UNIVERSITY OF LOUISIANA AT LAFAYETTE

Lafayette, Louisiana

BID FILE No. 17213

PROPOSAL FOR FURNISHING

ALL LABOR, MATERIALS, EQUIPMENT, TRANSPORTATION, SUPERVISION, PERMITS, ETC. NECESSARY FOR BROUSSARD HALL - HVAC REPLACEMENT - PHASE 2, LOCATED ON THE UL LAFAYETTE CAMPUS, LAFAYETTE, LOUISIANA.

NOTE: A pre-bid meeting will be held at 1:30 pm on October 4, 2016 at Parker Hall, 310 East Lewis, Lafayette, LA, at which time details of the specifications will be discussed.

Proposals will be received up to 2:00PM October 13, 2016 by the Purchasing Office, University of Louisiana at Lafayette, Lafayette, Louisiana. Proposals will not be received after this specified hour and date. At this time, the proposals will be publicly opened and read in the Purchasing Office, Room 123, Martin Hall, 104 University Circle, on the University Campus.

This is a *Competitive Sealed Bid;* bids SHALL be submitted in a sealed envelope. Complete details for submitting bid, etc. are contained in the attached INSTRUCTIONS TO BIDDERS. Vendors submitting bids in the amount of $50,000.00 or more SHALL show their license number on the front of the sealed envelope in which their bid is enclosed; bids not submitted in accordance with this requirement, SHALL be rejected and shall not be read.

Bid must be received by the due date and time in the Purchasing Office at the University of Louisiana at Lafayette, 104 University Circle, Martin Hall, Room 123, Lafayette, LA, 70503. Bid is to be in a SEALED ENVELOPE with the BID NUMBER and DUE DATE ON THE OUTSIDE OF THE ENVELOPE.

All inquiries regarding this request shall be directed to:

Director of Purchasing
UL Lafayette Purchasing Department
(337) 482-5396
purchasing@louisiana.edu

TO: **University of Louisiana at Lafayette**
Purchasing Office, Martin Hall Room 123
104 University Circle
P O Box 40197
Lafayette, LA 70504 0197
Fax – 337-482-5059

To Whom It May Concern:

Attached is the completed proposal of the firm listed below. The undersigned certifies that he/she (or they) has/have carefully examined *the Instructions to Bidders, the General Conditions, and the Specifications* hereto attached and made part herein, and agrees to comply with the instructions, conditions, and specifications, as covered by the attached papers. On the basis of the specifications, the undersigned proposes to furnish any or all items listed in the schedule of items hereto attached, upon which prices are requested, and at the price stated for each item.

Firm Name	**Signature [By signing this bid, bidder certifies compliance with La. R.S. 38:2212(A)(1)(c) or RS 38:2212(0)]**
Address	**Name (Printed)**
City, State, Zip Code	**Title**
Telephone No. including area code	**Date**
Fax No. including area code	**E-Mail**

FURNISH ALL LABOR, MATERIALS, EQUIPMENT, TRANSPORTATION, SUPERVISION, PERMITS, ETC. NECESSARY FOR BROUSSARD - HALL HVAC MODIFICATIONS – PHASE 2, LOCATED ON THE UNIVERSITY OF LOUISIANA AT LAFAYETTE CAMPUS, LAFAYETTE, LOUISIANA, AS SHOWN ON THESE SPECIFICATIONS.....

SCOPE OF WORK

1) Demolition and removal of existing fan coil units and associated piping.
2) Electrical modifications necessary for new HVAC equipment.
3) Installation of new HVAC System for Broussard Hall.
4) Installation of restroom exhaust fans and associated electrical.
5) Clean up and startup of new equipment.
6) Alternate #1 work shall include the Installation of Outside Air Unit(s) for the Second Floor and associated Electrical and Building Modifications.
7) Alternate #2 work shall include the Installation of Outside Air Unit(s) for the First Floor and associated Electrical and Building Modifications.
8) Alternate #3 work shall include the Complete Removal of Existing Main HVAC Chilled and Hot Water Piping, Insulation, Supports, etc.

DUE TO THE IMPORTANCE OF THE SCHEDULE, LIQUIDATED DAMAGES IN THE AMOUNT OF ONE HUNDRED DOLLARS ($100.00) PER DAY WILL BE ASSESSED FOR EVERY CALENDAR DAY THAT THE NEW AC UNITS ARE NOT OPERATIONAL BEYOND SUNDAY JANUARY 8, 2017 (OUTSIDE AIR AND RESTROOM EXHAUST SYSTEMS MUST BE COMPLETED AND PUT INTO OPERATION NO LATER THAN JANUARY 18, 2017, HOWEVER, ANY WORK THAT IS REQUIRED WITHIN THE BUILDING – FIRST OR SECOND FLOORS – MUST BE COMPLETED BY JANUARY 8, 2017 AND OTHER WORK OUTSIDE THE BUILDING OR IN THE ATTIC AREA MUST BE COMPLETED BY JANUARY 18, 2017).

Each bidder MUST accompany his/her proposal with a bid security for five percent (5%) of the total maximum amount of his/her bid. The bid security shall be drawn in favor of the University of Louisiana at Lafayette and SHALL be in the form of a Bid Bond (Insurance Company), Bank Money Order, Certified Check or Cashier's Check. It shall become the property of the Owner in the event the contract and any performance bond are not executed within the time set forth. Bid bond shall be written by a surety or insurance company currently on the US Department of the Treasury Financial Management Service List of Approved Bonding Companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an "A-" Rating in the latest printing of the AM Best's Key Rating Guide to write individual bonds up to ten percent (10%) of policyholders' surplus as shown in the AM Best's Key Rating Guide.

Successful bidder WILL BE required to execute and deliver within ten (10) days of notification, a satisfactory performance bond and payment bond in the amount of one hundred percent (100%) of the contract price. Performance Bond, with Power of Attorney, shall be secured by a surety or insurance company currently on the US Department of the Treasury Financial Management Service List of Approved Bonding Companies, and in accordance with restrictions set by them or by an insurance company that is either domiciled in Louisiana or owned by Louisiana residents and is licensed to write surety bonds. In addition, any surety bond written for a public works project shall be written by a surety or insurance company that is currently licensed to do business in the State of Louisiana. Also, to be provided at the same time is a Labor and Materials payment Bond in an amount equal to one hundred percent (100%) of the contract amount.

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Contractors or contracting firms submitting bids in the amount of $10,000.00 or more shall show their license number on the front of the sealed envelope in which their bid is enclosed. Bids in the amount of $10,000.00 or more, not submitted in accordance with this requirement, shall be rejected and shall not be read. (Revised dollar amount according to ACT 725.) Bids shall be accepted from Contractors who are licensed under L.A. R.S. 37:2150-2163 in a classification such as: **Mechanical Work**. Additional information relative to licensing may be obtained from the Louisiana State Licensing Board for Contractors, Baton Rouge, Louisiana.

In accordance with La. R.S. 38:2227, LA. R.S. 38:2212.10 and LA. R.S. 23:1726(B) each bidder on this project must submit a completed Attestations Affidavit (Past Criminal Convictions of Bidders, Verification of Employees and Certification Regarding Unpaid Workers Compensation Insurance) form found within this bid package. The Attestations Affidavit form shall be submitted to the Purchasing Department within 10 days **after** the opening of bids**. Affidavits submitted with the Bid Documents, prior to the opening of bids, will not be accepted in accordance with stated Revised Statute.**

Delivery of any document(s) will NOT be accepted during non-business hours. Business hours are Monday through Thursday, 7:30 am to 11:45 am, 12:30 pm to 5:00 pm, and Friday, 7:30 am to 12:30 pm. The Purchasing office will be closed during Federal, State and University holidays. It is the responsibility of the prospective bidder to be aware of such closures.

In making this bid, each bidder represents that: They have read and understand the bid documents and the bid is made in accordance herewith, and the bid is based upon the specifications described in the bid documents without exception.

It is the responsibility of the prospective bidder to visit and examine jobsite, take measurements to his/her own satisfaction and determine conditions under which work is to be done. Owner will not accept responsibility for conditions which careful examination of premises would have shown existed.

To visit jobsite and for further information, prospective bidder is to contact Mr. Terry Jenkins, 337-482-2001.

A pre-bid meeting will be held at 1:30pm on October 4, 2016 at the Parker Hall, 310 East Lewis, Lafayette, LA, at which time details of plans and specifications will be discussed.

RECORDATION CERTIFICATE

Contractor shall, upon receipt of executed contract, bond and purchase order, record contract and bond with the Clerk of Court in the Parish in which the work is to be performed, obtain a certificate of recordation from the Clerk of Court and forward this certificate immediately to the Purchasing Office at the University of Louisiana at Lafayette. This certificate must be received before any invoices on this project can be processed. **The expense for this is the responsibility of the contractor.**

ACCEPTANCE

Upon written notice by the Facility Management Department to the Purchasing Office, a Notice of Acceptance of work will be executed and forwarded to the contractor for recording with the Clerk of Court in the Parish in which the work has been performed and contractor shall furnish a Clear Lien Certificate from the Clerk of Court (to the Facility Management Department along with final invoice) Forty-Five (45) days after recordation of Acceptance. Final payment of Ten Percent (10%) will be made at this time.

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For vendors unable to download and print plans, the plans are available at the UL Lafayette Facilities Management Department offices located at Parker Hall, 310 East Lewis, at a non-refundable charge of $10.00 per set.

DO NOT SEND CHECKS/CASH TO PURCHASING FOR PLANS!

VENDOR CHECK LIST

REQUIRED FORMS/ITEMS UPON BID SUBMISSION

____ Louisiana Uniform Public Works Bid Form
____ Bid Security Equal to 5% of Bid
____ Louisiana Contractor's License Number (If Applicable) on Envelop Exterior

REQUIRED FORMS AFTER BID OPENING/UPON BID AWARD

____ Attestation Affidavit (ALL BIDDERS, WITHIN 10 DAYS OF BID OPENING)
____ Performance and Payment Bond (LOW BIDDER, WITHIN 10 DAYS OF REQUEST)
____ Proof of Insurance
____ Certificate of Recordation of Contract and Bonds
____ Clear Lean Certificate

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INSTRUCTIONS TO BIDDERS

ARTICLE 1

DEFINITIONS

1.1 The Bid Documents include the following:
Advertisement for Bids
Instructions to Bidders
Bid Form
Bid Bond
General Conditions of the Contract for Construction,
AlA Document A201, 2007 Edition
Supplementary Conditions
Contract Between Owner and Contractor
and Performance and Payment Bond
Affidavit
User Agency Documents (if applicable)
Change Order Form
Partial Occupancy Form
Recommendation of Acceptance
Asbestos Abatement (if applicable)
Other Documents (if applicable)
Specifications & Drawings
Addenda issued during the bid period and
acknowledged in the Bid Form

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

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

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

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

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

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

1.8 A Sub-bidder is one who submits a bid to a Bidder for materials and/or labor for a portion of the work.
1.9 Where the word "Architect" is used in any of the documents, it shall refer to the Prime Designer of the project, regardless of discipline.
1.10 An agent is the University's representative in Facility Management who is referred to throughout these documents as singular in number.
1.11 A Contractor is the person who contracts with UL Lafayette to perform the work as called for on these documents who is referred to as singular in number.
1.12 The Owner is The University of Louisiana at Lafayette (UL Lafayette)

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ARTICLE 2

PRE-BID CONFERENCE

2.1 A Pre-Bid Conference may be held at the project site. The Architect or Owner shall coordinate the setting of the date, time and place for the Pre-Bid Conference with the Agent and shall invite in writing all who have received sets of the Bid Documents to attend. The purpose of the Pre-Bid Conference is to familiarize Bidders with the requirements of the Project and the intent of the Bid Documents, and to receive comments and information from interested Bidders. If the Pre-Bid Conference is stated in the Advertisement for Bids to be a Mandatory Pre-Bid Conference, bids shall be accepted only from those bidders who attend the Pre-Bid Conference. Contractors who are not in attendance for the **entire** Pre-Bid Conference will be considered to have not attended.

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

ARTICLE 3

BIDDER'S REPRESENTATION

3.1 Each Bidder by making his bid represents that:

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

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

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

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

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

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

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

ARTICLE 4

BID DOCUMENTS

4.1 Copies

4.1.1 Bid Documents may be obtained from the University Purchasing Office as stated in the Advertisement for Bids. <u>If deposits are required, no deposits will be refunded on Bid Documents returned later than ten days</u>

after receipt of bids.

4.1.1.1 As an alternative method of distribution, the Designer or Architect may provide the Bid Documents in electronic format. They may be obtained with or without charge as stated in the Advertisement for Bids.

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

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

4.2 Interpretation or Correction of Bid Documents

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

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

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

4.3 Substitutions

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

4.3.2 No substitution will be considered unless written request for approval has been submitted by the Proposer and has been received by the Architect at least seven (7) working days prior to the opening of bids. (RS38:2295C) Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including model numbers, drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. It shall be the responsibility of the proposer to include in his proposal all changes required of the Bid Documents if the proposed product is used. Prior approval is given contingent upon supplier being responsible for any costs which may be necessary to modify the space or facilities needed to accommodate the materials and equipment approved.

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

4.4 Addenda

4.4.1 Addenda will be mailed or delivered to all who are known by the Owner to have received a complete set of Bid Documents.

4.4.2 Copies of addenda will be made available for inspection wherever Bid Documents are on file for that purpose. Owner utilizes the Office of State Purchasing LaPAC website for posting Bid Documents and Addenda. Bidder should check frequently for any possible addenda that may be issued.

4.4.3 Except as described herein, addenda shall not be issued within a period of seventy-two (72) hours prior to the advertised time for the opening of bids, excluding Saturdays, Sundays, and any other legal holidays. If the necessity arises of issuing an addendum modifying plans and specifications within the seventy-two (72) hour

period prior to the advertised time for the opening of bids, then the opening of bids shall be extended at least seven but no more than twenty-one (21) working days, without the requirement of re-advertising. The revised time and date for the opening of bids shall be stated in the addendum.

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

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

ARTICLE 5

BID PROCEDURE

5.1 Form and Style of Bids

5.1.1 Bids shall be submitted on the Louisiana Uniform Public Work Bid Form provided with the Bid Document.

5.1.2 All blanks on the Bid Form shall be filled in manually in ink or typewritten.

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

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

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

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

5.1.7 Bidders are strongly cautioned to ensure that all blanks on the bid form are completely and accurately filled in.

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

5.1.9 The bid shall include the legal name of Bidder and shall be signed by the person or persons legally authorized to bind the Bidder to a Contract.
The authority of the signature of the person submitting the bid shall be deemed sufficient and acceptable under any of the following conditions:
(a) Signature on bid is that of any corporate officer or member of a partnership or partnership in commendam listed on most current annual report on file with Secretary of State.
(b) Signature on bid is that of authorized representative of corporation, partnership, or other legal entity and bid is accompanied by corporate resolution, certification as to the corporate principal, or other documents indicating authority.
(c) Corporation, partnership, or other legal entity has filed in the records of the Secretary of State, an affidavit, resolution or other acknowledged or authentic document indicating the names of all parties authorized to submit bids for public contracts. A bid submitted by an agency shall have a current Power of Attorney attached certifying agent's authority to bind Bidder. The name and license number on the envelope shall be the same as the entity identified on the Bid Form.

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

5.2 Bid Security

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

The bid security shall be drawn in favor of the University of Louisiana at Lafayette and SHALL be in the form of a Bid Bond (Insurance Company), Bank Money Order, Certified Check or Cashier's Check. It shall become the property of the Owner in the event the contract and any performance bond are not executed within the time set forth. Bid bond shall be written by a surety or insurance company currently on the US Department of the Treasury Financial Management Service List of Approved Bonding Companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an "A-" Rating in the latest printing of the AM Best's Key Rating Guide to write individual bonds up to ten percent (10%) of policyholders' surplus as shown in the AM Best's Key Rating Guide.

Bid security furnished by the Contractor shall guarantee that the Contractor will, if awarded the work according to the terms of his proposal, enter into the Contract and furnish Performance and Payment Bonds as required by these Bid Documents, within ten (10) days after written notice that the instrument is ready for his signature.

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

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

5.3 Submission of Bids

5.3.1 The Bid shall be sealed in an opaque envelope. The bid envelope shall be identified on the outside with the name of the project, file number, and the name, address, and license number of the Bidder.
The envelope shall contain **only one bid form** and will be received until the time specified and at the place specified in the Advertisement for Bids. It shall be the specific responsibility of the Bidder to deliver his sealed bid to the Purchasing Department at the appointed place and prior to the announced time for the opening of bids. Late delivery of a bid for any reason, including late delivery by United States Mail, or express delivery, shall disqualify the bid.

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

University of Louisiana at Lafayette
Purchasing Department,
P. 0. Box 40197
Lafayette, LA 70504.

Bids sent by express delivery shall be delivered to:

University of Louisiana at Lafayette
Purchasing Department
Martin Hall, Room 123
104 University Circle
Lafayette, LA 70503

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

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

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

5.4 Modification or Withdrawal of Bid

5.4.1 A bid may not be modified, withdrawn or canceled by the Bidder during the time stipulated in the Bid Document, for the period following the time and bid date designated for the receipt of bids, and Bidder so agrees in submitting his bid, except in accordance with R.S. 38:2214 which states, in part, "Bids containing patently obvious mechanical, clerical or mathematical errors may be withdrawn by the Contractor if clear and convincing sworn, written evidence of such errors is furnished to the public entity within forty eight hours of the Bid Opening excluding Saturdays, Sundays and legal holidays".

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

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

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

ARTICLE 6

CONSIDERATION OF BIDS

6.1 Opening of Bids

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

6.2 Rejection of Bids

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

6.3 Acceptance of Bid

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

ARTICLE 7

POST-BID INFORMATION

7.1 Submissions
7.1.1 At the Pre-Construction Conference, the Contractor shall submit the following information to the Architect. (If Applicable)

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

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

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

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

7.1.2 The Contractor will be required to establish to the satisfaction of the Architect the reliability and responsibility of the proposed Subcontractors to furnish and perform the work described in the sections of the Specifications pertaining to such proposed Subcontractor's respective trades. The General Contractor shall be responsible for actions or inactions of Subcontractors and/or material suppliers.

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

7.1.3 Subcontractors and other persons and organizations selected by the Bidder must be used on the work for which they were proposed and shall not be changed except with the written approval of the Owner and the Architect.

7.1.4 In accordance with La. R.S. 38:2227, LA. R.S. 38:2212.10 and LA. R.S. 23:1726(B) each bidder on this project must submit a completed Attestations Affidavit (Past Criminal Convictions of Bidders, Verification of Employees and Certification Regarding Unpaid Workers Compensation Insurance) form found within this bid package. The Attestations Affidavit form shall be submitted to the Purchasing Department within 10 days **after** the opening of bids**. Affidavits submitted with the Bid Documents, prior to the opening of bids, will not be accepted in accordance with stated Revised Statute.**

ARTICLE 8

PERFORMANCE AND PAYMENT BOND

8.1 Bond Required

8.1.1 The Contractor shall furnish and pay for a Performance and Payment Bond written by a company licensed to do business in Louisiana, which shall be signed by the surety's agent or attorney-in-fact, in an amount equal to 100% of the Contract amount. Surety must be listed currently on the U. S. Department of Treasury Financial Management Service List (Treasury List) as approved for an amount equal to or greater than the contract amount, or must be an insurance company domiciled in Louisiana or owned by Louisiana residents. If surety is qualified other than by listing on the Treasury list, the contract amount may not exceed fifteen percent of policyholders' surplus as shown by surety's most recent financial statements filed with the Louisiana Department of Insurance and may not exceed the amount of $500,000. However, a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A. M. Best's Key Rating Guide shall not be subject to the $500,000 limitation, provided that the contract amount does not exceed ten percent of policyholders' surplus as shown in the latest A. M. Best's Key Rating Guide nor fifteen percent of policyholders' surplus as shown by surety's most recent financial statements filed with the Louisiana Department of Insurance. The Bond shall be signed by the surety's agent or attorney-in-fact. The Bond shall be in favor of the State of Louisiana, Office of Facility Planning and Control.

8.2 Time of Delivery and Form of Bond

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

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

ARTICLE 9

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

9.1 Form to be Used

9.1.1 Form of the Contract to be used shall be furnished by the Purchasing Department.

9.2 Award

9.2.1 Before award of the Contract, the successful Bidder shall furnish to the Owner a copy of a Disclosure of Ownership Affidavit stamped by the Secretary of State, a certified copy of the minutes of the corporation or partnership meeting which authorized the party executing the bid to sign on behalf of the Contractor.

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

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

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions modify, change, delete from or add to the General Conditions of the Contract for Construction, AIA Document A201, 2007 Edition. Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these supplements, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

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

ARTICLE 1

GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

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

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

1.5.1 Delete the first sentence of the paragraph.

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

ARTICLE 2

OWNER

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 Delete this paragraph.

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

ARTICLE 3

CONTRACTOR

3.4 LABOR AND MATERIALS

3.4.2 Delete this paragraph.

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

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

3.7.1 Delete Subparagraph 3.7.1

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

Delete Subparagraph 3.7.5 and substitute the following:

3.7.5 If, during the course of the Work, the Contractor discovers human remains, unmarked burial or archaeological sites, burial artifacts, or wetlands, which are not indicated in the Contract Documents, the Contractor shall follow all procedures mandated by State and Federal law, including but not limited to L.R.S. 8:671 et seq., R.S. 49:213.1 et seq., and Sections 401 & 404 of the Federal Clean Water Act. Request for adjustment of the Contract Sum and Contract Time arising from the existence of such remains or features shall be submitted in writing to the Owner pursuant to the Contract Documents.

3.8 ALLOWANCES

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

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

3.9 SUPERINTENDENT

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

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

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

3.10.3 Delete the word "…general…" Add the following: If the Work is not on schedule, as determined by the Architect, and the Contractor fails to take action to bring the Work on schedule, then the Contractor shall be deemed in default under this Contract and the progress of the Work shall be deemed unsatisfactory. Such default may be considered grounds for termination by the Owner for cause in accordance with 14.2.

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

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

3.11 DOCUMENTS AND SAMPLES AT THE SITE

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

ARTICLE 4

ARCHITECT

4.1 GENERAL

Delete Subparagraph 4.1.1 and substitute the following:

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

4.1.3 Delete the words: "as to whom the Contractor has no reasonable objection and"

4.2 ADMINISTRATION OF THE CONTRACT

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

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

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

4.2.10 Add the following sentence to the end of Subsection 4.2.10:

There will be no restriction on the Owner having a Representative.

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

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

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

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

ARTICLE 5

SUBCONTRACTORS

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

Delete Subparagraph 5.2.1, and substitute the following:

5.2.1 Unless otherwise required by the Contract Documents, the Contractor shall furnish at the Pre-Construction Conference, to the Owner and the Architect, in writing, the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. No Contractor payments shall be made until this information is received.

Delete Subparagraph 5.2.2 and substitute the following:

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

Delete Subparagraph 5.2.3 and 5.2.4 and add the following:

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

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

Delete Subparagraphs 5.4.1, 5.4.2 and 5.4.3

ARTICLE 7

CHANGES IN THE WORK

7.1 GENERAL

Add the following paragraph:

7.1.4 As part of the pre-construction conference submittals, the contractor is to submit the following prior to the commencement of Work:

Fixed job site overhead cost itemized with documentation to support daily rates.
Bond Premium Rate with supporting information from the General Contractor's carrier.
Labor Burden by trade for both Subcontractors and General Contractor.
Internal Rate Charges for all significant company owned equipment.

Failure to submit this information as part of the pre-construction submittals shall

prohibit the Contractor from claiming these items as costs on any change order issued on the project.

7.2 CHANGE ORDERS

Delete Subparagraph clause 7.2.1, and substitute the following paragraphs:

7.2.1 A Change Order is a written order to the Contractor prepared by the Architect and signed by the Owner and the Architect, issued after execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time. Any reservation of rights, stipulation, or other modification made on the change order by the contractor will have no effect.

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

7.2.2.1 Wages paid direct labor personnel, delineating a labor burden markup for applicable payroll taxes, worker's compensation insurance, unemployment compensation, and social security taxes.

7.2.2.2 Cost of all materials and supplies, including the identification of each item and its cost including taxes.

7.2.2.3 Identify each necessary piece of machinery and equipment and its individual cost including taxes.

7.2.2.4 Increases in insurance premiums for those forms of insurance required by Article 11 of these Supplementary Conditions and only for those forms.

7.2.2.5 Bond costs.

Credit will not be required for Overhead and Profit.

7.2.3 Overhead and Profit - The Contractor and Subcontractor shall be due job-site and home office fixed overhead and profits on the Cost of the Work, but shall not exceed a total of 25% of the direct cost of any portion of Work:

The credit to the Owner resulting from a change in the Work shall be the sum of those items above, except credit will not be required for Overhead and Profit. Where a change results in both credits to the Owner and extras to the Contractor for related items, overhead and profit will only be computed on the net extra cost to the Contractor.

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

7.2.4.1 When all of the Work is General Contract Work; 15% markup on the Cost of the Work.

7.2.4.2 When the Work is all Subcontract Work; 15% markup on the Cost of the Work for Subcontractor's Overhead and Profit, plus 10% markup on the Cost of the Work, not including the Subcontractor's Overhead and Profit markup, for General Contractor's Overhead and Profit.

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

Premiums for the General Contractor's bond may be included, but after the markup is added to the Cost of the Work.

7.2.4.4 Subcontract cost shall consist of the items in 7.2.2 above plus Overhead and Profit as defined in 7.2.4.

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

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

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

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

7.2.7 The Contractor will be due extended fixed job-site overhead for time delays only when complete stoppage of Work occurs causing a contract completion extension, and the Contractor is unable to mitigate financial damages through replacement Work. The stoppage must be due to acts or omissions solely attributable to the Owner. In all cases the Contractor is to notify the Architect in writing as required by Article 15.1.2. Reasonable proof may be required by the architect that alternate Work could not be performed. Reasonable proof may be required by the Architect that the stoppage affected the Completion Date.

7.2.8 "Cost of the Work" whether General Contract cost or Subcontract cost shall not apply to the following:
Salaries or other compensation of the Contractor's personnel at the Contractor's principal office and branch offices.

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

Overhead and general expenses of any kind or the cost of any item not specifically and

expressly included above in Cost of the Work.

Cost of supervision not specifically required by the Change Order.

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

Add the following:

7.2.10 Unless otherwise agreed to by the Owner and Contractor, the Contractor shall submit all change order documents through the web based electronic document management system designated by Facility Planning and Control. Any fees charged by the provider of the system shall be the responsibility of the Owner. In using this system the Contractor shall strictly adhere to the naming conventions for change orders assigned by Facility Planning and Control.

7.3 CONSTRUCTION CHANGE DIRECTIVES

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

7.3.7 Delete the following from .1 of the list: "fringe benefits required by agreement or custom,"

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

Delete the following from .5 of the list: "and field office personnel"

7.3.9 Delete Subparagraph 7.3.9 and substitute the following:

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

ARTICLE 8

TIME

8.1 DEFINITIONS

Add the following:

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

8.2 PROGRESS AND COMPLETION

Add to Subparagraph 8.2.1 the following:

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

Delete Subparagraph 8.2.2

8.3 DELAYS AND EXTENSIONS OF TIME

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

ARTICLE 9

PAYMENTS AND COMPLETION

9.2 SCHEDULE OF VALUES

Delete Subparagraph 9.2 and substitute the following:

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

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

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

9.3 APPLICATIONS FOR PAYMENT

Delete Subparagraph 9.3.1 and clause 9.3.1.1 and 9.3.1.2 and substitute the following:

9.3.1 Monthly, the Contractor shall submit to the Architect an Application & Certificate for Payment on the AIA Document G702-1992, accompanied by AIA Document G703-1992, and supported by any additional data substantiating the Contractor's right to payment as the Owner or the Architect may require. Application for Payment shall be submitted on or about the first of each month for the value of labor and materials incorporated into the Work and of materials, suitably stored, at the site as of the twenty-fifth day of the preceding month, less normal retainage as follows, per R.S. 38:2248:

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

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

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

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

Delete Subparagraph 9.3.2 and substitute the following:

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

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Subparagraph 9.5.1.7: Delete the word "repeated".

Delete Subparagraph 9.5.3

9.6 PROGRESS PAYMENTS

Delete Subparagraph 9.6.1 and substitute the following:

9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment within twenty days except for projects funded fully or in part by a Federal reimbursement program. For such projects the Owner will make payment in a timely manner consistent with reimbursement.

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

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

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

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

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

9.7 FAILURE OF PAYMENT

Delete Subparagraph 9.7

9.8 SUBSTANTIAL COMPLETION: Delete this section and substitute the following:

9.8 SUBSTANTIAL COMPLETION

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

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

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

inspection by the Architect to determine Substantial Completion.

9.8.4 When the Architect determines that the project is Substantially Complete, he shall prepare a punch list of exceptions and the dollar value related thereto. The monetary value assigned to this list will be the sum of the cost estimate for each particular item of Work the Architect develops based on the mobilization, labor, material and equipment costs of correcting the item and shall be retained from the monies owed the contractor, above and beyond the standard lien retainage. The cost of these items shall be prepared in the same format as the schedule of values. At the end of the 45 day lien period payment shall be approved for all punch list items completed up to that time. After that payment, none of the remaining funds shall be due the contractor until all punch list items are completed and are accepted by the Architect. If the dollar value of the punch list exceeds the amount of funds, less the retainage amount, in the remaining balance of the Contract, then the Project shall not be considered as substantially complete. If funds remaining are less than that required to complete the Work, the Contractor shall pay the difference.

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

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

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

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 Delete paragraph and substitute the following:

Partial Occupancy is that stage in the progress of the Work when a designated portion of

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

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1 After the first sentence, add the following:

If the Architect does not find the Work acceptable under the Contract Documents, the Architect shall make one additional inspection; if the Work is still not acceptable, the Architect, and each of the Architect's principal consultants, shall be paid $175.00/hour for their time at the project site, for each additional inspection, to be withheld from the unpaid funds remaining in the Contract sum. The payment shall be made by the Owner and deducted from the construction contract funds.

9.10.4 Replace with the following:

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

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

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

9.10.4.3 Terms of special warranties required by the Contract Documents.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.2 SAFETY OF PERSONS AND PROPERTY

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

10.3 HAZARDOUS MATERIALS

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

10.3.2 After the first sentence, delete all remaining sentences.

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

10.4 EMERGENCIES

Delete Subparagraph 10.4 and substitute the following:

10.4 In an emergency affecting the safety of persons or property, the Contractor shall notify the Owner and Architect immediately of the emergency, simultaneously acting at his discretion to prevent damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency Work shall be determined as provided in Article 15 and Article 7.

ARTICLE 11

INSURANCE AND BONDS

Delete all of Paragraphs 11.1, 11.2 and 11.3 and substitute the following:

**INSURANCE REQUIREMENTS FOR
NEW CONSTRUCTION, ADDITIONS AND RENOVATIONS**

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

11.2 MINIMUM SCOPE AND LIMITS OF INSURANCE

11.2.1 Worker's Compensation

Worker's Compensation insurance shall be in compliance with the Worker's Compensation law of the State of Louisiana. Employers Liability is included with a minimum limit of $500,000 per accident/per disease/per employee. If Work is to be performed over water and involves maritime exposure, applicable LHWCA, Jones Act or other maritime law coverage shall be included and the Employers Liability limit increased to a minimum of $1,000,000. A.M. Best's insurance company rating requirement may be waived for Worker's compensation coverage only.

11.2.2 Commercial General Liability

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

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

COMBINED SINGLE LIMIT (CSL) PER OCCURRENCE

Type of Construction	**Projects up to $1,000,000**	**Projects over $1,000,000 up to $10,000,000**	**Projects over $10,000,000**
New Buildings:			
Each Occurrence Minimum Limit	$1,000,000	$2,000,000	$4,000,000
Per Project Aggregate	$2,000,000	$4,000,000	$8,000,000
Renovations:	**The building(s) value for the Project will be released if applicable**		
Each Occurrence Minimum Limit	$1,000,000**	$2,000,000**	$4,000,000**
Per Project Aggregate	2 times per occur limit**	2 times per occur limit**	2 times per occur limit**

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

11.2.3 Automobile Liability

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

11.2.4 Excess Umbrella

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

11.2.5 Builder's Risk

Builder's Risk Insurance shall be in an amount equal to the greater of the fully-completed project value or the amount of the construction contract including any amendments and

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

Flood coverage shall be provided by the Contractor on the first floor and below for projects North of the Interstate Corridor beginning at the Texas – Louisiana border at Interstate 10 East to the Baton Rouge junction of Interstate 12, East to Slidell junction with Interstate 10 to the Louisiana – Mississippi border. If flood is included in the builder's risk insurance policy, then the sub-limit shall not be less than ten percent (10%) of the total contract cost per occurrence. If flood is purchased as a separate policy, the limit shall be ten percent (10%) of the total contract cost per occurrence (with a max of $500,000 if NFIP). Coverage for roofing projects shall **not** require flood coverage.

On projects South of this corridor, flood coverage shall be provided by the State of Louisiana as the Owner. The Contractor will be liable for the $5,000 policy deductible from the Notice to Proceed date through the date of final payment of the project in the event of a flood loss.

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

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

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

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

11.2.7 Deductibles and Self-Insured Retentions

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

11.3 OTHER INSURANCE PROVISIONS

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

11.3.1.1 Worker's Compensation and Employers Liability Coverage

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

11.3.1.2 General Liability Coverage

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

11.3.1.2.2 The Contractor's insurance shall be primary as respects the Owner, its officers, agents, employees and volunteers. The coverage shall contain no special limitations on the scope of protection afforded to the Owner, its officers, officials, employees or volunteers. Any insurance or self-insurance maintained by the Owner shall be excess and non-contributory of the Contractor's insurance.

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

11.3.1.3 Builder's Risk

The policy must include an endorsement providing the following:

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

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

11.3.1.4 All Coverages

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

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

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

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

11.3.2 ACCEPTABILITY OF INSURERS

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

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

11.3.3 VERIFICATION OF COVERAGE

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

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

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

Upon failure of the Contractor to furnish, deliver and maintain such insurance as above provided, this contract, at the election of the Owner, may be suspended, discontinued or terminated. Failure of the Contractor to purchase and/or maintain any required insurance

shall not relieve the Contractor from any liability or indemnification under the contract.

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

11.3.4 SUBCONTRACTORS

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

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

11.3.5 WORKER'S COMPENSATION INDEMNITY

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

11.3.6 INDEMNIFICATION/HOLD HARMLESS AGREEMENT

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

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

action are groundless, false or fraudulent.

11.4 PERFORMANCE AND PAYMENT BOND

Add the following Subparagraph 11.4.3:

11.4.3 RECORDATION OF CONTRACT AND BOND [38:2241A (2)]

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

ARTICLE 12

UNCOVERING AND CORRECTION OF WORK

12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

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

12.2.2 AFTER SUBSTANTIAL COMPLETION

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

12.2.2.1 At the end of the paragraph delete the last sentence and add the following sentences: If the Contractor fails to correct Work covered by warranties within a thirty (30) day period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within thirty (30) days after notification, the Surety

has not corrected the warranty Work, through no fault of the Architect or Owner, the Owner may contract to have the warranty Work corrected and hold the Surety responsible for the cost including architects fees and other indirect costs. Corrections by the Owner shall be in accordance with Section 2.4. If the Surety fails to correct the warranty Work within the stipulated time period and fails to meet its obligation to pay the costs, the Owner may not accept bonds submitted, in the future, by the Surety.

ARTICLE 13

MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

Delete all after the word "located".

13.2 SUCCESSORS AND ASSIGNS

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

Delete paragraph 13.2.2

13.4 RIGHTS AND REMEDIES

Add the following clause 13.4.3

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

13.5 TESTS AND INSPECTIONS

In Subparagraph 13.5.1, delete the second sentence and substitute the following:

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

Delete the last sentence of Subparagraph 13.5.1

13.6 INTEREST

Delete Paragraph 13.6

13.7 TIME LIMITS ON CLAIMS

Delete Paragraph 13.7 (See L.R.S. 38:2189).

ARTICLE 14

TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

Delete clause 14.1.1.4

In Subparagraph 14.1.3, after the word "profit" add the following: "for Work completed prior to stoppage".

14.2 TERMINATION BY THE OWNER FOR CAUSE

Add the following clause:

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

14.2.3 Add the following sentence:

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

14.2.5 Add the following Subparagraph:

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

ARTICLE 15

CLAIMS AND DISPUTES

15.1 CLAIMS

In the first sentence of Subparagraph 15.1.1, after the word "money", add the phrase: "extension of time,"

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

15.1.3 In the second sentence of the Subparagraph, delete "the decisions of the Initial Decision Maker" and replace with: "his/her decision".

Delete Paragraph 15.1.5.2 and substitute the following:

If adverse weather conditions are the basis for a claim for additional time, the Contractor shall document that weather conditions had an adverse effect on the scheduled construction. An increase in the contract time due to weather shall not be cause for an increase in the contract sum. At the end of each month, the Contractor shall make one

Claim for any adverse weather days occurring within the month. The Claim must be accompanied by sufficient documentation evidencing the adverse days and the impact on construction. Failure to make such Claim within twenty-one (21) days from the last day of the month shall prohibit any future claims for adverse days for that month.

15.1.5.3 Add the following Subparagraph:

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

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

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

Note: Contract is on a calendar day basis.

15.2 INITIAL DECISION

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

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

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

In the third sentence, delete: "unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered."

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

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

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

15.2.6 Delete Paragraph.

Delete Subparagraph 15.2.6.1

15.3 MEDIATION

Delete Article 15.3

15.4 ARBITRATION

Delete Article 15.4

GENERAL SPECIFICATIONS

GENERAL REQUIREMENTS

The Contractor shall furnish and install all labor and material necessary to provide and install the complete portion of this contract, including all materials and equipment as shown on the plans. It is the intention of these specifications that all systems be furnished complete with whatever necessary items are required to produce a satisfactory installation in a working order. The Contractor shall be responsible for bringing to the attention of the Owner any shortcomings of the design, or thereby, shall be responsible in full to meet the conditions set forth, that being, the system is to be in a satisfactory working order.

All material shall be installed in accordance with the instructions of the manufacturers. The work shall be done in strict compliance with state and local ordinances governing this class of work. The prospective bidder shall visit the job site and become familiar with all existing conditions found at the site. The Contractor shall become acquainted with all existing factors and conditions which affect the work. Failure to do so shall not relieve meeting the responsibility to install the work correctly.
The Contractor shall protect the entire installation from injury on the project until final acceptance. Failure to do so shall be sufficient cause for the Agent to reject any work.

CONSTRUCTION FORCE

The Contractor shall provide and maintain in full operation at all times during the performance of the contract a sufficient work crew to execute the work with dispatch. The Contractor shall provide a full time superintendent who shall be on the job during all working periods.

The Contractor shall be responsible for maintenance and repair of all equipment installed by him which fails due to substandard workmanship.

PARKING

Contractor shall be responsible for all fees for temporary campus parking permits. The Facility Management department shall request the permits through the UL Parking and Transit department. Contractor shall be required to display the permit on their vehicles at all times while on campus. Failure to do so may result in parking citation.

DEQ NOTIFICATION

The Contractor shall be responsible for the proper notification of the Department of Environmental Quality whenever demolition work is to be performed. Copies of the DEQ Notification Form AAC-2 and any additional correspondence with DEQ shall be copied to the University.

STANDARDS

All materials furnished under this contract shall be designed, constructed and rated in accordance with the latest applicable standards, and shall pass tests as recommended therein.

WORKMANSHIP AND MATERIALS

The workmanship shall conform to the best accepted construction practice. Should it become evident that during the course of construction that the items indicated on the plans, are for any reason undesirable, the Contractor shall immediately bring the situation to the attention of the Agent for a decision. The Contractor shall be responsible for installing the proper materials as described by the drawings and specifications.

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All materials furnished for this project shall be new, undamaged, and bear the label of the Underwriters' Laboratories, Inc. Deliver materials in manufacturer's original package and store on skids so that the materials are off the ground, and so that product labels are exposed for easy inspection.

The Bidder shall base the proposal on materials herein specified. Reference to specific manufacturers or trade names is not intended to limit or indicate preference to specific manufacturers, but to indicate a standard of quality. Written approval from the Agent is required on all substitutions prior to installations.

GUARANTEE

The Contractor shall guarantee new materials and workmanship for a minimum of one (1) full year after formal acceptance of the project. The Contractor will replace defective material and repair all workmanship defects promptly, and absorb all costs.

This provision shall not override any other warranties that are specified herein.

CAMPUS SAFETY POLICY

Contractor shall adhere to the campus safety policy. Information regarding campus safety can be found on the UL Lafayette website at: http://www.louisiana.edu/ehs

LOUISIANA ONE CALL

UL Lafayette is a member in the Louisiana One Call system. At least 72 hours before digging anywhere on UL Lafayette property the contractor **must** call 1-800-272-3020 to verify the location of utilities.

EXISTING LANDSCAPING

Contractor is liable for any damages caused to the existing landscaping. All landscaping must be protected from root compaction and other physical damage. Contractor **must** provide three foot high orange construction fencing around the drip line of all trees within the construction site.

ASBESTOS

The contractor **will not** be required to interface with any asbestos containing material (ACM) during this project. The State of Louisiana has conducted an asbestos survey of all buildings on the UL Lafayette campus. The results of the survey are compiled in management plans for each building. The management plans were assembled according to the requirements set forth in the Department of Environmental Quality Required Elements Index. These plans are available for review to anyone interested in the results. The plans are kept on file in the Reserve Reading Room of Edith Garland Dupre' Library.

COORDINATION OF WORK

The Contractor shall inform the Agent each day of his work location before proceeding to work, and each time the Contractor moves into a different area.

PAYMENT

The Contractor may invoice the Owner for work performed on a monthly basis. The work performed shall meet the approval of UL Lafayette. UL Lafayette shall process payment after verification of the invoice.

On projects where a performance bond is specified, the University will withhold ten percent (10%) retainage from all payments for completed work. The retainage will be released to the contractor

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according to the procedures set forth in the "INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS", section 10.
FINAL PAYMENT WILL NOT BE ISSUED UNTIL ALL UNIVERSITY KEYS HAVE BEEN RETURNED TO THE FACILITY MANAGEMENT OFFICE.

CLEAN-UP
The Contractor is responsible for the daily clean-up and disposal of all trash and construction debris relating to this project. University dumpsters shall **not** be used for the disposal of debris. Should the Contractor dispose of any debris into University facilities, the cost of removal will be deducted from the University's final payment under this contract. Occupied areas (e.g.: Classrooms, Offices, Labs, etc.) shall be broom cleaned and vacuumed at the end of the work day to allow use of the room by the university. Debris and materials shall be removed from the rooms to allow use of the room by the university.

INSURANCE REQUIREMENTS
The Contractor shall purchase and maintain for the duration of the contract insurance by a company or companies lawfully authorized to do business in the State of Louisiana with a A.M. Best's rating of A-:VI or higher against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, its agents, representatives, employees or subcontractors. Failure to comply with all terms of this section for the duration of the Contract places the Contractor in breach of this Contract. Request for any variations to this section may be reviewed by the University's Risk Manager, who will make the final decision.

A. Minimum Scope of Insurance and Limits

1. Workers Compensation
   Workers Compensation insurance shall be in compliance with the Workers Compensation law of the State of Louisiana. (R.S. 23:1020).

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

   If liquor is served and/or if there is valet parking performed in the execution of this contract, then the contractor is required to provide liquor liability and/or garagekeepers liability respectively in the minimum amount of $1,000,000 per occurrence.

3. Professional Liability, Errors and Omissions, Malpractice (if applicable)
   NOTE – this insurance is applicable for contracts that involve the following services:
   - Medical Professionals (Doctors, Nurse Practitioners, etc.)
   - Architects and Engineers
   - Attorneys
   - Accountants and Professional Financial Advisors
   - Real Estate Brokers and Appraisers

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- Insurance Agents
- Consultants

Professional Liability shall have minimum limit of $1,000,000. Claims-made coverage is acceptable.

1. Automobile Liability (if a Motor Vehicle owned, hired, or rented by the contractor is used in the performance of this contract)

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

B. Other Insurance Provisions

The Contractor shall either require each Subcontractor or Vendor to procure and maintain all applicable insurance of the type and limits specified in this section or assure in writing that all activities of the Subcontractor are covered by the Contractor's own insurance policies.

Any deductibles or self-insured retentions must be declared to and accepted by the University. The Contractor shall be responsible for all deductibles and self-insured retentions. Any insurance or self-insurance maintained by the University shall be excess and non-contributory of the Contractor's insurance. The coverage shall contain no special limitations on the scope of protection afforded to the University. The Contractor's insurance shall be primary as respects the University, The University of Louisiana Board of Supervisors, its officers, agents, employees and volunteers.

The University and The University of Louisiana Board of Supervisors, its officers, agents, employees and volunteers shall be named as an additional insured as regards negligence by the contractor. ISO Form CG 20 10 (current form approved for use in Louisiana), or equivalent, is to be used when applicable.

Certificate(s) of Insurance shall be addressed to:
University of Louisiana at Lafayette
ATTN: Purchasing Department
P.O. Box 40197
Lafayette, LA 70504

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

Reduced Limits, Special Circumstances

The scope of work for any bid may dictate that a reduction of insurance limits is necessary in order to facilitate competition and/or ensure the University's ability to hire qualified Contractors. Low risk activities such as, but not limited to any of the following:

- Services in which the owner/operator is the only Contractor employee
- Services that do not involve the use of a motor vehicle

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- Services in which there is no use of hazardous or radioactive materials
- Services in which there is no use of power machinery or tools
- Services in which there is no use of high voltage equipment
- Services in which no work is actually performed on the University campus

For these bids/contracts, the Director of Purchasing, at his/her discretion may choose to reduce the insurance requirements as follows:

1. Workers Compensation

The University may not require officers of a corporation, partners in a partnership, members of a limited liability company, and sole proprietors to elect Workers compensation coverage on themselves if they are the only person employed by the contractor performing the work specified in the Contract.

2. Commercial General Liability

Commercial General Liability insurance, including Personal and Advertising Injury Liability, shall have a minimum limit per occurrence of $100,000. The Insurance Services Office (ISO) Commercial General Liability occurrence coverage form CG 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. Claims-made form is unacceptable.

3. Automobile Liability

Automobile Liability Insurance may be waived from the insurance requirements of the contractor only if the scope of work does not involve the use of a motor vehicle. Examples include but are not limited to:

- Goods and/or services will be delivered to the University by a third party
- Goods and/or services will be delivered to the University electronically

INDEMNIFICATION

The Contractor will indemnify and hold harmless the Owner and all of their agents and employees from and against all claims, damages, losses, and expenses including attorney's fees arising out of or resulting from operations under the Contract Documents by the Contractor, and subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, which are caused in whole or in part by any error, omission, or act of any of them. If any and all claims against the Owner or any of their agents or employees by any employee of the Contractor, subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation of the Contractor under this article shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under Workmen's Compensation laws.

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DETAILED SPECIFICATIONS

SUMMARY

PROJECT

A. Project Name: Broussard Hall - HVAC Replacement – Phase 2 - University of Louisiana at Lafayette -Lafayette, Louisiana.

B. Owner's Name: University of Louisiana at Lafayette.

C. Project: The Project consists of the Replacement of an existing four pipe chilled/hot water fan coil unit system, and expanding the existing new Variable Refrigerant Flow (VRF) equipment. The Project consists of demolition of the existing chilled/hot water fan coil units system, installation of select new supports for equipment, repairs to existing plaster walls, ceilings, etc.,

Local Building Permits will not be required for State of Louisiana owned building projects.

CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in contract documents.

WORK BY OWNER

A. Not Applicable.

USER AGENCY

A. Schedule the Work to accommodate User Agency occupancy.

CONTRACTOR USE OF SITE AND PREMISES

A. Arrange use of site and premises to allow User Agency occupancy during construction.

B. Emergency Building Exits During Construction: Keep all exits required by code open during construction period.

C. Existing building spaces may not be used for storage.

D. Utility Outages and Shutdown: Limit disruption of utility services to hours the building is unoccupied. All outages coordinated with User Agency.

WORK SEQUENCE

A. Coordinate construction schedule and operations with User Agency for Occupied areas.
B. Contractor shall coordinate with owner for work schedule in other areas of the building.

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PRICE AND PAYMENT PROCEDURES

SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

SCHEDULE OF VALUES

A. Immediately after award of the bid, the successful contractor shall submit a breakdown of costs with a building by breakdown of equipment, piping, insulation, controls, electrical, etc.

B. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet.

C. Contractor shall submit an itemized breakdown of all proprietary items including but not limited to parts, software, programming, commissioning and check out, etc.

APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.
B. Present required information in typewritten form.
C. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.
D. Execute certification by signature of authorized officer.

Submit one original with signature in BLUE ink and three copies of each Application for Payment.

MODIFICATION PROCEDURES

A. The Owner 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.

B. Construction Change Directive: Owner may issue a document, signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. The document will describe changes in the Work, and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change in Work.

C. Proposal Request: The Owner may issue a document which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation

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within 10 days.

D. Computation of Change in Contract Amount:

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

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.

