

**REQUEST FOR
BID (RFB) FORM**

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

REQUEST NO.	9-121113RJ
DATE	October 22, 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; November 13, 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**

Shelbina and Mexico, MO

BUYER: Reva Jones **EMAIL:** reva.jones@modot.mo.gov

BUYER TELEPHONE: 573-526-2744

The purpose of this Request For Bids (RFB) is to accept bids for the construction of two truck washes at the Shelbina Maintenance Facility in Shelby County, MO and Mexico Maintenance Facility in Audrain County, MO. The project described as "**Shelbina and Mexico Truck Washes**" 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").

Notice to Contractors

MoDOT will receive bids at the following mailing address: P.O. Box 270, Jefferson City, MO 65102-0270, Attn: Reva Jones or hand-delivered in a sealed envelope to the following physical address: General Services Procurement at 830 MoDOT Drive, Attn: Reva Jones, Jefferson City, MO 65109, until 2:00 p.m., November 13, 2012. Bid forms and information may be obtained by contacting the buyer at the phone number or e-mail addresses indicated above, or electronically download them at no charge from

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 No bid may be amended or withdrawn after the bid is opened.

Contact Todd Roth at 573-231-6593 for appointments to view the locations. Physical locations are as follows:

Shelbina – Shelby County – Routes 36, 0.4 miles west of Route 15
Mexico – Audrain County – Route JJ, 0.5 miles south of Route 54

Written Questions: All written questions must be addressed to Reva Jones no later than 2:00 p.m., Local Time, November 7, 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 reva.jones@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

in the form of a written addendum. It is anticipated this addendum will be issued on November 8, 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

TABLE OF CONTENTS

DIVISION		PAGE
DIVISION 0 - BIDDING AND CONTRACT INFORMATION		
	FINAL CHECKLIST BEFORE SUBMITTING BID	1
00100	BIDDER REQUIREMENTS	2
00301	BID FORM	8
00430	SUBCONTRACTOR LISTING	12
00600	BID BOND	13
DIVISION 1 – GENERAL REQUIREMENTS (BROAD SCOPE)		
01019	CONTRACT REQUIREMENTS	14
01039	COORDINATION AND MEETING REQUIREMENT	16
01300	SUBMITTAL REQUIREMENTS	19
01400	QUALITY CONTROL REQUIREMENTS	23
01500	CONSTRUCTION FACILITIES AND TEMPORARY CONTROL REQUIREMENTS	25
01600	MATERIAL AND EQUIPMENT REQUIREMENT	27
01650	STARTING OF SYSTEMS REQUIREMENT	29
01700	CONTRACT CLOSEOUT REQUIREMENT	31
DIVISION 2 - SITEWORK		
02685	GAS DISTRIBUTION SYSTEM	34
DIVISION 5 - METALS		
05500	METAL FABRICATIONS	41
DIVISION 7 - THERMAL AND MOISTURE PROTECTION		
07210	BUILDING INSULATION	43
07229	SPRAYED INSULATION	45
07900	JOINT SEALERS	47
DIVISION 8 - DOORS AND WINDOWS		
08111	STANDARD STEEL DOORS	50
08112	STANDARD STEEL FRAMES	53
08351	OVERHEAD COILING DOORS	56
08710	DOOR HARDWARE	58
08720	ELECTRIC DOOR OPERATORS	61
DIVISION 9 - FINISHES		
09971	FIBERGLASS WALL PANELS	63
DIVISION 13 - SPECIAL CONSTURCTION		
13121	PRE-ENGINEERED BUILDINGS	65
DIVISION 15 - MECHANICAL		
15050	MATERIALS AND METHODS	68
15400	PLUMBING SYSTEMS	70
15500	HEATING, VENTILATING AND AIR CONDITIONING	72
15990	TESTING AND BALANCING	75
DIVISION 16 - ELECTRICAL		
16100	ELECTRICAL WORK	80
16101	GENERAL	80
16102	FIELD CONDITIONS AND MEASUREMENTS	80
16103	CLEANUP	80
16104	GUARANTEE	80
16105	CODES	80
16106	SUBMITTALS	80
16107	QUALITY ASSURANCE	81
16108	CONDUIT	81
16109	WIRE AND CABLE	81
16110	JUNCTION AND OUTLET BOXES	82
16111	LIGHTING FIXTURES	82
16112	WIRING DEVICES	82

16115	DISCONNECT SWITCHES	83
16116	GROUNDING	83
16117	OTHER MATERIALS	83
16118	EXECUTION	83
16119	PREPARATION	83
16120	TRENCHING AND BACKFILLING	84
16122	INSTALLATION OF CONDUCTORS	84
16123	INSTALLATION OF PANELS	84
16124	TESTING AND INSPECTION	84
16125	PROJECT COMPLETION	85
16931	GROUNDING AND GROUND FIELD (SPECIFICATIONS AND REQUIREMENTS)	86

Terms & Conditions

Project Drawings for Shelbina and Mexico Truck Washes

Annual Wage Order #19 for Shelby County

Annual Wage Order #19 for Audrain County

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.

BIDDER REQUIREMENTS

1. SCOPE OF WORK

The project scope shall include to erect at each site on existing concrete foundation that has red iron and metal roof in place; girts, metal siding, roof and wall insulation, passage doors, overhead coiling doors, unit heaters and electrical.

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 six (6) 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 "Item by Item" 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 , Missouri Department of Transportation 573-526-7934 (Direct line) or Doug Record [General Services Manager – Facilities, Missouri Department of Transportation] (573) 526-7937, 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 Todd Roth, [Facility Operations Supervisor in the Northeast District], (573) 231-6593.

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

<p>Vendor Name/Mailing Address:</p> <p>Email Address:</p>	<p>Vendor Contact Information (including area codes):</p> <p style="text-align: center;">Phone #:</p> <p>Cellular #:</p> <p>Fax #:</p>									
<p>Printed Name of Responsible Officer or Employee:</p>	<p>Signature:</p>									
<p>For Corporations - State in which incorporated:</p>	<p>For Others - State of domicile:</p>									
<p>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:</p> <p><i>If additional space is required, please attach an additional sheet and identify it as Addresses of Missouri Offices or Places of Business.</i></p>										
<p>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:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; border-bottom: 1px solid black;"><u>M/WBE Name</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Percentage of Contract</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>M/WBE Certifying Agency</u></th> </tr> </thead> <tbody> <tr> <td style="border-bottom: 1px solid black;"> </td> <td style="border-bottom: 1px solid black;"> </td> <td style="border-bottom: 1px solid black;"> </td> </tr> <tr> <td style="border-bottom: 1px solid black;"> </td> <td style="border-bottom: 1px solid black;"> </td> <td style="border-bottom: 1px solid black;"> </td> </tr> </tbody> </table> <p><i>If additional space is required, please attach an additional sheet and identify it as M/WBE Information</i></p>		<u>M/WBE Name</u>	<u>Percentage of Contract</u>	<u>M/WBE Certifying Agency</u>						
<u>M/WBE Name</u>	<u>Percentage of Contract</u>	<u>M/WBE Certifying Agency</u>								

Preference Certification

All bidders must furnish ALL applicable information requested below

<p>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.</p>	
Item (or item number)	Location Where Item is Manufactured or Produced
<p><i>If additional space is required, please attach an additional sheet and identify it as Location Products are Manufactured or Produced.</i></p>	
<p>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:</p> <p>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.</p> <p>Service-Disabled Veteran Business is defined as a business concern:</p> <ol style="list-style-type: none"> 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. 	
<u>Veteran Information</u>	<u>Business Information</u>
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: **9-121113RJ – Shelbina and Mexico Truck Washes** 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:

Shelbina Truck Wash Building

_____ DOLLARS (\$_____)

Mexico Truck Wash Building

_____ DOLLARS (\$_____)

Note: Awards will be made on an "Item By Item" basis.

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

Name of Partnership

(State Name and Residence Address of All Partners)

Partner

Residence Address

Partner

Residence Address

Federal Tax I.D. Number

Address for Communications

Signature of Either Partner

Telephone Number

IF A CORPORATION

Name of Corporation

Incorporated under the laws of the
State of _____

Name and Title of Officer

Corporate License No. _____
(If a corporation organized in a state other than
Missouri, attach Certificate of Authority to do
business in the State of Missouri.)

Signature of Officer

Federal Tax I.D. Number

Address for Communications

(ATTEST)

Telephone Number

(SEAL) Secretary

(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

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

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

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

01400

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

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

1.3 TELEPHONE SERVICE

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 SANITARY FACILITIES

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

1.5 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.

1.6 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.

1.7 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.

1.8 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.

1.9 **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.

1.10 **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

01600

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

01650

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

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

1.6 PROJECT RECORD DOCUMENTS

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

GAS DISTRIBUTION SYSTEM

PART 1 GENERAL

1.1 SUMMARY

- A. Provide gas distribution system as shown on the Drawings, specified herein and 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. Names and addresses of the nearest service and maintenance organization that readily stocks repair parts;
 - 4. 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

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

Comply with pertinent provisions of Section 01620.

PART 2 PRODUCTS

2.1 PIPE AND FITTINGS

- A. Gas distribution main:
 - 1. Use polyvinyl chloride pipe (PVC), polyethylene pipe (PE), or black steel pipe, as permitted by the utility company and other agencies having jurisdiction and as selected by the Contractor.
 - 2. Where matching or joining existing mains, use the material being matched or joined unless otherwise specifically approved by the Architect.
- B. Gas service lines:
 - 1. Use same material used for gas distribution main.
 - 2. Assume connection point to building service lines as being approximately five feet outside buildings and structures to which service is required.

