



*LIFE OUTSIDE THE LINES*

**CONTRACT DOCUMENTS AND  
SPECIFICATIONS**

**2022 BUCKNER TARSNEY ROAD  
WATERLINE EXTENSION**

**Bid 22-**

**City of Grain Valley  
Community Development Department  
711 S. Main Street  
Grain Valley, MO 64029**

**Bidder's Name and Address:  
Phone & Fax No.**

---

---

---

---

---

---

July 2022



BUCKNER TARSNEY ROAD  
WATERLINE EXTENSION  
FOR  
CITY OF GRAIN VALLEY, MO  
  
2022

I hereby certify that this plan, specification, or report, was prepared by me or under my direct personal supervision, and that I am a duly registered Professional Engineer under the laws of the State of Missouri and that I am competent to prepare this document.

\_\_\_\_\_  
Chad Harrington  
(Engineer's Name)

Date: \_\_\_\_\_

Reg. No. 2012003558

Lamp Rynearson  
9001 State Line Road, Suite 200  
Kansas City, Missouri 64114  
[P] 816.361.0440 • [F] 816.361.0045  
lamprynearson.com

**Lamp Rynearson Project No. 0322006.02**



**TABLE OF CONTENTS**  
**SPECIFICATIONS AND CONTRACT DOCUMENTS**  
**BUCKNER TARSNEY ROAD WATERLINE EXTENSION**  
**CITY OF GRAIN VALLEY, MO**  
**LAMP RYNEARSON PROJECT NO. 0322006.02**

<b>SUBJECT</b>	<b>PAGE TO PAGE (INCLUSIVE)</b>
Engineer’s Certification .....	EC-1 : EC-1
Advertisement for Bidders .....	A-1 : A-2
Instructions to Bidders.....	IB-1 : IB-8
Missouri E-Verify Affidavit .....	EV-1 : EV-2
Bidders Affidavit .....	BA-1 : BA-2
Bid Form (EJCDC C-410) .....	1 : 7
Bid Bond Form.....	BB-1 : BB-2
Bid Guaranty.....	BG-1 : BG-1
Missouri Domestic Products Procurement Law .....	MO-PR-1 : MO-PR-1
Notice of Award.....	NOA-1 : NOA-1
Agreement (Unit Price).....	AUP-1 : AUP-7
Performance Bond (EJCDC C-610).....	1 : 3
Payment Bond (EJCDC C-615) .....	1 : 3
Maintenance Bond .....	MB-1 : MB-2
Surety Authorization Letter.....	SA-1 : SA-1
Anti-Discrimination Against Israel Act Certification .....	AIC-1: AIC-3
Missouri Project Exemption Certificate .....	PEC-1: MO-PE-1
Missouri Prevailing Wage Affidavit.....	PWA-1: MO-PWA-1
Missouri Division of Labor Standards/Annual Wage Order - No. 29 .....	MO-AWO-1 : MO-AWO-4
Missouri Statement of Compliance.....	MO-SC-1 : MO-SC-1
Missouri Affidavit Compliance .....	MO-AFC-1 : MO-AFC-1
Notice to Proceed (EJCDC C-550).....	1 : 1
Contractor’s Affidavit and Release for Partial Payment .....	APP-1 : APP-1
Certificate of Substantial Completion.....	CSC-1 : CSC-1
General Conditions – Table of Contents .....	GC-i : GC-iii
General Conditions.....	GC-1 : GC-44
Technical Specifications – Table of Contents .....	TS-i : TS i
Technical Specifications .....	TS-1 : TS-118



**CITY OF GRAIN VALLEY, MISSOURI**  
**(“Owner”)**  
**COMMUNITY DEVELOPMENT DEPARTMENT**  
**BUCKNER TARSNEY WATERLINE EXTENSION**  
**ADVERTISEMENT FOR BIDS**

Sealed Bids will be received by the City of Grain Valley at City Hall, 711 Main Street, Grain Valley, Missouri until **2:00 p.m. on September 14, 2022**. At said place and time, all Bids that have been duly received will be publicly opened and read aloud in the Lower Level Conference Room.

The Work is generally described as follows:

***Buckner Tarsney Waterline Extension***

All Bids must be in accordance with the Bidding Documents, including, Drawings, Specifications, and Contract Documents on file at the Community Development Department, located in City Hall, 711 Main Street, Grain Valley, Missouri.

Copies of plans, specifications, bid documents, and other Contract Documents can be seen or purchased on-line at [www.drexeltech.com](http://www.drexeltech.com) in their eDistribution plan room, additional assistance is available at [distribution@drexeltech.com](mailto:distribution@drexeltech.com). Information regarding this project can be found under the “Public Jobs” link on the website. Prospective bidders desiring the Contract Documents for use in preparing bids shall obtain a set of such documents from Drexel Technologies, 10840 West 86th Street, Lenexa, KS 66214, telephone number is 913-371-4430. Any questions regarding the project, plans, specification, or bid documents should be directed to Lamp Rynearson, (816) 361-0440.

Bids will be received on a unit price basis.

Each Bid shall be accompanied by a certified check, made payable to the City of Grain Valley, Missouri in an amount not less than five percent (5%) of the total Bid or by a Bid Bond with a Surety licensed to do business in the State of Missouri in the amount of five percent (5%) of the total Bid. This Security may be retained by the Owner until the Contract for the Project has been fully executed.

The Contractor and all subcontractors will be required to comply with all applicable Federal and State labor regulations including Equal Employment Opportunity, Non-segregated Facilities, Minimum Wage Rates and Affirmative Action requirements. The City of Grain Valley hereby notifies all Bidders that it will affirmatively ensure that in any Contract entered into pursuant to this Advertisement, minority business enterprises will be afforded full opportunity to submit Bids without discrimination, regardless of race, color, or national origin in consideration for any award.

Wage rates paid for Work for this Project shall be at least equal to the prevailing wage rates as determined by the Division of Labor Standards of the State of Missouri.

The project contractor and each subcontractor shall require each on-site employee to complete the ten-hour safety program required under Section 292.675, RSMo, within 30 days of beginning any of the work on the project if he or she has not previously completed the program or does not have documentation of having done so.

All bids are subject to the Buy Local/American policy and any other applicable purchasing statutes of the State of Missouri.

No bidder may withdraw its Bid within 90 days after the actual date of the opening of Bids. The City of Grain Valley, Missouri reserves the right to award the Contract by sections, to reject any or all Bids, and to waive any informalities or irregularities therein.

**Owner:** City of Grain Valley, Missouri

**Date:** August 24, 2022

#### PRE-BID CONFERENCE

---

**A pre-Bid conference will be held at City of Grain Valley, City Hall Lower Level Conference Room, 711 Main Street, Grain Valley, Missouri, 2:00 p.m. on September 7, 2022.** Representatives of Owner will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Owner will transmit to all prospective Bidders of record such Addenda as Owner considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.



**City of Grain Valley, Missouri**  
**711 Main ♦ Grain Valley, MO 64029**  
**Phone: (816) 847-6200 ♦ Fax: (816) 847-6209**

**Buckner Tarsney Waterline Extension**

**INSTRUCTIONS TO BIDDERS**

ARTICLE 1 - DEFINED TERMS

---

1.01 Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions of the Contract for Construction and any Supplementary Conditions as contained in the Bidding Documents. Additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both singular and plural thereof:

- A. *Bid* - The offer of a Bidder submitted on the prescribed form contained in the Bidding Documents setting forth the price(s) for the Work to be performed.
- B. *Bidder* - The entity who submits a Bid for the Work described in the Contract Documents.
- C. *Bidding Documents* - The Bidding Requirements and the Contract Documents (including *without* limitation all Drawings, Specifications and Addenda issued prior to receipt of Bids).
- D. *Bidding Requirements* - The Advertisement for Bids or Invitation to Bid, these Instructions to Bidders, the Bid Form and *required* attachments as set forth in the Bidding Documents and Bid Security.
- E. *Bid Security* - The deposit of an approved Bid Bond, Cashier's Check or Certified Check furnished by the Bidder and made payable to the Owner for the amount stipulated in the Advertisement for Bids or Invitation to Bid.
- F. *Owner* - City of Grain Valley, Missouri, 711 Main, Grain Valley, Missouri 64029.

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

---

2.01 Complete sets of the Bidding Documents may be obtained from Owner as set forth in the Advertisement for Bids. A copy of the Bidding Documents are on file with the Owner at the City of Grain Valley, Missouri, 711 Main, Grain Valley, Missouri 64029.

2.02 Complete sets of Bidding Documents must be used in preparing Bids; Owner assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner in making copies of the Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

## ARTICLE 3 - QUALIFICATIONS OF BIDDERS

---

3.01 The Bidder must be qualified by experience, adequate financing, and equipment to perform the Work required by the Contract within the Contract Times.

3.02 To document Bidder's qualifications to perform the Work, within five days of Owner's request, Bidder shall submit written evidence such as financial data, previous experience, qualifications of personnel, present commitments, and other data regarding Bidder's qualifications.

## ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS AND SITE

---

4.01 It is the responsibility of each Bidder, before submitting a Bid, to (a) thoroughly examine the Bidding Documents, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance, or furnishing of the Work, (c) consider federal, state, and local laws and regulations that may affect cost, progress, performance, or furnishing of the Work, (d) study and carefully correlate Bidder's observations with the Bidding Documents, and (e) notify the City of all conflicts, errors, or discrepancies discovered by Bidder in the Bidding Documents.

4.02 Bidder must carefully study all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site which have been made available to Bidder but Bidder shall not be entitled to rely upon the accuracy or completeness of such reports or tests. Such reports and drawings are not Contract Documents and may not be complete for Bidder's purposes, including without limitation, any reports or test described on Exhibit A hereto. Owner does not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to subsurface conditions, physical conditions or underground facilities at or contiguous to the site. Bidder must obtain and carefully study, and assume responsibility for all such additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions, including, but not limited to, surface, subsurface, and underground facilities, at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder and safety precautions and programs incident thereto as Bidder deems necessary. Any discrepancies between the reports and drawings made available to the Bidder and the information revealed in the Bidder's own examinations, tests, studies, explorations or investigations of any type shall be immediately reported in writing by the Bidder to Professional.

4.03 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, underground facilities, and other physical conditions appear in the General Conditions.

4.04 Before submitting a Bid, each Bidder will be responsible to make or obtain such explorations, tests, and data concerning physical conditions, surface, subsurface, and underground facilities at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents. On reasonable notice, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up, and restore the site to its former condition upon completion of such explorations. Each Bidder wishing to inspect the site and any existing facilities shall contact:

**Richard J. Tuttle, P.E. City Engineer | 816.847.6222 | [dtuttle@cityofgrainvalley.org](mailto:dtuttle@cityofgrainvalley.org)**

**Michael Myers | 816.847.6272 | [mmyers@cityofgrainvalley.org](mailto:mmyers@cityofgrainvalley.org)**

4.05 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with the provisions of Section 4 of the Instructions to Bidders, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents, that Bidder has given Professional written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Professional are acceptable to Bidder, and that the Bidding Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

#### ARTICLE 5- SITE AND OTHER AREAS

---

5.01 The lands upon which the Work is to be performed and access thereto, and other lands designated for use by Contractor in performing the Work are identified in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

#### ARTICLE 6 - INTERPRETATIONS AND ADDENDA

---

6.01 All questions about the meaning or intent of the Bidding Documents are to be directed to Professional. Questions concerning the Bidding Documents may be directed to:

**Richard J. Tuttle, City Engineer I816.847.6222 |**  
[dtuttle@cityofgrainvalley.org](mailto:dtuttle@cityofgrainvalley.org)

6.02 Interpretations or clarifications considered necessary by Owner in response to such questions will be issued by Addenda. Questions received less than four (4) days prior to the date for the receipt of Bids may not be answered. Only answers issued by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. Addenda may also be issued to modify the Bidding Documents as deemed advisable by Professional. Such Addenda must also be in writing in order to be binding.

#### ARTICLE 7 - BID SECURITY

---

7.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of five percent (5%) of Bidder's maximum Bid Price and in the form of a certified or bank check or a Bid Bond on the form attached issued by a surety meeting the requirements of the General Conditions.

7.02 The Bid Security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required Contract Security and met the other conditions of the Notice of Award, whereupon the Bid Security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within fifteen (15) days after the Notice of Award, Owner may annul the Notice of Award and the Bid Security of that Bidder will be forfeited. The Bid Security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven (7) days after the Effective Date of the Agreement or ninety one (91) days after the Bid opening, whereupon Bid Security furnished by such Bidders will be returned.

7.03 Bid Security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven (7) days after the Bid opening.

ARTICLE 8 - CONTRACT TIMES

---

8.01 The Contract Times shall be the dates by which: (a) Contractor shall achieve Substantial Completion of the entire Work; and (b) Contractor shall achieve Final Completion of the entire Work. The Contract Times for the Project are set forth in Article 3 of the Agreement Between Owner and Contractor.

ARTICLE 9 - LIQUIDATED DAMAGES

---

9.01 Provisions for liquidated damages are set forth in Article 3 of the Agreement.

ARTICLE 10 - SUBSTITUTE AND "OR-EQUAL" ITEMS

---

10.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Owner, application for such acceptance will not be considered by Owner until after the Effective Date of the Agreement. The procedure for submission of any such application by Contractor and consideration by Owner is set forth in the General Conditions and may be supplemented in the General Requirements or the Supplementary Conditions.

ARTICLE 11 - SUBCONTRACTORS, SUPPLIERS AND OTHERS

---

11.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within *five* (5) days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual or entity if requested by Owner. If Owner or Professional after due investigation has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, require the apparent Successful Bidder to submit a substitute, in which case, apparent Successful Bidder shall submit an acceptable substitute, and Bidder's Bid price will be adjusted in accordance with Paragraph 6.09 of the General Conditions.

11.02 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 12-PREPARATION OF BID

---

12.01 The Bid Form is provided in the Bidding Documents. Bid Forms must be fully completed in ink or typewritten and include all required attachments.

12.02 Bids by corporations must be executed in the corporate name by the president or vice-president (or other corporate officer accompanied by evidence of authority to sign), and the corporate seal shall be affixed and attested by the secretary or an assistant secretary. The state of incorporation shall be shown below the corporate name. Bids by partnerships must be executed in the partnership name and signed by a partner (accompanied by evidence of authority to sign) and the official address of the partnership must be shown below the signature. Bids by joint ventures shall be signed by each participant in the joint venture or by an authorized agent of each participant. Bids by limited liability companies shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm

and the official address of the firm must be shown below the signature. All names shall be typed or printed in ink below the signatures. The address and telephone number for communications regarding the Bid shall be shown.

12.03 A Bid by a person who affixes to his signature the word "president", "secretary", "agent", or other designation without disclosing his principal may be held to be the bid of the individual signing.

12.04 All blank spaces in the Bid Form shall be filled.

12.05 The Bid shall contain an acknowledgment of receipt of all Bidding Documents.

12.06 Each Bid shall be accompanied by an executed Affidavit in the form attached hereto.

#### ARTICLE 13 - BASIS OF BID

---

13.01 The Bidder shall complete the schedule of unit prices included in the Bid Form and shall accept all fixed unit prices listed therein. The total Bid will be calculated as the sum of the products of the estimated quantity of each item and the unit price bid. Discrepancies in the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. The unit prices set forth in the Bid Form shall be considered complete and include: (1) all materials, equipment, labor, delivery, installation, overhead and profit; and (2) any other costs or expenses in connection with, or incidental to, the performance of that portion of the Work to which such unit prices apply. Any estimated quantities of Work contained in any Bidding Document or Contract Document are not guaranteed and are solely for the purpose of comparison of Bids. Estimated quantities may change because of changes ordered by Owner or because of actual site conditions or other reasons. The unit prices for the Work shall remain unchanged even if the actual quantity of Work performed by Contractor differs materially and significantly from any estimated quantity of such items. Contractor agrees that it shall make no claim for an adjustment in any unit price for any variance between the actual quantity of Work performed by Contractor and any estimated quantity of such item.

#### ARTICLE 14 - SUBMISSION OF BIDS

---

14.01 Bids shall be submitted no later than the date and time prescribed in the Advertisement or Invitation for Bids, or the modified time and place indicated by Addendum. The unbound copy of the Bid Form is to be completed and accompanied by all other required documents, including the Bid Security.

14.02 Bids shall be enclosed in an opaque sealed envelope plainly marked as a "Bid" with the Project title and marked with the name and address of the Bidder. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it.

14.03 Bids received after the time and date for receipt of Bids will be returned unopened. Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids. Oral, telephone, telegraph, or facsimile Bids are invalid and will not receive consideration.

ARTICLE 15- MODIFICATION AND WITHDRAWAL OF BIDS

---

15.01 Bids may be modified or withdrawn by an appropriate document duly executed in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

ARTICLE 16-OPENING OF BIDS

---

16.01 Bids will be opened and read aloud publicly. An abstract of the amounts of the base Bids will be made available to Bidders after the opening of Bids.

ARTICLE 17- BIDS TO REMAIN SUBJECT TO ACCEPTANCE

---

17.01 All Bids will remain subject to acceptance for 90 days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to that date. Any extension of the commencement date for Work as specified in the Contract Documents shall be governed by the applicable provisions of the Contract Documents and shall not be grounds for withdrawal of a Bid.

ARTICLE 18-APPROVAL BY CITY COUNCIL

---

18.01 The Contract will not be binding and effective on the City until approved by Ordinance of the City Council of Grain Valley, Missouri.

ARTICLE 19-AWARD OF CONTRACT

---

19.01 Owner reserves the right to reject any and all Bids, including, without limitation, the right to reject any or all bids which in the Owner's discretion are nonconforming, nonresponsive, unbalanced, or conditional Bids and to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work.

19.02 In evaluating Bids, Owner will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternatives, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

19.03 Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

19.04 If the Contract is to be awarded, it will be awarded to the lowest, responsive and responsible Bidder whose evaluation by Owner indicates to Owner that Bidder is responsible and qualified to perform the Work.

19.05 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

## ARTICLE 20- CONTRACT SECURITY AND INSURANCE

---

20.01 The General Conditions as may be modified by the Supplementary Conditions, set forth the requirements as to Performance and Payment Bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required Performance and Payment Bonds.

## ARTICLE 21- EXECUTION OF AGREEMENT AND BONDS

---

21.01 When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by unsigned counterparts of the Agreement with other written Contract Documents attached; the required number of copies will be determined by Owner. Within fifteen (15) days thereafter Contractor shall sign, leaving the dates blank, and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds and power of attorney. After confirmation of the Contract by action of the City, if required, or within fifteen (15) days if not required, Owner shall execute all copies of the Agreement and other Contract Documents submitted by Contractor/Successful Bidder, insert the date of Contract on the Agreement, Bonds, and power of attorney, and return all copies to Contractor for distribution. Distribution of signed copies shall be as directed by Owner.

## ARTICLE 22- TAXES AND PERMITS

---

22.01 Responsibility for payment of taxes and permits is set forth in the General Conditions. As set forth in the General Conditions, certain equipment and materials are exempt from State and Local Sales and Use taxes. Said taxes shall not be included in the Bid.

## ARTICLE 23- LAWS AND REGULATIONS

---

23.01 Provisions concerning Laws and Regulations are set forth in the Contract Documents.

23.02 Bids shall be based on payment by Contractor and each Subcontractor of wage rates not less than the prevailing hourly wage for each craft or classification of workmen engaged on the Work as determined by the Industrial Commission of Missouri on behalf of the Department of Labor and Industrial Relations. Higher prevailing wage rates may apply if a federal governmental agency is providing funding for this Project. Requirements regarding payment of prevailing wage rates are set forth in the General Conditions.

23.03 Information on the Missouri Domestic Product Procurement (Buy American) Act is contained in the General Conditions.

23.04 A pre-Bid conference will be held at City of Grain Valley, City Hall Lower Level Conference Room, 711 Main Street, Grain Valley, Missouri, **2:00 pm on September 5, 2022**. Representatives of Owner will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Owner will transmit to all prospective Bidders of record such Addenda as Owner considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

23.05 Successful bidder must obtain a City of Grain Valley Business License prior to the start of work.

**EXHIBIT A**  
**REPORTS AND DRAWINGS REFERRED TO IN PARAGRAPH 4.02**

NONE



**AFFIDAVIT of COMPLIANCE**

**(Section 285.530.2, Revised Statutes of Missouri)**

State of Missouri

County of \_\_\_\_\_ ) ss:  
\_\_\_\_\_ )

Now this \_\_\_ day of \_\_\_, 2022 the undersigned being first duly sworn, deposes and says:

1. I am more than 18 years of age.
2. I make this affidavit from my personal knowledge of the facts stated herein or upon information and facts available to me as a duly authorized owner, partner, corporate, or LLC officer or Human Relations Director of \_\_\_\_\_ ("Contractor").
3. I am authorized to make this affidavit on behalf of Contractor.
4. I state and affirm that Contractor is enrolled and is currently participating in E-Verify, a federal work authorization program or another equivalent electronic verification of work authorization program operated by the United States Department of Homeland Security under the Immigration Reform and Control Act of 1986.
5. Further, Contractor does not knowingly employ any person who is an unauthorized alien.
6. Further, Contractor has performed an electronic verification check as described above on all workers hired since January 1, 2009 or obtained documents required for completion of a Federal 1-9 form before it began participating in E-Verify.
7. Attached to this affidavit is a true and accurate copy of Contractor's Memorandum of Understanding with the United States concerning the use of E-Verify.