ADMINISTRATIVE REQUIREMENTS

PROJECT COORDINATION

A. Project Coordinator: Owner.
B. Cooperate with the Owner in allocation of mobilization areas of site; for field offices and sheds, for building access, traffic, and parking facilities.
C. During construction, coordinate use of site and facilities through the Owner.
D. Comply with Owner procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
E. Comply with instructions of the Owner for use of temporary utilities and construction facilities.
F. Coordinate field engineering and layout work under instructions of the Owner.

G. Make the following types of submittals to the Owner:
   1. Requests for interpretation.
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Manufacturer's instructions and field reports.
   6. Applications for payment and change order requests.
   7. Progress schedules.
   8. Coordination drawings.
   9. Closeout submittals.

PRE-CONSTRUCTION MEETING

A. Attendance Required:
   1. Owner.
   2. Contractor
      I. Primary Subcontractors

B. Agenda:
   1. Distribution of Contract Documents.
   2. The contractor shall submit a list of Subcontractors, a list of Products and Material Suppliers, a completed Schedule of Values, and the Construction Schedule.
   3. Designation of personnel representing the parties in Contract.
   4. Procedures and processing of field decisions, submittals, substitutions, applications for

payments, proposal request, Change Orders, and Contract closeout procedures.
5. Scheduling of work.

C. The Owner shall Record minutes and distribute copies to participants within an agreed upon timeframe after meeting, with two copies to State of Louisiana, participants, and those affected by decisions made.

COORDINATION DRAWINGS

SUBMITTALS FOR REVIEW

A. Product data.
B. Shop drawings.
C. Submit to Owner for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

SUBMITTALS FOR INFORMATION

A. Design data.
B. Certificates.
C. Manufacturer's instructions.

SUBMITTALS FOR PROJECT CLOSEOUT

A. Project record documents.
B. Operation and maintenance data.
C. Warranties.
D. Bonds.
E. Submit to Owner for the Owner’s benefit during and after project completion.

NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:
   1. Small size sheets, not larger than 8-1/2 x 11 or 11 x 17 inches: Submit the number of copies which the Contractor requires, plus four copies which will be retained by the Engineer.

B. Documents for Information: Submit five (5) copies.

C. Documents for Project Closeout: Make one reproduction of submittal originally reviewed with all project changes and corrections included. Submit three (3) extra of submittals for user agency and owner information.

CONSTRUCTION PROGRESS SCHEDULE

SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

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CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
B. Identify each item by specification section number.
C. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
D. Provide legend for symbols and abbreviations used.

QUALITY REQUIREMENTS

CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
B. Comply with manufacturers' instructions, including each step in sequence.
C. Should manufacturers' instructions conflict with Contract Documents, request clarification from the Architect before proceeding.
D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
E. Have Work performed by persons qualified to produce required and specified quality.
F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

REFERENCE STANDARDS

QUALITY ASSURANCE

A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
B. Should specified reference standards conflict with Contract Documents, request clarification from the Owner before proceeding.
C. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Owner shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

TEMPORARY FACILITIES AND CONTROLS

BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to allow for user agency's

use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades required by governing authorities for public rights-of-way and for public access to existing building.
C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

STAGING AREA

A. Coordinate Staging Area with the Owner. Contractor to restore Staging Area to it's original condition after completion of the project.

WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition. Clean and remove debris from site on a daily basis.

VEHICULAR ACCESS AND PARKING

PARKING

A. Use of designated areas of existing parking facilities by construction personnel is permitted.
   I. Coordinate with Owner for all parking requirements.

REMOVAL, REPAIR

A. Repair existing facilities damaged by use, to original condition.
B. Repair damage caused by installation.

SECURITY MEASURES

ENTRY CONTROL

A. Restrict entrance of persons into Project site and existing facilities. All work shall be coordinated with Owner.

PRODUCT REQUIREMENTS

SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
B. Shop Drawing Submittals: Prepared specifically for this Project.
C. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

PRODUCTS

A. Provide interchangeable components of the same manufacture for components being replaced.

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B. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, temperature limitations, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
C. Electrical connections shall be in compliance with NEC 110-14 (c), temperature limitations associated with the ampacity of conductor / equipment requirements.

PRODUCT OPTIONS

A. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
C. A request for substitution constitutes a representation that the submitter:
    1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
    2. Will provide the same warranty for the substitution as for the specified product.
    3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to the Owner.
    4. Waives claims for additional costs or time extension which may subsequently become apparent.

TRANSPORTATION AND HANDLING

A. Transport and handle products in accordance with manufacturer's instructions.
B. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

STORAGE AND PROTECTION

A. Store and protect products in accordance with manufacturers' instructions.
B. Store with seals and labels intact and legible.
C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
D. For exterior storage of fabricated products, place on sloped supports above ground.
E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
G. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

EXECUTION REQUIREMENTS

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SUBMITTALS

A. Cutting and Patching: Submit written request in advance of cutting or alteration which affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of State of Louisiana or separate Contractor.

PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

COORDINATION

A. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate occupancy requirements.
B. 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.
C. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
D. Coordinate space requirements, supports, and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for ducts and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
F. Coordinate completion and clean-up of work of separate sections.
G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner activities.

PATCHING MATERIALS

A. New Materials: Match existing products and work for patching and extending work.
B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Beginning new work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
C. Examine and verify specific conditions described in individual specification sections.
D. Verify that utility services are available, of the correct characteristics, and in the correct locations.

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E. 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.

PREPARATION

A. Prepare surfaces and remove surface finishes to provide for proper installation of new work and finishes.
B. Clean substrate surfaces prior to applying next material or substance.
C. Seal cracks or openings of substrate prior to applying next material or substance.
D. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.
B. Promptly notify Owner of any discrepancies discovered.
C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
D. Promptly report to Owner the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Owner.
F. Utilize recognized engineering survey practices.
G. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
H. Periodically verify layouts by same means.
I. Maintain a complete and accurate log of control and survey work as it progresses.

GENERAL INSTALLATION REQUIREMENTS

A. Install Products as specified in individual sections.
B. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new Work abuts or aligns with existing, perform a smooth and even transition.
C. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Owner.

CUTTING AND PATCHING

A. Execute cutting and patching including excavation and fill to complete the work, to uncover work to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit Products together to integrate with other work.
B. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
C. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

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D. Restore work with new Products in accordance with requirements of Contract Documents.
E. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
F. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.
G. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

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 rubbish from site and dispose off-site.
E. Remove debris from site on a daily basis. Contractor shall have spaces (e. g.: Classrooms, Offices, Labs, etc.) Broom cleaned and Vacuumed at the end of each work day to allow use of the rooms by the university. Debris and materials shall be removed from the rooms to allow use of the room by the university.

PROTECTION OF INSTALLED WORK

A. The contractor shall protect installed work and provide special protection where specified in individual specification sections.
B. The contractor shall provide temporary and removable protection for installed products. The contractor shall control activity in the immediate work area to prevent damage.
C. The contractor shall provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
F. The contractor shall provide protective covering for the owner’s existing equipment in Classrooms, Offices, Labs, etc. to protect the owner’s equipment, computers, desks, etc. from dust, damage, etc. during construction.

STARTING SYSTEMS

A. Coordinate schedule with the owner start-up of various equipment and systems. The new VRF system shall be started and operational before demolition work begins on the existing chilled/hot water fan coil unit system.
B. The contractor shall verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
D. Verify that wiring and support components for equipment are complete and tested.
E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's

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representative in accordance with manufacturers' instructions.

F. Submit a written report that equipment or system has been properly installed and is functioning correctly.
G. All filters equal to the final filter specification shall be provided at all times equipment is to be operated.
H. The contactor shall complete the "Commissioning Report" as recommended by the VRF manufacturer (i.e.: see Mitsubishi Electric City Multi R-410A Series System Commissioning Report as prepared by Mitsubishi Electric HVAC Training, HVAC Advanced Products Division. **The Owner shall be present for the commissioning work.**

ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

FINAL CLEANING

A. Remove waste and surplus materials, rubbish, and construction facilities from the site.

CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Owner.
   B. Notify Owner when work is considered ready for Substantial Completion.
C. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Owner's review.
D. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
E. Notify Owner when work is considered finally complete.
F. Complete items of work determined by Owner's final inspection.

CLOSEOUT SUBMITTALS

SUBMITTALS

A. Project Record Documents: Submit documents to Owner with claim for final Application for Payment.
B. Operation and Maintenance Data:
   1. Submit three copies of preliminary draft or proposed formats and outlines of contents before start of Work. The Owner will review draft and return two copies with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit three sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
   2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.

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3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of final acceptance as the beginning of the warranty period.

PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
B. Record information concurrent with construction progress.
C. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Changes made by Addenda and modifications.
D. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. Details not on original Contract drawings.

OPERATION AND MAINTENANCE DATA

A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.
B. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
C. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
D. Provide servicing and lubrication schedule, and list of lubricants required.
E. Include manufacturer's printed operation and maintenance instructions.
F. Include sequence of operation by controls manufacturer.

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G. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
H. Provide control diagrams by controls manufacturer as installed.
I. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
J. Include test and balancing reports.
K. Additional Requirements: As specified in individual product specification sections.

OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
B. Prepare data in the form of an instructional manual.
C. Binders: Commercial quality, 8-1/2 x 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.

WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
B. Verify that documents are in proper form, contain full information, and are notarized.
C. Co-execute submittals when required.
D. Retain warranties and bonds until time specified for submittal.

DEMOLITION

GENERAL

A. Work Included: Comply with requirements of the Contract Documents and all applicable codes and regulations to provide demolition, as shown on the Drawings, as specified herein and as needed for a complete and proper installation.

B. Related Work: Comply with the relative requirements of other Divisions, Sections, the General and Supplementary Conditions and the Drawings of the entire Contract Documents. The breakdown of this project manual into Divisions and Sections shall not define any limit of work.

C. Quality Assurance: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for the proper performance of the work of this Section.

D. Salvage: The Owner shall have priority for the selection of salvaged equipment and materials. Any equipment and material selected to remain the property of the Owner shall be removed from the site by Owner. Material not retained by the Owner shall become the property of the Contractor and shall be removed from the site by the contractor.

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E. Submittals:
   1. Schedule of Building Demolition: Submit, in writing at Preconstruction Conference, proposed methods and operations of demolition to Owner for review. Include in schedule, coordination for shut-off and capping and continuation of utility services as required.
   2. Permit: If required by local authorities, obtain permit for transport and/or disposal of debris.

F. Site Conditions:
   1. Condition of Structures: The Owner assumes no responsibility for the actual condition of structures to be demolished. Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner in so far as practicable. However, variations within the structure may occur prior to the start of the demolition work.
   2. Uncovering of Asbestos: If, in the course of demolition, any form of asbestos, previously undiscovered, is uncovered, the work shall be immediately halted and the Owner shall be so informed, first by telephone and then in writing. Work shall not continue until the asbestos is removed by a Specialty Contractor, under a separate contract, who is experienced in the removal of this type of material.
   3. Asbestos Removal:
      a. Separate Contract: Any asbestos encountered will be removed by the Owner through a separate contract.
      b. This Contract: Coordinate the Work to allow the work of the separate contract to be accomplished before any work of this Contract is done in these areas. The replacement of the item(s) removed is scheduled in the Drawings.

PRODUCTS

G. Demolished Materials: Remove accumulations daily or as approved by Owner.

EXECUTION

H. General Demolition:
   1. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with adjacent facilities.
   2. Protection: Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to adjacent buildings, trees and vegetation, and persons. Contractor shall protect work area with proper barricades to prevent access by students.
   3. Pollution Control: Use water sprinklering, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level.
   4. Damages: Promptly repair any damage to adjacent facilities by demolition operations at no cost to Owner.
   5. Utility Services: Maintain existing utilities indicated to remain; keep in service, and protect against damage during demolition operations. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by Owner. Provide temporary services during interruptions to existing utilities, as acceptable to Owner.
   6. Fill: Where excavation is required by demolition work, select fill material shall be provided to bring the finish grade back to surrounding finish grade elevations with good drainage. Fill shall be installed in 6" lifts and compacted to proper densities. Fill material is not available on site.

I. Removal:
   1. General: Remove all debris from site daily.

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2. Disposal: Off site.
3. Burning: Shall not be allowed on site.
4. Completion: Remove all demolished materials, tools, and equipment from site upon completion of work.

CAST-IN-PLACE CONCRETE

GENERAL

A. Work Included: Comply with requirements of the Contract Documents and all applicable codes and regulations to provide cast-in-place concrete and related accessories, in the types and arrangements shown on the Drawings, as specified herein and as needed for a complete and proper installation.

B. Related Work: Comply with the relative requirements of other Divisions, Sections, the General and Supplementary Conditions and the Drawings of the entire Contract Documents. The breakdown of this project manual into Divisions and Sections shall not define any limit of work.

C. Quality Assurance:
   1. General: Comply with requirements and recommendations of referenced standards and with all applicable codes and regulations.
   2. Project Copy: A copy of ACI Field Reference Manual, SP-15 (05), shall be furnished by Contractor and kept at project site for duration of Contract. A copy of this manual may be purchased by calling ACI @ (248) 848-3800.

D. References:
   1. "Specifications for Structural Concrete for Buildings, ACI 301-05", as published by the American Concrete Institute. (ACI)
   2. "Field Reference Manual, SP-15 (99), Specifications for Structural Concrete for Buildings with Selected ACI and ASTM References", as published by the American Concrete Institute.
   3. "Manual of Standard Practice for Detailing Reinforced Concrete Structures", ACI 315, as published by the American Concrete Institute.

E. Submittals:
   1. Shop Drawings: Submit in accordance with Specifications. Comply with requirements and recommendations of ACI 315. Submit drawings for fabrication, bending and placement of concrete reinforcement. Show bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include complete list of support bars and accessories with clear instructions regarding their location and placement. Include elevations of all walls, railings, etc., showing complete details of vertical and horizontal reinforcement.
   2. Product Data: Submit in accordance with Specifications. Submit manufacturer's product data with application and installation instructions for proprietary items, including reinforcement and forming accessories, admixtures, patching compounds, joint systems, curing compounds, and others as requested by Owner.
   3. Material Certificates: Provide materials certificates in lieu of materials laboratory test reports.

PRODUCTS

F. Materials: Concrete work and materials shall conform to all requirements of ACI 301-05, except as modified by Supplemental Requirements below.

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EXECUTION

G. Supplemental Requirements:
1. Admixtures: A water reducing admixture shall be used in all concrete mixes.
2. Strength: The type and strengths of concrete for the various portions of the work shall be as follows:
   a. All Concrete: Regular weight mix (150 pcf) and shall attain 3000 psi compressive strength at 28 days. Use 5% +/- 1% Air Entrainment for exposed exterior concrete pavement, walks, etc. Refer to Structural Drawings for additional concrete mix requirements.
3. Formwork: Earth cuts will be permitted as forms for vertical surfaces of footings and grade beams which will not be exposed in the finished work provided the earth will stand without caving and sluffing and provided 3 inch clearance is maintained to reinforcing steel from earth formed surfaces.
4. Reinforcing Steel: ASTM A615, Grade 60. All concrete shall be reinforced in accordance with the Drawings. All concrete slabs and/or paving shall be reinforced in accordance with the Drawings. Welded wire fabric reinforcing for concrete shall be shipped to the site in flat sheets and supported on chair carriers of a height
   equal to 1/2 of the slab thickness.
5. Testing: Contractor shall select and pay for the services of an independent testing laboratory to perform job site testing and reviews required by Section 16 of ACI Publication SP-15 (05). All concrete for all foundations (except fencing), grade beams, building slabs and paving slabs, shall be placed under the full-time supervision of the testing agency. No water may be added at the job site without specific approval of the Testing Technician; tests, in addition to those specified by Chapter 16, shall be made after each such incident.
6. Exposed Concrete Finish: All exposed exterior vertical concrete surfaces shall be rubbed finish.

ROUGH CARPENTRY

GENERAL

A. Work Included: Comply with requirements of the Contract Documents and all applicable codes and regulations to provide rough carpentry, in the types and arrangements shown on the Drawings, as specified herein and as needed for a complete and proper installation.

B. Related Work: Comply with the relative requirements of other Divisions, Sections, the General and Supplementary Conditions and the Drawings of the entire Contract Documents. The breakdown of this project manual into Divisions and Sections shall not define any limit of work.

C. Quality Assurance:
1. Comply with recommendations and requirements of referenced standards and with all applicable codes and regulations.
2. Lumber Grading Rules and Wood Species: In conformance with Voluntary Product Standard PS 20.
3. Plywood Grading Rules: Softwood Plywood, Construction and Industrial, Product Standard PS 1.
4. Grade Marks: Identify all lumber and plywood by official grade mark.

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D. References:
   1. "Standard Grading Rules for Western Lumber", G-5, as published by Western Wood Products Association. (WWPA)
   2. "APA Product Guide: Grades & Specifications", as published by the American Plywood Association. (APA)
   3. "National Design Specification for Stress Grade Lumber and Its Fastenings", as published by the National Forest Products Association. (NFPA)
   4. "Standard Grading Rules for Southern Pine Lumber", by Southern Pine Inspection Bureau. (SPIB)
   5. "Standards for Softwood Lumber, Timber and Plywood, Pressure Treated with Water-Borne Preservatives", LP-2 and LP-22, by American Wood Preservers Bureau. (AWPB)

E. Submittals:
   1. Pressure Treated Wood: Submit certification by treating plant stating chemicals and process used, net amount of salts retained, and conformance with AWPA Standards, and that moisture content was reduced to 19% maximum, after treatment.
   2. Samples: Submit all samples requested by Owner.

F. Product Delivery, Storage and Handling: Comply with requirements of Specifications. Immediately upon delivery to job site, place materials in area protected from weather. Store materials a minimum of 6 inches above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation or ventilation.

PRODUCTS

G. Lumber, General:
   1. Dimensions: Specified lumber dimensions are nominal. Actual dimensions conform to industry standards.
   2. Moisture Content: Unseasoned or 19% maximum at time of permanent closing in of building.
   3. Surfacing: Surface four sides (S4S), unless specified otherwise.

H. Studs: SPIB No.1 KD SYP or SPIB No.2 KD SYP, select on job to eliminate through holes and wild grain that will effect structural capabilities.

I. Rafters, Joists: SPIB No.2 KD SYP, Big Mill Stock, No thru holes.

J. Bracing, Blocking, and General Utility, Non-Exposed: SPIB No.2 KD.

K. Plates and Blocking: Refer to Item O. Pressure Treated Wood Products.
L. Felt: 15# asphalt saturated felt, un-perforated.

M. Gypsum Sheathing: See Section on Gypsum Board.

N. Rough Hardware and Miscellaneous:

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1. Nails: Common wire, galvanized for exterior work.
2. Screws: Standard domestic manufacture, bright steel, except galvanized for exterior use and of brass, bronze, aluminum, or stainless steel, when attached to items made of those materials.
3. Bolts: Standard mild steel, square head machine bolts with square nuts and malleable iron or steel plate washers or carriage bolts with square nuts and cut washers where applicable. Bolts, nuts, and
   washers, wholly or partially exposed on exterior shall be galvanized.
4. Toggle Bolts: FS FF-B-561.
5. Expansion Shields, Lag Screws and Bolts: FS FF-B-561.
6. Staples: FS FF-N-105.
7. Lag Screws: Conform to requirements of NFPA.
8. Construction Adhesive: Liquid Nails adhesive as manufactured by MACCO, Division of ICI Corporation, or West System Brand Epoxy Adhesive.

O. Pressure Treated Wood Products: Provide pressure treated wood products as follows:
   1. AWPB, LP-22 Standard: For all framing, plates, blocking and nailing strips, etc., in contact with masonry, concrete, steel, or the ground, as required on Drawings or by job conditions.
   2. AWPB, LP-2 Standard: For all nailers for metal flashing, fascias and wood exposed to weather conditions, except redwood or cedar surfaces, as required in Drawings or by job conditions. Apply two coats of same preservative used in original treatment to all sawed or cut surfaces of treated lumber.

EXECUTION

P. Erection:
   1. General: Verify that surfaces to receive rough carpentry materials are prepared to exact grades and dimensions and are free of irregularities and debris.

   2. Plates and Stud Members: Provide single bottom plate and double top plates for all partitions. Provide studs in continuous lengths without splices; toenail to bottom plate and end nail to lower top plate. Overlap double top plates width of member at corner and intersections; face nail upper top plate to lower top plate. Anchor bottom plate to concrete structure with anchor bolts with washers at exterior walls and with anchor bolts or power driven anchors at interior partitions, spaced 4 feet o.c., unless otherwise noted on drawings. Double studs at openings, triple studs at tees and corners.
   3. Headers: Continuous headers, same width as studs, depth required to span widest opening. Toenail headers to studs and opening framing. Stagger joints in individual header members a minimum of three stud spaces, allowing no joints to occur over openings. Lap headers at intersections with bearing partitions or tie with metal straps. Install opening headers as follows: spans to 3 feet, two 2x4; spans to 4 ½ feet, two 2x6; spans to 6 feet, two 2x8; spans to 8 feet, two 2x10.
   4. Blocking: Wedge, align, and anchor blocking with countersunk bolts, washers and nuts, or nails. Locate blocking to facilitate installation of finishing materials, fixtures, specialty items, and trim.
   5. Joist Framing: Install with crown edge up. Support ends of each member minimum 2" of

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bearing on wood. Lap members framing from opposite sides of beams, girders, or partitions, minimum 4", or tie opposing members together by toe-nailing or metal connectors. Notches, in top or bottom of joists are permitted, maximum 1/6 depth of member and in ends of joists, 1/3 depth of member.

6. Framing for Mechanical Work: Frame members for passage of pipes and ducts to avoid cutting structural members. Do not cut, notch, or bore framing members for passage of pipes or conduits without approval of Architect.

Q. Cleaning: Remove all excess materials and debris from site daily.

FINISH CARPENTRY

GENERAL

A. Work Included: Comply with requirements of the Contract Documents and all applicable codes and regulations to provide finish carpentry, in the types and arrangements shown on the Drawings, as specified herein and as needed for a complete and proper installation.

B. Related Work: Comply with the relative requirements of other Sections and the Drawings of the entire Contract Documents. The breakdown of this project manual into Divisions and Sections shall not define any limit of work.

C. Quality Assurance:
   1. General: Comply with recommendations and requirements of referenced standards and with all applicable codes and regulations.
   2. Standards: The quality standards of the AWI apply to work of this Section. Materials and workmanship of all woodwork shall conform to the Custom Grade requirements of the AWI Quality Standards unless more stringent requirements are applied by these specifications.

D. Reference: "Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program", as published by the American Woodwork Institute. (AWI)

E. Submittals:
   1. Shop Drawings: Submit in accordance with Specifications. Submit for all items fabricated for this project. Locate all grounds and other anchoring devices required to secure the work. Approval by the Owner does not relieve the Contractor of checking and verifying job dimensions and conditions required by the details on approved Shop Drawings. Coordinate drawings with work in place and with all other trades whose work relates to work of this Section.

   2. Product Data: Submit in accordance with Specifications. Submit for all applicable products complete with recommended installation procedures.
   3. Samples: Submit in accordance with Specifications. Submit plastic laminate, moldings, plywood, etc. samples as requested by Owner.

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F. Handling: Deliver all materials under protective cover and store within dry enclosed area. Handle so as not to cause damage.

G. Site Conditions:
1. Interior: Install Finish Carpentry items only when normal temperature and humidity conditions approximate the interior conditions that will exist when the building is occupied; glazing shall be in place and all exterior openings closed. Provide heat and ventilation to maintain proper conditions before, during and after Finish Carpentry is performed. Back prime all items before installation.
2. Exterior: Install Finish Carpentry items only when weather permits installation and prime painting by others to be completed before item is exposed to wetting. Back prime all items before installation.

PRODUCTS

H. Materials:
1. Exterior Vertical Siding: "Hardipanel" Cedarmill Vertical Siding, 4' x 8', 9' or 10' as required x 5/16" woodgrain texture w/ primer & sealer, as manufactured by James Hardie Siding Products; "Cempanel" manufactured by Cemplank.
2. Miscellaneous Interior Trim: Solid Wood, B Grade or better, Poplar or Magnolia.

EXECUTION

I. Inspection: Verify all dimensions shown on drawings by taking field measurements; proper fit and attachment of all parts is required. Coordinate with all other trades as required to complete work. Inspect all areas to receive work for any deficiency which might prevent satisfactory installation of same, and for the presence and proper positioning of rough bucks, grounds, and other anchoring devices. Correct any deficiencies.

J. Installation of Cabinets and Doors: Install cabinets plumb and level without distortion. Shim as required with concealed shims. Accurately scribe and closely fit all face plates, filler strips, and trim strips to irregularities of adjacent surfaces. Make cuts for hardware neat and true and fit to prevent looseness. Adjust all drawers, doors and removable parts to operate easily and smoothly without binding. Sand all surfaces and edges smooth, slightly rounding exposed corners.

K. Installation of Finish Carpentry:
1. Exterior Vertical Siding: Use hot dip galvanized nails as recommended by manufacturer. Install siding in strict accordance with manufacturer's instructions. Instructions can be downloaded at "www.hardie.com" or "www.cemplank.com" .
2. Use only hot dip galvanized or aluminum finish casing nails. Set nails for putty stopping in surfaced members. Hammer marks not acceptable on any exposed

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finished surface and may be cause for rejection of work by Owner.

3. Make all end splices exposed in finished members, bevel splices and not square butted. Install members in as long a lengths as possible. Kerf back side of wide, flat members.
4. Install work to details shown, plumb, level and to line and securely anchored. Make scribes where required accurate. Miter corners of trim, unless otherwise shown on drawings.
5. Provide and install other miscellaneous millwork items and other related work required to complete work of this Section. Install in strict accordance with manufacturer's directions acceptable to Architect.
6. Prepare all woodwork by cleaning and sanding as required to receive finishes specified in the Painting Section.

L. Touch-up and Cleaning: On completion of work, touch-up all abraded areas on exposed finish work and wherever required to complete the work for Architect's approval. Dust and wipe clean all finished surfaces. Remove all excess materials and debris from site.

GYPSUM BOARD

GENERAL

A. Work Included: Comply with requirements of the Contract Documents and all applicable codes and regulations to provide gypsum drywall systems and related accessories, in the types and arrangements shown on the Drawings, as specified herein and as needed for a complete and proper installation.

B. Related Work: Comply with the relative requirements of other Sections, and the Drawings of the entire Contract Documents. The breakdown of this project manual into Sections shall not define any limit of work.

C. Quality Assurance:
   1. General: Comply with requirements and recommendations of referenced standards and with all applicable codes and regulations.
   2. Applicator: A specialty subcontractor, capable of showing successful installations similar to work required for this project, shall perform the work of this Section.
   3. Industry Standards: Comply with Gypsum Association Standard GA-216 for application and finishing.
   4. Allowable Tolerances: 1/8" offsets between planes of board faces and 1/4" in 8'-0" for plumb, bow, level and warp.
   5. Manufacturer: All products from a single manufacturer or as otherwise recommended by the single manufacturer. Approved manufacturers for gypsum board are: U. S. Gypsum Co. and Gold Bond Building Products. Prior approval is required for products of other manufacturers.

D. Product Handling: Deliver to site in sealed container and bundles identified with manufacturer's name, brand, product type, and grade. Store in dry, ventilated place under

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cover and off the ground.

E. Job Conditions: Installer is responsible to examine substrates and all other job conditions affecting this work and, if unsatisfactory conditions are present, to notify contractor in writing of such detrimental conditions. Do not proceed until unsatisfactory conditions have been corrected to Installer's acceptance.

F. Submittals:
   1. Manufacturer's Data, Gypsum Drywall: For information only, submit 2 copies of manufacturer's product specifications and installation instructions for each gypsum drywall system required, including other data as may be required to show compliance with these specifications. Distribute an additional copy of each installation instruction to the Installer.
   2. Standards, Gypsum Drywall; For information only, submit a current copy of GA-216 (by Gypsum Association), and distribute an additional copy to the Installer (current means in effect as of the date of these contract documents).

PRODUCTS

A. Gypsum Board Products and Accessories:
   1. Interior Exposed Gypsum Board: USG or Gold Bond, Firecode X Gypsum Panels or equal. Provide where indicated in 5/8" thickness, unless otherwise indicated.
   2. Exterior Gypsum Sheathing: USG, Fiberock Brand “AquaTough” or Gold Bond Brand “DensGlass” Gypsum Sheathing Panels, or equal. Provide where indicated in ½" thickness x 48" x 8'-12' as required.
   3. Gypsum Trim Accessories: Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge trim-beads, U-type edge trim-beads, special L-kerf-type edge trim-beads, and one-piece control joint beads.

EXECUTION

A. Installation of Gypsum Board:
   1. Preparations and Coordination:
      a. Pre-Installation Conference: Prior to the start of installation of gypsum board, meet at the project site with the installers of related work including work requiring openings, chases, frames, access panels, support and similar integrated requirements (including mechanical and electrical work). Review areas of potential interference and conflicts, and coordinate layout and sequencing requirements for proper integration of the work.
      b. Do not proceed with gypsum board installation until blocking, framing, bracing and other supports for subsequently applied work have been installed.
      c. Do not install gypsum board until thermal insulation to be concealed by board has been installed.

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d. Install sound attenuation blankets where indicated and where required to achieve STC ratings or fire resistance ratings, before installation has been installed.

2. General Installation Requirements:
   a. Standards: Comply with "Recommended Specifications for the Application and Finishing of Gypsum Board", GA-216, by the Gypsum Association except where more detailed or more stringent requirements are indicated herein or by the manufacturer's instructions and recommendations. Comply with requirements for indicated fire-resistance ratings.
   b. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 1'-0" in alternate courses of board.
   c. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force into place.
   d. Locate either edge or end joints over supports, except in horizontal applications or where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that both tapered edge joints abut, and mill-cut or field cut end joints abut. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
   e. Attach gypsum board to framing and blocking as required for additional support at openings and cutouts.
   f. Form control joints in drywall construction at minimum 30'-0" o.c., vertically above corners of all interior door and window frames, or where shown.
   g. Do not locate joints within 8" of corners or openings, except where control joints are shown at jamb lines or where openings occur adjacent to corners in the partition/wall layout. Where necessary, place a single vertical joint over the corners of wide openings.
3. Method of Gypsum Board Installation:
   a. General: In addition to compliance with the standards, comply with the specific requirements indicated for each type of arrangement of gypsum drywall system shown. Otherwise, options permitted by the standards, including manufacturer's recommendations, are Installer's option.
   b. Installation of Single-Layer Walls and Partitions: Install exposed gypsum board in the manner indicated. Where possible, apply sheets vertically and provide sheet lengths which will minimize end joints. Where height of work is less than 8'-2", sheets may be applied horizontally if maximum length available is used so as to minimize end joints. For parallel applications, locate edge joints over supports; for right-angle applications, stagger end joints over supports. Fasten with screws, or with nails where permitted. At "wet" areas indicated for tile finish, install water-resistant backing board. Apply horizontally with uncut edge at bottom of work, l/4" above fixture lip. Seal cut edges of each piece with water-resistant sealant before installation and seal around pipe penetrations and similar cut-outs in each sheet.

I. Installation of Drywall Trim Accessories:
   1. General: Coordinate, and integrate where possible, the installation of trim accessories with the installation of gypsum board. Where feasible, use the same fasteners to anchor

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trim accessory flanges as required to fasten gypsum board at the supports. Otherwise, fasten flanges by nailing or stapling in accordance with manufacturer's instructions and recommendations.

2. Install metal corner beads at external corners of drywall work.
3. Install metal edge trim wherever edge of gypsum board would otherwise be exposed or semi-exposed.
4. Install L-type trim beads (for joint compound) where edge is shown to be tightly fitted to abutting work (without reveal or sealant pocket).
5. Install U-type trim-beads (for joint compound) where edge is not tightly fitted to abuting work (exposed, revealed, sealant pocket, gasketed, or other separation), except as otherwise indicated.

6. Install J-type semi-finishing trip (not for joint compound) at the following locations and elsewhere as shown:
   a. Edges of exterior gypsum board not covered by applied moldings.
   b. On interior wall panels of exterior walls at the juncture with ceilings.
   c. At sealant-filled isolation joints and sound control joints, where gypsum drywall work abuts other construction (walls and ceilings).
   d. At sealant-filled or gasket-filled building expansion joints install back-to-back units spaced as shown (l/4" if not other is shown).
7. Install control joint bead units above corners of door and window frames, and where control joints are indicated.
8. Miter corners of exposed molding and trim (semi-finishing) units. Align joints and support to eliminate off-sets.

ACOUSTICAL PANEL CEILINGS

SUMMARY

This Section includes the following: Acoustical panel ceilings installed with exposed suspension systems. Exposed suspension system, and Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

SUBMITTALS

General: Submit the following in accordance with Specification Sections.
Product data for each type of product specified.

Samples for selection purposes in form of actual sections of acoustical units and suspension system members showing full range of colors, textures, and patterns available for each type of unit indicated.

6-inch-square samples of each acoustical panel type, pattern, and color.

Set of 12-inch-long samples of exposed suspension system members, including moldings and bulkhead trim, for each color and system type required.

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QUALITY ASSURANCE

Installer Qualifications: Engage an experienced installer who has completed acoustical panel ceilings similar in material, design and extent to that indicated for this Project and with a record of successful in-service performance.

Source Limitations for Ceiling Units: Obtain each acoustical panel from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

Source Limitations for Suspension System: Obtain each suspension system from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

Surface-burning characteristics of acoustical panels comply with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84.

DELIVERY, STORAGE, AND HANDLING

Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

PROJECT CONDITIONS

Environmental Limitations: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

COORDINATION

Coordinate layout and installation of acoustical ceiling units and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, and partition system (if any).

EXTRA MATERIALS

Deliver extra materials to Owner. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with appropriate labels.

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Acoustical Ceiling Units: Furnish quantity of full-size units equal to 1.0 percent of each type installed.

Exposed Suspension System Components: Furnish quantity of each exposed component equal to 1.0 percent of amount installed.

ACOUSTICAL CEILING UNITS, GENERAL

Standard for Acoustical Ceiling Units: Provide manufacturers' standard units of configuration indicated that comply with ASTM E 1264 classifications as designated by reference to types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.

ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING

General: The following acoustical ceiling units are intended for use at all areas of the building, except as noted otherwise.

Type, Form, and Finish: Provide type III, Form 2 units per ASTM E 1264 with painted finish that comply with pattern and other requirements indicated.

Acoustical Panel Ceiling in Restrooms and Wet Areas:

Perforated and Fissured Pattern: Units fitting ASTM E 1264 pattern designations C and E, with other panel characteristics as follows: Color/Light Reflectance Coefficient: White/LR 0.80 (min.). Color: White. Noise Reduction Coefficient: NRC 0.50, minimum. Ceiling Attenuation Class: Non-Fire Rated: CAC 35-39. Edge Detail: Square. Size: Nominal 24" X 24" by 5/8 inch thick. Warranty: Ten years to withstand temperature and humidity conditions up to 104 degrees F / 90% relative humidity without visible sag. Available Products: Subject to compliance with requirements, products which may be incorporated in the Work include, but are not limited to, the following: Mineral-Base Panels - Water Felted, with Painted Finish and Perforated and Fissured Pattern, Non-Fire-Resistance Rated: “Ceramaguard #605”, Lay-in Ceiling tile, with Armstrong ALPrelude XL, 15/16” aluminum grid, white, baked-on paint finish, grid with minimum 12 gauge aluminum hanger wires, Armstrong World Industries, Inc.

Acoustical Panel Ceiling in Corridors, Classrooms, Labs, offices:

Non-directional nominal 24” X 24” Armstrong – 1728 Fine Figured non-sag ceiling tile, USG Radar Clima Plus, or prior approved equivalent. Color to be White. 15/16” aluminum grid, white, baked-on paint finish, grid with minimum 12 gauge aluminum hanger wires, Armstrong World Industries, Inc.

METAL SUSPENSION SYSTEMS, GENERAL

Standard for Metal Suspension Systems: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable

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ASTM C 635 requirements.

Finishes and Colors: Provide manufacturer's standard factory-applied finish to match color of ceiling panels selected for each type of system indicated.

Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.

Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.

Gage: Provide wire sized so that stress at 3 times hanger design load (ASTM C 635, Table 1, Direct- Hung), will be less than yield stress of wire, but provide not less than 0.106-inch diameter (12 gage) except where required to support grid at light fixture, use 9 gage wire.

Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit type of edge detail and suspension system indicated.

NON-FIRE-RESISTANCE-RATED DIRECT-HUNG SUSPENSION SYSTEMS

Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross-runners roll-formed from pre-painted or electrolytic zinc-coated cold-rolled steel sheet, with pre-finished 15/16-inch-wide metal caps on flanges; other characteristics as follows:

Structural Classification: Intermediate-Duty System.

Cap Material and Finish: Steel cold-rolled sheet.

Areas of Lay-in Panel Installation: Steel sheet painted white.

EXAMINATION

Examine substrates and structural framing to which ceiling system attaches or abuts, with Installer present, for compliance with requirements specified in this and other sections that affect installation and anchorage of ceiling system. Do not proceed with installation until unsatisfactory conditions have been corrected.

PREPARATION

Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.

Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half-width units at borders, and comply with reflected ceiling plans.

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INSTALLATION

General: Install acoustical ceiling systems to comply with installation standard referenced below, per manufacturer's instructions and CISCA "Ceiling Systems Handbook."

Standard for Installation of Ceiling Suspension Systems: Comply with ASTM C 636.

Suspend ceiling hangers from building structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacing that interfere with the location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
3. Secure wire hangers by looping and wire-tying with a minimum of three tight turns, either directly to structures or to inserts, eye-screws, or other devices that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
4. Do not support ceilings directly from permanent metal forms; Fasten hangers to cast-in-place hanger inserts, power-actuated fasteners, or drilled-in anchors that extend through forms into concrete.
5. Do not attach hangers to steel deck tabs or to steel roof deck. Attach hangers to structural members.
6. Space hangers not more than 4'-0" O.C. along each member supported directly from hangers, unless otherwise shown, and provide hangers not more than 8 inches from ends of each member.
7. Install main beams perpendicular to the 6 inch wide Technical Panels.
8. In addition to hanger wire specified above, provide hanger wire at each of the following locations; secure to structure above.

    a) Two diagonally opposed corners of light fixture. Light fixture shall be independently supported from the ceiling suspension grid.
    b) Mid-span of all cross tees adjacent to light fixtures.
    c) Mid-span of all cross tees adjacent to air outlets.
    d) Adjacent to each main runner splice.

    Install edge moldings of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical units.

9. Apply acoustical sealant on all acoustically rated partitions in a continuous ribbon on back of vertical legs of moldings before they are installed.
10. Screw-attach moldings to substrate at intervals not over 16 inches O.C. and not

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more than 3 inches from ends, leveling with ceiling suspension system to tolerance of 1/8 inch in 12'-0". Miter corners accurately and connect securely.

11. Do not use exposed fasteners, including pop rivets, on moldings and trim.

Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations, including sprinkler head penetrations.

CLEANING

Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

PAINTING

GENERAL

A. Work Included: Comply with requirements of the Contract Documents and all applicable codes and regulations to provide painting and wall covering and related accessories, in the types and arrangements shown on the Drawings, as specified herein and as needed for a complete and proper installation.

B. Related Work: Comply with the relative requirements of other Sections, and the Drawings of the entire Contract Documents. The breakdown of this project manual into Sections shall not define any limit of work.

C. Quality Assurance: A specialty subcontractor, normally engaged in work required, with minimum 3 years of experience, capable of showing successful applications, shall perform the work of this Section.

D. Submittals:
   1. Product Data: Submit manufacturer's product data and installation instructions in accordance with contract documents..
   2. Color Samples: Submit manufacturer's color chips if requested by Owner.
   3. Job Samples: Request review of first finished room, space, or item of each color scheme required by Owner for color, texture, and workmanship. Use first acceptable room, space, or item as project standard. For spray application, paint surface not smaller than 100 square feet as project standard.

E. Handling: Deliver sealed containers with labels legible and intact. Store only acceptable

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project materials on project site in a suitable location. Restrict storage to paint materials and related equipment. Comply with health and fire regulations.

F. Site Conditions: Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be applied. Do not apply finish in areas where dust is being generated.

G. Extra Stock: Submit to Owner, at final inspection, one gallon of each type and final color of finish used on project.

PRODUCTS

H. Acceptable Manufacturers: Unless otherwise specified, materials shall be the products of the following manufacturers: Benjamin Moore, Devoe, Glidden, PPG, Sherwin-Williams and Tnemec. Materials selected for coating systems for each type surface shall be the product of a single manufacturer.

I. Materials: Products indicated on drawings shall match existing finishes. Similar products of acceptable manufacturers may be furnished in lieu of those listed.

J. Colors: Colors of paints (including shades of stains) shall match color chips submitted by Owner and shall match approved shades in sample areas.

K. Mixing and Tinting: Deliver paints and stains ready-mixed to job site. Accomplish job mixing and tinting only when acceptable to Architect. Mix only in mixing pails placed in suitably sized non-ferrous or oxide resistant metal pans. Use tinting colors recommended by manufacturer for the specific type of finish. Fungicidal agent shall be incorporated into the paint by the manufacturer.

L. Miscellaneous Materials: Thinners, cleaners, other materials shall be only as recommended by coatings manufacturer.

EXECUTION

M. Inspection: Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence, or quality of work and which cannot be put into an acceptable condition through preparatory work as included in Painting Preparation. Do not proceed with surface preparation or coating application until conditions are suitable.

N. Workmanship: Do all work under supervision of a capable foreman.

O. Coverage: Thoroughly cover with uniform color and finish; the number of coats specified being a minimum, provide any additional coats to produce work satisfactory to Architect.

P. Mechanical and Electrical Miscellaneous Items: Any primed or color painted, except aluminum or red (emergency), steel mechanical or electrical miscellaneous items,

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such as panel boards, grilles, primed hardware, etc. shall be painted to match adjacent surfaces, unless otherwise directed.

Q. Application: Strictly follow paint manufacture's application requirements and recommendations.

R. Moisture Content: Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer. Test with moisture meter (Delmhorst or equal).

S. Rate of Application: Apply paint, enamel, stain, and varnish with suitable brushes, rollers, or spraying equipment. Rate of application shall not exceed that recommended by paint manufacturer for the surface involved less ten percent allowance for losses. Keep equipment clean.

T. Drying Time: Comply with recommendation of product manufacturer for drying time between succeeding coats. Vary slightly the color of successive coats.

U. Coats: Sand and dust between each coat to remove defects visible from a distance of 5 feet. Finish coats shall be smooth, free of brush marks, streaks, laps, or pile up of paints, and skipped or missed areas. Do not apply additional coats until completed coat has been inspected by Owner. Only inspected coats of paint will be considered in determining number of coats applied. Apply primer and first coat on all glass frames and stops before glazing.

V. Refinishing: Refinish whole wall where portion of finish has been damaged or is not acceptable.

W. Back Priming: Back prime all exterior and interior woodwork and exterior plywood edges.

X. Cleaning: Touch-up and restore finish where damaged. Remove spilled, splashed, or splattered paint from all surfaces. Do not mar surface finish of item being cleaned. Leave storage space clean and in condition required for equivalent spaces in project.

Y. Surface Preparation:

1. General: Strictly follow paint manufacturer's surface preparation recommendations for all surfaces. Before painting surfaces, remove all dust, dirt, grease, rust or other matter affecting proper application of the paint or permanency of this work. All surfaces shall be dry and shall be sanded before applying any paint. If any surface to be finished cannot be put in proper condition for finishing by customary cleaning (power cleaning or washing), sanding or grinding, putty operations, notify Owner, in writing, or assume responsibility for and rectify any unsatisfactory finish resulting.
2. Wood: Sandpaper to smooth, even surface and then dust off. After priming or stain coat has been applied, thoroughly fill nail and other holes and cracks with plastic wood or putty; for natural finish wood, putty shall be colored to match wood.

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All knots, pitch streaks and sappy spots shall first be cleaned of residue and touched up with shellac where the finish coat is painted.

3. Steel, Iron and Hollow Metal Frames: Immediately after erection, all welded spots, scratches, and erection damage shall be carefully brushed, thoroughly cleaned and then spot primed with the shop primer specified. No finish paint shall be applied to any metal surface which has not been properly prepared. Any improperly prepared areas should be brought to the Contractor's attention so that he might take remedial action. Grinding or power brushing of rust spots on existing steel items may be required.
4. Gypsum Board: Fill, tape and sand all joinings in strict accordance with manufacturer's instructions to achieve smooth surface. All joints in all finished spaces, habitable rooms scheduled to receive no finish, unexposed ceilings and furrings, and on all fire walls and smoke partitions shall be taped and floated; sanding is not required in unfinished spaces.
5. Galvanized Iron: Clean thoroughly with solvent to remove grease, residue and corrosive products on the surface or with chemical washes used as directed by the manufacturer.

Z. Painting Schedule:

1. General: The following schedule indicates the number of coats and type paint or finish for various surfaces to be finished. All finishes are not applicable.
2. Interior Woodwork (Painted): Coat 1 - 8801 Primer tinted to finish color. Coat 2, 3 - 509XX.
3. Interior Woodwork (Stain): Coat 1 - Oil stain. Tint putty for nail holes to match finish color. Coats 2, 3, 4 - 6600 Satin Mirrothane. Use filler on open grain.
4. Gypsum Board: Coat 1 - Latex Primer 50801. Coats 2 and 3 - 38XX Wondertone Interior Acrylic Latex Semi-Gloss.
5. Miscellaneous Interior and Exterior Metal: Coat 1 - Mirrolac Cover Up Rust Penetrating Metal Primer #13102. Coats 2 and 3 - Mirrolac Cover Up Interior/Exterior Alkyd-Urethane Gloss Enamel 70XX Gloss.
6. Exterior Galvanized Steel: Coat 1 - Mirrolac Galvanized Metal Primer #13201. Coats 2 and 3 - Mirrolac Cover Up Interior/Exterior Alkyd-Urethane Gloss Enamel 70XX Gloss.
7. Interior Concrete Block (Epoxy): Coat 1 - 52901 Block Fill. Coats 2, 3 - Tru-Glaze 129XX Water Based Epoxy Gloss Coating.
8. Interior Concrete Block (Enamel): Coat 1 - 52901 Block Fill. Coats 2, 3 - 585XX Acrylic Satin Enamel.
9. Exterior Concrete Block: Coat 1 - 59201 Block Fill. Coats 2,3 - 16XX Satin Latex.
10. Exterior Split-Face Concrete Block (Field Applied Clear Sealer): 1 Coat - 49100 Devoe Super-Por-Seal Silicone Masonry Water Repellant. Apply by low pressure flood spray application.
11. Exposed Concrete: Coats 1, 2 - 481XX Re-New-Coat.
12. Exterior Wood (Painted): Coat 1 - 56302 Exterior Acrylic Latex Wood Primer. Coats 2, 3 - 11XX All Weather House Paint.
13. Exterior Wood (Stained): Coat 1, 2 - Olympic Transparent Wood Stain.
14. Exterior Plaster: Coats 1, 2 - 481XX Re-New-Coat.
15. Existing Brick Masonry: Same specification as Interior Concrete Block (Enamel).

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16. Mechanical and Electrical Equipment:
    a. Painting of equipment, piping, conduit, etc., in building and items exposed in building shall be painted as specified by Painting subcontractor.
    b. Exposed canvas covered pipe, electrical conduit, electric panels, intercom speakers (wall type), bells, ductwork, hangers and grills shall receive two coats of paint. Type paint and color shall be as selected by Owner.
    c. Factory finished equipment, including convection covers, unit ventilators, etc., which are damaged, scratched, etc., shall be retouched or painted completely as directed by Owner.

MECHANICAL GENERAL PROVISIONS

GENERAL:

The General Conditions of the Specifications, along with the supplementary conditions, special conditions, information to bidders, and any other pertinent information and documents shall apply the same as if repeated herein.

SCOPE OF WORK:

Furnish all labor and material necessary to provide and install the complete mechanical portion of this Contract for Air Conditioning, Heating and Ventilating Systems as called for herein and on accompanying drawings. Parts of the mechanical division may be bid separately or in combination, at the Contractor's option; however, it shall be the responsibility of the General Contractor to assure himself that all items covered in the Mechanical Division have been included if he chooses to accept separate bids.

This Contractor shall refer to the existing Architectural and Structural drawings and install equipment, piping, etc. to meet building and space requirements. No equipment shall be bid on or submitted for approval if it will not fit in the space provided.

It is the intention of these Specifications that all mechanical systems shall be furnished complete with all necessary valves, controls, insulation, piping, devices, equipment, etc. necessary to provide a satisfactory installation in working order.

Contractor shall visit the site and acquaint himself thoroughly with all existing facilities and conditions which would affect his portion of the work. Failure to do so shall not relieve the Contractor from the responsibility of installing his work to meet the conditions.

This Contractor shall protect the entire system and all parts thereof from injury throughout the project and up to acceptance of the work. Failure to do so shall be sufficient cause for the Owner to reject any piece of equipment.

DEMOLITION:

The contractor shall visit the site prior to bid to determine the extent of work required to

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complete the project.

Contractor shall coordinate demolition with owner. The Owner shall have "First Right of Refusal" regarding salvage of all equipment and materials to be removed. Locate equipment as directed by owner. All equipment and materials not salvaged by the owner shall be removed from the site and discarded at the contractor's expense.