- C. Above ground, and within vaults and substations, use:
1. Pipe:
 - a. Black steel complying with ASTM A120, schedule 40; threaded ends on 2" and smaller, otherwise plain end beveled for butt-welding.
 2. Fittings:
 - a. Black malleable iron complying with ANSI B-16.3.
 3. Unions:
 - a. Black malleable iron complying with Fed Spec W-U-531.
 4. Flanges:
 - a. Black steel slip-on welding.
 5. Gaskets:
 - a. Neoprene, 1/16" thickness, 50 to 60 shore "A" hardness.
 6. Fasteners:
 - a. Cadmium plated steel nuts, bolts, and washers.
- D. For buried PVC systems, use:
1. Pipe design:
 - a. Comply with ASTM D2241, SDR 13.5 long term tested:
 - (1) PVC 2110, 160 p.s.i;
 - (2) PVC 2112, 200 p.s.i; or
 - (3) PVC 2116, 250 p.s.i.
 2. Fittings:
 - a. Comply with ASTM D2467, schedule 80.
 3. Cement:
 - a. Comply with ASTM D2564.
 4. Gaskets:
 - a. Neoprene, 1/8" thickness, 50 to 60 shore "A" hardness.
 5. Fasteners:
 - a. Monel nuts, bolts, and washers.
- E. For PE systems:
1. Comply with ASTM D2513 with pipe and fittings compounded in accordance with ASTM D1248, type and grade as recommended by the manufacturer for natural gas installation.
 2. Pipe:
 - a. Comply with ASTM D2239, SDR 11.5, 77 p.s.i, for pipes up to 4" diameter.
 - b. Greater wall thickness (smaller SDR number) is acceptable.
 3. Fittings:
 - a. Comply with ASTM D2683, except that size 2" and larger may be butt fused, and fusion saddles with protective sleeves may be used for lines when branch is two or more pipe sizes smaller than size of main.
 4. Gaskets and fasteners:
 - a. Use pertinent materials specified for PVC systems.
- F. Risers for PVC or PE systems.
1. Use red brass pipe complying with ASTM B-43 with brazed bronze flange complying with ANSI B-16.24, and inside plastic coating or liner.
 2. For sizes larger than 2-1/2", provide threaded ends aboveground.
 3. For PVC systems, use only a manufacturer's standard transition fitting, UL listed for gas service, transition from plastic to brass pipe with O-ring seals and swaged gastight with metal insert.
 4. For PE systems:
 - a. Use only a manufacturer's standard transition fitting consisting of steel nipple bonded to PE coupling with a copper sleeve pressed over the PE coupling.
 - b. Extend the copper sleeve at least 2" above finish grade.
 - c. Provide manufacturer-applied corrosion resistant enamel on exterior steel surfaces.

- G. Transition fittings to existing pipe line or service branch:
 - 1. Provide monel bolts, nuts, and washers.
 - 2. Steel-to-plastic, PVC, or PE:
 - a. Use flanged fitting complying with ANSI B-16.5, 150 lb; or
 - b. Use transition fitting as specified for risers except designed for steel-to-plastic with a tapping tee.
 - 3. Plastic-to-plastic, PVC-to-PVC, or PVC-to-PE:
 - a. Use manufacturer's standard bolt-on plastic tapping saddle tee, UL listed for gas service, rated for 100 psig, with O-ring seals.
 - b. On PVC-to-PVC, provide bolted flange ends or manufacturer's standard transitions.
 - 4. Plastic-to-plastic, PE-to-PE:
 - a. Use manufacturer's standard fused tapping tee assembly with shut-off feature.

2.2 BURIED SHUT-OFF VALVES

- A. Provide ball valves designed for close-off pressure in either direction:
 - 1. Body and end connections:
 - a. Use gray or ductile cast iron, ANSI flanged ends or flangeless short pattern or configuration for installation between two 150 lb ANSI flanges.
 - 2. Ball:
 - a. Stainless steel, chromium plated shell, or chromium plated ductile iron.
 - 3. Stem, nuts, bolts, and washers:
 - a. Monel, except stem may be type 316 stainless steel.
 - 4. Seal and stem seals:
 - a. Glass reinforced TFE (Teflon).
 - 5. Handle:
 - a. For each series of valves requiring a common wrench provide two valve wrenches.

2.3 ABOVEGROUND VALVES

- A. For shut-off valves size 2" and smaller, provide either:
 - 1. Bronze body ball valve complying with Fed Spec WW-V-35, type I, class A, style 3, full port pattern, with reinforced Teflon seals and threaded ends; or
 - 2. Bronze body plug valve, straightway, taper plug, regular pattern with port opening at least equal to the internal pipe area or round port full bore pattern, non-lubricated, Teflon packing, flat or square-head stem with lever operator, 325 psig WOG rating, and threaded ends.

2.4 VALVE BOXES

- A. Provide and place service box of cast iron or precast concrete over valves. Do not locate valve boxes in concrete walks.
- B. Valves 2-1/2" and smaller:
 - 1. Use precast concrete valve box with the wording "GAS" cast into the cover.
 - 2. Acceptable products:
 - a. Manufactured by Brooks Products, Inc., El Monte, California.
 - 3. Provide risers on pipeline to place valve within the box depth.
- C. Valves 3" and larger:
 - 1. Use service box of cast iron, extension type of the required length, having screw adjustment.
 - 2. Acceptable products:
 - a. Manufactured by Alhambra Foundry, Alhambra, California:

- (1) Use model A-3004 for valves 6" in size and less;
 - (2) Use model A-3005 for valves 8" in size and more.
3. Provide cast iron cover with the wording "GAS" cast into the cover.

2.5 TRACER WIRE

Provide No. 14 TW insulated copper tracer wire on non-metallic pipes.

2.6 CASING

Where gas lines are below concrete pavement, provide galvanized pipe complying with ASTM A120, schedule 40, with extruded polyethylene coating, in pipe sizes 2 sizes larger than the gas line.

2.7 WARNING TAPE FOR BURIED GAS LINES

- A. Provide polyethylene plastic tape manufactured specifically for warning and identification of buried utility lines:
1. Roll type, 6" minimum width, color coded for natural gas (orange), with warning and identification imprinted in bold black letters continuously and repeatedly over entire length of tape.
 2. Code and lettering color: Permanent, unaffected by moisture and other substances contained in trench back fill materials.
 3. Message: "CAUTION, BURIED GAS LINE BELOW," or similar message as approved by the Architect.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

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 FIELD MEASUREMENT

Make necessary measurements in the field to assure precise fit of items in accordance with the approved design.

3.3 INSTALLATION

- A. Install pipefittings in accordance with ANSI B-31.8, the Drawings and as specified herein.
- B. Excavating and backfilling:
1. Comply with pertinent provisions of Section 02221.
 2. Coordinate provision of utility warning and identification tape with backfill operations:
 - a. Provide the specified tape above all buried gas lines at a depth of 8" to 12" below finished grade.
- C. Plastic pipe and fittings:
1. Handle pipe and fittings carefully.
 2. Transport PVC pipe in a long-bed vehicle with pipe lying flat; do not subject the pipe to bending or concentrated external loads at any point.
 3. Discard plastic pipe and fittings that have been dented or damaged.
- D. Pipe cleaning:
1. Thoroughly clean inside of pipe and fittings before installing.
 2. Blow lines clear by using 80 psig to 100-psig clean dry compressed air.

3. Rap steel lines sharply along entire length before blowing clear.
 4. Cap or plug ends of pipe as necessary to maintain cleanliness throughout installation.
- E. Aboveground steel lines:
1. Determine and establish measurements for piping at the job site.
 2. Cut pipe accurately to determined length requirements.
 3. Threaded joints:
 - a. Use threaded joints for pipe of 2" size and smaller.
 - b. Where possible, use pipe with factory-cut threads; otherwise cut pipe ends square, remove all fins and burrs and cut taper pipe threads in accordance with ANSI B-2.1.
 - c. Make threads smooth, clean, and full cut.
 - d. Apply joint compound to male joints only.
 - e. Work piping into place without springing or forcing.
 - f. Do not back-off joints to permit alignment.
 - g. Engage threads so that not more than three threads remain exposed.
 - h. Use unions for connections to valves for which no other means of disconnecting is provided.
 4. Welded joints:
 - a. Use welded joints for pipe in sizes larger than 2".
 - b. Weld by the shielded metal-arc process, using covered electrodes and in accordance with procedures established and qualified in accordance with ANSI B-31.8.
 - c. Qualify each welder and welder operator in accordance with ANSI procedures:
 - (1) Provide required tests;
 - (2) Upon request of the Architect, display certificates complying with ANSI B-31.8.
 5. Flanged joints:
 - a. Use flanged joints for connecting welded joint pipe and fittings to valves to provide for disconnection.
 - b. Install joints so that flange faces bear uniformly on gaskets.
 - c. Engage bolts so that there is complete threading through the nuts, and tighten so that bolts are uniformly stressed and equally torqued.
 6. Valves:
 - a. Install shut-off valves with stems either in the vertical position with operators (lever or handwheel) on top or in the horizontal position.
 - b. Install pressure reducing valves with outlet pressure adjustment on top.
 7. Pipe size changes:
 - a. Use reducing fittings for changes in pipe size.
 - b. Do not make size changes with bushings.
 8. Painting:
 - a. Paint ferrous metal piping, including supports, in accordance with the provisions of Section 09900.
 - b. Do not apply paint until piping tests have been completed.
 - c. Upon completion of painting, identify piping in accordance with MIL-STD-101, except use commercially manufactured piping identification tape and decals in lieu of stencils and paint.
- F. Buried plastic lines:
1. For buried plastic lines, use either totally PE or totally PVC.
 - a. Combinations of PE and PVC will not be acceptable.
 - b. Install in accordance with the manufacturers' recommendations as approved by the Architect.
 2. PVC piping:
 - a. Remove fins and burrs.

