

**REQUEST FOR  
BID (RFB) FORM**

**MAILING ADDRESS:  
MISSOURI DEPARTMENT OF TRANSPORTATION  
GENERAL SERVICES, P.O. BOX 270  
JEFFERSON CITY, MO 65102**

REQUEST NO.	9-120810TV
DATE	July 23, 2012

SEALED BIDS, SUBJECT TO THE CONDITIONS ON ALL PAGES OF THIS RFB WILL BE RECEIVED AT THIS OFFICE UNTIL

**2:00 PM LOCAL TIME; August 10, 2012**

AND THEN PUBLICLY OPENED AND READ FOR FURNISHING THE FOLLOWING SUPPLIES OR SERVICES. SIGN AND RETURN BEFORE TIME SET FOR OPENING.

**BIDS TO BE BASED F.O.B.  
MISSOURI DEPARTMENT OF TRANSPORTATION  
City of St. Louis, MO**

**BUYER: Tom Veasman EMAIL: [tom.veasman@modot.mo.gov](mailto:tom.veasman@modot.mo.gov)**

**BUYER TELEPHONE: 573-522-4404**

The purpose of this Request For Bids (RFB) is to accept bids for the construction of a 50' X 100' storage building located at 6138 Wilson Ave., St. Louis MO 63139 in accordance with the plans and as directed by the Facility Operations Supervisor. The project described as "Hampton Storage Building Project" shall be completed according to project drawings and specifications. The pricing being solicited under this RFB is for bids to be rendered to the Missouri Highways and Transportation Commission (hereinafter, "MHTC" or "Commission"), acting by and through its operating arm, the Missouri Department of Transportation (hereinafter, "MoDOT").

A pre-bid conference is scheduled for July 31, 2012 @ 10:30 a. m. Local Time at the Hampton Project Office (Room 103) at 6138 Wilson Ave., St. Louis, MO 63139. It is the first building on the left.

**Notice to Contractors**

This Request For Bid seeks bids from qualified organizations to construct the Hampton Storage Building at St. Louis, MO. MoDOT will receive bids at the following mailing address: P.O. Box 270, Jefferson City, MO 65102-0270, or hand-delivered in a sealed envelope to the following physical address: General Services Procurement at 830 MoDOT Drive, Jefferson City, MO 65109 until 2:00 p.m., August 10, 2012. Bid forms and information may be obtained by contacting Tom Veasman at 573-522-4404, [tom.veasman@modot.mo.gov](mailto:tom.veasman@modot.mo.gov), or electronically download them at no charge from [http://modot.mo.gov/business/contractor\\_resources/FacilitiesConstructionandMaintenance.htm](http://modot.mo.gov/business/contractor_resources/FacilitiesConstructionandMaintenance.htm). Prevailing wage as established by the Missouri Department of Labor and Industrial Relations shall apply. Bid securities in the amount of 5% of the bid will be required to accompany bids. Bids must be made on forms provided by the Commission. The Commission reserves the right to reject any or all bids and to waive irregularity in the bids and the bidding. No bid may be amended or withdrawn after the bid is opened.

**Written Questions:** All written questions must be addressed to Tom Veasman no later than 2:00 p.m., Local Time, Monday, August 6, 2012 at the following mailing address: Missouri Dept. of Transportation, General Services Procurement Unit, P.O. Box 270, Jefferson City, MO 65102-0270 or by e-mail to [tom.veasman@modot.mo.gov](mailto:tom.veasman@modot.mo.gov). Any questions received after this deadline will not be accepted. MoDOT may issue an addendum and post the responses to all questions on-line for vendors to retrieve. Responses to the questions will be posted on MoDOT's website at: [http://modot.mo.gov/business/contractor\\_resources/FacilitiesConstructionandMaintenance.htm](http://modot.mo.gov/business/contractor_resources/FacilitiesConstructionandMaintenance.htm) in the form of a written addendum. It is anticipated this addendum will be issued on Tuesday, August 7, 2012. It is the sole responsibility of the Bidder to check for any and all addendums throughout the Bid process.

**(SEE ATTACHED FOR TERMS, CONDITIONS, AND INSTRUCTIONS)**

In compliance with the above Request For Bid, and subject to all conditions thereof, the undersigned bidder agrees to furnish and deliver any or all the items on which prices were bid within the timeframe specified herein.

Date: \_\_\_\_\_  
Telephone No.: \_\_\_\_\_  
Fax No.: \_\_\_\_\_  
Federal I.D. No. \_\_\_\_\_  
Email Address: \_\_\_\_\_

Firm Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
By (Signature): \_\_\_\_\_  
Type/Print Name \_\_\_\_\_

Is your firm MBE certified?  Yes  No

Title: \_\_\_\_\_  
Is your firm WBE certified?  Yes  No

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Terms & Conditions (Attached)  
 City of St. Louis Wage Order (Separate Attachment)  
 Project Drawings (Separate Attachment)

## FINAL CHECKLIST BEFORE SUBMITTING BID

- \_\_\_\_ 1. Complete the Bid Form by filling in the total dollar amount of the bid; listing any addenda which may have been issued; filling in the dollar amount of the bidder's check or Bid Bond, sign the proper signature line, and supply the required information in connection with the signature for the individual bidder, joint adventurer, or corporation.
- \_\_\_\_ 2. Submit Bid Bond executed by the bidder and surety. Bidders are required to use the Bid Bond furnished by the Commission or attach cashier's check to Bid Bond form. Personal checks are not accepted.
- \_\_\_\_ 3. Complete Subcontractor section by listing major subcontractor(s) and general supervisor(s), sign as required.
- \_\_\_\_ 4. Complete Vendor Information and Preference Certification Form.
- \_\_\_\_ 5. If addenda(s) are issued attach to the back of the bid package.

## NEWSPAPER ADVERTISEMENT

### Notice to Contractors

MoDOT will receive bids at its General Services, Procurement section, 830 MoDOT Drive, Jefferson City, MO until 2:00 p.m., August 10, 2012 for the construction of a 50' X 100' storage building located at 6138 Wilson Ave., St. Louis MO 63139. Contact Tom Veasman at 573-522-4404 or Tom.Veasman@modot.mo.gov to obtain plans, forms, and information or download them at no charge from <http://www.modot.org/gsbidding/>. A pre-bid conference is scheduled for July 31, 2012 @ 10:30 a. m. at the Hampton Project Office (Room 103) at 6138 Wilson Ave., St. Louis, MO 63139.

**BIDDER REQUIREMENTS**

## 1. SCOPE OF WORK

100' wide x 50' deep x 15'-3" eave height pole barn on concrete foundation wall. Approximate 50' x 50' x 6" concrete floor on one side. Two new garage doors and incidental site work.

## 2. BID INSTRUCTIONS

In order to receive consideration, bids must be made in strict accordance with the following.

- A. Make bids, upon the forms provided herein, properly signed and with all items filled out. Do not change the wording of the bid form and do not add words to the bid form. Unauthorized conditions, limitations or provisions attached to the bid will be cause for rejection of the bid.
- B. No telegraphic bid or telegraphic modification of a bid will be considered. No bids received after the time fixed for receiving them will be considered. Late bids will be returned to the bidder unopened.
- C. Address bids to the Missouri Department of Transportation, and deliver to the address given in the Invitation for Bid, on or before the day and hour set for opening the bids. Enclose each bid in a sealed envelope bearing the title of the Work, the name of the bidder, and the date and hour of the bid opening. Submit only the original signed copy of the bid. It is the sole responsibility of the bidder to see that the bid is received on time.

## 3. INVOICING AND PAYMENT

- A. Each invoice should be itemized in accordance with items listed on the contract in accordance with Section 01019, Contract Considerations, Applications for Payment provisions. Failure to comply with this requirement may delay processing of invoices for payment.
- B. Unless otherwise provided for in the solicitation documents, payment for all equipment, supplies, and/or services required herein shall be made in arrears. The Commission shall not make any advance deposits.
- C. The Commission assumes no obligation for equipment, supplies, and/or services shipped or provided in excess of the quantity ordered. Any authorized quantity is subject to the Commission's rejection and shall be returned at the Contractor's expense.
- D. The Commission reserves the right to purchase goods and services using the state-purchasing card.

## 4. EXAMINATION OF DOCUMENTS AND SITE OF WORK

- A. Before submitting a bid, each bidder shall examine the Drawings carefully, read the Specifications and all other proposed Contract Documents, and visit the site of the work. Each bidder shall fully inform themselves, prior to bidding, as to existing conditions and limitations under which the Work is to be performed and shall include in his bid a sum to cover the cost of items necessary to perform the Work, as set forth in the proposed Contract Documents. No allowance will be made to a bidder because of lack of such examination or knowledge. The submission of a bid will be considered conclusive evidence that the bidder has made such examination.
- B. The contract price shall include any necessary permits and licenses required by law incidental to the work. Local ordinances requiring building permits are not applicable to the state. Contractor will comply with local laws involving safety in the prosecution of the work.

## 5. INTERPRETATION

No oral interpretations will be made to any bidder as to the meaning of the plans and specifications or the acceptability of alternate products, materials, form or type of construction. Every request for interpretation shall be made in writing and submitted with all supporting documents not less than eight (8) days before opening of bids. The request shall be sent directly to the Senior Facilities Designer. Every interpretation made to a bidder will be in the form of an addendum and will be sent as promptly as is practicable to all persons to whom plans and specifications have been issued. All such addenda shall become part of the contract documents.

## 6. PROOF OF COMPETENCY OF BIDDER

A bidder may be required to furnish evidence, satisfactory to the Commission, that he and his proposed subcontractor(s) have sufficient means and experience in the types of work called for to assure completion of the Contract in a satisfactory manner.

7. WITHDRAWAL OF BIDS

After the bid opening, a vendor may be permitted to withdraw a bid prior to award at the sole discretion of the division if there is a verifiable error in the bid and enforcement of the bid would impose an unconscionable hardship on the vendor. This withdrawal will be considered only after receipt of a written request and supporting documentation from the vendor. Withdrawal shall be the vendor's sole remedy for an error other than an obvious clerical error. Withdrawal of a bid may result in forfeiture of the bid bond.

8. AWARD OR REJECTION OF BIDS

The Contract, if awarded, will be made on an "All or None" basis using the "lowest and best" principle of award, subject to the Commission's right to reject any or all bids and to waive informality and irregularity in the bids and in the bidding.

9. CONTRACT DOCUMENTS

The contract expresses the complete agreement of the parties and performance shall be governed solely by the specifications and requirements contained therein. Any change, whether by modification and/or supplementation, must be accomplished by a formal contract amendment signed and approved by and between the duly authorized representative of the Contractor and the duly authorized representative of the Commission, by a modified purchase order prior to the effective date of such modification. The Contractor expressly and explicitly understands and agrees that no other method and/or no other document, including correspondence, acts, and oral communications by or from any person, shall be used or construed as an amendment or modification.

10. SUBMITTALS

Review of Submittals. The Architect/Engineer/Designer review of submittals is only for the limited purpose of checking for conformance with information given and seeing if they conform to design intent. The General Services Facilities Manager is not responsible for determining the accuracy of measurements and completeness of details, for verifying quantities, or for checking fabrication or installation procedures. The General Services Facilities Manager's review does not relieve the contractor of his or her responsibilities under the contract documents. The submittal process shall be carried out as outlined in Section 01300, Submittals.

11. WORK QUALITY

- A. Inspection of Work. The General Services Facility Operations Supervisor or designated representative shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other data and records relating to the work. If requested by the General Services-Facility Operations Supervisor or designated representative, the contractor shall at any time before final acceptance of the work uncovers any portion of the finished work as directed for inspection. After examination, the contractor shall restore said portions of the work to the standards required by the contract. Should the work thus exposed and examined prove acceptable, the actual cost of uncovering, removing and replacing shall be paid by the Commission. Should the work so exposed and examined prove unacceptable, the uncovering, removing and replacing shall be at the expense of the contractor.
- B. Defective Work. All work which has been rejected shall be remedied, or if necessary, removed and replaced in an acceptable manner by the contractor at its expense. If the contractor fails to remedy or replace such defective work immediately after receiving written notice from the General Services-Facility Operations Supervisor or designated representative, the Commission may employ labor to correct the defective work, and the cost incurred in making such corrections shall be deducted from the payment due or to become due the contractor under this contract.
- C. Contractor will provide a one-year warranty for parts and labor on all building material, and equipment or a standard manufacturer's warranty whichever is greater. All warranties, including extended service agreements shall begin upon MoDOT's written acceptance of the punch list items.
- D. Contractor's Responsibility for Work. Until the General Services-Facility Operations Supervisor or designated representative, accepts the work, it shall be in the custody and under the charge and care of the contractor. Contractor shall rebuild, repair, restore or make good at its own expense any lost or stolen Commission-owned material and all injuries or damages to any portion of the work caused by action of the elements or from any other reason before its

completion and final acceptance. Issuance of a payment estimate on any part of the work done will not be considered as final acceptance of any work completed up to that time.

- E. Preservation of Utilities and Monuments. The contractor shall be responsible for the preservation of all public and private utilities, wires, lines, pipes, poles, cables, and conduit at the site of the work and shall use every precaution necessary to prevent damage or injury thereto. The contractor shall not disturb or damage any land monument or property landmark until an authorized agent has witnessed or otherwise referenced, their location and shall not remove them until directed by General Services Facilities Manager.
- F. Cooperation with Other Contractors. The contractor shall arrange its work so as not to interfere with the operations of other contractors of the Commission which might be engaged in performing adjacent or nearby work. Whenever work being done by other contractors is contiguous or related to the work involved in this contract, the respective rights of the various contractors will be determined by the General Services-Facility Operations Supervisor or designated representative in order to secure the completion of the work under all contracts in general harmony.
- G. The contractor will be required to remove from the Commission's property all debris.
- H. Temporary Suspension of Work. The General Services-Facility Operations Supervisor or designated representative shall have authority to suspend work, wholly or in part, for such period or periods of time as he may deem necessary when weather or other conditions are such that in the opinion of the General Services-Facility Operations Supervisor or designated representative the work may be done at a later time with advantage to the Commission or for failure on the part of the contractor to comply with any of the provisions of the contract. The contractor may suspend work for reasonable cause with written approval of the General Services-Facility Operations Supervisor or designated representative. Liquidated damages shall not accrue during the period in which work is suspended with the approval of the General Services-Facility Operations Supervisor or designated representative, however, if the suspension is because of the contractor's failure to comply to any of the provisions of the contract, the contractor shall not be entitled to an extension of completion time nor to a waiver of liquidated damages. In the event work is suspended, the contractor shall store all materials in a manner that will protect them from damage, and shall take every precaution to prevent damage or deterioration of, the portions of the work completed. If work has been discontinued for any reason, the contractor shall give the General Services-Facility Operations Supervisor or designated representative written notice at least forty-eight (48) hours before resuming operations.

## 12. CHANGE ORDERS

- A. General. All departures from the plans and specifications will be considered unauthorized unless, before proceeding with the work, the contractor has had delivered to it a change order, signed by the General Services-Facility Operations Supervisor or designated representative, authorizing and directing such changes or departures. All unauthorized work shall be at the contractor's expense and the General Services-Facility Operations Supervisor or designated representative may order such unauthorized work removed and replaced at the contractor's expense.
- B. Overhead and Profit on Change Orders. The percentages for overhead and profit charged on Change Orders and Field Work Authorizations shall be negotiated and may vary according to the nature, extent and complexity of the work involved. However, the overhead and profit for the contractor or subcontractor actually performing the work shall not exceed 15%. When one or more tiers of subcontractors are used, in no event shall any contractor or subcontractor receive as overhead and profit more than 7% of the cost of the work performed by any of his subcontractors. In no case shall the total overhead and profit paid by the owner on any change order exceed twenty five percent (25%) of the cost of materials, labor and equipment necessary to put the change order work in place.
- C. Contractor's Procedure for Claims. If the contractor considers additional compensation may be due for work or material not clearly covered in the contract or ordered in writing by the General Services-Facility Operations Supervisor or designated representative as extra work, or if additional compensation may be requested beyond the scope of such provisions, the contractor shall notify the General Services-Facility Operations Supervisor or designated representative in writing of the intention to make a claim before beginning the work in question. If notification is not given and the General Services-Facility Operations Supervisor or designated representative is not afforded proper facilities by contractor to provide necessary inspection and for keeping strict account of actual cost, the contractor agrees to waive any claims for additional compensation. Notice by the contractor, and the fact that the General Services-Facility Operations Supervisor or designated representative has kept account of the cost shall not be construed as substantiating the validity of the claim. The contractor shall file a written notice of claim for additional compensation in triplicate within 60 days after completing the work in question.

- a. If the claim is against the Commission, the notice of claim shall be personally delivered, or sent by certified mail to the office of the Secretary of the Commission in Jefferson City, Missouri. All notices of claims shall contain an itemized statement showing completely and fully the items and amounts forming the basis of the claim.
- b. Any claim or an item of any claim, not included in the notice and statement, or any claim included but not clearly defined and specifically set out and itemized or any claim not filed within the time and in the manner provided, shall be forever waived and shall neither constitute the basis of nor be included in any legal action, counterclaim, set-off, or arbitration.
- c. All claims filed with Missouri Highway and Transportation Commission's Secretary will be forwarded to the Missouri Department of Transportation's Claims Committee.

#### 13. GENERAL PERFORMANCE

- A. Bidders are encouraged to obtain minority business enterprise (MBE) and women business enterprise (WBE) participation in this work through the use of subcontractors, suppliers, joint ventures, or other arrangements that afford meaningful participation for M/WBEs. Bidders are encouraged to obtain 10% MBE and 5% WBE participation.
- B. This work is to be performed under the general supervision and direction of the Missouri Department of Transportation (MoDOT) and, if awarded any portion of the work, the Contractor agrees to furnish at his own expense all labor and equipment required to complete the work, it being expressly understood that this solicitation is for completed work based upon the price(s) specified and is not a solicitation for rental of equipment or employment of labor by MoDOT, and MoDOT is to have no direction or control over the employees used by the Contractor in performance of the work.

#### 14. REMEDIES AND RIGHTS

- A. No provision in the contract shall be construed, expressly or implied, as a waiver by the MHTC of any existing or future right and/or remedy available by law in the event of any claim by the MHTC of the Contractor's default or breach of contract.
- B. The Contractor agrees and understands that the contract shall constitute an assignment by the Contractor to the MHTC of all rights, title and interest in and to all causes of action that the Contractor may have under the antitrust laws of the United States or State of Missouri for which causes of action have accrued or will accrue as the result of or in relation to the particular equipment, supplies, and/or services purchased or produced by the Contractor in the fulfillment of the contract with the MHTC.
- C. In the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Contractor may request MoDOT to enter into such litigation to protect the interests of the MHTC, and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

#### 15. INVENTIONS, PATENTS, AND COPYRIGHTS

The Contractor shall defend, protect, and hold harmless the MHTC, its officers, agents, and employees against all suits of law or in equity resulting from patent and copyright infringement concerning the Contractor's performance or products produced under the terms of the contract.

#### 16. INSPECTION AND ACCEPTANCE

- A. No equipment, supplies, and/or services received by MoDOT pursuant to a contract shall be deemed accepted until MoDOT has had reasonable opportunity to inspect said equipment, supplies, and/or services.
- B. All equipment, supplies, and/or services which do not comply with the specifications and/or requirements or which are otherwise unacceptable or defective may be rejected. In addition, all equipment, supplies, and/or services which are discovered to be defective or which do not conform to any warranty of the Contractor upon inspection (or at any later time if the defects contained were not reasonably ascertainable upon the initial inspection) may be rejected.
- C. The MHTC reserves the right to return any such rejected shipment at the Contractor's expense for full credit or replacement and to specify a reasonable date by which replacements must be received.

- D. The MHTC's right to reject any unacceptable equipment, supplies, and/or services shall not exclude any other legal, equitable or contractual remedies the MHTC may have.

## 17. DEFINITIONS

**Architect/Engineer/Designer:** When the term "Architect or Engineer or Designer" is used herein, it shall refer to Larry Carver (573) 526-7934, FAX (573) 526-6948.

**MoDOT Inspector or Facility Operations Supervisor:** When the term "MoDOT Inspector or Facility Operations Supervisor" is used herein, it shall refer to those MoDOT individuals authorized to perform site inspections by Allen Lane, [Facility Operations Supervisor in the St. Louis District], 314-581-0137.

**Owner:** When the term "Owner" is used herein, it shall refer to Missouri Department of Transportation (MoDOT).

# VENDOR INFORMATION & PREFERENCE CERTIFICATION FORM

## Vendor Information

**All bidders must furnish ALL applicable information requested below**

Vendor Name/Mailing Address:  Email Address:	Vendor Contact Information (including area codes):  Phone #:  Cellular #:  Fax #:
Printed Name of Responsible Officer or Employee:	Signature:
For Corporations - State in which incorporated:	For Others - State of domicile:

If the address listed in the Vendor Name/Mailing Address block above is not located in the State of Missouri, list the address of Missouri offices or places of business:

*If additional space is required, please attach an additional sheet and identify it as **Addresses of Missouri Offices or Places of Business.***

**M/WBE INFORMATION:** List all certified Minority or Women Business Enterprises (**M/WBE**) utilized in the fulfillment of this bid. Include percentages for subcontractors and identify the M/WBE certifying agency:

<u>M/WBE Name</u>	<u>Percentage of Contract</u>	<u>M/WBE Certifying Agency</u>

*If additional space is required, please attach an additional sheet and identify it as **M/WBE Information***

## Preference Certification

**All bidders must furnish ALL applicable information requested below**

**GOODS/PRODUCTS MANUFACTURED OR PRODUCED IN USA:** If any or all of the goods or products offered in the attached bid which the bidder proposes to supply to the MHTC are **not** manufactured or produced in the "United States", or imported in accordance with a qualifying treaty, law, agreement, or regulation, list below, by item or item number, the country other than the United States where each good or product is manufactured or produced.