Contractor shall coordinate all work with the Owner and phase work as required by project.

All equipment piping, etc. required to be removed to accommodate the modifications shall be removed.

Contractor shall maintain services to existing facilities which shall remain during and after construction is complete.

Contractor shall coordinate any shutdown of services with the owner. It is intended that the building will remain occupied during construction. Contractor shall schedule shut down of services with the owner in order to prevent disruption of building occupancy.

Contractor shall be responsible for draining down of existing systems to complete demolition work in phases. All work shall be scheduled with the owner. Contractor shall also be responsible for refilling system and removing all air in order to return the systems to proper operating conditions.

All shut-down of services shall be done at night or during a time period approved by the owner. The systems shall be required to be back up and running each morning unless otherwise approved by the owner.

GROUNDS AND CHASES:

This Contractor shall see that all required chases, grounds, holes and accessories necessary for the installation of his work are properly built in as the work progresses; otherwise, he shall bear the cost of providing them.

CUTTING AND PATCHING:

Initial cutting and patching shall be the responsibility of the Contractor. The Mechanical Contractor shall be responsible for laying out and marking any and all holes required for the reception of his work. No structural beams or joists shall be cut or thimbled without first receiving the approval of the Owner. After initial surfacing has been done, any further cutting, patching and painting shall be done at the Contractor's expense.

FILL AND CHARGES FOR EQUIPMENT:

Fill and charge with materials or chemicals all those devices or equipment as required to comply with the manufacturer's guarantee or as required for proper operation of the equipment.

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REPAIRING ROADWAYS AND WALKS:

Where this Contractor cuts or breaks roadways or walks, in order to lay piping, he shall repair or replace these sections to meet the Architect's approval.

EXCAVATION AND BACKFILL:

Contractor shall perform all excavating necessary to lay the specified services. Perform excavation of every description and of whatever substance encountered to depths indicated or specified. Pile materials suitable for backfilling a sufficient distance from banks of trenches to prevent slides or cave-ins. Comply with OSHA requirements for excavation, trenching and shoring. Waste excavation materials, rubbish, etc. shall be carted away from the premises, as indicated. Remove water from trenches by pumping or other approved method, discharge at a safe distance from the excavation.

Provide trenches of necessary width for proper laying of pipe and comply with latest publication of OSHA 2226 Excavating and Trenching Operations. Coordinate trench excavation with pipe installation to avoid open trenches for prolonged periods. Accurately grade bottoms of trenches to provide uniform bearing and support for each section of pipe on undisturbed soil or the required thickness of bedding material at every point along its entire length.

Provide minimum 12 inches between outer surfaces and embankment or shoring, which may be used, when excavating for manholes and similar structures. Remove unstable soil that is incapable of supporting the structure in the bottom of the excavation to the depth necessary to obtain design bearing.

Material to be excavated is “unclassified”. No adjustment in the contract price will be made on account of the presence or absence of rock, shale, masonry, or other materials.

Protect existing utility lines that are indicated or the locations of which are made known prior to excavating and trenching and that are to be retained. Protect utility lines encountered during excavating and trenching operations, from damage during excavating, trenching and backfilling; if damaged, repair lines as directed by utilities, owner and A/E. Issue notices when utility lines that are to be removed are encountered within the area of operations in ample time for the necessary measures to be taken to prevent interruption of the service.

Provide trenches for utilities of a depth that will provide the following minimum depths of cover from existing grade or from indicated finished grades, whichever is lower:

a. 1-Foot Minimum Cover: Sanitary sewer, storm drainage, industrial waste, acid waste.
b. 2-Foot Minimum Cover: Domestic water, fire line.

Backfill trenches after piping, fittings and joints have been tested and approved.

Backfill trenches with sand to provide 6 inches of sand below piping and 12 inches of sand cover above piping.

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Backfill remainder of trenches with satisfactory material consisting of earth, loam, sandy clay, sand and gravel or soft shale, free from large clods of earth and stones not over 1-1/2 inches in size. Deposit backfill material in 9 inch maximum layers, loose depth as indicated or as specified. Take care not to damage utility lines.

Deposit the remainder of backfill materials in the trench in 1 foot maximum layers and compact by mechanical means. Refer to architectural for minimum density for compaction (Minimum 85 percent of maximum soil density as determined by ASTM D 698). Re-open trenches and excavation pits improperly backfilled or where settlement occurs to the depth required to obtain the specified compaction, the refill and compact with the surface restored to the required grade and compaction.

Backfill utility line trench with backfill material, in 6 inch layers, where trenches cross streets, driveways, building slabs, or other pavement. Moisten each layer and compact to 95 percent of the maximum soil density as determined by ASTM D 698. Accomplish backfilling in such a manner as to permit the rolling and compaction of the filled trench with the adjoining material to provide the required bearing value so that paving of the area can proceed immediately after backfilling is complete.

WELDING:

Weld piping and above grade steel tanks in accordance with qualified procedures using performance qualified welders and welding operators. Qualified procedures and welders in accordance with ASME Section IX. Welding procedures qualified by others and welders and welding operators qualified by another employer may be accepted as permitted by ANSI B31.1. Notify the A/E 24 hours in advance of tests, and perform the tests at the work site if practicable. Furnish A/E with a copy of qualified procedures and a list of names and identification symbols of qualified welders and welding operators. Apply welders or welding operators assigned symbols near each weld they make as permanent record.

ACCESS DOORS:

Provide access doors in walls, floors and ceilings to permit access to equipment and piping requiring service or adjustment:

1. Valves.
2. Manual balancing dampers and automatic control dampers.
3. Fire dampers, smoke dampers and smoke/fire dampers.
4. Air terminal units.
5. Duct mounted filters and coils.
6. Plumbing drainage cleanouts.
7. Kitchen hood exhaust ductwork in accordance with NFPA requirements.
8. Other mechanical equipment indicated in mechanical equipment schedules requiring maintenance, adjustment or operation.

Provide hinged access doors and frames as follows:

1. Drywall Construction

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a. Provide with concealed spring hinges and flush screwdriver operated cam locks in sufficient number of the size of the panel.
b. Provide prime paintable surface (not galvanized).
c. Product: Milcor "Style DW" (Karp RDW).
2. Visible Masonry and Ceramic Tile: Milcor "Style M" (Karp DSC-210).
3. Gypsum and cement plaster: Milcor "Style K" (KarpDSC-214 PL)
4. Acoustical Plaster:
a. Reinforced panel as required to prevent sagging. Provide continuous steel piano type hinge for the length of the panel, and sufficient number for the size of the panel. Provide factory prime paint surface (not galvanized).
b. Product: Milcor "Style AP" (Karp 214 PL).
5. Acoustical Tile: Milcor "Style AT" (Larsen L-CPA).

Provide continuous concealed hinges and cam locks.

Provide UL listed 1-1/2 hour label "B" access doors with automatic self-closing latching mechanism where required.

Provide removable ceiling access tile section immediately adjacent to each mechanical or electrical device located in the ceiling plenum above removable tile ceiling.

Coordinate approval and location of access doors with A/E.

CLEANING AND ADJUSTING:

Upon completion of his work, the Contractor shall clean and adjust all equipment, controls, valves, etc.; clean all piping, ductwork, etc.; and leave the entire installation in good working order.

OPERATING AND MAINTENANCE INSTRUCTIONS:

Provide services of authorized representatives of the manufacturer to ensure that the equipment is installed according to the manufacturer's recommendations and is operating properly and to instruct the owner's operating personnel during start-up and operating tests of complete mechanical systems. Prove proper operation of equipment to the Owner. Notify the Owner seven (7) days prior to beginning equipment start-up.

Certify in writing that these services have been performed.

Provide the Owner with three (3) copies of printed instructions indicating various pieces of equipment by name and model number, complete with parts lists, maintenance and repair instructions and test and balance report.

COPIES OF SHOP DRAWINGS WILL NOT BE ACCEPTABLE AS OPERATION AND MAINTENANCE INSTRUCTIONS.

This information shall be bound in plastic hardbound notebooks with the job name permanently

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embossed on the cover. Rigid board dividers with labeled tabs shall be provided for different pieces of equipment. Submit manuals to the Owner for approval.

In addition to the operation and maintenance brochure, the Contractor shall provide a separate brochure which shall include registered warranty certificates on all equipment, especially any pieces of equipment which carry warranties exceeding one (1) year.

The operation and maintenance brochure shall be furnished with a detailed list of all equipment furnished to the project, including the serial number and all pertinent nameplate data such as voltage, amperage draw, recommended fuse size, rpm, etc. The Contractor shall include this data on each piece of equipment furnished under this contract.

SERVICE:

Inspect, clean and service air filters and strainers immediately prior to final acceptance of project.

Provide lubrication for operation of equipment until final acceptance of the equipment by the Owner. Protect bearings during installation and thoroughly grease steel shafts to prevent corrosion. Provide extended lubrication lines for parts requiring lubrication which are concealed or inaccessible.

Provide complete and working charge of proper refrigerant, free of contaminants, into each refrigerant system. After each system has been in operation long enough to ensure completely balanced condition, check the charge and modify it for proper operation as required.

Place mechanical systems in complete working order and clean and polish fixtures, equipment and materials thoroughly returning to “as new” condition prior to request for final review.

Remove excess material and debris. Clean out lines and fittings and adjust valves. Broom clean areas. Thoroughly clean ductwork inside and outside before grilles are installed.

GUARANTEE:

The Contractor shall guarantee all materials, equipment and workmanship for a period of one (1) year from the date of Notice of Final Acceptance of the project. This guarantee shall include furnishing of all labor and material necessary to make any repairs, adjustments or replacement of any equipment, parts, etc. necessary to restore the project to first class condition. During this period, make good faults or imperfections that may arise due to defects or omissions in materials or workmanship with no additional compensation and as directed by the Owner. This guarantee shall exclude only the changing or cleaning of filters. Warranties exceeding one (1) year are hereinafter specified with individual pieces of equipment.

If the Contractor's office is in excess of a one hundred fifty (150) mile radius of the project, he shall appoint a local qualified contractor to perform any emergency repairs or adjustments

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required during the guarantee period. The name of the contractor appointed to provide emergency services shall be submitted to the Owner for his approval.

LOCAL CONDITIONS:

The location and elevation of all utility services is based on available plans and are reasonably accurate; however, these shall serve as a general guide only, and the Contractor shall visit the site and verify the location and elevation of all services to his satisfaction in order to determine the amount of work required for the execution of the Contract.

In case major changes are required, this fact, together with the reasons therefor, shall be submitted to the Owner, in writing, not less than seven (7) days before the date of bidding. Failure to comply with this requirement will make the Contractor liable for any changes, additions and expenses necessary for the successful completion of the project.

PERMITS, INSPECTIONS AND TESTS:

All permits, fees, etc. for the installation, inspections, plan review, service connections locations, equipment inspections and/or construction of the work which are required by any authority and/or agencies having jurisdiction, shall be obtained and paid for by the Contractor throughout the duration of the project.

The Contractor shall make all tests required by the Owner or other governing authorities at no additional cost to the Owner.

The Contractor shall notify the Owner and local governing authorities before any tests are made, and the tests are not to be drawn off a line covered or insulated until examined and approved by the authorities. In event defects are found, these shall be corrected and the work shall be retested.

Prior to requesting final inspection by the Owner, the Contractor shall have a complete coordination and adjustment meeting of all of his sub-contractors directly responsible for the operation of any portion of the system. At the time of this meeting, each and every sequence of operation shall be checked to assure proper operation. Notify the Owner in writing ten (10) days prior to this meeting, instructing him of the time, date and whom you are requesting to be present.

This project shall not be accepted until the above provisions are met to the satisfaction of the Owner.

CODES AND STANDARDS:

The entire mechanical work shall comply with the rules and regulations of the City, Parish and State in which this project is being constructed, including the State Fire Marshal ,State Office of Public Health, Local Heath Unit, OSHA, ANSI. All modifications required by these authorities

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shall be made without additional charge to the Owners. The Mechanical Contractor shall report these changes to the Owner and secure his approval before work is started.

In addition to the codes heretofore mentioned, all mechanical work and equipment shall conform to the applicable portions of the following specifications, codes and/or regulations:

1. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
2. National Electrical Code (NEC)
3. National Fire Protection Association (NFPA)
4. American Society of Mechanical Engineers (ASME)
5. American Gas Association (AGA)
6. Building Code (Latest local approved with local amendments)
7. Mechanical Code (Latest local approved with local amendments)
8. Fuel Gas Code (Latest local approved with local amendments)
9. Underwriters Laboratories (UL)
10. Louisiana State Plumbing Code (Latest local approved with local amendments)

All materials, equipment and accessories installed under this Contract shall conform to all rules, codes, etc. as recommended by National Associations governing the manufacturer, rating and testing of such materials, equipment and accessories. All materials shall be new and of the best quality and first class in every respect. Whenever directed by the Owner, the Contractor shall submit a sample for approval before proceeding.

Where laws or local regulations provide that certain accessories such as gauges, thermometers, relief valves and parts be installed on equipment, it shall be understood that such equipment be furnished complete with the necessary accessories, whether or not called for in these Specifications.

All unfired pressure vessels shall be built in accordance with the A.S.M.E. Code and so stamped. Furnish shop certificates for each vessel.

REVIEW OF MATERIALS:

Whenever manufacturers or trade names are mentioned in these Plans or Specifications, the words "or Prior Approved Equivalent" shall be assumed to follow whether or not so stated. Manufacturers or trade names are used to establish a standard of quality only, and should not be construed to infer a preference. Equivalent products which meet the Owner's approval will be accepted; however, these products must be submitted to the Owner a minimum of ten (10) days prior to the Bid Date. Faxed copies or electronic submissions via E-Mail will not be accepted.

Submission shall include the manufacturer's name, model number, rating table and construction features.

Upon receipt and checking of this submittal, the Owner will issue an addendum listing items

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which are approved as equivalent to those specified. THE CONTRACTOR SHALL BASE HIS BID SOLELY ON THOSE ITEMS SPECIFIED OR INCLUDED IN THE "PRIOR APPROVAL ADDENDUM", AS NO OTHER ITEM WILL BE ACCEPTABLE.

Prior approval of a particular piece of equipment does not mean automatic final acceptance and will not relieve the Contractor of the responsibility of assuring himself that this equipment is in complete accordance with the Plans and Specifications and that it will fit into the space provided. Shop drawings must be submitted on all items of equipment for approval as hereinafter specified.

Before proceeding with work and/or within thirty (30) days after the award of the General Contract for this work, the Mechanical Contractor shall furnish to the Owner complete shop and working drawings of such apparatus, equipment, controls, insulation, etc. to be provided in this project. These drawings shall give dimensions, weights, mounting data, performance curves and other pertinent information.

The Owner's approval of shop drawings shall not relieve the Contractor from the responsibility of incorrectly figured dimensions or any other errors which may be contained in these drawings. Any omission from the shop drawings or specifications, even though approved by the Owner, shall not relieve the Contractor from furnishing and erecting same.

Ten (10) sets of shop drawings shall be submitted to the Owner for approval. These submittals shall be supplied as part of this Contractor's contract. Any drawings not approved shall be resubmitted until they are approved. SUBMIT ALL SHOP DRAWINGS AT THE SAME TIME. NO SEPARATE ITEMS WILL BE ACCEPTED. Faxed copies and electronic submissions via E-Mail will not be accepted.

MINOR DEVIATIONS:

Plans and detail sketches are submitted to limit, explain and define conditions, specified requirements, pipe sizes and manner of erecting work. Structural or other conditions may require certain modifications from the manner of installation shown, and such deviations are permissible and shall be made as required. However, specified sizes and requirements necessary for satisfactory operation shall remain unchanged. It may be necessary to shift ducts or pipes, or to change the shape of ducts, and these changes shall be made as required. All such changes shall be referred to the Owner for approval before proceeding. Extra charges shall not be allowed for these changes. The contractor shall obtain a full set of plans and specifications for the coordination of his work prior to bidding this project. Items which are unclear to the bidding contractor shall be brought to the Owner’s attention prior to bidding the project. An interpretation shall be clarified by the Owner prior to bidding.

The Contractor shall realize that the drawings could delve into every step, sequence or operation necessary for the completion of the project, without drawing on the Contractor's experience or ingenuity. However, only typical details are shown on the Plans. In cases where the Contractor is not certain about the method of installation of his work, he shall ask for details. Lack of details will not be an excuse for improper installation.

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In general, the drawings are diagrammatic and the Contractor shall install his work in a manner so that interferences between the various trades are avoided. In cases where interferences do occur, the Owner is to state which item was first installed.

AS-BUILT DRAWINGS:

The Contractor shall obtain at his cost, two sets of black-line prints of the original bid documents by the Owner. One set shall be kept on the site with all information as referenced below, and shall update same as the work progresses. The other set will be utilized to record all field changes to a permanent record copy for the Owner.

If the Contractor elects to vary from the Contract Documents and secures prior approval from the Owner for any phase of the work, he shall record in a neat and readable manner, **ALL** such variances on the black-line print in red. The original blue lines shall be returned to the Owner for documentation.

All deviations from sizes, locations, and from all other features of the installations shown in the Contract Documents shall be recorded.

In addition, it shall be possible using these drawings to correctly and easily locate, identify and establish sizes of all piping, directions and the like, as well as other features of the work which will be concealed underground and/or in the finished building.

Locations of underground work shall be established by dimensions to columns, lines or walls, locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.

For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases this may be by dimension. In others, it may be sufficient to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. The Owner's decision in this matter will be final.

The following requirements apply to all "As-Built" drawings:

(1) They shall be maintained at the Contractor's expense.
(2) All such drawings shall be done carefully and neatly, and in a form approved by the Owner.
(3) Additional drawings shall be provided as necessary for clarifications.
(4) These drawings shall be kept up-to-date during the entire course of the work and shall be available upon request for examination by the Owner; and when necessary, to establish clearances for other parts of the work.
(5) "As-built" drawings shall be returned to the Owner upon completion of the work and are subject to approval of the Owner.

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MANUFACTURER'S DIRECTION:

The mechanical contractor shall install and operate all equipment and materials in strict accordance with the manufacturer's installation and operating instructions. The manufacturer's instructions shall become part of the Contract Documents and shall supplement the Drawings and Specifications.

Store equipment in a clean, dry place protected from other construction. While stored, maintain factory wrapping or tightly cover and protect equipment against dirt, water, construction debris, chemical, physical or weather damage, traffic and theft.

LABELING MECHANICAL EQUIPMENT:

All mechanical equipment (Air Handling Units, Condensing Units, Fan Coil Units, Fans, Thermostats, HVAC Equipment, etc.) furnished under Division 15 of contract documents shall be labeled with permanent laminated plate secured to equipment. Units shall be labeled as indicated on plans and schedules and with commissioning addresses used by the manufacturer.

BASIC MATERIALS AND METHODS

PIPE:

REFRIGERANT LINES:

These shall be Government Type "L" hard copper.

At contractor’s option, piping for ductless mini-split systems and Variable Refrigerant Flow systems may be ACR type L refrigerant soft tubing. Tubing shall be properly straightened for clean straight installation and all bends shall be made with a conduit bender. Excessive bends, curves, etc. in the installations will not be accepted.

CONDENSATE DRAIN LINES:

All such lines shall be Schedule 40 PVC plastic pipe and fittings with solvent weld joints. Install trap at all air handling equipment.

Provide air gap between the indirect waste and the building drainage system in accordance with Louisiana State Plumbing Code (Latest local approved with local amendments).

All condensate drain lines between the AHU or FCU Unit and the independent condensate drainage system shall be Schedule 40 PVC plastic pipe and fittings with solvent weld joints.

Install trap at all air handling equipment.

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Condensate Drainage System Pipe shall be supported at no more than 5 ft. intervals with steel hangars secured in the existing structure above.

CHILLED WATER PIPING (Above Slab/Grade):

Shall be standard black steel, Schedule 40. Fittings two inches and below shall be malleable screw fittings. Piping above two inches shall be electrically welded utilizing welded fittings. All elbows shall be long radius type.

Utilize dielectric unions between steel and copper piping.

All new piping, valves and fittings shall be coated with rust-inhibiting primer coat prior to insulation.

HOT WATER PIPING (Above Slab/Grade):

Shall be standard black steel, schedule 40. Fittings two inches and below shall be malleable screw fittings. Piping above two inches shall be electrically welded utilizing welded fittings. All elbows shall be long radius type.

Utilize dielectric unions between steel and copper piping.

All new piping, valves and fittings shall be coated with rust-inhibiting primer coat prior to insulation.

INSTALLATION OF PIPING:

All pipe shall be true and straight, without sags or traps.

The Contractor shall exercise care in cleaning joints after making cuts on pipe to prevent pipe particles from entering the system.

All pipe fittings shall be same as piping specified unless indicated otherwise.

Arrange, install piping approximately as indicated, straight, plumb and as direct as possible; form right angles, or parallel lines with building walls. The most practical appearance of piping runs is required. Keep pipes close to walls, partitions, ceilings; off-set only where necessary to follow walls as directed.

Before installing piping, check plumbing and HVAC drawings with architectural, mechanical, structural, electrical drawings; make accurate layout of HVAC piping. Where interferences may appear and departures from indicated arrangements are required, consult with other trades involved; come to agreement as to changed locations and elevations of piping; obtain approval of proposed changes. Note runs of other contractor's piping and large conduits and cooperate to

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achieve neat appearance.

Unless otherwise indicated, conceal all piping in building construction in finished areas. Install such piping in time so as not to cause delay to work of other trades and to allow ample time for tests and approval; do not cover before approval is obtained.

Locate groups of pipes parallel to each other and building lines; space them at distance to permit access for servicing, valves, and to create most practical appearance when racked with conduits, refrigerant, etc., provided by other contractors.

Rigidly support pipes projecting from walls, chases, etc. to make firm, well-braced installation. Loosely supported pipe or accessory is not acceptable.

Install horizontal piping to coordinate with other trades and install without sags or humps.

Grade inside condensate piping at uniform slope of 1/4 inch per foot, minimum; where this is impossible, maintain slope as directed but in no case less than 1/8 inch per foot. Waste lines 3 inches and smaller must grade at minimum 1/4 inch per foot. See Drawings for fall on exterior sewer lines.

Grade other piping as specified under heading or service where used, or as directed.

Keep piping free from scale and dirt, protect open pipe ends wherever work is suspended during construction. To prevent foreign bodies entering and lodging in pipe, use temporary plugs or other approved material.

Where changes in pipe sizes occur, do not bush down; use only reducing fittings. For drainage piping changes in direction, use long-sweep-bends where possible; otherwise, short sweep 1/4 bends or combination Y and 1/8 bends; also Y's in combination with other bends.

Provide shut off valves at all connections to all equipment. Supplier of equipment shall provide rough-in drawings and this contractor shall fully connect all items, supply necessary piping and fittings as required, unless otherwise noted individually.

Do not locate valves with stems below horizontal.

Locate valves for easy access and operations. Where concealed, verify exact location in order that openings are provided for access panels. Provide access panels.

Provide unions, screwed or flanged, where indicated, and in following locations even if not indicated.

1. In connection to equipment requiring disconnection for repairs or replacement. Locate between shut-off and equipment.

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Weld-O-let fittings shall be used in iron pipe.

All screwed fittings and pipe shall have threads cut to standard pipe thread dimensions. Pipe shall be properly reamed after cutting of threads.

Joint compound, Rector Seal Series 100, LACO Series Slick-Tite or equal thread lubricant shall be applied to male threads of the screwed pipe and fittings only.

Approved expansion joints or flexible couplings shall be provided as necessary.

Care shall be taken in making up pipe and fittings such that the pipe does not extend into fitting sufficiently to reduce the waterway.

Standard, one-piece reducing fittings of approved design shall be used wherever a change in size is made. Changes in pipe sizes shall not be made by means of reducing flanges.

Bushings may be used only where standard, one-piece reducing fittings are not available and shall be subject to the following:

(1) Bushings shall be of the face or flush type.
(2) Bushings shall not be used in elbow fittings.
(3) Bushings shall not be used when the reduction in size of the outlet is less than 1/2".
(4) Bushings shall not be used in more than one outlet of any tee or two outlets of any cross fitting.

PIPE SPECIALTIES:

Dielectric unions shall be used between copper and iron pipe.

RATED WALL OR FLOOR PENETRATIONS:

Piping penetrating fire rated walls, floors, or ceilings shall be sealed with fire rated sealant in accordance with the manufacturer’s recommendations for the specific U.L. Assembly.

Piping penetrating fire rated walls or ceilings shall be sealed with fire rated sealant in accordance with the manufacturer’s recommendations for the specific U.L. Assembly.

PIPE HANGERS AND SUPPORTS:

This Contractor shall furnish and install all foundations and supports required for his equipment unless indicated otherwise on the Drawings.

This Contractor shall furnish and install all escutcheons, inserts, thimbles, hangers, etc. required for the proper support and installation of his equipment and piping and he shall cooperate with

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other trades in locating and placing these items.

PROVIDE SLEEVES FOR ALL PIPES PASSING THROUGH WALLS, FLOORS, BEAMS, ETC.:

Sleeves passing through structural members or concrete footings shall be of cast iron or Schedule 40 steel pipe. Sleeves passing through nonstructural walls or floors shall be of 26 gauge galvanized iron. Joints between sleeves and pipes passing through floors shall be made weather-tight with plastic materials. Where pipes pass through water proofing membrane, flashing sleeves shall be installed.

Provide Grinnell, Fee & Mason, or equivalent malleable iron split ring hangers with rod supports throughout. STRAP HANGERS OR WIRE WILL NOT BE ACCEPTED.

Maximum spacing of hangers for cast iron pipes shall be 5 ft.
Provide galvanized iron shields between hangers and pipe covering.

Provide Grinnel, Fee & Mason, Crane or equivalent heavy steel riser clamps on vertical risers at floors to support pipes.

Provide chrome plated brass escutcheons wherever pipes pass through floors, walls or ceilings in exposed or finished areas.

All piping projecting from chases shall be rigidly supported in the wall or chase. Loosely supported fixtures or accessories will not be accepted.

VALVES AND UNIONS:

Furnish and install all valves, unions, stops, connections, etc. shown on plans as necessary to make a complete system in working order. Provide valves on inlet and outlet of all equipment and fixtures and on branch lines to fixtures or groups of fixtures.

Ball Valves, 3" and smaller, rated for 150 PSI saturated steam pressure, 600 PSI WOG pressure; shall be 2-piece construction, bronze body conforming to ASTM B-62, conventional port, chrome-plated brass ball, replaceable TFE seats and seals, blow-out proof stem, and vinyl-covered steel handle. Provide solder ends for HVAC chilled water and HVAC hot water service of Kitz 59/69, Apollo 77C, NIBCO Design S-580-70, Milwaukee BA-150-S, Red & White 5049F or equal, threaded ends of Kitz 58/68, NIBCO Design T-580-70, Milwaukee BA-100-S, Red & White 5044F or equal. For insulated piping systems, provide ball valves with extended stem, insulated handle with protective thermal barrier sleeve to prevent condensate moisture drip and pipe insulation deterioration.

Select Valves with the following ends or types of pipe/tube connections:

Copper Tube Size 2 Inch and Smaller: Solder ends, except provide threaded ends for heating hot

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water.

Steel Pipe Sizes, 2 Inch and Smaller: Threaded or grooved end.

Steel Pipe Sizes, 2-1/2 Inch and Larger: Grooved end or flanged.

INSTALLATION OF VALVES:

Use ball valves for shut-off duty.

Locate valves for easy access and provide separate support where necessary.

Install valves and unions for each fixture and item of equipment arranged to allow equipment removal without system shutdown. Unions are not required on flanged devices.

Install valves in horizontal piping with stem at or above the center of the pipe.

Install valves in a position to allow full stem movement.

All valves, unions, etc. where pipe is chrome plated shall have similar finish. All exposed supplies to plumbing fixtures shall be chrome plated.

All valves, on insulated piping shall be complete with extended lever handle stem.

ESCUTCHEONS:

Provide escutcheons for all exposed lines passing through floors, walls, and ceilings. They shall be chrome plated brass and shall be of such flange size as to cover necessary penetrating openings.

TEST:

Make such tests of work as specified, or required by Owner, Manufacturer, or by State and Municipal Bureaus having jurisdiction, and under their supervision. Perform tests in presence of Owner's representative. Notify Owner two days prior to testing.

Provide apparatus, temporary piping connections, or other requirements necessary for tests. Take precautions to prevent damage to building or contents by tests. Contractor is required to repair and make good at his expense damage so caused.

Correct leaks, defects, or deficiencies discovered as result of tests. Repeat tests until test requirements are met. Caulking of pipe joints to remedy leaks is not permitted.

ELECTRICAL WORK:

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The Mechanical Contractor shall coordinate with the Electrical Contractor for installation of equipment. All electrical work not indicated on the electrical drawings that is required to provide a complete operable HVAC System shall be the responsibility of the Mechanical Contractor. The Mechanical Contractor shall provide sub-contractor(s) capable of preforming the required scope of work. All work shall be coordinated with the Electrical drawings.

ACCESS PANELS:

Furnish and install access panels where valves, dampers, control boxes, etc. are concealed in walls, ceilings, floors, or otherwise inaccessible or where specifically called for on plans. Panels shall be Milcor Style DW, or Bar-Co. Model 500, J-L Industries Model WB, or equal sized as required and furnished with prime coat finish.

INSULATION

GENERAL:

Pipe insulation shall not begin until all work has been tested and found to be tight. All insulation jackets, adhesives, sealers, tapes and mastic shall meet the latest NFPA requirements and shall meet 25/50 flame spread and smoke developed ratings.

All insulation shall be installed in strict accordance with the manufacturer's recommendations.

All pipe insulation where recommended by the manufacturer shall be banded with aluminum bands, three to a section and with one band on each side of each fitting, valve, etc.

Insulation shall be continuous through walls and ceilings.

All valves, strainers, etc. shall be insulated the same as its adjacent piping and the covering shall extend all the way up to the equipment.

USE HIGH DENSITY INSULATION INSERTS AT HANGERS ON ALL PIPING 1.5" AND ABOVE TO PREVENT CRUSHING OF INSULATION.

THERMAL INSULATION:

After all work has been tested and approved, insulate as follows:

INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.

CONDENSATE DRAIN PIPING:

All condensate drain lines between the AHU, FCU, or Outdoor Air Unit and the independent

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condensate drainage system shall be insulated with ½" thick flexible closed cell elastomeric thermal tube pipe insulation as manufactured by Armaflex AP, Rubatex or prior approved equal. All joints are to be firmly butted together. All lamp and butt joint strips are to be sealed in place with vapor barrier adhesive. Fittings are to be mitered segments of insulation held in place with vapor barrier sealant. Engineered Polymer Foam Insulation (EPFI) will not be accepted. Insulation shall be applied in accordance with manufacturer's recommendations and instructions. Insulation shall be rated for use in return air plenum applications.

All condensate drain lines on the outside of the building exposed to the weather shall be covered with 0.016 smooth aluminum jacket and elbows. At contractor's option, in lieu of 0.016 aluminum jacket, the contractor may use Venture Clad 1577CW multi-layered laminate coated, acrylic pressure sensitive adhesive jacket system.

INDEPENDENT CONDENSATE DRAINAGE SYSTEM PIPING AND P-TRAPS:

Independent Condensate Drainage System Pipe and associated P-traps receiving HVAC condensate (exposed, in walls, in furrings, or above ceilings) (vertical and horizontal drain and vent lines) shall be insulated with 2" thick 3/4 # density fiberglass ductwrap insulation with aluminum foil vapor barrier. Insulation shall be sealed at all seams and joints. Insulation shall be installed with a foil backed adhesive tape around the diameter of the pipe with insulation at 24" on center intervals.

SANITARY SEWER WASTE PIPING (Receiving A/C Condensate):

All vertical and Horizontal sanitary sewer drain lines located above the ground level slab shall be insulate with ½" thick flexible closed cell elastomeric thermal tube pipe insulation as manufactured by Armaflex AP, Rubatex or prior approved equal. All joints are to be firmly butted together. All lap and butt joint strips are to be sealed in place with vapor barrier adhesive. Fittings are to be mitered segments of insulation held in place with vapor barrier sealant. Engineered Polymer Foam Insulation (EPFI) will not be accepted. Insulation shall be applied in accordance with manufacturer's recommendations and instructions. Insulation shall be rated for use in return air plenum applications.

At contractor's option, on piping not exposed to the weather and where space is available, piping may be covered with 2.125" thick 3/4# density fiberglass insulation with aluminum foil vapor barrier.

WASTE LINE P-TRAPS:

P-traps receiving HVAC condensate (above ceilings, in walls or chases) and horizontal drain lines up to vertical stacks shall be insulated with 2" thick 3/4 # density fiberglass ductwrap insulation with aluminum foil vapor barrier. Vertical stacks shall be insulated one foot above and one foot below sanitary tee. Insulation shall be sealed at all seams and joints.
REFRIGERANT LINES:

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Insulate with 3/4" close cell elastomeric thermal tube insulation as manufactured by Armaflex AP, Rubatex or prior approved equivalent. All joints are to be firmly butted together. All lap and butt joint strips are to be sealed in place with vapor barrier adhesive. Fittings are to be mitered segments of insulation held in place with vapor barrier sealant. Engineered Polymer Foam Insulation (EPFI) will not be accepted. Insulation shall be applied in accordance with manufacturer's recommendations and instructions.

Apply two coats of weatherproof mastic on all piping below grade or exposed to weather.

All refrigerant lines for ductless mini-split systems, Variable Refrigerant Flow systems (liquid, gas, and Recovery piping) shall be insulated.

All refrigerant lines on the outside of the building exposed to the weather shall be covered with 0.016 smooth aluminum jacket and elbows. At contractor's option, in lieu of 0.016 aluminum jacket, the contractor may use Venture Clad 1577CW multi-layered laminate coated, acrylic pressure sensitive adhesive jacket system.

All refrigerant lines within the crawl space below the building shall be covered with 0.016 smooth aluminum jacket and elbows. At contractor's option, in lieu of 0.016 aluminum jacket, the contractor may use Venture Clad 1577CW multi-layered laminate coated, acrylic pressure sensitive adhesive jacket system.

Contractor shall install refrigerant lines below grade in watertight PVC sleeve in accordance with manufacturer's recommendations. Ends shall be sealed with water tight sealant.

HVAC DUCTWORK INSULATION:

Low Pressure (existing and new) (excluding double wall insulated ductwork) outside air shall be wrapped on outside with 2.125" minimum thickness, 3/4# density, minimum installed R-value of R-6.0, fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per the manufacturer's recommendations. This is in addition to any internal lining as indicated in Section 15750.

Secure insulation with vapor barrier and seal jacket joints with vapor barrier adhesive or tape to match jacket. Install without sag on underside of ductwork. Use 4"wide strips of adhesive (Foster 85-60 or Childers CP-127 water based adhesive) on 8 inch centers or mechanical fasteners 12" on center to prevent sagging. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping. Cover seams, joints, pin penetrations and other breaks with Foster 30-65 or Childers CP-34 vapor barrier coating reinforced with reinforced glass cloth. Reinforcing mesh shall be Foster Mast A Fab or Childers Chil Glas #10.

Insulation shall have a minimum R-value of R-6 if located in an unconditioned space or R-8 if located outside of building.

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Refer to air distribution section of mechanical specifications for low pressure duct insulation supplied by the sheet metal sub-contractor.

HVAC FLEX-CONNECTIONS:

Shall be wrapped on outside with 2.125" minimum thickness, 3/4# density, minimum installed R-value of R-6.0, fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per the manufacturer's recommendations.

Insulation shall have a minimum R-value of R-6 if located in an unconditioned space or R-8 if located outside of building.

SUPPLY AIR DIFFUSERS WITH PLENUMS:

Plenums shall be completely covered with 2.125" minimum thickness, 3/4# density, minimum installed R-value of R-6.0, fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per the manufacturer's recommendations. Overlap insulation 6" around perimeter of diffuser.

FIRE DAMPERS, SMOKE DAMPERS AND COMB. FIRE/SMOKE DAMPERS:

Shall be wrapped on outside with 2.125" minimum thickness, 3/4# density, minimum installed R-value of R-6.0, fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per the manufacturer’s recommendations.

Insulation shall have a minimum R-value of R-6 if located in an unconditioned space or R-8 if located outside of building.

CHILLED WATER SUPPLY AND RETURN PIPING:

Where contractor removes or damages existing chilled water pipe insulation during the project, insulate lines with foamglass or approved equivalent pipe covering with factory applied Flame Bar Jacket to pipe with all joints firmly butted together. Seal all laps and butt joint strips with vapor barrier adhesive. Fittings to be insulated with pre-fabricated fitting covers and finished with an envelope coverage of solvent based, vapor barrier mastic reinforced with Foster 30-35, Childers CP-30LO, Insulacoustic 501-C or prior approved equal. Coat all service jacket (ASJ) seams with same vapor barrier coating to prevent moisture ingress.

Seal all Foamglass insulation butt and longitudinal joints with Foster 95-50 or Childers CP-76 sealant. Thickness to be 1" thick for pipe sizes up to and including 2", 1.5" thick for pipe sizes from 2.5" to 6", and 2" thick for pipe sizes 8" and above.

Finish entire installation with a white 0.020 PVC covering fittings with clear solvent weld joints and seams suitable for installation in return air plenum.

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Lines on the exterior of the building shall be covered with smooth 0.016 aluminum jacket and elbows. Seal all laps of metal jacketing with Foster 95-44 or Childers CP-76 sealant with 1/8" bead under each lap.

At Contractor's Option: Pipe insulation may be Armaflex closed cell elastomeric foam insuation with self-seal longitudinal seal sealer. Insulation thickness shall be 2" thick for pipe diameters 1.5" diameter and above. Insulation thickness may be 1" thick for piping 1" diameter and below. Insulation shall be firmly butted together and seams shall be sealed with Armaflex 520, Foster 85-75, or Childers CP-82 adhesive. Fabricated fittings shall be used at all elbows and tees. Armafix IPH, NPH Pipe Hangers shall be used at all supports. The entire installation shall be coated with two (2) coats of Armaflex WB, or Foster 30-64. Finish white water-based latex enamel coating or prior approved equivalent prior installing PVC or Aluminum Jacket. PVC and Aluminum Jackets with sheet metal saddles at supports shall be required as noted above.

HOT WATER HEATING SUPPLY AND RETURN LINES:

Where contractor removes or damages existing HVAC hot water pipe insulation during the project, insulate lines above grade with 3.5 pound density fiberglass pipe covering. Finish to be factory applied flame safe vapor barrier jacket sealed and stapled in place.

Thickness to be 1/2" for run-outs up to and including 2" and 1.5" thick for other pipe sizes.

Finish entire installation with white 0.020 PVC covering and fittings similar to above.

At Contractor's Option: Pipe insulation may be Armaflex closed cell elastomeric foam insuation with self-seal longitudinal seal sealer. Insulation thickness shall be 2" thick for pipe diameters 1.5" diameter and above. Insulation thickness may be 1" thick for piping 1" diameter and below. Insulation shall be firmly butted together and seams shall be sealed with Armaflex 520, Foster 85-75, or Childers CP-82 adhesive. Fabricated fittings shall be used at all elbows and tees. Armafix IPH, NPH Pipe Hangers shall be used at all supports. The entire installation shall be coated with two (2) coats of Armaflex WB, or Foster 30-64. Finish white water-based latex enamel coating or prior approved equivalent prior installing PVC or Aluminum Jacket. PVC and Aluminum Jackets with sheet metal saddles at supports shall be required as noted above.
Lines on the exterior of the building shall be covered with smooth 0.016 aluminum jacket and elbows. Seal all laps of metal jacketing with Foster 95-44 or Childers CP-76 sealant with 1/8" bead under each lap.

INSULATION THROUGH HANGERS AND SLEEVES:

The insulation shall be continuous through pipe hangers and pipe sleeves. At hangers where the pipe is supported by insulation, provide a galvanized iron protection shield. Provide pipes 1.5-inch I.P.S. and larger with insulation inserts at points of hanger supports. The inserts shall be of calcium silicate, cellular glass, pre-stressed molded glass fiber of minimum 13-pound density, or other approval material of the same thickness as adjacent insulation and not less than 13-pound density. The inserts shall have sufficient compression strength to adequately support the pipe

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without compressing the inserts to a thickness less than the adjacent insulation. Inserts shall be 180 degrees and not less than the length of the protection shield. Vapor barrier facing of the insert shall be the same as the facing on the adjacent insulation. Where copper clad hangers are used on domestic copper pipe, insulation may cover pipe and hanger. Provide 18 gauge metal saddles between all hangers and insulation.

INSULATION THROUGH FLANGES, VALVES, ELBOWS, ETC.:

The insulation shall be continuous around flanges, valves, elbows, and other devices located in the piping system. Provide fiberglass packing around devices where rigid insulation will not meet the contour of the device. Cover insulation with universal jacket and vapor barrier mastic and reinforcing mesh Fosters 30-35, Childers CP-30LO, Insulacoustic 501-C or prior approved equal. Cover entire installation as indicated above.

PLUMBING

GENERAL:

Furnish all labor and materials as hereinbefore specified, indicated or reasonably implied for the complete installation of the following systems:

Condensate Drainage System

HUB DRAIN (MARKED "HD"):

Contractor shall install “Trap Guard” in all new and existing condensate drainage system traps. Provide Proset Systems trap guard TG22 for 2" diameter condensate hub drains. Where different size hub drains are used, contractor shall install proper trap guard to accommodate pipe size.

AIR CONDITIONING, HEATING AND VENTILATING

GENERAL:

The air conditioning system, in general, shall be for the entire building, providing cooling and dehumidification in summer and heating in winter. A constant amount of fresh air shall be taken into the system and all air shall be filtered.

VARIABLE REFRIGERANT FLOW EQUIPMENT:

The variable capacity, heat pump heat recovery air conditioning system shall be a Mitsubishi Electric CITY MULTI VRFZ (Variable Refrigerant Flow Zoning) System. The systems shall provide simultaneous cooling and heating split system outdoor units and indoor units.

The simultaneous systems shall consist of an outdoor units, BC (Branch Circuit) Controller(s) (Single, Main, or Main with Sub(s), multiple indoor units, and Direct Digital Controls. The

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simultaneous outdoor unit shall be a vertical discharge type unit.

The units shall be listed by Electrical Laboratories (ETL) and bear the ETL label.
Equipment shall meet the latest requirements of ASHRAE 90.1 2010 Standards.
All wiring shall be in accordance with the National Electrical Code (N.E.C.).

A full charge of R-410A for the condensing unit only shall be provided in the condensing unit. The contractor shall provide refrigerant as required to properly charge the refrigerant piping system.
Units shall be stored and handled according to the manufacturer's recommendation.

The units shall be covered by the manufacturer's limited warranty for a period of one (1) year from date of substantial completion of the project. The contractor shall be responsible for one (1) years labor warranty for the entire installation (including but not limited to material/equipment provided by the owner.

Contractor shall be responsible for (1) one year parts and labor warranty for all materials furnished and installed by the contractor.

Contractor shall also be responsible for any refrigerant lost during the (1) one year warranty period resulting from any leaks that develop.
The contractor shall provide the following system features:

1) The system, refrigerant piping, and controls designed by a factory certified Designer.
2) The system, refrigerant piping, and controls shall be installed by a certified Dealer.
3) The entire system shall be verified with a completed commissioning report submitted to the manufacturer by a factory authorized agent. The units shall then be covered by an extended manufacturer's limited warranty for a period of five (5) years from date of installation. The contractor will be required to provide a certified designer, Commissioning Report, etc.

In addition the compressors shall have a manufacturer's limited warranty for a period of six (6) years from date of substantial completion of the project.

If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

This extended warranty shall not include labor.

The VRF system shall be installed by an authorized manufacturer's Dealer with extensive manufacturer's installation and service training. The mandatory contractor service and installation training should be performed by the equipment manufacturer.

In order to obtain the manufacturer's extended warranty, the contractor installing the VRF equipment must have completed the installation, service and designer training prior to first date

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of advertisement for bids for this project. A minimum of two (2) people must be actively employed by the contractor and have certificates showing successful completion of the installation, service and designer training by an approved VRF manufacturer. The sub-contractor shall only bid on equipment that they have completed the training (noted above) from the manufacturer of the product that the contractor intends to use on the project prior to bid date of the project. Training certificates must be submitted with the construction schedule and schedule of values at the Pre-Construction Conference at the beginning of the project.

The mechanical contractor shall be responsible for informing the electrical contractors bidding the project of any differences in electrical required by specific manufacturers (e.g.: individual motor rated switches for Refrigerant Flow Controllers (e.g.: BC, etc.), additional power wiring, etc.) to accommodate a specific manufacturer. These modification required to accommodate a manufacturer shall be provided at no additional cost to the owner.

Refrigerant piping throughout the entire project shall be installed in accordance with manufacturer's recommendations. The manufacturer shall provide a qualified representative to visit the site (minimum of 2 visits) to review installation and submit a written report indicating that the system is being installed in accordance with the manufacturer's recommendations.

All refrigerant piping shall be installed in accordance with manufacturer's recommendations with proper spacing between joints, between joints and elbows, between elbows and refrigerant flow controllers, etc. Refrigerant Flow Diagrams and control wiring diagrams shall be included with shop drawings.

OUTDOOR UNIT (SIMULTANEOUS COOLING & HEATING)

The outdoor unit shall be used specifically with approved manufacturer's components. The system shall consist of the outdoor unit, Branch Circuit (BC) Controller, indoor units, and DDC (Direct Digital Controls). The outdoor units shall be equipped with multiple circuit boards that interface to the controls system and shall perform all functions necessary for operation. The outdoor unit shall have a powder coated finish. The outdoor unit shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory.

The sum of connected capacity of all indoor air handlers shall range from 50% to 150% of outdoor rated capacity (or as approved by the equipment manufacturer).

Outdoor unit shall have a sound rating no higher than 63 dB(A).

All refrigerant lines from the outdoor unit to the BC (Branch Circuit) Controller (Single or Main) shall be insulated.
The outdoor unit shall have an accumulator with refrigerant level sensors and controls.
The outdoor unit shall have a high pressure safety switch, over-current protection and DC bus protection.
The outdoor unit shall have the ability to operate with a maximum height difference of 164 feet and have total refrigerant tubing length of 984-1312 feet. The greatest length is not to exceed 492

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feet between outdoor unit and the indoor units without the need for line size changes or traps. Limits shall be approved by the manufacturer.

The outdoor unit shall be capable of operating in heating down to -4°F ambient temperature without additional low ambient controls.

The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained.

Unit Cabinet shall be fabricated of galvanized steel, bonderized and finished with a powder coated baked enamel.

Fan: The outdoor unit shall be furnished with one direct drive or two direct drive, variable speed propeller type fans. All fan motors shall have inherent protection, have permanently lubricated bearings, and be completely variable speed. All fan motors shall be mounted for quiet operation. All fans shall be provided with a raised guard to prevent contact with moving parts. The outdoor unit shall have vertical discharge airflow.

Refrigerant: R410A refrigerant shall be required for VRF systems.

Coil: The outdoor coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing. The coil shall be protected with an integral metal guard. Refrigerant flow from the outdoor unit shall be controlled by means of an inverter driven compressor. The outdoor coil shall include 4 circuits with two position valves for each circuit, except for the last stage.

Compressor: The outdoor units shall be equipped with one inverter driven scroll hermetic compressor, or one inverter driven scroll hermetic compressor and one scroll hermetic compressor. A crankcase heater(s) shall be factory mounted on the compressor(s). The outdoor unit compressor shall have an inverter to modulate capacity. The capacity shall be completely variable down to 16% of rated capacity. The compressor will be equipped with an internal thermal overload. The compressor shall be mounted to avoid the transmission of vibration.

Electrical: The outdoor unit electrical power shall be as indicated on drawings. The outdoor unit shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253V (230V/60Hz). The outdoor unit shall be controlled by integral microprocessors. The control circuit between the indoor units, BC Controller and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

BRANCH CIRCUIT (BC) CONTROLLERS FOR SIMULTANEOUS COOLING & HEATING:

The BC (Branch Circuit) Controllers shall be specifically used with R410A simultaneous cooling & heating systems. These units shall be equipped with a circuit board that interfaces to the controls system and shall perform all functions necessary for operation. The unit shall have a

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galvanized steel finish. The BC Controller shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory. This unit shall be mounted indoors. The sum of connected capacity of all indoor air handlers shall range from 50% to 150% of rated capacity (or as recommended by the manufacturer).

Each BC Controller branch shall connect to indoor unit(s) (except heat pump systems) not exceeding 54,000 Btu/h per branch. BC Controller models and number of branch shall be in accordance with the manufacturer's requirements.

BC Unit Cabinet: The casing shall be fabricated of galvanized steel. Each cabinet shall house a liquid-gas separator and multiple refrigeration control valves. The unit shall house two tube-in-tube heat exchangers.

Refrigerant: R410A refrigerant shall be required for BC Controllers in conjunction with other VRF system components.

Refrigerant valves: The unit shall be furnished with multiple two position refrigerant valves. Each circuit shall have one (54,000 Btu/h or smaller indoor unit section) two-position liquid line valve and a two-position suction line valve. When connecting a 54,000 Btu/h or larger indoor unit section, two branch circuits shall be joined together at the branch controller to deliver an appropriate amount of refrigerant. The two refrigerant valves shall operate simultaneously. Linear electronic expansion valves shall be used to control the variable refrigerant flow. Integral Drain Pan: An integral condensate pan and drain shall be provided.