- b. Do not thread pipe.
 - c. Wipe the matting surfaces as recommended by pipe manufacturer to break surface film prior to applying solvent cement.
 - d. Do not solvent weld while raining, at temperatures below 50 degrees F, or under direct exposure to sun above 90 degrees F.
3. PE piping:
- a. Prior to installation, demonstrate to the Architect that the installing personnel are thoroughly qualified by experience and training for installation of PE gas distribution piping.
 - b. For fittings, saddles, and butt connections, use the specified materials; for all other branch connections, provide protective sleeves as recommended by the pipe manufacturer and approved by the Architect.
 - c. Fusion weld joints, except where transitions are approved.
 - d. Use electrically heated tools, thermostatically controlled, with an indicating thermometer.
4. Tracer wire:
- a. Place parallel to pipe; tape to pipe at least every 20 feet.
 - b. Terminate wires at gas terminals by taping the wire to riser 6" above grade.
 - c. Mechanically bond the wire ends together; wrap bare wire with plastic tape.
5. Plastic pipe installation:
- a. Bury pipe 24" below finish grade or deeper where indicated.
 - b. PVC pipe:
 - (1) Snake the pipe from side to side of trench bottom to allow for expansion and contraction of the pipe.
 - (2) Backfill trenches when ambient temperature is 80 degrees F or less.
 - (3) If this not possible, flood trenches before and during backfilling.
6. Sand cushion:
- a. Provide sand cushion in accordance with pertinent provisions of Section 02221.

G. Wrapping:

- 1. Where connection to existing lines is made underground, wrap all new steel transition fittings and all exposed existing pipe having damaged coating.
- 2. Clean pipe to bare metal.
- 3. Use 1-mil minimum thickness polyethylene tape.
- 4. Initially stretch tape to conform to the surface while spirally half-lapping.
- 5. Apply a second layer, half-lapped and spiraled as above but with spirals perpendicular to first wrapping.

3.4 CONNECTION

Make connection to utility company or agency service line or meter in accordance with the requirements of the utility having jurisdiction.

3.5 FIELD INSPECTIONS AND TESTS

A. Metal welding or brazing inspection:

- 1. Inspect for compliance with ANSI B-31.8.
- 2. Replace or repair defective welds and retest until compliance.

B. PE fusion welding inspection:

- 1. Visually inspect butt-fusion welds by comparing with manufacturer's visual joint appearance chart.
- 2. Inspect other joints for proper fused connection.
- 3. Replace unsatisfactory joints by cutting out defective joint or replacing fittings.
- 4. Inspect 100% of joints; inspect again for corrections.
- 5. For initial inspections, secure assistance of authorized representative of the pipe manufacturer.

- C. Pressure tests:
1. Test pressure: 1-1/2 times working pressure, but in no case less than 50 psig.
 2. Do not test until last solvent welded joint has set and cured at least 24 hours at temperatures above 70 degrees F.
 3. Perform testing before backfilling. However, place sufficient backfill material between fittings to hold pipe in place during tests.
 4. Test system gastight in accordance with ANSI B-31.8.
 - a. Use clean dry air for testing. Purge if required prior to testing.
 - b. Make tests on entire system or on sections that can be isolated by valves.
 - c. After pressurization, isolate entire piping system from all sources of air during test period.
 - d. Maintain test pressure for at least 8 hours between times of first and last reading of pressure and temperature.
 - e. Do not take test readings during rapid weather changes.
 - f. Verify that ambient temperature is same as actual trench temperature. Do not permit reduction in applied test pressure other than that due to a change in ambient temperature.
 - g. Allow for ambient temperature change in accordance with the relationship: $P + 14.7 = (P_1 + 14.7) (T_2 + 460) / (T_1 + 460)$, in which "T" and "P" represent Fahrenheit temperature and gage pressure, respectively, "P1" and "P2" denote initial and final readings, and "P" is the calculated final pressure. If P exceeds the measured final pressure (final gage reading) by 1/2 p.s.i or more: isolate sections of the piping system, retest each section individually and apply a solution of warm soapy water to joints to each section for which a reduction in pressure occurs after allowing for ambient temperature change.
 - h. Repair leaking joints and repeat test until no reduction in pressure occurs.
 - i. Use a test gage calibrated in 1-psi increments and readable to 1/2 p.s.i.
- D System purging:
1. After pressure tests, and before testing a gas-contaminated line, purge the line with nitrogen a junction with main line to remove all air and gas.
 2. Clear the completed line by attaching a test pilot fixture at capped stub-in line at building location and let gas flow until test pilot ignites.
 3. Use procedures complying with ANSI B-31.8.

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 05520 - Handrails and Railings.
- B. Section 09900 - Painting: Paint finish.
- C. Section 03300 - Cast-In-Place Concrete: Placement of metal fabrications in concrete.
- D. Section 04300 - Unit Masonry System: Placement of metal fabrications in masonry.

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.
- F. Chrome Plating: ASTM B177, weight, nickel-chromium alloy, satin finish.

PART 3 EXECUTION

3.1 EXAMINATION

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

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

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 - R-25 fiberglass batt insulation installed between the girts.
Provide full height 6 mil. vapor barrier fabric between the girts and interior FRP panels.

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

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

SPRAYED INSULATION**PART 1 GENERAL****1.1 RELATED DEOCUMENTS**

Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specifications Sections apply to this Section.

1.2 SUMMARY

- A. Section Includes: Medium-density, polyurethane spray foam insulation.
- B. Coordinate mechanical ventilation and fresh air supply with Mechanical sections and ASHRAE Guidelines for optimum indoor air quality.

1.3 REFERENCES

- A. American Society for Testing and Materials International (ASTM).
 1. ASTM C 518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 2. ASTM E 84: Test Method for Surface Burning Characteristics of Building Materials.
 3. ASTM E 96: Standard Test Methods for Water Vapor Transmission of Materials.
 4. ASTM E 283: Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

1.4 SUBMITTALS

- A. Product Data for each type of insulation product specified.
- B. Product test reports performed by a qualified third-party testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test-response characteristics, water-vapor transmission, and other properties, based on comprehensive testing of current products.
- C. Evaluation Report: Evidence of compliance of foam-plastic insulations with International Building Code (IBC), International Residential Code (IRC), International Energy Conservation Code (IECC).
- D. Manufacturer's certificate certifying insulation provided meets or exceeds specified requirements.
- E. Installer's certificate showing the Icynene installation certification (or equal).
- F. Sample warranty.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Product produced in an ISO 9001 registered factory.
- B. Single Source Responsibility: Single source product from one manufacturer.
- C. Installer Qualifications: Engage an Icynene (or equal) Licensed Dealer (installer) who has been trained and certified by Icynene.
- D. Fire-Test-Response Characteristics: Provide materials specified as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 1. Surface-Burning Characteristics: ASTM E 84.
- E. Toxicity/Hazardous Materials.
 1. Provide products that contain no urea-formaldehyde.
 2. Provide products that contain no PBDEs.
 3. Provide products that are "Low-emitting".

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturers written instructions for handling and protection prior to and during installation.
- B. Store both components in a temperature controlled area between 65 and 85 degrees F. Do not allow product to freeze.
- C. Use only those components that are supplied by the Manufacturer.

1.7 PROJECT CONDITIONS

Do not expose to sunlight, except to extent necessary for period of installation and concealment.

1.8 WARRANTY

- A. Residential projects: Manufacturer's standard limited lifetime warranty.
- B. Refer to www.Icynene.com (or equal) for full warranty terms.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

Polyurethane Spray Foam Insulation: ICYNENE MD-C-200TM (or equal) by Icynene Inc.

2.2 MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
- B. Equal to ICYNENE MD-C-200TM Spray Foam Insulation: Medium-density, conforming to the following:
 - 1. Thermal Resistance (for 1 inch of material) (R-Value/inch @75 deg F): ASTM C 518; 6.5 hr.sq ft.degree F/BTU.
 - 2. Air Permeance (for 1 inch of material): ASTM E 283: <0.02 L/s.m2 @75 Pa.
 - 3. Water Vapor Transmission (for 1.5 inches of material): ASTM E 96; 0.9 perms.
 - 4. Flame Spread and Smoke Developed Rating: ASTM E 84.
 - a. Flame Spread: Less than 25.
 - b. Smoke Development: Less than 450.
- C. Product Description:
 - 1. Collaborative for High-Performance Schools (CHPS) "Low-emitting material" per CA 01350 Criteria. White in color.

2.3 SOURCE QUALITY CONTROL

Product produced in an ISO 9001 registered factory.

PART 3 – EXECUTION

3.1 EXAMINATION

Examine substrates and conditions, under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.

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

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 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.
- C. Type III - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, single component, paintable.
 - 1. Standard colors matching finished surfaces. Applications: Use for:
 - a. Interior wall and ceiling control joints.
 - b. Joints between door and window frames and wall surfaces.
 - c. Other interior joints for which no other type of sealant is indicated.
- D. Type IV - Sealant for Continuous Water Immersion: Polysulfide or Polyurethane; ASTM C920, Grade NS, Class 25, Uses M and A; approved by manufacturer for continuous water immersion; single or multi- component.
 - 1. Standard colors matching finished surfaces.
 - 2. Applications: Use for:
 - a. Vehicle washing booths

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.

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

Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

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.

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

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

1.7 REGULATORY REQUIREMENTS

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 FOR 24 GAGE 1-3/4" STAINLESS STEEL INSULATED DOOR:

- A. American Garage Door Supply, 1225 Industrial Park Drive, S E. Bemidji, MN 56601. Phone: 1-800 233-1487
- B. A. J. Manufacturing, Inc., 1217 Oak Street, Bloomer WI. Phone: 1-800-328-9448.