I certify under penalty of perjury that the statements above are complete, true and accurate to the best of my knowledge and belief.

\_\_\_\_\_  
Authorized Agent, Partner, Owner or Officer

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

If Contractor has a Human Relations Director or equivalent that person must sign as an affiant as well.

I certify under penalty of perjury that the statements above are complete, true and accurate to the best of my knowledge and belief.

\_\_\_\_\_  
Human Relations Director

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

Subscribed and sworn to before me this\_ day of \_\_\_\_\_,20\_.

\_\_\_\_\_  
Notary Public

My commission expires:  
  
\_\_\_\_\_

This form is promulgated pursuant to 15CSR 60-15.020. Use of this form is not required but the Attorney General has deemed this affidavit sufficient in form to satisfy the requirements of section 285.540 RSMo., Supp. 2008.



I further depose and state that Bidder has not received any payment or gratuity from a Subcontractor or Supplier, as an inducement for the award of a subcontract or a purchase order.

The undersigned further warrants that he or she has the authority to execute this affidavit on behalf of the Bidder.

\_\_\_\_\_  
Signature

, before me, a Notary Public, personally appeared

to me known to be the person who executed the within Bidder's Affidavit and acknowledged to me that he/she executed the same for the purposes therein stated.

\_\_\_\_\_  
Notary Public

My commission expires:

\_\_\_\_\_

**BID FORM**

**2022 TABLE OF CONTENTS**

	<b>Page</b>
ARTICLE 1- Bid Recipient .....	1
ARTICLE 2 - Bidder's Acknowledgements .....	1
ARTICLE 3 - Bidder's Representations .....	1
ARTICLE 4- Bidder's Certification.....	2
ARTICLE 5 - Basis of Bid.....	3
ARTICLE 6- Time of Completion.....	4
ARTICLE 7 - Attachments to this Bid.....	4
ARTICLE 8 - Bid Submittal.....	5



**ARTICLE 1 - BID RECIPIENT**

1.01 This Bid is submitted to:

**City of Grain Valley, Missouri  
C/O Richard Tuttle, City Engineer  
711 Main  
Grain Valley, Missouri 64029**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

**ARTICLE 2 - BIDDER'S ACKNOWLEDGEMENTS**

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

**ARTICLE 3 - BIDDER'S REPRESENTATIONS**

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

<b>Addendum No.</b>	<b>Addendum, Date</b>
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related

reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

- F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

#### **ARTICLE 4 - BIDDER'S CERTIFICATION**

##### **4.01 Bidder certifies that:**

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
  - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
  - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.



**ARTICLE 5 - BASIS OF BID**

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

**Project 1-Waterline Extension**

<b>Item No.</b>	<b>Description</b>	<b>Units</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Extension</b>
1	10" C900	LF	2155		
2	10" Restrained Joint PVCC900	LF	260		
3	Locator Wire	LF	2415		
4	10" Gate Valve with Box	EA	1		
5	Connect to existing waterline (A1)	LS	1		
6	Connect to existing waterline (A2)	LS	1		
7	Pressure reducing valve vault	LS	1		
8	12" steel casing	LF	240		
9	Erosion Control	LS	1		
10	Traffic Control	LS	1		
11	Construction staking	LS	1		
12	Force Account (Set)	LS	1	\$20,000.00	\$20,000.00
<b>Total Amount of All Unit Price Bid Items</b>					<b>\$</b>

**Total Amount of Bid for Project (Typed or Written)**

**Firm Name**

**The City reserves the right to adjust quantities for budget purposes**

**BID ALTERNATE 1**

Sump pump within Pressure Reducing Valve and related appurtenances:

**LUMP SUM BID ALTERNATE 1 \$** \_\_\_\_\_

\_\_\_\_\_  
(Amount in Words)

**BID ALTERNATE 2**

Two 1" tap and ball valves for future pressure transmitters within Pressure Reducing Valve Vault and related appurtenances:

**LUMP SUM BID ALTERNATE 2 \$** \_\_\_\_\_

\_\_\_\_\_  
(Amount in Words)

**BID ALTERNATE 3**

Two 2.5" openings for 1" or 3/4" conduit within Pressure Reducing Valve Vault and related appurtenances.

**LUMP SUM BID ALTERNATE 3 \$** \_\_\_\_\_

\_\_\_\_\_  
(Amount in Words)

**BID ALTERNATE 4**

SCADA System Improvements including telemetry panel within Pressure Reducing Valve Vault and related appurtenances.

**LUMP SUM BID ALTERNATE 3 \$** \_\_\_\_\_

\_\_\_\_\_  
(Amount in Words)

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

## **ARTICLE 6 -TIME OF COMPLETION**

- 6.01 Bidder agrees that the Work will be substantially complete on or before December 15, 2022 and will be completed and ready for final payment in accordance with Paragraph 14.10 of the General Conditions within 15 days of final punch list.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

## **ARTICLE 7 - ATTACHMENTS TO THIS BID**

- 7.01 The following documents are submitted with and made a condition of this Bid:
- A. Required Bid security;
  - B. Bidders Affidavit;
  - C. E-Verify Affidavit;
  - D. List of Proposed Subcontractors;
  - E. List of Proposed Suppliers;
  - F. List of Equipment;
  - G. List of Contracts on Hand;
  - H. Evidence of authority to do business in the state of Missouri; or a written covenant to obtain such license within the time for acceptance of Bids;
  - I. Contractor's License No.:                    **[or]** Evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license within the time for acceptance of Bids;
  - J. All manufactured goods or commodities used or supplied under this contract must meet the requirements of the Domestic Products Procurement law RSMo 34.350 - RSMo 34.359. Compliance certification must be submitted with the bid.
- 7.02 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.



**ARTICLE 8 - BID SUBMITTAL**

BIDDER: *[Indicate correct name of bidding entity]*

By: \_\_\_\_\_  
*[Signature]*

*[Printed name]*  
*[If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.]*

Attest: \_\_\_\_\_  
*[Signature]*

*[Printed name]* \_\_\_\_\_

Title: \_\_\_\_\_

Submittal Date: \_\_\_\_\_

Address for giving notices:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Contact Name and e-mail address: \_\_\_\_\_

Bidder's License No.: \_\_\_\_\_  
*(where applicable)*



# BID BOND

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

---

**BIDDER** (Name and Address):

**SURETY** (Name and Address of Principal Place of Business):

**OWNER** (Name and Address):

City of Grain Valley, Missouri  
711 Main Street  
Grain Valley, MO 64029

**PROJECT**

Date:  
Amount:  
Description (Name and Location):  
2022 Buckner Tarsney Road  
Waterline Extension

**BOND**

Date:  
Amount:

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent or representative.

**BIDDER AS PRINCIPAL**

Company: \_\_\_\_\_ (Corp. Seal)

Signature: \_\_\_\_\_  
Name and Title: \_\_\_\_\_

**SURETY**

Company: \_\_\_\_\_ (Corp. Seal)

Signature: \_\_\_\_\_  
Name and Title: \_\_\_\_\_  
(Attach certified Power of Attorney)

NOW THEREFORE, Bidder and Surety jointly and severally agree to bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of the Bond and subject to the following terms and conditions:

1. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents the executed Agreement required by the Bidding Documents and the performance and payment bonds required by the Bidding Documents and Contract Documents.
2. This obligation shall be null and void if:
  - a. Owner accepts Bidder's bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and the performance and payment bonds required by the Bidding Documents and Contract Documents, or
  - b. All bids are rejected by Owner, or
  - c. Owner fails to issue a notice of award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder.
3. Payment under this Bond will be due and payable upon default of Bidder and within ten (10) calendar days after receipt by Bidder and Surety of written notice of default from Owner.
4. Notice required hereunder shall be in writing and sent via U.S. Mail or hand delivered to both Bidder and Surety at their respective addresses shown on the face of this Bond and shall be deemed to be effective upon receipt by the party concerned.
5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue notice of award agreed to in writing by Owner and Bidder.
6. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
7. This Bond is intended to conform to all applicable laws. Any applicable requirement of any applicable law that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of the Bond conflicts with any applicable provision of any applicable law, then the provisions of said laws shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

Address of Owner:

City of Grain Valley, Missouri  
711 Main Street  
Grain Valley, MO 64029

Address of Bidder:

[Insert Name and Address]

Address of Surety:

[Insert Name and Address]



**BID GUARANTY**

Attached hereto is a \_\_\_\_\_ Certified Check from \_\_\_\_\_ (the "Bidder") in the amount of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_), which represents no less than five percent (5%) of the total Bid and payable to the City of Grain Valley, Missouri.

The Undersigned Bidder agrees that the accompanying Bid Security shall be forfeited to and become the property of the Owner, should Bidder fail or refuse within the time required by the Bidding Documents to fully execute the Agreement as required by the Bidding Documents and timely delivery of a fully executed Performance Bond and Payment Bond required by the Bidding Documents and Contract Documents.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_  
Name of Bidder (typed)

By: \_\_\_\_\_  
(Authorized Signature)

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

ATTEST:

\_\_\_\_\_  
Secretary (If Corporation)

*Affix Corporate Seal*







**NOTICE OF AWARD**

\_\_\_\_\_20\_\_

**TO:** \_\_\_\_\_  
**AT:** \_\_\_\_\_  
\_\_\_\_\_  
"Contractor"

**FROM:**  
**CITY OF GRAIN VALLEY, MISSOURI**  
711 Main Street  
Grain Valley, MO 64029  
"Owner"

**RE:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
"Project"

You are notified that your Bid dated \_\_\_\_\_ for the referenced Contract has been evaluated. Your organization has been determined to be the lowest responsible and best Bidder and has been awarded the Contract for the Work.

The Contract Price of your Contract is \_\_\_\_\_ Dollars (\$\_\_\_\_\_).

Five (5) copies of the Agreement Between Owner and Contractor accompany this Notice of Award.

Your organization shall comply with the following conditions precedent within the number of days after receipt of the Notice of Award specified in the Instruction to Bidders or otherwise stipulated, that is by \_\_\_\_\_, 20\_\_ you shall:

Sign and return to the **Professional** the executed Notice of Award and all of the following required documents:

1. Five (5) fully executed counterparts of the Agreement Between Owner and Contractor
2. Fully executed Performance and Maintenance Bond and Payment Bond as specified in the General Conditions which may be modified by Supplementary Conditions.
3. Certificate of Insurance as specified the General Conditions which may be modified by Supplementary Conditions.

Failure to comply with these conditions within the time specified may entitle the Owner to consider your Bid abandoned, annul this Notice of Award and declare your Bid Security forfeited.

**Issued On Behalf Of The Owner:**

**Contractor**

By: \_\_\_\_\_

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Received on \_\_\_\_\_, 20\_\_

Return to the Professional: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# BUCKNER TARSNEY WATERLINE EXTENSION

## AGREEMENT BETWEEN OWNER AND CONTRACTOR (UNIT PRICE)

**THIS AGREEMENT BETWEEN OWNER AND CONTRACTOR** (this "Agreement") is made and Entered into and is effective on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between the City of Grain Valley, Missouri, a municipality, ("Owner"), and \_\_\_\_\_, a \_\_\_\_\_, having its principal place of business located at \_\_\_\_\_ ("Contractor")

**WHEREAS**, Owner has caused to be prepared specifications, plans and other Contract Documents for the Work herein described, and has approved and adopted the Contract Documents defined herein and has invited proposals for furnishing materials, labor, and equipment for, and in connection with, the construction of improvements in accordance with the terms of the Contract Documents; and

**WHEREAS**, Owner held a Pre-Bid conference on \_\_\_\_\_, and

**WHEREAS**, the Contractor, in response to the Owners invitation to bid which closed at \_\_\_\_\_ on \_\_\_\_\_, 20\_\_\_\_, has submitted to Owner in the manner and at the time specified, a proposal in accordance with the terms of the Contract Documents; and

**WHEREAS**, Owner has opened, and examined the bids submitted and as a result of such examination, has determined and declared the Contractor to be the lowest and best bidder for constructing said improvements, and has duly awarded to this Contract to Contractor.

Owner and Contractor, in consideration of the mutual covenants herein set forth, agree as follows:

### **ARTICLE 1** **WORK**

Contractor, at his own cost and expense, will provide all labor, tools, equipment and materials required to complete all Work specified or indicated in the Contract Documents or reasonably inferable by the Contractor therefrom as necessary to produce the results intended by the Contract Documents.

### **ARTICLE 2** **PROFESSIONAL**

The Project has been designed by the City of Grain Valley, who is referred to in the Contract Documents as the Professional. Professional, and its duly authorized agents, are to act as Owner's representative, assume all duties and responsibilities, and have the rights and authorities assigned to Professional in the Contract Documents in accordance with the Contract Documents.

### **ARTICLE 3** **CONTRACT TIME AND COMPLETION**

3.1 The date of commencement is the date from which the Contract Time(s) of Paragraph 3.3 is measured and shall be fixed in a written notice to proceed issued by Owner.

3.2 The Contractor shall achieve Substantial and Final Completion of the entire Work, and if set forth below, the various designated stages of the Work, not later than the following dates:

3.3 Bidder agrees that the Work will be substantially complete on or before December 15, 2022 and will be completed and ready for final payment in accordance with Paragraph 14.10 of the General Conditions within 15 days of final punch list.

3.4 Time is of the essence to the Contract Documents and all obligations thereunder. The Contractor acknowledges and recognizes that (1) Owner is entitled to full and beneficial occupancy and use of the completed Work following expiration of the Contract Times and (2) Owner will sustain damages if the

Contract Time(s) are not met by Contractor. The Contractor further acknowledges and agrees that if the Contractor fails to achieve Substantial Completion of the entire Work or any phase of the Work within the Contract Time(s), Owner will sustain extensive damages and serious loss as a result of such failure. The exact amount of such damages will be extremely difficult to ascertain. Therefore, Owner and the Contractor agree as follows in this Paragraph 3.4:

1. If the Contractor fails to achieve Substantial Completion of the Work or designated portions within the Contract Time(s) as set forth in Paragraph 3.2, Owner shall be entitled to retain or recover from the Contractor, as liquidated damages and not as a penalty, the following per diem amounts for each day that expires after the time specified in Paragraph 3.3 for Substantial Completion of the Work or designated phases of the Work and continuing until the actual Date(s) of Substantial Completion:

\$400 per Calendar Day

2. After Substantial Completion, if Contractor shall neglect, refuse or fail to complete remaining Work or designated portions within the Contract Time(s), as set forth in Paragraph 3.3, Owner shall be entitled to retain or recover from Contractor as liquidated damages and not as a penalty, the following per diem amounts for each day that expires after the time specified in Paragraph 3.2 for final completion of the Work or phases of the Work and until the actual date(s) of final completion:

\$400 per Calendar Day

3. All such liquidated damages referred to in this Paragraph 3.4 are hereby agreed to be a reasonable pre-estimate of damages Owner will incur as a result of delayed completion of the Work or phases of the Work. Owner may deduct liquidated damages described in Paragraph 3.4 from any unpaid amounts then or thereafter due the Contractor under this Agreement. Any liquidated damages not so deducted from any unpaid amounts due the Contractor shall be payable to Owner at the demand of Owner, together with interest from the date of the demand at a rate of one and one-half percent (1.5%) per month.

#### **ARTICLE 4** **CONTRACT SUM**

4.1 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount equal to the sum of the below established unit price of each separately identified item of Work set forth below, times the actual quantities of that item completed by Contractor ("Contract Price"):

SEE ATTACHED BID

4.2 The unit prices set forth above are considered complete and include: (1) all materials, equipment, labor, delivery, installation, overhead and profit; and (2) any other costs or expenses in connection with, or incidental to, the performance of that portion of the Work to which such unit prices apply.

4.3 Owner will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Owner will review with Contractor's representative preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Owner's written decisions thereon will be final and binding upon Contractor, unless, within ten (10) days after the date of any such decision, Contractor delivers to Owner a written objection to such determination.

4.4 Any estimated quantities of Work contained in any Contract Document are not guaranteed and are solely for the purpose of comparison of Bids. Contractor acknowledges and agrees that the estimated quantities may change because of changes ordered by Owner or because of actual site conditions or other reasons. Contractor agrees that the unit prices for the Work shall remain unchanged even if the actual quantity of Work performed by Contractor differs materially and significantly from any estimated quantity of such items. Contractor agrees that it shall make no claim for an adjustment in any unit price for any variance between the actual quantity of Work performed by Contractor and any estimated quantity of such item.



**ARTICLE 5**  
**PAYMENTS**

5.1 Contractor shall submit Applications for Payment in accordance with the General Conditions of the Contract for Construction and in the form provided by Owner. Owner shall make progress payments to Contractor in accordance with the Contract Documents. The period covered by each Application for Payment shall be one (1) calendar month ending on the last day of the previous month.

5.2 The Application for Payment submitted by Contractor shall include the quantities of each item of Work completed by Contractor. Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

- .1 The value of all completed Work by Contractor as determined by the sum of the unit price of each separately identified item of Work set forth in Paragraph 4.1 times the actual quantities of that item completed as determined by Owner as set forth in Paragraph 4.3;
- .2 Less retainage of five percent (5%) of the amount of Subparagraph .1;
- .3 Less the aggregate of previous payments made by Owner; and
- .4 Less amounts, if any, for which the Owner has withheld or nullified an approval of payment as set forth in the Contract Documents.

5.3 Owner shall make progress payments and final payment in accordance with the General Conditions of the Contract for Construction.

**ARTICLE 6**  
**CONTRACTOR'S REPRESENTATIONS**

In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

6.1 Contractor has examined and carefully studied the Contract Documents (including the Addenda listed in Article 7) and the other related data identified in the Bidding Documents including "technical data."

6.2 Contractor has visited the site and become familiar with and satisfied itself as to the general, local, and site conditions that may affect cost, progress, performance, or furnishing of the Work.

6.3 Contractor is familiar with and has satisfied itself as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.

6.4 Contractor has been provided any and all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site. Contractor acknowledges that such reports and drawings are not Contract Documents. A list of such reports and drawings are attached hereto as Exhibit A. Contractor acknowledges that Owner and Professional do not assume responsibility for the accuracy or completeness of such information. Contractor also acknowledges that Owner and Professional do not assume responsibility for the accuracy or completeness of data shown or indicated in the Contract Documents with respect to underground facilities or utilities at or contiguous to the site, and Contractor shall not be entitled to rely on the accuracy or completeness of such data. Contractor has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities and utilities) at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto. Contractor does not consider that any additional examinations, investigations, explorations, tests, studies, or data are necessary for the performance and furnishing of the Work at the Contract Sum, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

6.5 Contractor is aware of the general nature of work to be performed by Owner and others at the site that relates to the Work as indicated in the Contract Documents.

6.6 Contractor has correlated the information known to Contractor, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

6.7 Contractor has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents and the written resolution thereof by Owner is acceptable to Contractor, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

6.8 Contractor has the full power and authority to make, execute, deliver and perform the Work hereunder and has authorized the undersigned to bind it to this Contract and the Contract Documents.

6.9 The representations of Contractor shall be continuing and shall survive the execution and termination of this Contract.

**ARTICLE 7  
CONTRACT DOCUMENTS**

The Contract Documents, except for Modifications executed after the date of this Contract, which comprise the entire agreement between Owner and Contractor concerning the Work, consist of the following:

- 7.1 This Agreement.
- 7.2 Exhibits to this Agreement, if any.
- 7.3 Notice to Proceed.
- 7.4 General Conditions of the Contract for Construction.
- 7.5 Supplementary Conditions of the Contract.
- 7.6 Performance Bond.
- 7.7 Payment Bond.
- 7.8 Maintenance Bond
- 7.9 Specifications of the Contract
- 7.10 The Drawings, as follows: "Map of Proposed Roads" and standard details.
- 7.11 Addenda, if any, as follows:

Number	<u>Date</u>	<u>Pages</u>

7.12 Other documents, if any, as follows:

There are no Contract Documents other than those listed above in this Article 7 or the General Conditions of the Contract for Construction.

**ARTICLE 8  
MISCELLANEOUS**

8.1 Terms used in this Contract which are defined in Article 1 of the General Conditions of the Contract for Construction will have the meanings indicated in the General Conditions of the Contract for Construction.

8.2 Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

8.3 The business address of Contractor given herein is the place to which all notices, letters, and other communication to Contractor will be mailed or delivered. The address of Owner appearing herein is hereby designated as the place to which all notices, letters, and other communication to Owner shall be mailed or delivered. Either party may change his address at any time by an instrument in writing delivered to Professional and to the other party.

**IN WITNESS WHEREOF**, Owner and Contractor *have* signed this Contract by and through their duly authorized representatives. All portions of the Contract Documents *have* been signed or identified by Owner and Contractor or by Professional on their behalf.