Each indoor and outdoor unit shall be provided with service stop valves with service port on the liquid, gas, and/ recovery lines. The valves shall be located adjacent to the unit to allow the unit to be serviced and/or removed and/or installed in the system without the need to shut down the entire system. The service port with stop valve shall also be located at the refrigerant line connection of the BC Controller for each fan coil unit and each outdoor unit connection.

The contractor shall adjust the refrigerant in the piping system as units are serviced, removed, or added to the system.

Electrical: The unit electrical power shall be as indicated on drawings. The unit shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253V (230V/60Hz). The BC Controller shall be controlled by integral microprocessors. The control circuit between the indoor units and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

Each unit shall be complete with a Plasma Air needle point brush type ionizer. The device shall be completely installed within the indoor unit by the product supplier.

WALL MOUNTED INDOOR UNIT:

The wall-mounted indoor unit section shall have a slim silhouette and shall have a modulating

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linear expansion device. The unit shall be used with the simultaneous cooling and heating outdoor unit and BC Controller or heat pump outdoor unit. The unit shall support individual control using DDC controllers.

Each system shall perform in accordance to the ratings shown in the table below. Performance shall be based on nominal cooling conditions of 80°FDB, 67°FWB for the indoor unit and 95°FDB for the outdoor unit and nominal heating conditions of 70°FDB for the indoor unit and 47°FDB, 43°FWB for the outdoor unit.

Indoor Unit: The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

Unit Cabinet: The casing shall have a white finish. Multi directional drain and refrigerant piping offering four (4) directions for refrigerant piping and two (2) directions for draining shall be standard. There shall be a separate back plate which secures the unit firmly to the wall.

Fan: The indoor fan shall be an assembly with one or two line-flow fan(s) direct driven by a single motor. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings. A manual adjustable guide vane shall be provided with the ability to change the airflow from side to side (left to right). A motorized air sweep louver shall provide an automatic change in airflow by directing the air up and down to provide uniform air distribution. The indoor fan shall consist of various speeds, as indicated in below table.

Filter: Return air shall be filtered by means of an easily removable, washable filter.

EXTRA MATERIALS: The supplier shall provide two (2) sets of filters for each indoor unit. Filters shall be turned over to the owner at the completion of the project.

Coil: The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy. The coils shall be pressure tested at the factory. A plastic or stainless steel condensate pan and drain shall be provided under the coil. Both refrigerant lines to the indoor units shall be insulated.

Each indoor unit shall be provided with service stop valves with service port on the liquid, gas, and/ recovery lines. The valves shall be located adjacent to the unit to allow the unit to be serviced and/or removed and/or installed in the system without the need to shut down the entire system.

CONDENSATE DRAIN CONNECTION: The contractor shall remove the plastic condensate hose clamp (at the indoor unit connection) on each unit. Furnish and install a stainless steel hose clamp on the condensate drain hose (at the indoor unit connection) on each unit. The stainless

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steel hose clamp shall be appropriately sized to create a water tight seal.

Electrical: The unit electrical power shall be as indicated on drawings. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz)

Controls: This unit shall use controls provided by the manufacture to perform functions necessary to operate the system.

Each unit shall be complete with a Plasma Air needle point brush type ionizer. The device shall be completely installed within the indoor unit by the product supplier.

CEILING SUSPENDED INDOOR UNIT:

The ceiling-suspended indoor unit section providing powerful airflow and shall have a modulating linear expansion device. The unit shall be used with the simultaneous cooling and heating outdoor unit and BC Controller(s) or heat pump outdoor unit. The unit shall support individual control using DDC controllers.

Each system shall perform in accordance to the ratings shown in the table below. Performance shall be based on nominal cooling conditions of 80°FDB, 67°FWB for the indoor unit and 95°FDB for the outdoor unit and nominal heating conditions of 70°FDB for the indoor unit and 47°FDB, 43°FWB for the outdoor unit.

Indoor Unit: The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

Unit Cabinet: The casing shall have a white finish.

Fan: The indoor unit fan shall be an assembly with two, three, or four Sirocco fan(s) direct driven by a single motor. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.

The indoor fan shall consist of four (4) speeds, Low, Mid1, Mid2, and High.

Filter: Return air shall be filtered by means of an easily removable, washable filter.

EXTRA MATERIALS: The supplier shall provide two (2) sets of filters for each indoor unit. Filters shall be turned over to the owner at the completion of the project.

Coil: The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints

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shall be brazed with phos-copper or silver alloy. The coils shall be pressure tested at the factory. A plastic or stainless steel condensate pan and drain shall be provided under the coil. All refrigerant lines to the indoor units shall be insulated.

Each indoor unit shall be provided with service stop valves with service port on the liquid, gas, and/ recovery lines. The valves shall be located adjacent to the unit to allow the unit to be serviced and/or removed and/or installed in the system without the need to shut down the entire system.

CONDENSATE DRAIN CONNECTION: The contractor shall remove the plastic condensate hose clamp (at the indoor unit connection) on each unit. Furnish and install a stainless steel hose clamp on the condensate drain hose (at the indoor unit connection) on each unit. The stainless steel hose clamp shall be appropriately sized to create a water tight seal.

Electrical: The unit electrical power shall be as indicated on drawings. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz)

Controls: This unit shall use controls provided by manufacture to perform functions necessary to operate the system.

Each unit shall be complete with a Plasma Air needle point brush type ionizer. The device shall be completely installed within the indoor unit by the product supplier.

CEILING RECESSED CASSETTE INDOOR UNIT:

The ceiling-mounted indoor unit section shall have a modulating linear expansion device. The unit shall be used with the simultaneous cooling and heating outdoor unit and BC Controller(s) or heat pump outdoor unit. The unit shall support individual control using DDC controllers.

Each system shall perform in accordance to the ratings shown in the table below. Performance shall be based on nominal cooling conditions of 80°F DB, 67°F WB for the indoor unit and 95°F DB for the outdoor unit and nominal heating conditions of 70°F DB for the indoor unit and 47°F DB, 43°F WB for the outdoor unit.

Indoor Unit: The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

Unit Cabinet: The casing shall have a white finish. There shall be a supply/return grille located below the ceiling with 4-way supply air flow and center return grille. The unit shall be provided with an outdoor intake tap and taps for extending supply duct to remote ceiling grilles.

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The unit shall have an integral condensate pump.

Fan: The indoor fan shall be an assembly with one fan, direct driven by a single motor. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings. A 4-way manual adjustable guide vane shall be provided with the ability to change the airflow. The indoor fan shall consist of various speeds, as indicated in below table.

Filter: Return air shall be filtered by means of an easily removable, washable filter.

EXTRA MATERIALS: The supplier shall provide two (2) sets of filters for each indoor unit. Filters shall be turned over to the owner at the completion of the project.

Coil: The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy. The coils shall be pressure tested at the factory. A plastic or stainless steel condensate pan and drain shall be provided under the coil. Both refrigerant lines to the indoor units shall be insulated.

Each indoor unit shall be provided with service stop valves with service port on the liquid, gas, and/ recovery lines. The valves shall be located adjacent to the unit to allow the unit to be serviced and/or removed and/or installed in the system without the need to shut down the entire system.

CONDENSATE DRAIN CONNECTION: The contractor shall remove the plastic condensate hose clamp (at the indoor unit connection) on each unit. Furnish and install a stainless steel hose clamp on the condensate drain hose (at the indoor unit connection) on each unit. The stainless steel hose clamp shall be appropriately sized to create a water tight seal.

Electrical: The unit electrical power shall be as indicated on drawings. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz)

Each unit shall be complete with a Plasma Air needle point brush type ionizer. The device shall be completely installed within the indoor unit by the product supplier.

FLOOR MOUNTED INDOOR UNIT:

The floor-mounted indoor unit section shall have a modulating linear expansion device. The unit shall be used with the simultaneous cooling and heating outdoor unit and BC Controller(s) or heat pump outdoor unit. The unit shall support individual control using DDC controllers.

Each system shall perform in accordance to the ratings shown in the table below. Performance shall be based on nominal cooling conditions of 80°F DB, 67°F WB for the indoor unit and 95°F DB for the outdoor unit and nominal heating conditions of 70°F DB for the indoor unit and 47°F DB, 43°F WB for the outdoor unit.

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Indoor Unit: The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

Unit Cabinet: The casing shall have a white finish. There shall be a supply/return grille located at the top/bottom. The supply and return grilles shall be heavy duty powder coated grilles custom made for each unit.

Fan: The indoor fan shall be an assembly with fan, direct driven by a single motor. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings. The indoor fan shall consist of various speeds, as indicated in below table.

Filter: Return air shall be filtered by means of an easily removable, washable filter.

EXTRA MATERIALS: The supplier shall provide two (2) sets of filters for each indoor unit. Filters shall be turned over to the owner at the completion of the project.

Coil: The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy. The coils shall be pressure tested at the factory. A plastic or stainless steel condensate pan and drain shall be provided under the coil. Both refrigerant lines to the indoor units shall be insulated.

Each indoor unit shall be provided with service stop valves with service port on the liquid, gas, and/ recovery lines. The valves shall be located adjacent to the unit to allow the unit to be serviced and/or removed and/or installed in the system without the need to shut down the entire system.

CONDENSATE DRAIN CONNECTION: The contractor shall remove the plastic condensate hose clamp (at the indoor unit connection) on each unit. Furnish and install a stainless steel hose clamp on the condensate drain hose (at the indoor unit connection) on each unit. The stainless steel hose clamp shall be appropriately sized to create a water tight seal.

Electrical: The unit electrical power shall be as indicated on drawings. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz)

Controls: This unit shall use controls provided by the manufacture to perform functions necessary to operate the system.

Each unit shall be complete with a Plasma Air needle point brush type ionizer. The device shall be completely installed within the indoor unit by the product supplier.

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Provide security type grilles (Titus Model CT-581) in place of supply grilles. An additional security grille will be placed over the return air portion of the unit. The plastic thermostat covers for the units shall be replaced with 26ga sheet metal covers of equal size. All exposed screws on the unit shall be replaced with security type screws. All modified components shall be powder coated with the same color as the replaced parts. All components shall be installed by the equipment manufacturer prior to delivery to the contractor.

CONTROLS

The Controls Network shall be capable of supporting remote controllers, schedule timers, system controllers, centralized controllers, an integrated web based interface, graphical user workstation, and system integration to Building Management Systems via BACnet®.

The Controls Network shall operate at 24VDC. Controller power and communications shall be via a common non-polar communications bus.

Control wiring shall be installed in a system daisy chain configuration from the indoor unit(s) to remote controller for indoor unit(s), and to the outdoor unit. Control wiring to remote controllers shall be run from the indoor unit terminal block to the controller associated with that unit. Control wiring for schedule timers, system controllers, and centralized controllers shall be installed in a daisy chain configuration from outdoor unit to outdoor unit, to system controllers, to the power supply.

Control wiring for the Simple controllers shall be from the remote controller to the first associated indoor unit then to the remaining associated indoor units in a daisy chain configuration.

The system controller shall be capable of being networked with other system controllers for web based control.

Wiring type:

Wiring shall be 2-conductor (16 AWG or 18 AWG), twisted shielded pair, stranded wire, as defined by the Design Tool AutoCAD output.

Network wiring shall be CAT-5e with RJ-45 connection.

The Controls Network (CMCN) shall be capable of supporting remote controllers, schedule timers, system controllers, centralized controllers, an integrated web based interface, graphical user workstation, and system integration to Building Management Systems via BACnet®.

The CMCN shall operate at 24VDC. Controller power and communications shall be via a common non-polar communications bus.

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Control wiring shall be installed in a system daisy chain configuration from indoor unit to ME remote controller to indoor unit, to the BC controller (main and subs, if applicable) and to the outdoor unit. Control wiring to remote controllers shall be run from the indoor unit terminal block to the controller associated with that unit.

Control wiring for schedule timers, system controllers, and centralized controllers shall be installed in a daisy chain configuration from outdoor unit to outdoor unit, to system controllers, to the power supply.

Control wiring for the Deluxe, Simple, and Wireless remote controllers shall be from the remote controller to the first associated indoor unit then to the remaining associated indoor units in a daisy chain configuration.

The system controller shall be capable of being networked with other system controllers for web based control.

Wiring type:

Wiring shall be 2-conductor (16 AWG or 18 AWG), twisted shielded pair, stranded wire, as defined by the Design Tool AutoCAD output.
Network wiring shall be CAT-5e with RJ-45 connection.

The Controls Network (CMCN) shall consist of remote controllers, schedule timers, system controllers, centralized controllers, and integrated web based interface communicating over a high-speed communication bus. The Controls Network shall support operation monitoring, scheduling, error email distribution, personal browsers, tenant billing, online maintenance support, and integration with Building Management Systems (BMS) using BACnet® interfaces.

The Wall Mounted Remote Controller shall be capable of controlling up to 16 indoor units (defined as 1 group). The Wall Mounted Remote Controller shall be compact in size, approximately 3” x 5” and have limited user functionality. The Wall Mounted Remote Controller shall allow the user to change on/off, temperature setting, and fan speed setting. The room temperature shall be complete with a temperature sensor with the controller so that space temperature to control the respective unit(s) will be sensed at either the Wall Mounted Remote Controller or the Indoor Unit (temperature sensor in the return air) dependent on the indoor unit dip-switch setting. The Wall Mounted Remote Controller shall display a four-digit error code in the event of system abnormality/error. All temperatures shall be displayed and/or communicated in degrees Fahrenheit.

The Wall Mounted Remote Controller shall only be used in same group with up to two remote controllers per group.
The Wall Mounted Remote Controller shall require no addressing. The Wall Mounted Remote Controller shall connect using two-wire, stranded, non-polar control wire to TB15 connection terminal on the indoor unit. The controller shall require cross-over wiring for grouping across indoor units.

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(Simple Remote Controller)			
Item	Description	Operation	Display
ON/OFF	Run and stop operation for a single group	Each Group	Each Group
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat. Operation modes vary depending on the air conditioner unit. Auto mode is in the simultaneous only.	N/A	Each Group
Temperature Setting	Sets the temperature for a single group. Range of temperature setting Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F	Each Group	Each Group
Fan Speed Setting	Models with 4 air flow speed settings: Hi/Mid-2/Mid-1/Low Models with 3 air flow speed settings: Hi/Mid/Low Models with 2 air flow speed settings: Hi/Low	Each Group	Each Group
Air Flow Direction Setting	Not Available	N/A	N/A
Timer Operation	Not Available	N/A	N/A
Permit / Prohibit Local Operation	Individually prohibit operation of each local remote control function (Start/Stop, Change operation mode, Set temperature, Reset filter). *1: Centrally Controlled is displayed on the remote controller for prohibited functions.	N/A	Each Group *1
Display Indoor Unit Intake Temp	Not Available	N/A	N/A
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed	N/A	Each Unit
Test Run	Operates air conditioner units in test run mode. *2 The display for test run mode will be the same as for normal start/stop (does not	Each Group	Each Group *2

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	display “test run”).		

The Centralized Controller shall be capable of controlling a maximum of 50 indoor units across multiple outdoor units. The Centralized Controller shall be approximately 5”x12” in size and shall be powered from a Power Supply Unit. The Centralized Controller shall support operation superseding that of the remote controllers, system configuration, daily/weekly scheduling, monitoring of operation status, and malfunction monitoring. The Centralized Controller shall have five basic operation controls which can be applied to an individual indoor unit, a group of indoor units (up to 50 indoor units), or all indoor units (collective batch operation). This basic control set of operation controls for the Centralized Controller shall include on/off, operation mode selection (cool, heat, auto (simultaneous cool/heat only, dry, and fan), temperature setting, fan speed setting, and airflow direction setting. Centralized control shall be able to enable or disable operation of local remote controllers. In terms of scheduling, the Centralized Controller shall allow the user to define both daily and weekly schedules with operations consisting of ON/OFF, mode selection, temperature setting, and permit/prohibit of remote controllers. All temperatures shall be displayed and/or communicated in degrees Fahrenheit.

(Centralized Controller)			
Item	Description	Operation	Display
ON/OFF	Run and stop operation for a single group	Each Group or Collective	Each Group or Collective
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat. (Group of Lossnay unit: automatic ventilation/vent-heat/interchange/normal ventilation) Operation modes vary depending on the air conditioner unit. Auto mode is in the simultaneous cool/heat only.	Each Group or Collective	Each Group
Temperature Setting	Sets the temperature for a single group. Range of temperature setting: Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F * Range of temperature setting varies depending on the model.	Each Group or Collective	Each Group
Fan Speed Setting	Models with 4 air flow speed settings: Hi/Mid-2/Mid-1/Low Models with 3 air flow speed settings: Hi/Mid/Low	Each Group or Collective	Each Group

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	Models with 2 air flow speed settings: Hi/Low		
Air Flow Direction Setting	Air flow direction angles 100%-80%-60%-40%, Swing, *1. Louver cannot be set. Air flow direction settings vary depending on the model.	*1 Each Group or Collective	Each Group
Timer Operation	Start/Stop and Enable/Disable can be set 3 times in one day. For a week's schedule, store three start/stop patterns and one enable/disable pattern. *2 When the timer is set, "Timer Enabled" is shown on the operation setting screen of the LCD.	Each Group or Collective	*2 Each Group
Permit / Prohibit Local Operation	Individually prohibit operation of each local remote control function (Start/Stop, Change operation mode, Set temperature, Reset filter). *3: Centrally Controlled is displayed on the remote controller for prohibited functions.	Each Group or Collective	*3 Each Group
Display Indoor Unit Intake Temp	Measures and displays the intake temperature of the indoor unit when the indoor unit is operating.	N/A	Each Group
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed *4 When an error occurs, the LED flashes. The operation monitor screen shows the abnormal unit by flashing it. The error monitor screen shows the abnormal unit address, error code and source of detection. The error log monitor screen shows the time and date, the abnormal unit address, error code and source of detection	N/A	*4 Each Unit or Collective
Test Run	Operates air conditioner units in test run mode.	Each Group	Each Group
Ventilation Equipment	This interlocked system settings can be performed by the master system controller. When setting the interlocked system, use the ventilation switch the free plan LOSSNAY settings between "Hi", "Low" and "Stop".	Each Group	Each Group

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	When setting a group of only free plan LOSSNAY units, you can switch between "Normal ventilation", "Interchange ventilation" and "Automatic ventilation".		
External Input / Output	By using accessory cables you can set and monitor the following. Input By level: "Batch start/stop", "Batch emergency stop" By pulse: "batch start/stop", "Enable/disable remote controller" Output: "start/stop", "error/Normal" ?5: Requires the external I/O cables (PAC-YG10HA-E) sold separately.	*5 Collective	*5 Collective

All Centralized Controllers shall be equipped with one RJ-45 Ethernet port to support interconnection with a network PC via a closed/direct Local Area Network (LAN).

The Centralized Controller shall be capable of performing initial settings via the keypad and display on the controller or via a PC using the Centralized Controller's initial setting browser.

Software Centralized Controller functions shall be available so that the building manager can securely log into each via the PC's web browser to support operation monitoring, scheduling, error email, personal browser for PCs and MACs, and online maintenance diagnostics. BACnet® interface shall be available through software operating on a dedicated PC and a Centralized Controller license. The software functions shall require advance purchasing and can only be activated upon receipt of a license number from the manufacturer. These optional software functions shall be licensed for a fixed term, subject to renewal and associated fees upon term expiration.

The Graphical User Workstation Software shall require a field supplied PC.

WIRING: Contractor shall be responsible for all control wiring, power wiring, etc. required to complete the VRF system and provide to owner with an operable working system. The contractor shall furnish and install a dedicated ethernet cable system specifically for the HVAC control system. Cat. 6 network cable between centralized controllers and the main controller to be located in the building. All building areas shall be completely connected with Cat. 6 cable for complete campus communication. An I.T. data drop will be provided in the building (data drop by others) in order for this contractor to connect the control system to the internet to obtain remote communications.

The Integrated System Software shall enable the user to control multiple Centralized Controller and shall provide additional functions. The configured computer shall be capable of controlling up to forty Centralized Controllers with a maximum of 2,000 indoor units across multiple outdoor units. The software shall be required if the user wants to simultaneously control more

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than 1 Centralized Controllers from a single PC using a single software session. Licensing per function, per Centralized Controller shall be required for the software. These optional software features shall require the TG-2000 software, advance purchase from the customer, and licensing from the manufacturer to enable feature activation. These software functions shall be licensed for a fixed term, subject to renewal and associated fees upon term expiration.

(Integrated System Software)				
Centralized Controller License				
Item	Details	PC Monitoring	PC Scheduling	Tenant Billing
ON/OFF	The units can turn ON and OFF for all floors or in a block, floor, or group of units.			√
Operation Modes	The operation mode can be switched between COOL, DRY, FAN, AUTO, and HEAT for all floors or in a block, floor, or group of units			√
Temperature Setting	The room temperature can be set for all floors in a block, floor, or group of units. Set temperature range Cool/Dry: 67°F-83°F Heat: 67°F-83°F Auto: 67°F-83°F * Depends on unit type			√
Fan Speed	The fan speed can be set to four stages for all floors or in a bloc, floor, or group of units			√
Air Direction	The air direction can be set in four vertical directions or to swing for all floors or in block, floor, or group of units. (The selectable air direction differs according to the model.)			√
Interlocked Unit ON/OFF LOSSNAY	If there is an interlocked unit (LOSSNAY), then the unit can be turned ON (strong/weak) or OFF for all floors or in a block, floor, or group of units. (Note that the ventilation mode cannot be selected for interlocked units.)			√
Local Operation Prohibit	The items for which operation with the local remote controller are to be prohibited can be selected for all floors or in a block, floor, or group of units. (The items that can be prohibited are ON/OFF, operation mode, set temperature and filter sign reset.)			√
Annual /	The annual/weekly		√	√

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Weekly Schedule	schedule function can be used by registering the license. Two settings, such as seasonal settings for summer and winter, can be saved.		
Power Rate Apportionment Charging	An RS-485 watt-hour meter (WHM) is connected to calculate the air conditioning charges based on the amount each tenant's air-conditioner has operated. Two charging rates can be applied per day.	√	√
History	Up to 3,000 items for the error history and up to 10,000 items for operation history can be saved. Each history file can be output as a daily report or monthly report in CSV format. (The operation history consists only of the operations carried out with the TG-2000 and is limited to some limited operation items.)		√
Operation Time Monitor	The cumulative operation time of each indoor unit can be viewed or output as a CSV format file. (This function is valid only when the charging function license is registered.)	√	√
Filter Sign Display Mask	The filter sign display at the remote controllers can be disabled.		√
Night Set-Back Function *1, *4	Heating from 55°F and higher can be set using the schedule.		√
Set Temperature Limit *1	The set temperature lower limit can be set for cooling and the upper limit for heating. (ME remote controller required)		√

With Night Set-Back function, the system can run at heating mode with target temperature set to 55ºF under schedule control. This function can protect the room from dropping down to extremely low temperature in the evenings.

System Integration: The CMCN shall be capable of supporting integration with Building Management Systems (BMS) via our BACnet® interfaces.

BACnet® Interface: The BACnet® interface, shall be compliant with BACnet®/IP (ANSI/ASHRAE 135-1995, 135a) and UDP/IP of Ethernet (ANSI/ASHRAE 135-1995, 135b). The BACnet® interface shall require a dedicated network computer and activated BACnet® software function via issued license for a fixed term, subject to renewal and associated fees. The BACnet® software license shall be on a per unit basis for a maximum of 50 indoor units controlled by one Centralized Controller. The BACnet® interface shall support a maximum of ten

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Centralized Controllers for a maximum of 500 indoor units. Operation and monitoring points include, but are not limited to, on/off, operation mode, fan speed, prohibit remote controller, filter sign reset, alarm state, error code, and error address.

Power Supply: The power supply shall supply 12VDC for the centralized controller and 24VDC voltage for the central control transmission. The power supply can power a maximum of 2 centralized controllers.

INTERFACE WITH THE CAMPUS BAS:

Interface to the existing Campus Building Automation System (BAS) shall be thru BACNET, and a detailed point mapping list shall be provided to the BAS contractor for the interface programming by the BAS contractor. All control work, BACnet cards, and software required for the VRF system controls and BAS controls work, panels, programming, etc. shall be included as part of the project. The requirement of the project is to have a complete and fully commandable, monitored system, viewable and controllable from the Central Campus graphical workstation (Siemen's workstation).

REFRIGERANT LINE COVER SYSTEM:

All exposed refrigerant line piping exposed within the building (except in: Attic Areas, Janitors Closets, and IT Rooms) shall be covered with an approved modular piping cover system.

Provide pipe covering system as manufactured by DecoShield Systems, Line-Hide Lineset Cover System, or prior approved equivalent.

REFRIGERANT LINE SIZING:

Refrigerant lines sizes for each system shall be sized in accordance with the equipment manufacturer's sizing guide lines.

Sizing for each system shall be submitted with equipment shop drawings. The contractor will be required to install refrigerant lines in accordance with equipment manufacturer's requirements. Service stop valves with service port shall be installed on each unit (inside and outside) for servicing systems without shutting down the entire system.

TESTING REFRIGERANT PIPING SYSTEMS:

Refrigerant lines shall be tested under 500 (minimum) psi carbon dioxide pressure (or as recommended by manufacturer for refrigerant type used in each system) for 5 hours using soap suds at joints to test for leaks. Evacuate system and charge with refrigerant.

LABELING A/C UNITS:

All indoor and outdoor A/C units, thermostats, fans, and other HVAC equipment shall be labeled

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with permanent laminated plate riveted to unit. Units shall be labeled as indicated in schedules and as addressed for the manufacturer's commissioning of equipment. Plate shall be black with white unit numbers. Height of unit number shall be minimum of one (1) inch. Label shall also indicate area serviced by unit as noted in schedules. Height of letters shall be minimum of one-half (1/2) inch. Height of letters for thermostats shall be 1/8". Submit sample to Engineer for approval.

PHASING INSTALLATION:

The systems shall be installed in sections as required to accommodate the Owner to occupy the building during construction. The contractor shall add refrigerant to the system when units are added to the refrigerant system in phases during construction. It is intended that the existing chilled/hot water fan coil system shall remain in operation until the contractor is completely ready to provide a fully operational VRF system for the building.

PROTECTION:

HVAC Equipment, ductwork, filters, etc. Shall be clean when installed and kept clean during construction.

Provide temporary closures of metal or taped polyethylene on openings on equipment, open ductwork, vent systems, etc. during construction to prevent construction dust from entering equipment or the duct system.

Equipment and system components that are not protected shall be cleaned by the contractor at the contractor's expense prior to acceptance.

All materials stored on site during construction shall be properly covered and protected from dust, rain, etc.

Materials damaged during construction shall be replaced with new materials.

Filters in equipment shall be replaced during construction if equipment is used during the construction phase. A final clean set of filters shall be installed in equipment when the systems(s) are turned over to the Owner.

AIR DISTRIBUTION

GENERAL:

Furnish and install all ducts for Air Conditioning, Heating and Ventilating System as shown on the plans and as may be required to provide complete system. Ductwork shall be complete with grilles, vanes, flashings, hangers, flexible connections at equipment (A.H.U.'s, fans, etc.,), splitters, manual dampers, fresh air inlets, louvers, reinforcing angles, etc. All ductwork shall be concealed and insulated as hereinafter specified.

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ALL DUCTWORK SIZES INDICATED ON DRAWINGS ARE METAL-TO-METAL OUTSIDE DIMENSIONS.

DUCT HANGERS AND SUPPORTS:

All ductwork shall be properly braced to prevent rattling, breathing or other unnecessary noise. No sharp edges or obstructions shall project into the air stream. Minimum duct strap support shall be 1" wide x 16 gauge.

LOW PRESSURE DUCTWORK:

All ductwork shall be galvanized steel and shall be of gauges and construction as recommended by ASHRAE Guide and Data Book. Gauges are as follows, with longest side governing. (Duct dimensions on Plans are metal-to-metal dimensions).

Dimensions of longest side:	Sheet Metal Gauge:
0" to 12"	26 Gauge
13" to 30"	24 Gauge
31" to 54"	22 Gauge
55" to 84"	20 Gauge

All ductwork shall be sealed at seams and joints with tape and hardcast duct sealant material.

Joints and reinforcing shall be as per ASHRAE Guide and Data Book and all slips shall be installed without edge of internal part of slip facing downstream.

Construction standards of Article 110 of the National Board of Fire Underwriters, Bulletin 90, latest edition, shall apply throughout.

Flashings shall be sheet copper or galvanized sheet metal, and shall be furnished and installed around all outside openings used for ducts of fans and wherever required. Roof flashings shall extend at least 8" above roof. Provide 1/16" thick rubber gasket material between flashing and fan housing and or sheet metal ductwork. Provide separation of dissimilar materials with die-electric material connection.

All ducts shall be straight and true and installed in a neat and workmanlike manner.

All edges shall be straight and true, and all bends shall be made with vaned turns. Where long radius turns cannot be used, the Contractor shall use square turns and use air splitters spaced not more than 3" center to center, and of a length so air will be properly distributed over the ducts.

Provide paint grip sheet metal where indicated on plans.

DOUBLE WALL SPIRAL PIPE AND FITTINGS:

All spiral piping as shown on drawings unless otherwise noted shall be double wall paint grip

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spiral pipe and fittings as manufactured by United McGill, Spiral Pipe of Texas, with insulation and perforated liner. Gauges shall be as recommended by S.M.A.C.N.A. Guidelines. Duct dimensions shown are internal dimension.

ROUND DUCTWORK:

Shall be constructed of 26 gauge galvanized sheet metal with screwed and taped joints.
At contractor's option , pre-insulated flexible ductwork as manufactured by Thermaflex Model MKE, Flexmaster 8M or prior approved equivalent (manufacturers literature and sample will be required for prior approval) may be used to connect to ceiling diffusers (maximum 5'-0" length). Flexible ductwork shall be installed in accordance with manufacturers recommended installation instructions. Inner and outer liner shall be properly sealed and secured.

EXTERNAL DUCT INSULATION:

New and Existing Low pressure rectangular and round outside air ductwork and exhaust ductwork shall be wrapped on outside with 2.125" minimum thickness, 3/4# density, minimum installed R-value of R-6.0, fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per manufacturer's recommendations.

DUCTWORK SEALANT:

All New and Existing Outside Air ductwork and exhaust ductwork shall be sealed air tight. All seams, both shop made and field installed, and shall be sealed with mastic. All transverse joints shall be sealed as well as spin collar takeoffs and rough duct connections. All duct connections and seams shall be sealed with a UL approved non-flammable mastic system. Strict adherence to manufacturer’s installation instruction is required. The duct sealant shall be equal to Hardcast SURE-GRIP 404, United McGill Solvent Based Duct Sealant, or prior approved duct sealing system. In Return Air Plenum spaces, all surfaces shall be rated for 25/50 Flame Spread and Smoke Development.

All ductwork shall be sealed to “Seal Class A”. Seal Class A is transverse joints and seams and wall penetrations (sensors).

DUCT ACCESSORIES:

Dampers of the fusible link operated type (2 hour rated) shall be provided in all ductwork passing through the floor or firewalls. In all cases, the time rating of damper shall be equal to or greater than the time rating of the wall.

Provide quadrant or adjustable splitters and mark shaft to give position of splitter damper in duct.

Provide vanes behind every supply grille or diffuser. Splitters shall be provided where shown on Plans and where located in concealed, non-accessible space, provide Young Regulators to operate splitter. Vanes shall be Tuttle and Bailey "Ducturns", Barber Coleman Uniflo or equivalent. Shop fabricated vanes will be acceptable. All dampers shall be constructed of 14

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gauge steel.

SPIN COLLARS:

All round take-offs to round branch duct shall be made with factory fabricated spin-type collar fittings with balancing damper and constructed of minimum 26 ga galvanized steel. The damper shall have a raised 2" handle with a high quality locking quadrant. A 3/8" continuous rod with "U" bolts connects the damper to the rod. Nylon end bearing are required where the rod penetrates the spin collar barrel. These spin-collars shall be as manufactured by Flexmaster Model FLD-B03, Dace #26ga MSD-C03 or approved equal.

REGISTERS, GRILLES AND DIFFUSERS:

Square or rectangular ceiling supply outlets shall be as indicated in schedules.

All wall supply grilles shall be complete with horizontal and vertical adjustable deflectors and opposed blade volume control damper. Grilles shall be as indicated in schedules.

Return air grilles shall be as indicated in schedules. Provide filters in filter back grilles.

All supply outlets shall have a sponge rubber gasket.

All grilles, diffusers and registers shall be of sizes and type as indicated on Plans or scheduled on Drawings.

Unless otherwise shown on Drawings, all grilles installed in walls and doors shall be furnished with prime coat finish suitable for painting by painting sub-contractor.

Grilles as manufactured by Anemostat, Metal-Aire, Titus, or Price may be used on the project. Grilles shall be equivalent to the types indicated in schedules.

PROTECTION:

HVAC Equipment, ductwork, etc. shall be clean when installed and kept clean during construction.

Provide temporary closures of metal or taped polyethylene on HVAC equipment, open ductwork, VRF Indoor units, and/or vent systems during construction to prevent construction dust from entering equipment and duct systems.

Equipment and system components that are not protected shall be cleaned by the contractor at the contractor's expense prior to acceptance.

All materials stored on site during construction shall be properly covered and protected from dust, rain, etc.

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Materials and/or equipment damaged during construction shall be replaced with new materials.

DUCT ACCESS PANELS:

Access panel shall be Air Balance "Fire/Seal Access Door", Greenheck Model CAD-10,Milcor Model WD or prior approved equivalent. Door shall be 1" insulated type and shall be 24 gauge with 22 gauge frame. Both door and frame shall be gasketed to provide air tight seal. Frame shall have notched knock-over edges for easy installation. Door shall have two (2) cam latches for locking purposes. Doors shall be a minimum of 10"x12" installed where shown on plans. Round duct access panels shall be Greenheck Model RAD, Ruskin Model ADR or prior approved equivalent.

FIRE DAMPERS:

The contractor shall furnish and install UL555 rated 1-1/2 hour fire dampers at the locations indicated on the drawings in new ducts and sound attenuators. The contractor shall provide dampers with sleeves and angle frames necessary to comply with the manufacturer's UL installation requirements. Dampers for vertical or horizontal air flow shall be provided as required.

Fire damper shall be 100% free area and installed in wall and floor openings utilizing steel sleeves, angles, other materials and practice required to provide an installation equivalent to that utilized by the manufacturer when dampers are tested by UL555. Installation shall be in accordance with the damper manufacturer's instructions.

Fire damper for rectangular ductwork and transfer openings shall be Ruskin type DIBD-B, Greenheck Model DFD-150-B, or prior approved equal.

Fire dampers for round ductwork shall be Ruskin Model DIBD-CR, Greenheck DFD-150-CR, or prior approved equal.

All fire dampers shall be installed per N.F.P.A. and U.L. requirements. Install U.L. approved sealant around the perimeter of the angle iron support at the sleeve and the wall in accordance with U. L. recommendations.

All fire dampers shall meet the latest Class 1 leakage requirements.

MANUAL DAMPERS:

Manual dampers for air flow balancing shall be Fantech IR Series IRIS Dampers or prior approved equivalent.

Dampers shall be installed in duct systems in accordance with Manufacturer’s recommendations.

DUCT LEAKAGE TESTS:

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Test all new and existing low pressure outside air duct work associated with OAU's with a static test pressure of 1.0".
Maximum Leakage Rate for round or oval duct shall be 3 CFM/100 Square Feet of duct surface area.
Maximum Leakage Rate for rectangular duct shall be 6 CFM/100 Square Feet of duct surface area.

Contractor is responsible for duct surface area calculations.
A report for each section of ductwork tested is required.
Report shall indicate test pressure, duct leakage, duct section surface area, date, persons present, and time of test.

Ductwork that initially fails these tests shall be replaced, modified, resealed, etc. as required to meet the leakage requirement and then re-test to ensure compliance.

TEMPERATURE CONTROLS

GENERAL:

Provide an electric temperature control system by Equipment Manufacturer, to be installed by the Mechanical Contractor.

Control work associated with the connection to the existing campus EMS/BAS shall be the responsibility of the Contractor.

The Contractor shall be responsible for installing wiring for the VRF equipment controls system. All work shall be coordinated with the Owner prior to installation.

Interface to the existing Campus Building Automation System (BAS) shall be thru BACNET, and a detailed point mapping list shall be provided to the BAS contractor for the interface programming by the BAS contractor. All control work, BACnet cards, and software required for the VRF system controls and BAS controls work, panels, programming, etc. shall be included as part of the project. The requirement of the project is to have a complete and fully commandable, monitored system, viewable and controllable from the Central Campus graphical workstation (Siemen's workstation).

FIRESTAT:

Provide manual reset firestat in return air to each Outside Air - air handling unit. Firestat shall stop associated fan on a rise in air temperature above 125^{o}F.

FLOAT SWITCH:

Provide float switch to emergency drain pan of each Outside Air AHU. Switch shall be interlocked with AHU to de-energize the unit when the water level in the pan rises above a set level. Float switch shall meet UL 508 requirements.

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CONTROL WIRING:

All wiring required in the control systems, including electrical connections for the thermostats, firestats, and all interlocking motor control wiring shall be furnished and installed by Mechanical Contractor.

All wiring shall be in conduit and in accordance with the National Electrical Code (N.E.C.).

All control wiring located outdoors shall be installed in rigid or intermediate metal conduit.

All control wiring located indoors where an accessible ceiling is not available shall be installed in E.M.T. conduit.

All control wiring located above accessible ceilings shall be N.E.C. approved cable. All control wiring located above accessible ceilings used as air plenums shall be N.E.C. approved "plenum cable".

All wiring for the VRF equipment shall be wiring as recommended by the equipment manufacturer.

All conductors shall be copper. Conductors used for power circuits shall be #12 TW minimum. Conductors used for control circuits shall be #18 TW (single strand) minimum. Conductors used for sensor circuits shall be #18 TW (single strand) minimum. Control wiring for DX equipment thermostats shall be 10 conductor cables.

TESTING, ADJUSTING AND BALANCING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. All division 15 specification sections, drawings, and general provisions of the contract apply to work of this section, as do other documents referred to in this section.

1.02 SCOPE OF WORK

A. The Contractor shall obtain the services of an independent Test and Balance (TAB) Company which specializes in the testing and balancing of heating, ventilating and air conditioning (HVAC) systems to test, adjust and balance all HVAC systems in the building(s). Work associated with Base Bid, Alternate #1, and Alternate #2 (Outside Air and Exhaust Systems) shall be tested and balanced as part of the scope of the project.

B. The work included in this section consists of furnishing labor, instruments, and

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tools required in testing, adjusting and balancing the HVAC systems as described in these specifications or shown on accompanying drawings. Services shall include checking equipment performance, taking the specified measurements, and recording and reporting the results. The testing, adjusting and balancing agency shall act as a reporting agency; that is, list and report each piece of equipment as to identification number, manufacturer, model number, serial number, proper location, specified performance, and report actual performance of all equipment as found during testing. The report is intended to be used during the life of the building as a ready reference indicating original conditions, equipment components, etc.

C. Representatives of the Test and Balance Company shall visit the job site during installation of the HVAC equipment, piping and ductwork as required.

D. Upon completion of the HVAC system installation, the Test and Balance Company shall perform all required testing and balancing with the full cooperation of the Contractor and his Sub-contractors. The Contractor shall make changes and/or adjustments to the HVAC system components that are required by the Test and Balance Company to accomplish proper balancing. The TAB agency shall not supply or install any materials or balancing devices such as pulleys, drives, belts, etc. All of this work is by the Contractor and shall be performed at no additional cost to the Owner.

E. The test and balance report complete with a summary page listing all deficiencies shall be submitted to the Architect for review. If the Architect agrees with the report, he shall sign it and return it to the Contractor. The test and balance report must be complete and must be accepted by the Architect prior to acceptance of the project. Any outstanding test and balance items shall be placed on the punch list and a monetary value shall be assigned to them.

F. After all deficiencies have been corrected the Architect shall sign the testing and balancing report, and the Test and Balance Company shall supply four (4) copies of the final and complete report to the Contractor for inclusion in the Operation and Maintenance Manuals.

G. The Test and Balance Company shall obtain a copy of all HVAC related shop drawings from the contractor. The contractor shall provide a set of approved shop drawings to the TAB contractor within 30 days from receiving approved shop drawings.

H. The items requiring testing, adjusting, and balancing include (but are not restricted to) the following:

<u>AIR SYSTEMS</u>:
Supply Fan AHU
Zone branch and main ducts

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Diffusers, Registers, Grilles and Dampers
Coils (Air Temperatures)

1.03 DEFINITIONS, REFERENCES, STANDARDS

A. All work shall be in accordance with the latest edition of the Associated Air Balance Council (AABC) National Standards or the latest standards of the National Environmental Balancing Bureau (NEBB). If these contract documents set forth more stringent requirements than the AABC National Standards or the NEBB Standards, these contract documents shall prevail.

1.04 QUALIFICATIONS

A. Agency Qualifications: The TAB Agency shall be a current member of the AABC or the NEBB and must be in good standing with FP&C. A list of these firms shall be obtained from FP&C. Falsification of a TAB report shall be grounds for removal from the FP&C list and the firm's actions shall be reported to the appropriate certification agency. The contractor may use any FP&C approved TAB firm on a state project.

1.05 SUBMITTALS

A. Procedures and Agenda: The TAB agency shall submit the TAB procedures and agenda proposed to be used.

B. Sample Forms: The TAB agency shall submit sample forms, which shall include the minimum data required by the AABC National Standards or the NEBB Standards.

1.06 TAB PREPARATION AND COORDINATION

A. Shop drawings, submittal data, up-to-date revisions, change orders, fan curves, pump curves and other data required for planning, preparation, and execution of the TAB work shall be provided when available and no later than 30 days after the Designer has returned the final approved submittal data to the Contractor.

B. System installation and equipment startup shall be complete prior to the TAB agency's being notified to begin.

C. The building control system (BCS) contractor shall provide and install the control system, including all temperature, pressure and humidity sensors. These shall be calibrated for accurate control. If applicable, the BCS contractor shall install all necessary computers and computer programs, and make these operational. Assistance shall be provided as required for reprogramming, coordination, and problem resolution.

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D. All test points, balancing devices, identification tags, etc., shall be accessible and clear of insulation and other obstructions that would impede TAB procedures.

E. Qualified installation or startup personnel shall be readily available for the operation and adjustment of the systems. Assistance shall be provided as required for coordination and problem resolution.

1.07 REPORTS

A. Final TAB Report - The TAB agency shall submit the final TAB report for review by the Architect. On plans provided, all outlets, devices, HVAC equipment, etc., shall be identified (including manufacturer, model number, serial number, motor manufacturer, HP, drive type, fan and motor sheaves and belt number), along with a numbering system corresponding to report unit identification. The TAB agency shall submit an AABC "National Project Performance Guaranty" (or similar NEBB Guaranty) assuring that the project systems were tested, adjusted and balanced in accordance with the project specifications and AABC National Standards (or similar NEBB Standards). The Designer shall certify his approval on the Performance Guaranty.

B. Submit 4 copies of the Final TAB Report to the Contractor for inclusion in the Operation and Maintenance Manuals.

PART 2 INSTRUMENTATION

A. All instruments used for measurements shall be accurate and calibrated. Calibration and maintenance of all instruments shall be in accordance with the requirements of AABC National Standards (or similar NEBB Standards).

PART 3 EXECUTION

3.01 GENERAL

A. The specified systems shall be reviewed and inspected for conformance to design documents. Testing, adjusting and balancing on each identified system shall be performed. The accuracy of measurements shall be in accordance with AABC National Standards (or similar NEBB Standards). Adjustment tolerances shall be: Water Flow (GPM) -5% to +5%, AHU Air Flow (CFM) -5% to +5%, Diffuser Air Flow (CFM) -10% to +10%, Outside Air Flow (CFM) -5% to +5%, Restroom Exhaust -2.5% to +2.5%, Temperatures at thermostats (space sensors) -1 degree F. To +1 degree F., DB/WB Temperatures on coils -1 degree F to +1 degree F., Humidity at Humidity sensors -1% RH to +1% RH, Water Temperatures -1 degree F. To +1 degree F., Air Pressures -0.01" WC to +0.01" WC taken with inclined manometer, Water Pressures -1 PSIG to +1 PSIG taken with Bourdon Gauge with scale 0 to 100 PSIG, Water Pressures -0.5' to +0.5' taken with Digital Pressure

Differential Meter, other tolerances shall be + or - 10% unless otherwise stated.

B. Equipment settings, including manual damper quadrant positions, valve indicators, fan speed control levers, and similar controls and devices shall be marked to show final settings.

C. All information necessary to complete a proper TAB project and report shall be per AABC or NEBB standards unless otherwise noted. The descriptions of work required, as listed in this section, are a guide to the minimum information needed.

D. TAB contractor shall cut insulation, ductwork and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. Upon completion, patch insulation, ductwork and housings using materials identical to those removed. Seal insulation to reestablish integrity of the vapor barrier.

E. TAB work shall include additional inspection and adjustment of components during the season following the initial balance to include re-balance of any items influenced by seasonal changes or as directed by the Owner.

3.02 AIR SYSTEMS

A. The TAB agency shall verify that all ductwork, splitters, extractors, dampers, grilles, registers, and diffusers have been installed per design, are functional and set full open. Any leakage in the ductwork shall be repaired prior to the test. The TAB agency shall perform the following TAB procedures in accordance with the AABC National Standards or NEBB Standards:

For supply fans (AHU):

1. Fan speeds - Test and adjust fan RPM to achieve design CFM requirements.

2. Current and Voltage - Test and record each motor line voltage and amperage. Compare data with the nameplate limits to ensure motors are not in or above the service factor, are not excessively below FLA, or are not operating with a line voltage exceeding required tolerances. Make corrections as deemed necessary by Architect.

3. Pitot-Tube Traverse - Perform a Pitot-tube traverse of main supply and return ducts, as applicable to obtain total CFM. If a Pitot-tube traverse is not practical, an explanation of why a traverse was not made must appear on the appropriate data sheet.

4. Outside Air - Test and adjust the outside air on applicable equipment using a Pitot-tube traverse. If a traverse is not practical, an explanation of why a traverse was not made must appear on the appropriate data sheet. If a

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traverse is not practical use the mixed-air temperature method if the inside and outside temperature difference is at least 20 degrees Fahrenheit or use the difference between Pitot-tube traverses of the supply and return air ducts.

5. Static Pressure - Test and record system static pressure, including the static pressure profile of each supply fan.

For zone, branch and main ducts:

1. Adjust ducts to within design CFM requirements. As applicable, at least one zone balancing damper shall be completely open. Multi-diffuser branch ducts shall have at least one outlet or inlet volume damper completely open.

For diffusers, registers and grilles:

1. Tolerances - Test, adjust, and balance each diffuser, grille, and register to within 10% of design requirements. Minimize drafts. Include required CFM, initial test CFM and final CFM.

2. Identification - Identify the type, location, and size of each grille, diffuser, and register. This information shall be recorded on air outlet data sheets.

For coils:

1. Air Temperature - Once air flows are set to acceptable limits, take wet bulb and dry bulb air temperatures on the entering and leaving side of each cooling coil. Dry-bulb temperature shall be taken on the entering and leaving side of each heating coil.

3.03 ADDITIONAL TAB SERVICES

A. Job Site Inspections:
During construction, the TAB agency shall inspect the installation of pipe systems, sheet metal work, temperature controls, and other component parts of the HVAC systems as required.

B. TAB Report Verification:
At the time of final inspection, the TAB agency may be required to recheck, in the presence of the owner's representative, specific and random selections of data, air quantities, and air motion recorded in the certified report. Points and areas for recheck shall be selected by the owner's representative. Measurements and test procedures shall be the same as approved for the initial work for the certified report. Selections for recheck, specific plus random, will not exceed 10% of the total number tabulated in the report.

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BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

This Section specifies the basic requirements for electrical installations and includes requirements common to more than one section of these specifications.

ELECTRICAL INSTALLATIONS:

Coordinate electrical equipment and materials installation with other building components.

Verify all dimensions by field measurements.

Arrange for chases, slots, and openings in other building components to allow for electrical installations.

Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete and other structural components, as they are constructed.

Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing-in the building.

Coordinate the cutting and patching of building components to accommodate the installation of electrical equipment and materials.

Where mounting heights are not detailed or dimensioned, install electrical services and overhead equipment to provide the maximum headroom possible.

Install electrical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.

Coordinate the installation of electrical materials and equipment above ceilings with suspension system, mechanical equipment and systems, and structural components.

Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.

CUTTING AND PATCHING:

This Article specifies the cutting and patching of electrical equipment, components, and materials to include removal and legal disposal of selected materials, components, and equipment.

Do not endanger or damage installed Work through procedures and processes of cutting and patching.

Arrange for repairs required to restore other work, because of damage caused as a result of

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electrical installations.

No additional compensation will be authorized for cutting and patching Work that is necessitated by ill-timed, defective, or non-conforming installations.