Item (or item number)	Location Where Item is Manufactured or Produced

*If additional space is required, please attach an additional sheet and identify it as **Location Products are Manufactured or Produced.***

**MISSOURI SERVICE-DISABLED VETERAN BUSINESS:** Please complete the following if applicable. Additional information may be requested if preference is applicable. See below definitions for qualification criteria:

**Service-Disabled Veteran** is defined as any individual who is disabled as certified by the appropriate federal agency responsible for the administration of veterans' affairs.

**Service-Disabled Veteran Business** is defined as a business concern:

- a. Not less than fifty-one (51) percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than fifty-one (51) percent of the stock of which is owned by one or more service-disabled veterans; and
- b. The management and daily business operations of which are controlled by one or more service-disabled veterans.

### Veteran Information

### Business Information

Service-Disabled Veteran's Name (Please Print)	Service-Disabled Veteran Business Name
Service-Disabled Veteran's Signature	Missouri Address of Service Disabled Veteran Business

00301

**BID FORM**

To: The Missouri Highway and Transportation Commission  
PO Box 270  
Jefferson City, Missouri 65102

1. The undersigned, having examined the proposed Contract Documents titled: **9-120810TV – Hampton Storage Building Project** and having visited the site and examined the conditions affecting the work, hereby proposes and agrees to furnish all labor, materials, equipment and everything which may be necessary or incidental thereto, as proposed by said Contract Documents, all to the satisfaction of the General Services-Facility Operations Supervisor or designated representative of the Missouri Department of Transportation and the Missouri Highway and Transportation Commission, for the stipulated sum of:

\_\_\_\_\_ DOLLARS  
(\$ \_\_\_\_\_)

2. The undersigned, acknowledges having examined and being familiar with the contract documents including the drawings, the Instructions to Bidders, General Conditions, Supplementary Conditions and the body of technical specifications.
3. The undersigned acknowledges receipt of Addenda number \_\_\_\_\_ through \_\_\_\_\_ inclusive.
4. Enclosed with this bid is bid security in the amount of not less than 5% of the bidder's proposed Contract Sum, the amount being \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_).

**IF AN INDIVIDUAL**

_____	_____
Name of individual	Residence address
_____	_____
Social Security Number	Telephone Number
_____	_____
Firm Name, If Any	
_____	
Address for communications	Signature
_____	_____

**IF A PARTNERSHIP**

_____	(State Name and Residence Address of All Partners)
Name of Partnership	_____
_____	_____
Partner	Residence Address
_____	_____
Partner	Residence Address
_____	_____
_____	Federal Tax I.D. Number
_____	_____
Address for Communications	Signature of Either Partner
_____	_____
Telephone Number	

**IF A CORPORATION**

_____	Incorporated under the laws of the
Name of Corporation	State of _____
_____	_____
Name and Title of Officer	Corporate License No. _____
_____	(If a corporation organized in a state other than
Signature of officer	Missouri, attach Certificate of Authority to do
_____	business in the State of Missouri.)
_____	_____
_____	Federal Tax I.D. Number
_____	(ATTEST)
Address for Communications	_____
_____	(SEAL) _____ Secretary
Telephone Number	

(Each bidder must complete the Bid Form by signing in the proper signature line above and by supplying the required information called for in connection with the signature. The information called for is necessary in the proper preparation of the contract and performance bond.)





00430

**SUBCONTRACTOR LISTING**

1. For portions of Work equaling or exceeding 1% of the total proposed Contract Sum, the undersigned proposes to use the following subcontractors. Except as otherwise approved by the Owner, the undersigned proposes to perform all other portions of the Work with his own forces.

2. Portion of the Work:	Subcontractor name and address:
_____	_____
	_____
	_____
_____	_____
	_____
	_____
_____	_____
	_____
	_____

USE ADDITIONAL SHEETS  
IF REQUIRED

BIDDER:  
\_\_\_\_\_

PROVIDE SIGNATURE  
IDENTICAL TO THAT  
SHOWN ON THE BID FORM

by \_\_\_\_\_

00600

**BID BOND**

KNOW ALL MEN BY THESE PRESENTS, that we \_\_\_\_\_,  
as Principal, and \_\_\_\_\_,  
as Surety, are held firmly bound unto the State of Missouri (acting by and through the Missouri Highway and  
Transportation Commission) in the penal sum of

\_\_\_\_\_ Dollars  
(\$ \_\_\_\_\_), to be paid to the State of Missouri, or the Missouri Highway and Transportation  
Commission, to be credited to the State Road Fund and Principal and Surety binding themselves, their heirs,  
executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Sealed with our seals and dated this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_

THE CONDITION OF THIS OBLIGATION is such that:  
WHEREAS, the Principal is submitting herewith a bid to the Missouri Highway and Transportation Commission on  
Route(s) \_\_\_\_\_,  
in \_\_\_\_\_ County(ies), Project(s) \_\_\_\_\_,  
for construction or improvement as set out in said bid.

NOW THEREFORE, if the Missouri Highway and Transportation Commission shall accept the bid of the Principal,  
and if said Principal shall properly execute and deliver to the Missouri Highway and Transportation Commission the  
Contract, Contract Bond, Specifications and evidence of insurance coverage in compliance with the requirements of  
the Bid, to the satisfaction of the Missouri Highway and Transportation Commission, then this obligation shall  
be void and of no effect, otherwise to remain in full force and effect.

In the event the said Principal shall, in the judgment of the Missouri Highway and Transportation Commission, fail to  
comply with any requirement as set forth in the preceding paragraph, then the State of Missouri, acting through the  
Missouri Highway and Transportation Commission, shall immediately and forthwith be entitled to recover the fees,  
and any other expense of recovery.

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Surety

By \_\_\_\_\_

\_\_\_\_\_  
Attorney in Fact (SEAL)

Attest: (CORPORATE SEAL)

\_\_\_\_\_  
Corporate Secretary

Note: This bond must be executed by the Principal and by a Corporate Surety authorized to conduct  
surety business in the State of Missouri.

**END OF SECTION**

**CONTRACT REQUIREMENTS**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Schedule of values.
- B. Application for payment.
- C. Change procedures.
- D. Alternatives.

1.2 RELATED SECTIONS

- A. Section 01600 - Material and Equipment: Product substitutions.

1.3 SCHEDULE OF VALUES

- A. Submit a printed schedule on Contractor's standard form. Electronic media printout will be considered.
- B. Submit Schedule of Values in duplicate within 20 days after date of Owner-Contractor Agreement.
- C. Revise schedule to list approved Change Orders, with each Application for Payment.

1.4 APPLICATIONS FOR PAYMENT

- A. Submit four copies of each application on Contractor's electronic media driven form.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
- C. Payment Period: 30 days.
- D. Submit waiver of liens from vendors.
- E. Include an updated construction progress schedule.
- F. Certified payroll records.

1.5 CHANGE PROCEDURES

- A. The Architect/Engineer/Designer may issue a Notice of Change that includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required.
- B. The Contractor may propose changes by submitting a request for change to the Architect/Engineer/Designer describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, the effect on the Contract Sum/Price and Contract Time, and a statement describing the effect on Work by the MoDOT District or other Contractors.
- C. Stipulated Sum/Price Change Order: Based on Notice of Change and Contractor's fixed price quotation or Contractor's request for a Change Order as approved by Architect/Engineer/Designer.
- D. Construction Change Directive: Architect/Engineer/Designer may issue a directive instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute the change.

- E. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract. Architect/Engineer/Designer will determine the change allowable in Contract Sum/Price and Contract Time as provided in the Contract Documents.
- F. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
- G. Execution of Change Orders: Architect/Engineer/Designer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.6 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specify requirements.
- B. If, in the opinion of the Architect/Engineer/Designer, it is not practical to remove and replace the Work, the Architect/Engineer/Designer will direct an appropriate remedy or adjust payment.

1.7 ALTERNATIVES

- A. Accepted Alternatives will be identified in Owner-Contractor Agreement.

**END OF SECTION**

**COORDINATION AND MEETING REQUIREMENT****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Coordination and project conditions.
- B. Field engineering.
- C. Preconstruction meeting.
- D. Site mobilization meeting.
- E. Progress meetings.
- F. Preinstallation meetings.
- G. Equipment electrical characteristics and components.
- H. Examination.
- I. Preparation.
- J. Cutting and Patching.
- K. Alteration project procedures.

**1.2 COORDINATION AND PROJECT CONDITIONS**

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

**1.3 FIELD ENGINEERING**

- A. Employ a Land Surveyor registered in the State of Missouri and acceptable to Architect/Engineer/Designer.
- B. Owner will locate and protect survey control and reference points.
- C. Control datum for survey is that established by Owner provided survey.
- D. Verify setbacks and easements; confirm drawing dimensions and elevations.
- E. Provide field engineering services. Establish elevations, lines and levels, utilizing recognized engineering survey practices.

**1.4 PRECONSTRUCTION MEETING**

- A. Architect/Engineer/Designer will schedule a meeting after Notice of Award.

- B. Attendance Required: District engineer or representative, Architect/Engineer/Designer and Contractor.
- C. Record minutes and distribute copies within 5 days after meeting to participants, with two copies to District Engineer, Architect/Engineer/Designer, participants and those affected by decisions made.

1.5 SITE MOBILIZATION MEETING

- A. Architect/Engineer/Designer will schedule a meeting at the Project site prior to Contractor occupancy.
- B. Architect/Engineer/Designer will record minutes and distributes copies within 5 days after meeting to participants, with two copies to Architect/Engineer/Designer, participants and those affected by decisions made.

1.6 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at when arranged by Architect/Engineer/Designer.
- B. Architect/Engineer/Designer will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, District engineer representative, Architect/Engineer/Designer, as appropriate to agenda topics for each meeting.
- D. Agenda:
  - 1. Review of Work progress.
  - 2. Field observations, problems, and decisions.
  - 3. Identification of problems, which impede planned progress.
  - 4. Maintenance of progress schedule.
  - 5. Corrective measures to regain projected schedules.
  - 6. Coordination of projected progress.
  - 7. Effect of proposed changes on progress schedule and coordination.
- E. Record minutes and distributes copies within 5 days after meeting to participants and those affected by decisions made.

1.7 PREINSTALLATION MEETING

- A. When required in individual specification sections, convene a pre-installation meeting at the site prior to commencing work of the section.
- B. Notify Architect/Engineer/Designer seven days in advance of meeting date.
- C. Prepare agenda and preside at meeting:
  - 1. Review conditions of installation, preparation and installation procedures.
  - 2. Review coordination with related work.
- D. Record minutes and distributes copies within 5 days after meeting to participants and those affected by decisions made.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

**3.1 CUTTING AND PATCHING**

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements, which affect:
  - 1. Structural integrity of element.
  - 2. Integrity of weather-exposed or moisture-resistant elements.
  - 3. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching to complete Work, and to:
  - 1. Uncover Work to install or correct ill-timed Work.
  - 2. Remove and replace defective and non-conforming Work.
  - 3. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Cut masonry and concrete materials using masonry saw or core drill.
- E. Fit Work tight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
- F. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- G. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
- H. Identify hazardous substances or conditions exposed during the Work to the Architect/Engineer/Designer for decision or remedy.

**3.2 ALTERATION PROJECT PROCEDURES**

- A. Materials: As specified in Product sections; match existing Products and work for patching and extending work.
- B. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- C. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Architect/Engineer/Designer for review.
- D. Patch or replace portions of existing surfaces that are damaged, lifted, discolored or showing other imperfections.
- E. Finish surfaces as specified in individual Product sections.

**END OF SECTION**

01300

**SUBMITTAL REQUIREMENTS**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Proposed Products list.
- D. Product Data.
- E. Shop Drawings.
- F. Samples.
- G. Design data.
- H. Test reports.
- I. Certificates.
- J. Manufacturer's instructions.
- K. Manufacturer's field reports.
- L. Erection drawings.
- M. Construction photographs.

1.2 RELATED SECTIONS

- A. Section 01300 - Submittals
- B. Section 01400 - Quality Control: Manufacturers' field services and reports.
- C. Section 01700 - Contract Closeout: Contract warranties, bonds, manufacturers' certificates and closeout submittals.

1.3 REFERENCES

- A. AGC Associated General Contractors of America publication "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".

1.4 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Architect/Engineer/Designer accepted form.
- B. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number and specification section number, as appropriate.
- C. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- D. Schedule submittals to expedite the Project, and deliver to Architect/Engineer/Designer at business address. Coordinate submission of related items.
- E. For each submittal for review, allow 15 days excluding delivery time to and from the contractor.
- F. Identify variations from Contract Documents and Product or system limitations, which may be detrimental to successful performance of the completed Work.
- G. Submittals not requested will not be recognized or processed.

1.5 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial schedule in duplicate within 15 days after date established in Notice to Proceed.
- B. Revise and resubmit as required.
- C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each major portion of Work or operation, identifying first workday of each week.

1.6 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation and reference standards.

1.7 PRODUCT DATA

- A. Product Data for Review:
  - 1. Submitted to Architect/Engineer/Designer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
  - 2. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.
- B. Product Data for Information:
  - 1. Submitted for the Architect/Engineer/Designer's knowledge as contract administrator or for the Owner.
- C. Product Data for Project Closeout:
  - 1. Submitted for the Owner's benefit during and after project completion.
- D. Submit the number of copies, which the Contractor requires, plus two copies that will be retained by the Architect/Engineer/Designer.
- E. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- F. After review distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01700 - CONTRACT CLOSEOUT.

1.8 SHOP DRAWINGS

- A. Shop Drawings for Review:
  - 1. Submitted to Architect/Engineer/Designer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
  - 2. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.
- B. Shop Drawings for Information:
  - 1. Submitted for the Architect/Engineer/Designer's knowledge as contract administrator or for the Owner.

- C. Shop Drawings for Project Closeout:
  1. Submitted for the Owner's benefit during and after project completion.
- D. Indicate special utility and electrical characteristics, utility connection requirements and location of utility outlets for service for functional equipment and appliances.
- E. Submit in the form of one reproducible transparency and one opaque reproduction.

#### 1.9 SAMPLES

- A. Samples for Review:
  1. Submitted to Architect/Engineer/Designer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
  2. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.
- B. Samples for Information:
  1. Submitted for the Architect/Engineer/Designer's knowledge as contract administrator or for the Owner.
- C. Samples for Selection:
  1. Submitted to Architect/Engineer/Designer for aesthetic, color, or finish selection.
  2. Submit samples of finishes for Architect/Engineer/Designer selection.
  3. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.

#### 1.10 DESIGN DATA

- A. Submit for the Architect/Engineer/Designer's knowledge as contract administrator or for the Owner.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

#### 1.11 TEST REPORTS

- A. Submit for the Architect/Engineer/Designer's knowledge as contract administrator or for the Owner.
- B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

#### 1.12 CERTIFICATES

- A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor, or the Contractor to Architect/Engineer/Designer, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product but must be acceptable to Architect/Engineer/Designer.

#### 1.13 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery,

storage, assembly, installation, and start-up, adjusting and finishing, to Architect/Engineer/Designer for delivery to owner in quantities specified for Product Data.

- B. Indicate special procedures, perimeter conditions requiring special attention and special environmental criteria required for application or installation.
- C. Refer to Section 01400 - Quality Control, Manufacturers' Field Services article.

#### 1.14 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for the Architect/Engineer/Designer's benefit as contract administrator or for the Owner.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

#### 1.15 ERECTION DRAWINGS

- A. Submit drawings for the Architect/Engineer/Designer's benefit as contract administrator or for the Owner.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by the Architect/Engineer/Designer or Owner.

**END OF SECTION**

QUALITY CONTROL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance - control of installation.
- B. Tolerances
- C. References and standards.
- D. Mock-up.
- E. Inspecting and testing laboratory services.
- F. Manufacturers' field services.

1.2 RELATED SECTIONS

- A. Section 01300 - Submittals: Submission of manufacturers' instructions and certificates.
- B. Section 01600 - Material and Equipment: Requirements for material and product quality.
- C. Section 01650 - Starting of Systems.

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

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

1.4 TOLERANCES

- A. Monitor fabrication and installation tolerance control of Products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer/Designer before proceeding.
- C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.5 REFERENCES AND STANDARDS

- A. For Products or workmanship specified by association, trade or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

- B. Conform to reference standard by date of issue current on date for receiving bids or date specified in the individual specification sections, except where a specific date is established by code.
- C. Neither the contractual relationships, duties or responsibilities of the parties in Contract nor those of the Architect/Engineer/Designer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

#### 1.6 TESTING SERVICES

- A. Contractor to provide all testing services as called out in these specifications.
- B. Testing and source quality control may occur on or off the project site. Perform off-site testing as required by the Architect/Engineer/Designer or the Owner.
- C. Testing does not relieve Contractor to perform Work to contract requirements.
- D. Re-testing required because of non-conformance to specified requirements shall be performed by the same MoDOT personnel on instructions by the Architect/Engineer/Designer.

#### 1.7 INSPECTION SERVICES

- A. Owner will employ MoDOT Personnel to perform inspection.
- B. Inspecting may occur on or off the project site. Perform off-site inspecting as required by the Architect/Engineer/Designer or the Owner.
- C. Inspecting does not relieve Contractor to perform Work to contract requirements.

#### 1.8 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and the balancing of equipment as applicable and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Refer to Section 01300 - SUBMITTALS, MANUFACTURERS' FIELD REPORTS article.

### PART 2 EXECUTION

#### 2.1 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.

#### 2.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer or conditioner prior to applying any new material or substance in contact or bond.

**END OF SECTION**

01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities: Electricity, telephone service, facsimile service and sanitary facilities.
- B. Temporary Controls: enclosures and fencing, protection of the Work and water control.
- C. Construction Facilities: progress cleaning and temporary buildings.

~~1.2 TEMPORARY ELECTRICITY~~

- ~~A. Cost: By Contractor; pay for temporary power service furnished by MoDOT.~~

~~1.3 TELEPHONE SERVICE~~

- ~~A. Provide, maintain, and pay for telephone service to field office and Architect/Engineer/Designer's field office at time of project mobilization.~~

1.4 TEMPORARY WATER SERVICE

- A. Connect to existing water source as directed for construction operations at time of project mobilization.
- ~~B. Contractor will reimburse Owner for water used in construction as agreed upon at time of project mobilization.~~

1.5 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

1.6 FENCING

- A. Construction: Use plastic mesh safety fencing or better.
- B. Provide 48" high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.7 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.8 EXTERIOR ENCLOSURES

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

1.9 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate

work area to prevent damage.

- C. Provide protective coverings at walls, projections, jambs, sills and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

#### 1.10 SECURITY

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

#### 1.11 ACCESS ROADS

- A. Provide and maintain access to fire hydrants, free of obstructions.
- B. Provide means of removing mud from vehicle wheels before entering streets.
- C. Designated existing on-site roads may be used for construction traffic.

#### 1.12 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris and rubbish from site periodically and dispose off-site.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

#### ~~1.13 FIELD OFFICES AND SHEDS~~

- ~~A. Office: Weather tight, with lighting, electrical outlets, heating and ventilating equipment and equipped with drawing rack and drawing display table.~~
- ~~B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.~~

#### 1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities and materials prior to Final Application for Payment inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

#### PART 2 PRODUCTS

Not Used.

#### PART 3 EXECUTION

Not Used.

END OF SECTION

**MATERIAL AND EQUIPMENT REQUIREMENT**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions.

1.2 RELATED SECTIONS

- A. Instructions to Bidders: Product options and substitution procedures.
- B. Section 01400 - Quality Control: Product quality monitoring.

1.3 PRODUCTS

- A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- B. Provide interchangeable components of the same manufacture for components being replaced.

1.4 TRANSPORTATION AND HANDLING

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

1.5 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.
- C. Store sensitive Products in weather tight, climate controlled, enclosures in an environment favorable to Product.
- D. For exterior storage of fabricated Products, place on sloped supports above ground.
- E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- F. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of Products.
- G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement or damage.

- I. Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.6 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description is acceptable.
- B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.7 SUBSTITUTIONS

- A. Architect/Engineer/Designer will consider requests for Substitutions only within 15 days after date established in Notice to Proceed.
- B. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
- D. A request constitutes a representation that the Contractor:
  - 1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
  - 2. Will provide the same warranty for the Substitution as for the specified Product.
  - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
  - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
  - 5. Will reimburse Owner for review or redesign services associated with re-approval by authorities.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
  - 1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
  - 2. Submit shop drawings, product data and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.
  - 3. The Architect/Engineer/Designer will notify Contractor in writing of decision to accept or reject request.

PART 2

PRODUCTS

Not Used.

PART 3

EXECUTION

Not Used.

END OF SECTION

## STARTING OF SYSTEMS REQUIREMENT

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Starting systems.
- B. Demonstration and instructions.
- C. Testing, adjusting and balancing.

