electrical

Operation shall be controlled by an integrated circuit board that includes LED diagnostic indicator lights. Supply voltage connections shall be made in a sealed junction box. 24-volt control connections shall be made on an externally mounted terminal strip with connections (W1, W2, R, and G). All internal wiring, both line and control voltages, shall be terminated by insulated terminal connectors to minimize shock hazard during service.

Each unit shall be equipped for use with 115/1 volt power supply.

Cabinet

All units will be equipped with a built-in disconnect switch.

The cabinet shall be low profile with a pre-coat or powdercoat RAL 1001 white paint finish. Finish shall be a minimum 80 gloss on G30 galvanized steel. The cabinet shall be constructed so that screws are not visible from the bottom, front, or sides, except for service panel and accessories. Unit construction shall incorporate a beveled front corner on control side for additional cabinet rigidity. All units shall be manufactured with a tooled drawn supply air orifice on the rear panel to reduce fan inlet noise.

The unit shall be designed for ceiling suspension featuring 3/8"-16 female threads (hanger kits for 1" pipe) at 4-point locations with no additional adapter kits.

The cabinet shall be equipped with RAL 3005 burgundy painted, roll-formed horizontal louvers. Louvers shall be spring held and adjustable for directing airflow. (Vertical louvers) (downturn nozzles) (downturn nozzles with vertical louvers) shall be available.

The cabinet shall be equipped with a full safety fan guard. The (open dripproof) (enclosed) motor and fan assembly shall be resiliently mounted to the cabinet to reduce vibration and noise.

The unit shall be designed with a full opening service access panel complete with screw closure attachment and lifting handle for removal. Service panel shall be fully gasketed and equipped with a safety interlock switch. All components in the gas train, all standard electrical controls, and the power venter shall be within the sealed service compartment.

Minimum top clearance from combustibles shall be 4". Minimum bottom clearance from combustibles shall be 1". Minimum clearance from combustibles on non-service side shall be 2".

Certifications

The unit shall be design ETL Listed for commercial/industrial installation.

Manufacturer must have a minimum of 50 years experience in the manufacture of gas fired unit heaters.
Sample Specifications
Model UDAS

GAS-FIRED, SEPARATED COMBUSTION UNIT HEATERS

Provide (82%, 83%) high-efficiency, separated-combustion, power vented, gas-fired unit heaters manufactured as Reznor® brand units. The unit shall be designed for use in a building with negative pressures up to 0.15" w.c. and for use in building where a non-explosive atmosphere exist that is dust laden and/or contains mildly corrosive fumes.

Fuel

Each of the 14 sizes in the Model UDAS series shall be equipped for use with (natural) (propane) gas. Gas connection shall be external to the cabinet.

Heat Exchanger

The heater shall be equipped with a multi-cell, 4 pass serpentine style steel heat exchanger. Heat exchanger tubes shall be press fabricated of (titanium stabilized, corrosion resistant aluminized steel) (409 stainless steel) (316 stainless steel). All heat exchangers shall be fabricated with no welding or brazing, only tool pressed mechanical joints. All heat exchanger cells shall be designed with an aerodynamic cross section to provide maximum airflow.

Burner

The units shall incorporate a single, one piece burner assembly with a single orifice. The burner shall have a continuous wound close pressed stainless steel ribbon separating the flame from the burner interior. All units shall have a single venturi tube and orifice supplying fuel to a one-piece burner housing. Each heat exchanger cell shall use balanced draft induction to maintain optimum flame control.

Controls

Controls shall include a (single-stage) (two-stage) gas valve; direct spark multi-try ignition with electronic flame supervision with timed lockout integrally controlled via a printed circuit control board. The control board shall also incorporate diagnostic lights, DIP switches for fan overrun settings, and a relay for fan only operation. All units shall be equipped with a safety limit switch.

All controls shall be enclosed in the sealed control compartment to protect them from accidental damage, dust, and atmospheric corrosion.

Combustion Air and Venting

The unit shall have a factory-installed power venter device to draw combustion air from outside of the building. The outside air shall enter the unit through a factory-installed round inlet air terminal on the rear of the heater. The control compartment shall be sealed and the access door shall be gasketed to prevent dirt, lint, dust, or other contaminants present in the heated space from entering the unit. The control compartment door shall be equipped with a safety interlock switch to prevent operation when the door is open.

The combustion air supply pipe and flue exhaust pipe shall be run in parallel from the heater to a factory supplied concentric adapter assembly, which allows for a single wall or roof penetration, to the (horizontal) (vertical) air inlet and vent terminal.

The combustion airventing system shall include a vibration isolated power venter motor and wheel assembly and a combustion air pressure switch. Unit Sizes 30-125 shall include a flame rollout switch.