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

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

Refer to Door and Frame Schedule on architectural drawings.

END OF SECTION

08112

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.

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

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.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURES FOR 16 GAGE STAINLESS STEEL FRAMES:

- A. American Garage Door Supply, 1225 Industrial Park Drive, S E. Bemidji, MN 56601.
Phone: 1-800 233-1487
- B. A. J. Manufacturing, Inc., 1217 Oak Street, Bloomer WI. Phone: 1-800-328-9448.

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 DHI.
- 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

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

3.4 SCHEDULE

Refer to Door Schedule on drawings.

END OF SECTION

OVERHEAD COILING DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide overhead coiling doors 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 45 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. Shop Drawings in sufficient detail show fabrication, installation, anchorage and interface of the work of this Section with the work of adjacent trades.
 - 4. Manufacturer's recommended installation procedures which, when approved or rejecting actual installation procedures used on the Work.

1.3 QUALITY ASSURANCE

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

1.4 DELIVERY, STORAGE AND HANDLING

Comply with the pertinent provisions of Section 01620.

PART 2 PRODUCTS

2.1 OVERHEAD COILING DOORS

- A. Provide standard rollup service doors of the dimensions and arrangements shown on the Drawings and with the following attributes:
 - 1. Design wind load: 20PSF
 - 2. Curtain: Interlocking, rolling formed, fully foamed-in-place, insulated, flat profile. The front slat shall be fabricated from minimum 22 gauge-galvanized steel, with the back slat to be fabricated from minimum 24 gauge.
 - 3. Bottom Bar: Extruded aluminum member, to reinforce the curtain in the guides and will have a vinyl weather seal attached.
 - 4. Guides: Hot-dipped galvanized structural steel shapes attached to continuous steel wall angle for door(s). Three structural steel angles with a minimum thickness of 3/16" for door(s). Guides will be weather stripped with a vinyl weather seal at each jamb on the interior and exterior curtain side.
 - 5. Brackets: Galvanized steel plate to support the counterbalance curtain and hood.
 - 6. Counterbalance: Helical torsion springs housed in a galvanized steel tube.

7. Weatherseals: Vinyl bottom seal, exterior guide and internal hood seals. Include header brush or broom seal with aluminum extrusion.
 8. Hood: Aluminum
 9. Operation: Motor and chain.
 10. Finish: Curtain slats shall be galvanizes per ASTM A-525 and shall receive a rust-inhibitive, roll coating process, including bonderizing, baked on prime paint to be .2 mils thick and a baked on polyester top coat to be .6 mils thick. All non-galvanized exposed ferrous surfaces will receive one coat of rust-inhibitive primer. All aluminum will be furnished in a clear mill finish. Door(s) to have factory white paint.
 11. Electric Sensing Edge: Provide for each door. Provide safety edges by Air Wave, Miller Edge, Model number MTAW21YB-U-door width minus 2" with coil cord or equal, extend full width of the door. Provide AW12 Air Wave waterproof switch. Upon contact with an obstruction the downward travel of the door shall be stopped or reversed.
- B. Provide electric motor operator with three position pushbutton operation, in capacity recommended by the manufacturer. See specification Section 08720.
- C. Acceptable products:
1. Model 625 Series face mounted rolling service door manufactured by Overhead Door Corporation P.O. Box 809046, Dallas, Texas 75380. 1-800-887-3667
 2. Equal products of other manufacturers when approved in advance by the Architect.

2.2 OTHER MATERIALS

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

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

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

3.2 INSTALLATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings per requirements of government agencies having jurisdiction, and the manufacturer's recommended installation procedures as approve by the Architect, anchoring all components firmly into position for long life under hard use.
- C. Upon completion of the installation, put all items through at least ten operating cycles. Make required adjustments and assure that components are in optimum operating condition.

END OF SECTION

08710

DOOR HARDWARE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Hardware for wood, hollow steel and aluminum 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

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

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.

1.11 EXTRA MATERIALS

Section 01730 - Operation and Maintenance Data.

PART 2 PRODUCTS

2.1 KEYING

- A. Door Locks: Keyed in like-groups. Master keyed.
- B. Include construction keying, and control keying with removable core cylinders. Key to the existing keying system where requested.
- C. Supply keys in the following quantities:
 - 1. Two master keys.
 - 2. Four construction keys.
 - 3. Three change keys for each lock.

2.2 HARDWARE

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

1.	Hardware group 1:	Doors: 1, 2, 5, & 6	
6	Pr. Butts	FBB179-4-1/2 x 4-1/2 US26D NRP	Stanley
4	Entrance	35H7F15J-626	Best
4	Closer	7601DS	Dorma
4	Threshold	2005A 36" x AL	Pemko
4	Sweep	18062 36" x AL	Pemko
4	Gasket Set	305CN	Pemko
4	Weather strip	305CN x W x H	Pemko

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 trolley type sectional overhead door operator and 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

Comply with pertinent provisions of Section 01620.

PART 2 PRODUCTS AND MATERIAL

2.1 REQUIRED ATTRIBUTES

- A. Front of Hood Mount Type: (with car wash modification)
 - 1. Motor - 115/230V single phase, 1/2 hp. Model "RDB" with hand chain hoist & 24V three button open-close-stop control, NEMA 4, from Overhead Door Corp. or equal.
 - 2. Reversing Contactor - Heavy Duty, electrically and mechanically interlocked.
 - 3. Electric bottom safety edge with coil cord.

2.2 OTHER MATERIALS

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

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

09971

FIBERGLASS WALL PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide fiberglass wall panels 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 SUBMITTAL

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 45 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

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

Comply with pertinent provisions of Section 01620.

PART 2 PRODUCTS

2.1 WALL PANELS

- A. Acceptable products:
 - 1. Nudo Products, Inc. distributed from 1500 Taylor Ave., Springfield, IL. 62703 1-800-826-4132. Fax 217-528-8722.
 - 2. Fiber-Corr, 7/16" pvc panel #F3C400-10. Color: White. Size: 4' x 10'. Surface: Textured.
 - 3. Equal products of other manufacturers approved in advance by the Architect.

2.2 OTHER MATERIALS

- A. Provide General Electric "Silicone Sealant SE 1200."
- B. Provide continuous inside and outside corner beads where required.
- C. Provide white low profile pancake head Quadrex Drive screws with spacing as recommended by the panel manufacturer.

- D. 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

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. Securely install the approved products in accordance with the manufacturer's recommendations as approved by the Architect, setting panels straight, plumb, level and true to the lines and levels shown on the Drawings, attached to the walls with the specified nails at 6" centers both ways.
- B. Finish butt joints, wall juncture, wall/ceiling and wall/curb joints with the specified sealant, tooling to a smooth finish.

END OF SECTION

13121

PRE-ENGINEERED BUILDINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

Pre-engineered, shop fabricated structural steel building wall frame and 26 gauge wall panels to match existing building manufacturer: Toplevel Steel Buildings, 550 North 159th Street East, Wichita, KS 67230. Phone number (800) 369-3882.

1.2 RELATED SECTIONS

- A. Section 07900: Joint Sealers.
- B. Section 08111: Standard Steel Doors.
- C. Section 08112: Standard Steel Frames.
- D. Section 08351: Overhead Coiling Doors.

1.3 REFERENCES

- A. AISC - Specification for Structural Steel for Buildings - Allowable Stress Design and Plastic Design.
- B. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. ASTM A325/A325M - High Strength Bolts for Structural Steel Joints.
- D. ASTM A446/A446M - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
- E. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- F. ASTM A529/A529M - Structural Steel with 42 k.s.i. Minimum Yield Point (1/2 in Maximum Thickness).
- G. ASTM C991 - Flexible Glass Fiber Insulation for Pre-Engineered Metal Buildings.
- H. AWS A2.0 - Standard Welding Symbols.
- I. AWS D1.1 - Structural Welding Code - Steel.
- J. MBMA (Metal Building Manufacturers Association) - Metal Building Systems Manual.
- K. UL - Building Materials Directory - Roof Deck Construction.

1.4 DESIGN REQUIREMENTS

- A. Exterior wall system shall withstand imposed loads with maximum allowable deflection of span: 1/180.
- B. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of -15 to +115 degrees F.
- C. Size and fabricate wall systems free of distortion or defects detrimental to appearance or performance.

1.5 SUBMITTALS FOR REVIEW

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections, attachments and openings; wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, method of installation.
- C. Samples: Submit two samples of precoated metal panels for each color selected, 12x12 inch in size illustrating color and texture of finish.
- D. Perform Work in accordance with Current IBC.
- E. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience. (match existing manufacturer.)
- F. Erector Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience or approved by manufacturer.
- G. Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Missouri.

1.6 PRE-INSTALLATION MEETING

- A. Section 01039 - Coordination and Meetings: Pre-installation meeting.
- B. Convene one week before starting work of this section.

1.7 WARRANTY

Provide a five-year warranty for weather tightness of building enclosure elements after installation.

PART 2 PRODUCTS

2.1 FABRICATION - WALL SYSTEMS

- A. Siding: Minimum 26 gauge; metal thickness, profile indicated, 1 3/16 inch deep, lapped edges.
- B. Girts: Rolled formed structural shape to receive siding and interior finishes.
- C. Internal and External Corners: Same material thickness and finish as adjacent material, profile shop cut and factory mitered to required angles. Back brace mitered internal corners.
- D. Flashings, Closure Pieces, Fascia, Infills and Caps. Same material and finish as adjacent material, profile to suit system.
- E. Fasteners: To maintain load requirements and weather tight installation, same finish as cladding, non-corrosive type.
- F. Provide rat-guard typical at bottom of exterior metal panels.