## 1.2 RELATED SECTIONS

- A. Section 01400 - Quality Control: Manufacturers field reports.
- B. Section 01700 - Contract Closeout: System operation and maintenance data and extra materials.

## 1.3 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect/Engineer/Designer seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, and control sequence and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable manufacturer's representative or Contractors' personnel in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up and to supervise placing equipment or system in operation.
- H. Submit a written report in accordance with Section 01300 that equipment or system has been properly installed and is functioning correctly.

## 1.4 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Final Completion.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance and shutdown of each item of equipment at agreed time, at equipment location.

- E. Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instruction.
- F. The amount of time required for instruction on each item of equipment and system that's specified in individual sections.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

**CONTRACT CLOSEOUT REQUIREMENT**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Closeout procedures.
- B. Final cleaning.
- C. Adjusting.
- D. Project record documents.
- E. Operation and maintenance data.
- F. Spare parts and maintenance Products.
- G. Warranties.

**1.2 RELATED SECTIONS**

- A. Section 01500 - Construction Facilities and Temporary Controls: Progress cleaning.
- B. Section 01650 - Starting of Systems: System start-up, testing, adjusting and balancing.

**1.3 CLOSEOUT PROCEDURES**

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer/Designer's review.
- B. Provide submittals to Owner that is required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments and sum remaining due.
- D. Owner will occupy portions of the building as specified in Section 01010.

**1.4 FINAL CLEANING**

- A. Execute final cleaning prior to final project assessment. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- B. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- C. Clean or replace filters of operating equipment used during construction and/or adjustment.
- D. Clean debris from roofs, gutters, downspouts and drainage systems.
- E. Clean site; sweep paved areas, rake clean landscaped surfaces.
- F. Remove waste and surplus materials, rubbish and construction facilities from the site.

**1.5 ADJUSTING**

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

**1.6 PROJECT RECORD DOCUMENTS**

- A. Store record documents separate from documents used for construction.

- B. Record information concurrent with construction progress.
- C. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
  1. Manufacturer's name and product model and number.
  2. Product substitutions or alternates utilized.
  3. Changes made by Addenda and modifications.
- D. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
  1. Measured depths of foundations in relation to finish main floor datum.
  2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  4. Field changes of dimension and detail.
  5. Details not on original Contract drawings.
- E. Submit documents to Architect/Engineer/Designer's with claim for final Application for Payment.

#### 1.7 OPERATION AND MAINTENANCE DATA

- A. Submit data bound in 8-1/2 x 11 inch (A4) text pages, three D side ring binders with durable plastic covers.
- B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project and subject matter of binder when multiple binders are required.
- C. Internally subdivide the binder contents with permanent page dividers, logically organized; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Submit 1 draft copy of completed volumes 15 days prior to final inspection. This copy will be reviewed and returned with Architect/Engineer/Designer comments. Revise content of all document sets as required prior to final submission.
- E. Submit two sets of revised final volumes, within 10 days after final inspection.

#### 1.8 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Provide spare parts, maintenance, and extra Products in quantities specified individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Owner.

#### 1.9 WARRANTIES

- A. Execute and assemble transferable warranty documents from Subcontractors, suppliers and manufacturers.
- B. Submit prior to final Application for Payment.
- C. For items of Work delayed beyond date of Final Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of the warranty period.

**PART 2      PRODUCTS**

Not Used.

**PART 3      EXECUTION**

Not Used.

**END OF SECTION**

02100

**SITE PREPARATION**

**PART 1 SCOPE**

- A. The contractor shall visit the site and carefully examine the conditions of the premises to determine the amount of work and materials required for the work necessary to prepare the site in every respect for the construction of the Storage Building, as shown on the plans.
- B. The contractor shall be responsible for determining the quantities of materials to be excavated and handled and for the amount of backfilling, filling and grading to be done in order to perform all work required on the plans.
- C. Contractor to provide 6" minimum Type 5 rock base for all lawn areas disturbed during construction. Slope away from building.

**END OF SECTION**

**EXCAVATING, BACKFILLING AND COMPACTING****PART 1 GENERAL****1.1 SUMMARY**

- A Excavate, backfill, compact, and grade the site to the elevations shown on the Drawings, as specified herein, and as needed to meet the requirements of the construction shown in the Contract Documents.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

**1.2 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity and numbers to accomplish the work of this Section in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the MoDOT Inspector.

**1.3 DELIVERY, STORAGE AND HANDLING**

- A. Comply with pertinent provisions of Section 01620.

**PART 2 PRODUCTS****2.1 SOIL MATERIALS**

- A. Fill and backfill materials:
  - 1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps over 6" in greatest dimension, and with not more than 15% of the rocks or lumps larger than 2-3/8" in their greatest dimension.
  - 2. Fill material is subject to the approval of the MoDOT Inspector, and are those materials removed from excavations or imported from off-site borrow areas; predominantly granular, non-expansive soils free from roots and other deleterious matter.
  - 3. Do not permit rocks having a dimension greater than 1" in the upper 12" of fill or embankment.
  - 4. Cohesionless material used for structural backfill. Provide sand free from organic material and other foreign matter, and as approved by the MoDOT Inspector.
  - 5. Where granular base is called for under building slabs, provide aggregate complying with requirements of Section 03300 of these Specifications.

**2.2 WEED KILLER**

- A. Provide a dry, free-flowing, dust-free chemical compound, soluble in water, capable of inhibiting growth of vegetation, and approved for use on this Work by governmental agencies having jurisdiction.

## 2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

## PART 3 EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 FINISH ELEVATIONS AND LINES

- A. Comply with pertinent provisions of Section 01050.

### 3.3 PROCEDURES

- A. Utilities:
  - 1. Unless shown to be removed, protect active utility lines shown on the Drawings or otherwise made known to the Contractor prior to excavating. If damaged, repair or replace at no additional cost to the Owner.
  - 2. If active utility lines are encountered and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
  - 3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
  - 4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Architect and secure his instructions.
  - 5. Do not proceed with permanent relocation of utilities until written instructions are received from the Architect.
- B. Protection of persons and property:
  - 1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.
  - 2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
  - 3. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, washout and other hazards created by operations under this Section.
- C. Dewatering:
  - 1. Remove all water, including rainwater encountered during trench and sub-structure work to an approved location by pumps, drains and other approved methods.
  - 2. Keep excavations and site construction area free from water.
- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors and to other work being performed on or near the site.
- E. Maintain access to adjacent areas at all times.

### 3.4 EXCAVATING

- A. Perform excavating of every type of material encountered within the limits of the Work to the lines, grades and elevations indicated and specified herein.

- B. Satisfactory excavated materials:
  - 1. Transport to and place in, fill or embankment areas within the limits of the Work.
- C. Unsatisfactory excavated materials:
  - 1. Excavate to a distance below grade as directed by the MoDOT Inspector and replace with satisfactory materials.
  - 2. Include excavation of unsatisfactory materials and replacement by satisfactory materials, as parts of the work of this Section.
- D. Surplus materials:
  - 1. Dispose of unsatisfactory excavated material, and surplus satisfactory excavated material, away from the site at disposal areas arranged and paid for by the Contractor.
- E. Excavation of rock:
  - 1. Where rocks, boulders, granite, or similar material is encountered, and where such material cannot be removed or excavated by conventional earth moving or ripping equipment, take required steps to proceed with the general grading operations of the Work, and remove or excavate such material by means which will neither cause additional cost to the Owner nor endanger buildings or structures whether on or off the site.
  - 2. Do not use explosives without written permission from the Architect.
- F. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.
- G. Borrow:
  - 1. Obtain material required for fill or embankment in excess of that produced within the grading limits of the Work from borrow areas selected and paid for by the Contractor and approved by the MoDOT Inspector.
- H. Ditches and gutters:
  - 1. Cut accurately to the cross sections, grades and elevations shown.
  - 2. Maintain excavations free from detrimental quantities of leaves, sticks, trash, and other debris until completion of the Work.
  - 3. Dispose of excavated materials as shown on the Drawings or directed by the MoDOT Inspector; except do not, in any case, deposit materials less than 3'-0" from the edge of a ditch.
- I. Unauthorized excavation:
  - 1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific instruction from the Architect or the MoDOT Inspector.
  - 2. Under footings, foundations, or retaining walls:
    - a. Fill unauthorized excavations by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevation.
    - b. When acceptable to the soil engineer, lean concrete fill may be used to bring the bottom elevation to proper position.
  - 3. Elsewhere backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the soil engineer.
- J. Stability of excavations:
  - 1. Slope sides of excavations to 1:1 or flatter, unless otherwise directed by the MoDOT Inspector.
  - 2. Shore and brace where sloping is not possible because of space restrictions or stability of the materials being excavated.

3. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.
- K. Excavating for structures:
1. Conform to elevations and dimensions shown within a tolerance of 0.10 ft, and extending a sufficient distance from footings and foundations to permit placing and removing concrete formwork, installation of services, other construction required and for inspection.
  2. In excavating for footings and foundations, take care not to disturb bottom of excavation:
    - a. Excavate by hand tools to final grade just before concrete is placed.
    - b. Trim bottoms to required lines and grades to leave solid base to receive concrete.
  3. Excavate for footings and foundations only after general site excavating, filling and grading are complete.
- L. Excavating for pavements:
1. Cut surface under pavements to comply with cross sections, elevations and grades.
- M. Cold weather protection:
1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

### 3.5 FILLING AND BACKFILLING

- A. General:
1. For each classification listed below, place acceptable soil material in layers to required subgrade elevations.
  2. In excavations:
    - a. Use satisfactory excavated or borrowed materials.
  3. Under building slabs:
    - a. Use subbase materials.
  4. Under building slabs:
    - a. Use granular fill, if so called for on the Drawings, complying with aggregate acceptable under Section 03300 of these Specifications.
- B. Backfill excavations as promptly as progress of the Work permits, but not until completion of the following.
1. Acceptance of construction below finish grade including, where applicable, dampproofing and waterproofing.
  2. Inspecting, testing, approving and recording locations of underground utilities.
  3. Removing concrete formwork.
  4. Removing shoring and bracing and backfilling of voids with satisfactory materials.
  5. Removing trash and debris.
  6. Placement of horizontal bracing on horizontally supported walls.
- C. Ground surface preparation:
1. Remove vegetation, debris, unsatisfactory soil materials, obstructions and deleterious matter from ground surface prior to placement of fills.
  2. Plow, strip, or break up sloped surfaces steeper than one vertical to four horizontal so that fill material will bond with existing surface.
  3. When existing ground surface has a density less than that specified under "compacting" for the particular area, break up the ground surface, pulverize, moisture-condition to the optimum moisture content and compact to required depth and percentage of maximum density.
- D. Placing and compacting:
1. Place backfill and fill materials in layers not more than 8" in loose depth.
  2. Before compacting, moisten or aerate each layer as necessary to provide the optimum moisture content.

3. Compact each layer to required percentage of maximum density for area.
4. Do not place backfill or fill material on surfaces that are muddy, frozen or containing frost or ice.
5. Place backfill and fill materials evenly adjacent to structures, to required elevations.
6. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.
7. Where the construction includes basement or other underground walls having structural floors over them, do not backfill such walls until the structural floors are in place and have attained sufficient strength to support the walls.

### 3.6 GRADING

#### A. General:

1. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
2. Smooth the finished surfaces within specified tolerance.
3. Compact with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.
3. Where a change of slope is indicated on the Drawings, construct a rolled transition section having a minimum radius of approximately 8'0", unless adjacent construction will not permit such a transition or if such a transition defeats positive control of drainage.

#### B. Grading outside building lines:

1. Grade areas adjacent to buildings to achieve drainage away from the structures and to prevent ponding.
2. Finish the surfaces to be free from irregular surface changes, and:
  - a. Shape the surface of areas scheduled to be under walks to line, grade and cross-section, with finished surface not more than 0.10 ft above or below the required subgrade elevation.
  - b. Shape the surface of areas scheduled to be under pavement to line, grade and cross-section, with finished surface not more than 0.05 ft above or below the required subgrade elevation.

### 3.7 COMPACTING

A. Control soil compaction during construction to provide the minimum percentage of density specified for each area as determined according to ASTM D1557.

B. Provide not less than the following maximum density of soil material compacted at optimum moisture content for the actual density of each layer of soil material in place and as approved by the MoDOT Inspector.

1. Structures:
  - a. Compact the top 8" of subgrade and each layer of fill material or backfill material at 90% of maximum density.
2. Lawn and unpaved areas:
  - a. Compact the top 8" of subgrade and each layer of fill material or backfill material at 90% of maximum density.
  - b. Compact the upper 12" of filled areas, or natural soils exposed by excavating, at 85% of maximum density.
3. Walks:
  - a. Compact the top 8" of subgrade and each layer of fill material or backfill material at 90% of maximum density.
4. Pavements:
  - a. Compact the top 8" of subgrade and each layer of fill material or backfill material at 90% of maximum density.

- C. Moisture control:
  - 1. Where subgrade or layer of soil material must be moisture-conditioned before compacting, uniformly apply water to surface of subgrade or layer of soil material to prevent free water appearing on surface during or subsequent to compacting operations.
  - 2. Remove and replace or scarify and air dry, soil material that is too wet to permit compacting to the specified density.
  - 3. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture-density relation tests approved by the MoDOT Inspector.

### 3.8 MAINTENANCE

- A. Protection of newly graded areas:
  - 1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds;
  - 2. Repair and establish grades in settled, eroded and rutted areas to the specified tolerances.
- B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape and compact to the required density prior to further construction.

**END OF SECTION**

**TRENCHING, BACKFILLING AND COMPACTING****PART 1 GENERAL****1.1 SUMMARY**

- A. Trench, backfill, and compact as specified herein and as needed for installation of underground utilities associated with the Work.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

**1.2 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirement and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity and numbers to accomplish the work in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the construction soil engineer.

**1.3 DELIVERY, STORAGE AND HANDLING**

- A. Comply with pertinent provisions of Section 01620.

**PART 2 PRODUCTS****2.1 SOIL MATERIALS**

- A. Fill and backfill materials:
  - 1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps over 6" in greatest dimension, and with not more than 15% of the rocks or lumps larger than 2-3/8" in their greatest dimension.
  - 2. Fill material is subject to the approval of the owner/architect and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soil free from roots and other deleterious matter.
  - 3. Do not permit rocks having a dimension greater than 1" in the upper 12" of fill.
  - 4. Cohesion less material used for backfill: Provide sand free from organic material and other foreign matter and as approved by the Owner/Architect

**2.2 OTHER MATERIALS**

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

**PART 3 EXECUTION****3.1 SURFACE CONDITIONS**

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 FINISH ELEVATIONS AND LINES

- A. Comply with pertinent provision of Section 01050.

### 3.3 PROCEDURES

#### A. Utilities:

1. Unless shown to be removed, protect active utility lines shown on the drawings or otherwise made known to the Contractor prior to trenching. If damaged, repair or replace at no additional cost to the Owner.
2. If active utility lines are encountered, and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Architect and secure his instructions.
5. Do not proceed with permanent relocation of utilities until written instructions are received from the Architect.

#### B. Protection of persons and property:

1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
3. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, washout and other hazards created by operations under this Section.

#### C. Dewatering:

1. Remove all water, including rainwater, encountered during trench and sub-structure work to an approved location by pumps, drains and other approved methods.
2. Keep trenches and site construction area free from water.

- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors and to other work being performed on or near the site.

- E. Maintain access to adjacent areas at all times.

### 3.4 TRENCHING

- A. Comply with pertinent provisions of Section 02220 and the provisions of this Section.

- B. Provide sheeting and shoring necessary for protection of the Work and for the safety of personnel.

1. Prior to backfilling, remove all sheeting.
2. Do not permit sheeting to remain in the trenches except when, in the opinion of the Architect, field conditions or the type of sheeting or methods of construction such as use of concrete bedding are such as to make removal of sheeting impracticable. In such cases, the Architect may permit portions of sheeting to be cut off and remain in the trench.

#### C. Open cut:

1. Excavate for utilities by open cut.
2. If conditions at the site prevent such open cut and if approved by the Architect, trenching may be used.
3. Short sections of a trench may be tunneled if, in the opinion of the Architect, the conductor can be installed safely and backfill can be compacted properly into such tunnel.

4. Where it becomes necessary to excavate beyond the limits of normal excavations lines in order to remove boulders or other interfering objects, backfill the voids remaining after removal of the objects as directed by the construction soil engineer.
  5. When the void is below the subgrade for the utility bedding, use suitable earth materials and compact to the relative density directed by the construction soil engineer, but in no case to a relative density less than 90%.
  6. When the void is in the side of the utility trench or open cut, use suitable earth or sand compacted or consolidated as approved by the construction soil engineer but in no case to a relative density less than 80%.
  7. Remove boulders and other interfering objects and backfill voids left by such removals, at no additional cost to the Owner.
  8. Excavating for appurtenances:
    - a. Excavate for manholes and similar structures to a distance sufficient to leave at least 12" clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.
    - b. Overdepth excavation beyond such appurtenances that has not been directed will be considered unauthorized. Fill with sand, gravel or lean concrete as directed by the construction soil engineer and at no additional cost to the Owner.
- D. Trench to the minimum width necessary for proper installation of the utility, with sides as nearly vertical as possible. Accurately grade the bottom to provide uniform bearing for the utility.
- E. Depressions:
1. Dig bell holes and depressions for joints after the trench has been graded. Provide uniform bearing for the pipe on prepared bottom of the trench.
  2. Except where rock is encountered, do not excavate below the depth indicated or specified.
  3. Where rock is encountered, excavate rock to a minimum overdepth of 4" below the trench depth indicated or specified.
- F. Where utility runs traverse public property or are subject to governmental or utility company jurisdiction, provide depth, bedding, cover and other requirements as set forth by legally constituted authority having jurisdiction but in no case less than the depth shown in the Contract Documents.
- G. Where trenching occurs in existing lawns, remove turf in sections and keep damp. Replace turf upon completion of the backfilling.
- H. Cover:
1. Provide minimum trench depth indicated below to maintain a minimum cover over the top of the installed item below the finish grade or subgrade.
    - a. Areas subject to vehicular traffic:
      - (1) Sanitary sewers:
      - (2) Storm drains:
    - b. Areas not subject to vehicular traffic:
      - (1) Sanitary sewers: 30";
      - (2) Storm drains: 18".
    - c. All areas:
      - (1) Water lines: 30";
      - (2) Natural gas lines: 24";
      - (3) Electrical cables: 42";
      - (4) Electrical ducts: 36".
    - d. Concrete encased:
      - (1) Pipe sleeves for water and gas lines: 24";
      - (2) Sanitary sewers and storm drains: 12";
      - (3) Electrical ducts: 24".

2. Where utilities are under a concrete structure slab or pavement, the minimum depth need only be sufficient to completely encase the conduit or pipe sleeve and electrical long-radius rigid metal conduit rise, provided it will not interfere with the structural integrity of the slab or pavement.
3. Where the minimum cover is not provided encase the pipes in concrete as indicated. Provide concrete with a minimum 28th day compressive strength of 2,500 psi.

### 3.5 BEDDING

- A. Provide bedding as indicated on the Drawings.

### 3.6 BACKFILLING

#### A. General:

1. Do not completely backfill trenches until required pressure and leakage tests have been performed, and until the utilities systems as installed conform to the requirements specified in the pertinent Sections of these Specifications.
2. Except as otherwise specified or directed for special conditions, backfill trenches to the ground surface with selected material approved by the construction soil engineer.
3. Reopen trenches that have been improperly backfilled, to a depth as required for proper compaction. Refill and compact as specified or otherwise correct to the approval of the construction soil engineer.
4. Do not allow or cause any of the Work performed or installed to be covered up or enclosed by work of this Section prior to required inspections, tests and approvals.
5. Should any of the Work be so enclosed or covered up before it has been approved, uncover all such Work and, after approvals have been made, refill and compact as specified, all at no additional cost to the Owner.

#### B. Lower portion of trench:

1. Deposit approved backfill and bedding material in layers of 6" maximum thickness, and compact with suitable tampers to the density of the adjacent soil, or grade as specified herein, until there is a cover of not less than 24" over sewers and 12" over other utility lines.
2. Take special care in backfilling and bedding operations to not damage pipe and pipe coatings.

#### C. Remainder of trench:

1. Except for special materials for pavements, backfill the remainder of the trench with material free from stones larger than 6" or 1/2 the layered thickness, whichever is smaller, in any dimension.
2. Deposit backfill material in layers not exceeding the thickness specified and compact each layer to the minimum density directed by the construction soil engineer.

#### D. Adjacent to buildings: Mechanically compact backfill within ten feet of buildings.

#### E. Consolidation of backfill by jetting with water may be permitted, when specifically approved by the construction soil engineer, in areas other than building and pavement areas.

### 3.7 TEST FOR DISPLACEMENT OF SEWERS AND STORMDRAINS

- A. Check sewers and storm drains to determine whether displacement has occurred after the trench has been backfilled to above the pipe and has been compacted as specified.
- B. Flash a light between manholes or, if the manholes have not yet been constructed, between the locations of the manholes, by means of a flashlight or by reflecting sunlight with a mirror.
- C. If the illuminated interior of the pipeline shows poor alignment, displaced pipes, or any other defects, correct the defects to specified conditions and at no additional cost to the Owner.