Electrical

Operation shall be controlled by an integrated circuit board that includes LED diagnostic indicator lights. Supply voltage connections shall be made in a sealed junction box. 24-volt control connections shall be made on an externally mounted terminal strip with connections (W1, W2, R, and G). All internal wiring, both line and control voltages, shall be terminated by insulated terminal connectors to minimize shock hazard during service.

Each unit shall be equipped for use with 115/1 volt power supply. (Stepdown transformers shall be available to be field installed for use with (208) (230) (460) volt power supply.) All units will be equipped with a built-in disconnect switch.

Cabinet

The cabinet shall be low profile with a pre-coat or powdercoat RAL 1001 white paint finish. Finish shall be a minimum 80 gloss on G30 galvanized steel. The cabinet shall be constructed so that screws are not visible from the bottom, front, or sides, except for service panel and accessories. Unit construction shall incorporate a beveled front corner on control side for additional cabinet rigidity. All units shall be manufactured with a tooled drawn supply air orifice on the rear panel to reduce fan inlet noise.

The unit shall be designed for ceiling suspension featuring 3/8"-16 female threads (hanger kits for 1" pipe) at both 2-point and 4-point locations with no additional adapter kits. (Hanger kit for ceiling mounting shall be available for Sizes 30-125.)

The cabinet shall be equipped with RAL 3005 burgundy painted, roll-formed horizontal louvers. Louvers shall be spring held and adjustable for directing airflow. (Vertical louvers) (downturn nozzles) (downturn nozzles with vertical louvers) shall be available.

The cabinet shall be equipped with a full safety fan guard with no more than ½ inch grill spacing on Sizes 30-125 or no more than 1 inch on Sizes 150-400. The (open dripproof) (enclosed) motor and fan assembly shall be resiliently mounted to the cabinet to reduce vibration and noise.

The unit shall be designed with a full opening service access panel complete with screw closure attachment and lifting handle for removal. Service panel shall be fully gasketed and equipped with a safety interlock switch. All components in the gas train, all standard electrical controls, and the power venter shall be within the sealed service compartment.

Minimum top clearance from combustibles shall be 1” for Sizes 30-125 and 4” for Sizes 150-400. Minimum bottom clearance from combustibles shall be 1” for all sizes. Minimum clearance from combustibles on non-service side shall be 1” for Sizes 30-125 and 2” for Sizes 150-400.
Certifications

Unit(s) shall be design certified by the Canadian Standards Association to ANSI Z83.8b and CSA 2.6b for commercial/industrial installation.

(Model sizes 30, 45, 60, 75, 100 and 125 MBH shall be certified to CSA International Requirement 10-96 - U.S., CR96-0005 - Canada for use in attached residential garage.

Manufacturer must have a minimum of 50 years experience in the manufacture of gas fired unit heaters.

Sample Specifications

Model UDBS

GAS-FIRED, SEPARATED COMBUSTION UNIT HEATERS

Provide (82%, 83%) high-efficiency, separated-combustion, power vented, gas-fired unit heaters manufactured as Reznor® brand units. The unit shall be designed for use in a building with negative pressures up to 0.15 " w.c. and for use in building where a non-explosive atmosphere exist that is dust laden and/or contains mildly corrosive fumes.

Fuel

Each of the 14 sizes in the Model UDBS series shall be equipped for use with (natural) (propane) gas. Gas connection shall be external to the cabinet.

Heat Exchanger

The heater shall be equipped with a multi-cell, 4 pass serpentine style steel heat exchanger. Heat exchanger tubes shall be press fabricated of (titanium stabilized, corrosion resistant aluminized steel) (409 stainless steel) (316 stainless steel). All heat exchangers shall be fabricated with no welding or brazing, only tool pressed mechanical joints. All heat exchanger cells shall be designed with an aerodynamic cross section to provide maximum airflow.

Burner

The units shall incorporate a single, one piece burner assembly with a single orifice. The burner shall have a continuous wound close pressed stainless steel ribbon separating the flame from the burner interior. All units shall have a single venturi tube and orifice supplying fuel to a one-piece burner housing. Each heat exchanger cell shall use balanced draft induction to maintain optimum flame control.

Controls

Controls shall include a (single-stage) (two-stage) gas valve; direct spark multi-try ignition with electronic flame supervision with timed lockout integrally controlled via a printed circuit control board. The control board shall also incorporate diagnostic lights, DIP switches for blower overrun settings, and a relay (definite purpose 3 pole contactor) for blower only operation. All open (TEFC) blower motors shall have automatic thermal overload protection or be equipped with a factory installed motor starter with adjustable thermal overloads. All units shall be equipped with a safety limit switch.

All controls shall be enclosed in the sealed control compartment to protect them from accidental damage, dust, and atmospheric corrosion.