2.2 FINISHES

- A. Framing Members: Clean, prepare and shop prime. Do not prime surfaces to be field welded.
- B. Exterior Surfaces of Wall Components and Accessories: Precoated enamel on steel of flouropolymer (Kynar) finish, color as selected from manufacturer's standard range.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
- B. Verify that foundation, floor slab, mechanical and electrical utilities and placed anchors are in correct position

3.2 ERECTION - WALL SYSTEMS

- A. Install in accordance with manufacturer's instructions.
- B. Exercise care when cutting prefinished material to ensure cuttings does not remain on finish surface.
- C. Fasten cladding system to structural supports, aligned level and plumb.
- D. Locate end laps over supports. End laps minimum 2 inches. Place side laps over bearing.
- E. Install insulation and vapor retarder utilizing adhesive for attachment. Place vapor retarder for support between framing members.
- F. Install sealant and gaskets to prevent weather penetration.
- G. Thermal-break mastic strip continuous horizontally along the outside of all exterior girts before the attachment of the exterior metal panels.

3.3 TOLERANCES

- A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.
- B. Siding: 1/8 inch from true position.

END OF SECTION

15050

MATERIALS AND METHODS

PART 1 GENERAL

1.1 OPERATION PRIOR TO ACCEPTANCE

When any equipment is operable, and it is to the advantage of the Contractor to operate the equipment, he may do so provided that he properly supervises the operation, and retains full responsibility for the equipment operated. Before final acceptance by the owner, the Contractor shall properly clean the equipment, install clean filter media, make all required adjustments and complete all punch list items.

1.2 WARRANTY

Warrant to Owner that materials, equipment, and workmanship provided under this Division of the Specifications will be free from defects for a period of one year from the date of acceptance by Owner. Additional equipment warranty requirements are stated in other sections of the specifications.

PART 2 PRODUCTS

2.1 MATERIALS

Products are to be new and free from defects, and are to be installed by competent specialist for each trade in accordance with the manufacturer's recommendations. Materials or equipment not meeting these standards, or the acceptance of the Engineer, may be rejected and will be replaced at no additional costs to the owner.

PART 3 EXECUTION

3.1 PIPING INSTALLATION

- A. Conceal piping in pipe chases, walls, furred spaces and above ceiling, unless otherwise indicated.
- B. Should any condition arise which would cause piping or ductwork to be exposed in finished areas, it will be called to the architect/owner's attention immediately and corrected in accordance with the architect/owner's instructions.

3.2 HANGERS AND SUPPORTS

- A. Provide and install per ANSI Standards SP-58 and SP-69.
- B. Adequately support pipes throughout the buildings, both horizontal and vertical.
- C. Hanger Schedule

PIPE SERVICE	HANGER SIZE	TYPE	GRINNELL NO.
Uninsulated Steel	2" & smaller	Split Ring	108 with 114
Uninsulated Copper	2" & smaller	Ring	CT 99

Cast Iron Soil Pipe	All	Clevis	590
Insulated Steel	4" & smaller	Clevis	260 with shield
Insulated Copper	2" & smaller	Clevis	CT 65

- D. Multiple or Trapeze Hangers” Steel channels with angles or unistrut spacers and hanger rods.
- E. Wall Support 2 1/2 inch and over: Welded steel bracket and wrought steel clamp.
- F. Vertical Support: Steel riser clamp.
- G. Provide copper plated hangers and supports for copper piping or provide sheet plastic tape wrapping between hanger or support and piping.
- H. Equivalent products of Fee and Mason or Elcen are acceptable substitutes for the Grinnell hangers specified.
- I. Maximum horizontal pipe hanger support spacing and minimum rod diameter for rigid rod hangers (see chart).
- J. Install hangers to provide minimum 1/2-inch clear space between finished covering and adjacent work.
- K. Place a hanger within one foot of each horizontal elbow.
- L. Support horizontal soil pipe near each hub, with 10 feet maximum spacing between hangers.
- M. Support PVC piping per manufacturer's recommendations.

3.3 ELECTRICAL WIRING OF MOTORS AND EQUIPMENT

Follow manufacturer's published directions in the delivery, storage, protection, installation, piping and wiring and start-up of equipment and materials.

3.4 ACCESS PANELS AND DOORS

Install access panels and doors for concealed equipment and valves.

3.5 TESTS

- A. Field test mechanical equipment furnished and installed under this Contract as required by the Engineer Tests.
- B. Perform tests required by governing authorities, in addition to tests specified in individual Sections.
- C. Complete final installation and testing 14 days prior to Contract Substantial Completion Date.
- D. All pipe work shall be tested at the pressure equal to the design working pressure of the pipe for the intended service and maintain this pressure for not less than two hours with not more than 1% drop in pressure.
- E. Notify architect/owner of any test failures. Submit weekly pipe test log listing service; section tested, initial and final pressure, time and temperature.

END OF SECTION

PLUMBING SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Water piping.
 - 2. Sanitary drainage.
 - 3. Condensate piping.
 - 4. Testing.
- B. Comply with other Division 15 Sections, as applicable. Refer to other Divisions for coordination of work.

1.2 SUBMITTALS

Make submittals for all products specified in the specification.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Water Piping Above Grade, Type "L" hard drawn, seamless copper water tube, ASTM B88 and Federal Specification WW-T-799. Joined with wrought copper pressure fittings, ANSI B16.22. Make joints using "lead free" solder and a non-corrosive paste-type flux. Core solder is not allowed. Solder will be solid string or wire type. Where soldered copper piping is connected to threaded brass piping, use a cast brass adaptor.
- B. Water Piping Below Grade, Type "K" hard drawn, seamless copper water tube, ASTM B88 and Federal Specification WW-T-799. Joined with wrought copper pressure fittings, ANSI B16.22. Make joints using "lead free" solder and a non-corrosive paste-type flux. Core solder is not allowed. Solder will be solid string or wire type. Where soldered copper piping is connected to threaded brass piping, use a cast brass adaptor.
- C. Make piping connections to fixtures and equipment with chrome-plated seamless brass tube, ASTM B-125 and Federal Specification WW-T0791. No ferrous piping or materials are allowed in water piping smaller than 4 inches.

2.2 SANITARY DRAINAGE

Sanitary Drainage lines (Soil, Waste and Vent): Cast iron soil pipe and fittings, coating inside and outside, ASTM A74 and Federal Specification WW-P-401. Label with Cast Iron Soil Pipe Institutes' "Mark of Quality and Permanence". Weights of pipe are required by code for location and duty. Joints shall be fabricated by use of "Push-On" type gasketed joints (above or below ground) or "No-Hub" mechanical joints (above ground only). Where permitted by local codes, PVC-DWV Plastic Schedule 40, NSF Seal CS-272 may be used for sanitary drainage pipes (soil, waste, and vent), with solvent-welded joints.

2.3 VALVES

Valves for Domestic Water Piping Systems: Nibco S580 or equal.

2.4 PRESSURE REDUCING VALVE

When the water system static pressure is greater than 75 PSI, furnish and install a pressure-reducing valve ahead of all fixtures and located in an accessible place. Set pressure at 50 PSI downstream of backflow preventer. Contractor to verify supply pressure.

2.5 COMMERCIAL TYPE WATER HAMMER ARRESTERS

- A. Provide commercial type water hammer arrester on hot and cold water supplies as generally indicated, with precise location and sizing to be in accordance with PD1-WH201.
- B. Water hammer arresters, where concealed, shall be accessible by means of access doors or removable panels.
- C. Water hammer arresters shall be in accordance with PD1-WH201, as furnished by Watt, Josam or equal.
- D. Vertical capped pipe columns will not be permitted.

PART 3 EXECUTION

3.1 PIPING INSTALLATION

- A. Install piping neatly and parallel with or perpendicular to lines of the structure. Install pipe hangers to maintain accurately aligned piping systems, adequately supported both laterally and vertically. Install horizontal soil, waste, and vent pipe with a grade of 1/4" per foot where possible and not less than 1/8" per foot. Where practicable, connect two or more vents together and extend as one vent through roof. Make vent connections to stacks by appropriate use of 45 wyes, long sweep quarter bends, sixth, eighth or sixteenth bends, except that sanitary tees may be used on the vertical stacks.
- B. Extend condensate drain piping from units with condensate discharge.
- C. Install drains at all low points and vents at high points in water distribution system.

3.2 PIPING

Refer to Section 15700 for insulation requirements.

3.3 PIPE TESTS

- A. Test water piping before installing equipment and before insulation is applied, using specified methods and conditions. Subject piping to test for not less than 24 hours under inspection by the Engineer. Make necessary replacements and repairs and repeat tests until entire system is accepted as satisfactory. Work includes testing equipment. After installation of equipment, operate systems; clean out scale, dirt, oil, waste and foreign matter, and correct additional leaks. Test underground piping prior to backfilling.
- B. Test plumbing drainage systems under 10 foot static head. Test water systems under 150 PSIG hydrostatic pressure.
- C. Flush system thoroughly of dirt and foreign matter, then fill with water treated with 50 ppm of chlorine. During filling process, open valves and faucets several times to assure treatment of entire system. Leave treated water in system for 24 hours after which time system may be flushed; if residual chlorine is not less than 10 ppm, repeat flushing. After sterilization, receive approval by regulatory agency on samples of water in system.