3.8 PIPE JACKING

- A. The Contractor may, at his option, install steel pipe casings, tongue-and-groove reinforced concrete pipes, and steel pipes under existing roads or pavements by jacking into place using procedures approved by the governmental agencies having jurisdiction approved by the construction soil engineer.

3.9 TUNNELING OPERATIONS

- A. The Contractor may, at his option, tunnel pipes into position using procedures approved by the construction soil engineer and the governmental agencies having jurisdiction.

3.10 FIELD QUALITY CONTROL

- A. The construction soil engineer will inspect open cuts and trenches before installation of utilities, and will make the following tests:
  1. Assure that trenches are not backfilled until all tests have been completed.
  2. Check backfilling for proper layer thickness and compaction.
  3. Verify that test results conform to the specified requirements, and that sufficient tests are performed.
  4. Assure that defective work is removed and properly replaced.

**END OF SECTION**

## TERMITE CONTROL

## PART 1 GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division One specification sections, apply to work of this Section.
- B. Comply with manufacturer's instructions and recommendations for work, including preparation of substrate and application.

## 1.2 DESCRIPTION OF WORK

- A. Extent of termite control work is as herein specified and applied at the **Hampton Storage Building project only.**

## 1.3 QUALITY ASSURANCE

- A. Scope of Work: Contractor shall furnish all superintendence, labor, tools, materials, equipment and perform all operations to complete the termite control work as shown on the drawings and specified herein.
- B. Engage a professional pest control operator licensed by the Missouri Department of Agriculture, Bureau of Pesticide Control, P.O. Box 630, Jefferson City, Missouri 65102, 573/751-2462, for application of termiticide soil treatment solutions.
  - 1. Contractor shall be responsible for certifying that applicator of termiticides is licensed and in good standing (no blemishes on record) with the Missouri Department of Agriculture, Bureau of Pesticide Control for the application of termiticides.
  - 2. Prior to commencement of termiticides application, applicator shall provide to the Construction Inspector certification of licensing and standing with the Missouri Department of Agriculture, Bureau of Pesticide Control for the application of termiticides.
  - 3. Termiticides shall be applied by the certified applicator and not by uncertified employees.
- C. Restrictions: Do not apply soil treatment solution until excavating, filling and grading operations, and landscaping is completed, except as otherwise required in construction operations.
- D. To insure penetration, do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with handling and application instructions of soil toxicant manufacturer.

## 1.4 SUBMITTALS

- A. Product Data: For information only, submit three copies of the manufacturer's technical data and application instructions.

## 1.5 JOB CONDITIONS

- A. Inspection: The applicator shall examine the areas and conditions under which the termite control work is to be performed and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the applicator.
  - 1. Applicator shall visually inspect the application areas to certify that building waste materials or organic matter has not been placed in the backfill materials.

1.6 WARRANTY

- A. Furnish written warranty certifying that applied soil poisoning treatment will prevent infestation of subterranean termites and, if subterranean termite activity is discovered during warranty period, Contractor will re-treat soil and repair or replace damage caused by termite infestation.
  - 1. Provide warranty for a period of 5 years from date of treatment, signed by applicator and Contractor.

PART 2 PRODUCTS

2.1 MATERIALS & COMPONENTS

- A. Soil Treatment Solution: Use emulsible concentrate insecticide for dilution with water, specifically formulated to prevent termite infestation. Provide a working solution of one of the following chemical elements that are accepted for registration by the Missouri Department of Agriculture.
  - 1. Chlorpyrifos.
    - Dursban TC Dow Chemical Company
  - 2. Permethrin.
    - Dragnet FT FMC Corporation
    - Torpedo ICI Americas, Inc.
  - 3. Cypermethrine.
    - Prevail FT FMC Corporation
    - Demon ICI Americas, Inc.
  - 4. Fenvalerate.
    - Gold Coast Tribute Du Pont
  - 5. Isofenphos.
    - Pryfon Mobay Corporation
  - 6. Other solutions may be used by applicator, if accepted for registration by the Missouri Department of Agriculture for use as a termiticide.

PART 3 EXECUTION

3.1 PREPARATION

- A. Written Application Procedures: The chemicals currently accepted for registration by the Missouri Department of Agriculture are highly toxic to aquatic life. The termiticide applicator shall provide written application procedures to the Contractor for approval by the Owner prior to application.
- B. Surface Preparation: Remove foreign matter that could decrease effectiveness of treatment on areas to be treated. Loosen, rake and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placement of compacted fill under slabs, if recommended by toxicant manufacturer.

3.2 APPLICATION

- A. Application Rates: Apply soil treatment solution at rates recommended by soil toxicant manufacturer and as submitted in the applicators written application procedures.
- B. Provide temporary berms, catchment basins or other devices to restrain termiticides or termiticide treated soils from migrating from the application site.
- C. Allow not less than 12 hours for drying after application, before beginning concrete placement or other construction activities.
- D. Post signs in areas of application warning workers that soil poisoning has been applied. Remove signs when areas are covered by other construction.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation or other construction activities following application.

END OF SECTION

**STORM SEWERAGE SYSTEM****PART 1 GENERAL****1.1 SUMMARY**

- A. Provide storm sewerage system where shown on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

**1.2 SUBMITTALS**

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section;
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
  - 3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

**1.3 QUALITY ASSURANCE**

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

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with pertinent provisions of Section 01620.

**PART 2 PRODUCTS****2.1 PIPE MATERIALS**

- A. Provide pipe and associated materials of the size indicated on the Drawings and meeting the following requirements.
  - 1. Non-reinforced concrete pipe (NRCP): Provide "extra strength" complying ASTM C14.
  - 2. Polyvinyl chloride pipe (PVC):
    - a. Acceptable products:
      - (1) "Ringtite" plastic pipe and fittings, class 160, SDR 26, manufactured by Manville, Los Angeles, California.
  - 3. Polyethylene material in plastic couplings: Comply with ASTM D2952.
  - 4. Flexible watertight joints:
    - a. Provide rubber type gaskets for concrete pipe, complying with ASTM C433 but with shore durometer hardness type A, 40-55, in lieu of the hardness specified.

## PART 3 EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 EXCAVATING, TRENCHING AND BEDDING

- A. Excavate, trench, and bed for site drains in accordance with pertinent provisions of Section 02220, and the following.
- B. Movement of construction machinery:
  - 1. Use means necessary to avoid displacement of an injury to, pipe and structures while compacting by rolling or operating equipment parallel to the pipe.
  - 2. Movement of construction machinery over a culvert or storm drain at any stage of construction is solely at the Contractor's risk.
- C. Bedding:
  - 1. Provide a bedding surface for the pipe with a firm foundation of uniform density throughout the entire length of the pipe.
  - 2. Bed the pipe carefully in a soil foundation accurately shaped and rounded to conform to the lower 1/4 of the outside perimeter of circular pipe or set the pipe in a bed of sand.
  - 3. Tamp bedding where necessary.
  - 4. Provide bell holes and depressions for pipe joints of only the length, depth, and width required for making the particular pipe joint properly.
  - 5. Where plastic pipe is used, provide a minimum of 4" of sand bedding over the top and under the pipe.

### 3.3 INSTALLING PIPE

- A. General:
  - 1. Carefully examine each pipe prior to placing.
    - a. Promptly set aside defective pipe and damaged pipe.
    - b. Clearly identify defects.
    - c. Do not install defective pipe or damaged pipe.
  - 2. Place pipe to the grades and alignment indicated, with a tolerance of one in 1000 vertical and one in 500 horizontal, unless otherwise directed by the Architect.
  - 3. Provide adequate facilities for lowering pipe safely into the trenches.
  - 4. Do not place pipe in water, nor place pipe when trench or weather is unsuitable for that work.

### 3.4 JOINTS

- A. Polyvinyl chloride pipe joints: Install with the specified materials and in accordance with the manufacturers' recommendations as approved by the Architect, applying solvent cement to pipe and fitting as recommended in ASTM D2855.
- B. Joining pipe of different materials: Provide fittings couplings made for the pipe material joining, or provide a concrete collar as approved by the Architect.
- C. Joining pipe of different sizes:
  - 1. Provide reducer fittings to the larger pipe.
  - 2. Where pipes are different materials as well as different sizes, use the same material for reducer fitting as in the larger pipe.

3. Use saddle connection when branch lines join a main or collector main.
4. Use eccentric collar joint when the slope of the pipe is less than 1%.

### 3.5 DRAINAGE STRUCTURES

- A. Install drainage structures in accordance with the Drawings and with the manufacturers' recommendations as approved by the Architect.

### 3.6 BACKFILLING

- A. Backfill and compact in accordance with pertinent provisions of Section 02220.

### 3.7 TESTING AND INSPECTING

- A. Provide personnel and equipment necessary, and perform tests required to demonstrate that the work of this Section has been completed in accordance with the specified requirements.
- B. Hydrostatic test on watertight joints:
  1. Make a hydrostatic test on each watertight joint. Test one sample of each type watertight joint used. If one sample fails because of faulty workmanship, test an additional joint.
  2. Demonstrate that joints in reinforced and unreinforced concrete pipe comply with ASTM C443.
  3. Comply with ASTM C425 for tests of joints in clay pipe.
  4. Make tests in concrete pipe and clay pipe at an internal hydrostatic pressure of 10 p.s.i for 24 hours.
  5. Only joints within the building area and outside the building area but within ten feet of exterior walls or faces of the buildings need be tested.
  6. Replace or repair joints found to be faulty. Repeat the test and repair cycle until joints are demonstrated to meet the specified requirements.

**END OF SECTION**

03100

CONCRETE FORMWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.
- B. Openings for other work.
- C. Form accessories.
- D. Form stripping.

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- A. Section 03200 - Concrete Reinforcement
- B. Section 03300 - Cast-in-Place Concrete: Supply of concrete accessories for placement by this section.
- C. Section 05500 - Metal Fabrications: Supply of metal fabrications for placement by this section.

1.3 RELATED SECTIONS

- A. Section 03200 - Concrete Reinforcement.
- B. Section 03300 - Cast-in-Place Concrete.

1.4 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 318 - Building Code Requirements for Reinforced Concrete.
- C. ACI 347 - Recommended Practice for Concrete Formwork.
- D. PS 1 - Construction and Industrial Plywood.

1.5 DESIGN REQUIREMENTS

- A. Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; concrete to conform to required shape, line and dimension.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide data on void form materials and installation requirements.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 347.

1.8 REGULATORY REQUIREMENTS

- A. Conform to applicable code for design, fabrication, erection and removal of formwork.

1.9 FIELD SAMPLES

- A. Provide under provisions of Section 01400. Coordinate with requirements stated in Section 03100 and 03300.

## 1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Deliver void forms and installation instructions in manufacturer's packaging.
- C. Store off ground in ventilated and protected manner to prevent deterioration from moisture.

## 1.11 COORDINATION

- A. Coordinate work under provisions of Section 01039.
- B. Coordinate this Section with other Sections of work that require attachment of components to formwork.
- C. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Architect/Engineer.

## PART 2 PRODUCTS

### 2.1 WOOD FORM MATERIALS

- A. Plywood: Douglas Fir species; grade B/B plyform class 1 or 2; sound undamaged sheets with clean, true edges.
- B. Lumber: Douglas Fir species; standard grade; with grade stamp clearly visible.

### 2.2 PREFABRICATED FORMS

- A. Preformed Steel Forms: Minimum 16 gage matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
- B. Pan Type: Steel of size and profile required.
- C. Tubular Column Type: Round, spirally wound laminated fiber material, surface treated with release agent, non-reusable, of sizes required.
- D. Void Forms: Moisture resistant treated paper faces, biodegradable, structurally sufficient to support weight of wet concrete mix until initial set; 2 inches thick.

### 2.3 FORMWORK ACCESSORIES

- A. Form Ties: Snap-off type, galvanized metal, fixed length, cone type, with waterproofing washer, free of defects that could leave holes larger than 1 inch in concrete surface.
- B. Form Release Agent: Colorless mineral oil which will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.
- C. Dovetail Anchor Slot: Galvanized steel, 22 gauge thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
- D. Flashing Reglets: Galvanized steel, 22 gage thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
- E. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
- F. Waterstops: Rubber, minimum 1,750 p.s.i tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, wide, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

### 3.2 EARTH FORMS

- A. Earth forms are not permitted.

### 3.3 ERECTION - FORMWORK

- A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with ACI 301.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to over stressing by construction loads.
- C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- D. Align joints and make watertight. Keep form joints to a minimum.
- E. Obtain approval before framing openings in structural members that are not indicated on Drawings.
- F. Install void forms in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.

### 3.4 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices and embedded items.
- C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

### 3.5 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in passing through concrete work.
- B. Locate and set in place items which will be cast directly into concrete.
- C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts and components of other Work.
- D. Install accessories in accordance with manufacturer's instructions, straight, level and plumb. Ensure items are not disturbed during concrete placement.
- E. Install water-stops continuous without displacing reinforcement. Heat seal joints watertight.
- F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- G. Close temporary openings with tight fitting panels, flush with inside face of forms and neatly fitted so joints will not be apparent in exposed concrete surfaces.

### 3.6 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
- D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.7 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 301.

3.8 FIELD QUALITY CONTROL

- A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design and that supports, fastenings, wedges, ties and items are secure.
- B. Do not reuse wood formwork more than 2 times for concrete surfaces to be exposed to view. Do not patch formwork.

3.9 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Loosen forms carefully. Do not wedge pry bars, hammers or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

**END OF SECTION**

**CONCRETE REINFORCEMENT**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Reinforcing steel bars, wire fabric and accessories for cast-in-place concrete.

1.2 RELATED SECTIONS

- A. Section 03100 - Concrete Formwork.
- B. Section 03300 - Cast-in-Place Concrete.

1.3 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 318 - Building Code Requirements For Reinforced Concrete.
- C. ACI SP-66 - American Concrete Institute - Detailing Manual.
- D. ACI 315-99 - Details and Detailing of Concrete Reinforcement
- E. ANSI/ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.
- F. ANSI/ASTM A184 - Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
- G. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- H. ANSI/AWS D1.4 - Structural Welding Code for Reinforcing Steel.
- I. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- J. AWS D12.1 - Welding Reinforcement Steel, Metal Inserts and Connections in Reinforced Concrete Construction.
- K. CRSI - Concrete Reinforcing Steel Institute - Manual of Standard Practice.
- L. CRSI - Placing Reinforcing Bars.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with CRSI - Manual of Standard Practice & ACI 318.

1.5 COORDINATION

- A. Coordinate work under provisions of Section 01039.
- B. Coordinate with placement of formwork, formed openings and other Work.

**PART 2 PRODUCTS**

2.1 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615, yield grade; deformed billet steel bars, unfinished.

- B. Reinforcing Steel Plain Bar and Rod Mats: ASTM A704, ASTM A615, Grade 60; steel bars or rods, unfinished.
- C. Stirrup Steel: ANSI/ASTM A82, unfinished.
- D. Welded Steel Wire Fabric: ASTM A815; in flat sheets.

## 2.2 ACCESSORY MATERIALS

- A. Tie Wire: Minimum gage annealed type.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor barrier puncture.
- C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel; size and shape as required.

## 2.3 FABRICATION

- A. Fabricate concrete reinforcing in accordance with CRSI Manual of Practice ACI SP-66.

# PART 3 EXECUTION

## 3.1 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Do not displace or damage vapor barrier.
- C. Accommodate placement of formed openings.
- D. Conform to applicable code for concrete cover over reinforcement.

**END OF SECTION**

03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cast-In-Place Concrete floors, shear walls, foundation walls and supported slabs.
- B. Floors and slabs on grade.
- C. Control, expansion and contraction joint devices associated with concrete work, including joint sealants.
- D. Equipment pads, light pole base, flagpole base, thrust blocks and manholes.

1.2 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Section 03100 - Concrete Formwork: Placement of joint device anchors in formwork.

1.3 RELATED SECTIONS

- A. Section 03100 - Concrete Formwork: Formwork and accessories.
- B. Section 03200 - Concrete Reinforcement.
- C. Section 03346 - Concrete Floor Finishing.
- D. Section 03370 - Concrete Curing.
- E. Section 07900 - Joint Sealers.

1.4 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 302 - Guide for Concrete Floor and Slab Construction.
- C. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
- D. ACI 305R - Hot Weather Concreting.
- E. ACI 306R - Cold Weather Concreting.
- F. ACI 318 - Building Code Requirements for Reinforced Concrete.
- G. ANSI/ASTM D994 - Preformed Expansion Joint Filler for Concrete (Bituminous Type).
- H. ANSI/ASTM D1190 - Concrete Joint Sealer, Hot-Poured Elastic Type.
- I. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
- J. ANSI/ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
- K. ASTM C33 - Concrete Aggregates.
- L. ASTM C94 - Ready-Mixed Concrete.
- M. ASTM C150 - Portland cement.

N. ASTM C260 - Air Entraining Admixtures for Concrete.

#### 1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide data on joint devices, attachment accessories and admixtures.

#### 1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.

#### 1.7 COORDINATION

- A. Coordinate work under provisions of Section 01039.
- B. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

### PART 2 PRODUCTS

#### 2.1 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I - Normal, Type II - Moderate, Type V - Sulfate Resistant.
- B. Fine and Coarse Aggregates: ASTM C33.
- C. Water: Clean and not detrimental to concrete.

#### 2.2 ADMIXTURES

- A. Air Entrainment: ASTM C260.

#### 2.3 ACCESSORIES

- A. Bonding Agent: Polymer resin emulsion.
- B. Vapor Barrier: thick clear polyethylene film.
- C. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

#### 2.4 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler Type A: ASTM D1751; ASTM D994; Asphalt impregnated fiberboard or felt, 1/2" thick; tongue and groove profile.
- B. Joint Filler Type B: ASTM D1752; Closed cell polyvinyl chloride foam, resiliency recovery of 95 percent if not compressed more than 50 percent of original thickness.
- C. Joint Filler Type C; ASTM D1752; Pre-molded sponge rubber fully compressible with recovery rate of minimum 95 percent.
- D. Expansion Joint Devices: ASTM B221 alloy, extruded aluminum; resilient filler strip with a Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery; extruded aluminum cover plate, of longest manufactured length at each location, flush Mounted, color as selected.
- E. Sealant: ASTM D1190; polymer based asphalt or coal tar and rubber compound.

#### 2.5 CONCRETE MIX

- A. All concrete shall be Type 1 cement with a compressive strength of 4,000 p.s.i. at 28 days.
- B. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94.

- C. Use accelerating admixtures in cold weather only when approved by Architect/Engineer. Use of admixtures will not relax cold weather placement requirements.
- D. Use calcium chloride only when approved by Architect/Engineer.
- E. Use set retarding admixtures during hot weather only when approved by Architect/Engineer.
- F. Add air entraining agent to normal weight concrete mix for work exposed to exterior.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Verify site conditions under provisions of Section 01039.
- B. Verify requirements for concrete cover over reinforcement.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely and will not cause hardship in placing concrete.

#### **3.2 PREPARATION**

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- B. In locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

#### **3.3 PLACING CONCRETE**

- A. Place concrete in accordance with ACI 304 & ACI 301.
- B. Notify Architect/Engineer minimum 24 hours prior to commencement of operations.
- C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.
- D. Separate slabs on grade from vertical surfaces with ½" thick joint filler.
- E. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- F. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07900 for finish joint sealer requirements.
- G. Install joint devices in accordance with manufacturer's instructions.
- H. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- I. Install joint device anchors. Maintain correct position to allow joint cover to be flush with floor and wall finish.
- J. Install joint covers in longest practical length, when adjacent construction activity is complete.
- K. Apply sealants in joint devices in accordance with Section 07900.
- L. Place concrete continuously between predetermined expansion, control and construction joints.
- M. Do not interrupt successive placement; do not permit cold joints to occur.
- N. Place floor slabs in pattern indicated on drawings.

- O. Saw cut joints within 24 hours after placing. Use 3/16" thick blade, cut into 1/4 depth of slab thickness. If in-slab-heating is used cut joints 1/2 inch deep
  - P. Screed floors and slabs on grade level, maintaining surface flatness of maximum.
- 3.4 SEPARATE FLOOR TOPPINGS
- A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.
  - B. Place required dividers, edge strips, reinforcing, and other items to be cast in.
  - C. Apply bonding agent to substrate in accordance with manufacturer's instructions.
- 3.5 CONCRETE FINISHING
- A. Provide formed concrete surfaces to be left exposed with smooth rubbed finish.
  - B. Finish concrete floor surfaces to requirements of Section 03346.
- 3.6 CURING AND PROTECTION
- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
  - B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
  - C. Cure concrete floor surfaces to requirements of Section 03370.
  - D. Cure floor surfaces in accordance with ACI 308.
- 3.7 FIELD QUALITY CONTROL
- A. Field inspection and testing will be performed in accordance with ACI 301 and under provisions of Section 01400.
  - B. Provide free access to Work and cooperate with appointed firm.
  - C. Submit proposed mix design to architect for review prior to commencement of Work.
  - D. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.
  - E. Three concrete test cylinders will be taken for every 75 or less cu yards of concrete placed.
  - F. One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.
  - G. One slump test will be taken for each set of test cylinders taken.
- 3.8 PATCHING
- A. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.
  - B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect/Engineer upon discovery.
  - C. Patch imperfections as directed.
- 3.9 DEFECTIVE CONCRETE
- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
  - B. Repair or replacement of defective concrete will be determined by the Architect/Engineer.
  - C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

END OF SECTION

**CONCRETE FLOOR FINISHING****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Finishing slabs-on-grade.
- B. Surface treatment with concrete hardener, non-skid finish and sealer.