**THE CONTRACT DOCUMENTS CONTAIN AN ARBITRATION PROVISION WHICH MAY BE ENFORCED BY THE PARTIES**

**ATTEST:**

\_\_\_\_\_  
City Clerk

**CITY OF GRAIN VALLEY, MISSOURI  
"Owner"**

By: \_\_\_\_\_

Printed Name: Kenneth Murphy

Title: City Administrator

\_\_\_\_\_  
**"Contractor"**

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_



# PERFORMANCE BOND

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

---

**CONTRACTOR** (Name and Address):

**SURETY** (Name and Address of Principal Place of Business):

**OWNER:**

City of Grain Valley, Missouri  
711 Main Street  
Grain Valley, MO 64029

**CONTRACT**

Date:

Price:

Description (Name and Location): Buckner Tarsney Waterline Extension

**BOND**

Date:

Amount:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

**CONTRACTOR AS PRINCIPAL**

Company: \_\_\_\_\_ (Corp. Seal)

Signature: \_\_\_\_\_  
Name and Title:

**SURETY**

Company: \_\_\_\_\_ (Corp. Seal)

Signature: \_\_\_\_\_  
Name and Title:  
(Attach certified Power of Attorney)

1. Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to Owner and any successor, grantee or assignee of Owner for the full performance of all of Contractor's obligations under the Contract. The Contract is incorporated herein by this reference.
2. If the Contractor fully performs all of its duties and obligations under the Contract, the Surety and the Contractor shall have no obligation under this Bond.
3. The Surety's obligations under this Bond shall arise after:
  - a. The Contractor fails to fully perform of all its duties and obligations under the Contract;
  - b. The Owner has given Surety notice of Contractor's failure to fully perform of all its duties and obligations under the Contract; and
  - c. The Owner has agreed to pay the Balance of the Contract Price, if any, to the Surety in accordance with the terms of the Contract.
4. When Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at Surety's expense take one of the following actions:
  - a. Arrange for Contractor, with the written consent of the Owner, to perform, complete or cure the default or breach of the Contract; or
  - b. Undertake to perform and complete the Contract itself through qualified contractors approved by Owner;
  - c. Waive its right to perform, complete or cure the default of breach of the Contract and pay to the Owner the total amount of this Bond.
5. If the Surety does not proceed as provided by Paragraph 4 within fifteen (15) days of the Owner's compliance with Paragraph 3 and complete its obligations with diligence and promptness, Surety shall be deemed to be in default under this Bond.
6. If Surety elects to act under Paragraph 4(a) or 4(b) above, then the responsibilities of Surety to Owner shall not be greater than those of the Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of the Owner under the Contract. Surety recognizes and acknowledges that subject to the amount of the Bond, Surety's obligations under this Bond, include but are not limited to:
  - a. The responsibilities of Contractor for correction of defective work and completion of the Contract;
  - b. Attorneys' fees and design professional fees and delay costs resulting from Contractor's breach of or default under the Contract, or resulting from the acts or omissions of the Surety;
  - c. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by the delayed performance or non-performance of the Contractor under the Contract or the Surety under this Bond.
7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner.
8. The Surety hereby waives notice of any change, including changes of times, to the Contract or to related subcontracts, purchase orders and other obligations.
9. It is agreed by Contractor and Surety that notwithstanding any contrary provisions contained in this Bond or the Contract, that there shall be no limits on the Owner's right to sue under this Bond for defects, defaults, or breaches not discovered or known by Owner at the time such Work was paid for and accepted by Owner except those limits provided by the statute of limitations applicable to suits on contracts.
10. Surety further agrees that in event of any default by the Owner in the performance of the Owner's obligations to the Contractor under the Contract, the Contractor or Surety shall cause written notice of such default specifying said default in detail to be given to the Owner, and the Owner shall have thirty (30) days from time after receipt of such notice within which to cure such default, or such additional reasonable period of time as may be required if the nature of such default is such that it cannot be cured within thirty (30) days. Such Notice of Default shall be sent by certified or registered U.S. Mail, return receipt requested, first class postage pre-paid, to the Owner.
11. Surety further agrees this Bond shall remain in effect following the date of Final Payment during the Guarantee Period or the time required to resolve any items of incomplete Work and the payment of any disputed amounts for the period provided in the statute of limitations applicable to suits on contracts. This Bond shall be in an amount equal to the Contract Price and any adjustments thereto.
12. Surety agrees that it is obligated under the bonds to any successor, grantee or assignee of Owner.
13. Definitions
  - a. Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Contract.
  - b. Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto and including, but not limited to, all duties to correct or repair non-conforming Work.

Address of Owner:  
 City of Grain Valley, Missouri  
 711 Main Street  
 Grain Valley, MO 64029

Address of Contractor/Principal:  
 [Insert Name and Address]

Address of Surety:  
 [Insert Name and Address]

# PAYMENT BOND

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

---

**CONTRACTOR** (Name and Address):

**SURETY** (Name and Address of Principal Place of Business):

**OWNER** (Name and Address):

City of Grain Valley, Missouri  
711 Main  
Grain Valley, MO 64029

**CONTRACT**

Date:

Amount:

Description (Name and Location): Buckner Tarsney Waterline Extension

**BOND**

Date:

Amount:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent or representative.

**CONTRACTOR AS PRINCIPAL**

Company: \_\_\_\_\_ (Corp. Seal)

Signature: \_\_\_\_\_

Name and Title:

**SURETY**

Company: \_\_\_\_\_ (Corp. Seal)

Signature: \_\_\_\_\_

Name and Title:

(Attach certified Power of Attorney)

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

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

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

4. The Surety's total obligation shall not exceed the amount of this Bond.

5. Amounts due and payable by the Owner to the Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under the Performance Bond provided in connection with the Contract. By the Contractor furnishing this Bond, Contractor agrees that all remaining funds due and payable by the Owner to the Contractor in the performance of the Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond subject to the Owner's priority to use the funds for the completion of the Work.

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

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

8. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location of the Project or after the expiration of one year from the date which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

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

10. Any provision in the Bond conflicting with any applicable law shall be deemed deleted herefrom and provisions conforming to such applicable law shall be deemed incorporated herein.

11. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor or Surety shall promptly furnish a copy of this Bond or shall permit a copy to be made.

12. The Contract is hereby made a part of this bond.

13. Surety agrees that it is obligated under this Bond to any successor, grantee or assignee of the Owner.

14. DEFINITIONS

a. Claimants: Individuals or entities that furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, design services required for performance of the Work of the Contractor and the Contractor's subcontractors.

b. Contract: The agreement between the Owner and the Contractor identified in the first page of this Bond, including all Contract Documents and changes thereto.

Address of Owner:

City of Grain Valley, Missouri  
711 Main Street  
Grain Valley, MO 64029

Address of Contractor/Principal:

[Insert Name and Address]

Address of Surety:

[Insert Name and Address]



**MAINTENANCE BOND**

KNOW ALL PERSONS BY THESE PRESENTS: That \_\_\_\_\_

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

a \_\_\_\_\_ hereinafter called Principal, and  
(Corporation, Partnership, or Individual)

\_\_\_\_\_  
(Name of Surety)

hereinafter called Surety, are held and firmly bound unto \_\_\_\_\_

\_\_\_\_\_  
(Name of Owner)

\_\_\_\_\_  
(Address of Owner)

hereinafter called OWNER, and unto all persons, firms, and corporations who or which may furnish labor, or who furnish materials to perform as described under the contract and to their successors and assigns in the total aggregate penal sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that, Whereas on the \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_, the Principal entered into a written agreement with the OWNER, for the construction and reconstruction, or repair of certain public improvements as designated and described in the said agreement; and

Whereas, it was a condition of the contract award by the Owner that these presents be executed by the Principal and Surety aforesaid, and

Whereas, the Principal agrees to guarantee the work hereinabove described, including all materials and workmanship, for the period of two (2) year(s) beginning on the date the Owner so accepts said Work, said date being the formal acceptance date.

NOW, THEREFORE, if the Principal shall and will, in all particulars, well, duly, and faithfully observe, perform and abide by each and every covenant, condition and part of said written agreement and other Contract Documents and shall protect the Owner against all damages, losses and expenses which may occur to Owner, by reason of defective materials used, or by reason of defective workmanship done, and for the construction, reconstruction or repair of said public improvements, and settlement of backfill excavated areas.

IN WITNESS WHEREOF, this instrument is executed in \_\_\_\_\_ counterparts, each one of which shall be  
Number

deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

ATTEST:

\_\_\_\_\_  
Principal  
\_\_\_\_\_  
(Principal) Secretary

(SEAL) By \_\_\_\_\_ (s)  
\_\_\_\_\_

\_\_\_\_\_  
(Witness as to Principal) (Address)  
\_\_\_\_\_

\_\_\_\_\_  
(Address) Surety  
\_\_\_\_\_

ATTEST:

\_\_\_\_\_  
(Witness to Surety) By \_\_\_\_\_ (s)  
Attorney-in-Fact  
\_\_\_\_\_

\_\_\_\_\_  
(Address) (Address)  
\_\_\_\_\_

NOTE:

1. Date of BOND must not be prior to date of contract.
2. If CONTRACTOR is partnership, all partners should execute BOND.
3. Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.
4. Accompany this bond with Attorney-in-Fact's Authority from the Surety Company certified to include the date of the bond.

BUCKNER TARSNEY ROAD WATERLINE EXTENSION  
FOR  
PWS GRAIN VALLEY, MO

RE: Performance, and Payment Bonds

The undersigned is an authorized representative of \_\_\_\_\_, Surety for  
\_\_\_\_\_, Contractor, for and during the entire period of construction  
of the Buckner Tarsney Road Waterline Extension project.

Authorization is hereby given by the Surety to PWS Grain Valley, MO to insert the date of the  
execution of the Contract on the Bonds and Powers of Attorney.

\_\_\_\_\_  
Surety (SEAL)

\_\_\_\_\_  
Authorized Representative

\_\_\_\_\_  
Date



**ANTI-DISCRIMINATION AGAINST ISRAEL ACT CERTIFICATION**

Pursuant to RSMo. §34.600, a public entity shall not enter into a contract to acquire or dispose of services, supplies, information technology, or construction valued at \$100,000, or with a contractor having ten or more employees, unless the contract includes a written certification that the person or company is not currently engaged in, and shall not, for the duration of the contract, engage in a boycott of:

Goods or services from the State of Israel;

Companies doing business in, or with, Israel

Companies authorized by, licensed by, or organized under, the laws of the State of Israel; or

Persons or entities doing business in the State of Israel.

For a definition of the term “boycott”, please refer to RSMo. §34.600.3. A copy of the statute is attached.

By signing below, the entity agrees and certifies that it does not currently, and will not for the duration of this contract, engage in any of the types of boycotts listed above.

\_\_\_\_\_:

**By:** \_\_\_\_\_

**Name:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**34.600. Citation of law — public entity contracts, no boycott of goods or services from Israel — definitions — violation, voiding of contract — rulemaking authority.**

1. This section shall be known as the "Anti-Discrimination Against Israel Act".

2. A public entity shall not enter into a contract with a company to acquire or dispose of services, supplies, information technology, or construction unless the contract includes a written certification that the company is not currently engaged in and shall not, for the duration of the contract, engage in a boycott of goods or services from the State of Israel; companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or persons or entities doing business in the State of Israel. This section shall not apply to contracts with a total potential value of less than one hundred thousand dollars or to contractors with fewer than ten employees.

3. As used in this section, the following terms and phrases shall mean:

(1) "**Boycott Israel**" and "**boycott of the State of Israel**", engaging in refusals to deal, terminating business activities, or other actions to discriminate against, inflict economic harm, or otherwise limit commercial relations specifically with the State of Israel; companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or persons or entities doing business in the State of Israel, that are all intended to support a boycott of the State of Israel. A company's statement that it is participating in boycotts of the State of Israel; companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or persons or entities doing business in the State of Israel, or that it has taken the boycott action at the request, in compliance with, or in furtherance of calls for a boycott of the State of Israel; companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or persons or entities doing business in the State of Israel shall be considered to be conclusive evidence that a company is participating in a boycott of the State of Israel; companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or persons or entities doing business in the State of Israel; provided, however that a company that has made no such statement may still be considered to be participating in a boycott of the State of Israel; companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or persons or entities doing business in the State of Israel if other factors warrant such a conclusion;

(2) "**Company**", any for-profit or not-for-profit organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, limited liability company, or other entity or business association, including all wholly owned subsidiaries, majority-owned subsidiaries, parent companies, or affiliates of those entities or business associations;

(3) "**Public entity**", the state of Missouri or any political subdivision thereof, including all boards, commissions, agencies, institutions, authorities, and bodies politic and corporate of the state created by or in accordance with state law or regulations.

4. Any contract that fails to comply with the provisions of this section shall be void against public policy.

5. The commissioner of administration or his or her designee may promulgate regulations to implement the provisions of this section \* so long as they are consistent with this section and do not create any exceptions. Any rule or portion of a rule, as that term is defined in section 536.010, that is created under the authority of this section shall become effective only if it complies with and is subject to all of the provisions of chapter 536 and, if applicable, section 536.028. This section and chapter 536 are nonseverable and if any of the powers vested with the general assembly pursuant to chapter 536 to review, to delay the effective date, or to disapprove and annul a rule are subsequently held unconstitutional, then the grant of rulemaking authority and any rule proposed or adopted after August 28, 2020, shall be invalid and void.

-----

(L. 2020 S.B. 739)







This form is to be completed and given to your contractor.

Exempt Entity and Project Information	Name of Exempt Entity Issuing the Certificate		Missouri Tax Exemption Number							
	City of Grain Valley		1	2	4	8	9	5	7	3
	Address			City		State		ZIP Code		
	711 Main St			Grain Valley		MO		64029		
	E-mail Address									
	dtuttle@cityofgrainvalley.org									
	Project Number			Project Begin Date (MM/DD/YYYY)			Estimated Project End Date (MM/DD/YYYY)			
	PO No.			____/____/____			____/____/____			
Description of Project										
2022 Buckner Tarsney Road Waterline Extension										
Project Location						Certificate Expiration Date (MM/DD/YYYY)				
City Wide						____/____/____				
Provide a signed copy of this certificate, along with a copy of the exempt entity's Missouri Sales and Use Tax Exemption Letter to each contractor or subcontractor who will be purchasing tangible personal property for use in this project. It is the responsibility of the exempt entity to ensure the validity of the information on the certificate. The exempt entity must issue a new certificate if any of the information changes.										
Signature of Authorized Exempt Entity			Printed Name of Authorized Exempt Entity			Date (MM/DD/YYYY)				
			Kenneth Murphy, City Administrator			____/____/____				

Contractor	The Missouri exempt entity named above hereby authorizes the purchase, without sales tax, of tangible personal property to be incorporated or consumed in the construction project identified herein and no other, pursuant to <b>Section 144.062, RSMo</b> . Under penalties of perjury, I declare that the above information and any attached supplement is true, complete, and correct.									
	Name of Purchasing Contractor			Signature of Contractor			Date (MM/DD/YYYY)			
	Address			City		State		ZIP Code		

Subcontractor	Contractors - Present this to your supplier in order to purchase the necessary materials tax exempt. Complete the Subcontractor portion if extending the certificate to your subcontractor. The contractor must sign the form in the space provided below.									
	Name of Purchasing Subcontractor									
	Address			City		State		ZIP Code		
	Signature of Contractor			Contractor's Printed Name			Date (MM/DD/YYYY)			

Form 5060 (Revised 11-2019)

Taxation Division  
P.O Box 358  
Jefferson City, MO 65105-0358

Phone: (573) 751-2836  
Fax: (573) 522-1666  
E-mail: [salestaxexemptions@dor.mo.gov](mailto:salestaxexemptions@dor.mo.gov)

Visit <http://dor.mo.gov/business/sales/sales-use-exemptions.php> for additional information.







**DIVISION OF  
LABOR  
STANDARDS**

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS  
**AFFIDAVIT  
COMPLIANCE WITH THE PREVAILING WAGE LAW**

I, \_\_\_\_\_, upon being duly sworn upon my oath state that: (1) I am the  
*(Name)*  
\_\_\_\_\_ of \_\_\_\_\_; (2) all requirements of  
*(Title)* *(Name of Company)*  
§§ 290.210 to 290.340, RSMo, pertaining to the payment of wages to workers employed on public works projects  
have been fully satisfied with regard to this company's work on \_\_\_\_\_;  
*(Name of Project)*

(3) I have reviewed and am familiar with the prevailing wage rules in 8 CSR 30-3.010 to 8 CSR 30-3.060; (4) based upon my knowledge of these rules, including the occupational titles set out in 8 CSR 30-3.060, I have completed full and accurate records clearly indicating (a) the names, occupations, and crafts of every worker employed by this company in connection with this project together with an accurate record of the number of hours worked by each worker and the actual wages paid for each class or type of work performed, (b) the payroll deductions that have been made for each worker, and (c) the amounts paid to provide fringe benefits, if any, for each worker; (5) the amounts paid to provide fringe benefits, if any, were irrevocably made to a fund, plan, or program on behalf of the workers; (6) these payroll records are kept and have been provided for inspection to the authorized representative of the contracting public body and will be available, as often as may be necessary, to such body and the Missouri Department of Labor and Industrial Relations; (7) such records shall not be destroyed or removed from the state for one year following the completion of this company's work on this project; and (8) there has been no exception to the full and complete compliance with the provisions and requirements of Annual Wage Order No. \_\_\_\_\_ Section \_\_\_\_\_ issued by the Missouri Division of Labor Standards and applicable to this project located in \_\_\_\_\_ County, Missouri, and completed on the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

The matters stated herein are true to the best of my information, knowledge, and belief. I acknowledge that the falsification of any information set out above may subject me to criminal prosecution pursuant to §§290.340, 570.090, 575.040, 575.050, or 575.060, RSMo.

\_\_\_\_\_  
**Signature**

Subscribed and sworn to me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.  
My commission expires \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
**Notary Public**

\_\_\_\_\_  
**Receipt by Authorized Public Representative**



# Missouri

## Division of Labor Standards

### WAGE AND HOUR SECTION



MICHAEL L. PARSON, Governor

## Annual Wage Order No. 29

Section 048  
**JACKSON COUNTY**

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by

Todd Smith, Director  
Division of Labor Standards

Filed With Secretary of State: \_\_\_\_\_ **March 10, 2022**

Last Date Objections May Be Filed: **April 11, 2022**

Prepared by Missouri Department of Labor and Industrial Relations

Building Construction Rates for  
JACKSON County

Section 048

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	\$67.05
Boilermaker	\$37.33*
Bricklayer	\$59.20
Carpenter	\$60.21
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	\$54.35
Plasterer	
Communications Technician	\$58.66
Electrician (Inside Wireman)	\$66.21
Electrician Outside Lineman	\$64.01
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	\$37.33*
Glazier	\$56.84
Ironworker	\$66.35
Laborer	\$49.04
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	\$54.39
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	\$60.71
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	\$50.15
Plumber	\$74.12
Pipe Fitter	
Roofer	\$57.93
Sheet Metal Worker	\$71.70
Sprinkler Fitter	\$61.32
Truck Driver	\$47.50
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

\*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

\*\*The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in Section 290.210 RSMo.

Heavy Construction Rates for  
JACKSON County

Section 048

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	\$60.95
Millwright	
Pile Driver	
Electrician (Outside Lineman)	\$84.43
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	\$49.28
General Laborer	
Skilled Laborer	
Operating Engineer	\$58.78
Group I	
Group II	
Group III	
Group IV	
Truck Driver	\$50.64
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate Sheet.

\*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

\*\*The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in Section 290.210 RSMo.

# OVERTIME and HOLIDAYS

## OVERTIME

For all work performed on a Sunday or a holiday, not less than twice (2x) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

For all overtime work performed, not less than one and one-half (1½) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, "**overtime work**" shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

## HOLIDAYS

January first;  
The last Monday in May;  
July fourth;  
The first Monday in September;  
November eleventh;  
The fourth Thursday in November; and  
December twenty-fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.



## Statement of Compliance

(To be submitted with weekly payroll if not using form WH-347)

I hereby certify the following:

- 1) The payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
- 2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
- 3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

---

Signature of Contractor or Subcontractor

---

Date



**AFFIDAVIT of COMPLIANCE**

**(Section 285.530.2, Revised Statutes of Missouri)**

State of Missouri                    )  
  ) ss:  
County of \_\_\_\_\_ )

Now this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, the undersigned, being first duly sworn, deposes and says:

1. I am more than 18 years of age.
2. I make this affidavit from my personal knowledge of the facts stated herein or upon information and facts available to me as a duly authorized owner, partner, corporate, or LLC officer or Human Relations Director of \_\_\_\_\_ (“Contractor”).
3. I am authorized to make this affidavit on behalf of Contractor.
4. I state and affirm that Contractor is enrolled and is currently participating in E-Verify, a federal work authorization program or another equivalent electronic verification of work authorization program operated by the United States Department of Homeland Security under the Immigration Reform and Control Act of 1986.
5. Further, Contractor does not knowingly employ any person who is an unauthorized alien.
6. Further, Contractor has performed an electronic verification check as described above on all workers hired since January 1, 2009 or obtained documents required for completion of a Federal I-9 form before it began participating in E-Verify.
7. Attached to this affidavit is a true and accurate copy of Contractor’s Memorandum of Understanding with the United States concerning the use of E-Verify.

