RFB NO. 109062

CONSTRUCTION DOCUMENTS
PROJECT MANUAL

DANE COUNTY DEPARTMENT OF PUBLIC WORKS,
HIGHWAY AND TRANSPORTATION

PUBLIC WORKS ENGINEERING DIVISION
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713

REQUEST FOR BIDS NO. 109062
NEW CENTRAL AIR CONDITIONING SYSTEM
JUVENILE SHELTER HOME
2402 ATWOOD AVE
MADISON, WISCONSIN

Opening Date / Time: **THURSDAY, APRIL 2, 2009 / 2:00 P.M.**

Location: **PUBLIC WORKS OFFICE**

Performance / Payment Bond: **100% OF CONTRACT AMOUNT**

Bid Deposit: **5% OF BID AMOUNT**

FOR INFORMATION ON THIS REQUEST FOR BIDS, PLEASE CONTACT:

JOHN WELCH, PROJECT MANAGER
TELEPHONE NO.: 608/267-8815
FAX NO.: 608/267-1533
E-MAIL: WELCH@CO.DANE.WI.US

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DRAWINGS

To be printed to correct scale or size, plot sheets on 24" x 36" (D) paper.
Sheet 1 – New Central Air Cond. System, dated 3/12/09

DANE COUNTY VENDOR REGISTRATION PROGRAM

All bidders / proposers wishing to submit a bid / proposal should be registered with Dane County Purchasing before bid / proposal opening & must be registered before award of contract. Complete a Vendor Registration Form at www.danepurchasing.com, or obtain one by calling 608/266-4131.

LEGAL NOTICE

INVITATION TO BID

Dane County Public Works, Highway & Transportation Dept., 1919 Alliant Energy Center Way, Madison, WI 53713, will receive sealed Bids until:

2:00 P.M., THURSDAY, APRIL 2, 2009

REQUEST FOR BIDS NO. 109062

NEW CENTRAL AIR CONDITIONING SYSTEM
JUVENILE SHELTER HOME
2402 ATWOOD AVENUE
MADISON, WISCONSIN

Dane County is inviting Bids for construction services. Furnish new central air conditioning system on second floor of Juvenile Shelter.

Request for Bids package may be obtained at Dane County Public Works, Highway & Transportation Dept., 1919 Alliant Energy Center Way, Madison, WI 53713, by calling 608-266-4018, or downloading it from www.countyofdane.com/pwht/bid/logon.aspx. Please call John Welch, Project Manager, at 608-516-4154 for any questions or additional information.

All Bidders wishing to submit Bids should be registered vendor with Dane County Purchasing before bid opening & must be registered before award of contract. Complete Vendor Registration Form at www.danepurchasing.com or obtain one by calling 608-266-4131.

An optional bidder's facility tour will be held on Monday, March 23, 2009 at 12:00 PM at the Juvenile Shelter Home, 2402 Atwood Ave, Madison WI 53704.

PUBLISH: **MARCH 12 & 19, 2009 - WISCONSIN STATE JOURNAL**
MARCH 9 & 16, 2009 - WESTERN BUILDER

INSTRUCTIONS TO BIDDERS

New Central Air Conditioning System
Juvenile Shelter Home
2402 Atwood Ave
Madison, Wisconsin

1. SECURING DOCUMENTS

A. Construction Documents may be obtained at:
Dane County Department of Public Works, Highway & Transportation
1919 Alliant Energy Center Way, Madison, Wisconsin 53713
608/266-4018
or at:
www.countyofdane.com/pwht/bid

B. If Construction Documents are obtained from the Dane County web site, Bidder is responsible to check back regularly at the web site for Addenda.

C. Deposit for Drawings and Specifications is not required.

2. BID REQUIREMENTS

A. Bidder shall submit lump sum bid for providing all labor, equipment, tools and materials necessary to perform all Work described in Construction Documents. Only firms with capabilities, experience and expertise with similar projects should submit Bids.

B. Envelope containing Bid shall be clearly marked as for this project (note title at top of page). Bids shall be delivered to:
Dane County Department of Public Works, Highway & Transportation
1919 Alliant Energy Center Way
Madison, Wisconsin 53713

C. One (1) Bid Form shall be submitted with your Bid. Bid Form is provided with Construction Documents; no other form or letter shall be accepted.

D. Bidders shall not add any conditions, escalator clauses of qualifying statements to Bid Form.

E. Erasures or other changes to Bid must be explained or noted, and shall be accompanied by initials of bidder.

F. Legally authorized official of bidder's organization shall sign Bids.

G. Bidder's organization shall submit completed Fair Labor Practices Certification form, included in these Construction Documents.

H. Bidder shall comply with Chapter 25.016 of the Dane County Ordinances with respect to domestic partnership benefits.

J. Bid Bond shall be made payable to Dane County in amount of five percent (5%) of bid amount. Bid Bond shall be either certified check or bid bond issued by surety licensed to conduct business in the State of Wisconsin. Successful bidder's Bid Bond shall be retained until Contract is signed and required Performance / Payment Bond is submitted. Bids shall be binding on bidder for sixty (60) days after Bid Opening. Bid Bond must be submitted with Bid.

K. Successful bidder shall furnish and pay for Performance / Payment Bond as called for in Conditions of Contract.

3. INQUIRIES

A. Written inquiries regarding intent of Construction Documents should be directed to:
John Welch, Project Manager
Dane County Department of Public Works, Highway & Transportation
1919 Alliant Energy Center Way, Madison, Wisconsin 53713
Fax: 608/267-1533
Email: welch@co.dane.wi.us

B. Bidders shall bring questions, discrepancies, omissions, conflicts or doubt as to meaning of any part of Construction Documents to attention of Department of Public Works, Highway & Transportation at least ten (10) days before due date for Bids. Prompt clarification of intent of Construction Documents shall be made available to bidders in form of Addendum. Bidder shall acknowledge all Addenda on Bid Form.

C. Failure to request clarification of interpretation of Construction Documents shall not relieve bidders of their responsibilities to perform Work.

4. EXAMINATION OF SITE

A. Coordinate site access activities with John Welch, Project Manager, 608/267-8815.

B. Bidder shall carefully examine project site. Investigate all site conditions that may affect execution of Work as detailed in Construction Documents.

C. A bidders facility tour will be held on Monday, March 23, 2009 at 12:00 PM at the Juvenile Shelter Home, 2402 Atwood Ave, Madison WI 53704. Bidders are strongly encouraged to attend this tour, however attendance is optional.

5. ALTERNATES

A. Not used.

6. WITHDRAWAL OF BIDS

A. Any bidder may withdraw their Bid any time prior to Bid Opening. Withdrawn Bids shall be returned unopened.

7. BID OPENING

A. See Legal Notice (advertisement).

8. COMMENCEMENT AND COMPLETION OF WORK

A. Notice to Proceed shall be issued by April 24, 2009.

B. Work shall be completed by July 2, 2009.

9. RESERVATION

A. Dane County reserves the right to reject any or all Bids, to waive any informalities in the Bid, and to accept any Bid which shall be in the best interest of Dane County.

BID FORM

BID NO. 109062
PROJECT: NEW CENTRAL AIR CONDITIONING SYSTEM
JUVENILE SHELTER HOME

TO: DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY & TRANSPORTATION PROJECT ENGINEER
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713

BASE BID - LUMP SUM:
Furnish new central air conditioning system on second floor of Juvenile Shelter. The undersigned, having examined the site where the Work is to be executed and having become familiar with local conditions affecting the cost of the Work and having carefully examined the Drawings and Specifications, all other Construction Documents and Addenda thereto prepared by Dane County Department of Public Works, Highway & Transportation hereby agrees to provide all labor, materials, equipment and services necessary for the complete and satisfactory execution of the entire Work, as specified in the Construction Documents, for the Base Bid stipulated sum of:

_____ and _____ /100 Dollars
Written Price

$_____
Numeric Price

Receipt of the following addenda and inclusion of their provisions in this Bid is hereby acknowledged:

Addendum No(s). _____ through_____

Dated _____

Dane County Juvenile Court Program must have this project completed by July 2, 2009. Assuming Notice to Proceed for this Work is issued by April 24, 2009, what dates can you commence and complete this job?

Commencement Date: _____ Completion Date: _____
(final, not substantial)

Name of Bidder: _____

Address: _____

Telephone No.: _____ Fax No.: _____

Contact Person: _____

SIGNATURE: _____
(Bid is invalid without signature)

BID CHECK LIST:
These items **must** be included with Bid or completed **before** bidding

☐ Bid Form	☐ Bid Bond
☐ Vendor Registration	☐ Fair Labor Practices Certification

FAIR LABOR PRACTICES CERTIFICATION

The undersigned, for and on behalf of the BIDDER, APPLICANT or PROPOSER named herein, certifies as follows:

A. That he or she is an officer or duly authorized agent of the above-referenced BIDDER, APPLICANT or PROPOSER, which has a submitted a proposal, bid or application for a contract with the county of Dane.

B. That BIDDER, APPLICANT or PROPOSER has (check one):

_____ not been found by the National Labor Relations Board ("NLRB") or the Wisconsin Employment Relations Commission ("WERC") to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ been found by the National Labor Relations Board ("NLRB") or the Wisconsin Employment Relations Commission ("WERC") to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ _____

Officer or Authorized Agent Signature | Date

_____

Printed or Typed Name and Title

_____

Printed or Typed Business Name

NOTE: You can find information regarding the violations described above at: www.nlrb.gov and werc.wi.gov.

For reference, Dane County Ordinance 25.11(28)(a) is as follows:

(28) BIDDER RESPONSIBILITY. (a) Any bid, application or proposal for any contract with the county, including public works contracts regulated under chapter 40, shall include a certification indicating whether the bidder has been found by the National Labor Relations Board (NLRB) or the Wisconsin Employment Relations Committee (WERC) to have violated any statute or regulation regarding labor standards or relations within the last seven years. The purchasing manager shall investigate any such finding and make a recommendation to the committee, which shall determine whether the conduct resulting in the finding affects the bidder's responsibility to perform the contract.

If you indicated that the NLRB or WERC have found you to have such a violation, you must include copies of any relevant information regarding such violation with your proposal, bid or application.

COUNTY OF DANE

PUBLIC WORKS CONTRACT

Contract No. _____ Bid No. 109062

Authority: Res. _____, 2008-09

THIS CONTRACT, made and entered into as of the date by which authorized representatives of both parties have affixed their signatures, by and between the County of Dane (hereafter referred to as "COUNTY") and _____ (hereafter, "CONTRACTOR"), and

W I T N E S S E T H :

WHEREAS, COUNTY, whose address is c/o Associate Public Works Director, 1919 Alliant Energy Center Way, Madison, WI 53713, desires to have CONTRACTOR provide New Central Air Conditioning System at the Juvenile Shelter Home ("the Project"); and

WHEREAS, CONTRACTOR, whose address is _____ _____ is able and willing to construct the Project, in accordance with the Construction Documents;

NOW, THEREFORE, in consideration of the above premises and the mutual covenants of the parties hereinafter set forth, the receipt and sufficiency of which is acknowledged by each party for itself, COUNTY and CONTRACTOR do agree as follows:

1. CONTRACTOR agrees to construct, for the price of $_____ the Project and at the CONTRACTOR'S own proper cost and expense to furnish all materials, supplies, machinery, equipment, tools, superintendence labor, insurance, and other accessories and services necessary to complete the Project in accordance with the conditions and prices stated in the Bid Form, Conditions of Contract, the drawings which include all maps, plats, plans, and other drawings and printed or written explanatory matter thereof, and the specifications therefore as prepared by Dane County Department of Public Works, Highway & Transportation, (hereinafter referred to as "the Architect / Engineer"), and as enumerated in the Project Manual Document Index, all of which are made a part hereof and collectively evidence and constitute the Contract.

2. COUNTY agrees to pay the CONTRACTOR in current funds for the performance of the Contract subject to additions and deductions, as provided in the Conditions of Contract, and to make payments on account thereof as provided in Article entitled, "Payments to Contractor" of the Conditions of Contract.

3. During the term of this Contract, CONTRACTOR agrees to take affirmative action to ensure equal employment opportunities. The CONTRACTOR agrees in accordance with Wisconsin Statute 111.321 and Chapter 19 of the Dane County Code of Ordinances not to discriminate on the basis of age, race, ethnicity, religion, color, gender, disability, marital status, sexual orientation, national origin, cultural differences, ancestry, physical appearance, arrest record or conviction record, military participation or membership in the national guard, state defense force or any other reserve component of the military forces of the United States, or political beliefs.

Such equal opportunity shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation. CONTRACTOR agrees to post in conspicuous places, available to all employees and applicants for employment, notices setting forth the provisions of this paragraph.

4. CONTRACTOR shall file an Affirmative Action Plan with the Dane County Contract Compliance Officer in accord with Chapter 19 of the Dane County Code of Ordinances. CONTRACTOR must file such plan within fifteen (15) days of the effective date of this Contract. During the term of this Contract CONTRACTOR shall also provide copies of all announcements of employment opportunities to COUNTY'S Contract Compliance Office, and shall report annually the number of persons, by race, ethnicity, gender, and disability status, which apply for employment and, similarly classified, the number hired and number rejected.

5. During the term of this Contract, all solicitations for employment placed on CONTRACTOR'S behalf shall include a statement to the effect that CONTRACTOR is an "Equal Opportunity Employer."

6. CONTRACTOR agrees to comply with provisions of Chapter 25.016 of the Dane County Code of Ordinances, which pertains to domestic partnership benefits.

7. CONTRACTOR agrees to furnish all information and reports required by COUNTY'S Contract Compliance Officer as the same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and the provisions of this Contract.

8. CONTRACTOR agrees that all persons employed by CONTRACTOR or any subcontractor shall be paid no less than the minimum wage established under Chapter 40, Subchapter II, Dane County Code of Ordinances. CONTRACTOR agrees to abide by and comply with the provisions of Chapter 40, Subchapter II of the Dane County Code of Ordinances, and said Subchapter is fully incorporated herein by reference.

9. CONTRACTOR hereby agrees to provide equal benefits as required by Dane County Code of Ordinances sec. 25.016. Contractor hereby certifies that it will provide equal benefits as required by that ordinance to all required employees during the term of the Contract.
For more information: http://www.danepurchasing.com/partner_benefit.aspx

9. This Contract is intended to be a Contract solely between the parties hereto and for their benefit only. No part of this Contract shall be construed to add to, supplement, amend, abridge or repeal existing rights, benefits or privileges of any third party or parties including, but not limited to, employees of either of the parties.

10. The entire agreement of the parties is contained herein and this Contract supersedes any and all oral agreements and negotiations between the parties relating to the subject matter hereof. The parties expressly agree that the express terms of this Contract shall not be amended in any fashion except in writing, executed by both parties.

IN WITNESS WHEREOF, COUNTY and CONTRACTOR, by their respective authorized agents, have caused this Contract and its Schedules to be executed, effective as of the date by which all parties hereto have affixed their respective signatures, as indicated below.

* * * * * * *

FOR CONTRACTOR:

Signature | Date

Printed or Typed Name and Title

Signature | Date

Printed or Typed Name and Title

NOTE: If CONTRACTOR is a corporation, Secretary should attest. In accordance with IRS Regulations, unincorporated entities are required to provide either their Social Security or Employer Number in order to receive payment for services rendered.

* * * * * * *

This Contract is not valid or effectual for any purpose until approved by the appropriate authority designated below, and no work is authorized until the CONTRACTOR has been given notice to proceed by COUNTY'S Associate Public Works Director.

FOR COUNTY:

Kathleen M. Falk, County Executive | Date

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A310

Bid Bond

Bond No.

KNOW ALL MEN BY THESE PRESENTS, that we

(Here insert full name and address or legal title of Contractor)

as Principal, hereinafter called the Principal, and

(Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of WI as Surety, hereinafter called the Surety, are held and firmly bound unto

(Here insert full name and address or legal title of Owner)

as Obligee, hereinafter called Obligee, in the sum of ( ) Percent of total amount bid

Dollars ($ Percent of attached bid).

For the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for Project No.:

(Here insert full name, address, and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this day of , 20 .

(Principal) (Seal)

(Witness)

(Title)

(Surety) (Seal)

(Witness)

ATTORNEY-IN-FACT

THE AMERICAN INSTITUTE OF ARCHITECTS

Bond No.

AIA Document A312

Performance Bond

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT
Date:
Amount: **$**
Description (Name and Location):

BOND
Date (Not earlier than Construction Contract Date):
Amount: **$**
Modifications to this Bond: [ ] None [ ] See Page 3

CONTRACTOR AS PRINCIPAL
COMPANY: (Corporate Seal)

SURETY COMPANY: (Corporate Seal)

Signature: _____
Name and Title:

Signature: _____
Name and Title:
Attorney-in-Fact

(Any additional signatures appear on page 3)

FOR INFORMATION ONLY-Name, Address and Telephone
AGENT OR BROKER:

OWNER'S REPRESENTATIVE (Architect, Engineer or other party):

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.

3. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:

3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and

3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph 3.1; and

3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.

4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or

4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or

4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

4.4 Waive its rights to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

1. After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or

2. Deny liability in whole or in part and notify the Owner citing reasons therefor.

5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

6. After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:

6.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and

6.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12 DEFINITIONS

12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

12.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature: _____		Signature: _____	
Name and Title:		Name and Title:	
Address:		Address:	

THE AMERICAN INSTITUTE OF ARCHITECTS

Bond No.

AIA Document A312

Payment Bond

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT
Date:
Amount: **$**
Description (Name and Location):

BOND
Date (Not earlier than Construction Contract Date):
Amount: **$**
Modifications to this Bond: [ ] None [ ] See Page 6

CONTRACTOR AS PRINCIPAL
COMPANY: (Corporate Seal)

SURETY COMPANY:
(Corporate Seal)

Signature: _____
Name and Title:

Signature: _____
Name and Title:
Attorney-in-Fact

(Any additional signatures appear on page 6)

FOR INFORMATION ONLY-Name, Address and Telephone
AGENT OR BROKER:

OWNER'S REPRESENTATIVE (Architect, Engineer or other party):

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.

2. With respect to the Owner, this obligation shall be null and void if the Contractor:

2.1 Promptly makes payment, directly, or indirectly, for all sums due Claimants, and

2.2 Defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity whose claim, demand, lien or suit is for the payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.

4. The Surety shall have no obligation to Claimants under this Bond until:

4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2 Claimants who do not have a direct contract with the Contractor:

1. Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and

2. Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and

3. Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.