Combustion Air and Venting

The unit shall have a factory-installed power venter device to draw combustion air from outside of the building. The outside air shall enter the unit through a factory-installed round inlet air terminal on the rear of the heater. The control compartment shall be sealed and the access door shall be gasketed to prevent dirt, lint, dust, or other contaminants present in the heated space from entering the unit. The control compartment door shall be equipped with a safety interlock switch to prevent operation when the door is open.

The combustion air supply pipe and flue exhaust pipe shall be run in parallel from the heater to a factory supplied concentric adapter assembly, which allows for a single wall or roof penetration, to the (horizontal) (vertical) air inlet and vent terminal.

The combustion air/venting system shall include a vibration isolated power venter motor and wheel assembly and a combustion air pressure switch.

Electrical

Operation shall be controlled by an integrated circuit board that includes LED diagnostic indicator lights. Supply voltage connections shall be made in a sealed junction box. 24-volt control connections shall be made on an externally mounted terminal strip with connections W1, W2, R, and G. All internal wiring, both line and control voltages, shall be terminated by insulated terminal connectors to minimize shock hazard during service.

Units shall be equipped with a 115V power supply (Stepdown transformers shall be available to be field installed for use with a (208) (230) (460) volt power supply.)

All units will be equipped with a suitably rated, factory installed built-in disconnect switch.

Blower

Size 30,000-125,000 BTUH units shall be equipped with a centrifugal blower with direct drive from an open dripproof motor with internal overloads. Size 30,000 and 45,000 BTUH units must be able to handle .5” w.c. of external static pressure. Size 60,000-125,000 BTUH units must be able to handle .75” w.c. of external static pressure. (Size 30,000-125,000 BTUH units may be equipped with a blower inlet guard.)

Size 150,000-400,000 BTUH units shall be equipped with a centrifugal blower and adjustable belt drive and an (open dripproof) (totally enclosed) blower motor with internal overloads. Size 150,000-400,000 BTUH units must be able to handle .5” w.c. of external static pressure. (Size 150,000-400,000 BTUH units may be equipped with an OSHA-type belt guard and blower inlet guard.)
Sample Specifications
Model UDBS (cont’d)

Cabinet

The cabinet shall be low profile with a pre-coat or powdercoat RAL 1001 white paint finish. The heat exchanger/control compartment cabinet shall be constructed so that screws are not visible from the bottom, front, or sides, except for service panel and accessories. Cabinet shall have a beveled front corner on the control side for additional cabinet rigidity.

The unit shall be designed for ceiling suspension featuring 3/8”-16 female threads (hanger kits for 1” pipe) at 4-point locations.

The cabinet shall be equipped with RAL 3005 burgundy painted, roll-formed horizontal louvers (duct flange). Louvers shall be spring held and adjustable for directing airflow. (Vertical louvers) (downturn nozzles) (downturn nozzles with vertical louvers) shall be available.

The unit shall be designed with a full opening service access panel complete with captive screw closure attachment and lifting handle for removal. Service panel shall be fully gasketed and equipped with a safety interlock switch. All components in the gas train, all standard electrical controls, and the power venter shall be within the sealed service compartment.

Minimum top clearance from combustibles shall be 6” (152mm) for Size 30,000-125,000 BTUH units and 14” (356mm) for Size 150,000-400,000 BTUH units. Minimum bottom clearance from combustibles shall be 1” (25mm) for all size units. Minimum clearance on access side shall be 18” (457mm) for all sizes. Minimum clearance on non-access side shall be 24” (610mm) for all sizes. Minimum rear clearance for all sizes is 18” (457mm).

Certifications

All sizes shall be design certified by the Canadian Standards Association to ANSI Z83.8 and CSA 2.6 for commercial/industrial installation.

Manufacturer must have a minimum of 50 years experience in the manufacture of gas fired unit heaters.

Sample Specifications
Model UDAP

GAS-FIRED, POWER VENTED UNIT HEATERS

Provide (82%, 83%) high-efficiency, power vented, gas-fired unit heaters manufactured as Reznor® brand units designed for use in building areas where higher reliability is required and venting is either vertical or horizontal.

Fuel

Each of the 14 sizes in the Model UDAP series shall be equipped for use with (natural) (propane) gas. Gas connection shall be external to the cabinet.

Heat Exchanger

The heater shall be equipped with a multi-cell, 4 pass serpentine style steel heat exchanger. Heat exchanger tubes shall be press fabricated of (titanium stabilized, corrosion resistant aluminized steel) (409 stainless steel) (316 stainless steel). All heat exchangers shall be fabricated with no welding or brazing, only tool pressed mechanical joints. All heat exchanger cells shall be designed with an aerodynamic cross section to provide maximum airflow.

