

**BATESTVILLE PUBLIC
WORKS FACILITY**

**Volume One of Two
Front End, Civil, Structural
&
Architectural**

Prepared for:

**City of Batesville
Batesville, Arkansas**




August 1, 2022



**ETC ENGINEERS & ARCHITECTS, INC.
1510 SOUTH BROADWAY
LITTLE ROCK, AR 72202**

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PROFESSIONAL CERTIFICATIONS

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Batesville Public Works Facility
Batesville, Arkansas

ETC Project Number 2106601CBATE

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END OF INDEX TO SPECIFICATIONS

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RE- ADVERTISEMENT FOR BIDS

The City of Batesville, Arkansas is extending the bid opening date for the construction of Batesville Public Works Facility Project to **August 18th, 2022**. The City of Batesville will receive sealed bids for the Project at City Hall **until 2:00 p.m. on August 18th, 2022**, at which time and place all bids will be publicly opened and read aloud.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, and Forms of Bid Bond, Performance and Payment Bond and other contract documents may be examined at the following locations:

ETC Engineers & Architects, Inc. 1510 South Broadway Little Rock, AR 72202	Southern Reprographics, Inc. Plan Room Services 901 West 7 th Street Little Rock, AR 72201
City Hall City of Batesville 500 E. Main Street Batesville, AR 72301	

Copies of the Contract Documents may be purchased from ETC Engineers & Architects, Inc., or at Southern Reprographics at a cost of One Hundred (\$100.00), non-refundable.

Obtaining contract documents through any source other than the Engineer/Architect listed above, or its representative(s) is not advisable due to the risks of receiving incomplete or inaccurate information, and the bidder runs the risk of basing bidder's proposal on such information. The documents obtained through the Engineer/Architect, or his representative(s) are considered to be the official version and takes precedence if any discrepancies occur. Bids will be accepted only from official bid document holders.

A certified check or bank draft, payable to the order of the City of Batesville, negotiable U.S. Government bonds (at par value), or satisfactory bid bond executed by the bidder and an acceptable surety in an amount equal to five (5%) of the total bid shall be submitted with each bid.

The City hereby notifies all bidders that this contract is subject to applicable labor laws, non-discrimination provisions, wage rate laws and other federal laws including the Fair Labor Standards Acts of 1938. The Work Hours Act of 1962 and Title VI of the Civil Rights Act of 1964 also apply.

Attention is called to the fact that not less than the minimum salaries and wages as set forth in the contract documents must be paid on the project, and that the contractor must ensure that employees and applicants for employment are not discriminated against because of their race, color, religion, sex or national origin.

The City reserves the right to reject any or all bids or to waive any informality in bidding. Bids may be held by the City for a period not to exceed Sixty (60) days from the date of opening of bids for the purpose of reviewing the bids and investigating the qualifications of bidders prior to awarding the contract.

City of Batesville
Mayor Elumbaugh

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SECTION 00004 - INFORMATION FOR BIDDERS

1. PROJECT SITE

The construction of the **City of Batesville Public Works Facility** to be accomplished by the contractor, is located in the City of Batesville, Batesville, Arkansas.

Work consists of the following: Construction of three buildings as shown on the plans fully functional, Utilities, Installation of Curb & Gutter, installing remaining Gravel Base as shown on the civil plans. Asphalt and Concrete Paving, Pavement Marking and signs. Erosion & Sediment Control, Sodding, etc.

2. NON-MANDATORY PRE-BID CONFERENCE

None

3. RECEIPT AND OPENING OF BIDS

The City of Batesville (OWNER) invites bids on the form attached hereto, all blanks of which must be appropriately filled in. Bids may be hand delivered to the City of Batesville, Public Works Facility, Batesville, Arkansas, at the time shown on the Advertisement for Bid", and then at said place publicly opened and read aloud. The envelopes containing the bids will be prepared as indicated below.

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 60 days after the actual date of the opening thereof.

4. PREPARATION OF BID

These contract documents include a complete set of bidding and contract forms which are for the convenience of bidders and are not to be detached from the contract documents, filled out or executed.

Each bid must be submitted on the prescribed bid form as well as accompanied by a Bid Bond. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures, and the foregoing certifications must be fully completed and executed when submitted.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form.

At the time of bid opening, the envelope containing the bid and bid bond will be opened and read aloud for the purpose of qualifying the bid. After all bids and required contract documents

have been thoroughly checked by the owner, the successful bidder will be announced and personally informed. Should a low bidder fail to execute all required documentation qualifying

his bid, the bid may be rejected, and the next lowest bidder awarded the work if he has qualified.

Envelope will be clearly marked as follows:

FROM: _____
(Name of Concern)

ADDRESS: _____
(Street or P.O. Box)
(City, State, Zip Code)

TO: City of Batesville
City Clerk/Treasurer

Construction at: **Batesville Public Works Facility**

To Be Opened: **August 18, 2022 at 2:00pm**

5. SUBCONTRACTS

The bidder is specifically advised that any person, firm or other party to whom it is proposed to award a subcontract, this contractor must possess a current Arkansas Contractors License* and must be able to obtain bonding, and must be acceptable to the owner.

6. FACSIMILE MODIFICATION

Any bidder may modify his bid by facsimile at any time prior to the scheduled opening time for receipt of bids, provided such facsimile is received by the owner prior to the opening time, and, provided further, the owner is satisfied that a written confirmation of the facsimile modification with the signature of the bidder was mailed prior to the bid opening time. The facsimile should not reveal the bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the owner until the sealed bid is opened. If written confirmation is not received within two (2) days from the bid opening time, no consideration will be given to the facsimile modification.

7. METHOD OF BIDDING

Method of bidding for the project will be as follows:

The proposal is defined as a "Lump Sum Contract". All bids are lump sum and to include all cost associated with the project for a complete turnkey construction.

Bidders must satisfy themselves of the accuracy of the quantities by examination of the site and a review of the drawings and specifications including Addenda.

After bids have been submitted, the bidder shall not assert that there was a misunderstanding concerning the quantities of work or the nature of the work to be done. No alternate bids will be considered unless alternate bids are specifically required by the contract documents.

8. QUALIFICATIONS OF BIDDER

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish the Owner all such information and data for this purpose as the owner may request. The owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids shall not be accepted.

9. BID SECURITY

Each bid must be accompanied by a certified check of the bidder, or a bid bond prepared on the form of bid bond attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the owner, in the amount of 5% of the bid. Such check or bid bond will be returned to all except the three lowest bidders within three days after the opening of bids, and the remaining check or bid bond will be returned promptly after the owner and the accepted bidder have executed the contract, or, if no award has been made within 60 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of this bid.

10. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds required within ten (10) days after he has received notice of the acceptance of this bid, shall forfeit to the owner, as liquidated damages for such failure or refusal, the security deposited with his bid.

11. TIME OF COMPLETION

Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" and to fully complete the project within **Two hundred seventy (270)** consecutive calendar days for thereafter.

12. LIQUIDATED DAMAGES FOR DELAY IN COMPLETION

As actual damages for any delay in completion of the work which the Contractor will be required to perform under the Contract are impossible to determine, the Contractor and his Sureties will be liable for and shall pay to the Owner the sum of \$250.00 as fixed, agreed and liquidated damages for each calendar day of delay from the date stipulated pursuant to the preceding paragraph.

13. CONDITIONS OF WORK

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provision of his contract. Insofar as possible, the contractor in carrying out his work must employ such methods or means as will not cause any interruption of or interference with the work or any other contractor.

14. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally. Every request for such interpretation should be in writing addressed to ETC Engineers & Architects, Inc. at 1510 South Broadway, Little Rock, Arkansas, 72202 RE: the **City of Batesville Public Works Facility**. To be given consideration, the request must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instruction will be in the form of written addenda to the contract documents which, if issued, will be mailed by certified mail with return receipt requested or sent by facsimile to all prospective bidders (at the respective addresses or fax numbers furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

15. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bonds shall be a duly authorized company satisfactory to the owner. The use of Arkansas Performance and Payment Bond (14-604 Arkansas Statutes, Rev. 1/76) is mandatory.

16. POWER OF ATTORNEY

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

17. NOTICE OF SPECIAL CONDITIONS

Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

1. Construction Schedule and Periodic Estimates
2. Payments to Contractor
3. Equal Employment Opportunity
4. Certification of Compliance with Air and Water Acts
5. Work by Others
6. Layout of Work
7. Construction Sequence, Maintenance of Traffic, and Maintenance of Access to Individual Properties
8. Contract to Check Plans and Schedules
9. Maintenance Bonds
10. Testing Laboratory Services

18. LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the

same as though herein written out in full.

19. METHOD OF AWARD - LOWEST QUALIFIED BIDDER

If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds available to finance the contract, the contract will be awarded on the base bid only. If such bid exceeds such amount, the owner may reject all bids.

20. OBLIGATION OF BIDDER

At the time of the opening of bids each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect of this bid.

21. SAFETY STANDARDS AND ACCIDENT PREVENTION

With respect to all work performed under this contract, the contractor shall:

- a. Comply with the safety standards provisions of applicable laws, building and construction codes and the Manual of Accident Prevention in Construction: published by the Associated General Contractors of America, the requirements of the Occupation Safety and Health Act of 1970 (Public Law 91-596 and the requirement of Title 29 of the Code of Federal Regulations, Section 1518 as published in the Federal Register, Volume 36 No. 75, Saturday, April 17, 1971).
- b. Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.
- c. Maintain at his office or other well-known place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees), who may be injured on the job site.

22. ARKANSAS STATE LICENSING LAW

- a. Attention of bidders is particularly called to the requirements that all bidders must be in compliance with the requirements of Act 150 of 1965 of the State of Arkansas, effective June 3, 1965, which is the current Arkansas State Licensing * Law for Contractors.
- b. Each bidder submitting a bid to the owner for any portion of the work contemplated by the documents of which bidding is based shall execute and include in the submission of the bid, a certification substantially in the form herein provided to the effect that he has a current Arkansas State Contractor's License* in compliance with the requirements of the aforementioned law.

END OF SECTION

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BID PROPOSAL

Bid Time: 2:00 PM
Bid Date: August 18th, 2022
Location: Batesville, Arkansas

BID TO: City of Batesville

PROJECT: Batesville Public Works Facility

Ladies & Gentlemen:

1. The undersigned bidder, in compliance with your request for bids for the above referenced project, having examined specifications, related documents, and site of the proposed project, hereby proposes to construct the City of Batesville Public Works Facility as described in the specifications contained in this solicitation for bids. These prices entered under "Total Bid" are for a complete turnkey project inclusive of all labor and materials and are to cover the specified equipment and delivery charges as stipulated in the scope of work. Having carefully examined the Contract Documents for this project, as well as the premises and all conditions affecting the proposed construction, the undersigned proposes to provide all labor, materials, services, and equipment necessary for, or incidental to, the construction of the project in accordance with the Contract Documents including the general conditions within the time set forth:

Lump Sum Base Bid

\$ _____
Dollar Amount Is To Be Shown Numerically

Dollar Amount Is To Be Shown Alphabetically

2. Ark. Code Ann. § 22-9-212 requires the contractor to indicate on this bid form the cost of Trenching Safety Systems. FAILURE TO SHOW THIS COST WILL INVALIDATE THE BID. (NOTE THIS COST SHALL BE INCLUDED IN THE ABOVE BASE BID)

(_____)
Dollar Amount Is To Be Shown Numerically.

3. Completion Date: Bidder agrees that the work will be complete and ready for final payment in accordance with the Contract Documents within **Two Hundred Seventy (270)** consecutive calendar days.
4. The undersigned, in compliance with the Contract Documents for the construction of the above-named project, does hereby declare:
 - a. That the undersigned understands that the Owner reserves the right to reject any and all bids and to waive any formality.

- b. If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds available to finance the contract, the contract will be awarded on the base bid only. If such bid exceeds such amount, the owner may reject all bids or accept one or more deductive bid alternates to determine the lowest base bid.
- c. That if awarded the Contract, the undersigned will enter into an Agreement, on a form identical to the form included in the Contract Documents and execute required performance and payment bonds within Seven (7) days after receipt of the Intent to Award, will commence work within 10 (10) days after the date of the Notice to Proceed, and will complete the Contract fully within **Two Hundred Seventy (270)** consecutive calendar days for thereafter. Should the undersigned fail to fully complete the work within the above stated time, he shall pay the Owner as fixed, agreed and liquidated damages and not as a penalty, the sum of **Two Hundred Fifty Dollars (\$250.00)** for each calendar day of delay until the work is completed or accepted.
- d. The undersigned further agrees that the bid security payable to Owner and accompanying this proposal shall become the property of the Owner as liquidated damages if the undersigned fails to execute the Contract or to deliver the required bonds to the Owner within Seven days from receipt of the Intent to Award as these acts constitute a breach of the Contractor's duties.
- e. That this bid may not be withdrawn for a period of 60 days after the bid opening.
- f. The undersigned understands that the Owner's intent is to construct all facilities proposed within the limits established by the funds appropriated for the project.
- g. Bids submitted by a Joint Venture/Joint Adventure shall be signed by representatives of each component part of the Joint Venture. The licenses of each component part of the Joint Venture shall also be listed in the bid submittal. Therefore, joint venture bidders shall indicate at least two (2) signatures and two (2) licenses numbers on the Bid Form.

Exception: Joint Ventures who have been properly licensed with the Arkansas Contractors Licensing Board as a Joint Venture need only to indicate the joint venture license number on the Bid Form. Joint Venture Bidders shall indicate at least two (2) signatures on the bid form even if they are licensed as a joint venture.

5. The following documents are attached to and made a condition of this Bid.

- a. Bid security.

6. The undersigned acknowledges receipt of and inclusion as a part of the Contract Documents the following addenda:

No. _____	Dated _____
No. _____	Dated _____
No. _____	Dated _____

7. LISTING OF ALL SUBCONTRACTORS INCLUDING MECHANICAL, PLUMBING,
ELECTRICAL AND ROOFING SUBCONTRACTORS

All subcontractors including mechanical, plumbing, electrical and roofing subcontractors shall be listed regardless of qualifications, licenses or work amount.

Indicate the Name(s) and Address, of each entity performing the listed work:

_____ License No: _____
Is the amount of work \$20,000.00 or over: Yes ___ No ___

_____ License No: _____
Is the amount of work \$20,000.00 or over: Yes ___ No ___
Respectfully Submitted:

_____ License No: _____
Is the amount of work \$20,000.00 or over: Yes ___ No ___

_____ License No: _____
Is the amount of work \$20,000.00 or over: Yes ___ No ___
Respectfully Submitted:

Name of Bidder (Typed or Printed)

Address

BY: (Signature and Title)

Contractor's License Number or Contractor's
(Joint Venture) License Number(s)

Telephone Number Fax Number

Federal ID Number or SSN#

Date of Bid

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BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
_____ as Principal, and _____
_____ as Surety, are hereby held and firmly bound unto, City of Batesville, Arkansas, as
OWNER in the penal sum of five percent (5%) for the payment of which, well and truly to be
made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators,
successors and assigns. Signed this _____ day of _____, 2022.

The condition of the above obligation is such that whereas the Principal has submitted to the
City of Batesville a certain BID, attached hereto and hereby made a part hereof to enter into a
contract in writing, for the Upgrades on the City of Batesville Public Works Facility.

NOW THEREFORE

- (a) If said BID shall be rejected, or in the alternate.
- (b) If said BID shall be accepted and the Principal shall execute and deliver a
contract in the Form of Contract attached hereto (properly completed in
accordance with said BID) and shall furnish a BOND for his faithful performance
of said contract, and for the payment of all persons performing labor or furnishing
materials in connection therewith, and shall in all other respects perform the
agreement created by the acceptance of the said BID.

then this obligation shall be void, otherwise the same shall remain in force and effect; it being
expressly understood and agreed that the liability of the Surety for any and all claims hereunder
shall, in no event, exceed the penal amount of the obligation as herein stated.

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

IMPORTANT Surety companies executing bonds must appear on the Treasurer Department's
most current list (Circular 570, as amended) and be authorized in accordance with Section 22 of
the General Conditions to transact business in the State of Arkansas.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals,
and such of them as are corporations have caused their corporate seals to be hereto affixed
and these presents to be signed by their proper officers, the day and year first set forth above.

Principal

Surety

By: _____

Seal

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CITY OF BATESVILLE, ARKANSAS

NON-COLLUSION AFFIDAVIT

I, _____, an authorized agent for _____, concerning a bid, proposal or contract with the City of Batesville, Arkansas, for _____, and being of lawful age, being first duly sworn on my oath, swear, that this Affidavit is true and correct. Further, I swear that neither I nor the firm, company or corporation or any other employee for whom I am authorized agent in this matter, has not been a party to any collusion among bidders or other competitors in restraint of freedom of competition by any agreement to bid at a fixed price or to refrain from bidding; or with any state, county, city or public works authority official or employee as to quantity, quality or price in this prospective contract; or any other terms of said prospective contract; or with any discussion between other competitors and any official of the awarding agency concerning the exchange of money or other thing of value for special consideration in the letting of this bid, proposal or contract.

Authorized Agent Signature

Subscribed and sworn before me this _____ day of _____, 2022.

Notary Public

My commission expires: _____

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CITY OF BATESVILLE, ARKANSAS

NON-KICKBACK AFFIDAVIT

I, _____, an authorized agent for _____, concerning a bid, proposal or contract with the City of Batesville, Arkansas, for _____, and being of lawful age, being first duly sworn, on my oath, swear that this Affidavit is true and correct. Further, I swear that the work, services or materials as described by this invoice or other billing claim, have been delivered, completed or supplied in accordance with the plans, specifications, orders, requests or contract furnished or executed by the affiant. I further swear that no payment, promise of payment or other valuable consideration, directly or indirectly, has or will be made to any elected official, officer or employee of the awarding agency to obtain payment of this claim, or to procure the contract or purchase order pursuant to which this claim is submitted.

Authorized Agent Signature

Subscribed and sworn before me this _____ day of _____, 2022.

Notary Public

My commission expires: _____

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AGREEMENT

THIS AGREEMENT made this _____ day of _____, 2022, by and between, _____ (a corporation organized and existing under the laws of the State of Arkansas) hereinafter called the "Contractor" and the City of Maumelle, Arkansas an agency thereof hereinafter called the "Owner".

WITNESSETH:

That the Contractor and the Owner for the consideration stated herein mutually agrees as follows:

ARTICLE 1. Statement of Work. The Contractor shall furnish all supervision, technical personnel, labor, materials, machinery, tools, equipment, incidentals and services, including utility and transportation services and perform and complete all work required for "City of Batesville Public Works Facility, in strict accordance with the Contract Documents, as prepared by the Engineer.

ARTICLE 2. The Contract Price is \$ _____. The Owner will pay the contractor, because of his performance of the Contract, for the total quantities of work performed at the lump sum and unit prices stipulated in the Proposal, subject to additions, and deductions as provided in the Section entitled "CHANGES IN THE WORK" under GENERAL CONDITIONS.

ARTICLE 3. Contract Time. The Contractor agrees to begin work within ten (10) calendar days after issuance by the Owner of a "Work Order" or "Notice to Proceed" and to complete the work within **Two Hundred Seventy (270) consecutive** calendar days thereafter (except as modified in GENERAL CONDITIONS of these Contract Documents). If the Contractor shall fail to complete the work within the time specified, he and his Surety shall be liable for payment to the Owner, as liquidated damages ascertained and agreed, and not in the nature of a penalty, the sum of **Two Hundred Fifty Dollars (\$250.00)** for each day of delay. To the extent sufficient in amount, liquidated damages shall be deducted from the payments to be made under this Contract.

ARTICLE 4. Contract. The executed Contract Documents shall consist of the following:

- a. This Agreement
- b. Advertisement for Bids
- c. Information for Bidders
- d. Bid Proposal
- e. General Conditions
- f. Technical Specifications

This Agreement, together with other Documents enumerated in this Article 4, which said other Documents are as fully a part of the Contract as if hereto attached to herein repeated, form the Contract between the parties hereto. In the event that any provisions in any component part of this Contract conflicts with any provision of any other component part, the conflict shall be resolved by the Engineer whose decision shall be final.

ARTICLE 5. Surety. The Surety on the Performance-Payment Bond shall be a surety company of financial resources satisfactory to the Owner and authorized to do business in the State of Arkansas.

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed in four (4) counterparts, each of which shall be considered an original on the day and year first above written.

ATTEST:CONTRACTOR

(Contractor)

Title

By: _____

(Owner)

City of Batesville

By: _____
(Mayor)

NOTICE TO PROCEED

To:

Date:

Project: City of Batesville Public Works
Facility

You are hereby notified to commence WORK in accordance with the Agreement dated _____, on or after _____.

The date of completion of all WORK is _____, 2022.

ETC Engineers & Architects, Inc.:

By: _____

Title: Project Manager

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by
this the day of , 2022.

Contractor _____

By: _____

Title: _____

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Arkansas Statutory Payment and Performance Bond

We _____, as Principal, hereinafter called Principal, and _____ authorized to do business in the State of Arkansas, as Surety, hereinafter called Surety, are held and firmly bound unto _____ as Obligee, hereinafter called Owner, in the amount of _____ Dollars (\$ _____), for the payment whereof Principal and Surety bind themselves, their heirs, personal representatives, successors and assigns, jointly and severally, by these presents.

Principal has by written agreement dated _____ entered into a contract with Owner for which contract is by reference made a part hereof and hereinafter referred to as the Contract.

City of Batesville Public Work Facility

THE CONDITION OF THIS OBLIGATION is such that if the Principal shall faithfully perform the Contract on his part and shall fully indemnify and save harmless the Owner from all cost and damage which he may suffer by reason of failure to do so and shall fully reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any such default, and further, that if the Principal shall pay all persons all indebtedness for labor or materials furnished or performed under said Contract, failing which such persons shall have a direct right of action against the Principal and Surety, jointly and severally, under this obligation, subject to the Owner's priority, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

No suit, action or proceeding shall be brought on this bond outside the State of Arkansas. No suit, action or proceeding shall be brought on this bond except by the Owner after six months from the date final payment is made on the Contract, nor shall any suit, action or proceeding be brought by the Owner after two years from the date on which the final payment under the Contract falls due.

Any alterations which may be made in the terms of the Contract, or in the work to be done under it, or the giving by the Owner of any extension of time for the performance of the Contract, or any other forbearance on the part of either the Owner or the Principal to the other shall not in any way release the Principal and the Surety or Sureties, or either or any of them, their heirs, personal representatives, successors or assigns from their liability hereunder, notice to the Surety or Sureties of any such alteration, extension or forbearance being hereby waived.

In no event shall the aggregate liability of the Surety exceed the sum set out herein.

Executed on this _____ day of _____, 20____

Principal

Surety Agent

Attorney-in-Fact

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 **AIA**® Document A201™ – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

Public Works Facility,
Batesville, Arkansas

THE OWNER:

City of Batesville, Arkansas
500 E. Main Street
Batesville, AR 72301

THE ARCHITECT:

ETC Engineers & Architects, Inc.
1510 S. Broadway
Little Rock, AR 72202

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ADDITIONS AND DELETIONS:

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

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents in the Agreement between the Owner and Contractor (hereinafter the Agreement) consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), the Contractor's bid or proposal, General Requirements, Invitation to Bid, Drawings, Specifications, Addenda, Notifications to Proceed and any changes in the Work approved by the Owner and Contractor issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work (as defined in section 7.4) issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

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

§ 1.1.2.1 The Owner and the Contractor hereby commit themselves to good faith negotiation, coordination, and cooperation to assure the timely completion of the Project.

§ 1.1.3 The Work

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

§ 1.1.4 The Project

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

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location, dimensions, and character of the Work, generally including but not limited to plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

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

§ 1.1.7 Instruments of Service

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

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith. At the Owner's sole discretion, the Initial Decision Maker may be replaced at any time, for any reason. If the Initial Decision Maker is replaced, notice shall be provided.

§ 1.1.9 Contractor

See 3.1.1 for definition.

§ 1.1.10 Damages for Untimely Performance

Damages for Untimely Performance is a monetary amount to be paid by the Contractor to the Owner, based on anticipated real costs which the Owner will incur, due to the Contractor's failure to complete the Work within the allowable time identified in the Contract Documents.

§ 1.1.11 Delay

A Delay is an event that causes an increase in the duration of the Project, or that changes the sequence of the Work or individual Work activities, thereby preventing completion of the Project within the time period specified in the Contract Documents.

§ 1.1.12 Equal

Equal means material, equipment or methods proposed and warranted by the Contractor as being equivalent to essential attributes of the material, equipment or method specified in the Contract Documents, and approved by the Architect and Project Representative.

§ 1.1.13 Notice To Proceed

Notice to Proceed is a written notice provided by the Owner to the Contractor authorizing the Contractor to proceed with the Work and establishing the date for completion of the Work.

§ 1.1.14 Owner

The Owner is the Board of Regents of the University of Wisconsin. The Board of Regents of the University of Wisconsin System exercises the powers and duties prescribed by Wis. Stat. § 16.855. The terms "Board," "Board of Regents," or "The Board of Regents" as used in this document also refer to the Owner.

§ 1.1.15 Reserved

§ 1.1.16 Project Representative

Project Representative is the person or persons delegated authority to act on behalf of the Owner. The Project Representative will be designated in writing. Owner reserves the right to change its designated Project Representative at any time for any reason. If the Project Representative is changed, notice shall be provided. The Project Representative may, upon written notice, delegate part of their responsibilities to the Architect or Contractor.

§ 1.1.17 Project Schedule

The Project Schedule is a graphic and written analysis of activity duration and sequencing, which is required for successful completion of the Project within the time period identified in the Contract Documents.

§ 1.1.18 Shop Drawing

See 3.12.1 for definition.

§ 1.1.19 Subcontractor

The Subcontractor means a person or firm who enters into a contract with the Contractor or a Subcontractor to perform a portion of the Work. Unless otherwise specifically provided, the term Subcontractor includes Subcontractors of all tiers.

§ 1.1.20 Submittal

Submittals includes Shop Drawings, Product Data, Samples, etc submitted by the Contractor to the Architect regarding some portion of the Work.

§ 1.1.21 Substantial Completion

Substantial Completion is the stage in the progress of the Work when the Project Representative determines that the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Project, or designated portion thereof, can be occupied and used for its intended purpose. A Certificate of Occupancy shall precede the Substantial Completion, when a Certificate of Occupancy is part of the Project.

§ 1.1.22 Substitution

Substitution means the use of material or equipment not specified in the Contract Documents, but that the Contractor proposes and warrants as suitable for the use intended and conforms to all other physical, functional, and performance requirements of the Contract Documents.

§ 1.1.24 Surety

Surety is a person or entity licensed to do business in the State of Wisconsin, who provides separate performance bonds and payment bonds to a Contractor to indemnify the Owner against all damages suffered by failure of the Contractor to perform the Work and to pay all lawful claims of Subcontractors, Material Suppliers, and laborers.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all labor, materials, and equipment necessary for the proper execution and completion of the Work with the standard of quality established by the Contract Documents and within the allowable time period specified. The Contract Documents are complementary, with technical provisions set forth in the Specifications and complemented by the Drawings and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. The failure of the Contractor to account for all aspects of the Work in its bid shall not relieve the Contractor from performing the Work.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract. In the event of any conflict between the terms of this Contract and any provision of law, the provision of law shall control, and the parties hereto shall not be free to Contract contrary to law.

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

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

§ 1.2.4 Conflicting Conditions

§ 1.2.4.1 The Architect shall take all reasonable steps to assure that the Contract Documents are as accurate as possible, and provide information which, in the opinion of the Architect, is necessary in preparing bids and constructing the Project. However, it is mutually understood that discrepancies or conflicts in the Contract Documents may be identified, in which case:

- .1 Amendments and addenda take precedence over the Specifications;
- .2 The Specifications take precedence over the Drawings;
- .3 Stated dimensions take precedence over scaled dimensions;
- .4 Large-scale detail drawings take precedence over small-scale drawings; and
- .5 Schedules take precedence over other data on the plans.

§ 1.2.4.2 Architect has the right for first interpretation of any ambiguity in the Contract Documents. Ambiguities in the Contract Documents will be resolved by the Owner if the Contractor and Architect cannot come to an agreement.

§ 1.2.4.3 Where the terms "A/E," "Architect/Engineer," "Architect," or "Engineer" are used in technical Sections of the Specifications, the Contractor shall understand that actions indicated to be accomplished by such named parties are actions which are solely the responsibility of the professional technical advisor and consultant to the Owner

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and such actions thus require final approval by the Owner.

§ 1.2.4.4 Periodically, the Architect may provide the Contractor additional instructions and drawings necessary to perform the Work. The Architect shall make a good faith effort to coordinate such instructions and drawings with the Contract Documents, preparing them so they can be reasonably interpreted as a part thereof. If such additional instructions change the scope of Work, provisions of Article 7, Changes in the Work, shall be followed.

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Drawings, Specifications, and other Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the reserved ownership rights. All Drawings and Specifications, renderings, models, scale details, approved copies of shop drawings and other such documents prepared by the Architect or any consultant for this Project shall become the property of Owner on completion and/or acceptance of the work, or upon any basis of termination of the Contract.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and, if necessary, the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission when there is proof that the notice was read by the recipient.

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

§ 1.6.3 The Contractor's presentation to Project Representative, or mailing, of such Notice to Project Representative is a condition precedent to any liability of the Owner for any actual or alleged breach of the Owner's contractual obligations hereunder. The Contractor's failure to give such written Notice in the manner and time prescribed by the Contract Documents shall result in the waiver of any and all claims, demands and causes of action that the Contractor may have against the Owner arising from or in connection with the actual or alleged breach.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties may use AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data. In lieu of separate agreed upon digital form protocols, or the AIA E203, industry accepted standards shall govern the digital communication of data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA

Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees. If Building Information Model and AutoCAD protocols are not established with the preceding, protocols will default to State of Wisconsin Department of Administration protocols.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. It is the intent of the Owner to provide, to extent possible, a single point of contact and communication for the Contractor to facilitate efficient, timely, and cost-effective completion of the Work. The Owner shall designate in writing a Project Representative, who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization (unless the Contract Documents specifically identify another party responsible for the Owner's activities). Changes to these Contract Documents that modify the General Conditions, Contract cost, and/or Contract time shall only be executed by a person duly authorized with signatory authority by the Board of Regents of the University of Wisconsin System. Person(s) with signatory authority will be identified for the Contractor.

(Paragraphs deleted)

§ 2.3 Information and Services Required of the Owner

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

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture or engineering, or an entity lawfully practicing architecture or engineering, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall exercise proper precautions relating to the safe performance of the Work.

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

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

§ 2.3.7 The Owner shall furnish surveys described in Section 2.3.4 and other information prepared by third parties for the Project to the extent the Owner deems necessary for the performance of the Contractor's services, and shall not withhold any reasonable information. The Owner makes no representations or warranties as to the accuracy of the information it obtains from third parties and provides to the Contractor pursuant to this Section 2.3. In addition, the Owner may provide the Contractor access to the Owner's records, which may contain information about the site and adjacent land and improvements that was not collected specifically for the Project. The Owner makes no representations as to the relevance, accuracy or completeness of information made available to the Contractor from the Owner's records.

§ 2.3.8 The Contractor shall attend a Pre-Construction Meeting, which will be scheduled by the Project Representative and Architect.

§ 2.3.9 The Project Representative or Architect will schedule progress meetings with the Contractor. At each such progress meeting, the parties will discuss the above-mentioned items, cooperate with others to assure successful completion of the Work, and help to quickly resolve problems which arise.

§ 2.4 Owner's Right to Stop the Work

In the event that any of the Work in progress, or Work already completed by the Contractor, or Subcontractors, is determined by the Project Representative to be of substandard quality, defective, or otherwise in violation of requirements of the Contract Documents, or if the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails or refuses to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4.1 The Contractor shall have ten (10) calendar days after the serving of such Notice within which to take corrective action or to make arrangements judged satisfactory by the Project Representative for the corrections to be made. If corrective actions or other arrangements are not judged satisfactory by the Project Representative, the Owner may terminate the Contract in accordance with the provisions of the General Conditions of the Contract.

§ 2.4.1.1 If, after suspension of the Work, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the suspension or termination had been issued for the convenience of the Owner under the Contract.

§ 2.4.2 The Project Representative may order the Contractor, in writing, to suspend or delay all or any part of the Work of the Contractor for the period of time that the Project Representative determines appropriate for the convenience of the Owner.

§ 2.4.2.1 If the Contractor determines that the cost of the Work is altered by such suspension, or the time for completion of such Work is altered or delayed, the Contractor shall provide Notice to the Project Representative of any such costs or delay;

§ 2.4.2.2 Such Notice shall be made within ten (10) calendar days of the order to stop or suspend Work;

§ 2.4.2.3 Provision of such Notice to the Project Representative shall be a condition precedent to any Owner liability for increased costs, delay, or time extension.

§ 2.4.3 The Owner may exercise any and all rights or remedies provided for herein, by law or in equity, either concurrently or singly in its sole discretion.

§ 2.5 Owner's Right to Carry Out the Work

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

§ 2.6 Owner's Responsibility For The Site

§ 2.6.1 Prior to start of construction, the Owner shall furnish all land and rights-of-way necessary for the carrying out and completion of the Work to be performed under this Contract.

§ 2.6.2 Reserved.

§ 2.6.3 Reserved.

§ 2.6.4 The Project Representative shall act on any Notice as soon as practicable. If the Project Representative determines that the conditions reported by the Contractor differ materially from those indicated in the Contract Documents, or are of an unknown and unusual nature which could not have been discovered during a reasonable site investigation by the Contractor, then to the extent established by the Contractor and approved by the Project Representative, the Project Representative shall authorize an increase or decrease in the cost or time required for performing any part of the Work under this Contract.

§ 2.6.5 No request by the Contractor for an equitable adjustment to the Contract shall be allowed, unless the Contractor gives proper Notice, which is a condition precedent to any liability on the part of the Owner.

§ 2.6.6 In no event shall any claim by the Contractor for equitable adjustment to the Contract for differing site conditions be allowed if presented after final payment under this Contract is made.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative. The Contractor is any individual, firm, corporation, or other non-governmental organization that, enters into a contract with the Owner to perform all work as required by the Contract Documents and enters into Contracts with Subcontractors including mechanical, electrical, plumbing and fire protection subcontractors identified by the Owner during the Single Prime bidding process. The term Contractor does not include the Owner or the Architect. The term Sub-subcontractor shall be equivalent to the term Subcontractor for all provisions of this Contract.

§ 3.1.1.1 By accepting this Agreement, the Contractor agrees that scheduling, coordination, and monitoring activity for all Work will be placed under the direct control and supervision of a person experienced in construction scheduling, means and methods. If such experience and knowledge must be obtained by contracting with a separate scheduling consultant, the entire cost of such consultant shall be borne by the Contractor. Additionally, the Contractor fully agrees to cooperate in all respects with all Subcontractors and suppliers to provide all data required, and shall coordinate the activities of its own workforces and the Work forces of the Subcontractors, in such manner and at such time as to not cause a delay in the Project

§ 3.1.1.2 The Contractor's bid price shall include the performance of all Work which:

- .1 in accordance with industry standards, customary practice, or by reasonable inference are details of Work that are necessary as part of the construction, operation, and coordination and interface of the Work;
- .2 would necessarily be readily apparent to one skilled in the trades; and
- .3 a component and experienced Contractor would recognize as part of its responsibility.

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

§ 3.1.2.1 The Contractor has the full and complete responsibility for the accomplishment of all Work within the specified time indicated in the Contract Documents, except where the Contract Documents explicitly and specifically place a limited duty for completion on the Owner.

§ 3.1.2.2 The Contractor is hereby put on notice that failure to furnish data or cooperate in good faith is a material breach of Contract and may be the basis for a termination for cause under the procedures set forth in these General Conditions. In such cases the Project Representative, in addition to, and not in lieu of the right to termination for default, may acquire the services of a scheduling specialist to perform any such duties and charge the cost thereof to the Contractor. In the event that the Project Representative is required to acquire any replacement scheduling services, the Contractor shall conform to any revised schedule resulting therefrom.

§ 3.1.2.3 In addition to the criteria set forth in these General Conditions, the full and complete performance of duties required to be performed under this Contract is a condition precedent to the right of the Contractor to payment of any sums due. In the event of any delays by the Contractor or other breach hereof which gives rise to penalties and/or damages to the Owner, then in any such event the Project Representative may offset such penalties and damages against the sums due or to become due the Contractor hereunder.

§ 3.1.2.4 Contractor's obligation for inspection and quality control shall be as provided for these General Conditions.

§ 3.1.2.5 Any Work necessary to be performed after regular working hours, on Sundays, or legal holidays, and for which the Contractor is responsible, shall be performed without additional expense to the Owner.

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

§ 3.1.3.1 In the event it becomes necessary to interpret this Article 3.1.3, the interpretation shall strive to achieve timely, effective and efficient performance of the Work under the Contract within the allowable time identified in the Contract Documents, and at no extra cost or inconvenience to any party, if at all possible.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.1.1 The Contractor is responsible for and hereby acknowledges that it has taken the steps reasonably necessary to prepare a bid which includes the costs for Work, the requirement for which would reasonably be known to a competent Contractor, in overcoming normal subsurface conditions at the site where the Work is to be performed and in order to accomplish the Work described in the Contract Documents. Additionally, the Contractor certifies that it has investigated the site and satisfied itself as to the general and local conditions which affect the Work or its cost, including, but not limited to:

- .1 Conditions bearing upon transportation, disposal, handling, and storage of materials;
- .2 The availability of labor, water, electric power, and roads or access;
- .3 Uncertainties of weather, river stages, tides, or similar physical conditions at the site;
- .4 The conformations and conditions of the ground; and
- .5 The character of facilities and equipment as represented by the Contract Documents.

§ 3.2.1.2 The Contractor also acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from a non-exploratory, visual inspection of the site, and information included in the Contract Documents.

§ 3.2.1.3 Any failure of the Contractor to take the actions described and acknowledged in will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the Work, or for proceeding to successfully perform the Work without additional expense to the Owner.

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§ 3.2.1.4 The Owner assumes no responsibility for any erroneous conclusions or interpretations made by the Contractor based on the information made available by the Owner. The Owner expects the Contractor to have the ability to interpret provided technical information, including geotechnical information, which would be reasonably analyzed or interpreted by any bidder knowledgeable and skilled in the work required by the bid. If the Contractor does not have the ability to interpret or analyze such information, it is the responsibility of the Contractor to obtain the professional services required to perform such analysis. The Owner assumes no responsibility for any understanding reached or representation made concerning conditions which can affect the Work by any of its officers, representatives, or agents before the execution of this Contract, unless that understanding or representation is expressly stated in the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect and Project Representative any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect or Owner may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

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

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall (1) give timely notice to the Project Representative and Architect; (2) shall propose alternative means, methods, techniques, sequences, or procedures; and (3) not proceed with that portion of the Work until the Contractor is satisfied such work can be performed safely and has received Notice from the Project Representative. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

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

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

§ 3.3.3.1 The Contractor shall, except where a provision of the Contract Documents explicitly states to the contrary, have the full, complete, and absolute responsibility and obligation for insuring that the Work performed by the Contractor and Subcontractors strictly conforms to the requirements set forth in the Contract Documents. The Contractor shall maintain an adequate inspection and quality control system and shall perform such inspections as will ensure that the Work performed under this Contract conforms to the requirements of the Contract Documents.

§ 3.3.3.2 At the Pre-Construction Meeting, the Contractor shall provide the Project Representative a full description of the Contractor's safety, quality control and inspection system and method of implementation.

§ 3.3.3.3 Prior to the start of significant on-site work by any trade, Project Representative, the Contractor's Superintendent and the Subcontractor's foremen, shall conduct a pre-installation conference. The purpose of the meeting is to review and discuss Contract requirements applicable to the work, samples required, level of quality necessary, and find answers to any questions that may arise. Such meeting is in addition to regularly-scheduled progress meetings and will be arranged on-site by Project Representative.

§ 3.3.3.4 The Contractor shall maintain complete inspection records and test data to ensure that quality of the Work is in strict compliance with the terms of the Contract Documents. These records shall be available to the Project Representative at all reasonable times and places. The doctrine of "substantial conformity" to the quality requirements of the Contract Documents shall have no application, unless the Project Representative accepts the Work in accordance the conditions of the Contract.

§ 3.3.3.5 The Owner reserves the right to conduct its own quality assurance verification, and to observe, inspect, and /or conduct tests relative to Contractor and Subcontractor performance. If, when conducting its own quality assurance program, the Owner determines that the Work or a portion thereof does not comply with requirements of the Contract Documents, the Owner shall attempt to notify the Contractor of such deficiencies as soon as practicable. However, the Owner's exercise of rights under this provision does not:

- .1 Relieve the Contractor of the responsibility for providing adequate inspection and quality control measures or the proper documentation of the occurrence of the events required to be tested or monitored in the performance of the Work required by the Contract Documents; and shall provide no basis for waiver or estoppel claims to be asserted against the Owner;
- .2 Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;
- .3 Constitute or imply acceptance on the part of the Owner; or
- .4 Affect the continuing rights of the Owner after acceptance of the completed Work, except as specifically stated to the contrary in the Contract Documents.

§ 3.3.3.6 The presence or absence of the Project Representative does not relieve the Contractor from any Contract requirement. If the Contractor desires waiver of any technical or Contract requirement or any other deviation from the strict requirements of the Contract Documents, a specific request for such waiver or deviation must be made to the Project Representative and Architect for consideration.

§ 3.3.3.7 The Contractor shall, without charge, replace or correct Work found not to conform to the Contract Document requirements, unless the Owner agrees to accept the non-conforming Work with an appropriate adjustment in the Contract price thereof. Such acceptance of non-conforming Work shall, whether the determination is to be made at the time of final completion or during the performance of Work, be based upon a determination by the Owner that the deviation from Contract Documents requirements does not adversely affect the integrity of completed Work.

§ 3.3.3.9 Unless otherwise specified in the Contract, the Project Representative shall accept, as reasonably as practicable after completion and inspection, all Work completed under the Contract or that portion of the Work which the Project Representative determines can be accepted separately.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work within the specified time, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. No materials or supplies which are to become part of the Work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage, conditional sale contract, or other agreement by which a security interest is retained by the seller.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.2.1 It is not the intention of the Owner to limit or restrict competition by the use of any reference to a particular manufacturer, process, technique, catalog number or other identifying information. Such proprietary specifications are intended to establish a level of quality or the minimum essential requirements to which the Contractor must conform, unless more explicit restrictions are stated to apply.

§ 3.4.2.2 When the Contract Documents list performance or functional characteristics in connection with Work to be performed, these characteristics are mandatory for reasons of design. Use of any Substitution shall be subject to the prior written approval of the Architect.

§ 3.4.2.3 Material, equipment, or processes offered for use as a substitution may be proposed by the Contractor in writing. Such proposals shall guarantee the proposed Substitution to be capable of performing the duties of the originally specified material, equipment, or process. The Architect shall respond to any such proposal as soon as practicable, but in no case later than seven (7) working days after receipt of such proposal.

§ 3.4.2.4 It shall be the sole responsibility of the Contractor to provide all documentation, regardless of type or quantity, to clearly establish the qualifications of items proposed as Substitutions under this Contract. If the value of the Substitution is less than the item specified in the Contract Documents, then an equitable reduction of the price of the Contract shall be made.

§ 3.4.2.5 When Substitutions are approved by the Project Representative and incorporated into the Project by the Contractor, all costs incurred to 1) correct deficiencies in items, 2) provide for installation or hookup, or 3) to achieve performance specified in the Contract Documents, will be borne by the Contractor.

§ 3.4.2.6 Any substitute material or equipment installed by the Contractor without approval of the Project Representative shall be subject to immediate removal and all costs required to conform to the Contract Documents shall be borne by the Contractor.

§ 3.4.2.7 The Contractor shall assume all liability and responsibility for any changes in the Work or additional Work required to accommodate use of proposed and approved Substitutions. The Owner's approval of such Substitutions does not relieve the Contractor from the obligation to pay all additional costs resulting from their inclusion in the Work, even if additional costs or Work become apparent after execution of the change or installation of the Substitution. The Contractor's liability shall include payment of any additional costs incurred by the Owner, made necessary by, or directly connected to, such changes.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements, including substitutions not properly approved and authorized, may

be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect or Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

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

§ 3.5.3 The Contractor warrants to the Owner that all materials and supplies used in the Work are free from all liens, claims, or encumbrances, and good title to materials and supplies is retained by the Contractor and shall be conveyed prior to approval of final payment.

§ 3.5.4 Printed, signed copies of Manufacturer's warranties, which are required by the Contract Documents, shall be presented to the Project Representative prior to substantial completion.

§ 3.5.5 All warranties, including manufacturer's warranties and Contractor warranties, shall take effect on the date of Substantial Completion and shall remain in effect for a period of one (1) year thereafter, unless Contract Documents specifically require a different warranty period.

§ 3.5.6 If any part of the Work is declared Substantially Complete by the Project Representative, and the Owner takes possession of that portion of the Work before completion of the entire Project, the warranty for that portion of the Work shall continue for a period of one (1) year from the date of Substantial Completion for that portion of the Work, unless Contract Documents specifically require a different warranty period.

§ 3.5.7 The Contractor shall remedy, at the Contractor's expense, any defect in the Work. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to the Owner's property, whether controlled or owned, when the damage is the result of:

- .1 The Contractor's failure to conform to Contract Document requirements; or
- .2 Any defect in equipment, material, Workmanship, or design furnished by the Contractor or Subcontractors regardless of tier.

§ 3.5.8 The Contractor shall warrant any Work restored or replaced due to damage caused in fulfilling the terms and conditions of this Article 3.5, or during performance of any Work required by the Contract Documents. The Contractor's warranty with respect to Work repaired or replaced will run for one (1) year from the date of Substantial Completion of said repair or replacement.

§ 3.5.9 The Project Representative shall notify the Contractor, in writing, within a reasonable time after discovery of any failure, defect, or damage.

§ 3.5.10 If, after the receipt of a Notice of a claim under this warranty, the Contractor fails to remedy any failure, defect, or damage within a time judged reasonable by the Project Representative, the Project Representative shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage, at the Contractor's expense.

§ 3.5.11 All warranties under this Contract or in any related to this Contract, express or implied, shall be obtained for and shall be subject to direct enforcement by the Owner. The Contractor shall provide in each subcontract, or other purchase agreement, for the assignment to the Owner of all such warranties and for the right of enforcement by the Owner. In addition, if necessary the Contractor shall:

- .1 Obtain for the Owner's benefit all warranties that would be given in normal commercial practice;
- .2 Require all warranties to be executed, in writing, for the benefit of the Owner, if so directed by the Project Representative;
- .3 Enforce all warranties for the benefit of the Owner; and

- 4 Obtain for the Owner's benefit all warranties given by any Subcontractor, at any tier, if such warranty is in excess of the one (1) year warranty period set forth herein.

§ 3.5.12 Unless a defect is caused by the negligence of the Contractor or Subcontractors at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Owner.

§ 3.5.13 The Contractor shall require any Subcontractor manufacturers, or suppliers to execute their warranties, in writing, directly to the Owner.

§ 3.6 Taxes

The Contractor shall pay all sales, consumer, use, and other similar taxes required by law assessed to or arising out of the construction of the Project. Per 2017 Wis. Stat. § 77.54 (9m), building materials sold to a construction contractor that will become a component of a facility owned by the Board of Regents of the University of Wisconsin System are exempt from sales and use tax.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded, and shall provide evidence of such permits, licenses, and approvals at the Pre-Construction Meeting or before commencement of the Work.

§ 3.7.1.1 Charges for water, sewer, and other utility connections made by municipalities will be paid by the Owner. Payment for use of such services and utilities before Substantial Completion shall be in accordance with provisions of the Contract.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work and/or relating to environmental quality and safety, the performance of the Work, the protection of adjacent property, and the maintenance of passageways, guard fences, or other protective facilities. Such Work shall not be subject to the ordinances or regulations (except land use zoning) of the municipality in which the construction takes place, including ordinances or regulations relating to materials used, permits, supervision of construction or installation, payment of permit fees, or other restrictions of any nature whatsoever. The Project Representative shall be notified by the Contractor of any notices of noncompliance or violation associated with Work required by the Contract Documents.

§ 3.7.2.1 Where Contract Documents require abatement of asbestos containing materials, prior written notice to the State of Wisconsin, Department of Natural Resources is required. The Contractor shall provide evidence of such notice prior to commencement of the Work. Contractor shall follow all State of Wisconsin and Federal rules associated with asbestos abatement.

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

§ 3.7.4 Concealed or Unknown Conditions

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

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

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection, except for subcontractors selected in the single prime bidding process.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted

accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

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

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. The Contractor shall give continuous personal superintendence to the Work and its performance at the site, or shall employ a construction superintendent or foreman, experienced in Work of the character covered by the Contract Documents. This person shall be delegated authority to act on behalf of the Contractor, and shall be, to the extent possible, a single point of contact and communication for the Project Representative, Architect, and all Subcontractors to facilitate efficient, timely, and cost effective completion of the Work. Communications given to the superintendent shall be as binding as if given to the Contractor. Communications between the Architect and Contractor shall be timely relayed to the Project Representative.

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

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

§ 3.10 Contractor's Construction and Submittal Schedules

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

§ 3.10.1.1 The Project Schedule shall incorporate all activities, events, and milestones required for successful Project completion within the allowable time for completion specified in the Contract Documents. The Contractor shall prepare a breakdown of all Work activities or events, whether the activities are to be performed by the Contractor's own forces, those of Subcontractors or the Owner, indicating the proposed duration and sequencing of such activities for successful completion of the Project within the allowable time specified in the Contract Documents. No single Work activity in the Project Schedule shall be for more than \$500,000 in Contract value or for a duration greater than four (4) successive weeks. The Contractor shall also identify whether any Work activity or event is dependent on the Work of its own forces or with those of the Owner. The failure to list any activity or to perform any other duty required by or incident to that required by these General Conditions shall not be the basis of a claim for adjustment of any provision of this Contract, or of any other type of claim whatsoever.

§ 3.10.1.2 The Contractor shall, within fourteen (14) calendar days from the Notice to Proceed, develop and publish a Project Schedule for the first sixty (60) calendar days of the Project. The completed Project Schedule, for all Work activities through Project completion, shall be developed and published within this sixty (60) day period. Pursuant to Wis. Stat. § 16.855 (14m)(d), the Contractor must base this Project Schedule on the schedule that the mechanical, electrical or plumbing Subcontractors and Contractors bid on (in the Specifications or bid instructions), unless otherwise agreed to by the Subcontractor. The Contractor shall update the Project schedule monthly.

§ 3.10.1.3 If the Contractor's Work depends upon construction or operations by the Owner, the Contractor shall, prior to proceeding with that portion of the Work, promptly give Notice to the Project Representative of any apparent deficiencies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor to so report shall constitute an acknowledgment that the Owner's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 3.10.1.4 The Contractor shall identify forthwith any critical event which will require the Owner to act or to refrain from acting, or critical time periods within which the Owner must complete activities or Work for which the Owner is responsible under the Contract. Timely Notice of any such identified event or time period shall be given to the Owner. The giving of such Notice is a condition precedent to the creation of any duty of the Owner to take any action or to refrain from taking any action. The failure of the Contractor to give such Notice forthwith shall thereafter bar and preclude any claim by the Contractor for adjustment of any Contract provision or claim predicated on the breach of any obligation by the Owner.

§ 3.10.1.5 The bonds furnished to secure these commitments shall be applicable to each and every one of these time and scheduling commitments.

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

§ 3.10.2.1 If the Contractor submits for approval items which do not strictly comply with the design requirements of Contract Documents, the Contractor shall provide all engineering or design information necessary for complete evaluation of the Submittal by the Architect and Project Representative. If it is determined by the Contractor or the Project Representative that the services of a professional consultant, engineer or architect are required to provide such information, the Contractor shall acquire such services at its own expense.

§ 3.10.2.2 If the Contractor believes that requirements of the Contract Documents are in conflict with the manufacturer's recommended method of installation or application of specified materials, products, or systems, the Contractor shall indicate such possible conflicts at the time of Submittal.

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

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§ 3.10.3.1 The Owner shall be given the opportunity to schedule its own Work as conveniently as is consistent with the overall needs of the Project Schedule.

§ 3.10.3.2 Where any Work activity required for completion of the Project is completed in less time than required, anticipated, or otherwise allowed by the Project Schedule, the unused time, hereinafter called Float, shall belong to the Project, to be used by the Contractor as the Project needs determine, including but not limited to providing additional time for completion of any other Work activities required for completion of the Project. Float shall not be considered owned, subject to the exclusive use, or management by any of the interested participants. No claim against the Owner or the Contractor shall be made by any party for the loss of Float time.

§ 3.10.3.3 The Contractor shall be independently responsible for resolving any time related matters with Subcontractors, suppliers, or others who may furnish supplies or services on the Project. No liability shall attach to the Owner, for the failure of any party to carry out the coordination and scheduling responsibilities which they have assumed under the Contract.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required Submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

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

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

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

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

- .1** THE CONTRACTOR NOTES THE CONSPICUOUS NATURE OF THIS ARTICLE and agrees that these provisions are material provisions and are to be enforced, in the event of controversy, in such a manner as to place upon the Contractor the full, complete, and total responsibility for the Submittal's conformance with the requirements of this Contract, and suitability or usability of preliminary submissions by the Contractor, without regard to any the Owner action or failure to act.
- .2** All Submittals and supporting information shall be delivered to a party designated by the Owner, who shall act on any such Submittal within 14 calendar days or notify the Contractor in writing, of the time required for such action if greater than the aforementioned 14 day period. Such designation shall take place at the Project Pre-Construction Meeting. Review of the Submittals for conformance with requirements of the Contract Documents shall be completed by the party responsible to the Owner for Project design. A copy of all such Submittal and transmittal forms shall also be sent to the Project Representative.

- .3 The Contractor shall make Submittals in a timely fashion to assure completion of the entire Project within the allowable time specified in the Contract Documents. The timing of such Submittals shall be subject to the provisions of the contract.
- .4 Each Submittal by the Contractor shall contain the cover page included in the Specifications. Such cover page shall be signed by a representative of the Contractor responsible for review of the Submittal to assure compliance with requirements of the Contract Documents.
- .5 The Contractor timing and phasing of Submittals shall be appropriate to the critical path project schedule, and to facilitate the timely review by the Architect.

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

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

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

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

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

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

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other Submittals prepared by such professional. Shop Drawings, and other Submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this

Section 3.12.10, the Architect will review and approve or take other appropriate action on Submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

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

§ 3.13 Use of Site

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

§ 3.14 Cutting and Patching

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

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

§ 3.15 Cleaning Up

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

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

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for promptly furnishing the information to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, its agents and employees from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.1.1 The obligations of the Contractor under this indemnification shall not extend to the liability of the Owner, the Architect and its agents or employees thereof arising out of (1) preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or Specifications, or (2) the giving of or the failure to give directions or instructions thereof provided such giving or failure to give is the cause of the injury or damage.

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

§ 3.19 Contractor Performance Evaluation

§ 3.19.1 The Contractor acknowledges that following completion of the Work, the Project Representative will evaluate the Contractor's performance under this Contract. Such evaluation may take place after Substantial Completion or after Final Completion of the Work, as determined by Project Representative. The purpose of such evaluation includes, but is not limited to, determining whether or not the Contractor responsibly performed its Contractual obligations and whether or not the best interests of the Owner were promoted thereby.

§ 3.19.2 Project Representative shall provide a copy of any such performance evaluation to the Contractor, as soon as practicable after completion of such evaluation.

§ 3.19.3 The Contractor may appeal results of the Contractor's performance evaluation completed by the Project Representative by submitting a request for performance review to the Owner. Any such request must include the reasons for such request, and documentation necessary to substantiate the Contractor's claim that initial performance evaluation was inappropriate or otherwise in error.

§ 3.19.4 The Owner reserves the right to waive the results of such performance evaluation(s) if, in the opinion of the Owner, corrective action has been taken to remediate substandard performance, events beyond the control of the Contractor resulted in substandard performance, or the best interests of the Owner will be served.

§ 3.19.5 The Contractor acknowledges and agrees that such evaluation(s) may be used by the Owner pursuant to Wis. Stat. § 16.855(9m) when determining whether the Contractor is a "qualified responsible bidder" for future Project(s); provided, however, any such evaluation made more than five (5) years prior to the submission of any such subsequent bid shall not be considered in any event.

§ 3.19.6 The Contractor acknowledges and agrees that all such evaluations so prepared by Project Representative shall constitute "open public records" available for inspection and copying as provided for by law.

ARTICLE 4 ARCHITECT

§ 4.1 General

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

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

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents until the date of the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

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

for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

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

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

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

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

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

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

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

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

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

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be consistent with the intent expressed in the Contract Documents and the Contractor will adhere to those decisions.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

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

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

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

§ 5.2.1.1 The Contractor must offer a subcontract to the successful mechanical, electrical and plumbing Subcontractors identified by the Owner and included in the Contractor's bid. This subcontract between a Contractor and a mechanical, electrical and plumbing Subcontractor must include a scope of work clause identical to the scope of work clause included in the Bid Documents and the contract between the Contractor and the Owner. A Contractor and a mechanical, electrical and plumbing Subcontractor may not enter any agreement in connection with bids submitted that would alter or affect the scope or price of the contracts entered into. This prohibition does not apply to the Owner's change orders that result in changes to the plans or specifications, or to back charges allowed by the contract. The Contractor shall base its Project Schedule on the schedule in the Specifications or bid instructions unless otherwise agreed to by the mechanical, electrical and plumbing Subcontractor.

§ 5.2.1.2 The Contractor may enter into subcontracts for work other than mechanical, electrical and plumbing Subcontractor work, if subcontractors are approved by Project Representative through the Request for Subcontractor Approval Form. However, the election to subcontract Work shall not relieve the Contractor from responsibility or liability which it has assumed under this Contract. The Contractor shall remain liable to the same extent that its liability would attach, as if the Work had been performed by the Contractor's own employees. If the Specifications require or otherwise designate only one Subcontractor or source of supply for Work required under the Contract Documents, the Contractor's failure to acquire suitable Contract arrangements with such Subcontractor or source of supply shall not excuse the Contractor from full responsibility and liability for any failure or default of such source of supply.

§ 5.2.1.3 Bidders shall submit a completed Request for Subcontractor Approval Form with their bid or within seven days of the Contractor bid opening. Submission of a completed Request for Subcontractor Approval Form is an element of responsiveness. Failure to submit this completed form within the above time limits will be considered unresponsiveness and may result in contract award to the next apparent low bidder. When no Subcontractors are anticipated, the Contractor shall give notice of this fact on the Request for Subcontractor Approval Form within the time limits noted above.

§ 5.2.1.4, All Subcontractors are subject to Owner's approval. The Owner may request, or the Contractor may provide, any of the following information to substantiate the proposed Subcontractors' qualifications or ability to perform the Work. The Owner shall consider such information when reviewing the qualifications of proposed Subcontractors to determine whether such qualifications serve the best interests of the Project.

- .1 The amount of experience completing similar Work to that required by the Contract Documents;
- .2 The quality of work the proposed Subcontractor has provided on past projects;
- .3 The extent of available staffing and financial resources of the proposed Subcontractor;
- .4 The Contractor's intended method of monitoring the proposed Subcontractor's Work;
- .5 The level of supervision of the Subcontractor's Work which the Contractor will provide; and
- .6 Any other information regarding the proposed Subcontractor's ability to complete the Work.

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

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

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution. The Contractor shall not replace any Owner-identified or approved Subcontractor or material supplier without written approval of the Owner. Any Contractor request for replacement of a Subcontractor previously approved by the Owner shall include the reason(s) for such replacement and all documentation necessary to substantiate such change.

§ 5.2.5 The Contractor agrees to maintain a list of all Subcontractors and suppliers performing labor or furnishing materials for the project.

§ 5.3 Subcontractual Relations

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

proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

(Paragraphs deleted)

§ 5.3.1 The Contractor shall be fully responsible for all acts and omissions of all Subcontractors and shall be responsible for scheduling and coordinating the Work of all Subcontractors and material suppliers.

§ 5.3.2 Nothing herein shall be construed to create any express or implied contractual relationship between Owner and any of the Contractor's Subcontractors, suppliers or vendors.

§ 5.3.3 The Contractor shall cause Article 10.2 (Safety of Persons and Property), with appropriate changes in paragraph and entity designation, to be incorporated in all Subcontracts, regardless of tier.