I certify under penalty of perjury that the statements above are complete, true and accurate to the best of my knowledge and belief.

\_\_\_\_\_  
Authorized Agent, Partner, Owner or Officer

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

If Contractor has a Human Relations Director or equivalent that person must sign as an affiant as well.

I certify under penalty of perjury that the statements above are complete, true and accurate to the best of my knowledge and belief.

\_\_\_\_\_  
Human Relations Director

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

Subscribed and sworn to before me this \_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public

My commission expires:

\_\_\_\_\_

This form is promulgated pursuant to 15CSR 60-15.020. Use of this form is not required but the Attorney General has deemed this affidavit sufficient in form to satisfy the requirements of section 285.540 RSMo., Supp. 2008.

## NOTICE TO PROCEED

Owner: City of Grain Valley, MO Owner's Project No.: \_\_\_\_\_  
Engineer: Lamp Rynearson Engineer's Project No.: 0322006.02  
Contractor: \_\_\_\_\_ Contractor's Project No.: \_\_\_\_\_  
Project: Buckner Tarsney Road Waterline Extension  
Contract Name: Buckner Tarsney Road Waterline Extension  
Effective Date of Contract: \_\_\_\_\_

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[date Contract Times are to start]** pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement: **[Select one of the following two alternatives, insert dates or number of days, and delete the other alternative.]**

The date by which Substantial Completion must be achieved is **[date for Substantial Completion, from Agreement]**, and the date by which readiness for final payment must be achieved is **[date for readiness, from Agreement]**.

**[or]**

The number of days to achieve Substantial Completion is **[number of days, from Agreement]** from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of **[date, calculated from commencement date above]**; and the number of days to achieve readiness for final payment is **[number of days, from Agreement]** from the commencement date of the Contract Times, resulting in a date for readiness for final payment of **[date, calculated from commencement date above]**.

Before starting any Work at the Site, Contractor must comply with the following:

**[Note any access limitations, security procedures, or other restrictions]**

Owner: City of Grain Valley, MO  
By (signature): \_\_\_\_\_  
Name (printed): Kenneth Murphy  
Title: City Administrator  
Date Issued: \_\_\_\_\_  
Copy: Engineer



# CONTRACTOR'S AFFIDAVIT AND RELEASE FOR PARTIAL PAYMENT

Application for Payment No.: \_\_\_\_\_

Application for Payment Application Date: \_\_\_\_\_

\_\_\_\_\_ ("Contractor") has entered into a Contract with the City of Grain Valley, Missouri ("Owner") to furnish labor, materials, equipment and services for the construction of improvements located at \_\_\_\_\_ ("Project")

For and in consideration of the above-said progress payment under the said Contract, the sufficiency of which is hereby acknowledged, Contractor upon its oath states:

1. Contractor, in making this request for payment, hereby certifies that all work, materials, and services required to date under said Contract have been furnished and that the work has been completed in a satisfactory and workmanlike manner and in compliance with drawings, specifications, instructions and Contract Documents furnished to the Contractor.
  
2. Contractor also certifies that all work, labor, materials, machinery, and equipment furnished by the Contractor through the date of the last previous Application for payment have been paid for by the Contractor and that there are no amounts unpaid in favor of any subcontractor or materialman or any other person furnishing labor and materials to said Contractor for such period and utilized in the performance of the obligations of the Contractor under the Contract.
  
3. Contractor warrants and represents that through the date of this Application for Payment it has complied with all applicable laws and requirements of the Contract Documents, including prevailing wage Laws.
  
4. It is further certified that all amounts, including taxes, required by law or by agreement, to be withheld from employees' wages have been withheld and distributed in the manner provided by law or by the Contract.
  
5. Except for the amount of retainage, Contractor hereby releases, relinquishes, discharges and waives any and all rights, and claims arising out of labor, services, equipment, and/or materials and supplies ordered, furnished or provided to or in connection with the construction of the Project through the Application for Payment Date stated above, whether such rights or claims arise by virtue of contract, statute, ordinance, regulation, constitution, common law, or otherwise.

CONTRACTOR

BY: \_\_\_\_\_

(authorized signature)

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

STATE OF \_\_\_\_\_ )SS

COUNTY OF \_\_\_\_\_

The undersigned personally appeared before me, is personally known to me to be the \_\_\_\_\_ of the above-named Contractor, and after being duly sworn, stated that: he/she was and is duly authorized by the above-named Contractor to make the statements, undertakings, warranties, releases, waivers, and discharges contained in the above and forgoing Contractor's Affidavit and Release for Partial Payment; the statements made therein are true and correct; and, he/she executed the same for the purposes and consideration therein expressed.

Subscribed and sworn before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_





**CERTIFICATE OF SUBSTANTIAL COMPLETION**

DATE OF ISSUANCE \_\_\_\_\_

PROJECT: \_\_\_\_\_ PROFESSIONAL: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

OWNER: City of Grain Valley, MO  
711 Main Street  
Grain Valley, MO 64029  
CONTRACTOR: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

This Certificate of Substantial Completion applies to all Work under the Contract Documents pursuant to that certain Agreement between Owner and Contractor dated \_\_\_\_\_. This Certificate of Substantial Completion is hereby issued by Professional to Owner and Contractor.

The Work has been inspected by authorized representatives of Owner and Professional, and the Work is hereby declared to be substantially complete in accordance with the Contract Documents on \_\_\_\_\_. (DATE OF SUBSTANTIAL COMPLETION).

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of Contractor to complete all the Work in accordance with the Contract Documents within the time required by the Contract Documents.

The responsibilities between OWNER and CONTRACTOR for security, maintenance, heat, utilities, insurance and other items shall be as follows:

OWNER \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CONTRACTOR: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of Contractor's obligation to complete the Work in strict accordance with the Contract Documents and within the Contract Times.

Issued and Executed by Professional on \_\_\_\_\_  
Date

\_\_\_\_\_  
"Professional"

By: \_\_\_\_\_  
(Authorized Signature)

CONTRACTOR accepts this Certificate of Substantial Completion on \_\_\_\_\_  
Date

\_\_\_\_\_  
"Contractor"

By: \_\_\_\_\_  
(Authorized Signature)

OWNER accepts this Certificate of Substantial Completion on \_\_\_\_\_  
Date

City of Grain Valley, Missouri  
"Owner"

By: \_\_\_\_\_  
(Authorized Signature)





*Grain Valley*  
*Come Home To Opportunity*

**GENERAL CONDITIONS  
OF THE CONTRACT FOR CONSTRUCTION**

**City of Grain Valley, Missouri**

711 Main ♦ Grain Valley, MO 64029

Phone: (816) 847-6200 ♦ Fax: (816) 847-6209



# TABLE OF CONTENTS

ARTICLE 1 DEFINITIONS AND TERMINOLOGY .....	1
1.01 Defined Terms .....	1
1.02 Furnish, Install, Perform, Provide .....	4
ARTICLE 2 PRELIMINARY MATTERS.....	4
2.01 Delivery of Bonds .....	4
2.02 Copies of Documents .....	4
2.03 Before Starting Construction.....	4
2.04 Preliminary Schedules.....	5
2.05 Audio/Video Tape Recordings of Surface.....	5
2.06 Preconstruction Conference .....	6
2.07 Commencement of Contract Times .....	6
2.08 Starting the Project.....	6
2.09 Erosion Control.....	6
ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE .....	7
3.01 Intent.....	7
3.02 Reference to Standards and Specifications of Technical Societies; Reporting and Resolving Discrepancies ...	7
3.03 Contractor's Representations .....	7
3.04 Amending Contract Documents.....	8
3.05 Reuse of Documents .....	8
ARTICLE 4 AVAILABILITY OF LANDS: PHYSICAL CONDITIONS: REFERENCE POINTS .....	8
4.01 Availability of Lands.....	8
4.02 Subsurface and Physical Conditions .....	8
4.03 Underground Facilities.....	9
4.04 Reserved .....	9
4.05 Hazardous Environmental Conditions at Site .....	9
4.06 Borrow and Waste Sites .....	10
ARTICLE 5 INSURANCE AND BONDS.....	10
5.01 Contractor's Liability Insurance.....	10
5.02 Commercial General Liability.....	10
5.03 Automobile Liability.....	11
5.04 Workers' Compensation Insurance.....	11
5.05 Miscellaneous Liability Insurance .....	11
5.06 General Requirements For Liability Insurance Coverages .....	11
5.07 Property Insurance .....	13
5.08 Bonds .....	14
ARTICLE 6 CONTRACTOR'S RESPONSIBILITY .....	14
6.01 General.....	14
6.02 Supervision.....	14
6.03 Labor and Construction Procedures .....	14
6.04 Materials and Equipment.....	16
6.05 Quality of Materials and Equipment.....	17
6.06 Schedule.....	17
6.07 "Or-Equal" Items .....	17
6.08 Substitutions.....	18
6.09 Concerning Subcontractors, Suppliers and Others.....	19
6.10 Patent Fees and Royalties.....	20
6.11 Permits and Fees .....	20
6.12 Laws and Regulations .....	20
6.13 Prevailing Wage Rates .....	20
6.14 Taxes.....	21
6.15 Use of Premises .....	22
6.16 Site Cleanup.....	22
6.17 Loading of Structures .....	22
6.18 Record Documents .....	22
6.19 Safety and Protection .....	22
6.20 Safety Representative .....	23
6.21 Emergencies.....	23
6.22 Submittals.....	23
6.23 Contractor's Warranty.....	24
6.24 Continuing the Work .....	25
6.25 Indemnification .....	25
6.26 Survival of Obligations.....	26

ARTICLE 7 OTHER WORK .....	26
7.01 Related Work at Site.....	26
7.02 Coordination .....	26
7.03 Liability.....	27
ARTICLE 8 OWNER'S RESPONSIBILITIES .....	27
8.01 Termination of Professional .....	27
8.02 Data and Information .....	27
8.03 Limitations on Owner's Responsibilities .....	27
ARTICLE 9 PROFESSIONAL'S STATUS DURING CONSTRUCTION .....	27
9.01 General.....	27
9.02 Visits to Site.....	28
9.03 Project Representation .....	28
9.04 Clarifications and Interpretations .....	28
9.05 Authorized Variations in Work .....	28
9.06 Rejecting Defective Work .....	28
9.07 Submittals.....	28
9.08 Change Orders .....	28
9.09 Payments.....	28
9.10 Determinations for Unit Prices .....	28
9.11 Limitations on Professional's Responsibilities .....	28
9.12 Terminology.....	29
ARTICLE 10 CHANGES IN THE WORK AND CLAIMS.....	29
10.01 Authorized Changes in Work .....	29
10.02 Unauthorized Changes in Work.....	29
10.03 Notice to Surety .....	29
10.04 Claims.....	29
ARTICLE 11 CHANGE OF CONTRACT PRICE .....	30
11.01 Contract Price.....	30
11.02 Change.....	30
11.03 Determination of Adjustment .....	30
11.04 Cost of the Work.....	30
11.05 Costs Excluded.....	31
11.06 Contractor's Fee .....	32
11.07 Submission of Itemized Costs .....	32
11.08 Allowance .....	32
ARTICLE 12 CHANGE OF CONTRACT TIMES .....	33
12.01 Claims for Additional Time .....	33
12.02 Delays of Contract Times .....	33
12.03 Delay Damages .....	33
12.04 Liquidated Damages.....	34
ARTICLE 13 TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK.....	34
13.01 Access to Work.....	34
13.02 Tests and Inspections.....	34
13.03 Uncovering Work .....	34
13.04 Owner May Stop the Work.....	35
13.05 Correction or Removal of Defective Work.....	35
13.06 Guarantee Period .....	35
13.07 Acceptance of Defective Work.....	35
13.08 Owner May Correct Defective Work .....	36
ARTICLE 14 PAYMENTS TO CONTRACTOR AND COMPLETION .....	36
14.01 Contract Price.....	36
14.02 Basis Of Progress Payments .....	36
14.03 Applications For Payment.....	36
14.04 Approval For Payment.....	37
14.05 Decisions To Withhold Approval.....	37
14.06 Progress Payments .....	38
14.07 Failure Of Payment.....	38
14.08 Substantial Completion.....	38
14.09 Partial Occupancy Or Use .....	39
14.10 Final Completion And Final Payment .....	39

ARTICLE 15 SUSPENSION OF WORK AND TERMINATION .....	40
15.01 Termination by Owner for Cause .....	40
15.02 Notice of Termination.....	40
15.03 Suspension by the Owner for Convenience.....	41
15.04 Owner's Termination For Convenience .....	41
ARTICLE 16 DISPUTE RESOLUTION .....	42
16.01 Methods and Procedures.....	42
16.02 Continuing Performance .....	42
16.03 Exceptions .....	42
ARTICLE 17 MISCELLANEOUS.....	42
17.01 Notice .....	42
17.02 Rights and Remedies .....	43
17.03 Buy American Requirements .....	43
17.04 Successors and Assigns.....	43
17.05 Records .....	43
17.06 General.....	43





# GENERAL CONDITIONS

## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 ..... Defined Terms

A. Wherever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

1. Abbreviations - Wherever in these specifications and Contract Documents the following abbreviations are used, they shall be the latest year of adoption or revision, unless otherwise specified:

A.A.S.H.T.O.	American Association of State Highway and Transportation Officials
A.C.I.	American Concrete Institute
A.I.S.C.	American Institute of Steel Construction
A.P.W.A. Association	Kansas City Metropolitan Chapter of the American Public Works Association
A.R.E.A.	American Railway Professionaling Association
A.S.T.M.	American Society for Testing and Materials
A.W.S.	American Welding Society
A.W.W.A.	American Water Works Association
C.R.S.I.	Concrete Reinforcing Steel Institute
M.C.I.B.	Midwest Concrete Industry Board, Inc.
MoDOT	Missouri Highway and Transportation Department
M.S.S.H.C.	Missouri Standard Specifications for Highway Construction
U.S.A.S.I.	United States of America Standards Institute
U.B.C.	Uniform Building Code
B.O.R.	Board of Outdoor Recreation
I.S.S.A	International Slurry Surfacing Association

2. Addenda - Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the Bidding Documents or the Contract Documents.

3. Agreement - The written agreement between Owner and Contractor covering the Work to be performed; other Contract Documents are attached to or referred to in the Agreement and are made a part thereof as provided therein.

4. Application for Payment - The form provided by Owner which is to be used by Contractor in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

5. Asbestos - Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

6. Bonds - Performance and Payment Bonds and any other instruments of security.

7. Change Order - Contractor's and Owner's and agreement with respect to an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement, as set forth in Paragraph 10.01 B.

8. Contract Documents - The Agreement, all Addenda which pertain to the Contract Documents, and identified in the Agreement, the Bonds, these General Conditions, the Supplementary Conditions, if any, the Specifications and the Drawings as the same are more specifically identified in the Agreement, any other document identified in the Agreement as part of the Contract Documents, and Modifications issued after execution of the Agreement. A Modification is: (a) a written amendment to the Contract signed by both parties; (b) a Change Order, or; (c) a Field Order. Shop Drawings, Submittals and reports and drawings of subsurface and physical conditions identified in Exhibit A to the Agreement are not Contract Documents.

9. Contract - The Contract Documents form the Contract. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior representations or agreements, either written or oral. The Contract may be amended or modified only by a written Modification defined above. The Contract Documents shall not be construed to create a contractual relationship of any kind between the Owner and a Subcontractor or any lower-tier Subcontractor of any tier or a Supplier.

10. Contract Price - The moneys payable by Owner to Contractor under the Contract Documents as stated in the Agreement.
11. Contract Times - The number of calendar days, or the completion dates stated in the Agreement: (i) to achieve Substantial Completion, and (ii) to achieve Final Completion.
12. Contractor - The person, firm, or corporation, with whom Owner has entered into the Agreement.
13. Day - a calendar day of 24 hours measured from midnight to the next midnight.
14. Defective - An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to Professional's recommendation of final payment.
15. Drawings - The drawings which show the character and scope of the Work to be performed and which have been prepared or provided by Professional and are referred to in the Contract Documents. Shop drawings are not Drawings as so defined.
16. Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
17. Field Order - A written order issued by Professional or Owner which orders minor changes in the Work in accordance with Paragraph 10.01 E., but which does not involve a change in the Contract Price or the Contract Times.
18. Final Completion - Final Completion shall mean the date upon which the Professional certifies that the Work has been completed in strict accordance with the terms and conditions of the Contract Documents, including all Punch List items, that all documents and information required by the Contract Documents have been submitted to Owner by Contractor and that the entire balance of the Contract Price is due and payable to Contractor.
19. General Requirements - Section VII of the Contract Documents. The General Requirements pertain to all sections of the Specifications.
20. Hazardous Waste - The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
21. Laws and Regulations- Any and all applicable laws, rules, regulations, ordinances and codes and interpretations thereof and any orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.
22. Liens - Liens, charges, security interests or encumbrances upon real property, Project funds or personal property.
23. Lump Sum Price Contract - A lump sum price contract is a contract for which compensation for the Work is based on one lump sum amount without regard to any units or portions of the Work accomplished.
24. Notice of Award - The written notice by Owner to the apparent successful bidder stating that upon compliance by the apparent successful Bidder with the conditions precedent enumerated therein, within the time specified, Owner will sign and deliver the Agreement.
25. Notice to Proceed - A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform Contractor's obligations under the Contract Documents.
26. Owner - The City of Grain Valley, Missouri with whom Contractor has entered into the Agreement and for whom the Work is to be provided.
27. Partial Utilization - Placing a portion of the Work in service for the purpose for which it is intended (or a related purpose) before reaching Substantial Completion for all the Work.
28. PCBs - Polychlorinated biphenyls.
29. Pavement - Rigid or flexible type riding surface placed upon a previously prepared Sub-grade or base.

30. Petroleum - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline's, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.
31. Product Data - Illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.
32. Professional - The person, firm or corporation named as such in the Agreement.
33. Project - The total construction of which the Work to be provided under the Contract Documents may be the whole or a part as indicated elsewhere in the Contract Documents.
34. Punch List - The list of items, prepared in connection with the inspection of the Project by the Professional in connection with Substantial Completion of the Work or a portion of the Work, which the Owner's Representative or Professional has designated as remaining to be performed, completed or corrected before the Work will be accepted by the Owner.
35. Radioactive Material - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time.
36. Resident Project Representative - The authorized representative of Professional who is assigned to the Project site or any part thereof.
37. Samples - Physical examples of materials, equipment or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. Site - Lands or areas indicated in the Contract Documents as being furnished by Owner which are designated for the use of the Contractor.
39. Shop Drawings - All drawings, diagrams, illustrations, performance charts, instructions, brochures, schedules and other data which are specifically prepared by or for Contractor to illustrate some portion of the Work.
40. Specifications - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.
41. Standard Specifications - The officially adopted "Standard Specifications" as adopted by the Owner.
42. Subcontractor - Any individual or entity having a direct contract with Contractor for the performance of the Work at the Site or any person or entity having a contract with a Subcontractor or any lower tier Subcontractor for the performance of part of the Work at the Site.
43. Street, Road or Alley - The whole area within the right-of-way limits.
44. Sub-Grade - That portion of the construction area which has been prepared as specified and upon which a layer of specified material, base, sub-base course, pavement, or other improvement is to be placed.
45. Substantial Completion - The Work (or a specified part thereof) has progressed to the point where, in the opinion of Professional as evidenced by Professional's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended and Owner has obtained any approvals, permits or certificates of occupancy from any applicable governmental entity or agency so that the Work can be utilized for its intended purposes. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.
46. Supplementary Conditions - The part of the Contract Documents which amends or supplements these General Conditions.
47. Supplier - A manufacturer, fabricator, distributor, material man or vendor having a direct contract with Contractor or with any Subcontractor or with any lower tier Subcontractor to furnish materials or equipment to be incorporated in the Work.

48. Underground Facilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

49. Unit Price Work - Work to be paid for on the basis of unit prices.

50. Work - The supervision, labor, equipment, tools, material, supplies, incidentals, operations and activities required by the Contract Documents or reasonably inferable by Contractor therefrom as necessary to produce the results intended by the Contract Documents in a safe, expeditious, orderly, and workmanlike manner, and in the best manner known to each respective trade. The Work may constitute the whole or part of the Project.

51. Work Change Directive - A written directive to Contractor, issued on or after the Effective Date of Agreement and signed by Owner and approved by Professional, ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in Sections 4.02 or 4.03 or to emergencies under Paragraph 6.21. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change directed or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times as provided in Article 10.

52. Written Amendments - A written amendment of the Contract Documents, signed by Owner and Contractor on or after the Effective Date of the Agreement and normally dealing with the non-engineering or non-technical matters rather than strictly construction-related aspects of the Contract Documents.

#### 1.02 Furnish, Install, Perform, Provide

A. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site ready for use or installation and in usable or operable condition.

B. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

C. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

D. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

### **ARTICLE 2 - PRELIMINARY MATTERS**

#### 2.01 Delivery of Bonds

A. When Contractor delivers the executed Agreement to Owner, Contractor shall also deliver to Owner such Bonds as Contractor is required to furnish by the Contract Documents.

#### 2.02 Copies of Documents

A. Owner shall furnish to Contractor up to five (5) copies of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

#### 2.03 Before Starting Construction

A. Since the Contract Documents are complimentary, before starting each portion of the Work, the Contractor shall carefully study and compare the various Drawings and other Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the Site affecting it. These obligations are for the purpose of facilitating construction by the Contractor; however, any errors, inconsistencies or omissions discovered by the Contractor shall be reported promptly to the Professional as a request for information in such form as the Professional may require. Contractor shall not be liable to Owner or Professional for failure to report

any error, inconsistencies or omissions in the Contract Documents, unless Contractor had actual knowledge thereof or should reasonably have known thereof.

B. Any design error, inconsistencies or omissions noted by the Contractor during any review of the Contract Documents shall be reported promptly to the Professional.

C. If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Professional in response to the Contractor's notices or requests for information pursuant to Subparagraphs 2.03 A. or 2.03 B., the Contractor shall make Claims as provided in Articles 11 and/or 12. If the Contractor fails to perform the obligations of Subparagraphs 2.03 A. or 2.03 B., the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations.

D. Before any Work at the site is started, Contractor shall deliver to Owner, with a copy to Professional, certificates (and other evidence of insurance requested by Owner) which Contractor is required to purchase and maintain in accordance with Sections 5.01, 5.02, 5.03, 5.04, 5.05 and 5.06 and 5.07.

#### 2.04 Preliminary Schedules

A. Within ten (10) days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements) Contractor shall submit to Professional for its timely review: (a) a preliminary construction schedule; and (b) a preliminary schedule for Submittals which will list each required submittal and the times for submitting, reviewing, and process such Submittals. The construction schedule shall be in a detailed format satisfactory to the and the Professional which shall also: (1) provide a graphic representation of all activities and events that will occur during performance of the Work; (2) identify each phase of construction and occupancy; and (3) set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter referred to as Milestones). If Professional has a reasonable objection to the construction schedule or schedule for Submittals by Contractor, the construction schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Professional and re-submitted for acceptance. Such acceptance will not impose on Professional or Owner responsibility for the construction schedule or schedule for Submittals, schedule, for sequencing, scheduling or progress of the Work nor interference with or relieve Contractor from Contractor's full responsibility thereof.

#### 2.05 Audio/Video Tape Recordings of Surface

A. Before starting the Work, the Contractor shall record the following surface conditions in audio and video form in the presence of the Professional and Owner in the following means:

1. The following location information shall be provided on color audio/video tape recording while walking the construction route.

a. Audio: Each recording shall begin with a verbal description of the current date, project name and municipality and be followed by the general location, (i.e., name of street, viewing side and direction of progress).

b. Video: Transparent information must appear on the viewing screen. This information will consist of the date and time of recording. The date information will contain the month, day and year.

c. Digital: To preclude the possibility of tampering or editing in any manner, all video recordings must, by electronic means, display continuously and simultaneously generated transparent digital information to include the date and time of recording. The date information will contain the month, day and year.

2. The taped coverage shall include all surface features located within the zone of influences of construction supported by appropriate audio description. Audio description shall be made simultaneously with video coverage. Such coverage shall include, but not be limited to, all existing driveways, sidewalks, fences, curbs, ditches, roadways, landscaping, trees, culverts, headwalls, retaining walls, or buildings located within such zone of influence. Particular and detailed attention shall be given to any defects noted, such as cracks, disturbed areas, damaged items, or as may be required by the Professional. It is the intent of this coverage to accurately and clearly document pre-existing conditions and especially any items that could result in construction claims. **The excavation areas shall be physically marked with high visibility fluorescent paint prior to video taping. The markings shall include the job number and stationing.**

3. The zone of influence shall be defined as an area within 30 feet of the proposed work, and an additional 20 feet of supplemental coverage shall be provided in residential areas.

4. The Contractor shall be able to televise and tape areas with paved roads, along co-owned easements through parks, lawns, and open fields. If video taping on private property, the Contractor shall give the Owner sufficient prior notice of such entry so that property owners may be advised of and their permission obtained for the work.

5. To produce the proper detail and perspective, adequate lighting will be required to fill in the shadow areas caused by trees, utility poles, road signs and other such objects in residential areas or as directed by the Professional.

6. Houses and buildings shall be identified visually by house number, when visible, in such a manner that structures of the proposed system, (i.e., manholes on a sewer system and hydrants on a water system), can be located by reference.

7. Panning rates and zoom-in, zoom-out rates shall be controlled sufficiently such that during playback will produce clarity of the object viewed. The playback picture shall be in focus and be of extreme clarity at all times.

8. All taping shall be done during times of good visibility. No taping shall be done during periods of visible precipitation, or when more than 10% of the ground area is covered with snow, unless otherwise authorized by the Professional.

9. Professional shall have the authority to designate what areas may be omitted or added for audio-video coverage.

10. All tapes (cassettes and cases) shall be properly identified by tape number, location and project name and municipality in a manner acceptable to the Professional.

11. A record of the contents of each tape shall be supplied by a run sheet identifying each segment in the tape by location, i.e., roll number, street or road viewing, tape counter number, viewing side, point starting from, traveling direction and ending destination point.

12. Any portion of the video tape recording not conforming to specifications shall be rejected.

13. Any taped coverage not acceptable to the owner shall be re-filmed at no additional charge. The Contractor shall reschedule unacceptable coverage five (5) days after being notified.

14. One original and two copies are to be provided. Original to Owner, one copy to Professional, and one copy to Contractor.

15. Payment will be at the contract lump sum price for Video Documentation which price shall include all labor, equipment, and materials necessary to complete the work.

16. The taping shall be performed while a representative of the City and Professional is present. The City shall be notified a minimum of 48 hours in advance.

#### 2.06 Preconstruction Conference

A. Within twenty (20) days after the Effective Date of the Agreement, but before Contractor starts the Work at the site, a conference attended by Contractor, Professional and others as appropriate will be held to discuss the schedules referred to in Section 2.04, to discuss procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, and to establish a working understanding among the parties as to the Work.

#### 2.07 Commencement of Contract Times

A. The Contract Times will commence to run on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within thirty (30) days after the Effective Date of the Agreement.

#### 2.08 Starting the Project

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run, but no Work shall be done at the Site prior to the date on which the Contract Times commence to run.

#### 2.09 Erosion Control

A. Contractor shall submit an erosion control plan for approval and shall implement the approved plan prior to any Work being performed.

## **ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**

### **3.01 Intent**

A. The Contract Documents comprise the entire agreement between Owner and Contractor concerning the Work. The Contract Documents are complimentary; what is called for by one is as binding as if called for by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed whether or not specifically called for at no additional cost to Owner. When words or phrases which have a well-known technical or construction industry or trade meaning are used to describe Work, materials or equipment, such words or phrases shall be interpreted in accordance with that meaning. Clarifications and interpretations of the Contract Documents shall be issued by Professional.

### **3.02 Reference to Standards and Specifications of Technical Societies; Reporting and Resolving Discrepancies**

A. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or Laws or Regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated in the Contract Documents.

B. No provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of Owner, Contractor or Professional, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Professional or Owner, or any of Professional's or Owner's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.

C. Except as otherwise specifically stated in the Contract Documents or as may be provided by a modification, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract Documents and:

1. the provisions of any standard, specification, manual, code or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
2. the provisions of any such Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

D. Drawings are intended to show general arrangements, design, and dimensions of the Work and are partly diagrammatic. Dimensions shall not be determined by scale or rule. If figured dimensions are lacking, they shall be supplied by the Professional on the Contractor's written request to the Professional. Where, on any Drawings, a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other like portions of the Work. Where ornaments or other details are indicated by starting only, such details shall be continued throughout the courses or parts in which they occur and shall also apply to all other similar parts in the Work, unless otherwise indicated. In case of differences between small and large scale drawings, the larger scale drawings shall govern.

### **3.03 Contractor's Representations**

A. Except as to any reported errors, inconsistencies or omissions, by executing the Contract, the Contractor represents the following:

1. The Contract Documents are sufficiently complete and detailed for the Contractor to (a) perform the Work required to produce the results intended by the Contract Documents and (b) comply with all the requirements of the Contract Documents; and
2. The Work required by the Contract Documents, including, without limitation, all construction details, construction means, methods, procedures and techniques necessary to perform the Work, use of materials, selection of equipment and requirements of product manufacturers are consistent with: (a) good and sound practices within the construction industry; (b) generally prevailing and accepted industry standards applicable to the Work; (c) requirements of any warranties applicable to the Work; and (d) all laws, ordinances, regulations, rules and orders which bear upon the Contractor's performance of the Work.

B. Execution of the Agreement by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents. Contractor represents that it has performed its own

investigation and examination of the Project site and its surroundings and satisfied itself before entering into this Contract as to:

1. conditions bearing upon transportation, disposal, handling and storage of materials;
2. the availability of labor, materials, equipment, water, electrical power, utilities and roads;
3. uncertainties of weather, river stages, flooding and similar characteristics of the site;
4. conditions bearing upon security and protection of material, equipment and Work in progress;
5. the form and nature of the Project site, including the surface and sub-surface conditions;
6. the extent and nature of Work and materials necessary for the execution of the Work and the remedying of any defects therein; and
7. the means of access to the site and the accommodations it may require and, in general, shall be deemed to have obtained all information as to risks, contingencies and other circumstances.

#### 3.04 Amending Contract Documents

A. The Contract Documents may be amended only by a Modification.

#### 3.05 Reuse of Documents

A. Neither Contractor nor any Subcontractor, Supplier, other person or organization performing or furnishing any of the Work under a direct or indirect contract with Owner shall have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof). They shall not reuse any of them on extensions of the Project or any other project without written consent of Owner and specific written verification or adaptation by the Professional who prepared the documents. This prohibition shall survive final payment, completion, acceptance of the Work, or termination or completion of the Contract. Nothing contained herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

### **ARTICLE 4 - AVAILABILITY OF LANDS: PHYSICAL CONDITIONS: REFERENCE POINTS**

#### 4.01 Availability of Lands

A. Contract Times: Owner shall obtain all lands and rights-of-way upon which the Work is located prior to the issuance of a notice to proceed, except as set forth in the Contract Documents. In the event Owner is unable to acquire all lands and rights-of-way prior to the issuance of the notice to proceed, Owner shall notify the Contractor of which lands and rights-of-way have not been obtained and will proceed with Work only upon lands and rights-of-way Owner has obtained. The Contractor recognizes this risk and this contingency has been included in the Contract Price. Owner, with reasonable promptness, shall obtain the lands and rights-of-way upon which the Work is located. In no event will the Contractor be entitled to monetary compensation for Owner's reasonable delay in obtaining the lands or rights-of-way, since this contingency has been included in the Contract Price. The Contractor's sole recovery will be in the form of an extension of time, if appropriate. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

#### 4.02 Subsurface and Physical Conditions

A. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions, other than Underground Facilities, which differ materially from those indicated in the Contract Documents, or (2) unknown physical conditions, other than Underground Facilities, of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the Contractor shall be given to the Professional promptly before conditions are disturbed, and in no event later than three (3) days after first observance of the conditions. The Professional will promptly investigate such conditions. If such conditions differ materially, as provided for above and cause an increase or decrease in the Contractor's cost of, or time required for performance of the Work, an equitable adjustment in the Contract Price or Contract Times, or both, shall be made, subject to the provisions and restrictions set forth herein. If Professional determines that the conditions at the site are not materially different from those indicated in the Contract Documents, and that no change in the terms of the Contract is justified, Professional will so notify the Contractor in writing. If the Contractor disputes the finding of the Professional that no change in the terms of the Contract is justified, Contractor shall proceed with the Work, taking whatever steps are necessary to overcome or correct such conditions so that Contractor can proceed in a timely manner. The Contractor shall have the right to file a Claim in accordance with the Contract Documents.

B. It is expressly agreed that no adjustment in the Contract Times or Contract Price shall be permitted, however, in connection with a concealed or unknown condition which does not differ materially from those conditions



disclosed or which reasonably should have been disclosed by the Contractor's (1) prior inspections, tests, reviews and preconstruction investigations for the Project, or (2) inspections, tests, reviews and preconstruction inspections which the Contractor had the opportunity to make or should have performed in connection with the Project. The Owner assumes no responsibility for any conclusions or interpretations based upon information relating to sub-surface or other site conditions made available by the Owner and marked "for informational purposes only." The Owner and Professional do not warrant the accuracy of any information relating to sub-surface conditions contained in reports, documents and drawings made available to Contractor marked "for informational purposes only" and such documents are not Contract Documents. Contractor may not rely upon the accuracy or completeness of such reports and drawings and should perform its own tests and investigations of the same. Contractor shall make no claim against the Owner or Professional for any inaccuracy of such information, reports, documents or drawings, including any Claim that the physical conditions are different than those indicated in such reports and drawings.

#### 4.03 Underground Facilities

A. The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to Owner or Professional by the Owners of such Underground Facilities or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Professional shall not be responsible for the accuracy or completeness of any such information; and
2. Contractor shall have full responsibility for reviewing and checking all such information and data, locating all Underground Facilities shown or indicated in the Contract Documents, coordination of the Work with the Owners of such Underground Facilities during construction, the safety and protection thereof as provided in Paragraph 6.21 and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

B. If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which Contractor could not reasonably have been expected to be aware of, Contractor shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by Paragraph 6.21) identify the Owner of such Underground Facility and give written notice thereof to that Owner and to Owner and Professional.

1. Professional will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility as provided in Article 6.20.
2. Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and which Contractor could not reasonably have been expected to be aware of. If the parties are unable to agree as to the amount or length thereof, Contractor may make a claim therefor as provided in Articles 11 and 12.

#### 4.04 Reserved

#### 4.05 Hazardous Environmental Conditions at Site

A. Contractor shall not be responsible for any Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work and which may present a substantial danger to persons or property exposed thereto in connection with the Work at the Site. Contractor shall be responsible for any such materials brought to the site by Contractor, Subcontractor, Suppliers or anyone else for whom Contractor is responsible.

B. Contractor shall immediately: (1) stop all Work in connection with such hazardous condition and in any area affected thereby (except in an emergency as required by Paragraph 6.21), and (2) notify Owner and Professional (and thereafter confirm such notice in writing). Owner shall promptly consult with Professional concerning the necessity for Owner to retain a qualified expert to evaluate such hazardous condition or take corrective action, if any. Contractor shall not be required to resume Work in connection with such hazardous condition or in any such affected area until after Owner has obtained any required permits related thereto and delivered to Contractor special written notice: (a) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (b) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or the amount or extent of any

adjustment, if any, in Contract Price or Contract Times as a result of such work stoppage or such special conditions under which Work is agreed by Contractor to be resumed, Contractor may make a claim therefor as provided in Articles 11 and 12.

C. If after receipt of such special written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe or does not agree to resume such Work under such special conditions, the Owner may order such portion of the Work that is in connection with such hazardous condition or in such affected area to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or the amount or extent of any adjustment, if any, in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a claim therefor as provided in Articles 11 and 12. Owner may have such deleted portion of the Work performed by Owners' own forces or others in accordance with Article 7.

D. It is acknowledged and agreed by Contractor that in no event shall Owner have any responsibility for any substance or material that is brought to the Project site by the Contractor, any Subcontractor of any tier, any materialman, Supplier or any person or entity for whom any of them is responsible. If Contractor brings to the Project site any hazardous material, toxic material or any material regulated by any Laws, Contractor shall notify Professional in writing and Contractor shall comply with all applicable Laws relating thereto and accept sole responsibility for compliance with all environmental quality standards, limitations and permit requirements promulgated thereunder, including without limitation federal, state and local air quality standards for fugitive dust control, prevention of surface and ground water contamination and hazardous and other waste disposal practices and procedures. Contractor shall utilize the highest degree of care in handling such materials and in taking all necessary precautions and measures to prevent any spills of such materials. The Contractor shall defend, indemnify and hold harmless the Owner from any and all claims, costs, losses, damages and expenses, including reasonable attorneys' fees and expert fees, prosecutions, payment of any and all fines or penalties, and the cost of abatement or remediation arising out of or relating to a hazardous condition created by Contractor, Subcontractor, Supplier, or anyone else for whom Contractor is responsible.

E. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers of the site in accordance with all applicable Laws.

#### 4.06 Borrow and Waste Sites

A. Unless borrow or waste sites are designated on the Plans or specified in the Supplementary Conditions, the Contractor shall secure and operate such sites at their own expense. These borrow and waste sites shall be operated in such a manner as to meet safety and health requirements all Laws and Regulations.

### **ARTICLE 5 - INSURANCE AND BONDS**

#### 5.01 Contractor's Liability Insurance

A. Contractor shall secure from the date of the Agreement and maintain for such periods of time as set forth below, insurance of such types and in such amounts specified in Sections 5.02 through 5.05, inclusive. The form of such insurance together with carriers thereof, shall satisfy the requirements set forth below in Sections 5.02 through 5.06, inclusive.

#### 5.02 Commercial General Liability

A. Contractor shall secure and maintain from the date of the Agreement and for a period of at least two (2) years from the date of Final Completion of the entire Work commercial general liability insurance ("CGL") with a combined single limit of not less than Two Million Dollars (\$2,000,000) per occurrence. If such CGL insurance contains a general aggregate limit, it shall separately apply to this Project. Such CGL insurance shall be on an occurrence basis.

B. CGL insurance shall be written on a comprehensive form and shall cover claims and liability in connection with or resulting from the Contractor's operations and activities under the Contract, for personal injuries, occupational sickness, disease, death or damage to property of others, including loss of use resulting therefrom, arising out of any operations or activities of the Contractor, its agents, or any Subcontractors of any tier or by anyone directly or indirectly employed by either of them.

C. CGL insurance shall include premises, operations, independent contractors, products-completed operations, personal injury and advertising injury and liability assumed under an insured contract (including the tort liability of another assumed in a business contract) coverages. In particular, and not by way of any limitation, the CGL insurance shall cover the Contractor's deference and indemnity obligations contained in the Contract Documents.

D. There shall be no endorsement or modification of the CGL policy limiting the scope of coverage for liability arising from blasting, explosion, collapse, or underground property damage.

E. "The City of Grain Valley, Missouri" shall be endorsed as an "additional insured" under the CGL policy. In lieu of naming the City of Grain Valley, Missouri as an additional insured, under the CGL policy, Contractor may satisfy such requirement by purchasing and maintaining an Owner's and Contractor's Protective Liability policy on behalf of Owner, as named insured with limits as provided for in Paragraph 5.02 A. The CGL policy shall also contain a "Separation of Insureds" provision. If Contractor's CGL policy does not contain a "Separation of Insureds" provision, Contractor's CGL policy shall be endorsed to provide cross-liability coverage.

F. Contractor waives all rights against Owner and its agents, officers, representatives and employees for recovery of damages to the extent those damages are covered by the CGL policy required hereunder.

#### 5.03 Automobile Liability

A. Contractor shall secure and maintain from the date of the Contract for Construction and for a period of at least two (2) years from the date of Final Completion of the entire Work, insurance, to be on comprehensive form, which shall protect Contractor against any and all claims for all injuries and all damage to property arising from the use of automobiles, trucks and motorized vehicles, in connection with the performance of Work under this Contract, and shall cover the operation on or off the site of the Work of all motor vehicles licensed for highway use whether they are owned, non-owned or hired. Such insurance shall include contractual liability coverage and shall provide coverage on the basis of the date of any accident. The liability limits under such policy shall not be less than Two Million Dollars (\$2,000,000) combined single limit for bodily injury and property damage per accident. "The City of Grain Valley, Missouri" shall be endorsed as an "additional insured" under the policy required by this Paragraph 5.03 A.

B. Contractor waives all rights against Owner and its agents, officers, directors and employees for recovery of damages to the extent such damages are covered by the automobile liability insurance required hereunder.

#### 5.04 Workers' Compensation Insurance

A. Contractor shall purchase and maintain workers' compensation insurance and employers' liability insurance which shall protect Contractor from claims for injury, sickness, disease or death of Contractor's employees or statutory employees. The insurance policies required hereunder shall include an "all states" or "other states" endorsement. In case any Work is sublet, Contractor shall require any Subcontractor of any tier to provide the insurance coverages required under this Section 5.04.

B. Contractor's workers' compensation insurance coverage shall be in compliance with all applicable Laws, including the statutes of the State of Missouri. Contractor's employers' liability coverage limits shall not be less than \$500,000 each accident for bodily injury by accident or \$500,000 each employee for bodily injury by disease.

C. Contractor waives all rights against Owner and its agents, officers and directors and employees for recovery of damages to the extent these damages are covered by the workers' compensation and/or employers' liability insurance required hereunder.

#### 5.05 Miscellaneous Liability Insurance

A. If required by the Supplementary Conditions, Contractor shall also secure and maintain Owner's and Contractor's Protective Liability insurance on behalf of Owner, as named insured, with a minimum limit of coverage as set forth in the Supplementary Conditions.