6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

6.1 Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2 Pay or arrange for payment of any undisputed amounts.

7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor

shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. DEFINITIONS

15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

15.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature: _____		Signature: _____	
Name and Title:		Name and Title:	
Address:		Address:	

CONDITIONS OF CONTRACT

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1. BIDS AND QUOTATIONS

A. **Addressing of Bids.** Bids shall be addressed to the attention of Public Works Engineering Division and received at the Dane County Department of Public Works, Highway & Transportation, 1919 Alliant Energy Center Way, Madison, WI 53713, on or before the local time and date specified herein for the Bid Opening. Seal all bids in envelopes and clearly mark the front with bid number and a reference to the specified contents of the bid. All uses of the term "County" in the Construction Documents shall mean Dane County.

B. **Only One Copy Required.** Unless otherwise specified, only one copy of a bid or quotation on prescribed Bid Form will be required.

C. **Additional Data with Bid.** Bidder may submit, on the firm's letterhead only, additional data and information deemed advantageous to the County. The County shall hold optional the consideration of such data and information.

D. **More than One Bid.** Bidders desiring to submit more than one bid may do so provided such additional bid or bids are properly submitted on the Dane County Department of Public Works, Highway & Transportation's Bid Form. Obtain extra sets of Construction Documents from the Dane County Department of Public Works, Highway & Transportation. All uses of the term "Department" in the Construction Documents shall mean the Department of Public Works, Highway & Transportation, which is a unit of Dane County government.

E. **Withdrawal or Late Bids.** The County will not accept formal bids, amendments thereto, or requests for withdrawal of a bid or any part thereof, after the time of Bid Opening.

F. **Preparation and Submission.** All written bids, unless otherwise provided for, must be submitted on and in accordance with forms provided by the County properly signed in ink. Bids not signed by hand are not accepted. Bidders must register in advance with the Purchasing Division.

G. **Products by Name.** Intention of Specifications of products by name is to be descriptive of quality, workmanship, finish, function and approximate characteristics desired; intention is not necessarily restriction. Consideration of products substitution for those named is possible, provided the substitute offered is, in the opinion of the Dane County Public Works

Project Engineer, equal or superior in quality, workmanship, finish, function and approximate characteristics to that specified in the Project Manual Specifications listed herein.

H. **Visitation of Sites.** Bidder shall visit the site(s) that will receive the intended work or installation, and in so doing, be held responsible for a job deemed satisfactory by the County after completion of the Work or installation. No additional compensation shall be allowed for any condition of which bidder could have been informed.

I. **Completeness.** Supply all information required by Construction Documents to constitute a regular bid. This shall include:
   1. Completed Bid Form.
   2. Completed Fair Labor Practices Certification.
   3. Completed Bid Bond.
   4. Vendor Registration

J. **Bids Binding Sixty (60) Days.** Unless otherwise specified all formal bids submitted shall be binding for sixty (60) calendar days following Bid Opening date.

K. **Conditional Bids.** Qualified bids are subject to complete rejection, or partial rejection.

L. **All or Part.** Bids or quotations may be considered and award made for all or any part of total quantities as specified in the Construction Documents.

M. **Errors.** Unit bid price shall govern when extending total prices has errors.. Carelessness in quoting prices or in preparation of bid otherwise, will not relieve the bidder. Explain all erasures in bids and include signature of bidder.

N. **Regulation by State Statutes.** The bidding and letting of contracts are subject to provisions of Wisconsin Statutes 59.52(29) and 66.0901 and all subsequent sections and amendments thereof.

O. **Bidders Present.** The Bid Opening is the time fixed for the opening of formal bids. The Bids' contents will be made public for the information of bidders and others properly interested, who may be present either in person or by representative. Bidders are encouraged to attend all openings, and to offer constructive suggestions for improvements to bid format or ways in which County can realize greater savings.

P. **Taxes.** Contractor shall pay applicable State and local sales taxes.

2. GUARANTEE AND BOND

A. **Bid Bond / Guarantee.** A Bid Bond shall accompany Bids, which shall be either a flat sum or a percentage figure as shown on the Project Manual Cover. This Bid Bond shall serve as a warrant that the successful bidder will fulfill the terms of the bid within the time limit as indicated in the bid after notice of award by the Dane County. The Bid Bond may be a certified bank check (note: uncertified checks will not be acceptable), a cashier's check or a United State money order payable to the order of the Treasurer of Dane County; or on a Bid Bond with corporate surety authorized to do business in the State of Wisconsin and a warranty of attorney to confess judgment thereon attached thereto. The County will return negotiable Bid Bonds to unsuccessful bidders after awarding of bid. The County shall return

a check held from a Contractor after satisfactory completion of the Contract or after receipt by the County of a Performance Bond from the Contractor, if one is required. Surety Bid Bonds will not be returned unless specifically requested by individual bidders.

B. **Guarantor Liability.** When guarantee is required, failure of bidder to furnish an acceptable Performance Bond (Article 2.C.) within twenty (20) days after receipt of notice of award shall render the guarantor liable to the County. Bids covered by certified check or bond such security shall become the absolute property of the County and shall be deposited with the County Treasurer for the benefit of the County as liquidated damages. The County shall forthwith proceed to collect on the Bid Bond.

C. **Performance / Payment Bond.** When required, file a guarantee that the successful bidder will faithfully perform the obligations of the bid as accepted. Such guarantee must be a bond complying with Wisconsin Statute 779.14 with corporate surety authorized to do business in this State, and that the Contractor or subcontractors will be responsible for all claims for injuries to persons or damages to property or premises arising out of or in connection with their operations prior to the acceptance of the finished work or supplies, and that they will promptly make payments to all persons supplying them with labor or materials in the execution of the Work provided for in the Contract; guarantee to indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from all costs, damages and expenses growing out of or by reason of the successful bidder's failure to comply and perform the Work and complete the Contract in accordance with the Construction Documents; attach thereto a warrant of attorney authorizing the confession of judgment thereon for the benefit of the County.

3. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

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

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

C. Samples are physical examples that illustrate materials, equipment or workmanship and establish standards to compare the Work.

D. Shop Drawings, Product Data, Samples and similar submittals are not Construction Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Construction Documents.

E. The Contractor shall review, approve and submit to the Public Works Project Engineer Shop Drawings, Product Data, Samples and similar submittals required by the Construction Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the County or of separate contractors. Submittals made by the Contractor not required by the Construction Documents, may be returned without action.

F. The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the Public Works Project Engineer has approved the respective submittal. Such Work shall be in accordance with approved submittals.

G. By approving and submitting, Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Construction Documents.

H. The Contractor shall not be relieved of responsibility for deviations from requirements of the Construction Documents by the Public Works Project Engineer's approval of Shop Drawings, Product Data, Samples and similar submittals unless the Contractor has specifically informed the Public Works Project Engineer in writing of such deviation at the time of submittal and the Public Works Project Engineer has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Sample or similar submittals by the Public Works Project Engineer's approval thereof.

I. The Contractor shall in writing direct specific attention to revised and / or resubmitted Shop Drawings, Product Data, Samples or similar submittals that were not requested by the Architect / Engineer or the Public Works Project Engineer on previous submittals.

J. Unless specified otherwise, Contractor shall submit three (3) copies of all Shop Drawings, Product Data, Samples or similar submittals for each submission, until receiving final approval. After final approval, provide five (5) additional copies for distribution and such other copies as may be required.

4. AWARDS

A. **Lowest Responsible Bidder.** Award will be to the lowest responsible bidder conforming to Construction Documents or on the most advantageous bid to the County.

B. **Other Considerations.** Quantities involved, time of delivery, purpose for which required, competency of bidder, the ability to render satisfactory service and past performance will be considered in determining responsibility.

C. **Rejection of Bids.** The County reserves the right to reject any or all bids or quotations in whole or in part and to award by items, parts of items, or by any aggregate group of items specified. The County reserves also the right to waive technical defects when in its judgment the best interests of the County thereby will be served.

D. **Notice of Acceptance.** Sufficient notification of acceptance of bid will be written notice of award to a bidder in the form of a Purchase Order or similar, mailed or delivered to the address shown on the Bid Form.

E. **Tie Bids.** If two or more bidders submit identical bids, the decision of the County to make award to one or more of such bidders shall be final. Cash discount will be taken into consideration determining an award. Also, see Article 7.A. IDENTICAL BIDDING, Antitrust Laws.

F. **Qualifying Bidders.** Prior to solicitation and / or awarding of bid, the County may require submission by bidder of complete financial statement and questionnaire describing bidder's financial ability and experience in performance of similar work. Refer to Instructions to Bidders.

G. **Disqualification.** Awards will not be made to any person, firm or company in default of a Contract with the County, or to any bidder having as its sales agent or representative or as a member of the firm, any individual previously in default or guilty of misrepresentation.

H. **Bid Results.** Bidders may secure information pertaining to results of bids by visiting the County Purchasing Division Office Monday through Friday, between 7:45 a.m. and 4:30 p.m.

5. CONTRACT PROVISIONS

A. **Acceptance Constitutes Contract.** Written acceptance by the Public Works Project Engineer of a proposal for services shall constitute a Contract, which shall bind the bidder to perform the Work as detailed in the Construction Documents, for the bid amount and in accordance with all conditions of said accepted bid. A formal Contract containing all provisions of the Contract signed by both parties shall be used when required by the Public Works Project Engineer.

B. **Local Restrictions and Permits.** All work shall be done according to applicable laws, ordinances and codes. The Contractor shall procure and pay for all required permits for permanent or temporary work.

C. **Payment of Invoices.** Payment may be made only after inspection and acceptance by the using agency and approval by the Dane County Public Works Project Engineer, and, where required by ordinances, approval by the Dane County Board of Supervisors. If materials or equipment were delivered, constructed, erected, installed or tested on site, payment shall be made based on ninety-five percent (95%) of the value of all Work performed up to fifty percent (50%) of scheduled values less the total of previous payments. Authorized extra work will be included in progress payments. Payment of balances will be made only after approval and final acceptance by the County in consideration and elimination of the possibilities of imperfect work, faulty materials or equipment, liens that have been filed, or if evidence indicates the possible filing of claims.

D. **Contract Alterations.** No alterations or variables in the terms of a contract shall be valid or binding upon the County unless made in writing and signed by the Purchasing Agent or authorized agent.

E. **Assignments.** No contract may be assigned, sublet or transferred without written consent of the Public Works Project Engineer.

F. **Cancellations.** A contract may be canceled or voided by the Public Works Project Engineer upon non-performance or violation of contract provisions, and an award made to the next low bidder or articles specified may be purchased on the open market. In either event, the defaulting contractor (or their surety) shall be liable to Dane County for costs to the County in excess of the defaulting contractor's contract prices.

G. **Right of the Department to Terminate Contract.**

1. In the event that the Contractor or any subcontractors violate any of the provisions of this Contract, the County may serve written notice upon the Contractor and the Surety of its intention to terminate the Contract. Such notice to contain the reasons for such intention to terminate the Contract, and unless within ten (10) days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement or correction be made, the Contract shall, upon the expiration of said ten (10) days, cease and terminate.

2. In the event of any such termination, the County shall immediately serve notice thereof upon the Surety and the Contractor, and the Surety shall have the right to take over and perform the Contract subject to County's approval. However, if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the County may take over the Work and prosecute the same to completion by Contract or by force account for the account and at the expense of the Contractor. The Contractor and Surety shall be liable to the County for any excess cost occasioned the County thereby, and in such event the County may take possession of and utilize in completing the Work, such equipment, materials and / or supplies as may be on the site of the Work and therefore necessary.

H. **Non-Liability.** The Contractor shall not be liable in damages for delay in shipment or failure to deliver when such delay or failure is the result of fire, flood, strike, the transporting carrier, act of God, act of government, act of an alien enemy or by any other circumstances which, in the Public Works Project Engineer's opinion, is beyond the control of the Contractor. Under such circumstances, however, the Public Works Project Engineer may in the discretion, cancel the Contract.

I. **Quality Assurance.** Inspection of equipment, materials and / or supplies shall be made by or at the direction of the County or the Agency to which the goods are delivered, and any articles supplied that are defective, or fails in any way to meet Specifications or other requirements of the Contract, will be rejected. The Public Works Project Engineer shall direct all required laboratory tests. The decision of the Public Works Project Engineer on acceptance shall be final.

J. **Time for Completion.** The Contractor agrees that the Work shall be prosecuted regularly and diligently and complete the entire project as stated in the Construction Documents.

K. **Changes in the Work.**
1. Except in cases of emergency, no changes in the Work covered by the approved Construction Documents shall be made without having prior written approval of the Department. Charges or credits for the work covered by the approved change shall be determined by one of the following methods:
   a) Unit bid prices previously approved.
   b) An agreed lump sum based on actual cost of:
      1) Labor, including foremen, and all fringe benefits that are associated with their wages;
      2) Materials entering permanently into the Work;
      3) The ownership or rental cost of construction plant and equipment during the time of use on the extra work;
      4) Power and consumable supplies for the operation of construction or power equipment;
      5) Workmen's Compensation Insurance, Contractor's Public Liability and Property Damage Insurance, and Comprehensive Automobile Liability Insurance;
      6) Social Security, pension and unemployment contributions;
      7) To the cost under K.1.b) 2), there shall be added a fixed fee to be agreed upon, but not to exceed fifteen percent (15%) of the actual cost of the Work performed with their own labor force; the fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expense;
      8) On that portion of the work under K.1.b) 2) done under subcontract, the Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit and any other general expense; and

9) The Contractor shall keep and present in such form as directed, a correct amount of the cost together with such supporting vouchers as may be required by the Department.

c) Cost-Plus Work, with a not-to-exceed dollar limit, based on actual cost of:
   1) Labor, including foremen, and all fringe benefits that are associated with their wages;
   2) Materials entering permanently into the Work;
   3) The ownership or rental cost of construction plant and equipment during the time of use on the extra work. (Rental cost cannot exceed fifty percent (50%) replacement value of rented equipment);
   4) Power and consumable supplies for the operation of construction or power equipment;
   5) Workmen's Compensation, Contractor's Public Liability and Property Damage Insurance, and Comprehensive Automobile Liability Insurance;
   6) Social Security, pension and unemployment contributions;
   7) To the cost under K.1.c) 3) there shall be added a fixed fee to be agreed upon, but not to exceed fifteen percent (15%) of the actual cost of the Work performed with their own labor force; the fee shall be compensation to cover the cost of supervision, overhead, bond, profit, and any other general expense;
   8) On that portion of the work under K.1.c) 3) done under subcontract, the Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit, and any other general expense; and
   9) The Contractor shall keep and present in such form as directed, a correct amount of the cost together with such supporting vouchers as may be required by the Department.

2. If the Contractor claims that by any instructions given by the Architect / Engineer, the Department, by drawings or otherwise, regarding the performance of the Work or the furnishing of material under the Contract, involves extra cost, the Contractor shall give the Department written notice thereof within two weeks after the receipt of such instructions and in any event before proceeding to execute the work, unless delay in executing the work would endanger life or property.

3. No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect / Engineer and approved by the Department, as previously mentioned, and the claim presented with the payment request submitted after the changed or extra work is completed.

4. Negotiation of cost for a change in the Work shall not be cause for the Contractor to delay prosecution of the Work if the Contractor has been authorized in writing by the Public Works Project Engineer to proceed.

L. **Payments to Contractor.**

1. The County will make partial payments to the Contractor for the value, proportionate to the amount of the Contract, of all labor and material incorporated in the work during the preceding calendar month upon receipt of approved Application and Certificate of Payment from the Architect / Engineer and approval of the Department.

2. The Contractor shall submit to the Architect / Engineer an Application and Certificate of Payment. The Architect / Engineer will review and approve this before sending it to the Public Works Project Engineer. Evidence may be required, and supplied on demand, that supports the request and the Contractor's right to the payment claimed.

3. Request for payment for preparatory work and materials delivered and suitably stored at the site to be incorporated into the Work at some future period, will be given due consideration. Requests involving materials stored off the site, may be rejected; however, if deemed essential for reasons of job progress, protection, or other sufficient cause, requests will be considered conditional upon the submission by the Contractor of bills of sale and such other procedures as will adequately protect the County's interest such as storage in a bonded warehouse with adequate coverage. If there is any error in a payment, the Contractor is obligated to notify the Department immediately, but no longer than ten (10) days from receipt of payment.

4. Payments by the County will be due within forty-five (45) days after receipt by the Department of a certified request.

5. Five percent (5%) of each request for certification will be retained until final completion and acceptance of all the Work covered by the Contract. However, anytime after fifty percent (50%) of the Work has been furnished and installed at the site, the remaining payments will be made in full if the Architect / Engineer and Public Works Project Engineer find that the progress of the Work corresponds with the construction progress schedule. If the Architect / Engineer and Public Works Project Engineer find that the progress of the Work does not correspond with the construction progress schedule, up to ten percent (10%) of each request for payment may be retained for the Work completed.

6. All material and work covered by partial payments made shall become the sole property of the County. This provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the County to require the fulfillment of all of the terms of the Contract.

7. Final payment will be made within sixty (60) days after final completion of the Work, and will constitute acceptance thereof.

8. On completion and acceptance of each separate division of the Contract, on which the stated price is separated in the Contract, payment may be made in full, including retained percentages thereon, less authorized deductions.

9. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit to this Department, as requested and with final application for payment for work under said contract, affidavit(s) as required to prove that all debts and claims against this Work are paid in full or otherwise satisfied, and give final evidence of release of all liens against the Work and County. If Wisconsin Prevailing Wage Rate Determination is required for this Work, use "Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination" and "Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination" (if applicable). If Wisconsin Prevailing Wage Rate Determination is not required for this Work, use "Dane County, Wisconsin Contractor Wage Affidavit". Forms of such affidavits are included in Supplementary Conditions.

M. **Withholding of Payments.**

1. The County, after having served written notice on the said Contractor, may either pay directly any unpaid bills of which the Department has written notice, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged. Then payment to the Contractor shall be resumed

in accordance with the terms of this Contract, but in no event shall these provisions be construed to impose any obligations upon the County to either the Contractor or the Contractor's Surety.

2. In paying any unpaid bills of the Contractor, the County shall be deemed the Agent of the Contractor, and any payment so made by the County, shall be considered as a payment made under the Contract by the County to the Contractor and the County shall not be liable to the Contractor for any such payment made in good faith.

3. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the performance of this Contract.

4. At the Department's request, the Contractor shall furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged or waived.