§ 5.3.4 The Contractor shall insert the following mandatory provisions, with appropriate changes in paragraph and entity designation, in all subcontracts with Subcontractors:

- .1 Article 9 - Payments and Completion
- .2 Article 9.6.2 and 9.6.5.1- Progress Payments
- .3 Article 13.8 - Nondiscrimination/Affirmative Action
- .4 Article 13.9 - Minimum Wages

§ 5.3.5 Pursuant to Wis. Stat. §16.855 (14m)(a), any contract that the Contractor (referred to below as General Prime Contractor) enters into with a subcontractor as defined under Wis. Stat. §16.855 (14)(e) shall include the following mandatory provisions:

PROMPT PAYMENT (General prime contractor) shall pay (mechanical, electrical, or plumbing subcontractor) in accordance with Wis. Stat §16.855(19)(b), for work that has been satisfactorily completed and properly invoiced by (mechanical, electrical, or plumbing subcontractor). A payment is timely if it is mailed, delivered, or transferred to (mechanical, electrical, or plumbing subcontractor) by the deadline under Wis. Stat §16.855(19)(b).

If (mechanical, electrical, or plumbing subcontractor) is not paid by the deadline in this Contract, (general prime contractor) shall pay interest on the balance due from the eighth day after the (general prime contractor) receives payment from the Board of Regents for the work for which payment is due and owing to (mechanical, electrical, or plumbing subcontractor), at the rate specified in Wis. Stat §71.82, compounded monthly.

A (mechanical, electrical, or plumbing subcontractor) that receives payment as provided under this Contract and that subcontracts with another entity shall pay those subcontractors, and be liable for interest on late payments to those subcontractors, in the same manner as the (General prime contractor) is required to pay the (mechanical, electrical, or plumbing subcontractor) under this Contract.

INSURANCE AND BONDS (mechanical, electrical, or plumbing subcontractor) shall not commence work under this Contract until it has obtained all necessary insurance required of (mechanical, electrical, or plumbing subcontractor) in the contract between the (general prime contractor) and the Board of Regents.

(Mechanical, electrical, or plumbing subcontractor) shall provide a separate 100 percent performance bond and a separate 100 percent payment bond to the benefit of the (general prime contractor) as the sole named obligee. Original bonds shall be given to the (general prime contractor) and a copy shall be given to the Board of Regents no later than 10 days after execution of this Contract.

INDEMNIFICATION To the fullest extent permitted by law, (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others whom (general prime contractor) is required to indemnify under its contract with the Board of Regents,

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and the employees of any of them, from and against claims, damages, fines, penalties, losses, and expenses, including but not limited to attorney fees, arising in any way out of or resulting from the performance of the work under this Contract, but only to the extent such claim, damage, fine, penalty, loss, or expense: (1) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of property, including but not limited to loss of use resulting therefrom and is caused by the negligence, or acts or omissions, of (mechanical, electrical, or plumbing subcontractor), its subcontractors, any of their employees, and anyone directly or indirectly employed by them or anyone for whose acts they may be liable, or (2) as related to such claims, damages, fines, penalties, losses, and expense of or against (general prime contractor), results from or arises out of the negligence of the (general prime contractor) or other fault in providing general supervision or oversight of the work of (mechanical, electrical, or plumbing subcontractor) or (3) as related to claims, damages, fines, penalties, losses, and expense against the Board of Regents arises out of the Board's status as owner of the project or project site.

In addition (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others (general prime contractor) is required to indemnify under its contract with the Board, and the employees of any of them, from any liability, including liability resulting from a violation of any applicable safe place act, that (general prime contractor) or the Owner incurs to any employee of (mechanical, electrical, or plumbing subcontractor) or any third party where the liability arises from a derivative claim from said employee, when the liability arises out of the failure of the (General prime contractor) or the Owner to properly supervise, inspect, or approve the work or work area of (mechanical, electrical, or plumbing subcontractor), but only to the extent that the liability arises out of the acts or omissions of (mechanical, electrical, or plumbing subcontractor), its employees, or anyone for whom (mechanical, electrical, or plumbing subcontractor) may be liable, or from (mechanical, electrical, or plumbing subcontractor's) breach of its contractual responsibilities or arises out of (General prime contractor's) negligence or other fault in providing general supervision or oversight of (mechanical, electrical, or plumbing subcontractor's) work or arises out of The Board of Regents' status as owner of the project or project site. In claims against (general prime contractor) or the Owner by an employee of (mechanical, electrical, or plumbing subcontractor) or its subcontractors or anyone for whose acts (mechanical, electrical, or plumbing subcontractor) may be liable, the indemnification obligation of this paragraph is not limited by a limitation on amount or type of damage, compensation, or other benefits payable by or for the (mechanical, electrical, or plumbing subcontractor) subcontractors under workers compensation act.

Except as identified above, the obligations of (mechanical, electrical, or plumbing subcontractor) under this indemnification do not extend to the liability of (general prime contractor) and its agents or employees arising out of (1) preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications; (2) the giving of or failure to give directions or instructions by the (general prime contractor) or the or their agents or employees provided the giving or failure to give is the cause of the injury or damage; or (3) the acts or omissions of other subcontractors.

RETAINAGE Retainage shall occur and be in amounts and on a schedule equal to that in the contract between (general prime contractor) and the Owner. Pursuant to Wis. Stat. §16.855(19)(b), Retainage between Contractor and mechanical, electrical and plumbing subcontractors is governed as follows:

As the work progresses under any subcontract as defined under Wis. Stat. § (14)(e) for construction of a project, the Contractor shall, upon request of a subcontractor, pay to the subcontractor an amount equal to the proportionate value of the subcontractor's work properly completed, less retainage. The retainage shall be an amount equal to not more than 5 percent of the subcontractor's work completed until 50 percent of the subcontractor's work has been completed. At 50 percent completion, no additional amounts may be retained, and partial payments shall be made in full to the subcontractor unless the Board certifies that the subcontractor's work is not proceeding satisfactorily. At 50 percent completion or any time thereafter when the progress of the subcontractor's work is not satisfactory, additional amounts may be retained but the total retainage may not be more than 10 percent of the value of the work completed. Upon substantial completion of the subcontractor's work, any amount retained shall be paid to the subcontractor, less the value of any required corrective work or uncompleted work. All payments the general prime contractor makes under this paragraph shall be within 7

calendar days after the date on which the general prime contractor receives payment from the Board.

Pursuant to Wis. Stat. §16.855(14m)(b), subcontracts under sub (14)(e) must include a scope of work clause that is identical to the scope of work clause on which the subcontractor bid. The following Scope of Work language shall be included in the contracts between the general prime contractor and subcontractors:

SCOPE OF WORK The mechanical, electrical and plumbing subcontractor scope of work is identical to the general prime contractor scope of work included in these bidding and contract documents. By submitting and signing a bid, all bidders have examined all the Bidding Documents listed in the Table of Contents of the project Specifications. The successful bidders will be required to do all work which is shown on the drawings, mentioned in the Specifications, or reasonably implied as necessary to complete the division of work bid for this project.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

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

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

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

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

§ 6.2 Mutual Responsibility

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

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

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

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§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, and Separate Contractors as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Project Representative will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

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

§ 7.1.2.1 The giving of each Notice by the Contractor as prescribed by this Article 7, shall be a condition precedent to liability of the Owner for payment of any additional costs incurred by the Contractor in implementing changes in the Work. Under this Article 7, no order or statement of the Owner shall be treated as a Change Order, or shall entitle the Contractor to an equitable adjustment of the terms of this Contract or damages for costs incurred by the Contractor on any activity for which the Notice.

§ 7.1.2.2 All Contractor requests for equitable adjustment shall be submitted to Architect and Project Representative in written form. Such requests shall set forth with specificity the amount of and reason(s) for the proposed adjustment and shall be accompanied by supporting information and documents. The review, resolution, and payment of such requests shall be governed by Article 15.

§ 7.1.2.3 No adjustment of any kind shall be made to this Contract if asserted by the Contractor for the first time, after the date of final payment.

§ 7.1.2.4 The Contractor shall provide Project Representative with costs for all proposed Change Orders as outlined by the Project Representative to the Contractor at the Pre-Construction Meeting.

§ 7.1.2.5 The completion date is determined by the Owner. The schedule, however, is the responsibility of the Contractor. Time extensions for extra Work will be considered when a schedule analysis shows that the Change Order places the Work beyond the completion date stated in the Notice to Proceed. Unless the cumulative time extensions for extra Work places the Work beyond the original completion time specified in the Instructions to Bidders, all extended overhead costs are included in the overhead and profit allowance. If significant scope changes occur which places the extra Work beyond the original completion time specified in the Instructions to Bidders, actual additional costs may be considered in accordance with Article 15.

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

§ 7.1.4 Except in cases of emergency, no changes in the Work required by the Contract Documents may be made by the Contractor without having prior approval of Owner.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect or Project Representative and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 The inclusion of Subcontractor terms and conditions in the supporting documentation of a Change Order shall have no bearing on the contract between the Owner and Contractor, and shall not change any of the terms and conditions between the Owner and Contractor. Such supporting documentation shall not be construed as creating any expressed or implied contractual obligation of those terms and conditions between Owner and any of the Contractor's Subcontractors, suppliers or vendors.

§ 7.2.3 A Change Order may be proposed by the Architect, Contractor, or the Owner. When a Change Order is proposed, the following procedures shall apply:

- .1 If requested by Project Representative, the Contractor shall prepare and submit a detailed proposal, including all cost and time adjustments to which the Contractor believes it will be entitled if the change proposed is incorporated into the Contract. Project Representative shall be under no legal obligation to issue a Change Order for such proposal;
- .2 The parties shall attempt in good faith to reach agreement on the adjustments needed to the Contract to properly incorporate the proposed change(s) into the Work;
- .3 In some instances, it may be necessary for Owner to authorize Work or direct changes in Work for which no final and binding agreement has been reached and for which unit prices are not applicable. In such cases the following shall apply:
 - .1 Upon written request by the Owner, through a Construction Change Directive, the Contractor shall perform the proposed Work;
 - .2 The cost of such changes shall not exceed the Construction Change Directive, and be determined in accordance with subparagraph 7.2.5;
 - .3 In the event agreement cannot be accomplished as contemplated herein, the Owner may authorize the Work to be performed by Owner or to hire others to complete the Work. Such action on the part of the Owner shall not be the basis of a claim by the Contractor for failure to allow it to perform the changed Work.

§ 7.2.4 In the event Work is required due to an emergency as described in Article 7.1.4., the Contractor must request an equitable adjustment as soon as practicable, and in no case later than ten (10) working days of the commencement of such emergency.

§ 7.2.5 Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.2 shall be limited to the following:

- .1 Actual labor rate includes the base rate, taxes, insurance and fringe benefits required by agreement or custom and no Contractor markup except as allowed in 7.2.5.6 below. Unit labor is the labor time anticipated to be expended to install the corresponding unit of actual materials. Labor cost is the labor hours approved by Project Representative multiplied by the Project Representative pre-approved composite hourly labor rates;
- .2 Actual material cost is the amount paid or to be paid by the Contractor for materials, supplies and equipment entering permanently into the Work, including cost of transportation and applicable taxes. This cost shall be substantiated by the vendor or supplier's verified invoices/quotes. The cost shall not exceed the usual and customary cost for such items available in the geographical area of the project;
- .3 Large tools and major equipment are those with an initial cost greater than \$1,000, whether from the Contractor or other sources. The rental rate shall not exceed the usual and customary amount for such items available in the geographical area of the project. Tool and equipment use time allowed is only for

the extra Change Order work. Rental cost is the above tool and equipment time approved by Project Representative multiplied by the Project Representative pre-approved rental rates also described above;

- .4 The cost of performance and payment bonds are the actual rate paid by the Contractor for such bonds;
- .5 Subcontractor costs are for those subcontracted specialties required to complete the Change Order work, with maximum markups as outlined hereinafter
- .6 The maximum allowable markup for overhead and profit, by all parties of the Contractor and Subcontractors, on Change Order proposals shall not exceed 15 percent total. The Contractor markup of change order work done by Subcontractors shall not exceed 7 ½ percent; and the total combined mark-up by Contractor and Subcontractor, on Subcontractor performed work shall not exceed 15 percent. When the value of a Change Order proposal exceeds \$30,000, a declining scale will be used to negotiate the allowable combined overhead and profit margin. Where Change Order proposals involve a credit only, a reasonable allowance for overhead and profit are properly included as part of the downward adjustment for a deductive change exceeding \$15,000. The amount of such allowance is subject to negotiation.
- .7 All other Change Order expenses are part of the overhead and profit allowance which are not reimbursable as separate items and include the following:
 - .1 All costs associated with the processing of the Change Order are included in the overhead and profit allowance;
 - .2 All such efforts, unless specifically requested by as additional Work to be documented as a Change Order proposal or portion thereof, is included in the overhead and profit allowance;
 - .3 The layout required for the installation of material and equipment, and installation design, is the responsibility of the Contractor and is included in the overhead and profit allowance;

§ 7.3 Construction Change Directives

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

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

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Time and Material, Not To Exceed. This Not To Exceed amount will be an amount the Contractor can confidently complete the needed work within, and shall include all costs for this work including overhead and profit;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon; or
- .3 Cost method agreed upon by all signing parties.
- .4 Intentionally deleted.

§ 7.3.4

(Paragraphs deleted)
Intentionally deleted.

§ 7.3.5 Intentionally deleted.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect and Project Representative of the Contractor's agreement or disagreement

with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them.

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

§ 7.3.9 Intentionally deleted.

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

§ 7.4 Minor Changes in the Work

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

ARTICLE 8 TIME

§ 8.1 Definitions

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

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

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect and Project Representative in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work. It is hereby understood and mutually agreed, by and between the Contractor and the Owner that the time for completion of the Work required by the Contract Documents is an essential condition of this Contract. The Contractor agrees that the Work required by the Contract Documents will be prosecuted regularly and diligently at a rate of progress that will ensure its full completion within the time specified in the Contract Documents. It is expressly understood and agreed, by the Contractor and the Owner, that the specified time period for completion of the Work described in the Contract Documents is a reasonable time for the completion of the Work, taking into consideration the average weather conditions and usual industrial conditions prevailing in the locality in which the Work is to be completed.

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

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

§ 8.2.4 Costs for acceleration of Work activities to allow completion of the Project in less time than that allowed by the Contract Documents shall be borne by the party requesting such acceleration or early completion. No claim for delay shall be valid against the Owner for compensation for delayed completion which extends completion beyond the early finish date, but which does not continue beyond the stated time for completion as set forth in the Contract.

§ 8.3 Delays and Extensions of Time

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

§ 8.3.1.1 If any activity is delayed, or anticipated to be delayed, thereby delaying the completion of the entire Project, the Contractor shall have the right to take action as may be necessary to recapture any delay. Such action shall include, but not be limited to:

- .1 Increase in staffing;
- .2 Increase in shifts, hours of Work, or number of days of Work;
- .3 Use of available Float; or
- .4 Changing the sequence of Work activities

Costs caused by delays or improperly timed activities shall be borne by the party responsible therefore, and Change Orders, as deemed appropriate, shall be issued in accordance with Article 7 of these General Conditions.

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

§ 8.3.2.1 When events occur which, in the opinion of the Contractor, prevent completion of the Project within the time period allowed by the Contract Documents, the Contractor shall request an extension of the specified time for completion. Such request shall include the reasons for delay, the amount of time extension being requested, and any cost(s) associated with the delay. All such requests shall be made in writing and delivered to Project Representative within ten (10) working days from the beginning of such delay, or within ten (10) working days from the time when the circumstance with potential for delay becomes reasonably known to the Contractor, whichever is earlier. The Project Representative shall act on such requests as soon as practicable and notify the Contractor of Owner's decision.

§ 8.3.2.2 If the Contractor fails to complete the Work within the time specified in the Contract and such failure is due to reasons which were not beyond the reasonable control of the Contractor or if the Contractor fails to complete the Work within the time specified in the Contract and fails to make the written request as provided for in 8.3.2, then in any such event the Contractor shall pay to the Owner actual damages.

§ 8.3.2.3 If Project Representative terminates the Contract, or suspends or stops Work in accordance with 2.4 due to the fault of the Contractor, the damages described in Paragraph 8.3.2.2 shall be assessed for each day (or any part thereof) such Work is stopped on the Project. If the Owner does not elect to terminate the Contract or to suspend or stop the Work, the damages shall be assessed for each day of delay in Substantial Completion.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents. The Owner may, at its discretion, waive damages due the Owner, or any portion thereof.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. Payments to the Contractor under the Contract Documents will be made as provided for in Wis. Stat. § 16.855(19)(a), as the Work progresses on this Project. Payment requests will be processed monthly, except for special circumstances approved by Project Representative. The Contractor must perform all of the conditions required for payment and must have met the

obligations which are necessary to qualify for any partial payments. No Contractor whose Work is deficient or whose Work fails to conform to the quality standards set forth in the Contract Documents shall be entitled to interim, progress or partial payments

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

§ 9.2 Schedule of Values

As soon as practicable after the Notice to Proceed is received, but not later than submission of the first payment application, the Contractor shall submit to the Architect a schedule of values for work to be performed, as prescribed by the Contract Documents and in the detail requested by the Architect. The cost breakdown items shall reflect actual work progress stages as closely as feasible which, if approved by Architect, will become the basis for Applications for Payment.

§ 9.3 Applications for Payment

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

§ 9.3.1.1

- .1** As a condition precedent to entitlement to payment, the Contractor shall, at the request of the Architect or Project Representative, submit satisfactory evidence to establish that the sum set forth in any Application for Payment represents the "proportionate value" of Work completed;
- .2** The Contractor shall certify each request for payment as being a true, accurate, and complete statement of account as of the date on which the certificate was made, and that the stated sums are then earned and payable to the Contractor.
- .3** All requests for payment shall be submitted to the Architect. To expedite payment of sums due under the Contract, the Contractor, Project Representative and Architect shall, where possible, jointly review any such request for payment at the site, inspecting the Work if necessary to determine the validity of the request or modifications to the request which are necessary to accurately represent the value of Work completed in accordance with the Contract Documents
- .4** The Contractor shall furnish any and all accounting records requested by the Architect or Project Representative to validate all or any part of any request for payment. The Contractor shall maintain these accounting records for a period of three (3) years from the date the Architect authorizes final payment.
- .5** The Contractor agrees to indemnify and hold the Owner harmless from all claims growing out of lawful demands of Subcontractors, laborers, workers, mechanics, material persons, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the performance the Work required by Contract Documents.
- .6** The Contractor shall, at Project Representative or Architect's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived.
- .7** If separate prices are set forth in the Contract Documents for identifiable items of Work, payment for such prices shall be made at the time of completion of those items of Work. Payment under this Paragraph shall be an interim payment until the time of final payment and acceptance of the Work by Architect.
- .8** Pursuant to Wis. Stat. § 16.855(19)(a), as the work progresses under this Contract for Construction the

Architect or Project Representative, from time to time, shall grant to the Contractor an estimate of the amount and proportionate value of the work properly completed, which shall entitle the Contractor to receive the amount, less the retainage, from the proper fund. The retainage shall be an amount equal to not more than 5 percent of the estimate until 50 percent of the work has been completed. At 50 percent completion, no additional amounts shall be retained, and partial payments shall be made in full to the Contractor unless the Owner certifies that the job is not proceeding satisfactorily. At 50 percent completion or any time thereafter when the progress of the work is not satisfactory, additional amounts may be retained but in no event shall the total retainage be more than 10 percent of the value of the work completed. Upon substantial completion of the work, any amount retained shall be paid to the Contractor, less the value of any required corrective work or uncompleted work. For the purposes of this section, estimates may include any fabricated or manufactured materials and components specified, previously paid for by Contractor and delivered to the work or properly stored and suitable for incorporation in the work embraced in the contract.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with the requirement that it holds clear title to all property of every description which serves as the basis for the Application for Payment. Contractor warrants that title to any such property is being transferred to the Owner free and clear of all liens. If requested by the Architect or Project Representative, the Contractor shall produce satisfactory evidence of transfer of title from suppliers and Subcontractors to the Contractor, without reservation, or with adequate waiver of lien. These payments may include any fabricated or manufactured materials and components specified, previously paid for by Contractor and delivered to the site, properly stored, and suitable for incorporation into the Work embraced in the Contract; The Contractor shall identify the method of storage for such materials. Proper evidence of insurance shall be presented to protect the interest of the Owner. If payment is intended to be requested for any off-site storage items, such items shall be listed as separate lines in the request and certification for payment, cost breakdown. Architect or Project Representative, upon their request, shall be allowed to verify such materials and equipment no matter the location stored and located.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work. The Contractor shall have the sole responsibility for obtaining proper insurance on, as well as the responsibility for the care and protection of materials and Work upon which payments have been made. The Contractor shall be responsible for the restoration of any damaged Work. Nothing herein shall operate as a waiver of the rights of the Owner to require fulfillment of all of the terms of the Contract.

§ 9.4 Certificates for Payment

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

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and

inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect.

§ 9.5 Decisions to Withhold Certification

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

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

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

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

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment. In paying any unpaid bills of the Contractor relating to the Work, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner shall be considered as a payment made under the Contract by the Owner to the Contractor for its account and the Owner shall not be liable to the Contractor for any such payment.

§ 9.6 Progress Payments

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

§ 9.6.2 Not more than seven (7) calendar days following the receipt of each payment from the Owner, the Contractor shall make payment to each and every person, Subcontractors, or entity who furnished goods or services for the progress of the Work on the Project, the value of which goods or services were included in the Contractor's Request for Payment and Certification for Payment, or who by law or Contract payment is due upon the receipt of the payment most recently received from the Owner. The Contractor shall insert a provision in all subcontracts requiring payment in the manner herein specified. The Contractor shall also require Subcontractors to include a like provision in all contracts with their subcontractors or suppliers, regardless of tier.

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

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor

fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

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

§ 9.6.5.1 In the event Owner receives notice from any person, Subcontractor, or other third party, that the Contractor has failed to pay such person(s) for Work performed in accordance with the Contract Documents, the Owner shall notify the Contractor and the Contractor shall, in no more than 10 calendar days, provide all documentation Project Representative believes necessary to determine whether such payment is due, or reasons for non-payment of disputed amounts. In the event Project Representative determines the claim to be valid and payment is due, or in the absence of aforementioned documentation, Project Representative may authorize direct payment of any unpaid bills, withholding from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such claims until satisfactory documentation is furnished that all liabilities have been fully discharged or reasons for non-payment of disputed amounts are provided by the Contractor. In no event shall these provisions be construed to impose any obligations upon the Owner to either the Contractor or the Contractor's Surety.

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

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

§ 9.6.7.1 Pursuant to Wis. Stat. § 16.855(19)(b) and § 16.855(14m)(a) retainage on a Subcontract shall occur and be in amounts and on a schedule equal to the retainage schedule in the contract between the Contractor and the Owner.

§ 9.6.7.2 Nothing herein shall preclude the Contractor from deducting from any request for payment such amounts as will properly represent the value of Work which fails to meet the quality standards of the Contract Documents or which the subcontractor fails to complete.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. In the event the Contractor elects to stop Work under this Section 9.7, upon recommencing the Work, the Contractor may seek a Change Order to assert a claim for adjustment of the Contract Time and the Contract Sum by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

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

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

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection identifies any item, whether or not included on the Contractor's list, which is not sufficiently complete, in need of correction, or in need of replacement to be in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

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

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. While the Owner has such possession or use, the Contractor shall be relieved of the responsibility for loss or damage to the Work resulting from the Owner's possession or use. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents. The Contractor will prepare a list of items of Work remaining to be performed or corrected on those portions of the Project that the Owner intends to take possession of or use.

§ 9.10 Final Completion and Final Payment

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

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor provides certification that all debts and claims against this Project have either been paid in full or otherwise satisfied and give final evidence of release of all liens against the Project, the Owner, and all proceeds payable hereunder. The Contractor shall certify upon such payment request that the data contained therein is current, accurate, and complete. Contractor shall permit, if requested by Project Representative, the final inspection to be jointly conducted by the Contractor, Architect and Project Representative. The Contractor shall give Notice at least 72 hours in advance of the time set for final inspection. Upon completion of the project and before receiving final payment for work on the project, as required by law, the Contractor shall file with Project Representative an affidavit stating that the Contractor has complied fully with Wis. Stat. § 103.49(4r) and that the Contractor has received an affidavit from each of the Contractor's agents, and Subcontractors stating that they also have complied fully with Wis. Stat. § 103.49(4r).

§ 9.10.2.1 As a condition precedent to final payment, all corrective actions to remedy deficiencies in the Work required by Contract Documents and Work identified on the punch list must have been completed. In addition, where required by Contract Documents, all training of the Owner's staff in the proper operation and maintenance of the Work shall have been completed, Operating and Maintenance Manuals and Instructions as well as drawings marked up to reflect "as built" conditions must have been transmitted to Project Representative and all warranty certificates signed and presented for Project Representative acceptance.

§ 9.10.2.2 When to the satisfaction of Project Representative and Architect the Work has been completed, and is of the quality required by the Contract Documents, Project Representative may authorize payment of all sums then due the Contractor. Receipt of the final payment, as provided for herein shall constitute a waiver of any and all claims against the Owner arising out of, under, or incident to the Work performed under the Contract.

§ 9.10.2.3 If the Contractor fails to submit a request for final payment or make satisfactory arrangements with Project Representative within thirty (30) calendar days of the final inspection or accepted punch list, no further payments will be made and the Contract will be closed. The last request for Certification for Payment will be considered the final payment under the terms and conditions of the Contract.

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

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from but not limited to:

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.
- .5 Any warranty or guarantee required by the Contract Documents;
- .6 Any other right surviving the Owner as to which the Contractor was specifically given notice before or during the final inspection and final payment process; or
- .7 Rights surviving to the Owner as a matter of law.

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

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

subcontractors will perform all work on the project in a safe and responsible manner. In particular, Contractor shall, at its own expense, conform to the safety policies and regulations established by the Contractor and shall comply with all specific safety requirements promulgated by any government authority, including without limitation the requirements of the Occupations Safety and Health Act of 1970 and the Construction Safety Act of 1969 and all standards and regulations which have been or shall be promulgated by the parties or agencies which administer the Acts. Contractor shall comply with said requirements, standards and regulations, and require and be directly responsible for compliance therewith on the part of its said agents, employees, materials suppliers and contractors; and shall directly receive, respond to, defend, and be responsible for all citations, assessments, fines or penalties which may be incurred by reason of its failure on the part of its agents, employees, material suppliers or subcontractors to so comply.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall strictly comply with, and bear full responsibility for, any safety procedure set forth in the Contract Documents. In the absence of such compliance, the Contractor shall be responsible for indemnification of the Owner for any cost and expense resulting from any such failure to abide by any safety procedure set forth in the Contract Documents, including legal fees. At the sole discretion of Owner, the Contractor may also be subject to termination of the Contract for default. The Contractor shall take all precautions for safety of, and shall provide all protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby (including, but not limited to the public, and the Owner's personnel and agents);
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

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

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

- .1 Provide appropriate safety barricades, signs, and signal lights;
- .2 Comply with any safety requirement published by any governmental authority with jurisdiction over the site, including Federal, Owner, or local jurisdictions;
- .3 Ensure that any additional measures which are reasonably necessary for the purposes stated are taken.

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

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18. If the Owner becomes aware of any noncompliance by the Contractor or any Subcontractor, with the safety conditions of this Contract or of any condition caused by the Contractor or any Subcontractor, which poses a serious or imminent danger to the health or safety of the public or to Owner personnel, for which the Contractor has been previously notified of, and the Contractor has failed to correct, the Owner has the right stop all work until satisfactory correction action has been taken. Satisfactory correction will be at the sole

discretion of the Owner.

§ 10.2.5.1 In case of an emergency which threatens loss or injury of property, or safety of life, the Contractor will be allowed to act, without previous instructions from the Project Representative, in a diligent manner. The Contractor shall notify Project Representative immediately thereafter. Any claim for compensation by the Contractor due to such extra Work shall be promptly submitted to the Initial Decision Maker for approval as provided for in Article 7 of the General Conditions.

§ 10.2.5.2 In the event of temporary suspension of Work, or during inclement weather, or whenever Project Representative shall direct, the Contractor shall reasonably protect all Work and materials against damage or injury from the weather. This contract provision shall be incorporated into the contracts between the Contractor and Subcontractors. If, in the opinion of Project Representative, any Work or materials have been damaged or injured by reason of failure on the part of the Contractor or Subcontractors to reasonably protect the Work, such materials shall be removed and replaced at the expense of the Contractor.

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

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

§ 10.2.8 Injury or Damage to Person or Property

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

§ 10.3 Hazardous Materials and Substances

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

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

§ 10.3.3 Intentionally deleted.

§ 10.3.4 Intentionally deleted.

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

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

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

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

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located. The bond may be enforced by any person or entity who is entitled to enforce the bonds as a matter of law and who is damaged as a result of breach of these commitments by the Contractor on the Project to which these provisions apply. The Owner shall not be responsible for the default of the Contractor and the remedies of any damaged party shall be limited to an action by the damaged party against the defaulting Contractor and/or its bonding company, in addition to any other coverage for the bond.

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

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

(Paragraph deleted)

§ 11.2 The Contractor shall not commence Work under this Contract until the Contractor has obtained all the insurance required under this Contract. Such insurance must be approved by the Owner. The company providing the insurance must be lawfully authorized to do business in State of Wisconsin and/or be approved by the Owner with a minimum A.M. Best rating of B. The Contractor shall provide the following insurance:

§ 11.2.1. Worker's Compensation Insurance:

- .1 The Contractor shall procure and maintain during the life of this Contract, and shall require all Subcontractors, to maintain, Worker's Compensation Insurance as required by State of Wisconsin Statutes and any applicable Federal Act coverage such as the Longshoremen's and Harbor Workers Act, the Jones Act or the Admiralty Act for all employees engaged in Work associated with the Project under this Contract. Minimum coverage is listed in paragraph 11.2.6.

- .2 The Contractor shall procure and maintain during the life of this Contract, and shall require all Subcontractors, to maintain, Employer's Liability Insurance. Minimum coverage is listed in paragraph 11.2.6.

§ 11.2.2 Commercial General Liability Insurance and Excess Liability-Umbrella:

- .1 The Contractor shall maintain during the life of this Contract, Commercial General Liability Insurance, including Products and Completed Operations for all claims that might occur in carrying out the Contract. Minimum coverage is listed in paragraph 11.2.6. Such coverage shall be of the "occurrence" type form.
- .2 The Contractor's Commercial General Liability and Umbrella Insurance shall apply to the provisions of indemnity obligations under Section 3.18 of these General Conditions.
- .3 The Contractor shall require Subcontractors to procure and maintain Commercial General Liability Insurance and Excess Liability equal to that required in subparagraph 11.2.6. The Contractor shall require each Subcontractor, to procure and maintain Commercial General Liability and Umbrella Insurance equal to that required in subparagraph 11.2.6. However, the Contractor may insure the activities of the remaining Subcontractor(s) in the Contractor's policy. The Contractor's policy shall include coverage for Owner's Contractors.

§ 11.2.3 Auto Liability Insurance:

- .1 The Contractor shall procure and shall maintain during the life of the Contract Commercial Automobile Liability Insurance for all owned, non-owned, and hired vehicles that are used in carrying out the Contract. Minimum coverage is listed in paragraph 11.2.6.
- .2 The Contractor shall require each Subcontractor, to procure and maintain Commercial Auto Liability Insurance equal to that required in paragraph 11.2.6 of the General Conditions.

§ 11.2.4 The minimum required limits do not represent the coverage and limits necessary to protect the Contractor. The limits should not be construed in any way to limit the Contractor's liability to the Owner.

§ 11.2.5 The General Contractor and its consultants retained under the terms of this Contract, shall procure and maintain professional liability insurance providing for payment of the insured's liability for errors, omissions, or negligent acts arising out of the performance of professional services required under this Contract. Minimum coverage shall not be less than \$1,000,000 each and every claim and in the aggregate; however "unique" or "high risk" projects and/or those with Contract values over \$10,000,000 will require a minimum coverage of \$5,000,000. Professional liability insurance shall not have any exclusion for pollution and/or environmental liabilities. Professional Services as defined in the insurance policy of the Contractor, shall include, and correspond with the services as provided by the Contractor in this agreement.

§ 11.2.6 Minimum Limits Required:

At Owner's discretion, the following limits may be increase.

TYPE	Limits
Commercial General Liability	\$2,000,000 General Aggregate (applies per project) \$1,000,000 Products Aggregate \$1,000,000 Personal Injury \$1,000,000 Each Occurrence \$50,000 Fire Damage \$5,000 Medical Expense Per Person
Automobile Liability	\$1,000,000 Combined Single Limit
Excess Liability Umbrella	\$5,000,000 Each Occurrence

\$5,000,000 Aggregate

Worker's Compensation/Employers Liability Insurance

- .1 State: Statutory to all states the work is being performed;
- .2 Federal: As Applicable;
- .3 All Employees, partners, individuals, any managers on project site must be included for coverage.

TYPE	Limits
Employers Liability	\$100,000 Each Accident
Employers Liability Disease	\$100,000 Each Employee
Employers Liability Disease	\$500,000 Policy Limit

§ 11.2.7 Proof of Insurance: The Contractor shall provide a certificate of insurance to the Owner indicating coverage is in place at the limits set forth in this Article. The insurance certificate shall be provided before commencement of the Contract. If the Contractor is self-insured, audited financial records will need to be provided that clearly demonstrate the financial ability to cover losses up to the limits of insurance required. The Contractor shall also be required to disclose deductibles or Self-Insured Retention's (SIR).

§ 11.2.8 Commercial General Liability and Auto Liability carried under this Contract shall contain a provision making it primary and non-contributory to any other coverage available to the Owner.

§ 11.3 The Owner shall purchase and maintain Builder's Risk insurance in the amount of, at least, the initial Contract sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis.

§ 11.3.1 Property Insurance shall include insurance for physical loss or damage to the Work, temporary buildings, and equipment or material consumed in the construction of the Work.

(Paragraphs deleted)

§ 11.3.2 Off-Site and Transit Coverage: Upon the request of the Contractor and written approval of the Owner, the Property Insurance policy, subject to policy terms, definitions, and conditions, will provide a \$250,000 limit for materials and/or Work stored off the site or in transit. It is the Contractor's responsibility to insure materials and/or Work in excess of this amount. The Owner will not be responsible for materials or completed Work under the care, custody, and control of the manufacturer prior to delivery;

§ 11.3.3 Deductible: The risk of loss within the deductible amount will be borne by the Contractor;

§ 11.3.4 Loss of Use Insurance: The Owner, may maintain such property insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. Except as set forth in section 11.4.1. below, the Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards covered by the Property Insurance described in subparagraph 11.3.1.

§ 11.3.5 Policy Review: A copy of the property insurance policy or policies may be obtained pursuant to the Public Records and Property Provisions of the Wisconsin State Statutes.

§ 11.4 The Owner and the Contractor waive all rights against each other and shall require its insurers to waive any rights of subrogation or recovery, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Contract or other property insurance applicable to the Work. The policies shall provide such waivers of subrogation by endorsement or otherwise, except as set forth in 11.4.1 below. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise; did not pay the insurance premium directly or indirectly; and whether or not the person or entity had an insurable interest in the property damaged. This waiver shall be effective only to the extent any policy of insurance is not impaired thereby. This contract provision shall be incorporated into the contracts between the Contractor and Subcontractors.

§ 11.4.1 The Owner retains the right to subrogate against the Contractor and Subcontractor(s), up to \$1,000,000 per occurrence, for damage to property, including loss of use thereof, provided said property damage is to work performed by other parties and provided said Contractor's and Subcontractors', negligence contributed in any way to said damage. This contract provision shall be incorporated into the contracts between the Contractor and Subcontractors.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's or Project Representative's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, or Project Representative, be uncovered for examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect or Project Representative has not specifically requested to examine prior to its being covered, the Architect or Project Representative may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense with no adjustment to Contract Time.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

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

§ 12.2.2 After Substantial Completion

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

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

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

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

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

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

§ 12.3 Acceptance of Nonconforming Work

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the laws of the State of Wisconsin.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. The Owner may withhold its consent in its sole discretion. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.1.1 In case the Contractor assigns all or any part of any moneys due or to become due under this Contract, the instrument of assignment shall contain an article substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the Contractor shall be subject to prior claims of all persons, firms, and corporations for services rendered or materials supplied for the performance of the Work called for in this Contract and subject to the terms of this Contract and claims of offset by the Owner.

§ 13.2.1.2 On the date of Substantial Completion, the Contractor shall assign to the Owner all warranties and guarantees of labor or material incorporated into the Work which are provided by third party vendors, suppliers, manufacturers, and Subcontractors.

§ 13.2.1.3 Upon Substantial Completion of the Work, good title to all materials and supplies incorporated into the Work shall be conveyed to the Owner, free and clear of all liens and encumbrances.

§ 13.2.2 Antitrust Agreement. The Contractor and the Owner recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the Owner. Therefore, the Contractor hereby assigns to the Owner any and all claims for such overcharges as to goods and materials purchased in connection with this Contract, except as to overcharges which result from antitrust violations commencing after the price is established under this Contract and any Change Order thereto.

§ 13.3 Rights and Remedies

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

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

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect and Project Representative timely notice of when and where tests and inspections are to be made so that the Architect

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and Project Representative may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

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

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

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

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

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

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate as listed in the Standard form of Agreement Between Owner and Contractor or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.6 Reserved

§ 13.7 Reserved

§ 13.8 Nondiscrimination/Affirmative Action -

§ 13.8.1 In connection with the performance of Work under this Contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of age, race, religion, color, handicap, sex, physical condition, developmental disability as defined in Wis. Stat. §51.01(5), sexual orientation, national origin, or any other basis prohibited by law. This provision shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training. Except with respect to sexual orientation, the Contractor further agrees to take affirmative action to ensure equal employment opportunities. This contract provision shall be incorporated into the contracts between the Contractor and Subcontractors.

§ 13.8.2 Contracts with a value of fifty thousand dollars (\$50,000) or more require the Contractor to submit a written affirmative action plan acceptable under Wisconsin Statutes. An exemption occurs from this requirement if the Contractor has a Work force of less than thirty (50) employees. The Contractor is responsible for obtaining affirmative action compliance from Subcontractors. Instructions on satisfying these requirements will be sent with the Notice to Proceed.

§ 13.8.3 The Contractor should establish and take appropriate initiatives to reach goals and timetables for minority and female utilization which shall be based on appropriate work force, demographic, or other relevant data which shall cover construction projects or construction contracts performed in specific geographical areas. The goals shall be applicable to the Contractor's, and Subcontractor's entire work force which is working in the area covered by the goals.

§ 13.8.4 Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom a Contractor has a collective bargaining agreement, to refer to either minorities or women shall excuse the Contractor's required initiatives under these specifications.

§ 13.8.5 The Contractor agrees to post in conspicuous places, available for employees and applicants for employment, a notice to be provided by the Owner that sets forth the provisions of this Article 13.8.

§ 13.8.6 Failure to comply with the conditions of this Article 13.8 may result in the Contractor becoming declared an "ineligible" Contractor, termination of the Contract, or withholding of payment.

§ 13.9 Minimum Wages

§ 13.9.1 The Contractor shall post, at an appropriate conspicuous point on the site of the Project, a schedule showing

all determined minimum wage rates for the various classes of laborers and mechanics to be engaged in Work on the Project under this Contract and all deductions, if any, required by law to be made from unpaid wages actually earned by the laborers and mechanics so engaged.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

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

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 Intentionally deleted.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

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

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

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

The Owner may exercise any and all rights or remedies provided for herein, by law or in equity, either concurrently or singly in its sole discretion.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, three days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon secured for this project by the Contractor; and
- .2 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

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

§ 14.3 Suspension by the Owner for Convenience

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

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time and at its sole discretion, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

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

§ 14.4.3.1 The Contractor shall be paid for all Work performed to the effective date of termination, and any "Reimbursable Expenses" outstanding as of the date of termination. The term "Reimbursable Expenses" shall include the cost of personal property or materials which meet requirements of the Contract Documents and have been purchased by the Contractor for incorporation into the Work but not yet incorporated therein; lease payments due to an unaffiliated third party lessor for equipment provided to the Project, where the lease term extends beyond the termination date of this Contract and the Contractor is unable to terminate said lease; and other costs approved by Project Representative. Reimbursable Expenses do not include lost profits or payments due to Subcontractors for any period of time subsequent to termination of the Contract. Upon payment of the Reimbursable Expenses, the Contractor shall deliver to the Owner any materials or personal property for which said payment has been made.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

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

§ 15.1.2 Time Limits on Claims

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

§ 15.1.3 Notice of Claims

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

- .1 First, the Contractor shall present its Claim to the Initial Decision Maker who shall have twenty one (21) calendar days after presentation of the Claim to act thereon or notify the Contractor in writing of the additional time required for such action if greater than the aforementioned twenty-one (21) day period. Failure by the Initial Decision Maker to so act within the aforesaid period of time shall constitute a rejection of the Contractor's Claim;
- .2 If the Initial Decision Maker is not the Owner and the Contractor's Claim is rejected by Initial Decision Maker, the Contractor may appeal it in writing to the Owner. Any such appeal shall be made within twenty-one (21) calendar days after it is rejected by Initial Decision Maker. If no such appeal is made, the decision of Initial Decision Maker shall become final and binding and the Contractor shall waive its right to pursue the Claim further;
- .3 If the Contractor files a timely appeal of the decision of Initial Decision Maker, the Owner shall act on the Contractor's Claim within fourteen (14) calendar days or notify the Contractor in writing, of the time required for such action if greater than the aforementioned fourteen (14) day period. Failure by the Owner to so act within the aforesaid period of time shall constitute a rejection of the Claim;
- .4 If the Contractor's Claim is rejected by the Initial Decision Maker, the Contractor shall, as a condition precedent to filing suit against the Owner, comply with resolution procedures set forth in Wisconsin statutes.

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

§ 15.1.4 Continuing Contract Performance

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

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker. The Owner and the Contractor shall act in good faith to efficiently and fairly resolve Claims and disputes arising under the Contract in order to avoid wherever possible, formal legal proceedings.

§ 15.1.5 Claims for Additional Cost

It is recognized by the Owner and Contractor that performance of the Owner's duties may require or cause the interruption or suspension of the Work for periods other than the reasonable time allowed under 2.4. If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5.1 In the event of such interruption or suspension, the Owner and the Contractor shall negotiate in good faith in an effort to agree upon the additional construction costs and other amounts, if any, that shall be paid the Contractor because of the interruption or suspension of Work. Anything in the Contract Documents to the contrary notwithstanding, however, it is expressly understood and agreed that:

- .1 The total amount recoverable by and payable to the Contractor shall be limited to an amount equal to the sum of the additional construction costs and other amounts actually incurred by the Contractor because of the Owner's actions and omissions; plus a maximum overhead and profit allowance equal to fifteen (15) percent of the sum of additional construction costs and other amounts.
- .2 Overhead costs for extended or unabsorbed overhead shall not be used as the basis for calculating or determining the amount of any additional construction costs or other amounts recoverable by or payable to the Contractor; and
- .3 By entering into this Contract with the Owner, the Contractor hereby waives any rights that it otherwise might have to pursue recovery of overhead costs for extended or unabsorbed overhead from the Owner.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

- .1 Where, under the Contract, Initial Decision Maker extends the amount of time specified for completion of the Project, the new time limit fixed by such extension shall be the essence of this Contract.
- .2 Time extensions and associated adjustments in the Contract Documents which are implemented by, or based on Change Orders for which an overhead allowance would otherwise be permitted hereunder, shall not include any allowance for extended and unabsorbed overhead costs.
- .3 Permitting the Work or any part of it to continue after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the Owner, of any of the Owner's rights under the Contract or a waiver of any default by the Contractor.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction. A determination on a Claims in accordance with 15.1.6.2 shall only be made by the Initial Decision Maker upon written request by the Contractor. Not all extension(s) in the allowable time for completion, when granted by Initial Decision Maker, will result in additional compensation to the Contractor.

(Paragraphs deleted)

§ 15.2 Initial Decision

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

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks

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sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

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

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

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

§ 15.2.6 Intentionally deleted.

§ 15.2.6.1 Intentionally deleted.

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

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

§ 15.3 Litigation

§ 15.3.1 Any judicial action relating to the construction, interpretation, or enforcement of the Contract Documents including without limitation, the Contractor's claims, demands, and causes of action for additional construction costs, delay damages, and other amounts owed hereunder, shall be brought and venue in the Dane County Circuit Court in Madison, Wisconsin. The Contractor hereby consents to personal jurisdiction in that venue, and waives any defenses that the Contractor otherwise might have relating thereto.

§ 15.3.2 The Contractor hereby waives its right to a jury trial in connection with any judicial action or proceeding that may arise by and between the Owner and the Contractor concerning the construction, interpretation, or enforcement of the Contract Documents including, without limitation, any claims, demands, or causes of action that the Contractor hereafter may assert against the Owner for additional construction costs, delay damages, and other amounts.

(Paragraphs deleted)

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SECTION 00800

SUPPLEMENTARY CONDITIONS

PART 1 - GENERAL

1.01 REFERENCE DOCUMENT

- A. These Supplementary Conditions are included as a part of the contract documents for this project to amend the provisions of the "General Conditions of the Contract for Construction", Document A201 of the American Institute of Architects, 2017 Edition, as required for this project. Reference herein to articles of the General Conditions refer to said Document A201.

1.02 PARAGRAPH 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

- A. Add subparagraph 3.3.4 as follows:

3.3.4 Contractor (1) shall review any specified construction or installation procedure (including those recommended by manufacturers); (2) shall advise the Architect (a) if the specified procedure deviates from good construction practice, (b) if following the procedure will affect any warranties, including the Contractor's general warranty, or (c) of any objections the contractor may have to the procedure; and (3) to propose any alternative procedure which the Contractor will warrant."

1.03 PARAGRAPH 3.4 LABOR AND MATERIALS

- A. Add Subparagraphs 3.4.4 and 3.4.5 as follows:

3.4.4 All contractors and subcontractors engaged in the Owner/Contractor Agreement shall conform to the labor laws of the State in which Work is to be performed and the various acts amendatory and supplementary thereto; and to all other laws, ordinances and legal requirements applicable thereto."

1.04 PARAGRAPH 3.5 WARRANTY

- A. Add subparagraph 3.5.3 as follows:

3.5.3 The Contractor shall guarantee and warrant his and his subcontractor's work and materials (including the materials and work of suppliers of the Contract and his subcontractors) for a period of one year from the date of Substantial Completion. This Warranty shall be for a longer period on certain items if so designated in the Specifications. The foregoing one-year guaranty and warranty shall not in any way limit, restrict or affect the liability of the Contractor, or his subcontractors, for indemnity as provided for in this Contract, nor shall it in any way shorten the period of limitation fixed by law for the filing of any action against the Contractor for enforcement of the or breach of any provision of the contract documents. Should the Contractor elect to use any of the equipment in the building during the construction period, he shall make

arrangements with the subcontractor or supplier of the equipment for any extension of warranty of that equipment made necessary by such use. The Warranty period for such equipment to the Owner shall not be reduced by the use of equipment by the Contractor".

1.05 PARAGRAPH 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- A. Add the following to subparagraph 3.12.5.1:

3.12.5.1 Incomplete or poorly prepared shop drawings or other submittals will be returned to the Contractor to be revised or redrawn prior to resubmittal. The Contractor will hold the Architect and Owner harmless against claims for losses or injury caused by errors or omissions in the shop drawings or other submittals for the Work made by the Contractor, a subcontractor, any lower tier subcontractor, manufacturer, supplier or distributor."

- B. Delete subparagraph 3.12.8 and substitute the following:

3.12.8 The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect of such deviations in a separate writing or by submitting a separate written request for change at the time of submittal and the Architect 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, Samples or similar submittals by the Architect's approval thereof."

1.06 PARAGRAPH 4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

- A. Add sub-subparagraph 4.2.4.1 as follows:

4.2.4.1 Any direct communications between the Owner and the Contractor; or between the Contractor or Sub-contractors and the Architect's Consulting Engineers that affect the performance or administration of the Contract shall be made or confirmed in writing, with copies to the Architect, and any such communications that represent a modification of the Contract requirements will be documented appropriately. Any communications among the Architect and Subcontractors shall be confirmed in writing to the Contractor."

1.07 PARAGRAPH 7.2 CHANGE ORDERS

- A. Delete subparagraph 7.2.1 and substitute the following:

7.2.1 All requests for changes, additions or deductions, shall be submitted in a complete itemized breakdown acceptable to the Architect.

7.2.2 Wherein unit prices are stated in the contract, submit itemized

break down showing each unit price and it quantities.

7.2.3 The contractor shall present an itemized accounting together with appropriate supporting data for the purposes of considering additions or deductions. Supporting data shall include but is not limited to the following:

- .1 costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and worker or workmen's compensation insurance;
- .2 costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
- .5 additional costs of supervision and field office personnel directly attributable to the change.
- .6 the value of all such additions and deductions shall then be computed as set forth in Paragraph 7.2.5.

7.2.4 The burden of proof of cost rests upon the Contractor. Contractor agrees that Owner or Owner's Representative shall have the right, at reasonable times, to inspect and audit the books and records of Contractor to verify the propriety and granting of such cost.

7.2.5 Compute requests for changes be they additions or deductions as follows:

- .1 For work performed by the Contractor:

Net cost of material and delivery	a
State Sales Tax	b
Net Placing cost	c
W.C. Insurance Premium and FICA Tax	<u>d</u>
	a+b+c+d
Overhead and Profit, shall not exceed 12% x (a+b+c+d)	<u>e</u>
Allowable Bond Premium	<u>f</u>
TOTAL COST	<u>a+b+c+d)+e+f</u>
- .2 Credit for work omitted shall be computed as outlined in 7.2.5.1 "a through e" except the contractor's share of overhead and profit is 7%.
- .3 For work performed by Subcontractors:

Subcontractors shall compute their work as outlined in 7.2.5.1 "a through e".

To the cost of that portion of the work (change) that is performed by the subcontractor, the general contractor shall add an overhead

and profit change of five (5%) percent plus the allowable bond premium.

1.08 PARAGRAPH 9.3 APPLICATIONS FOR PAYMENT

A. Delete subparagraph 9.3.1 and substitute the following:

9.3.1 The Contractor shall present to the Architect an application for payment on or before the twenty-fifth day of each calendar month. These periodical estimates for partial payment shall be submitted on forms, prepared at the Contractor's expense and conforming to AIA Document G702. An original and a requested number of copies of such estimate shall be tendered to the Architect."

1. Each application for payment shall be accompanied by a revised Construction Schedule. Failure to provide the revised Construction Schedule may cause a delay in processing payment applications. Any areas of the Construction Schedule that are delayed from the previous schedule shall be highlighted for the Architects attention and a detailed explanation of the reason for the delay shall accompany the revised schedule.
1. The contractor and each subcontractor shall keep an accurate record showing the names, addresses, social security numbers, occupations or work classifications, and hours worked of all workers employed by them in connection with the public works, and showing the actual wages paid to each of the workers.
2. Certified copies of these records shall be submitted with each and every Application for Payment.

1.09 PARAGRAPH 9.6 PROGRESS PAYMENTS

EDIT IF CMAR INVOLVED (Retainage references may conflict with Owner/CM Agreement and sub retainages as may be stated in Trade Packages)

A. Delete subparagraph 9.6.1 and substitute the following:

9.6.1 Retainage: No later than the 10th day of each calendar month, the Owner will make partial payment to the Contractor, but the Owner will retain 10% of the amount of each payment. Retaining 10% of each payment will continue until final completion and acceptance of all work covered by the contract. However, the Architect may upon approval by the Owner, at any time after 50% of the Contract Work has been completed and based on satisfactory workmanship, and progress has been attained, including written consent of surety, recommend that any of the remaining partial payments be stopped. The retainage will be paid to the Contractor after completion of the Contract for Construction and after the Contractor has submitted all Project Record Documents, Maintenance Manuals, Warranties and Guarantees (Close-Out Documents). No retainage shall be held on materials properly stored at the site or in the Contractor's bonded or insured warehouse if certificates of insurance or bond and invoices are provided."

9.6.1.1 Progress payments will be made for work completed or for materials delivered and properly stored, in accordance with subparagraph 9.6.1, through the Contracted Construction Period. No payments will be made after the Contracted Construction Period has expired until Final Payment, unless an extension of the Contract Time has been granted. in which case, an additional progress payment will be made for work performed during the extension time period only."

1.10 PARAGRAPH 9.8 SUBSTANTIAL COMPLETION

A. Add the following sub-subparagraphs 9.8.3.1 thru 9.8.3.3 as follows:

9.8.3.1 If the Architect or any of the Architect's Consultants determines that the Work has still not reached Substantial Completion a second list of deficiencies will be issued to the Contractor.

9.8.3.2 Any additional inspections by the Architect or the Architect's Consultants to determine Substantial Completion will be considered additional services and will be billed directly to the Owner.

9.8.3.3 The Contractor will reimburse the Owner for expenses related to these additional services, or, the Owner may choose to withhold money from Progress Payment(s) or from retainage as reimbursement for additional services."

1.11 PARAGRAPH 9.10 FINAL COMPLETION AND FINAL PAYMENT

A. Add sub-subparagraphs 9.10.1.1 thru 9.10.1.4 as follows:

9.10.1.1 If the Architect or any of the Architect's Consultants determines that the Work has not reached Final Completion a list of deficiencies will be issued to the Contractor.

9.10.1.2 Any additional inspections by the Architect or the Architect's Consultants to determine Final Completion will be considered additional services and will be billed directly to the Owner.

9.10.1.3 The Contractor will reimburse the Owner for expenses related to these additional services, or, the Owner may choose to withhold money from Final Payment or from retainage as reimbursement for additional services.

9.10.1.4 Before issuance of the final certificate, the Contractor shall obtain in writing from the bonding company approval of such payment. No certificate issued nor payment made to the Contractor, nor partial or entire use or occupancy of the Contract Work by the Owner, shall be an acceptance of any work or materials not in accordance with this contract."

9.10.1.5 Final payment will not be made until all project closeout documents are received from the Contractor and a release from the Contractor's Surety Company is received.

1.12 PARAGRAPH 11.1 CONTRACTOR'S INSURANCE AND BONDS

A. Delete subparagraph 11.1.2 and substitute the following:

11.1.2 Coverages, whether written on an occurrence or claims-made basis, shall

be maintained without interruption from date of commencement of the work until date of final payment and termination of any coverage required to be maintained after final payment. The insurance required shall be written for not less than the following, or greater if required by law:

- .1 Workers' Compensation:
 - (a) State: Statutory
 - (b) Applicable Federal: Statutory
 - (c) Employer's Liability: \$100,000 per accident; \$500,000 disease limit, policy; \$100,000 disease limit, individual
- .2 Commercial General Liability (including premises-operations); independent contractors protective; products and completed operations) as follows:
 - (a) Coverage should apply at each work site. Limits required as follows:
 - (1) General Aggregate \$2,000,000
 - Products/Completed Operations Aggregate \$1,000,000
 - Personal Injury & Advertising Injury \$1,000,000
 - Each Occurrence \$1,000,000
 - (b) Comprehensive General Liability. Coverage provided will be on the Comprehensive General Liability form with the Broad Form General Liability Endorsement. Limits provided as follows:
 - (1) Combined Single Limit: \$1,000,000 each occurrence and aggregate
 - (2) Products and Completed Operations to be maintained for one year after final payment.
 - (3) Property Damage Liability Insurance will provide X, C, or U coverage as applicable.
 - (4) Contractual Liability:
 - Bodily Injury: Combined Single Limit
 - Property Damage: \$1,000,000 Each Occurrence
 - (5) Personal Injury, with Employment Exclusion deleted: Combined Single Limit \$1,000,000 Each Occurrence
 - (6) Bodily Injury and Property Damage (Combined Single Limit) (any auto, including Owned, Hired and Non-Owned Autos):

FOLLOW TWO HIGHLIGHTED ITEMS NEED TO BE VERIFIED - DBA DOES NOT IDENTIFY

Fire Damage-Legal Liability
(any one fire) \$50,000
\$1,000,000
Medical Payments (any one person) \$10,000
\$1,000,000

Bodily Injury: Combined Single Limit
Property Damage: \$1,000,000 Each Occurrence"

- B. Add sub-subparagraph 11.1.2.1 as follows:

11.1.2.1 The performance-payment bond shall be in compliance with the laws of the State in which the Work is to be performed and as stipulated in Document 00 61 13, Performance and Payment Bond, of these specifications."

- C. Add sub-subparagraphs 11.1.3.1 and 11.1.3.2 as follows:

11.1.3.1 The Contractor shall furnish one copy of each certificate of insurance herein required for each copy of the agreement which shall specifically set forth evidence of all coverage required by subparagraphs 11.1.1 and 11.1.2. Furnish to the Owner copies of any endorsements that are subsequently issued amending coverage of limits."

11.1.3.2 The Contractor shall not commence work under this contract until he has obtained all insurance with responsible insurance companies satisfactory to the Owner required under this article, and such insurance has been accepted by the Owner. Nothing in this article shall create any obligation on the part of the Architect to see that the specified insurance is maintained."

- D. Add subparagraph 11.1.5 as follows:

11.1.5 All Subcontractors shall be required to maintain contractors liability insurance the same as required to be maintained by the Prime Contractor as specified in 11.1.1 and the limits of liability shall be not less than those required to be maintained by the Prime Contractor unless their operations are covered to the specified limits by the insurance maintained by the Prime Contractor."

1.13 PARAGRAPH 11.2 OWNER'S INSURANCE

- A. Delete subparagraph 11.2.1 and substitute the following:

11.2.1 The Contractor shall procure and maintain during the term of this contract, Owner's Protective Liability Insurance with an endorsement to the policy to include as additional insured, the Architect, with limits not less than \$1,000,000 each occurrence and \$1,000,000 in the aggregate for property damage liability."

1.14 PARAGRAPH 11.2.3 PROPERTY INSURANCE

- A. In subparagraph 11.3.1, in the first line, change the word "Owner" to "Contractor".
B. In subparagraph 11.3.2, in the first line, change the word "Owner" to "Contractor".

1.15 PARAGRAPH 15.1 CLAIMS

- A. Refer to sub-paragraph 15.1.5, Claims for Additional Time and add the following sub-subparagraph 15.1.6.3 as follows:

15.1.6.3 In order for a claim for additional time due to adverse weather conditions to be considered valid, the Contractor must show that adverse weather conditions beyond those normally expected have occurred. For claims related specifically to "Rain Days" the following table of normal rain days will be employed to determine if the Contractor is entitled to a time extension. A "Rain Day" is defined as a 24 hour period in which 1/100" (.01) of rain or more falls and is recorded by the National Weather Service or other official reporting service in the immediate vicinity of the project. Extensions of time will be granted if the number of officially reported "Rain Days" is greater than normal during a given month. Claims for additional time must be submitted with the Contractor's monthly payment application for review. Failure to make timely and proper request for additional time will result in no time extension being allowed.

Average Days with 1/100" of Precipitation or More: Central Arkansas

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
9	9	10	10	10	9	8	7	7	7	8	9

Average Days with 1/100" of Precipitation or More: Northwest Arkansas

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
8	8	9	10	11	9	7	7	7	7	7	7

Average Days with 1/100" of Precipitation or More: Northeast Arkansas

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
9	8	11	11	11	9	9	8	8	8	9	9

Average Days with 1/100" of Precipitation or More: Southern Arkansas

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
9	8	9	7	8	9	12	11	9	6	8	9

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF DOCUMENT 00 73 00

SECTION 00855

TRENCH SAFETY, OCCUPATIONAL SAFETY AND HEALTH ADMIN, LABOR

Subpart P—Excavations

§1926.650 Scope, application, and definitions applicable to this subpart.

§1926.651

(a) *Scope and application.* This sub-part applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

(b) *Definitions* applicable to this subpart.

Accepted engineering practices means those requirements which are compatible with standards of practice required by a registered professional engineer.

Aluminum Hydraulic Shoring means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such system is designed, specifically to support the sidewalls of an excavation and prevent cave-ins.

Bell-bottom pier hole means a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

Benching (Benching system) means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near vertical surfaces between levels.

Cave-in means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

Competent person means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Cross braces mean the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

Excavation means any manmade cut, cavity, trench, or depression in an earth surface, formed by earth removal. Faces or sides mean the vertical or inclined earth surfaces formed as a result of excavation work.

Failure means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

Hazardous atmosphere means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury. Kickout means the accidental release or failure of a cross brace.