Burner

The units shall incorporate a single, one piece burner assembly with a single orifice. The burner shall have a continuous wound close pressed stainless steel ribbon separating the flame from the burner interior. All units shall have a single venturi tube and orifice supplying fuel to a one-piece burner housing. Each heat exchanger cell shall use balanced draft induction to maintain optimum flame control.

Controls

Controls shall include a (single-stage) (two-stage) gas valve; direct spark multi-try ignition with electronic flame supervision with timed lockout integrally controlled via a printed circuit control board. The control board shall also incorporate diagnostic lights, DIP switches for fan overrun settings, and a relay for fan only operation. All units shall be equipped with a safety limit switch.

All controls shall be enclosed in the unit housing to protect them from accidental damage that could be caused by factors in the building that would adversely affect external controls.

Combustion Air and Venting

The unit shall have a factory-installed power venter device to draw combustion air through an inlet in the rear of the cabinet.

The combustion air/venting system shall include a vibration isolated power venter motor and wheel assembly and a combustion air pressure switch. Unit Sizes 30-100 shall include a flame rollout switch. (The unit shall be equipped with an approved common vent option to allow venting with another gravity vented Category I gas appliance).

(A vent cap shall be available.)
Sample Specifications
Model UDAP (cont’d)

Electrical
Operation shall be controlled by an integrated circuit board that includes LED diagnostic indicator lights. Supply voltage connections are made at the circuit board. 24-volt control connections shall be made on an externally mounted terminal strip with connections (W1, W2, R, and G). All internal wiring, both line and control voltages, shall be terminated by insulated terminal connectors to minimize shock hazard during service.

Each unit shall be equipped for use with 115/1 volt power supply. (Stepdown transformers shall be available to be field installed for use with (208) (230) (460) volt power supply.)

Cabinet
The cabinet shall be low profile with a pre-coat or powdercoat RAL 1001 white paint finish. Finish shall be a minimum 80 gloss on G30 galvanized steel. The cabinet shall be constructed so that screws are not visible from the bottom, front, or sides, except for service panel and accessories. Unit construction shall incorporate a beveled front corner on control side for additional cabinet rigidity. All units shall be manufactured with a tooled drawn supply air orifice on the rear panel to reduce fan inlet noise.

The unit shall be designed for ceiling suspension featuring 3/8"-16 female threads (hanger kits for 1” pipe) at both 2-point and 4-point locations with no additional adapter kits. (Hanger kit for ceiling mounting shall be available for Sizes 30-125.)

The cabinet shall be equipped with RAL 3005 burgundy painted, roll-formed horizontal louvers. Louvers shall be spring held and adjustable for directing airflow. (Vertical louvers) (downdraft nozzles) (downdraft nozzles with vertical louvers) shall be available.

The cabinet shall be equipped with a full safety fan guard with no more than ½ inch grill spacing on Sizes 30-125 or no more than 1 inch on Sizes 150-400. The (open drip proof) (enclosed) motor and fan assembly shall be resiliently mounted to the cabinet to reduce vibration and noise.

The unit shall be designed with a full opening service access panel complete with screw closure attachment and lifting handle for removal. All components in the gas train, all standard electrical controls, and the power venter shall be within the service compartment.

Minimum top clearance from combustibles shall be 1” for Sizes 30-125 and 4” for Sizes 150-400. Minimum bottom clearance from combustibles shall be 1” for all sizes. Minimum clearance from combustibles on non-service side shall be 1” for Sizes 30-125 and 2” for Sizes 150-400.

Certifications
Unit(s) shall be design certified by the Canadian Standards Association to ANSI Z83.8b and CSA 2.6b for commercial/industrial installation.

(Model sizes 30, 45, 60, 75, 100 and 125 MBH shall be certified to CSA International Requirement 10-96 - U.S., CR96-0005 - Canada for use in attached residential garage.

Manufacturer must have a minimum of 50 years experience in the manufacture of gas fired unit heaters.

Sample Specifications
Model UDBP

GAS-FIRED, POWER VENTED UNIT HEATERS
Provide (82%, 83%) high-efficiency, power vented, gas-fired unit heaters manufactured as Reznor® brand units designed for use in building areas where higher reliability is required and venting is either vertical or horizontal.

Fuel
Each of the 14 sizes in the Model UDBP series shall be equipped for use with (natural) (propane) gas. Gas connection shall be external to the cabinet.

Heat Exchanger
The heater shall be equipped with a multi-cell, 4 pass serpentine style steel heat exchanger. Heat exchanger tubes shall be press fabricated of (titanium stabilized, corrosion resistant aluminized steel) (409 stainless steel) (316 stainless steel). All heat exchangers shall be fabricated with no welding or brazing, only tool pressed mechanical joints. All heat exchanger cells shall be designed with an aerodynamic cross section to provide maximum airflow.