N. **Acceptance of Final Payment as Release.**
   1. The making of final payment shall constitute a waiver of all claims by the County except those arising from:
      a) Unsettled lien;
      b) Faulty or defective work appearing after substantial completion;
      c) Failure of the work to comply with the requirements of the Construction Documents; or
      d) Terms of any special guarantees required by the Construction Documents.

   2. The acceptance of final payment shall constitute a waiver of all claims by the Contractor.

O. **Lien Waivers.** The Contractor warrants that title to all work covered by an application for Payment will pass to the County no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all work for which Certificates for Payment have been previously issued and payments received from the County shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, subcontractor, material suppliers, or other persons or entities making a claim by reason of having provide labor, materials and equipment related to the Work.

P. **Use and Occupancy Prior to Acceptance.** The Contractor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the Department, provided the Department:
   1. Secures written consent of the Contractor; except when in the opinion of the Department's Public Works Project Engineer, the Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other Contract requirements;
   2. Secures endorsement from the insurance carrier and consent of the Surety permitting occupancy of the building or use of the project during the remaining period of construction, or, secures consent of the Surety;
   3. Assumes all costs and maintenance of heat, electricity and water; and
   4. Accepts all work completed within that portion or unit of the project to be occupied, at time of occupancy.

Q. **Correction of Work.**

1. All work, all materials whether incorporated in the Work or not, and all processes of manufacture shall at all times and places be subject to the inspection of the Architect / Engineer and the Public Works Project Engineer who shall be the judge of the quality and suitability of the work, materials, and processes of manufacture for the purposes for which they are used. Should they fail to meet the Architect / Engineer's and the Public Works Project Engineer's approval they shall be reconstructed, made good, replaced or corrected, as the case may be, by the Contractor at the Contractor's expense. Rejected material shall immediately be removed from the site.

2. If the Contractor defaults or neglects to carry out the Work in accordance with the Construction Documents or fails to perform any provision of the Contract, the Department may, after ten (10) days written notice to the Contractor and without prejudice to any other remedy the County may have, make good such deficiencies. In such case, an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including the cost of the Architect / Engineer's additional services made necessary by such default, neglect or failure.

6. GENERAL GUARANTEE

A. Neither the final certificate of payment nor any provision in the Construction Documents nor partial or entire occupancy of the premises by the County shall constitute an acceptance of work not done in accordance with the Construction Documents or relieve the Contractor of liability in respect to any expressed warranties or responsibility for faulty materials or workmanship.

1. In no event shall the making of any payment required by the Contract constitute or be construed as a waiver by County of any breach of the covenants of the Contract or a waiver of any default of Contractor and the making of any such payment by County while any such default or breach shall exist shall in no way impair or prejudice the right of County with respect to recovery of damages or other remedy as a result of such breach or default.

B. The Contractor shall remedy and make good all defective workmanship and materials and pay for any damage to other work resulting therefrom, which appear within a period of one year from the date of substantial completion, providing such defects are not clearly due to abuse or misuse by the County. The Department will give notice of observed defects with reasonable promptness.

C. Guarantee on work executed after certified date of substantial completion will begin on the date when such work is inspected and approved by the Architect / Engineer and the Public Works Project Engineer.

D. Where guarantees or warrantees are required in sections of Construction Documents for periods in excess of one year, such longer terms shall apply; however, the Contractor's Performance / Payment Bond shall not apply to any guarantee or warranty period in excess of one year.

7. IDENTICAL BIDDING

A. **Antitrust Laws.** All identical bids submitted to the County because of advertised procurement for materials, supplies, equipment or services exceeding $1,000,000.00 in total

amount shall be reported to the Attorney Generals of the United States and the State of Wisconsin for possible violation and enforcement of antitrust laws.

8. BINDING CONTRACTS

A. **Contract Commitment.** Any contracts resulting from this bid shall be binding on a successful bidder(s) to its conclusion and on its assigns, heirs, executors, administrators or successors.

9. AFFIRMATIVE ACTION PROVISION AND MINORITY / WOMEN / DISADVANTAGED BUSINESS ENTERPRISES

A. **Affirmative Action Provisions.** During the term of its Contract, Contractor agrees not to discriminate on the basis of race, religion, color, sex, handicap, age, sexual preference, marital status, physical appearance, or national origin against any person, whether a recipient of services (actual or potential), an employee, or an applicant for employment. Such equal opportunity shall include but not be limited to the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation or level of service(s). Contractor agrees to post in conspicuous places, available to all employees, service recipients and applicants for this paragraph. The listing of prohibited bases for discrimination shall no be construed to amend in any fashion state or federal law setting forth additional bases and exceptions shall be permitted only to the extent allowable in state or federal law.

B. Contractor is subject to this paragraph only if Contractor has ten (10) or more employees and receives $10,000.00 or more in annual aggregate contracts with County. Contractor shall file an Affirmative Action Plan with the Dane County Contract Compliance Officer in accord with Chapter 19 of the Dane County Code of Ordinances. Contractor must file such plan within fifteen (15) days of the effective date of this Contract and failure to do so by that date shall constitute grounds for immediate termination of the Contract. During the term of this Contract, Contractor shall also provide copies of all announcements of employment opportunities to the County's Contract Compliance Office, and shall report annually the number of persons, by race, sex and handicap status, which apply for employment and, similarly classified, the number hired and the number rejected.

C. Contact the Dane County Contract Compliance Officer at Dane County Contract Compliance Office, 210 Martin Luther King, Jr. Blvd., Room 421, Madison, WI 53703, 608/266-4114.

D. In all solicitations for employment placed on Contractor's behalf during the term of this Contract, Contractor shall include a statement to the effect the Contractor is an "Equal Opportunity Employer."

E. Contractor agrees to furnish all information and reports required by County's Contract Compliance Officer as the same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance whit Chapter 19, Dane County Code of Ordinances, and the provision of this Contract.

F. **Minority / Women / Disadvantaged / Emerging Small Business Enterprises.** Chapter 19.508 of the Dane County Code of Ordinances is the official policy of Dane County to utilize Minority Business Enterprises (MBEs), Women Business Enterprises (WBEs), Disadvantage Business Enterprises (DBEs) and Emerging Small Business Enterprises (ESBEs) fully.

G. The Contractor may utilize MBEs / WBEs / DBEs / ESBEs as subcontractors or suppliers. A list of subcontractors will be required of the low bidder as stated in this Contract. The list shall indicate which subcontractors or suppliers are MBEs / WBEs / DBEs / ESBEs and what percentage of subcontract is awarded, shown as a percentage of the total dollar amount of the bid.

10. COMPLIANCE WITH FAIR LABOR STANDARDS

A. During term of this Contract, Contractor shall report to County Contract Compliance Officer, within ten (10) days, any allegations to, or findings by National Labor Relations Board (NLRB) or Wisconsin Employment Relations Commission (WERC) that Contractor has violated statute or regulation regarding labor standards or relations. If investigation by Contract Compliance Officer results in final determination that matter adversely affects Contractor's responsibilities under this Contract, and which recommends termination, suspension or cancellation of this Contract, County may take such action.

B. Contractor may appeal any adverse finding by Contract Compliance Officer as set forth in Dane County Ordinance 25.015(11)(c) through (e).

C. Contractor shall post this statement in prominent place visible to employees: "As condition of receiving and maintaining contract with Dane County, this employer shall comply with federal, state and all other applicable laws prohibiting retaliation or union organizing."

11. DOMESTIC PARTNERSHIP BENEFITS

A. Contractor agrees to provide same economic benefits to all of its employees with domestic partners as it does to employees with spouses, or cash equivalent if such benefit cannot reasonably be provided. Contractor agrees to make available for County inspection Contractor's payroll records relating to employees providing services on or under this Contract or subcontract. If any payroll records of Contractor contain any false, misleading or fraudulent information, or if Contractor fails to comply with provisions of Chapter 25.016, Dane County Ordinances, contract compliance officer may withhold payments on Contract; terminate, cancel or suspend Contract in whole or in part; or, after due process hearing, deny Contractor right to participate in bidding on future County contracts for period of one year after first violation is found and for period of three years after second or subsequent violation is found. For questions regarding this requirement, please contact John Welch, Project Manager, at 608/267-8815.

12. INSURANCE REQUIREMENTS

A. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from and against all claims, damages, losses and expenses including attorneys' fees arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting there from, and is caused in whole or in part by any act or omission of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a part indemnified hereunder.

B. In any and all claims against Dane County, its boards, commissions, agencies, officers, employees and representatives or by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Contract 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 worker's compensation acts, disability benefits or other employee benefit acts.

C. The obligations of the Contractor under this Contract shall not extend to the liability of the Architect / Engineer, its agents or employees arising out of (1) the preparation or approval of maps, drawings, opinion, reports, surveys, change orders, designs or specifications; or (2) the giving of or the failure to give directions or instruction by the Architect / Engineer, its agents or employees provided such giving or failure to give is the primary cause of the injury or damage.

D. The County shall not be liable to the Contractor for damages or delays resulting from work by third parties or by injunctions or other restraining orders obtained by third parties.

E. **Contractor Carried Insurance.** In order to protect itself and the County, the Contractor shall not commence work under this Contract until obtaining all the required insurance and the County has approved such insurance. The Contractor shall not allow any subcontractor to commence work on the subcontract until the insurance required of the subcontractor has been so obtained and approved.

1. Worker's Compensation Insurance
   The Contractor shall procure and shall maintain during the life of this Contract, Worker's Compensation Insurance as required by statute for all of its employees engaged in work at the site of the project under this Contract and, in case of such work sublet, the Contractor shall require the subcontractor similarly to provide Worker's Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Worker's Compensation Insurance.

2. Contractor's Public Liability and Property Damage Insurance
   The Contractor shall procure and maintain during the life of this Contract, Contractor's Public Liability Insurance and Contractor's Property Damage Insurance in an amount not less then $1,000,000.00 per occurrence for bodily injury and death, and Contractor's Property Damage Insurance in an amount not less than $1,000,000.00 and shall be primary with Dane County as an "Additional Insured".

3. Auto Liability Insurance
   The Contractor shall procure and maintain during the life of this Contract, Comprehensive Automobile Liability Insurance covering owned, non-owned and hired automobiles for limits of not less than $1,000,000.00 and shall be primary with Dane County as an "Additional Insured".

F. Contractor either (1) shall require each subcontractors to procure and to maintain during life of subcontract, subcontractor's Public Liability Property Damage Insurance, and Comprehensive Automobile Liability Insurance of type and in same amount specified in preceding paragraphs; or (2) insure that activities of subcontractors in their own policy.

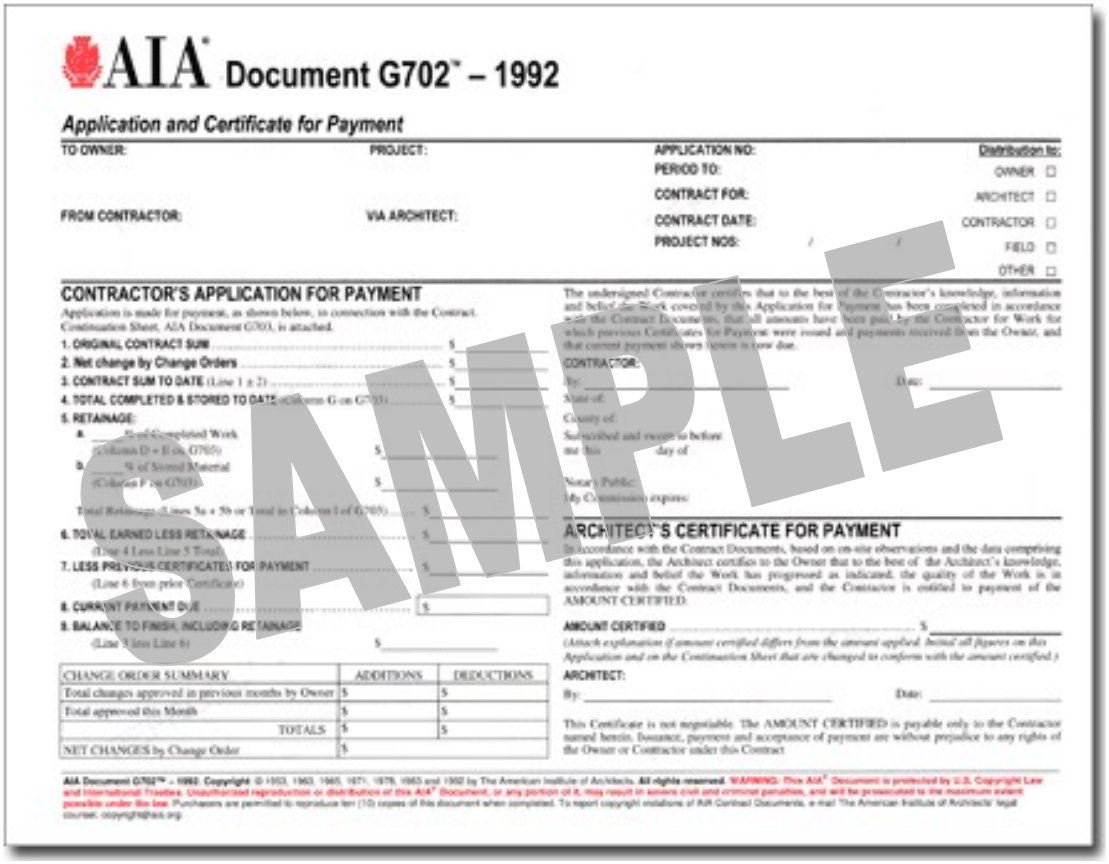
G. Contractor shall furnish the County with certificates showing type, amount, class of operations covered, effective dates and dates of expiration of policies. Such certificates shall

also contain substantially this statement: “Insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by the County.”

SUPPLEMENTARY CONDITIONS

1. APPLICATION & CERTIFICATE FOR PAYMENT

A. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit partial and final Application & Certificate for Payment for work under said contract. Form shall provide similar information as shown on AIA G702™ and G703™ forms (samples shown below). Forms shall be submitted to Public Works Project Manager for approval.



AIA Document G702™ – 1992

Application and Certificate for Payment

TO OWNER: PROJECT: APPLICATION NO: Distribution to:
PERIOD TO: OWNER ☐
CONTRACT FOR: ARCHITECT ☐
FROM CONTRACTOR: VIA ARCHITECT: CONTRACT DATE: CONTRACTOR ☐
PROJECT NOS: / / FIELD ☐
OTHER ☐

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM ..... $
2. Net change by Change Orders ..... $
3. CONTRACT SUM TO DATE (Line 1 ± 2) ..... $
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) ..... $
5. RETAINAGE:
   a. ____ % of Completed Work (Column D + E on G703) $
   b. ____ % of Stored Material (Column F on G703) $
   Total Retainage (Lines 5a + 5b or Total in Column I of G703) ..... $
6. TOTAL EARNED LESS RETAINAGE ..... $
   (Line 4 Less Line 5 Total)
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT ..... $
   (Line 6 from prior Certificate)
8. CURRENT PAYMENT DUE ..... $
9. BALANCE TO FINISH, INCLUDING RETAINAGE $
   (Line 3 less Line 6)

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this Month	$	$
TOTALS	$	$
NET CHANGES by Change Order	$	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:
By: Date:
State of:
County of:
Subscribed and sworn to before me this day of
Notary Public:
My Commission expires:

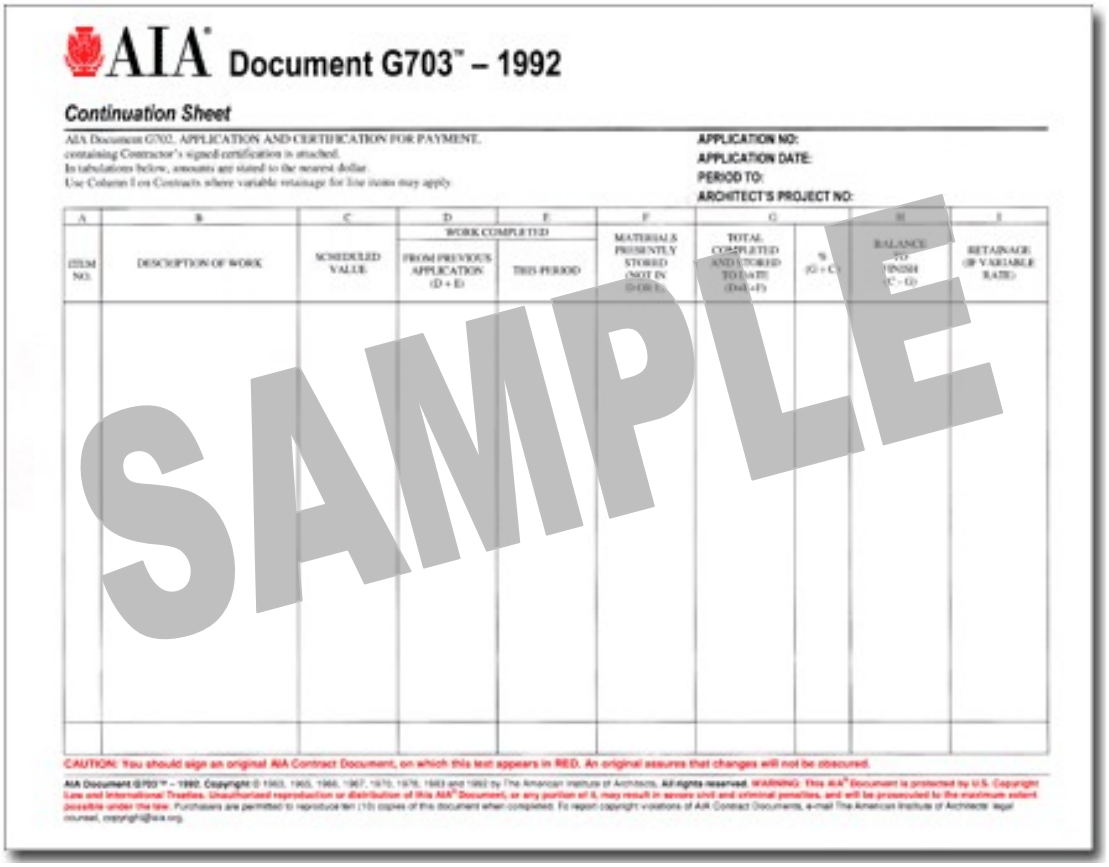
ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $
(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:
By: Date:

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.