Protective system means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection. Ramp means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

Registered Professional Engineer means a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a “registered professional engineer” within the meaning of this standard when approving designs for “manufactured protective systems” or “tabulated data” to be used in interstate commerce.

Sheeting means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield (Shield system) means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses.

Additionally, shields can be either premanufactured or job built in accordance with § 1926.652 (c)(3) or (c)(4). Shields used in trenches are usually referred to as “trench boxes” or “trench shields.”

Shoring (Shoring system) means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins. Sides. See “Faces.”

Sloping (Sloping system) means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Stable rock means natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Structural ramp means a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps. Support system means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Tabulated data means tables and charts approved by a registered professional engineer and used to design and construct a protective system.

Trench (Trench excavation) means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench. Trench box. See “Shield.” Trench shield. See “Shield.”

Uprights means the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called “sheeting.”

Wales means horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

§1926.652 Specific excavation requirements.

- (a) *Surface encumbrances.* All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.
- (b) *Underground installations.*
 - (1) The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.
 - (2) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.
 - (3) When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.
 - (4) While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.
- (c) *Access and egress—*
 - (1) *Structural ramps.*
 - (i) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.
 - (ii) Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.
 - (iii) Structural members used for ramps and runways shall be of uniform thickness.
 - (iv) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.
 - (v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.
 - (2) *Means of egress from trench excavations.* A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.
- (d) *Exposure to vehicular traffic.* Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high visibility material.
- (e) *Exposure to falling loads.* No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with § 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.
- (f) *Warning system for mobile equipment.* When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning

system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

(g) *Hazardous atmospheres—*

(1) *Testing and controls.*

- (i) In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50–1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:
- (ii) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.
- (iii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.
- (iv) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.
- (v) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(2) *Emergency rescue equipment.*

- (i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.
- (ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

(h) *Protection from hazards associated with water accumulation.*

- (1) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.
- (2) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.
- (3) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(1) and (h)(2) of this section.

(i) *Stability of adjacent structures.*

- (1) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.
 - (2) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:
 - (i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or
 - (ii) The excavation is in stable rock; or
 - (iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or
 - (iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.
 - (3) Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.
- (j) *Protection of employees from loose rock or soil.*
- (1) Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.
 - (2) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.
- (k) *Inspections.*
- (1) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.
 - (2) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
- (l) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with § 1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

§1926.653 Requirements for protective systems.

- (a) *Protection of employees in excavations.*

- (1) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:
 - (i) Excavations are made entirely in stable rock; or
 - (ii) Excavations are less than 5 feet (1.52m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.
- (2) Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.
- (b) *Design of sloping and benching systems.* The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b)(1); or, in the alternative, paragraph (b)(2); or, in the alternative, paragraph (b)(3), or, in the alternative, paragraph (b)(4), as follows:
 - (1) *Option (1)—Allowable configurations and slopes.*
 - (i) Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.
 - (ii) Slopes specified in paragraph (b)(1)(i) of this section, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.
 - (2) *Option (2)—Determination of slopes and configurations using Appendices A and B.* Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart.
 - (3) *Option (3)—Designs using other tabulated data.*
 - (i) Designs of sloping or benching systems shall be selected from and be in accordance with tabulated data, such as tables and charts.
 - (ii) The tabulated data shall be in written form and shall include all of the following:
 - (A) Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;
 - (B) Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;
 - (C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.
 - (iii) At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.
 - (4) *Option (4)—Design by a registered professional engineer.*
 - (i) Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) under paragraph (b) of this section shall be approved by a registered professional engineer.
 - (ii) Designs shall be in written form and shall include at least the following:
 - (A) The magnitude of the slopes that were determined to be safe for the particular project;
 - (B) The configurations that were determined to be safe for the particular project; and
 - (C) The identity of the registered professional engineer approving the design.
 - (iii) At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the Secretary upon request.

(c) *Design of support systems, shield systems, and other protective systems.* Designs of support systems shield systems, and other protective systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(1); or, in the alternative, paragraph (c)(2); or, in the alternative, paragraph (c)(3); or, in the alternative, paragraph (c)(4) as follows:

- (1) *Option (1)—Designs using appendices A, C and D.* Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c)(2) of this section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.
 - (2) *Option (2)—Designs Using Manufacturer's Tabulated Data.*
 - (i) Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.
 - (ii) Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.
 - (iii) Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall
 - (3) *Option (3)—Designs using other tabulated data.*
 - (i) Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.
 - (ii) The tabulated data shall be in written form and include all of the following:
 - (A) Identification of the parameters that affect the selection of a protective system drawn from such data;
 - (B) Identification of the limits of use of the data;
 - (C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.
 - (iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.
 - (4) *Option (4)—Design by a registered professional engineer.*
 - (i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.
 - (ii) Designs shall be in written form and shall include the following:
 - (A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and
 - (B) The identity of the registered professional engineer approving the design.
 - (iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.
- (c) *Design of support systems, shield systems, and other protective systems.* Designs of support systems shield systems, and other protective systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(1); or, in the alternative, paragraph (c)(2); or, in the alternative, paragraph (c)(3); or, in the alternative, paragraph (c)(4) as follows:

- (1) *Option (1)—Designs using appendices A, C and D.* Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c)(2) of this section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.
- (2) *Option (2)—Designs Using Manufacturer's Tabulated Data.*
 - (i) Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.
 - (ii) Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.
 - (iii) Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall be made available to the Secretary upon request.
- (3) *Option (3)—Designs using other tabulated data.*
 - (i) Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.
 - (ii) The tabulated data shall be in written form and include all of the following:
 - (A) Identification of the parameters that affect the selection of a protective system drawn from such data;
 - (B) Identification of the limits of use of the data;
 - (C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.
 - (iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.
- (4) *Option (4)—Design by a registered professional engineer.*
 - (i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.
 - (ii) Designs shall be in written form and shall include the following:
 - (A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and
 - (B) The identity of the registered professional engineer approving the design.
 - (iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.
- (d) *Materials and equipment.*
 - (1) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.
 - (2) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.
 - (3) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued

use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

(e) *Installation and removal of support—*

(1) *General.*

- (i) Members of support systems shall be securely connected together to prevent sliding, falling, kick outs, or other predictable failure.
- (ii) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.
- (iii) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.
- (iv) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.
- (v) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.
- (vi) Backfilling shall progress together with the removal of support systems from excavations.

(2) *Additional requirements for support systems for trench excavations.*

- (i) Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.
- (ii) Installation of a support system shall be closely coordinated with the excavation of trenches.

(f) *Sloping and benching systems.* Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

(g) *Shield systems—*

(1) *General.*

- (i) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.
- (ii) Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.
- (iii) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.
- (iv) Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

(3) *Additional requirement for shield systems used in trench excavations.* Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

Batesville Public Works Facility
Batesville, Arkansas

ETC Project Number 2106601CBATE

All other remaining parts of 29CFR Section 1926 Subpart P is hereby made part of this section

SECTION 01000 - GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

Furnish all required labor, equipment, and materials to complete all work in accordance with the drawings and specifications.

1.2 DEFINITIONS

Whenever the specifications require approval or selection of any item, it shall be construed to mean approval or selection by the Engineer. Whenever the specifications require submittal of reports or certifications, it shall be construed to mean submitted to the Engineer.

Approvals made by the Owner prior to final project inspection and acceptance do not relieve the Contractor from his obligation to perform the work in accordance with the specifications and drawings. These approvals do not prohibit the Owner from subsequently asserting any other contract rights under this contract.

A. Locations of Work

The work to be performed is at the following location: City of Batesville Public Works Facility, Batesville, Arkansas.

B. Principal Features

Clearing & Grubbing; Demolition & Dispose of; Cutting & Filling; Grading; Installation of Curb & Gutter, Concrete Sidewalk, Gravel Base, Asphalt Paving, Drainage Pipes & Inlets, Erosion & Sediment control, hydro seeding etc.

1.4 SUBMITTALS

A. Product Data

Submittals shall be furnished to ETC Engineers & Architects, Inc. 1510 South Broadway, Little Rock, Arkansas. 72202 RE: City of Batesville Public Works Facility, no later than 30 days after contract award, prior to the installation of the submitted materials and equipment. Submittals shall be approved by the Engineer, in writing, prior to the installation of the submitted materials and equipment. A seven-day review period may be anticipated upon receipt of Contractor furnished submittals to the Engineer.

Submittals shall include shop drawings, certifications, manufacturer's literature, samples, etc., sufficient in detail to show full compliance with this contract

document.

Contractor shall mark all submittals to show specific equipment or materials to be furnished under this contract.

If shop drawings show variations from the contract requirements, the Contractor shall, in writing, describe such variations and the reasons therefore, separate from the drawings, at the time of submittal.

In lieu of the label or listing of a specified agency (UL, FM, etc.) a written certificate from an approved, nationally recognized testing organization may be submitted. The testing organization shall be equipped to perform such services and shall certify that the items have been tested and conform to the requirements and testing methods of the specified agency.

B. Product Format

Submittals shall consist of two separately bound copies, placed in a hard cover binder, with each technical section separated by tabbed dividers. The dividers shall be keyed to an index inserted in the front of the binder.

Three copies of the submittal will be returned to the Contractor after the Engineer has reviewed it.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Access to Sites

Access to the sites will be from 6:30 A.M. to 5:30 P.M., Monday through Friday, unless other arrangement agreed upon with the site manager.

B. Excavation

Prior to start of the work, the contractor must contact utility companies. Any work without authorization to excavate will be shut down.

C. Protection

The Contractor shall provide signs, barriers, and barricades to provide a safe work area.

1.6 PRE-FINAL DEFICIENCY LIST

A. All work shall be coordinated with ETC Engineers& Architects, Inc. at (501) 375-1786.

- B. Prior to the completion of the work, the Owner/Engineer will furnish to the Contractor a list of all known project deficiencies. All deficiencies shall be corrected by the Contractor prior to final payment.
- C. Owner, Engineer, or his authorized representative, will conduct the final inspection and certify completion of the project to the Owner.

PART 2 PRODUCTS (Not applicable)

PART 3 EXECUTION (Not applicable)

END OF SECTION

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SECTION 01010 - SUMMARY OF WORK AND PROCEDURES

1.01 DEFINITIONS

- A. Contractor: The Party of the first part of the contract
- B. Owner: City of Batesville
Batesville, Arkansas
- C. Architect: ETC Engineers & Architects, Inc.
1510 So. Broadway
Little Rock, Arkansas 72202

1.02 FORM OF AGREEMENT

The "Standard Form of Agreement" A.I.A. Document A-101 shall be the Form of Agreement between Contractor and Owner. The Agreement takes place over all other Contract Documents.

1.03 NOTICE TO PROCEED

Do not begin work prior to receipt of written Notice to Proceed authorizing performance of the Contract for each Project.

1.04 PAYMENTS TO CONTRACTOR

- A. Partial payments to include the value of materials delivered to site and labor executed shall be paid by Owner to Contractor in monthly installments upon Architect's certificate as work progresses in proportion to amount of work executed during monthly period, and in accordance with Article 9, Supplementary Conditions.
- B. Deliver four (4) copies of monthly application for payment to Architect. Include four (4) copies of the updated Progress Schedule with Payment Request.
- C. After payment, submit receipted invoices from all Subcontractors and Material Suppliers, certifying that payment has been made in full, less 5%.

1.05 PROGRESS SCHEDULE

Submit copies of Progress Schedule in accordance with Section 01300, Submittals & Substitutions.

1.06 CONSTRUCTION DOCUMENTS

The Contractor is to supply all contract drawings and specifications to his subcontractors or material suppliers. Additional sets or portions of contract drawings and specifications requested by the Contractor will be furnished for actual cost of printing at the Contractor's expense.

1.07 ORDERS FOR MATERIALS

- A. Place material orders within ten (10) days after execution of Contract. Furnish evidence of orders to Architect upon request.
- B. Place orders contingent upon selection of colors and finishes, approval of shop drawings and samples by Architect.
- C. Include with monthly request for payment and progress schedule a report of materials purchased and date materials are scheduled for delivery.

1.09 SUBCONTRACTOR LIST

Submit list of proposed Sub-contractors to Architect in accordance with Article 5, Supplementary Conditions. Do not award any Sub-contract without Architect's prior approval. This list does not refer only to subcontractors named in the Bid Form. It should include all of the subcontractors.

1.10 GUARANTEES

- A. Guarantee all work to be free from defects in materials and workmanship for a period of one (1) year from date of authorization of final settlement except where a different time period is specifically prescribed.
- B. When, at any time during the guaranty period, work is considered defective by either Owner or Architect, immediately:
 - 1. Place such defective work into satisfactory condition, free from faults and defects and in conformance with Contract requirements.
 - 2. Make good all damage to work, including contents thereof and grounds,

developing within guaranty period when such damage is due to use of materials and labor not conforming to Contract requirements.

3. Make good all work disturbed in fulfillment of Contract obligations during guaranty period. If work of other contractors is disturbed in the process of fulfilling Contract, restore such work to it original condition and guarantee such restored work.
- C. Upon failure by Contractor to proceed promptly to comply with terms of any guaranty under the Contract, Owner shall have such work performed as necessary to fulfill guarantees, and Contractor shall pay Owner such sums as expended to fulfill such guaranty.
 - D. Work required for fulfillment of guarantees embraced under the Contract shall be performed at no additional expense to Owner.

1.11 CONTRACT TIME

Perform all work necessary to bring entire Contract, Base Bid work, and its individual Projects, to state of final completion in not more than the time listed in the Bid Form.

1.12 WORK PERFORMED BY OWNER

- A. Owner Furnished, Contractor Installed Items:
 1. The Owner will purchase and deliver item to site. The Contractor shall unload, uncrate, assemble, and provide utilities and hook-up, as required for complete and operational installation.
 2. Refer to plans for items that are Owner Furnished, Contractor Installed:

1.13 COORDINATION

- A. Provide administrative and supervisory requirements necessary for coordination of work, including meetings, administrative and supervisory personnel, survey, records, reports, limitations for use of site, installation provisions, cutting and patching, cleaning, protection, conservation, and salvage. Coordinate work with work performed by Owner, including storage of materials and equipment, and connections and execution of work.

END OF SECTION

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SECTION 01020 - SPECIAL CONDITIONS

- 1.01 GENERAL: The GENERAL CONDITIONS form a part of this Section.
- 1.02 EXAMINATION OF SITE:
- A. Each bidder shall visit the site of the work compare the Drawings and Specifications with any work in place and inform himself of all conditions. Failure to visit the site will in no way relieve the successful bidder from necessity of furnishing materials or performing any work that may be required to complete work in accordance with Drawings and Specifications, without additional cost to the Owner.
 - B. Take special care to verify all existing conditions, elevations, lines and dimensions. Prior to submitting bids or commencing work, report any dimensional variations, discrepancies, obvious omissions, or other conditions materially affecting performance of the work in accordance with requirements indicated in Drawings and Specifications.
- 1.03 PROJECT LIMITS: The Contractor shall confine his operation, other than work required in the installation of utilities, drainage, etc., to the area indicated on the plans.
- 1.04 CODES: All work shall be performed to meet the requirement of applicable local, state and national codes and other agencies having jurisdiction.
- 1.05 PROTECTION: Protect work from injury due to weather, frost, dampness, accident and other like causes.
- 1.06 TEMPORARY JOB OFFICES:
- A. The Contractor shall furnish and maintain:
 - 1. A job office to accommodate Contractor and Architect. Substantially construct with floors above grade. Provide heat, light, and ventilation. A suitable travel trailer may be substituted in lieu of job constructed office space. Locate as directed by the Owner.
 - B. Maintain on file in job office: Copies of Drawings, and Specifications, supplemental drawings or data, shop drawings, approved samples, records pertinent to project.
 - C. Do not store tools, materials, supplies and equipment in job office.
 - D. Telephone and Facsimile: Provide telephone and fax in the field office. Pay costs for temporary service.

- 1.07 STORAGE SHEDS: Provide temporary, substantially constructed, dampproof storage sheds for materials and tools. Locate as directed.
- 1.08 SANITARY FACILITIES: Contractor shall provide temporary toilets, as required.
- 1.09 UTILITIES:
- A. Make necessary arrangements for all temporary and permanent electric services for lighting and power as required. The Contractor shall coordinate with all local utility companies for utilities to be relocated during construction.
 - B. Provide temporary and permanent water, gas, and sewer connections as required.
 - C. Refer to Mechanical and Electrical plans and specifications for additional information concerning construction utilities.
 - D. The Contractor shall pay all fees associated with temporary and permanent utility connections.
- 1.10 LAYING OUT WORK:
- A. Employ a Civil Engineer or Land Surveyor to lay out the work. Verify grades, levels and dimensions indicated on Drawings. Report any errors or inconsistencies to Architect in writing before commencing work.
 - B. Provide and maintain well-built batter boards at all corners of new construction, establish bench marks at not less than two widely separated locations, locate all general reference points and take such action necessary to prevent their destruction.
 - C. Employ a professional Civil Engineer or Land Surveyor registered in the State of Arkansas, and approved by the Architect, to confirm or define site boundaries and/or building lines. Erect substantial bench marks and preserve them throughout the work.
- 1.11 BARRICADES AND SIGNS:
- A. Provide and maintain lights, public barriers, and barricades, as required for protection of persons and property in accordance with local codes and good safety practices. The Contractor is solely responsible for the safety on the project.
 - B. Provide and maintain such signs required by safety regulations and necessary to safeguard life and property.

1.12 RESPONSIBILITIES OF CONTRACTOR:

- A. Except as otherwise specifically stated in the Contract, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, heat, power, transportation, superintendence, permits, fees, temporary construction of every nature, taxes legally collectible because of the work and all other services and facilities of every nature whatsoever necessary to execute the work to be done under the contract and deliver it complete in every respect within the specified time.
- B. If work is required in a manner to make it impossible to produce first class work, or should discrepancy appear among Contract Documents, request interpretation before proceeding with work. If Contractor fails to make such request, no excuse will thereafter be entertained for failure to carry out work in a satisfactory manner.
- C. Should conflict occur in or between Drawings and Specifications, the Contractor is deemed to have estimated on more expensive way of doing work unless he shall have asked for and obtained a written decision before submission of Proposal as to which method of materials will be required.

1.13 FILE DRAWINGS: At the completion of this project, the General Contractor shall furnish to the Architect, and to the Owner, a complete file of the final copies of all shop drawings used in the construction of this project.

1.14 COORDINATION: In the interest of expediting the Work, it shall be the responsibility of the Contractor to coordinate the work of all trades. The Contractor shall increase his forces, work overtime, or take other measures necessary in order to protect the work or complete certain portions of the work within the established time for the Project at no additional cost to the Owner under the Base Contract.

- A. Provide administrative and supervisory requirements necessary for coordination of work, including meetings, administrative and supervisory personnel, survey, records, reports, limitations for use of site, installation provisions, cutting and patching, cleaning, protection, conservation, and salvage.
- B. Coordinate construction activities included under various sections of these specifications to assure efficient and orderly installation of each part of the work. Coordinate construction operations included under different sections of the specifications that are dependent upon each other for proper installation, connection, and operation.
 - 1. Where installation of one part of the work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain its best results.

2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
- Prepare similar memoranda for the Owner and separate contractors where coordination for their work is required.
- D. Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the work. Such administrative activities include, but are not limited to, the following:
1. Preparation of schedules.
 2. Installation and removal of temporary facilities.
 3. Delivery and processing of submittals.
 4. Progress meetings.
 5. Project close-out activities.
- E. Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water and materials.
- F. Coordinate work with work performed by Owner and separate contractors, including storage of materials and equipment, and connections and execution of work.

1.15 ASSIGNMENT OF WORK: The terms "this Contractor" and "this Sub-Contractor" have not been used in this Specification. Whenever the term "Contractor" is mentioned within this Specification, it shall not be interpreted to imply that work required of various sub-contractors is assigned to other sub-contractors of the General Contractor.

1.16 ELECTRICAL LICENSE REQUIREMENT:

- A. No person shall perform electrical work on the contract without possessing an

Arkansas State Master or Journeyman License from the Arkansas State Electrical Examiners Board. All electrical work and apprentice electricians shall be supervised by a Master or Journeyman Electrician on a one-to-one ratio.

- B. All electricians shall have a copy of their license with them and shall be required to show it to an appropriate inspector upon request.
- 1.17 INSPECTION: The Contractor awarded this project agrees to allow any Federal or State Inspector, acting in their official capacity, to have access to the job site.
- 1.18 CERTIFICATIONS: Provide all required certifications for all systems as required in the Contract Price, including but not limited to mechanical, electrical, plumbing.
- 1.19 SUPERINTENDENT: Prior to start of work, the Contractor shall submit in writing to the Architect/Owner, the qualifications of the Superintendent for approval. If the Architect/Owner finds the Superintendent is unacceptable for any reason, the Contractor shall provide one which is acceptable.
- 1.20 INDUSTRY STANDARDS:
- A. Applicability of Standards: Except where more explicit or stringent requirements are written into the contract documents, applicable construction industry standards have the same force and effect as if bound into or copied directly into the contract documents. Such industry standards are made a part of the contract documents by reference. Individual specification sections indicate which codes and standards the Contractor must keep available at project site for reference.
 - B. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of contract documents.
 - C. Conflicting Requirements: Where compliance with two or more standards is specified, and where these standards establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the contract documents specifically indicate otherwise. Refer to requirements that are different, but apparently equal and uncertainties as to which quality level is more stringent to the Architect for decision before proceeding.
 - D. Copies of Standards: The Contract Documents require that each entity performing work be experienced in that part of the work being performed. Each entity is also required to be familiar with industry standards applicable to that part of the work. Copies of applicable standards are not bound with the contract documents. Where copies of standards are needed for proper performance of the work, the Contractor is required to obtain such copies directly from the

publication source.

- E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where acronyms or abbreviations are used in the specifications or other contract documents they are defined to mean the recognized name of the trade association, standards generating organization, governing authority, or other entity applicable to the context of the text provisions.
- 1.21 CONSTRUCTION AIDS: Provide and maintain for the duration of construction temporary equipment and apparatus including scaffolds, elevators and hoists, canopies, tarpaulins, barricades, warning signs, steps, ladders, platforms, ramps, chutes, and other temporary construction aids and miscellaneous facilities as necessary for proper completion of the work; comply with pertinent safety regulations.
- 1.22 TEMPORARY HEAT: Provide temporary heat where indicated and where needed for the proper performance of work, for curing or drying of work recently installed, and protection of work in place from, adverse effects of low temperature.
- 1.23 DEWATERING AND SNOW AND ICE REMOVAL: Maintain site, excavations, and construction free of water, snow and ice, as necessary for protection and execution of the work. Comply with dewatering requirements specified in Division 2 Specification Sections; where feasible, utilize same facilities.
- 1.24 TEMPORARY FIRE PROTECTION: During construction period and until fire protection needs are fulfilled by permanent facilities, provide and maintain types and forms of temporary fire protection needed to protect facilities against fire losses. Store combustible materials in recognized fire-safe locations and containers.
- 1.25 SECURITY: Provide sufficient control to prevent illegal entry or damage during nights, holidays, or other periods when work is not being executed, and such other controls as required during working hours.
- 1.26 RODENT CONTROL: Institute an effective program of rodent control. Provide marked metal containers for edible rubbish and enforce their use by employees. Empty containers and remove contents from site as often as required to maintain an adequate rodent control program. If this program of rodent control is not effective, additionally provide for regular services of an experience exterminator who shall visit the site at least once a month for entire construction period.
- 1.27 REMOVAL: Maintain construction facilities and temporary controls as long as needed for safe and proper completion of work. Remove temporary facilities and controls as rapidly as progress of work will permit or as directed by Architect.

END OF SECTION

SECTION 01030 - ALLOWANCES

PART 1 - GENERAL

- 1.01 SCOPE: The Contractor shall include in Contract Sum all Allowances stated in the Contract Documents.

The Contractor shall include in the Base Bid all allowances named in the Contract Documents and shall cause the work so covered to be done by such contractors and for such sums as the Architect may direct, the Contract Sum being adjusted in conformity therewith. The Contractor declares that the Contract Sum include such sums for expenses and profit on account of cash allowances as he deems proper. No demand for expenses or profit other than those included in the Contract Sum shall be allowed.

- 1.02 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Include the sum of Five Thousand Dollars (\$5,000.00) for the design, shop drawings, purchase, taxes, freight, delivery, and installation of all interior signage for this project. (Handicapped parking signs, parking stripes and painted directional arrows are included in the Sitework.) This allowance shall be for a turn-key process from design through installation.
- B. Allowance No. 2: Include the sum of Five Thousand Dollars (\$5,000.00) for the design, shop drawings, purchase, taxes, freight, delivery, and installation of all exterior building signage for this project. This allowance shall be for a turn-key process from design through installation.

- 1.03 ADJUSTMENTS OF COSTS: If the costs are more or less than the specified amount of Allowance, the Contract Sum will be adjusted accordingly by change order.

- 1.04 Allowance shall not be made a part of any subcontract agreement by Contractor until all materials stipulated have been selected by Architect.

END OF SECTION

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SECTION 01200- PROJECT MEETINGS

1.01 PRE-CONSTRUCTION MEETING:

- A. Architect will schedule and administer a pre- construction meeting within 15 days after date of Notice to Proceed.
- B. Location: A central site, convenient for all parties.
- C. Attendance:
 - 1. Owner's Representative.
 - 2. Architect and his professional consultants.
 - 3. Contractor's Superintendent.
 - 4. Major Subcontractors.
 - 5. Others as appropriate.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule regular periodic meetings, as required by progress of the work.
- B. Location of the meetings: The project field office of the Contractor.
- C. Attendance:
 - 1. Architect and his professional consultants as needed.
 - 2. Subcontractors and suppliers as appropriate to the agenda.
- D. Representative of contractors, subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.
- E. Architect may attend meetings to ascertain that Work is expedited consistent with Contract Documents and the construction schedules.

END OF SECTION

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SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

- 1.01 SCOPE: Provide all submittals, including shop drawings, product data, samples, schedules, reports, and requests for substitutions, as required by the Bidding and Contract Documents and in strict accordance with the provisions of this section.
- 1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS:
- A. Contractual Requirements for Submittals:
 - Section 00700: General Conditions
 - Section 00800: Supplementary Conditions
 - B. Individual Submittals Required: Pertinent sections of these specifications.
 - C. Contract Close-out: Section 01700

PART 2 - PRODUCTS

- 2.01 SHOP DRAWINGS:
- A. Submit required shop drawings drawn to a scale sufficiently large enough to show all pertinent features of the item and its method of connection to the Work. Submit related shop drawings together; partial submittals will not be accepted. Provide manufacturer's name and model number of prefabricated items and indicate methods of attachment and clearances required relative to other trades affecting all elements of the Work. Identify deviations from the Contract Documents (if any), check dimensions, check that trades have been coordinated and that no conflict will develop in this installation. Notify the Architect in writing of any errors or deviations at the time of submittal. Any dimensional or coordination problems which surface during construction due to lack of coordination by the General Contractor will be corrected at the Contractor's expense. After reviewing the shop drawings, indicate Contractor's approval by signing and dating on Contractor's stamp. The use of stamps which pass on responsibility to subcontractors will not be allowed. The General Contractor is responsible for review and coordination of all aspects of the work, and shall indicate that submittals have been reviewed for dimensions and coordination of all subcontractor work. Failure to follow these procedures will result in rejection of the submission and no additional contract time will be allowed for delay of this cause.

- B. Submit one transparency and one print of Contractor's stamped and approved shop drawings for Architect's review. The Architect will review the transparency, and stamp it with indication of action as appropriate. The Architect will retain the print for his record, and will return the transparency to the Contractor. For transparencies marked "Revise and Resubmit, Rejected", correct the original drawings, make a new transparency reproduction and print, and resubmit. For transparencies returned "Reviewed, Furnish as Corrected", provide such number of prints of the transparency as may be needed for field distribution.
- 2.02 PRODUCT DATA AND SAMPLES: Submit three (3) copies of product data for Architect's review for items specified in the various specification sections (five copies required for mechanical and electrical data). Submit samples, where specified, along with product data. Mark data clearly to indicate exact items submitted, and note deviations from Contract Documents (if any). After reviewing the submittals, indicate approval by signing and dating on Contractor's stamp, and submit to the Architect for review.
- 2.03 PROGRESS SCHEDULE:
- A. Prior to signing the Contract, submit to the Architect a bar chart progress schedule indicating a time for each trade for operation of Work to be performed at the site. Chart shall demonstrate planned Work, properly sequenced and intermeshed and all critical dates to complete work, for expeditious completion of Work. Indicate all critical dates for Owner furnished items, either Owner installed or General Contractor installed. Identify phases if required. Contractor's schedule shall become a part of the Contract.
- B. Submit with application for payments monthly updates of the schedule accurately depicting actual progress to the first day of the month. Indicate percentage of completion on the time bars at 10% increments.
- 2.04 SCHEDULE OF VALUES: Submit a schedule of values on AIA Document G703 (Continuation Sheet for G702). Itemize separate line cost for each major item of Work and each subcontracted item of Work (use Sections under Division 2 through 16 in Table of Contents as a basis for listing).
- 2.05 APPLICATION AND CERTIFICATE FOR PAYMENT: Submit Application and Certificate for Payment on AIA Document G702 and G703. Refer to Section 01370, Schedule of Values, Part 2, Paragraph A.
- 2.06 MANUAL: Upon completion of the Work and prior to final payment, submit to

the Architect a loose-leaf hard cover binder with the project name printed on it, containing five indexed sections as follows:

- A. Subcontractors: A listing of all subcontractors for the project, including portions of the Work done, address and telephone number of the firm, and contact at the firm familiar with the project.
- B. Guaranties and Warranties: One fully executed copy of each guaranty and warranty specified.
- C. Certificates: One fully executed copy of each certificate specified.
- D. Instructions: One operating, service, and maintenance manual or instruction sheet for each item specified.
- E. List of As-Built Drawings, Record Drawings, Shop Drawings, Product Data, and Samples.

2.07 DRAWINGS AND SUBMITTALS PACKAGE: Upon completion of the Work and prior to final payment, submit to the Architect a package labeled with the project name and containing one copy of all final record drawings, specifications, shop drawings, product data, and samples (see AIA A201 paragraph 3.11.1). This package and the manual will be presented by the Architect to the Owner upon completion of the project.

PART 3 - EXECUTION

- 3.01 IDENTIFICATION OF SUBMITTALS: Completely identify each submittal and resubmittal by showing at least the following information. Submittals not properly identified are subject to return without review.
- A. Name and address of submitter, plus name and telephone number of the individual who may be contacted for further information.
 - B. Name of project as it appears in these specifications.
 - C. Drawing number and specifications section number to which the submittal applies.
 - D. Number each submittal consecutively.

END OF SECTION

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SECTION 01310 - SUBSTITUTION REQUEST FORM

Mail to: ETC Engineers & Architects, Inc.
1510 South Broadway, Little Rock, Arkansas
Phone: 501-375-1786 Fax: 501-375-1277

SECTION PARAGRAPH SPECIFIED ITEM:
PROPOSED SUBSTITUTE:

Attach complete description, designation, catalog or model number, Spec Data Sheet, and other technical data, including laboratory tests, if applicable.

Fill In Blanks Below:

1. Will substitution affect dimensions indicated on Drawings?

2. Will substitution affect wiring, piping, ductwork, etc., indicated on Drawings?

3. What affect will substitution have on other trades?

4. Differences between proposed substitutions and specified items?

5. If necessary, will the undersigned pay for Architect's cost, required to revise working drawings, caused by substitution?

6. Manufacturer's warranties of specified items and proposed items are: []Same [] Different(Explain)

7. Does substitution come in same colors, patterns, etc., as specified item, if applicable?

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SECTION 01370 - SCHEDULE OF VALUES

PART 1 - GENERAL

- A. Prior to the first Application for Payment Contractor shall submit to the Architect, an expanded Schedule of Values which will define labor and material separately for each significant portion of the work to be performed.
- B. Upon request of the Architect, Contractor shall support the values with date, which will substantiate their correctness.
- C. The Schedule of Values, unless objected to by the Architect, shall be used only as the basis for the Contractor's Applications for Payment.

PART 2 - FORM AND CONTENT OF SCHEDULE OF VALUES

- A. Submit schedule of AIA Document G703, Contractor's standard forms and automated printout will be considered for approval by Architect upon Contractor's request.
- B. Schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction.
- C. Follow the table of contents of this Project Manual as the format for listing component items. Identify each line item with the number and title of the respective major section of the specifications.
- D. For each major line item list sub-values of major products or operations under the item.
- E. For items on which progress payments will be requested for stored materials, break down the value into:
 - 1. The cost of the materials, delivered and unloaded, with taxes paid.
 - 2. The total installed value.
- F. The sum of all values listed in the schedule shall equal the total Contract Sum.

END OF SECTION

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SECTION 01400–QUALITY CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. The Contractor shall employ and pay for the services of an independent testing laboratory to perform specified testing, except where designated otherwise in the Specification Sections.
- B. Testing laboratory services are required for, but are not necessarily limited to, the following:
 - 1. Soil testing and compaction control.
 - 2. Cast-in-place concrete: Curing and testing of molded cylinders.
 - 3. Concrete paving: Density of compacted base for paving.

1.02 RELATED WORK:

- A. Related requirements in other parts of the Project Manual:

Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities: General Conditions of the Contract.
- B. Related requirements specified in other sections:
 - 1. Certification of products: The respective sections of Specifications.
 - 2. Test, adjust and balance of equipment: The respective sections of Specifications.
 - 3. Laboratory tests required, and standards for testing: Each specification section listed.

1.03 QUALITY ASSURANCE:

- A. The testing laboratory employed by the Owner will meet "Recommended Requirements for Independent Laboratory Qualification" published by the American Council of Independent laboratories.
- B. In its work on this project, the testing laboratory will be required to meet the basic requirements of ASTM E 329, "Standards of Recommended

Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction".

1.04 SUBMITTALS:

Submit written report of each test and inspection to the following:

- A. Architect/Engineer.
- B. Contractor.
- C. Project Record file at job site.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 DUTIES OF TESTING LABORATORY:

- A. Cooperate with Architect and Contractor; provide qualified personnel after due notice.
- B. Perform specified inspections, sampling and testing of materials and method of construction:
 - 1. Comply with specified standards.
 - 2. Ascertain compliance of materials with requirements of Contract Documents.
- C. Promptly notify Architect and Contractor of observed irregularities or deficiencies of work or products.
- D. Promptly submit copies of the written report of each test and inspection as required in Article 1.04 above.

3.02 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY:

- A. The testing laboratory is not authorized to:
 - 1. Release, revoke, alter or enlarge on the requirements of the Contract Documents.
 - 2. Approve or accept any portion of the Work.
 - 3. Perform any duties of the Contractor.

3.03 CONTRACTOR'S RESPONSIBILITIES:

- A. Cooperate with laboratory personnel and provide access to the Work and to Manufacturer's Operations.
- B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
- C. Provide to the laboratory the proposed design mix to be used for concrete and other material mixes which require control by the testing laboratory.
- D. Furnish copies of Products test reports as required.
- E. Furnish incidental labor and facilities:
 - 1. To provide access to the Work to be tested.
 - 2. To obtain and handle samples at the Project site or at the source of the product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. For storage and curing of test specimens.
- F. Notify the laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
- G. Provide all required time within the construction schedule for the testing laboratory to perform its tests and to issue each of its findings.
- H. Provide at the site three extra standard test cylinder molds for emergency use.

END OF SECTION

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SECTION 01410 - ENVIRONMENT PROTECTION

1.1 GENERAL REQUIREMENTS

The Contractor shall perform the work minimizing environmental pollution and damage as the result of construction operations. Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the utility of the environment for aesthetic, cultural and/or historical purposes. The control of environmental pollution and damage requires consideration of land, water, and air, and includes management of visual aesthetics, noise, solid waste, as well as other pollutants. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract.

A. Subcontractors

The Contractor shall ensure compliance with this section by subcontractors.

B. Environmental Protection Plan

The Contractor shall submit an environmental protection plan within 15 days after receipt of the notice to proceed. Approval of the Contractor's plan will not relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures. The environmental protection plan shall include, but shall not be limited to, the following:

1. Location of the solid waste disposal area.

C. Stormwater Pollution Prevention Plan

The contractor shall provide and comply with stormwater pollution plan developed by Engineer. (Not included in this contract.)

D. Permits

The Contractor shall obtain all needed permits or licenses. The Contractor shall be responsible for implementing the terms and requirements of the appropriate permits as needed and for payment of all fees.

E. Notification

The Architect/Engineer will notify the Contractor in writing of any observed noncompliance with the previously mentioned Federal, State or local laws or regulations, permits, and other elements of the Contractor's environmental protection plan. The Contractor shall, after receipt of such notice, inform the Architect/Engineer of proposed corrective action and take such action when approved. If the Contractor fails to comply promptly, the Architect/Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or costs or damages allowed to the Contractor for any such suspensions.

F. Litigation

If work is suspended, delayed, or interrupted due to a court order of competent jurisdiction, the Architect/Engineer will determine whether the order is due in any part to the acts or omissions of the Contractor, or subcontractors at any tier, not required by the terms of the contract. If it is determined that the order is not due to Contractor's failing, such suspension, delay, or interruption shall be considered as ordered by the Architect/Engineer in the administration of the contract under the contract clause SUSPENSION OF WORK.

G. Payment

No separate payment will be made for work covered under this section; all costs associated with this section shall be included in the contract unit and/or lump sum prices in the Bidding Schedule.

1.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify the land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without permission. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, earth or other material displaced into uncleared areas shall be removed.

A. Work Area Limits

Prior to any construction, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are to be saved and protected shall also be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

B. Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques.

C. Unprotected Erodible Soils

Earthwork brought to final grade shall be finished as indicated. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils.

D. Disturbed Areas

The Contractor shall effectively prevent erosion and control sedimentation through approved methods including, but not limited to, the following:

1. Retardation and control of runoff. Runoff from the construction site or from storms shall be controlled, retarded, and diverted to protected drainage courses by means of diversion ditches, benches, berms, and by any measures required by area wide plans under the Clean Water Act.

E. Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Architect/Engineer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas from despoilment.

1.3 WATER RESOURCES

The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation when such application may cause contamination of the fresh water reserve.

1.4 AIR RESOURCES

Equipment operation and activities or processes performed by the Contractor in accomplishing the specified construction shall be in accordance with the State's rules and all Federal emission and performance laws and standards. Ambient Air Quality Standards set by the Environmental Protection Agency shall be maintained. Monitoring of air quality shall be the Contractor's responsibility.

A. Hydrocarbons and Carbon Monoxide

Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to Federal and State allowable limits at all times.

B. Odors

Odors shall be controlled at all times for all construction activities, processing and preparation of materials.

C. Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise.

1.5 WASTE DISPOSAL

Disposal of wastes shall be as specified in Section 02220: DEMOLITION and as specified below.

A. Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off City property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal.

B. Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to ground or water.

Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. Chemical waste shall be collected in corrosion resistant, compatible containers. Wastes shall be disposed of in accordance with Federal and local laws and regulations.

C. Hazardous Wastes

The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing and shall collect waste in suitable containers observing compatibility. The Contractor shall transport hazardous waste off City property and dispose of it in compliance with Federal and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Architect/Engineer. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility.

D. Burning

Burning will not be allowed on construction site.

1.6 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rocks or coral alignments, paving's, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Architect/Engineer.

1.7 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction.

1.8 RESTORATION OF LANDSCAPE DAMAGE

The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work areas.

1.9 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

1.10 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental pollution control.

END OF SECTION

SECTION 01630 - SUBSTITUTIONS

PART 1 - GENERAL

1.01 GENERAL: General Conditions of the Contract, Supplementary Conditions, pertinent portions of sections in Division 1 of the Project Specifications and the Drawings shall apply to the Work of this Section

1.02 SUBSTITUTIONS:

A. Product List: Within 30 days after Contract Date, submit to the Architect a complete list of major products proposed to be used, with name of manufacturer and installing contractor.

B. Contractor's Option:

1. For products or methods specified only by commercial standard, reference standard, Federal Specification, trade association standards or other similar standards; select any product or method meeting that standard. Where this specification requires a better quality than such standard, these project specifications shall govern.
2. For products specified by naming several products or manufacturers, select any one of products or manufacturers named, which complies with this project specification.
3. For products specified by naming one or more products, methods or manufacturers and "or equal", Contractor must submit a request as for substitutions for any product or method or manufacturer not specifically named.
4. For products specified by naming only one product, method or manufacturer, and "no substitutions"; provide specified product, methods or manufacturer.

NOTE: Where proprietary products or methods are specified for one use, the intention is to establish a standard of quality, performance and/or size and not to exclude any other products of equal merit unless stated otherwise.

1.03 SUBSTITUTIONS: For products specified as above, bids shall be based on products named in project manual, or on items which Architect has designated as an "approved equal". A product not named in project manual or that is not approved by Architect will only be acceptable when such product meets all other requirements of project specifications, including specifications of

- originally specified products' manufacturer as of date of contract documents.
- 1.04 REQUESTS FOR SUBSTITUTIONS: Requests for Architects approval of a product as equal will not be considered unless sufficient data for evaluation is received by Architect.
- 1.05 SUBMITTALS: Submit a separate request for each product, supported with complete data, with drawings, cut sheets, and samples as appropriate, including:
- A. Comparison of qualities of proposed substitution with that of specified product.
 - B. Changes required in other elements of the Work because of substitution.
 - C. Effect on construction schedule.
 - D. Cost data comparing proposed substitution with product specified.
 - E. Availability of maintenance service, and source of replacement parts.
- 1.06 CONTRACTOR'S REPRESENTATION: Contractor's substitution of a product constitutes a representation that Contractor:
- A. Has investigated proposed product and determined that it is equal or superior in all respects to that specified.
 - B. Will provide same warranties or bonds for substitutions as for product specified.
 - C. Will coordinate installation of an accepted substitution into Work, and make such other changes as may be required to make Work complete in all respects.
 - D. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.
- 1.07 APPROVAL: Architect shall be judge of acceptability of proposed substitutions. Architect will review requests for substitutions with reasonable promptness, and notify Contractor, in writing, of decision to accept or reject requested substitution.
- 1.08 NOTICE: Architect's approval of an item for a previous project does not constitute approval for this Project.

Batesville Public Works Facility
Batesville, Arkansas

ETC Project Number 2106601CBATE

PART 2 - PRODUCTS NOT APPLICABLE

PART 3 - EXECUTION NOT APPLICABLE

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SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

- 1.01 SCOPE: Comply with requirements state in Conditions of the Contract and in Specifications for administrative procedure in closing out the Work.
- 1.02 WORK SPECIFIED IN OTHER SECTION:
- A. Cleaning: Section 01710
 - B. Project Record Documents: Section 01720
 - C. Operating and Maintenance Data: Section 01730
 - D. Warranties and Bonds: Section 01740
- 1.03 SUBSTANTIAL COMPLETION:
- A. When Contractor considers the Work is substantially complete, he shall submit to Architect, written notice that the Work, or designated portion thereof, is substantially complete including list of items to be completed or corrected.
 - B. Within a reasonable time after receipt of such notice, Architect will make an inspection to determine the status of completion.
 - C. Should Architect determine that the Work is not substantially complete:
 - 1. Architect will promptly notify the Contractor in writing, giving the reasons therefore including list of items to be completed or corrected.
 - 2. Contractor shall remedy the deficiencies in the Work, and send a second written notice of substantial completion to the Architect.
 - 3. Architect will reinspect the Work.
 - D. When Architect concurs that the Work is substantially complete, he will:
 - 1. Prepare a Certificate of Substantial Completion on AIA Form G704, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Architect.
 - 2. Submit the Certificate to Owner and Contractor for their written

acceptance of the responsibilities assigned to them in the Certificate.

1.04 FINAL INSPECTION:

- A. When Contractor considers the Work is complete, he shall submit written certification that:
 - 1. Contract Documents have been reviewed.
 - 2. Work has been inspected for compliance with Contract Documents.
 - 3. Work has been completed in accordance with Contract Documents.
 - 4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
 - 5. Work is completed and ready for final inspection.
- B. Architect will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should Architect consider that the Work is incomplete or defective:
 - 1. Architect will promptly notify the Contractor in writing, listing the incomplete or defective work.
 - 2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Architect that the Work is complete.
 - 3. Architect will reinspect the Work.
- D. When the Architect finds that the Work is acceptable under the Contract documents, he shall request the Contractor to make closeout submittals.

1.05 REINSPECTION FEES:

- A. Should Architect perform reinspection due to failure of the Work to comply with the claims of status of completion made by the Contractor:
 - 1. Owner will compensate Architect for such additional services.
 - 2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

1.06 CONTRACTOR'S CLOSEOUT SUBMITTALS:

- A. Evidence of compliance with requirements of governing authorities:
 - 1. Certificate of Occupancy.
 - 2. Certificates of Inspection:
 - a. Mechanical
 - b. Electrical
- B. Project Record Documents: To requirements of Section 01720.
- C. Operating and Maintenance Data, Instructions to Owner's Personnel: To requirements of Section 01730.
- D. Warranties and Bonds: To requirements of Section 01740.
- E. Keys and Keying Schedule: To requirements of Section 08710-Finish Hardware.
- F. Evidence of Payment and Release of Liens: To requirements of General and Supplementary Conditions.

1.07 FINAL ADJUSTMENTS OF ACCOUNTS:

- A. Submit a final statement of accounting to Architect. Statement shall reflect all adjustments to the Contract Sum:
 - 1. The original Contract Sum.
 - 2. Additions and deductions resulting from:
 - a. Previous Change Orders.
 - b. Allowances.
 - c. Unit Prices
 - d. Deductions for uncorrected Work.
 - e. Deductions for reinspection payments.
 - f. Other adjustments.
 - 3. Total Contract Sum, as adjusted.
 - 4. Previous payments.
 - 5. Sum remaining due.

- B. Architect will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.08 FINAL APPLICATION FOR PAYMENT:

- A. Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

END OF SECTION

SECTION 01710 - CLEANING

PART 1 - GENERAL

- 1.01 DESCRIPTION: Execute cleaning, during progress of the Work, and at completion of the Work, as required by General Conditions.
- 1.02 DISPOSAL REQUIREMENTS: Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 - PRODUCTS

- 2.01 MATERIALS:
- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
 - B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
 - C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

- 3.01 DURING CONSTRUCTION:
- A. Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations or his subcontractor's operations. Oversee cleaning and ensure that building and grounds are maintained free from accumulations of waste materials and rubbish.
 - B. At reasonable intervals during progress of work, clean up site, building and access, and dispose of waste materials, rubbish and debris. Provide containers and locate on site for collection of waste materials, rubbish and debris. Do not allow waste materials, rubbish and debris to accumulate and become an unsightly or hazardous condition.
 - C. Transport waste materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces. Sprinkle dusty debris with water.

- D. Burning or burying of rubbish and waste materials on the project site is not permitted. Disposal of volatile fluid wastes (such as mineral spirits, oil, or paint thinner) in storm or sanitary sewer systems is not permitted. Remove waste materials, rubbish and debris from the site and legally dispose of at public or private dumping areas off the Owner's property.

3.02 DUST CONTROL:

- A. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.
- B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.
- C. Broom clean interior building areas when ready to receive finish painting and continue cleaning on an as-needed basis until building is ready for acceptance or occupancy.

3.03 FINAL CLEANING:

- A. At completion of construction and just prior to acceptance or occupancy conduct a final inspection of exposed interior and exterior surfaces. Perform final cleaning and maintain cleaning until building, or portion thereof, is accepted by Owner.
- B. Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials from interior and exterior surfaces. Repair, patch and touch-up marred surfaces to match adjacent finishes. Broom clean paved surfaces; rake clean other surfaces of grounds.
- C. Clean all glass and all other finish surfaces, replace all broken and scratched glass; remove stains, spots, marks and dirt from decorated work; clean all hardware; remove paint spots and smears from all surfaces, clean all fixtures and wash or vacuum all floors; leaving work in a clean and spotless condition.
- D. Replace air conditioning filters if units were operated during construction. Clean ducts, blowers and coils if air conditioning units were operated without filters during construction.
- E. Remove all waste materials and rubbish from and about the Project as well as all tools, construction equipment, machinery and surplus cleaning.

- F. Use experienced workmen or professional cleaners for final cleaning.
- G. Comply with cleaning instructions contained in the Specifications. In absence of specific cleaning instructions, follow accepted cleaning practices or the recommendations of the manufacturer of the material to be cleaned.

END OF SECTION

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SECTION 01720 - PROJECT RECORD DOCUMENTS

1.01 GENERAL:

- A. Maintain at the Site for the Owner one record copy of:
 - 1. Drawings and Specifications
 - 2. Addenda
 - 3. Change Orders and other Modifications to the Contract
 - 4. Architect/Engineer Field Orders or written instructions.
 - 5. Approved Shop Drawings, Product Data and Samples.
 - 6. Field Test records.
- B. The Contractor will provide one set of Construction Drawings at the time construction is commenced. These drawings shall be marked-up by each Contractor, throughout the construction period, indicating all changes, revisions and additions to the work, including field relocations of work concealed from view.

1.02 RECORD DRAWINGS: In accordance with the requirements of the General Conditions, the Architect will provide the Contractor with a set of reproducible drawings of the original bidding documents, as required and at Contractor's expense as follows:

- A. If the Contractor elects to vary from the Contract Documents, and secures prior approval of the Architect, for any phase of the Work other than those listed below, he shall record in a neat readable manner all such variances on the reproducible drawings furnished.
- B. For plumbing, heating, ventilating and air conditioning, electrical, and fire protection Work Record Drawings shall be maintained by the Contractor as the Work progresses and as follows:
 - 1. All deviations from sizes, locations and from all other features of all installations shown in the Contract Documents shall be recorded.
 - 2. In addition, it shall be possible, using these drawings, to correctly and easily locate, identify and establish sizes of all piping, directions and the like, as well as all other features of Work which

will be concealed underground and/or in the finished building.

- a. Locations of underground Work shall be established by dimensions to column lines or walls, locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.
 - b. For Work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases, this may be sufficient to illustrate the Work on the drawings in relation to the spaces in the building near which it was actual installed. Architect's decisions shall be final.
- C. The following requirements apply to all Record Drawings:
1. They shall be maintained at the Contractor's expense.
 2. All such drawings shall be done carefully and neatly by a competent draftsman and in form approved by the Architect.
 3. Additional drawings shall be provided as necessary for clarification.
 4. They shall be kept up-to-date during the entire course of the Work and shall be available on request for examination by the Architect and, when necessary, to establish clearances for other parts of the work.
 5. The Record Drawings shall be returned to the Architect on completion of the Work and are subject to the approval of the Architect.

END OF SECTION

SECTION 01730 - OPERATING AND MAINTENANCE DATA(N/A)

PART 1 - GENERAL

1.01 GENERAL:

- A. Compile Manufacturer's Directions and Manuals, Product Data and related information appropriate for Owner's maintenance and operation of products furnished under the Contract.
 - 1. Furnish operating and maintenance data as specified in other pertinent sections of Specifications.
- B. Instruct Owner's personnel in the maintenance of products and in the operation of equipment and systems.

1.02 FORM OF SUBMITTALS:

- A. Prepare data in the form of an instructional manual for use by Owner's personnel.
- B. Bind in Commercial quality three-ring binders with durable and cleanable plastic cover, with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS".
- C. When multiple binders are used, correlate the data into related consistent groupings.

1.03 CONTENT OF MANUAL:

- A. Neatly typewritten table of contents for each volume, arranged in a systematic order.
 - 1. Contractor, name of responsible principal, address and telephone number.
 - 2. A list of each product required to be included, indexed to the content of the volume.
 - 3. List, with each product, the name, address and telephone number of:
 - a. Subcontractor or installer.
 - b. Maintenance contractor, as appropriate.
 - c. Identify the area of responsibility of each.

- d. Source of supply for parts and replacement.
 - 4. Identify each product-by-product name and other identifying symbols.
 - B. Product Data: Include only those sheets which are pertinent to the specific product. Clearly identify the specific product or part installed.
 - C. Drawings: Supplement product data with drawings as necessary to clearly illustrate relations of component parts of equipment and systems, and control and flow diagrams.
 - 1. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
 - 2. Do not use Project Record Documents as maintenance drawings.
 - D. Written text, as required to supplement product data for the particular installation:
 - 1. Organize in a consistent format under separate headings for different procedures.
 - 2. Instances which might affect the validity of warranties or bonds.
- 1.04 MANUAL FOR MATERIALS AND FINISHES:
 - A. Submit two copies of complete manual in final form.
 - B. Content, for architectural products, applied materials and finishes:
 - 1. Manufacturer's data, giving full information on products.
 - 2. Instructions for care and maintenance.
- 1.05 MANUAL FOR EQUIPMENT AND SYSTEMS:
 - A. Submit copies of complete manuals for mechanical and electrical equipment as required by Specifications.
- 1.06 SUBMITTAL SCHEDULE:
 - A. Submit one copy of completed data in final form fifteen days prior to final inspection or acceptance.

1. Copy will be returned after final inspection or acceptance, with comments.
- B. Submit specified number of copies of approved data in final form 10 days after final inspection or acceptance.

1.07 INSTRUCTION OF OWNER'S PERSONNEL:

- A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in the operation, adjustment and maintenance of all products, equipment and systems.
- B. Operating and maintenance manual shall constitute the basis of instruction.
- C. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.

END OF SECTION

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SECTION 01740 -WARRANTIES AND BONDS

1.01 SUBMITTAL REQUIREMENTS:

- A. Assemble warranties, bonds and services and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.
- B. Review submittals to verify compliance with Contract Documents. Submit to Architect for review and transmittal to Owner.

1.02 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during progress of construction submit within 10 days after inspection and acceptance.
- B. Otherwise make submittals within ten days after Date of Substantial Completion, prior to final request for payment.
- C. For items of work, where acceptance is delayed materially beyond the Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing the date of acceptance as the start of the warranty period.

END OF SECTION

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SECTION 01780 - CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SUBMITTALS

Two sets of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location. Engineer/Architect approval is required for submittals with an "A/E" designation; submittals having an "FIO" designation are for information only.

As-Built Drawings; A/E.

Drawings showing final as-built conditions of the project. The manually prepared drawings shall consist of 1 set approved marked working as-built prints.

Warranty Management Plan; A/E.

Two sets of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

1.2 PROJECT RECORD DOCUMENTS

A. As-Built Drawings

This paragraph covers as-built drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to contract drawings which are revised to be used for final as-built drawings.

1. Working As-Built and Final As-Built Drawings

The Contractor shall revise 1 set of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a weekly basis and at least one set shall be available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. The working as-built marked prints will be jointly reviewed for accuracy

and completeness by the Engineer/Architect and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working drawings as specified herein, the Engineer/Architect will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement can be reached between the Engineer/Architect and the Contractor regarding the accuracy and completeness of updated drawings. The working as-built drawings shall show, but shall not be limited to, the following information:

- a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.
- b. The location and dimensions of any changes within the building structure.
- c. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.
- d. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.
- e. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.
- f. Changes or modifications which result from the final inspection.
 - 1) Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints.
 - 2) Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation

- systems.
- 3) Modifications (change order price shall include the Contractor's cost to change working and final as-built drawings to reflect modifications) and compliance with the following procedures.
 - 4) Directions in the modification for posting descriptive changes shall be followed.
 - 5) A Modification Circle shall be placed at the location of each deletion.
 - 6) For new details or sections which are added to a drawing, a Modification Circle shall be placed by the detail or section title.
 - 7) For minor changes, a Modification Circle shall be placed by the area changed on the drawing (each location).
 - 8) For major changes to a drawing, a Modification Circle shall be placed by the title of the affected plan, section, or detail at each location.
 - 9) For changes to schedules or drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

B. Drawing Preparation

These working as-built marked prints shall be neat, legible and accurate. These drawings are part of the permanent records of this project and shall be returned to the Engineer/Architect after approval by the District. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the City of Cabot.

C. Manually Prepared Drawings

When final revisions have been completed, each drawing shall be lettered or stamped with the words "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 3/16 inch high.

D. Payment

No separate payment will be made for as-built drawings required under this contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.3 WARRANTY MANAGEMENT

The Contractor shall develop a warranty management plan which shall contain information relevant to the clause Warranty of Construction of the contract. The Contractor shall submit the warranty management plan for the City of Danville's approval. The warranty management plan shall include all required actions and documents to assure that the City receives all warranties to which it is entitled.

The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. Approved information shall be assembled in a binder and shall be turned over to the City upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. Information contained in the warranty.

- A. Warranty Management Plan
 - 1. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.
 - 2. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

1.4 OPERATION AND MAINTENANCE MANUALS

Operation manuals and maintenance manuals shall be submitted as specified. Operation manuals and maintenance manuals provided in a common volume shall be clearly differentiated and shall be separately indexed.

1.5 FINAL CLEANING

The premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. Equipment and fixtures shall be cleaned to a sanitary condition. Filters of operating equipment shall be cleaned. Debris shall be removed from roofs, drainage systems, gutters, and downspouts. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 02110 - SITE PREPARATION

PART 1 GENERAL

1.1 PROVISIONS

- A. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer for consideration. Those judged to be equal to that specified will receive written approval.

1.2 DESCRIPTION

- A. Work covered by this section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.
- B. The Work described in this section of the specifications includes, but is not limited to, the following:
 - 1. Site clearing in preparation for grading and excavation.
 - 2. All debris and surplus soil undercut shall be disposed of off site in strict accordance with governing regulatory agencies. Any dumping in public waters such as lakes, streams, floodways is strictly prohibited. The contractor may be required to present a consent letter from the property owner for permitted dumping.
 - 3. Compliance with applicable air pollution control regulations.
 - 4. Procuring permits for transportation of debris and surplus soil to disposal site, and dust permits.

1.3 SUBMITTALS

- A. Permit, Notices, Etc.: Submit for the record copies of permits and notices, and certificates of severance of utility services. No copies will be returned.

1.4 ENVIRONMENTAL CONDITIONS

- A. Protect plant growth and features remaining as final landscaping, and bench marks and existing construction from damage or displacement.
- B. Maintain designated site access for vehicle and pedestrian traffic.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CLEARING

- A. Clear areas required for access to site and execution of Work.
- B. Remove following except those designated to remain:
 - 1. Existing surface vegetation and other organic materials.
 - 2. Underground facilities including septic tanks and cesspools.
 - 3. Abandoned utility lines.
 - 4. Construction rubble and debris, existing fill or backfill, and unstable soils.
- C. Clear undergrowth and deadwood, without disturbing subsoil.
- D. Perform demolition in accordance with applicable authorities having jurisdiction.
- E. Assume possession of materials being demolished, unless indicated otherwise.
- F. Carefully remove and deliver materials and equipment to be retained by Owner, such as cornerstones, their contents, commemorative plaques and tablets, to Owner when and where directed.
- G. Sprinkle area with water to prevent dust. Provide and maintain hoses and connections to watermain or hydrant.
- H. Do not burn materials on site.
- I. Pump out buried tanks located outside building proper. Remove tanks and service piping from site.
- J. Immediately upon discovery, remove and dispose of contaminated, vermin infested, or dangerous materials by safe means so as not to endanger health of workers and public.
- K. Remove trees and shrubs within marked areas, clear undergrowth and dead plant material.
- L. Backfill open pits and holes caused by demolition in accordance with Section 02210.
- M. Remove demolished materials, tools and equipment upon completion of work. Leave site in acceptable condition.

END OF SECTION

SECTION 02210 - GRADING

PART 1 GENERAL

1.1 PROVISIONS

Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer/Architect for consideration. Those judged to be equal to that specified will receive written approval.

1.2 DESCRIPTION

- A. Work covered by this section includes furnishing all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.
- B. The Work described in this section of the specifications includes, but is not limited to the following:
 - 1. Excavation, stockpiling and disposal of topsoil and subsoil, rough/fine grading and contouring of site in preparation for site.

1.3 RELATED WORK

- A. The following items of related work are specified and included in other sections of these specifications:
 - 1. Section 02110 - Site Preparation.

1.4 REFERENCE STANDARDS

- A. ASTM D698-Latest - Tests for Moisture-Density Relations of Soils and Soil Aggregate Mixtures using 5.5 lb. hammer and 12 inch drop.
- B. ASTM D1557-Latest - Tests for Moisture-Density Relations of Soils and Soil Aggregate Mixtures using 10 lb. hammer and 18 inch drop.

1.5 SUBMITTALS

- A. Project Record Documents:
 - 1. Submit documents in accordance with Section 01000 - General Requirements.