The units shall incorporate a single, one piece burner assembly with a single orifice. The burner shall have a continuous wound close pressed stainless steel ribbon separating the flame from the burner interior. All units shall have a single venturi tube and orifice supplying fuel to a one-piece burner housing. Each heat exchanger cell shall use balanced draft induction to maintain optimum flame control.

Controls
Controls shall include a (single-stage) (two-stage) gas valve; direct spark multi-try ignition with electronic flame supervision with timed lockout integrally controlled via a printed circuit control board. The control board shall also incorporate diagnostic lights, DIP switches for blower overrun settings, and a relay (definite purpose 3 pole contactor) for blower only operation. All open (TEFC) blower motors shall have automatic thermal overload protection or be equipped with a factory installed motor starter with adjustable thermal overloads. All units shall be equipped with a safety limit switch.

All controls shall be enclosed in the sealed control compartment to protect them from accidental damage, dust, and atmospheric corrosion.
Sample Specifications
Model UDBP (cont’d)

Combustion Air and Venting

The unit shall have a factory-installed power venter device to draw combustion air through an inlet in the rear of the cabinet.

The combustion air/venting system shall include a vibration isolated power venter motor and wheel assembly and a combustion air pressure switch.

(An approved vent cap shall be available.)

Electrical

Operation shall be controlled by an integrated circuit board that includes LED diagnostic indicator lights. Supply voltage connections are made at the circuit board. 24-volt control connections shall be made on an externally mounted terminal strip with connections W1, W2, R, and G. All internal wiring, both line and control voltages, shall be terminated by insulated terminal connectors to minimize shock hazard during service.

Units shall be equipped with a 115V power supply (Stepdown transformers shall be available to be field-installed for use with a (208) (230) (460) volt power supply.)

Blower

Size 30,000-125,000 BTUH units shall be equipped with a centrifugal blower with direct drive from an open dripproof motor with internal overloads. Size 30,000 and 45,000 BTUH units must be able to handle .5” w.c. of external static pressure. Size 60,000-125,000 BTUH units must be able to handle .75” w.c. of external static pressure. (Size 30,000-125,000 BTUH units may be equipped with a blower inlet guard.)

Size 150,000-400,000 BTUH units shall be equipped with a centrifugal blower and adjustable belt drive and an (open dripproof) (totally enclosed) blower motor with internal overloads. Size 150,000-400,000 BTUH units must be able to overcome .5” w.c. of external static pressure. (Size 150,000-400,000 BTUH units may be equipped with an OSHA-type belt guard and blower inlet guard.)

Cabinet

The cabinet shall be low profile with a pre-coat or powdercoat RAL 1001 white paint finish. Finish shall be a minimum 80 gloss on G30 galvanized steel. The heat exchanger/control compartment cabinet shall be constructed so that screws are not visible from the bottom, front, or sides, except for service panel and accessories. Cabinet shall have a beveled front corner on the control side for additional cabinet rigidity.

The unit shall be designed for ceiling suspension featuring 3/8”-16 female threads (hanger kits for 1” pipe) at 4-point locations.

The cabinet shall be equipped with RAL 3005 burgundy painted, roll-formed horizontal louvers (duct flange). Louvers shall be spring held and adjustable for directing airflow. (Vertical louvers) (downturn nozzles) (downturn nozzles with vertical louvers) shall be available.

The unit shall be designed with a full opening service access panel complete with captive screw closure attachment and lifting handle for removal. All components in the gas train, all standard electrical controls, and the power venter shall be within the service compartment.

Minimum top clearance from combustibles shall be 6” (152mm) for Size 30,000-125,000 BTUH units and 14” (356mm) for Size 150,000-400,000 BTUH units. Minimum bottom clearance from combustibles shall be 1” (25mm) for all size units. Minimum clearance on non-access side shall be 18” (457mm) for all sizes. Minimum rear clearance for all sizes is 18” (457mm).

Certifications

All sizes shall be design certified by the Canadian Standards Association to ANSI Z83.8 and CSA 2.6 for commercial/industrial installation.

Manufacturer must have a minimum of 50 years experience in the manufacture of gas fired unit heaters.

Sample Specifications
Model F

GAS-FIRED, POWER VENTED UNIT HEATERS

Provide gravity-vented, high-efficiency, gas-fired unit heaters manufactured as Reznor® brand units. Units are designed to take combustion air from the indoor space and vent to the outdoors.

Model F - Gas-fired, propeller fan, gravity-vented model

Fuel

Each Model F series unit shall be equipped for use with (natural) (propane) gas and (120/1/60) (208/1/60) (230/1/60) (220-240/1/50) volt power supply.