**1.2 RELATED SECTIONS**

- A. Section 03300 - Cast-in-Place Concrete: Prepared concrete floors ready to receive finish; control and formed expansion and contraction joints and joint devices.
- B. Section 03370 - Concrete Curing.
- C. Section 07900 - Joint Sealers.

**1.3 REFERENCES**

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 302 - Guide for Concrete Floor and Slab Construction.
- C. ASTM E1155 - Determining Floor Flatness and Levelness Using the F-Number System.

**1.4 SUBMITTALS**

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide data on concrete hardener, sealer and slip resistant treatment, compatibilities and limitations.

**1.5 MAINTENANCE DATA**

- A. Submit under provisions of Section 01700.
- B. Maintenance Data: Provide data on maintenance renewal of applied coatings.

**1.6 QUALITY ASSURANCE**

- A. Perform Work in accordance with ACI 301 and ACI 302.

**1.7 DELIVERY, STORAGE AND HANDLING**

- A. Deliver, store, protect, and handle products to site under provisions of Section 01039.
- B. Deliver materials in manufacturer's packaging including application instructions.

**1.8 ENVIRONMENTAL REQUIREMENTS**

- A. Temporary Lighting: Minimum 200 W light source, placed above the floor surface, for each 100 square feet of floor being finished.
- B. Do not finish floors until the interior heating system is operational.
- C. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

**1.9 COORDINATION**

- A. Coordinate work under provisions of Section 01039.
- B. Coordinate the work with concrete floor placement and concrete floor curing.

**PART 2 PRODUCTS**

**2.1 CURING/SEALING COMPOUNDS**

- A. Curing/sealing compound equal to Ashford Formula as distributed by:  
Curecrete Chemical Company, Inc.  
1201 W. Spring Creek Place  
Springville, UT 84663  
(801) 489-5663

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- A. Verify site conditions under provisions of Section 01039.
- B. Verify that floor surfaces are acceptable to receive the work of this section.

**3.2 FLOOR FINISHING**

- A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.
- B. Steel trowel surfaces that will receive carpeting, resilient flooring and seamless flooring.
- C. Steel trowel surfaces that areas scheduled to be exposed.
- D. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains at nominal.

**3.3 FLOOR SURFACE TREATMENT**

- A. Apply sealer in accordance with manufacturer's instructions on floor surfaces.

**3.4 TOLERANCES**

- A. Maximum Variation of Surface Flatness for Exposed Concrete Floors: 1/4 inch.

**END OF SECTION**

**CONCRETE CURING**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Initial and final curing of horizontal and vertical concrete surfaces.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete.
- B. Section 03346 - Concrete Floor Finishing.

1.3 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 302 - Recommended Practice for Concrete Floor and Slab Construction.
- C. ACI 308 - Standard Practice for Curing Concrete.
- D. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- E. ASTM D2103 - Polyethylene Film and Sheeting.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and ACI 302.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products under provisions of Section 01600.
- B. Deliver curing materials in manufacturer's packaging including application instructions.

**PART 2 PRODUCTS**

2.1 MATERIALS

- A. Curing/sealing compound equal to Ashford Formula as distributed by:  
Curecrete Chemical Company, Inc.  
1201 W. Spring Creek Place  
Springville, UT 84663  
(801)489-5663

**PART 3 EXECUTION**

3.1 EXAMINATION

- A. Verify substrate conditions under provisions of Section 01039.
- B. Verify that substrate surfaces are ready to be cured.

3.2 EXECUTION - HORIZONTAL SURFACES

- A. Cure floor surfaces in accordance with ACI 308.

3.3 EXECUTION - VERTICAL SURFACES

- A. Cure surfaces in accordance with ACI 308.

3.4 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01500.
- B. Do not permit traffic over unprotected floor surface.

**END OF SECTION**

05500

METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Shop fabricated ferrous metal items.
- B. Shop fabricated aluminum items.

1.2 RELATED SECTIONS

- A. Section 09900 - Painting: Paint finish.
- B. Section 03300 - Cast-In-Place Concrete: Placement of metal fabrications in concrete.

1.3 REFERENCES

- A. ASTM A36 - Structural Steel.
- B. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.
- C. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- D. ASTM A283 - Carbon Steel Plates, Shapes and Bars.
- E. ASTM A307 - Carbon Steel Bolts and Studs, 60,000 p.s.i Tensile Strength.
- F. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- G. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- H. AWS A2.0 - Standard Welding Symbols.
- I. AWS D1.1 - Structural Welding Code.
- J. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Steel Sections: ASTM A36.
- B. Steel Tubing: ASTM A500, Grade B.
- C. Plates: ASTM A283.
- D. Pipe: ASTM A53, Grade B, Schedule 40.
- E. Bolts, Nuts, and Washers: ASTM A325 galvanized to ASTM A153 for galvanized components.
- F. Welding Materials: AWS D1.1; type required for materials being welded.
- G. Ladders: ANSI A14.3.
- H. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

2.2 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

### 2.3 FABRICATION TOLERANCES

- A. Squareness: 1/8-inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation from Plane: 1/16 inch in 48 inches.

### 2.4 FINISHES - STEEL

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime paint items with one coat.
- D. Structural Steel Members: Galvanize after fabrication to ASTM A123. [Provide minimum 1.25 oz/sq ft galvanized coating.]
- E. Non-structural Items: Galvanized after fabrication to ASTM A123. Provide minimum 1.25 oz/sq ft galvanized coating.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

### 3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

### 3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated on Drawings.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

### 3.4 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset from True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

**END OF SECTION**

**FRAMING AND SHEATHING**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Structural wall and roof framing.
- B. Built-up structural beams and columns.
- C. Floor, wall and roof sheathing.
- D. Sill flashings.
- E. Preservative treatment of wood.
- F. Miscellaneous framing and sheathing.
- G. Pre-engineered Wood Trusses.

1.2 REFERENCES

- A. AHA (American Hardboard Association) A135.4 - Basic Hardboard.
- B. ALSC (American Lumber Standards Committee) - Softwood Lumber Standards.
- C. ANSI A208.1 - Mat-Formed Wood Particleboard.
- D. APA (American Plywood Association).
- E. NFPA (National Forest Products Association).
- F. SPIB (Southern Pine Inspection Bureau).
- G. WCLIB (West Coast Lumber Inspection Bureau).
- H. WWPA (Western Wood Products Association).

1.3 SUBMITTALS FOR REVIEW

- A. Shop Drawings for Pre-Engineered Wood Trusses: Indicate dimensions, wood species and grades, component profiles, drilled holes, fasteners, connectors, erection details and sequence.

1.4 QUALITY ASSURANCE

- A. In lieu of grade stamping exposed to view lumber and plywood, submit manufacturer's certificate certifying that products meet or exceed specified requirements.
- B. Design structural shop fabricated trusses under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Missouri.

1.5 DELIVERY, STORAGE AND PROTECTION

- A. Section 01600 - Material and Equipment: Transport, handle, store and protect products.
- B. Protect trusses from warping or other distortion by stacking in vertical position, braced to resist movement.

**PART 2 PRODUCTS**

2.1 WOOD STUD WALL MATERIALS

- A. #2 or better.

2.2 ACCESSORIES

- A. Fasteners and Anchors:

- 1. As indicated on the Drawings.
- B. Sill Flashing (Under Sill Gasket): Galvanized steel.
- C. Termite Shield: Galvanized sheet steel.

### **PART 3 EXECUTION**

#### **3.1 FRAMING**

- A. Set structural members level and plumb, in correct position.
- B. Make provisions for erection loads and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until completion of erection and installation of permanent bracing.
- C. Place horizontal members, crown side up.
- D. Construct load bearing framing members' full length without splices.
- E. Double members at openings over 24 inches wide. Space short studs over and under opening to stud spacing.
- F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists. Framed rigidly into joists.
- G. Bridge joists or other framing in excess of 8 feet span at mid-span. Fit solid blocking at ends of members.
- H. Place full width continuous sill flashings under framed walls on cementitious foundations. Lap flashing joint 4 inches.

#### **3.2 TOLERANCES**

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Surface Flatness of Floor: 1/4 inch in 10 feet maximum and 1/2 inch in 30 feet maximum.

**END OF SECTION**

07210

BUILDING INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Provide building insulation where shown on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Upon completion of this portion of the Work, complete and post a certificate of insulation compliance in accordance with pertinent requirements of governmental agencies having jurisdiction.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01620.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Provide the following building insulation where shown on the Drawings or otherwise needed to achieve the degree of insulation required under pertinent regulations of governmental agencies having jurisdiction.
  - 1. Exterior Wall Insulation – 5-1/2" thick, R-21 fiberglass batt insulation installed at exterior wood stud walls. Provide full height 6 mil. vapor barrier fabric between the stud wall and interior liner panels.
  - 2. Roof Insulation - 10-1/4" thick, R-38, unfaced glass fiber thermal batt insulation. The first layer laid between the bottom chords of the trusses, the second layer laid perpendicular across the top of the truss bottom chord. Equal to Owens-Corning Fiberglass Corporation, Toledo, Ohio 43659.

2.2 OTHER MATERIALS

- A. Provide 6 mil. vapor barrier where specified on drawings.
- B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

**PART 3        EXECUTION**

**3.1        SURFACE CONDITIONS**

- A.        Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B.        Remove, or protect against, projections in construction framing that may damage or prevent proper insulation.

**3.2        INSTALLATION**

- A.        Install the work of this Section in strict accordance with the original design, requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position.

**END OF SECTION**

## METAL ROOF AND WALL PANELS

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes: Factory-formed metal roof and wall panels, including fascia, soffit and liner panels and includes:
1. Factory-formed panels in vertical installation.
  2. Factory-formed panels in horizontal installation.
  3. Metal flashings and trim.

## 1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. ASTM A653/A653M Standard specification for steel sheets, zinc-coated (galvanized) or zinc-iron alloy-coated (galvannealed) by the hot-dip process.
  2. ASTM A792/A792M Standard specification for steel sheet, 55% aluminum-zinc alloy coated by the hot-dip process.
  3. ASTM B209 Standard specification for aluminum and aluminum-alloy sheet and plate.
  4. ASTM D2247 Standard practice for testing water resistance of coatings in 100% relative humidity.
  5. ASTM E1680 Standard test method for determining the rate of air leakage through exterior metal roof systems under specified pressure differences across the specimen.
  6. ASTM E1646 Standard test method for water penetration of metal roof systems by uniform static air pressure difference.
  7. ASTM G90 Standard practice for performing accelerated outdoor weathering of non-metallic materials using concentrated natural sunlight.

## 1.3 SYSTEM DESCRIPTION

- A. Panel Performance requirements: Provide panels, which have been manufactured, fabricated and installed to withstand structural and thermal movement, wind loading and weather exposure to maintain manufacturer's performance criteria without defects, damage, failure or infiltration of water.
- B. Finish Performance Requirements:
1. Color change and fade resistance: No cracking, peeling, blistering or loss of adhesion when tested in accordance with ASTM G23; color change, after removal of surface deposits such as dirt or chalk, maximum 5 Hunter units.
  2. Humidity resistance: No blistering peeling, or loss of adhesion after 2,000 hours testing in accordance with ASTM D2247.

## 1.4 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 submittal procedures section.
- B. Product Data: Submit manufacturer's product data for specified products.
- C. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including anchorage, accessories, finish colors and textures.
1. Indicate layout of panels and panel sizes, including custom-fabricated panels if indicated; indicate each item of trim and accessories.
  2. Indicate in detailed drawings profile and gauge of interior and exterior sheets, and location and types of fasteners; indicate locations, gauges, shapes and methods of attachment of panels, trim and accessory items.

3. Indicate products/materials required for construction activities of this section not supplies by manufacturer of products of this section.
- D. Samples: Submit selection and verification samples for finishes, colors and textures.
  1. Selection Samples: For each product requiring color selection, 2 sets of manufacturer's sample chips representing full range of colors and finishes available.
  2. Verification Samples: For each color and finish selected, 2 chips indicating match to selected color and finish.
- E. Quality Assurance Submittals: Submit the following
  1. Contractor Certificates: Contractor's certification that:
    - a. Manufacturer of products of this section meets specified qualifications.
    - b. Installer of products of this section meets specified qualifications.
  2. Manufacturer Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
  3. Manufacturer's Instructions: Manufacturer's installation instructions.
- F. Closeout Submittals: Submit the following
  1. Warranty: Warranty documents specified herein.
  2. Record Documents: Project record documents for installed materials in accordance with Division 1 Closeout submittals (project record documents) section.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in the installation of work similar to that required for this project.
  1. Certificate: When requested, submit certificates indicating qualification.
- B. Sheet Metal Industry Standard: Comply with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Architectural Sheet Metal Manual.
- C. Preinstallation Meetings: Conduct preinstallation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 1 Project Management and Coordination, Project Meetings Section.

#### 1.6 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirements Sections.
  1. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Deliver: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Identify fabricated components with UL 90 label where appropriate.
- C. Packing, Shipping, Handling, and Unloading:
  1. Bundle panels in waterproof wrapping paper when nested, or wooden crates when panels cannot be nested.
  2. Package trim and accessories in waterproof wrapping paper.
- D. Storage and Protection: Store materials protected from exposure to harmful conditions. Store material in dry, above-ground location.
  1. Stack prefinished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture run off.
  2. Store products of this section in manufacturer's unopened packaging until installation of products.
  3. Maintain dry, heated storage area for products of this section until installation of products.

#### 1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual measurements/openings by field measurement before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

## 1.8 WARRANTY

- A. Project warranty: Refer to conditions of the contract for project warranty provisions.
- B. Manufacturer's Warranty: Submit for Owner's acceptance manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not a limitation of other rights Owner may have under the Contract Documents.
  - 1. Warranty Period: one year commencing on Date of Substantial Completion.

## PART 2 PRODUCTS

### 2.1 METAL WALL AND ROOF PANELS

- A. Manufacturer: McElroy Metal, Inc.
  - 1. Contact: 1500 Hamilton Road, Bossier City, LA 71111; Telephone (800) 950-6531, (318) 747-8000; Fax (318) 747-8059; Email [marketing@mcelroymetal.com](mailto:marketing@mcelroymetal.com); website [www.mcelroymetal.com](http://www.mcelroymetal.com)
  - 2. Proprietary products: McElroy Preformed Wall and Roof Panels.
- B. Or Equal.

### 2.2 MANUFACTURED UNITS

- A. McElroy Max-Rib panel
  - 1. Profile: Major longitudinal ribs 3/4" (45 mm) deep, spaced 9" (229 mm) on center; minor longitudinal ribs centered between major ribs.
  - 2. Size: 36" (914 mm) cover width, lengths indicated on drawings.
  - 3. Material Galvalume steel sheet conforming to ASTM A792, AZ55 coating; 26 gauge sheet thickness.
  - 4. Finish: Kynar 500, applied to sight-exposed face of sheet after pretreatment and priming in accordance with coating manufacturer's recommendations.
    - a. Color: Selected from full range of manufacturer's standard colors.
- B. Trim
  - 1. Manufacturer's standard 26 gauge sheet metal matching panel material and finish, break-formed, to profiles indicated on drawings, and including, but not limited to:
    - a. Copings.
    - b. Gravel stops.
    - c. Gutters and downspouts.
    - d. Termination and transition strips.
  - 2. Color: Match panel Kynar 500 finish.
  - 3. Color: Selected from full range of manufacturer's standard color.
- C. Clips and Fasteners: Supply items required for installation of panels in accordance with manufacturer's installation instructions and other indicated items; supply galvanized clips and fasteners.

### 2.3 MATERIALS

- A. Galvanized Steel Sheet: ASTM A653, G90 steel sheet, zinc coated (galvanized) by hot dip process, structural quality.

### 2.4 RELATED MATERIALS

- A. General: Coordinate use of related materials:
  - 1. Sealants: Refer to Division 7 Joint Sealants Section.

### 2.5 SOURCE QUALITY

- A. Source Quality: Obtain metal panel products from a single manufacturer.

## PART 3 EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, recommendations and installations instructions for substrate verification, preparation requirements and installation.
  - 1. Verification of Conditions:
    - a. Panel support systems are ready for construction activities of this section and within specified tolerances.
    - b. Rough-in utilities are in correct locations.
  - 2. Installer's Examination:
    - a. Have installer of this section examine conditions under which construction activities of this section are to be performed, then submit written notification if such conditions are unacceptable.
    - b. Transmit 2 copies of installer's report to Architect within 24 hours of receipt.
    - c. Delay construction activities of this section until unacceptable conditions have been corrected.
    - d. Beginning construction activities of this section indicates installer's acceptance of conditions.

### 3.3 PREPARATION

- A. Coordination: Coordinate metal roofing with other work including drainage, flashing and trim, deck substrates, parapets, copings, walls and other adjoining work to provide a noncorrosive and leakproof installation.
- B. Dissimilar Metals: Prevent galvanic action of dissimilar metals.

### 3.4 INSTALLATION

- A. General: Install metal roofing panels to profiles, patterns and drainage indicated and required for leakproof installation. Provide for structural and thermal movement of work. Seal joints for leakproof installation.
  - 1. Seams: Provide uniform, neat seams.
  - 2. Fasteners: Conceal fasteners where possible in exposed work. Cover and seal fasteners and anchors for watertight and leakproof installation.
  - 3. Sealant-Type Joints: Provide sealant-type joint where indicated. Form joints to conceal sealant. Comply with Division 7 Joint Sealants Section for sealant installation.
- B. Panel Installation:
  - 1. Install panels plumb, true in correct alignment with structural framing, in accordance with shop drawings and manufacturer's printed installation instructions.
  - 2. Install panels in horizontal installations using manufacturer's concealed fastening system only; sight-exposed fasteners are prohibited.
  - 3. Install panels in vertical installations using manufacturer's concealed fastening system or noncorroding fasteners color-match to panel.
  - 4. Install trim using concealed fasteners where possible; sight-exposed noncorroding fasteners color-matched to trim are permitted on vertical surfaces only.
- C. Installation Tolerances:
  - 1. Variation from Plumb: Maximum 1/8" (3.2 mm) in 20 feet (6.096m).
  - 2. Variation from Level: Maximum 1/8" (3.2 mm) in 20 feet (6.096m).
  - 3. Variation from True Plane: Maximum 1/8" (3.2 mm) in 20 feet (6.096m).

### 3.5 FIELD QUALITY REQUIREMENTS

- A. Site Tests (Post-Installation Testing): Owner reserves right to perform post-installation testing of installed metal panel installation.
- B. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product

installation in accordance with manufacturer's instructions.

### 3.6 CLEANING

- A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of the debris.
  - 1. Remove strippable coating from perform dry wipe-down cleaning of panels as erected.

### 3.7 PROTECTION

- A. Protection: Protect installed product's finish surfaces from damage during construction.
  - 1. Protect installed products from damage by subsequent construction activities.
  - 2. Replace products having damage other than minor finish damage.
  - 3. Repair products having minor damage to finish in accordance with panel manufacturer's recommendations.
  - 4. Architect shall be sole judge of acceptability of repair to damaged finishes; replace products having rejected repairs.

**END OF SECTION**

07416

## BITUMINOUS DAMPPROOFING

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Cold applied cut-back asphalt dampproofing.
- B. cold-applied, emulsified-asphalt dampproofing.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

#### 1.3 PROJECT CONDITIONS

- A. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain Ventilation until dampproofing has cured.

### PART 2 PRODUCTS

#### 2.1 COLD-APPLIED, CUT-BACK ASPHALT DAMPROOFING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. ChemMasters Corp.
  - 2. Degussa Building Systems: Someborn Brand Products.
  - 3. Henry Company
  - 4. Karnak Company
- B. Trowel Coats: ASTM D 4586, Type I, Class 1, fibered.
- C. Brush and Spray Coats: ASTM D 4479, Type I, fibered or nonfibered.
- D. VOC Content: 2.5 lb./gal. or less

#### 2.2 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. ChemMasters Corp.
  - 2. Degussa Building Systems: Sonneborn Brand Products.
  - 3. Henry Company
  - 4. Karnak Company
- B. Trowel Coats: ASTM D 1227, Type II, Class 1.
- C. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class 1.
- D. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.
- E. VOC Content: Zero.

#### 2.3 PROTECTION COURSE

- A. Protection Course, Asphalt-Board Type: ASTM D 6506, premolded, 1/8" thick, multi-ply, semi rigid board consisting of a mineral-stabilized asphalt core sandwiched between layers of asphalt-saturated felt, and faced on one side with polyethylene film.
- B. Protection Course: Fan folded, with a core of extruded-polystyrene board insulation faced on side(s) with plastic film, nominal thickness 1/4", with compressive strength of not less than 8 PSI per ASTM D 1621, and maximum water absorption by volume of 0.6 % per ASTM C 272.

- C. Protection Course: Unfaced, fan-folded, extruded-polystyrene board insulation, nominal thickness 1/4" with compressive strength of not less than 8 PSI per ASTM D 1621.
- D. Protection Course, Roll-Roofing Type: Smooth-surfaced roll roofing complying with ASTM D 6380, Class S, Type III.