AIA Document G703™ – 1992

Continuation Sheet

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G	H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED: FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED: THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)

SAMPLE

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

AIA Document G703™ – 1992. Copyright © 1963, 1965, 1966, 1967, 1970, 1978, 1983 and 1992 by The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. Purchasers are permitted to reproduce ten (10) copies of this document when completed. To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

2. CONTRACTOR WAGE AFFIDAVIT

A. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit to this Department, as requested and with final application for payment for work under said contract, affidavit in form as hereinafter set forth in this section. Affidavit affirms that all persons employed by contractor or by any of contractor's subcontractors on such contract have been paid no less than minimum wages established under Dane County Ordinances, Chapter 40, Subchapter II (Minimum Wage Ordinance) and in effect at date of execution of contract, that full payment of wages earned has been made, and that no rebates either directly or indirectly have been made. Form of such affidavit is included in this section.

DANE COUNTY, WISCONSIN

CONTRACTOR WAGE AFFIDAVIT

COMPANY NAME: _____

ADDRESS: _____

_____

CONTRACT NO.: _____ DIVISION(S) OF WORK: _____

AFFIDAVIT

STATE OF WISCONSIN)
) ss.
DANE COUNTY)

I, _____, being
name and title of person signing affidavit
first duly sworn at _____,
city & state of company incorporation
on oath, depose and say that with respect to the payment of the persons employed by the

_____, subcontractors on the _____
contractor company name division(s) of work
_____, at the _____
building or site of project
that during the period commencing _____, and ending _____
date date
all persons employed on said project have been paid the full wages earned, that no rebates have been or will be made either directly or indirectly by said contractor or subcontractor from the full weekly wages earned by any person, and that no deductions have been made either directly or indirectly from the full weekly wages earned by any person, other than authorized legal deductions (including taxes such as Federal Income Withholding and Social Security, State and

_____,
state any other legal deductions such as union dues, unemployment insurance, 401k contributions, etc., or fill in "N/A"
and that there is full compliance with the provisions and intent of the requirements of Dane County Ordinances, Chapter 40, Subchapter II (Minimum Wage Ordinance). This affidavit is made to induce Dane County to approve the application for payment to which this affidavit is attached.

_____
Contractor Company Name

_____ _____
Signature Title

Sworn to before me this _____ day of _____, 20___.

_____ My Commission expires _____
Notary Public Date

3. EQUAL PARTNER BENEFITS COMPLIANCE

A. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit to this Department, as requested and with final application for payment for work under said contract, equal benefits compliance payment certification in form as hereinafter set forth in this section. Certification affirms that all persons employed by contractor or by any of contractor's subcontractors on such contract have has complied fully with the requirements of Chapter 25.016 "Equal Benefits Requirement" of the Dane County Ordinances. A copy of the certification form is included in this section.

DANE COUNTY EQUAL BENEFITS COMPLIANCE

Payment Certification Form

PURPOSE

25.016(8) of the Dane County Ordinance requires that each contractor receiving payment for contracted services must certify that he or she has complied fully with the requirements of Chapter 25.016 "Equal Benefits Requirement" of the Dane County Ordinances. Such certification must be submitted prior to the final payment on the contract.

This form should be included with a copy of the final contract invoice forwarded to your contract representative at Dane County.

CERTIFICATION

I _____ certify that

_____ (include contractor's name) has complied fully with the requirements of Chapter 25.016 of the Dane County Ordinances "Equal Benefits Requirements".

Signed _____

Date _____

For questions on this for, please contact Chuck Hicklin at 608-266-4109 or your contract representative at Dane County.

SECTION 01 00 00

BASIC REQUIREMENTS

PART 1 GENERAL

1.1 SECTION SUMMARY

A. Section Includes:
1. Section Summary
2. Summary of the Work
3. Contractor Use of Premises
4. Applications for Payment
5. Coordination
6. Cutting and Patching
7. Conferences
8. Progress Meetings
9. Submittal Procedures
10. Proposed Products List
11. Shop Drawings
12. Product Data
13. Samples
14. Manufacturers' Instructions
15. Manufacturers' Certificates
16. Quality Assurance / Quality Control of Installation
17. References
18. Interior Enclosures
19. Protection of Installed Work
20. Parking
21. Staging Areas
22. Occupancy During Construction and Conduct of Work
23. Protection
24. Progress Cleaning
25. Products
26. Transportation, Handling, Storage and Protection
27. Product Options
28. Substitutions
29. Starting Systems
30. Demonstration and Instructions
31. Contract Closeout Procedures
32. Final Cleaning
33. Adjusting
34. Operation and Maintenance Data
35. As-Built Drawings and Specifications

1.2 SUMMARY OF THE WORK

A. Project Description: Perform the Work as specified and detailed in Construction Documents package. Contractor to furnish new central air conditioning system on second floor of Juvenile Shelter. This Work includes, but is not limited to all mechanical, electrical, carpentry, system controls, and testing and balancing Work detailed in Construction Documents package.

B. Work by Owner: Not applicable.

C. Permits: Prior to commencement of the Work, Contractor to secure any and all necessary permits for completion of the Work and facility occupancy.

1.3 CONTRACTOR USE OF PREMISES

A. Limit use of premises to allow work by Contractors or Subcontractors and access by Owner.

1.4 APPLICATIONS FOR PAYMENT

A. Submit two (2) copies of each application on AIA G702™ and G703™ forms or approved contractors invoice form.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Payment Period: Monthly or bi-weekly.

D. With final payment, submit Contractor Wage Affidavit Form and Equal Benefits Compliance Certification. Both of these forms are in included in the Supplemental Conditions section of this Construction Documents package.

1.5 COORDINATION

A. Coordinate scheduling, submittals, and work of various sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirement characteristics of operating equipment are compatible with building utilities.

C. Coordinate space requirements and installation of mechanical and electrical work that are indicated diagrammatically on Drawings.

1.6 CUTTING AND PATCHING

A. Employ a skilled and experienced installer to perform cutting and patching new work; restore work with new Products.

B. Submit written request in advance of cutting or altering structural or building enclosure elements.

C. Fit work tight to adjacent elements. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

D. Refinish surfaces to match adjacent finishes.

1.7 CONFERENCES

A. Dane County Department Public Works, Highway & Transportation will schedule a preconstruction conference after Award of Contract for all affected parties.

B. When required in individual Specification section, convene a pre-installation conference at project site prior to commencing work of the section.

1.8 PROGRESS MEETINGS

A. Owner shall schedule and administer meetings throughout progress of the Work at minimum of one (1) per week.

B. Owner shall preside at meetings, record minutes, and distribute copies within two (2) days to those affected by decisions made.

1.9 SUBMITTAL PROCEDURES

A. Submittal form to identify Project, Contractor, Subcontractor or supplier; and pertinent Construction Documents references.

B. Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction work, and coordination of information is in accordance with requirements of the Work and Construction Documents.

C. Identify variations from Construction Documents and Product or system limitations that may be detrimental to successful performance of completing the Work.

D. Revise and resubmit submittals as required; identify all changes made since previous submittal.

1.10 PROPOSED PRODUCTS LIST

A. Within fifteen (15) days after date of Award of Contract, submit complete list of major Products proposed for use, with name of manufacturer, trade name, and model number of each Product.

1.11 SHOP DRAWINGS

A. Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Engineer.

1.12 PRODUCT DATA

A. Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Engineer.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.

1.13 SAMPLES

A. Submit samples to illustrate functional and aesthetic characteristics of the Product.

B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Public Works Project Engineer's selection.

1.14 MANUFACTURERS' INSTRUCTIONS

A. When specified in individual Specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

1.15 MANUFACTURERS' CERTIFICATES

A. When specified in individual Specification sections, submit manufacturers' certificate to Public Works Project Engineer for review, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.16 QUALITY ASSURANCE / QUALITY CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply fully with manufacturers' instructions.

C. Comply with specified standards as minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

1.17 REFERENCES

A. Conform to reference standard by date of issue current as of date for receiving bids.

B. Should specified reference standard conflict with Construction Documents, request clarification from Public Works Project Engineer before proceeding.

1.18 INTERIOR ENCLOSURES

A. Provide temporary partitions as required to separate work areas from Owner occupied areas, to prevent distribution of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.

1.19 PROTECTION OF INSTALLED WORK

A. Protect installed work and provide special protection where specified in individual Specification sections.

1.20 PARKING

A. Arrange for temporary parking areas to accommodate construction personnel. One parking stall shall be available at the Work site. Additionally, a job trailer may be parked on the lawn. Contractor is responsible for repairing any damage to the lawn.

1.21 STAGING AREAS

A. Coordinate staging areas with Public Works Project Engineer prior to starting the Work.

B. On-site space for use as staging areas and storage of materials is limited and will be apportioned among the various Contractors as their needs dictate with due regard for storage requirements of each Contractor. Each Contractor shall be responsible for safety of equipment and materials that are stored on site.

1.22 OCCUPANCY DURING CONSTRUCTION AND CONDUCT OF WORK

A. Areas of existing facility will be occupied during period when the Work is in progress. Typically, Work may be done between 8:00 AM and 7:00 PM, but Contractor must set a schedule with Owner in advance. Schedule work and store materials so as to interfere as little as possible with normal use of premises. Notify Owner when coring or similar noise making work is to be done and obtain Owner's written approval of schedule. If schedule is not convenient for Owner, reschedule and resubmit new times for Owner approval.

B. Work shall be done and temporary facilities furnished so as not to interfere with access to any occupied area and so as to cause least possible interference with normal operation of facility or any essential service thereof.

C. Contractor shall, at all times, provide approved, safe walkways and facility entrances for use by Owner, employees and public.

D. Contractor shall provide adequate protection for all parts of facility, its contents and occupants wherever the Work under this contract is to be performed.

E. Each Contractor shall arrange with Owner to make necessary alterations, do new work, make connections to all utilities, etc., at such times as will not cause interruption of utility services to facility. Contractor doing this work shall protect, cap, cut off and / or replace and relocate existing pipes, electrical work and other active utilities encountered which may interfere with new construction work.

F. New work in extension of existing work shall correspond in all respects with that to which it connects or similar existing work unless otherwise indicated or specified.
   1. Existing work shall be cut, altered, removed or replaced as necessary for performance of contract obligations.
   2. Work remaining in place, damaged or defaced by reason of work done under this contract shall be restored equal to its condition at time of Award of Contract.
   3. If removal of work exposes discolored or unfinished surfaces or work out of alignment, such surfaces shall be refinished or materials replaced as necessary to make continuous work uniform and harmonious.

1.23 PROTECTION

A. Contractor shall protect from injury all trees, shrubs, hedges, walks and driveways and pay for any damage to same resulting from insufficient or improper protection.

1.24 PROGRESS CLEANING

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

B. When working in second floor sleeping rooms, clean work area and remove all tools and equipment at the end of each work day.

1.25 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work, but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components specifically identified for reuse.

B. Do not use materials and equipment removed from existing premises, except as specifically identified or allowed by Construction Documents.

1.26 TRANSPORTATION, HANDLING, STORAGE AND PROTECTION

A. Transport, handle, store and protect Products in accordance with manufacturer's instructions.

1.27 PRODUCT OPTIONS

A. Where definite material is specified, it is not intention to discriminate against "equal" product made by another manufacturer. Intention is to set definite standard of material quality.

B. Requests for substitutions that result in minor variations in specification may be accepted if, in the opinion of Dane County, they do not adversely affect the quality, maintenance or performance of the items.

C. Should bidder choose to bid materials other than those specified, bidder shall submit said materials specifications to Project Engineer for approval at least seven (7) days prior to Bid Opening. Public Works Project Engineer shall consider requests for Substitutions up to seven (7) days prior to date of Bid Opening.

D. Products and materials that are not specified, but have been approved for use by Public Works Project Engineer shall be identified in addenda to all bidding contractors.

E. Requests for material or product substitutions submitted up to fifteen (15) days after Bid Opening may be considered, but Project Engineer is not required to consider them. Dane County reserves right to approve or reject substitutions based on Specification requirements and intended use.

1.28 SUBSTITUTIONS

A. Document each request with complete data substantiating compliance of proposed Substitution with Construction Documents.

B. Submit three (3) copies of requests for Substitution for consideration. Limit each request to one (1) proposed Substitution.

C. Substitutions shall not change contract price established at Bid Opening.

1.29 STARTING SYSTEMS

A. Provide written notification prior to start-up of each equipment item or system.

B. Ensure that each piece of equipment or system is ready for operation.

C. Execute start-up under supervision of responsible persons in accordance with manufacturers' instructions.

D. Submit written report that equipment or system has been properly installed and is functioning correctly.

1.30 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of Products to Owner's personnel prior to date of final inspection.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at designated location. This shall include at least one hour of demonstration.

C. Owner may choose to videotape demonstration session; demonstration and demonstrator shall be to level of satisfaction of Owner.

1.31 CONTRACT CLOSEOUT PROCEDURES

A. Submit written certification that Construction Documents have been reviewed, the Work has been inspected, and the Work is complete in accordance with Construction Documents and ready for Public Works Project Engineer's inspection.

B. Submit final Application for Payment identifying total adjusted Contract Sum / Price, previous payments, and amount remaining due. With final payment, submit Contractor Wage Affidavit Form and Equal Benefits Compliance Certification.

1.32 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean interior and exterior surfaces exposed to view.

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

1.33 ADJUSTING

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

B. See Section 23 05 93 for further description.

1.34 OPERATION AND MAINTENANCE DATA

A. Provide operation and maintenance manuals for all mechanical and electrical equipment supplied and installed in project.

1.35 AS-BUILT DRAWINGS AND SPECIFICATIONS

A. Contractor shall furnish Public Works Project Engineer with one set of as-built drawings in manually drafted format.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 74 19

RECYCLING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Waste Management Goals
2. Waste Management Plan
3. Reuse
4. Recycling
5. Materials Sorting and Storage On Site
6. Lists of Recycling Facilities Processors and Haulers
7. Waste Management Plan Form

1.2 WASTE MANAGEMENT GOALS

A. Dane County requires that as many waste materials as possible produced as result of this project be salvaged, reused or recycled in order to minimize impact of construction waste on landfills and to minimize expenditure of energy and cost in fabricating new materials. Additional information may be found in The Dane County Green Building Policy, Resolution 299, 1999-2000.

B. Contractor shall develop, with assistance of Public Works Project Engineer and Architect / Engineer, Waste Management Plan (WMP) for this project. Outlined in RECYCLING section of this specification are examples of materials that can be recycled or reused as well as recommendations for waste sorting methods.

1.3 WASTE MANAGEMENT PLAN

A. Contractor shall complete WMP and include cost of recycling / reuse in Bid. WMP will be submitted to Public Works Project Engineer within fifteen (15) days of Notice to Proceed date. Copy of blank WMP form is in this Section. Submittal shall include cover letter and WMP form with:
1. Information on:
a. Types of waste materials produced as result of work performed on site;
b. Estimated quantities of waste produced;
c. Identification of materials with potential to be recycled or reused;
d. How materials will be recycled or reused;
e. On-site storage and separation requirements (on site containers);
f. Transportation methods; and
g. Destinations.

1.4 REUSE

A. Contractors and subcontractors are encouraged to reuse as many waste materials as possible. Salvage should be investigated for materials not reusable on site.

1.5 RECYCLING

A. These materials can be recycled in Dane County area:
   1. Wood.
   2. Wood Pallets.
   3. Fluorescent Lamps.
   4. Foam Insulation & Packaging (extruded and expanded).
   5. PVC Plastic (pipe, siding, etc.).
   6. Asphalt & Concrete.
   7. Bricks & Masonry
   8. Corrugated Cardboard.
   9. Metal.
   10. Carpet Padding.
   11. Gypsum Drywall.
   12. Shingles.
   13. Barrels & Drums.
   14. Solvents.

1.6 MATERIALS SORTING AND STORAGE ON SITE

A. Contractor shall provide separate containers for recyclable materials. Number of containers will be dependent upon project and site conditions.

B. Contractor shall provide on-site locations for subcontractors supplied recycling containers to help facilitate recycling.

1.7 LISTS OF RECYCLING FACILITIES PROCESSORS AND HAULERS

A. Web site www.countyofdane.com has recycling symbol (link) near top of page that lists current information for Dane County Recycling Markets. Contractors can also contact Dane County's Recycling Manager at 608/267-8815, or local city, village, town recycling staff listed in above referenced web site. Statewide listings of recycling / reuse markets at available from Wisconsin Department of Natural Resources, www.dnr.state.wi.us/org/aw/wm/markets.

1.8 WASTE MANAGEMENT PLAN FORM

A. Contractor Information:
Name: _____
Address: _____
_____
Phone No.: _____ Recycling Coordinator: _____

MATERIAL	ESTIMATED QUANTITY	DISPOSAL METHOD (CHECK ONE)	RECYCLING / REUSE COMPANY OR DISPOSAL SITE
Salvaged & reused building materials	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Glass	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Wood	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Wood Pallets	_____ units	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Fluorescent Lamps	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Foam Insulation	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Asphalt & Concrete	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Bricks & Masonry	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
PVC Plastic	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Corrugated Cardboard	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Metals	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Carpet Padding	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Gypsum / Drywall	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____

Shingles	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Barrels & Drums	_____ units	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Solvents	_____ gallons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 23 05 00

COMMON WORK RESULTS FOR HVAC

PART 1 G E N E R A L

1.1 SCOPE

A. This section includes information common to two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections.

B. The Mechanical Work shall include:
1. All HVAC work for the installation of the air conditioning system.
2. All required General Construction work shall be included as part of the Mechanical work.
3. All required Electrical work shall be included as part of the Mechanical work.
4. All Fire Alarm work shall be included as part of the Mechanical work. The fire alarm work controlling the smoke dampers and interfacing with the blower coil unit shutdown shall be performed by Dane County's current fire alarm service contractor servicing this facility. The current fire alarm service contractor servicing this facility is Midwest Alarm. The contact person for Midwest Alarm is:

Brad Eno
2851 Index Rd
Madison WI 53713
608/441-5476

1.2 RELATED WORK

A. Related Work includes:
1. Section 23 07 00 - HVAC Insulation
2. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC
3. Section 23 09 14 - Controls
4. Section 23 31 00 – Air Ducts
5. Section 23 33 00 - Air Duct Accessories.
6. Section 23 37 13 – Diffusers, Registers and Grilles
7. Section 23 62 13 - Air Cooled Compressor and Condensing Units
8. Section 23 82 00 – Heating and Cooling Units

1.3 REFERENCE STANDARDS

A. Abbreviations of standards organizations referenced in other sections are as follows:

1.	AABC	Associated Air Balance Council
2.	ABMA	American Boiler Manufacturers Association
3.	ADC	Air Diffusion Council
4.	AMCA	Air Movement and Control Association
5.	ANSI	American National Standards Institute
6.	ARI	Air-Conditioning and Refrigeration Institute

7. ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers
8. ASME American Society of Mechanical Engineers
9. ASTM American Society for Testing and Materials
10. EPA Environmental Protection Agency
11. IEEE Institute of Electrical and Electronics Engineers
12. ISA Instrument Society of America
13. MCA Mechanical Contractors Association
14. MICA Midwest Insulation Contractors Association
15. NBS National Bureau of Standards
16. NEBB National Environmental Balancing Bureau
17. NEC National Electric Code
18. NEMA National Electrical Manufacturers Association
19. NFPA National Fire Protection Association
20. SMACNA Sheet Metal and Air Conditioning Contractors' National Association. Inc.
21. UL Underwriters Laboratories Inc.
22. ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops
23. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
24. UL1479 Fire Tests of Through-Penetration Firestops
25. UL723 Surface Burning Characteristics of Building Materials

1.4 QUALITY ASSURANCE

A. Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs involved in integrating the equipment or accessories into the system and for obtaining the performance from the system into which these items are placed. This may include changes found necessary during the testing, adjusting, and balancing phase of the project.