Heat Exchanger

The heat exchanger shall be aluminized (E-3 stainless) (409 stainless) steel. Die-formed burners shall be of aluminized steel and include flared ports and a stainless steel insert. The units shall be designed to provide 80% thermal efficiency.

Controls

Controls include a 24-volt control transformer; single-stage (two-stage) gas control system; an intermittent spark pilot with electronic flame supervision (intermittent spark pilot with electronic flame subversion and timed lockout); fan and limit safety controls; an open, drip-proof (totally enclosed) fan motor with internal overloads; and a blocked vent switch system.

Cabinet

The cabinet is equipped with a full safety fan guard and horizontal (vertical) louvers (downturn nozzles) for directing airflow. The unit is arranged for ceiling suspension with 2-point (4-point) threaded hanger connections (hanger kits).

Certifications

Model F unit heaters are design certified to ANSI and CAN/CGA Standards by the Canadian Standards Association for installation in the United States and Canada.
# Sample Specifications

## Model B

**GAS-FIRED, POWER VENTED UNIT HEATERS**

Provide gravity-vented, high-efficiency, gas-fired unit heaters manufactured as Reznor® brand units. Units are designed to take combustion air from the indoor space and vent to the outdoors.

**Fuel**

Each Model B series unit shall be equipped for use with (natural) (propane) gas and (120/1) (230/1) (460/3) (575/3) volt power supply.

**Heat Exchanger**

The heat exchanger shall be aluminized (E-3 stainless) (409 stainless) steel. Die-formed burners shall be of aluminized steel and include flared ports and a stainless steel insert. The units shall be designed to provide 80% thermal efficiency.

**Controls**

Controls include a 24-volt control transformer; single-stage (two-stage) gas control system; an intermittent spark pilot with electronic flame supervision (intermittent spark pilot with electronic flame supervision and timed lockout); fan and limit safety controls; a centrifugal blower with (direct) (adjustable belt) drive; and an (open, drip-proof) (totally enclosed) blower motor with internal overloads.

**Blower**

Each unit shall be able to overcome .25” w.c. (.5” w.c.) of external static pressure (and may be equipped with an OSHA-type belt and/or blower inlet guard).

**Cabinet**

The cabinet is equipped with horizontal (vertical) louvered (downturn nozzles) for directing airflow or with a duct flange. The unit is arranged for ceiling suspension with 4-point threaded hanger connections (hanger kits).

**Certifications**

Model B unit heaters are design certified to ANSI and CAN/CGA Standards by the Canadian Standards Association (CSA).

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## Model OH

**OIL-FIRED, POWER VENTED UNIT HEATERS**

Provide oil-fired unit heaters manufactured as Reznor® brand units. The units shall be completely packaged and arranged for ceiling suspension with four-point threaded suspension sockets. They shall be equipped for use with #2 oil using a pressure-atomizing gun-type power burner, a single-stage fuel pump, and an electric spark ignition with an automatic cad-cell flame safety system with manual reset.

**Heat Exchanger**

Heaters are to be equipped with a heavy, 13 gauge combustion chamber and low stress 18 gauge steel heat exchanger. All sizes shall include flame observation port, CO₂ sample port, and service and cleanout access panels.

**Controls**

Each unit is to be equipped with a combination fan and limit switch with manual fan switch for safety and comfort control. The units are to be used with 115 volt supply and have a 24-volt control transformer.

**Blower**

Model OH heaters are provided with a propeller fan and a totally enclosed fan motor with internal overloads. Each unit is to be equipped with a burner service tray, an OSHA-type fan guard, and horizontal (vertical) air directional louvers.

**Certifications**

Model OH unit heaters are design certified by Underwriters Laboratories (UL) or certified by the Canadian Standards Association (CSA).

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## Model LDAP

**INDIRECT-FIRED, DOWNFLOW HEATERS**

Provide packaged indoor heating units as Reznor® brand equipment. The units shall be Model LDAP (400, 800, 1200) arranged for ceiling suspension with vertical (down) air discharge. Each unit must have a single point wall or roof penetration for exhaust of flue gases. Units shall be rated for 83% thermal efficiency.

**Cabinet**

The cabinet shall be in one piece. Painted and ready to be suspended from ceiling by four suspension points (or wall mounted), designed for ease of installation with an external 24-volt terminal strip and gas line connections.

**Discharge Air Options**

Air supply will be directed by means of (2-way down discharge louvers) (4-way down discharge louvers) (30° bend multi-positional discharge nozzles with 2-way louvers) (60° bend multi-positional discharge nozzles with 2-way discharge louvers) (30° bend multi-positional discharge nozzles with 4-way down discharge louvers).