END OF SECTION

15500

HEATING, VENTILATING AND AIR CONDITIONING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide heating and ventilating systems where shown on the Drawings, as specified herein and as needed for a complete and proper installation including but not necessarily limited to:
 - 1. Gas-fired, ceiling-hung Unit Heaters
 - 2. Temperature control system including low-voltage wiring.
- 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 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Manufacturers catalogs, samples and other items needed to fully demonstrate the quality of the proposed materials and equipment.
- C. Record drawings:
 - 1. Comply with pertinent provisions of Section 01720.
 - 2. Include a copy of the Record Drawings in each copy of the operation and maintenance manual described below.
- D. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Architect two copies of an operation and maintenance manual compiled in accordance with the provisions of Section 01730 of these Specifications.

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. Without additional cost to the Owner, provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.
- C. Provide minimum 1-year manufacturer's warranty on all units.

1.4 DELIVERY, STORAGE AND HANDLING

Comply with pertinent provisions of Section 01620.

PART 2 PRODUCTS

2.1 UNIT HEATERS

- A. Unit Heater. Furnish gas fired, propeller fan and unit heaters as manufactured by one of the following companies: Crane, Reznor, National, Pearless, Carrier, Tran Bryant, or equal in the capacity shown on the plans. Units shall be A.G.A. certified, completely assembled and be operationally tested before shipment from factory.
- B. Unit Heater Exchanger. Shall be stainless steel seam or arc welded with tubes and headers not lighter than 20 gauge thickness. Draft diverters shall be aluminized steel or equal. Electrical characteristics as required.
- C. Burners. The burners shall be of cast iron or stainless steel construction that will give quiet, smooth ignition throughout the length of the burner. They shall be equipped with adjustable air shutters to regulate flame characteristics for maximum efficiency. All burners shall be individually removable.
- D. Pilot. Shall be of the intermittent pilot systems type using gas only when the system calls for heat, is lit by high voltage capacitive discharge spark, turns off automatically when demand for heat is satisfied or flame is lost. If flame is lost, unit shuts off main valve, re-starts ignition sequence.
- E. Wiring. Units shall be factory wired for high limit and fan control. Fan motor shall be 115 volt, single phase, 60 cycle totally enclosed with overload protection.
- F. Gas Valve. The gas valve shall be standard type 24-volt single phase, 60 cycle arranged for 100% safety shut off on main and pilot burner. 115/24-volt transformer to be supplied with unit heater and factory wired on low voltage side to gas valve.

2.2 AUTOMATIC TEMPERATURE CONTROL

- A. Provide a system of temperature control with the attributes listed below.
 - 1. Include thermostats, sensors, temperature controllers, and air piping as requiring for a complete and operable system compatible with approved Heating and Central Air Unit.
 - 2. Provide devices calibrated and adjusted with the actual operating conditions.

2.3 OTHER MATERIALS

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

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 COORDINATION

Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.3 EQUIPMENT INTERFACE

- A. Provide all required shutoff valves, unions and final connections of piping to the work of this Section.
- B. For electrically operated equipment, verify the electrical characteristics actually available for the work of this Section and provide equipment meeting those characteristics.

3.4 INSTRUCTIONS

- A. Upon completion of this portion of the Work, and prior to its acceptance by the Owner, provide a qualified engineer and fully instruct the Owner's maintenance personnel in the proper operation and maintenance of items provided under this Section.
- B. Demonstrate the contents of the approved operation and maintenance manual required under Article 1.2 above.

3.5 TESTING AND ADJUSTING

- A. Test and adjust each piece of equipment and each system as required to assure proper balance and operation.
 - 1. Test and regulate ventilation and air conditioning systems to conform to the air volumes shown on the approved design drawings.
 - 2. Make tests and adjustments in apparatus and ducts for securing the proper volume and face distribution of air for each grille and ceiling outlet.
 - 3. Where required, provide pulleys for fans at no additional cost to the Owner and set to drive the fans at the speed needed to give the indicated volume.
 - 4. For each system, take the following data in tabulated form:
 - a. Air volumes at all supply return and exhaust outlets;
 - b. Total c.f.m. supplied;
 - c. Total c.f.m. returned;
 - d. Total static pressure at each fan and at each system;
 - e. Motor speed, fan speed and input ampere rating for each fan.
- B. Submit two sets of test and balance reports to the Architect for approval.
- C. Eliminate noise and vibration, and assure proper function of all controls, maintenance of temperature and operation in accordance with the approved design.
- D. Secure required approval from governmental agencies having jurisdiction.

END OF SECTION

TESTING AND BALANCING**PART 1 GENERAL**

1.1 RELATED DOCUMENTS

- A. This section specifies the requirements and procedures for total mechanical systems testing, adjusting and balancing. Requirements include measurement and establishment of the fluid quantities of the mechanical system as required to meet design specifications, recording and reporting the results and operation of all systems to demonstrate satisfactory performance to the Owner.
- B. Test, adjust and balance the following mechanical systems:
 - 1. Supply, return and exhaust air systems
 - 2. Hydronic heating and cooling systems.
 - 3. Verify temperature control system operation.
- C. This Section does not include:
 - 1. Specifications for materials for patching mechanical systems.
 - 2. Specifications for materials and installation of adjusting and balancing devices. If devices must be added to achieve proper adjusting and balancing, refer to the respective system sections for materials and installation requirements.
 - 3. Requirements and procedures for piping and ductwork systems leakage tests.

1.2 DEFINITIONS

- A. Systems testing, adjusting, and balancing is the process of checking and adjusting all the building environmental systems to produce the design objectives. It includes:
 - 1. The balance of air and water distribution
 - 2. Adjustment of total system to provide design quantities
 - 3. Electrical measurement
 - 4. Verification of performance of all equipment and automatic controls
 - 5. Sound and vibration measurement
- B. Test: To determine quantitative performance of equipment.
- C. Adjust: To regulate the specified fluid flow rate and air patterns at the terminal equipment (e.g. reduce fan speed, throttling).
- D. Balance: To proportion flows within the distribution system (sub mains, branches and terminals) according to specified design quantities.
- E. Procedure: Standardized approach and execution of sequence of work operations to yield reproducible results
- F. Report Forms: Test data sheets arranged for collecting test data in logical order for submission and review. These data sheets should also form the permanent record to be used as the basis for required future testing, adjusting and balancing.
- G. Terminal: The point where the controlled fluid enters or leaves the distribution system. There are supply inlets on water terminals, supply outlets on air terminals, return outlets on water terminals, and exhaust or return inlets on air terminal such as registers, grilles, diffusers, louvers and hoods.
- H. Main: Duct or pipe containing the system's major or entire fluid flow.

- I. Submain: Duct or pipe containing part of the system's capacity and serving two or more branch mains.
- J. Branch Main: Duct or pipe serving two or more terminals.
- K. Branch: Duct or pipe serving a single terminal.

1.3 SUBMITTALS

- A. Agency Data:
 - 1. Submit proof that the proposed testing, adjusting, and balancing agency meets the qualifications specified below. The firm or individuals performing the work herein specified may be the installing firm or individuals or may be separate and independent firm or individuals employed by the contractor but in either case the personnel performing the work shall be qualified and certified as specified.
- B. Engineer and Technicians Data:
 - 1. Submit proof that the proposed testing, adjusting, and balancing agency meets the qualifications specified below. The firm or individuals performing the work herein specified may be the installing firm or individuals or may be a separate and independent firm or individuals employed by the Contractor, but in either case the personnel performing the work shall be qualified and certified as specified.
- C. Procedures and Agenda: Submit a synopsis of the testing adjusting and balancing procedures and agenda proposed to be used for this project.
- D. Maintenance Data: Submit maintenance and operating data that includes how to test, adjust and balance the building system. Include this information in maintenance data specified in Division 15 - Basic Mechanical Requirements.
- E. Sample Forms: Submit sample forms, if other than those standard forms prepared by the AABC or NEBB are proposed.
- F. Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of the Test and Balance Engineer. The reports shall be certified proof that the systems have been tested, adjusted, and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting, and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the systems. Follow the procedures and form as specified below:
- G. Reports: Upon completion of testing, adjusting, and balancing procedures, prepare reports on the approved forms. Reports may be hand written, but must be complete, factual, accurate and legible. Submit 3 complete sets of reports. Only 2 complete sets of draft reports will be returned.
- H. Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted and balanced. Bind report forms complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders. Provide binding edge labels with the project identification and a title descriptive of the contents. Divide the contents of the binder into the below listed divisions, separated by divider tabs.
 - 1. General Information and Summary
 - 2. Air Systems
 - 3. Temperature Control Systems

- I. Report Contents: Provide the following minimum information, forms and data:
 1. General Information and Summary: Inside cover sheet to identify testing, adjusting and balancing agency, contractor, Owner, Architect, Engineer and Project. Include addresses, and contact names a telephone numbers. Also include a certification sheet containing the seal and name, address, telephone number and signature of the Certified Test and Balance Engineer. Include in this division a listing of the instrumentation used for the procedures along with the proof of calibration.
 2. The remainder of the report shall contain appropriate forms containing as a minimum, the information indicated on the standard report forms prepared by the AABC and NEBB, for each respective item and system to accompany each respective report form. The report shall contain the following information, and all other data resulting from the testing, adjusting and balancing work:
 3. All nameplate and specification data for all pumps, air handling equipment and motors.
 4. Inlet water and outlet water temperatures of each heating and cooling element.
 5. Water pressure drop through each heating and cooling coil.
 6. Operating suction and discharge pressure and final total discharge head for each pump.
 7. Water flow readings at all pumps and coils.
 8. Actual metered running amperage for each phase of each motor on all pumps and air handling equipment.
 9. Actual metered voltage at each pump and each piece of air handling equipment (phase to phase for all phases)
 10. Static pressure for each piece of air handling equipment and at each location in ductwork system where static pressure controllers are located.
 11. Fan RPM for each piece of air handling equipment.
 12. Total actual DCM being handled by each piece of air handling equipment.
 13. Entering and leaving air temperature of all air handling unit heating coils and cooling coils.
 14. Actual CFM of systems by rooms.