B. If the Work is to be performed in or adjacent to a railroad right-of-way or if required by the Supplementary Conditions, Contractor shall secure on behalf of such applicable railroad company, as named insured, railroad protective liability insurance with minimum liability limits set forth in the Supplementary Conditions. Such insurance shall protect and defend the railroad company against claims as a result of the operations of Contractor. This insurance shall be acceptable to the railroad and shall be maintained throughout the period when Contractor is working on or adjacent to property the railroad company has an interest. Contractor shall not enter upon the property the railroad company has an interest until such insurance is in effect.

C. Contractor shall also provide any type of insurance not described above which Contractor requires for its own protection or on account of any applicable Laws.

#### 5.06 General Requirements For Liability Insurance Coverages

A. All insurance coverages required herein shall be provided by insurance companies that are duly licensed to conduct business in the State of Missouri as an admitted carrier. The form and content of all insurance coverages provided by Contractor are subject to the approval of Owner. All required coverages shall be obtained and

paid for by Contractor. Any acceptance of the form, content or insurance company by Owner shall not relieve the Contractor from the obligation to provide the coverages required herein.

B. All insurance coverage procured by the Contractor shall be provided by insurance companies having policyholder ratings no lower than "A" and financial ratings not lower than "XII" in the Best's Insurance Guide, latest edition in effect as of the date of the Agreement, and subsequently in effect at the time of renewal of any policies required by the Contract Documents. Insurance coverages required hereunder shall not be subject to a deductible amount on a per-claim basis of more than \$10,000.00 and shall not be subject to a per-occurrence deductible of more than \$25,000.00. Insurance procured by Contractor covering the additional insureds shall be primary insurance and any insurance maintained by Owner shall be excess insurance.

C. All insurance required hereunder shall provide that the insurer's cost of providing the insureds a defense and appeal, including attorneys' fees, shall be supplementary and shall not be included as part of the policy limits but shall remain the insurer's separate responsibility. Contractor shall cause its insurance carriers to waive all rights of subrogation against the Owner and its officers, employees and agents.

D. The Contractor shall furnish the Owner with certificates, policies or binders which indicate the Contractor and Owner are covered by the required insurance showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates, policies or binders shall be submitted to Owner within ten (10) days from the date Contractor receives notice of the award of the Contract. All certificates, policies and binders shall be executed by a duly authorized agent of each of the applicable insurance carriers and shall contain the statement that: "The insurance covered by this certificate will not be canceled or altered except after thirty (30) days' written notice has been received by Owner." All certificates, policies and binders shall be in a form acceptable to the Owner. Contractor shall provide certified copies of all insurance policies required above within ten (10) days of Owner's written request for said copies.

E. With respect to all insurance coverages required to remain in force and affect after final payment, Contractor shall provide Owner additional certificates, policies and binders evidencing continuation of such insurance coverages along with Contractor's application for final payment and shall provide certificates, policies and binders thereafter as requested by Owner.

F. The maintenance in full current force and effect of such forms and amounts of insurance and bonds required by the Contract Documents shall be a condition precedent to Contractor's exercise or enforcement of any rights under the Contract Documents.

G. Failure of Owner to demand certificates, policies and binders evidencing insurance coverages required by the Contract Documents, acceptance by Owner of such certificates, policies and binders or failure of Owner to identify a deficiency from evidence that is provided by Contractor shall not be construed as a waiver of Contractor's obligations to maintain the insurance required by the Contract Documents.

H. The Owner shall have the right to terminate the Contract if Contractor fails to maintain the insurance required by the Contract Documents.

I. If Contractor fails to maintain the insurance required by the Contract Document, Owner shall have the right, but not the obligation, to purchase said insurance at Contractor's expense. If Owner is damaged by Contractor's failure to maintain the insurance required by the Contract Documents, Contractor shall bear all reasonable costs properly attributable to such failure.

J. By requiring the insurance set forth herein and in the Contract Documents, Owner does not represent or warrant that coverage and limits will necessarily be adequate to protect Contractor, and such coverages and limits shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

K. If Contractor's liability policies do not contain a standard separation of insureds provision, such policies shall be endorsed to provide cross-liability coverage.

L. If a part of the Work hereunder is to be sublet, the Contractor shall: (1) cover any and all Subcontractors in its insurance policies; (2) require each Subcontractor to secure insurance which will protect said Subcontractor and supplier against all applicable hazards or risks of loss designated in accordance with Article 5 hereunder; and (3) require each Subcontractor or supplier to assist in every manner possible in the reporting and investigation of any accident, and upon request, to cooperate with any insurance carrier in the handling of any claim by securing and giving evidence and obtaining the attendance of witnesses as required by any claim or suit.

M. It is understood and agreed that the insurance coverages required by the provisions of this Article 5 are required in the public interest and that the Owner does not assume any liability for acts of Contractor or Subcontractors of any tier or their employees in the performance of the Contract or Work.

#### 5.07 Property Insurance

A. The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the State of Missouri, as an admitted carrier, builder's risk insurance on the entire Work. Such insurance shall be written on a completed value form and in the amount of the initial Contract Price as well as subsequent modifications thereto for the entire Work. The insurance shall apply on a replacement cost basis.

B. The insurance as required in Paragraph 5.07 shall name as insureds the Owner, Contractor and all Subcontractors of any tier. The insurance policy shall contain a provision that the insurance will not be canceled, allowed to expire or materially changed until at least thirty (30) days prior written notice has been given to Owner.

C. The insurance as required in Paragraph 5.07 shall cover the entire Work, including reasonable compensation for Professional's services and expenses made necessary by an insured loss. Insured property shall include portions of the Work located away from the site but intended for use at the site and shall also cover portions of the Work in transit, including ocean transit. The policy shall include as insured property scaffolding, falsework, and temporary buildings located at the site. The policy shall cover the cost of removing debris, including demolition as may be made legally necessary by the operation of any law, ordinance or regulation.

D. The insurance required by Paragraph 5.07 shall be on an all risk form and shall be written to cover all risks of physical loss or damage to the insured party and shall insure at least against the perils of fire and extended coverage, theft, vandalism, malicious mischief, collapse, lightning, earthquake, flood, frost, water damage, windstorm and freezing.

E. If there are any deductibles applicable to the insurance required by Paragraph 5.07, Contractor shall pay any part of any loss not covered because of the operation of such deductibles.

F. The insurance as required in Paragraph 5.07 shall be maintained in effect until the earliest of the following dates:

1. the date which all persons and organization who are insureds under the policy agree in writing that it shall be terminated;
2. the date on which final payment of this Contract has been made by Owner to Contractor; or
3. the date on which the insurable interests in the property of all insureds other than the Owner have ceased.

G. Contractor shall purchase and maintain boiler and machinery insurance required by the Supplementary Conditions, which shall specifically cover such insured objects during installation until final acceptance by the Owner. This insurance shall name as insureds Owner, Contractor and Subcontractors of any tier in such Work.

H. The Owner and Contractor waive all rights against (1) each other and any of their subcontractors of any tier, suppliers, agents and employees, each of the other, (2) the Professional and Professional's consultants, and (3) separate contractors described in Article 6, if any, and any of their subcontractors of any tier, suppliers, agents and employees, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Section 5.07 or other insurance applicable to the Work, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require of the Professional, Professional's consultants, separate contractors described in Article 7, if any, and the Subcontractors of any tier, Suppliers, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, was at fault or was negligent in causing the loss and whether or not the person or entity had an interest in the property damaged.

I. A loss insured under Contractor's property insurance shall be adjusted by the Owner in good faith and made payable to the Owner for the insureds, subject to requirements of the Contract Documents. The Contractor shall pay Subcontractors of any tier their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors of any tier to make payments to their Sub-subcontractors in similar manner.

J. Partial occupancy or use shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

5.08 Bonds

A. The Contractor shall procure and furnish a Performance and Payment Bond in the form prepared by the Owner, in an amount equal to one hundred percent (100%) of the Contract Price, as well as adjustments to the Contract Price. The Performance Bond shall secure and guarantee Contractor's faithful performance of this Contract, including but not limited to Contractor's obligation to correct defects after final payment has been made as required by the Contract Documents. The Payment Bond shall secure and guarantee payment of all persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract. These Bonds shall be in effect through the duration of the Contract plus the Guarantee Period as required by the Contract Documents.

B. The bonds required hereunder shall be executed by a responsible surety licensed in the State of Missouri, with a Best's rating of no less than A/XII. The Contractor shall require the attorney in fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of this power of attorney indicating the monetary limit of such power.

C. If the surety of any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to conduct business in the State of Missouri is terminated, or it ceases to meet the requirements of this paragraph, Contractor shall within ten (10) days substitute another bond and surety, both of which must be acceptable to Owner. If Contractor fails to make such substitution, Owner may procure such required bonds on behalf of Contractor at Contractor's expense.

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

E. The Contractor shall keep the surety informed of the progress of the Work, and, where necessary, obtain the surety's consent to or waiver of: (1) notice of changes in the Work; (2) request for reduction or release of retention; (3) request for final payment; and (4) any other material required by the surety. The Owner shall be notified by the Contractor, in writing, of all communications with the surety. The Owner may, in the Owner's sole discretion, inform surety of the progress of the Work, any defects in the Work, or any defaults of Contractor under the Contract Documents and obtain consents as necessary to protect the Owner's rights, interest, privileges and benefits under and pursuant to any bond issued in connection with the Work.

F. Contractor shall indemnify and hold harmless the Owner and any agents, employees, representative or elected official of Owner from and against any claims, expenses, losses, costs, including reasonable attorneys' fees, as a result of any failure of Contractor to procure the bonds required by this Paragraph 5.08.

**ARTICLE 6 - CONTRACTOR'S RESPONSIBILITY**

6.01 General

A. The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. Contractor shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. Contractor shall be responsible to see that the finished Work strictly complies with the Contract Documents.

6.02 Supervision

A. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under the Contract. The Contractor shall supply sufficient and competent supervision and personnel, and sufficient material, plant, and equipment to prosecute the Work with diligence to insure completion thereof within the time specified in the Contract Documents, and shall pay when due any laborer, Subcontractor of any tier, or supplier. Contractor shall keep on the Work at all times during its progress, a competent resident superintendent, who shall not be replaced without written notice to Owner and Professional except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to the superintendent shall be as binding as if given to Contractor.

6.03 Labor and Construction Procedures

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours, and Contractor will not permit overtime work or the performance of the Work

on Saturday, Sunday or any legal holiday without Owner's written consent given after prior written notice to Professional.

B. The Contractor shall only employ labor on the Project or in connection with the Work capable of working harmoniously with all trades, crafts and any other individuals associated with the Project. The Contractor shall take all measures to minimize the likelihood of any strike, work stoppage or other labor disturbance. If the Work is to be performed by trade unions, the Contractor shall make all necessary arrangements to reconcile, without delay, damage or cost to the Owner and without recourse to the Professional or Owner, any conflict between the Contract Documents and any agreements or regulations of any kind at any time in force among members or councils which regulate or distinguish what activities shall not be included in the Work of any particular trade. In case the progress of the Work is affected by any undue delay in furnishing or installing any items or materials or equipment required under the Contract Document because of such conflict involving any such labor agreement or regulation, the Owner may require that other material or equipment of equal kind and quality be provided pursuant to a Change Order or Work Change Directive. Notwithstanding any other provision contained herein and superseding any contrary term expressed herein or in any of the Contract Documents, Contractor agrees that in the event of any strike, picket, sympathy strike, work stoppage, or other form of labor dispute (collectively referred to as "Disruption") at the Project site, whether that Disruption is in connection with Contractor, a Subcontractor of any tier, the Owner or any other contractor, subcontractor or supplier on this Project site, Contractor will continue to perform the Work required herein without interruption or delay. In the event Contractor fails to continue the performance of the Work included herein, without interruption or delay, because of such Disruption or other form of labor dispute, the Owner may terminate the services of Contractor after giving forty-eight (48) hours written notice of an intent to do so, or the Owner may invoke any of the rights set forth in the Contract Documents. Contractor expressly waives the right to any extension of time for any delay that may occur as the result of any Disruption, strike, picket, sympathy strike, work stoppage or other form of labor dispute at the Project site. Whenever Contractor has knowledge that any actual or potential Disruption or labor dispute is delaying or threatens to delay the timely performance of the Project, Contractor shall immediately notify Owner in writing.

C. The Contractor shall establish and maintain a permanent bench-mark to which access may be had during progress of the Work, and Contractor shall establish all lines and levels, and shall be responsible for the correctness of such. Contractor shall protect the established benchmarks and horizontal and vertical control points. Benchmarks and control points destroyed or that require relocation because of necessary construction activities shall be immediately reported to Professional. Contractor shall be fully responsible for all layout work for the proper location of Work in strict accordance with the Contract Documents. The Contractor shall establish and maintain alignment and grades, including the setting of all stakes, ranges, grid lines and other appurtenance facilities. Contractor shall carefully protect and maintain such stakes and keep the same uncovered for examination during the progress of the Work. Before starting construction on the site, the Contractor shall provide written assurances certifying that the monuments or markers which delineate the site boundaries are placed in the correct position and that the proposed new construction and site development work, as staked-out by the Contractor, are wholly within the limits of the Owner's ownership, leasehold or right-of-way. Contractor shall be responsible for the accurate replacement of any boundary markers which are disturbed, removed or destroyed during the performance of the Work.

D. The Contractor shall be responsible for the layout of the Work in the proper location and for any damage which may occur to the Work or the work of separate contractors, because of errors or inaccuracies in the layout of the Work.

E. The Contractor shall be responsible for the shoring required to protect its work or adjacent property and shall pay for any damage caused by failure to shore or by improper shoring or by failure to give proper notice. Shoring shall be removed only after completion of permanent supports.

F. During the performance of the Work, the Contractor shall be responsible for providing and maintaining warning signs, lights, signal devices, barricades, guard rails, fences, and other devices appropriately located on site which shall give proper and understandable warning to all persons of danger of entry onto land, structure, or equipment.

G. The Contractor shall be responsible for care of the Work and must protect same from damage or defacement until acceptance by the Owner. All damaged or defaced Work shall be repaired or replaced to the Owner's satisfaction, without cost to the Owner.

H. When requested by the Contractor, at no extra charge, shall provide scaffolds or ladders in place as may be required by the Professional or the Owner for examination of Work in progress or completed.

I. The Contractor shall coordinate all Work so there shall be no prolonged interruption of existing utilities, systems and equipment of Owner. Any existing plumbing, heating, ventilating, air conditioning, or electrical disconnection necessary, which affect portions of construction or building of the Project or any other building, must be

scheduled with the Owner and Professional to avoid any disruption of operation within the building under construction or other buildings or utilities. In no case shall utilities be left disconnected at the end of a work day or over a weekend. Any interruption of utilities, either intentionally or accidentally, shall not relieve the Contractor from repairing and restoring the utility to normal service. Repairs and restoration shall be made before the workers responsible for the repair and restoration leave the job.

J. The Contractor shall pump, bail, or otherwise keep any general excavations free of water. The Contractor shall keep all areas free of water before, during and after concrete placement.

K. The Contractor shall ensure that the Work is at all times performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the Work shall be free from all debris, building materials and equipment likely to cause hazardous conditions. Without limitation of any other provision of the Contract Documents, Contractor shall not interfere with the occupancy or beneficial use of (1) any areas and buildings adjacent to the site of the Work or (2) the Work in the event of partial occupancy. Contractor shall assume full responsibility for any damage to the property comprising the Project or to the owner or occupant of any adjacent land or areas resulting from the performance of the Work.

L. Contractor shall, and in accordance with any regulations or site rules presented by the Owner use only designated site entrances and roadways or use temporary entrances and roadways constructed by Contractor.

M. The Contractor shall not permit any workers to use any existing facilities at the Project site, including, without limitation, lavatories, toilets, entrances and parking areas other than those designated by Owner. The Contractor, Subcontractors of any tier, suppliers and employees shall comply with instructions or regulations of the Owner and Professional governing access to, operation of, and conduct while in or on the premises and shall perform all Work required under the Contract Documents in such a manner as not to unreasonably interrupt or interfere with the conduct of Owner's operations. Any request for Work, a suspension of Work or any other request or directive received by the Contractor from occupants of existing buildings shall be referred to the Professional for determination.

N. The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported in writing to the Professional and Owner within twenty-four (24) hours. During the progress of Work, Contractor shall verify all field measurements prior to fabrication of building components or equipment and proceed with the fabrication to meet field conditions. Contractor shall consult all Contract Documents to determine the exact location of all Work and verify spatial relationships of all Work. Any question concerning said location or spatial relationships shall be submitted to the Professional. Specific locations for equipment, pipelines, ductwork and other such items of Work, where not dimensioned on plans, shall be determined in consultation with Professional. Contractor shall be responsible for the proper fitting of the Work in place. The exactness of grades, elevations, dimensions, or locations given on any Drawings issued by the Professional, or the work installed by separate contractors, is not guaranteed by the Professional or the Owner. The Contractor shall, therefore, satisfy itself as to the accuracy of all grades, elevations, dimensions and locations. In all cases of interconnection of its Work with existing or other work, Contractor shall verify at the site all dimensions relating to such existing or other work. Any errors due to the Contractor's failure to so verify all such grades, elevations, locations or dimensions shall be promptly rectified by the Contractor without any additional cost to the Owner.

O. The Contractor shall be responsible for inspection of portions of the Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent Work.

P. Before ordering any materials or doing any Work, the Contractor and each Subcontractor shall verify measurements at the Project site and shall be responsible for the correctness of such measurements. No extra charge or compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings. Any difference which may be found shall be submitted to the Professional for resolution before proceeding with the Work. If a minor change in the Work is found to be necessary due to actual field conditions, the Contractor shall submit detailed drawings of such departure for the approval by the Professional before making the change.

#### 6.04 Materials and Equipment

A. Contractor shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.

B. Unless otherwise specifically noted, the Contractor shall provide and pay for supervision, labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other



facilities and services necessary for the proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated in the Work. Contractor shall arrange for and pay all fees and charges for installation of motors and other devices and connection to existing outside services and utilities necessary for the Work. Contractor shall pay for bills for utilities for the Contractor's use and consumption of utilities until the date of Substantial Completion. Contractor, unless otherwise provided for in the Special Conditions, shall provide an office and maintain the office for use by Contractor, Professional and Owner. The office shall be removed when directed by Owner. Contractor shall provide heat, air conditioning, ventilation, other environmental controls and shall take all actions necessary to protect all Work, materials and equipment against injury, damage or loss from theft, weather, vandalism, wetness, temperature and humidity conditions, dust and other adverse environmental conditions.

#### 6.05 Quality of Materials and Equipment

A. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by Professional, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents. No provision of any such instructions will be effective to assign to Professional, Owner or any of Professional's or Owner's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work.

B. Materials and workmanship shall be subject to inspection, examination, and test by the Professional at any and all times during manufacture, installation and construction of any of them, at places where such manufacture, installation or construction is performed.

#### 6.06 Schedule

A. Contractor shall submit to Professional for acceptance adjustments in the progress schedule to reflect the impact thereon of new developments. These will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto. The submission or acceptance of such schedules shall not change or modify the Contract Times. Adjustments in the progress schedule that will change the Contract Times or Milestones shall be submitted in accordance with Article 12. An adjustment in the Contract Times or Milestones may only be made by Change Order in accordance with Article 12 regardless of the submission of a progress schedule or acceptance of such schedule.

B. The Contractor shall monitor the progress of the Work for conformance with the requirements of the most recently approved schedule and shall promptly advise the Owner of any delays or potential delays. The accepted construction schedule shall be updated to reflect actual conditions. Contractor shall submit written progress reports and updated schedules to Professional and Owner with each Application for Payment showing actual progress of the Work compared with the scheduled and planned progress. In the event any schedule or progress report indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor and equipment and/or expediting delivery of materials, if necessary. In no event shall any progress report or construction schedule constitute an adjustment in the Contract Times, any Milestone Date or the Contract Price unless any such adjustment is agreed to by the Owner and authorized pursuant to Change Order.

C. In the event the Owner or Professional determines that the performance of the Work, as of a Milestone Date, has not progressed or reached the level of completion required by the Contract Documents, the Owner shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation, (1) working additional shifts or overtime, (2) supplying additional manpower, equipment, facilities, (3) expediting delivery of materials, and (4) other similar measures (hereinafter referred to collectively as Extraordinary Measures). Such Extraordinary Measures shall continue until the progress of the Work complies with the stage of completion required by the Contract Documents. The Owner's right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor's compliance with the construction schedule. The Contractor shall not be entitled to an adjustment in the Contract Price in connection with Extraordinary Measures required by the Owner under or pursuant to this Paragraph 6.06 C. The Owner may exercise the rights furnished the Owner under or pursuant to this Paragraph 6.06 C. as frequently as the Owner deems necessary to ensure that the Contractor's performance of the Work will comply with any Milestone Date or completion date set forth in the Contract Documents.

#### 6.07 "Or-Equal" Items

A. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by Professional if it is proven as set forth in this Section 6.07 that the material or equipment proposed is equivalent or equal to that named.