**Fan and Air Controls**

The fans shall include a propeller fan for each heat section with 3-speed 208/230 Volt open fan motor(s) with internal overload protection, pressure switch to verify ventor flow, resiliently isolated venter motor, resiliently isolated axial fan and motor assembly, a high temperature limit control, a destratification fan control, and a built-in disconnect switch. Operation shall be controlled through an integrated circuit board. The circuit board monitors heater operation and has LED diagnostic indicator lights to identify abnormalities in control functions. Unit shall have a single-stage (2-stage on size 400) gas valve field adjustable for up to 10,000 ft/3,045 M elevation (high altitude pressure switch kit for units installed above 6,000 ft/1,830 M).

**Fuel**

Units shall be equipped for use with (natural gas) (propane), (208/1) (230/1) (460/1) (575/3) volt power supply, multi-try direct ignition with timed lockout.

**Heat Exchanger**

Each heat section shall have the Reznor TCore® heat exchanger and single burner combustion system. The heat exchanger shall be of (aluminized steel) (409 stainless steel). The furnace shall be equipped with all required safety elements.

**Options**

The following shall be available (manual shutoff valve) (1” pipe coupling hanger kit) (24 volt thermostat) (multiple heater control) (thermostat guard) (vent cap).

**Certifications**

Heaters shall be certified by the ETL Testing Agency for commercial and industrial applications.
Vertical Vent Terminal/Combustion Air Inlet Assembly

(Optional CC2)

REAR VIEW

SIDE VIEW

Sizes 75-225
4 ft (1.2M) Minimum
Sizes 250-400A
6 ft (1.8M) Minimum

Wall or Adjoining Building

9-3/8" (238mm)

12” (305mm) Minimum
Cold Climate NOTE: In geographic areas where the design ambient is -10°F (-23°C) or lower, minimum height is 24” (610mm).

Roof

9-3/8" (238mm)

11" (279mm)

18" (457mm) 4 ft (1.2M)
Minimum Maximum

2" (51mm) if roof is combustible

Attach box to roof with brackets.

"Inlet air cap must be at least 6" (152mm) higher than anticipated snow depth.

Double-Wall Vent Pipe

Seal with silicone sealant supplied with the kit.

Shaded area represents required continuous (no joints) section of double-wall vent pipe. Section of pipe may extend higher.

Combustion Air Inlets

Double-Wall Vent Pipe

Attach to vent run no more than 6" (152mm) from the box.
Horizontal Vent Terminal/Combustion Air Inlet Assembly

(Option CC6)

Approved vent terminals are illustrated below. No other venting arrangements are approved or certified for use with Reznor separated combustion heaters.

Both the horizontal and vertical assemblies include: concentric adapter, screened exhaust or cap, inlet ring or inlet cap, rubber gasket ring and a tube of high temperature silicone rubber sealant; all shipped separately.

**TOP VIEW**

**SIDE VIEW**

<table>
<thead>
<tr>
<th>Model SDH Sizes</th>
<th>X*</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>75, 100</td>
<td>4 ft: 1.2 M</td>
<td>18&quot; (457 mm)</td>
</tr>
<tr>
<td>125, 150, 1/2&quot;, 200, 225</td>
<td>4 ft: 1.2 M</td>
<td>24&quot; (610 mm)</td>
</tr>
<tr>
<td>250, 300, 350, 400A</td>
<td>6 ft: 1.8 M</td>
<td>36&quot; (914 mm)</td>
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*Minimum: Check for and comply with local Codes.
Blower Curves for Sizes 30 - 45 (Direct Drive Blower Motors)

UDBP/UDBS 30

UDBP/UDBS 45

Form RZ-C-UH (Version H) Page 55
Blower Curves for Sizes 60 - 75 (Direct Drive Blower Motors)

**UDBP/UDBS 60**

- **TOTAL EXTERNAL STATIC PRESSURE (IN. W.C.)**
- **TEMPERATURE RISE (DEG. F.)**
- **CFM**

**UDBP/UDBS 75**

- **TOTAL EXTERNAL STATIC PRESSURE (IN. W.C.)**
- **TEMPERATURE RISE (DEG. F.)**
- **CFM**
Blower Curves for Sizes 100 - 125 (Direct Drive Blower Motors)

**UDBP/UDBS 100**

- **LOW**
- **MED**
- **HIGH**

**UDBP/UDBS 125**

- **LOW**
- **MED**
- **HIGH**
The blower curves for Models B (Sizes 25, 50, 75 and 100) with direct drive motors indicate the temperature rise available for each size of heater at a given total external static pressure. These units are designed and certified for total external static pressures up to .5" w.c. and temperature rises from 45°-75°F.