Perform cutting, fitting, and patching of electrical equipment and materials required to:

Uncover Work to provide for installation of ill-timed Work;

Remove and replace defective Work;

Remove and replace Work not conforming to requirements of the Contract Documents;

Remove samples of installed Work as specified for testing;

Install equipment and materials in existing structures;

Upon written instructions from the Architect/Engineer, uncover and restore Work to provide for Architect/Engineer observation of concealed Work.

Cut, remove and legally dispose of selected electrical equipment, components, and materials as indicated, including, but not limited to removal of electrical items indicated to be removed and items made obsolete by the new Work.

Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

Locate, identify, and protect electrical services passing through remodeling or demolition area and serving other areas required to be maintained operational. When transit services must be interrupted, provide temporary services for the affected areas and notify the Owner prior to changeover.

ELECTRICAL SUBMITTALS:

Submittal of shop drawings, product data, and samples will be accepted only when submitted by The Contractor. Data submitted from subcontractors and material suppliers directly to the Architect/Engineer will not be processed.

DELIVERY, STORAGE, AND HANDLING:

Deliver products to project properly identified with names, model numbers, types, grades, compliance labels, and similar information needed for distinct identifications; adequately packaged and protected to prevent damage during shipment, storage, and handling.

Store equipment and materials at the site, unless off-site storage is authorized in writing. Protect stored equipment and materials from damage.

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Coordinate deliveries of electrical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

RECORD DOCUMENTS:
Mark Drawings to indicate revisions to conduit size and location both exterior and interior; actual equipment locations, dimensioned for column lines; concealed equipment, dimensioned to column lines; distribution and branch electrical circuitry; fuse and circuit breaker size and arrangements; support and hanger details; Change Orders; concealed control system devices.

Mark Specifications to indicate approved substitutions; Change Orders; actual equipment and materials used.

OPERATION AND MAINTENANCE DATA:
Include the following information:

Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of all replaceable parts.

Manufacturer's printed operating procedures to include start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shut-down, and emergency instructions; and summer and winter operating instructions.

Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

Servicing instructions and lubrication charts and schedules.

WARRANTIES:
Refer to individual equipment specifications for warranty requirements.

Compile and assemble the warranties into a separated set of vinyl covered, three ring binders, tabulated and indexed for easy reference.

Provide complete warranty information for each item to include product or equipment to include date of beginning of warranty or bond; duration of warranty or bond; and names, addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.

CLEANING:
Clean all light fixtures, lamps and lenses prior to final acceptance. Replace all inoperative lamps.

RACEWAYS

DESCRIPTION OF WORK:

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Extent of raceway work is indicated by drawings and schedules.

Types of raceways specified in this section include the following:

Electrical metallic tubing (EMT).
Liquid-tight flexible metal conduit.
Rigid metal conduit.
Rigid nonmetallic conduit.
Flexible metal conduit.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of raceway systems of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 3 years of successful installation experience on projects with electrical raceway work similar to that required for this project.

Codes and Standards:

NEMA Compliance: Comply with applicable portions of NEMA Standards Publications pertaining to raceways.

UL Compliance and Labeling: Comply with applicable requirements of UL safety standards pertaining to electrical raceway systems. Provide raceway products and components which have been UL-listed and labeled.

NEC Compliance: Comply with applicable requirements of NEC pertaining to construction and installation of raceway systems.

PRODUCTS:

METAL CONDUIT AND TUBING:
General: Provide metal conduit, tubing and fittings of types, grades, sizes and weights (wall thicknesses) for each service indicated. Where types and grades are not indicated, provide proper selection determined by Installer to fulfill wiring requirements, and comply with applicable portions of NEC for raceways.

Rigid Steel Conduit: Provide rigid steel, zinc-coated, threaded type conforming to FS WW-C-581, ANSI C80.1 and UL 6.
Provide zinc coating fused to inside and outside walls.

Liquid-Tight Flexible Metal Conduit: Provide liquid-tight flexible metal conduit; construct of single strip, flexible, continuous, interlocked, and double-wrapped steel; galvanized inside and outside; coat with liquid-tight jacket of flexible polyvinyl chloride (PVC).

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Rigid Metal Conduit Fittings: Cast malleable iron, galvanized or cadmium plated, conforming to FS W-F-408.

Use Type 1 fittings for raintight connections.

Use Type 2 fittings for concrete tight connections.

Use Type 3 fittings for other miscellaneous connections.

Liquid-Tight Flexible Metal Conduit Fittings: FS W-F-406, Type 1, Class 3, Style G. Provide cadmium plated, malleable iron fittings with compression type steel ferrule and neoprene gasket sealing rings, with insulated, or noninsulated throat.

Electrical Metallic Tubing (EMT): FS WW-C-563, ANSI C80.3 and UL 797.

Electrical Metallic Tubing (EMT): Provide galvanized steel hot-dipped zinc galvanized tubing with smooth corrosion resistant interior wall. Tubing shall bare the UL label and conform to UL 797 and ANSI 680.3 installation shall be in accordance with National Electrical Code Article 348.

NONMETALLIC CONDUIT AND DUCTS:

General: Provide nonmetallic conduit, ducts and fittings of types, sizes and weights for each service indicated. Where types and grades are not indicated, provide proper selection determined by Installer to fulfill wiring requirements which comply with provisions of NEC for raceways.

Electrical Plastic Conduit:

Heavy Wall Conduit: Schedule 40, 90 C, UL-rated, construct of polyvinyl chloride and conforming to NEMA TC-2, for direct burial, or normal above ground use, UL-listed and in conformity with NEC Article 347.

Extra Heavy Wall Conduit: Schedule 80, UL-rated, construct of polyvinyl chloride compound C-200 PVC, and UL-listed in accordance with NEC Article 347 for direct burial, or above ground use.

Conduit, and Tubing Accessories: Provide conduit, tubing and duct accessories of types, sizes and materials, complying with manufacturer's published product information, which mate and match conduit and tubing.

Conduit Bodies: Provide galvanized cast-metal conduit bodies of types, shapes and sizes as required to fulfill job requirements and NEC requirements. Construct conduit bodies with threaded- conduit-entrance ends, removable covers, either cast or of galvanized steel, and corrosion-resistant screws.

WIREWAYS:

General: Provide electrical wireways of types, grades, sizes, and number of channels, for each type service as indicated. Provide complete assembly of raceway including, but not limited to, couplings, offsets, elbows, expansion joints, adapters, holddown straps, end caps, and other components and accessories as required for complete system.

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Raintight Wireway: Construct raintight lay-in wireways with hinged covers, in accordance with UL 870 and with components UL-listed, including lengths, connectors and fittings. Design units to allow fastening hinged cover closed without use of parts other than standard lengths, fittings and connectors. Construct units to be capable of sealing cover in closed position with sealing wire. Provide wireway units with knockouts only in bottom of troughs.

EXECUTION

INSPECTION:

Examine areas and conditions under which raceways are to be installed, and substrate which will support raceways. Notify contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

INSTALLATION OF RACEWAYS:

General: Install raceways as indicated; in accordance with manufacturers' written installation instructions, and in compliance with NEC and NECA's "Standard of Installation". Install units plumb and level, and maintain manufacturer's recommended clearances.

Coordinate with other work including wires/cables, boxes, and panel work, as necessary to interface installation of electrical raceways and components with other work.

INSTALLATION OF CONDUITS:

General: Install concealed conduits in new construction work, either in walls, slabs, or above hung ceilings. Run conduits concealed in existing work where practicable. Where conduits can not be concealed in finished areas, use surface metal raceways.

Mechanically fasten together metal conduits, enclosures, and raceways for conductors to form continuous electrical conductor. Connect to electrical boxes, fittings and cabinets to provide electrical continuity and firm mechanical assembly.

Avoid use of dissimilar metals throughout system to eliminate possibility of electrolysis. Where dissimilar metals are in contact, coat surfaces with corrosion inhibiting compound before assembling.

Install miscellaneous fittings such as reducers, chase nipples, 3-piece unions, split couplings, and plugs that have been specifically designed and manufactured for their particular application. Install expansion fittings in raceways every 200' linear run or wherever structural expansion joints are crossed.

Use roughing-in dimensions of electrically operated unit furnished by supplier. Set conduit and boxes for connection to units only after receiving review of dimensions and after checking location with other trades.

Provide nylon pull cord in empty conduits where indicated. Test conduits required to be

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installed, but left empty, test with ball mandrel. Clear any conduit which rejects ball mandrel. Pay costs involved for restoration of conduit and surrounding surfaces to original condition.

Conduit Installation: Follow minimum requirements in other areas as follows:

Rigid metallic conduit. (Branch circuits and sub-feeders installed outdoors)

Electrical metallic tubing (EMT). (Branch circuits and sub-feeders installed indoors in concealed areas)

Flexible metal conduit. (Final connections to light fixtures)

Liquid-tight flexible metal conduit. (Final connections to all motors - interior and exterior)

Rigid nonmetallic conduit. (Underground feeders & sub feeders, and underground branch circuits)

Surface Metal Raceway (Branch circuits installed exposed indoors)

Use liquid-tight flexible conduit where subjected to one or more of the following conditions:

Exterior location.
Moist or humid atmosphere where condensate can be expected to accumulate.
Corrosive atmosphere.
Subjected to water spray or dripping oil, water or grease.
Final 24" of connection to motors, or control items subject to movement or vibration.

Cut conduits straight, properly ream, and cut threads for heavy wall conduit deep and clean.

Field-bend conduit with benders designed for purpose so as not to distort nor vary internal diameter.

Size conduits to meet NEC, except no conduit smaller than 3/4 inch shall be embedded in concrete or masonry.

Fasten conduit terminations in sheet metal enclosures by 2 locknuts, and terminate with bushing. Install locknuts inside and outside enclosure.

Conduits are not to cross pipe shafts, or ventilating duct openings.
Keep conduits a minimum distance of 6" from parallel runs of flues, hot water pipes or other sources of heat. Wherever possible, install horizontal raceway runs above water and steam piping.

- continued -

Support riser conduit at each floor level with clamp hangers.

Use of running threads at conduit joints and terminations is prohibited. Where required, use 3-piece union or split coupling.

Complete installation of electrical raceways before starting installation of cables/wires within raceways.

Concealed Conduits:

Metallic raceways installed underground or in floors below grade, or outside are to have conduit threads painted with corrosion inhibiting compound before couplings are assembled. Draw up coupling and conduit sufficiently tight to ensure watertightness.

For floors-on-grade, install conduits under concrete slabs.

Install underground conduits minimum of 24" below finished grade.

Conduits in Concrete Slabs:

Place conduits between bottom reinforcing steel and top reinforcing steel.

Place conduits either parallel, or at 90 degrees, to main reinforcing steel.

Separate conduits by not less than diameter of largest conduit to ensure proper concrete bond.

Conduits crossing in slab must be reviewed for proper cover by Engineer.

Embedded conduit diameter is not to exceed 1/3 of slab thickness.

Install conduits as not to damage or run through structural members. Avoid horizontal or cross runs in building partitions or side walls.

Aboveground Conduits:

Install all conduit systems neatly, parallel with, or at right angles to walls of building.

Install conduit work as not to interfere with ceiling inserts, lights or ventilation ducts or outlets.

Support all conduits by use of hangers, clamps, or clips. Support conduits on each side of bends and on spacing not to exceed following: up to 1": 6'-0"; 1-1/4" and over: 8'-0".

Run conduits for outlets on waterproof walls exposed. Set anchors for supporting conduit on waterproof wall in waterproof cement.

Non-Metallic Conduits:

Make solvent cemented joints in accordance with recommendations of manufacturer.

- continued -

Install PVC conduits in accordance with NEC and in compliance with local utility practices.

Conduit Fittings:

Construct locknuts for securing conduit to metal enclosure with sharp edge for digging into metal, and ridged outside circumference for proper fastening.

Bushings for terminating conduits smaller than 1-1/4" are to have flared bottom and ribbed sides, with smooth upper edges to prevent injury to cable insulation.

Install insulated type bushings for terminating conduits 1-1/4" and larger. Bushings are to have flared bottom and ribbed sides. Upper edge to have phenolic insulating ring molded into bushing.

Bushing of standard or insulated type to have screw type grounding terminal.

Miscellaneous fittings such as reducers, chase nipples, 3-piece unions, split couplings, and plugs to be specifically designed for their particular application.

INSTALLATION OF RACEWAYS AND WIREWAYS:

General: Mechanically assemble metal enclosures, and raceways for conductors to form continuous electrical conductor, and connect to electrical boxes, fittings and cabinets as to provide effective electrical continuity and rigid mechanical assembly.

Avoid use of dissimilar metals throughout system to eliminate possibility of electrolysis. Where dissimilar metals are in contact, coat all surfaces with corrosion inhibiting compound before assembling.

Install expansion fittings in all raceways wherever structural expansion joints are crossed.

Make changes in direction of raceway run with proper fittings, supplied by raceway manufacturer. No field bends of raceway section will be permitted.

Properly support and anchor raceways for their entire length by structural materials. Raceways are not to span any space unsupported.

Use boxes as supplied by raceway manufacturer wherever junction pull or devices boxes are required. Standard electrical "handy" boxes, etc. shall be permitted for use with surface raceway installations.

WIRES AND CABLES

DESCRIPTION OF WORK:

- continued -

Extent of electrical wire and cable work is indicated by drawings and schedules.

Types of electrical wire, cable, and connectors specified in this section include the following:

Copper conductors.
Tap type connectors.
Split-bolt connectors.
Wire nut connectors.

Applications of electrical wire, cable and connectors required for project are as follows:

For motor-branch circuits.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of electrical wire and cable products of types, sizes and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 3 years of successful installation experience with projects utilizing electrical wiring and cabling work similar to that required for this project.

NEC Compliance: Comply with NEC requirements as applicable to construction, installation and color coding of electrical wires and cables.

UL Compliance: Comply with applicable requirements of UL Std 83, "Thermoplastic-Insulated Wires and Cables", and Std 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors".

UL Compliance: Provide wiring/cabling and connector products which are UL-listed and labeled.

ETL Compliance: Provide wiring/cabling and connector products which are ETL-listed and labeled.

NEMA/ICEA Compliance: Comply with NEMA/ICEA Std Pub/No.'s WC 5, "Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy", and WC-30, "Color Coding of Wires and Cables", pertaining to electrical power type wires and cables.

ASTM Compliance: Comply with applicable requirements of ASTM B1, 2, 3, 8 and D-753. Provide copper conductors with conductivity of not less than 98% at 20 deg C (68 deg F).

SUBMITTALS:

Product Data: Submit manufacturer's data on electrical wires, cables and connectors.

- continued -

DELIVERY, STORAGE, AND HANDLING:

Deliver wire and cable properly packaged in factory-fabricated type containers, or wound on NEMA-specified type wire and cable reels.
Store wire and cable in clean dry space in original containers. Protect products from weather, damaging fumes, construction debris and traffic.

Handle wire and cable carefully to avoid abrasing, puncturing and tearing wire and cable insulation and sheathing. Ensure that dielectric resistance integrity of wires/cables is maintained.

PRODUCTS

WIRE, CABLE AND CONNECTORS:

General: Provide electrical wires, cables, and connectors of manufacturer's standard materials, as indicated by published product information; designed and constructed as recommended by manufacturer, for a complete installation, and for application indicated. Except as otherwise indicated, provide copper conductors with conductivity of not less than 98% at 20 deg C (68 deg F).

Building Wires: Provide factory-fabricated wire of sizes, ampacity ratings, and materials for applications and services indicated. Where not indicated, provide proper selection as determined by Installer to comply with project's installation requirements, NEC and NEMA standards. Select from the following UL types, those wires with construction features which fulfill project requirements:

Type THWN: For dry and wet locations; max operating temperature 75 deg C (167 deg F). Insulation, flame-retardant, moisture- and heat-resistant, thermoplastic; outer covering, nylon jacket; conductor, annealed copper.

EXECUTION

INSTALLATION OF WIRES AND CABLES:

General: Install electrical cables, wires and connectors as indicated, in compliance with applicable requirements of NEC, NEMA, UL, and NECA's "Standard of Installation", and in accordance with recognized industry practices.

Coordinate wire/cable installation work including electrical raceway and equipment installation work, as necessary to properly interface installation of wires/cables with other work.

Install UL Type THWN or THHN wiring in conduit, for circuits. MC Cable is allowed in concealed spaces.

Pull conductors simultaneously where more than one is being installed in same raceway.

- continued -

Use pulling compound or lubricant, where necessary; compound used must not deteriorate conductor or insulation.

Use pulling means, including fish tape, cable, rope and basket weave wire/cable grips which will not damage cables or raceway.

Keep conductor splices to minimum. All splices and taps shall be made in junction boxes.

Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Std 486A and B.

VARIABLE REFRIGERANT FLOW EQUIPMENT:

FIELD QUALITY CONTROL:

Prior to energization of circuitry, check installed wires and cables with megohm meter to determine insulation resistance levels to ensure requirements are fulfilled.

Prior to energization, test wires and cables for electrical continuity and for short-circuits.

Subsequent to wire and cable hook-ups, energize circuitry and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance.

Color Coding shall be as follows:

1. 120/208 volt circuits: Phase A - Black; Phase B - Red; Phase C - Blue; Neutral - White; Ground - Green.

2. 277/480 volt circuits: Phase A - Brown; Phase B - Orange; Phase C - Yellow; Neutral - Gray; Ground - Green w/stripe.

ELECTRICAL CONNECTIONS FOR EQUIPMENT

DESCRIPTION OF WORK:

Extent of electrical connections for equipment is indicated by drawings and schedules. Electric connections are hereby defined to include connections used for providing electrical power to equipment.

Applications of electrical power connections specified in this section includes the following:

From electrical source to motor starters.
From motor starters to motors.

- continued -

To grounds including earthing connections.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of electrical connectors and terminals, of types and ratings required, and ancillary connection materials, including electrical insulating tape, electrical flux, and cable ties, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firms with at least 2 years of successful installation experience on projects utilizing electrical connection for equipment similar to that required for this project.

NEC Compliance: Comply with applicable portions of NEC as to type products used and installation of electrical power connections (terminals and splices), for junction boxes, motor starters, and disconnect switches.

IEEE Compliance: Comply with Std 241, "IEEE Recommended Practice for Electric Power Systems in Commercial Buildings" pertaining to connections and terminations.

ANSI Compliance: Comply with applicable requirements of ANSI/NEMA and ANSI/EIA standards pertaining to products and installation of electrical connections for equipment.

UL Compliance: Comply with UL Std 486A, "Wire Connectors and Soldering Lugs for Use With Copper Conductors" including, but not limited to, tightening of electrical connectors to torque valves indicated. Provide electrical connection products and materials which are UL-listed and -labeled.

PRODUCTS

MATERIALS AND COMPONENTS:

General: For each electrical connection indicated, provide complete assembly of materials, including but not necessarily limited to, pressure connectors, terminals (lugs), electrical insulating tape, electrical solder, electrical soldering flux, heat-shrinkable insulating tubing, cable ties, solderless wirenuts, and other items and accessories as needed to complete splices and termination of types indicated.

Metal Conduit, Tubing and Fittings:
General: Provide metal conduit, tubing and fittings of types, grades, sizes and weights (wall thicknesses) indicated for each type service. Where types and grades are not indicated, provide proper selection as determined by Installer to fulfill wiring requirements and comply with NEC requirements for raceways. Provide products complying with basic electrical materials and methods section "Raceways", and in accordance with the following listing of metal conduit, tubing and fittings:

Rigid steel conduit.
Liquid-tight flexible metal conduit.

- continued -

Liquid-tight flexible metal conduit fittings.

Wire, Cable and Connectors:

Wires/Cables: Unless otherwise indicated, provide wires/cables (conductors) for electrical connections which match, including sizes and ratings, of wires/cables which are supplying electrical power. Provide copper conductors with conductivity of not less than 98% at 20 deg C (68 deg F).

Connectors and Terminals: Provide electrical connectors and terminals which mate and match, including sizes and ratings with equipment terminals and are recommended by equipment manufacturer for intended applications.

Electrical Connection Accessories: Provide electrical insulating tape, heat-shrinkable insulating tubing and boots, electrical solder, electrical soldering flux, wirenuts and cable ties as recommended for use by accessories manufacturers for type services indicated.

EXECUTION

INSPECTION:

Inspect area and conditions under which electrical connections for equipment are to be installed and notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

INSTALLATION OF ELECTRICAL CONNECTIONS:

Install electrical connections as indicated; in accordance with connector manufacturer's written instructions and with recognized industry practices, and complying with applicable requirements of UL, NEC and NECA's "Standard of Installation" to ensure that products fulfill requirements.

Coordinate with other work, including wires/cables, raceway and equipment installation, as necessary to properly interface installation of electrical connections for equipment with other work.

Connect electrical power supply conductors to equipment conductors in accordance with equipment manufacturer's written instructions and wiring diagrams. Mate and match conductors of electrical connections for proper interface between electrical power supplies and installed equipment.
Maintain existing electrical service and feeders to occupied areas and operational facilities, unless otherwise indicated, or when authorized otherwise in writing by Owner, or Architect/Engineer. Provide temporary service during interruptions to existing facilities. When necessary, schedule momentary outages for replacing existing wiring systems with new wiring systems. When that "cutting-over" has been successfully accomplished, remove, relocate, or abandon existing wiring as indicated.

- continued -

Cover Splices with electrical insulating material equivalent to, or of greater insulation resistivity rating, than electrical insulation rating of those conductors being spliced.

Prepare cables and wires, by cutting and stripping covering armor, jacket, and insulation properly to ensure uniform and neat appearance where cables and wires are terminated. Exercise care to avoid cutting through tapes which will remain on conductors. Also avoid "ringing" copper conductors while skinning wire.

Trim cables and wires as short as practicable and arrange routing to facilitate inspection, testing and maintenance.

Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturers published torque tightening values for equipment connectors. Accomplish tightening by utilizing proper torquing tools, including torque screwdriver, beam-type torque wrench, and ratchet wrench with adjustable torque settings. Where manufacturer's torquing requirements are not available, tighten connectors and terminals to comply with torquing values contained in UL's 486A.

Provide liquid-tight flexible conduit for connection of motors and for other electrical equipment where subject to movement and vibration, and also where subjected to one or more of the following conditions:

Exterior location.
Moist or humid atmosphere where condensate can be expected to accumulate.
Corrosive atmosphere.
Water spray.
Dripping oil, grease, or water.

Fasten identification markers to each electrical power supply wire/cable conductor which indicates their voltage, phase and feeder number. Affix markers at each terminal conductor, as close as possible to the point of connection.

FIELD QUALITY CONTROL:

Upon completion of installation of electrical connections, and after circuitry has been energized with rated power source, test connections to demonstrate capability and compliance with requirements. Ensure that direction of rotation of each motor fulfills requirement. Correct malfunctioning units at site, then retest to demonstrate compliance.

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

GENERAL

RELATED DOCUMENTS
Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

- continued -

SUMMARY

This Section includes individually mounted enclosed switches and circuit breakers used for the following:

Service disconnecting means.
Motor and equipment disconnecting means.

DEFINITIONS

GFCI: Ground-fault circuit interrupter.
RMS: Root mean square.
SPDT: Single pole, double throw.

SUBMITTALS

Product Data: For each type of switch, circuit breaker, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

Shop Drawings: For each switch and circuit breaker.

Qualification Data: Submit data for testing agencies indicating that they comply with qualifications specified in "Quality Assurance" Article.

Maintenance Data: For enclosed switches and circuit breakers and for components to include in maintenance manuals specified in Division 1. In addition to requirements specified in Division 1 Section "Closeout Procedures," include the following:

Routine maintenance requirements for components.

Manufacturer's written instructions for testing and adjusting switches and circuit breakers.

Time-current curves, including selectable ranges for each type of circuit breaker.

QUALITY ASSURANCE

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

Comply with NEMA AB 1 and NEMA KS 1.

Comply with NFPA 70-2005.

Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and

- continued -

other items. Comply with indicated maximum dimensions.

COORDINATION
Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PRODUCTS

MANUFACTURERS
Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Fusible Switches:

Eaton Corp.; Cutler-Hammer Products.
General Electric Co.; Electrical Distribution & Control Division.
Siemens Energy & Automation, Inc.
Square D Co.

ENCLOSED SWITCHES
Enclosed, Nonfusible Switch: NEMA KS 1, Type HD, with lockable handle.

Enclosed, Fusible Switch, 800 A and Smaller: NEMA KS 1, Type HD, with clips to accommodate specified fuses, lockable handle with two padlocks, and interlocked with cover in closed position.

ENCLOSURES
NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.

Outdoor Locations: NEMA 250, Type 3R

EXECUTION

EXAMINATION
Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance.

Proceed with installation only after unsatisfactory conditions have been corrected.

IDENTIFICATION
Enclosure Nameplates: Label each enclosure with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

CONNECTIONS
Install equipment grounding connections for switches and circuit breakers with ground continuity to main electrical ground bus.

- continued -

Install power wiring. Install wiring between switches and circuit breakers, and control and indication devices.

Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

FIELD QUALITY CONTROL

Prepare for acceptance tests as follows:

Test insulation resistance for each enclosed switch, circuit breaker, component, and control circuit.

Test continuity of each line- and load-side circuit.

Testing: After installing enclosed switches and circuit breakers and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

Procedures: Perform each visual and mechanical inspection and electrical test indicated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.

Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

CLEANING

On completion of installation, inspect interior and exterior of enclosures. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

MEDIUM-VOLTAGE TRANSFORMERS

GENERAL

SUMMARY

This section includes the following types of transformers with medium-voltage primaries:

Pad-mounted, liquid-filled transformers.

SUBMITTALS

Product Data: Include rated nameplate data, capacities, weights, dimensions, minimum clearances, installed devices and features, location of each field connection, and performance for each type and size of transformer indicated.

Shop Drawings: Wiring and connection diagrams.

- continued -

Source quality-control test reports.

Follw-up service reports.

Operation and Maintenance Data: For transformer and accessories to include in emergency, operation, and maintenance manuals.

QUALITY ASSURANCE

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

Comply with manufactures testing requirements.

Comply with MFPA 70-2005.

DELIVERY, STORAGE, AND HANDLING

Store transformers so condensation will not form on or in units. Provide temporary heating according to manufacturer's written instructions.

COORDINATION

Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified on the drawings.

PRODUCTS

MANUFACTURES

Available Manufacturers: Subject t compliance with requirements, manufacturers offering products that may be incorporated into the Work included, but are not limited to the following:

Cooper Industries: Cooper Power Systems Division, Padmount transformers.
Cutler-Hammer, Padmount transformers.
GE Electrical Distribution & Control, Padmount transformers.
Hammond Manufacturing: Transformer Group, Padmount transformers.
Siemens Energy & Automation, Inc. Padmount transformers.
Square D/ Groupe Schneideer NA, Padmount transformer.

PAD-MOUNTED, LIQUID-FILLED TRANSFORMERS

Description: ANSI C57.12.13, IEEE C57.12.22, IEEE C57.12.26, padmounted, 2-winding transformers. Stainless-steel tank base and cabinet. Cooper winding and copper bus.

- continued -

Impedence between 5.2% and 5.8%. Primary 13,200 volt, Secondary 277/480 volt, 500 KVA (or as indicated on drawings).

Insulating Liquid: Mineral oil, complying with ASTM D 3487, Type II, and tested according to ASRM D 117.

Insulation Temperature Rise: 65 degree C when operated at rated kVA output in a 40 degree C ambient temperature. Transformer shall be rated to operate at rated kilovolt ampere in an average ambient temperature of 30 degrees C over 24 hours with a maximum ambient temperature of 40 degree C without loss of service life expectancy.

Basic Impulse Level: 95V.

Full-Capacity Voltage Taps: Four 2.5 percent taps, 2 above and 2 below rated high voltage; with externally operable tap changer for de-energized use and with position indicator and padlock hasp.

High-Voltage Switch: 200 amp, make and latch rating f 10KA RMS, symmetrical, arrange for dual feed source) A_, FF, source (B).

Primary Fuses: 150-kV fuse assembly with fuses complying with IEEE C37.47. Rating f current-limiting fuses shall be 50-kA RMS at specified system voltage.

SILVER Link Bayonet fuses in series with current limiting fuses.

Surge Arresters: Distribution class, one for each primary phase; complying with IEEE C62.11 and NEMA LA 1; support from tank wall within high-voltage compartment. Transformers shall have six arresters for dual radial feed circuits.

High-Voltage Terminations and Equipment: Dead front with universal-type bushing wells for dead-front bushing-well inserts, complying with IEEE 386 and including the following:

Bushing-Well Inserts: One for each high-voltage bushing well, 200 amp.
Surge Arresters: Dead-front, elbow-type, metal-oxide-varistor units.
Parking Stands: One for each high-voltage bushing well.
Portable Insulated Bushings: Arranged for parking insulated, high-voltage, lad-break cable terminators; one for each primary feeder conductor terminating.

Accessories:
Drain Valve: 1 inch (25mm), with sampling device.
Dial-type thermometer.
Liqid-level gage.
Pressure-vacuum gage.
Pressure Relief Device: Self-sealing with an indicator.
Mounting provisions for low-voltage current transformers.

- continued -

Meter: Electronic kilowatt-hour/demand measuring to record electricity used and highest peak demand over a time period according to electric utility. Meter is designed for use on the type and rating of circuit indicated for its application. Install meter on transformer.

1. Kilowatt-Hour Display: Digital liquid crystal.
2. Kilowatt-Demand Display: Digital, liquid-crystal type to register highest peak demand.
3. Enclosure: NEMA 250, Type 1, minimum, with hasp for padlocking or sealing.
4. Memory Backup: Self-contained to maintain memory throughout power outages of 72 hours, minimum.
5. Sensors: Current-sensing type, with current or voltage output, selected for optimum range and accuracy for the ratings of the circuits indicated for this application.
    a. Type: Solid Core.
6. Accuracy: Nationally recognized testing laboratory certified to meet ANSI C12.16 Specifications.
7. Demand Signal Communication Interface: Match signal to building automation system input that conveys data on instantaneous/integrated demand level measured by meter used or load switching to control demand. Provide cable, conduit for a complete connection to the building automaton system.
8. Provide metering shunt switches to short C.T.'s and open voltage source.
9. Mount meter on building

IDENTIFICATION DEVICES

Nameplates: Engrave, laminated-plastic or metal nameplate for each transformer, mounted with corrosion-resistant screws.

SOURCE QUALITY CONTROL

Factory Tests: Perform design and routine tests according to standards specified for components. Conduct transformer tests according to IEEE C57.12.91.

EXECUTION

EXAMINATION

Examine areas and conditions for compliance with requirements for medium-voltae transformers.

Examine roughing-in of conduits and grounding systems to verify the following:
Wiring entries comply with layout requirements.
Entries are within conduit-entry tolerances specified by manufacturer and no feeders will have to cross section barriers to reach load or line lugs.

Examine walls, floors, roofs, and concrete bases for suitable mounting conditions where transformers will be installed.

- continued -

Verify that ground connections are in place and that requirements of the NEC have been met. Maximum ground resistance shall be 5 ohms at the location for the transformer.

Proceed with the installation only after unsatisfactory conditions have been corrected.

INSTALLATION

Install transformers on concrete bases.
Anchor transformers to concrete bases according to manufacturer's written instructions.
Construct concrete bases of dimensions indicted, but mot less than 4 inches larger in both directions than supported unit and 4 inches high.
Use 3000-psi, 28 day compressive strength concrete and reinforcement as specified herein.
There shall be no exposed earth in transformer pad.

Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and NFPA 70.

Grounding per NFPA 70.

IDENTIFICATION

Identify field-installed wiring and components and provide warning signs as specified in "Electrical Identification".

CONNECTIONS

Ground equipment according to NEC.
Connect wiring according to NEC.
Tighten electrical connections and terminals according to manufacturer's published torque-tightening values.

FIELD QUALITY CONTROL

Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

Testing agency: Engage a qualified testing and inspection agency to perform the following field tests and inspections and prepare test reports:

Perform the following field tests and inspections and prepare test reports:

After installing transformers but before primary is energized, verify that grounding system at substation is tested at specified value or less.

- continued -

After installing transformers and after electrical circuitry has been energized, test for compliance with requirements.

Perform electrical test and visual and mechanical inspection per manufacturers requirements.

Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

Remove malfunctioning units, replace with new units, and retest as specified above.
Test Reports: Prepare written reports to record the following:
Test procedures used.
Test results that comply with requirements.
Tests results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

INTERIOR LIGHTING

SUMMARY

This Section includes interior lighting fixtures, lighting fixtures mounted on exterior building surfaces, lamps, ballasts, emergency lighting units, and accessories.

SUBMITTALS

Product Data: For each type of lighting fixture indicated, arranged in order of fixture designation. Include data on features, accessories, and the following:

Dimensions of fixtures.
Certified results of independent laboratory tests for fixtures and lamps for electrical ratings and photometric data.
Certified results of laboratory tests for fixtures and lamps for photometric performance.
Emergency lighting unit battery and charger.
Fluorescent and high-intensity-discharge ballasts.
Types of lamps.

Shop Drawings: Show details of nonstandard or custom fixtures. Indicate dimensions, weights, method of field assembly, components, features, and accessories.

Wiring Diagrams: Detail wiring for fixtures and differentiate between manufacturer-installed and field-installed wiring.

Maintenance Data: For lighting fixtures to include in maintenance manuals specified in Division 1.

QUALITY ASSURANCE

- continued -

Fixtures, Emergency Lighting Units, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

Comply with NFPA 70- Latest edition or edition enforced by state and local code authority.

NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

COORDINATION

Fixtures, Mounting Hardware, and Trim: Coordinate layout and installation of lighting fixtures with ceiling system and other construction.

WARRANTY

General Warranty: The contractor shall warranty all work for one year after acceptance of project.

PART 2 - PRODUCTS

MANUFACTURERS

Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products indicated in the Fixture schedule on the drawings.

FIXTURES AND FIXTURE COMPONENTS, GENERAL

Metal Parts: Free from burrs, sharp corners, and edges.

Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit re-lamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during re-lamping and when secured in operating position.

FLUORESCENT LAMP BALLASTS

General Requirements: Unless otherwise indicated, features include the following:

Designed for type and quantity of lamps indicated at full light output.
Total Harmonic Distortion Rating: Less than 20 percent.
Sound Rating: A.

Electronic Ballasts for Linear Lamps: Unless otherwise indicated, features include the following, besides those in "General Requirements" Paragraph above:

- continued -

Encapsulation: Without voids in potting compound.
Parallel Lamp Circuits: Multiple lamp ballasts connected to maintain full light output on surviving lamps if one or more lamps fail.

Ballasts for Compact Lamps in Recessed Fixtures: Unless otherwise indicated, additional features include the following:
Type: Electronic or electromagnetic, fully encapsulated in potting compound.
Power Factor: 90 percent, minimum.
Operating Frequency: 20 kHz or higher.
Flicker: Less than 5 percent.
Lamp Current Crest Factor: Less than 1.7.

EXIT SIGNS

Internally Lighted Signs: As follows:
Lamps for AC Operation: Light-emitting diodes, 70,000 hours minimum rated lamp life.

LAMPS

Fluorescent Color Temperature and Minimum Color-Rendering Index: Refer to drawings.

Non-compact Fluorescent Lamp Life: Rated average is 20,000 hours at 3 hours per start when used on rapid-start circuits.

All fluorescent lamps shall be low mercury.

FIXTURE SUPPORT COMPONENTS

Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

Aircraft Cable Support: Use cable, anchorages, and intermediate supports recommended by fixture manufacturer.

FINISHES

Fixtures: Manufacturer's standard, unless otherwise indicated.

Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.
Metallic Finish: Corrosion resistant.

PART 3 - EXECUTION

INSTALLATION

- continued -

Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.

Support for Fixtures in or on Grid-Type Suspended Ceilings: Use grid for support.

Install a minimum of four ceiling support system rods or wires for each fixture. Locate not more than 6 inches from fixture corners.
Fixtures of Sizes Less Than Ceiling Grid: Arrange as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.

Suspended Fixture Support: As follows:

Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.

CONNECTIONS

Ground equipment.

Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values.

FIELD QUALITY CONTROL

Inspect each installed fixture for damage. Replace damaged fixtures and components.

Provide instruments to make and record test results.

Tests: As follows:

Verify normal operation of each fixture after installation.
Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.
Verify normal transfer to emergency source and retransfer to normal.
Report results in writing.

Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

Corrosive Fixtures: Replace during warranty period.

CLEANING AND ADJUSTING

Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.

- continued -

SWITCHBOARDS

SUMMARY

A. This section includes service and distribution switchboards rated 600 V and less.

DEFINITIONS

A. EMI: Electromagnetic interference.
B. GFCI: Ground-Fault circuit interrupter.
C. RFI: Radio-Frequency interference.
D. RMS: Rot Mean Square.
E. SPDT: Single Pole, Double Throw.

SUBMITTALS

A. Product Data: For each type of switchboard, overcurrent protection device, ground-fault protector, accessory, and component indicated. Include dimensions and manufacturer' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each switchboard and related equipment.
1. Dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings. Include the following:
a. Enclosure types and derails for type other than NEMA 250, Type 1.
b. Bus configuration, current, and voltage ratings.
c. Short-circuit current ratings of switchboards and overcurrent protection devices.
d. Description documentation of optional barriers specified for electrical insulation and isolation.
e. Metering provisions.
f. UL listing for series rating of installed devices.
g. Features, characteristics, ratings, and factory settings of individual overcurrent protection devices and auxiliary components.
h. Floor plan indicating all electrical equipment and clearances.

2. Wiring Diagrams: Diagram power, signal, and control wiring and differentiate between manufacturer=installed and field-installed wiring.

C. Maintenance Data: For switchboards and components to include in maintenance manuals specified. In addition to requirements specified herein, include the following:

1. Routine maintenance requirements for switchboards and all installed components.
2. Manufacturer's written instructions for testing and adjusting overcurrent protection devices.
3. Time-current curves, including selectable ranges for each type of overcurrent protection device.

QUALITY ASSURANCE

- continued -

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. Comply with NFPA 70- Latest edition or edition enforced by state and local code authority.
C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for switchboards, including clearances between switchboards, and adjacent surfaces and other items. Comply with indicted maximum dimensions.

DELIVERY, STORAGE, AND HANDLING

A. Deliver in sections of lengths that can be moved past obstructions in delivery path.
B. Store indoors in clean dry space with uniform temperature to prevent condensation. Protect from exposure to dirt, fumes, water, corrosive substances, and physical damage.
C. If stored in areas subjected to weather, cover switchboards to provide protection from weather, dirt, dust, corrosive substances, and physical damage. Remove lose packing and flammable materials from inside switchboards; install electric heating (250-W per section) to prevent condensation.
D. Handle switchboards according to manufactures requirements.

COORDINATION

A. Coordinate layout and installation of switchboards and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PRODUCT

MANUFACTURERS

A. Available Manufactures: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work included, but not limited to, the following:

1. Eaton Corp.: Cutler-Hammer Products, Pow-R-Line C.
2. General Electric Co.: Electrical Distribution & Control Div., Spectra/AV.
3. Siemens Energy & Automation, Inc. SB 3/SB2.
4. Square D Co., QED-S.

MANUFACTURED UNITS

Types described below include service and distribution switchboards most commonly applied.
Select types required for Project from options in paragraphs below.
Coordinate with Drawings.
If more than one type is required, identify by Drawing identification number.

Coordinate type of switchboard with type of overcurrent protection devices and with switchboard arrangement and available space. Consult manufacturer to determine layout requirements.

- continued -

See Evaluations for further discussion.

A. Front-Connected, Front-Accessible Switchboard: Panel-mounted main device, panel-mounted branches, and sections rear aligned.
B. Normal System Voltage: Refer to Drawings.
C. Main-Bus Continuous: Ampacity indicated on schedule.

FABRICATION AND FEATURES

A. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting primer on a treated metal surface.
B. Barriers: Between adjacent switchboard sections.
C. Insulation and isolation for main and vertical busses of feeder sections.
D. Buses and Connections: Three phase, four, wire, unless otherwise indicated. Include the following features:
1. Phase- and Neutral-bus material: Hard-Drawn copper of 98 percent conductivity with feeder circuit-breaker line connections.
2. Load Terminals: Insulated, rigidly braced, silver-plated, copper runback bus extensions equipped with pressure connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full ampere ratings of circuit-breaker position.
3. Ground Bus: ¼=by-2-inch minimum size, drawn-temper copper of 98 percent conductivity, equipped with pressure connectors for feeder and branch-circuit ground conductors. For busway feeders, extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.
4. Contact Surfaces of Buses: Silver Plated.
5. Main Phase Buses, Neutral Buses, and Equipment Ground Buses} Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions for both ends.
6. Isolation Barrier Access Provisions: Permit checking of bus-bolt tightness.
7. Neutral Buses: 100 Percent of the ampacity of the phase buses, unless otherwise indicated, equipped with pressure connectors for outgoing circuit neutral cables. Bus extensions for busway feeder neutral bus is braced.

E. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.

OVERCURENT PROTECTION DEVICES

A. Molded-Case Circuit Breaker: NEMA AN 1, with interrupting capacity to meet available fault currents.
1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjust magnetic trip setting for circuit-breaker frame sizes 250 A and larger. 100 percent rated.

B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.

- continued -

1. Lugs: Mechanical style, suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
3. Ground-fault Protection: Integrally mounted relay and trip unit ith adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.

SWITCHBOARD SHORT-CIRCUIT RATING

A. Series rating of panels and breakers is allowed UL Label indicating series-connected rating with integral or remote upstream devices. Include size and type of upstream device allowable, branch devices allowable, and UL series-connected short-circuit rating.

TRANSIENT VOLTAGE SURGE SUPPRESSOR

A. Contractor shall furnish UL 1449 Listed TVSS with NEC compliant Short Circuit Current Rating of no less than available short circuit at panel being protected. RVSS shall be suitable for use on circuits up to 200,000 rms symmetrical amperes or as indicated on the drawings, and shall not require any upstream overcurrent protection in series to obtain said rating.

Devices shall be factory installed in the switchboard equipment, and shall utilize a UL recognized and listed, field replaceable module or modules, with UL Listed 200kAIC fusing for overcurrent protection and thermal cutouts to prevent catastrophic failure caused by sustained over voltages.

Device shall be rated for the minimum amps shown on drawings per mode for each L-N, L-G, and N-G modes, with a maximum UL Suppressed Voltage Rating of 800V for 480Y/277V applications, and 400V for 208Y/120V applications. A UL approved disconnect switch shall be provided as a means of disconnect if a 60A breaker is not provided or available. The rating of the TVSS is indicated on the panel schedule or riser, “N/A” on panel schedule indicates not applicable to that panel schedule.

Device will include NO/NC dry contacts for connection to facility management systems, and provide an audible alarm with push to test and on/off switch for notification of reduced or lost protection. Device shall offer LED indicators to indicators to indicate the status of protection on each phase and/or mode. All diagnostics shall be situated on an external location f the panel for easy facilitation.

Device shall have a minimum of 5 years warranty, and shall have an available factory authorized repair service or toll free number for access to technical personnel and/or parts.

EXECUTION

PROTECTION

A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer’s written instructions.

- continued -

EXAMINATION

A. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

A. Install switchboard and accessories according to manufactures requirements.
B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from switchboard units and components.
C. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.

IDENTIFICATION

A. Switchboard Nameplates: Label each switchboard compartment with engraved metal or laminated-plastic nameplate mounted with corrosion resistant screws.

CONNECTIONS

A. Install equipment grounding connections for switchboard compartment with ground continuity to main electrical ground bus.
B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values.

FIELD QUALIRY CONTROL

A. Prepare for acceptance tests as follows:
1. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

CLEANING

A. On completion of installation, inspect interior and exterior of switchboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

- continued -

PANELBOARDS

GENERAL

SUMMARY

A. This Section includes load centers and panelboards, overcurrent protective devices, and associated auxiliary equipment rated 600 V and less for the following types:

1. Lighting and appliance branch-circuit panelboards.
2. Distribution panelboards.

DEFINITIONS

Retain abbreviations that remain after this Section has been edited.

A. EMI: Electromagnetic interference.
B. GFCI: Ground-fault circuit interrupter.
C. RFI: Radio-frequency interference.
D. RMS: Root mean square.
E. SPDT: Single pole, double throw.

SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:

    a. Enclosure types and details for types other than NEMA 250, Type 1.
    b. Bus configuration, current, and voltage ratings.
    c. Short-circuit current rating of panelboards and overcurrent protective devices.
    d. UL listing for series rating of installed devices.
    e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
    f. Floor plans indicating all electrical equipment with actural sizes and clearances.

2. Wiring Diagrams: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.

- continued -

C. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

D. Maintenance Data: For panelboards and components to include in maintenance manuals specified in Division 1. In addition to requirements specified in Division 1 Section "Contract Closeout," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

QUALITY ASSURANCE

Retain paragraph and subparagraph below if Contractor or manufacturer selects testing agency.

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70- Latest edition or edition enforced by state and local code authority.

COORDINATION

Edit below to delete or add types of equipment that affect panelboard installation.

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

PRODUCTS

MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Lists below are examples only. Retain or insert only those manufacturers whose products correspond with other requirements and whose availability and suitability for the application have been verified.

See Editing Instruction No. 1 in the Evaluations for cautions about naming products and manufacturers.

1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:

    a. Eaton Corp.; Cutler-Hammer Products, Pow-R-Line Series.
    b. General Electric Co.; Electrical Distribution & Control Div., Spectra Series, A-Series
    c. Siemens Energy & Automation, Inc., P1/SE/53
    d. Square D Co., NQOD, NEHB, I-Line.

FABRICATION AND FEATURES

A. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1, to meet environmental conditions at installed location.

Delete items below if not applicable. Add other Project-specific requirements.

1. Outdoor Locations: NEMA 250, Type 3R.

B. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.

Retain paragraph above or below.

C. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.

D. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

E. Directory Card: Type written, with transparent protective cover, mounted inside metal frame, inside panelboard door.

F. Bus: Hard-drawn copper, 98 percent conductivity.

G. Main and Neutral Lugs: Mechanical type suitable for use with conductor material.

Ten paragraphs below are special features. Add other required features and coordinate with Drawings.

H. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.

Delete paragraph below except for panelboards incorporating one or more main service disconnect switches. Edit to suit Project.

I. Service Equipment Label: UL labeled for use as service equipment for panelboards with

main service disconnect switches.

Delete paragraph below if future provisions are not required.

J. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

PANELBOARD SHORT-CIRCUIT RATING

Select one of two paragraphs below for series-rated system or system that has panelboards and circuit breakers rated for full value of short-circuit current available at location of equipment. Edit to suit Project and coordinate with Drawings.

A. Series rating of panels and breakers is allowed. UL label indicating series-connected rating with integral or remote upstream devices. Include size and type of upstream device allowable, branch devices allowable, and UL series-connected short-circuit rating.

LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

Coordinate below with Drawings.

B. Doors: Front mounted with concealed hinges; secured with flush latch with tumbler lock; keyed alike.

DISTRIBUTION PANELBOARDS

Edit three paragraphs and associated subparagraphs below to suit Project. Coordinate with Drawings.

A. Doors: Front mounted, except omit in fused-switch panelboards; secured with vault-type latch with tumbler lock; keyed alike.

B. Main Overcurrent Protective Devices: Circuit breaker.

C. Branch overcurrent protective devices shall be one of the following:

1. For Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
2. For Circuit-Breaker Frame Sizes Larger than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

OVERCURRENT PROTECTIVE DEVICES

Edit three paragraphs and associated subparagraphs below to suit Project. Coordinate with

schedules and Drawings.

A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. GFCI Circuit Breakers: Single- and two-pole configurations with 5 -mA trip sensitivity.

B. Molded-Case Circuit-Breaker Features and Accessories. Standard frame sizes, trip ratings, and number of poles.

1. Lugs: Mechanical style, suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.

All breakers shall be bolt-on.

EXECUTION

INSTALLATION

A. Install panelboards and accessories according to manufactures requirements.
B. Mounting Heights: Top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.
C. Mounting: Plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
D. Circuit Directory: Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
E. Install filler plates in unused spaces.
F. Provision for Future Circuits at Flush Panelboards: Stub five 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.
G. Wiring in Panelboard Gutters: Arrange conductors into groups and bundle and wrap with wire ties after completing load balancing.

IDENTIFICATION

Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

- continued -

CONNECTIONS

Coordinate paragraphs below with Drawings.

A. Install equipment grounding connections for panelboards with ground continuity to main electrical ground bus.
B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:
   1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
   2. Test continuity of each circuit.

CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION

.

LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: University of Louisiana at Lafayette
Purchasing Office, Martin Hall Room 123
104 University Circle
PO Box 40197
Lafayette, LA 70504
(Owner to provide name and address of owner)

BID FOR: Broussard Hall - HVAC Replacement (Phase 2)
File No. 17213
(Owner to provide name of project and other Identifying information)

The undersigned bidder hereby declares and represents that she/he: a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by:
University of Louisiana at Lafayette **and dated:** September 2016.
(Owner to provide name of entity preparing bidding documents.)