#### 2.4 MISCELLANEOUS MATERIALS

- A. Cut-Back Asphalt Primer: ASTM D 41.
- B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended by manufacturer.
- C. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.
- D. 6" ADS perimeter drain pipe wrapped in filter fabric. Drain to daylight.

### PART 3 EXECUTION

#### 3.1 PREPARATION

- A. Clean substrates of projections and substances detrimental to work; fill voids, seal joints and apply bond breakers if any, as recommended by prime material manufacturer.

#### 3.2 APPLICATION, GENERAL

- A. Comply with manufacturer's written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.
- B. Apply dampproofing to footings and foundation walls where opposite sides of wall faces building interior.
  1. Apply from finished grade line to top of footing, extend over top of footing, and down a minimum of 6" over face of footing.
  2. Extend 12" onto intersection walls and footings, but do not extend onto surfaces to view when Project is complete.
  3. Install flashings and corner projection stripping at internal and external corners, changes in plane, construction joints, cracks and where shown as "reinforced," by embedding a 8" wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing . Dampproofing coat for embedding fabric is in addition to other coats required.
- C. Apply Dampproofing to provide continuous plane of protection on interior face of above-grade, exterior concrete and masonry wall unless walls are indicated to receive direct application of paint.

#### 3.3 COLD-APPLIED, CUT-BACK ASPHALT DAMPPROOFING

- A. On Concrete foundations: Apply 2 brush or spray coats at not less than 1.25 gal./100sq. ft. first coat and 1 gal./100 sq. ft. for second coat, or 1 trowel coat at not less than 4 gal./100 sq. ft.
- B. On Unparged Masonry Foundation Walls: Apply primer and 1 trowel coat at not less than 4 gal./100 sq. ft.
- C. On Unexposed Face of Concrete Retaining Walls: Apply 1 brush coat or spray coat at not less than 1.25 gal./100 sq. ft.
- D. On unexposed Face of Masonry Retaining Walls: Apply primer and 1 brush or spray coat of not less than 1.25 gal./100 sq. ft.

#### 3.4 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFFING

- A. On Concrete Foundations: Apply 2 brush or spray coats at not less than 1.5 gal./100 sq. ft. for first coat and 1 gal./100 sq. ft. for second coat, 1 fibered brush or spray coat at not less than 3 gal./100 sq. ft., or 1 trowel coat at not less than 4 gal./100 sq. ft.
- B. On Unparged Masonry Foundation Walls: Apply primer and 1 trowel coat at not less than 5 gal./ 100 sq. ft.

- C. On Unexposed Face of Concrete Retaining Walls: Apply 1 brush coat or spray coat at not less than 1.25 gal./ 100 sq. ft.
- D. On Un exposed Face of Masonry Retaining Walls: Apply primer and 1 brush or spray coat at not less than 1.25 gal./100 sq. ft.

### 3.5 INSTALLATION OF PROTECTION COURSE

- A. Where indicated, install protection course over completed-and cured dampproofing. Comply with dampproofing material manufacturer's written recommendations for attaching protection course.
  - 1. Support protection course with spot application of adhesive of type recommended by protection board manufacturer over cured coating.
  - 2. Install protection course within 24 hours of installation of dampproofing (while coating is tacky) to ensure adhesion.

**END OF SECTION**

## ALUMINUM SOFFIT PANELS

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Preformed aluminum soffit panels, trim, and accessories for enclosing exterior roof overhangs.

## 1.2 RELATED SECTIONS

- A. Section 05500 – Metal Fabrications.
- B. Section 06112 – Framing and Sheathing.
- C. Section 07240 – Exterior Insulation Finish System. (N. I. C.)
- D. Section 07900 – Joint Sealers.

## 1.3 REFERENCES

- A. AAMA 1402-86 – Aluminum Siding, Soffit, and Fascia.
- B. ASTM B 209 – Aluminum and Aluminum-Alloy Sheet and Plate.
- C. ASTM D 226 – Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- D. ASTM E 84 – Surface Burning Characteristics of Building Materials.

## 1.4 PERFORMANCE REQUIREMENTS

- A. Soffits shall be fabricated and installed to withstand positive and negative wind pressure loads in accordance with applicable codes.
- B. Soffit system to accommodate without damage to components or failure of weather barrier movement caused by seasonal temperature cycling and deflection of structural support framing.
- C. Moisture entering or condensation occurring within soffit system shall drain to exterior.

## 1.5 SUBMITTALS

- A. Provide in accordance with Section 01300:
  - 1. Product data including material descriptions, dimensions, and profiles.
  - 2. Shop drawings showing layout, location of vents, dimensions, penetrations, trim, and installation methods.
  - 3. 4 inch long minimum samples of soffit panel and trim in color selected.
  - 4. Certificates documenting soffit system complies with requirements specified.
  - 5. Manufacturer's installation instructions.
  - 6. Copy of warranty for review by Architect.

## 1.6 QUALITY ASSURANCE

- A. Manufacturer: Company with a minimum 5 years' successful experience manufacturing aluminum soffit.
- B. Single Source Responsibility: To ensure functional and appearance compatibility, soffit panels and all trim pieces shall be products of single manufacturer.
- C. Aluminum soffit system shall be fabricated and installed to comply with:
  - 1. AAMA 1402-86.
  - 2. International Code Council-ES Legacy – Report No. 97-64.
  - 3. International Conference of Building Officials (ICBO): Report No. 2027.

## 1.7 PRODUCT HANDLING

- A. Deliver components in manufacturer's protective cartons clearly labeled as to specific products contained.
- B. During delivery and storage keep cartons flat and supported along entire length.
- C. Store material off ground, out of weather, in dry place. Provide ventilation. Protect from falling objects and construction activities.
- D. Handling: Avoid gouging, scratching, and denting.

## 1.8 WARRANTY

- A. Provide under provisions of section 01780 – Closeout Submittals: Fifty (50) year lifetime limited, non-prorated, transferable warranty.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Fabricate soffit panels and trim from sheet aluminum complying with ASTM B 209, AA3000 Alloy:
- B. Minimum Aluminum Properties:
  - 1. Ultimate Strength: 25 KSI.
  - 2. Yield Strength: 22 KSI.
  - 3. Modulus of Elasticity: 10,000 KSI.
  - 4. Coefficient of Linear Thermal Expansion:  $1.31 \times 10^{-5}$  inch/inch/degree F.
  - 5. Melting Range: 1175 to 1210 degrees F.

### 2.2 SOFFIT PANELS

- A. Type: Fully vented, hi-tensile, double V-groove soffit panel with installation flanges along both edges.
  - 1. Dimensions: 12 inches exposed width by 144 inches long.
  - 2. Thickness: 0.016 inches.
  - 3. Profile: V-grooves forming three (3) 4-inch wide panels with all panels vented.
  - 4. Net Free Open Area: 11.6 square inches per linear foot.
  - 5. Surface: Smooth.
  - 6. Finish Color: Per Northeast District.

### 2.3 TRIM

- A. Provide trim pieces as detailed on manufacturer's installation manual and as required for complete, weathertight, functional installation.
- B. Aluminum Trim: Fabricate from same material as soffit to shape, dimensions, and profile required to accommodate soffit panel and project conditions. Provide with channels to receive panels, flanges for concealed weathertight attachment, and slotted attachment holes. Color shall match or coordinate with soffit color. In order to eliminate or minimize visible joints, form in longest possible lengths with 10 feet being minimum.
  - 1. J-channel: ½ inch wide channel to receive soffit panels with ½ inch attachment flange.
  - 2. Reverse Frieze Molding: F-shaped piece with ½ inch wide channel to receive aluminum soffit panels.
  - 3. Soffit T-Bar: Double channel to receive two soffit panels with exposed face.

## 2.4 ACCESSORIES

- A. Fasteners: Weather and corrosion resistant nails of type, size, and spacing as recommended by soffit manufacturer.
  - 1. Plain Shank Nails: Use for wood studs, furring, and other framing with minimum lengths of 1-1/2 inches. Allow 3/4 inch minimum penetration into wood framing.
  - 2. Screw Shank Nails: Use for plywood sheathing.
  - 3. Exposed Nails: Trim nails that match soffit and trim.
- B. Sealants: Silicone type as recommended by soffit manufacturer.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Prepare substrate and install soffit in accordance with manufacturer's instructions, approved shop drawings, and manufacturer's soffit installation manual.
- B. Coordinate work with provisions and installation of exterior insulation finish system to ensure compatibility and weathertight, neat transition from vertical surface to horizontal soffit panels.

### 3.2 PREPARATION

- A. Inspection: Verify that soffit support framing is rigid, level, and spacing does not exceed 24 inches. Do not proceed until deficiencies are addressed.

### 3.3 INSTALLATION

- A. Field Cutting: Accurately measure and cut soffit panels and trim. Use power circular saw with 10-point aluminum cutting blade, duckbill sheet metal snips, or hacksaw as recommended by manufacturer for specific cutting operation.
- B. Trim: Prior to installing soffit panels, locate and anchor perimeter to receive channels.
- C. Soffit Panels:
  - 1. Layout panels as detailed on approved shop drawings. Provide vented panels to provide sufficient ventilation of space above soffit.
  - 2. Insert panel into receiver channel, flex panel, and insert other end into opposing receiver channel. Ensure panels are perpendicular to perimeter and aligned. Fasten panel to supports by nailing through attachment flanges.
  - 3. Overlap, engage, and lock subsequent panels over preceding ones.
  - 4. At corners, miter cut soffit panels and install with soffit T-bar. Align joints and grooves of intersecting panels.
- D. Expansion Joints: Where soffit panel engages receiver channel and where aluminum components butt or adjoin other materials, leave expansion gap:
  - 1. Hot weather with aluminum components partially expanded: 1/16 inch.
  - 2. Cold weather with aluminum components partially contracted: 1/8 inch.
- E. Fastening: Install panels and trim with nails. Where exposed, use trim nails with color to match aluminum components.
  - 1. Drive fasteners straight and level. Do not slant fasteners.
  - 2. Do not drive head of fastener tightly against attachment flange. Allow 1/32 inch clearance between fastener head and aluminum surface.
  - 3. Do not place fastener through face of soffit panel.
  - 4. Spacing: Fasten soffit panels at 24 inches maximum.
- E. Sealants: Apply sealants where indicated on manufacturer's approved shop drawings and as required to provide weathertight installation. Depth of sealant bead shall be 1/4 inch minimum.

3.4 CLEANING AND PROTECTION

- A. Clean aluminum soffits and trim. Use detergent as required. Do not use solvents, abrasive, wire brushes, or steel scrapers.
- B. Remove Excess materials and debris from site.
- C. Protect soffit from subsequent construction operations. If damage occurs, remove and replace damaged components to provide installation in original, undamaged condition.

**END OF SECTION**

## FLASHING AND SHEET METAL

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Fascia Systems
- B. Metal Roof Flashing and Trim

## 1.2 RELATED SECTIONS

- A. Section 06112 – Framing and Sheathing
- B. Section 07900 - Sealants

## 1.3 REFERENCES

- A. ASTM A 526 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
- B. ASTM A 527 – Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality.
- C. ASTM B 209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- D. National Roofing Contractors Association (NRCA) – “Roofing and Waterproofing Manual” third edition.
- E. Sheet Metal and Air Conditioning Contractor’s National Association (SMACNA) – Architectural Sheet Metal Manual.

## 1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Manufacturer’s data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation method.
- C. Shop Drawings:
  - 1. Indicate material profile, dimensions, jointing pattern, jointing details, fastening methods, flashing, termination, and installation details.
  - 2. Show the layout of wall sections, attachment, joint details, trim flashing, accessories and air infiltration seals.
  - 3. Show thickness of treated wood nailers and substrate.
- D. Design Data:
  - 1. Submit manufacturer’s certification that product supplied meets Factory Mutual Research Corporation’s (FMRC) requirements for Roof Perimeter Flashing for use in Zone 1 and Zone 2 Windstorm Resistance Areas as defined in FME & R Loss Prevention Data Sheet 1-7 and 1-49 design recommendations, and meets the wind resistance requirements specified.
  - 2. Certify that perimeter metal edge systems furnished meet the specified design pressures as tested using ANSI/SPRI ES-1-98 test method RE-2 or RE-3 test methodology.
  - 3. Certify that membrane attachment by perimeter edge systems exceeds 100 lb/ft of force as tested by ANSI/SPRI ES-1-98 test method RE-1.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches square, representing actual product, color, and pattern.

## 1.5 QUALITY ASSURANCE

- A. Installer qualifications: Companies specializing in sheet metal work with 5 years documented experience.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Materials shall be delivered with identification labels, warnings and storage recommendations.
- D. Materials shall be stored in a clean, dry location prior to installation to prevent any damage to the contents. Store materials off the ground and protect from damage and deterioration as required by the material manufacturer.
- E. Handle materials to prevent damage to their surfaces, edges and ends of metal items. Damaged material shall be rejected and immediately removed from the site.

## 1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

## 1.8 WARRANTY

- A. Warranty Certification: Installing contractor shall certify that sheet metal work has been installed per National Sheet Metal System's printed details and specifications.
- B. Manufacturer warrants sheet metal fabrications are warranted to be free of defects in material and workmanship for a period of five (5) years from date of shipment.
- C. Provide manufacturer's Twenty (20) year finish warranty for standard coil-coated Kynar 500 colors against peeling, chalking, fading, checking and crazing, commencing upon date of final completion.
- D. No other warranties either expressed or implied are acceptable unless so stated in writing.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: McElroy Metal, PO Box 1148, Shreveport, LA 71163, Toll free 800-950-6532.
- B. Equal to 26 ga. Max-Rib Ultra with Kynar 500® coating.
- C. Other manufacturer's as approved by the Architect.

### 2.2 FASCIA AND ROOF EDGE SYSTEMS

- A. Provide fascia/flashing system which meets the criteria recommended by Factory Mutual Research Corporation's (FRMC) requirements for Roof Perimeter Flashing for use in Zone 1 and Zone 2 Windstorm Resistance Areas as defined in FME & R Loss Prevention Data Sheet 1-7 and 1-49.
- B. 2-Piece Fascia:
  - 1. As shown on details.
- C. Accessories:
  - 1. Closure Cleat.
  - 2. Custom Fabrications as shown on details.
- D. Fascia Covers and Accessories to be Fabricated from:
  - 1. .050 inch aluminum ASTM B 209 3105-H14 alloy.
- E. Waterdam Components:
  - 1. 0.040 inch aluminum ASTM B 209 3105-H14 alloy.

- F. Standard Length of Product: Produce components in longest possible lengths for system specified.
- G. Aluminum Finish:
  - 1. Kynar 500/Hylar 5000 from manufacturer's standard coil-coated colors.
    - a. Color – Picked by District Representative.

### 2.3 METAL ROOF FLASHING & TRIM

- A. Profile: As indicated on Roof Manufacturer's standard details.
  - 1. Pitch Break.
  - 2. Valley Flashing.
  - 3. Peak Flashing.
  - 4. Ridge/Hip Flashing.
  - 5. Eave Flashing.
  - 6. Outside Corner Flashing.
  - 7. Inside Corner Flashing.
  - 8. Material and Finish: 26 ga. Steel galvanneal/paint grip.
- B. Steel Finish:
  - 1. Prefinished steel with Kynar 500/Hylar 5000 from manufacturer's standard colors.

### 2.4 MATERIALS

- A. Prefinished Zinc-Coated Steel: Hot-dip galvanized steel, commercial quality A1 S1 G90 extra smooth, primed on both sides and finished on 1 side with 70 percent Kynar 500 based fluorocarbon coating of minimum 0.70 mils total dry film thickness.
  - 1. Strippable coating: Shop-applied liquid to front side of pre-finished metal to protect finish during fabrication, shipment, and field handling.
- B. Prefinished Aluminum Sheet: ASTM B 209, alloy 3003, coil-coated, 70 percent Kynar based fluorocarbon coating of minimum 0.70 mils total dry film thickness.

### 2.5 FABRICATION

- A. General Metal Fabrication: Shop-fabricate work to the greatest extent possible. Comply with details indicated on Drawings, and with applicable requirements of SMACNA. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
- B. Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. Form seams and solder tin edges to be seamed.
- C. Expansion and Contraction:
  - 1. Provide for thermal expansion and contraction, and building movement in completed work, without over-stressing the material, breaking connections, or producing wrinkles and distortion in finished surfaces. Make watertight and weather-resistive.
  - 2. Where subject to thermal expansion and contraction, attach members with clips to permit movement without damage, or provide slotted or oversize holes with washers only, as acceptable to Architect.
  - 3. Make lock seam work flat and true to line, and sweat full of solder, except where installed to permit expansion and contraction.
- a. Lap flat lock seams and soldered lap seams according to pitch, but in no case less than 3 inches. Make seams in direction of flow.
- D. Sealant Joints: Where movable, non-expansion type joints are indicated, or required for proper performance of work, form metal to provide for proper installation of sealant per SMACNA standards.

- E. Metal Separation: Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact with bituminous coatings or other permanent separation as recommended by manufacturer.
- F. Soldering:
  1. Clean material and tin prior to soldering. Solder with heavy coppers of blunt design, properly tinned before use.
  2. Solder slowly with well-heated coppers. Heat seams thoroughly and completely fill with solder.
  3. Make exposed joints on finish surfaces full flowing and smooth.
  4. Wash acid flux with soda solution after soldering, and remove soldering flux on exposed and painted surfaces.
- G. Accessories:
  1. Factory assemblies shall be furnished to maintain watertight integrity.
  2. Provide matching accessories or other special fabrications from the manufacturer; color to match specified profile unless noted otherwise.
- H. Fascia/flashing sections furnished with strippable protective vinyl masking shall have film removed immediately before installation to prevent damage to the coating if left exposed to the ultra-violet rays of sunlight.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

#### **3.2 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### **3.3 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Except as otherwise indicated, comply with SMACNA recommendations.
- C. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units. Conceal fasteners wherever possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather-restive.
- D. Strictly follow the material manufacturer's printed installation requirements.
- E. Completed work shall be true to line without buckling, creasing, warp or wind in finished surfaces. "Oil-canning" surfaces are not acceptable.
- F. Isolate dissimilar metals, masonry or concrete from metals using bituminous paint, tape or slip-sheet. Use gasketed fasteners where required to prevent corrosive actions.
- G. Allow sufficient clearances for expansion and contraction of linear metal components. Secure metal using continuous cleats, clips and fasteners as required by the system. No exposed face fastening shall be accepted.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Maintain prefinished surfaces in undamaged condition until date of final completion. Repair or replace damaged components, any touch-up to be indistinguishable from undamaged surface/finish.
- C. Upon completion of work, a final inspection by the owner's representative shall be made. Any necessary corrective actions will be noted and the installing contractor shall make corrections within five (5) working days. Upon acceptance of the project, any applicable warranties shall be presented to the owner's representative.

**END OF SECTION**

**ALUMINUM GUTTERS AND DOWNSPOUTS****PART 1 GENERAL**

## 1.1 SECTION INCLUDES

- A. Pre-finished continuous aluminum gutters and downspouts.
- B. Precast concrete splash pads. (N.I.C.)

## 1.2 RELATED SECTIONS

- A. Section 09900 - Painting: Field painting of metal surfaces.

## 1.3 REFERENCES

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

## 1.4 DESIGN REQUIREMENTS

- A. Conform to SMACNA Manual CDA Handbook for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.

## 1.5 SUBMITTALS FOR REVIEW

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations and installation details.
- C. Samples: Submit two samples, 12 inches long illustrating component design, finish, color and configuration.

## 1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01600 - Material and Equipment: Transport, handle, store and protect.
- B. Stack material to prevent twisting, bending or abrasion and to provide ventilation. Slope to drain.
- C. Prevent contact with materials during storage that may cause discoloration, staining or damage.

## 1.7 PROJECT CONDITIONS

- A. Section 01039 - Coordination and Meetings.
- B. Coordinate the work with downspout discharge pipe inlet.

**PART 2 PRODUCTS**

## 2.1 MATERIALS

- A. Pre-Finished Aluminum Sheet: ASTM B209; 0.032 inch thick; plain finish shop pre-coated with acrylic coating; color as selected from manufacturer's standard.

## 2.2 COMPONENTS

- A. Gutters: SMACNA Square style profile.
- B. Connectors: Furnish required connector pieces for PVC (Polyvinyl Chloride) components.
- C. Anchors and Supports: Profiled to suit gutters and downspouts.

1. Anchoring Devices: Type recommended by fabricator.
  2. Gutter Supports: Straps. Use spikes and ferrules.
  3. Downspout Supports: Straps.
- D. Fasteners: Aluminum. Same material and finish as gutters and downspouts, with soft neoprene washers.

### 2.3 ACCESSORIES

- A. Splash Pads: Precast concrete type, size and profiles indicated; minimum 3,000 p.s.i. at 28 days, with minimum 5 percent air entrainment.
- B. Downspout Boots: PVC.

### 2.4 FABRICATION

- A. Form gutters and downspouts of profiles and size indicated.
- B. Fabricate with required connection pieces.
- C. Form sections square, true and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
- D. Hem exposed edges of metal.
- E. Fabricate gutter and downspout accessories; seal watertight.

### 2.5 FACTORY FINISHING

- A. Modified silicone polyester coating: Baked enamel system conforming to AAMA 603.8.
- B. Primer Coat: Finish concealed side of metal sheets with primer compatible with finish system, as recommended by finish system manufacturer.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
- B. Verify that contact surfaces are ready to receive work.