The direct drive motors are equipped with multispeed taps for speed adjustment as indicated on the curve charts. Models 25 and 75 are factory-wired to the medium speed tap; Models 50 and 100 are factory-wired to the high-speed tap.

NOTE: If the heater includes a blower cabinet, refer to appropriate pressure drop chart.
Blower Curves (cont'd)
Apply to Models B with Direct-Drive Motor

**B75**

- Temperature Rise vs. Total External Static Pressure (Inches W.C.)
- Low-speed Tap
- Medium-speed Tap
- High-speed Tap

**B100**

- Temperature Rise vs. Total External Static Pressure (Inches W.C.)
- Low-speed Tap
- Medium-speed Tap
- High-speed Tap
REZNOR® PRODUCT LIMITED WARRANTY

Reznor, LLC warrants to the original owner-user that this Reznor product will be free from defects in material or workmanship. This warranty is limited to twelve (12) months from the date of original installation, whether or not actual use begins on that date, or eighteen (18) months from date of shipment by Reznor, LLC, whichever occurs first.

EXTENDED WARRANTY

Models UEAS, UDAP, UDAS, UDBP, and UDBS — Extended nine (9)-year, non-prorated warranty on the heat exchanger, burners, and flue collection box assembly. Extended four (4)-year, non-prorated warranty on all electrical and mechanical operating components (with the exception of blower belts on Models UDBP and UDBS).

Models F and B — Extended nine (9)-year, non-prorated warranty on the heat exchanger, burners, draft hood, and flue baffle assembly. Extended four (4)-year, non-prorated warranty on all electrical and mechanical operating components (with the exception of blower belts on Model B).

Models OH — Extended four (4)-year, non-prorated warranty on the heat exchanger and combustion chamber.

Application NOTE: Extended four (4)-year warranty on electrical and mechanical operating components excludes any Reznor® HVAC equipment installed in a corrosive or highly humid atmosphere such as a greenhouse.

LIMITATIONS AND EXCLUSIONS

Reznor, LLC obligations under this warranty and the sole remedy for its breach are limited to repair, at its manufacturing facility, of any part or parts of its Reznor products which prove to be defective; or, in its sole discretion, replacement of such products. All returns of defective parts or products must include the product model number and serial number, and must be made through an authorized Reznor distributor or arranged through Reznor Customer Service. Authorized returns must be shipped prepaid. Repaired or replacement parts will be shipped by Reznor, LLC F.O.B. shipping point.

1. The warranty provided herein does not cover charges for labor or other costs incurred in the troubleshooting, repair, removal, installation, service or handling of parts or complete products.

2. All claims under the warranty provided herein must be made within ninety (90) days from the date of discovery of the defect. Failure to notify Reznor, LLC of a warranted defect within ninety (90) days of its discovery voids Reznor, LLC’s obligations hereunder.

3. The warranty provided herein shall be void and of no effect in the event that (a) the product has been operated outside its designed output capacity (heating, cooling, airflow); (b) the product has been subjected to misuse, neglect, accident, improper or inadequate maintenance, corrosive environments, environments containing airborne contaminants (silicone, aluminum oxide, etc.), or excessive thermal shock; (c) unauthorized modifications are made to the product; (d) the product is not installed or operated in compliance with the manufacturer’s printed instructions; (e) the product is not installed and operated in compliance with applicable building, mechanical, plumbing and electrical codes; or (f) the serial number of the product has been altered, defaced or removed.

4. The warranty provided herein is for repair or replacement only. Reznor, LLC shall not be liable for any loss, cost, damage, or expense of any kind arising out of a breach of the warranty. Further, Reznor, LLC shall not be liable for any incidental, consequential, exemplary, special, or punitive damages, nor for any loss of revenue, profit or use, arising out of a breach of this warranty or in connection with the sale, maintenance, use, operation or repair of any Reznor product. In no event will Reznor, LLC be liable for any amount greater than the purchase price of a defective product. The disclaimers of liability included in this paragraph 4 shall remain in effect and shall continue to be enforceable in the event that any remedy herein shall fail of its essential purpose.

5. THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY FOR REZNOR PRODUCTS, AND IS IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES. REZNOR, LLC SPECIFICALLY DISCLAIMS ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. No person or entity is authorized to bind Reznor, LLC to any other warranty, obligation or liability for any Reznor product. Installation, operation or use of the Reznor product for which this warranty is issued shall constitute acceptance of the terms hereof.
Reznor® is your global source for heating, ventilating and air conditioning equipment.

Global Headquarters
★ Manufacturing or Warehouse Facility
▲ Corporate Sales Office
★ Representative Sales Office

For more information on Reznor HVAC Equipment, go to www.ReznorHVAC.com or contact your local Reznor Representative by calling 800-695-1901.