1.5 CONTINUITY OF EXISTING SERVICES

A. Do not interrupt or change existing services without prior written approval from the Dane County Project Manager and the building user. When interruption is required, coordinate the down-time with the user to minimize disruption to their activities. Unless specifically stated, all work involved in interrupting or changing existing services is to be done during normal working hours.

1.6 PROTECTION OF FINISHED SURFACES

A. Protect the existing building surfaces. Repair and damaged surfaces to condition before the start of this project.

1.7 SEALING AND FIRE STOPPING

A. Sealing and firestopping of sleeves/openings between ductwork, etc. and the sleeve, structural or partition opening shall be the responsibility of the contractor whose work penetrates the opening. The contractor responsible shall hire individuals skilled in such

work to do the sealing and fireproofing. These individuals hired shall normally and routinely be employed in the sealing and fireproofing occupation.

1.8 SUBMITTALS

A. Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name and/or number, as indicated in the contract documents.

B. Before submitting electrically powered equipment, verify that the electrical power and control requirements for the equipment are in agreement with the electrical requirements indicated on the drawings.

C. Include wiring diagrams of electrically powered equipment.

D. Submit sufficient quantities of shop drawings to allow the following distribution:
1. Operating and Maintenance Manuals - 2 copies
2. Testing, Adjusting and Balancing Contractor - 1 copy
3. Dane County Project Manager - 1 copy
4. Engineer - 1 copy

1.9 CERTIFICATES AND INSPECTIONS

A. Obtain and pay for all required State installation inspections except those provided by the Architect/Engineer in accordance with Wis Adm Code Section ILHR 50.12. Deliver originals of these certificates to the Dane County Project Manager. Include copies of the certificates in the Operating and Maintenance Instructions.

1.10 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Assemble material in three-ring or post binders, using an index at the front of each volume and tabs for each system or type of equipment. Include the following information:
1. Copies of all approved shop drawings.
2. Manufacturer's wiring diagrams for electrically powered equipment
3. Records of tests performed to certify compliance with system requirements
4. Certificates of inspection by regulatory agencies
5. Temperature control wiring diagrams and control sequences
6. Parts lists for manufactured equipment
7. Lubrication instructions, including list/frequency of lubrication done during construction
8. Warranties
9. Additional information as indicated in the technical specification sections

1.11 TRAINING OF OWNER PERSONNEL

A. Instruct owner personnel in the proper operation and maintenance of systems and equipment provided as part of this project. All training to be during normal working hours. This training may take up to 1 hour.

1.12 RECORD DRAWINGS

A. Maintain temperature record drawings on originals prepared by the installing contractor/subcontractor. Include copies of these record drawings with the Operating and Maintenance manuals.

PART 2 P R O D U C T S

2.1 ACCESS PANELS AND DOORS

A. Plaster or drywall Walls and Ceilings:
1. 16 gauge frame with not less than a 20 gauge hinged door panel, prime coated steel for general applications, stainless steel for use in toilets, showers, and similar wet areas, concealed hinges, screwdriver operated cam latch for general applications, key lock for use in public areas, UL listed for use in fire rated partitions if required by the application. Use the largest size access opening possible, consistent with the space and the equipment needing service; minimum size is 12" by 12".

2.2 IDENTIFICATION

A. Stencils:
1. Not less than 1 inch high letters/numbers for marking duct and equipment.

2.3 SEALING AND FIRESTOPPING

A. FIRE AND/OR SMOKE RATED PENETRATIONS:

1. Manufacturers:
a. 3M, Hilti, Rectorseal, STI/SpecSeal, Tremco, or equal, as approved by Project Manager.

b. All firestopping systems shall be provided by the same manufacturer.

2. Submittals:
a. Contractor shall submit product data for each firestop system. Submittals shall include product characteristics, performance and limitation criteria, test data, MSDS sheets, installation details and procedures for each method of installation applicable to this project. For non-standard conditions where no UL tested system exists, submit manufacturer's drawings for UL system with known performance for which an engineering judgement can be based upon.

3. Product:
a. Fire stop systems shall be UL listed or tested by an independent testing laboratory approved by the Department of Commerce.

b. Use a product that has a rating not less than the rating of the wall or floor being penetrated. Reference architectural drawings for identification of fire and/or smoke rated walls and floors.

c. Contractor shall use firestop putty, caulk sealant, intumescent wrapstrips, intumescent firestop collars, firestop blocks, firestop mortar or a combination of these products to provide a UL listed system for each application required for this project. Provide mineral wool backing where specified in manufacturer's application detail.

B. NON-RATED PENETRATIONS:

1. Pipe Penetrations:

a. At pipe penetrations of non-rated interior partitions, floors and exterior walls above grade, use urethane caulk in annular space between pipe insulation and sleeve. For non-rated drywall, plaster or wood partitions where sleeve is not required use urethane caulk in annular space between pipe insulation and wall material.

2. Duct Penetrations:

a. Annular space between duct (with or without insulation) and the non-rated partition, ceiling or floor opening shall not be larger than 2". Where existing openings have an annular space larger than 2", the space shall be patched to match existing construction to within 2" around the duct.

b. Where shown or specified, pack annular space with fiberglass batt insulation or mineral wool insulation. Provide 4" sheet metal escutcheon around duct on both sides of partition or floor to cover annular space.

PART 3 E X E C U T I O N

3.1 DEMOLITION

A. Perform all demolition as indicated on the drawings to accomplish new work. Where demolition work is to be performed adjacent to existing work that remains in an occupied area, construct temporary dust partition to minimize the amount of contamination of the occupied space. Clean all occupied spaces at the end of Work each day. Where pipe or duct is removed and not reconnected with new work, cap ends of existing services as if they were new work. Coordinate work with the user agency to minimize disruption to the existing building occupants.

B. All items demolished, abandoned, or deactivated are to be removed from the site by the Contractor.

3.2 CUTTING AND PATCHING

A. Provide all cutting and patching for the installation of material and equipment provided by this Division of the work and the associated electrical and fire alarm work preformed as a subcontract to this Division.

3.3 BUILDING ACCESS

A. Arrange for the necessary openings in the building to allow for admittance of all apparatus. Building access must be provided by this contractor, restore any opening to its original condition after the apparatus has been brought into the building.

3.4 EQUIPMENT ACCESS

A. Install all piping, conduit, ductwork, and accessories to permit access to equipment for maintenance and service. Coordinate the exact location of wall and ceiling access panels and doors with the General Contractor, making sure that access is available for all equipment and specialties. Access doors in general construction are to be furnished by the Mechanical Contractor and installed by the Mechanical Contractor.

3.5 COORDINATION

A. Verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not limited to, diffusers, register, grilles, and recessed or semi-recessed heating and/or cooling terminal units installed in/on architectural surfaces.

B. Cooperate with the test and balance agency in ensuring Section 23 05 93 specification compliance. Verify system completion to the test and balance agency (clean filters, duct systems cleaned, controls adjusted and calibrated, controls cycled through their sequences, etc.), ready for testing, adjusting and balancing work. Install dampers, etc., required for functional and balanced systems. Demonstrate the starting, interlocking and control features of each system so the test and balance agency can perform its work.

3.6 LUBRICATION

A. Lubricate all bearings with lubricant as recommended by the manufacturer before the equipment is operated for any reason. Include lubrication information in the Operating and Maintenance Manuals at the completion of the project.

3.7 SLEEVES

A. PIPE SLEEVES:

1. Provide galvanized sheet metal sleeves for pipe penetrations through interior and exterior walls to provide a backing for sealant or firestopping. Patch wall around sleeve to match adjacent wall construction and finish. In finished spaces where pipe penetration through wall is exposed to view, sheet metal sleeve shall be installed flush with face of wall.

2. Pipe sleeves are not required in interior non-rated drywall, plaster or wood partitions and sleeves are not required in existing poured concrete walls where penetrations are core drilled.

B. DUCT SLEEVES:

1. Duct sleeves are not required in non-rated partitions or floors.

2. Provide sleeve required for fire or smoke dampers in fire-rated partitions and floors.

3.8 SEALING AND FIRESTOPPING

A. FIRE AND/OR SMOKE RATED PENETRATIONS:

1. Install approved product in accordance with the manufacturer's instructions where pipes penetrate a fire/smoke rated surface. When pipe is insulated, use a product which maintains the integrity of the insulation and vapor barrier.

B. NON-RATED PARTITIONS:

1. At all interior partitions and exterior walls, pipe penetrations are required to be sealed. Apply sealant to both sides of the penetration in such a manner that the annular space between the pipe sleeve or cored opening and the pipe or insulation is completely blocked.

2. Duct penetrations through non-rated partitions shall require sheet metal escutcheons with fiberglass or mineral wool insulation fill for spaces.

END OF SECTION

SECTION 23 05 93

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 G E N E R A L

1.1 SCOPE

A. This section includes air and water testing, adjusting and balancing for the entire project.

1.2 RELATED WORK

A. Related Work includes:
1. Section 23 05 00 - Common Work Results for HVAC
2. Section 23 07 00 - HVAC Insulation
3. Section 23 09 14 - Control
4. Section 23 33 00 - Air Duct Accessories
5. Section 23 37 13 - Diffusers, Registers and Grilles
6. Section 23 62 13 - Air Cooled Compressor and Condensing Units
7. Section 23 82 00 - Heating and Cooling Units

1.3 REFERENCE STANDARDS

A. Reference Standards Include:
1. AABC National Standards for Total System Balance, Sixth Edition, 2002.
2. ASHRAE ASHRAE Handbook, 2007 HVAC Applications, Chapter 37, Testing Adjusting and Balancing.
3. NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems, Seventh Edition, 2005.

1.4 DESCRIPTION

A. The Division 23 Contractor shall contract with an independent test and balance agency to perform all testing, adjusting, and balancing of air systems required for this project. Work related to the testing, adjusting, and balancing that must be performed by the installing mechanical contractor is specified in other section of these specifications.

B. Provide total mechanical systems testing, adjusting and balancing. Requirements include the balance of air distribution, adjustment of new systems and equipment to provide design requirements indicated on the drawings, electrical measurement and verification of performance of all mechanical equipment, all in accordance with standards published by AABC or NEBB.

C. Test, adjust and balance all air systems so that each room, piece of equipment or terminal device meets the design requirements indicated on the drawings and in the specifications.

D. Accomplish testing, adjusting and balancing work in a timely manner that allows occupancy of the building.

E. Verify that provisions are being made to accomplish the specified testing, adjusting and balancing work. If problems are found, handle as specified in Part 3 under Deficiencies.

1.5 QUALITY ASSURANCE

A. Qualifications:
1. An independent Firm specializing in the Testing and Balancing of HVAC systems for a minimum of 3 years. A Firm not engaged in the commerce of furnishing or providing equipment or material generally related to HVAC work other then that specifically related to installing Testing and Balancing components necessary for work in this section such as, but not limited to sheaves, pulleys, and balancing dampers.
2. A certified member of AABC or certified by NEBB in the specific area of work performed. Maintain certification for the entire duration of the project.

1.6 SUBMITTALS

A. See also Related Work in this section.

B. Submit testing, adjusting and balancing reports bearing the seal and signature of the NEBB or AABC Certified Test and Balance Supervisor. The reports certify that the systems have been tested, adjusted and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed and are operating; and are an accurate record of all final quantities measured to establish normal operating values of the systems.

C. Submission:
1. Format: Cover page identifying project name, project number and descriptive title of contents. Divide the contents of the report into the below listed divisions:
a. General Information
b. Summary
c. Air Systems

2. Contents: Provide the following minimum information, forms and data:
a. General Information: Inside cover sheet identifying Test and Balance Agency, Contractor, Engineer, Project Name and Project Number. Include addresses, contact names and telephone numbers. Also include a certification sheet containing the seal and signature of the Test and Balance Supervisor.
b. Summary: Provide summary sheet describing mechanical system deficiencies. Describe objectionable noise or drafts found during testing, adjusting and balancing. Provide recommendations for correcting unsatisfactory performances and indicate whether modifications required are within the scope of the contract, are design related or installation related. List instrumentation used during testing, adjusting and balancing procedures.
c. The remainder of the report to contain the appropriate standard NEBB or AABC forms for each respective item and system. Fill out forms completely. Where information cannot be obtained or is not applicable indicate same.

PART 2 P R O D U C T S

2.1 INSTRUMENTATION

A. Provide all required instrumentation to obtain proper measurements. Application of instruments and accuracy of instruments and measurements to be in accordance with the requirements of NEBB or AABC Standards and instrument manufacturer's specifications.

B. All instruments used for measurements shall be accurate, and calibration histories for each instrument to be available for examination by Owners Project Manager upon request. Calibration and maintenance of all instruments to be in accordance with the requirements of NEBB or AABC Standards.

PART 3 E X E C U T I O N

3.1 PRELIMINARY PROCEDURES

A. Check filters for cleanliness, dampers for correct positioning, equipment for proper rotation and belt tension, temperature controls for completion of installation.

3.2 PERFORMING TESTING, ADJUSTING AND BALANCING

A. Perform testing, adjusting and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards except as may be modified below.

B. Unless specifically instructed in writing, all work in this specification section is to be performed during the normal workday.

C. Cut insulation, ductwork and piping for installation of test probes to the minimum extent necessary for adequate performance of procedures. Install test probes. Patch using materials identical to those removed, maintaining vapor barrier integrity and pressure rating of systems.

D. Measure and record system measurements at the fan to determine total flow. Adjust equipment as required to yield specified total flow at terminals. Proceed taking measurements in mains and branches as required for final terminal balancing.

E. Measure and record static air pressure conditions across fans, coils and filters. Indicate in report if cooling coil measurements were made on a wet or dry coil and if filter measurements were made on a clean or dirty filter.

F. Adjust outside air dampers for design conditions at both the minimum and maximum settings and record both sets of data.

G. Adjust register, grille and diffuser vanes and accessories to achieve proper air distribution patterns and uniform space temperatures free from objectionable noise and drafts within the capabilities of the installed system.

H. Provide fan and motor drive sheave adjustments necessary to obtain design performance. If work of this section indicates that any drive or motor is inadequate for the application,

advise the Owner's Project Manager by providing the properly sized motor/drive information (in accordance with manufacturers original service factor and installed motor horsepower requirements); Confirm any change will keep the duct system within its design limitations with respect to speed of the device and pressure classification of the distribution system. Required motor/drive changes not specifically noted on drawings or in specifications will be considered an extra cost and will require an itemized cost breakdown submitted to Owner's Project Manager. Prior authorization is needed before this work is started.

I. Final air system measurements to be within the following range of specified cfm:

1.	Fans	0% to +10%
2.	Supply grilles, registers, diffusers	0% to +10%
3.	Return/exhaust grilles, registers	0% to -10%

J. Permanently mark equipment settings, including damper positions, control settings, and similar devices allowing settings to be restored.

K. Leave systems in proper working order, replacing belt guards, closing access doors and electrical boxes, and restoring temperature controls to normal operating settings.

3.3 DEFICIENCIES

A. Division 23 00 00 contractor to correct any installation deficiencies found by the test and balance agency that were specified and/or shown on the Contract Documents to be performed as part of that division of work. Test and balance agency will notify the Owner's Project Manager of these items and instructions will be issued by the Owner's Project Manager to the Division 23 00 00 contractor for correction of the deficient work. All corrective work to be done at no cost to the Owner. Retest mechanical systems, equipment, and devices once corrective work is complete as specified and at no additional cost to Owner.

END OF SECTION

SECTION 23 07 00

HVAC INSULATION

PART 1 G E N E R A L

1.1 SCOPE

A. This section includes insulation specifications for heating, ventilating and air conditioning piping, ductwork and equipment.

1.2 RELATED WORK

A. Related work includes:
1. Section 23 05 00 - Common Work Results for HVAC
2. Section 23 07 00 - HVAC Insulation
3. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC
4. Section 23 09 14 - Controls
5. Section 23 31 00 – Air Ducts
6. Section 23 33 00 - Air Duct Accessories.
7. Section 23 62 13 - Air Cooled Compressor and Condensing Units
8. Section 23 82 00 – Heating and Cooling Units

1.3 REFERENCE

A. Applicable provisions of Division 1 govern work under this section.

1.4 REFERENCE STANDARDS

A. Reference standards include:
1. ASTM C165 Test Method for Compressive Properties of Thermal Insulations
2. ASTM C177 Heat Flux and Thermal Transmission Properties
3. ASTM C195 Mineral Fiber Thermal Insulation Cement
4. ASTM C302 Density of Preformed Pipe Insulation
5. ASTM C355 Test Methods for Test for Water Vapor Transmission of Thick Materials
6. ASTM C518 Heat Flux and Thermal Transmission Properties
7. ASTM C534 Preformed Flexible Elastomeric Thermal Insulation
8. ASTM C547 Mineral Fiber Preformed Pipe Insulation
9. ASTM C553 Mineral Fiber Blanket and Felt Insulation
10. ASTM C612 Mineral Fiber Block and Board Thermal Insulation
11. ASTM C921 Properties of Jacketing Materials for Thermal Insulation
12. ASTM C1136 Flexible Low Permeance Vapor Retarders for Thermal Insulation
13. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
14. ASTM D1000 Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications
15. ASTM D1621 Standard Test Method for Compressive Properties Of Rigid Cellular Plastics

16. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics
17. ASTM D1940 Method of Test for Porosity of Rigid Cellular Plastics
18. ASTM D2126 Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging
19. ASTM D2240 Standard Test Method for Rubber Property—Durometer Hardness
20. ASTM E84 Surface Burning Characteristics of Building Materials
21. ASTM E814 Standard Test Method for Fire Tests of Penetration Firestop Systems
22. ASTM E2336 Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems
23. MICA National Commercial & Industrial Insulation Standards
24. NFPA 225 Surface Burning Characteristics of Building Materials
25. UL 723 Surface Burning Characteristics of Building Materials

1.5 QUALITY ASSURANCE

A. Label all insulating products delivered to the construction site with the manufacturer's name and description of materials.