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

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

_____ **Dollars ($_____)**

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

Alternate No. 1 ***Additional Installation of Outside Air Units (Second Floor)*** **for the lump sum of:**

_____ **Dollars ($_____)**

Alternate No. 2 Additional Installation of Outside Air Units (First Floor) ***for the lump sum*** **of:**

_____ **Dollars ($_____)**

Alternate No. 3 Additional Removal of HVAC Chilled and Hot Water Piping for the lump sum of:

_____ **Dollars ($_____)**

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

_____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

NAME OF AUTHORIZED SIGNATORY OF BIDDER: _____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER:** _____

DATE: _____

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

****** If someone other than a corporate officer signs for the Bidder/Contractor, a copy of a corporate resolution or other signature authorization shall be required for submission of bid. Failure to include a copy of the appropriate signature authorization, if required, may result in the rejection of the bid unless bidder has complied with La. R.S. 38:2212(A)(1)(c) or RS 38:2212(0).

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

NOTE: Affidavit submitted with the Bid Documents, prior to the opening of bids, will not be accepted in accordance with LA. R.S. 38:2212.10.

_____	_____
Name of Project	**Project No.**

STATE OF _____

PARISH OF _____

ATTESTATIONS AFFIDAVIT

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

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

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

(a) Public bribery (R.S. 14:118)
(b) Corrupt influencing (R.S. 14:120)
(c) Extortion (R.S. 14:66)
(d) Money laundering (R.S. 14:23)

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

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

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

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

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

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

Name of Project **Project No.**

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

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

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

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

DATE **TITLE OF AUTHORIZED SIGNATORY OF BIDDER**

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER/AFFIANT

Sworn to and subscribed before me by Affiant on the _____ day of _____, 20___.

Notary Public

UNIVERSITY of LOUISIANA at LAFAYETTE

BROUSSARD HALL

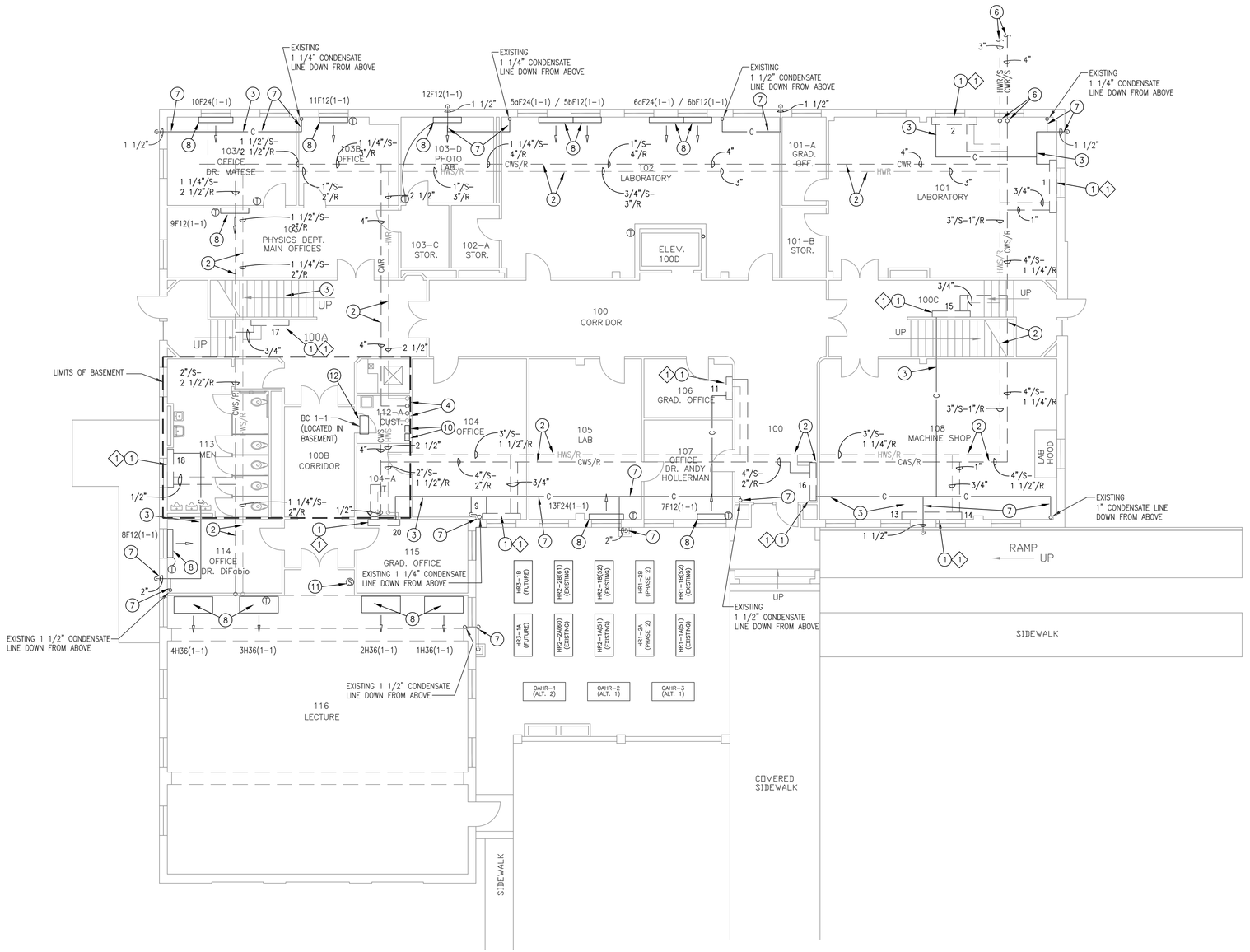
HVAC REPLACEMENT - PHASE 2

PHYSICAL PLANT
THE UNIVERSITY of LOUISIANA at LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL LAFAYETTE

DRAWING SHEET INDEX:

AUGUST 2016



NOTE: IT IS INTENDED THAT THE CW/HW FOUR PIPING SYSTEM SHALL REMAIN IN USE WHILE THE NEW VRF SYSTEM IS BEING INSTALLED. COORDINATE PHASING OF WORK WITH OWNER AND OTHER TRADES.

MECHANICAL DEMOLITION NOTES:

1. EXISTING FLOOR FAN COIL UNIT, ASSOCIATED CHILLED/HOT WATER PIPING, AND CONDENSATE DRAIN LINE TO BE REMOVED. CONTRACTOR SHALL PATCH FLOOR/WALL PENETRATION. FINISHED SURFACES SHALL MATCH EXISTING. THE WALL BEHIND THE EXISTING FLOOR MOUNTED FAN COIL UNIT SHALL BE PATCHED AND PAINTED TO MATCH THE EXISTING WALL AFTER THE EXISTING FAN COIL UNIT IS REMOVED AND BEFORE THE NEW VRF INDOOR UNIT IS INSTALLED. THE WALL AREA TO BE PATCHED AND PAINTED SHALL BE LIMITED TO THE AREA THAT WILL BE VISIBLE AFTER THE NEW VRF INDOOR UNITS ARE INSTALLED.
2. EXISTING CHILLED/HOT WATER SUPPLY/RETURN PIPING IN CRAWL SPACE HUNG FROM FLOOR SLAB TO BE REMOVED. (TYPICAL) (ALTERNATE No.3)
3. EXISTING CONDENSATE DRAIN LINE IN CRAWL SPACE HUNG FROM FLOOR SLAB SHALL REMAIN.
4. EXISTING CHILLED/HOT WATER SUPPLY/RETURN PIPING UP TO ATTIC SHALL BE REMOVED. (BASE BID)
5. EXISTING CONDENSATE DRAIN LINES SHALL BE MODIFIED TO ACCOMMODATE NEW VRF INDOOR UNITS.
6. EXISTING CHILLED/HOT WATER SUPPLY/RETURN PIPING BELOW GRADE TO REMAIN. CAP LINES ABOVE GRADE AND INSULATE CAPPED PIPING. (BASE BID)
7. EXISTING CONDENSATE DRAIN LINE TO REMAIN FOR USE WITH NEW VRF SYSTEM. CAP LINES AS REQUIRED TO REUSE EXISTING PIPING.
8. EXISTING VRF INDOOR UNIT TO REMAIN.
9. THE EXISTING FCU WALL MOUNTED THERMOSTAT AND FCU SPEED CONTROL SWITCHES SHALL BE REMOVED ALONG WITH THE ASSOCIATED WALL BOX AND WIRE MOLDING. THE WALL BEHIND THE WALL BOXES AND WIRE MOLD SHALL BE PATCHED AND PAINTED TO MATCH THE EXISTING WALL FINISH.
10. EXISTING VRF SYSTEM CONTROL PANEL TO REMAIN.
11. EXISTING EMS SPACE SENSOR TO REMAIN.
12. EXISTING VRF SYSTEM BC CONTROLLER TO REMAIN.

ELECTRICAL DEMOLITION NOTES:

1. MODIFY CONDUIT AND WIRING TO ACCOMMODATE REQUIREMENTS FOR NEW VRF INDOOR AND UNITS.

NOTE: CONTRACTOR SHALL REMOVE AND REPLACE ALL LAMINATED IDENTIFICATION LABELS ON ALL EXISTING VRF INDOOR AND OUTDOOR UNITS. CONTRACTOR SHALL TRACE ALL EXISTING REFRIGERANT LINES FROM EACH BC CONTROLLER TO EACH INDOOR VRF UNIT. NEW LABELS SHALL BE INSTALLED WITH CORRECT IDENTIFICATION INFORMATION (UNIT NO, UNIT TYPE, UNIT SIZE, ASSOCIATED OUTDOOR UNIT, & BC PORT). OUTDOOR UNITS SHALL HAVE LABELS CORRECT FOR ACTUAL CONTROL IDENTIFICATIONN LABEL.

NORTH

MECHANICAL and ELECTRICAL DEMOLITION PLAN - FIRST FLOOR

SCALE: 0 4' 8' (APPROXIMATE)

GENERAL NOTES

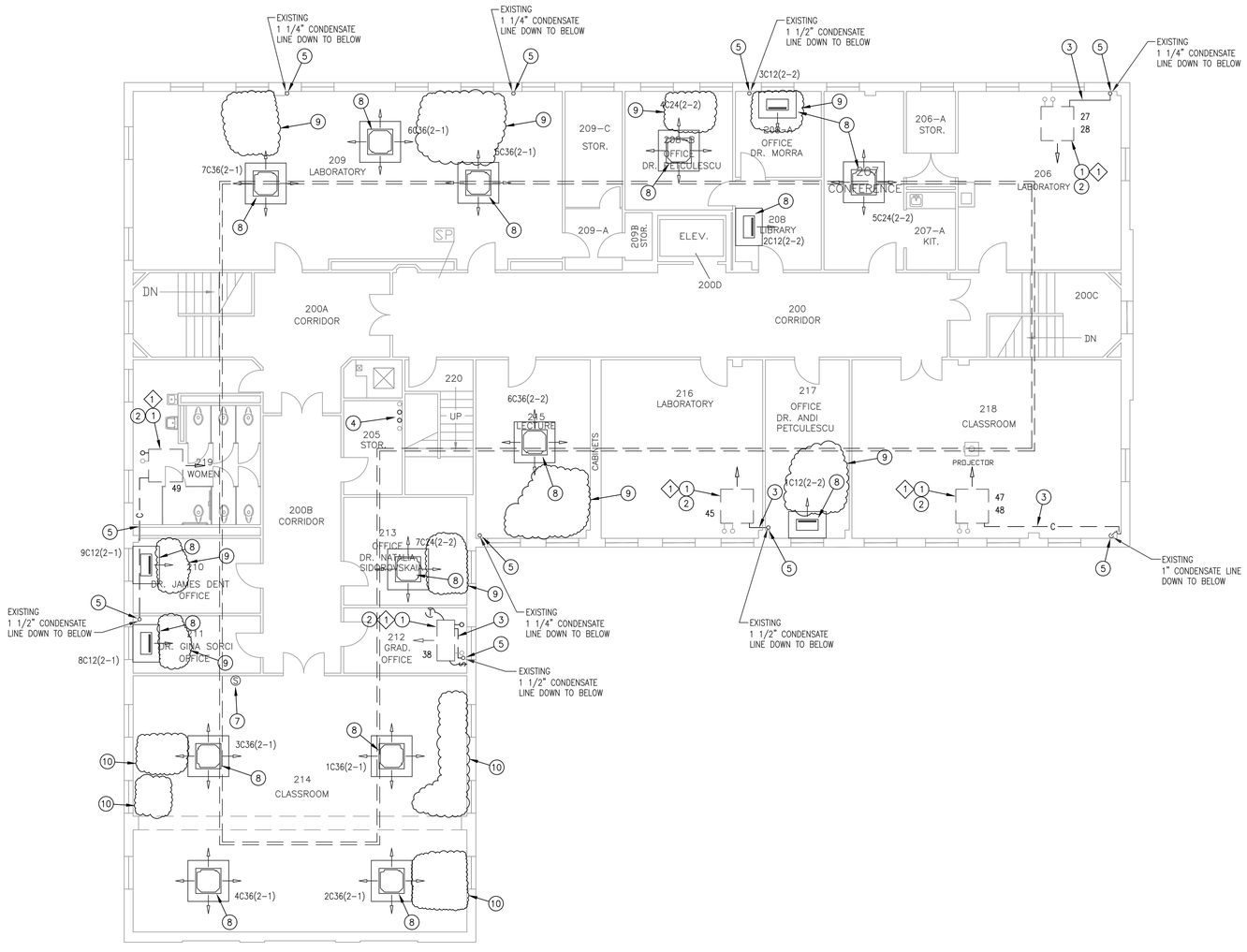
NO:	REVISIONS:	DATE:

BROUSSARD HALL
HVAC REPLACEMENT - PHASE 2

UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210 70504
LAFAYETTE, LOUISIANA

UL LAFAYETTE
UNIVERSITY OF LOUISIANA
PHYSICAL PLANT

PROJECT NO:	SHEET: ME1.1
DATE: AUGUST 2016	
SCALE: AS SHOWN	



NOTE: IT IS INTENDED THAT THE CW/HW FOUR PIPING SYSTEM SHALL REMAIN IN USE WHILE THE NEW VRF SYSTEM IS BEING INSTALLED. COORDINATE PHASING OF WORK WITH OWNER AND OTHER TRADES.

MECHANICAL DEMOLITION NOTES:

1. EXISTING SUSPENDED FAN COIL UNIT, ASSOCIATED CHILLED/HOT WATER PIPING, AND CONDENSATE DRAIN LINE TO BE REMOVED. CONTRACTOR SHALL PATCH CEILING, ATTIC, AND FLOOR PENETRATIONS. FINISHED SURFACES SHALL MATCH EXISTING. INSTALL 18 GAUGE PAINT GRIP SHEET METAL PLATE ON CEILING TO COVER PIPE AND SUPPORT ROD PENETRATIONS THRU EXISTING CEILING. PAINT PLATE TO MATCH EXISTING CEILING COLOR. CAP PIPING IN ATTIC AT MAIN. INSULATE OVER CAPPED PIPING.
2. PATCH CEILING AND PAINT TO MATCH EXISTING SURFACES AFTER UNIT AND PIPING IS REMOVED.
3. EXISTING CONDENSATE DRAIN LINE TO BE REMOVED.
4. EXISTING CHILLED/HOT WATER SUPPLY/RETURN PIPING UP FROM FIRST FLOOR TO BE REMOVED. PATCH FLOOR TO MATCH EXISTING. (BASE BID)
5. EXISTING CONDENSATE DRAIN LINE TO REMAIN FOR USE WITH NEW VRF SYSTEM. CAP LINES AS REQUIRED TO REUSE EXISTING PIPING.
6. THE EXISTING FCU WALL MOUNTED THERMOSTAT AND FCU SPEED CONTROL SWITCHES SHALL BE REMOVED ALONG WITH THE ASSOCIATED WALL BOX AND WIRE MOLDING. THE WALL BEHIND THE WALL BOXES AND WIRE MOLD SHALL BE PATCHED AND PAINTED TO MATCH THE EXISTING WALL FINISH.
7. EXISTING EMS SENSOR TO REMAIN. (TYPICAL)
8. EXISTING VRF INDOOR UNIT TO REMAIN.
9. CONTRACTOR SHALL REPAIR PLASTERED CEILING AREA TO MATCH EXISTING ADJACENT CEILING. PRIME AND PAINT TO MATCH EXISTING CEILING COLOR.
10. CONTRACTOR SHALL REPAIR EXISTING TILE CEILING AREA TO MATCH EXISTING ADJACENT CEILING. COORDINATE SELECTION OF TILE WITH OWNER TO MATCH EXISTING. PROVIDE SAMPLE TILE TO OWNER FOR APPROVAL.

ELECTRICAL DEMOLITION NOTES:

1. MODIFY CONDUIT AND WIRING TO ACCOMMODATE REQUIREMENTS FOR NEW VRF INDOOR UNITS.

NOTE: CONTRACTOR SHALL REMOVE AND REPLACE ALL LAMINATED IDENTIFICATION LABELS ON ALL EXISTING VRF INDOOR AND OUTDOOR UNITS. CONTRACTOR SHALL TRACE ALL EXISTING REFRIGERANT LINES FROM EACH BC CONTROLLER TO EACH INDOOR VRF UNIT. NEW LABELS SHALL BE INSTALLED WITH CORRECT IDENTIFICATION INFORMATION (UNIT NO, UNIT TYPE, UNIT SIZE, ASSOCIATED OUTDOOR UNIT, & BC PORT). OUTDOOR UNITS SHALL HAVE LABELS CORRECT FOR ACTUAL CONTROL IDENTIFICATIONN LABEL.

NORTH

MECHANICAL and ELECTRICAL DEMOLITION PLAN - SECOND FLOOR

SCALE: 0 4' 8' (APPROXIMATE)

GENERAL NOTES

NO:	REVISIONS:	DATE:

BROUSSARD HALL
HVAC REPLACEMENT - PHASE 2

THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
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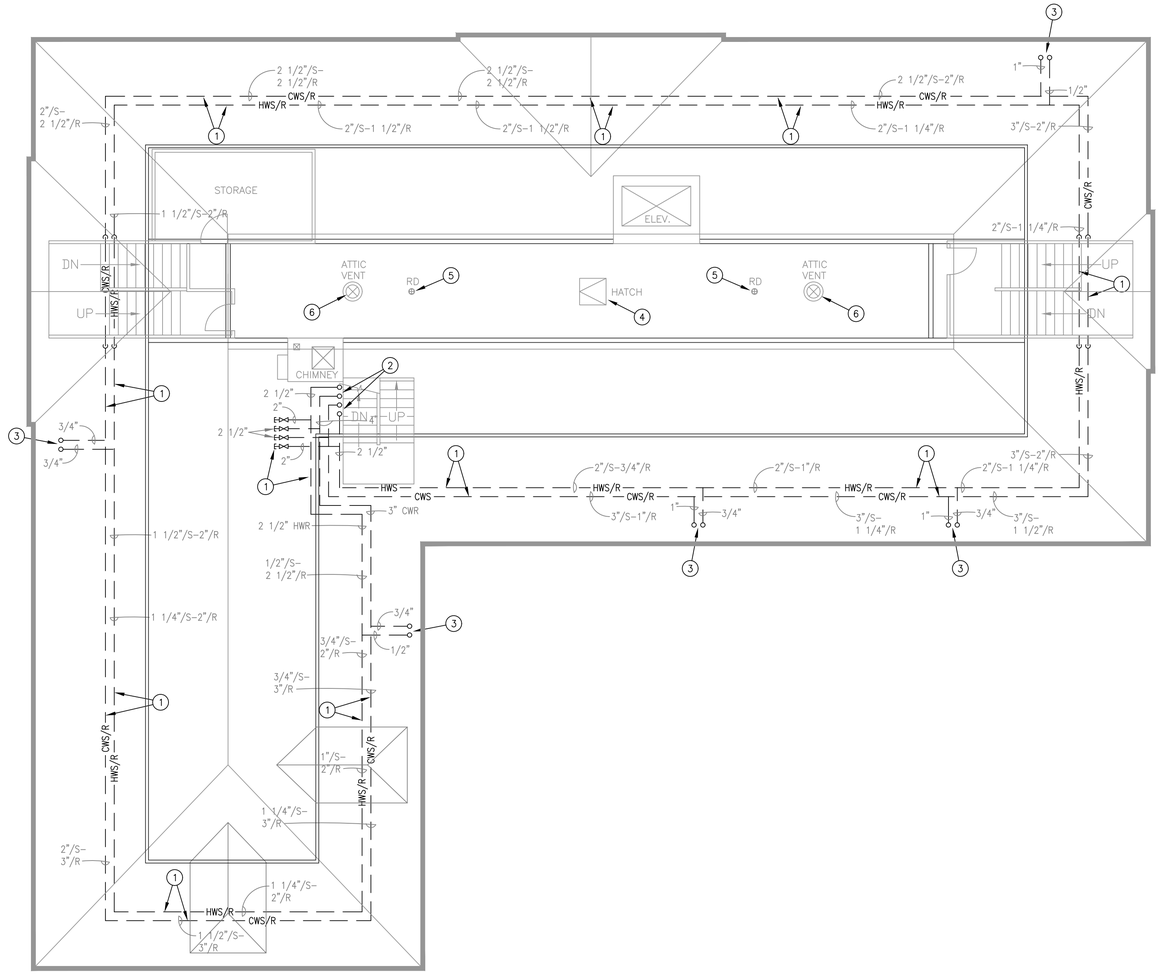
PROJECT NO:	SHEET:
DATE: AUGUST 2016	ME2.1
SCALE: AS SHOWN	



NOTE: IT IS INTENDED THAT THE CW/HW FOUR PIPING SYSTEM SHALL REMAIN IN USE WHILE THE NEW VRF SYSTEM IS BEING INSTALLED. COORDINATE PHASING OF WORK WITH OWNER AND OTHER TRADES.

MECHANICAL DEMOLITION NOTES:

1. EXISTING CHILLED/HOT WATER SUPPLY/RETURN PIPING AND SUPPORTS IN ATTIC TO BE REMOVED. (ALT. 3)
2. EXISTING CHILLED/HOT WATER SUPPLY/RETURN PIPING UP FROM FIRST FLOOR TO BE REMOVED. (BASE BID)
3. EXISTING CHILLED/HOT WATER SUPPLY/RETURN BRANCH PIPING DOWN TO FCU AT SECOND FLOOR SHALL BE REMOVED. CONTRACTOR SHALL PATCH CEILING AND FLOOR PENETRATIONS. FINISHED SURFACES SHALL MATCH EXISTING. THIS NOTE SHALL APPLY TO FCU'S REMOVED UNDER BASE BID.
4. EXISTING ROOF HATCH TO REMAIN.
5. EXISTING ROOF DRAIN TO REMAIN.
6. EXISTING ATTIC VENT TO REMAIN.

NOTE: CONTRACTOR SHALL REMOVE AND REPLACE ALL LAMINATED IDENTIFICATION LABELS ON ALL EXISTING VRF INDOOR AND OUTDOOR UNITS. CONTRACTOR SHALL TRACE ALL EXISTING REFRIGERANT LINES FROM EACH BC CONTROLLER TO EACH INDOOR VRF UNIT. NEW LABELS SHALL BE INSTALLED WITH CORRECT IDENTIFICATION INFORMATION (UNIT NO, UNIT TYPE, UNIT SIZE, ASSOCIATED OUTDOOR UNIT, & BC PORT). OUTDOOR UNITS SHALL HAVE LABELS CORRECT FOR ACTUAL CONTROL IDENTIFICATIONN LABEL.

MECHANICAL and ELECTRICAL DEMOLITION PLAN - ATTIC

SCALE: 0 4' 8' (APPROXIMATE)

GENERAL NOTES

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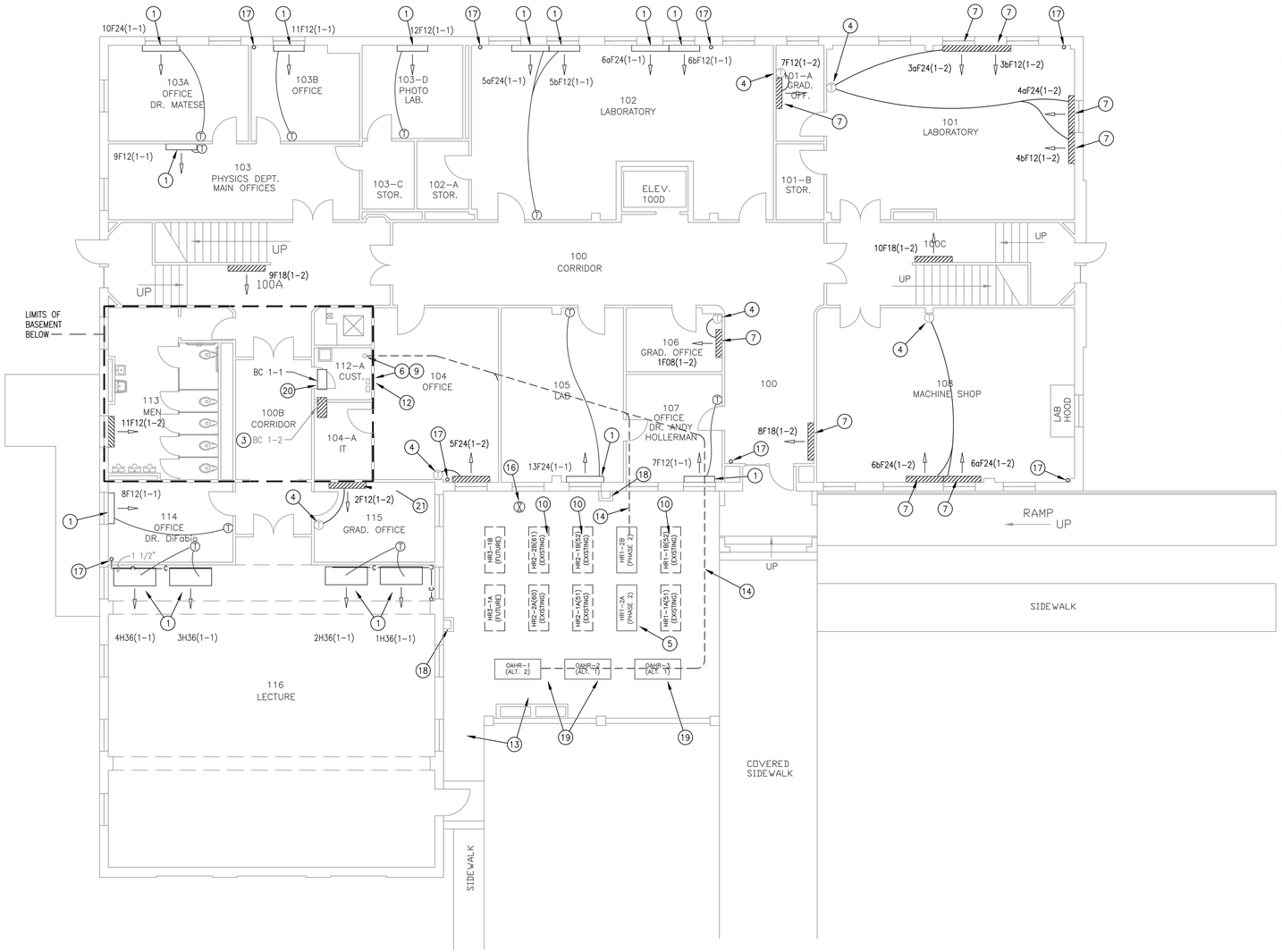
SCALE: AS SHOWN	



NORTH

VARIABLE REFRIGERANT FLOW SYSTEM
MECHANICAL PLAN - FIRST FLOOR

SCALE: 0 4' 8' (APPROXIMATE)

MECHANICAL NOTES:

1. EXISTING VRF INDOOR UNIT TO REMAIN.
2. REFRIGERANT LINES AND CONDENSATE DRAIN LINES EXPOSED IN BUILDING SHALL BE COVERED WITH LINE HIDE TYPE COVERING SYSTEM.
3. BC CONTROLLER TO BE SUSPENDED FROM CEILING STRUCTURE IN BASEMENT AREA. IT IS INTENDED THAT FOR THE FIRST LEVEL UNITS, REFRIGERANT LINES AND CONTROL WIRING MAY BE ROUTED IN THE CRAWL SPACE. EXISTING HOT WATER PIPING TO EXISTING FLOOR MOUNTED FCU'S MAY BE REMOVED TO ALLOW PATH FOR PIPING, CONTROLS, ETC.
4. WALL MOUNTED THERMOSTAT MOUNTED ON WALL (TYPICAL). CONTROL WIRING SHALL BE RUN IN WIRE MOLD (COLOR TO MATCH WALL).
5. OUTDOOR UNIT TO BE MOUNTED ON VIBRATION ISOLATION PADS SIMILAR TO EXISTING. REFRIGERANT LINES TO BE RUN BELOW UNITS, PENETRATE CRAWL SPACE WALL, ROUTE PIPING IN CRAWL SPACE TO RESPECTIVE BC CONTROLLER. (1ST LEVEL UNIT – BC TO BE LOCATED IN BASEMENT, 2ND LEVEL UNITS – BC TO BE LOCATED IN 3RD LEVEL ATTIC).
6. CORE HOLE IN FLOORS/WALLS TO ROUTE REFRIGERANT LINES TO BC'S IN BASEMENT, OR ROUTE LINES UP TO ATTIC LEVEL.
7. CONNECT FLOOR MOUNTED UNITS TO EXISTING CONDENSATE DRAIN PIPING SYSTEM. (TYPICAL)
8. CONDENSATE DRAIN PIPING TO BE ANCHORED TO WALL/CEILING. CONNECT TO EXISTING CONDENSATE DRAIN PIPING SYSTEM.
9. CONTRACTOR SHALL INSTALL FIRE RATED SEALANT (PAINT TO MATCH WALL) FOR ALL FLOOR/WALL/CEILING PENETRATIONS REQUIRED FOR REFRIGERANT PIPING, CONDUIT, CONTROL WIRING, ETC.
10. EXISTING OUTDOOR UNIT TO REMAIN.
11. PATCH ALL PENETRATIONS THRU WALLS, FLOORS, ETC. TO MATCH EXISTING SURFACES.
12. CENTRALIZED CONTROLLERS – COORDINATE FINAL LOCATION IN FIELD WITH OWNER. COORDINATE WITH ELECTRICAL CONTRACTOR.
13. EXISTING EQUIPMENT YARD.
14. NEW REFRIGERANT LINE ROUTING (TYPICAL).
15. ROUTING OF THE REFRIGERANT LINES, POWER WIRING, CONTROL WIRING, AND CONDENSATE DRAIN LINES FOR THE FIRST LEVEL FLOOR MOUNTED UNITS SHALL BE LOCATED IN THE CRAWL SPACE BELOW THE FIRST FLOOR.
16. EXISTING WATER VALVE TO REMAIN.
17. EXISTING CONDENSATE DRAIN RISER PIPING TO REMAIN.
18. EXISTING STORM DRAIN BASIN TO REMAIN.
19. IF ALTERNATE NO. 1 (AND/OR 2) IS ACCEPTED, PROVIDE OUTSIDE AIR OUTDOOR UNIT.
20. EXISTING BC CONTROLLER IN BASEMENT TO REMAIN.
21. REMOVE EXISTING CARPET BELOW NEW FLOOR MOUNTED UNIT. INSTALL BLACK FLOOR TILE. PUT TRANSITION STRIP BETWEEN NEW FLOOR TILE & EXISTING CARPET. PROPERLY TERMINATE EDGE OF CARPET AT TRANSITION STRIP.

GENERAL NOTES

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BROUSSARD HALL
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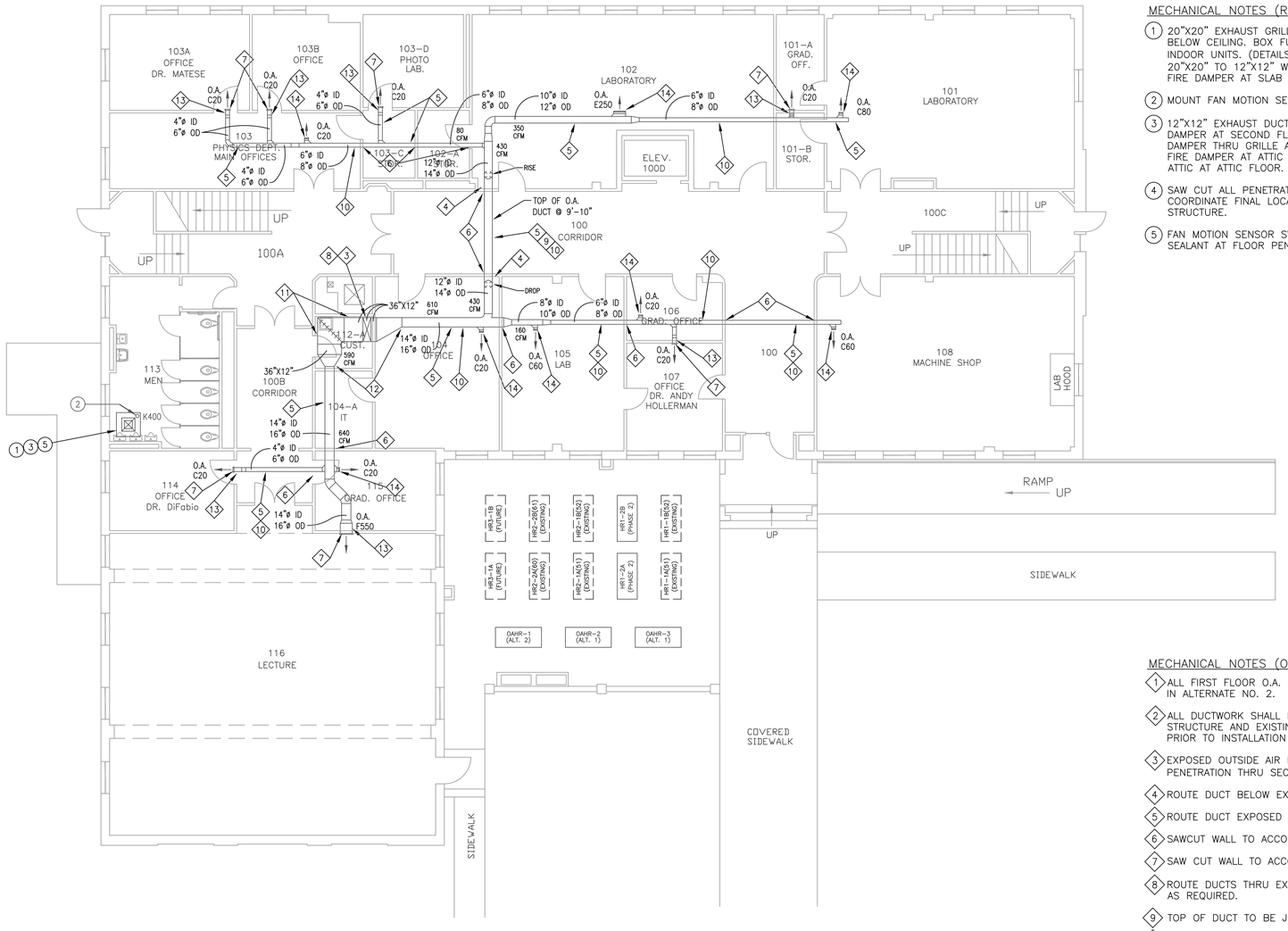
PROJECT NO: -	SHEET: M1.1
DATE: AUGUST 2016	
SCALE: AS SHOWN	

NOTE: EXHAUST FAN AND ASSOCIATED DUCTWORK, CONTROL WIRING AND POWER WIRING SHALL BE PART OF BASE BID. THE OUTSIDE AIR SYSTEM INCLUDING OUTSIDE AIR DUCTWORK AND GRILLES SHALL BE PART OF ALTERNATE NO. 2.



MECHANICAL NOTES (RESTROOM EXHAUST): (BASE BID)

1. 20"X20" EXHAUST GRILLE ("K") MOUNTED ON BOTTOM OF BOX FURRING BELOW CEILING. BOX FURRING TO BE SIMILAR TO VRF CEILING MOUNTED INDOOR UNITS. (DETAILS 1&2 ON SHEET M4.2) TRANSITION DUCT FROM 20"X20" TO 12"X12" WITHIN BOX FURRING. INSTALL HIGH HAT HORIZONTAL FIRE DAMPER AT SLAB PENETRATION.
2. MOUNT FAN MOTION SENSOR ON BOTTOM OF BOX FURRING.
3. 12"X12" EXHAUST DUCT UP THRU SECOND FLOOR TO ATTIC. INSTALL FIRE DAMPER AT SECOND FLOOR AND ATTIC FLOOR PENETRATION. ACCESS FIRE DAMPER THRU GRILLE AT FIRST LEVEL FOR SECOND FLOOR SLAB. ACCESS FIRE DAMPER AT ATTIC FLOOR PENETRATION THRU DUCT ACCESS DOOR IN ATTIC AT ATTIC FLOOR.
4. SAW CUT ALL PENETRATIONS THRU PLASTER CEILING AND FLOOR SLAB. COORDINATE FINAL LOCATION WITH STRUCTURAL SLAB. DO NOT CUT RIBS IN STRUCTURE.
5. FAN MOTION SENSOR SWITCH WIRING UP TO ATTIC. INSTALL FIRE RATED SEALANT AT FLOOR PENETRATIONS FOR CONDUIT.

MECHANICAL NOTES (OUTSIDE AIR): (ALTERNATE #2)

1. ALL FIRST FLOOR O.A. DUCT AND ASSOCIATED UNITS, ETC. SHALL BE INCLUDED IN ALTERNATE NO. 2.
2. ALL DUCTWORK SHALL BE ROUTED TO ACCOMMODATE EXISTING CONCRETE STRUCTURE AND EXISTING CONDITIONS. VERIFY ALL ROUTING WITH OWNER PRIOR TO INSTALLATION AND FABRICATION.
3. EXPOSED OUTSIDE AIR DUCT DOWN FROM ABOVE. PROVIDE FIRE DAMPER AT PENETRATION THRU SECOND FLOOR. (SEE DIAGRAM ON SHEET M5.1)
4. ROUTE DUCT BELOW EXISTING BEAM. OFFSET BELOW BEAM.
5. ROUTE DUCT EXPOSED BELOW CEILING.
6. SAWCUT WALL TO ACCOMMODATE INSTALLATION OF DUCT.
7. SAW CUT WALL TO ACCOMMODATE INSTALLATION OF DUCT AND GRILLE.
8. ROUTE DUCTS THRU EXISTING CW/HW PIPE PENETRATION. MODIFY OPENING AS REQUIRED.
9. TOP OF DUCT TO BE JUST BELOW GRAY FIRE ALARM WIRING CHASE ON WALL.
10. EXPOSED DOUBLE WALL DUCT WITH PAINT GRIP FINISH ANCHORED TO FLOOR STRUCTURE ABOVE.
11. RECTANGULAR OUTSIDE AIR DUCT WITH 2" DUCTWRAP.
12. TRANSITION FROM RECTANGULAR TO DOUBLE WALL ROUND DUCT.
13. TRANSITION FROM ROUND EXPOSED DOUBLE WALL DUCT TO RECTANGULAR DOUBLE WALL DUCT TO ACCOMMODATE SIDEWALL GRILLE.
14. GRILLE CONNECTED TO ROUND DOUBLE WALL DUCT (SEE DETAIL ON SHEET M5.2).
15. ALL EXPOSED OUTSIDE AIR DUCTWORK SHALL BE PAINTED TO MATCH EXISTING CEILING/WALL.

NORTH

OUTSIDE AIR and EXHAUST SYSTEMS MECHANICAL PLAN - FIRST FLOOR

SCALE: 0 4' 8' (APPROXIMATE)

GENERAL NOTES

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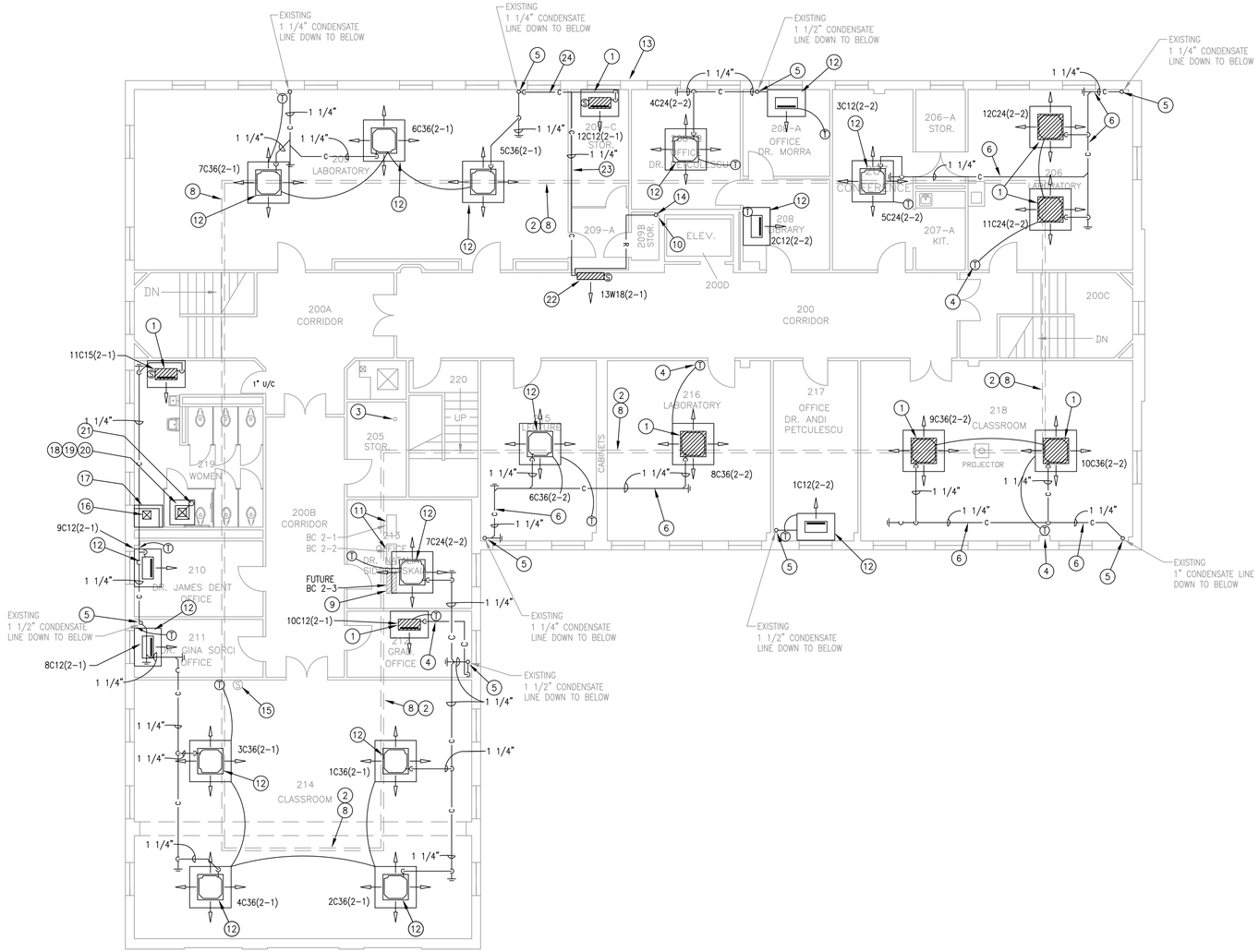

NORTH

VARIABLE REFRIGERANT FLOW SYSTEM
MECHANICAL PLAN - SECOND FLOOR

SCALE: 0 4' 8' (APPROXIMATE)

MECHANICAL NOTES:

1. CEILING RECESSED CASSETTE TYPE UNIT INSTALLED IN BOX FURRING (SEE DETAILS ON SHEET M4.2.). ANCHOR TO STRUCTURE. REFRIGERANT LINES, CONDUIT, CONTROL WIRING, CONDENSATE DRAIN LINES SHALL PENETRATE CEILING STRUCTURE. SEAL PENETRATION WITH FIRE RATED SEALANT.
2. IT IS INTENDED THAT THE REFRIGERANT LINES, CONTROL WIRING, CONDENSATE DRAIN LINES AND POWER WIRING SHALL BE ROUTED IN THE 3RD LEVEL ATTIC (OUTSIDE OF CENTER FRAMED OUT AREA) AND THEN DOWN TO RESPECTIVE INDOOR UNIT. SEAL PENETRATIONS WITH FIRE RATED SEALANT. CORE HOLES IN CONCRETE FLOORS TO ACCOMMODATE ROUTING OF PIPING, ETC.
3. REFRIGERANT LINES UP FROM BELOW. EXTEND UP TO 3RD LEVEL ATTIC AREA. CORE SLAB(S) FOR PENETRATIONS. SEAL OPENINGS WITH FIRE RATED SEALANT.
4. WALL MOUNTED THERMOSTAT MOUNTED ON WALL (TYPICAL). CONTROL WIRING SHALL BE RUN IN WIRE MOLD (COLOR TO MATCH WALL).
5. CONNECT NEW CONDENSATE DRAIN PIPING TO EXISTING CONDENSATE DRAIN SYSTEM PIPING IN THIS VICINITY. CORE HOLE IN ATTIC SLAB AND SEAL WITH FIRE RATED SEALANT.
6. CONDENSATE DRAIN PIPING TO BE ROUTED OVER 3RD LEVEL ATTIC FLOOR. PROVIDE GALVANIZED SUPPORTS TO ALLOW PROPER SLOPE ON PIPING TO CONNECT TO EXISTING CONDENSATE DRAIN PIPING SYSTEM. (TYPICAL)
7. PATCH ALL PENETRATIONS IN FLOORS, CEILINGS, AND WALLS WITH FIRE RATED SEALANT. PAINT TO MATCH EXISTING FINISHES.
8. LINE OF EXISTING WOOD FRAMING IN ATTIC. PENETRATIONS FOR CONNECTIONS TO INDOOR UNITS SHALL BE LOCATED OUTSIDE OF CENTER AREA (FUTURE AREA TO BE FINISHED OUT). ADJUST LOCATIONS OF INDOOR UNITS TO ACCOMMODATE FRAMING, LIGHTS, ETC.
9. NEW BC CONTROLLER TO BE LOCATED IN 3RD LEVEL ATTIC.
10. CORE HOLE IN ATTIC SLAB TO ROUTE PIPING (TYPICAL).
11. EXISTING BC CONTROLLER TO REMAIN.
12. EXISTING VRF INDOOR UNIT TO REMAIN.
13. ROUTING OF THE REFRIGERANT LINES FOR THE SECOND LEVEL CEILING CASSETTE UNITS SHALL BE LOCATED IN THE ATTIC AREA. ROUTE LINES TO ALLOW CENTER SECTION OF THE ATTIC SPACE TO BE USED AS FUTURE OFFICE SPACE. THE AREA IN THE ATTIC IN FRONT OF THE ROUND WINDOW SHALL BE KEPT CLEAR OF REFRIGERANT LINES, POWER LINES, CONDENSATE DRAIN LINES, ETC. TO ALLOW THIS AREA TO BE USED FOR A FUTURE OFFICE SPACE WITHOUT ANY PIPING RUNNING WITHIN THE SPACE. LINES TO UNITS DIRECTLY BELOW THIS AREA SHALL BE RUN ADJACENT TO THE PERIMETER OF THE BUILDING. PIPING SHALL BE ROUTED AROUND OR OVER THE SPACE WITHIN THE ROOF TRUSS. AREA IN ATTIC IN VICINITY OF WINDOW SHALL BE KEPT CLEAR FOR FUTURE OFFICE.
14. REFRIGERANT LINE DOWN FROM ATTIC. RUN BELOW DECK IN OFFICE. COVER REFRIGERANT LINES AND CONDENSATE DRAIN LINE WITH LINE HIDE SYSTEM.
15. EXISTING EMS SENSOR TP REMAIN.
16. 12"x12" EXHAUST DUCT UP FROM FIRST LEVEL, UP THRU SECOND LEVEL, INTO ATTIC.
17. CONTRACTOR TO INSTALL NEW EXHAUST DUCT CHASE. REMOVE AND REPLACE ADJACENT TOILET PARTITION WALL TO INSTALL CHASE WALLS. CHASE WALLS TO BE CONSTRUCTED WITH 3-1/2" METAL STUDS, 5/8" HIGH IMPACT PURPLE SHEET ROCK. CHASE TO BE FLOOR TO CEILING. INSTALL "J" MOLD AT TOP OF NON-BEVELED SHEET ROCK WALL. CAULK JOINT AT CEILING TO FINISH JOINT. PRIME SHEET ROCK. INSTALL SHERWIN-WILLIAMS ULTRA-CRETE A44W801. INSTALL 2 COATS OF ACRYLIC LATEX SATIN ENAMEL SUPER PAINT. COLOR TO MATCH EXISTING WALLS/CEILING. BASE TO BE 1/8" X 4" BLACK VINYL COVE BASE (JOHNSONITE) WITH MOLDED CORNERS, TRIM EDGE TO ACCOMMODATE CONNECTION TO EXISTING WALLS. USE ARDEX/HENRY SYSTEM-ONE ADHESIVE TO ATTACH BASE. COORDINATE EXACT LOCATION OF CHASE WALLS WITH OWNER & EXHAUST DUCT LOCATION.
18. EXHAUST GRILLE ("K") MOUNTED ON BOTTOM OF BOX FURRING MOUNTED BELOW CEILING. BOX FURRING TO BE SIMILAR VRF CEILING MOUNTED INDOOR UNITS (DETAIL 1&2 ON SHEET M4.2). TRANSITION DUCT FROM 20"X20" TO 12"X12" WITHIN BOX FURRING. INSTALL HIGH HAT HORIZONTAL FIRE DAMPER AT SLAB PENETRATION.
19. SAW CUT ALL PENETRATIONS THRU PLASTER CEILING AND FLOOR SLAB. COORDINATE FINAL LOCATION WITH STRUCTURE SLAB. DO NOT CUT RIBS IN STRUCTURE.
20. FAN MOTION SENSOR SWITCH WIRING UP TO ATTIC. INSTALL FIRE RATED SEALANT AT FLOOR PENETRATIONS FOR CONDUIT
21. FAN MOTION SENSOR SWITCH MOUNTED TO BOTTOM OF BOX FURRING.
22. NEW WALL MOUNTED VRF UNIT.
23. ROUTE CONDENSATE DRAIN LINE BELOW CEILING, CONNECT TO EXISTING DRAIN LINE.
24. ROUTE CONDENSATE BELOW CEILING IN LINE HIDE SYSTEM COVER.