B. The standard products of manufacturers other than those specified will be accepted when, prior to the ordering or use thereof, it is proven to the satisfaction of the Professional that such products are equal in design, appearance, spare parts availability, strength, durability, usefulness, serviceability, operation cost, maintenance cost, and convenience for the purpose intended. Any general listings of approved manufacturers in any Contract Document shall be for informational purposes only and it shall be the Contractor's sole responsibility to ensure that any proposed "or equal" complies with the requirements of the Contract Documents.

C. In the event that Contractor desires to propose an "or equal" of any article, appliance, device or material, Contractor shall submit a written list of all proposed or equals that Contractor proposes to provide to the Professional and within ten (10) days from the execution of the Agreement. Within ten (10) days from the execution of the Agreement, the Contractor shall submit to Professional and a written and full description of the proposed "or equal" including all supporting data, including technical information, catalog cuts, warranties, test results, installation instructions, operating procedures, and similar information demonstrating that the proposed "or equal" strictly complies with the Contract Documents. The Professional shall take appropriate action with respect to the submission of a proposed "or equal" item. If Contractor fails to submit proposed "or equals" as set forth herein, it shall waive any right to supply such items. The Contract Price and Contract Times shall not be adjusted as a result of any failure by Contractor to submit proposed "or equals" as provided for herein. All documents submitted in connection with preparing an "or equal" shall be clearly and obviously marked as a proposed "or equal" submission.

D. No "or equal" items shall be installed or utilized until Professional's review is complete and approved in writing. No approvals or action taken by the Professional or shall relieve Contractor from its obligation to ensure that an "or equal" article, appliance, device or material strictly complies with the requirements of the Contract Documents. Contractor shall not propose "or equal" items in connection with Shop Drawings or other Submittals, and Contractor acknowledges and agrees that no approvals or action taken by the Professional or with respect to Shop Drawings or other Submittals shall constitute approval of any "or equal" item or relieve Contractor from its sole and exclusive responsibility. Any changes required in the details and dimensions indicated in the Contract Documents for the incorporation or installation of any "or equal" item supplied by Contractor shall be properly made and approved by the Professional at the expense of the Contractor. No "or equal" items will be permitted for components of or extensions to existing systems when, in the opinion of the Professional, the named manufacturer must be provided in order to insure compatibility with the existing systems, including, but not limited to, mechanical systems, electrical systems, fire alarms, smoke detectors, etc. No action will be taken by the Professional with respect to proposed "or equal" items prior to receipt of bids, unless otherwise noted in the Supplementary Conditions.

#### 6.08 Substitutions

A. If, after execution of the Contract or prior to submittal of applicable Shop Drawings, the Contractor desires to submit an alternate product or method in lieu of what has been specified or shown in the Contract Documents, which is not an "or equal" as set forth in Section 6.07, the Contractor may do so in writing and setting forth the following:

1. Full explanation of the proposed substitution and submittal of all supporting data including technical information, catalog cuts, warranties, test results, installation instructions, operating procedures, and other like information necessary for a complete evaluation of the substitution.
2. Reasons the substitution is advantageous and necessary, including the benefits to the Owner and the Work in the event the substitution is acceptable.
3. The adjustment, if any, in the Contract Price, in the event the substitution is acceptable.
4. The adjustment, if any, in the time of completion of the Contract and the construction schedule in the event the substitution is acceptable.
5. An affidavit stating that (a) the proposed substitution conforms to and meets all of the Contract Documents, except as specifically disclosed and set forth in the affidavit and (b) the Contractor accepts the warranty and correction obligations in connection with the proposed substitution as if originally specified by the Professional. Proposals for substitutions shall be submitted to the Professional and in sufficient time to allow the Professional and no less than ten (10) working days for review. No substitution will be considered or allowed without the Contractor's submittal of complete substantiating data and information as stated herein.

B. Substitutions and alternates may be rejected without explanation in Owner's sole discretion and will be considered only under one or more of the following conditions:

1. Required for compliance with interpretation of code requirements or insurance regulations then existing;
2. Unavailability of specified products, through no fault of the Contractor;

3. Material delivered fails to comply with the Contract Documents;
4. Subsequent information discloses inability of specified products to perform properly or to fit in designated space;
5. Manufacturer/fabricator refuses to certify or guarantee performance of specified product as required; or
6. When in the judgment of the Owner or the Professional, a substitution would be substantially to the Owner's best interests, in terms of cost, time, or other considerations.

C. Professional and Owner shall be allowed a reasonable time to evaluate each substitute proposed. No substitute will be ordered, included or utilized until Professional's review is complete and approved, which will be evidenced by a Change Order. Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other guaranty with respect to any substitution. Whether or not any proposed substitution is accepted by the Owner or the Professional, the Contractor shall reimburse the Owner for any fees charged by the Professional or other consultants for evaluating each proposed substitute.

#### 6.09 Concerning Subcontractors, Suppliers and Others

A. Contractor shall not employ any Subcontractor, Supplier or other person or organization whether initially or as a substitute, against whom Owner or Professional may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials and equipment) to be submitted to Owner in advance of the specified date prior to the Effective Date of the Agreement for acceptance by Owner and Professional and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's or Professional's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents or the Contract Documents) of any such Subcontractor, Supplier or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case Contractor shall submit an acceptable substitute. The Contract Price shall be increased by the difference between the subcontract amount proposed by the person or entity recommended by the Contractor and the subcontract amount proposed by the person or entity to whom the Owner has no objection. However, no increase in the Contract Price shall be allowed unless the Contractor has acted promptly and responsively in complying with the provisions of Paragraph 6.09 B and the person or entity to which Owner has an objection is capable of performing the Work. No acceptance by Owner or Professional of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of Owner or Professional to reject defective Work.

C. Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

1. assignment is effective only after termination of the Contract by the Owner for cause pursuant to Paragraph 15.01 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor in writing; and
2. assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

Each subcontract shall specifically provide that the Owner shall only be responsible to the Subcontractor for those obligations of the Contractor that accrue subsequent to the Owner's exercise of any rights under this conditional assignment.

D. Contractor shall be fully responsible to Owner and Professional for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with Contractor just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between Owner or Professional and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of Owner or Professional to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.

E. The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

F. All Work performed for Contractor by a Subcontractor will be pursuant to an appropriate agreement between Contractor and the Subcontractor which specifically binds the Subcontractor to the applicable terms and

conditions of the Contract Documents for the benefit of Owner and Professional and contains waiver provisions as required by Section 5.07. Contractor shall pay each Subcontractor a just share of any insurance moneys received by Contractor on account of losses under policies issued pursuant Section 5.07.

G. Contractor shall perform with its own forces and organization Work amounting to not less than thirty percent (30%) (or a greater percentage if required by the Supplementary Conditions) of the original Contract Price.

#### 6.10 Patent Fees and Royalties

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Professional its use is subject to patent right or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents. Contractor shall defend, indemnify and hold harmless Owner and Professional and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorney's fees and court and arbitration costs) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work of any invention, design, process, product or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.

#### 6.11 Permits and Fees

A. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the work, which are applicable at the time of opening of Bids, or if there are no Bids on the Effective Date of the Agreement, Contractor shall pay all governmental charges and inspection fees necessary for the completion of the Work, which are applicable at the time of opening of Bids. Contractor shall pay all charges or assessments of utility owners for connections of utilities to the Work.

B. Contractor shall procure and obtain all bonds required of the Owner or the Contractor by the municipality in which the Project is located or any other public or private body with jurisdiction over the Project. In connection with such bonds, the Contractor shall prepare all applications, supply all necessary backup material, and furnish the surety with any required personal undertakings. Contractor shall also obtain and pay all charges for all approvals for street closings, parking meter removal, and other similar matters as may be necessary or appropriate from time to time for the performance of the Work.

#### 6.12 Laws and Regulations

A. Contractor shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Professional shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor observes that the Specifications or Drawings are at variance with any Laws or Regulations, Contractor shall give Professional prompt written notice thereof. If Contractor performs any Work knowing or having reason to know that it is contrary to such Laws or Regulations, and without such notice to Professional, Contractor shall bear all costs arising therefrom; however, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with such Laws and Regulations.

#### 6.13 Prevailing Wage Rates

A. This Contract shall be based upon payment by the Contractor and his Subcontractors of wage rates not less than the prevailing hourly wage rate for each craft or classification of workman engaged on the Work as determined by the Labor and Industrial Relations Commission of Missouri on behalf of the Department of Labor and Industrial Relations. The Contractor shall comply with all requirements of the prevailing wage law of Missouri, RSMo. §§ 290.210 to 290.340, including the latest amendments thereto. The Contractor and each Subcontractor shall keep an accurate record showing the names, occupations, and crafts of all workmen employed, together with the number of hours worked by each workman and the actual wages paid to each workman. At all reasonable hours, such records shall be open to inspection by the representatives of the Labor and Industrial Relations Commission of Missouri and Owner. The payroll records shall not be destroyed or removed from the state for at least two (2) years after completion of the Work. Throughout the life of this Contract, a copy of the wage determination and the rules promulgated by the Labor and Industrial Relations Commission of Missouri shall be displayed in at least four (4) conspicuous places on the Project under a heading of NOTICE, with the heading in letters at least one (1) inch high. Pursuant to RSMo. § 290.250, the Contractor shall forfeit to Owner as a penalty, One hundred Dollars (\$100.00) for each workman employed, for each calendar day, or portion thereof, such workman is paid less than the stipulated rates for any work done under the Contract, by him or by any Subcontractor under him. After completion of the Work, and before final payment can be made under this Contract, the Contractor and each Subcontractor must file with Owner an affidavit of compliance stating that he has fully complied with the provisions and requirements of the 295893v1

prevailing wage law of Missouri. During the life of this Contract, the prevailing hourly rate of wages is subject to change by the Department of Labor and Industrial Relations or by court decision, as provided by law. Any such change shall not be the basis of any claim by the Contractor against Owner, nor will deductions be made by Owner against sums due the Contractor by reason of any such change.

B. If a federal governmental agency is providing funding for the Project and if required by Division 1 of the Specifications or the Contract Documents, the Contractor agrees to pay prevailing hourly rate of wages for regular, holiday and overtime work as determined by the Secretary of Labor in accordance with the Davis-Bacon Act as amended and supplemented. The Contractor further agrees to comply with all applicable federal laws, statutes and regulations relating to and establishing prevailing wage rates. Where Missouri and Federal prevailing wage rates are applicable, the higher of the two will be paid by the Contractor.

C. Violations of the Missouri prevailing wage statute, whether by the Contractor or its Subcontractors, result in additional costs for Owner, including, but not limited to, costs of construction delays, of additional work for City staff, of added interest expense, of legal and litigation expense, and of delays in the levying of special assessments. The Contractor shall ensure that prevailing wage rates are paid, and that Work is done by the correct category of worker both on this Contract and on all subcontracts. The cost to Owner of any particular violation is difficult to establish; in the event of the failure by the Contractor or any of its Subcontractors to pay wages as provided in the Missouri prevailing wage Laws, Owner may deduct from the price specified in the Contract and may retain as liquidated damages, and not as a penalty, Thirty-Five Dollars (\$35.00) per day per individual who is paid less than the prevailing wage, to approximate the investigative costs resulting to Owner from such violations. To approximate the cost of delay, including interest expense from delay in levying special assessments and issuing special assessment tax bills, additional liquidated damages, and not as a penalty, shall be paid in the amount of One Hundred Dollars (\$100.00) per day for any delay in closing out the Contract occasioned by failure to pay the prevailing wage. Such additional sum shall be collected, whether or not the work days on the Contract could be closed out. Action under this section shall be commenced by Owner giving a written notice to the Contractor. The notice shall set out the persons who are claimed to have been underpaid, and the days they are claimed to have been underpaid. The Contractor shall have ten (10) days, or such longer time as Owner shall allow, to respond to the allegation. Based on the information in the notice, the response by the Contractor and such additional information as Owner shall determine, Owner shall render its decision, in writing, giving the amount of liquidated damages owed, including any damages for occasioning a delay in closing out the Contract. The Contractor shall not be required to pay liquidated damages for any false or malicious claims. This liquidated damage will be in addition to the liquidated damages specified in the Agreement.

#### 6.14 Taxes

A. Contractor shall pay all sales, consumer, use and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work. However, certain purchases by the Contractor of materials incorporated in or consumed in the construction of the Project are exempt from certain sales taxes pursuant to RSMo 144.062. The Contractor shall be issued a Project Tax Exemption Certificate for this Project to obtain the benefits of RSMo 144.062.

B. The Contractor shall furnish this certificate to all Subcontractors, and any person or entity purchasing materials for the Work shall present such certificate to all material suppliers as authorization to purchase, on behalf of the Owner, all tangible personal property and materials to be incorporated into or consumed in the Project and no other project on a tax-exempt basis. Such suppliers shall provide the purchasing party invoices bearing the name of the exempt entity and the Project identification number. Nothing in this section shall be deemed to exempt from any sales or similar tax the purchase of any construction machinery, equipment or tools used in construction, repairing or remodeling facilities for the Owner. All invoices for all personal property and materials purchased under a Project Tax Exemption Certificate shall be obtained and retained by the Contractor for a period of five years and shall be subject to audit by the director of revenue.

C. Any excess resalable tangible personal property or materials which were purchased for the Project under this Project Tax Exemption Certificate but which were not incorporated into or consumed in the construction of the Project shall either be returned to the supplier for credit or the appropriate sales or use tax on such excess property or materials shall be reported on applicable tax returns and paid by such purchasing party not later than the due date of the purchasing party's Missouri sales or use tax return following the month in which it was determined that the materials were not used in the Project.

D. If it is determined that sales tax is owed by the Contractor on property and materials due to the failure of the Owner to revise the certificate expiration date to cover the applicable date of purchase, Owner shall be liable for the tax owed.

E. The Owner shall not be responsible for any tax liability due to Contractor's neglect to make timely orders, payments, etc. or Contractor's misuse of the Project Tax Exemption Certificate. Contractor represents that the Project Tax Exemption Certificate shall be used in accordance with RSMo § 144.062 and the terms of the Project Tax Exemption Certificate. Contractor shall defend and indemnify the Owner for any loss or expense, including but not limited to, reasonable attorneys' fees, arising out of Contractor's use of the Project Tax Exemption Certificate.

#### 6.15 Use of Premises

A. Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project site, land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment.

B. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof of any land or area, or to the owner or occupant thereof of any land or areas contiguous thereto, resulting from the performance of the Work. Should any such owner or occupant because of the performance of the Work make any claim against Owner or Professional, Contractor shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or by law.

C. Contractor shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold Owner and Professional harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, Professionals, attorneys and other professionals and court and arbitration's costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any such other party against Owner or Professional to the extent based on a claim arising out of Contractor's performance of the work.

#### 6.16 Site Cleanup

A. During the progress of the Work, Contractor shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by Owner. Contractor shall restore to original condition all property whether or not designated for alteration by the Contract Documents.

#### 6.17 Loading of Structures

A. Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

#### 6.18 Record Documents

A. Contractor shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Directive Changes, Field Orders and written interpretations and clarifications in good order and annotated to show all changes made during construction. These record documents together with all approved samples, Submittals and a counterpart of all approved Shop Drawings will be available to Professional for reference. Upon completion of the Work and prior to final payment, these record documents, samples, Shop Drawings and Submittals will be delivered to Professional for Owner.

#### 6.19 Safety and Protection

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. Contractor shall take all necessary precautions for the safety of, and provide the necessary protection to prevent damage, injury or loss to:

1. all employees on the Work and other persons and organizations who may be affected thereby;
2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
3. other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of construction.
4. Contractor shall comply with all applicable Laws and Regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may

affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property.

B. All damage, injury or loss to any property referred to in Paragraph 6.19 A.2. and 6.19 A.3. caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss solely attributable to the fault of Owner or Professional or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor).

C. The Contractor shall be solely responsible for materials delivered and Work performed until completion and final acceptance of the entire construction thereof. The Contractor shall bear the risk of injury, loss or damage to any and all parts of the Work for whatever cause, whether arising from the execution or from the non-execution of Work. The Contractor shall promptly rebuild, repair or restore Work and materials which have been damaged or destroyed from any causes before Final Completion, and shall bear the expense thereof. The Contractor shall provide security and drainage and erect temporary structures as necessary to protect the Work and materials from damage, including damage from water, flooding, wetness, temperature, dust, environmental conditions and all reasonably anticipated risks. The Contractor shall be responsible for materials not delivered to the Work site for which any progress payment has been made to the same extent as if the materials were so delivered.

#### 6.20 Safety Representative

A. Contractor shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be Contractor's superintendent unless otherwise designated in writing by Contractor to Owner.

#### 6.21 Emergencies

A. In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, Contractor, without special instruction or authorization from Professional or Owner, is obligated to act to prevent threatened damage, injury or loss. Contractor shall give Professional prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If Professional determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a Work Directive Change or Change Order will be issued to document the consequences of the changes or variations.

#### 6.22 Submittals

A. Shop Drawings, Product Data, Samples and similar submittals (collectively referred to as "Submittals") are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which Submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

B. After checking and verifying all field measurements and after complying with applicable procedures specified in the Contract Documents, Contractor shall submit to Professional for review and approval in accordance with the accepted schedule of Submittals, or for other appropriate action if so indicated in the Supplementary Conditions, five (5) copies (unless otherwise specified in the General Requirements) of all Shop Drawings, which will bear a stamp or specific written indication that Contractor has satisfied Contractor's responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as Professional may require for tracking. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable Professional to review the information as required.

C. Contractor shall also submit to Professional for review and approval, with such promptness as to cause no delay in Work, all Samples, Product Data and other similar Submittals required by the Contract Documents in accordance with the Schedule for Submittals. All Samples and Product Data will have been checked by and accompanied with a specific written indication that Contractor has satisfied Contractor's responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.

D. When professional certification of performance criteria of materials, systems, or equipment is required by the Contract Documents, the Contractor shall provide the person or party providing the certification with full information on the relevant performance requirements and on the materials, systems, or equipment that are expected to operate at the Project site. The certification shall be based on performance under the operating conditions generally prevailing or expected at the Project site. All certificates from persons or entities other than Contractor shall be endorsed by Contractor and Contractor shall submit such certificates as its own.

E. The Contractor represents and warrants that all Shop Drawings shall be prepared by persons and entities possessing expertise and experience in the trade for which the Shop Drawing is prepared and, if required by the Contract Documents, or the Professional or applicable Laws and Regulations, by a licensed engineer or other design professional.

F. Before submission of each Submittal Contractor shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Submittal with other Submittals and with the requirements of the Work and the Contract Documents.

G. By approving and submitting to Professional any Submittals, the Contractor represents such Submittals strictly comply with the requirements of the Contract Documents and that the Contractor has determined and verified field measurements and field construction criteria related thereto, that materials are fit for their intended use and that the fabrication, shipping, handling, storage, assembly and installation of all materials, systems and equipment are in accordance with best practices in the industry and are in strict compliance with any applicable requirements of the Contract Documents. Contractor shall also coordinate each Submittal with other Submittals.

H. Contractor shall be responsible for the correctness and accuracy of the dimensions, measurements and other information contained in the Submittals.

I. Each Submittal will bear a stamp or specific indication that the Submittal complies with the Contract Documents and Contractor has satisfied its obligations under the Contract Documents with respect to Contractor's review and approval of that Submittal. Each Submittal shall bear the signature of the representative of Contractor who approved the Submittal, together with the Contractor's name and Project identification.

J. The Contractor shall perform no portion of the Work requiring submittal and review of Submittals until the respective submittal has been approved by the Professional. Such Work shall be in accordance with approved Submittals.

K. At the time of each submission, Contractor shall give Professional specific written notice of each variation that the Submittals may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to Professional for review and approval of each such variation.

L. Professional's review and approval will be for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

M. Contractor shall make corrections required by Professional and shall return the required number of corrected copies of Shop Drawings and other Submittals and submit as required new Submittals for review and approval. Contractor shall direct specific attention in writing to revisions on the Submittals other than the revisions called for by Professional on previous Submittals.

N. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Professional on previous Submittals.

O. Professional's review and approval of Submittals shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has in writing called Professional's attention to each such variation at the time of submission as required by Paragraph 6.23 K. and Professional has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Submittal approval; nor will any approval by Professional relieve Contractor from responsibility for errors or omissions in the Submittals or from responsibility for having complied with the provisions of Section 6.23. In the event Contractor fails to submit any Submittals within the time required in the Contract Documents or submits inadequate or incorrect Submittals, Contractor shall be liable for all additional costs and damage suffered by Owner as a result thereof.

P. Where a Submittal or sample is required by the Specifications, any related Work performed prior to Professional's review and approval of the pertinent submission will be the sole expense and responsibility of Contractor.

#### 6.23 Contractor's Warranty

A. In addition to all other warranties implied by law or expressed in the Contract Documents or elsewhere, the Contractor warrants to Owner that:



1. the materials and equipment furnished under the Contract will be of the most suitable grade of their respective kinds for the purposes intended, fit and sufficient for the purpose intended, merchantable, free from defects in material and workmanship, new, and in strict conformance with the Contract Documents; and

2. the Work will be executed in a workmanlike manner, in the best manner known to each respective trade, free of defects in material and workmanship, of the highest quality in the industry; and in strict conformance with the Contract Documents.