B. Insulation systems shall be applied by experienced contractors.

1.6 DESCRIPTION

A. Furnish and install all insulating materials and accessories as specified or as required for a complete installation. The following types of insulation are specified in this section:
   1. Pipe Insulation
   2. Duct Insulation

B. Install all insulation in accordance with the latest edition of MICA (Midwest Insulation Contractors Association) Standard and manufacturer's installation instructions.

1.7 DEFINITIONS

A. Concealed: shafts, attics, furred spaces, space above finished ceilings, utility tunnels and crawl spaces. All other areas, shall be considered as exposed.

1.8 SHOP DRAWINGS

A. Submit a schedule of all insulating materials to be used on the project, including adhesives, fastening methods, fitting materials along with material safety data sheets and intended use of each material. Include manufacturer's technical data sheets indicating density, thermal characteristics, jacket type, and manufacturer's installation instructions.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not store insulation materials on grade or where they are at risk of becoming wet. Do not install insulation products that have been exposed to water.

B. Protect installed insulation work with plastic sheeting to prevent water damage.

PART 2 P R O D U C T S

2.1 MATERIALS

A. Manufacturers: Armacell, Certainteed, Manson, Childers, Dow, Extol, Fibrex, Halstead, H.B. Fuller, Imcoa, Johns Manville, Knauf, Owens-Corning, Partek, Pittsburgh Corning, Rubatex, VentureTape or approved equal.

B. Materials or accessories containing asbestos will not be accepted.

C. Use composite insulation systems (insulation, jackets, sealants, mastics, and adhesives) that have a flame spread rating of 25 or less and smoke developed rating of 50 or less, with the following exceptions:

D. Pipe insulation which is not located in an air plenum may have a flame spread rating not over 25 and a smoke developed rating no higher than 450 when tested in accordance with UL 723 and ASTM E84.

2.2 INSULATION TYPES

A. Insulating materials shall be fire retardant, moisture and mildew resistant, and vermin proof. Insulation shall be suitable to receive jackets, adhesives and coatings as indicated.

B. FLEXIBLE FIBERGLASS INSULATION:
1. Minimum nominal density of 0.75 lbs. per cu. ft., and thermal conductivity of not more than 0.3 at 75 degrees F, rated for service to 250 deg F.

C. RIGID FIBERGLASS INSULATION:
1. Minimum nominal density of 3 lbs. per cu. ft., and thermal conductivity of not more than 0.23 at 75 degrees F, minimum compressive strength of 25 PSF at 10% deformation, rated for service to 450 deg F.

D. ELASTOMERIC INSULATION:
1. Flexible closed cell, minimum nominal density of 5.5 lbs. per cu. ft., thermal conductivity of not more than 0.27 at 75 degrees F, minimum compressive strength of 4.5 psi at 25% deformation, maximum water vapor permeability of 0.17 perm inch, maximum water absorption of 6% by weight, rated for service range of -20 deg F to 220 degrees F on piping and 180 degrees F where adhered to equipment.
2. Pipe insulation shall be preformed in two (2) half cylinder sections. Cut V-groove sheet insulation is not acceptable. Provide three (3) stainless steel bands for each section of insulation.

2.3 JACKETS

A. FOIL SCRIM ALL SERVICE JACKETS (FSJ):
1. Glass fiber reinforced foil kraft laminate, factory applied to insulation. Maximum permeance of .02 perms and minimum beach puncture resistance of 25 units.

2.4 ACCESSORIES

A. All products shall be compatible with surfaces and materials on which they are applied, and be suitable for use at operating temperatures of the systems to which they are applied.

B. Adhesives, sealants, and protective finishes shall be as recommended by insulation manufacturer for applications specified.

C. Insulation bands to be 3/4 inch wide, constructed of aluminum or stainless steel. Minimum thickness to be .015 inch for aluminum and .010 inch for stainless steel.

D. Tack fasteners to be stainless steel ring grooved shank tacks.

E. Staples to be clinch style.

F. Insulating cement to be ANSI/ASTM C195, hydraulic setting mineral wool.

G. Finishing cement to be ASTM C449.

H. Fibrous glass or canvas fabric reinforcing shall have a minimum untreated weight of 6 oz./sq. yd.

I. Bedding compounds to be non-shrinking and permanently flexible.

J. Vapor barrier coatings to have maximum applied water vapor permeance of .05 perms.

K. Fungicidal water base coating (Foster 40-20 or equal) to be compatible with vapor barrier coating.

PART 3 E X E C U T I O N

3.1 EXAMINATION

A. Verify that all piping, equipment, and ductwork are tested and approved prior to installing insulation. Do not insulate systems until testing and inspection procedures are completed.

B. Verify that all surfaces are clean, dry and without foreign material before applying insulation materials.

3.2 INSTALLATION

A. All materials shall be installed by skilled labor regularly engaged in this type of work. All materials shall be installed in strict accordance with manufacturer’s recommendations, building codes, and industry standards. Do not install products when the ambient temperature or conditions are not consistent with the manufacturer’s recommendations. Surfaces to be insulated must be clean and dry.

B. Locate insulation and cover seams in the least visible location. All surface finishes shall be extended in such a manner as to protect all raw edges, ends and surfaces of insulation.

C. Install insulation with smooth and even surfaces. Poorly fitted joints or use of filler in voids will not be accepted. Provide neatly beveled and coated terminations at all nameplates, uninsulated fittings, or at other locations where insulation terminates.

D. Install fabric reinforcing without wrinkles. Overlap seams a minimum of 2 inches.

E. Use full length material (as delivered from manufacturer) wherever possible. Scrap piecing of insulation or pieces cut undersize and stretched to fit will not be accepted.

F. All pipe and duct insulation shall be continuous through walls, ceiling or floor openings and through sleeves except where firestop or firesafing materials are required. Vapor barriers shall be maintained continuous through all penetrations.

G. Provide a continuous unbroken moisture vapor barrier on insulation applied to systems noted below. Attachments to cold surfaces shall be insulated and vapor sealed to prevent condensation.

H. Provide a complete vapor barrier for insulation on the following systems:
1. Refrigerant

3.3 PIPING, VALVE, AND FITTING INSULATION

A. General:
1. Install insulation continuous through pipe hangers and supports with hangers and supports on the exterior of insulation.
2. Where insulated piping is installed on hangers and supports, the insulation shall be installed continuous through the hangers and supports. High density inserts shall be provided as required to prevent the weight of the piping from crushing the insulation. Pipe shields are required at all support locations. The insulation shall not be notched or cut to accommodate the supporting channels.

B. ELASTOMERIC:
1. Where practical, slip insulation on piping during pipe installation when pipe ends are open. Miter cut fittings allowing sufficient length to prevent stretching. Completely seal seams and joints for vapor tight installation. For elastomeric insulation, apply full bed of adhesive to both surfaces. For polyeolefin, seal factory preglued seams with roller and field seams and joints with full bed of hot melt polyolefin glue to both surfaces. Cover elastomeric insulation on systems operating below 40 degrees F with vapor barrier mastic.

3.4 Pipe Insulation Schedule:

A. Provide insulation on new piping as indicated in the following schedule:

Service	**Insulation**	**Jacket**	**Insulation Thickness by Pipe Size**	
			≤ 1-1/4”	**1-1/2"**
Refrigerant Suction				
>40°F	Elast.	None	0.5"	1"
40°F to 20°F	Elast.	None	1”	1.5”

3.5 DUCT INSULATION

A. General:

1. Secure flexible duct insulation on sides and bottom of ductwork over 24" wide and all rigid duct insulation with weld pins. Space fasteners 18” on center or less as required to prevent sagging.
2. Secure rigid board insulation to ductwork with weld pins. Apply insulation with joints firmly butted as close as possible to the equipment surface. Pins shall be located a maximum of 3” from each edge and spaced no greater than 12” on center.
3. Install weld pins without damage to the interior galvanized surface of the duct. Clip pins back to washer and cover penetrations with tape of same material as jacket. Firmly butt seams and joints and cover with 4” tape of same material as jacket. Seal tape with plastic applicator and secure with staples. All joints, seams, edges and penetrations to be fully vapor sealed.
4. Stop and point insulation around access doors and damper operators to allow operation without disturbing insulation or jacket material.
5. Where insulated ductwork is supported by trapeze hangers, the insulation shall be installed continuous through the hangers. Drop the supporting channels required to facilitate the installation of the insulation. Where rigid board or flexible insulation is specified, install high density inserts to prevent the weight of the ductwork from crushing the insulation.

3.6 DUCT INSULATION SCHEDULE:

A. Provide duct insulation on new and existing remodeled ductwork in the following schedule:

Service	**Insulation Type**	**Jacket**	**Insulation Thickness**
Outside air ducts	Rigid Fiberglass	FSJ	2"
Mixed air ducts	Rigid Fiberglass	FSJ	2"
Exposed supply ducts	Rigid Fiberglass	FSJ	2"
Concealed supply ducts	Flexible Fiberglass	FSJ	1-1/2"
Concealed supply ducts (in attic)	Flexible Fiberglass	FSJ	3"
Concealed return ducts (in attic)	Flexible Fiberglass	FSJ	3"

END OF SECTION

SECTION 23 09 14

CONTROLS

PART 1 G E N E R A L

1.1 SCOPE

A. This section includes control system specifications for all HVAC equipment.

1.2 RELATED WORK

A. Related work includes:
1. Section 23 05 00 - Common work Results for HVAC
2. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC
3. Section 23 31 00 - Air Ducts
4. Section 23 33 00 - Air Duct Accessories.
5. Section 23 62 13 - Air Cooled Compressor and Condensing Units
6. Section 23 82 00 - Heating and Cooling Units

1.3 SYSTEM DESCRIPTION

A. System is to be electric/electronic to control the blower coil unit with refrigerant cooling coil and electric heat and air cooled compressor/condensing unit.

1.4 SUBMITTALS

A. Include the following information:

1. Manufacturer's data sheets indicating model number, capacity, methods and materials of construction, installation instructions, and recommended maintenance. General catalog sheets showing a series of the same device is not acceptable unless the specific model is clearly marked.
2. Schedule of control dampers indicating size, leakage rating, arrangement, pressure drop at design airflow, and number and size of operators required.
3. A complete description of each control sequence for equipment.

1.5 OPERATION AND MAINTENANCE DATA

A. Provide the following documentation:
1. A complete set of record control wiring drawings.
2. Data on all control components.

PART 2 P R O D U C T S

2.1 CONTROL DAMPERS

A. Provide control dampers shown on the plans and as required to perform the specified functions. Dampers shall be rated for velocities that will be encountered at maximum

system design and rated for pressure equal or greater than the ductwork pressure class as specified in Section 23 31 00 of the ductwork where the damper is installed.

B. Use only factory fabricated dampers with mechanically captured replaceable resilient blade seals, stainless steel jamb seals and with entire assembly suitable for the maximum temperature and air velocities encountered in the system.

C. Dampers in galvanized ductwork shall be constructed of galvanized steel and/or aluminum.

D. All dampers, unless otherwise specified, to be rated at a minimum of 180º F working temperature. Leakage testing shall be certified to be based on latest edition of AMCA Standard 500-D and all dampers, unless otherwise specified, shall have leakage ratings as follows:

Damper Class	DifferentialPressure	Leakage
Class IA	1" w.g.	$\leq$3 CFM/ft^2

E. Jack shafts shall be extended outside of the ductwork for external actuator mounting. Provide bearings on the point of exit for support of damper shafts to prevent wear on the shaft and the ductwork.

F. All power required for electric actuation shall be provided by this contractor.

G. Provide operators with linkages and brackets for mounting on device served.

2.2 ELECTRIC/ELECTRONIC THERMOSTATS

A. ELECTRIC THERMOSTATS:

1. For single setpoint applications, provide line or low voltage electric type suitable for heating or heating and cooling as required. Provide the required number of heating and/or cooling stages required for the application.

B. LOW VOLTAGE ELECTRONIC THERMOSTATS:

1. Where unoccupied setpoints are specified, provide electronic programmable type with setup/setback for heating and cooling applications, provide automatic heating/cooling switchover. There shall be a minimum of 5 degrees (adjustable) span between heating and cooling set points.

2.3 DUCT SMOKE DETECTOR AND FIRE ALARM INTERFACE

A. Coordinate with the fire alarm subcontractor, which is part of the mechanical contract, for the interface of shutdown of the blower coil unit and closing the smoke damper upon activation of the fire alarm system. See section 23 05 00, paragraph 1.1.B for more information.

2.4 TIME CLOCKS

A. UL listed, 7-day, minimum of 4 on/off programs per day, or 5 day (weekdays), 1 day (Saturday), 1 day (Sunday) programming minimum of 4 on/off programs per day. The time clock function may be integrated into a programmable thermostat function.

2.5 POWER SUPPLIES

A. Provide all required power supplies.

PART 3 E X E C U T I O N

3.1 INSTALLATION

A. Install all control equipment, accessories, wiring, and piping in a neat and workmanlike manner. All control devices must be installed in accessible locations. This contractor shall verify that all control devices furnished under this Section are functional and operating the mechanical equipment as specified in the control sequence.

B. All control devices and electrical boxes mounted on insulated ductwork shall be mounted over the insulation. Provide mounting stand-offs where necessary for adequate support. Cutting and removal of insulation to mount devices directly on ductwork is not acceptable. This contractor shall coordinate with the insulation contractor to provide for continuous insulation of ductwork.

C. Provide all electrical relays and wiring, line and low voltage, for control systems, devices and components. Install all high voltage wiring or low voltage wiring exposed in the mechanical room in metal conduit, Electrical Non-metallic Tubing (ENT), or Electrical Metallic Tubing (EMT), as hereafter referred to generically as conduit. All conduit must be installed in accordance with the National Electrical code.

3.2 CONTROL AND SMOKE DAMPERS

A. All control dampers are to be installed by the Mechanical Contractor in locations shown on plans or where required to provide specified sequence of control.

B. Coordinate installation with the sheetmetal installation to obtain smooth duct transitions where damper size is different than duct size.

C. Smoke dampers shall close on activation of the fire alarm system.

3.3 CONTROL SEQUENCES

A. BLOWER COIL UNIT AND AIR COOLED COMPRESSOR/CONDENSING UNIT

1. System is a split system heating-cooling. The system consists of a blower coil unit with an electric heating coil, refrigerant cooling coil, minimum outside air damper and air cooled compressor/condensing unit.
2. The heating and cooling will have heating and cooling controlled with a duct mounted return air thermostat. There will be automatic changeover between heating and cooling. There shall have a minimum span of 5 degrees (adjustable) between heating and cooling.
3. A time clock will control the occupied and unoccupied modes. The user shall program the occupied/unoccupied schedule based on when the rooms are occupied or unoccupied.

4. The user shall have the ability to lock out heating or cooling during the occupied mode while retaining the ability to operate the system fan with the outside air damper open.
5. In the occupied mode the system fan shall operate, the outside air damper shall be open and the thermostat shall control the heating and cooling to maintain the set points. The electric coil in the blower coil unit shall be controlled to provide heating and the air cooled compressor/condensing unit shall be controlled to provide cooling.
6. In the unoccupied mode the unit shall be off and the outside air damper be closed. The heating and cooling shall be disabled.
7. The operation of the unit shall be interfaced with the fire alarm system to shut the blower off and close the outside air damper when the fire alarm is activated.

END OF SECTION

SECTION 23 31 00

AIR DUCTS

PART 1 G E N E R A L

1.1 SCOPE

A. This section includes specifications for all duct systems used on this project.

1.2 APPENDIX

A. Duct Leakage Test Report

1.3 RELATED WORK

A. Related work includes:
1. Section 23 07 00 - HVAC Insulation
2. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC
3. Section 23 09 14 - Controls
4. Section 23 33 00 - Air Duct Accessories.
5. Section 23 37 13 - Diffusers, Registers and Grilles
6. Section 23 82 00 - Heating and Cooling Units

1.4 REFERENCE

A. Applicable provisions of Division 1 govern work under this Section.

1.5 REFERENCE STANDARDS

A. Reference standards include:
1. ASTM A90 Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles
2. ASTM A623 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
3. ASTM A527 Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality
4. ASTM 924 Standard Specification for General Requirements for Sheet Steel, Metallic-coated by the Hot-dip Method
5. ASTM E 84 Test Method for Surface Burning Characteristics of Building Materials
6. ASTM C 1338 Test Method for Determining Fungal Resistance of Insulation Materials and Facings
7. ASTM G 21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
8. ASTM C 916 Standard Specification for Adhesives for Duct Thermal Insulation
9. NFPA 90A Standard for the Installation of Air Conditioning and Ventilating Systems

10.	UL 181	Standard for Safety for Factory Made Air Ducts and Air Connectors.
11.	NAIMA	Fibrous Glass Duct Liner Standard

1.6 SHOP DRAWINGS

A. Include manufacturer's data and/or Contractor data for the following:
   1. Fabrication and installation drawings.
   2. Schedule of duct systems including material of construction, gauge, pressure class, system class, method of reinforcement, joint construction, fitting construction, and support methods, all with details as appropriate.
   3. Duct sealant and gasket material.
   4. Duct liner including data on thermal conductivity, air friction correction factor, and limitation on temperature and velocity.

1.7 DESIGN CRITERIA

A. Construct all ductwork to be free from vibration, chatter, objectionable pulsations and leakage under specified operating conditions.

B. Use material, weight, thickness, gauge, construction and installation methods as outlined in the following SMACNA publications, unless noted otherwise:
   1. HVAC Duct Construction Standards, Metal and Flexible, 2nd Edition, 1995
   2. HVAC Air Duct Leakage Test Manual, 1st Edition, 1985
   3. HVAC Systems - Duct Design, 3rd Edition, 1990
   4. Round Industrial Duct Construction Standards, 2nd Edition, 1999

C. Use products which conform to NFPA 90A, possessing a flame spread rating of not over 25 and a smoke developed rating no higher than 50.