2. Maintain existing utilities and accurately record location of newly encountered utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Clean soils free of vegetation, debris and organic contaminants with:
 1. On site silty to sandy clay (CL) should be suitable for use as fill material (see soils report).
 2. Use fat clay (CH) only in non-structural fill areas such as ball field areas.
 3. Use fat clay (CH) as liner material for the pond (6" to 12" thick).
 4. Consult soils report to determine usability of soil as fill material.
 5. Use site excavated material for site fill material.
 6. Maximum plasticity index of 15 as determined in accordance with ASTM D4318.
 7. Comply with Paragraph 3.5 A. Section 02210.
- B. Select clayey sand (SC) or clayey gravel (GC) or sandy clay (CL) with liquid limit less than 40.

PART 3 EXECUTION

3.1 PREPARATION

- A. Perform construction staking and site layout using horizontal and vertical control points provided on the drawings
- B. Identify and maintain required lines, levels, contours, and baseline points.
- C. Identify, maintain and protect existing utilities which pass through construction area.
- D. Notify utility company to remove and relocate utilities when required for construction.
- E. Upon discovery of unknown utility or concealed conditions, discontinue affected construction and notify Engineer/Architect.

3.2 EXCAVATION

- A. Strip topsoil (approximately 8 inches) and stockpile for later use.
- B. Excavate to elevations and grades indicated.
- C. Widen depressions to accommodate compaction equipment and provide a level base for placing fill.
- D. Stockpile excavated material to be reused on site where directed, not higher than 6 feet and with maximum 25 percent slope. Cover stockpiles to prevent erosion.
- E. Grass, grass roots and incidental topsoil shall not be left beneath a fill area nor shall this material be used as fill material. It may be stockpiled for later use in the top 6 inches of fills outside building pads and roadways.
- F. Remove unusable and surplus material to designated site. (Future community center see drawing for location).
- G. The detention ponds bottoms should be scarified and compacted. Top 6 inches of the bottom should have CL material. The in-situ clay (CL) soils should be used as the liner material scarified and re-compacted. Minimum permeability should be 1×10^{-5} cm/sec. Where cohesionless soils are encountered in the pond bottom or slopes, a clay liner will be required. The in-situ CL material should be used.

3.3 SCARIFICATION

- A. Scarify, adjust moisture, and compact exposed natural surface soils to minimum 12 inch depth in all fill areas. Bring the upper 12 inches to optimum moisture content or above as determined in ASTM D1557.
- B. Scarify undisturbed surfaces which receive fill to depth of 6 inches.

3.4 FILL

Fill required for low areas shall be placed in 8 inch loose lifts, within two percentage points of optimum, and compacted to 95% Modified Procter (ASTM D 1557)

- A. Place and compact fill material in continuous layers not exceeding twelve (12) inches loose depth. Maintain optimum moisture content in fill materials to obtain required compaction density.
- B. Deeper lifts may be authorized when proposed equipment is proven to compact deeper lifts.
- C. Controlled fill shall not be constructed when the atmospheric temperature is below 35°F. When the temperature falls below 35°F, it shall be the responsibility of the contractor to protect all areas of completed surface against any detrimental effects

of ground freezing by methods approved by the geotechnical engineer. Any areas that are damaged by freezing shall be reconditioned, reshaped, and compacted by the contractor in conformance with the requirements of this specification without additional cost to the Owner.

3.5 COMPACTION

- A. Use mechanical compaction equipment which will not disturb adjacent structures. Do not use water settling and jetting methods.
- B. Compact fill materials in accordance with ASTM D1557.
- C. Rework, moisten or dry as required, and compact exposed surface and subgrade soils to minimum depth of 8 inches. Reworking may be accomplished by scarification, dicing, removal and replacement or other method which will result in uniform moisture contents and densities.
- D. Compact soils within following ranges of moisture content:
 - 1. On-Site Subgrade Soils: 2 percent below optimum or higher.
 - 2. Imported Soils: Minimum weight of 125.0 of pcf placed at +1 to +3 of optimum moisture.
 - 3. Subgrade Soil and Fill Below Asphaltic Pavement: 2 percent below optimum or higher.
- E. Compact fill materials to following minimum percent compaction:
 - 1. Native Soils and Subbase Fill:
 - a. Below footings 95 percent
 - b. Below concrete slabs-on-grade 95 percent
 - 2. Subbase Fill:
 - a. Below footings 95 percent
 - b. Below concrete slabs-on-grade 95 percent
 - 3. Miscellaneous Backfill outside of building pad (Not Intended for Lateral Support of Pipelines): 95 percent

3.6 SUBGRADE PREPARATION

Maintain subgrade of areas to be covered with structural fill or aggregate base course in moist condition until covered.

3.7 GRADING TOLERANCES

- A. Subgrade: Within 0.5 feet from grades and cross section indicated.
- B. Ball Fields: Within 0.2 feet from grades
- C. Variations Within Tolerances: Compensating so that average grade and cross-section are met.

3.8 OBSERVATION AND TESTING OF WORK

- A. Observation and testing shall be performed by an independent geotechnical testing laboratory in accordance with Section 01000, General Requirements.
- B. Testing shall be performed so as to least encumber construction.
- C. When tests indicate that compacted materials do not meet specified requirements, correct defective construction, and have construction retested.
- D. Ensure compacted fills are tested before proceeding with placement of surface materials.
- E. Tests of fill materials and embankments will be made at the following minimum rates:
 - 1. One field density test for each 5,000 square yards of original ground surface prior to placing fill or constructing floor slabs.
 - 2. One field density test for each 250 cubic yards of fill placed or each layer of fill for each work area, whichever is the greater number of tests.
 - 3. One moisture-density curve for each type of material used, as indicated by sieve analysis and plasticity index.
 - 4. The contractor shall bear the cost all required testings.

3.9 PROTECTION

- A. Protect trees, shrubs, and other features remaining as portion of final landscaping.
- B. Protect bench marks, property monuments, walls, fences, roads, sidewalks paving and curbs.
- C. Protect above or below grade utilities which are to remain.

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- D. Protect newly graded areas from traffic and erosion, keep areas free of trash and debris. Repair and reestablish grades in settled, rutted, or eroded areas.
- E. Repair damage.

END OF SECTION

SECTION 02220
EXCAVATING, BACKFILLING AND COMPACTING

PART 1 GENERAL

1.1 PROVISIONS

Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer for consideration. Those judged to be equal to that specified will receive written approval.

1.2 DESCRIPTION

- A. Work covered by this Section includes furnishing all labor, materials, services, appliances, licenses, taxes, and equipment necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.
- B. The Work described in this section of the specifications includes, but is not limited to, the following:
 - 1. Excavating, backfilling and compacting for structures, utilities, driveways, curbs, gutters, sidewalks and other hardscape.

1.3 RELATED WORK

- A. The following items of related work are specified and included in other sections of these specifications:
 - 1. Section 02110 - SITE PREPARATION.
 - 11.2 Section 02210 - GRADING.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fill: In accordance with Section 02210.
- B. Bedding Material: Granular material containing no pieces larger than 3/4 inches and free of broken concrete pavement, wood or other deleterious materials. Do not use open graded rock unless approved; sum of plasticity index and percent of material passing No. 200 sieve not to exceed 23.
- C. Base Course: Gravel aggregate base course.

1. Gravel: Fully or partially rounded and water-worn particles with uniformly distributed crushed rock exceeding ASTM D422 maximum gradation sizes as follows:
 - a. 100% passing 1 inch sieve by weight.
 - b. 85% to 100% passing 3/4 inch sieve by weight.
 - c. 45% to 95% passing No. 4 sieve by weight.
 - d. 10% to 40% passing No. 30 sieve by weight.
 - e. 0% to 8% passing No. 200 sieve by weight.
2. Maximum plasticity index of 3 when tested in accordance with ASTM D4318.
3. Maximum percent of wear of 50 when subjected to Los Angeles abrasion test (ASTM C131).

PART 3 EXECUTIONS

3.1 PREPARATION AND LAYOUT

- A. Maintain baseline points and other reference points throughout the project. Any control point destroyed during the construction shall be re-established by the contractor.
- B. Stake limits of excavation horizontally and vertically by using furnished baseline points.

3.2 PROTECTION

- A. Protect areas to receive planting, and other features specified to remain.
- B. Protect baseline points existing structures, roads, sidewalks, paving, and curbs from damage by equipment and vehicular or foot traffic.
- C. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods, as required.
- D. Underpin adjacent structures which may be damaged by excavation work, including service lines and pipe chases.
- E. Notify Engineer of unexpected subsurface conditions and discontinue work in area until Engineer provides notification to resume work.
- F. Protect bottom of excavations and soil around and beneath foundations from frost.

- G. Grade around excavations to prevent surface water run-off from flowing into excavated areas.

3.3 UTILITIES

- A. Before starting excavation, contact A One Call@ at 1-800-482-8998, establish location and extent of underground utilities occurring in work area.
- B. Maintain existing utility lines designated to remain within the work area.
- C. Include costs for maintaining utilities in bid.
- D. Protect utility services uncovered by excavation.
- E. Remove abandoned utility service lines from areas of excavation; cap, plug or seal such lines and identify at grade.
- F. Accurately locate (tie to control points) and record abandoned and active utility lines rerouted or extended, on Project Record Documents.

3.4 TRENCHING FOR UTILITIES

- A. Do not disturb soil within branch spread of existing trees or shrubs designated to remain. When necessary to excavate through roots, excavate by hand, tunnel through roots where possible and cut roots with sharp ax where tunneling is not possible.
- B. Where trenches lie within concrete or asphaltic concrete pavement sections, sawcut to neat, vertical, true lines without damage to adjoining surfaces.
- C. Accurately grade trench bottom to specified lines and grades and provide uniform bearing and support for each section of pipe at every point along its entire length. Trim and shape trench bottoms and leave free of irregularities, lumps and projections.
- D. Brace, sheath or shore as necessary to perform and protect excavation and personnel.
- E. Minimize length of open trench whenever possible.
- F. Cut trenches sufficiently wide to enable proper installation of services and to allow for inspection, but not in excess of following maximum widths at top of pipe greater than O.D. of barrel and minimum widths at spring line each side of pipe:
 - 1. For Pipe Less than 18 inches (I.D.): 16 inches at top and 6 inches at spring line.

2. For Pipe from 18 through 24 inches (I.D.): 19 inches at top and 7-1/2 inches at spring line.
 3. For Pipe from 27 through 39 inches (I.D.): 22 inches at top and 9 inches at spring line.
 4. For Pipe from 42 through 60 inches (I.D.): Half O.D. at top and 12 inches at spring line.
 5. For Pipe over 60 inches (I.D.): 36 inches at top and 12 inches at spring line.
- G. Dig bell or coupling holes after grading trench only as necessary to permit accurate work in making joints.
- H. Refill unauthorized excavation below specified grade with aggregate base material and compact to uniform density of 95%.
- I. When excavations are complete, request and receive inspection. Correct unauthorized excavation.
- J. For pipe 12 inches or greater in diameter, provide initial granular bedding at least 4 inches thick or 1/12 outside diameter of pipe whichever is greater. Place bedding material at uniform density with minimum compaction. Granular bedding for pipes less than 12 inches in diameter shall be 3" thick.
- K. Excavate for manholes, valves, inlets, catch basins and other accessories. Structures may be placed directly against excavated earth when excavated faces are firm and unyielding, and outside structure line. Over excavate unacceptable native material, backfill with aggregate base material and compact. Request and receive inspection of excavation prior to pouring concrete.
- L. Stockpile excavated soil for reuse where directed. Remove excess or unsuitable excavated soil from site.

3.5 DEWATERING

- A. Keep trenches dry. Provide necessary equipment including pumps, piping and temporary drains.
- B. Do not discharge drainage water lines into municipal sewers without municipal approval. Ensure water discharge does not contain silt held in suspension.
- C. Control grading in and adjacent to excavations to prevent water from running into excavated areas or onto adjacent properties or public thoroughfares.
- D. Furnish and operate suitable pumps on 24 hour basis to keep excavations free of water until after installing utility service and backfilling.

3.6 BACKFILLING UTILITY TRENCHES

- A. Do not start backfilling until services have been inspected and approved.
- B. Keep building debris and water out of trenches.
- C. Backfill systematically and as early as possible to allow maximum time for natural settlement and compaction.
- D. Place fill materials in accordance with governing utility company requirements. Use method which will not disturb or damage services.
- E. Maintain optimum moisture content of fill materials so as to attain required compaction density.
- F. From bottom of trench to 12 inches above top of pipe compact to minimum of 95% maximum dry density.
- G. From 12 inches above top of pipe to 24 inches below surface compact fill to minimum of 95% maximum dry density.
- H. Compact upper 24 inches to 100% maximum density for granular soils, 95% maximum density for nongranular soils except in areas where solid sodding or seeding is required. In those areas the top 6 inches shall be topsoil compacted to the density of adjacent soil.
- I. Remove surplus fill materials from site.
- J. Compact fill at trenches where footings occur to 95% maximum density.

3.7 EXCAVATION FOR PAVEMENT DRIVEWAYS, CURBS AND GUTTERS, SIDEWALKS, AND OTHER HARDSCAPE

- A. Remove debris and loose material.
- B. Excavate:
 - 1. Unstable material outside planned improvement or ditch slopes which constitutes potential slides.
 - 2. Material which has deposited on improvement site or in ditch.
 - 3. Material which has slipped out of embankments.
- C. Excavate material to grades indicated.

- D. No point on the completed slope shall vary from the designated plane by more than one inch as measured at right angles to the slope, except where otherwise indicated.
- E. Do not encroach on road bed or parking area.
- F. Round tops, toes and ends of excavation slopes.

3.8 COMPACTION, TOLERANCES

- A. Compact soils under improvements in accordance with Section 02210 - GRADING.
- B. Grading tolerances under improvements shall be in accordance with Section 02210 - GRADING.

3.9 SURPLUS AND UNSUITABLE MATERIALS

- A. Dispose of materials in accordance with regulatory requirements specified in Section 02110 - SITE PREPARATION.
- B. Quantities when shown or specified are approximate.

3.10 OBSERVATION AND TESTING OF WORK

- A. Conform to requirements specified in Section 02210 - GRADING
- B. One field density test for each 100 lineal ft. of trench backfill per lift shall be performed, unless directed otherwise.

END OF SECTION

SECTION 02221

TRENCHING AND BACKFILLING

PART 1 GENERAL

1.1 WORK INCLUDED IN THIS SECTION

This section shall consist of excavation of trench, bedding of pipe and backfilling of trench.

1.2 RELATED WORK SPECIFIED ELSEWHERE

Not applicable.

1.3 QUALITY ASSURANCE

- A. Materials which have been rejected shall be removed from the job site.
- B. Bedding or backfill that do not conform to the specifications shall be removed or reworked until the specifications are met.

1.4 PROTECTION

- A. Existing Property - The contractor shall exercise reasonable care in excavating trenches for water lines or sewer force mains in order not to interfere with or damage existing improvements on public or private property. Any property damaged shall be replaced by the contractor at his own expense.
- B. Existing Utilities
 - 1. The contractor shall be responsible for determining the exact location of existing utilities within the work area.
 - 2. Any utility line that is cut must be reported to the Owner and repaired immediately in order to maintain service to the customers. These repairs are considered part of the pipe laying cost and will not be paid for separately.
 - 3. The contractor shall coordinate with the utility company and the Owner in the event that utilities must be shut off.

1.5 SITE CONDITIONS

- A. Excavations
 - 1. Trenches and other excavations more than five feet deep (or less when

hazardous ground movement is expected) shall be shored, laid back to a stable slope or some other means of protection provided (such as trench boxes) where employees may be exposed to moving ground or cave-ins.

2. Additional precaution (shoring or bracing) shall be installed when trenches are exposed to vibrations (railroad, highway or machinery) or adjacent to backfill. Cross braces or trench jacks shall be placed in true horizontal position, be spaced vertically and be secured.
 3. Trenches over five feet deep shall have ladders or stairs every 50 feet.
 4. In all events all excavations and trenches shall be in compliance with all codes and ordinances especially the OSHA "Construction Standards for Excavations" 29CFR Part 1926.650 through 1926.652 Subpart P.
- B. Dewatering - If dewatering is required, the contractor shall exercise care not to allow water to damage existing property or damage bedding.

PART 2 PRODUCTS

2.1 BEDDING

Pipe Bedding - Shall consist of pea gravel.

2.2 BACKFILL

- A. PIPE - Initial backfill material shall consist of pea gravel.
- B. Remaining backfill (called general backfill) shall be select material free of stones (maximum particle size of 6 inches). Stones or rock larger than 6 inches shall be removed from the work site.

PART 3 EXECUTION

3.1 TRENCH EXCAVATION

- A. Trenches shall be excavated to the depth specified. In the event rock is encountered in the excavation, the trench must be excavated to a depth not less than six (6) inches below grade and then filled back to grade with bedding material. There shall be no additional payment for the excavation of rock or the placing of the bedding in the bottom of the trench.
- B. Rock or other unsuitable material excavated which is not suitable for backfill shall be removed from the job site.
- C. Trench Width - (1) Water mains shall be of sufficient width for the proper installation of the pipe. Maximum widths are as follows:

PIPE SIZE
1" - 3"

TRENCH WIDTH (Maximum)
18"

3.2 DEPTH OF TRENCH

Except when otherwise shown on the drawings, or herein specified, all pipe trenches shall be constructed to a minimum depth of 36 inches. Pipe shall be laid deeper whenever necessary in order to avoid obstructing other lines.

3.4 METHOD OF PAYMENT AND MEASUREMENT

- A. Trenching for pipes shall be subsidiary to the other items. Trenching will not be measured or paid for separately.
- B. Rock excavation shall be subsidiary to the trenching and shall be included in the lump sum price and will not be paid for separately.
- C. All items of work in this section shown on the plans or called for in the specifications which are not given in the list of variable quantities shall be included in the various unit contract prices of work.

END OF SECTION

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SECTION 02232
SUBGRADE

PART 1 GENERAL

1.1 PROVISIONS

- A. Requirements of the General Provisions apply to all work under this section.
- B. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer for consideration. Those judged to be equal to that specified will receive written approval.

1.2 DESCRIPTION

This item shall consist of shaping, compacting and otherwise preparing the completed roadbed for the placing of base and surface courses and pavements in accordance with these specifications and in substantial conformity with the lines, grades, and cross sections shown on the Plans.

PART 2 PRODUCT (Not Applicable)

PART 3 EXECUTION

- 3.1** The subgrade shall be prepared in such manner as to insure that the base, surface course, or pavement will be placed on a firm foundation that is stable and reasonably free from dust pockets, wheel ruts and other defects.

The subgrade area shall be scarified as may be necessary for shaping, and shaped and compacted to the required grade and section. The top eight (8) inches of the subgrade shall be compacted to a density, as determined by AASHO T 191, of not less than 95% of the maximum density obtained by AASHO T 99. This compaction shall be accomplished by any satisfactory method or methods that will obtain the required density. The Contractor shall bring the moisture content of the material to be compacted to substantially that of optimum moisture by the addition of water or by manipulation and aeration as it may be necessary to increase or decrease the moisture content under the conditions encountered.

The density requirements specified above will not apply to subgrade for unbound granular type surface courses.

Compaction operations may be dispensed with when an old stone or gravel roadbed is used as a foundation or subgrade for a base course or pavement where scarifying for shaping is unnecessary and its stability is approved by the Engineer.

All soft and yielding material and other portions of the subgrade which will not compact readily when rolled or tamped shall be removed. Holes or depressions made by the removal of unsuitable material as directed above shall be filled with an approved material and the whole subgrade brought to the lines, grade and cross section shown on the plans and compacted to the required density.

If the succeeding course is not placed immediately after the subgrade has been prepared and the subgrade becomes cut up, rough, or unstable, it shall again be shaped and recompactd in accordance with the above requirements.

END OF SECTION

SECTION 02233
AGGREGATE BASE COURSE

PART 1 GENERAL

1.1 PROVISIONS

- A. Requirements of the General Provisions apply to all work under this Section.
- B. Throughout the specifications, types of materials may be specified by manufacturers name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer for consideration. Those judged to be equal to that specified will receive written approval.

1.2 DESCRIPTION

This item shall consist of a foundation course for surface courses pavements. It shall be constructed on the prepared subgrade or other completed base course in accordance with these specifications, and in substantial conformity with the lines, grades, compacted thickness and typical cross section shown on the Plans.

PART 2 PRODUCTS

2.1 MATERIALS

This material shall consist of crusher run stone or a mixture of crushed stone and natural fines uniformly mixed and so proportioned as to meet all the requirements hereinafter specified, with further provisions that a mixture of crushed stone and natural fines shall contain not less than 90 per cent crusher produced material. The stone shall be hard and durable with a percent of wear by the Los Angeles Test (AASHO T 96) not greater than 45. For the purpose of this specification, shale and slate are not considered to be stone. The material furnished shall not contain more than 5% by weight of shale, slate, and other objectionable, deleterious, or injurious matter.

The class or classes of crushed stone base course material that may be used on any particular job will be those called for on the proposal schedule.

GRADING REQUIREMENTS

Size of Sieve Total Retained	Percent by Weight	
	Class SB-2	Class SB-3
1-1/2"	0	0
1"	0	0
3/4"	10-50	0-35
#4	45-75	45-75

Total Passing		
#40	10-30	10-30
#200	3-10	3-10

The fraction passing the No. 200 sieve shall not be greater than two-thirds the fraction passing the No. 40 sieve. The fraction passing the No. 40 sieve shall have a liquid limit not greater than 25 and a plasticity index not greater than 6.

When it is necessary to blend two or more materials, each material shall be proportioned separately through mechanical feeders to insure uniform production. Premising or blending in the pit to avoid separate feeding will not be permitted.

The blending of materials on the roadway in order to obtain a mixture that will comply with the above requirements will not be permitted.

PART 3 EXECUTION

3.1 GENERAL

- 1.1 The base course material shall be placed on a completed and approved subgrade or existing base that has been bladed to substantially conform to the grade and cross section shown on the plans.
- 1.2 The subgrade shall be prepared as specified in Section 02234, and shall be free from an excess or deficiency of moisture at the time of placing the base course. The subgrade shall also comply, where applicable, with the requirements of other items that may be contained in the contract that provide for the construction or shaping of the subgrade or the reconstruction of the existing base course.
- 1.3 Base course material shall not be placed on a frozen subgrade or subbase.
- 1.4 The crushed stone shall be placed on the subgrade or other base course material and spread uniformly to such depth and lines that when compacted it will have the thickness, width and cross section shown on the plans.
- 1.5 If the required compacted depth of the base course exceeds 6 inches, the base shall be constructed in two or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed 6 inches. When vibrating or other approved types of special compacting equipment are used, the compacted depth of a single layer of the base course may be increased to 8 inches upon approval.
- 1.6 The spreading shall be done the same day that the material is hauled, and it shall be performed in such manner that no segregation of coarse and fine particles nor nests or hard areas caused by dumping the crushed stone on the subgrade will exist. To insure proper mixing, the crushed stone shall be bladed across the roadbed before being spread. Care must be taken to prevent mixing of subgrade

or shoulder material with the base course material in the blading and spreading operation.

- 1.7 Each course shall be compacted by any satisfactory method that will obtain the density herein specified. The crushed stone shall be substantially maintained at optimum moisture during the mixing, spreading, and compacting operations, water being added or the material aerated as may be necessary. The specified grade and section shall be maintained by blading throughout the compaction operation. The density of the compacted material in each course, as determined by AASHO T 191, shall not be less than 100% of the density obtained in the laboratory. The crushed stone shall be compacted across the full width of application.
- 1.8 The laboratory density shall be obtained as follows: the sample is prepared by removing the aggregate passing the $\frac{3}{4}$ " inch sieve and retained on a #4 sieve in an amount equal to that removed. The sample so prepared is compacted at various water contents in five equal layers in a mould 6 inches in diameter and 7 inches high. Each layer is compacted by 55 blows of a 10 pound hammer 2 inches in diameter dropped at a height of 18 inches. The density used is the dry weight obtained at the optimum water content.
- 1.9 The compacted base course shall be tested for depth and any deficiencies corrected by scarifying, placing additional material, mixing, reshaping, and recompacting to the specified density, as directed.
- 1.10 Where neither prime coat, surfacing, nor pavement are provided in the same contract with the base course, the density requirement for the base course will be waived and no compaction will be required beyond that obtained by systematic maintenance under traffic.
- 1.11 The Contractor shall maintain the base course in a satisfactory condition until accepted.

END OF SECTION

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**SECTION 02285 - SOIL TREATMENT FOR SUBTERRANEAN
TERMITE CONTROL**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUBMITTALS

Approval is required for submittals.

- A. Data
Manufacturer's label and Material Safety Data Sheet (MSDS) for pesticides proposed for use.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Pesticides shall be delivered to the project site in sealed and labeled containers in good condition as supplied by the manufacturer or formulator. Pesticides shall be stored, handled, and used in accordance with manufacturer's labels. Labels shall bear evidence of registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended.

1.4 SAFETY REQUIREMENTS

- A. The Contractor shall formulate, treat, and dispose of termiticides and their containers in accordance with label directions. Water for formulating shall only come from sites as designated, and filling hose shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Pesticides and related materials shall be kept under lock and key when unattended. Proper protective clothing and equipment shall be worn and used during all phases of termiticide application.

1.5 WARRANTY

- A. The Contractor shall provide a 5-year written warranty against infestations or reinfestations by subterranean termites of the buildings or building additions constructed under this contract. Warranty shall include annual inspections of the building addition. If live subterranean termite infestation or subterranean termite damage is discovered during the warranty period, and the soil and building conditions have not been altered in the interim, the Contractor shall:
 - B. Re-treat the soil and perform other treatment as may be necessary for elimination of subterranean termite infestation;
 - C. Repair damage caused by termite infestation; and
 - D. Re-inspect the building approximately 180 days after the retreatment.

PART 2 - PRODUCTS

2.1 MATERIALS

Termiticides shall be currently registered by the EPA/Arkansas State Plant Board.

PART 3 - EXECUTION

3.1 VERIFICATION OF CONDITIONS

At the time of application, the soil moisture content shall be sufficiently low to allow uniform distribution of the treatment solution throughout the soil.

Applications shall not be made during or immediately following heavy rains or when conditions may cause runoff and create an environmental hazard.

3.2 APPLICATION

A. Treatment of New Structures

The Contractor shall establish complete and unbroken vertical and/or horizontal (as necessary) soil poison barriers between the soil and all portions of the intended structure which may allow termite access to wood and wood related products. Application shall not be made to areas intended for use as a plenum air space. Surface treatments shall not be made for areas to serve as crawl spaces. Termiticide shall be applied as a coarse spray and provide uniform distribution unto the soil surface. Treatment shall be applied prior to placement of a vapor barrier or waterproof membrane and at least 12 hours prior to concrete placement. Where treated soil or fill material is not to be covered with a vapor barrier or waterproof membrane, adequate precautions shall be taken to prevent its disturbance. Soil or fill material disturbed after treatment shall be re-treated as specified above before placement of slabs or other covering structures. Treatment of the soil on the exterior sides of foundation walls, grade beams, and similar structures shall be coordinated with final grading and planting operations so as to avoid disturbance of the treated barriers. Manufacturer's warnings and precautions shall be observed in the handling and use of such materials. Care shall be taken to prevent these chemicals from entering water supply systems, potable water supplies, or aquifers; and that they do not endanger plants or animals.

B. Treatment of Existing Structures

The Contractor shall establish complete and unbroken vertical and/or horizontal (as necessary) soil poison barriers between the soil and all portions of the structure which may allow access to wood and wood related products. This barrier may be established by rodding, trenching and/or injection as necessary. No pesticides shall be applied to the soil beneath a plenum air space or surface applied to crawl spaces. Chemicals shall not be applied until the location of heat or air conditioning ducts, vents, and water, sewer, and plumbing lines are known and identified. Extreme caution shall be taken to avoid contamination of these structural elements and airways.

C. Rates and Methods of Application

Rates and methods of application shall be in accordance with the manufacturer's instructions on the pesticide label. Maximum application or dosage rates shall be used. If the pesticide contains less than the amount of active ingredient specified on the label, work shall be repeated with pesticides conforming to this specification.

3.3 DISPOSAL

The Contractor shall dispose of residual pesticides and containers off Government property in accordance with label instructions and EPA criteria.

END OF SECTION

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SECTION 02511

CONCRETE SIDEWALKS AND CURBS AND GUTTERS

PART 1 SCOPE

1.1 PROVISIONS

- A. Requirements of the General Provisions apply to all work under this section.
- B. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer for consideration. Those judged to be equal to that specified will receive written approval.

1.2 DESCRIPTION

This item shall consist of construction of all sidewalks, curbs and gutters as shown on the drawings.

1.3 RELATED WORK

The following items of related work are specified and included in other sections of these specifications:

- A. Section 02210 – GRADING
- B. Section 02220 - EXCAVATING, BACKFILLING, AND COMPACTION
- C. Section 02513 - PORTLAND CEMENT CONCRETE PAVING
- D. Section 03300 - CAST-IN PLACE CONCRETE

PART 2 PRODUCTS

2.1 CONCRETE

- A. Strength - Concrete shall have a minimum compressive strength of 3500 psi at 28 days. Maximum size of aggregate shall be 1-1/2 inches.
- B. Air Content - Mixtures may have air content by volume of concrete of 5 to 7 percent, based on measurements made immediately after discharge from the mixer.

2.2 CONCRETE PROTECTION MATERIALS

Concrete protection materials shall be a linseed oil mixture of equal parts, by volume, of linseed oil and either mineral spirits, naphtha, or turpentine. At the option of the contractor, commercially prepared linseed oil mixtures, formulated specifically for application to concrete to provide protection against the action of deicing chemicals may be used, except that emulsified mixtures are not acceptable.

2.3 JOINT FILLER STRIPS

- A. Contraction/Expansion Joint Filler.
- B. Joint filler shall be Omniseal as manufactured by Sonneborn or approved equal
- C. Expansion joint filler, premolded, shall conform to ASTM D 1751 or ASTM D 1752, ½ inch thick, unless otherwise indicated.

2.4 FORM WORK

Form work shall be designed and constructed to insure that the finished concrete will conform accurately to the indicated dimensions, lines, and elevations, and within the tolerances specified. Forms shall be of wood or steel, straight, of sufficient strength to resist springing during depositing and consolidating concrete. Wood forms shall be surfaced plank, 2-inch nominal thickness, straight and free from warp, twist, loose knots, splits or other defects. Wood forms shall have a nominal length of 10 feet. Radius bends may be formed with ¾-inch boards, laminated to the required thickness. Steel forms shall be channel-formed sections with a flat top surface and with welded braces at each end and at not less than two intermediate points. Ends of steel forms shall be interlocking and self-aligning. Steel forms shall include flexible forms for radius forming, corner forms, form spreaders, and fillers. Steel forms shall have a nominal length of 10 feet with a minimum of three welded stake pockets per form. Stake pins shall be solid steel rods with chamfered heads and pointed tips designed for use with steel forms.

A. Sidewalk Forms

Sidewalk forms shall be of a height equal to the full depth of the finished sidewalk.

B. Curb and Gutter Forms

Curb and gutter outside forms shall have a height equal to the full depth of the curb or gutter. The inside form of curb shall have batter as indicated and shall be securely fastened to and supported by the outside form. Rigid forms shall be provided for curb returns, except that benders or thin plank forms may be used for curb or curb returns with a radius of 10 feet or more, where grade changes occur in the return, or where the central angle is such that a rigid form with a central angle of 90 degrees cannot be used. Back forms for curb returns may be made of 1-1/2 inch benders, for the full height of the curb, cleated together.

2.5 REINFORCEMENT STEEL

Reinforcement steel shall be as specified in Section 02513 - PORTLAND CEMENT CONCRETE PAVING.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

The subgrade shall be constructed to the specified grade and cross section prior to

concrete placement.

A. Sidewalk Subgrade

The subgrade shall be tested for grade and cross section with a template extending the full width of the sidewalk and supported between side forms.

B. Curb and Gutter Subgrade

The subgrade shall be tested for grade and cross section by means of a template extending the full width of the curb and gutter. The subgrade shall be of materials equal in bearing quality to the subgrade under the adjacent pavement.

C. Maintenance of Subgrade

The subgrade shall be maintained in a smooth, compacted condition in conformity with the required section and established grade until the concrete is placed. The subgrade shall be in a moist condition when concrete is placed. The subgrade shall be prepared and protected so as to produce a subgrade free from frost when the concrete is deposited.

3.2 FORM SETTING AND REMOVAL

Forms shall be held rigidly in place by a minimum of three stakes per form placed at intervals not to exceed 4 feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Clamps, spreaders, and braces shall be used where required to insure rigidity in the forms. Forms shall be removed without injuring the concrete. Bars or heavy tools shall not be used against the concrete in removing the forms. Any concrete found defective after form removal shall be promptly and satisfactorily repaired. Forms shall be cleaned and coated with form oil each time before concrete is placed.

A. Sidewalks

Forms for sidewalks shall be set with the upper edge true to line and grade with an allowable tolerance of 1/8 inch in any 10-foot long section. After forms are set, grade and alignment shall be checked with a 10-foot straightedge. Forms shall have a transverse slope of 2% (maximum) with the low side adjacent to the roadway, unless otherwise shown on the drawings. Side forms shall not be removed for 24 hours after finishing has been completed.

B. Curbs and Gutters

The forms of the front of the curb shall be removed not less than 2 hours nor more than 6 hours after the concrete has been placed. Forms back of curb shall remain in place until the face and top of the curb have been finished as specified for concrete finishing. Gutter forms shall not be removed while the concrete is plastic enough to slump in any direction.

3.3 SIDEWALK CONCRETE PLACEMENT AND FINISHING

A. Reinforcement Steel Placement

Reinforcement steel shall be accurately and securely fastened in place with suitable supports and ties before the concrete is placed.

B. Formed Sidewalks

Concrete shall be placed in the forms in one layer of such thickness that when consolidated and finished the sidewalks will be of the thickness indicated. After concrete has been placed in the forms, a strike-off guided by side forms shall be used to bring the surface to proper section to be compacted. The concrete shall be consolidated with an approved vibrator, and the surface shall be finished to grade with a wood float, bull float, or darby, edged and broom finished.

C. Concrete Finishing

After straightedging, when most of the water sheen has disappeared, and just before the concrete hardens, the surface shall be finished to a smooth and uniformly fine granular or sandy texture free of waves, irregularities, or tool marks. A scored surface shall be produced by brooming with a fiber-bristle brush in a direction transverse to that of the traffic.

D. Edge and Joint Finishing

All slab edges, including those at formed joints, shall be finished carefully with an edger having a radius of 1/8 inch. Transverse joints including those used for handicapped ramps shall be edged before brooming, and the brooming shall eliminate the flat surface left by the surface face of the edger. Corners and edges which have crumbled and areas which lack sufficient mortar for proper finishing shall be cleaned and filled solidly with a properly proportioned mortar mixture and then finished.

3.4 CURB AND GUTTER CONCRETE PLACEMENT AND FINISHING

A. Formed Curb and Gutter

Concrete shall be placed to the section required in a single lift. Consolidation shall be achieved by using approved mechanical vibrators.

B. Concrete Finishing

Exposed surfaces shall be floated and finished with a smooth wood float until true to grade and section and uniform in texture. Floated surfaces shall then be brushed with a fine-hair brush with longitudinal strokes.

The edges of the gutter and the base edge of the top of the curb shall be rounded with an edging tool to a radius of 1/2 inch. Immediately after removing the front curb form, the face of the curb shall be rubbed with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. The front curb surface, while still wet, shall be brushed in the same manner as the gutter and curb top. The top surface of gutter and entrance shall be finished to grade with a wood float.

C. Joint Finishing

Curb edges at formed joints shall be finished as indicated.

3.5 SIDEWALK JOINTS

Sidewalk joints shall be constructed to divide the surface into rectangular areas. Transverse contraction joints shall be spaced at a distance equal to the sidewalk width or 5 feet on centers, whichever is less, and shall be continuous across the slab. Longitudinal contraction joints shall be constructed along the centerline of all sidewalks 10 feet or more in width. Transverse expansion joints shall be installed at sidewalk returns and in line with expansion joints in adjoining curbs. Where the sidewalk is not in contact with the curb, transverse expansion joints shall be installed as indicated. Expansion joints shall be formed about structures and features which project through or into the sidewalk pavement, using joint filler of the type, thickness, and width indicated.

A. Contraction Joints

The contraction joints shall be formed in the fresh concrete by cutting a groove in the top portion of the slab to a depth of at least one-fourth of the sidewalk slab thickness, using a jointer to cut the groove, or by sawing a groove in the hardened concrete with a power-driven saw, unless otherwise approved. Sawed joints shall be constructed by sawing a groove in the concrete with a 1/8-inch blade to the depth indicated. An ample supply of saw blades shall be available on the job before concrete placement is started, and at least one standby sawing unit in good working order shall be available at the jobsite at all times during the sawing operations.

B. Expansion Joints

Expansion joints shall be formed with 3/8-inch joint filler strips. Joint filler shall be placed with top edge 1/4 inch below the surface and shall be held in place with steel pins or other devices to prevent warping of the filler during floating and finishing. Immediately after finishing operations are completed, joint edges shall be rounded with an edging tool having a radius of 1/8 inch, and concrete over the joint filler shall be removed. At the end of the curing period, expansion joints shall be carefully cleaned and filled with joint sealer. Concrete at the joint shall be surface dry and the atmospheric and pavement temperatures shall be above 50 degrees F at the time of application of joint-sealing materials. Joints shall be filled with sealer flush with the concrete surface in such manner as to avoid spilling or smearing onto the walk surface.

3.6 CURB AND GUTTER JOINTS

Curb and gutter joints shall be constructed at right angles to the line of curb and gutter.

A. Contraction Joints

Contraction joints shall be constructed in line with contraction joints in abutting Portland cement concrete pavements and spaced so that monolithic sections between curb returns will not be less than 5 feet nor greater than 15 feet in length. Contraction joints shall be constructed by means of 1/8-inch thick separators and of a section conforming to the cross section of the curb and

gutter. Separators shall be removed as soon as practicable after concrete has set sufficiently to preserve the width and shape of the joint and prior to finishing.

B. Expansion Joints

Expansion joints shall be formed by means of preformed expansion joint filler material cut and shaped to the cross section of curb and gutter. Expansion joints shall be provided in curb and gutter in line with expansion joints of abutting Portland cement concrete pavement, and shall be of the same type and thickness as joints in the pavement. Where curb and gutter do not abut Portland cement concrete pavement, expansion joints at least 3/8 inch in width shall be provided at intervals not exceeding 30 feet. Expansion joints shall be provided in nonreinforced concrete gutter at locations indicated.

END OF SECTION

SECTION 02513
PORTLAND CEMENT CONCRETE PAVING

PART 1 GENERAL

1.1 PROVISIONS

Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer for consideration. Those judged to be equal to that specified will receive written approval.

1.2 DESCRIPTION

Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings. The covered work includes excavating and compacting of subgrade, and forming, placing and curing of concrete driveways, curbs, gutters and sidewalks.

1.3 RELATED WORK

The following items of related work are specified and included in other sections of these specifications:

- A. Section 02220 - Excavating, Backfilling and Compacting for Utilities
- B. Section 03300 - Cast-In-Place Concrete

1.4 SUBMITTALS

Concrete Design: Contractor shall be responsible for design of concrete mixes. An independent testing laboratory shall determine design mixes of each type concrete based on specified strengths and materials in accordance with ACI 318-89. Submit 4 copies of design mix for approval.

1.5 MOCK-UP

Construct sidewalk width by 5-foot-long mock-up, which may be incorporated into the work. Construct mock-up in time to allow evaluation of color and texture after setting.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Portland Cement: ASTM C-150-78a, Type I or III.
- B. Fine Aggregate: Natural Sand, ASTM C-33-78.
- C. Coarse Aggregate: Hard, durable natural gravel or crushed rock meeting requirements of ASTM C-33-78. Maximum size and gradation in accordance with Size No. 67 or 467 in Table II of ASTM C-33.

- D. Grading: ASTM C-136.
- E. Water: Potable.
- F. Admixture: Cement-dispersing, water reducing compound such as Pozzolith 100 series, as made by Master Builders. Air entraining agent meeting requirements of ASTM C260.
- G. Reinforcing Steel: ASTM A615, grade 60.
- H. Wire Mesh, ASTM A185.
- I. Forms: Nominal 2" thickness dimension fir wood, 3/4" fir plywood, or steel paving forms.
- J. Premolded Expansion Joint Filler: ASTM D-1782, non-asphaltic.
- K. Dowels and Sleeves: 3/4" plain round bars, with plastic sleeve at one end, 24 inches long, allowing one inch of movement. Refer to drawings.

PART 3 EXECUTION

3.1 PREPARATION

- A. Sawcut existing pavements and concrete to be joined by new construction to neat, vertical, true lines in such manner that adjoining surfaces will not be damaged. Clean cut asphalt pavement with approved equipment. Do not rip or root outside limits of cuts. Haul surfacing materials removed from the Project site to an approved offsite disposal area immediately. Do not use removed surfacing materials for backfill.
- B. Excavate, backfill and compact subbase in accordance with related work.
- C. Do not place excavated or displaced material on the base course or surface of the roadway. Do not deposit excavated materials where the material will interfere with access to property or traffic flow in street.
- D. Sawcut and remove concrete driveways as required to provide the slopes indicated by the standard details.
- E. Sawcut and remove concrete sidewalks as required to provide slopes within the specified limits.

3.2 FORMWORK AND REINFORCING

- A. Construct concrete curbs, gutter and sidewalks with conventional forms, or with appropriate machines specifically designed for construction of concrete curbs, gutters and sidewalks when approved.
- B. When machines designed specifically for such work and approved are used and results are not satisfactory, discontinue use of machine and make repairs. Apply applicable requirements of construction with use of forms to use of machines.

- C. Carefully set forms conforming to dimensions of curb, gutter, sidewalk and driveway to line and grade, and securely stake forms in position. Oil forms and luster subgrade immediately prior to placing concrete.
- D. Install ½ inch thick expansion joint filler strips with top edge 1/4 inch below projected concrete surface. Hold joint filler strips in place with steel pins or other devices to prevent warping or deflecting of filler during placing and finishing. Install expansion joints as noted in paragraph 3.3. Install the joints in straight lines and vertical planes perpendicular to longitudinal lines of sidewalks or curbs and gutters, or when in curved alignments, along radial lines. Install joints to full depth and width of concrete and matching joints in adjacent sidewalks or curb gutters. Install joints at P.C.'s and P.T.'s of curves, at intersection between driveways, sidewalks, and at eyes of adjoining structures.
- E. Install reinforcement as required in the drawings.
- F. Thoroughly clean forms after each use and coat forms with light oil, or other releasing agent which will not discolor concrete.

3.3 CONCRETE PLACEMENT AND FINISHING

- A. Place concrete in accordance with related work.
- B. Place concrete in one lift so when compacted and finished pavement will be of thickness indicated.
- C. After placing concrete, strike-off surface with strike-off tool guided by side forms. Thoroughly spade concrete away from forms so that there is no rock pockets next to forms, or compact concrete with approved mechanical vibrators. Continue tamping or vibrating until mortar flushes to surface, and coarse aggregate is below surface.
- D. Finish surface with wood float.
- E. Divide surface into rectangular areas as indicated or at approximately 5 feet o.c. with scored ½ inch deep control joints. Score control joints with deep cutting scoring tool.
- F. Control Joints: Strike control joints in straight lines and vertical planes perpendicular to longitudinal lines of sidewalks or curbs and gutters, or when in curved alignments, along radial lines of curbs.
- G. Construction Joints: Stoppage of concrete placing shall occur at expansion joint or other detailed contraction joints. Construct bulkheads to permit continuation of reinforcing steel.
- H. Expansion Joints: Place expansion joint fillers where detailed on drawings; where paving abuts existing paving, structure or walls; every 30 feet each way in paving. Provide removable tacked-on strips to provide a recess for joint sealing compound. Provide expansion joints every 30 feet in curbs at walks. ¾" Dowels, 24" long shall be placed at 24" O.C. through expansion joints, sleeved

one side, at all expansion joints except where joint abuts building, unless noted otherwise.

- I. Saw-Cut Contraction Joints: Saw-cut joints when concrete is hard enough not to be torn, raveled, or damaged by saw cutting equipment and no later than 10 hours after concrete placement. Trial cuts shall be made prior to execution. Use a power drive concrete saw. Saw blades shall make a clean, smooth cut, producing a groove 1/8" to 1/4" wide to depth required (1/4 slab depth). Locate contraction joints nominally at 15'-0" O.C., unless specified otherwise on Drawings. All joints shall receive sealant.
- J. Immediately after finishing, round edges of perimeter of forms and joint edges with edging tool having radius of 1/8 inch, and remove concrete from over joint fillers.
- K. Completed surface shall be uniform in color and should be free of surface blemishes and tool marks.
- L. Do not remove front face forms until concrete has initially set and has sufficient strength to carry its own weight. Do not remove gutter forms and rear forms until concrete has hardened sufficiently to prevent damage to edges. Exercise care to prevent damage. Repair or replace concrete damaged while stripping forms. Test faces, tops backs, and flow lines of curbs and gutters with ten foot straightedge or curve template, longitudinally along surfaces. Correct deviation in excess of 1/4 inch.
- M. Finish concrete as follows:
 - 1. Sidewalks: Light brown perpendicular to walk centerline.
 - 2. Driveway: Medium broom perpendicular to driveway centerline.
 - 3. Curb and Gutter: Fine hair brush parallel with curb.
- N. Stamp name and year on work on each end of curb, gutter, or sidewalk in letters not less than 3/4 inch high.

Backfill behind curbs or sidewalks with soil native to area to lines and grades indicated.

3.4 INSTALLATION OF CONCRETE STRUCTURES

- A. Place concrete on firm subgrade, free from water. Keep ground water several inches below subgrade until concrete has set. Moisten subgrade in dry earth with water from spray nozzles immediately before concrete is placed.
- B. Place reinforcing steel and concrete immediately after placing filter or drain material. Keep filter or drain material dewatered to prevent concrete materials from being carried away before concrete has set.
- C. Construct concrete formwork, reinforcement, concrete accessories and cast-in-place concrete in accordance with related work.

3.5 CURING

Cure concrete in accordance with related work.

3.6 TESTING OF SURFACES

- A. Test surfaces of concrete sidewalks with 5 foot straightedge. Correct deviations in excess of 1/8 inch.
- B. Water test gutters slopes of 0.8 foot per hundred feet or less, or where unusual or special conditions cast doubt on capability of gutters to drain. Establish flow in length of gutter to be tested by supplying water from hydrants, tank trucks or other source. One hour after water supply is shut off, inspect gutter for evidence of ponding or improper shape. Correct defects when water is found ponded in gutters or on adjacent asphalt pavement to 1/4 inch or greater, No ponding of any depth is allowed at the bottom of the handicapped ramps.

3.7 PROTECTION AND REPAIR

- A. Protect concrete work from damage and vandalism. Repair damaged or vandalized concrete and clean discolored concrete.
- B. When concrete cannot be repaired and must be removed, remove damaged concrete and replace concrete between expansion joints.

3.8 OPENING TO TRAFFIC

- A. Obtain approval prior to opening pavement to traffic.
- B. Close pavement to traffic for at least 7 full days or until minimum compressive strength of concrete is at least 75% of design strength.
- C. Restrict traffic to passenger cars and light trucks for at least 14 days after concrete is placed.

3.9 TESTING

- A. Inspection and testing will be performed accordance with Division 1, General Requirements.
- B. Provide free access to work and cooperate with appointed firm.
- C. Tests of cement and aggregates may be performed to ensure conformance with Contract Documents.
- D. Three concrete test cylinders will be taken for every 75 or less cu. yds. of each class of concrete placed. Make and cure concrete compressive strength test specimens in accordance with ASTM C31.
- E. One additional test cylinder will be taken during cold weather and shall be cured on the Project site under same conditions as concrete it represents. Construct storage box of sufficient size and design to provide protection for cylinders stored on site.

- F. One slump test will be taken in accordance with ASTM C143 for each set of compressive strength test cylinders taken.
- G. Where concrete is placed by pumping, tests shall be taken at truck before concrete is placed in pump.
- H. Testing laboratory will perform compressive strength tests in accordance with ASTM C39.

END OF SECTION

SECTION 02622

PVC PRESSURE PIPE AND FITTINGS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

This section shall include the furnishing and installation of PVC pressure pipe.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Trenching and backfilling: Section 02223

1.3 QUALITY ASSURANCE

- A. The pipe manufacturer shall be a member of the Plastic Pipe and Fittings Association or Uni-Bell PVC Pipe Association and shall have manufactured the pipe and/or joint proposed for use for not less than five (5) years.
- B. The pipe shall be permanently marked by the manufacturer and coded for the date, batch and shift in which the pipe was made along with other required marking as set forth in ASTM or AWWA Standard Specifications. The pipe shall also bear the NSF seal.
- C. The supplier shall furnish to the contractor a warranty governing both workmanship and material and shall be for a period of not less than one (1) year from date of acceptance by the Owner or his agent. The warranty of the material by the supplier shall be in writing to the contractor. Any material failure shall be replaced at no cost to the Owner.
- D. All PVC water pipe shall be by the same manufacturer, unless otherwise approved by the Engineer.

PART 2 - PRODUCTS

2.1 PVC PRESSURE PIPE

- A. General - The pipe and fittings shall be manufactured from NSF approved Type I, Grade I PVC, which is Class 12454-B rigid PVC compound, conforming to ASTM Resin Specifications D-1784 as amended and/or revised and shall be stamped with the NSF seal of approval and permanently marked.

- B. Provisions shall be made for expansion and contraction at each joint by use of a gasket type joint and integral bell, or equal.
- C. Size Four Inch and Larger - The pipe shall have a minimum pressure rating of 200 psi at 73.4° F and conform to the requirements of specifications ASTM D-2241-69, and Product Standards PS 22-70 as amended and/or revised, and with standard dimension ratio (SDR) of 21. Pipe with a pressure rating of 250 psi (SDR-17) or 315 psi (SDR-13.5) shall be installed at locations required by the plans. Also where called for by the plans, pipe meeting the requirements of AWWA C-900 Class 200, Class 150, Class 100 shall be installed.
- D. Size Three-Inch and Smaller - The pipe shall have a minimum pressure rating of not less than 200 psi at 73.4° F and conform to the requirements of Specifications ASTM D-2241-69 and Product Standard PS 22-70 and with standard dimensions ratio (SDR) of 21. Pipe with a pressure rating of 250 psi (SDR-17) or 315 psi (SDR-13.5) shall be installed at locations required by the plans.

2.2 FITTINGS

- A. Size Four Inch and Larger - All fittings and specials used in connection with pipe four-inch and larger shall conform to AWWA short or long bodied cast or ductile iron fittings using a mechanical joint system with hardened or duct tipped type of rubber gaskets in accordance with AWWA Specifications C-110 and C-111. The fittings shall be cement lined in accordance with AWWA Specification C-104. The pipe and fittings shall be installed in accordance with the recommendations of the pipe manufacturer and the Engineer or his representative.
- B. Size Three-Inch and Smaller - All fittings and specials used in connection with pipe three-inch and smaller shall be rated at least equal to pressureclass rating of the pipe and conform to recommendations by the pipe manufacturer or be of proven pipe. The pipe and fittings shall be installed in accordance with the recommendations of the pipe manufacturer and as directed by the Engineer. No PVC male adapters will be allowed.

2.3 LUBRICANTS

The joint lubricant shall be nontoxic, shall not support the growth of *bacteria* and shall have no deteriorating effects on the gasket and pipe materials. The

lubricants shall comply with NSF Standards 14 and 61, ASTM D 3139 and shall not impart taste or odor to water in a pipe that has been flushed in accordance with AWWA C601-68.

PART 3 - EXECUTION

3.1 HANDLING AND LAYING PVC PLASTIC PIPE AND FITTINGS

Remove any dirt or foreign material from groove so that ring will set completely in the ring groove. The ring shall be faced in the proper direction with color marking faced out. Smooth ring so that it sets evenly all around in the groove free from any twists. Ring insertion on small pipe can be made easier by dipping ring in plain water (do not use lubricant on ring). Clean the entire circumference of the spigot end of the pipe and apply lubricant of the type recommended by the pipe manufacturer. The lubricant shall be applied from a point one inch back from the beveled end of the pipe with pad, sponge, or cloth. The thickness of the applied coat or lubricant shall be constant with a brush coat of enamel paint.

The bell of the pipe shall be held firmly in place to prevent the joints already assembled in the line from closing up. Insert the spigot end of the pipe in line with the bell and as straight as possible and shove in place to the preset reference mark. Assembly shall be made with the pipe as close to the ground as possible. The use of metal chains, cables, etc., for assembly will not be permitted. Any undue resistance during assembly indicates the ring may have become twisted and the joint shall be pulled apart and reassembled.

If it becomes necessary to cut pipe, a tubing cutter or carpenter's saw shall be used and cut shall be made perpendicular to the centerline of the pipe. Remove burrs from inside of wall by means of a knife or fine sandpaper. After cutting pipe and before jointing, the end shall be beveled to conform as near as possible to a factory bevel using a milled curved tooth flatfile so as to get a smooth surface. No threading of pipe will be allowed. Use a pencil or crayon to make new reference mark using a factory mark as a pattern.

Minimum curves of pipe shall not be less than that recommended by the pipe manufacturer.

3.2 SETTING FITTINGS

Cast Iron and ductile iron fittings shall be set in the line as the work progresses and shall be connected to the water line as specified. Plugged fittings shall be carefully laid and properly blocked to avoid leakage. Where small service mains are to be connected at specials, the contractor shall use

tapped plugs.

3.3 TESTING

- A. General - After the water mains have been laid as specified, the entire system shall be given a hydrostatic pressure test and a leakage test. This may be done by sections between valves as selected by the Engineer for convenience.

These tests shall be performed by the contractor in the presence of the Engineer. The contractor shall furnish all necessary pressure gauges, meters, and pumps, and make all taps and connections.

- B. Hydrostatic Test - The section to be tested shall be slowly filled with water and all air expelled. Pressure shall be applied by means of a pressure pump and maintained for at least two hours or until the whole section can be examined. The test shall be at 50% above normal operating pressure for the area, not to exceed the class rated pressure of the pipe; however, in no case shall the testing pressure be lower than 100 psi on any portion of the line being tested. All leaks and defects found during the test shall be satisfactorily repaired and corrected by the contractor.
- C. Leakage Test - The contractor will make a leakage test, and the test shall be at the same pressure conditions as specified for the hydrostatic test. Each leakage test shall be of two hours duration or longer, if necessary, to satisfy the Engineer that leakage in the line meets the .

Allowable leakage (in GPH) is given by the formula:

$$L = (N D^{1/2}) / 7400$$

N = Number of Joints

D = Nominal diameter of pipe in inches

P = Average test pressure in psi

If the leakage in the test section does not meet the specifications, the contractor shall locate and repair the leaks and retest the line. The cost of this work shall be included in the unit price for laying pipe and will not be paid for separately.

3.4 STERILIZATION

All mains shall be thoroughly flushed until all foreign material -and colored water is expelled before sterilization.

Before the mains are placed in service, they shall be sterilized with chlorine.

Either liquid chlorine or hypochlorite may be used in such amount as to provide a dosage of chlorine not less than 50 ppm. The sterilizing agent may be introduced in any manner, approved by the Engineer that will insure a uniform distribution.

Following a contact period of not less than 24 hours, the chlorine shall have a residual of not less than 25 ppm. The chlorinated water shall then be flushed from the line or structures and sample taken and analyzed for bacterial purity. This process shall be continued until samples indicate that the water is safe for human consumption as determined by the Arkansas Health Department. All valves in water lines being sterilized shall be opened and closed several times during the test period. Two consecutive daily samples are presently required by the Health Department for approval.

The contractor shall provide samples as directed by the Engineer for bacterial analysis and approval by the Arkansas Health Department. The cost of this work shall be included in the unit price for laying pipe and will not be paid for separately.

3.5 CONTRACTOR'S SUPPLIER LIST

At the time of the pre-construction conference, the contractor shall present to the Engineer and Owner a complete listing (by manufacturer) of all materials to be used on the project. If required to do so, he will also furnish submittal information and other material needed to determine if the proposed material will meet these specifications.

END OF SECTION

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**SECTION 02669
POTABLE WATER SYSTEM**

PART 1 GENERAL

1.1 PROVISIONS

Throughout the specifications, manufacturer's name and catalogue number may specify types of materials in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer for consideration. Those judged to be equal to that specified will receive written approval.

1.2 DESCRIPTION

- A. Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawing.
- B. The Work described in this section of the specifications includes, but is not limited to the following:
 - 1. Water line construction with necessary water main materials, fittings, connections and accessories.

1.3 RELATED WORK

The following items of related work are specified and included in other sections of these specifications:

- 1. Section 02220 - Excavating, Backfilling and Compacting.

1.4 CONSTRUCTION SCHEDULING AND COORDINATION

Service to water customers shall not be disrupted during installation of the water line improvements except for the time required to change individual services as specified herein.

The Contractor shall notify the City of Forrest City Utility Department at least 48 hours prior to scheduled connections of mains. Scheduling shall be subject to the approval of the Utility Department and the Engineer.

The work of this Section shall be coordinated with the work of other Sections. The Contractor shall make field measurements at the site to verify or supplement indicated dimensions and to ensure proper coordination of all construction items.

The sequence of construction and change over shall be as follows:

- A. Install new mains as shown on the plans, including fire hydrants in accordance with the specification shown in the plan.

- B. Test, disinfect and sample mains as specified. After samples are approved, place mains in service.
- C. Install new services, including saddles, and transfer customer's services to the new main.
- D. On lines to be abandoned, close existing valves and cut and plug line; remove existing valve box and fire hydrants.

PART 2 PRODUCTS

2.1 PVC PIPE

- A. All Polyvinyl chloride (PVC) pressure pipe shall conform to AWWA C 900 made from class 12454 - A or 12454-B material as defined by ASTM D1784 with classification specified in the drawing. PVC pipe shall have a minimum pressure class rating of 150 psi.

2.2 GATE VALVES AND BOXES

- A. Gate valves 3" and smaller shall be iron body, bronze mounted, resilient seat or double disc, parallel seat "O" ring. Gate valves may be either mechanical or slip joint rubber gasket joint. Gate valves shall be Mueller or American Flow Control AWWA Standard or equal. All valves must operate to close in the same direction as described in "C" below.
- B. Gate valves 4" and larger shall be resilient seat type iron body with modified wedge disc. Valve interior shall have an iron body with modified wedge disc. Valve interior shall have an epoxy coating. Gate valve may be either mechanical or slip joint rubber gasket joint. Gate valves shall be Mueller resilient seat gate valve or equal.
- C. All gate valves shall be non-rising stem type with 2" square operating nuts. Gate valves shall open to the left (counterclockwise) and shall be 200 psi design. One operating wrench shall be provided to the Owner. All gate valves by one manufacturer.
- D. Valve boxes shall consist of cast iron base and top section with cover which shall be marked "Water." The top section shall be adjustable for elevations and shall be set to allow equal movement above and below finished grade. The base shall be centered over the valve and below finished grade. The base shall be centered over the valve and shall rest on compacted backfill. The top of the base section shall be approximately on line with nut at top of valve stem, and the entire assembly shall be plumb. The boxes shall be two-piece screw type, Tyler #142-Q on 2" and 3" valves, #562-S on 4" and 6" valves, and #461-S on 8" through 12" valves, or approved equal. Valve boxes shall be made by an American manufacturer.

2.3 CORPORATION COCKS

Shall be suitable for use with plastic or copper water service and shall be similar or equal to Type F1000 as manufactured by Ford Meter Box Company, or H-15008 as manufactured by Mueller Corporation. All 'brass' service line fittings shall be of red brass containing 85% copper and 5% each of tin, lead, and zinc in accordance with ASTM B-62. Upon request by the Owner, the supplier shall certify in writing to the Engineer that the fittings supplied meet the above specifications and those of AWWA C-800. All corporation cocks shall be designed to withstand working pressures of up to 250 psi.

2.4 MASTER METER VAULT

- A. Concrete Vault - To be constructed by the contractor as per Drawings.

2.5 MASTER WATER METERS

- A. The Contractor will coordinate with the City utility company and pay for the installation of water meter assembly as per City standards and specifications.

2.6 FIRE HYDRANTS

Three-way hydrants shall be 5-1/4" safety break flange design equal to Mueller Centurion Catalog No. A-423. Leads shall be of the same material as the mains. One safety flange repair kit (Mueller A-301) shall be furnished to the Owner.