### 3.2 PREPARATION

- A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

### 3.3 INSTALLATION

- A. Install gutters, downspouts and accessories in accordance with manufacturer's instructions.
- B. Slope gutters 1/8 inch per foot
- C. Connect downspouts to downspout boots or shoes at 8 inches above grade or into storm sewer system. Seal connection watertight.
- D. Set splash pads under downspouts.

END OF SECTION

JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Precompressed foam sealers.
- C. Hollow gaskets.

1.2 RELATED SECTIONS

- A. Section 07311: Sealants required in conjunction with waterproofing.
- B. Section 08800 - Glazing: Glazing sealants and accessories.
- C. Section 09260 - Gypsum Board Systems: Acoustic sealant.

1.3 REFERENCES

- A. ASTM C834 - Standard Specification for Latex Sealing Compounds.
- B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
- C. ASTM C1193 - Standard Guide for Use of Joint Sealants.
- D. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
- E. ASTM D1565 - Standard Specification for Flexible Cellular Materials -Vinyl Chloride Polymers and Copolymers (Open-Cell Foam).
- F. ASTM D1667 - Standard Specification for Flexible Cellular Materials -Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section and approved by manufacturer.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.6 COORDINATION

- A. Section 01039 - Coordination and Meetings: Coordination requirements.
- B. Coordinate the work with all sections referencing this section.

1.7 WARRANTY

- A. Section 01700 - Warranties.
- B. Correct defective work within a five-year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal and exhibit loss of adhesion or cohesion or do not cure.

## 1.8 SEALANTS

- A. Type I - General Purpose Exterior Sealant: Polyurethane or Polysulfide; ASTM C920, Grade NS, Class 25, Uses M, G and A; single or multi- component.
  - 1. Standard colors matching finished surfaces.
  
- B. Type II - Exterior Expansion Joint Sealer: Precompressed foam sealer; urethane with water-repellent:
  - 1. Face color: Gray.
  - 2. Size as required providing watertight seal when installed.
  - 3. Provide product recommended by manufacturer for traffic-bearing use.
  - 4. Applications: Use for:
    - a. Exterior wall expansion joints.
    - b. Paving surface joints.
    - c. Set in floor components.
  
- C. Type III - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, non-drying, non-skinning, non-curing.
  - 1. Applications: Use for:
    - a. Concealed sealant bead in sheet metal work.
    - b. Concealed sealant bead in siding overlaps.
  
- D. Type IV - Interior Floor Joint Sealant: Polyurethane, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A; single or multi-component.
  - 1. Approved by manufacturer for wide joints up to 1-1/2 inches.
  - 2. Standard colors matching finished surfaces.
  - 3. Applications: Use for:
    - a. Expansion joints in floors.
  
- E. Type V - Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, M and A; single or multi-] component.
  - 1. Gray color.
  - 2. Applications: Use for:
    - a. Joints in sidewalks and vehicular paving.

## PART 2 PRODUCTS

### 2.1 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D1056, sponge or expanded rubber; oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- E. Greenstreak or Voclay water stops. Install per manufacturer recommendations.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that substrate surfaces and joint openings are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

### 3.2 PREPARATION

- A. Remove loose materials and foreign matter that might impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Protect elements surrounding the work of this section from damage or disfiguration.

### 3.3 INSTALLATION

- A. Perform installation in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- D. Install bond breaker where joint backing is not used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Tool joints concave.
- H. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.
- I. Compression Gaskets: Avoid joints except at ends, corners, and intersections; seal all joints with adhesive; install with face 1/8 to 1/4 inch below adjoining surface.

### 3.4 CLEANING

- A. Clean adjacent soiled surfaces.

### 3.5 PROTECTION OF FINISHED WORK

- A. Protect sealants until cured.

**END OF SECTION**

08111

STANDARD STEEL DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Non-rated, fire rated and thermally insulated steel doors and panels.
- B. Louvers. Glass and glazing.

1.2 RELATED SECTIONS

- A. Section 08112 - Standard Steel Frames.
- B. Section 08710 - Door Hardware.
- C. Section 08800 - Glazing: Glass for doors. (N.I.C.)
- D. Section 09900 - Painting: Field painting of doors.

1.3 REFERENCES

- A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
- B. ASTM A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- C. ASTM E152 - Methods of Fire Tests of Door Assemblies.
- D. NFPA 80 - Fire Doors and Windows.
- E. NFPA 252 - Fire Tests for Door Assemblies.
- F. SDI-100 - Standard Steel Doors and Frames.
- G. UL 10B - Fire Tests of Door Assemblies.

1.4 SUBMITTALS FOR REVIEW

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Shop Drawings: Indicate door elevations, internal reinforcement, closure method and cutouts for glazing and louvers.

1.5 SUBMITTALS FOR INFORMATION

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer: Specializing in manufacturing products specified in this section with three years experience.

1.7 REGULATORY REQUIREMENTS

- A. Installed Door and Panel Assembly: Conform to NFPA 80 for fire rated class as scheduled.

1.8 DELIVERY, STORAGE AND PROTECTION

- A. Section 01600 - Material and Equipment: Transport, handle, store and protect products.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Break seal on site to permit ventilation.

## 1.9 PROJECT CONDITIONS

- A. Section 01039 - Coordination and Meetings.
- B. Coordinate frame installation with size, location, and installation of service utilities.
- C. Coordinate the work with door opening construction, doorframes and door hardware installation.
- D. Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE PRODUCTS:

- A. Allied Steel Products, Inc.
- B. Amweld/Div. American Welding & Mfg. Co.
- C. Ceco Corp.
- D. Curries Mfg., Inc.
- E. Pioneer Builders Products Corp./Div. CORE Industries, Inc.
- F. Steelcraft/Div. American Standard Co.
- G. Republic Builders Products Corp./Subs. Republic Steel.

### 2.2 DOORS AND PANELS

- A. Astragals for Double Doors: Steel T shaped, specifically for double doors (As required).
- B. Fabricate doors with hardware reinforcement welded in place.
- C. Attach fire rated label to each fire rated door unit.
- D. Configure exterior doors with special profile to receive recessed weather stripping.
- E. Type and Design:
  - 1. Tightly hemmed vertical seam on lock and hinge edges, with top flush channel and beveled lock edge, in the dimensions and types shown on the drawings, reinforced for the finish hardware being provided under Section 08710 of these Specifications, and in the following gauges:
    - a. Interior Doors: 18 gauge honeycomb core. Labeled and/or Non-labeled.
    - b. Exterior Doors: 16 gauge insulated core. Labeled and/or Non-labeled.

### 2.3 FINISH

- A. Steel Sheet: Exterior doors to be galvanized to ASTM A525.
- B. Primer: Air-dried.
- C. Paint per Specification Section 09900: color as selected.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

### 3.2 INSTALLATION

- A. Install doors in accordance with SDI-100 and DHI.
- B. Coordinate installation of glass and glazing.
- C. Install door louvers, plumb and level.
- D. Coordinate installation of doors with installation of frames and hardware specified in Section 08710.
- E. Touch-up finished doors.

3.3 ERECTION TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.4 ADJUSTING

- A. Section 01650 - Starting of Systems: Adjusting installed work.
- B. Adjust door for smooth and balanced door movement.

3.5 SCHEDULE

- A. Refer to Door and Frame Schedule on architectural drawings.

**END OF SECTION**

STANDARD STEEL FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Non-rated and fire rated steel frames.
- B. Interior and Exterior glazed light frames.

1.2 RELATED SECTIONS

- A. Section 08111 - Standard Steel Doors.
- B. Section 08710 - Door Hardware: Hardware, silencers and weather stripping.
- C. Section 08800 - Glazing.

1.3 REFERENCES

- A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
- B. ASTM A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- C. ASTM E152 - Methods of Fire Tests of Door Assemblies.
- D. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
- E. NFPA 80 - Fire Doors and Windows.
- F. NFPA 252 - Fire Tests for Door Assemblies.
- G. SDI-100 - Standard Steel Doors and Frames.
- H. UL 10B - Fire Tests of Door Assemblies.

1.4 SUBMITTALS FOR REVIEW

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacing, location of cutouts for hardware and finish.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.6 REGULATORY REQUIREMENTS

- A. Fire Rated Frame Construction: Conform to NFPA 252 or UL 10B.
- B. Installed Frame Assembly: Conform to NFPA 80 for fire rated class same as fire door.

1.7 DELIVERY, STORAGE AND PROTECTION

- A. Section 01600 - Material and Equipment: Transport, handle, store and protect products.
- B. Accept frames on site in manufacturer's packaging. Inspect for damage.

1.8 PROJECT CONDITIONS

- A. Section 01039 - Coordination and Meetings.
- B. Coordinate the work with frame opening construction, door and hardware installation.

- C. Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

## 1.9 FRAMES

- A. Frames: To suit SDI-100 Grade and Model of door specified in Section 08111.

## PART 2 PRODUCTS

### 2.1 FRAMES

- A. 16 gauge. To suit SDI-100 Grade.
  - 1. Provide drywall wrap around frames for interior and exterior doors.

### 2.2 ACCESSORIES

- A. Removable Stops: Rolled steel channel shape, butted corners; prepared for countersink style tamper proof screws.
- B. Bituminous Coating: Fibered asphalt emulsion.
- C. Primer: Zinc chromate type.
- D. Silencers: Specified in Section 08710.
- E. Weatherstripping: Specified in Section 08710.

### 2.3 FABRICATION

- A. Fabricate frames as welded unit.
- B. Mullions for Double Doors: Fixed type, of same profiles as jambs.
- C. Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.
- D. Fabricate frames with hardware reinforcement plates welded in place. Provide mortar guard boxes.
- E. Reinforce frames wider than 4" with roll formed steel channels fitted tightly into frame head, flush with top.
- F. Configure exterior frames with special profile to receive recessed weather stripping.
- G. Attach fire rated label to each fire rated door unit.

### 2.4 FINISH

- A. Steel Sheet: Galvanized.
- B. Primer: Air-dried.
- C. Paint per Specification Section 09900: color as selected.
- D. Coat inside of frame profile with bituminous coating.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

### 3.2 INSTALLATION

- A. Install frames in accordance with SDI-100 and DHL.
- B. Coordinate with masonry, gypsum board or concrete wall construction for anchor placement.
- C. Coordinate installation of glass and glazing.
- D. Coordinate installation of frames with installation of hardware specified in Section 08710 and doors in Section 08111.

- E. Install roll-formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

### 3.3 ERECTION TOLERANCES

- A. Maximum Diagonal Distortion: 1/8" measured with straight edges, crossed corner to corner.

### 3.4 SCHEDULE

- A. Refer to Door Schedule on drawings.

**END OF SECTION**

## SECTIONAL OVERHEAD DOORS

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Electric overhead sectional door.
- B. Operating hardware, supports and controls.

## 1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Steel channel opening frame.
- B. Section 08710 - Door Hardware: Cylinder locks.
- D. Section 16100 - Electrical: Wiring.

## 1.3 REFERENCES

- A. ANSI A216.1 - Sectional Overhead Type Door (NAGDM 102).
- B. ASTM A526/A526M - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
- C. NEMA MG 1 - Motors and Generators.
- D. NFPA 70 - National Electrical Code. Conform to BOCA code for motor and motor control requirements. Listed and classified by Underwriters Laboratories, Inc.

## 1.4 SYSTEM DESCRIPTION

- A. Panels: Insulated with glazed panels.
- B. Lift Type: Standard lift or High lift operating style with track and hardware.
- C. Operation: Electric.
- D. Loads: Design and size components to withstand dead and live loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with BOCA code.

## 1.5 SUBMITTALS FOR REVIEW

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations and installation details.
- C. Product Data: Provide component construction, anchorage method and hardware.
- D. Samples: Submit two exterior and interior panel finish samples, 18 x 18 inches in size, illustrating color and finish.

## 1.6 SUBMITTALS AT PROJECT CLOSEOUT

- A. Section 01700 - Operation and Maintenance Data: Procedures for submittals.
- B. Operation Data: Include electrical control adjustments.
- C. Maintenance Data: Include data for motor and transmission, shaft and gearing, lubrication frequency, spare part sources.
- D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

## 1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with ANSI A216.1, Application Type: Industrial. Maintain one copy on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years' experience.
- C. Installer: Company specializing in performing the work of this section and approved by manufacturer.

## 1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

## 1.9 WARRANTY

- A. Section 01700 - Warranties.
- B. Correct defective Work within a one-year period after Date of Substantial Completion.
- C. Warranty: Include coverage for electric motor and transmission.
- D. Provide a one-year manufacturer warranty for electric operating equipment.

## PART 2 PRODUCTS

### 2.1 SECTIONAL OVERHEAD DOORS (Non-Insulated)

- A. Provide standard sectional overhead doors of the dimensions and arrangements shown on the drawings, and with the following attributes: Equal to Overhead Doors Inc., 420 Series, Non-Insulated Steel Sectional Door. Steel door assembly with rabbeted meeting rails to form weathertight joints and provide full-width interlocking structural rigidity. Units shall have the following characteristics.
  - 1. Panel Thickness: 2".
  - 2. Exterior Surface: Ribbed
  - 3. Steel: Minimum 20 gauge, galvanized.
  - 4. Center and End Stiles: 16 gauge.
  - 5. Standard Springs: 10,000 cycles. (High cycles.)
  - 6. Partial Glazing of Steel Panels: 1/8" double strength glass. See Door Schedule.
- B. Finish Color: Factory-applied baked-on white polyester.
- C. Wind load Design: ANSI/DASMA 102 standards and as required by code.
- D. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- E. Lock: Interior mounted slide lock. (Keyed lock.)
- F. Weather stripping: Flexible PVC on bottom section. (Jamb seals.) (Header seals.)
- G. Track: Provide track as recommended by manufacturer to suit loading required and clearances available and galvanized.

- H. Manual Operation: Chain hoist. Include Pull rope release automatic opening device.

## 2.2 SECTIONAL OVERHEAD DOORS

- A. Provide standard sectional overhead doors of the dimensions and arrangements shown on the drawings, and with the following attributes: Equal to Overhead Doors Inc., 592 Series, Thermacore Insulated Steel Sectional Door but with the following minimum requirements.
1. Design wind load: Comply with NAGDM specification 102-1976, except that minimum wind load shall be 80 mph.
  2. Door sections:
    - a. Exterior: Roll-form from .016" hot-dip galvanized steel, with integral reinforcing ribs consisting of six longitudinal ribs and two flat bottom V-grooves.
    - b. Provide meeting rails of double-rabbeted weatherproof interlocking joints functioning as integral struts and assuring alignment full width of each section.
    - c. Provide a minimum thickness of 2", R-Value 16.00. U-Value of .057.
  3. Glass openings: N. I. C.
  4. Track and Hardware:
    - a. Tracks shall be 2" wide galvanized steel, mounted by continuous galvanized steel angle.
    - b. Stainless Steel lift cables shall have a safety factor of 8 to 1.
    - c. Roller shall be full-floating ball bearings with hardened steel racers.
    - d. Counterbalance shall consist of a torsion spring mounted on a continuous thru solid steel shaft.
    - e. Provide interior side locking device, which with a slide bar extends through the left and right side tracks.
    - f. Astragal - Provide "U" type rubber astragal at the bottom edge of each door or an approved equal.
  5. Finish: Provide the manufacturer's standard pre-finish system in color selected by the owner from the manufacturer's standard colors.
  6. Insulation: Rigid foamed-in-place polyurethane core free of CFC's and will be fully encapsulated in non-permeable materials to prevent loss of thermal efficiency over time. Insulation shall have a back cover of .013" steel.
  7. Electric Sensing Edge: Provide for each door. Provide safety edges by Air Wave, Miller Edge, Model number AW14K500 with coil cord or equal, extending the full width of the door. Upon contact with an obstruction the downward travel of the door shall be stopped or reversed.
  8. Weather strip
    - a. Between sections will be EPDM rubber tube seals fitted every joint.
    - b. Jamb seals. Provide pliable bulb seals.
  9. Springs: Springs will be 25,000 cycles.

## 2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

- B. Sheet Steel: ASTM A526/A526M galvanized to G60, pre-coated with silicone polyester finish, plain surface.
- C. Exterior Surfaces: Factory painted. (White)
- D. Interior Surfaces: Factory painted. (White)

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
- B. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.
- C. Verify that electric power is available and of the correct characteristics.

#### **3.2 PREPARATION**

- A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.

#### **3.3 INSTALLATION**

- A. Install door unit assembly in accordance with manufacturer's instructions.
- B. Anchor assembly to wall construction and building framing without distortion or stress.
- C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- D. Fit and align door assembly including hardware.
- E. Coordinate installation of electrical service, power and control wiring by electrical contractor from disconnect to unit components.
- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.
- G. Install perimeter trim and closures.

#### **3.4 ERECTION TOLERANCES**

- A. Section 01400 - Quality Assurance: Tolerances.
- B. Maximum Variation from Plumb: 1/16 inch.
- C. Maximum Variation from Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10 ft. straight edge.
- E. Maintain dimensional tolerances and alignment with adjacent work.

#### **3.5 MANUFACTURER'S FIELD SERVICES**

- A. Section 01650 - Starting of Systems: Prepare and start systems.
- B. Ensure the operation and adjustments to door assembly for specified operation.

#### **3.6 ADJUSTING**

- A. Section 01650 - Starting of Systems: Adjusting installed work.
- B. Adjust door assembly to smooth operation and in full contact with weather stripping.

#### **3.7 CLEANING**

- A. Section 01700 - Contract Closeout: Cleaning installed work.
- B. Clean doors, frames and glass.
- C. Remove temporary labels and visible markings.

3.8 PROTECTION OF FINISHED WORK

- A. Section 01700 - Contract Closeout: Protecting installed work.
- B. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

3.9 SCHEDULES

Refer to Door Schedule on Architectural Drawings

**END OF SECTION**

**DOOR HARDWARE**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Hardware for steel doors.
- B. Thresholds.
- C. Weatherstripping, seals and door gaskets.

**1.2 RELATED SECTIONS**

- A. Section 08111 - Standard Steel Doors.
- B. Section 08112 - Standard Steel Frames.

**1.3 REFERENCES**

- A. NFPA 80 - Fire Doors and Windows.
- B. NFPA 101 - Life Safety Code.
- C. NFPA 252 - Fire Tests of Door Assemblies.
- D. UL 10B - Safety Fire Tests of Door Assemblies.

**1.4 SUBMITTALS FOR REVIEW**

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Shop Drawings:
  - 1. Indicate locations and mounting heights of each type of hardware, schedules and catalog cuts.
  - 2. Submit manufacturer's parts lists and templates.
- C. Samples:
  - 1. Submit 1 sample of hinge, latchset, lockset and closer, illustrating style, color and finish.
  - 2. Samples will be incorporated into the Work.

**1.5 SUBMITTALS AT PROJECT CLOSEOUT**

- A. Section 01700 - Operation and Maintenance Data.
- B. Section 01300 - Procedures for submittals.
- C. Maintenance Data: Include data on operating hardware, lubrication requirements and inspection procedures related to preventative maintenance.
- D. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

**1.6 REGULATORY REQUIREMENTS**

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

**1.7 DELIVERY, STORAGE AND PROTECTION**

- A. Section 01600 - Material and Equipment: Transport, handle, store, and protect products.
- B. Package hardware items individually, label and identify each package with door opening code to match hardware schedule.

1.8 PROJECT CONDITIONS

- A. Section 01039 - Coordination and Meetings.
- B. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
- C. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- D. Coordinate Owner's keying requirements during the course of the Work.

1.9 WARRANTY

- A. Provide five-year manufacturer warranty for door closers.

1.10 MAINTENANCE PRODUCTS

- A. Section 01730 - Operation and Maintenance Data.
- B. Provide special wrenches and tools applicable to each different or special hardware component.
- C. Provide maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 PRODUCTS

2.1 HARDWARE

- A. Furnish the following hardware groups in the amounts as indicated on the drawings.
 

1.	Hardware group 1:	Door: 2 & 3	
	3	Pr. Butts	FBB179-4-1/2 x 4-1/2 US26D NRP Stanley
	2	Entrance	35H7F15J-626 (Provided by Owner) Best
			(Installed by Contractor)
	2	Closer	760IDS Dorma
	2	Threshold	2005A 36" x AL Pemko
	2	Sweep	18062 36" x AL Pemko
	2	Gasket Set	305CN Pemko
	2	Kick Down Stop	1153M Glynn Johnson
	2	Kick Plate	8" x DW-2" Rockwood
	2	Top Filler Plate	
	2	Closure Door Reinforcement	

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
- B. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
- C. Verify that electric power is available to power operated devices and is of the correct characteristics.

3.2 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions.
- B. Use templates provided by hardware item manufacturer.

3.3 FIELD QUALITY CONTROL

- A. Section 01400 - Quality Control 01650 - Starting of Systems: Field inspection, testing, and adjusting.
- B. Architectural Hardware Consultant will inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.4 ADJUSTING

- A. Section: 01650 - Starting of Systems: Adjusting installed work.
- B. Adjust hardware for smooth operation.

**END OF SECTION**

**ELECTRIC DOOR OPERATORS****PART 1 GENERAL**

## 1.1 SUMMARY

- A. Provide electric rolling door operator, where shown on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

## 1.2 SUBMITTALS

- A. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section;
  - 2. Manufacturers' specifications and other data needed to prove compliance with the specified requirements;
  - 3. Shop drawings showing general layout, installation, materials, construction and assembly wiring.
  - 4. Manufacturers' recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.
- B. Upon completion of this portion of the work and as a condition of its acceptance, deliver to the owner three copies of the operation and maintenance manual.