GENERAL NOTES

NO:	REVISIONS:	DATE:

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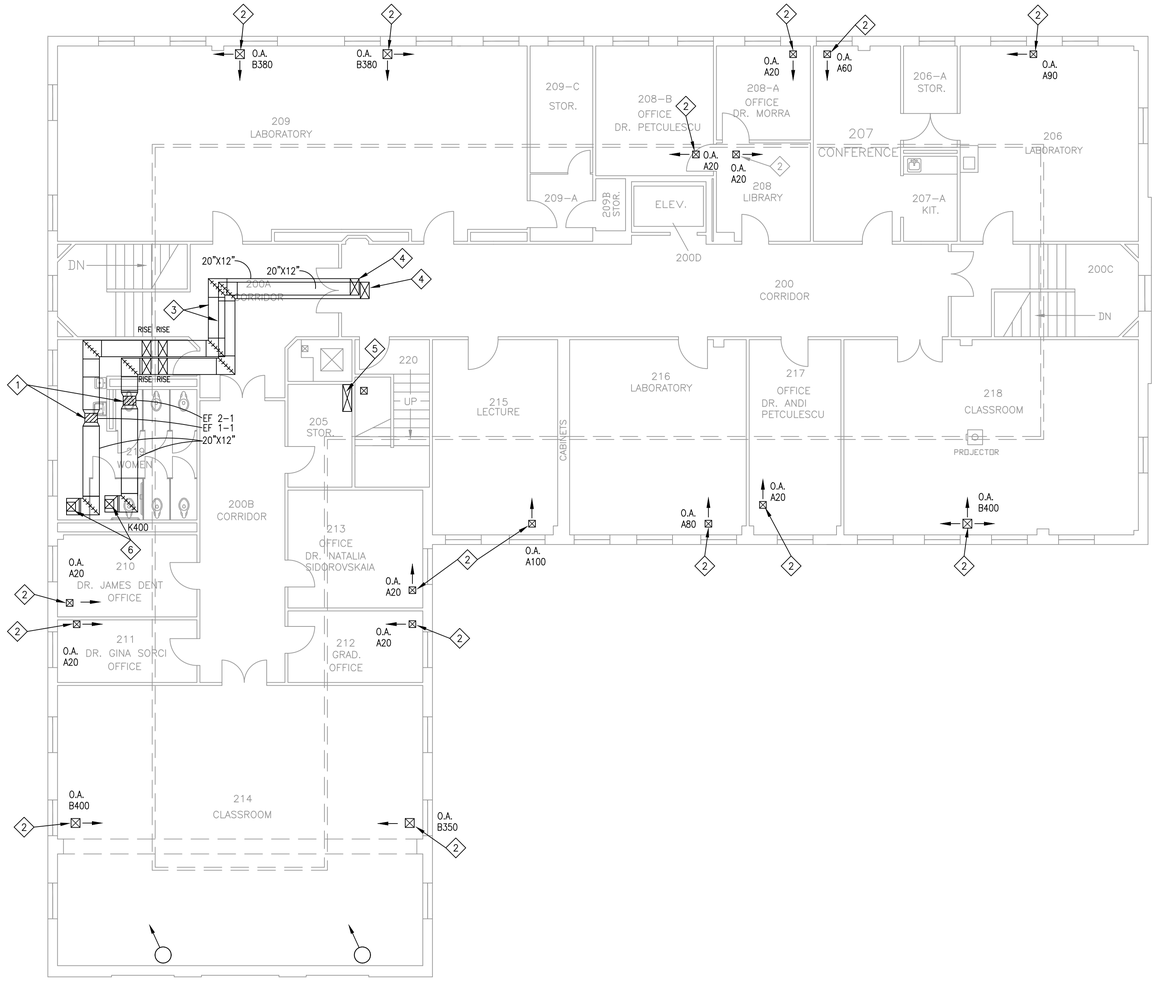
PROJECT NO:	SHEET:
DATE: AUGUST 2016	M2.1
SCALE: AS SHOWN	

NOTE: EXHAUST FAN AND ASSOCIATED DUCTWORK, CONTROL WIRING AND POWER WIRING SHALL BE PART OF BASE BID. THE OUTSIDE AIR SYSTEM INCLUDING OUTSIDE AIR DUCTWORK AND GRILLES SHALL BE PART OF ALTERNATE NO. 1.



MECHANICAL NOTES (OUTSIDE AIR/EXHAUST):

1. NEW IN-LINE EXHAUST FAN SUSPENDED IN ATTIC. ANCHOR TO ROOF STRUCTURE. (BASE BID)
2. OUTSIDE AIR SUPPLY GRILLE MOUNTED IN CEILING. CORE HOLE OR SAW CUT ATTIC FLOOR AND INSTALL GRILLE IN PLASTER CEILING BELOW. COORDINATE FINAL LOCATION WITH EXISTING CONCRETE STRUCTURAL WEBS/RIBS. (ALT. No.1)
3. ROUTE DUCT MAXIMUM HEIGHT A.F.F. (BASE BID)
4. TERMINATE DUCT AT BOTTOM OF ROUND ATTIC VENT OPENING IN EXISTING FLAT ROOF. (BASE BID)
5. OUTSIDE AIR DUCT DOWN FROM ATTIC, EXTEND DOWN IN CHASE TO FIRST LEVEL. INSTALL FIRE DAMPER AT ATTIC FLOOR AND SECOND FLOOR PENETRATION. SAWCUT FLOORS TO ACCOMMODATE DUCT INSTALLATION. (ALTERNATE No.1)
6. CORE HOLE OR SAW CUT ATTIC FLOOR TO DROP EXHAUST DUCT TO CEILING MOUNTED GRILLE. COORDINATE FINAL LOCATION WITH EXISTING CONCRETE STRUCTURAL WEBS/RIBS. (BASE BID)
7. COORDINATE ROUTING OF EXHAUST DUCT WITH EXISTING ROOF TRUSS SYSTEM. (BASE BID)

NORTH

OUTSIDE AIR and EXHAUST SYSTEMS
MECHANICAL PLAN - SECOND FLOOR

SCALE: 0 4' 8' (APPROXIMATE)

GENERAL NOTES

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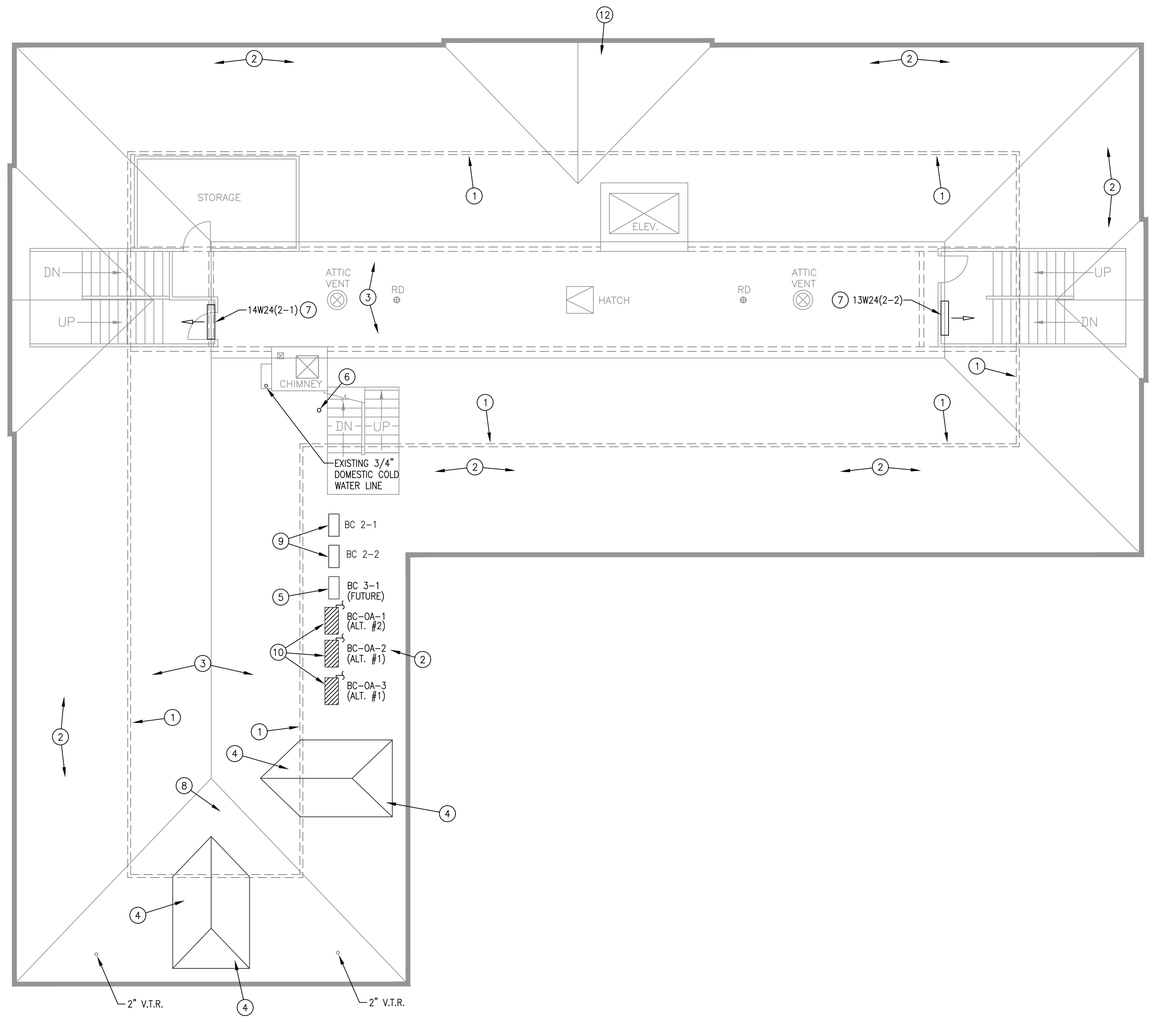

MECHANICAL NOTES:

1. EXISTING STUD WALL ROOF SUPPORTS SHALL REMAIN.
2. REFRIGERANT LINES FROM BC CONTROLLER TO INDOOR UNITS SHALL BE RUN OUTSIDE OF EXISTING STUD WALL SUPPORTS (BETWEEN STUD WALL SUPPORTS AND EXTERIOR WALL OF BUILDING). PROPERLY ANCHOR LINES TO BOTTOM OF ROOF TRUSS SYSTEM. PENETRATE CONCRETE DECK AS REQUIRED TO CONNECT TO RESPECTIVE INDOOR UNIT. SEAL ALL DECK PENETRATIONS WITH FIRE RATED SEALANT MATERIAL.
3. ROUTING OF LINES MAY BE RUN IN THIS AREA, HOWEVER LINES SHALL BE RUN ABOVE TRUSS SYSTEM.
4. COORDINATE ROUTING OF REFRIGERANT LINES IN THIS AREA WITH ROOF DORMERS, OUTDOOR AIR UNITS, AND OUTSIDE AIR UNIT DUCTWORK.
5. LOCATION FOR BC CONTROLLER ASSOCIATED WITH UNITS ON 3RD FLOOR.(NIC)
6. APPROXIMATE LOCATION FOR REFRIGERANT LINES TO BE ROUTED UP FROM CRAWL SPACE BELOW BUILDING UP THRU 1ST AND 2ND FLOOR TO ATTIC LEVEL. SEAL FLOOR PENETRATIONS WITH FIRE RATED SEALANT.
7. LOCATION OF INDOOR UNIT FOR STAIR AREA. EXTEND DRAIN TO NEAREST DRAIN LINE CONNECTION. SEAL WALL PENETRATIONS WITH FIRE RATED SEALANT.
8. LOCATION OF OUTSIDE AIR–AIR HANDLING UNITS.
9. EXISTING BC CONTROLLER TO REMAIN.
10. (ALTERNATE NO. 1 & 2) LOCATION FOR NEW BC CONTROLLER ASSOCIATED WITH OUTSIDE AIR UNITS IN THE ATTIC.
11. ROUTING OF THE REFRIGERANT LINES FOR THE SECOND LEVEL CEILING CASSETTE UNITS SHALL BE LOCATED IN THE ATTIC AREA. ROUTE LINES TO ALLOW CENTER SECTION OF THE ATTIC SPACE TO BE USED AS FUTURE OFFICE SPACE. THE AREA IN THE ATTIC IN FRONT OF THE ROUND WINDOW SHALL BE KEPT CLEAR OF REFRIGERANT LINES, POWER LINES, CONDENSATE DRAIN LINES, ETC. TO ALLOW THIS AREA TO BE USED FOR A FUTURE OFFICE SPACE WITHOUT ANY PIPING RUNNING WITHIN THE SPACE. LINES TO UNITS DIRECTLY BELOW THIS AREA SHALL BE RUN ADJACENT TO THE PERIMETER OF THE BUILDING. PIPING SHALL BE ROUTED AROUND OR OVER THE SPACE WITHIN THE ROOF TRUSS.
12. ROUTE PIPING OUTSIDE OF THIS AREA. AREA TO BE USED AS FUTURE OFFICE.

NORTH

VARIABLE REFRIGERANT FLOW SYSTEM
MECHANICAL PLAN - ATTIC / ROOF

SCALE: 0 4' 8' (APPROXIMATE)

GENERAL NOTES

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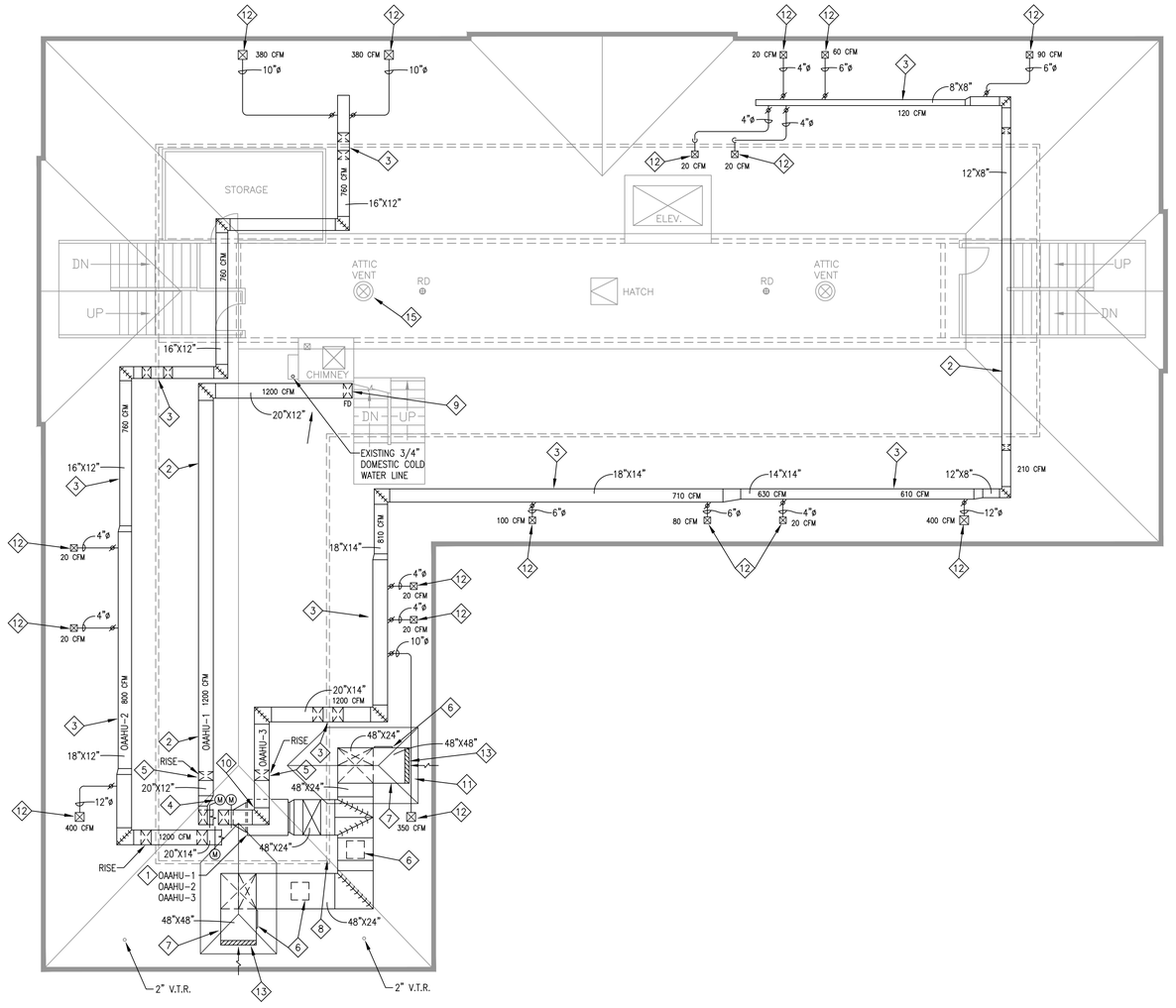
P.O. BOX 43210 70504
LAFAYETTE, LOUISIANA

UL LAFAYETTE
UNIVERSITY OF LOUISIANA
PHYSICAL PLANT

PROJECT NO:	SHEET:
DATE: AUGUST 2016	M3.1
SCALE: AS SHOWN	

NOTE: EXHAUST FAN AND ASSOCIATED DUCTWORK, CONTROL WIRING AND POWER WIRING SHALL BE PART OF BASE BID. THE OUTSIDE AIR SYSTEM INCLUDING OUTSIDE AIR DUCTWORK AND GRILLES SHALL BE PART OF ALTERNATE NO. 1.



OUTSIDE AIR and EXHAUST SYSTEMS
MECHANICAL PLAN - ATTIC / ROOF

SCALE: 0 4' 8' (APPROXIMATE)

MECHANICAL NOTES (OUTSIDE AIR/EXHAUST):

1. MITSUBISHI DEDICATED OUTSIDE AIR UNITS (3 UNITS) IN ATTIC MOUNTED ON Ppainted ANGLE IRON STAND WITH AN EMERGENCY DRAIN PAN WITH FLOAT SWITCH BELOW EACH UNIT. CONDENSATE DRAIN LINE SHALL CONNECT TO NEAREST CONDENSATE DRAIN LINE ROUTED IN ATTIC FROM CEILING RECESSED UNITS. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
2. ROUTE DUCT ABOVE ROOF SUPPORT STRUCTURE (±10'-0" A.F.F.).
3. ROUTE DUCT MAXIMUM HEIGHT A.F.F. (JUST BELOW ROOF STRUCTURE).
4. MOTORIZED OPERATED DAMPER INTERLOCKED WITH RESPECTIVE AIR HANDLING UNIT FAN MOTOR. (TYPICAL)
5. SUPPLY DUCT UP TO ABOVE HORIZONTAL ROOF SUPPORTS (MAXIMUM HEIGHT A.F.F.).
6. 24" X 24" INSULATED DUCT ACCESS PANEL IN DUCT FOR ACCESS TO CLEAN DUCTWORK.
7. 48" X 48" DUCT CONNECTION TO LOUVER IN DORMER. REFRAME 2X6 ROOF SUPPORT MEMBERS TO ACCOMMODATE DUCTWORK.
8. REFRAME 2X6 ROOF SUPPORTS TO ACCOMMODATE DUCT ROUTING (TYPICAL).
9. OUTSIDE AIR DUCT DOWN THRU ATTIC FLOOR WITH FIRE DAMPER AT FLOOR PENETRATION. CONTINUE DOWN TO FIRST LEVEL WITH FIRE DAMPER AT DROP IN SECOND FLOOR.
10. SUPPLY DUCT TO RISE AND RUN OVER UNIT MAXIMUM HEIGHT A.F.F. (JUST BELOW HORIZONTAL ROOF SUPPORTS).
11. CUT AND PATCH EXISTING ROOF AT DORMER LOCATION TO ACCOMMODATE PATH TO INSTALL OUTSIDE AIR AHU INTO ATTIC.
12. SAW CUT ATTIC CONCRETE FLOOR FOR OUTDOOR AIR DUCT DROP TO SECOND FLOOR SPACE. INSTALL FIRE DAMPER AT ATTIC FLOOR PENETRATION (TYPICAL).
13. CONNECT OUTSIDE AIR DUCT TO 48" X 48" INTAKE LOUVER.
14. ALL OUTSIDE AIR DUCT IN ATTIC AND DROP DOWN TO FIRST LEVEL SHALL BE INSULATED WITH EXTERNAL DUCT WRAP.
15. EXHAUST DUCT UP FROM SECOND FLOOR SHALL CONNECT TO EXISTING ROUND ATTIC VENT OPENING IN THIS VICINITY.

GENERAL NOTES

NO:	REVISIONS:	DATE:

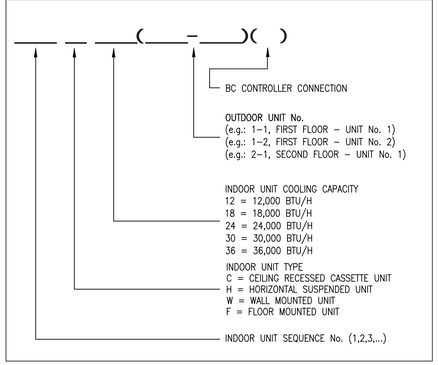
BROUSSARD HALL
HVAC REPLACEMENT - PHASE 2

THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
UL PHYSICAL PLANT
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL LAFAYETTE
UNIVERSITY OF LOUISIANA
PHYSICAL PLANT

PROJECT NO:	SHEET:
DATE: AUGUST 2016	M3.2
SCALE: AS SHOWN	

INDOOR UNIT No. KEY



VARIABLE REFRIGERANT FLOW (VRF) – HEAT RECOVERY – INDOOR UNIT SCHEDULE

	UNIT NO.	SERVICE	BC CONTROLLER CONNECTION	FAN CFM		COOLING			HEATING		ELECTRICAL SERVICE	FLA/MCA	SOUND LEVEL dB(A)		UNIT CONTROL TSTAT OR INTERNAL SENSOR	COMMENTS
				HIGH	LOW	MIN. BTU/H OUTPUT	EAT (°F) DB	EAT (°F) WB	MIN. BTU/H OUTPUT	INDOOR TEMP.			HIGH	LOW		
EXISTING	1H36(1–1)	116 LECTURE	BC 1–1	1095	742	36,000	80	67	40,000	70°F D.B.	208–1–60	0.97/–	44	36	WALL MOUNTED CONTROLLER	CITY MULTI PCFY–P36NKMU–ER1 (HORIZONTAL SUSPENDED UNIT) (EXISTING TO REMAIN)
EXISTING	2H36(1–1)	116 LECTURE	BC 1–1	1095	742	36,000	80	67	40,000	70°F D.B.	208–1–60	0.97/–	44	36	WALL MOUNTED CONTROLLER	CITY MULTI PCFY–P36NKMU–ER1 (HORIZONTAL SUSPENDED UNIT) (EXISTING TO REMAIN)
EXISTING	3H36(1–1)	116 LECTURE	BC 1–1	1095	742	36,000	80	67	40,000	70°F D.B.	208–1–60	0.97/–	44	36	WALL MOUNTED CONTROLLER	CITY MULTI PCFY–P36NKMU–ER1 (HORIZONTAL SUSPENDED UNIT) (EXISTING TO REMAIN)
EXISTING	4H36(1–1)	116 LECTURE	BC 1–1	1095	742	36,000	80	67	40,000	70°F D.B.	208–1–60	0.97/–	44	36	WALL MOUNTED CONTROLLER	CITY MULTI PCFY–P36NKMU–ER1 (HORIZONTAL SUSPENDED UNIT) (EXISTING TO REMAIN)
EXISTING	5aF24(1–1)	102 LABORATORY	BC 1–1	494	353	24,000	80	67	27,000	70°F D.B.	208–1–60	0.51/–	46	40	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P24NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
EXISTING	5bF12(1–1)	102 LABORATORY	BC 1–1	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
EXISTING	6aF24(1–1)	102 LABORATORY	BC 1–1	494	353	24,000	80	67	27,000	70°F D.B.	208–1–60	0.51/–	46	40	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P24NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
EXISTING	6bF12(1–1)	102 LABORATORY	BC 1–1	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
EXISTING	7F12(1–1)	107 OFFICE	BC 1–1	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
EXISTING	8F12(1–1)	114 DR. DiFabio	BC 1–1	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
EXISTING	9F12(1–1)	103 OFFICE	BC 1–1	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
EXISTING	10F24(1–1)	103a OFFICE	BC 1–1	494	353	24,000	80	67	27,000	70°F D.B.	208–1–60	0.51/–	46	40	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P24NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
EXISTING	11F12(1–1)	103b OFFICE	BC 1–1	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
EXISTING	12F12(1–1)	103d LAB	BC 1–1	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
EXISTING	13F24(1–1)	105 LAB	BC 1–1	494	353	24,000	80	67	27,000	70°F D.B.	208–1–60	0.51/–	46	40	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P24NEMU–E (FLOOR MOUNTED UNIT) (EXISTING TO REMAIN)
BASE BID	1F08(1–2)	106 GRAD. OFFICE	BC 1–2	229	194	8,000	80	67	9,000	70°F D.B.	208–1–60	0.25/–	41	36	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P08NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	2F12(1–2)	115 GRAD. OFFICE	BC 1–2	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	3aF24(1–2)	101 LABORATORY	BC 1–2	494	353	24,000	80	67	27,000	70°F D.B.	208–1–60	0.51/–	46	40	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P24NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	3bF12(1–2)	101 LABORATORY	BC 1–2	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	4aF24(1–2)	101 LABORATORY	BC 1–2	494	353	24,000	80	67	27,000	70°F D.B.	208–1–60	0.51/–	46	40	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P24NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	4bF12(1–2)	101 LABORATORY	BC 1–2	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	5F24(1–2)	104 OFFICE	BC 1–2	494	353	24,000	80	67	27,000	70°F D.B.	208–1–60	0.51/–	46	40	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P24NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	6aF24(1–2)	108 MACHINE SHOP	BC 1–2	494	353	24,000	80	67	27,000	70°F D.B.	208–1–60	0.51/–	46	40	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P24NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	6bF24(1–2)	108 MACHINE SHOP	BC 1–2	494	353	24,000	80	67	27,000	70°F D.B.	208–1–60	0.51/–	46	40	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P24NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	7F12(1–2)	101a GRAD. OFFICE	BC 1–2	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	WALL MOUNTED CONTROLLER	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	8F18(1–2)	100 CORRIDOR	BC 1–2	459	353	18,000	80	67	20,000	70°F D.B.	208–1–60	0.38/–	43	38	UNIT INTERNAL SENSOR	CITY MULTI PFFY–P18NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	9F18(1–2)	100A CORRIDOR	BC 1–2	459	353	18,000	80	67	20,000	70°F D.B.	208–1–60	0.38/–	43	38	UNIT INTERNAL SENSOR	CITY MULTI PFFY–P18NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	10F18(1–2)	100C CORRIDOR	BC 1–2	459	353	18,000	80	67	20,000	70°F D.B.	208–1–60	0.38/–	43	38	UNIT INTERNAL SENSOR	CITY MULTI PFFY–P18NEMU–E (FLOOR MOUNTED UNIT)
BASE BID	11F12(1–2)	113 MENS R.R.	BC 1–2	317	247	12,000	80	67	13,500	70°F D.B.	208–1–60	0.30/–	41	37	UNIT INTERNAL SENSOR	CITY MULTI PFFY–P12NEMU–E (FLOOR MOUNTED UNIT)
EXISTING	1C36(2–1)	214 CLASSROOM	BC 2–1	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT) (EXISTING TO REMAIN)
EXISTING	2C36(2–1)	214 CLASSROOM	BC 2–1	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT) (EXISTING TO REMAIN)
EXISTING	3C36(2–1)	214 CLASSROOM	BC 2–1	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT) (EXISTING TO REMAIN)
EXISTING	4C36(2–1)	214 CLASSROOM	BC 2–1	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT) (EXISTING TO REMAIN)
EXISTING	5C36(2–1)	209 LABORATORY	BC 2–1	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT) (EXISTING TO REMAIN)
EXISTING	6C36(2–1)	209 LABORATORY	BC 2–1	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT) (EXISTING TO REMAIN)
EXISTING	7C36(2–1)	209 LABORATORY	BC 2–1	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT) (EXISTING TO REMAIN)
EXISTING	8C12(2–1)	211 GINA SORCI	BC 2–1	328	258	12,000	80	67	13,500	70°F D.B.	208–1–60	0.21/–	37	32	WALL MOUNTED CONTROLLER	CITY MULTI PMFY–P12NBMU–ER5 (ONE WAY CEILING RECESSED CASSETTE UNIT) (EXISTING TO REMAIN)
EXISTING	9C12(2–1)	210 JAMES DENT	BC 2–1	328	258	12,000	80	67	13,500	70°F D.B.	208–1–60	0.21/–	37	32	WALL MOUNTED CONTROLLER	CITY MULTI PMFY–P12NBMU–ER5 (ONE WAY CEILING RECESSED CASSETTE UNIT) (EXISTING TO REMAIN)
BASE BID	10C12(2–1)	212 GRAD OFFICE	BC 2–1	328	258	12,000	80	67	13,500	70°F D.B.	208–1–60	0.21/–	37	32	WALL MOUNTED CONTROLLER	CITY MULTI PMFY–P12NBMU–ER5 (ONE WAY CEILING RECESSED CASSETTE UNIT)
BASE BID	11C15(2–1)	219 WOMEN'S R.R.	BC 2–1	378	272	15,000	80	67	17,000	70°F D.B.	208–1–60	0.26/–	39	33	UNIT INTERNAL SENSOR	CITY MULTI PMFY–P15NBMU–ER5 (ONE WAY CEILING RECESSED CASSETTE UNIT)
BASE BID	12C12(2–1)	209 STORAGE	BC 2–1	328	258	12,000	80	67	13,500	70°F D.B.	208–1–60	0.21/–	37	32	UNIT INTERNAL SENSOR	CITY MULTI PMFY–P12NBMU–ER5 (ONE WAY CEILING RECESSED CASSETTE UNIT)
BASE BID	13W18(2–1)	200 CORRIDOR	BC 2–1	425	320	18,000	80	67	20,000	70°F D.B.	208–1–60	0.30/–	45	36	UNIT INTERNAL SENSOR	CITY MULTI PKFY–P18NHMU–E2 (WALL MOUNTED UNIT)
BASE BID	14W24(2–1)	3RD LEVEL STAIR (S)	BC 2–1	920	570	24,000	80	67	27,000	70°F D.B.	208–1–60	0.50/–	49	39	UNIT INTERNAL SENSOR	CITY MULTI PKFY–P24NKMU–E2 (WALL MOUNTED UNIT)
EXISTING	1C12(2–2)	217 PETCULESCU	BC 2–2	328	258	12,000	80	67	13,500	70°F D.B.	208–1–60	0.21/–	37	32	WALL MOUNTED CONTROLLER	CITY MULTI PMFY–P12NBMU–ER5 (ONE WAY CEILING RECESSED CASSETTE UNIT)(EXISTING TO REMAIN)
EXISTING	2C12(2–2)	208 LIBRARY	BC 2–2	328	258	12,000	80	67	13,500	70°F D.B.	208–1–60	0.21/–	37	32	WALL MOUNTED CONTROLLER	CITY MULTI PMFY–P12NBMU–ER5 (ONE WAY CEILING RECESSED CASSETTE UNIT)(EXISTING TO REMAIN)
EXISTING	3C12(2–2)	208A OFFICE	BC 2–2	328	258	12,000	80	67	13,500	70°F D.B.	208–1–60	0.21/–	37	32	WALL MOUNTED CONTROLLER	CITY MULTI PMFY–P12NBMU–ER5 (ONE WAY CEILING RECESSED CASSETTE UNIT)(EXISTING TO REMAIN)
EXISTING	4C24(2–2)	208B OFFICE	BC 2–2	706	530	24,000	80	67	27,000	70°F D.B.	208–1–60	0.43/–	34	28	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P24NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT)(EXISTING TO REMAIN)
EXISTING	5C24(2–2)	207 CONFERENCE	BC 2–2	706	530	24,000	80	67	27,000	70°F D.B.	208–1–60	0.43/–	34	28	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P24NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT)(EXISTING TO REMAIN)
EXISTING	6C36(2–2)	215 LECTURE	BC 2–2	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT)(EXISTING TO REMAIN)
EXISTING	7C24(2–2)	213 NATALIA	BC 2–2	706	530	24,000	80	67	27,000	70°F D.B.	208–1–60	0.43/–	34	28	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P24NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT)(EXISTING TO REMAIN)
BASE BID	8C36(2–2)	216 LABORATORY	BC 2–2	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT)
BASE BID	9C36(2–2)	218 CLASSROOM	BC 2–2	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT)
BASE BID	10C36(2–2)	218 CLASSROOM	BC 2–2	1059	777	36,000	80	67	40,000	70°F D.B.	208–1–60	1.07/–	43	35	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P36NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT)
BASE BID	11C24(2–2)	206 LABORATORY	BC 2–2	706	530	24,000	80	67	27,000	70°F D.B.	208–1–60	0.43/–	34	28	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P24NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT)
BASE BID	12C24(2–2)	206 LABORATORY	BC 2–2	706	530	24,000	80	67	27,000	70°F D.B.	208–1–60	0.43/–	34	28	WALL MOUNTED CONTROLLER	CITY MULTI PLFY–P24NBMU–ER2 (3X3 CEILING RECESSED CASSETTE UNIT)
BASE BID	13W24(2–2)	3RD LEVEL STAIR (N)	BC 2–2	920	570	24,000	80	67	27,000	70°F D.B.	208–1–60	0.50/–	49	39	UNIT INTERNAL SENSOR	CITY MULTI PKFY–P24NKMU–E2 (WALL MOUNTED UNIT)

NOTE:
1. ALL UNITS SHALL BE COMPLETE WITH STOP VALVE WITH SERVICE PORT ON LIQUID, GAS AND RECOVERY LINES. VALVES SHALL BE LOCATED SUCH THAT UNIT CAN BE REMOVED AND REPLACED WITHOUT SHUTTING DOWN THE ENTIRE SYSTEM.
2. CEILING RECESSED UNITS (ONE–WAY AND FOUR–WAY) SHALL BE PROVIDED WITH INTEGRAL CONDENSATE PUMP.
3. UNIT CONTROL: WALL MOUNTED CONTROLLER (WIRED REMOTE WALL MOUNTED CONTROLLER WITH INTERNAL TEMPERATURE SENSOR) OR UNIT'S INTERNAL SENSOR (NO WALL MOUNTED CONTROLLER, TEMPERATURE SENSED AT RETURN SENSOR). REFER TO PLANS FOR QUANTITY OF WALL MOUNTED CONTROLLERS REQUIRED AS SOME UNITS SHARE A WALL MOUNTED CONTROLLER.
4. UNIT SHALL BE PROVIDED WITH LIFE LONG FILTER IN UNIT. PROVIDE ONE (1) SPARE SET OF FILTERS WITH EACH UNIT.
5. ELECTRICAL DATA FOR BC CONTROLLER: BC CONTROLLER (CITY MULTI) = 1.89 AMPS.
6. CONTRACTOR SHALL REMOVE PLASTIC CONDENSATE HOSE CLAMP (AT UNIT CONNECTION) ON EACH INDOOR UNIT. FURNISH AND INSTALL A STAINLESS STELL HOSE CLAMP ON THE CONDENSATE DRAIN HOSE (AT THE UNIT CONNECTION) ON EACH INDOOR UNIT. THE STAINLESS STEEL HOSE CLAMP SHALL BE APPROPRIATELY SIZED TO CREATE A WATER TIGHT SEAL.
7. ALL INDOOR UNITS SHALL HAVE AN IONIZATION DEVICE BY PLASMA AIR INSTALLED. DEVICES SHALL BE INSTALLED BY FACTORY REPRESENTATIVE.
8. BC CONTROLLER PORT CONNECTION SHALL BE DETERMINED WHEN FINAL SHOP DRAWINGS ARE BEING PRODUCED.
9. BC CONTROLLER 1–1 – EXISTING TO REMAIN.
10. BC CONTROLLER 2–1 AND 2–2 – EXISTING TO REMAIN.
11. BC CONTROLLER 1–2 – NEW 16 PORT CONTROLLER
12. FLOOR MOUNTED UNITS SHALL BE PROVIDED WITH CUSTOM SUPPLY AND RETURN GRILLES TO MATCH EXISTING.

VARIABLE REFIRGERANT FLOW SYSTEM
MECHANICAL SCHEDULES

GENERAL NOTES

NO:	REVISIONS:	DATE:

BROUSSARD HALL
HVAC REPLACEMENT - PHASE 2

UL PHYSICAL PLANT
UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210 70504
THE UNIVERSITY OF LOUISIANA
LAFAYETTE, LOUISIANA

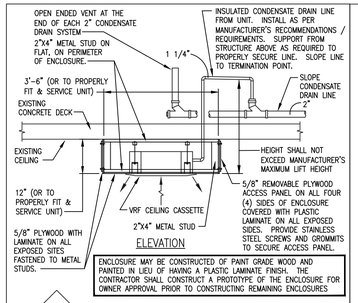
UL LAFAYETTE
UNIVERSITY OF LOUISIANA
PHYSICAL PLANT

PROJECT NO:	SHEET:
-	M4.1
DATE: AUGUST 2016	
SCALE: AS SHOWN	

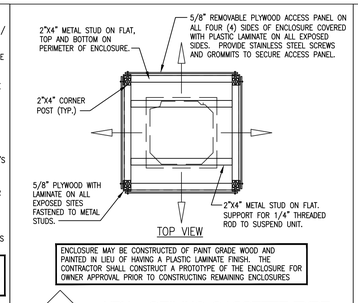
VARIABLE REFRIGERANT FLOW (VRF) – HEAT RECOVERY – OUTDOOR UNIT SCHEDULE

	GROUP NO.	UNIT NUMBER	SERVICE	COOLING		HEATING				ELECTRICAL SERVICE	REFRIGERANT	SOUND LEVEL dB(A)	MCA (CITY–MULTI)	MAX. FUSE/BREAKER (CITY–MULTI)	COMMENTS
				MIN. BTU/H OUTPUT	AMBIENT TEMP.	MIN. BTU/H OUTPUT	INDOOR TEMP.	OUTDOOR D.B.°F	OUTDOOR W.B.°F						
EXISTING	1–1	HR 1–1A & 1–1B	PARTIAL FIRST FLOOR	288,000	95°F	320,000	70°F	47°F	43°F	208–3–60	R–410a	64	54 + 53	60 + 60	CITY MULTI PURY–P288TSKMU–A (SIMULTANEOUS COOLING AND HEATING) (EXISTING TO REMAIN)
BASE BID	1–2	HR 1–2A & 1–2B	PARTIAL FIRST FLOOR	288,000	95°F	320,000	70°F	47°F	43°F	208–3–60	R–410a	64	54 + 53	60 + 60	CITY MULTI PURY–P288TSKMU–A (SIMULTANEOUS COOLING AND HEATING)
EXISTING	2–1	HR 2–1A & 2–1B	PARTIAL SECOND FLOOR	288,000	95°F	320,000	70°F	47°F	43°F	208–3–60	R–410a	64	54 + 53	60 + 60	CITY MULTI PURY–P288TSKMU–A (SIMULTANEOUS COOLING AND HEATING) (EXISTING TO REMAIN)
EXISTING	2–2	HR 2–2A & 2–2B	PARTIAL SECOND FLOOR	288,000	95°F	320,000	70°F	47°F	43°F	208–3–60	R–410a	64	54 + 53	60 + 60	CITY MULTI PURY–P288TSKMU–A (SIMULTANEOUS COOLING AND HEATING) (EXISTING TO REMAIN)
N.I.C.	3–1	HR 3–1A & 3–1B	THIRD FLOOR (FUTURE)	288,000	95°F	320,000	70°F	47°F	43°F	208–3–60	R–410a	64	54 + 53	60 + 60	CITY MULTI PURY–P288TSKMU–A (SIMULTANEOUS COOLING AND HEATING)

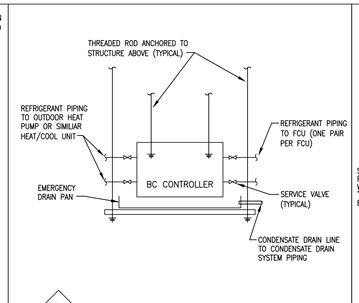
NOTE:
1. MAXIMUM DISTANCE BETWEEN COMBINED UNITS ON ONE REFRIGERANT SYSTEM – 32 FEET.
2. INSULATE SUCTION, LIQUID AND RECOVERY REFRIGERANT LINES.
3. INSTALL BC CONTROLLER(CITY–MULTI) FOR EACH CONDENSING UNIT AS REQUIRED BY MANUFACTURER'S SPECIFICATIONS
4. ALL UNITS SHALL BE COMPLETE WITH STOP VALVE WITH SERVICE PORT ON LIQUID, GAS, AND RECOVERY LINES. VALVES SHALL BE LOCATED SUCH THAT UNIT CAN BE REMOVED AND REPLACED WITHOUT SHUTTING DOWN THE ENTIRE SYSTEM.
5. INSTALLATION OF REFRIGERANT PIPING, CONTROL WIRING, POWER WIRING, ETC. SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
6. PROVIDE A TWINNING KIT FOR EACH UNIT GROUP.
7. EACH UNIT REQUIRES A DEDICATED ELECTRICAL CIRCUIT(EG. HR–A1A & B(CITY–MULTI) – REQUIRES TWO (2) DEDICATED CIRCUITS.
8. ANCHOR UNITS TO VIBRATION ISOLATION SUPPORT. ANCHOR VIBRATION ISOLATION SUPPORT TO CONCRETE PAD.
9. COORDINATE ELECTRICAL REQUIREMENTS WITH EQUIPMENT MANUFACTURER.



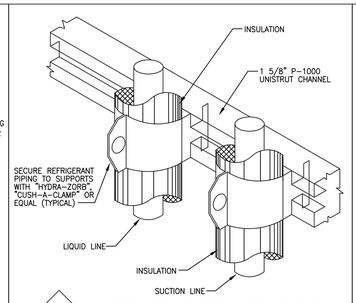
1 VRF – CEILING CASSETTE TYPE IN FURRED ENCLOSURE NO SCALE



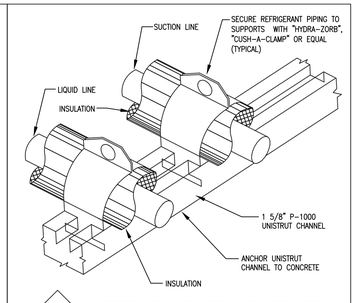
2 VRV – CEILING CASSETTE TYPE IN FURRED ENCLOSURE NO SCALE



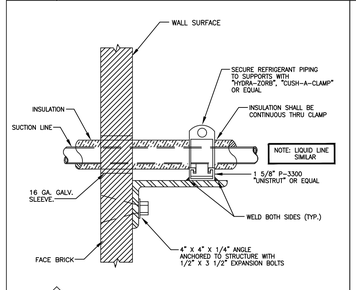
3 BC CONTROLLER DETAIL NO SCALE



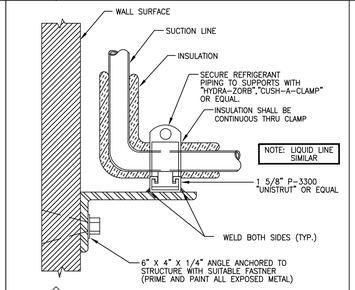
4 REFRIGERANT PIPE SUPPORT DETAIL NO SCALE



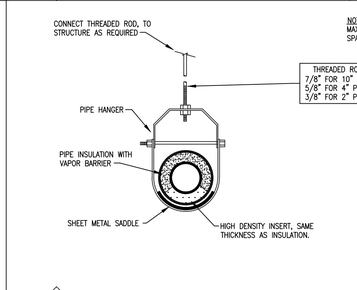
M14A REFRIGERANT PIPE SUPPORT AT CONCRETE PAD NO SCALE



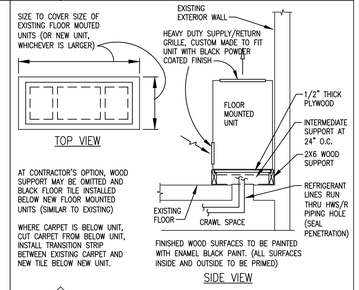
6 REFRIGERANT PIPE SUPPORT AT WALL DETAIL NO SCALE



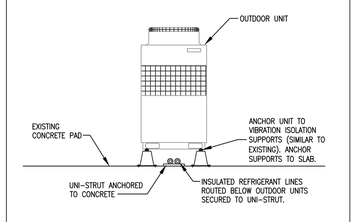
7 REFRIGERANT PIPE SUPPORT AT WALL DETAIL NO SCALE



8 INSULATED PIPE HANGER DETAIL NO SCALE



M126D VRF – FLOOR MOUNTED DETAIL NO SCALE



M108C OUTDOOR UNIT DETAIL NO SCALE

VARIABLE REFIRGERANT FLOW SYSTEM
MECHANICAL SCHEDULES and DETAILS

GENERAL NOTES

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HVAC REPLACEMENT - PHASE 2

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PHYSICAL PLANT

PROJECT NO:	SHEET:
DATE: AUGUST 2016	M4.2
SCALE: AS SHOWN	

OUTSIDE AIR and EXHAUST SYSTEMS
MECHANICAL SCHEDULES and DETAILS

DEDICATED 100% OUTSIDE AIR – VARIABLE REFRIGERANT FLOW (VRF) – INDOOR UNIT SCHEDULE

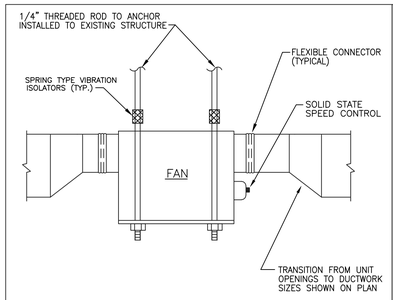
	UNIT NO.	SERVICE	BC CONTROLLER	FAN		COOLING			HEATING			REHEAT	ELECTRICAL SERVICE	MCA	SOUND LEVEL dB(A)		COMMENTS
				CFM	E.S.P.	MIN. BTU/H OUTPUT	EAT (°F) DB	EAT (°F) WB	MIN. BTU/H OUTPUT	EAT (°F)	LAT (°F)	MIN. BTU/H OUTPUT			HIGH	LOW	
ALTERNATE NO. 2	OAAHU–1	BUILDING – FIRST FLOOR	BC–OA–1	1200	0.8	112,000	80	80	61,400	20	67	24,200	208–1–60	3.99	41	36	CITY MULTI PEFY–AF1200CFMR (DEDICATED OUTSIDE AIR UNIT WITH REHEAT)
ALTERNATE NO. 1	OAAHU–2	BUILDING – SECOND FLOOR	BC–OA–2	1200	0.8	112,000	80	80	61,400	20	67	24,200	208–1–60	3.99	41	36	CITY MULTI PEFY–AF1200CFMR (DEDICATED OUTSIDE AIR UNIT WITH REHEAT)
ALTERNATE NO. 1	OAAHU–3	BUILDING – SECOND FLOOR	BC–OA–3	1200	0.8	112,000	80	80	61,400	20	67	24,200	208–1–60	3.99	41	36	CITY MULTI PEFY–AF1200CFMR (DEDICATED OUTSIDE AIR UNIT WITH REHEAT)

NOTES: 1. ALL UNITS SHALL BE COMPLETE WITH STOP VALVE WITH SERVICE PORT ON LIQUID, GAS, AND RECOVERY LINES. VALVES SHALL BE LOCATED SUCH THAT THE UNIT CAN BE REMOVED AND REPLACED WITHOUT SHUTTING DOWN THE ENTIRE SYSTEM.
2. UNIT SHALL BE PROVIDED WITH INTEGRAL CONDENSATE PUMP.
3. ELECTRICAL DATA FOR BC CONTROLLERS: MCA = 0.8A
4. UNITS LAT SHALL BE NEUTRAL (±72° F ADJUSTABLE)

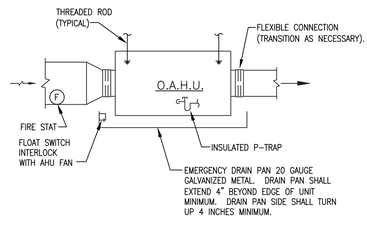
DEDICATED 100% OUTSIDE AIR – VARIABLE REFRIGERANT FLOW (VRF) – OUTDOOR UNIT SCHEDULE

	UNIT NO.	SERVICE	COOLING		HEATING				FAN CFM	ELECTRICAL SERVICE	EER	REFRIGERANT	CDU E.S.P.	SOUND LEVEL dB(A)	MCA	COMMENTS
			MIN. BTU/H OUTPUT	AMBIENT TEMP.	MIN. BTU/H OUTPUT	INDOOR TEMP.	OUTDOOR D.B.°F	OUTDOOR W.B.°F								
ALTERNATE NO. 2	OAHR–1	BUILDING – FIRST FLOOR	120,000	95°F	135,000	70°F	47	43	10,600	480–3–60	--	R–410a	0"	60	21	MITSUBISHI CITY MULTI PURY–P120YKMU–A (SIMULTANEOUS HEATING AND COOLING)
ALTERNATE NO. 1	OAHR–2	BUILDING – SECOND FLOOR	120,000	95°F	135,000	70°F	47	43	10,600	480–3–60	--	R–410a	0"	60	21	MITSUBISHI CITY MULTI PURY–P120YKMU–A (SIMULTANEOUS HEATING AND COOLING)
ALTERNATE NO. 1	OAHR–3	BUILDING – SECOND FLOOR	120,000	95°F	135,000	70°F	47	43	10,600	480–3–60	--	R–410a	0"	60	21	MITSUBISHI CITY MULTI PURY–P120YKMU–A (SIMULTANEOUS HEATING AND COOLING)

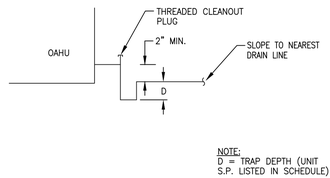
NOTES: 1. INSULATE SUCTION, LIQUID AND RECOVERY REFRIGERANT LINES.
2. INSTALL BC CONTROLLER ON EACH CONDENSING UNIT AS REQUIRED BY MANUFACTURER'S SPECIFICATIONS.
3. ALL UNITS SHALL BE COMPLETE WITH STOP VALVE WITH SERVICE PORT ON LIQUID, GAS, AND RECOVERY LINES. VALVES SHALL BE LOCATED SUCH THAT THE UNIT CAN BE REMOVED AND REPLACED WITHOUT SHUTTING DOWN THE ENTIRE SYSTEM.
4. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR ON MANUFACTURER SELECTED FOR THE PROJECT. INSTALLATION OF THE REFRIGERANT PIPING, CONTROL WIRING, POWER WIRING, ETC. SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
5. ANCHOR UNITS TO VIBRATION ISOLATION SUPPORT AND ANCHOR SUPPORT TO CONCRETE PAD.