2.7 TAPPING SLEEVES AND VALVES

The tapping sleeve shall be either of the following types acceptable to Utility Company:

- A. Cast Iron - Tapping sleeves shall be of cast iron material with mechanical joint type seals and shall be of split gland type designed for 150 psi working main pressure. The sleeves shall have a Class 125 outlet flange and be similar and equal to Mueller H-615.
- B. Stainless Steel - Tapping sleeves shall be of stainless steel material of the split gland type designed for 150 psi working main pressure. The sleeve shall be similar and equal to Ford "SST."
- C. Carbon Steel - Tapping sleeves shall be of ASTM 285 Grade C carbon steel with corrosion resistant bolts. The body of the fitting shall be coated with a fusion applied epoxy coating. The sleeve shall be similar and equal to JCM 412.

The tapping valve shall have a Class 125 inlet flange, be rated for 150 psi working pressure, and have a mechanical joint outlet. The valve shall be a gate valve meeting latest revision of AWWA Standard C500.

2.8 LOCATOR TAPE

3" wide MAGNA - TEC or approved equal

PART 3 EXECUTION

3.1 LAYING OF WATER PIPE AND FITTINGS

- A. Pipe and accessories shall be handled in such a manner as to insure delivery on the work in sound, undamaged condition. Particular care shall be taken not to injure the pipe coating. Cutting the pipe for closure pieces or for other reasons shall be done by means of mechanical cutters of an approved type. Wheeled cutters shall be used where practicable.
- B. Before lowering into trench, and while suspended, the pipe shall be inspected for defects and cracks. Any defective, damaged, or unsound pipe shall be rejected. Deflections from a straight line or grade, made necessary by vertical or horizontal curves or offsets, shall not exceed the maximum recommended by the pipe manufacturer. Where these maximum deficiencies would otherwise be exceeded,

the contractor shall provide special bends as approved by the Engineer, or a sufficient number of shorter lengths of pipe to provide angular deflections within the limits set out above. Except where otherwise necessary, pipe shall be laid with the bells facing in the direction of laying.

- C. All fittings at bends in the pipe shall be firmly wedged against the vertical face of the trench, or have suitable thrust backing as required by the Engineer. Reaction of thrust bearing shall be of concrete, placed between solid ground and the fitting.

3.2 TESTING

- A. General - After the water mains have been laid as specified, the entire system shall be given a hydrostatic pressure test and a leakage test. This may be done by sections between valves as selected by the Engineer for convenience. These tests shall be performed by the contractor in the presence of the Engineer. The contractor shall furnish all necessary pressure gauges, meters, and pumps, and make all taps and connections.
- B. Hydrostatic Test - The section to be tested shall be slowly filled with water and all air expelled. Pressure shall be applied by means of a pressure pump and maintained for at least two hours or until the whole section can be examined. The test shall be at 50% above normal operating pressure for the area, not to exceed the class rated pressure of the pipe; however, in no case shall the testing pressure be lower than 100 psi on any portion of the line being tested. All leaks and defects found during the test shall be satisfactorily repaired and corrected by the contractor. The contractor shall provide the water for testing.
- C. Leakage Test - The contractor will make a leakage test, and the test shall be at the same pressure conditions as specified for the hydrostatic test. Each leakage test shall be of two hours duration or longer, if necessary, to satisfy the Engineer that leakage in the line meets the specifications.

Allowable leakage (in GPH) is given by the formula:

$$W_L = \frac{N D \sqrt{P}}{7,400 h}$$

where:

- N = Number of Joints
- D = Nominal diameter of pipe in inches
- P = Average test pressure in psi

If the leakage in the test section does not meet the specifications, the contractor shall locate and repair the leaks and retest the line. The cost of this work shall be included in the unit price for laying pipe and will not be paid for separately.

3.3 STERILIZATION

All mains shall be thoroughly flushed until all foreign material and colored water is expelled before sterilization.

Before the mains are placed in service, they shall be sterilized with chlorine. Either liquid chlorine or hypochlorite may be used in such amount as to provide a dosage of chlorine not less than 50 ppm. The sterilizing agent may be introduced in any manner, approved by the Engineer, that will insure a uniform distribution. Following a contact period of not less than 24 hours, the chlorine shall have a residual of not less than 25 ppm. The chlorinated water shall then be flushed from the line or structures and samples taken and analyzed for bacterial purity. This process shall be continued until samples indicate that the water is safe for human consumption as determined by the Arkansas Health Department. All valves in water lines being sterilized shall be opened and closed several times during the test period. Two consecutive daily samples are presently required by the Health Department for approval.

The contractor shall provide samples as directed by the Engineer for bacterial analysis and approval by the Arkansas Health Department. The cost of this work shall be included in the unit price for laying pipe and will not be paid for separately.

3.4 SETTING VALVES

Valves shall be placed in the line at points designated on the drawings. Valves shall be placed with the stem vertical. Valve boxes shall be placed with the top of the finished grade of the street.

3.5 INSTALLATION OF SERVICE CONNECTION

Service connection shall be made in accordance with details shown on the plans. The service line shall be laid perpendicular to the main line where possible. The contractor is responsible to connect the building shown on the drawings to the main water main. This task shall only take place after, testing and sterilizing of the main and service lines.

3.6 SETTING FIRE HYDRANTS

All fire hydrants shall have a minimum bury of 3 feet, and shall be installed as shown on the plans.

END OF SECTION

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SECTION 02730

SANITARY SEWAGE SYSTEM

PART 1 GENERAL

1.1 PROVISIONS

- A. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer for consideration. Those judged to be equal to that specified will receive written approval.

1.2 DESCRIPTION

- A. Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawing.
- B. The Work described in this section of the specifications includes, but is not limited to, the following:
1. Relocate sewer service to backwash pit.

1.3 RELATED WORK

- A. The following items of related work are specified and included in other sections of these specifications:
1. Section 02220 - Excavating, Backfilling and Compacting.

PART 2 PRODUCTS

2.1 SANITARY SEWER MAIN

The pipe for the gravity sewer shall be PVC SDR 35 sewer pipe, ASTM Specification D3034(PSM), made from plastic having cell classification of 12454-B as defined in ASTM D1784. All wyes, tees, and bends shall be manufactured of the same material as the sewer pipe used and all wyes or ends of service shall be equipped with a watertight plug. All sewer pipe shall be installed using either Class I embedment materials.

2.2 SANITARY SEWER SERVICE

4" PVC SDR 35 sewer pipe as specified above shall be used for service gravity sewer. Maintain minimum slope of 1% for all service lines.

PART 3 EXECUTION

3.1 GENERAL

All equipment necessary and required for the proper construction of the sanitary sewers shall be on the project in first class working condition. The contractor shall provide the necessary hand tampers and pneumatic tampers to obtain the compaction of the pipe bed and backfill as specified. In order to comply with the requirements of the Arkansas State Health Department, the contractor shall maintain a minimum of ten (10) feet of horizontal separation between water and sewer lines when they are installed parallel and a vertical separation of 18" (minimum) when these lines cross.

Backfilling operations shall not lag more than 500 feet behind laying operations unless written authorization to do otherwise is given by the Engineer. The contractor shall mark all trenches left open at the end of the working day with appropriate barriers, lights, and signs as required by the various safety codes.

3.2 EXCAVATION

- A. The Contractor shall do all excavation to the depth shown on the plans. Common excavation shall include all excavation including such rock as may be encountered in the trench. If the soil at the bottom of the trench is mucky, or in such condition that it cannot be properly shaped and graded, or if this material is too soft to properly support the bedding material, the contractor shall excavate below the normal subgrade elevation as directed by the Engineer. Whenever excavation is carried below the subgrade, at the direction of the Engineer, the contractor shall provide and install a foundation material of gravel or crushed stone thoroughly tamped into place up to an elevation sufficient to prepare the bedding as specified. A minimum of 6 inches of such foundation material will be required.
- B. Where rock excavation is encountered in trench, the contractor shall excavate to the depth shown on the plans plus at least six inches (6"). A bedding material of at least six (6") inches shall be placed between the rock and the bottom of the pipe. This bedding shall consist of ballast, concrete aggregate or other acceptable graded or crushed stone material as shown on the plans. The depth of cut shown on the plans is from the surface of the ground to the invert of the pipe. The width of the trench at the top of the pipe shall be the outside diameter of the pipe bells plus twelve inches, minimum, and plus sixteen inches maximum. The bed for the pipe shall be so shaped that at least the lower quarter of the pipe shall be in continuous contact with the top of the bedding. The contractor shall do all bracing, sheathing, and shoring necessary to perform and protect all excavations required to prepare trenches for laying and installing pipe, and other structures incidental to the construction of this sewer system.

3.3 LAYING AND INSTALLING PIPE

The contractor shall provide a laser beam type grade light to insure the pipe is laid to the lines and grade shown on the plans. The Engineer shall inspect all pipe before it is laid and reject any pipe damaged or defective. Laying of pipe shall be started at the lowest point and be laid up grade. The pipe shall be protected from water during placing and until joints are made.

3.4 BACKFILLING

All trenches and excavations shall be backfilled in a reasonable time after the pipe is installed and bedded. Backfill material shall be shown on the standard detail drawings. Select backfill material containing stones or rock exceeding three inches (3") in diameter shall not be used adjacent to the pipe or until the fill over the pipe exceeds one foot (1') in common excavation and two feet (2') in rock excavation. No haunching or initial backfill material may be dropped from a height exceeding two feet (2') over the top of the pipe. Compaction of the bedding, haunching, and initial backfill material shall be obtained by hand tamping method until cover exists over the pipe as shown on the standard trench detail drawings. General backfill material containing large clods or stones larger than six inches (6") in diameter shall not be placed in trenches. In trenches located in paved streets, the general backfill shall be made in layers not to exceed six inches (6") and shall be compacted to a density of 95% Modified Proctor by pneumatic tampers or other equipment approved by the Engineer in such manner that minimal settling of the trench will occur. The contractor will top the backfill by placing the stone or gravel base material level with the existing surface. The crossing shall then be opened to traffic for a period of at least three weeks before the finished surface is placed. Where sufficient backfill material is not available for any of the above operations, it shall be hauled to the work site by the contractor.

3.7 TESTING OF GRAVITY SEWERS AND MANHOLES

Mandrel deflection testing is required for gravity sewer lines. Deflection shall not exceed 5 percent. Tests for water tightness shall be made on each section of sewer line by the contractor in the presence of the Engineer or his authorized representative by one of the following methods:

A. Exterior Saturated Ground Water Pressure - Infiltration due to exterior ground water pressure shall not exceed 50 gallons per mile per inch diameter per day. The contractor shall furnish all equipment necessary for the completion of this test. If dependable results cannot be achieved due to a low ground water table, the low pressure air loss method shall be used. This method (the E.S.G.W.P.) shall be used only when the ground water table is over the top of the sewer pipe.

B. Low Pressure Air Loss - for testing the water tightness of sewer lines. The contractor shall furnish all equipment necessary for this test. The test shall be conducted following procedures outlined. Air pressure in the lines shall not exceed 5.0 psig. An internal pressure of 3.5 psig minimum shall be maintained for at least 5 minutes. After the stabilization period, the time required for a pressure loss of 0.5 psig (3.5 psig to 3.0 psig) will be recorded. If the time for this pressure loss is greater than that shown in the table below, the section undergoing the test shall have passed.

END OF SECTION

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**SECTION 02741
HOT-MIX ASPHALT (HMA)**

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

**AMERICAN ASSOCIATION OF STATE HIGHWAY AND
TRANSPORTATION OFFICIALS (AASHTO)**

AASHTO M 17	(1994) Mineral Filler for Bituminous Paving Mixtures
AASHTO M 20	(1994) Penetration Graded Asphalt Cement
AASHTO M 226	(1994) Viscosity Graded Asphalt Cement
AASHTO T 11	(1994) Materials Finer Than 75-Micrometer (No. 200) Sieve in Mineral Aggregates by Washing
AASHTO T 27	(1994) Sieve Analysis of Fine and Coarse Aggregates
AASHTO T 30	(1994) Mechanical Analysis of Extracted Aggregate
AASHTO T 164	(1994) Quantitative Extraction of Bitumen From Bituminous Paving Mixtures
AASHTO T 166	(1994) Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface -Dry Specimens

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
(AHTD)**

Standard Specifications for Highway Construction (2003 Edition)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 2950	(1997) Density of Bituminous Concrete in Place by Nuclear Method
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1.2 MEASUREMENT AND PAYMENT

Subsections 407.05 and 407.06 of the AHTD Standard Specifications for Highway Construction are not applicable.

1.3 STANDARD SPECIFICATIONS

Asphaltic concrete hot mix surface course shall conform to the provisions of Section 407

- Asphalt Concrete Hot Mix Surface Course, Section 409. Materials and Equipment for Asphalt Concrete Hot Mix Binder and Surface Courses, and Section 410 - Construction Requirements for Asphalt Concrete Hot Mix Binder and Surface Courses of the Arkansas State Highway and Transportation Department "Standard Specifications for Highway Construction", except as specified herein. Reference hereinafter to the Arkansas State Highway and Transportation Department "Standard Specifications for Highway Construction" will be by the basic designation "Standard Specifications". The words "Chief Engineer" or "Engineer" in the Standard Specifications shall be interpreted to mean "Contracting Officer". In case of conflict between the Standard Specifications and this specification, this specification shall govern. Copies of the Standard Specifications may be obtained from the Arkansas State Highway and Transportation Department, Little Rock, Arkansas, for \$8 per copy.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Physical Characteristics of Asphalt Cement.

The specific physical characteristics of the asphalt cement grade proposed shall be submitted to the Contracting Officer for approval.

SD-07 Certificates

Mix Designs (Contractor and Job).

The Contractor shall submit the job mix formula for asphaltic concrete to the Contracting Officer for approval.

The Contractor shall furnish certificates of compliance with the requirements of penetration grade 60-70 asphalt cement in Table 1 of AASHTO M 20 for each lot of asphalt cement used in the production of asphalt mixture used in this contract. If the Contractor furnishes the viscosity-graded asphalt cement as permitted in paragraph: Asphalt Cement, he shall submit certificates of compliance for that material.

1.5 EQUIPMENT

1.5.1 General Requirements

Batching plant, rollers and mechanical spreading and finishing equipment shall be as specified in Subsections 409.03 through 409.05 of the Standard Specifications. The pavement lay-down machine shall be equipped with an automatic screed control.

1.5.2 Scales

Scales shall be standard truck scales of the beam type and of sufficient size and capacity to accommodate all trucks to be used by the Contractor in handling bituminous mixtures. Scales shall be tested and approved by an inspector of the State Inspection Bureau, charged with scale inspection within the State in which the project is located. If such testing by an inspection bureau is not available, the scales will be tested by the Contractor in the presence of the Contracting Officer. The necessary number of standard weights for testing the scales shall be on hand at all times. Scales shall meet the minimum requirements of the State Inspection Bureau.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Mineral Aggregate

Mineral aggregate shall be as specified in Sections 407 and 409 of the Standard Specifications for asphaltic concrete hot mix surface course, except as specified herein.

2.1.2 Asphalt Cement

The asphalt cement shall be as specified for penetration grade 60-70 in Table 1 of AASHTO M 20. The Contractor may furnish a viscosity graded asphalt cement. The viscosity graded asphalt cement furnished shall be in accordance with AASHTO M 226 as revised herein. Specific physical requirements to be met are those set forth in Table II of AASHTO M 226 with the following added grade.

TEST	VISCOSITY GRADE
	AC-30
	Viscosity, 60C (140F), poises 3000± 600
Viscosity, 135C (274F), cs-minimum	350
Penetration, 25c (77F), 100g, 5 sec. -minimum	55
Flash Point, COC, C(F)-minimum	450
<u>Solubility in trihaloroethylene. Percent-minimum</u>	<u>99.0</u>
Tests on Residue from Thin-Film Oven Test:	
Loss on heating, percent—maximum	0.5
Viscosity, 60C (140F), poises-maximum	12,000
Ductility, 25C (77F), 5 cm/mm., cm-minimum	100
Spot Test	Negative

Change the requirement on Ductility for Grades AC-10, AC-20, and AC-40 to 40 inch minimum.

If required, the asphalt cement shall contain a heat-stable anti-stripping additive. The additive shall be one approved by the Contracting Officer. It shall be added at the rate specified by the Contracting Officer as determined by laboratory analysis, depending on the brand name, concentration of the

additive and laboratory mix design. The anti-stripping additive shall be added either to the supply fill line as the tanker is filled at the refinery or at the hot mix plant in a method approved by the Contracting Officer. In either case, the additive shall be thoroughly mixed with the asphalt cement. The anti-stripping additive will not be paid for directly, but will be considered subsidiary to the item of asphalt cement.

2.2 JOB MIX MATERIALS

2.2.1 Approved Source

If the paving material is to be furnished from an existing plant that has been furnishing material meeting the requirements of Section 407 of the Standard Specifications for work for the Arkansas State Highway and Transportation Department, the state-approved job mix formula for Type 2 Asphaltic Concrete Hot Mix Surface Course may be used. This job mix formula shall be submitted to the Contracting Officer for approval.

2.2.2 New Source

If the paving material is to be furnished from a new plant, or an existing plant that has not been furnishing material meeting requirements of Section 407 of the Standard Specifications for work for the Arkansas State Highway and Transportation Department, the job-mix formula shall be designed by the Contractor and furnished to the Contracting Officer for approval prior to use. The job-mix formula will meet the requirements of the Standard Specifications.

PART 3 EXECUTION

3.1 APPLICATION OF ASPHALTIC CONCRETE SURFACE COURSE

Type 2 asphaltic concrete surface course shall be laid to the typical section or sections indicated on the drawings or specified for the particular road and in accordance with Section 410 of the Standard Specifications or as otherwise specified herein.

3.1.1 Automatic Screed Control

The automatic screed control system shall be used for laying sections of roadway but will not be required on parking areas, camping turnouts, intersections, short loops, or non-typical width sections of roadways.

3.1.2 Establishment of Rolling Pattern

The Contractor shall establish a rolling pattern that will produce the required density at the beginning of pavement operations. The Contractor shall lay a strip of the required pavement, not to exceed 100 feet in length, and use a nuclear density gauge to determine the number of roller coverages necessary to achieve the required density. No further paving shall be performed until an acceptable rolling pattern is established. If the density achieved is unacceptable, then the compaction method or equipment shall be changed and a new rolling pattern established. Also, a new rolling pattern shall be established after any change in the job mix.

Final acceptance of the pavement will be based on density tests on samples taken from the finished pavement.

3.2 TESTING

Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government. Testing shall be performed by a commercial testing laboratory approved by the Contracting Officer or may be performed by the Contractor when approved in writing by the Contracting Officer. Tests to be performed shall be as specified or as otherwise specified by the Contracting Officer.

3.2.1 Density of Pavement

One sample for density determination shall be sawed or cored from the finished pavement for each 200 tons or less of bituminous mix placed each day of this contract and tested in accordance with AASHTO T166. Sample locations shall be selected by the Contracting Officer. Additional samples and testing may be required if any sample fails to meet density requirements.

3.2.2 Fine and Coarse Aggregates

Fine and coarse aggregates shall be tested once for each day of operation in accordance with AASHTO T11, T27, and 30, as applicable.

3.2.3 Mineral Filler for Bituminous Paving Mixtures

Mineral filler shall be tested once for each day of operation in accordance with AASHTO M17.

3.2.4 Extraction Tests on Bituminous Mixtures

One extraction test on the paving mixture shall be made in accordance with AASHTO T 164 for each day of operation.

3.2.5 Thickness Check Tests

Thickness check tests shall be performed every 50 lineal feet of asphalt roadway using a straightedge and ruler.

End of Section

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SECTION 02760
FIELD MOLDED SEALANTS FOR SEALING JOINTS IN RIGID PAVEMENTS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in this text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 509	(1994) Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM D 789	(1998) Determination of Relative Viscosity and Moisture Content of Polyamide (PA)
ASTM D 3405	(1997) Joint Sealants, Hot-Applied, for Concrete and Asphalt Pavements

1.2 SUBMITTALS

Engineer's approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Materials List; G

List of all materials required and the manufacture's data for each material listed 30 days prior to use on the project.

Manufacturer's Recommendations; G

Where installation procedures, or any part thereof, are required to be in accordance with the manufacturer's recommendations, printed copies of these recommendations, 30 days prior to use on the project. Installation of the material will not be allowed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

Construction Equipment List; G

List of proposed equipment to be used in performance of construction work including descriptive data, 45 days prior to use on the project.

SD-04 Samples

Materials; G

Samples of the materials (sealant, primer if required, and backup material), in sufficient quantity for testing and approval 30 days prior to the beginning of work. No material will be allowed to be used until it has been approved.

1.3 TEST REQUIREMENTS

The joint sealant and backup or separating material shall be tested for conformance with the referenced applicable material specification. Testing of the materials shall be performed in an approved independent laboratory and certified copies of the test reports shall be submitted and approved 30 days prior to the use of the materials at the job site. Samples will be retained by the Government for possible future testing should the materials appear defective during or after application. Conformance with the requirements of the laboratory tests specified will not constitute final acceptance of the materials. Final acceptance will be based on the performance of the in-place materials.

1.4 EQUIPMENT

Machines, tools, and equipment used in the performance of the work required by this section shall be approved before the work is started and shall be maintained in satisfactory condition at all times.

1.4.1 Joint Cleaning Equipment

1.4.1.1 Tractor-Mounted Routing Tool

The routing tool used for removing old sealant from the joints shall be of such shape and dimensions and so mounted on the tractor that it will not damage the sides of the joints. The tool shall be designed so that it can be adjusted to remove the old material to varying depths as required. The use of V-shaped tools or rotary impact routing devices will not be permitted. Hand-operated spindle routing devices may be used to clean and enlarge random cracks.

1.4.1.2 Concrete Saw

A self-propelled power saw with water-cooled diamond or abrasive saw blades will be provided for cutting joints to the depths and widths specified or for refacing joints or cleaning sawed joints where sandblasting does not provide a clean joint.

1.4.1.3 Sandblasting Equipment

Sandblasting equipment shall include an air compressor, hose, and long-wearing venturi-type nozzle of proper size, shape and opening. The maximum nozzle opening should not exceed 6.4 mm. The air compressor shall be portable and shall be capable of furnishing not less than 71 liters per second and maintaining a line pressure of not less than 621 kPa at the nozzle while in use. Compressor capability under job conditions must be demonstrated before approval. The compressor shall be equipped with traps that will maintain the compressed air free of oil and water. The nozzle shall have an adjustable guide that will hold the nozzle aligned with the joint approximately 1 inch above the pavement surface. The height, angle of inclination and the size of the nozzle shall be adjusted as necessary to secure satisfactory results.

1.4.1.4 Waterblasting Equipment

Waterblasting equipment shall include a trailer-mounted water tank, pumps, high-pressure hose, wand with safety release cutoff control, nozzle and auxiliary water resupply equipment. The water tank and auxiliary resupply equipment shall be of sufficient capacity to permit continuous operations. The nozzle shall have an adjustable guide that will hold the nozzle aligned with the joint approximately 1 inch above the pavement surface. The height, angle of inclination and the size of the nozzle shall be adjustable as necessary to obtain satisfactory results. A pressure gauge mounted at the pump shall show at all times the pressure in pounds per square inch at which the equipment is operating.

1.4.1.5 Hand Tools

Hand tools may be used, when approved, for removing defective sealant from a crack and repairing or

cleaning the crack faces.

1.4.2 Sealing Equipment

1.4.2.1 Hot-Poured Sealing Equipment

The unit applicators used for heating and installing ASTM D 3405 joint sealant materials shall be mobile and shall be equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the joint to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. The applicator unit shall be designed so that the sealant will circulate through the delivery hose and return to the inner kettle when not in use.

1.5 TRIAL JOINT SEALANT INSTALLATION

Prior to the cleaning and sealing of the joints for the entire project, a test section of at least 60 m long shall be prepared using the specified materials and approved equipment, so as to demonstrate the proposed joint preparation and sealing of all types of joints in the project. Following the completion of the test section and before any other joint is sealed, the test section shall be inspected to determine that the materials and installation meet the requirements specified. If it is determined that the materials or installation do not meet the requirements, the materials shall be removed, and the joints shall be recleaned and resealed at no cost to the Government. When the test section meets the requirements, it may be incorporated into the permanent work and paid for at the contract unit price per linear foot for sealing items scheduled. All other joints shall be prepared and sealed in the manner approved for sealing the test section.

1.6 DELIVERY AND STORAGE

Materials delivered to the job site shall be inspected for defects, unloaded, and stored with a minimum of handling to avoid damage. Storage facilities shall be provided by the Contractor at the job site for maintaining materials at the temperatures and conditions recommended by the manufacturer.

1.7 ENVIRONMENTAL CONDITIONS

The ambient air temperature and the pavement temperature within the joint wall shall be a minimum of 10 degrees C and rising at the time of application of the materials. Sealant shall not be applied if moisture is observed in the joint.

PART 2 PRODUCTS

2.1 SEALANTS

Materials for sealing cracks in the paved areas indicated on the drawings shall be as follows: ASTM D 3405 AND COE CRD-C 525

2.2 PRIMERS

Primers, when their use is recommended by the manufacturer of the sealant, shall be as recommended by the manufacturer of the sealant.

2.3 BACKUP MATERIALS

The backup material shall be a compressible, nonshrinking, nonstaining, nonabsorbing material and shall be nonreactive with the joint sealant. The material shall have a melting point at least 3 degrees C greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D 789.

The material shall have a water absorption of not more than 5 percent of the sample weight when tested in accordance with ASTM C 509. The backup material shall be 25 plus or minus 5 percent larger in diameter than the nominal width of the crack.

2.4 BOND BREAKING TAPES

The bond breaking tape or separating material shall be a flexible, nonshrinkable, nonabsorbing, nonstaining, and nonreacting adhesive—backed tape. The material shall have a melting point at least 3 degrees C greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D 789. The bond breaker tape shall be approximately 3 mm wider than the nominal width of the joint and shall not bond to the joint sealant.

PART 3 EXECUTION

3.1 PREPARATION OF JOINTS

Immediately before the installation of the sealant, the joints shall be thoroughly cleaned to remove all laitance, curing compound, filler, protrusions of hardened concrete, and old sealant from the sides and upper edges of the joint space to be sealed.

3.1.1 Existing Sealant Removal

The in-place sealant shall be cut loose from both joint faces and to the depth shown on the drawings, using the concrete saw as specified in paragraph EQUIPMENT. Depth shall be sufficient to accommodate any separating or backup material that is required to maintain the depth of new sealant to be installed. Prior to further cleaning operations, all loose old sealant remaining in the joint opening shall be removed by blowing with compressed air. Hand tools may be required to remove sealant from random cracks. Chipping, spalling, or otherwise damaging the concrete will not be allowed.

3.1.2 Facing of Joints

Facing of joints shall be accomplished using a concrete saw as specified in paragraph EQUIPMENT. The blade shall be stiffened with a sufficient number of suitable dummy (used) blades or washers. Immediately following the sawing operation, the joint opening shall be thoroughly cleaned using a water jet to remove all saw cuttings and debris.

3.1.3 Refacing of Random Cracks

Sawing of the cracks shall be accomplished using a power-driven concrete saw as specified in paragraph EQUIPMENT. The saw blade shall be 152 mm or less in diameter to enable the saw to follow the trace of the crack. The blade shall be stiffened as necessary with suitable dummy (or used) blades or washers. Immediately following the sawing operation, the crack opening shall be thoroughly cleaned using a water jet to remove all saw cuttings and debris.

3.1.4 Sandblasting

The newly exposed concrete joint faces and the pavement surfaces extending a minimum of 13 mm from the joint edges shall be sandblasted clean. A multiple-pass technique shall be used until the surfaces are

free of dust, dirt, curing compound, filler, old sealant residue, or any foreign debris that might prevent the bonding of the sealant to the concrete. After final cleaning and immediately prior to sealing, the joints shall be blown out with compressed air and left completely free of debris and water.

3.1.5 Back-Up Material

When the joint opening is of a greater depth than indicated for the sealant depth, the lower portion of the joint opening shall be plugged or sealed off using a back-up material to prevent the entrance of the sealant below the specified depth. Care shall be taken to ensure that the backup material is placed at the specified depth and is not stretched or twisted during installation.

3.1.8 Bond Breaking Tape

Where inserts or filler materials contain bitumen, or the depth of the joint opening does not allow for the use of a backup material, a bond breaker separating tape will be inserted to prevent incompatibility with the filler materials and three-sided adhesion of the sealant. The tape shall be securely bonded to the bottom of the joint opening so it will not float up into the new sealant.

3.1.7 Rate of Progress of Joint Preparation

The stages of joint preparation, which include sand blasting, air pressure cleaning and placing of the back-up material shall be limited to only that lineal footage that can be sealed during the same day.

3.2 PREPARATION OF SEALANT

3.2.1 Hot-Poured Sealants

Sealants conforming to ASTM D 3405 shall not be heated in excess of the safe heating temperature recommended by the manufacturer as shown on the sealant containers. Sealant that has been overheated or subjected to application temperatures for over 4 hours or that has remained in the applicator at the end of the day's operation shall be withdrawn and wasted.

3.3 INSTALLATION OF SEALANT

3.3.1 Time of Application

Joints shall be sealed immediately following final cleaning of the joint walls and following the placement of the separating or backup material. Open joints that cannot be sealed under the conditions specified, or when rain interrupts sealing operations shall be recleaned and allowed to dry prior to installing the sealant.

3.3.2 Sealing Joints

Immediately proceeding, but not more than 15 m ahead of the joint sealing operations, a final cleaning with compressed air shall be performed. The joints shall be filled from the bottom up to 3 mm plus or minus 1.5 mm below the pavement surface. Excess or spilled sealant shall be removed from the pavement by approved methods and shall be discarded. The sealant shall be installed in such a manner as to prevent the formation of voids and entrapped air. In no case shall gravity methods or pouring pots be used to install the sealant material. Traffic shall not be permitted over newly sealed pavement until authorized by the Contracting Officer. Then a primer is recommended by the manufacturer, it shall be applied evenly to the joint faces in accordance with the manufacturer's instructions. Joints shall be checked frequently to ensure that the newly installed sealant is cured to a tack-free condition within the time specified.

3.4 INSPECTION

3.4.1 Joint Cleaning

Joints shall be inspected during the cleaning process to correct improper equipment and cleaning

techniques that damage the concrete pavement in any manner. Cleaned joints shall be approved prior to installation of the separating or back-up material and joint sealant.

3.4.2 Joint Sealant Application Equipment

The application equipment shall be inspected to ensure conformance to temperature requirement⁵~ proper proportioning and mixing (if two-component sealant) and proper installation. Evidences of bubbling, improper installation, failure to cure or set shall be cause to suspend operations until causes of the deficiencies are determined and corrected.

3.4.3 Joint Sealant

The joint sealant shall be inspected for proper rate of cure and set, bonding to the joint walls, cohesive separation within the sealant, reversion to liquid, entrapped air and voids. Sealants exhibiting any of these deficiencies at any time prior to the final acceptance of the project shall be removed from the joint, wasted, and replaced as specified herein at no additional cost to the Government.

3.5 CLEAN-UP

Upon completion of the project, all unused materials shall be removed from the site and the pavement shall be left in a clean condition.

END OF SECTION

SECTION 02763
PAVEMENT MARKINGS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO M 247 (2005) Glass Beads Used in Traffic Paints

ASTM INTERNATIONAL (ASTM)

ASTM D 4280 (2004) Extended Life Type, Nonplowable, Raised, Retroreflective Pavement Markers

ASTM D 4505 (2005) Preformed Retroreflective Pavement Marking Tape for Extended Service Life

ASTM D 792 (2000) Density and Specific Gravity (Relative Density) of Plastics by Displacement

ASTM E 28 (2004) Softening Point of Resins Derived from Naval Stores by Ring and Ball Apparatus

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-B-1325(Rev C) Beads (Glass Spheres) Retro-Reflective (Metric)

FS TT-P-1952(Rev D) Paint, Traffic and Airfield Markings, Waterborne

1.2 UNIT PRICES

1.2.1 Measurement

1.2.1.1 Surface Preparation

The unit of measurement for surface preparation will be the number of square meters feet of pavement surface prepared for marking and accepted by the Contracting Officer.

1.2.1.2 Pavement Striping and Markings

The unit of measurement for pavement striping and markings will be the number of square meters feet of reflective and nonreflective striping or marking actually completed and accepted by the Contracting Officer.

1.2.1.3 Raised Pavement Markers

The unit of measurement for raised pavement markers will be the number of square meters feet of each specific color required. Payment will be for the total number actually placed and approved by the Contracting Officer.

1.2.1.4 Removal of Pavement Markings

The unit of measurement for removal of pavement markings shall be the number of square meters feet of pavement markings actually removed and accepted by the Contracting Officer.

1.2.2 Payment

The quantities of surface preparation, pavement striping or markings, raised pavement markers, and removal of pavement markings determined as specified in paragraph Measurement, will be paid for at the contract unit price. The payment will constitute full compensation for furnishing all labor, materials, tools, equipment, appliances, and doing all work involved in marking pavements. Any striping or markings which are placed without reflective media, when reflective media is required, shall be removed and replaced at no cost to the Government. Striping or markings which do not conform to the alignment and/or location required shall be removed and replaced at no cost to the Government.

1.3 SUBMITTALS

Engineer's approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval information only. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment; [G]

Lists of proposed equipment, including descriptive data, and notifications of proposed Contractor actions as specified in this section. List of removal equipment shall include descriptive data indicating area of coverage per pass, pressure adjustment range, tank and flow capacities, and safety precautions required for the equipment operation.

Composition Requirements

Manufacturer's current printed product description and Material Safety Data Sheets (MSDS) for each type paint/color proposed for use.

Qualifications

Documentation on personnel qualifications, as specified.

SD-06 Test Reports

Sampling and Testing

Certified copies of the test reports, prior to the use of the materials at the jobsite. Testing shall be performed in an approved independent laboratory.

SD-07 Certificates

Volatile Organic Compound (VOC)

Certificate stating that the proposed pavement marking paint meets the VOC regulations of the local Air Pollution Control District having jurisdiction over the geographical area in which the project is located.

1.4 DELIVERY AND STORAGE

All materials shall be delivered and stored in sealed containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's name, and directions, all of which shall be plainly legible at time of use.

1.5 EQUIPMENT

All machines, tools and equipment used in the performance of the work shall be approved and maintained in satisfactory operating condition. Equipment operating on roads and runways shall display low speed traffic markings and traffic warning lights.

1.5.1 Paint Application Equipment

1.5.1.1 Self-Propelled or Mobile-Drawn Pneumatic Spraying Machines

The equipment to apply paint to pavements shall be a self-propelled or mobile-drawn pneumatic spraying machine with suitable arrangements of atomizing nozzles and controls to obtain the specified results. The machine shall have a speed during application not less than 8 km/hour 5 mph, and shall be capable of applying the stripe widths indicated, at the paint coverage rate specified in paragraph APPLICATION, and of even uniform thickness with clear-cut edges. [Equipment used for marking streets and highways shall be capable of placing the prescribed number of lines at a single pass as solid lines, intermittent lines or a combination of solid and intermittent lines using a maximum of two different colors of paint as specified.] [The equipment used to apply the paint binder to airfield pavements shall be a self-propelled or mobile-drawn pneumatic spraying machine with an arrangement of atomizing nozzles capable of applying a line width at any one time in multiples of 150 mm 6 inches, from 150 mm 6 inches to 900 mm 36 inches]. The paint applicator shall have paint reservoirs or tanks of sufficient capacity and suitable gauges to apply paint in accordance with requirements specified. Tanks shall be equipped with suitable air-driven mechanical agitators. The spray mechanism shall be equipped with quick-action valves conveniently located, and shall include necessary pressure regulators and gauges in full view and reach of the operator. Paint strainers shall be installed in paint supply lines to ensure freedom from residue and foreign matter that may cause malfunction of the spray guns. The paint applicator shall be readily adaptable for attachment of an air-actuated dispenser for the reflective media approved for use. Pneumatic spray guns shall be provided for hand application of paint in areas where the mobile paint applicator cannot be used.

1.5.1.2 Hand-Operated, Push-Type Machines

All machines, tools, and equipment used in performance of the work shall be approved and maintained in satisfactory operating condition. Hand-operated push-type machines of a type commonly used for application of paint to pavement surfaces will be acceptable for marking small streets and parking areas. Applicator machine shall be equipped with the necessary paint tanks and spraying nozzles, and shall be capable of applying paint uniformly at coverage specified. Sandblasting equipment shall be provided as required for cleaning surfaces to be painted. Hand-operated spray guns shall be provided for use in areas where push-type machines cannot be used.

1.5.2 Thermoplastic Application Equipment

1.5.2.1 Thermoplastic Material

Thermoplastic material shall be applied to the primed pavement surface by spray techniques or by the extrusion method, wherein one side of the shaping die is the pavement and the other three sides are contained by, or are part of, suitable equipment for heating and controlling the flow of

material. By either method, the markings shall be applied with equipment that is capable of providing continuous uniformity in the dimensions of the stripe.

1.5.2.2 Application Equipment

- a. Application equipment shall provide continuous mixing and agitation of the material. Conveying parts of the equipment between the main material reservoir and the extrusion shoe or spray gun shall prevent accumulation and clogging. All parts of the equipment which come into contact with the material shall be easily accessible and exposable for cleaning and maintenance. All mixing and conveying parts up to and including the extrusion shoes and spray guns shall maintain the material at the required temperature with heat-transfer oil or electrical-element-controlled heat.
- b. The application equipment shall be constructed to ensure continuous uniformity in the dimensions of the stripe. The applicator shall provide a means for cleanly cutting off stripe ends squarely and shall provide a method of applying "skiplines". The equipment shall be capable of applying varying widths of traffic markings.
- c. The applicator shall be equipped with a drop-on type bead dispenser capable of uniformly dispensing reflective glass spheres at controlled rates of flow. The bead dispenser shall be automatically operated and shall begin flow prior to the flow of composition to assure that the strip is fully reflectorized.

1.5.2.3 Mobile and Maneuverable

Application equipment shall be mobile and maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. The equipment used for the placement of thermoplastic pavement markings shall be of two general types: mobile applicator and portable applicator.

- a. Mobile Application Equipment: The mobile applicator shall be defined as a truck-mounted, self-contained pavement marking machine that is capable of hot applying thermoplastic by either the extrusion or spray method. The unit shall be equipped to apply the thermoplastic marking material at temperatures exceeding 190 degrees C 375 degrees F, at widths varying from 75 to 300 mm 3 to 12 inches and in thicknesses varying from 1.0 to 5.0 mm 0.020 to 0.190 inch and shall have an automatic drop-on bead system. The mobile unit shall be capable of operating continuously and of installing a minimum of 6 km 20,000 lineal feet of longitudinal markings in an 8-hour day.

(1) The mobile unit shall be equipped with a melting kettle which holds a minimum of 2.7 metric tons 6000 pounds of molten thermoplastic material. The kettle shall be capable of heating the thermoplastic composition to temperatures of 195 to 220 degrees C 375 to 425 degrees F. A thermostatically controlled heat transfer liquid shall be used. Heating of the composition by direct flame will not be allowed. Oil and material temperature gauges shall be visible at both ends of the kettle. [The mobile unit shall be equipped with a minimum of two extrusion shoes located one on each side of the truck, and shall be capable of marking simultaneous edgeline and centerline stripes. Each extrusion shoe shall be a closed, oil-jacketed unit; shall hold the molten thermoplastic at a temperature of 195 to 220 degrees C 375 to 425 degrees F; and shall be capable of extruding a line of 75 to 200 mm 3 to 8 inches in width; and at a thickness of not less than 3 mm 0.125 inch nor more than 5.0 mm 0.190 inch, and of generally uniform cross section.] [The mobile unit shall be equipped with a spray gun system. The spray system shall consist of a minimum of four spray guns, located two on each side of the truck, and shall be capable of marking simultaneous edgeline and centerline stripes. The spray system shall be surrounded (jacketed) with heating oil to maintain the molten thermoplastic at a temperature of 195 to 220 degrees C 375 to 425 degrees F; and shall be capable of spraying a stripe of 75 to 300 mm 3 to

12 inches in width, and in thicknesses varying from 1.5 mm 0.055 inch to 2.5 mm 0.095 inch, and of generally uniform cross section.]

(2) The mobile unit shall be equipped with an electronic programmable line pattern control system. The control system shall be capable of applying skip or solid lines in any sequence, through any and all of the extrusion shoes, or the spray guns, and in programmable cycle lengths. In addition, the mobile unit shall be equipped with an automatic counting mechanism capable of recording the number of lineal meters feet of thermoplastic markings applied to the pavement surface with an accuracy of 0.5 percent.

b. Portable Application Equipment: The portable applicator shall be defined as hand-operated equipment, specifically designed for placing special markings such as crosswalks, stopbars, legends, arrows, and short lengths of lane, edge and centerlines. The portable applicator shall be capable of applying thermoplastic pavement markings by the extrusion method. The portable applicator shall be loaded with hot thermoplastic composition from the melting kettles on the mobile applicator. The portable applicator shall be equipped with all the necessary components, including a materials storage reservoir, bead dispenser, extrusion shoe, and heating accessories, so as to be capable of holding the molten thermoplastic at a temperature of 195 to 220 degrees C 375 to 425 degrees F, of extruding a line of 75 to 300 mm 3 to 12 inches in width, and in thicknesses of not less than 3.0 mm 0.125 inch nor more than 5.0 mm 0.190 inch and of generally uniform cross section.

1.5.3 Reflective Media Dispenser

The dispenser for applying the reflective media shall be attached to the paint dispenser and shall operate automatically and simultaneously with the applicator through the same control mechanism. The dispenser shall be capable of adjustment and designed to provide uniform flow of reflective media over the full length and width of the stripe at the rate of coverage specified in paragraph APPLICATION, at all operating speeds of the applicator to which it is attached.

1.5.4 Preformed Tape Application Equipment

Mechanical application equipment shall be used for the placement of preformed marking tape. Mechanical application equipment shall be defined as a mobile pavement marking machine specifically designed for use in applying precoated, pressure-sensitive pavement marking tape of varying widths, up to 300 mm 12 inches. The applicator shall be equipped with rollers, or other suitable compactive device, to provide initial adhesion of the preformed, pressure-sensitive marking tape with the pavement surface. Additional hand-operated rollers shall be used as required to properly seat the thermoplastic tape.

1.5.5 Surface Preparation Equipment

1.5.5.1 Sandblasting Equipment

Sandblasting equipment shall include an air compressor, hoses, and nozzles of proper size and capacity as required for cleaning surfaces to be painted. The compressor shall be capable of furnishing not less than 70.8 L/sec 150 cfm of air at a pressure of not less than 620 kPa 90 psi at each nozzle used, and shall be equipped with traps that will maintain the compressed air free of oil and water.

1.5.5.2 Waterblast Equipment

The water pressure shall be specified at 17.9 MPa 2600 psi at 60 degrees C 140 degrees F in order to adequately clean the surfaces to be marked.

1.5.6 Marking Removal Equipment

Equipment shall be mounted on rubber tires and shall be capable of removing markings from the pavement without damaging the pavement surface or joint sealant. Waterblasting equipment shall be capable of producing an adjustable, pressurized stream of water. Sandblasting equipment shall include an air compressor, hoses, and nozzles. The compressor shall be equipped with traps to maintain the air free of oil and water.

1.5.6.1 Shotblasting Equipment

Shotblasting equipment shall be capable of producing an adjustable depth of removal of marking and pavement. Each unit shall be self-cleaning and self-contained, shall be able to confine dust and debris from the operation, and shall be capable of recycling the abrasive for reuse.

1.5.6.2 Chemical Equipment

Chemical equipment shall be capable of application and removal of chemicals from the pavement surface, and shall leave only non-toxic biodegradable residue.

1.5.7 Traffic Controls

Suitable warning signs shall be placed near the beginning of the worksite and well ahead of the worksite for alerting approaching traffic from both directions. Small markers shall be placed along newly painted lines or freshly placed raised markers to control traffic and prevent damage to newly painted surfaces or displacement of raised pavement markers. Painting equipment shall be marked with large warning signs indicating slow-moving painting equipment in operation.

1.6 MAINTENANCE OF TRAFFIC

1.6.1 Airfield

The performance of work in the controlled zones of airfields shall be coordinated with the Contracting Officer and with the Flight Operations Officer. Verbal communications shall be maintained with the control tower before and during work in the controlled zones of the airfield. The control tower shall be advised when the work is completed. A radio for this purpose [will be provided by the Government] [shall be provided by the Contractor and approved by the Contracting Officer].

1.6.2 Roads, Streets, and Parking Areas

When traffic must be rerouted or controlled to accomplish the work, the necessary warning signs, flagpersons, and related equipment for the safe passage of vehicles shall be provided.

1.7 WEATHER LIMITATIONS FOR REMOVAL

Pavement surface shall be free of snow, ice, or slush. Surface temperature shall be at least 5 degrees C 40 degrees F and rising at the beginning of operations, except those involving shot or sand blasting. Operation shall cease during thunderstorms. Operation shall cease during rainfall, except for waterblasting and removal of previously applied chemicals. Waterblasting shall cease where surface water accumulation alters the effectiveness of material removal.

1.8 QUALIFICATIONS

The Contractor shall submit documentation certifying that pertinent personnel are qualified for equipment operation and handling of chemicals.

PART 2 PRODUCTS

2.1 PAINT

The paint shall be homogeneous, easily stirred to smooth consistency, and shall show no hard settlement or other objectionable characteristics during a storage period of 6 months. Paints for airfields, roads, parking areas, and streets shall conform to FS TT-P-1952, color as [indicated] [selected]. Pavement marking paints shall comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Paint materials shall conform to the restrictions of the local Air Pollution Control District.

2.2 THERMOPLASTIC COMPOUNDS

The thermoplastic reflectorized pavement marking compound shall be extruded or sprayed in a molten state onto a primed pavement surface. Following a surface application of glass beads and upon cooling to normal pavement temperatures, the marking shall be an adherent reflectorized strip of the specified thickness and width that is capable of resisting deformation by traffic.

2.2.1 Composition Requirements

The binder component shall be formulated as a hydrocarbon resin. The pigment, beads and filler shall be uniformly dispersed in the binder resin. The thermoplastic composition shall be free from all skins, dirt, and foreign objects and shall comply with the following requirements:

Component	Percent by Weight	
	White	Yellow
Binder	17 min.	17 min.
Titanium dioxide	10 min.	-
Glass beads,	20 min.	20 min.
Calcium carbonate & inert fillers	49 max.	*
Yellow pigments	-	*

*Amount and type of yellow pigment, calcium carbonate and inert fillers shall be at the option of the manufacturer, providing the other composition requirements of this specification are met.

2.2.2 Physical Properties

2.2.2.1 Color

The color shall be as indicated.

2.2.2.2 Drying Time

When installed at 20 degrees C 70 degrees F and in thicknesses between 3 and 5 mm 1/8 and 3/16 inch, after curing 15 minutes.

2.2.2.3 Softening Point

The composition shall have a softening point of not less than 90 degrees C 194 degrees F when tested in accordance with ASTM E 28.

2.2.2.4 Specific Gravity

The specific gravity of the composition shall be between 1.9 and 2.2 as determined in accordance with ASTM D 792.

2.2.3 Asphalt Concrete Primer

The primer for asphalt concrete pavements shall be a thermosetting adhesive with a solids content of pigment reinforced synthetic rubber and synthetic plastic resin dissolved and/or dispersed in a volatile organic compound (VOC). Solids content shall not be less than 10 percent by weight at 20 degrees C 70 degrees F and 60 percent relative humidity. A wet film thickness of 0.10 mm 0.005 inch plus or minus 0.025 mm 0.001 inch, shall dry to a tack-free condition in less than 5 minutes.

2.2.4 Portland Cement Concrete Primer

The primer for Portland cement concrete pavements shall be an epoxy resin primer. The primer shall be of the type recommended by the manufacturer of the thermoplastic composition. Epoxy primers recommended by the manufacturer shall be approved by the Contracting Officer prior to use. Requests for approval shall be accompanied with technical data, instructions for use, and a 1 liter 1 quart sample of the primer material.

2.3 PREFORMED TAPE

The preformed tape shall be an adherent reflectorized strip in accordance with ASTM D 4505 Type I or IV, Class optional.

2.4 SAMPLING AND TESTING

Materials proposed for use shall be stored on the project site in sealed and labeled containers, or segregated at source of supply, sufficiently in advance of needs to allow 60 days for testing. Upon notification by the Contractor that the material is at the site or source of supply, a sample shall be taken by random selection from sealed containers by the Contractor in the presence of a representative of the Contracting Officer. Samples shall be clearly identified by designated name, specification number, batch number, manufacturer's formulation number, project contract number, intended use, and quantity involved. [Materials will be sampled and tested by the Government. No material shall be used at the project prior to receipt by the Contractor of written notice that the materials meet the laboratory requirements. The cost of initial testing of samples from each lot of materials will be borne by the Government. If the sample fails to meet specification requirements, the material represented by the sample shall be replaced and the new material will be tested. Cost of sampling and testing the new material will be borne by the Contractor.] [Testing shall be performed in an approved independent laboratory. If materials are approved based on reports furnished by the Contractor, samples will be retained by the Government for possible future testing should the material appear defective during or after application.]

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Surfaces to be marked shall be thoroughly cleaned before application of the pavement marking material. Dust, dirt, and other granular surface deposits shall be removed by sweeping, blowing with compressed air, rinsing with water or a combination of these methods as required. Rubber deposits, surface laitance, existing paint markings, and other coatings adhering to the pavement shall be completely removed with scrapers, wire brushes, sandblasting, approved chemicals, or mechanical abrasion as directed. Areas of old pavement affected with oil or grease shall be scrubbed with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinsed thoroughly after each application. After cleaning, oil-soaked areas shall be sealed with cut shellac to prevent bleeding through the new paint. Pavement surfaces shall be allowed to dry, when water is used for cleaning, prior to striping or marking. Surfaces shall be recleaned, when work has been stopped due to rain.

3.1.1 Pretreatment for Early Painting

Where early painting is required on rigid pavements, a pretreatment with an aqueous solution containing 3 percent phosphoric acid and 2 percent zinc chloride shall be applied to prepared pavement areas prior to painting.

3.1.2 Cleaning Existing Pavement Markings

In general, markings shall not be placed over existing pavement marking patterns. Existing pavement markings, which are in good condition but interfere or conflict with the newly applied marking patterns, shall be removed. Deteriorated or obscured markings that are not misleading or confusing or interfere with the adhesion of the new marking material do not require removal. New preformed and thermoplastic pavement markings shall not be applied over existing preformed or thermoplastic markings. Whenever grinding, scraping, sandblasting or other operations are performed the work must be conducted in such a manner that the finished pavement surface is not damaged or left in a pattern that is misleading or confusing. When these operations are completed the pavement surface shall be blown off with compressed air to remove residue and debris resulting from the cleaning work.

3.1.3 Cleaning Concrete Curing Compounds

On new Portland cement concrete pavements, cleaning operations shall not begin until a minimum of 30 days after the placement of concrete. All new concrete pavements shall be cleaned by either sandblasting or water blasting. When water blasting is performed, thermoplastic and preformed markings shall be applied no sooner than 24 hours after the blasting has been completed. The extent of the blasting work shall be to clean and prepare the concrete surface as follows:

- a. There is no visible evidence of curing compound on the peaks of the textured concrete surface.
- b. There are no heavy puddled deposits of curing compound in the valleys of the textured concrete surface.
- c. All remaining curing compound is intact; all loose and flaking material is removed.
- d. The peaks of the textured pavement surface are rounded in profile and free of sharp edges and irregularities.
- e. The surface to be marked is dry.

3.2 APPLICATION

All pavement markings and patterns shall be placed as shown on the plans.

3.2.1 Paint

Paint shall be applied to clean, dry surfaces, and only when air and pavement temperatures are above 5 degrees C 40 degrees F and less than 35 degrees C 95 degrees F. Paint temperature shall be maintained within these same limits. New asphalt pavement surfaces and new Portland concrete cement shall be allowed to cure for a period of not less than 30 days before applications of paint. Paint shall be applied pneumatically with approved equipment at rate of coverage specified. The Contractor shall provide guide lines and templates as necessary to control paint application. Special precautions shall be taken in marking numbers, letters, and symbols. Edges of markings shall be sharply outlined.

3.2.1.1 Rate of Application

- a. Reflective Markings: Pigmented binder shall be applied evenly to the pavement area to be coated at a rate of 2.9 plus or minus 0.5 square meter/L 105 plus or minus 5 square feet/gallon. Glass spheres shall be applied uniformly to the wet paint [on airfield pavement at a rate of 1.0 8] [on road and street pavement at a rate of 0.7 6] plus or minus 0.06 kg 0.5 pounds of glass spheres per L gallon of paint.
- b. Nonreflective Markings: Paint shall be applied evenly to the pavement surface to be coated at a rate of 2.9 plus or minus 0.5 square meter/L 105 plus or minus 5 square feet/gallon.

3.2.1.2 Drying

The maximum drying time requirements of the paint specifications will be strictly enforced to prevent undue softening of bitumen, and pickup, displacement, or discoloration by tires of traffic. If there is a delay in drying of the markings, painting operations shall be discontinued until cause of the slow drying is determined and corrected.

3.2.2 Thermoplastic Compounds

Thermoplastic pavement markings shall be placed upon dry pavement; surface dry only will not be considered an acceptable condition. At the time of installation, the pavement surface temperature shall be a minimum of 5 degrees C 40 degrees F and rising. Thermoplastics, as placed, shall be free from dirt or tint.

3.2.2.1 Longitudinal Markings

All centerline, skipline, edgeline, and other longitudinal type markings shall be applied with a mobile applicator. All special markings, crosswalks, stop bars, legends, arrows, and similar patterns shall be placed with a portable applicator, using the extrusion method.

3.2.2.2 Primer

After surface preparation has been completed the asphalt and/or concrete pavement surface shall be primed. The primer shall be applied with spray equipment. Primer materials shall be allowed to "set-up" prior to applying the thermoplastic composition. The asphalt concrete primer shall be allowed to dry to a tack-free condition, usually occurring in less than 10 minutes. The Portland cement concrete primer shall be allowed to dry in accordance with the thermoplastic manufacturer's recommendations. To shorten the curing time of the epoxy resins an infrared heating device may be used on the concrete primer.

- a. Asphalt Concrete Primer: Primer shall be applied to all asphalt concrete pavements at a wet film thickness of 0.10 mm 0.005 inch, plus or minus 0.025 mm 0.001 inch (25-40 square meters/L 265-400 square feet/gallon).
- b. Portland Cement Concrete Primer: Primer shall be applied to all concrete pavements (including concrete bridge decks) at a wet film thickness of between 1.0 to 1.3 mm 0.04 to 0.05 inch (30-40 square meters/L 320-400 square feet/gallon).

3.2.2.3 Markings

After the primer has "set-up", the thermoplastic shall be applied at temperatures no lower than 190 degrees C 375 degrees F nor higher than 220 degrees C 425 degrees F at the point of deposition. Immediately after installation of the marking, drop-on glass spheres shall be mechanically applied so that the spheres are held by and imbedded in the surface of the molten material.

- a. Extruded Markings: All extruded thermoplastic markings shall be applied at the specified width and at a thickness of not less than 3.0 mm 0.125 inch nor more than 5.0 mm 0.190 inch.
- b. Sprayed Markings: All sprayed thermoplastic markings shall be applied at the specified width and the thicknesses designated in the contract plans. If the plans do not specify a thickness, centerline markings shall be applied at a wet thickness of 2.0 mm 0.090 inch, plus or minus 0.10 mm 0.005 inch, and edgeline markings at a wet thickness of 1.5 mm 0.060 inch plus or minus 0.10 mm 0.005 inch.
- c. Reflective Glass Spheres: Immediately following application, reflective glass spheres shall be dropped onto the molten thermoplastic marking at the rate of 1 kg/2 square meters 1 pound/20 square feet of compound.

3.2.3 Preformed Tape

The pavement surface temperature shall be a minimum of 15 degrees C 60 degrees F and the ambient temperature shall be a minimum of 15 degrees C 60 degrees F and rising. The preformed markings shall be placed in accordance with the manufacturer's written instructions.

3.3 MARKING REMOVAL

Pavement marking, including plastic tape, shall be removed in the areas shown on the drawings. Removal of marking shall be as complete as possible without damage to the surface. Aggregate shall not be exposed by the removal process. After the markings are removed, the cleaned pavement surfaces shall exhibit adequate texture for remarking as specified in paragraph SURFACE PREPARATION. Contractor shall demonstrate removal of pavement marking in an area designated by the Contracting Officer. The demonstration area will become the standard for the remainder of the work.

3.3.1 Equipment Operation

Equipment shall be controlled and operated to remove markings from the pavement surface, prevent dilution or removal of binder from underlying pavement, and prevent emission of blue smoke from asphalt or tar surfaces.

3.3.2 Cleanup and Waste Disposal

The worksite shall be kept clean of debris and waste from the removal operations. Cleanup shall immediately follow removal operations in areas subject to air traffic. Debris shall be disposed of at approved sites.

END of SECTION

SECTION 02936 - SODDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide solid sodding for erosion control where shown on Drawings.

1.02 RELATED SECTIONS

- A. Section 02210 - Site Grading
- B. Section 02812 - Landscape Irrigation System Performance Specification
- C. Section 02932 - Hydromulching.
- D. Section 02950 - Trees, Shrubs and Ground Cover.

1.03 REFERENCES

- A. Federal Specifications (FS):
 - 1. FS O-F-241 - Fertilizers, Mixed, Commercial.

1.04 QUALITY ASSURANCE

- A. American Sod Producers Association (ASPA) - Guideline Specifications to Sodding.

1.05 SUBMITTALS

- A. Submit results of soil analysis of samples taken from existing and/or imported, topsoils.
- B. Submit samples of sod to Architect/Engineer for approval prior to installation.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fertilizer in waterproof bags showing net weight, chemical analysis, and name of manufacturer.

1.07 PRICES

- A. Solid Sodding: Sodding in place as specified in this section and shown on the Drawings. Payment will be made at the lump sum price bid for "Solid Sodding", which price shall be full compensation for subgrade preparation, sod, lime, fertilizer, and water, including all labor, tools, equipment and incidentals necessary to complete the work.
- B. Topsoil: Imported topsoil incorporated into the Work as specified in this section and shown on the drawings. Payment will be made at the lump sum price bid for "Topsoil", which price shall include all costs of purchasing the loading, hauling, dumping, and spreading topsoil at the site.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Topsoil:
 - 1. Existing Topsoil: Natural, fertile agricultural soil capable of sustaining vigorous plant growth, not in frozen or muddy condition, containing not less than 3% organic matter, and corrected to pH value of 5.9 to 7.0. Free from subsoil, slag, clay, stones, lumps, live plants, roots, sticks, crabgrass, coughgrass, noxious weeds, and foreign matter.
 - 2. Imported Topsoil: Natural, fertile, agricultural soil typical of locality, capable of sustaining vigorous plant growth, from well-drained site free of flooding, not in frozen or muddy condition, not less than 3% organic matter, and pH value of 5.9 to 7.0. Free from subsoil, slag, clay, stones, lumps, live plants, roots, sticks, crabgrass, coughgrass, noxious weeds and foreign matter.
 - 3. Very fine sandy loams and silt loams are not allowed.
 - 4. Have topsoil analyzed and submit written analysis stating the nitrogen, phosphorus, and potassium requirements, organic matter content, and pH value of the soil.
- B. Fertilizer: FS O-F-241, commercial type.
 - 1. Proportions: 10N-20P-10K.
- C. Lime: Lime, if required, shall be agricultural grade ground limestone ground to pass an 8-mesh sieve with 25 percent passing a 100-mesh sieve. Calcareous limestone shall contain not less than 50 percent calcium oxide, and dolomitic limestone shall contain not less than 40 percent magnesium oxide. Coarser materials will be accepted provided the specified rates of application are increased proportionately, on the basis of quantities passing the 8 and 100 mesh sieves, but no additional payment will be made for the increase quantity.
- D. Sod: Conforming to ASPA Guidelines.
 - 1. Type: As specified in the Turf Materials List on the drawings.
 - 2. Use certified nursery grade cultivated grass sod, 98% weed free.
 - 3. Content: Strong, fibrous root system and free from stones and burned or bare spots.
- E. Water: Water shall be of irrigation quality and free of impurities that would be detrimental to plant growth.

PART 3 - EXECUTION

3.01 PREPARATION OF SUBGRADE

- A. Fine grade subgrade, eliminating uneven areas and low spots. Maintain lines, levels, profiles and contours, allowing for thickness of topsoil and sod. Make changes in grade gradual. Blend slopes into level areas. Allow for positive drainage.
- B. Remove foreign materials, undesirable plants and their roots, stones, and debris. Do not bury foreign material beneath areas to be sodded. Remove subsoil which has been contaminated with petroleum or chemical products.