1.4 CERTIFICATION

- A. Agency Qualifications:
 1. Employ the services of a certified testing, adjusting and balancing agency meeting the qualifications specified below, to be the single source of responsibility to test, adjust and balance the building mechanical systems, identified above, to produce the design objectives. Services shall include checking installations for conformity to design, measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, recording and reporting the results and operation of all systems to demonstrate satisfactory performance to the Owner.
 2. The testing, adjusting, and balancing agency certified by National Environmental Balancing Bureau (NEBB) or Associated Air Balance Council (AABC) in those testing and balancing disciplines required for this project and having at least one person certified by NEBB or AABC as a Test and Balance Engineer.
- B. Codes and Standards
 1. NEBB: "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems". Or
 2. AABC: "National Standards for Total System Balance", And
 3. ASHRAE: "ASHRAE Handbook", 1984 Systems Volume, Chapter 37, Testing, Adjusting and Balancing.
- C. Pre-balancing Conference: Prior to beginning of the testing, adjusting, and balancing procedures, schedule and conduct a conference with the Architect/Engineer and representatives of installers of the mechanical system. The objective of the conference is final coordination and verification of system operation and readiness for testing, adjusting and balancing.

1.5 PROJECT CONDITIONS

Systems Operation: System shall be fully operational and clean prior to beginning procedures.

1.6 SEQUENCING AND SCHEDULING

- A. Test, adjust and balance the air systems before Hydronic, steam and refrigerant systems.
- B. Test, adjust, and balance air conditioning systems during summer season and heating systems during winter season, including at least a period of operation at outside conditions within 5 deg. F. Wet bulb temperature of maximum summer design condition and within 10 deg. F. Dry bulb temperature of minimum winter design condition. Take final temperature readings during seasonal operation.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

3.1 PRELIMINARY PROCEDURE FOR AIR SYSTEM BALANCING

- A. Before operating the system, perform these steps:
 - 1. Walk the system from the system air handling equipment to terminal units to determine variations of installation from design.
 - 2. Check filters for cleanliness and to determine if they are the type specified.
 - 3. Check dampers (both volume and fire) for correct and locked position. Check automatic operating and safety controls and devices to determine that they are properly connected, functioning and at proper operating set point.
 - 4. Check automatic control dampers to determine that they are functioning properly, that they will close tightly and those they will open and close smoothly without binding or backlash.
 - 5. Prepare report test sheets for both fans and outlets. Obtain manufacturer's outlet factors and recommended procedures for testing. Prepare a summation of required outlet volumes to permit a cross check with required fan volumes.
 - 6. Determine best locations in main and branch ductwork for most accurate duct traverses.
 - 7. Place outlet dampers in the full open position.
 - 8. Prepare schematic diagrams of system "as-built" ductwork and piping layouts to facilitate reporting.
 - 9. Lubricate all motors and bearings.
 - 10. Check fan belt tension.
 - 11. Check fan rotation.

3.2 MEASUREMENTS

- A. Provide all required instrumentation to obtain proper measurements, calibrated to the tolerances specified in the referenced standards. Instruments shall be properly maintained and protected against damage.
- B. Provide instruments meeting the specifications of the referenced standards.
- C. Use only those instruments that have the maximum field measuring accuracy and are best suited to the function being measured.
- D. Apply instrument as recommended by the manufacturer.
- E. Use instruments with minimum scale and maximum subdivision and with scale ranges proper for the value being measured.

- F. When averaging values, take a sufficient quantity of readings that will result in a repeatability error of less than 5 percent. When measuring a single point, repeat readings until 2 consecutive identical values are obtained.
- G. Take all readings with the eye at the level of the indicated value to prevent parallax.
- H. Use pulsation dampeners where necessary to eliminate error involved in estimating average of rapidly fluctuating readings.
- I. Take measurements in the system where best suited to the task.

3.3 PERFORMANCE TESTING, ADJUSTING, AND BALANCING

- A. Perform testing and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards. Balancing of the air systems and hydronic systems shall be achieved by adjusting the automatic controls, balancing valves, dampers, air terminal devices and the fan/motor drives within each system.
- B. Cut insulation, ductwork and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures.
- C. Patch insulation, ductwork and hosing, using materials identical to those removed.
- D. Seal ducts and piping, and test for and repair leaks.
- E. Seal insulation to re-establish integrity of the vapor barrier.
- F. Mark equipment settings, including damper control positions, valve indicators, fan speed control levers and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.
- G. Retest, adjust and balance systems subsequent to significant system modifications and resubmit test results.

3.4 RECORD AND REPORT DATA

- A. Record all data obtained during testing, adjusting, and balancing in accordance with, and on the forms recommended by the referenced standards and as approved on the sample report forms.
- B. Prepare report of recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.

3.5 DEMONSTRATION

- A. Training:
 - 1. Train the Owner's maintenance personnel on trouble shooting procedures and testing, adjusting and balancing procedures. Review with the Owner's personnel, the information contained in the Operating and Maintenance Data specified in Division 15.
 - 2. Schedule training with Owner through Engineer with at least 7 days prior notice.

END OF SECTION

16100

ELECTRICAL WORK

16101 GENERAL

- A. Requirements of the conditions of the contract and Instruction to Bidders, and General Conditions, apply to all work of this Section.
- B. Provide complete electrical service where shown on the drawings, as specified herein, and as needed for a complete and proper installation including, but not necessarily limited to:
 - 1. Panelboards as needed.
 - 2. Branch circuit wiring, in conduit for lighting, receptacles, junction boxes and motors.
 - 3. Hangers, anchors, sleeves, chases, supports, for fixtures and other electrical material and equipment in association therewith.
 - 4. Lighting fixtures and lamps.
 - 5. Wiring system, in conduit, for equipment and control provided under other Sections of these specifications.
 - 6. Other items and services required to complete the system.
- C. 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

16102 FIELD CONDITIONS AND MEASUREMENTS

The Electrical Contractor shall visit the site of the work and familiarize himself with all available information concerning the structural, excavations, the location condition bearing on transportation, handling, and storage of materials. The Electrical Contractor shall make his own estimate of the facilities needed, and difficulties of execution of the contract including local conditions, availability of labor, uncertainties of weather, transportation, and other contingencies. Failure of the contractor to acquaint himself with all available information concerning these conditions will not relieve him from responsibility for estimating the difficulties and costs or successfully performing the complete work.

16103 CLEANUP

- A. The Electrical Contractor shall have electrical rubbish and debris removed from the premises as directed. On completion of the electrical contract all associated debris and rubbish shall be removed from the premises.
- B. All electrical equipment and materials furnished by this contractor shall be thoroughly cleaned and ready for use upon completion of the work.

16104 GUARANTEE

Contractor guarantees by his acceptance of the contract, that all work installed shall be free from any defects in workmanship and/or materials and that all apparatus will develop capacities and characteristics specified and that if, during a period of one year or as therefore specified, from substantial completion of work, any such defects in workmanship, materials or performance appear, he will with no cost to owner remedy such defect.

16105 CODES

All electrical work shall be done in strict accordance with the National Electrical Code and all regulations, laws and ordinances which may be applicable.

16106 SUBMITTALS

- A. 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 owner/architect, will become the basis for accepting or rejecting actual installation procedures used on the work.
- B. Submittals shall include the following:
1. Panelboards
 2. Lighting fixtures
 3. Wiring devices
 4. Electric cord reels
- C. Samples
1. When so requested by the owner/architect, promptly provide samples of items scheduled to be exposed in the final structure.
 2. When specifically so requested by the Contractor and approved by the Architect, approved samples will be returned to the Contractor for installation on the work.
- D. Manuals: Upon completion of this portion of the work, and as a condition of its acceptance, deliver to the owner/architect two copies of an operation and maintenance manual. Include with each manual.
1. Copy of the approved record documents for this portion of work.
 2. Copies of all circuit directories.
 3. Copies of all warranties and guarantees.

16107 QUALITY ASSURANCE

- A. Use adequate number of skilled workmen who are thoroughly trained and experienced in the crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- B. Without additional cost to the owner, provide such other labor and materials as are required to complete the work of this section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these contract documents.

16108 CONDUIT

- A. All interior wiring above grade shall be installed in electrical metallic tubing with screw coupling fittings.
- B. All interior wiring below slab shall be Galvanized Rigid Steel conduit. Schedule 40 PVC conduits may be used if approved by Owner/Architect. If PVC is used the last two feet to point of emergence shall be Galvanized Rigid Steel conduit with grounding bushing and a grounding conductor sized according to ART. 250-95 of the National Electrical Code shall be installed.
- C. Wiring in office areas shall be concealed, wiring in shop and storage areas shall be installed on surface.
- D. All exterior wiring shall be in galvanized Rigid Steel Conduit.
- E. Type MC cable with grounding conductor or type AC cable may be used for fixture whips.

16109 WIRE AND CABLE

- A. Building wire and cable with 600 volt insulation shall be 98% conductivity copper unless otherwise noted. The minimum size conductor for lighting and power shall be No. 12 AWG. The minimum size conductor for control shall be No. 14 AWG.
- B. Conductors sized No. 10 and smaller shall be Type "THHN" solid or stranded as required unless otherwise noted, sizes No. 8 and larger shall be type "THHN" stranded unless otherwise noted.