## 1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Comply with all governmental agencies having jurisdiction in this work.
- C. Each operator shall have a minimum one (1) year manufacturer's warranty.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01620.

**PART 2 PRODUCTS AND MATERIAL**

## 2.1 REQUIRED ATTRIBUTES

- A. Trolley Type:
  - 1. Motor - 115/230V single phase, 1/2 hp instant reversing with automatic reset thermal overload. Equal to Overhead Door Corp. Model "JST".
  - 2. Reversing Contactor - Heavy duty, electrically and mechanically interlocked.
  - 3. Limit Switches - Adjustable rotary type synchronized with door operation.
  - 4. Control Circuit - 24 volt class 2, three button, OPEN-CLOSE-STOP.
  - 5. Reduction - Primary-V-belt, secondary-chain and sprocket.
  - 6. Clutch - Adjustable disc friction type.
  - 7. Brake - Solenoid actuated drum type.
  - 8. Where required provide car wash modification, electrical enclosure and 3-button station meeting NEMA 1.

9. Electric bottom safety edge with coil cord

2.2 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

**PART 3 EXECUTION**

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install the work of this section in strict accordance with the manufacturer's recommendations and shop drawings and in accordance with pertinent requirements of governmental agencies having jurisdiction.
- B. Electrical contractor will run electricity to the electric door operator. Final connection to the door operator shall be the responsibility of the electric door operator installer.

3.3 ADJUSTMENTS AND INSTRUCTIONS

- A. Upon completion of the installation, carefully inspect each component and verify that all items have been installed in the proper location, adequately anchored and adjusted to achieve optimum operation.
- B. Demonstrate to the owner, operation and maintenance procedures.

**END OF SECTION**

09900

## PAINTING

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints, stains, varnishes and other coatings.

#### 1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Shop primed items.

#### 1.3 REFERENCES

- A. ASTM D16 - Standard Terminology Relating to Paint, Varnish, Lacquer and Related Products.
- B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials.
- C. NACE (National Association of Corrosion Engineers) - Industrial Maintenance Painting.
- D. NPCA - Guide to U.S. Government Paint Specifications; National Paint and Coatings Association.
- E. PDCA - Architectural Specifications Manual; Painting and Decorating Contractors of America.
- F. SSPC - Steel Structures Painting Manual; Steel Structures Painting Council.

#### 1.4 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.

#### 1.5 SUBMITTALS FOR REVIEW

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Samples:
  - 1. Submit two paper chip samples, 2 x 4 inches in size illustrating range of colors and textures available for each surface finishing product scheduled.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.

#### 1.7 DELIVERY, STORAGE AND PROTECTION

- A. Section 01600 - Material and Equipment: Transport, handle, store and protect products.
- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- C. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation and instructions for mixing and reducing.
- D. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

#### 1.8 ENVIRONMENTAL REQUIREMENTS

- A. Section 01600 - Material and Equipment: Environmental conditions affecting products on site.
- B. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- C. Do not apply exterior coatings during rain or snow or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior, unless required otherwise by manufacturer's instructions.
- E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

#### 1.9 PROJECT CONDITIONS

- A. Section 01039 - Coordination and Meetings.
- B. Sequence application to the following:
  1. Do not apply finish coats until paintable sealant is applied.
  2. Back prime wood trim before installation of trim.

#### 1.10 EXTRA MATERIALS

- A. Section 01730 - Operation and Maintenance Data.
- B. Supply 1 gallons of each color, type and surface texture; store where directed.
- C. Label each container with color, type, texture and room locations in addition to the manufacturer's label.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
  1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
  2. For good flow and brushing properties.
  3. Capable of drying or curing free of streaks or sags.
- B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.
- C. Patching Materials: Latex filler.
- D. Fastener Head Cover Materials: Latex filler.

#### 2.2 BRAND OF PAINT

- A. Sherwin-Williams or equal.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting Work.
- B. Verify that surfaces and substrate conditions are ready to receive Work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Test shop applied primer for compatibility with subsequent cover materials.

### 3.2 PREPARATION

- A. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons and fittings prior to preparing surfaces or finishing.
- B. Surfaces: Correct defects and clean surfaces that affect work of this section.
- C. Marks: Seal with shellac those that may bleed through surface finishes.
- D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt and rust. Where heavy coatings of scale are evident, remove by [hand] [power tool] wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Spot prime paint after repairs.
- F. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with a solvent. Prime paint bare steel surfaces.
- G. Metal Doors and Frames scheduled for Painting: Prime metal door top and bottom edge surfaces.

### 3.3 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding
- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

### 3.4 CLEANING

- A. Collect waste material that may constitute a fire hazard, place in closed metal containers and remove daily from site.

### 3.5 SCHEDULE - EXTERIOR SURFACES

- A. Steel - Unprimed:
  - 1. One coat of alkyd primer.
  - 2. Two coats of alkyd enamel, gloss.
- B. Steel - Shop Primed:
  - 1. Touch-up with zinc chromate primer.
  - 2. Two coats of alkyd enamel, gloss.

**END OF SECTION**

**Missouri Highways and Transportation Commission  
Standard Bid/Proposal Provisions, General Terms and Conditions and Special Terms and Conditions**

**STANDARD SOLICITATION PROVISIONS**

- a. The solicitation for the procurement of the supplies referenced therein, to which these "Standard Bid Provisions, General Terms and Conditions and Special Terms and Conditions" are attached, is being issued under, and governed by, the provisions of Title 7 – Missouri Department of Transportation, Division 10 – Missouri Highways and Transportation Commission, Chapter 11 – Procurement of Supplies, of the Code of State Regulations. The Missouri Highways and Transportation Commission (MHTC), acting by and through its operating arm, the Missouri Department of Transportation (MoDOT), draws the Bidder's attention to said 7 CSR 10-11 for all the provisions governing solicitation and receipt of bids/quotes and the award of the contract pursuant to this solicitation.
- b. All bids/quotes must be signed with the firm name and by a responsible officer or employee. Obligations assumed by such signature must be fulfilled.

**GENERAL TERMS AND CONDITIONS**

**Definitions**

Capitalized terms as well as other terms used but not defined herein shall have the meaning assigned to them in section 7 CSR 10-11.010 Definition of Terms.

**Nondiscrimination**

- a. The Contractor shall comply with all state and federal statutes applicable to the Contractor relating to nondiscrimination, including, but not limited to, Chapter 213, RSMo; Title VI and Title VII of Civil Rights Act of 1964 as amended (42 U.S.C. Sections 2000d and 2000e, *et seq.*); and with any provision of the "Americans with Disabilities Act" (42 U.S.C. Section 12101, *et seq.*)
- b. **Sanctions for Noncompliance:** In the event of the Contractor's noncompliance with the nondiscrimination provisions of this contract, MHTC shall impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:
  - i. withholding of payments to the Contractor under the contract until the Contractor complies, and/or,
  - ii. cancellation, termination or suspension of the contract, in whole or in part.

**Contract/Purchase Order**

- a. By submitting a bid/quote, the Bidder agrees to furnish any and all equipment, supplies and/or services specified in the solicitation documents, at the prices quoted, pursuant to all requirements and specifications contained therein.
- b. A binding contract shall consist of: (1) the solicitation documents, amendments thereto, and/or Best and Final Offer (BAFO) request(s) with any changes/additions, (2) the Contractor's bid response, and (3) the MHTC's acceptance of the bid by post-award contract or purchase order.
- c. A notice of award does not constitute an authorization for shipment of equipment or supplies or a directive to proceed with services. Before providing equipment, supplies and/or services, the Contractor must receive a properly authorized notice to proceed and/or purchase order.

**Applicable Laws and Regulations**

- a. The contract shall be construed according to the laws of the State of Missouri. The Contractor shall comply with all local, state, and federal laws and regulations related to the performance of the contract. The exclusive venue for any legal proceeding relating to or arising, out of the contract shall be in the Circuit Court of Cole County, Missouri.
- b. The Contractor must be registered and maintain good standing with the Secretary of State of the State of Missouri, Missouri Department of Revenue, and other regulatory agencies, as may be required by law or regulations. Prior to the issuance of a purchase order and/or notice to proceed, the Contractor may be required to submit to MHTC a copy of their current Authority Certificate from the Secretary of State of the State of Missouri and/or a copy of their Certificate of No Tax Due from the Missouri Department of Revenue.
- c. Prior to the issuance of a purchase order and/or notice to proceed, all out-of-state Contractors **providing services** within the state of Missouri must submit to MHTC a copy of their current Transient Employer Certificate from the Missouri Department of Revenue, in addition to a copy of their current Authority Certificate from the Secretary of State of the State of Missouri.

**Executive Order:**

The Contractor shall comply with all the provisions of Executive Order 07-13, issued by the Honorable Matt Blunt, Governor of Missouri, on the sixth (6<sup>th</sup>) day of March, 2007. This Executive Order, which promulgates the State of Missouri's position to not tolerate persons who contract with the state engaging in or supporting illegal activities of employing individuals who are not eligible to work in the United States, is incorporated herein by reference and made a part of this Agreement.

- 1) "By signing this Agreement, the Contractor hereby certifies that any employee of the Contractor assigned to perform services under the contract is eligible and authorized to work in the United States in compliance with federal law."
- 2) In the event the Contractor fails to comply with the provisions of the Executive Order 07-13, or in the event the Commission has reasonable cause to believe that the contractor has knowingly employed individuals who are not eligible to work in the United States in violation of federal law, the Commission reserves the right to impose such contract sanctions as it may determine to be appropriate, including but not limited to contract cancellation, termination or suspension in whole or in part or both.
- 3) The Contractor shall include the provisions of this paragraph in every subcontract. The Contractor shall take such action with respect to any subcontract as the Commission may direct as a means of enforcing such provisions, including sanctions for noncompliance.

**Preferences**

- a. In the evaluation of bids/quotes, preferences shall be applied in accordance with 7 CSR 10-11.020(7). Contractors should apply the same preferences in selecting subcontractors. The attached document entitled "VENDOR INFORMATION AND PREFERENCE CERTIFICATION FORM" must be completed and returned with the solicitation documents.
- b. Bidders are encouraged to obtain minority business enterprise (MBE) and women business enterprise (WBE) participation in this work through the use of subcontractors, suppliers, joint ventures, or other arrangements that afford meaningful participation for M/WBEs. Bidders are encouraged to obtain 10% MBE and 5% WBE participation.

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**Cancellation of Contract**

The MHTC may cancel the Contract at any time for a material breach of contractual obligations or for convenience by providing Contractor with written notice of cancellation. Should the MHTC exercise its right to cancel the contract for such reasons, cancellation will become effective upon the date specified in the notice of cancellation sent to the Contractor.

**Bankruptcy or Insolvency**

Upon filing for any bankruptcy or insolvency proceeding by or against the Contractor, whether voluntarily, or upon the appointment of a receiver, trustee, or assignee, for the benefit of creditors, the Commission reserves the right and sole discretion to either cancel the Agreement or affirm the Agreement and hold the Contractor responsible for damages.

**Warranty**

The Contractor expressly warrants that all equipment, supplies, and/or services provided shall: (1) conform to each and every specification, drawing, sample or other description which was furnished to or adopted by the MHTC, (2) be fit and sufficient for the purpose expressed in the solicitation documents, (3) be merchantable, (4) be of good materials and workmanship, and (5) be free from defect.

**Status of Independent Contractor**

The Contractor represents itself to be an independent Contractor offering such services to the general public and shall not represent itself or its employees to be an employee of the MHTC. Therefore, the Contractor shall assume all legal and financial responsibility for taxes, FICA, employee fringe benefits, workers' compensation, employee insurance, minimum wage requirements, overtime, etc., and agrees to indemnify, save and hold the MHTC, its officers, agents and employees harmless from and against any and all losses (including attorney fees) and damage of any kind related to such matters.

**Non-Waiver**

If one of the parties agrees to waive its right to enforce any term of this Contract, that party does not waive its right to enforce such term at any other time or to enforce any or all other terms of this Contract.

**Indemnification**

The Contractor shall defend, indemnify and hold harmless MHTC, including its members and department employees, from any claim or liability whether based on a claim for damages to real or personal property or to a person for any matter relating to or arising out of the Contractor's performance of its obligations under the contract awarded pursuant to this solicitation.

**SPECIAL TERMS AND CONDITIONS**

**Tax Exempt Status:**

MHTC is exempt from paying Missouri Sales Tax, Missouri Use Tax and Federal Excise Tax. However, the Contractor may themselves be responsible for the payment of taxes on materials they purchase to fulfill the contract. A Project Tax Exemption Certificate will be furnished to the successful Bidder upon request if applicable.

**Insurance**

The Contractor shall maintain or cause to be maintained at Contractor's own expense commercial general liability, automobile liability, worker's compensation insurance against negligent acts, errors or omissions of the Contractor, or its subcontractors and anyone directly or indirectly employed by any of them. Any insurance policy required as specified in this Section shall be written by a company that is licensed and authorized to issue such insurance in the state of Missouri and shall provide insurance coverage for not less than the following limits of liability:

- 1) General Liability: Not less than \$500,000 for any one person in a single accident or occurrence, and not less than \$3,000,000 for all claims arising out of a single occurrence;
- 2) Automobile Liability: Not less than \$500,000 for any one person in a single accident or occurrence, and not less than \$3,000,000 for all claims arising out of a single occurrence;
- 3) Missouri State Workmen's Compensation policy or equivalent in accordance with state law.

Upon request from the Commission, the Contractor shall provide the Commission with certificates of insurance evidencing the required coverage and that such insurance is in effect.

**Bid Guaranty/Contract Bond**

- a. Each bid shall be accompanied by a Bid Bond, Certified Check, Cashier's Check or Bank Money Order payable to the Director of Revenue - Credit State Road Fund for an amount equal to Five Percent (5%) of the amount of the bid submitted. This is to act as a guarantee that the bidder, if awarded the contract, will furnish an acceptable performance and payment bond (Contract Bond) or a cashier's check, a bank money order or a certified check made payable to "Director of Revenue--Credit State Road Fund" in an amount equal to One Hundred (100%) of the contract price.
- b. If a BID BOND is used (in lieu of a certified check, cashier's check, or bank money order), it must be in the form provided and executed by the bidder as principal and by a surety company authorized to do business in the State of Missouri as surety. The agent executing the same on behalf of the surety company must attach a current Power of Attorney setting forth his authority to execute the bond involved.
- c. Certified Checks, Cashier's Checks or Bank Money Orders of unsuccessful bidders will be returned as soon as the award is made. The checks or bank money orders of the successful bidder(s) will be retained until the contract is executed and a satisfactory Performance and Payment (Contract Bond) is furnished. Bid Bonds will not be returned except on specific request of the bidder.
- d. Failure to execute the contract and file acceptable performance payment (Contract Bond) or cashier's check, bank money order or certified check

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within 15 days after the contract has been mailed to the bidder shall be just cause for the cancellation of the award and the forfeiture of the proposal guaranty. Award may then be made to the next lowest responsible bidder, or the work may be re-advertised and performed under contract or otherwise, as the Commission may decide. No contract shall be considered effective until it has been executed by all parties thereto.

**Subcontracting**

- a. It is specifically understood that no portion of the material or any interest in the contract, shall be subcontracted, transferred, assigned or otherwise disposed of, except with the written consent of MHTC. Request for permission to subcontract or otherwise dispose of any part of the work shall be in writing to MHTC and accompanied by documentation showing that the organization which will perform the work is particularly experienced and equipped for such work.
- b. Consent to subcontract or otherwise dispose of any portion of the work shall not be construed to relieve the Contractor of any responsibility for the production and delivery of the contracted work and the completion of the work within the specified time.
- c. All payments for work performed by a subcontractor shall be made to the Contractor to whom the contract was awarded and the purchase order issued.

**Prohibition Of Employment Of Unauthorized Aliens:**

- a. **Non-employment of Unauthorized Aliens:** Pursuant to Section 285.530, RSMo., no business entity or employer shall knowingly employ, hire for employment, or continue to employ an unauthorized alien to perform work within the State of Missouri. As a condition for the award of any contract or grant in excess of five thousand dollars by the State or by any political subdivision of the State to a business entity, or for any business entity receiving a state-administered or subsidized tax credit, tax abatement, or loan from the state, the business entity shall:
  - 1) By sworn affidavit and provision of documentation, affirm its enrollment and participation in a federal work authorization program with respect to the employees working in connection with the contracted services. E-Verify is an example of a federal work authorization program. The business entity must affirm its enrollment and participation in the E-Verify federal work authorization program with respect to the employees proposed to work in connection with the services requested herein by providing acceptable enrollment and participation documentation consisting of completed copy of the E-Verify Memorandum of Understanding (MOU). For business entities that are not already enrolled and participating in a federal work authorization program, E-Verify is available at [http://www.dhs.gov/files/programs/gc\\_1185221678150.shtm](http://www.dhs.gov/files/programs/gc_1185221678150.shtm)
  - 2) By sworn affidavit, affirm that it does not knowingly employ any person who is an unauthorized alien in connection with the contracted services. A copy of the affidavit referenced herein is provided within this document, attached as Exhibit A.
- b. **Proof of Lawful Presence For Sole Proprietorships and Partnerships:** If the business entity is a sole proprietorship or partnership, pursuant to Section 208.009, RSMo., each sole proprietor and each general partner shall provide affirmative proof of lawful presence in the United States. Such sole proprietorship or partnership is eligible for temporary public benefits upon submission by each sole proprietor and general partner of a sworn affidavit of his/her lawful presence on the United States until such lawful presence is affirmatively determined, or as otherwise provided by Section 208.009, RSMo. A copy of the affidavit reference herein is provided within this document, attached as Exhibit B.

**Construction Safety Program**

Missouri law, 292.675 RSMo, requires the awarded Contractor and its subcontractor(s) to provide a ten-hour occupational safety and health administration (OSHA) construction safety program (or a similar program approved by the Missouri Department of Labor and Industrial Relations as a qualified substitute) for their on-site employees (laborers, workmen, drivers, equipment operators, and craftsmen) who have not previously completed such a program and are directly engaged in actual construction of the improvement (or working at a nearby or adjacent facility used for construction of the improvement). The Contractor and its subcontractor(s) shall require all such employees to complete this ten-hour program, pursuant to 292.675 RSMo, unless they hold documentation on their prior completion of said program. Penalties for non-compliance include Contractor forfeiture to the Commission in the amount of \$2,500, plus \$100 per contractor and subcontractor employee for each calendar day such employee is employed beyond the elapsed time period for required program completion under 292.675 RSMo.

**Prevailing Wage**

- a. The work to be performed under this solicitation is governed by the provisions of Chapter 290 RSMo, as amended, related to prevailing wages to be paid on public works.
- b. If the bid/quote is accepted, the vendor will be required to comply with the prevailing wages as fixed by the Missouri Department of Labor and Industrial Relations, in effect as of the date of the issuance of the solicitation, for each affected craft and type of workmen in the following county(ies): **Statewide**. The Annual Wage Order #19 is attached to the bid documents. Pursuant to the requirements of the Chapter 290 RSMo., not less than the prevailing hourly rate of wages, as set out in the wage order attached to and made part of the specification for work under the contract, must be paid to all workers performing work under the contract.
- c. The Contractor shall provide all information, reports and other documentation as required by MHTC to ensure compliance with Chapter 290 RSMo., as amended, relating to prevailing wages to be paid on public works.
- d. The Contractor shall forfeit a penalty to the contracting public body of \$500 per day (or portion of a day) for each worker that is paid less than the prevailing rate for any work done under the contract by the contractor or by any subcontractor.

**Permits, Licenses and Safety Issues**

The contract price shall include any necessary permits and licenses required by law incidental to the work. Local ordinances requiring building permits are not applicable to state agencies.

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**Liquidated Damages**

- a. In the event the successful Contractor fails to deliver the material within the time specified, the Department and the public will sustain damages because of such delay in delivery, the exact extent of which would be difficult to ascertain, and in order to liquidate such damage in advance it is agreed that the sum of \$500 per day, for each assessable calendar day on which the delivery has not been completed, is reasonable and the best estimate which the parties can arrive at as liquidated damages, and it is therefore agreed that said amount will be withheld from payments due the Contractor or otherwise collected from the Contractor as liquidated damages.
- b. Saturdays, Sundays, holidays and days whereas the Department has suspended work shall not be assessable days.

**Time of Completion**

If this bid is accepted, it is hereby agreed that work will begin not later than the date specified in the "Notice to Proceed" and will diligently be prosecuted in order to complete the work and billing within **40-working days** from the date specified. Completion of work will be based on FINAL ACCEPTANCE of the building; "SUBSTANTIAL COMPLETION" will not be accepted as basis for completion.

**A Working Day**

Is defined as any day when, soil and weather conditions would permit the major operation of the project for six hours or more unless other unavoidable conditions prevent the contractor's operation. If conditions require the contractor to stop work in less than six hours, the day will not be counted as a working day. Working days will begin as soon as notice to proceed is issued. In order for MoDOT not to change a workday due to unavoidable conditions, the contractor must have enough forces, equipment, and materials on site to begin the project. The contractor must notify MoDOT inspector before 12:00 noon of said working day if forces will not be present.