- C. Cultivate subsoil to a depth of 3 inches where topsoil is to be placed. Repeat cultivation in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.02 PLACING TOPSOIL

- A. Spread topsoil to the minimum depth stated on the drawings over all areas to be sodded.
- B. Place topsoil during dry weather and on dry, unfrozen subgrade.
- C. Rake until surface is smooth.
- D. Remove stones, roots, grass, weeds, debris and other foreign non-organic material while spreading.
- E. Lightly compact area after application of lime and fertilizer.

3.03 LIME APPLICATION

- A. Spread lime at the rate recommended by soil analysis-lime requirement testing.
- B. Mix lime thoroughly into topsoil layer.

3.04 FERTILIZING

- A. Apply fertilizer at a rate of 800 pounds per acre. Apply after fine grading and prior to compaction. Mix thoroughly into upper two inches of topsoil.
- B. Lightly water to aid the breakdown of fertilizer.
- C. Apply fertilizer within 48 hours before laying sod.

3.05 LAYING SOD

- A. Lay sod within 24 hours after delivery to prevent deterioration.
- B. Lay sod closely knit together with no open joints visible, and pieces not overlapped. Lay smooth and flush with adjoining grass areas, paving and top surfaces of curbs.
- C. On slopes 2.5:1 and steeper, lay sod perpendicular to slope and secure every row with 6 inch long metal staples at maximum 2 feet on center. Drive metal staples flush with soil portion of sod.
- D. Immediately water sodded areas after installation. Water in sufficient amounts to saturate sod and upper 4 inches of soil.
- E. After sod and soil has dried sufficiently to prevent damage, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities. Ensure rolling equipment weight is not over 250 lbs. or less than 150 lbs.

3.06 MAINTENANCE SERVICE

- A. Begin maintenance services of sodded areas immediately after installation and continue throughout construction period until final acceptance of work.
- B. Establish and maintain turf in a vigorous and healthy growing condition. Include the following items:
 - 1. Mowing turf as necessary to maintain a height of grass above ground between 2 and 4 inches.

2. Water sufficiently to saturate root system.
3. Weed control applications.
4. Disease and insect control.
5. Fertilizing every 30 days following initial application and installation.

END OF SECTION

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SECTION 03001 - SITE CONCRETE WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Formwork, complete with required shoring, bracing and anchorage.
- B. Control joints and expansion joints.
- C. Concrete reinforcing, complete with required supports, spacers, and related accessories.
- D. Cast-in-place concrete.

1.03 RELATED WORK

- A. Section 01410 - Testing Laboratory Services.
- B. Section 02220 - Structure Excavation & Backfill.
- C. Section 02510 - Sidewalks.
- D. Section 02720 - Storm Drainage.
- E. Section 02736 - Sanitary Sewer Manholes.

1.04 QUALITY ASSURANCE

- A. Perform cast-in-place concrete work in accordance with ACI 301, unless specified otherwise in this Project Manual.
- B. Keep copy of ACI 301-99 in field office for duration of project.

1.05 TESTING AGENCY

- A. Field testing of the concrete mix will be performed by an independent testing laboratory in accordance with Section 01410.
- B. Provide free access to work and cooperate with the appointed laboratory.
- C. Tests of cement and aggregates may be performed to ensure conformance with requirements state herein.

1.06 REFERENCE STANDARDS

- A. ACI 301 - 99, Specifications for Structural Concrete.
- B. ACI Manual of Concrete Practice, Parts 1, 2, and 3.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Allowable Concrete Mix Temperatures: ACI 301 – 99 Section 4.2.2.7.
 - 1. Cold Weather: Minimum 55 degrees F.
 - 2. Hot Weather: Maximum 90 degrees F.
- B. Do not place concrete during rain, sleet, or snow unless protection is

- provided.
- C. Keep accurate thermometer in area where work is proceeding.

PART 2 - PRODUCTS

2.01 CEMENT (ACI 301-99 Section 4.2)

- A. Portland Cement: ASTM C150, Type 1.
- B. Use one brand and type of cement throughout project unless otherwise specified.

2.02 ADMIXTURES (ACI 301-99 Section 4.2)

- A. Add air entraining agent as indicated in ACI 301-99 Section 4.2.1.4.
- B. Use of accelerating admixtures such as salts, chemicals, or other foreign materials in cold weather will not be allowed. Use no other admixtures without prior approval of the Architect/Engineer.
- C. Use of set-retarding admixtures during hot weather will not be allowed.

2.03 STRENGTH (ACI 301-99 Section 1.7.4)

- A. Provide concrete of following strength: Compressive strength (28 day): 3,000 psi, except where noted otherwise in the Contract Documents.

2.04 AIR ENTRAINMENT (ACI 301-99 Section 4.2.1.4)

- A. Add air entraining agent to concrete mix for concrete work exposed to exterior.

2.05 SLUMP (ACI 301-99 Section 4.2.2.2)

- A. Contractor shall provide slump cone and test slump for each load of concrete.
- B. Minimum slump for all concrete work: 3 inches.
- C. Slump for consolidation by vibration: 4 inches maximum.
- D. Slump for slabs and consolidation other than by vibration: 5 inches maximum.

2.06 PROPORTIONS

- A. Selection of proportions for normal weight concrete: Method 1, Method 2, or Method 3, Contractor's Option.
- B. Fine aggregate shall conform to the requirements of ASTM Specifications C-33, latest edition, and shall consist of clean, fresh water sand graded uniformly to conform to Paragraph 4 of the above referenced Specification C-33.
- C. Coarse aggregate shall conform to the requirements of ASTM Specification C-33, latest edition, using standard grading size 1-1/2" to No. 4 of washed gravel or crushed stone meeting requirements above and soundness requirements of ASTM C-33.
- D. Water: Clean and free of injurious amounts of oil, acids, alkalis, organic materials, or other deleterious substances.

2.07 REINFORCING STEEL (ACI 301-99 Section 3)

- A. Reinforcing Steel: 60 ksi yield grade; deformed billet steel bars, ASTM A615;

plain finish.

- B. Welded Steel Wire Fabric: plain type, ASTM A185; in coiled rolls, plain finish, 6x6 - W1.4 x W1.4 or 6x6 - W2.9 x W2.9 as shown on the Drawings.

2.08 ACCESSORIES

- A. Premolded expansion joint fillers: ASTM D1621, 1/2 inch thick. Refer to ACI 301-99 Section 10.2.5.

2.09 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C94.
- B. Mix concrete until there is a uniform distribution of the materials and the mass is homogeneous in consistency and colors. Continue mixing for at least 1-1/2 minutes after all the ingredients are in the mixer.

PART 3 - EXECUTION

3.01 GENERAL

- A. Notify Architect/Engineer at least 24 hours before the planned time to pour concrete.
- B. Inspection:
 - 1. Ensure that excavations and form work are completed and within the allowed tolerances.
 - 2. Ensure that ice and excess water are removed, no frost is present, and that ground is not frozen.
 - 3. Check that reinforcement is secured in place.
 - 4. Verify that insulation, anchors, and other embedded items are secured in position.
- C. Install concrete work in accordance with ACI 301-99 except as amended by this section.

3.02 FORMWORK (ACI 301-99 Section 2)

- A. Obtain Architect/Engineer's review for use of earth forms. When using earth forms, hand-trim sides and bottoms, and remove loose dirt prior to placing concrete.
- B. Tolerances for Formed Services: Comply with ACI 301-99 Section 2).

3.03 FORM SURFACES PREPARATION (ACI 301-99 Section 2)

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations. Apply prior to placing reinforcing steel, anchoring devices and embedded parts. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are affected by agent.

3.04 FINISHING FORMED SURFACES

- A. Formed Surface Finishes: Provide rough form finish (ACI 301-99 Section 2) at all surfaces not exposed to view. Provide smooth rubbed finish (ACI 301-99

Section 2) at all surfaces exposed to view.

3.05 REMOVAL OF FORMS (ACI 301-99 Section 2)

- A. Do not remove forms, shores, and bracing until concrete has gained sufficient strength to carry its own weight, construction loads, and design loads which are liable to be imposed upon it. Verify strength of concrete by compressive test results.

3.06 PLACING REINFORCING

- A. Reinforcing shall be unpainted and uncoated, free from rust or scale and shall be cleaned and straightened before being shaped and in position.
- B. Position reinforcing accurately and tie securely.
- C. Support footing reinforcement on support chairs or concrete grout at maximum 3 feet on center each way to insure proper depth from bottom.
- D. Wire dowels to longitudinal bars and place top bars in perfect alignment by the use of wood templates placed 2 inches from the top of the form.
- E. Support wire mesh on support chairs, or other approved means, at no greater than three feet on center way to hold reinforcing in the center of the slab or as shown on the Drawings.
 - 1. Do not depend on lifting mesh as concrete is being poured.
 - 2. Lap sides and ends not less than one wire spacing in slabs on grade and not less than 12 inches in structural slabs.
- F. Provide 3 inches of concrete between reinforcing and the ground, unless detailed otherwise, where concrete is poured against the ground.
- G. If, after the removal of forms, concrete surfaces are to be in contact with the ground or exposed to the weather:
 - 1. Bars larger than No. 5: Protect with 2 inches of concrete.
 - 2. No. 5 bars and smaller: Protect with 1-1/2 inches of concrete.
- H. Concrete covering for any reinforcing at surfaces not exposed directly to the ground or weather: Protect with 1-1/2 inches of concrete.

3.07 PLACING CONCRETE

- A. Convey concrete from mixer to final position by method which will prevent separation or loss of material.
- B. Maximum height of concrete free fall: 60 inches.
- C. Regulate rate of placement so concrete remains plastic and flows into position.
- D. Deposit concrete in continuous operation until panel or section is completed.
- E. Do not use concrete that has set and do not re-temper or use concrete that has been mixed for more than 1-1/2 hours.

3.08 CONSOLIDATING CONCRETE

- A. Use mechanical vibrating equipment for consolidation.

- B. Vertically insert and remove hand-held vibrators at points 18 inches to 30 inches apart, inserting to within 6 inches of bottom of freshly poured concrete.
- C. Do not use vibrators to transport concrete in forms.
- D. Minimum vibrator frequencies: 6000 impulses per minute.
- E. Vibrate concrete minimum amount required for consolidation.
- F. Keep spare vibrator on hand during concrete placing operation.
- G. Make sure the concrete is thoroughly worked around the reinforcing, the embedded items, and into corners of forms.

3.09 SLABS (ACI 301-99 Section 5)

- A. Finish concrete slab surfaces in accordance with ACI 301-99 Section 5:
 - 1. Uniformly spread, screed, and float slabs. Do not use grate tampers or mesh rollers. Do not spread concrete by vibration.
 - 2. Light broom finish exterior surfaces, except exposed aggregate.
- B. Sidewalks: Finish sidewalks in accordance with Section 02510.

3.10 CURING

- A. Cure slabs: use damp method as per ACI 301-99 Section 5.
- B. Cure Walls above Grade: Use moisture-retaining coverings as approved by Architect/Engineer in accordance with ACI 308.

3.11 WELDING (ACI 301-99 Section 3)

- A. Welding Reinforcing Steel: Not allowed.

3.12 CONSTRUCTION JOINTS

- A. Install construction joints in accordance with ACI 301-99 Section 5

3.13 INSERTS, EMBEDDED PARTS AND OPENINGS

- A. Provide formed openings where required for pipes, conduits, sleeves and other work to be embedded in and passing through concrete members.
- B. Coordinate work of other sections and cooperate with trade involved in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

3.14 REPAIR OF SURFACE DEFECTS (ACI 301-99 Section 5.3.7)

- A. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Modify or replace concrete not conforming to required lines, detail, and elevations.
- C. Repair or replace concrete not properly placed resulting in excessive honeycombing and other defects. Do not patch, repair, or replace exposed architectural concrete except upon express direction of Architect/Engineer.

3.15 FIELD QUALITY CONTROL

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- A. Four (4) concrete test cylinders will be taken by the testing laboratory for every cu. yds., or fraction thereof, of concrete placed. Not less than one (1) set of test cylinders shall be taken for each day's pour.
- B. One (1) additional test cylinder will be taken during cold weather concreting and be cured on job site under same conditions as concrete it represents.
- C. One (1) slump test will be taken by the testing laboratory for each set of test cylinders taken and for each separate batch of concrete placed.
- D. Compression test cylinders: Test cylinders shall be cast on the project site by a representative of the testing laboratory.
 - 1. Make cylinders according to ASTM C31.
 - 2. Make additional sets of test cylinders for curing under job conditions:
 - a. When it is needed to determine when to remove forms.
 - b. When to put a structure into service.
 - c. When temperature extremes are expected during the curing test period.
 - 3. Make test cylinders in the presence of Architect/Engineer.
 - 4. Properly mark prepared test cylinders and fill out the card supplied by the testing laboratory with instructions on when to make test breaks and where to send the test results.
 - 5. Transport in a protected condition, each set of prepared and marked test cylinders to the designated testing laboratory for curing and testing as soon as the cylinders can be transported without damage.
- E. Compression Testing Concrete Cylinders ASTM C-39: by commercial testing laboratory.
 - 1. Cure cylinders in laboratory until time for testing.
 - 2. Test each set of cylinders at 7 days and 28 days after pouring.
 - 3. Tabulation of breakage schedule and action:

Specified strength of 3,000 psi at 28 days

	<u>Test Break</u>	<u>Action</u>
7 day	Less than 2400 psi 2400 - 3000 psi over 3000 psi	Contractor notify A/E Break 28 day cylinder Stop Testing
28 day	Less than 3000 psi	Contractor notify Architect, investigate reason for low break and report in writing to A/E.

- 4. For testing cylinders for specified compressive strength other than 3,000 psi, see the Architect/Engineer.
- F. In Case of Low Compression Test Results:
 - 1. Architect/Engineer will have right to order change in the mix design, costs

to be borne by the contractor.

2. Architect/Engineer will have right to order core tests of the concrete in accordance with ACI C42, or load tests of the structure, the costs to be borne by the Contractor for either test.

3.16 PROTECTION OF COMPLETED WORK

- A. During curing period, protect the concrete from damaging mechanical disturbances, water flow, loading, shock, and vibration.

END OF SECTION

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SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide cast-in-place concrete work, complete. Provide reinforcing steel, dowels, chairs, and accessories as specified for concrete work.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Excavation and filling, including base course and drainage fill; Section 02220.
- B. Soil treatment for termite control; Section 02285.
- C. Portland cement concrete paving; Section 02513.
- D. Furnishing of structural steel base-plates, anchor rods and other metal accessories for insertion in concrete work; Section 05120.
- E. Joint sealants; Section 07900.

1.4 SUBMITTALS

- A. Comply with Section 01300, unless noted.
- B. Product Data: Submit manufacturer's product data for reinforcement and forming accessories, admixtures, patching compounds, curing compounds, and others materials as requested by Architect.
- C. Shop Drawings:
 - 1. Submit to the Architect for review prior to installation, shop drawings of all reinforcing steel, including bar cutting lists and typical bar bend diagrams.
 - 2. The Contractor shall submit two prints of each shop drawing for review. One checked set will be returned to the Contractor who will then run and distribute all copies required. The Contractor shall require all shop drawings to be checked 100 percent before they are submitted to the Architect Engineer for Review. Failure to do so will result in the shop drawing being considered incomplete and rejected.
- D. Design Mix: Prior to placement of concrete, submit concrete mix designs proposed by the concrete supplier, for class of concrete, including recent test results substantiating the quality of concrete produced by each mix.
- E. Reports: Weekly reports of all compression, slump, and air content tests from the testing laboratory. Weekly reports of quality assurance test on fly ash mixture.
- F. **THE CONTRACTOR SHALL SUBMIT A POUR PLAN TWO WEEKS PRIOR TO BEGINNING ANY POURS ON THE CONCRETE SLABS,**

**WHICH SHALL INDICATE HOW HE PLANS ON SCHEDULING THE
POURS OF VARIOUS SEGMENTS OF THE FLOOR SLAB FOR THE
APPROVAL OF THE ARCHITECT.**

1.5 CODES AND STANDARDS

- A. Reference Standards and Specifications: Comply with the provisions of the following specifications and standards, except as otherwise noted or specified, or as accepted or directed by the Architect during unusual climatic conditions.
 - 1. ACI 301, "Specifications for Structural Concrete for Buildings".
 - 2. ACI 318, "Building Code Requirements for Reinforced Concrete".
 - 3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
- B. Local Codes and Ordinances: Wherever provisions of the Standard Building Code or the local current ordinances are more stringent than the above specifications and standards, the local codes and ordinances shall govern.
- C. Concrete Testing Service: Engage a testing laboratory acceptable to Owner and Architect to perform material evaluation tests and to design concrete mixes.
 - 1. Tests, including retesting of rejected materials for installed work, shall be paid for by the Contractor. Testing requirements are specified in Field Sampling and Testing paragraph.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. For Exposed Finish Concrete: Plywood, metal, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces.
- B. For Unexposed Finish Concrete: Use plywood, lumber, metal, or other acceptable material. If lumber is used, it must be dressed on at least 2 edges and 2 sides for a tight fit.
- C. Form Coatings: Commercial formulation form coating compound with maximum VOC of 350 mg/l that will not bond with, stain, nor adversely affect concrete surfaces, will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1-1/2" to exposed surface.
 - 1. Provide ties that, when removed, will leave holes not larger than 1" diameter in concrete surface.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615 deformed billet steel of grades indicated on structural drawings, free from loose rust, scale and other coatings that may reduce bond.
- B. Mesh or Fabric Reinforcement: ASTM A 185, welded wire fabric, of sizes and types as indicated on the drawings.
- C. Supports For Reinforcement: Bolsters, chairs, spacers, ties, and other devices necessary for -properly spacing and fastening reinforcement in place, including rebars on grade.
 - 1. For rebars-on grade, use supports with sand plates or horizontal runners.

- D. For footings, support reinforcing steel with wire, metal chairs, bolsters or other approved devices; do not use bricks or stones.

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
- B. Aggregate: ASTM C 33, and as specified.
 - 1. Fine Aggregate: Clean, Sharp, natural or manufactured sand, free from loam, clay, lumps, or other deleterious substances.
 - 2. Coarse Aggregate: Clean, uncoated, processed, locally available aggregate,
containing no clay, mud, loam or foreign matter; maximum size of 1-1/2".
Maximum size of 1" in vault slabs and walls.
- C. Mixing Water: Clean, free from oil, acid, salt, injurious amounts of vegetable matter, alkalies, and other impurities; potable.
- D. Admixtures: Provide admixture manufacturer's written certification of no chloride ion content.
 - 1. Air Entrained Admixture: ASTM C 260.
 - 2. Water Reducing or Water Reducing and Retarding ASTM C 494.
 - 3. Other Admixtures:- Do not use other admixtures unless accepted in writing by Architect.
- E. Miscellaneous Materials:
 - 1. Connectors: Provide all metal connectors required for placement in cast-in-place concrete, for the attachment of structural and non-structural members.
 - 2. Expansion Joint Filler: ASTM D 1751, non-extruding premoulded material, 1/2" thick, unless otherwise noted, composed of fiberboard impregnated with asphalt, except use ASTM D 1752, Type II, resin-bound cork for walks and other exposed areas. Sonneborn "Sonoflex F" closed cell polyurethane foam expansion joint filler is acceptable.
 - 3. Vapor Barrier: Polyethylene film, 10 mill thick Visqueen or approved equal.
 - 4. Liquid Membrane-Forming Curing Compound: ASTM C 309, Type I, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal. Conspec "Conspec Cure & Seal", L & M "L & M Dress & Seal", Sonneborn "Kure-N-Seal", Euclid "Eurocure", Master Builders "MasterKure", or approved equal.
 - 5. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
 - 6. Moisture-Retaining Cover: One of the following, complying with ASTM C 171; waterproof paper, polyethylene film, polyethylene-coated burlap.
 - 7. Non-Shrink Grout: CRD-C 621, factory pre-mixed grout.
 - a. Non-Metallic: Conspec "100 Non-Shrink Grout Non-Metallic", Master Builders "Set Grout", Sonneborn "SonogROUT", Euclid "Euco-NS", or L & M Crystex".
 - 8. Bonding Agent: Polyvinyl acetate, rewettable type; W.R. Grace "Daraweld C", Sonneborn "Sonocrete", Larsen "Weldcrete", Euclid "Euroweld", or L & M "Everbond".

9. Patching Mortar: Free-flowing, polymer-modified cementitious coating; Euclid "ThinCoat", Sika Chemical "Sikatop 120", Thoro Thoro Underlayment", or Sonneborn "Sonoflow".

2.4 PROPORTIONING OF MIXES

- A. Strength: Concrete minimum ultimate strength at 28 days as noted on structural drawings.
- B. Mix Designs:
 1. Prepare design mixes for each type of concrete, in accordance with ACI 301 and ACI 318, except as otherwise specified.
 2. Proportion design mixes by weight for class of concrete required, complying with ACI 211, except as otherwise specified.
- C. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as approved by Architect. Laboratory test data for revised mix design and strength results must be submitted to and approved by Architect before using in work.
- D. Provide test results from concrete supplier for proposed design mix, to establish the following:
 1. Gross weight and yield per cu. yd. of trial mixtures.
 2. Measured slump.
 3. Measured air content.
 4. Compressive strength developed at 7 days and 28 days, from not less than 3 test cylinders cast for each 7- and 28-day test, and for each design mix.
 5. Submit written reports to the Architect for design mix at least 15 calendar days prior to the start of work.

2.5 ADMIXTURES

- A. Use air-entrained admixture in strict compliance with manufacturer's directions at concrete exposed to weather. Provide 5% to $\pm 1\%$ air entrainment at point of placement.
- B. Water/Cement Ratio: Concrete subjected to freezing and thawing shall have a maximum water/cement ratio of 0.50.

2.6 SLUMP LIMITS

- A. $4" \pm 1-1/2"$.

2.7 BATCHING AND MIXING

- A. Concrete shall be ready-mixed in accordance with the governing building code and with the referenced ACI 318. No hand mixing allowed.
- B. Ready-Mix Concrete:
 1. Comply with requirements of ASTM C 94, and as specified.
 2. When air temperature is between 85° F and 90° F, reduce mixing and

delivery time from 90 minutes to 75 minutes, and when air temperature is above 90° F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORM WORK

- A. Coordinate installation of joint materials and vapor retarders with placement of forms and reinforcing steel.
- B. Design, erect, support, brace, and maintain formwork to support vertical and lateral loads, and static and dynamic loads that might be applied until such loads can be supported by the concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment elevations, and position.
- C. Construct forms in accordance with ACI 347, to sizes, shapes, lines and dimensions indicated, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, molding, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
- D. Fabricate forms for easy removal without hammering or prying against the concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.
- E. Provide temporary openings where interior area of formwork is inaccessible for cleanup, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous location.
- F. Chamfer exposed corners and edges 3/4" unless otherwise indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- G. Preparation of Form Surfaces: Coat the contact surfaces of forms with a form-coating compound where applicable before reinforcement is placed.
- H. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such ties. Accurately place and securely support items built in to form.
- I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms after concrete placement, if required, to eliminate mortar leaks.

3.2 VAPOR BARRIER INSTALLATION

- A. General: Following leveling and compaction (by vibrating sled) of granular base for slabs-on-grade, place vapor barrier with longest dimension parallel with direction of pour.

- B. Lap joints 6" and seal vapor barrier joints with manufacturer's recommended mastic and pressure-sensitive tape.

3.3 PLACING REINFORCEMENT

- A. Comply with the Concrete Reinforcing Steel Institute (CRSI) recommended practice for "Placing Reinforcing Bars" for details and methods of reinforcement placement and supports, and as herein specified.
 - 1. Avoid cutting or puncturing vapor barriers during reinforcement placement and concreting operations.
- B. Clean reinforcement of loose rust, mill scale, dirt, and other materials or coatings which reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers as required.
- D. Place reinforcement to obtain at least minimum coverage's indicated on drawings for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Do not place bars more than 2" beyond the last leg of continuous support. Do not use supports to hold runways for conveying equipment.
- F. Install mesh welded wire fabric reinforcement in as long lengths as practicable, lapping pieces at least one mesh plus 2" but in no case less than 8". Lace splices with wire. Offset end laps to prevent continuous laps in either direction.

3.4 JOINTS AND INSERTS

- A. Joints: Provide slab and wall construction joints.
- B. Inserts: Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Properly locate all embedded items in cooperation with other trades, and secure in position before concrete is poured. Use setting drawings, diagrams, instructions, and directions provided by suppliers of the items to be attached thereto.

3.5 PREPARATION OF FORM SURFACES

- A. Coat contact surfaces of forms with an approved nonresidual, low-VOC, form coating compound before reinforcement is placed. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed or on rebars. Apply in compliance with manufacturer's instructions.

3.6 CONCRETE PLACEMENT

- A. Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete", and as herein specified.
- B. Pre-Placement Inspection: Before placing concrete, clean and inspect formwork, reinforcing steel, and items to be embedded or cast-in. Notify other crafts in ample time to permit the installation of their work, and cooperate with them in setting such work, as required. Make sure soil treatment for termite control has been applied to drainage fill before vapor barrier and concrete are installed.

- Coordinate the installation of joint materials and vapor barriers with placement of forms and reinforcing steel.
- C. Notify Architect 48 hours before placing any concrete.
 - D. Conveying: Convey concrete from the mixer to the place of final deposit by methods which will prevent the separation or loss of materials. Provide equipment for chuting, pumping, and pneumatically conveying concrete of proper size and design as to insure a practically continuous flow of concrete at the point of delivery and without segregation of the materials. Keep open troughs and chutes clean and free from coatings of hardened concrete. Do not allow concrete to drop freely more than 10 feet. All equipment and methods used for conveying are subject to the approval of Architect.
 - E. Depositing: Deposit concrete continuously or in layers of such thickness that no concrete will be placed on hardened concrete so as to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete near or in its final location to avoid segregation due to rehandling or flowing, and displacement of the reinforcement.
 - F. Placing Concrete In Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
 - G. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
 - 1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Bring slab surfaces to correct level with straightedge and strike off. Use bull floats or derbies to smooth surface, free of humps and hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 - 3. Maintain reinforcing in proper position during concrete placement.
 - H. Cold Weather Placing: Comply with the requirements of ACI 306.
 - I. Hot Weather Placing:, Comply with the requirements of ACI 305. Use a water reducing or water reducing and retarding admixture.

3.7 FIELD SAMPLING AND TESTING

- A. The Contractor shall employ an independent testing agency, acceptable to the Owner and Architect to perform the following test and samples.
1. Field samples shall be made and cured in accordance with ASTM C 31, for each concrete strength, at the rate of 4 test cylinders and one slump test for each 50 cubic yards of concrete from each days pour. In accordance with ASTM C 173 Volumetric Method, or ASTM C 231 Pressure Method, make air content check for each set of test cylinders. Air content and slump shall be checked and recorded at both truck discharge and point of placement for pumped concrete from the first load each day.
 2. Test Cylinders as follows: one at 7 days, two at 28 days, and reserve the remaining cylinder for testing after a longer period as required by the Architect, if the 28 day tests do not meet the required strength.
 3. The taking of samples from small pours of 10 cubic yards or less may be omitted at the discretion of the Architect.
 4. Additionally, test slump every 25 cu. yds, recording location for report.
 5. When early form removal is requested, test field cured cylinders at 7 or less days to determine sufficient strength.
- B. Testing:
1. Where average strength of any group of 3 cylinders falls below the minimum compressive strength or of individual cylinder fall more than 500 psi below minimum compressive strength specified, the Architect shall have the right to require that test specimens be cut from the structure. Specimens shall be selected by Architect from location in structure represented by test specimen or specimens which failed.
 2. Specimens shall be secured, prepared, and tested in accordance with ASTM C 42, within a period of 60 days after placing concrete.
 3. Concrete shall be considered to meet the strength requirements of this specification if it meets the strength requirements of paragraph 5.6.4 of ACI 318.
 4. Should laboratory analysis indicate that the proper concrete mix has not been used by the Contractor, all such concrete poured using the improper mix shall be subject to rejection.
 5. The cost of cutting specimens from the structure, patching the resulting holes, and making laboratory analysis shall be borne by the Contractor.
 6. The holes from which the cored samples are taken shall be packed solid with no slump concrete proportioned in accordance with the ACI 211 "Recommended Practice for Selecting Proportions of No-Slump Concrete". The patching shall have the same design strength as the specified concrete.
 7. If any of the specimens cut from the structure fail to meet the requirements outlined in paragraph 5.6.4 of ACI 318, the Architect shall have the right to require any and all defective concrete to be replaced, and all costs resulting therefrom shall be borne by the Contractor.
- C. Contractor Sampling: In addition to the slump test specified above, the Contractor shall keep a cone (mold) and rod apparatus on the job site for random testing of batches. When concrete does not meet the specified slump

requirements, and when directed by the Architect, immediately perform a slump test in accordance with ASTM C 143. Concrete not meeting the slump requirements shall be removed from the job site.

- D. Inspection:
1. Verify compliance with the design documents and approved shop drawings of all rebar and WWF placement.
 2. File reports to the Architect at each phase of construction.

3.8 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, painting or other similar system. The as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 SLAB FINISHES

- A. Float Finish:
1. Apply float finish to slab surfaces to receive trowel finish and other finishes specified.
 2. After screening, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power driven floats, or by hand-floating if area is small or inaccessible to power units. check and level surface plane to tolerances of Ff 18 - Fl 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to uniform, smooth, granular texture.
- B. Trowel Finish:
1. Apply where exposed-to-view, and where-slab surfaces are to be covered with carpet or other thin finish coating system.
 2. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and

appearance, and with surface leveled to tolerances of Ff 20 - F1 17. Grind smooth surface defects which would telegraph through applied floor covering.

- indi-
C. Non-Slip Broom Finish: At exterior walks, pavements, and other locations as indicated; specified in Section 02511.

3.10 CONCRETE CURING AND PROTECTION

- moisture-
with
using
- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.
- B. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, or by combinations thereof, as specified.
1. Provide moisture curing by keeping concrete surface continuously wet by covering with water, by water-fog spray, or by covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. **Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.**
 2. Provide moisture-cover curing by covering concrete surface with retaining cover for curing concrete, placed in widest practicable width sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 3. Provide curing and sealing compound on interior slabs left exposed; and to exterior slabs and walks, as follows:
 - a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - b. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.
- C. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, **by moist curing with forms in place for full curing period or until forms are removed.** If forms are removed, continue curing by methods specified above, as applicable.
- D. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs and other flat

surfaces by application of appropriate curing compound. Final cure concrete surfaces to receive finish flooring by moisture-retaining cover, unless otherwise directed.

3.11 PROTECTION

- A. No wheeling, working, or walking on finished surfaces will be allowed for 16 hours after the concrete is placed.
- B. Provide plywood or other acceptable protective cover at all traffic areas throughout the job.
- C. Protect all exposed concrete floors', steps, and walks from paint and other materials or equipment which may mar or damage these surfaces.

3.12 REMOVAL OF FORMS

- A. **DO NOT REMOVE FORMS UNTIL THE CONCRETE HAS ATTAINED 67% OF 28 DAY STRENGTH OR A MINIMUM OF 4 DAYS.** Use a method Of form removal which will not cause over-stressing of the concrete.

3.13 MISCELLANEOUS ITEMS

- A. Filling Holes: Fill in holes and openings left in concrete for the passage of work by other trades after their work is in place. Mix, place, and cure concrete to blend with in-place construction. Provide all other miscellaneous concrete filling required to complete work.
- B. Non-Shrink Grout Application: Grout base plates, equipment bases and other location indicated with specified non-shrink grout. Provide non-metallic type grout.

3.14 CONCRETE SURFACE REPAIRS

- A. Repair and patch defective areas with cement mortar of the same type and class as the original concrete, immediately after removal of forms. Cut out honeycomb, rock pockets, voids over 1/2" diameter, and holes left by tie rods and bolts down to solid concrete but in no case to a depth of less than one inch. Make edges of cuts perpendicular to the concrete surface, before placing cement mortar in the same manner as adjacent concrete. Proprietary patching compounds may be used when acceptable to the Architect.
- B. Other repair methods may be used, subject to Architect's acceptance.

3.15 CLEAN-UP

- A. Do not allow debris to accumulate. Clean up all concrete and cement materials, equipment and debris upon completion of any portion of the concrete work, and upon completion of the entire cast-in-place concrete work.

END OF SECTION

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SECTION 04200 –CONCRETE UNIT MASONRY

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

1.02 SCOPE:

Furnish labor and materials necessary to complete concrete masonry work as indicated.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS:

- A. Joint Sealants: Section 07900

1.04 QUALITY ASSURANCE:

- A. Codes and Standards: Provide material and work complying with referenced codes, regulations and standards.
- B. Manufacturer: Obtain each type of unit from one manufacturer, cured by one process, and of uniform texture and color.

1.05 SUBMITTALS:

- A. Certification: Submit certification that each type of unit complies with specified requirements.
- B. Manufacturer's Data: Submit manufacturer's technical data and installation instructions for insulation material.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion and other causes.
- C. Store cementitious materials off ground, under cover and in dry location.
- D. Store aggregates where grading and other required characteristics can be maintained.
- E. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.07 JOB CONDITIONS:

- A. Protect masonry materials during storage and construction from wetting by rain, snow or ground water and from soilage or intermixture with earth or other materials. Do not use metal reinforcing or ties having loose rust or other coatings, including ice, which will reduce or destroy bond.
- B. During erection, cover top of wall with heavy waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- C. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls or columns. Do not apply concentrated loads for at least 3 days after building masonry walls or columns.
- D. Prevent grout or mortar from staining the face of masonry to be left exposed or painted. Immediately remove grout or mortar in contact with masonry. Protect sills, ledges and projections from droppings of mortar.
- E. Do not lay masonry when the temperature of outside air is below 40EF, unless means are provided to heat and maintain temperature of masonry materials and protect completed work from freezing. Protection shall consist of heating and maintaining temperature of masonry materials to at least 40EF, and maintaining an air temperature above 40EF on both sides of masonry for at least 48 hrs.

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY UNITS:

- A. General:
 - 1. Comply with referenced standards and other specified requirements for each type of masonry unit required.
 - 2. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding, cap, cove, bullnose and other special conditions.
- B. Concrete Block: Provide units complying with characteristics specified below for Grade, Type, face size, exposed face, and weight classifications.
 - 1. Grade N.
 - 2. Size: Manufacturer's standard units with nominal face dimensions of 16" long X 8" high X thicknesses indicated.
 - 3. Type I, moisture-controlled units.
 - 4. Exposed Faces: Manufacturer's standard color and texture, except where otherwise indicated or specified.

5. Hollow Loadbearing Block: ASTM C 90; lightweight, except use normal weight block for all work below grade.
6. Curing: Cure units in a moisture-controlled atmosphere or in an autoclave at normal pressure and temperature to comply with ASTM C 90 Type I requirements.

2.02 MORTAR AND GROUT MATERIALS:

- A. Portland Cement: ASTM C150 Type I, except Type III may be used for cold weather construction.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Aggregate for Mortar: Sand, conforming to ASTM C144 or ASTM C404, Size No. 2.
- D. Aggregate for Grout: ASTM C404, Size No. 8 or Size No. 89.
- E. Water: Clean, drinkable.

2.03 MASONRY INSULATION:

- A. Provide loose-fill masonry fill insulation, full height of masonry units, in all block voids, such as RYOLEX, loose fill Perlite insulation, by Silbrico Corporation. Install as per manufacturer's recommendations. Provide in the following locations:
 1. Concrete block walls which surround conditioned interior spaces.

PART-3 – EXECUTION

3.01 EXAMINATION:

Examine the areas and conditions under which masonry is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 PREPARATION:

- A. CMU: Do not wet concrete masonry units.
- B. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.

3.03 CONSTRUCTION TOLERANCES:

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10', or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story of 20' maximum, nor 1/2" in 40' or more.
- B. Variation from Level: For lines of exposed lintels, sills, parapets, horizontal

grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 3/4" in 40' or more.

- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.

3.04 INSTALLATION, GENERAL:

- A. Thickness: Build composite/cavity walls to the full thickness shown. Build single wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.
- B. Build chases and recesses as indicated or required for the work of other trades. Provide not less than 8" of masonry between chases or recess and jamb openings, and between adjacent chases and recesses.
- C. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- D. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to fit adjoining work neatly. Use full-size units without cutting wherever possible.

3.05 LAYING MASONRY WALLS:

- A. Lay walls plumb and true to comply with specified tolerances, with courses level, accurately spaced and coordinated with other work.
- B. Lay concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and foundation walls and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or to be filled with grout. Lay CMU in running bond with vertical joint in each course centered on units above and below.
- C. Build-in items specified under this and other sections of this specification. Fill in solidly with masonry around built-in items. Fill space between hollow metal frames and masonry solidly with mortar.
- D. Joints: Lay walls with 3/8" joints. Use mortar mix as dry as practicable and compress joints as much as possible to produce a dense tight joint.
 - 1. Concealed joints: Strike flush.
 - 2. Exposed CMU joints: Tooled.

3.06 HORIZONTAL JOINT REINFORCING:

- A. Reinforce walls with continuous horizontal reinforcing. Fully embed longitudinal side rods in mortar for their entire length. Lap reinforcement a

minimum of 6" at ends of units. Do not bridge control joints with reinforcing. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcing as directed by the manufacturer for special conditions. Space reinforcing 16" o.c. vertically.

- B. Reinforce masonry openings greater than 12" wide with horizontal joint reinforcing placed in 2 horizontal joints approximately 8" apart, both immediately above the lintel and below the sill. Extend reinforcing a minimum of 2' beyond jambs of the opening bridging control joints where provided.

3.07 CONTROL AND EXPANSION JOINTS:

Install vertical expansion and control joints. Build-in related items as masonry work progresses. Refer to Section 07900 for sealants.

3.08 REPAIR, POINTING AND CLEANING:

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of placement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up joints at corners, openings and adjacent work to provide a neat, uniform appearance, properly prepared for application of caulking or sealant compounds.
- C. Clean exposed CMU masonry by dry brushing at end of each day's work and after final pointing to remove mortar spots and drippings.

END OF SECTION

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SECTION 05120 - STRUCTURAL STEEL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide all structural steel work, complete.

1.3 SUBMITTALS

- A. Comply with Section 01300, unless noted.
- B. Shop Drawings:
 - 1. Submit shop drawings including complete details and schedules for fabrication and shop assembly of the members, and details, schedules, procedures and diagrams showing the sequence of erection. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld. Provide setting drawings, templates, and directions for the installation of anchor rods and other anchorages to be installed by others.
 - 2. The Contractor shall submit two prints of each shop drawing for review. One checked set will be returned to the Contractor who will then run and distribute all copies required. The contractor shall require all shop drawings to be checked 100 percent before they are submitted to the Architect Engineer for review. Failure to do so will result in the shop drawings being considered incomplete and rejected.
- C. Certification: Submit current certification papers (within last 3 years) for each welder.

1.4 QUALITY ASSURANCE

- A. Codes And Standards: Comply with the following:
 - 1. AISC "Code of Standard Practice for Steel Buildings and Bridges".
 - 2. AISC "Specifications for Structural Steel Buildings", including "Commentary".
 - 3. AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" approved by the Research Council on Structural Connections.
 - 4. AWS D1.1 "Structural Welding Code - Steel".
- B. Qualifications For Welding Work: Qualify welding procedures and welding operators in accordance with AWS "Qualification" requirements.
- C. Testing And Inspection:

1. The Contractor shall employ an independent testing agency, acceptable to Owner and Architect, to inspect welded and bolted connections. The following items will be included in testing agency inspection:
 - a. Visual inspection of all welded and bolted connections for quality.
 - b. Check by ultrasonic (or other means approved by Owner's representative) all of beam to beam or column full penetration-welds. After 2 beams (1 top and 1 bottom flange each) welds have been placed by each welder, the testing agency shall check and approve these welds before additional welds are placed. Each welder shall mark his weld.
 - c. Test approximately 10% of high strength bolts for correct nut tightness.
2. Correct as directed, at Contractor's expense, connections that are found unsatisfactory by testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site at such intervals as to ensure uninterrupted progress of work.
- B. Deliver anchor rods and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time not to delay work.
- C. Store materials to permit easy access for inspection and identification. Keep steel members off ground using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. If bolts and nuts become dry or rusty, clean and relubricate before use.
- D. Do not store materials on structure in manner that might cause distortion or damage to members or supporting structures. Repair and replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: For fabrication of work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and apply surfaces finishes.
- B. Structural W Steel Shapes: ASTM A 992.
- C. Channels, angles, plates and bars : shall be ASTM A360 A572
- D. Cold Formed Steel Tubing: ASTM A500, Grade B, $F_y=46$ ksi.
- E. Steel Pipe: ASTM A 53, Type E or S, Grade B; or ASTM A 501.
- F. High Strength Threaded Fasteners: ASTM A 325, Type 1.
- G. Unfinished Threaded Fasteners: ASTM A 307, Grade A.
- H. Headed Stud-Type Shear Connectors: ASTM A 108, Grade 1015 or 1020, cold-finished carbon steel with dimensions complying with AISC specifications.

- I. Anchor Rods: ASTM A 36, nonheaded type, unless otherwise indicated.
- J. Electrodes For Welding: Comply with AWS Code.
- K. Grout: Non-Metallic Shrinkage-Resistant Grout: Conspec 100 Non-Shrink Grout (Non-Metallic)," Euclid "Euco N.S.," L & M "Crystex," Master Builders "Masterflow 713," W. R. Meadows "Sealtight 588 Grout," or approved equal.
- L. Shop Paint: Lead free, alkyd primer; Tnemec 10-99 Series, Southern Coatings Enviro-Guard 1-2900, or approved equal, meeting performance requirements of TT-P-86, Type 1, and passing ASTM B 117 after 500 hours with no blistering, cracking, softening, delamination, or rust creepage at scribe and rusting at edges.

2.2 FABRICATION

- A. Shop Fabrication And Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.
 - 1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.
 - 2. Where shop finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.
- B. Connections: Weld or bolt shop connections, as indicated.
 - 1. Bolt field connections, except where welded connections or other connections are indicated.
 - a. Provide high-strength threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.
 - b. Provide unfinished threaded fasteners as noted and for temporary bracing to facilitate erection.
 - 2. High-Strength Bolted Construction: Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts".
- C. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.
- D. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld shear connectors in field, spaced as shown, to beams and girders. Use automatic end of welding of headed stud shear connectors in accordance with manufacturer's printed instructions.
- E. Holes For Other Work: Provide holes for securing other work to structural steel framing.
 - 1. Provided threaded nuts welded to framing and other specialty items as indicated to receive other work.
 - 2. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame-cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.3 SHOP PAINTING

- A. Shop paint exposed structural steel work. Paint embedded steel which is partially exposed on the exposed portions and the initial 2" of embedded areas only. Do not paint surfaces which are to be welded and interior steel in "air conditioned" spaces.
- B. Surface Preparation: Before painting, thoroughly clean all surfaces of all grease, rust, welding droppings and loose mill scale by methods conforming to SSPC-SP-1 and SSPC-SP-3. After erection, wire-brush and touch-up welded or abraded areas. Touch-up with primer.
- C. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with the manufacturer's instructions and at a rate to provide a uniform dry film thickness of 2.0 mils. Use painting methods which will result in full coverage of joints, corners, edges and all exposed surfaces.

PART 3 - EXECUTION

3.1 ERECTION

- A. Setting Bases And Bearing Plates: Clean bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom of base and bearing plates.
 - 1. Set loose and attached bearing plates and bearing plates for structural members on wedges or other adjusting devices.
 - 2. Tighten nuts on anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
 - 3. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
 - 4. For grout materials, comply with manufacturer's instructions.
- B. Field Assembly:
 - 1. Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clear bearing surfaces and other surfaces that will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 2. Level and plumb individual members of structure within specified AISC tolerances.
- C. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.

1. Comply with AISC specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
2. Do not enlarge unfair holes in members by burning or by using drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.

3.2 TOUCH-UP PAINTING

- A. Cleaning and touch-up painting of field welds, bolted connections and abraded areas of the shop paint on structural steel is included in Section 09900.

END OF SECTION

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SECTION 05310 - METAL DECKING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply To this Section.

1.2 SCOPE

- A. Provide all metal decking, complete, including roof and floor decking.

1.3 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provision of the following codes and standards:
 - 1. AISI "Specification for the Design of Cold-formed Steel Structural Members".
 - 2. AWS "Structural Welding Code".
 - 3. SDI "Steel Roof Deck Design Manual".
- B. Qualification of Welding Work: Quality welding processes and welding operators in accordance with AWS "Standard Qualifications Procedure".
- C. The Contractor shall employ an independent testing agency, acceptable to the Owner and Architect to inspect the installation of the decking.

1.4 SUBMITTALS

- A. Comply with Section 01300, unless noted.
- B. Manufacturer's Data: Provide manufacturer's technical data indicating compliance with specified requirements, and installation instructions.
- C. Shop Drawings:
 - 1. Submit detailed erection drawings, including layout of deck panels, anchorage details, conditions requiring supplementary framing, jointing, or other accessories.
 - 2. The Contractor shall submit two prints of each shop drawing for review. One checked set will be returned to the Contractor who will then run and distribute all copies required. The Contractor shall require all shop drawings to be checked 100 percent before they are submitted to the Architect Engineer for review. Failure to do so will result in the shop drawing being considered incomplete and rejected.

1.5 PRODUCT HANDLING

- A. Store off the ground with one end elevated to provide drainage. Protect from the elements with waterproof covering, ventilated to avoid condensation.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Steel for Painted Finish: ASTM A611, Grade C.
- B. Steel for Galvanized Finish: ASTM A446, Grade E.
- C. Miscellaneous Steel Shapes: ASTM A36.
- D. Galvanizing: ASTM 525, G60 (0.60 oz. per sq. ft.)
- E. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with Military Specifications MIL-P-21035 (Ships).
- F. Paint for Non-Galvanized Deck: Deck unit manufacturer's baked-on, rust-inhibitive paint, for application to metal surfaces which have been chemically cleaned and phosphate chemical treated.

2.2 FABRICATION

- A. Form deck units in lengths to span 3 or more supports with flush, telescoped or nested 2" end laps and nesting side laps, unless otherwise indicated. Provide deck configurations complying with SDI "Basic Design Specifications", and as specified herein.

2.3 DECKING

- A. Manufacturer's: Vulcraft, Merco, Inryco, Roll Form, U.S. Steel, Wheeling, Mac-Fab, Epic, or acceptable equal.
- B. Floor Decking: 26 gage steel, .6C floor decking with galvanized finish unless noted otherwise on Structural drawings..
- C. All miscellaneous plates, closure strips, etc. shall be galvanized.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions under which metal decking items are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install deck units and accessories in accordance with manufacturer's recommendations and accepted shop drawings. Fasten deck to supporting beams and joists as indicated on structural drawings.

3.3 TOUCH-UP PAINTING

- A. Cleaning and touch-up painting of field welds, abraded areas, and rust spots of shop painting and galvanizing is included under Section 09900.

END OF SECTION

SECTION 05400 - LIGHTGAGE METAL FRAMING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide cold-formed metal framing units, complete, including C-shaped steel studs at exterior walls, soffits, facias and as noted.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Structural steel is specified in Section 05120.

1.4 SUBMITTALS

- A. Comply with Section 01300.
- B. Product Data: Submit copies of product data for each item of lightgauge framing and accessories.
- C. Shop Drawings: Submit shop drawings including placing drawings for framing members showing size and gage designations, number, type, location and spacing. Indicate supplemental bracing, accessories, and details as may be required for proper installation.

1.5 QUALITY ASSURANCE

- A. Comply with AISI "Specifications For Design Of Cold Formed Steel Structural Members".
- B. See light gauge metal framing notes on Sheet S6.1.

1.6 PRODUCT DELIVERY AND STORAGE

- A. Protect metal framing units from rusting and damage. Deliver to the project site in manufacturer's unopened containers or bundles, fully identified with name, brand, type, location and spacing.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Dietrich, USG, Marino, Dale/Incor, Superior, Gold Bond, or approved equal.

2.2 METAL FRAMING SYSTEM

- A. System Components: Provide manufacturer's standard steel studs of type, size, shape, and gage indicated. With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, and accessories as indicated and as recommended by

manufacturer for application indicated, as needed to provide a complete metal framing system.

- B. Materials and Finishes:
 - 1. For 16 gage and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 50,000 psi ASTM A 446, A 570 or A 611.
 - 2. For 18 gage and lighter units, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi; ASTM A 446, A 570, or A 611.
 - 3. Provide galvanized finish to metal framing components complying with ASTM A 525 for minimum G 60 coating.
- C. Fasteners: Provide nuts, bolts, washers, screws, and other fasteners with corrosion-resistant plated finish.
- D. Electrodes For Welding: Comply with AWS Code and as recommended by stud manufacturer.
- E. Minimum Gauges: Provide minimum 18 gauge metal studs at all exterior wall framing. Provide minimum 20 gauge metal studs at all interior stud walls.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations, and final shop drawings.
- B. Runner Tracks: Install continuous tracks sized to match studs.
- C. Wall Studs: Space studs 16" o.c., unless noted.
 - 1. Secure studs to top and bottom runner tracks by screw fastening at both inside and outside flanges.
 - 2. Set studs plumb.
 - 3. Where stud system abuts structural columns or walls anchor ends of bridging to supporting structure.
 - 4. Install supplementary framing, blocking and bracing in the metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering the weight or loading resulting from the items supported.
 - 5. Frame wall openings larger than 2' square with double stud at each jamb of frame except where more than two are either shown or indicated in manufacturer's instruction. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure studs system wall opening frame in manner indicated.
 - 6. Install horizontal bridging in stud system, spaced (vertical distance) at not more than 5' o.c. Weld or screw at each intersection.

3.2 FIELD PAINTING

- A. Touch-up shop-applied protective coatings damaged during handling and installation. Use galvanized repair paint for galvanized surfaces.

END OF SECTION

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**SECTION 05500 - METAL FABRICATIONS
AND MISCELLANEOUS METAL WORK**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide miscellaneous metal work, complete, including:
 1. Pipe railings and handrails.
 2. Ladder.
 3. Metal pan stairs.
 4. Steel supports for work of other trades.
 5. Miscellaneous metal steel attachments, anchors, plates, angles, etc.
 6. Anchors angles, bolts, expansion shields for items in this section only, and other accessories shown in details and or required for the complete installation of all work.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Cast-In-Place Concrete; Section 03300.
- B. Aluminum window frames and finishing of ornamental grillwork; Section 08410.

1.4 SUBMITTALS

- A. Comply with Section 01300.
- B. Product Data: Submit for products used in miscellaneous metal fabrications, including paint products and grout.
- C. Shop Drawings: Submit shop drawings for the fabrication and erection of all assemblies of miscellaneous metal work. Include plans, elevations, sections, and details of fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections.

1.5 PROJECT CONDITIONS

- A. Field Measurements:
 1. Check actual locations of, walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.
 2. Where field measurements cannot be made without delaying work, guarantee

dimensions and proceed with fabrication of products without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Surfaces, General: For metal fabrications exposed to view upon completion of work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, and roughness.
- B. Miscellaneous Steel Bars, Rods and Shapes: ASTM A 36, A 283, A 108, A 663, A 501, and A 575, as applicable.
- C. Pipe: ASTM A 53 black finish steel pipe, standard weight (Schedule 40) .
- D. Aluminum Extruded Bar and Tube: ASTM B 221, alloy 6063T5/T52.
- E. Bolts and Nuts: ASTM A 307, Grade A. High strength bolts; ASTM A 325. Hot-dip galvanize all items in accordance with ASTM A 153.
- F. Expansion Bolts Wedge Anchors: Ramset "Trubolt" or Hilti "Kwik Bolt."
- G. Adhesive Anchors: Hilti "HVA."
- H. Expansion Shields: F.S. FF-S-325
- I. Anchor Rods: Furnish and deliver to site, anchor rods and other items to be embedded in concrete. Provide necessary shop details and diagrams for concrete forms and, if required, provide templates to insure proper and accurate locations and setting of anchor rods.
- J. Toggle Bolts: Tumble-wing type F.S. FF-B-588 type, class and style as required.
- K. Lock Washers: F.S. FF-W-84, helical spring type carbon steel.
- L. Welding Rods And Electrodes: Select in accordance with AWS specifications for metal alloy to be welded.
- M. Miscellaneous Items: Furnish bent or otherwise custom fabricated bolts, plates, z-clips, anchors, hangers, dowels and other miscellaneous steel shapes as required for framing and supporting work and for anchoring or securing work to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Section 06100.
- N. Shop Paint: Lead free, alkyd primer; Tnemec 10-99, Southern Coatings Enviro-Guard 1-2900, or approved equal, meeting performance requirements of F.S. TT-P-86, and passing ASTM B 117 after 500 hours. Primer selected must be compatible with finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Section 09900.
- O. Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel work, complying with SSPC-Paint 20.
- P. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 except containing no asbestos fibers.
- Q. Non-shrink Nonmetallic Grout: Conspec "100 Non-Shrink Grout NonMetallic,"

- Master Builders "Masterflow 713," Euclid "Euco N.S. Grout," L & M "Crystex," or U. S. Grout "Five Star Grout," or Sonneborn "Sonogrout," or W.
R. Meadows "Sealtight 588 Grout".

2.2 FABRICATION, GENERAL

- A. Workmanship: Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support. Use type of materials shown or specified for various components of work.
- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise close up impairing work.
- C. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, Phillips flat-head (countersunk) screws or bolts. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use. Cut reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
- E. Shop Painting:
 - 1. Shop paint miscellaneous metal work, except concealed metal work, members or portion of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise specified.
 - 2. Remove scale, rust and other deleterious materials before applying shop coat. Clean off heavy rust and loose mill scale in accordance with SSPC SP-2 or SSPC SP-3.
 - 3. Remove oil, grease and similar contaminants in accordance with SSPC SP-1.
 - 4. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's instructions, and at rate to provide uniform dry film thickness of 2.0 mils for each coat. Use painting methods which will result in full coverage of joints, corners, edges, and exposed surfaces.

2.3 MISCELLANEOUS METAL FABRICATIONS

- A. Pipe Railings And Handrails:
 - 1. Fabricate of standard weight steel pipe to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of- pipe, post spacings, and anchorage, but not less than that required to support structural loads.
 - 2. Interconnect railing and handrail members using butt-welding or welding with internal connectors.
 - 3. Form changes in direction by insertion of prefabricated elbow fittings, by

- radius bends or by bending.
4. Provide wall returns at ends of wall-mounted handrails.
 5. Close exposed ends of pipe by welding 3/16" thick steel plate in place or by use of prefabricated fittings.
 6. Brackets, Flanges, Fittings, Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete.
 7. Prime as specified in this section.
- B. Steel Wall Ladder: Steel bars, rods and shapes of sizes and designs indicated, and securely anchored to floor and wall.
- C. Metal Pan Stairs: Fabricate of 12 gage steel treads and risers bolted to angles and welded or bolted to stringers. Concrete fill is specified in Section 03300.
- D. Steel Supports: Provide structural steel lintels, channels, braces, angles, etc., as indicated and assemble as detailed. Secure all connections to provide rigid supports for all items required including supports not specifically specified in other sections.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to site.
- B. Set sleeves in concrete with , tops flush with finish surface elevations; protect sleeves from water and concrete entry.

3.2 INSTALLATION

- A. Fastening To In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- B. Cutting, Fitting, Placement: Perform cutting, drilling and fitting required for installation. Set metal fabrication accurately in location, alignment and elevation; with edges and surfaces level, plumb, true, and free of rack; measured from established lines and levels.
- C. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correcting welding work, and the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.
- D. Setting Loose Plates:
1. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom of surface of bearing plates.
 2. Set loose leveling and bearing plates on wedges, or other adjustable devices. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with edge of bearing plate before packing with grout.
- E. Steel Pipe Railings And Handrails: Set pipe in concrete in non-corrosive pipe sleeves with non-shrink grout or anchor to supports as indicated or required by project conditions. Secure handrails to wall with wall brackets and end fittings.
- F. Ornamental Aluminum Grillwork: Mount grille to aluminum window frame using 1/2" X 10/24 undercut flathead machine screws. Drill and tap completely thru aluminum grill with screws and dress down any exposed portion of the screw. Isolate steel hinges from aluminum as recommended by hinge manufacturer. Coordinate with Section 08410 for steel backing and blocking as required to support grill weight.

3.3 TOUCH-UP SHOP PAINTING

- A. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Use galvanizing repair paint on damaged galvanized surfaces.

END OF SECTION

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SECTION 06100 - CARPENTRY

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide carpentry work, complete. In general, this work includes the following:
 - 1. Concealed framing, studs, furring.
 - 2. Braces, stripping, backing, blocking, cants, grounds, and nailers indicated or necessary to install cabinetwork, toilet room accessories, and to receive or back work of other trades.
- B. Wall Sheathing.
- C. Roof decking.

1.3 QUALITY ASSURANCE

- A. Grading Marks: Factory-mark each piece of lumber with type, grade, mill and grading agency identification; and submit mill certificate that material has been inspected and graded in accordance with requirements if it cannot be marked on a concealed surface.
- B. Wood Preservative Treatment: Label each piece of pressure treated lumber with the Quality Control mark of the American Wood Preservers Bureau showing compliance with the appropriate standard.

1.4 PRODUCT HANDLING

- A. Keep carpentry materials dry during delivery, storage and handling. Store lumber in stacks for air circulation within stacks. Protect bottom of stacks against contact with damp surface. Protect exposed materials against weather. Do not store dressed or treated lumber outdoors.

PART 2 - PRODUCTS

2.1 SOFTWOOD

- A. Comply with the standards of WCLIB, "Standard Grading Rules for West Coast Lumber", for Douglas fir, and SPIB "Standard Grading Rules for Southern Pine Lumber", for Southern pine.
 - 1. For structural light framing 2" to 4" thick, 2" to 4" wide, and studs use KD, S4S, No. 2.
 - 2. For light framing 2" to 4" thick, 2" to 4" wide, use KD, S4S, Construction Grade.

2.2 SOFTWOOD PLYWOOD

- A. Comply with PS-1, exposure 1, group 1, use C-D grade, at wall sheathing and roof decking.

2.3 ROUGH HARDWARE

- A. Nails, metal connectors, bolts, nuts, screws, washers, staples, and other fasteners (except as specified or noted otherwise); hot-dip galvanized steel.

2.4 WOOD PRESERVATIVE TREATMENTS

- A. Pressure treat above-ground items with water-borne preservatives to comply with AWPB-LP-2. After treatment, kiln-dry lumber to a maximum moisture content, of 19 percent. Treat indicated items and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry and concrete.
 - 3. Wood framing members less than 18" above grade.
 - 4. Wood floor plates installed over concrete slabs directly in contact with earth.
- B. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment and to comply with AWPB M4.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
- B. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.
- C. Securely attach carpentry work to substrate by anchoring and fastening as indicated and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.
- D. Use common wire nails, except as otherwise indicated or specified. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.
- E. Anchor carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to grounds, strips, backing, and blocking, of thickness and shape required to secure work and equipment in place, as indicated on the drawings or

required by conditions. Fasten wood grounds, furring and other engaging woodwork to various types of walls with approved types and sizes of nails, ties, and inserts,

spaced to provide rigid secure supports.

3.2 ROUGH CARPENTRY

- A. Provide wood grounds, strips, bucks, plates, backing, and blocking, of thickness and shape required to secure work and equipment in place, as indicated on drawings or required by conditions. Fasten with approve types and sizes of nails, ties, and inserts, spaced to provide rigid secure supports.

3.3 ROUGH HARDWARE

- A. Provide rough hardware necessary or required for installation of work specified. Use sufficient size and number of spikes, nails, screws, bolts, etc., to insure rigidity, security, and permanence.

3.4 CLEAN-UP

- A. Remove from the premises all rubbish, debris, and unused materials which may be accumulated during the progress of the work.

END OF SECTION

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SECTION 06400 - ARCHITECTURAL WOODWORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide architectural woodwork items, complete, including cabinetwork, countertops, shelving, and hardware.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Finishing; Section 09900.

1.4 QUALITY ASSURANCE

- A. Cabinet Material and Fabrication Standards: Premium grade for areas to receive transparent finish as indicated, in accordance with the latest edition of the Architectural Woodwork Institute Quality Standards and Guide Specifications, conforming to the following sections except where modified elsewhere in this section.
 1. Section 100 - Lumber
 2. Section 200 - Panel Products
 3. Section 300 - Standing and Running Trim
 4. Section 400 - Architectural Cabinets
 5. Section 1700 - Installation
- B. Fabrication of architectural woodwork to be by a single firm.