- C. Conductors shall be colored coded as required by governmental agencies having jurisdiction or as required by the National Electrical Code.
- D. Contractor shall provide and install all telephone and data cable and equipment as required by the project and per specifications sections 16930.
- E. Contractor shall provide and install all of the grounding and grounding field as required by this project and per specification section 16931.
- F. Tele/ data cables installed above accessible ceilings may be installed without conduit. Tele/data cables installed above non-accessible ceilings and on surface shall be in conduit. Open cables installed in space used for environmental air shall be rated for plenum use.

16110 JUNCTION AND OUTLET BOXES

- A. Outlet Boxes
 - 1. Provide standard one-piece units, galvanized or sherardized steel of shape and size best suited to that particular location, of sufficient size to contain enclosed wires according to ART. 370-16 of the National Electrical Code.
 - 2. Provide outlet boxes 2 1/8" deep for 1" conduits.
 - 3. For lighting outlets, provide standard 4" octagon or square units with 3/8" fixture stud and box hanger where required.
 - 4. For switches and receptacles, provide standard boxes with plaster or dry wall ring with stainless steel cover plate for concealed devices and pressed steel boxed with galvanized or cadmium plated steel cover plates for exposed devices.
- B. Junction or Pull Boxes
 - 1. Interior junction boxes shall be galvanized code-gauge sheet steel units with screw-on covers, of size and shape required to accommodate wires without crowding, and to suit the location.
 - 2. Exterior boxes shall meet NEMA 3R or 4 standards.

16111 LIGHTING FIXTURES

- A. Install lighting fixtures, complete with lamps, as shown on drawings and schedules. Manufacturers shown on schedules are for quality and type only, manufacturers of equal quality will be accepted if approved by owner.
 - 1. Recessed fixtures:
 - a. Provide unit having an attached pull box and with UL label.
 - b. Provide local label in addition if so required by governmental agencies having jurisdiction..
 - 2. Fluorescent fixtures
 - a. Provide ballasts thermally protected against overheating by built-in thermal protectors sensitive to ballast winding temperature and current.
 - b. Provide protector preventing winding temperature from exceeding 120 degrees C, allowing winding temperatures to reach 105 degrees C under normal operating conditions at 40 degrees C ambient and, after opening, not reclosing above 80 degrees C.
 - c. Exterior ballast shall be cold weather type.
 - d. Where fixture substitutes are proposed, submit a sample fixture with materials list required to be submitted under Art. 16106 above.
 - e. Light fixtures in work areas shall be located so as not to interfere with the operation of overhead doors.

16112 WIRING DEVICES

- A. Toggle switches - Mount 48" above finished floor.
 - 1. Single pole Leviton 5521-I
 - 2. 3-way Leviton 5523-I

- B. Receptacles - Mount 18" above Finished Floor in office area 48" above Finished Floor in garage and storage areas and above splashboard over counters.
 - 1. Duplex receptacles Leviton 5800-I
 - 2. Weatherproof duplex receptacles Leviton 6599-I mounted in FS box and 6196-VFS cover.
 - 3. Ground Fault Interrupter duplex receptacles Leviton 6599-I
 - 4. Isolated ground receptacles Leviton 5262-IG
- C. Telephone and Computer Outlets shall be 4" x 4" x 1 1/2" outlet box with plaster ring. Install 3/4" EMT from box to just above accessible ceiling as required.
- D. Outlets in finished walls shall be 4' x 4" x 1 1/2" outlet box with plaster ring and a cover plate.
- E. Outlets on surface shall be 4" x 4" x 1 1/2" outlet box and 4" x 4" raised cover plate.
- F. Devices of the following manufacturers will be accepted as equal.
 - 1. Hubbel
 - 2. Arrow-Hart
 - 3. General Electric

16115 DISCONNECT SWITCHES

Disconnect switches shall be Sq. 'D' Class 3130 General Duty fusible or non-fusible as shown on drawings. Interior switches shall be NEMA 1 and Exterior switches shall be NEMA 3R.

16116 GROUNDING

- A. Install a 5/8" x 10' copperclad ground rod at service entrance with a #6 bare copper conductor between ground rod and grounding bus in Panel board.
- B. All grounding shall comply with ART. 250 of the National Electrical Code.

16117 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation as approved by the Architect.

16118 EXECUTION

- A. Surface Conditions
 - 1. 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.

16119 PREPARATION

- A. Coordinate
 - 1. Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this section.
 - 2. Coordinate the installation of electrical items with the schedule for work of other trades to prevent unnecessary delays in the total work.
- B. Data indicated on the drawings and in these specifications are as exact as could be secured but there absolute accuracy is not warranted. The exact locations, distances, levels and other conditions will be governed by actual construction and the drawings and specifications should be used only for guidance in such regard.
- C. Verify all measurements at the building. No extra compensation will be allowed because of differences between work shown on the drawings and actual measurements at the site of construction.

- D. Branch circuit wiring and arrangement of home runs have been designed for maximum economy consistent with adequate sizing for voltage drops and other considerations. Install the wiring and circuits arranged exactly as shown on the Drawings, except as otherwise approved in advance by the architect.
- E. The electrical drawings are diagrammatic, but are required to be followed as closely as actual construction and work of other trades will permit. Where deviations are required to conform actual construction and the work of other trades, make such deviations without additional cost to the owner.

16120 TRENCHING AND BACKFILLING

Perform trenching and backfilling associated with the work of this section in strict accordance with the provisions of the appropriate sections of these specifications.

16122 INSTALLATION OF CONDUCTORS

- A. Unless otherwise shown use #12 type THHN conductors for all branch circuits protected by 20 amp circuit breakers. Where so indicated on the drawings, use larger wires to limit voltage drops.
- B. Use identified (white) neutrals and color-coded phase wires for all branch circuit wiring.
 - 1. Make splices electrically and mechanically with pressure-type connectors.
 - a. For wire size #6 AWG and smaller, provide "Scotch-Lock" connectors.
 - 2. Insulate splices with a minimum of two half-lapped layers of Scotch Brand #33 vinyl-plastic electrical tape where insulation is required.
- C. Tape all joints with rubber tape 1 1/2 times the thickness of the conductor insulation, than cover with vinyl-plastic electrical tape specified above.
- D. The drawings do not indicate the home runs. Continue all home runs to the panel as though the routes were shown completely.

16123 INSTALLATION OF PANELS

- A. Install panels as shown on drawings and specifications or as directed by the owner/architect.
- B. Mount a typewritten directory behind glass or plastic on the inside of each panel door and, on the directory, show the number and complete description of all outlets on each circuit.

16124 TESTING AND INSPECTION

- A. Make required tests in the presence of the owners representative and required approvals from the owner/architect and governmental agencies having jurisdiction.
- B. Make written notice to the owner/architect adequately in advance of each of the following stages of construction.
 - 1. In the underground condition prior to placing concrete floor slab, when all associated electrical is in place.
 - 2. When all rough in is complete, but not covered.
 - 3. At completion of the work of this section.
- C. When material and/or workmanship is found to not comply with the specified requirements, within three days after receipt of notice of such non-compliance remove the non-complying items from the job site and replace them with items complying with the specified requirements, all at no additional cost to the owner.
- D. In the owner/architect's presence:
 - 1. Test all parts of the electrical systems for phase to phase and phase to ground short circuits and prove that all such items provided under this section function electrically in the required manner.
 - 2. Immediately submit to the architect a report of maximum and minimum voltages and a

- copy of the recording voltmeter chart.
3. Also measure voltages between phase wires and neutral and report these voltages to the Architect.

16125 PROJECT COMPLETION

- A. Upon completion of the work of this section, thoroughly clean all exposed portions of the electrical installation, removing all traces of soil, labels, grease, oil, and other foreign material and using only the type cleaner recommended by the manufacturer of the item being cleaned.
- B. Thoroughly indoctrinate the owner's operation and maintenance personnel in the contents of the operations and maintenance manual required to be submitted under article 16106 of this section of these specifications.

END OF SECTION

16931

**GROUNDING AND GROUND FIELD
(SPECIFICATIONS AND REQUIREMENTS)**

Requirements for MoDOT Project Office shall follow the TIA/EIA - 607 Commercial Building Grounding Requirements for Telecommunications.

This building will require a separate telecommunications ground system. The requirements for this ground system is (15 ohms to ground or less), and shall be tested and certified at time of installations.

This system will consist of the following:

- A. A (TMGB) Telecommunications Main Ground Busbar (Erico grounding bar kit p/n b544a017 or equivalent). This Grounding Busbar shall be located in the telecommunication room and serves as the dedicated extension of the building grounding electrode system for telecommunications only.
- B. A Number four Green Insulated stranded copper cable run from the (TMGB) in the telecommunication room to the new grounding electrode system located outside the building.
- C. The grounding electrode system shall consist of all specifications found in the IEEE Green and Emerald Books. There shall be a minimum of (4) or (as many as needed) copper electrodes (5/8" x 8') spaced 8' apart, connected with number four bare copper cable as needed to achieve 15 ohms to ground or less.
- D. All connectors and splices shall be of copper compression type and meet the specifications of the Standard IEEE 837 latest revision and the specifications of the NEC code, section 250-81 and 250-91.
- E. There shall be no other grounding electrode system connected to this Telecommunication room grounding electrode system except by a number six stranded green copper cable connected to the Building (TMGB) Main Grounding Bar or system.

REV. on 12-22-03

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 (6th) 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.

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

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

Missouri Highways and Transportation Commission

Standard Bid/Proposal Provisions, General Terms and Conditions and Special Terms and Conditions

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
 - 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): **For the construction of Shelbina Truck Wash, the wage rate for Shelby County applies and for the construction of the Mexico Truck Wash, the wage rate for Audrain County applies.** The **Annual Wage Order #19, Incremental Increase #3** 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 \$100 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.

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

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 \$300 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 **30-working days per location** 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.