1 IN-LINE CEILING FAN SUSPENDED FROM STRUCTURE NO SCALE



2 HORIZONTAL A.H.U. DETAIL (OAHU) NO SCALE



3 P-TRAP DETAIL NO SCALE

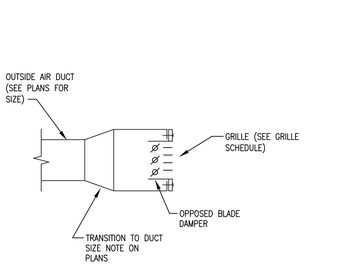
FAN SCHEDULE

NO	SERVICE	MIN. CFM	EXT. S.P.	RPM	SONES	FAN H.P.	TYPE	DRIVE	ELECTRIC SERVICE	CONTROL	COMMENTS
EF 1–1	MEN 113	400	0.4"	1150	3.0	130 W.	IN–LINE	DIRECT	120–1–60	OCC. SEN.	PANASONIC FY–40NLF1
EF 2–1	WOMEN 219	400	0.4"	1150	3.0	130 W.	IN–LINE	DIRECT	120–1–60	OCC. SEN.	PANASONIC FY–40NLF1

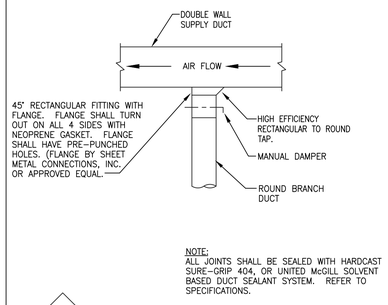
NOTE: 1. EXHAUST FANS SHALL BE INTERLOCKED WITH LIGHTS AND OCCUPANCY SENSOR SWITCH.
2. PROVIDE OCCUPANCY SENSOR TO BE MOUNTED ON BOTTOM OF BOX FURRING (BRYANT ODCOS–11).

DIFFUSER / GRILLE SCHEDULE

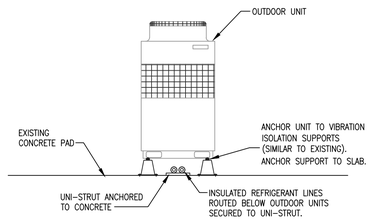
SYMBOL	SIZE	SERVICE	LOCATION	FINISH	O.B.D.	COMMENTS
A	6" X 6"	SUPPLY	CEILING	WHITE	O.B.D.	TITUS TDC–AA–6–26–AG–95–AA–4, PRICE AMD–6 OR APPROVED EQUAL
B	12" X 12"	SUPPLY	CEILING	WHITE	O.B.D.	TITUS TDC–AA–6, PRICE AMD–6 OR APPROVED EQUAL
C	6" X 6"	SUPPLY	WALL	WHITE	O.B.D.	TITUS 300FS–1–26–AG–15–AA OR APPROVED EQUAL
E	18" X 6"	SUPPLY	WALL	WHITE	O.B.D.	TITUS 300FS–1–26–AG–15–AA OR APPROVED EQUAL
F	18" X 8"	SUPPLY	WALL	WHITE	O.B.D.	TITUS 300FS–1–26–AG–15–AA OR APPROVED EQUAL
K	20" X 20"	EXHAUST	CEILING	WHITE	---	TITUS 4FS–1–26–AG–35 OR APPROVED EQUAL



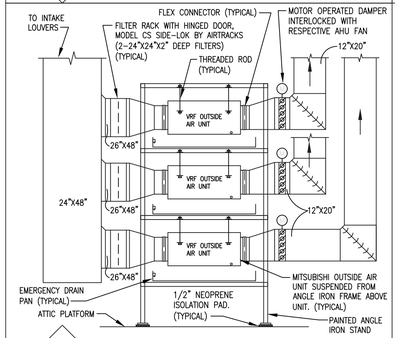
4 OUTSIDE AIR SUPPLY GRILLE DETAIL NO SCALE



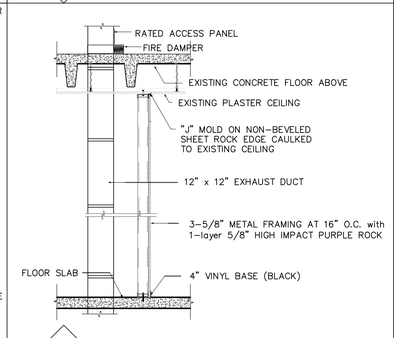
5 SUPPLY DUCT CONNECTION DETAIL NO SCALE



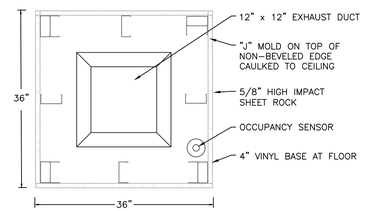
6 OUTDOOR UNIT DETAIL NO SCALE



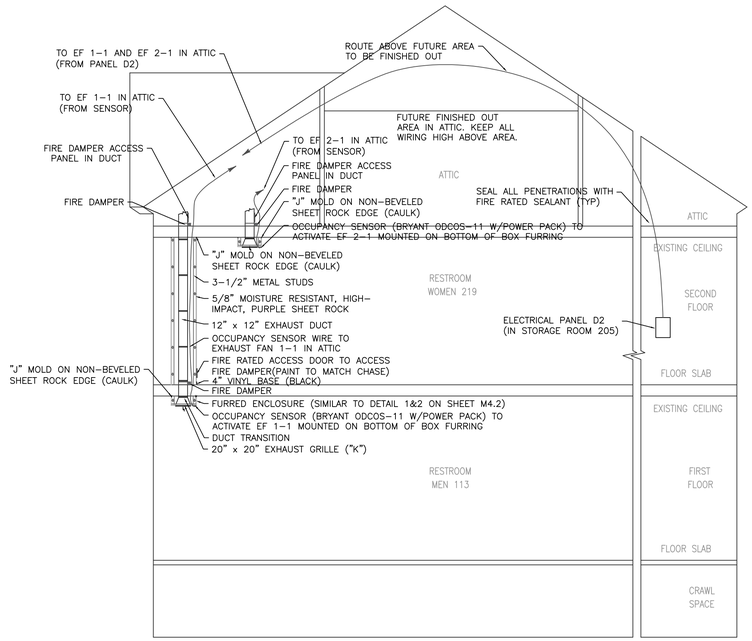
7 MITSUBISHI OUTSIDE AIR UNIT DETAIL (ALTERNATE NO. 1) NO SCALE



8 CHASE WALL DETAIL NO SCALE



9 CHASE WALL DETAIL NO SCALE



10 RESTROOM EXHAUST DUCT DIAGRAM NO SCALE

GENERAL NOTES

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HVAC REPLACEMENT - PHASE 2

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PHYSICAL PLANT

PROJECT NO:	SHEET: M4.3
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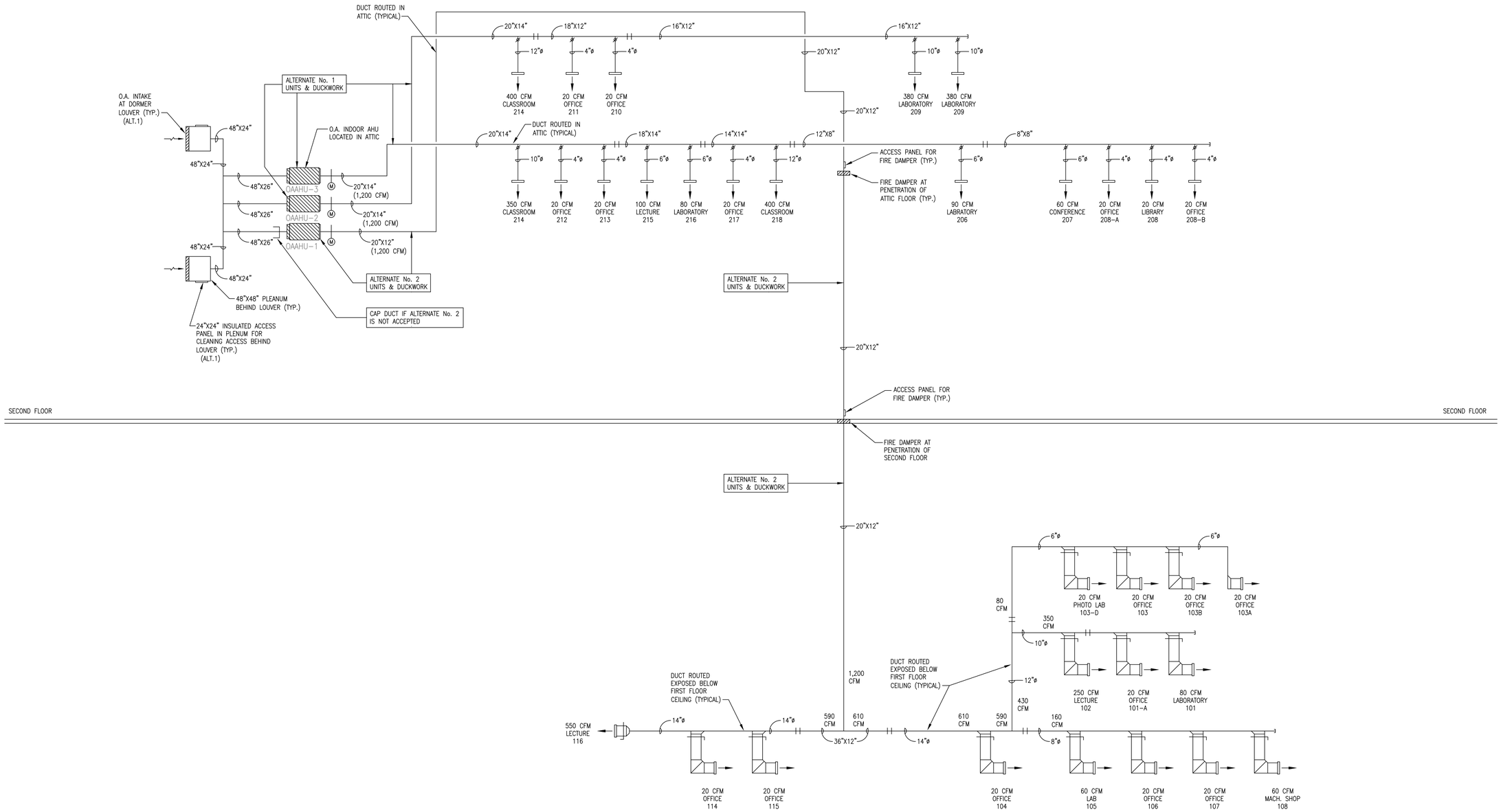

OUTSIDE AIR FLOW DIAGRAM (ALTERNATE NO. 1 and 2)

NO SCALE

NOTE: NEW ROOF MOUNTED DORMERS, OA AHU-2 & 3, AND ASSOCIATED INTAKE AND SUPPLY DUCKWORK SHALL BE INCLUDED IN ALTERNATE No. 1.

NOTE: OA AHU-1 AND ASSOCIATED INTAKE AND SUPPLY DUCKWORK SHALL BE INCLUDED IN ALTERNATE No. 2.

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PROJECT NO:	SHEET:
-	M5.1
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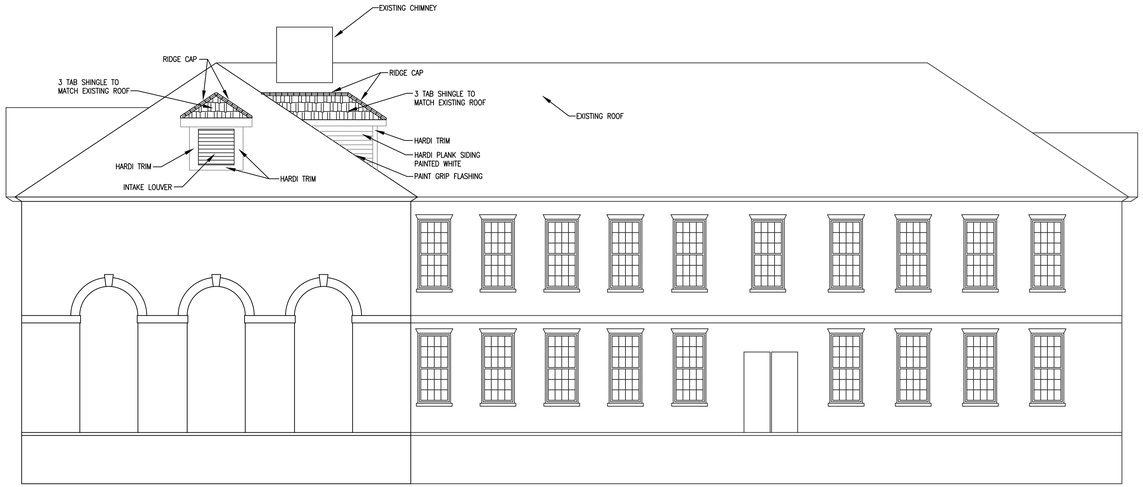
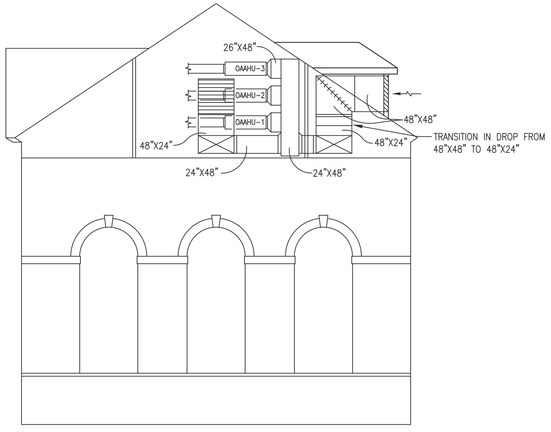
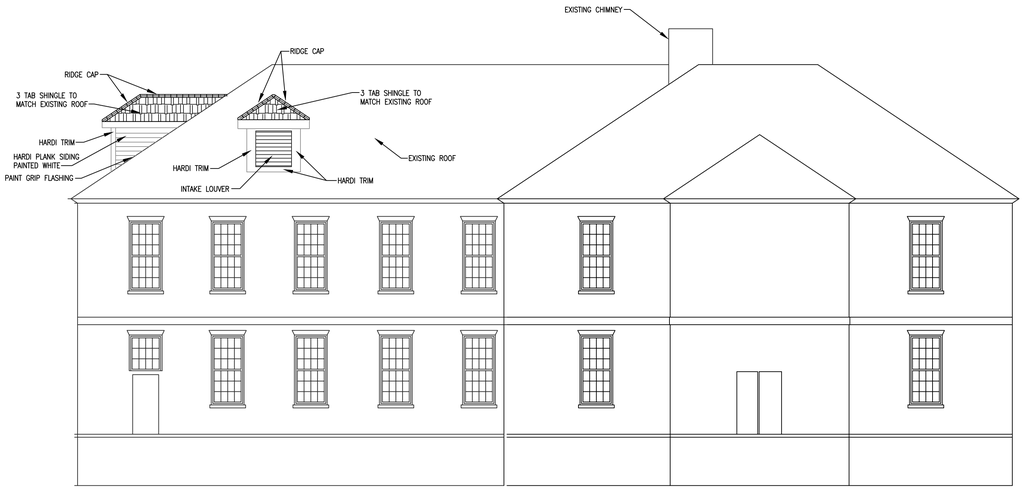


NORTH ELEVATION
SCALE: 1/8" = 1'-0"

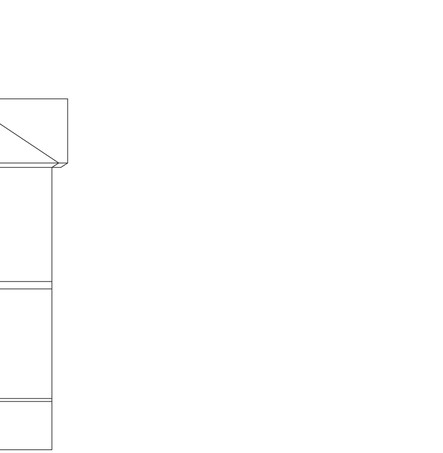


SECTION
SCALE: 1/8" = 1'-0"



WEST ELEVATION
SCALE: 1/8" = 1'-0"

NOTE: DORMER WORK SHALL BE PART OF ALTERNATE NO. 1.



1 SECTION AT DORMER
NO SCALE

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PROJECT NO: -	SHEET: M5.2
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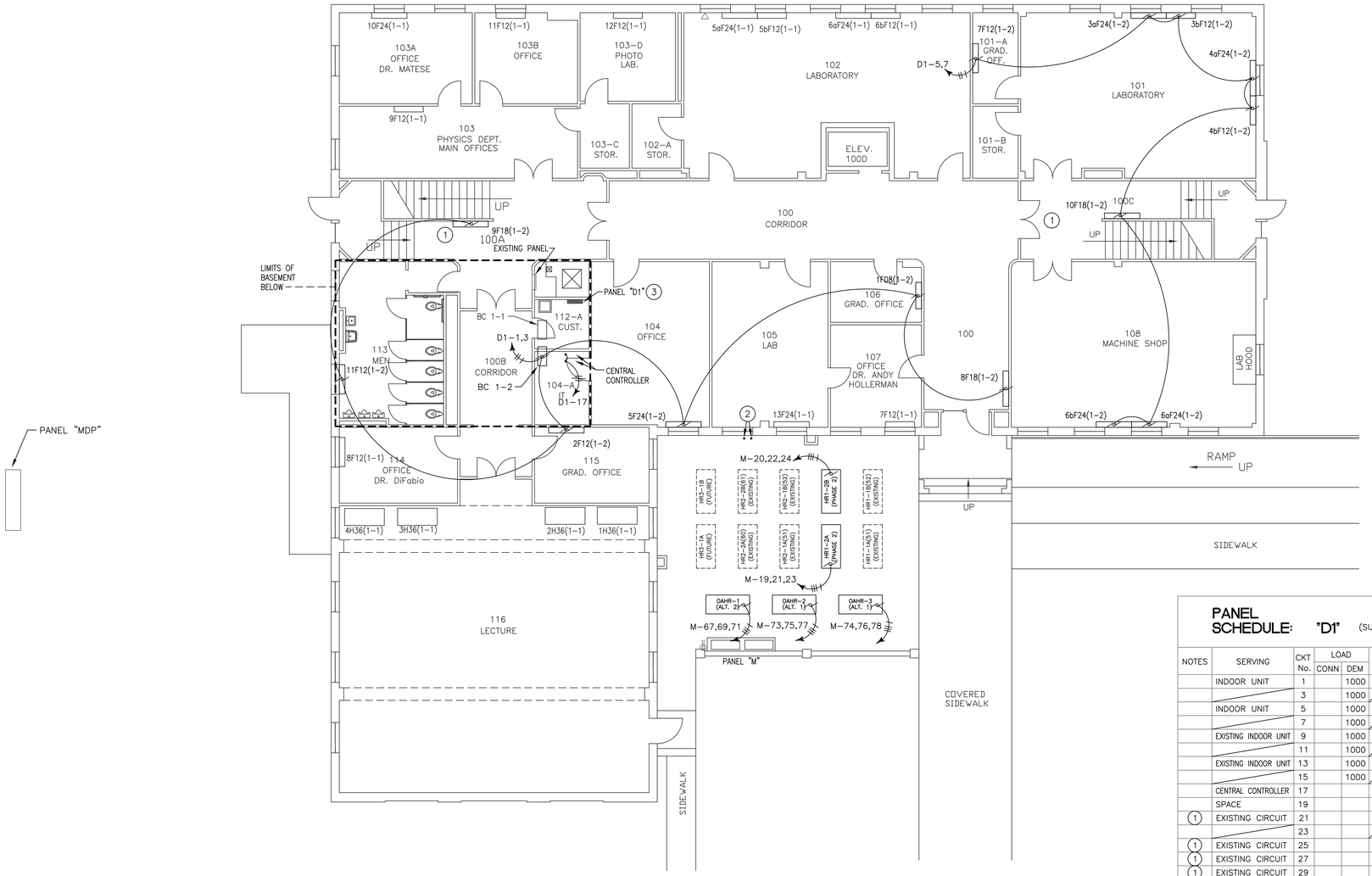


NORTH

ELECTRICAL PLAN - FIRST FLOOR

GENERAL NOTES:

1. REFER TO MECHANICAL DRAWINGS FOR NEW UNITS AND DEMOLITION WORK ASSOCIATED WITH THE BASE BID AND EACH ALTERNATE.
2. ELECTRICAL DESIGN IS BASED ON MITSUBISHI EQUIPMENT DATA. ELECTRICAL CONTRACTOR SHALL COORDINATE REQUIREMENTS OF EQUIPMENT WITH MANUFACTURE REQUIREMENTS.
3. ALL INDOOR VRF UNITS SHALL BE PROVIDED WITH MOTOR RATED SWITCHES. FLOOR MOUNTED UNITS ON THE FIRST FLOOR SHALL HAVE MOTOR RATED SWITCHES MOUNTED INSIDE THE CABINET OF THE UNIT. COORDINATE FINAL LOCATION WITH EQUIPMENT SUPPLIER.

ELECTRICAL NOTES:

(1) ONLY CIRCUITS SERVING EQUIPMENT FOR STAIR/EGRESS CORRIDOR SHALL PENETRATE STAIR WALLS.

(2) APPROXIMATE LOCATION OF CONDUIT STUBBED UP FROM PANEL "M" FOR PANEL "D1" AND "D2".

(3) REMOVE EXISTING PANEL AND INSTALL "D1" AT THE SAME LOCATION. RE-FEED EXISTING PANEL CIRCUITS FROM "D1".

PANEL SCHEDULE: "D1" (SURFACE)

MOUNTING: SURFACE
A.I.C.: 10,000
MAIN: 200A. LO.

VOLT: 120/208
PHASE: 3
WIRE: 4

NOTES	SERVING	CKT No.	LOAD CONN	LOAD DEM	BKR AMP.	WIRE	COND.	PHASE A B C	COND.	WIRE	BKR AMP.	LOAD CONN	LOAD DEM	CKT No.	SERVING	NOTES
	INDOOR UNIT	1		1000	15	3#12	1/2"				100			2	FUTURE	
		3		1000	2									4		
	INDOOR UNIT	5		1000	15	3#12	1/2"				3			6		
		7		1000	2						100			8	FUTURE	
	EXISTING INDOOR UNIT	9		1000	15	3#12	1/2"							10		
		11		1000	2						3			12		
	EXISTING INDOOR UNIT	13		1000	15	3#12	1/2"		4#10	30				14	EXISTING CIRCUIT	(1)
		15		1000	2						2			16		
	CENTRAL CONTROLLER	17			20	3#12	1/2"		3#12	20				18	EXISTING CIRCUIT	(1)
	SPACE	19												20	SPACE	
(1)	EXISTING CIRCUIT	21			15	4#12					20			22	SPARE	
		23			2						20			24	SPARE	
(1)	EXISTING CIRCUIT	25			20	3#12					20			26	SPARE	
(1)	EXISTING CIRCUIT	27			20	3#12					20			28	SPARE	
(1)	EXISTING CIRCUIT	29			20	3#12					20			30	SPARE	
(1)	EXISTING CIRCUIT	31			20	3#12					15			32	SPARE	
(1)	EXISTING CIRCUIT	33			20	3#12					2			34		
(1)	EXISTING CIRCUIT	35			20	3#12					15			36	SPARE	
(1)	EXISTING CIRCUIT	37			20	3#12					2			38		
(1)	EXISTING CIRCUIT	39			20	3#12					30			40	SPARE	
(1)	EXISTING CIRCUIT	41			20	3#12					2			42		

DEMAND LOAD: PHASE A= PHASE B= PHASE C=

TOTAL LOAD _____ KVA
_____ AMPS

NOTES:

(1) CONTRACTOR TO VERIFY BREAKERS IN EXISTING PANEL AND RE-FEED FROM THIS PANEL. PROVIDE BREAKER AS NEEDED.

GENERAL NOTES

NO:	REVISIONS:	DATE:

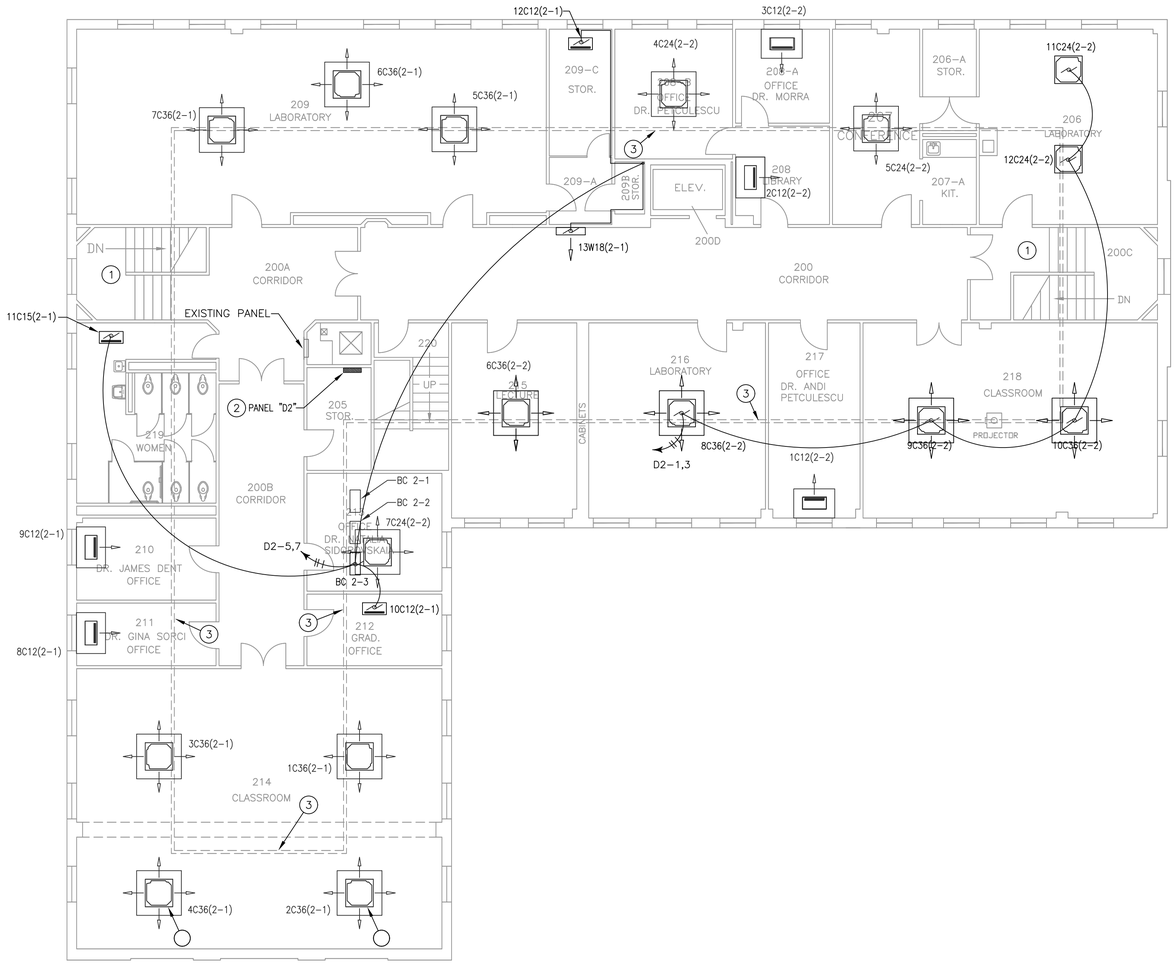
BROUSSARD HALL
HVAC REPLACEMENT - PHASE 2

UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210 70504
LAFAYETTE, LOUISIANA

UL LAFAYETTE
UNIVERSITY OF LOUISIANA
PHYSICAL PLANT

PROJECT NO: .
DATE: AUGUST 2016
SCALE: AS SHOWN

SHEET: E1.1



GENERAL NOTES:

1. REFER TO MECHANICAL DRAWINGS FOR NEW UNITS AND DEMOLITION WORK ASSOCIATED WITH THE BASE BID AND EACH ALTERNATE.
2. ELECTRICAL DESIGN IS BASED ON MITSUBISHI EQUIPMENT DATA. SHOULD THE CONTRACTOR ELECT TO PURCHASE OTHER EQUIPMENT (e.g.: DAIKIN) ELECTRICAL CONTRACTOR SHALL MAKE REQUIRED ADJUSTMENTS TO ACCOMMODATE EQUIPMENT REQUIREMENTS (e.g.: 3 OUTDOOR UNIT SERVICES IN LIEU OF 2, ETC.)
3. ALL INDOOR VRF UNITS SHALL BE PROVIDED WITH MOTOR RATED SWITCHES. CEILING CASSETTES ON THE SECOND FLOOR SHALL HAVE MOTOR RATED SWITCH LOCATED WITHIN THE FURRED ENCLOSURE.

ELECTRICAL NOTES:

(1) ONLY CIRCUITS SERVING EQUIPMENT FOR STAIR/EGRESS CORRIDOR SHALL PENETRATE STAIR WALLS.

(2) REMOVE EXISTING PANEL AND INSTALL "D2" AT THE SAME LOCATION. REFEED EXISTING PANEL CIRCUITS FROM "D2".

(3) LINE OF EXISTING ROOF STRUCTURE. AREA IN CENTER OF ATTIC SHALL BE OPEN FOR FUTURE ATTIC FINISH OUT. DO NOT INSTALL ANY CONDUITS OR CABLING IN THIS AREA IN THE ATTIC. INSTALL IN SECOND FLOOR CEILING WHEN CROSSING THIS AREA.

PANEL SCHEDULE: "D2" (SURFACE)

MOUNTING: SURFACE
A.I.C.: 10,000
MAIN: 200A. LO.
VOLT: 120/208
PHASE: 3
WIRE: 4

NOTES	SERVING	CKT No.	LOAD CONN	LOAD DEM	BKR AMP.	WIRE	COND.	PHASE A B C	COND.	WIRE	BKR AMP.	LOAD CONN	LOAD DEM	CKT No.	SERVING	NOTES
	INDOOR UNIT	1		1000	15	3#12	1/2"		1/2"	3#12	15			2	BC-OA CONTROLLERS	
		3		1000	2						2			4		
	INDOOR UNIT	5		1000	15	3#12	1/2"		1/2"	4#12	15			6	OAAHU #1,#2,#3	
		7		1000	2									8		
(1)	EXISTING INDOOR UNIT	9		1000	15	3#12	1/2"				3			10		
		11		1000	2				1/2"	3#12	20			12	OA MOTORIZED DAMPERS	
(1)	EXISTING INDOOR UNIT	13		1000	15	3#12	1/2"		1/2"	3#12	20			14	EF1-1 & EF2-1	
		15		1000	2									16	SPACE	
(1)	EXISTING CIRCUIT	17			20	3#12								18	SPACE	
(1)	EXISTING CIRCUIT	19			20	3#12								20	SPACE	
(1)	EXISTING CIRCUIT	21			20	3#12								22	SPACE	
(1)	EXISTING CIRCUIT	23			20	3#12								24	SPACE	
(1)	EXISTING CIRCUIT	25			20	3#12								26	SPACE	
(1)	EXISTING CIRCUIT	27			20	3#12								28	SPACE	
(1)	EXISTING CIRCUIT	29			20	3#12								30	SPACE	
	SPARE	31			20									32	SPACE	
	SPARE	33			20									34	SPACE	
	SPARE	35			20									36	SPACE	
	SPARE	37			20									38	SPACE	
	SPARE	39			20									40	SPACE	
	SPARE	41			20									42	SPACE	

DEMAND LOAD: PHASE A= 3K PHASE B= 3K PHASE C= 3K
TOTAL LOAD 9 KVA
25 AMPS

NOTES:
(1) CONTRACTOR TO VERIFY BREAKERS IN EXISTING PANEL AND RE-FEED FROM THIS PANEL. PROVIDE BREAKER AS NEEDED.

ELECTRICAL PLAN - SECOND FLOOR

SCALE: 0 4' 8' (APPROXIMATE)

GENERAL NOTES

NO:	REVISIONS:	DATE:

BROUSSARD HALL
HVAC REPLACEMENT - PHASE 2

UL PHYSICAL PLANT
UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210 LAFAYETTE, LOUISIANA 70504

THE UNIVERSITY OF LOUISIANA SYSTEM
LAFAYETTE

UL LAFAYETTE
UNIVERSITY OF LOUISIANA
PHYSICAL PLANT

PROJECT NO: .
DATE: AUGUST 2016
SCALE: AS SHOWN
SHEET: E2.1

GENERAL NOTES:

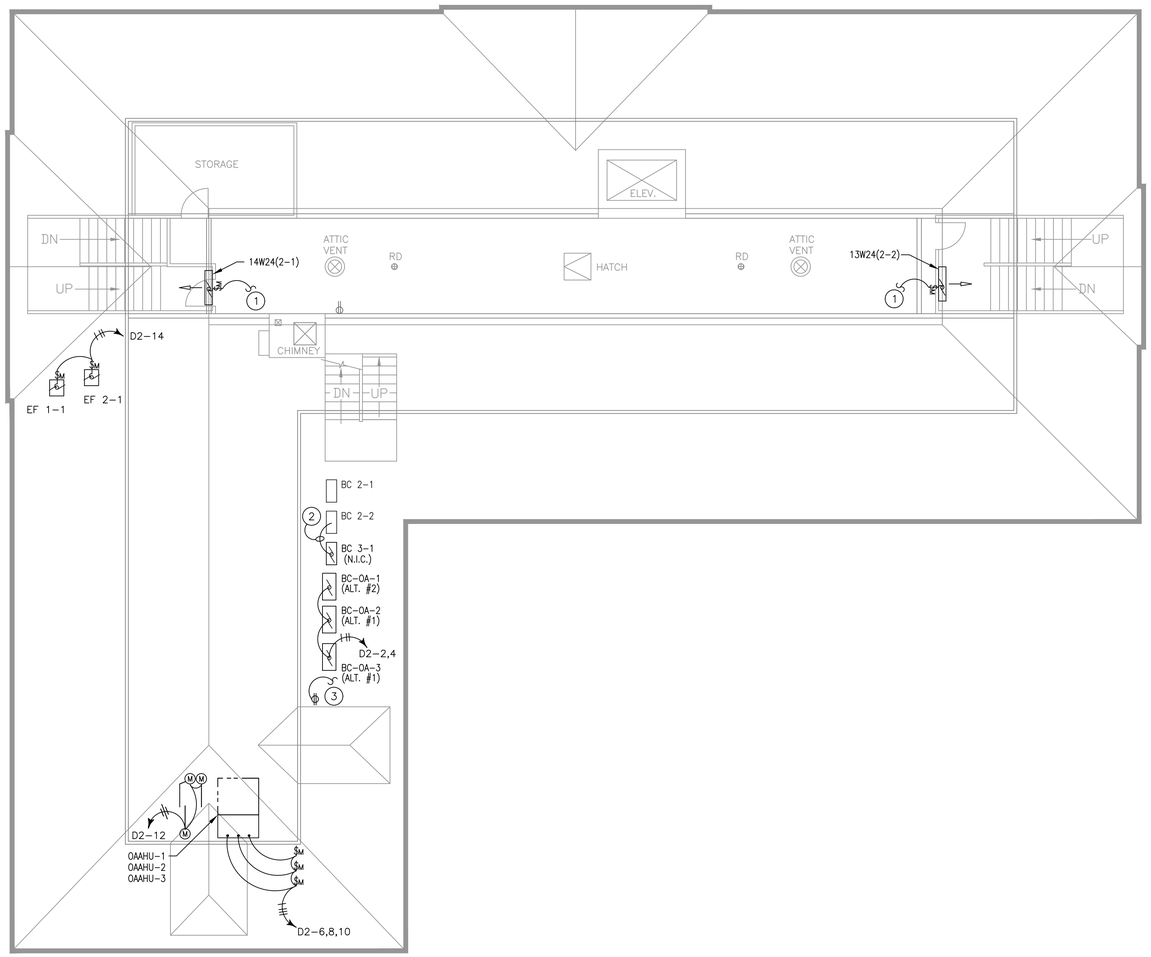
1. REFER TO MECHANICAL DRAWINGS FOR NEW UNITS AND DEMOLITION WORK ASSOCIATED WITH THE BASE BID AND EACH ALTERNATE.
2. ELECTRICAL DESIGN IS BASED ON MITSUBISHI EQUIPMENT DATA. ELECTRICAL CONTRACTOR SHALL MAKE REQUIRED ADJUSTMENTS TO ACCOMMODATE EQUIPMENT REQUIREMENTS.
3. ALL INDOOR VRF UNITS SHALL BE PROVIDED WITH MOTOR RATED SWITCHES. CEILING CASSETTES ON THE SECOND FLOOR SHALL HAVE MOTOR RATED SWITCH LOCATED WITHIN THE FURRED ENCLOSURE.

ELECTRICAL NOTES:

(1) TO CIRCUITS BELOW.

(2) 1/2" CONDUIT 3#12 TIE INTO EXISTING CIRCUIT. (N.I.C. – FUTURE)

(3) TO NEARBY 120V CIRCUIT.



NORTH

ELECTRICAL PLAN - ATTIC/ROOF

SCALE: 0 4' 8' (APPROXIMATE)

GENERAL NOTES

NO:	REVISIONS:	DATE:

BROUSSARD HALL
HVAC REPLACEMENT - PHASE 2

UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL LAFAYETTE
UNIVERSITY OF LOUISIANA
PHYSICAL PLANT

PROJECT NO:	SHEET:
-	E3.1
DATE: AUGUST 2016	
SCALE: AS SHOWN	

ELECTRICAL LEGEND

SYMBOL	POWER DESCRIPTION
	DUPLEX CONVENIENCE OUTLET (18" A.F.F. FOR GENERAL AREAS, 36" A.F.F. FOR GARAGES, HANGARS AND THE LIKE OR AS NOTED)
	DOUBLE DUPLEX CONVENIENCE OUTLET (18" A.F.F. OR AS NOTED)
	SPECIAL OUTLET (VERIFY TYPE AND MOUNTING HEIGHT WITH EQUIPMENT MANUFACTURE)
	COUNTER TOP DUPLEX OUTLET (CLEAR BACK SPLASH)
J	JUNCTION BOX
	ELECTRICAL MOTOR (COORDINATE TERMINATION WITH SUPPLIER)
SM	MOTOR RATED SWITCH
XX/Y	FUSED DISCONNECT SWITCH – FUSE AT MANUFACTURE RECOMMENDED RATING UNLESS NOTED OTHERWISE. XXDENOTES AMPACITY – Y DENOTES PHASE.
	ELECTRICAL PANEL SURFACE MOUNTED
	ELECTRICAL PANEL FLUSH MOUNTED
	CONDUIT RUN CONCEALED IN WALL OR ABOVE CEILING
	CONDUIT RUN CONCEALED UNDER FLOOR OR BELOW GRADE
	HOMERUN TO ELECTRIC PANEL BOARD (INDICATED NUMBER OF CIRCUIT BY NUMBER OF ARROWS)
	THREE (3) CONDUCTORS RUN IN CONDUIT
	FOUR (4) CONDUCTORS RUN IN CONDUIT
	ABBREVIATIONS DESCRIPTION
CT	DENOTES COUNTER–TOP–HEIGHT MOUNTED
E	DENOTES EMERGENCY DEVICE
GFI	DENOTES GROUND FAULT INTERRUPTER PROTECTED
WP	DENOTES WEATHERPROOF
AFF	DENOTES ABOVE FINISHED FLOOR
C	DENOTES CONDUIT
A	DENOTES AMP
W	WALL MOUNTED–48" ABOVE FINISHED FLOOR OR AS NOTED
FDS	FUSED DISCONNECT SWITCH
BOF	BOTTOM OF FIXTURE
MRR	MANUFACTURER'S RECOMMENDED RATING

* ITEMS ON THIS SCHEDULE ARE NOT NECESSARILY SHOWN ON PLANS

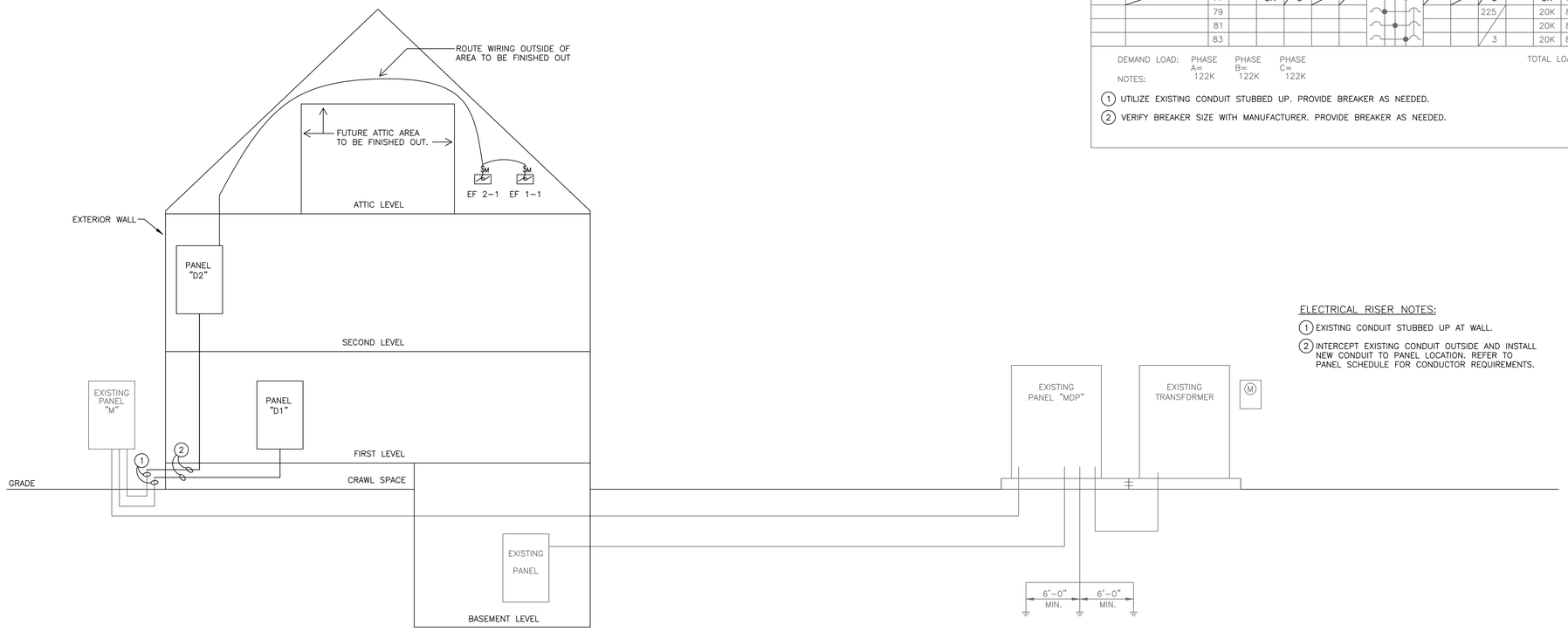
PANEL SCHEDULE: "M" (EXISTING)

MOUNTING: SURFACE
A.I.C.: 27,000
MAIN: 1200 L.O.
VOLT: 120/208
PHASE: 3
WIRE: 4

NOTES	SERVING	CKT No.	LOAD CONN	LOAD DEM	BKR AMP.	WIRE	COND.	PHASE A B C	COND.	WIRE	BKR AMP.	LOAD CONN	LOAD DEM	CKT No.	SERVING	NOTES
		1												2		
		3												4		
		5												6		
(1)	HRU–2–3B	7		5.4K	60	3#6	1"		1"	3#6	60		5.4K	8	HRU–2–3A	(1)
		9		5.4K		1#10				1#10			5.4K	10		
		11		5.4K	3						3		5.4K	12		
		13												14		
		15												16		
		17												18		
	HRU–1–2B	19		5.4K	60	3#6	1"		1"	3#6	60		5.4K	20	HRU–1–2A	
		21		5.4K		1#10				1#10			5.4K	22		
		23		5.4K	3						3		5.4K	24		
	HRU–1–1B	25		5.4K	60	3#6	1"		1"	3#6	60		5.4K	26	HRU–1–1A	
		27		5.4K		1#10				1#10			5.4K	28		
		29		5.4K	3						3		5.4K	30		
(1)	HRU–2–2B	31		5.4K	60	3#6	1"		1"	3#6	60		5.4K	32	HRU–2–2A	(1)
		33		5.4K		1#10				1#10			5.4K	34		
		35		5.4K	3						3		5.4K	36		
	HP–2–1B	37		5.4K	60	3#6	1"		1"	3#6	60		5.4K	38	HP–2–1A	
		39		5.4K		1#10				1#10			5.4K	40		
		41		5.4K	3						3		5.4K	42		
	FUTURE	43			175						20			44	FUTURE	
		45												46		
		47			3						3			48		
(1)	PANEL D2	49			200	4#3/0	2"		2"	4#3/0	200			50	PANEL D1	(1)
		51				1#6				1#6				52		
		53			3						3			54		
		55			40						40			56		
		57												58		
		59			3						3			60		
		61			40						40			62		
		63												64		
		65			3						3			66		
(2)	OAHR1	67		5K	30	3#8	1"				40			68		
		69		5K		1#10								70		
		71		5K	3						3			72		
(2)	OAHR2	73		5K	30	3#8	1"		1"	3#8	30		5K	74	OAHR3	(2)
		75		5K		1#10				1#10			5K	76		
		77		5K	3						3		5K	78		
		79									225		20K	80	FUTURE	
		81											20K	82		
		83									3		20K	84		

DEMAND LOAD: PHASE A= 122K PHASE B= 122K PHASE C= 122K
TOTAL LOAD 366 KVA
1016 AMPS

NOTES:
(1) UTILIZE EXISTING CONDUIT STUBBED UP. PROVIDE BREAKER AS NEEDED.
(2) VERIFY BREAKER SIZE WITH MANUFACTURER. PROVIDE BREAKER AS NEEDED.



ELECTRICAL RISER NOTES:
(1) EXISTING CONDUIT STUBBED UP AT WALL.
(2) INTERCEPT EXISTING CONDUIT OUTSIDE AND INSTALL NEW CONDUIT TO PANEL LOCATION. REFER TO PANEL SCHEDULE FOR CONDUCTOR REQUIREMENTS.

ELECTRICAL PANEL SCHEDULES, LEGEND AND RISER

NO SCALE

GENERAL NOTES

NO:	REVISIONS:	DATE:

BROUSSARD HALL HVAC REPLACEMENT - PHASE 2

UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL LAFAYETTE
UNIVERSITY OF LOUISIANA
PHYSICAL PLANT

PROJECT NO: .
DATE: AUGUST 2016
SCALE: AS SHOWN
SHEET: E4.1