1.5 SHOP DRAWINGS

- A. Comply with Section 01300.
- B. Product Data: Submit manufacturer's product data for each product and process specified as work of this section and incorporated into items of architectural woodwork during fabrication, finishing, and installation.
- C. Shop Drawings: Prior to fabrication, submit shop drawings indicating location, material quality and species, fabrication and assembly details.
- D. Samples: Submit samples, in full color and pattern ranges for Architect's selection, for solid surface counter top material.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver store, and handle architectural woodwork in a manner to prevent damage and deterioration. Protect all surfaces of items subject to damage during transit. Coordinate delivery and storage with trade providing installation.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Conform to Sections 100 and 200 of reference standard, except as modified below.
- B. Exposed Solid Wood for Opaque Finish: Birch.
- C. Solid Wood for Concealed Members: Douglas fir or Southern Pine.
- D. Exposed Plywood for Opaque Finish: Birch.
- E. Semi-exposed Plywood: Same as exposed plywood.
- F. Concealed Plywood: Douglas fir.
- G. Plywood Cores; use only plywood, particle board shall not be used.
- H. Fasteners And Anchors: Screws (F.S. FF-S-111), nails (F.S. FF-N-105), and anchors and expansion bolts of material, type, and finish required for each use and for secure anchorage
- I. Laminated Plastic: NEMA LD-3, standard quality, .050" thick (cabinets), and .040" thick (Countertops), Formica, Wilson ART, Nevamar, or approved equal. Colors as selected by the Architect from manufacturer's standard line.
- J. Adhesive: Complying with FS MMM-A-130 for contact adhesives. Type as recommended by laminate manufacturer to suit application.
- K. Grommets: 2" diameter rubber.
- L. Fasteners and anchors: Screws (F.S. FF-S-111), nails (F.S. FF-N-105) and anchors and expansion bolts of material, type, and finish required for each use and for secure anchorage.

2.2 FABRICATION AND MANUFACTURE

- A. Cabinets: Comply with specified sections of referenced standard, except do not use staples in exposed millwork construction.

2.3 COUNTERTOPS

- A. Laminated Plastic, waterproof glued to ¾" Douglas fir Exterior Grade plywood or, where structurally adequate, mounted on ¾" medium density particle board with waterproof adhesive recommended by the plastic manufacturer. Provide with coved back and post-formed exposed edges. Install laminated plastic in single pieces up to the limits of the sheet sizes, small patches will not be acceptable.

2.4 HARDWARE

- A. Cabinet Doors:
 - 1 pr. concealed hinges, Hafele or Stanley.
 - 1 pull, Stanley 4483-1/2, US26.
- B. Cabinet Drawers:
 - 1 pr. drawer slides, KV1300 (length as required)
 - 1 pull, Stanley 4483-1/2, US26.
- C. Adjustable Shelves: KV 255 with 256 clips.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas prior to installing.
- B. Prior to installation, examine shop fabricated work for completion, and complete work as required, including back priming and removal of packing.

3.2 INSTALLATION

- A. General:
 - 1. Install woodwork plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level (including countertops); and with no variations in flushness of adjoining surfaces.
 - 2. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
 - 3. Anchor woodwork to anchors or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork, and matching final finish where transparent finish is specified.
- B. Cabinets: Install without distortion so that doors and drawers will fit openings properly and be accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items.
- C. Countertops: Anchor securely to base units and other support systems.
- D. Shelving: Complete assembly of units and install at areas indicated, including hardware and accessories.

3.3 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

- A. Repair damaged and defective woodwork wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean hardware, lubricate and make final adjustments for proper operation.
- C. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop applied finishes to restore damaged or soiled areas.
- D. Protection: Provide final protection and maintain conditions necessary to ensure that the work will be without damage or deterioration at the time of acceptance.

END OF SECTION

SECTION 07110 - SHEET MEMBRANE WATERPROOFING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 SCOPE

- A. Provide 10 mil vapor barrier under concrete floor slabs.

1.3 SUBMITTALS

- A. Comply with Section 01300.
- B. Product Data: Submit product data and general recommendations from waterproofing materials manufacturer for types of materials required.
- C. Samples: Submit samples of sheet waterproofing and auxiliary materials as requested by Architect.
- D. Certificates: Include certificates substantiating that materials comply with specified requirements.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Obtain primary materials from a single manufacturer, to greatest extent possible. Provide secondary materials only as recommended by manufacturer of primary materials.
- B. Installer: Firm with not less than three years of successful experience in installations similar to requirements of this project and which is acceptable to manufacturer of primary waterproofing system manufacturers.

1.5 PROJECT CONDITIONS

- A. Substrate: Proceed with work after substrate construction, openings, and penetrating work have been completed.
- B. Weather: Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturers' recommendations and warranty requirements.

1.6 WARRANTY

- A. Submit written warranty, executed by manufacturers, agreeing to repair and replace sheet membrane waterproofing system that fails in materials and workmanship.
- B. Warranty period is five (5) years.

PART 2 – PRODUCTS

2.1 VAPOR BARRIER

- A. Provide 10 mil vapor barrier as called out on the Structural Drawings at all areas under concrete floor slabs.

2.3 AUXILIARY MATERIALS

- A. Flashing Materials: Except as otherwise indicated, provide types of flexible sheet material for flashing as recommended by waterproofing sheet manufacturer.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Comply with manufacturers instructions for surface preparation.
- B. Chip off projections where necessary for proper placement and adhesion of waterproofing sheet.

3.2 INSTALLATION

- A. Comply with manufacturer's instructions for handling and installation of sheet - waterproofing materials.
- B. Coordinate installation of waterproofing materials and associated work to provide complete system complying with combined recommendations of manufacturers and installers involved in work. Schedule installation to minimize period of exposure of sheet waterproofing materials.
- C. Seal projections through membrane and seal seams. Bond to vertical surfaces.
- D. Extend waterproofing sheet as indicated and finish under flashing. Seal exposed edges with mastic or sealant.

3.3 PROTECTION

- A. Provide for protection of completed membrane during installation of other materials or processes over membrane and throughout remainder of construction period.

END OF SECTION

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SECTION 07210 THERMAL INSULATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide building and perimeter insulation, complete.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Sound insulation; Section 09250.

1.4 SUBMITTALS

- A. Comply with Section 01300. Submit manufacturer's installation instructions for each type of insulation. Include data substantiating that materials comply with physical and thermal properties, and other requirements of specified insulation.

1.5 PRODUCT HANDLING

- A. Do not allow insulation materials to become wet or soiled. Comply with manufacturer's instructions for handling, storage, and protection during installation.

1.6 JOB CONDITIONS

- A. Do not proceed with the installation of insulation until the work which follows (and which conceals the insulation) is scheduled to follow immediately.

PART 2 - PRODUCTS

2.1 THERMAL INSULATION, BUILDING WALLS with METAL STUDS

- A. Batt Insulation: Owens/Corning, Manville, are the basis of design, or acceptable equal. 4" thick (R-13) and 6" thick (R-19) kraft-faced fiberglass insulation. Provide in 16" width, or in same width as stud spacing. Typical at exterior 6" stud walls.

2.2 THERMAL INSULATION, BUILDING WALLS with CONCRETE MASONRY

- A. At all 8" concrete block walls, which surround areas that are heated and/or cooled, provide loose fill masonry fill insulation, full height of masonry units, in all block voids, such as RYOLEX or equal, loose fill Perlite insulation, by Silbrico Corporation. Install as per manufacturer's recommendations.

2.3 MISCELLANEOUS MATERIALS

- A. Provide adhesive for bonding insulation, mechanical anchors, or other required items, as recommended by the insulation manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's instructions. Extend insulation full thickness over entire surface to be insulated. Cut and fit tightly around obstructions and fill voids with insulation.

END OF SECTION

SECTION 07274 COMMERCIAL BUILDING WRAP

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this Section.

1.02 SUMMARY

- A. Includes but not limited to:
 - 1. Furnish and install air barrier/weather resistant barrier over exterior of wall
sheathing at all locations regardless of whether or not indicated on drawings to protect exterior sheathing and interior walls.

1.03 RELATED SECTIONS

- A. Section 05400 – Cold Formed Metal Framing
- B. Section 06160 – Sheathing
- C. Section 07610 – Flashing and Sheet Metal

1.04 REFERENCES:

- A. American Society for Testing and Materials
- B. Technical Association of Pulp and Paper Industry
- C. American Association of Textile Chemists and Colorists

1.05 SUBMITTALS:

- A. General: Submit each item in this Article according to the conditions of the Contract and Division I Specifications Sections.
- B. Product Data: Submit product specifications, technical data and installation instructions of manufacturer equaling or exceeding those specified.

1.06 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Installer with successful experience in the installation of air barrier/secondary weather resistant barriers.
- B. Install job mock-up using specified air barrier/secondary weather resistant barrier with system of fastening and taping seams as per manufacturer's instructions. Obtain architect's and manufacturer's approval of system for appearance and workmanship standard.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Tyvek, by DuPont Weatherization Systems is the basis of design. Other manufacturers may be acceptable. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed. The Architect shall be the judge of the equivalency and acceptability of any substitutions.

2.02 MATERIALS

- A. A flash spun-bonded olefin, non-woven, non-perforated secondary weather resistant barrier.
- B. Performance Characteristics:
1. AATCC-127, Water Penetration Resistance, exceeded at 280.
 2. TAPPI T-460, Gurley Hill (sec/100cc) Air infiltration at >1500 seconds.
 3. ASTM E 96 Method B(g/m²-24hr.) Water vapor transmission of 200.
 4. TAPPI T-41D, Basis weight of 2.7 oz/yd.
 5. ASTM E96 Method B, Water Vapor Transmission, 28 perms.
 6. ASTM E1677, Air Retarder Material Standard Specification, Type I air barrier.
- C. Sealing Tape/Fasteners
1. DuPont Tyvek Tape, DuPont Weatherization Systems.
 2. For steel frame construction: DuPont Tyvek Wrap Cap Screws. DuPont Weatherization Systems. 1 5/8" rust resistant screws with 2" diameter plastic cap.
 3. For wood frame construction: DuPont Tyvek Wrap Caps, DuPont Weatherization Systems. Nails with large heads or plastic washers.
 4. Caulks or Sealants: polyurethane or elastomeric sealants
 - a. Available Products:
 1. OSI[®] Quad Pro-Series[®], solvent release butyl rubber sealant.
 2. DAP[®] Dynaflex 230[™].
 3. Other products as approved and recommended by air barrier/weather resistant barrier manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install Air Barrier over exterior side of exterior wall sheathing.
1. Install Air Barrier after sheathing is installed and before windows and doors are installed. Install lower level barrier prior to upper layers to ensure proper shingling of layers.
 2. Overlap Air Barrier at corners of building by a minimum of 12 inches.
 3. Overlap Air Barrier vertical seams by a minimum of 6 inches.
 4. Ensure barrier is plum and level with foundation, and unroll extending Air Barrier over window and door openings.
 5. Attach Air Barrier to wood, insulated sheathing board or exterior gypsum

with plastic cap nails every 12” to 18” on vertical stud line with wood stud framing, and screws with washers to metal stud framing. When attaching to masonry, use adhesive recommended by manufacturer.

6. Prepare window and door rough openings as follows:
 - a. Prepare each window rough openings by cutting a modified “I” pattern in the Air Barrier.
 1. Horizontally cut Air Barrier along bottom of header.
 2. Vertically cut Air Barrier down the center of window openings from the top of the window opening down to 2/3 of the way to the bottom of the window openings.
 3. Diagonally cut Air Barrier from the bottom of the vertical cut to the left and right corners of opening.
 4. Fold side and bottom flaps into window opening and fasten every 6 inches. Trim off excess.
 - b. Prepare each rough door opening by cutting a standard “I” pattern in the Air Barrier.
 1. Horizontally cut Air Barrier along bottom of door frame header and along top of sill.
 2. Vertically cut Air Barrier down the center of the door openings from the top of the door opening (header) down to the bottom of the door opening (sill).
 3. Fold side flaps inside around door openings and fasten every 6 inches. Trim off excess.
7. Tape all horizontal and vertical seams of Air Barrier with air barrier manufacturer’s tape.
8. Seal all tears and cuts in Air Barrier with air barrier manufacturer’s tape.

END OF SECTION

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SECTION 07410 – METAL WALL PANELS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Furnish all labor, materials, tools, equipment and services for all preformed metal wall panels, in accordance with the provisions of the Contract Documents.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Structural Steel; Section 05120
- B. Steel Joists; Section 05210
- C. Flashing and Sheet Metal; Section 07600

1.4 QUALITY ASSURANCE

- A. Applicable Standards:
 - 1. SMACNA: “Architectural Sheet Metal Manual”, Sheet Metal and Air Conditioning Contractors National Association, Inc.
 - 2. ASTM A 792-83-AZ50: Specifications for Steel Sheet, Aluminum-Zinc Alloy Coated (Galvanized) by the Hot Dip Process, General Requirements (Galvalume), American Society for Testing and Materials.

1.5 SUBMITTALS

- A. Comply with Section 01300.
- B. Shop Drawings: Submit shop drawings indicating method of erection, elevations and details, anticipated loads, flashing, roof curbs, vents, sealants, interfaces with all materials not supplied and proposed identification of component parts and their finishes. Do not proceed with manufacture prior to review of shop drawings. Do not use drawings prepared by the Architect for shop or erection drawings.

1.6 DELIVERY AND STORAGE

- A. Deliver metal wall panels to job site properly packaged to provide protection against transportation damage.
- B. Exercise extreme care in unloading, storing and erecting metal wall panels to prevent bending, warping, twisting and surface damage.
- C. Store all materials and accessories above ground on well skidded platforms. Store under waterproof covering. Provide proper ventilation of metal roof system to prevent condensation build-up between each panel. Do not store panels in contact with other materials that might cause staining, denting or other surface damage.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. MBCI Metal Roof and Wall Systems is the basis of design. Equivalent products of other manufacturers may be acceptable. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed. The Architect shall be the judge of the equivalency and acceptability of any substitutions.

2.2 METAL WALL PANEL TYPE 'A': OFFICE BUILDING ONLY

- A. MBCI Metal Roof and Wall Systems, or approved equal, Panel "FlexLoc", 22 gauge, 91/2" wide, (or as indicated on the drawings), with Galvalume Plus finish.
1. Length: Exterior wall panels shall run horizontally full length of building bay spacing (between columns) without joints. Center to center bay spacing is as indicated on the drawings.
 2. Accessories: Provide manuf. recommended screw fasteners at 16" o.c. Fasteners shall be concealed when installing FlexLoc panels. Provide panel closure strips, tape sealant and joint sealant as required for a water-proof installation. Refer to architectural drawings for flashing and closure trim items at top, bottom and sides of panel areas.

2.3 METAL WALL PANEL TYPE 'B': OFFICE BUILDING ONLY

- A. MBCI Metal Roof and Wall Systems, or approved equal, Panel "PBD" 22 gauge, 32" wide, 162 lb./sf. with Galvalume Plus finish.
1. Length: Exterior wall panels shall run horizontally full length of building bay spacing (between columns) without joints. Center to center bay spacing is as indicated on the drawings.
 2. Accessories: Provide manuf. recommended screw fasteners and neoprene washers at 16" o.c. horz. Vertical spacing of screws at manuf. recommendations. Provide panel closure strips, tape sealant and joint sealant as required for a waterproof installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A.
1. Inspect installed work of other trades and verify that such work is complete to a point where this work may continue.
 1. Verify that installation may be made in accordance with approved shop drawings and manufacturer's instructions.
 2. In the event of discrepancy, notify the Architect. Do not proceed with installation until discrepancies have been resolved.

3.2 INSTALLATION

- A. General:

1. Install metal panels so that they are weather tight, without waves, warps, buckles, fastening stresses or distortions.
2. Install metal panels in accordance with manufacturer's instructions and shop drawings.
3. Install metal panels plumb, level and straight with seams and ribs parallel, Conforming to design as drawn.

3.3 CLEANING

- A. Dispose of excess material and remove debris from site.
- B. Clean work in accordance with manufacturer's recommendations.
- C. Protect work against damage until final acceptance. Replace or repair to the satisfaction of the Architect, any work that becomes damaged prior to final acceptance.
- D. Touch up minor scratches and abrasions with touch-up paint supplied by the metal panel manufacturer.
- E. Do not allow panels or trim to come in contact with dissimilar metals such as copper, lead or graphite. Water run-off from these materials is also prohibited. This specifically includes condensate from roof top units, and a/c units.

END OF SECTION

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SECTION 07411 – STANDING SEAM METAL ROOF

Part - GENERAL

1.01 DESCRIPTION

A. General

1. Furnish all labor, material, tools, equipment and services for all preformed metal roofing as indicated, in accord with provisions of Contract Documents.
2. Completely coordinate with work of all other trades.
3. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and completion installation.
4. See Division 1 for General Requirements.

B. Related Work Specified Elsewhere:

1. Structural steel: Section 051200.
3. Flashing and sheet metal: Section 07600.

1.02 QUALITY ASSURANCE

A. Applicable Standards:

1. SMACNA: “Architectural Sheet Metal Manual”, Sheet Metal and Air Conditioning Contractors National Association, Inc.
2. AISC: “Steel Construction Manual”, American Institute of Steel Construction.
3. AISI: “Cold Form Steel Design Manual”, American Iron and Steel Institute (1996 Edition).
4. UL580: “Tests for Uplift Resistance of Roof Assembles”, Underwriters Laboratories, Inc.
5. ASTM E-283: “Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems”, American Society for Testing and Materials.
6. ASTM E-331: “Standard Test Method for Water Penetration Through Exterior Metal Roof Panel Systems”, American Society for Testing and Materials.
7. ASTM A 792-83-AZ50 (Painted) & ASTM A792-83-AZ55 (Bare Galvalume Plus[®])”, American Society for Testing and Materials.
8. ASTM E 1514-93: “Standard Specification for Structural Standing Seam Steel Roof Panel Systems”, American Society for Testing and Materials.

B. Manufacturer’s Qualifications:

1. Manufacturer has a minimum of five years experience in manufacturing metal roof systems of this nature. Panels specified in this section shall be produced in a permanent manufacturing facility or on manufacturing owned and operated roll-former equipment.

C. Installation Contractor's Qualifications:

1. Installation contractor shall be an approved installer, certified by the manufacturer before the beginning of installation of the metal roof system.
2. Provide five references from five different architects or building owners for projects that have been in service for a minimum of two years, stating satisfactory performance by the installation contractor.

D. Pre-Installation Conference:

1. Prior to installation of roofing system, conduct a pre-installation conference at the project site.
2. Attendance: Owner, Architect, Contractor, Project Superintendent and Installer.
3. Agenda:
 - a. Roofing details and agenda.
 - b. Critical work sequencing and review of phasing plan.
 - c. Inspection sequencing.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

A. Performance Testing:

1. Metal roof system must be tested in accordance with **Underwriters Laboratories, Inc. (UL) Test Method 580** "Tests for Uplift Resistance of Roof Assemblies".
2. Metal roof system must meet the air infiltration requirements of ASTM E-283 when tested with a (20 PSF).
3. Metal roof system must meet the water penetration requirements of ASTM E-331 when tested with a (20 PSF) pressure differential with no uncontrollable water leakage when five gallons per hour of water is sprayed per square foot of roof area.

1.04 DESIGN REQUIREMENTS

A. Roof Design Loads:

1. Design criteria shall be in accordance with the most current version of the applicable local building code.
2. Dead Loads
 - a. The dead load shall be the weight of the SSMR system. Collateral loads, such as sprinklers, mechanical and electrical systems, and ceilings shall not be attached to the panels.
3. Live Loads
 - a. The panels and concealed anchor clips shall be capable of supporting a minimum uniform live load of 20 psf.
4. Roof Snow Loads
 - a. The design roof snow loads shall be as shown on the contract drawings.
5. Wind Loads
 - a. The design wind uplift pressure for the roof system shall be as shown on the contract drawings.

6. Thermal Loads
 - a. Roof panels shall be free to move in response to the expansion and contraction forces resulting from a total temperature range of 100 degrees F during the life of the structure.

1.05 SUBMITTALS

A. Shop Drawings:

1. Submit complete shop drawings and erection details, approved by or supplied by the metal roofing manufacturer, to the architect for review. Do not proceed with manufacture of roofing materials prior to review of shop drawings and field verification of all dimensions. Do not use drawings prepared by the architect for shop or erection drawings.
2. Shop drawings shall be reviewed and stamped by a Professional Engineer licensed in the State of Arkansas.

B. Performance Tests:

1. Submit certified test results by a recognized testing laboratory or manufacturer's lab (witnessed by a professional engineer) in accordance with specified test methods for each panel system.

C. Samples:

1. Submit samples and color chips for all proposed finishes.
 - a. Submit one 8-inch long sample of panel, including clips.

D. Warranties:

1. Finish Warranty:

- a. Panel manufacturers' 20-year warranty against structural defects or corrosion and the 20 year warranty on finish durability.

2. Weathertightness Warranty:

- a. Subcontractor's 5 year guarantee on workmanship and leaks.
- b. Manufacturer's standard 20 year Weathertight Warranty.

F. Test Reports:

1. Submit Test Reports showing that metal panels have been tested in accordance with the Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference of ASTM E 1592-95. Metal roof system must meet the air infiltration requirements of ASTM E 1680-95 when tested with 20 PSF.
2. Submit Test Reports showing that metal panels meet the water penetration requirements of ASTM E 1646-95 when tested with a 20 PSF pressure differential with no uncontrollable water leakage when five gallons per hour of water is sprayed per square foot of roof area.

G. Metal Roof System Fabrication Certification:

1. Submit a letter from the metal roof system manufacturer certifying the panels have been produced in a manner to meet this specification.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. Deliver metal roof system to job site properly packaged to provide protection against transportation damage.

B. Handling:

1. Exercise extreme care in unloading, storing and erecting metal roof system to prevent bending, warping, twisting and surface damage.

C. Storage:

1. Store bundled sheets off the ground sufficiently high enough to allow air circulation beneath bundle and to prevent rising water from entering bundle. Slightly elevate one end of bundle. Prevent rain from entering bundle by covering with tarpaulin, making provision for air circulation between draped edges of tarpaulin and the ground.

1.07 WEATHERTIGHTNESS WARRANTY

- A.** The Contractor shall provide to the Owner, a 20 warranty signed by the roofing manufacturer of the Standing Seam Roof System.
- B.** An employee of the manufacturer shall inspect the installation at least twice before warranty is issued.

PART 2 – PRODUCTS

2.01 MATERIALS

- A.** MBCI is the basis of design. Other manufacturers, such as Pederson and McElroy may be equal and acceptable. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed. The Architect shall be the judge of the equivalency and acceptability of any substitutions.
- B. Metal roof system profile:**
 1. LoKSeam/ 16” Coverage, 1-3/4” high x 3/8” inch wide rib x 16” wide panel.
- C. Metal roof system style:**
 1. Vertical leg, concealed fastener, standing seam, utilizing male and female rib configurations, with factory applied **hot metal mastic** in female rib, continuously locked together by an electrically powered mechanical seaming device during installation.
- D. Gauge:**
 1. Roof panels shall be 24 gauge galvanized sheet steel.

E. Substrate:

1. Galvalume® steel sheet, minimum yield of 50,000 PSI.

F. Clips:

1. One piece fixed clip, 22 gauge, with factory-applied mastic. (#UL90 rated-Underwriters Laboratories).
2. Two piece floating clip, 18 gauge base, 24 gauge top, with factory applied mastic.
3. Manufacturer shall provide documentation for clip performance, ability to accommodate thermal movement.

G. Texture:

1. Panels shall be have a smooth surface texture.

H. Finish:

1. Galvalume Plus finish on sheet steel.

2.02 MISCELLANEOUS MATERIALS

A. Fasteners:

1. All self-tapping/self-drilling fasteners, bolts, nuts, self-locking rivets and other suitable fasteners shall be designed to withstand specified design loads.
2. Use long life fasteners for all interior and exterior metal roof system applications.
3. Provide fasteners with a factory applied coating in a color to match metal roof system application.
4. Provide neoprene washers under heads of exposed fasteners.
5. Locate and space all exposed fasteners in a true vertical and horizontal alignment. Use proper torque settings to obtain controlled uniform compression for a positive seal without rupturing the neoprene washer.

B. Accessories:

1. Provide all components required per the metal roof system manufacturer's approved shop drawings for a complete metal roof system to include panels, panel clips, ridge, closures, and any other required items.
 - a. All outside closures will be fabricated from material of the same gauge, finish and color as the panels.
 - b. All tape seal is to be a pressure sensitive, 100 percent solids, polyisobutylene compound sealing tape with a release paper backing. Provide permanently elastic, non-sagging, non-toxic, non-staining tape seal approved by the metal roof system manufacturer.
 - c. All tube sealant is to be a one-part elastomeric polyurethane sealant approved by the metal roof system manufacturer.

2.03 FABRICATION

- A. Where possible roll form panels in continuous lengths, full length of detailed runs.
- B. Fabricate trim/flashing and accessories to detailed profiles.
- C. Fabricate trim/flashing from same material as panel.
- D. Installer owned or operated roll forming equipment will not be acceptable.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

A. Examination:

1. Inspect installed work of other trades and verify that such work is complete to a point where this work may continue.
2. Verify that installation may be made in accordance with approved shop drawings and manufacturer's instructions. This specifically includes verifying that secondary structural members and/or decking are installed to meet UL and building code requirements. Coordinate with metal roof system manufacturer to insure that reduced clip spacings at eave, rake, ridge and corner areas are accommodated.

B. Discrepancies:

1. In event of discrepancy, notify the architect.
2. Do not proceed with installation until discrepancies have been resolved.

3.02 INSTALLATION

- A. Install metal roof system so that it is weathertight, without excessive warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.
- B. Install metal roof system in accordance with manufacturer's instructions and shop drawings.
- C. Provide concealed anchors at all panel attachment locations.
- D. Install panels plumb, level and straight with seams and ribs parallel, conforming to design as indicated.

3.04 CLEANING, PROTECTION

- A. Dispose of excess materials and remove debris from site.
- B. Clean work in accordance with manufacturer's recommendations.
- C. Protect work against damage until final acceptance. Replace or repair to the satisfaction of the architect (owner), any work that becomes damaged prior to final acceptance.
- D. Touch up minor scratches and abrasions with touch up paint supplied by the metal roof system manufacturer.
- E. **Do not allow panels or trim to come in contact with dissimilar metals such as copper, lead, or graphite. Water run-off from these materials is also prohibited.**

END OF SECTION

SECTION 07900 - JOINT SEALANTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Completely close with sealant all joints. Include joints around frames of doors, windows, or other openings in exterior walls, flooring joints, joints at penetrations of walls, decks, and floors by piping and other services and equipment, joints between items of equipment and other construction, and other joints indicated or specified to be sealed.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Aluminum Entrances And Storefront; Section 08410.
- B. Glazed Curtain Walls; Section 08900.
- C. Highway Department Standards for Roadways
- D. Modified Bitumen Roofing; Section 07550

1.4 QUALITY ASSURANCE

- A. Obtain elastomeric materials only from manufacturer who will, if required, send a qualified technical representative to project site, for the purpose of advising the installer of proper procedures and precautions for the use of the material.

1.5 SUBMITTALS

- A. Comply with Section 01300.
- B. Product Data: Submit manufacturer's specifications, recommendations, and installation instructions for each type of sealant and miscellaneous materials. Include letter of certification, or certified test laboratory reports indicating that each material complies with the requirements and is intended for the applications indicated.
- C. Samples: Submit 12" long sample of each color required (except black) for each type of sealant exposed to view. Samples will be viewed for color only.
- D. Provide Compatibility Statement & Certification for each type of sealant.

1.6 JOB CONDITIONS

- A. Examine joint surfaces, backing, and anchorage of units forming sealant rabbet. Do not proceed with work until unsatisfactory conditions have been corrected.
- B. Do not proceed with installations of sealants under adverse weather conditions, or when temperatures are above or below manufacturer's recommended limitations for installation. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.
- B. Provide in colors as selected by Architect from manufacturer's standard colors.

2.2 ELASTOMERIC JOINT SEALANTS

- A. Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated with complies with ASTM C 920 requirements, including those for Type, Grade Class, and Uses.
 - 1. Two-Or-More Component Nonsag Urethane Sealant: Type M, Grade NS, Class 25. Tremco "Dymeric", Sonneborn "Sonolastic NP 2", Bostik "Chem-Calk 500", Pecora "Dynatrol II", or Mameco "Vulkem 922".
 - 2. Two-Component Pourable Urethane Sealant: Type M, Grade P, Class 25. Tremco "THC 900", Sonneborn "Sonolastic SL2", Bostic "Chem-Calk 550", Pecora "NR-200 Urexpan", or Mameco "Vulkem 245".
 - 3. One-Component Mildew-Resistant Silicone Sealant: Type S, Grade NS, Class 25. GE "SCS 1702", Dow Corning "786", Tremco "Proglaze White", or Pecora "898".
 - 4. Glazing system perimeter framing; Dow Silicone 795.

2.3 ACRYLIC EMULSION SEALANT

- A. One component, nonsag, acrylic, paintable, complying with ASTM C 834.
 - 1. Tremco "Acrylic Latex 834", Sonneborn "Sonolac", Pecora Corp. "AC-20", or Bostik "Chem-Calk 600".

2.4 MISCELLANEOUS MATERIALS

- A. Joint Cleaner: Type of joint cleaning compound recommended by sealant manufacturer for joint surfaces to be cleaned.
- B. Joint Primer/Sealer: Type recommended by the sealant manufacturer for the joint surfaces to be primed or sealed.
- C. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to the substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape wherever applicable.
- D. Sealant Backer Rod: Compressible rod stock closed cell polyurethane foam. Provide size and shape of rod which will control joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back side, and provide a highly compressible backer to minimize the possibility of sealant extrusion when joint is compressed.

PART 3 - EXECUTION

3.1 JOINT TYPES AND USAGES

- A. Acrylic Emulsion Sealant: All interior joints except joints with metal, aluminum, ceramic tile and wet work.
- B. Urethane Sealants: Multi-component. All exterior joints and interior joints with aluminum or metal. Use minimum 35 Shore A hardness urethane sealant for horizontal joints subject to pedestrian and vehicular traffic.
- C. Silicone Sealants: Use mildew resistant silicone sealant at ceramic tile, sinks, plumbing fixtures and other wet work.

3.2 JOINT SURFACE PREPARATION

- A. Clean joint surfaces immediately before installation of sealant. Remove dirt, insecure coatings, moisture, and other substances which would interfere with bond of sealant.
- B. For elastomeric sealants, do not proceed with installation of sealant over joint surfaces which have been painted, lacquered, waterproofed or treated with water repellent or other treatment or coating. Remove coating or treatment from joint surfaces before installing sealant.
- C. Etch concrete and masonry joint surfaces to remove excess alkalinity. Etch with 5% solution of muriatic acid; neutralize with diluted ammonia solution, rinse thoroughly with water and allow to dry before sealant installation.
- D. Roughen joint surfaces on vitreous coated and similar non-porous materials, wherever sealant manufacturer's data indicates lower bond strength than for porous surfaces. Rub with fine abrasive cloth or wool to produce a dull sheen.

3.3 INSTALLATION

- A. Comply with sealant manufacturer's printed instructions, except where more stringent requirements are indicated or specified and except where manufacturer's technical representative directs otherwise.
- B. Prime or seal the joint surfaces wherever shown or recommended by the sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.
- C. Install sealant backer rod for liquid elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown.
- D. Install bond breaker tape wherever shown and wherever required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.
- E. Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of the joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.
- F. Install sealants to depths as shown or, if not shown, as recommended by the sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead.

1. For sidewalks and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to a depth equal to 75% of joint width, but neither more than 5/8" deep nor less than 3/8" deep.
 2. For normal moving joints sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.
 3. For joints sealed with non-elastomeric sealants, fill joints to a depth in the range of 75% to 125% of joint width.
- G. Do not allow sealants to overflow or spill onto adjoining surfaces. Use masking tape or other precautionary devices to prevent staining of adjoining surfaces, by either the primer/sealer or the sealant.
- H. Remove excess and spillage of sealants promptly as the work progresses. Clean the adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage, without damage to the adjoining surfaces of finishes.

3.4 CURE AND PROTECTION

- A. Cure sealants in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength, and surface durability. Cure and protect sealants in a manner which will minimize increases in modulus of elasticity and other accelerated aging effects. Replace or restore sealants which are damaged or deteriorated during construction period.

END OF SECTION

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

- B. Related Sections:

1. Division 01 Section "General Conditions".
2. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
3. Division 08 Section "Flush Wood Doors".
4. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
5. Division 08 Section "Door Hardware".
6. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

- C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of anchorages, joints, field splices, and connections.
 6. Details of accessories.
 7. Details of moldings, removable stops, and glazing.
 8. Details of conduit and preparations for power, signal, and control systems.
- D. Samples for Verification:
 1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.
 - 1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
 - 2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
 - 3. Smoke Control Door Assemblies: Comply with NFPA 105.
 - a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
 - D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
 - E. Energy Efficient Exterior Openings: Comply with minimum thermal ratings, based on ASTM C1363. Openings to be fabricated and tested as fully operable, thermal insulating door and frame assemblies.
 - 1. Thermal Performance (Exterior Openings): Independent testing laboratory certification for exterior door assemblies being tested in accordance with ASTM C1363 and meet or exceed the following requirements:
 - a. Door Assembly Operable U-Factor and R-Value Ratings: U-Factor 0.37, R-Value 2.7, including insulated door, thermal-break frame and threshold.
 - 2. Air Infiltration (Exterior Openings): Independent testing laboratory certification for exterior door assemblies being tested in accordance with ASTM E283 to meet or exceed the following requirements:
 - a. Rate of leakage of the door assembly shall not exceed 0.25 cfm per square foot of static differential air pressure of 1.567 psf (equivalent to 25 mph wind velocity).
 - F. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
 - 1. CECO Door Products (C).
 - 2. Curries Company (CU).
 - 3. Pioneer Industries (PI).

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.
- B. Exterior Doors (Energy Efficient): Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A924 A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model, ANSI/SDI A250.4 for physical performance level, and HMMA 867 for door construction.
 - 1. Design: Flush panel.
 - 2. Core Construction: Foamed in place polyurethane and steel stiffened laminated core with no stiffener face welds, in compliance with HMMA 867 "Laminated Core".
 - a. Provide 22 gauge steel stiffeners at 6 inches on-center internally welded at 5" on-center to integral core assembly, foamed in place polyurethane core chemically bonded to all interior surfaces. No stiffener face welding is permitted.
 - b. Thermal properties to rate at a fully operable minimum U-Factor 0.37 and R-Value 2.7, including insulated door, thermal-break frame and threshold.
 - c. Kerf Type Frames: Thermal properties to rate at a fully operable minimum U-Factor 0.38 and R-Value 2.6, including insulated door, kerf type frame, and threshold.
 - 3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053 inch - 1.3-mm) thick steel, Model 2.
 - 4. Vertical Edges: Vertical edges to be mechanically interlocked with hairline seam. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
 - 5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
 - 6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".
 - 7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- C. Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with

requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
 2. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
 3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
 4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
 5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- D. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Design: Flush panel.
 - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
 2. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
 3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
 4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
 5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- E. Manufacturers Basis of Design:
1. Curries Company (CU) - Polystyrene Core - 707 Series.
 2. Curries Company (CU) - Energy Efficient - 777 Trio-E Series.

2.4 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Thermal Break Frames: Subject to the same compliance standards and requirements as standard hollow metal frames. Tested for thermal performance in accordance with NFRC 102, and resistance to air infiltration in accordance with NFRC 400. Where indicated provide thermally broken frame profiles available for use in both masonry and drywall construction. Fabricate with 1/16" positive thermal break and integral vinyl weatherstripping.

- C. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
 - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - 2. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.
 - 3. Manufacturers Basis of Design:
 - a. CECO Door Products (C) – Thermal Break TQB Series.
 - b. Curries Company (CU) – M Series.
 - c. Curries Company (CU) – Thermal Break TQ Series.

- D. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
 - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
 - 3. Manufacturers Basis of Design:
 - a. Curries Company (CU) - M Series.

- E. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

- F. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.

- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 LOUVERS

- A. Metal Louvers: Unless otherwise indicated provide louvers to meet the following requirements.
 - 1. Blade Type: Vision proof inverted V or inverted Y.
 - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

- B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.
 - 1. Manufacturers: Subject to compliance with requirements, provide louvers to meet rating indicated.
 - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.7 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.
- D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.8 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.9 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
 - 1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.

2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
9. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Two anchors per jamb up to 60 inches high.
 - 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
 - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.

- 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
 11. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.
- E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.10 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
 - 1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

3.5 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
 - 1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

END OF SECTION 081113

SECTION 08200 - WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide wood doors, complete. Type of doors required are solid core flush wood door with wood veneer faces, and doors with solid stock stiles and glass lites of various sizes.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Metal frames; Section 08110.
- B. Hardware; Section 08700.

1.4 SUBMITTALS

- A. Comply with Section 01300.
- B. Product Data: Submit door manufacturer's product data for each type of door, including details of core and edge construction, trim for openings, and veneer sample.
- C. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, and other pertinent data.
- D. Warranty: Submit executed warranty.

1.5 QUALITY ASSURANCE

- A. Quality Standards: Comply with the following standards:
- B. Architectural Woodwork Institute (AWI) "Architectural Woodwork Quality Standards", including Section 1300 "Architectural Flush Doors" for grade of door, core construction, finish and other requirements.
- C. Fire-Rated Doors: Provide doors which comply with the requirements of ASTM E 152 and which are labeled and listed for ratings indicated by U.L., Warnock-Hersey, or other testing and inspection agency acceptable to authorities having jurisdiction.
- D. Manufacturer: Obtain doors from a single manufacturer.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with requirements of referenced standards and recommendations of WDMA pamphlet "How to Store, Handle, Finish, Install, and Maintain Wood Doors", as with manufacturer's instructions.
- B. Identify each door with numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

1.7 WARRANTY

- A. Submit written agreement on door manufacturer's standard form, signed by manufacturer, installer, and Contractor, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or that show telegraphing of core construction in face veneers, or do not conform to tolerance limitations of referenced standards. Warranty shall be in effect for lifetime of installation for solid core interior doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Marshfield is the basis of design, Equivalent products of Graham, Algoma, Eggers or Oshkosh Door Co. are acceptable. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed. The Architect shall be the judge of the equivalency and acceptability of any substitution.

2.2 INTERIOR FLUSH WOOD DOORS

- A. Refer to Door Schedule for size and location.
- B. Solid Core Doors For Transparent Finish:
 - 1. WDMA Grade: Premium.
 - 2. Faces: Plain Sliced Red Oak.
 - 3. Veneer Grade: "A"
 - 4. Veneer Match: Book Matched.
 - 5. Veneer Face Assembly: Center Balanced Matched.
 - 6. Construction: PC-5
 - 7. Vertical Edges: Stiles to be veneered with same species as the face.
- C. Fire-Rated Solid Core Doors:
 - 1. Faces And WDMA Grade: Match non-rated doors.
 - 2. Construction: Manufacturer's standard core construction to provide fire resistance rating indicated.
 - 3. Edge Construction: Provide manufacturer's standard laminated edge construction for improved screw-holding capability and split resistance as compared to edges composed of single layer of treated lumber.

2.3 ACCESSORIES

- A. Moldings For Light Openings: Manufacturer's standard beveled solid stock wood molding, in species to match face veneer.

2.4 FABRICATION

- A. Fabricate flush wood doors to produce doors complying with following requirements:
- B. Factory-prefit and premachine doors to fit frame opening sizes indicated with the following uniform clearances and bevels.
 - 1. Comply with tolerance requirements of WDMA for prefitting. Comply with final hardware schedules and door frame shop drawings and with hardware templates.
 - 2. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory premachining.

- C. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kinds of doors required.
 - 1. Light Openings; Trim openings with moldings of material and profile specified and indicated.

2.5 FINISH OF WOOD DOORS

- A. Finish of Wood Doors: Doors to be pre-finished at factory. Finish as selected by Architect from manufacturer's standard selection of wood finishes during the submittal phase of the Project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and door frames prior to hanging to:
 - 1. Verify that frames comply with indicated requirements for type, size, and location, and swing characteristics, and, frames have been installed with plumb jambs and level heads.
 - 2. Verify that doors are free of defects that could cause their rejection.

3.2 INSTALLATION

- A. Install wood doors to comply with manufacturer's instructions referenced AWI standards, NFPA for fire-rated doors, and as specified.
- B. Condition doors to average prevailing humidity in installation area prior to hanging.
- C. Fit to frame for uniform clearance at each edge.
- D. Hardware: For installation refer to Section 08700.
- E. Veneer panel installation is specified in Section 06400.

3.3 ADJUSTING AND PROTECTION

- A. Rehang or replace doors which do not swing or operate freely, as directed by Architect.
- B. Take protective measures to assure that wood doors will be without damage or deterioration at time of substantial completion.

END OF SECTION

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SECTION 08331 – OVERHEAD ROLLING SERVICE DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following types of overhead coiling doors:
 - 1. Motorized, Insulated galvanized metal coiling overhead doors.
 - 2. Manually operated insulated, galvanized metal coiling overhead door.
- B. Related Sections include the following:
 - 1. Division 8 Section "Door Hardware" for lock cylinders and keying.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide overhead coiling doors capable of withstanding the effects of gravity loads and loads without evidencing permanent deformation of door components.
- B. Wind Loading: Supply doors to withstand up to 20 psf maximum wind load.
- C. Door Slat Material: Galvanized metal, with flame spread Index of 0 and a smoke developed index of 10 as tested per ASTM E84.
- D. Minimum sound transmission class (STC) rating of 26 as per ASTM E 90.
- E. Minimum R-value of 8.0 (U-factor of 0.125) as calculated using ASHRAE Handbook of Fundamentals.
- F. Insulation to be CFC Free with an Ozone Depletioin Potential (ODP) rating of zero.

1.4 SUBMITTALS

- A. Product Data: For each type and size of overhead doors and accessory. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes. Provide roughing-in diagrams, operating instructions, and maintenance information. Include the following:
 - 1. Setting drawings, templates, and installation instructions for built-in or embedded anchor devices.
- B. Shop Drawings: For special components and installations not dimensioned or detailed in manufacturer's data sheets. **DO NOT SUBMIT SHOP DRAWINGS UNTIL THE SITE CONDITIONS HAVE BEEN VERIFIED BY THE INSTALLER. SHOW AND ADDRESS ALL SPECIAL CONDITIONS ON THE SHOP DRAWING SUBMITTALS.**
- C. Samples for Verification: Of each type of exposed finish required, prepared on Samples of size indicated below and of same thickness and material indicated for

Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.

- D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- E. Provide manufacturer's standard written warranties for each door and grille installed.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who is an authorized representative of the overhead door manufacturer for both installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain overhead doors through one source from a single manufacturer.
 - 1. Obtain operators and controls from the overhead roll-up door manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Overhead Door Corporation, P.O. Box 809046 Dallas, Texas 75380. (1-800-887-3667. Overhead Door is basis of design. Other door companies must be judged to be equal and acceptable after evaluation by the Architect. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed.

2.2 DOOR SERIES

Overhead Door Series 620, flat slat overhead coiling door, face of wall mounted. Motorized.

2.3 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtain: Fabricate overhead door curtain of interlocking slats, designed in a continuous length for width of door without splices. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
 - 1. Galvanized metal door curtain slats. Front slats shall be fabricated of 22GA. aluminum. Back slat shall be of 22GA. Galvanized metal. Slat cavity shall be filled with CFC-free foamed-in-place, polyurethane insulation.
- B. Finish: factory painted galvanized metal.
- C. Windload Design: 20PSF
- D. Bottom Bar: Consisting of 2 galvanized angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch thick. See Hardware Schedule for additional information regarding required locks. The bottom bar must be designed to lock both door jambs from one lock device.
- E. Curtain Jamb Guides: Fabricate curtain jamb guides of three steel angles, with minimum thickness of 3/16". Guides shall be weatherstripped with a vinyl weather seal at each jamb, on the exterior side.

- F. Counterbalance: Helican torsion spring type designed for standard 20,000 cycle life design. Counterbalance shall be housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03" per foot of span. Counterbalance shall be adjustable by means of an adjusting wheel.

2.4 HOODS AND ACCESSORIES

- A. Hood: Form to entirely enclose roll-up curtain and operating mechanism at opening head and act as weatherseal. Contour to suit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Provide closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting projecting beyond wall face. Provide intermediate support brackets as required to prevent sag.
 - 1. Fabricate hood for galvanized metal door of not less than 22 gauge, with factory painted finish.
 - 2. Shape: Round.
- B. Locking: Doors shall not have separate locks. They will function by either the push button controller on the interior, or the remote controls from the exterior.

2.5 MOTORIZED DOOR OPERATORS

- A. Provide model RSX motor, bench mounted configuration at side of each door. Voltage to the doors shall be 208 three phase.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General: Install door and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports according to Shop Drawings, manufacturer's written instructions, and as specified.

3.2 ADJUSTING

- A. Lubricate bearings and sliding parts; adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

END OF SECTION 08331

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SECTION 08410 - ALUMINUM FRAMING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply To this Section.

1.2 SCOPE

- A. Provide the various types of aluminum framing systems complete.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Glass and glazing requirements; Section 08800.
- B. Aluminum Swinging Doors, Section 08901
- C. Section 07900 for sealant installation procedures.

1.4 SUBMITTALS

- A. Comply with Section 01300.
- B. Shop Drawings: Submit shop drawings for the fabrication and installation of framing and associated components. Include wall elevations at 1/2 scale, and half size detail sections of every typical composite member. Show anchors, joint system, expansion provisions, glazing and sealing details, finishes.
- C. Warranty: Submit executed warranty.
- D. Samples: Submit sample of finish and glass specified for Architect's verification.
- D. Product data for sealants and compatibility statement, and manufactures' approval of installer.

1.5 WARRANTY

- A. Submit a warranty signed by the manufacturer, contractor, and installer, agreeing to replace glazing which fail in materials and workmanship within 2 years of the date of acceptance. Failure of materials or workmanship shall include, but not be limited to, excessive leakage of air infiltration, excessive deflections, delamination of panels, deterioration of finish or metal in excess of normal weathering, and defects in accessories, and other components of the work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Kawneer is specified, as basis of design. Equivalent systems of Oldcastle, US Aluminum, and Efco are acceptable. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed. The Architect shall be the judge of the equivalency and acceptability of any substitution requests.
- B. Sealant System: Dow 795 silicone with closed cell backer rod.

2.2 FRAMING

System : (Exterior), Kawneer TriFab VG 451, 2" X 4-1/2" framing members designed
AL-1 for front plane glazing applications, with 1" insulated glass units. Finish of
aluminum shall be clear anodized.

System : (Interior), Kawneer TriFab 450, center plane, aluminum glass setting system,
AL-2 1-3/4" x 4-1/2" for 1/4" center plane glazing. Kawneer 350 medium stile alum.
doors where shown, or wood doors.

2.3 FINISH

- A. Kawneer #14 Clear Anodized Aluminum, Aluminum Association Specification, AA-M12C22A41, Architectural Class 1. Anodic finishes shall meet the requirements of the Aluminum Association DAF-45 and AAMA 611 for anodized architectural aluminum.

2.4 OTHER MATERIALS

- A. Provide all other materials, not specifically described but required for a complete, weathertight, and proper installation of framing systems, subject to acceptance by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in compliance with manufacturer's specifications, recommendations and final shop drawings.
- B. Set units plumb, level and true to line, without warp or rack of framing. Anchor securely in place. Secure to structure with non-staining, non-corrosive shims, anchors, fasteners, spacers, and fillers. Use care in erection so as not to mar, abrade, or stain finished surfaces.
 - 1. Seal frames with an approved sealant in color to match frames, making a neat fully weatherproof job. Refer to Section 07900, and comply with requirements of that section. Clean and prime surfaces as required by manufacturer for sealant adhesion.
- C. Paint concealed contact surfaces of dissimilar materials, including metal in contact with masonry or concrete work, with heavy coating of bituminous paint, or provide other separation as recommended by manufacturer.

3.2 CLEANING

- A. Clean metal surfaces promptly after installation, exercising care to avoid damage to coatings.
- B. Clean glass surfaces after installation. Remove excess glazing and sealant compounds, dirt, and other substances.

3.3 PROTECTION

- A. Institute protective measures required throughout remainder of construction period to ensure that units will be without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION

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SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 08 Section "Hollow Metal Doors and Frames".
 - 2. Division 08 Section "Flush Wood Doors".
 - 3. Division 08 Section "Aluminum-Framed Entrances and Storefronts".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series.
 - 2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
 - 3. ANSI/UL 294 - Access Control System Units.
 - 4. UL 305 - Panic Hardware.

5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- D. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
- F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
1. Function of building, purpose of each area and degree of security required.
 2. Plans for existing and future key system expansion.
 3. Requirements for key control storage and software.
 4. Installation of permanent keys, cylinder cores and software.
 5. Address and requirements for delivery of keys.

- H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 - 3. Review sequence of operation narratives for each unique access controlled opening.
 - 4. Review and finalize construction schedule and verify availability of materials.
 - 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- I. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Five years for exit hardware.
 - 3. Twenty five years for manual overhead door closer bodies.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 - 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
 - 5. Manufacturers:
 - a. Bommer Industries (BO).
 - b. McKinney (MK).
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:
 - a. Bommer Industries (BO).
 - b. Pemko (PE).

2.3 DOOR OPERATING TRIM

- A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 5. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Rockwood (RO).

2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
 1. Manufacturers:
 - a. Match Existing.
- C. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
 1. Threaded mortise cylinders with rings and cams to suit hardware application.
 2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
 4. Tubular deadlocks and other auxiliary locks.
 5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 6. Keyway: Match Facility Standard.

- D. Interchangeable Cores: Provide small format interchangeable cores as specified, core insert, removable by use of a special key; usable with other manufacturers' cylinders.
- E. Patented Cylinders: ANSI/BHMA A156.5, Grade 1 Certified Products Directory (CPD) listed cylinders employing a utility patented and restricted keyway requiring the use of a patented key. Cylinders are to be protected from unauthorized manufacture and distribution by manufacturer's United States patents.
 - 1. Patented key systems shall not be established with products that have an expired patent. Expired systems shall only be specified and supplied to support existing systems.
 - 2. Manufacturers:
 - a. Medeco (MC) - X4.
- F. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
 - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 - 3. Existing System: Field verify and key cylinders to match Owner's existing system.
- G. Key Quantity: Provide the following minimum number of keys:
 - 1. Change Keys per Cylinder: Three (3).
 - 2. Master Keys (per Master Key Level/Group): Five (5).
 - 3. Construction Keys (where required): Ten (10).
 - 4. Construction Control Keys (where required): Two (2).
 - 5. Permanent Control Keys (where required): Two (2).
- H. Construction Keying: Provide temporary keyed construction cores.
- I. Key Registration List (Bitting List):
 - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 - 2. Provide transcript list in writing or electronic file as directed by the Owner.

2.5 KEY CONTROL

- A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
 - 1. Manufacturers:
 - a. Lund Equipment (LU).

- b. MMF Industries (MM).
- c. Telkee (TK).
- d. No Substitution.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.
 - 1. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.13 requirements to 14 million cycles or greater.
 - 2. Where specified, provide status indicators with highly reflective color and wording for “locked/unlocked” or “vacant/occupied” with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1” x 0.6” with a curved design allowing a 180 degree viewing angle with protective covering to prevent tampering.
 - 3. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ML2000 Series.
 - b. No Substitution.
- B. Multi-Point Locksets, Security: ANSI/BHMA A156.37, Certified Products Directory (CPD) listed three-point deadbolt locking devices are engineered for use on inswing and outswing door applications. Concealed, fortified steel construction secures the door to the frame at top, bottom, and center latching points. All three latching points shall be activated with one single motion when the device is closed and retracted with one single motion for egress. Devices shall come in mechanical and electro-mechanical functions as specified.
 - 1. The locking system device shall be a part of an integrated door, frame, and hardware assembly listed to the following standards:
 - a. ANSI-BHMA listed to A156.37 Grade 1 for multi-point locks:
 - 1) Lever torque to retract all bolts less than 28 in.lb.
 - 2) Cycle tested to 800,000 cycles.
 - b. Meets NFPA 80 and NFPA 101 life safety requirements.
 - c. UL10B or UL10C, 3-hour fire rated openings.
 - 2. Latchbolt construction:
 - a. Center Bolt: one piece, 3/4" throw anti-friction stainless steel latch and one piece, 1" throw, hardened stainless steel deadbolt; 2-3/4" backset standard.
 - b. Top and Bottom Bolt: 3/4" x 3/4" square stainless steel latchbolt with 3/4" projection.

3. Independent top and bottom bolt projection shall be field adjustable at the center mortise pocket, while the door is hung which does not require taking the door down to adjust.
4. Bottom strike shall be offset and reversible to accommodate alignment issues due to rough opening tolerances.
5. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - MP6600 Series.
 - b. No Substitution.

2.7 AUXILIARY LOCKS

- A. Mortise Deadlocks, Small Case: ANSI/BHMA A156.36, Grade 1, small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.
 1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DL4000 Series.
 - b. No Substitution.

2.8 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 4. Dustproof Strikes: BHMA A156.16.

2.9 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
 4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
 5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
 7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 9. Extended cycle test: Devices to have been cycle tested to 9 million cycles.
 10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. No Substitution.

C. Security Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed rim panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be constructed of high grade, heat treated, corrosion resistant nickel steel alloy, and have a full 3/4" throw projection with slide action positive deadlocking.

1. Static Load Force Resistance: Minimum 3000 lbs certified independent tested.
2. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000S / ED5000S Series.
 - b. No Substitution.

2.10 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or

aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:
 - a. Norton Rixson (NO) - 7500 Series.
 - b. No Substitution.

- C. Door Closers, Surface Mounted (Unitrol): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted closers with door stop mechanism to absorb dead stop shock on arm and top hinge. Hold-open arms to have a spring loaded mechanism in addition to shock absorber assembly. Arms to be provided with rigid steel main arm and secondary arm lengths proportional to the door width.

1. Manufacturers:
 - a. Norton Rixson (NO) - Unitrol Series.
 - b. No Substitution.

2.11 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Rockwood (RO).

2.12 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 - 1. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Hiawatha, Inc. (HI).
 - c. Rockwood (RO).

2.13 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 - 1. Pemko (PE).
 - 2. Reese Enterprises, Inc. (RE).

2.14 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.15 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
 - 1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
 - 1. Quantities listed are for each pair of doors, or for each single door.
 - 2. The supplier is responsible for handing and sizing all products.
 - 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
 - 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.
- B. Manufacturer's Abbreviations:

- 1. MK - McKinney
- 2. PE - Pemko
- 3. RU - Corbin Russwin
- 4. RO - Rockwood
- 5. MC - Medeco
- 6. NO - Norton

Hardware Sets

Set: 1.0

Doors: o100

Description: Ext - Alum - Pair - Rim/NL - KRM - Closer/stop

2	Continuous Hinge	CFM__SLF-HD1		PE
1	Mullion	CR907BKM		RU
1	Rim Exit, Nightlatch	ED4200 K157ET M110 M54 CT7SD	630	RU
1	Rim Exit, Exit Only	ED4200 EO M110 M54	630	RU
1	Cylinder	CR1080-114 CT7R	626	RU
2	Pull	RM3312-36	US32D	RO
2	SFIC Keymark Core	33N700006	626	MC
2	Closer (surface, stop arm)	UNI7500 7788	689	NO
1	Threshold - Panic with T.B. (PR)	273x292AKFGPK		PE
1	Mullion Gasketing	5110BL		PE
2	Sweep	3452AV		PE

Notes: Balance of weatherstrip by door manufacturer.

Set: 2.0

Doors: o101

Description: Vestibule - Alum - Pair - Rim/NL - KRM - Closer/stop

2	Continuous Hinge	CFM__SLF-HD1		PE
1	Mullion	CR907BKM		RU
2	Rim Exit, Nightlatch	ED4200 K157ET M110 M54 CT7SD	630	RU
1	Rim Exit, Exit Only	ED4200 EO M110 M54	630	RU
1	Cylinder	CR1080-114 CT7R	626	RU
2	Pull	RM3312-36	US32D	RO
2	SFIC Keymark Core	33N700006	626	MC
2	Closer (surface, stop arm)	UNI7500 7788	689	NO
1	Mullion Gasketing	5110BL		PE

Notes: Balance of weatherstrip by door manufacturer.

Set: 3.0

Doors: o114.3

Description: Ext - Pair - Rim/Storeroom - KRM - Closer/stop - KP

2	Continuous Hinge	CFM__SLF-HD1		PE
1	Mullion	CR907BKM		RU
1	Rim Exit, Exit Only	ED5200S EO M110 M54	630	RU
1	Rim Exit, Storeroom	ED5200S 109957ET M110 M54 CT7SD	630	RU
1	Cylinder	CR1080-114 CT7R	626	RU
2	SFIC Keymark Core	33N700006	626	MC
2	Closer (surface, stop arm)	UNI7500 7788	689	NO
2	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1	Threshold - Panic with T.B. (PR)	273x292AKFGPK		PE

1 Gasketing	45041CNB		PE
1 Mullion Gasketing	5110BL		PE
2 Sweep	3452AV		PE

Set: 4.0

Doors: M100.11, M100.14, M100.3, M100.6
 Description: Ext - Sgl - Rim/EO - Closer/stop - KP

1 Continuous Hinge	CFM_HD1		PE
1 Rim Exit, Exit Only	ED5200S EO M110 M54	630	RU
1 Closer (surface, stop arm)	UNI7500 7788	689	NO
1 Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1 Threshold - Panic with T.B. (SG)	273x292AKFGPK		PE
1 Gasketing	45041CNB		PE
1 Sweep	3452AV		PE

Set: 5.0

Doors: M107.1, M108.1, o113, o117
 Description: Ext - Sgl - Entry - Closer/stop - KP

1 Continuous Hinge	CFM_HD1		PE
1 Office Lock	ML2051 109X M34 CT7SD	626	RU
1 SFIC Keymark Core	33N700006	626	MC
1 Closer (surface, stop arm)	UNI7500 7788	689	NO
1 Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1 Threshold - Panic with T.B. (SG)	273x292AKFGPK		PE
1 Gasketing	45041CNB		PE
1 Sweep	3452AV		PE

Set: 6.0

Doors: o114.1, o114.2, V100.1, V100.2, v100.3, v105.1
 Description: Ext - Sgl - Storeroom - Closer/stop - KP

1 Continuous Hinge	CFM_HD1		PE
1 Storeroom Lock	ML2057 109X CT7SD	626	RU
1 SFIC Keymark Core	33N700006	626	MC
1 Closer (surface, stop arm)	UNI7500 7788	689	NO
1 Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1 Threshold - Panic with T.B. (SG)	273x292AKFGPK		PE
1 Gasketing	45041CNB		PE
1 Sweep	3452AV		PE

Set: 7.0

Doors: o111
 Description: Sgl -Multi-Point/Lever - Closer/stop - KP - Seal

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Multi-Point Lock	MP6618 109T CT7SD	626	RU
1 SFIC Keymark Core	33N700006	626	MC

1 Door Closer	CLP7500	689	NO
1 Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406/409 to suit	US32D	RO
1 Gasketing	S88BL		PE

Set: 8.0

Doors: M104, M105, M111, o110, o112, o118.1
 Description: Sgl - Storeroom - Closer - KP - Seal

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lock	ML2057 109X CT7SD	626	RU
1 SFIC Keymark Core	33N700006	626	MC
1 Door Closer (surface)	PR7500	689	NO
1 Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1 Gasketing	S88BL		PE

Set: 9.0

Doors: M103, M109, o102, o103, o104, o105, o106, o107, o109, o115.1, o115.2, o116.1, o116.2, o119
 Description: Sgl - Classroom

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Classroom Lock	ML2055 109X CT7SD	626	RU
1 SFIC Keymark Core	33N700006	626	MC
1 Wall Stop	406/409 to suit	US32D	RO

Set: 10.0

Doors: o108, o120
 Description: Sgl - Privacy/IND - KP

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Privacy Lock	ML2060 109X M34 V20	626	RU
1 Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406/409 to suit	US32D	RO

Set: 11.0

Doors: M101.1, M101.2, M106, M110.1, M110.2
 Description: Sgl - BTB Pull - Closer - KP

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
2 Pull	RM3312-36	US32D	RO
1 Door Closer (surface)	PR7500	689	NO
1 Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406/409 to suit	US32D	RO

Set: 12.0

Doors: M107.2, M108.2
 Description: Sgl - BTB Pull - Deadlock - Closer - KP

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
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1 Deadbolt	DL4111 CT7SB	626	RU
2 Pull	RM3312-36	US32D	RO
2 SFIC Keymark Core	33N700006	626	MC
1 Door Closer (surface)	PR7500	689	NO
1 Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406/409 to suit	US32D	RO

Set: 13.0

Doors: M100.1, M100.10, M100.12, M100.13, M100.15, M100.16, M100.2, M100.4, M100.5, M100.7, M100.8, M100.9, o118.2, v100.4

Description: Cyl only

1 Cylinder	1080-114- A02- CT7B	626	RU
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SECTION 08800 - GLAZING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide glass and glazing, complete, for each of the specific types of glazing systems specified for this project.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Steel Doors and Frames; Section 08110.
- B. Wood Doors; Section 08200.