1.8 DELIVERY, STORAGE AND HANDLING

A. Protect Ductwork against damage.

B. Protect Ductwork by storing inside or by durable, waterproof, above ground packaging. Do not store material on grade. Protect Ductwork from dirt, dust, construction debris and foreign material. Where end caps/packaging are provided, take precautions so caps/packaging remain in place and free from damage.

PART 2 P R O D U C T S

2.1 GENERAL

A. All sheet metal used for construction of duct shall be 24 gauge or heavier except for round and spiral ductwork and spiral duct take-offs 12” and below may be 26 gauge where allowed in SMACNA HVAC Duct Construction Standards, Metal and Flexible, 2nd Edition, 1995.

B. Duct sizes indicated on plans are net inside dimensions; where duct liner is specified, dimensions are net, inside of liner.

2.2 DUCTWORK PRESSURE CLASS

A. Minimum acceptable duct pressure class, for all ductwork except transfer ductwork, is 2 inch W.G. positive or negative, depending on the application. Transfer ductwok minimum acceptable duct pressure class is 1 inch W.G. positive or negative, depending on the application.

2.3 MATERIALS

A. Galvanized Steel Sheet:
   1. Use ASTM A 653 galvanized steel sheet of lock forming quality. Galvanized coating to be 1.25 ounces per square foot, both sides of sheet, G90 in accordance with ASTM A90. Provide “Paint Grip” finish for ductwork that will be painted.

2.4 LOW PRESSURE DUCTWORK (Maximum 2 inch pressure class)

A. Fabricate and install ductwork in sizes indicated on the drawings and in accordance with SMACNA recommendations, except as modified below.

B. Construct so that all interior surfaces are smooth. Use slip and drive or flanged and bolted construction when fabricating rectangular ductwork. Use spiral lock seam construction when fabricating round spiral ductwork. Sheet metal screws may be used on duct hangers, transverse joints and other SMACNA approved locations if the screw does not extend more than 1/2 inch into the duct.

C. Use elbows and tees with a center line radius to width or diameter ratio of 1.5 wherever space permits. When a shorter radius must be used due to limited space, install single wall sheet metal splitter vanes in accordance with SMACNA publications, Type RE 3. Where space will not allow and the C value of the radius elbow, as given in SMACNA publications, exceeds 0.31, use rectangular elbows with turning vanes as specified in Section 23 33 00. Square throat-radius heel elbows will not be acceptable. Straight taps or bullhead tees are not acceptable.

D. Where rectangular elbows are used, provide turning vanes in accordance with Section 23 33 00.

E. Provide expanded take-offs or 45 degree entry fittings for branch duct connections with branch ductwork airflow velocities greater than 700 fpm. Square edge 90-degree take-off fittings or straight taps will not be accepted.

F. Button punch snaplock construction will not be accepted.

G. Round ducts may be substituted for rectangular ducts if sized in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by written permission of the Architect/Engineer.

H. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 45 degrees.

2.5 DUCT SEALANT

A. Manufacturer: 3M 800, 3M 900, H.B. Fuller/Foster, Hardcast, Hardcast Peal & Seal, Lockformer cold sealant, Mon-Eco Industries, United Sheet Metal, or approved equal. Silicone sealants are not allowed in any type of ductwork installation.

B. Install sealants in strict accordance with manufacturer's recommendations, paying special attention to temperature limitations. Allow sealant to fully cure before pressure testing of ductwork, or before startup of air handling systems.

2.6 GASKETS

A. 2 inch pressure class and lower:
   1. Soft neoprene or butyl gaskets in combination with duct sealant for flanged joints.

PART 3 E X E C U T I O N

3.1 SPECIAL PROJECT INSTALLATION REQUIREMENTS

A. Verify the final location of ductwork to be installed in the attic space coordinating the final duct locations with the roof framing structure, ceiling framing structure and locations of following existing items:
   1. Fire protection sprinkler piping and sprinkler heads
   2. Exhaust ductwork
   3. Plumbing vent piping
   4. Electrical conduits

3.2 INSTALLATION

A. Verify dimensions at the site, making field measurements and drawings necessary for fabrication and erection.

B. Make allowances for beams, pipes or other obstructions in building construction and for work of other contractors. Transform, divide or offset ducts as required, in accordance with SMACNA HVAC Duct Construction Standards, Figure 2-7, except do not reduce duct to less than six inches in any dimension and do not exceed an 8:1 aspect ratio. Where it is necessary to take pipes or similar obstructions through ducts, construct easement as indicated in SMACNA HVAC Duct Construction Standards, Figure 2-8, Fig. E. In all cases, seal to prevent air leakage. Pipes or similar obstructions may not pass through high pressure or fume exhaust ductwork.

C. Test openings for test and balance work shall be furnished under Section 23 05 93.

D. Provide frames constructed of angles or channels for coils, filters, dampers or other devices installed in duct systems, and make all connections to such equipment including equipment furnished by others. Secure frames with gaskets and screws or nut, bolts and washers.

E. Install duct to pitch toward outside air intakes and drain to outside of building. Solder or seal seams to form watertight joints.

F. Where two different metal ducts meet, the joint shall be installed in such a manner that metal ducts do not contact each other by using proper seal or compound.

G. Install all motor operated dampers and connect to or install all equipment furnished by others. Blank off all unused portions of louvers, as indicated on the drawings, with 1-1/2 inch board insulation with galvanized sheet metal backing on both sides.

H. Do not install ductwork through dedicated electrical rooms or spaces unless the ductwork is serving this room or space.

I. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

J. Provide adequate access to ductwork for cleaning purposes.

K. Protect diffusers, registers and grilles with plastic wrap or some other approved form of protection during construction to maintain dirt and dust free and to prevent entry of dirt, dust and foreign material into the Ductwork.

L. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent dirt, dust and foreign material from entering ductwork system.

3.3 DUCTWORK SUPPORT

A. Support ductwork in accordance with SMACNA HVAC Duct Construction Standards, Figure 4-4, except supporting ductwork with secure wire method is not allowed.

B. Support with 3/32 inch, 7 x 7, stainless steel air-craft cable, with matching fastener rated for 50% of actual load, will be allowed on round ductwork under 12 inches if installed as detailed, with cable double looped on duct and at point of support.

3.4 LOW PRESSURE DUCT (Maximum 2 inch pressure class)

A. Seal all duct, with the exception of transfer ducts, in accordance with SMACNA seal class "A"; all seams, joints, and penetrations shall be sealed.

B. Install a manual balancing damper for each diffuser or grille.

C. Hangers must be wrapped around bottom edge of duct and securely fastened to duct with sheetmetal screws or pop rivets. Trapeze hangers may be used at contractor's option.

3.5 CLEANING

A. Remove all dirt and foreign matter from the entire duct system and clean diffusers, registers, grilles and the inside of air-handling units before operating fans.

3.6 LEAKAGE TEST

A. Test all ductwork in accordance with test methods described in Section 5 of SMACNA HVAC Air Duct Leakage Test Manual. Do not insulate ductwork until it has been successfully tested. Test pressure shall be equal to the duct pressure class. If excessive air leakage is found locate leaks, repair the duct in the area of the leak, seal the duct, and retest.

B. Leakage rate shall not exceed more than 5% of the system air quantity for low pressure ductwork, determined in accordance with Appendix C of the SMACNA HVAC Air Duct Leakage Test Manual.

C. Leakage test for ductwork may be omitted, with written approval of the Owner's Project Manager, if visual inspection indicates that the duct is sealed in accordance with this specification but will not relieve the contractor from duct sealing requirements.

D. Submit a signed report to the Owners Project Manager, indicating test apparatus used, results of the leakage test, and any remedial work required to bring duct systems into compliance with specified leakage rates.

DUCT LEAKAGE TEST REPORT

Project Number:_____

Date Submitted:_____

Project **Name:**_____

Location:_____

Contractor:_____

System Data **Fan No:**_____ **Leakage Class (C_L):**_____

Fan Design CFM:_____ **Duct Pressure Class (P_C):**_____

Test Pressure (P_T):_____

Test Equipment **Manufacturer:**_____ **Model No:**_____ **Serial No:**_____

For large systems, use the reverse side for a simple sketch of the entire duct system. Then use letter desigations to indicate the various duct sections being tested at one time. Also use the reverse side for test comments.

Note that due to normal construction sequencing it is usually necessary to test risers seperately prior to enclosing chases.

Design Data					Field Test Data							
			Allowable Leakage		Diameter		Pressure (in. wc.)					
Duct Section	Duct Shape	Duct Surface (Ft^2)	Leakage Factor ($P^{.65}C_L$)	CFM for Section	Tube (D_1)	Orifice (D_2)	In Duct (P)	Across Orifice (P_{drop})	Date	Performed By	Observed By	Actual CFM
TOTAL												

END OF SECTION

SECTION 23 33 00

AIR DUCT ACCESSORIES

PART 1 G E N E R A L

1.1 SCOPE

A. This sections includes accessories used in the installation of duct systems.

1.2 RELATED WORK

A. Related work includes:
1. Section 23 07 00 - HVAC Insulation
2. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC
3. Section 23 09 14 - Controls
4. Section 23 31 00 – Air Ducts
5. Section 23 33 00 - Air Duct Accessories.
6. Section 23 37 13 – Diffusers, Registers and Grilles
7. Section 23 82 00 – Heating and Cooling Units

1.3 REFERENCE

A. Applicable provisions of Division 1 govern work under this Section.

1.4 REFERENCE STANDARDS

A. Reference standards include:

1.	NFPA 90A	Standard for Installation of Air Conditioning and Ventilating Systems
2.	SMACNA	HVAC Duct Construction Standards - Metal and Flexible, 2nd Edition, 1995
3.	UL 214	Standard for Tests for Flame-Propagation of Fabrics and Films
4.	UL 555 (6^{th} edition)	Standard for Fire Dampers and Ceiling Dampers
5.	UL 555S (4^{th} edition)	Leakage Rated Dampers for Use in Smoke Control Systems

1.5 SHOP DRAWINGS

A. Refer to division 1, Basic Requirements, Submittal Procedures.

B. Submit for all accessories and include dimensions, capacities, ratings, installation instructions, and appropriate identification.

C. Include certified test data on dynamic insertion loss, self-noise power levels, and aerodynamic performance of sound attenuators.

D. Submit manufacturer's color charts where finish color is specified to be selected by the Architect/Engineer.

PART 2 P R O D U C T S

2.1 MANUAL VOLUME DAMPERS

A. Manufacturers: Ruskin, Vent Products, Air Balance, or approved equal.

B. Dampers must be constructed in accordance with SMACNA Fig. 2-12, Fig. 2-13, and notes relating to these figures, except as modified below.

C. Reinforce all blades to prevent vibration, flutter, or other noise. Construct dampers in multiple sections with mullions where width is over 48 inches. Use rivets or tack welds to secure individual components; sheet metal screws will not be accepted. Provide operators with locking devices and damper position indicators for each damper; use an elevated platform on insulated ducts. Provide end bearings or bushings for all volume damper rods penetrating ductwork constructed to a 3" w.c. pressure class or above.

2.2 TURNING VANES

A. Manufacturers: Aero Dyne, Anemostat, Barber-Colman, Hart & Cooley, or approved equal.

B. Construct turning vanes and runners for square elbows in accordance with SMACNA Fig. 2-3 and Fig. 2-4 except use only airfoil type vanes. Construct turning vanes for short radius elbows and elbows where one dimension changes in the turn in accordance with SMACNA Fig. 2-5 and Fig. 2-6.

2.3 FIRE DAMPERS

A. Manufacturers: Air Balance, Advanced Air, American Warming and Ventilating, Greenheck, Phillips-Aire, Prefco, Ruskin, Safe-Air or approved equal.

B. STATIC FIRE DAMPERS

1. Static fire damper assemblies must be UL 555 (6^{th} edition) listed and labeled for static applications (where air systems do not operate during a fire) and meet requirements of NFPA 90A. Damper must be type B curtain type with blades out of the air stream; dampers with blades in the air stream will not be accepted. Damper fire rating to be compatible with the rating of the building assembly in which the damper is used.

C. DYNAMIC FIRE DAMPERS

1. Dynamic fire damper assemblies must be UL 555 (6^{th} edition) listed and labeled for dynamic applications (where air systems operate during a fire) and meet requirements of NFPA 90A. Dampers must be type B curtain type with curtain 100% out of air stream. Dampers larger than 30” by 30” or with velocity rating requirements of 3000 fpm or higher, may be multiblade type with blades located in the airstream. Velocity ratings and static pressure ratings as indicated on the drawings. Damper fire rating to be compatible with the rating of the building assembly in which the damper is used.

2.4 SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS

A. Manufacturers: Ruskin, Johnson Controls, Air Balance, Advanced Air, American Warming and Ventilating, Greenheck, Safe-Air, Phillips-Aire, Prefco, or approved equal.

B. Smoke damper assemblies to be UL 555S(4th edition) listed and labeled, and leakage rated at no higher than Class II under UL 555S(4th edition). Unless ratings are indicated elsewhere, dampers should be rated for minimum 2,000 fpm air velocity and 4" static pressure.

C. Combination fire/smoke damper assemblies to be UL 555(6th edition) and UL 555S(4th edition) listed and labeled, and have a fire rating compatible with the rating of the building assembly in which the damper is used, and be leakage rated at no higher than Class II under UL 555S.

D. For electric actuation, provide factory installed electric operated dampers with linkage and UL listed operators arranged so that the damper is closed on a loss of power. **Provide dampers for two-position control.** All electric actuators will be provided with overload protection to prevent motor from damage when stall condition is encountered. Locate all operators out of the air stream unless large damper size will not allow. Provide form "C" end switches to indicate damper position.
VERIFY THE REQUIRED ELECTRIC OPERATOR VOLTAGE WITH THE FIRE ALARM SUBCONTRACTOR BEFORE ORDERING THE DAMPERS.

See section 23 05 00, paragraph 1.1.B for more information regarding alarm subcontractor.

2.5 CONTROL DAMPERS

A. Control dampers are specified in section 23 09 14.

2.6 SMOKE DETECTORS

A. Smoke detectors are furnished and installed by the Electrical Contractor.

2.7 ACCESS DOORS

A. Access door to be designed and constructed for the pressure class of the duct in which the door is to be installed. Doors in exposed areas shall be hinged type with cam sash lock. Hinges shall be steel full length continuous piano type. Doors in concealed spaces may be secured in place with cam sash latches. For both hinged and non hinged doors provide sufficient number of camp sash latches to provide air tight seal when door is closed. Do not use hinged doors in concealed spaces if this will restrict access. Use minimum 1" deep 24 gauge galvanized steel double wall access doors with minimum 24 gauge galvanized steel frames. For non-galvanized ductwork, use minimum 1" deep double wall access door with frame that shall use materials of construction identical to adjacent ductwork. Provide double neoprene gasket that shall provide seals from the frame to the door and frame to the duct. When access doors are installed in insulated ductwork or equipment provide insulated doors with insulation equivalent to what is provided for adjacent ductwork or equipment. Access doors constructed with sheet metal screw fasteners will not be accepted.

B. Use insulated, 1-1/2 hour UL 1978 listed and labeled access doors in kitchen exhaust ducts.

2.8 FLEXIBLE DUCT

A. Manufacturers: Anco Products, Clevaflex, Thermaflex, Flexmaster or approved equal.

B. Factory fabricated , UL 181 listed as a class 1 duct, and having a flame spread of 25 or less and a smoke developed rating of 50 or under in accordance with NFPA 90A.

C. Suitable for pressures and temperatures involved but not less than a 180°F service temperature and ±2 inch pressure class, depending on the application.

D. Duct to be composed of polyester film, aluminum laminate or woven and coated fiberglass fabric bonded permanently to corrosion resistant coated steel wire helix. Two-ply, laminated, and corrugated aluminum construction may also be used.

E. Where duct is specified to be insulated, provide a minimum 1 inch fiberglass insulation blanket with maximum thermal conductance of 0.23 K (75 degrees F.) and vapor barrier jacket of polyethylene or metalized reinforced film laminate. Maximum perm rating of vapor barrier jacket to be 0.1 perm.

2.9 DUCT FLEXIBLE CONNECTIONS

A. Material to be fire retardant, be UL 214 listed, and meet the requirements of NFPA 90A.

B. Connections to be a minimum of 3 inches wide, crimped into metal edging strip, and air tight. Connections to have adequate flexibility and width to allow for thermal expansion/contraction, vibration of connected equipment, and other movement.

C. Use coated glass fiber fabric for all applications. Material for inside applications other than corrosive environments, fume exhaust, or kitchen exhaust to be double coated with neoprene, air and water tight, suitable for temperatures between -10°F and 200°F, and have a nominal weight of 30 ounces per square yard. Material used for outdoor applications other than corrosive environments, fume exhaust, or kitchen exhaust to be double coated with Hypalon¿,air and water tight, suitable for temperatures between -10°F and 250°F, and have a nominal wight of 26 ounces per square yard.

2.10 LOUVERS

A. Manufacturers: Airolite K6776, Industrial Louvers 658, American Warming and Ventilating LE-31, or Construction Specialties 6177, or approved equal.

B. Similar to Airolite Type K6776, extruded aluminum alloy not less than 12 gauge (.081" thick), 6063 series frame and blades, all-welded assembly, 35 degree or 45 degree blades with water baffle, 6 inches thick. Provide with bird screen of ½" x ½" mesh aluminum in 12 gauge aluminum frame and an aluminum sill. Locate the bird screen inside of the louver unless noted otherwise.

C. Louver to bear the AMCA certified ratings seal for both air performance and water penetration, having a free area not less than 50% based on a 48" x 48" section, a water

penetration less than 0.1 oz/square foot under AMCA test at 1000 feet per minute, and an intake pressure drop less than 0.20 inches of water at 1000 feet per minute.

D. Finish to be anodized.

PART 3 E X E C U T I O N

3.1 MANUAL VOLUME DAMPERS

A. Install manual volume dampers in each branch duct and for each grille, register, or diffuser as far away from the outlet as possible while still maintaining accessibility to the damper. Install so there is no flutter or vibration of the damper blade(s).

3.2 TURNING VANES

A. Install turning vanes in all rectangular, mitered elbows in accordance with SMACNA standards and/or manufacturer's recommendations.