1.4 QUALITY ASSURANCE

- A. Provide safety glass (tempered, laminated) complying with requirements of ANSI Z97.1 and CPSC 16 CFR 1201 CII.
- B. Label each piece of glass designating type and thickness of glass. Do not remove label prior to installation.
- C. Permanently identify each unit of tempered glass. Etch or ceramic fire identification on glass; identification shall be visible when unit is glazed.

1.5 SUBMITTALS

- A. Comply with Section 01300.
- B. Product Data: Submit copy of manufacturer's specifications and installation instructions for each type of glass and glazing material. Include test data or certification substantiating that glass complies with specified requirements.
- C. Samples: Prior to ordering, submit minimum 6" x 6" sample of each type and thickness of glass required for review by Architect.

1.6 PROTECTION

- A. Protect glass surfaces and edges at all times during the construction period. Keep glass free from contamination by materials capable of staining glass.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. PPG Industries, Inc. is the basis of design. Other manufacturers may be equal and acceptable. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed.

The Architect shall be the judge of the equivalency and acceptability of any substitutions.

2.2 SEALED INSULATED UNITS/GLASS MATERIALS AND PRODUCTS

A. Preassembled units consisting of organically sealed lites of glass separated by dehydrated air spaces complying with ASTM E 774 and with other specified requirements.

V-2: Clear Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select).

1. Class 1 (clear), 1/4" thick, unless otherwise specified. For interior glass lites in walls and doors and exterior entrance doors. To be tempered in interior and exterior doors and at glass lites immediately next to doors and /or that extend to within 18" of the floor.

V-1: 1" Insulated Vision Unit:

- Outer lite, 1/4" PPG Solarban R-100 clear/clear. With the Low-E coating on the No. 2 surface. Tempered where required by codes.
- 1/2" air space.
- Inner lite, 1/4" clear float glass. Tempered where required by codes.

2.3 GLAZING MATERIALS

A. Provide materials with proven record of compatibility with surfaces contacted in installation.

1. Glazing Sealants: Tremco "Proglaze", Bostik Chem-Calk 1200", Pecora "836", Sonneborn "OmniGlaze", or other approved by system manufacturer.
2. Glazing Gaskets: Structural rubber, molded neoprene, or cellular neoprene as recommended by manufacturer of glazing system.
3. Glazing Tape: Bostik "Chem Tape 60", Pecora "Shim-Seal", or Tremco "Pre-shimmed Tremco 440 Tape".
4. Setting Blocks: Neoprene or other resilient blocks of 70 to 90 Shore A durometer hardness, adhesively backed on one face only, tested for compatibility with specified glazing sealants.
5. Spacers: Neoprene or other resilient blocks of 40 to 50 Shore A durometer hardness, tested for compatibility with specified glazing sealant.
6. Compressible Filler Rod: Closed-cell or waterproof-jacketed foam of polyethylene, butyl rubber, neoprene, polyurethane or vinyl, tested for compatibility with specified glazing sealants, of 5 to 10 psi compression strength (25% deflection), recommended by sealant manufacturer for use in glazing channel to prevent sealant exudation from the channel.
7. Mirror Mastic: An adhesive setting compound, produced specifically for setting mirrors by spot application method (25% coverage) without support, to be used in 1/8" to 1/2" thickness.

PART 3 - EXECUTION

3.1 PERFORMANCE REQUIREMENTS

- A. Watertight and airtight installation of each piece of glass is required. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating doors) without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials, and other defects in work. The design wind speed criteria shall be 90 mph.

3.2 INSTALLATION

- A. Comply with recommendations of glass manufacturers and manufacturers of sealants and other glazing materials, unless otherwise indicated or specified, including preparation of surfaces.
- B. Clean channel surfaces and prime as recommended by sealant manufacturer.
- C. Cut glass to size as required for measured opening, provide adequate edge clearance and glass bite all around. Cut prior to tempering.
- D. Do not install sheets which have edge damage or face imperfections.
- E. Miter-cut and bond (weld) ends of channel gaskets at corners to provide a continuous gasket.
- F. Seal face gaskets at corners with liquid elastomeric sealant to close openings and prevent withdrawal of gaskets from corners.
- G. Remove and replace glass which is broken, chipped, cracked, abraded or damaged during construction period.

3.3 CURING

- A. Cure glazing sealants and compounds in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.

END OF SECTION 08800

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SECTION 08901 - ALUMINUM SWINGING DOORS

PART 1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide aluminum swinging doors, glass and glazing, and hardware.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Aluminum Framing Systems AL-1, AL-2, Section 08410.
- B. Glass and glazing requirements; Section 08800.
- C. Lock cylinders and panic devices; Section 08700.

1.4 SUBMITTALS

- A. Comply with Section 01300.
- B. Shop Drawings:
 - 1. Doors: Submit shop drawings for the fabrication and installation of doors, framing and associated components. Include wall elevations at ½ scale, and half size detail sections of every typical composite member. Show anchors, joint system, expansion provisions, glass enclosure, glazing and sealing details, finishes, speed control units, and hardware.
- C. Samples: If requested, submit sample of specified finish on aluminum for Architect's verification.
- D. Maintenance Instructions: Submit manufacturer's maintenance and service instructions for adjustment, operation, and maintenance of revolving door. Include instructions for maintenance of finish.
- E. Warranty: Submit executed warranty.

1.5 WARRANTY

- A. Provide written 2 year warranty, signed by Contractor and Installer, agreeing to repair or replace defective materials and workmanship.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Kawneer is specified as the basis of design, equivalent systems from Oldcastle, Efcó or U S Aluminum are acceptable. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed. The Architect shall be the judge of the equivalency and acceptability of any substitution request.

2.2 SWINGING DOORS

- A. Interior Doors; Kawneer 190 Narrow Stile doors, 2-1/8" vertical stile, 2-1/4" top and 3-7/8" bottom rail. Butt hinges, surface mounted closures.
- B. Exterior Doors; Kawneer 350 Medium Stile doors, 3-1/2" vertical stiles, 3-1/2" top and 6-1/2" bottom rail. Offset pivots, surface mounted closures.
- C. Hardware:
 - 1. Pull: 1" diameter round bent bar with 90 degree offset (3-1/2"+), 12" length center to center.
 - 2. Push: 1" diameter round bent bar; Kawneer CPII, (for non-egress doors).
 - 3. Closers: Shall be rated for the size and weight of the door it is matched with.
 - a. Regular 3'-0 x 7'-0 entrance door; LCN 4040 Super Smoothee
 - b. Closures for H.M. exterior and interior doors shall be listed in the Hardware Schedule, Section 08700.
 - 4. Pivots: Manufacturer's standard top, intermediate and bottom offset pivots.
 - 5. Threshold: Manufacturer's with anchors and clips, coordinate with offset pivots and closer. Maximum 1/2" height. Thresholds shall be ADA compliant.
 - 6. Weatherstripping; Thermoplastic elastomer weathering on tubular shape with semi-rigid polymeric backing, or EPDM blade gasket sweep strip applied with concealed fasteners.
 - 7. Locks; Adams Rite MS 1850 deadlock (active leaf) and one pair flush bolts (inactive leaf).
 - 8. Panic hardware shall be scheduled on the Hardware Schedule for egress doors.
- D. Glazing: 1/4" thick float, tempered, meeting requirements specified in Section 08800.

2.3 FINISH

- A. Clear anodized to match aluminum glass setting system.

2.4 OTHER MATERIALS

- A. Provide all other materials, not specifically described but required for a complete, weathertight, and proper installation of doors and framing systems, subject to acceptance by Architect.

PART 3 – EXECUTION

3.1 INSTALLATION – DOORS

- A. Set units plumb, level and true to line, without warp or rack of doors and framing. Anchor securely in place. Secure to structure with non-staining, non-corrosive shims, anchors, fasteners, spacers, and fillers. Use care in erection so as not to mar, abrade, or stain finished surfaces.
 - 1. Seal frames with an approved sealant in color to match frames, making a

neat fully weatherproof job. Refer to Section 07900 & 08800 and comply with requirements of that section.

- B. Paint concealed contact surfaces of dissimilar materials, including metal in contact with masonry or concrete work, with heavy coating of bituminous paint, or provide other separation as recommended by manufacturer.

3.2 ADJUSTING

- A. Adjust doors to provide tight fit at contact points and weatherstripping, for smooth operation and weathertight closure, and to operated smoothly with hardware and operators functioning properly. Lubricate hardware and other moving parts.

3.3 CLEANING

- A. Clean completed system, inside and out, promptly after erection and installation of glass and sealants, allowing for normal curing of sealants. Protect systems from damage and deterioration for remainder of construction period.

END OF SECTION

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SECTION 09250 - GYPSUM BOARD ASSEMBLIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide gypsum wallboard work, complete, including non-load bearing metal studs and gypsum board partitions, furred walls, furred areas, and metal trim and accessories. Provide sound insulation in partitions where called for.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Taping and finishing of gypsum wall board joints; Section 09900.
- B. Metal Flashings; Section 07600.
- C. Commercial Building Wrap; Section 07274
- D. Lightgauge Metal framing; Section 05400
- E. Insulation; Section 07210

1.4 SUBMITTALS

- A. Comply with Section 01300.
- B. Product Data: Submit manufacturer's installation instructions for each gypsum wallboard component.
- C. Shop Drawings: Submit drawings showing typical and special partition and ceiling assemblies. Include materials, material gages, stud spacing, and bracing of studs.

1.5 QUALITY ASSURANCE

- A. Allowable tolerances; 1/8" offsets between planes of board faces, and 1/4" in 8 ft. for plumb, level, warp, and bow.
- B. Fire-Resistance Rating: Where work is indicated for fire-resistance ratings, provide materials and installations identical with assemblies which have been tested and listed by recognized authorities, including U.L., O.S.U., and U.S.G.

1.6 DELIVERY, STORAGE AND PRODUCT HANDLING

- A. Deliver materials in original packages, containers and bundles, fully identified with manufacturer's name, brand, type and grade. Store in dry, well ventilated space, protected from the weather under cover and off the ground. Stack flat to prevent sagging. Handle to prevent damage to edges, ends and surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. U.S. Gypsum System is specified; equivalent systems of Gold Bond and Georgia Pacific are acceptable.

- B. Refer to Section 07274 for commercial building wrap.

2.2 MATERIALS

- A. Studs, Channels And Runners: Roll-formed, 20 gage except where otherwise indicated, electro-galvanized steel. 7/8" furring channels. Stud sizes 6", 3-5/8" and 2-1/2", as indicated. Punch holes near each end of the stud to facilitate installation of horizontal electrical wiring or conduit; punch as required for piping.
- B. Hangers: 8 gage galvanized soft annealed wire.
- C. Tie Wire: 18 gage galvanized soft annealed wire.
- D. Interior gypsumboard: Sheetrock Firecode (Type X), 5/8" thick with tapered edges.
- E. Trim Accessories: Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound. Provide all corner beads, edge trim-beads, and control joint beads, types as indicated, and as required by project conditions.
- F. Fasteners:
 - 1. Self-drilling, self-tapping screws for power driving with special head design for gypsumboard attachment (Type S), producing surface depression for proper concealment; 1" long for single layer and 1-5/8" long for double layer.
 - 2. Provide other fasteners as required by project conditions and as recommended by manufacturer.
- G. Acoustical Sealant: U.S.G. Acoustical Sealant, or approved equal.
- H. Laminating Adhesive: Type recommended by gypsum wallboard manufacturer.
- I. Sound Attenuation Batts: Schuller's, "Sound-SHIELD" sound control batts, complying with performance requirements of ASTM 665, Type 1. 4" thick batts for 35/8" stud walls, and 63/4" batts for 6" stud walls. As manufactured by Schuller International, Inc. Denver, Colorado. Knauf, "Quietherm" is acceptable.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with ASTM C 840, manufacturer's instructions, as specified and as indicated on the drawings.
- B. Partitions: Provide partition assemblies as indicated; space studs 16" o.c., unless otherwise indicated.
 - 1. Provide floor and ceiling runner designed to hold and align studs. Provide additional studs at door frames.
 - 2. At insulated walls, wedge insulation between studs, and fit snugly against floor and ceiling runners and against protrusions. At sound insulated walls, cut board neatly in around openings, pipes, ducts, electrical boxes, outlets, fixtures, etc. Seal to fill all gaps and around entire perimeter with acoustical sealant, including floor and ceiling joints and intersections with vertical surfaces to provide a completely airtight wall.
 - 3. At fire rated assemblies, provide tested assemblies for ratings indicated.

- C. Furred Walls/Areas: 5/8" thick gypsum board, as indicated, on studs and furring channels, as indicated.
- D. Suspended Ceiling: 5/8" thick gypsum board on furring channels at 24" o.c., attached to carrying channels at 4' o.c. suspended by hanger wire from the structural bracing at 4' o.c.
 - 1. Note: Drywall suspension system may be used; direct hung heavy-duty single-web steel main tees with furring channels and cross tees at light fixtures; similar to U.S.G. (Donn) Rigid X or Chicago Metallic 640 Furring.
- E. Encasement of Steel: 5/8" thick gypsum board on studs as indicated.
- F. Application: Except where specified otherwise:
 - 1. Apply gypsum board parallel to studs with single panels in longest length available.
 - 2. Provide casing beads where edges of gypsum board meet dissimilar materials.
 - 3. Grout hollow metal frames solid with portland cement grout in framed wall construction. Provide double studs at door frames.
 - 4. Fasten gypsum board with specified screws.
 - a. Space screws 16" o.c. for walls and 12" o.c. for single layer. Space screws 24" o.c. for walls and 16" o.c. for base layer of double layer (both layers mechanically attached) and 16" o.c. for walls and 12" o.c. for ceilings of face layer.
 - b. At fire rated assemblies, conform to fastening required of rated assembly.
 - 5. Cooperate with the other trade contractors in placing of backing and blocking required as backing for all millwork, fixtures, fittings, and accessories. Reinforce and brace studs in partitions supporting fixtures, to provide firm backing and prevent deflection of the wall.
 - 6. Brace studs in compliance with manufacturer's recommendations for wall height, stud spacing, and other project conditions indicated. Include bracing in shop drawing submittal.
 - 7. Arrange gypsum board joints on opposite sides of partitions to occur on different studs.
 - 8. Install expansion/control joints in partition and wall runs exceeding 30'. Do not exceed a distance of 30' between control joints in walls.
 - 9. Treat all internal angles formed by the intersection of either wall board surfaces with metal trim and/or a taped joint system as indicated or required.
 - 10. Treat all vertical and horizontal external corners with metal bead corner reinforcement applied in accordance with manufacturer's instructions.
 - 11. Comply with mfg. requirements for installation of fire rated sealants at fire rated partitions and acoustical sealants at sound rated partitions

END OF SECTION

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SECTION 09510 - ACOUSTICAL CEILING SYSTEMS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide acoustical ceiling, complete, including elements of the suspension system, trim, and facilities for the support and attachment of lighting fixtures, air diffusers, grilles and registers. See Finish Schedule and Reflected Ceiling Plans for location.

1.3 SUBMITTALS

- A. Comply with requirements of Section 01300.
- B. Shop Drawings: Submit shop drawings, for review by Architect, indicating location of ceiling units and items of work which are to be coordinated with the ceiling, and framing and support details for all work supported by the suspension system.
- C. Samples: Submit sample of ceiling panel material, grid and wall molding proposed for use for acceptance by Architect.
- D. Compatibility statement of adhesive and concrete curing materials.
- E. Moisture test prior to tile application.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original unopened packages, fully identified with type, finish, performance data and compliance labels. Handle and store in accordance with manufacturer's instructions and recommendations.

1.5 JOB CONDITIONS

- A. Do not install interior acoustical units until space has been enclosed and is weathertight, wet work has been completed and is dry, until work above ceiling is complete, and until temperature and humidity conditions will be continuously maintained at values near those indicated for final occupancy.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Armstrong is the basis of design for ceilings LA-1. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed. The Architect shall be the judge of the equivalency and acceptability of substitution requests.

2.2 ACOUSTICAL LAY-IN CEILING, LA-1

A. Lay-In Panel:

1.Characteristics:

- a. Material: Wet formed mineral fiber with DuraBrite acoustically transparent membrane.
- b. Surface Finish: DuraBrite with factory applied latex paint.
- c. Color: White.
- d. Light Reflectance: LR 0.90.
- e. Size: 24" X 24" X 3/4".
- f. Edge Detail: Beveled 15/16" tegular lay-in.
- g. NRC: 0.70.
- h. CSTC: Minimum 35.
- i. Surface Burning Characteristics: Class A (Flame Spread 25 or under), UL labeled.
- j. Insulation Value: Average R factor (at 75F), 2.2.
- k. RH90 Performance: No visible sag under conditions not to exceed 90%.
- l. Warranty: 30 year limited system warranty against visible sag
- m. Pattern: Armstrong Ultima RH90, 1911.

2.3 SUSPENSION SYSTEM MATERIALS

- A. General: Provide suspension system materials conforming to ASTM C 635.
- B. Attachment Devices: Type recommended by suspension system manufacturer for attachment or anchorage of ceiling hangers to structure above ceiling, sized for not less than 5 times the hanger design load for the structural classification indicated.
- C. Hanger Wire: Minimum No. 12 gage, galvanized annealed steel wire.
- D. Exposed Grid System:
 1. For Armstrong, Ultima RH90, 1911, Ceiling LA-1.
Armstrong 15/16" Prelude Exposed Tee;
 - a. Material: Double-web electrogalvanized steel.
 - b. Face Dimension: 15/16".
 - c. Profile: Expose tee.
 - d. Surface Finish: Baked Polyester paint.
 - e. Color: White.
 - f. Structural Classification: Intermediate Duty.

PART 3 - EXECUTION

3.1 INSTALLATION AND WORKMANSHIP

- A. Install mechanical suspension system and acoustical units in strict accordance with ASTM C 636 and manufacturer's directions, using experienced acoustical mechanics.
- B. Install in the patterns indicated on the drawings in such a manner to permit border units of the greatest possible size, unless otherwise indicated.
- C. Refer to drawings for quantities and locations of lighting fixtures, air supply and return diffusers, grilles and registers, and fire sprinkler heads, which will be installed in the ceilings, and which will replace and/or pierce the acoustical unit.

D. Exposed Grid:

1. Install acoustical ceiling suspension system level and true to line, with neat and close-fitting joints between spliced and intersecting members. Grid to be square, and ends and cross tees tightly butted, and all faces in the same plane. Do not rest flanges of the cross tees on the flanges of the main runners.
2. Neatly and accurately cut and place acoustical panels to fit snugly into the main and cross tees, with no space between the bottom of the acoustical panels and grid system, and without gaps and edges (except at tegular edges) showing in the finished installation.

3.2 CLEANING

- A. Clean soiled or discolored acoustical units, trim, moldings, and suspension members after installation. Touch up scratches, abrasions, voids, and other defects in painted surfaces. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09510

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SECTION 09678 - RESILIENT WALL BASE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide resilient wall base and accessories, complete. See Finish Schedule for locations and extent of floor accessories as well as the Master Colors and Materials Schedule on the Finish Plans.

1.3 SUBMITTALS

- A. Product Data: Submit copy of manufacturer's technical data, installation instructions, and maintenance instructions for each accessory.
- B. Samples: Submit full color range samples for type and pattern of each accessory specified for selection by Architect.

1.4 DELIVERY AND STORAGE

- A. Delivery: Deliver materials to the project site in the manufacturer's original unopened containers, clearly marked to indicate pattern gage, lot number and sequence of manufacture.
- B. Storage: Store in original container at not less than 70 F for at least 48 hours before start of installation.

1.5 JOB CONDITIONS

- A. Maintain minimum temperature of 70 F for minimum of 48 hours prior to installation. Maintain 70 temperature continuously during and after installation as recommended by the flooring manufacturer, but in any case not less than 48 hours.

PART 2 - PRODUCTS

2.1 RUBBER BASE

- A. Johnsonite is specified, Roppe, Flexco, Burke, are acceptable, 4" & 6" topset cove, with preformed or molded interior and exterior corners; colors as selected by Architect from full color selection except premium colors.
- B. Refer to the Master Colors and Materials Schedule on Finish Plans for specific color selections.

2.2 OTHER MATERIALS

- A. Provide adhesives, primers, crack fillers and other materials required but not specifically described, as recommended by the wall base manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the areas and conditions under which resilient accessory work is to be placed. Moisture content of concrete slabs, building air temperature and relative humidity must be within limits recommended by flooring manufacturer. Do not proceed until unsatisfactory conditions have been corrected.
- B. Use trowleable leveling and patching compounds epr manufacturer's directions to fill cracks, holes, and depressions.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil or silicone.
- D. Broom clean or vacuum substrates to be covered immediately before installing products specified. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust.

3.2 INSTALLATION

- A. Install products using methods indicated according to manufacturer's installation directions.
- B. Resilient Base: Apply resilient base to walls, columns, pilasters, casework, and other permanent fixtures in rooms or areas where base is indicated. Install base in as long lengths as practicable. Tightly bond base to backing throughout the length of each piece, with continuous contact at horizontal and vertical surfaces. Do not stretch resilient base during installation.
 1. Preformed Corners: Install inside and exterior corners before installing straight pieces.
 2. Formed corners:
 - a. Form inside corners from straight pieces of maximum lengths possible by cutting an inverted V-shaped notch in toe of rubber base at the point where corner is formed. Shave back of base where necessary to produce snug fit to substrate.
 - b. Form outside corners from straight pieces of maximum lengths possible by shaving back of base at point where bending will occur. Remove a strip perpendicular to length of base only deep enough to produce a snug fit without bends whitening or removal of more than half the thickness of rubber base.

3.3 CLEANING

- A. Immediately after installation perform the following operations:
 1. Remove visible adhesive and other surface blemishes using cleaner recommended by manufacturer of resilient products involved.
 2. Sweep or vacuum floor thoroughly.

END OF SECTION

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.1 SCOPE

- A. Provide painting and finishing of interior and exterior items and surfaces throughout the project, except as otherwise indicated. Provide field painting of hangers, exposed steel and iron work, of primed metal surfaces and exposed-to-view prefinished metal surfaces of items, as required to match adjacent surfaces, and equipment installed under mechanical and electrical work. Refer to those respective sections for painting requirements. Provide touch-up of pre-finished items as required to match original finish.

1.2 SUBMITTALS

- A. Comply with Section 01300.
- B. Paint Schedule: Submit paint schedule listing each material cross-referenced to the specific paint and finish system and application. Identify by manufacturer's catalog number and general classification.
- C. Samples: Submit samples of finishes type and color on specified materials for verification.

1.3 DELIVERY AND STORAGE

- A. Deliver materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide all paints, enamels, stains, varnishes, and admixtures of first line quality as manufactured by Sherwin Williams, Pratt and Lambert, Glidden, Benjamin Moore, Pittsburgh, Devoe and Sterling.

2.2 MATERIALS

- A. See paragraph 3.05, SCHEDULE OF PAINT TREATMENT for materials. All finish coats shall contain mildewcides. Grind in the factory all exterior colors. Shop mixing is not permitted. Colors as selected by Owner's representative, and subject to modification on the job at the discretion of Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the areas and conditions under which painting work is to be performed. Do not proceed with the work until unsatisfactory conditions have been corrected. Starting of painting work will be construed as acceptance of the surfaces within any particular areas.

3.2 SURFACE PREPARATION

- A. Perform all preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified. Remove all hardware, plates, lighting fixtures, and similar items in place and not to be finish painted, or provide protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items and adjacent surfaces. Reinstall the removed items by workmen skilled in the trades involved, after painting is completed.
- B. Gypsum Wall Board: Treat all joints, nail heads and other depressions in the surface of the wallboard, in accordance with the recommended manner, with a taped joint system by the gypsum wallboard manufacturer. Do not paint over gypsum wallboard work until taped joints are thoroughly dry.
- C. Wood: Clean wood surfaces to be painted of all dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those surfaces exposed to view, and dust off. Prime, stain, or seal wood required to be job painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood. Scrape and clean small, dry seasoned knots, and apply thin coat of white shellac or other recommended knot sealer, before application of the priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.
- D. Ferrous Metals: Touch-up shop-applied prime coats which have damaged or bare areas. Wire-brush, solvent clean, and touch up with the same primer as the shop coat.
- E. Galvanized Surfaces: Clean free of oil and surface contaminants with an acceptable non-petroleum based solvent.

3.3 APPLICATION

- A. Apply paint by brush, roller, spray, or other acceptable practice in accordance with the manufacturer's directions. Use brushes best suited for the type of material being applied. Use rollers of carpet, velvet back, or high pile sheeps wool as recommended by the manufacturer for material and texture required.
- B. The number of coats and paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has completely dried. Sand between each enamel coat application with fine sand paper, or rub surfaces with pumice stone where required to produce an even smooth surface in accordance with the coating manufacturer's directions.
- C. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance.
- D. Give special attention to insure that all surfaces, including edges corners, crevices, welds, and exposed fasteners receive a film thickness equivalent of that of flat surfaces.

3.4 CLEAN-UP

- A. Thoroughly clean all spots, smears, spills, etc., remove from the site all discarded paint materials, rubbish cans and rags at the end of each work day.

3.5 SCHEDULE OF PAINT TREATMENTS

Treatment

No.	Location	Coats	Materials
1	Ext. & Int. ferrous metal	3	Shop priming is specified under the respective metal section. <u>1st Coat:</u> Rust primer <u>2nd & 3rd Coats:</u> Ext. alkyd semi-gloss paint.
2	Ext. & Int. galvanized metal	3	Shop priming is specified under the respective metal section. Pretreatment: Chemical wash. <u>1st Coat:</u> Galvanized iron primer. <u>2nd & 3rd Coats:</u> Ext. alkyd semi-gloss paint.
3	Other metal surfaces	2	Clean and prime abraded (factory finished, primed or spots as specified in metal pre-finished) sections and finish in 2 coats specified for adjoining surfaces.
4	Ext. plywood construction	2	<u>1st Coat:</u> Acrylic sign emulsion primer. <u>2nd Coat:</u> Semi-gloss acrylic latex.
5	Int. gypsum board, except as specified below	2	<u>1st Coat:</u> Latex wall primer. <u>2nd Coat:</u> Semi-gloss acrylic latex enamel.
6	Int. gypsum board where indicated to receive epoxy coating	3	<u>1st Coat:</u> Latex wall primer. <u>2nd and 3rd Coats:</u> Water based acrylic epoxy, full gloss.
7	Int. wood and plywood (stained)	3	<u>1st Coat:</u> Paste wood filler/stain. <u>2nd and 3rd Coats:</u> Polyurethane varnish.
8	Int. wood and plywood (painted)	3	<u>1st Coat:</u> Wood and wall primer. <u>2nd and 3rd Coats:</u> Semi-gloss acrylic latex.
9	Accent colors and dark	2	Allow 5% of surfaces to be painted in accent or intense toned colors as

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directed by Architect. Trim will not
necessarily be same color as walls.

END OF SECTION 09900

SECTION 10165 - PLASTIC LAMINATE TOILET PARTITIONS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide plastic laminate toilet partitions, and shower compartment doors and frames, complete.

1.3 SUBMITTALS

- A. Comply with Section 01300.
- B. Product Data: Submit manufacturer's detailed technical data for materials, fabrication, and installation.
- C. Shop Drawings: Submit shop drawings for the fabrication and erection of toilet partition assemblies not fully described by manufacturer's data. Show all anchorages, gages of laminated plastic, hardware, fittings and fastenings. Submit setting drawings, templates and instructions for the installation of anchorage devices built into other work. **Shop drawings shall be minimum ¼" scale, clearly indicating dimensions, plan layouts, elevations and details such that the Architect can readily compare and check the shop drawings to the original contract drawings.**
- D. Samples: Submit full color range of plastic laminate samples for selection by Architect.

PART 2A - PRODUCTS

2.1 MANUFACTURERS

- A. Bobrick Washroom Equipment is the basis of design. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed. The Architect shall be the judge of the equivalency and acceptability of any substitutions.
- B. Bobrick, Classic Series 1540, w/ high pressure plastic laminate finish, 4516 density impregnated particle board stiles, panels & doors.

2.2 TYPE:

- A. Flush construction, wall mounted type partitions. Width, length, and height as indicated on the Drawings.

2.3 MATERIALS AND FABRICATION

- A. Laminated Plastic: NEMA Std. LDS-1985, minimum .050" thick in pattern and color from the manufacturer's full range of options.

- B. Door, Panel, Screens: High density particleboard or close-grained hardwood-faced plywood. Finished pilasters 1 - 1/4" thick (1 - 1/8" core); finished doors, partition and screen panels 1" thick (7/8" core).
- C. Sealer: Seal core surfaces exposed by machining for hardware attachment with sealer as recommended by the manufacturer.
- D. Adhesive: Urea resin glue for permanent water resistant heat resistant bonding.
- E. Pilaster Shoes: 3" high, 20 gauge type 302/304 polished stainless steel.
- F. Stirrup Brackets: Manufacturer's standard design for attaching panels to walls of stainless steel or chrome-plated brass to match hardware finish.
- G. Hardware and Accessories: Polished stainless steel or chrome-plated brass hardware and accessories, including cutout insert type (not surface mounted) gravity or spring action cam type hinges, latch/keeper.
- H. Anchorages and Fasteners: Exposed fasteners of stainless steel, or brass finished match hardware. Use theft resistant (oneway) type heads and nuts for exposed screws. Use stainless steel for concealed anchors.

2.4 FABRICATION

- A. Furnish standard doors, panels, screens, and pilasters fabricated for mounted partition system. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as specified.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install partitions and screens rigid, straight, plumb and level, in strict accordance with manufacturer's instructions and final shop drawings.
- B. Provide uniform clearance of not more than 1/2" between pilasters and walls, and not more than 1" between panels and walls.
- C. Secure panels to wall with not less than 2 stirrup brackets attached near top and bottom of panel. Locate wall brackets so that holes for wall anchorages occur in tile joints.
- D. Secure panels in position with manufacturer's recommended anchoring devices.
- E. Attach screens with full length and continuous stainless steel, anodized aluminum or chrome plated brass channel supports, as recommended by manufacturer to suit supporting structure. Set units to provide support and to resist lateral impact.

3.2 ADJUST AND CLEAN

- A. Adjust and lubricate hardware for proper operation. Set hinges on inswinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges outswinging doors to return to fully closed position.
- B. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION

SECTION 10800 - TOILET ACCESSORIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide toilet accessories, complete.

1.3 SUBMITTALS

- A. Comply with Section 01300.
- B. Product Data: Submit technical data and installation instructions for each toilet accessory.
- C. Shop Drawings: Submit shop drawings showing grab bar installation. Provide setting drawings, instructions and directions for installation of anchorage devices in other work.

1.4 JOB CONDITIONS

- A. Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Bobrick, Classic Series is the basis of design. Bradley or ASI is acceptable. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed. The Architect shall be the judge of the equivalency and acceptability of any substitutions.

2.2 MATERIALS

- A. Stainless Steel: ANSI Type 302/304, No. 4 finish, 22 gage minimum.
- B. Fasteners: Screws, bolts, and other devices of same material as accessory unit, or of galvanized steel where concealed.

2.3 ACCESSORIES

- A. Numbers in parenthesis correspond with numbers indicated on drawings.
- B. Paper Towel Dispenser and Receptacle Combination (TA-13), recessed: Bobrick Classic Series B-3944, Bradley 234, or ASI 0469.
- C. Toilet Tissue Dispenser (TA-01), Single Roll, surface mounted: Bobrick Classic Series B-2730, Bradley 5071-50, or ASI 0263-1A. (Without controlled delivery.)
- D. Dual Sanitary Napkin Disposal (TA-9) double, partition mounted: Bobrick Classic Series B-354, Bradley 4721-15, or ASI 0472. Serves two toilet compartments.
- E. Framed Mirror (TA-7), Bobrick Model B-165-2436, 24" wide x 36" high, with one

- piece Stainless steel channel frame.
- F. Grab Bars (TA-2) 3'-6, (TA-3) 3'-0 & (TA-4) 1'-6": Bobrick B-6806.99 Series, Bradley 812-2 Series, or ASI 3200-P; shapes and sizes indicated. Strongly secure fastenings to steel backing plate or by other accepted methods to withstand contemplated stress. Submit shop drawings of anchoring methods. Bars to have satin finish w/ peened gripping surface.
 - G. Mop and Broom Holder (TA-10) (At janitor sinks): Bobrick B-223 x 24, Bradley 9953, or ASI 0796-A. Position directly above mop sink.
 - J. Wall Mounted Soap Dispenser (TA-06) Bobrick #B-155"Liquidmate" Liquid Soap Dispenser, 24 oz., vandal-resistant, chrome-plated ABS. Translucent polyethylene container.
 - K. Shower Curtain Rod (TA-12) Bobrick, #B-6047 Classic Series Extra-Heavy Duty Shower Curtain Rod. Type 304 stainless steel, satin finish. 18 gauge, 1-1/4" dia rod. To fit opening width.
 - L. Shower Curtain (TA-11), Bobrick #204-2 Vinyl Shower Curtain. Opaque matte white vinyl, 008" thick, contains antibacterial and flame retardant agents.
 - M. Robe Hook (TA-08), Bobrick #B-7671 satin-finish stainless steel Robe Hook. Consealed mounting bracket.
 - N. Towel Shelf (TA-16), #B-76767 Classic Series Towel Shelf with towel bar. Satin-finish stainless steel, 24" length x 8-1/4" wide.
 - O. Toiletry Shelf (TA-14), Bobrick #B-295 x 16, surface mounted s.s. shelf, satin-finish stainless steel 24" long. Install below mirror at toilets where shown on plans.
 - P. Soap holders at showers (TA-15), #B-680 Classic Series Soap Dish, satin-finish stainless steel, 4 1/4"W x 2" H.
 - Q. Surface Mount Sanitary Napkin Disposal (TA-09), B-270.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install toilet accessory units in accordance with manufacturer's instructions, using fasteners which are appropriate to substrate and recommended by manufacture of unit.
- B. At grab bars strongly secure fastenings to steel backing plate or by other accepted methods. Submit shop drawings of anchoring methods.
- C. Install units plumb and level, firmly anchored in location and at heights indicated or directed by Architect. Comply with all ADA regulations for grab bars and accessory installations.

END OF SECTION

SECTION 10990 - MISCELLANEOUS SPECIALTIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE

- A. Provide miscellaneous specialties, complete.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Finish Painting; Section 09900.

1.4 SUBMITTALS

- A. Comply with Section 01300.
- B. Product Data: Submit manufacturer's technical data and installation instructions for accessory item specified.
- C. Shop Drawings: Submit shop drawings indicating location, details of installation, finishes, and other pertinent data.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. The manufacturer listed for each of the following products is the basis of design. Other manufacturers may be equivalent and acceptable. Any substitutions must be submitted as per Section 01300 and within 60 days of the start of construction as indicated by the date of the Notice to Proceed.

2.2 FIRE EXTINGUISHERS, CABINETS & BRACKETS

- A. Larsen's Manufacturing Company is specified. Equivalent product of J. L. Industries and Potter Roemer are acceptable.
- B. Extinguisher: MP10 4A-60B:C multi-purpose, 10 lb. heavy duty steel extinguisher.
- D. Wall mounted extinguisher: provide Standard Bracket No. 817 at all locations showing a wall mounted fire extinguisher on the plans.

2.3 WHITE MARKERBOARD (Where shown on drawings)

- A. Claridge, or approved equal, Series 5, Type A board configuration, with satin anodized aluminum trim, chalktrough, and map rail, 24 gauge LCS face on hardboard core, ½" thick and size as shown on the drawings. Provide complete with proper installation hardware fasteners. Refer to the Architectural drawings for sizes and locations.

2.4 BULLETIN BOARDS (Where shown on drawings)

- A. Claridge, or approved equal, Cork Bulletin Boards, ¼" mounted cork, with Type A configuration. No. 804A satin anodized aluminum channel trim. Size of units to be 4'-0 x 8'-0.

2.5 WALL FLAT SCREEN TV MOUNTING ASSEMBLY (Where shown on drawings)

- A. Draper, Inc., SMS Flatscreen mount for medium weight displays. Model No. WM T wall Mount. Aluminum construction, display can be tilted up to 15 degrees. Silver finish. Universal Bracket built in, no other bracket required.
Draper, Inc. 411 S. Pearl P.O. Box 425; Spiceland, IN 47385-0425. 800-238-7999

2.6 KNOX BOXES

- A. Provide Knox Boxes as manufactured by Knox Company, telephone 800-552-5669, model 3200 recessed mounted: 5" high x 4" wide x 3 ¼" deep with 7" x 7" flange aluminum box with 3200 recessed mounting kit. Refer to Architectural Building Elevations and Floor Plans for location.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install each accessory in compliance with manufacturer's instruction and final shop drawings.
- B. Install at locations and mounting heights indicated or as directed by Architect.

END OF SECTION

Section 13000
PRE-FABRICATED STEEL BUILDING

PART ONE - GENERAL

1.1 GENERAL CONDITIONS

All work under this section is subject to General Conditions and Supplementary General Conditions and shall be governed by the requirements therein.

1.2 BUILDING DESCRIPTION

1.2.1 The building size will be defined as building line to building line. Clear height under primary frames and roof purlins will be as noted on the architectural building sections. Interior and exterior column locations will be as noted on the structural plans.

1.2.2 Primary Structural: Frames will consist of welded up plate section columns and roof beams complete with necessary splice plates for bolted field assembly. All bolts for field assembly of primary frames will be high strength bolts. End wall structure shall consist of rigid frame with interior bearing columns. Exterior columns and interior columns will be welded "H" sections. Connection of all major structural members will be made with A 325 high-tensile bolts through prepunched or predrilled holes for exact alignment. All structurals will be painted with manufacturer's standard primer with manufacturer's standard surface preparation per structural painting in framing system specifications.

1.2.3 Secondary structurals shall be purlins or girts with a red primer finish applied by coil coater.

1.2.4 The roof system shall be equal to VSR panels by Butler Manufacturing Co. Color shall be Butler-Cote 500 FP and shall be selected from manufacturers standard colors - "6 minimum choices". The roof system shall also be in compliance with ENERGY STAR rating.

All roof penetrations (plumbing, mechanical, electrical, etc.) shall be performed by, and therefore the responsibility of, the roofing contractor.

1.2.5 Wall System: The metal faces shall be of zinc coated steel 24 gage and shall be supplied with a factory applied color coating. The color finish and shape shall be selected from those standard with the building manufacturer and be capable of meeting design criteria herein.

1.3 QUALITY ASSURANCE

1.3.1 Contractor shall submit contract drawings and specifications to manufacturer. Contractor is ultimately responsible that manufacturer complies with drawings and specifications.

1.3.2 Submit written Letter of Certification prepared and signed by a Professional Engineer, registered to practice in the State of Arkansas verifying that the building system design and metal roof system design (including panels, clips, and support system components) meet indicated loading requirements and codes of authorities having jurisdiction. The certification must reference specific dead loads, live loads, snow loads, wind loads/speeds, tributary area load reductions (if applicable), concentrated loads, collateral loads, seismic loads, end use categories, governing code bodies including year, load applications and deflections. The Letter of Certification must be approved before shop drawings are submitted. Letter of Certification referring to the building order will not be accepted.

1.3.3 In addition to mill certifications of structural steel, the manufacturer shall provide, upon request, evidence of compliance with specifications through testing independent of the manufacturer's suppliers. This quality assurance testing to include structural bolts, nuts, screw fasteners, mastics, and metal coatings (primers, metallic coated products, and painted coil products).

1.3.4 Design Loads:

- a. Structural design criteria for the building structural system will be the - 2012 International Building Code.
- b. Risk Category per ASCE 7-10 = II
- c. Roof live loads are loads produced during the life of the structure by moveable objects. Wind, snow, seismic or dead loads are not live loads. Roof live loads are applied based on the Tributary Area as follows:
 - 1) 20 PSF Max. Reduction (no reduction allowed)
- d. The roof snow load used for designing the structure may not be reduced and shall be the product of the following items as per ASCE- 7, 2010:

Snow Load Coefficient (Ce)	1.0
Importance Factor (I)	1.0
Ground Snow Load (Pg)	10 PSF
Thermal Factor (Ct)	1.0

Roof Snow Load (Pf) = Calculate per (EQ. 7.3-1, ASCE 7) Minimum Pm = Is x Pg
The Snow Load (Pf) shall be used for design if it exceeds minimum live load. Rain or Snow additional load-governing codes may require an additional 5 psf be added to the roof snow loads if the roof slope is < 1/2:12.
- e. Ultimate wind speed is 120 mph as per ASCE-7, 2010.
Importance factor = 1.0
Exposure = C
Internal Pressure Wind Pressure Coefficient = $\pm .18$. Coefficients and the design pressures shall be applied per governing code.
- f. Seismic design shall be per ASCE 7, 2010 and based on:
Seismic Risk Category = II
Ss = .557
S1 = .211
Sds = .334
Sd1 = .112
Site Class = B
Seismic Design Category = C
Seismic Importance Factor; Ie = 1.0
- g. Dead Load is the weight of building system construction, such as roof, framing and covering members.
- h. Collateral Load - Additional imposed loads required by the contract documents other than the weight of the metal building system. These added loads could include such items mechanical, electrical and ceiling systems.
 1. UNIFORM ROOF LOADS
All roof framing – 7 psf.
 2. CONCENTRATED ROOF LOADS
See mechanical drawings for suspended and rooftop equipment.

- i. Load Combinations: Load combinations used to design primary and secondary structural members shall be according to the governing code.

1.3.5 Calculations for deflections shall be done using only the bare frame method. Reductions based on engineering judgment using the assumed composite stiffness of the building envelope shall not be allowed. When maximum deflections are specified, calculations shall be included in the design data. Deformation calculations for wind shall use 50-year mean recurrence allowable wind loading. Frame deformations used for seismic drift criteria is based upon the amplified deflection as determined by EQ. 12.8-15 of ASCE 7-10. All other seismic deflection criteria is based upon elastic deflections. Refer to the table in the specifications for deflection limits.

<u>MEMBER</u>	<u>SPECIFIED DEFORMATION</u>	<u>MAXIMUM</u>	<u>LOADING</u>
Metal Wall Panels	Perpendicular to girts	L/120	Wind
Purlins (w/ ceiling)	Vertical deflection	L/240	DL+LL+Collateral
Purlins (w/o ceiling)	Vertical deflection	L/120	DL+LL+Collateral
Purlins (w/ ceiling)	Vertical deflection	L/360 or 1" max	LL
Purlins (w/o ceiling)	Vertical deflection	L/180	LL
Frames (w/ ceiling)	Vertical deflection	L/240	DL+LL+Collateral
Frames (w/o ceiling)	Vertical deflection	L/180	DL+LL+Collateral
Frames (w/ ceiling)	Vertical deflection	L/360 or 2" max	LL
Frames (w/o ceiling)	Vertical deflection	L/240	LL
Frame Drift at eave	Horizontal deflection	H/240	Wind
Frame Drift at eave	Horizontal deflection	H/66	Seismic
Wall Girts Bracing Masonry	Horizontal deflection	L/360 or 1" max	Wind or Seismic
Wall Girts for Metal Panel	Horizontal deflection	L/240	Wind or Seismic

1.4 WARRANTIES

1.4.1 Weathertightness: Weathertightness of roof against leaks and perforations due to workmanship and/or materials shall be guaranteed for 20 years by metal building manufacturer. The Contractor shall furnish a two (2) year guarantee on material and workmanship.

1.4.2 Color: The exterior color finish for the wall and roof panels shall be guaranteed by the building manufacturer for twenty (20) years against blistering, peeling, cracking, flaking, checking and chipping. Excessive color change and chalking shall be guaranteed for twenty (20) years. Chalking shall not exceed #8 – ASTM D4214 and color change shall not exceed 5 N.B.S. units (ASTM D-2244).

1.4.3 Provide signed warranty of above guarantees at completion of work.

1.5 SHOP DRAWINGS

1.5.1 Shop Drawings: After receiving an approved letter of certification, provide 2 opaque copies and 1 reproducible copy of complete shop drawings for the metal building and all its components. Include layout drawings, purlin hanger details, detailed erection drawings, etc. A copy of the proposed building warranties shall also be submitted at this time for review and approval. The contractor/metal building manufacturer shall allow two weeks for the completed set of shop drawings to be reviewed by the Architect/Engineer.

1.5.2 Calculations: Three (3) copies of calculations shall be submitted with the shop drawings. Calculations shall be stamped and signed by a professional engineer registered to practice in the state of Arkansas.

1.5.3 Column Reactions: Column reactions for each column shall be submitted for approval. This submittal shall include reactions for each load case and maximum and minimum reactions for each load combination. Reactions shall not include amplified seismic loads or seismic overstrength factors.

1.6 SYSTEM DESCRIPTION

1.6.1 The pre-engineered metal building covered by this specification is to be a beam-and-column structure or steel frames and columns, complete with purlins, girts, wall panels, roof panels, braces and miscellaneous framing required.

1.6.2 The roof slope shall be as noted on plans.

1.6.3 Column spacing shall be as shown on the foundation plan.

1.6.4 Provide frames with eaves heights and clearances shown on plans.

1.6.5 Vertical diagonal bracing shall be permitted only in the sidewall or roof planes where they will not obstruct openings. Horizontal plane bracing shall be permitted providing it is above the building's required interior clear height. Cables for bracing are not allowed. Portal frames shall be located as shown on the drawings.

1.6.6 All roof accessories (roof curbs, snowguards, roof walkways, roof hatches, etc.) shall be provided by a manufacturer approved by the metal building manufacturer and shall be included in the weathertightness warranty.

1.6.7 All column base plates will be pinned connections to foundation.

PART TWO - MATERIALS

2.1 MANUFACTURERS

2.1.1 Manufacturers shall meet the requirements of the International Accreditation Service, Inc. document AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems." Manufacturers are not required to be certified by the International Accreditation Service (IAS), but must meet the technical criteria. Upon successful bidding, the manufacturer shall submit documentation depicting how it meets the requirements of the IAS. This documentation shall be submitted to the Architect/Engineer and approved prior to contracts being signed. Manufacturers meeting this criteria shall be considered approved fabricators and not subject to Special Inspections of the IBC 2012. However, approved fabricators shall

submit a certification of compliance found in Section 01450 - Special Inspections to the building official at the completion of fabrication.

2.2 STRUCTURAL STEEL

2.2.1 The design of the structure system shall be a clear or multi span frame system with tapered or straight legged columns and roof beams with a gable roof as noted on the drawings.

2.2.2 Field modifications of parts shall be in accordance with the best standard procedures, require the approval of the manufacturer, and shall be the responsibility of the building erector.

2.2.3 Anchor bolt diameter and length shall be as specified by the building manufacturing company's standard anchor bolt layout drawings. Anchor bolts shall be supplied by the contractor, not the building manufacturer. Design of anchor bolts shall be by the building manufacturer.

2.2.4 All structural mill sections or welded-up plate sections shall be designed in accordance with the 1989 AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings," and all cold-formed steel structural members shall be designed in accordance with the 1986 AISI "Specification for the Design of Cold-Formed Steel Structural Members".

2.2.5 The structural system will be designed in accordance with a specified building code. (Refer to Design Loads and Building Codes).

2.2.6 Frames shall consist of welded-up plate section columns and roof beams complete with necessary splice plates for bolted field assembly.

- a. All base plates, cap plates, compression splice plates and stiffener plates shall be factory welded into place and have the connection holes shop fabricated.
- b. Columns and roof beams shall be fabricated complete with holes in webs and flanges for the attachment of secondary structural members and bracing except for field work as noted on manufacturer's erection drawings.

2.2.7 All bolts for field assembly of frame members shall be high strength bolts as indicated on erection drawings.

2.2.8 The endwall structurals shall be welded-up plate sections designed in accordance with the latest AISC Specification.

2.2.9 The endwall frames shall consist of endwall multi-span frames with endwall bearing posts as required by design criteria.

- a. All splice plates and base clips shall be shop fabricated, complete with bolt connection holes. All base plates, cap plates, compression splice plates and stiffener plates shall be factory welded into place and have the connection holes shop fabricated.
- b. Beams and posts shall be shop fabricated, complete with holes for the attachment of secondary structural members except of field work as noted on manufacturer's erection drawings.

2.3 SECONDARY STRUCTURAL MEMBERS

2.3.1 Purlin and girts:

- a. Purlin and girts precision roll formed.
- b. Girts backing metal wall panel shall be "Z" shaped sections.
- c. Girts above stud or block walls shall be "C" shaped sections.
- d. Purlins shall be "Z" shaped sections.

2.3.2 Eave struts shall be factory pre-punched "C" sections.

2.3.3 Bracing shall be located as required. Diagonal bracing shall be hot-rolled rods and attached to columns and roof beams. Flange braces, purlin braces, etc., when required, shall be cold formed and installed as required.

2.4 WELDING

2.4.1 Welding procedure and operator qualifications and welding quality standards shall be in accordance with the American Welding Society Structural Welding Code. Inspection other than visual inspection as defined by AWS paragraph 8.15.1, shall be identified and negotiated prior to bidding. Certification of welder qualification shall be supplied when requested.

2.5 STRUCTURAL PAINTING

2.5.1 General:

- a. All structural steel shall be prime painted as temporary protection against ordinary atmospheric conditions. Subsequent finish, painting, if required, shall be performed in the field by others.
- b. Prior to painting all steel shall be cleaned of loose rust, loose mill scale, dirt and other foreign material. Unless otherwise specified, the fabricator shall not sand blast, flame clean or pickle prior to painting.
- c. Factory cover all steel with one coat of red oxide primer paint formulated to equal or exceed the performance requirements of Federal Specifications TT-P-636D, TT-P-664C and SSPC Paint-25.

2.5.2 Primary frames:

- a. Clean all steel per SSPC-SP2.
- b. Apply one coat of water reducible alkyd primer by spray or dip method to a minimum coating thickness of 1.0 mil.

2.5.3 Secondary structurals:

- a. Clean all steel per SSPC-SP8.
- b. Apply one coat of coil applied polyester primer to a minimum coating thickness of 0.5 mil. (purlin and girts).

2.6 ROOF PANEL

2.6.1 The exposed metal roof covering shall be 24-gage minimum commercially pure G-90 galvanized steel or galvalume coated steel, with factory applied color coating. The color finish applied to the exterior (exposed) surface of the panel shall be of such composition as to provide twenty (20) years of film and color life. Panel configuration to provide the specified load carrying capabilities and deflection requirements of this specification. Roof panels shall be of "standing-seam interlocking" design, Butler VSR or equal, and secured to the purlins with a concealed structural fastening system. The concealed system shall provide minimal through penetration of the exposed roofing surface and allow the roof covering to move independently of any differential thermal movement by the structural framing system. Except at the concealed fastener, there shall be no thermal contact of the roof panels with the supporting purlin. The standing seams shall have a factory-applied non-hardening sealant, and the seams shall have a continuously locked or crimped together by mechanical means during erection. Roof panels shall be "seamed" same day as installation. Roof panels with lap-type side longitudinal joints and exposed structural fasteners shall not be considered acceptable. Clips shall be compatible with roof covering and have a protective metallic coating. Panel assembly shall have UL90 wind uplift rating. Manufacturer's logo will not be allowed on gable ends.

2.6.2 Roof panel finish: Provide manufacturer's standard shop applied fluoropolymer finish to roof panels.

- a. Clean galvanized steel with an alkaline compound, then treat with a zinc phosphate conversion coating and seal with a chromic acid rinse.
- b. Apply to exterior surfaces of pretreated galvanized steel a fluoropolymer coating system supplied to provide a total dry film thickness of 0.90 mils minimum. Color shall be Butler-Cote 500FP or approved equal.
- c. Interior finish of roof panels shall be same as exterior finish or may be polyester color coat at manufacturer's option.

2.6.4 Physical characteristics of exterior coating:

- a. The physical characteristics of the exterior coating shall provide resistance to failure through cracking, checking, crazing, spotting or loss of adhesion.
- b. The physical characteristics of the exterior coating shall be measured by laboratory weather simulating tests to obtain test results justifying the manufacturer's 10 year warranty.

2.7 ROOF CURBS

2.7.1 For equipment less than a 1000 pounds, metal roof curbs shall be single piece 14 gage metal (galvalume or aluminum) with all joints welded. Curbs shall be built as per manufacturers suggested size and height. Insulated walls shall be manufactured by a factory authorized fabricator and shall have damper tray, and a cricket/water diverter which shall match roof panel configuration with ribbed edges. Curb shall be supplied and installed by metal building supplier. (Coordinate number and exact location with Mechanical).

2.7.2 Metal roof curbs for mechanical equipment in excess of 1000 pounds shall be structural double curb with acoustic style inner curb (20 gauge insulated floor), 14 gauge galvalume as manufactured by Thybar Corporation. All other metal of curbs shall be single piece 14 gauge metal (galvalume or aluminum). All joints shall be welded.

2.7.3 Curbs shall be built as per manufacturers suggested size and height. Insulated walls shall be manufactured by a factory authorized fabricator and shall have damper tray. Shall have cricket/water diverter which shall match roof panel configuration. Curb shall be supplied and installed by metal building supplier. (Coordinate size, quantity, and exact location with Mechanical).

2.8 MISCELLANEOUS

2.8.1 Snow retention system shall be ColorGard, pre-punched, as manufactured by S-5!, matching roof panel color. When installing on MR-24 panels, a S-5-E clamp and SnoClip III shall be used. The S-5-U clamp and SnoClip II shall be used with VSR panels.

2.8.2 Roof walkway shall be by a manufacturer recommended by the metal building supplier. Walkways to be located as shown on drawings.

2.8.3 Self-adhered roofing underlayment as manufactured by W.R. Grace & Co. or Architect approved equal. Install following manufacturers installation instructions.

2.9 WALL SYSTEM

2.9.1 The metal faces shall be of zinc coated steel 24 guage and shall be supplied with a factory applied fluoropolymer color coating. The color finish applied to the exterior (exposed) surface of the panel shall be of such composition as to provide twenty (20) years of film and color life. Color and shape shall be selected from those standard with the building manufacturer and be capable of meeting design criteria here in.

2.9.2 The top, bottom and intermediate panel closures, flashings, fascias, gutters, downspouts and trim shall be the building manufacturer's standard, compatible with materials furnished as wall panels. Gutters shall be manufacturer's standard except, in no case, shall the back of the gutter extend less than 2" above front of the gutter.

2.9.3 Liner Panels shall be 24 guage flat panels (without face beads) with concealed fasteners. Siliconized polyester color shall be selected by Architect from manufacturer's standard colors.

2.10 INSULATION

2.10.1 In all areas where insulation is exposed, provide 6" R-19 fiberglass blanket insulation with facing composed of 0.0015" white metalized polypropylene film laminated to a fiberglass/polyester blend fabric with a fire resistant adhesive. The resulting facing shall have a water vapor transmission rate of 0.02 US perm (ASTM E96, Procedure A), a beach puncture of 650 scale units and a mullen burst of 250 psi. Tensile strength shall be 195# in the machine direction and 150# in the cross-machine direction, Lamtec Gymguard as manufactured by Lamtec Corp., Mount Bethel, PA. In areas where insulation is not exposed, provide 6" R-19 fiberglass blanket insulation with reinforced vinyl facing. In areas where shown on drawings, provide two layers of 4" R-13 fiberglass blanket insulation, one layer with reinforced vinyl facing. Refer to drawings for placement of each layer of insulation.

2.11 MISCELLANEOUS FRAMING

2.11.1 Provide frames for all mechanical openings as required.

2.11.2 Provide support members between purlins and girts to carry mechanical equipment shown on mechanical plans. This contractor is responsible for coordinating the equipment requirements with members supplied.

2.11.3 Provide lintels and jambs for all openings in wall panels.

PART THREE - EXECUTION

3.1 ERECTION

3.1.1 Erection shall include the setting of all columns and bases and erection of all steel as called for under the contract for furnishing and delivery of pre-fabricated steel building.

3.1.2 Field errors shall not be corrected by burning except with the permission of the Architect.

3.1.3 Brace and guy all structural members until all connections are made.

3.1.4 After erection, touch up all injuries to priming coat and all others where field welding is done. Bolt heads and nuts shall be touched up in field. Use same material as specified for shop coat.

3.1.5 Assembled parts shall be brought into close contact and drift pins shall be used only for bringing members into position, not to enlarge or distort holes.

3.2 WELDING

3.2.1 Welding in shop and field shall be done by operators who have been previously qualified by tests as prescribed in the American Welding Society, "Standard Qualification Procedure". All operators must have successfully passed the welding qualification tests within a 24-month period preceding erection. The Architect shall be provided a copy of the welding qualification test for each operator at no additional cost to Owner.

3.2.2 Equipment to be of a type which will produce proper current so that operator may produce satisfactory welds. Welding machine shall be of 200-400 ampere, 25-40 volt capacity.

3.2.3 Electrodes shall be suitable for positions and other conditions of intended use in accordance with the instruction with each container.

3.2.4 Field welding shall be done by direct current.

3.2.5 Technique of welding employed, the appearance and quality of welds made and methods of correcting defective work shall conform to American Welding Society "Code of Arc Welding in Building Construction", Section 4, "Workmanship".

3.2.6 Surfaces to be welded shall be free from loose scale, rust grease, paint and other foreign material except that mill scale withstanding vigorous wire brushing may remain. A light film of linseed oil may likewise be disregarded. Joint surfaces shall be free from fins and tears.

3.2.7 No welding shall be performed when temperature of the base metal is lower than 0 degrees F. At temperatures between 32 degrees F and 0 degrees F., the surfaces of all areas within 3" of a point where a weld is started shall be heated until they are too hot to touch before welding is started.

3.2.8 Finished members shall be true to line and free from twists, bends and open joints.

3.3 TESTS

3.3.1 Field tests: All field and shop welders shall be tested and certified by an approved testing laboratory. The American Welding Society Operator Qualification Test shall be used as a basis of qualification.

All field and shop operators shall qualify for the following:

<u>Type of Weld</u>	<u>Position of Welding</u>
Groove	Horizontal
Groove	Vertical
Groove	Overhead
Fillet	Vertical
Fillet	Overhead

3.3.2 The Architect's Representative may require strap cuts from welds in any supporting member to stand nick-break test. If strap fails to meet requirements, Contractor shall replace strap cut from member at no charge to Owner. If strap does meet requirements, the Architect shall pay expenses of having metal replaced. In event strap fails, the welder shall be discharged.

3.4 ROOF PANELS

3.4.1 Panels shall be positioned and properly aligned by matching the prepunched holes in the panel end with the prepunched holes in the eaves structural member and by aligning the panel with the panel clip.

3.4.2 Panel sidelaps shall be field seamed by a self-propelled and portable electrical lock seaming machine. The machine field forms the final 180 degrees of a 360 degree Pittsburgh double lock standing seam; all sidelaps sealant shall be factory applied.

3.4.3 Panel endlaps, when required, shall be at least 6", sealed with Butler sealants and fastened together by clamping plates. Sealants shall contain hard nylon beads which prevent mastic from flowing out due to clamping action. The panel laps shall be jointed by means of a two piece clamped connection consisting of a bottom reinforcing plate and a top panel strap. The panel endlaps shall be located directly over, but not fastened to, a supporting secondary roof structural member and be staggered, so as to avoid a four panel lap splice condition.

3.5 WALL PANELS

3.5.1 Structural system shall be plumb before wall panels are attached.

3.5.2 Wall panels shall be sealed with a molded foam closure block that fits the panel configuration at the bottom of the wall panel.

3.6 INSPECTION

The work shall be inspected in the shop and the field. The Contractor shall give proper notice and allow full facilities for this inspection. Notify Architect 48 hours prior to shipping structural steel.

END OF SECTION