B. Install double wall, airfoil, 2 inch radius vanes in ducts with vane runner length 18" or greater and air velocity less than 2000 fpm. Install double wall, airfoil, 4-1/2 inch radius vanes in ducts with vane runner length 18" or greater and air velocity 2000 fpm or greater.

C. If duct size changes in a mitered elbow, use single wall type vanes with a trailing edge extension. If duct size changes in a radius elbow or if short radius elbows must be used, install sheetmetal turning vanes in accordance with SMACNA Figure 2-5 and Figure 2-6.

3.3 FIRE DAMPERS

A. Install dampers in strict accordance with manufacturer's installation instructions. Install damper sleeves with retaining angles on both sides of rated partition. Connections of ductwork to fire damper assemblies to be as specified on the installation instructions. Where it is necessary to set dampers out from the rated wall, install a sleeve extension encased in two hour rated fire proofing insulation. Install an access door at each fire damper, located to permit resetting the damper by replacing the fusible link.

B. Manually test each fire damper for proper operation by removing the fusible link. Repair or replace any fire damper that does not close completely. Re-install fusible link after test.

3.4 SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS

A. Install smoke dampers in locations indicated on the drawings in accordance with the manufacturer's instructions. Install an access door adjacent to each damper for inspection and cleaning. Coordinate damper linkage with operators so the dampers are closed when the air system is not operating.

B. Install combination fire/smoke dampers as specified above for fire dampers. Coordinate damper linkage with operators so the dampers are closed when the air system is not operating.

C. Coordinate the installation of smoke dampers with the fire alarm subcontractor. See section 23 05 00, paragraph 1.1.B for more information.

3.5 CONTROL DAMPERS

A. Install dampers in locations indicated on the drawings, as detailed, and according to the manufacturer's instructions. Install blank-off plates or transitions where required for proper mixing of airstreams in mixing plenums. Provide adequate operating clearance and access to the operator. Install an access door adjacent to each control damper for inspection and maintenance.

3.6 SMOKE DETECTORS

A. Installation and wiring of detectors will be by the Electrical Contractor. Install an access door at each detector location.

3.7 ACCESS DOORS

A. Install access doors where specified, indicated on the drawings, and in locations where maintenance, service, cleaning or inspection is required. Examples include, but are not limited to motorized dampers, fire and smoke dampers, smoke detectors, fan bearings, heating and cooling coils, filters, valves, and control devices needing periodic maintenance.

B. Size and numbers of duct access doors to be sufficient to perform the intended service. Minimum access door size shall be 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, or other size as indicated. Install access doors on both inlet and outlet sides of reheat coils as well as other duct mounted coils.

3.8 FLEXIBLE DUCT

A. Flexible duct may only be used for final connections of air inlets and outlets at diffuser, register, and grille locations. Where flexible duct is used, it shall be the minimum length required to make the final connections, but no greater than 5 feet in length, and have no more than one (1) 90 degree bend.

B. Secure inner jacket of flexible duct in place with stainless steel metal band clamp. Secure insulation vapor barrier jacket in place with steel or nylon draw band. Sheetmetal screws and/or duct tape will not be accepted.

C. Flexible duct used to compensate for misalignment of main duct or branch duct will not be accepted.

D. Individual sections of flexible ductwork shall be of one piece construction. Splicing of short sections will not be accepted.

E. Flexible ductwork used as transfer duct shall be sized for a maximum velocity of 300 fpm.

F. Penetration of any partition, wall, or floor with flexible duct will not be accepted.

3.9 DUCT FLEXIBLE CONNECTIONS

A. Install at all duct connections to rotating or vibrating equipment, including air handling units (unless unit is internally isolated), fans, or other motorized equipment in accordance with SMACNA Figure 2-19. Install thrust restraints to prevent excess strain on duct flexible connections at fan inlets and outlets; see Related Work.

B. For applications in corrosive environments or fume exhaust systems, use a double layer of the Teflon coated fabric when making the connector.

3.10 LOUVERS

A. Mechanical Contractor shall mount louver in exterior walls. Mechanical Contractor shall cut opening in existing wall. Connect outside air intake duct to the louver, sealing all connections air and water tight.

B. Provide bird screen on inside of active louver area where none is provided with louvers.

END OF SECTION

SECTION 23 37 13

DIFFUSERS, REGISTERS & GRILLES

PART 1 GENERAL

1.1 SCOPE

A. This section includes specifications for air terminal equipment.

1.2 RELATED WORK

A. Related work includes:
1. Section 23 31 00 - HVAC Ducts and Casings
2. Section 23 33 00 - Air Duct Accessories
3. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC

1.3 REFERENCE

A. Applicable provisions of Division 1 govern work under this section.

1.4 REFERENCE STANDARDS

A. Reference standards include:
1. NFPA 90A - Installation of Air Conditioning and Ventilation Systems.
2. UL 181 - Factory-Made Air Ducts and Connectors.
3. ARI-ADC Standard 880

1.5 SUBMITTALS

A. Furnish submittal information including, but not limited to, the following:
1. Manufacturer's name and model number
2. Identification as referenced in the documents
3. Capacities/ratings
4. Materials of construction
5. Sound ratings
6. Dimensions
7. Finish
8. Color selection charts where applicable
9. Manufacturer's installation instructions
10. All other appropriate data

1.6 DESIGN CRITERIA

A. All performance data shall be based on tests conducted in accordance with Air Diffusion Council (ADC) Test Code 1062 GRD 84.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Carnes, Krueger, Titus, Metal-Aire, and E.H. Price, or approved equivalent.

B. Acceptable style, type and material for each mark are described in the schedule on the drawings. Not all types included in this specification may be included in this project.

2.2 SQUARE CEILING DIFFUSERS

A. Aluminum or Steel unless otherwise indicated, louvered face furnished with frame type appropriate to installation.

B. Directional blow pattern as shown on the drawings and/or as scheduled.

C. One-piece construction louver cones with no corner joints.

D. Unless otherwise indicated, baked enamel finish with color selected by Project Manager.

2.3 SIDE-WALL REGISTERS AND GRILLES

A. Aluminum or Steel unless otherwise indicated, with frame type appropriate to installation.

B. Double deflection type blade supply registers and supply grilles allow deflection adjustment in all direction.

C. Opposed blade volume control damper supply registers, operable from face.

D. Fixed blade (0 degree, 45 degree) core return and exhaust registers and grilles.

E. Opposed blade volume control damper return registers, operable from face.

F. Register and grille sizes as shown on drawings and/or as scheduled. Unless noted otherwise, baked enamel finish with color selected by Architect.

G. Screw holes on surface counter sunk to accept recessed type screws.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install grilles, registers and diffusers as shown on drawings and according to manufacturer's instructions.

B. Furnish diffusers with equalizing grids where it is not possible to maintain minimum 2 duct diameter straight duct into diffuser. Equalizing grids shall consist of individually adjustable vanes designed for equalizing airflow into diffuser neck and providing directional control of airflow.

C. Unless otherwise indicated, size ductwork drops to diffusers or grilles to match unit collar size.

D. Seal connections between ductwork drops and diffusers/grilles airtight.

END OF SECTION

SECTION 23 62 13

AIR-COOLED COMPRESSOR AND CONDENSING UNITS

PART 1 G E N E R A L

1.1 SCOPE

A. This section includes specifications for air cooled condensing units for use with split system type air conditioning.

1.2 RELATED WORK

A. Related work includes:
1. Section 23 05 00 - Common Work Results for HVAC
2. Section 23 07 00 - HVAC Insulation
3. Section 23 09 14 - Controls
4. Section 23 82 00 – Heating and Cooling Units

1.3 REFERENCE

A. Applicable provisions of Division 1 shall govern work under this section.

1.4 REFERENCE STANDARDS

A. Reference standards include:

1.	ARI 210/240	Unitary Air Conditioning and Heat Pump Equipment
2.	ARI 365	Commercial and Industrial Unitary Air Conditioning Condensing Units
3.	ASHRAE 15	Safety Standard for Refrigeration Systems
4.	ASHRAE 90.1	(2004 edition)Energy Standard for Buildings Except Low Rise Residential Buildings
5.	NEC	National Electrical Code
6.	UL	Underwriters Laboratory

1.5 QUALITY ASSURANCE

A. Unit Energy Efficiency Ratio (EER), Coefficient of Performance (COP) and Integrated Part Load Value (IPLV) shall meet the minimum applicable requirements of ASHRAE 90.1(2004 edition). Units that are labeled ENERGY STAR® will be acceptable.

B. Rate unit performance in accordance with the latest edition of ARI Standard 365 or ARI Standard 210/240, whichever is applicable for the equipment.

C. Construct units in accordance with ASHRAE 15, UL standards and the NEC. Units shall carry the UL label.

1.6 SUBMITTALS

A. Refer to division 1, Basic Requirements, Submittal Procedures.

B. Submit air cooled condensing unit shop drawings including the following information: specific manufacturer and model numbers, dimensional and weight data, required clearances, materials of construction, capacities and ratings, stages of unloading capacity achievable without hot gas bypass (and with hot gas bypass if applicable), refrigerant type and charge, component information, size and location of piping connections, electrical connections, wiring diagrams and information for all specialties and accessories.

C. Submit manufacturer's installation and start-up instructions, maintenance data, troubleshooting guide, parts lists, controls and accessories.

D. At substantial completion, submit warranty certificate and copy of start-up report.

1.7 OPERATION AND MAINTENANCE DATA

A. All operations and maintenance data shall comply with the submission and content requirements specified under section Common Work Results for HVAC.

1.8 DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer's instructions for storing, rigging, unloading, and transporting units. Protect units from physical damage. Leave factory-shipping covers in place until installation.

1.9 WARRANTY

A. Provide a one year parts and labor warranty on the entire unit beginning upon substantial completion of project.

B. Provide a five year parts warranty on the compressor(s) beginning upon substantial completion of project.

PART 2 PRODUCTS

2.1 UNITS UP TO 5 TONS

A. Manufacturers: Carrier, Trane, York, McQuay or approved equal.

B. Units shall be provided that meet or exceeds the ASHRAE 90.1(2004 edition) energy efficiency requirements. Units that are labeled ENERGY STAR® will be acceptable. Minimum performance shall be 13 SEER.

C. Provide factory assembled, outdoor mounted, air-cooled condensing unit suitable for on grade or rooftop installation. Include compressor, air cooled condenser, refrigerant, lubrication system, interconnecting wiring, safety and operating controls, motor starting

components and additional features as specified herein or required for safe, automatic operation. Capacity as indicated in the equipment schedule. Refrigerant is to be R-22.

2.2 CABINET

A. Construct cabinet of heavy gauge, galvanized steel coated with weather resistant paint. Provide removable access panels to facilitate full access to the compressor, fan and control components.

2.3 COMPRESSOR

A. Provide hermetic scroll type compressor with built in motor winding temperature and current protection, liquid and suction service valves, gage ports, sight glass and liquid line filter dryer. Mount compressors on vibration isolators.

2.4 CONDENSER

A. Provide condenser coils with aluminum alloy plate fins mechanically fastened to seamless copper tubing with integral subcooler. Construct coils with design working pressure suitable for the refrigerant.

B. Provide direct-drive statically and dynamically balanced propeller type fans with vertical or horizontal discharge and guards constructed of heavy gage PVC coated wire or galvanized steel.

2.5 POWER WIRING

A. Provide factory installed 24-volt control circuit with fusing; control power transformer and all associated internal wiring. Provide a single point power connection to the unit. Provide factory installed magnetic contactors for compressor and condenser motors.

B. Electrical characteristics shall be as indicated in the equipment schedule.

2.6 CONTROLS

A. Coordinate the thermostat or control requirements with the air unit.

B. Provide high/low refrigerant pressure cutouts with manual reset and anti-short cycle compressor timer.

C. Unit must be capable of operating down to ambient temperature of 40 deg F. Provide low ambient lockout to prevent compressor from operating below 40 degrees.

2.7 REFRIGERANT PIPING SIZING

A. It is not the intent of this specification to require a hard piped system on small air cooled condensing units that are typically provided by the manufacturer with precharged tubing. If precharged tubing is available in the proper length, it may be used. In that case, use the manufacturer's standard liquid line refrigerant specialties also. If a field constructed refrigerant piping system is used, conform to the following pipe specification.

B. ASTM B88 type L hard drawn copper tube, cleaned and capped in accordance with ASTM B280, and marked "ACR", with ANSI B16.22 wrought copper or forged brass solder-type fittings.

2.8 REFRIGERANT PIPING SIZING

A. The unit manufacturer shall verify the final refrigeration pipe sizing process to insure conformance to specific unit requirements such as max lengths, refrigerant velocities, unloading considerations and proper oil return. This contractor shall provide refrigeration piping drawings from the field which details the way the piping will actually be installed.

2.9 REFRIGERANT PIPING ACCESSORIES

A. Provide all refrigerant piping specialties with a maximum working pressure of full vacuum to 450 psig and a maximum working temperature of 225 deg F.

B. Flexible pipe connectors: Double braided bronze hose flexible pipe connectors with solder end connections.

C. Solenoid Valves: Two way normally closed with two piece brass body, full port, stainless steel plug, stainless steel spring, teflon diaphragm and solder end connections. Provide replaceable coil assembly.

D. Thermostatic Expansion Valves: Brass body, bronze disc, neoprene seat, bronze bonnet, stainless steel spring and solder end connections.

E. Charging Valves: Provide ¼" SAE brass male flare access ports with finger tight, quick seal caps. Provide 2-inch long copper extension sections.

F. Check valves: Spring loaded type with bronze body, bronze disc, neoprene seat, bronze bonnet, stainless steel spring and solder end connections.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install units, piping and accessories in accordance with the manufacturer's written instructions and recommendations. Mount unit on roof mounted roof curbs where indicated on the drawings.

B. Maintain adequate service access and airflow clearances for all components as recommended by the manufacturer and as indicated on the drawings.

C. Charge unit(s) with full oil charge and refrigerant charge based on the entire refrigeration system pipe size and length.

D. Provide all control wiring in conduit.

E. Coordinate power wiring requirements with the electrical trade which is a subcontractor of the Mechanical Contractor.

3.2 STARTUP

A. Adjust units for maximum operating efficiency, adjust all controls to required final settings and demonstrate that all components are functioning properly. Submit a copy of a written startup report following the initial start up. Include in the report: work done to the system, all readings taken, a statement certifying that the refrigeration system(s) are leak free and a statement certifying that the unit(s) have been placed in proper running condition as recommended by the manufacturer and as intended in the drawings and specifications.

END OF SECTION

SECTION 23 82 00

HEATING AND COOLING UNITS

PART 1 G E N E R A L

1.1 SCOPE

A. This section includes specification for heating and cooling.

1.2 RELATED WORK

A. Related work includes:
1. Section 23 05 00 - Common Work Results for HVAC
2. Section 23 07 00 - HVAC Insulation
3. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC
4. Section 23 09 14 - Controls
5. Section 23 31 00 - Air Ducts
6. Section 23 33 00 - Air Duct Accessories.
7. Section 23 62 13 - Air Cooled Compressor and Condensing Units

1.3 REFERENCE STANDARDS

A. Reference standards include:
1. ARI 210 Standard for Unitary Air-Conditioning Equipment
2. ARI 410 Standard for Forced-Circulation Air-Cooling and Air-Heating Coils

1.4 SHOP DRAWINGS

A. Include dimensions, capacities, materials of construction, ratings, weights, wiring diagrams, and appropriate identification for all equipment in this section.

1.5 OPERATION AND MAINTENANCE DATA

A. All operations and maintenance data.

1.6 DESIGN CRITERIA

A. Forced Circulation Coils: Ratings certified in accordance with ARI 410.

B. Electrical Equipment and heaters shall be UL listed for the service specified.

C. Electrical components and work must be in accordances with National Electrical Code.

PART 2 P R O D U C T S

2.1 BLOWER COIL UNITS

A. Manufacturers: Carrier, Trane, York, McQuay or approved equal

2.2 GENERAL

A. Blower coil units shall be completely factory assembled including coil, condensate drain pan, fan, motor, filters and controls in an insulated casing that can be applied in horizontal or vertical configuration. The unit shall be provided with 4.2 “R” value insulation and additional sealing systems.

B. The unit ships in the vertical upflow configuration and convertible to horizontal right just by laying the unit on its side. Coil shall be capable of rotation to provide downflow or horizontal applications.

C. Units shall be UL listed.

2.3 CASING

A. Units shall have a sheet metal and steel frame construction and shall be painted with an enamel finish. Casing shall be insulated and knockouts provided for electrical power and control wiring.

B. Provide ducted units with air inlet and outlet duct collars.

C. Provide access doors in cabinet to allow maintenance of internal mechanical and electrical devices.

2.4 REFRIGERANT CIRCUITS

A. The units shall have a single refrigerant circuit. Refrigerant circuit shall be controlled by a factory installed non-bleed thermal expansion valve.

2.5 COIL

A. Aluminum fin surface shall be mechanically bonded to 3/8-inch OD copper tubing. Coils are factory pressure and leak tested.

2.6 FAN

A. Forward curved, dynamically balanced and statically balanced with 3-speed direct drive shall be standard, fan motor bearing shall be permanently lubricated.

2.7 CONTROLS

A. Low voltage pig tails, fan contactor, and plug-in module for accessory electric heat control shall be included.

2.8 ELECTRICAL CONNECTION

A. Electrical connection shall be a Circuit Breaker.

2.9 FILTERS

A. Furnish each unit with filter rack and 1" panel filters.

2.10 ELECTRIC HEATERS

A. Shall be provided with capacities and voltages and staging options as scheduled. Units shall be provided with plug-in control wiring. Heaters shall fit inside the internal compartment.

PART 3 E X E C U T I O N

3.1 INSTALLATION

A. Install units in accordance with manufacturer's installation instructions.

B. After installation, provide protective covers to prevent accumulation of dirt on units during balance of construction.

3.2 BLOWER COIL UNITS

A. Mount units in locations indicated on the drawings and as detailed.

B. Install a condensate drain from the cooling coil to the outside of the building. Provide a trap in the condensate drain line.

C. Make duct connection with flexible connections.

D. Pipe refrigerant piping from air cooled condensing unit to the blower coil cooling coil.

E. Suspended unit shall have spring hangers in the hanger rods.

F. Coordinate controls with control sequence specified in section 23 09 14.

G. Units will be wired by the Electrical Sub-Contractor as part of the mechanical work.

END OF SECTION