B. The above warranties are not intended as a limitation, but are in addition to, and not in lieu of, all other express warranties set forth in this Contract and such other warranties as are implied by law, in equity, custom, and usage of trade. The Contractor, and its surety or sureties, if any, shall be liable for the satisfaction and full performance of the warranties set forth herein.

C. The Contractor's warranties above shall not be affected by the specification of a product or procedure unless Contractor objects in writing promptly, and in any event before performing the Work in question affected by or related to such product or procedure, and advises the and Professional in writing of possible substitute products or procedures which will not affect the warranty.

D. Contractor shall assign to Owner all manufacturer, supplier or installer's warranties upon Final Completion of the Work; provided, however, the Contractor's warranties provided in this Section 6.23 and other provisions of the Contract Documents shall not be affected, diminished or restricted by the limitations, restrictions, or conditions of a manufacturer, supplier or installer's warranty, including, but not limited to, the expiration of any Uniform Commercial Code statute of limitations. Inability or refusal of a Subcontractor, lower-tier Subcontractor, supplier or installer furnishing defective Work to correct or warrant such Work shall not relieve Contractor of its responsibility for the warranties set forth above and in other provisions of the Contract Documents.

E. Contractor's obligation to perform and complete the Work in strict accordance with the Contract Documents shall be absolute. None of the following shall constitute an acceptance of Work that is not in strict accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in strict accordance with the Contract Documents:

1. observations or inspections by the Professional;
2. approval of any progress or final payment by the Professional;
3. the issuance of a certificate of Substantial or Final Completion or any payment by the Owner to Contractor under the Contract Documents;
4. use or occupancy of the Work or any part thereof by the Owner;
5. any acceptance by the Owner or any failure to do so;
6. any review or approval of Shop Drawings or other Submittal by the Professional;
7. any inspection, test or approval by others; or
8. any correction of defective Work by Owner.

F. The Contractor shall defend, indemnify, and save harmless the Owner from any and all loss, damages, costs, and attorneys' fees suffered or incurred on account of any breach of the aforesaid warranties, obligations and covenants.

#### 6.24 Continuing the Work

A. Contractor shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as Contractor and Owner may otherwise agree in writing.

#### 6.25 Indemnification

A. To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Owner, the Professional, Professional's consultants, and the agents, employees, representatives, insurers and re-insurers of any of the foregoing (hereafter collectively referred to as the "Indemnitees") from and against claims, damages (including loss of use of the Work itself), punitive damages, penalties and civil fines unless expressly prohibited by law, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from performance of the Work to the extent caused in whole or in part by negligent acts or omissions or other fault of Contractor, a Subcontractor of any tier, Supplier or anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part

by the negligent acts or omissions or other fault of a party indemnified hereunder. The Contractor's obligations hereunder are in addition to and shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that the Owner may possess. If one or more of the Indemnitees demand performance by the Contractor of obligations under this paragraph or other provisions of the Contract Documents and if Contractor refuses to assume or perform, or delays in assuming or performing Contractor's obligations, Contractor shall pay each Indemnitee who has made such demand its respective attorneys' fees, costs, and other expenses incurred in enforcing this provision. The defense and indemnity required herein shall, however, be a binding obligation upon Contractor whether or not an Indemnitee has made such demand. Even if a defense is successful to a claim or demand for which Contractor is obligated to indemnify the Indemnitees from under this Paragraph, Contractor shall remain liable for all costs of defense.

B. The indemnity obligations of Contractor under this Section 6.25 shall survive termination of this Contract or final payment thereunder. In the event of any claim or demand made against any party which is entitled to be indemnified hereunder, the Owner may in its sole discretion reserve, return or apply any monies due or to become due the Contractor under the Contract for the purpose of resolving such claims; provided, however, that the Owner may release such funds if the Contractor provides the Owner with reasonable assurance of protection of the Owner's interests. The Owner shall in its sole discretion determine if such assurances are reasonable. Owner reserves the right to control the defense and settlement of any claim, action or proceeding which Contractor has an obligation to indemnify the Indemnitees against under this Section 6.25.

C. In claims against any person or entity indemnified under this Section 6.25 by an employee of the Contractor, a Subcontractor of any tier, a Supplier, or anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Section 6.25 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor a Subcontractor of any tier or Supplier under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

#### 6.26 Survival of Obligations

A. All representation, indemnifications, warranties and guarantees made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination of completion of the Agreement.

### **ARTICLE 7- OTHER WORK**

#### 7.01 Related Work at Site

A. Owner may perform other work related to the Project at the site by Owner's own forces, have other work performed by utility owners or let other direct contracts therefor which shall contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to Contractor prior to starting any such other work. In such events, Contractor must anticipate in its scheduling that its Work may be interfered with or delayed by such other Work. Contractor shall fully cooperate and coordinate its Work with the other work to avoid or mitigate such interferences or delays.

B. Contractor shall afford each utility owner and other contractor who is a party to such a direct contract (or Owner, if Owner is performing the additional work with Owner's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work and shall properly connect and coordinate the Work with theirs. Contractor shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of Professional and the others whose work will be affected. The duties and responsibilities of Contractor under this paragraph are for the benefit of such utility owners and other contractors.

C. If any part of Contractor's Work depends on proper execution or results upon the work of any such other contractor or utility owner (or Owner), Contractor shall inspect and promptly report to Professional in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results Contractor's failure to report this will constitute an acceptance of the other work as fit and proper for integration with Contractor's Work except for latent or non-apparent deficiencies in the other work.

#### 7.02 Coordination

A. If Owner contracts with others for the performance of other work on the Project site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the **Supplementary Conditions**, and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided in

the Supplementary Conditions. Unless otherwise provided in the Supplementary Conditions, neither Owner nor Professional shall have any authority or responsibility in respect of such coordination.

#### 7.03 Liability

A. Contractor shall not delay a separate contractor by neglecting to perform its Work at the proper time. Contractor shall be required to coordinate its Work with separate contractors so as to afford separate contractors a reasonable and safe opportunity for execution of their work. Any costs caused by delays or improperly timed activities or defective construction shall be borne by the party responsible therefor.

B. Contractor shall be responsible for damage to Owner's or separate contractors' property caused by Contractor or any person or entity for whose acts or omissions Contractor may be liable.

C. In the event Contractor is delayed or damaged by the activities, fault, negligent acts or omissions, delays or improperly timed activities, or defective construction of any separate contractor of Owner or person or entity for whose acts or omissions the separate contractor may be liable, Contractor agrees to solely look to the separate contractor for compensation as a result of such activities, fault, negligent acts or omissions, delays or improperly timed activities, or defective construction. Contractor shall be considered a third party beneficiary of any contract between Owner and any separate contractor for the Project solely for the purpose of recovering damages from such separate contractor which are caused by the activities, fault, negligent acts or omissions, delays or improperly timed activities, or defective construction of such separate contractor of Owner or any person or entity for whose acts or omissions such separate contractor may be liable.

D. Contractor shall be responsible for any damages of separate contractors of Owner caused by the activities, fault, negligent acts or omissions, delays or improperly timed activities, or defective construction of Contractor or of any person or entity for whose acts or omissions Contractor is liable. Contractor acknowledges that such separate contractors shall be considered third party beneficiaries of this Contract for the sole purpose of allowing any separate contractor the right to directly recover damages from Contractor which are caused by the activities, fault, negligent acts or omissions, delays or improperly timed activities, or defective construction of Contractor or of any person or entity for whose acts or omissions Contractor may be liable.

E. Should Contractor cause any damage to a separate contractor of the Owner, Contractor shall promptly attempt to settle with such separate contractor in good faith. Contractor shall defend, indemnify and hold harmless Owner, and its agents, representatives and employees from and against any claims of separate contractors in accordance with Section 6.25.

F. If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, they may clean up and allocate the cost among those responsible as Owner determines to be just.

### **ARTICLE 8 - OWNER'S RESPONSIBILITIES**

#### 8.01 Termination of Professional

A. In case of termination of the employment of Professional, Owner shall appoint a design professional whose status under the Contract Documents shall be that of the former Professional.

#### 8.02 Data and Information

A. When requested in writing by Contractor, Owner shall furnish the data required of Owner under the Contract Documents promptly.

#### 8.03 Limitations on Owner's Responsibilities

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

### **ARTICLE 9 - PROFESSIONAL'S STATUS DURING CONSTRUCTION**

#### 9.01 General

A. Professional will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Professional as Owner's representative during construction are set forth in the Contract Documents and shall not be extended without written consent of Owner and Professional.

9.02 Visits to Site

A. Professional will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. On the basis of such visits and on-site observations, Professional will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defects and deficiencies in the Work.

9.03 Project Representation

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in observing the performance of the Work. The duties, responsibilities and limitations of authority of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions. If Owner designates another agent to represent Owner at the site who is not Engineer's agent or employee, the duties, responsibilities and limitations of authority of such other person will be as provided in the Supplementary Conditions.

9.04 Clarifications and Interpretations

A. Professional will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as Professional may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If Contractor believes that a written clarification or interpretation justifies an increase in the Contract Price or an extension of the Contract Times and the parties are unable to agree to the amount or extent thereof, Contractor may make a claim therefor as provided in Articles 11 or Article 12.

9.05 Authorized Variations in Work

A. Professional may authorize minor variations in the Work from the requirements of the Contract Documents that do not involve an adjustment in the Contract Price or the Contract Times and are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner, and also on Contractor who shall perform the Work involved promptly. The Professional shall not have the authority to order changes without the agreement of Owner which affect the Contract Price or Contract Times.

9.06 Rejecting Defective Work

A. Professional will have authority to disapprove or reject Work which Professional believes to be defective and will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.03 B., whether or not the Work is fabricated, installed or completed.

9.07 Submittals

A. In connection with Professional's responsibility for Submittals, see Section 6.22 inclusive.

9.08 Change Orders

A. In connection with Professional's responsibilities as to Change Orders, see Articles 10, 11 and 12.

9.09 Payments

A. In connection with Professional's responsibilities in respect of Applications for Payment, see Article 14.

9.10 Determinations for Unit Prices

A. Professional will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Professional will review with Contractor's representative preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Professional's written decisions thereon will be final and binding upon Contractor, unless, within ten (10) days after the date of any such decision, Contractor delivers to Owner and Professional a written objection to such determination.

9.11 Limitations on Professional's Responsibilities

A. Neither Professional's authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by Professional in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of Professional to Contractor, any Subcontractor, any Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

#### 9.12 Terminology

A. Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of Professional as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to Professional any duty or authority to supervise or direct the furnishing or performance of the Work.

### **ARTICLE 10 – CHANGES IN THE WORK AND CLAIMS**

#### 10.01 Authorized Changes in Work

A. Without invalidating the Agreement and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions or revisions in the Work. Such additions, deletions or revisions will be authorized by a Written Amendment, a Change Order, or a Work Change Directive or Field Order. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved, which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. A Change Order is a written instrument signed by the Owner and Contractor, stating their agreement upon all of the following:

1. a change in the Work;
2. the amount of the adjustment in the Contract Price, if any; and
3. the extent of the adjustment in the Contract Time, if any.

C. Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work which is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contract Price and the Contract Times and any applicable Milestone Dates. In the event a Change Order increases the Contract Price, Contractor shall include the Work covered by such Change Orders in Applications for Payment as if such Work were originally part of the Contract Documents.

D. A Work Change Directive is a written order approved by Professional and issued by Owner directing a change in the Work and stating a proposed basis for adjustment in the Contract Price and/or Contract Times. A Work Change Directive shall be used in the absence of total agreement on the terms of a Change Order. Upon receipt of a Work Change Directive, the Contractor shall proceed with the change in the Work involved and advise Owner and Professional of Contractor's agreement or disagreement with the method, if any, provided in the Work Change Directive for determining the proposed adjustment in the Contract Price or Contract Times. A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Price and Contract Times or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

E. The Professional will have authority to issue order changes in the Work not involving adjustment in the Contract Price or extension of the Contract Times and not inconsistent with the intent of the Contract Documents. Such minor changes shall be effectuated by a written Field Order and shall be binding on Owner and Contractor. The Contractor shall carry out such changes set forth in a Field Order promptly.

#### 10.02 Unauthorized Changes in Work

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented by a Modification, except in the case of an emergency as provided in Article 6.21 and except in the case of uncovering Work as provided in Section 13.03 B.

#### 10.03 Notice to Surety

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the Surety. Such notice shall

#### 10.04 Claims

A. A Claim is a demand or assertion by Contractor seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or any other relief with respect to the terms of the Contract. The term "Claim(s)" also includes demands and assertions of Contractor arising out of or relating to the

Contract Documents, including Claims based upon breach of contract, mistake, misrepresentation, or other cause for Contract Modification or rescission. Claims must be made by written notice in strict accordance with the Contract Documents. Contractor shall have the responsibility to substantiate Claims. A Claim for an adjustment in the Contract Price shall be submitted in accordance with Paragraph 11.02 B. A Claim for each adjustment in the Contract Times shall be submitted in accordance with Paragraph 12.01 A.

#### **ARTICLE 11 - CHANGE OF CONTRACT PRICE**

##### **11.01 Contract Price**

A. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change in the Contract Price.

##### **11.02 Change**

A. The Contract Price may only be changed by a Change Order or by a Written Amendment. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that the Owner has been unjustly enriched by any alteration or addition to the Work, whether or not there is, in fact, any unjust enrichment to the Owner, shall be the basis of any Claim to an increase in any amounts due under the Contract Documents.

B. Any claim by Contractor for an adjustment in the Contract Price shall be based on written notice as set forth herein. Any claim for an increase or decrease in the Contract Price by Contractor shall be based on written notice delivered by Contractor to Owner and to Professional promptly (but in no event later than fifteen (15) days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within forty-five (45) days after such occurrence (unless Professional allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by Contractor's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which Contractor is entitled as a result of the occurrence of said event. No claim for an adjustment in the Contract Price by Contractor will be valid if not submitted in accordance with this Paragraph 11.02 B.

C. Any work completed by Contractor not agreed to by Owner in a Change Order, Work Change Directive or a Field Order shall be at Contractor's sole cost and expense and shall be deemed a waiver of all rights the Contractor may have for any adjustment in the Contract Price or Contract Times.

##### **11.03 Determination of Adjustment**

A. The value of the Work covered by a Change Order or of any Claim for an increase or decrease in the Contract Price shall be determined by Owner in one of the following ways:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices contained in the Contract Documents to the quantities of the items involved in the change.
2. By mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.06 A.2.); or
3. On the basis of the Cost of the Work (determined as provided in Paragraphs 11.04 and 11.05) plus a Contractor's Fee for overhead and profit (determined as provided in Paragraph 11.06).

##### **11.04 Cost of the Work**

A. The term Cost of the Work means the sum of all costs necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs described in Paragraph 11.05:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of

performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to the Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from Subcontractors acceptable to Contractor and shall deliver such bids to Owner who will then determine, with the advice of Professional, which bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a Fee, the Subcontractor's Cost of the Work shall be determined in the same manner as Contractor's Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

4. Cost of special consultants (including but not limited to engineers, Professionals, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following

a. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost less market value of such items used but not consumed which remain the property of Contractor.

b. Rentals of all construction equipment and machinery and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Professional, and the cost of transportation, loading, unloading, installation, dismantling and removal thereof - all in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

c. Sales, consumer, use or similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

6. Cost of premiums for additional Bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by Owner in accordance with Paragraph 5.07.

#### 11.05 Costs Excluded

A. The term Cost of the Work shall not include any of the following:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, Professionals, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by Contractor whether at the site or in Contractor's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.04 A.1. or specifically covered by Paragraph 11.04 A.4. all of which are to be considered administrative costs covered by the Contractor's Fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Cost of premiums for all Bonds and for all insurance whether or not Contractor is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by Paragraph 11.04. A.6.).

5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable including but not limited to, the

correction of defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

6. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Section 11.04.

11.06 Contractor's Fee

A. The Contractor's Fee allowed to Contractor for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee;
2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
  - a. for costs incurred under Paragraphs 11.04 A.1. and 11.04 A.2., the Contractor's Fee shall be ten percent;
  - b. for costs incurred under Paragraph 11.04 A.3., the Contractor's Fee shall be five percent. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of this Section is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of ten percent (10%) of the costs incurred by Subcontractor under Paragraphs 11.04 A.1. or 11.04 A.2. and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent (5%) of the amount paid to the next lower tier Subcontractor. In no event shall there be more than three-mark ups of cost on extract work regardless of the number of tiers of Subcontractors;
  - c. no fee shall be payable on the basis of costs itemized under Paragraphs 11.04. A.4., 11.04 A.5. and 11.04.A6;
  - d. the amount of credit to be allowed by Contractor to Owner for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in Contractor's Fee by an amount equal to ten percent (10%) of the net decrease; and
  - e. when both additions and credits are involved in any one change, the adjustment in Contractor's Fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04 A.2.a. through 11.04 A.2.d., inclusive.

11.07 Submission of Itemized Costs

A. Whenever the cost of any Work is to be determined pursuant to Article 11.04, Contractor will submit in a form acceptable to Owner and Professional an itemized cost breakdown together with supporting data.

11.08 Allowance

A. It is understood that Contractor has included in the Contract Price all allowances (if any) so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to Professional. Contractor agrees that:

1. The allowances include the cost to Contractor (less any applicable trade discount) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and
2. Contractor's cost for unloading and handling material on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.
3. Prior to final payment, an appropriate Change Order will be issued as recommended by Professional to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.



## **ARTICLE 12 - CHANGE OF CONTRACT TIMES**

### **12.01 Claims for Additional Time**

A. The Contract Times may only be changed by a Change Order or a Written Amendment. Any claim by Contractor for an adjustment in the Contract Price shall be based on written notice as set forth herein. Any claim for an extension or shortening of the Contract Times shall be based on written notice delivered by Contractor to Owner and to Professional promptly (but in no event later than fifteen (15) days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within forty-five (45) days after such occurrence (unless Professional allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. No claim for an adjustment in the Contract Times will be valid if not submitted in accordance with the requirements of this Paragraph 12.01 A.

B. If abnormal weather conditions are the basis for a Claim for additional time, such Claim shall be documented by the Contractor by data acceptable to the Professional substantiating that weather conditions were abnormal for the period of time in question, and could not have been reasonably anticipated, and that weather conditions had an adverse effect on the scheduled construction. Requests for extension of the scheduled Completion Date(s) or Milestone Dates due to adverse weather conditions shall include reliable or official climatological reports for the months involved, plus a report indicating the average precipitation, temperature, and other climatological data for the past ten (10) years from a reporting station near the Project site. The ten-year average will be the basis for determining the number of adverse weather days and the effect resulting therefrom on construction which Contractor would normally expect to encounter.

### **12.02 Delays of Contract Times**

A. If the Contractor is delayed in the commencement or progress of the Work by an act or neglect of the Owner or Professional, or of an employee of either, or by changes in the Work, or by fire, or by unavoidable casualties, acts of God, or abnormal weather conditions established pursuant to Paragraph 12.01 B, or by acts or neglect of utility owners or separate contractors performing other Work as provided in Article 7, the Contract Times and applicable Milestones will be extended in an amount equal to the time lost due to such delay if a Claim is made therefore by Contractor as provided herein. The Contract Times and applicable Milestones will not be extended due to delays within the reasonable control of Contractor. Where Contractor is prevented from completing any part of the Work within the Contract Times or any applicable Milestones due to delay beyond the control of both Owner and Contractor, including but not limited to fires, unavoidable casualties, acts of God, abnormal weather conditions, or acts or neglect of utility owners or separate contractors performing other work as provided for in Article 7, an extension of the Contract Times or any applicable Milestones in an amount equal to the time lost due to such delay shall be Contractor's sole and exclusive remedy for such delay.

B. The Contractor further acknowledges and agrees that adjustments in the Contract Times will be permitted for a delay only to the extent such delay (1) is not caused, or could not have been anticipated, by the Contractor, (2) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay, (3) prevents Contractor from completing its Work by the Contract Time, and (4) is of a duration not less than one (1) day. Delays attributable to and within the control of a Subcontractor or supplier shall not justify an extension of the Contract Times.

### **12.03 Delay Damages**

A. Professional Notwithstanding anything to the contrary in the Contract Documents, an extension in the Contract Times, to the extent permitted under this Article, shall be the sole remedy of the Contractor for any (1) delay in the commencement, prosecution or completion of the Work, (2) hindrance or obstruction in the performance of the Work, or (3) loss of productivity except as set forth below. In no event shall the Contractor be entitled to any compensation or recovery of any damages or any portion of damages resulting from delays caused by or within the control of Contractor or by acts or omissions of Contractor or its Subcontractors of any tier or Supplier or delays beyond the control of both Owner and Contractor. If the Contractor contends that delay, hindrance, obstruction or other adverse condition results from acts or omissions of the Owner, or the Professional, Contractor shall promptly provide written notice to the Owner. Contractor shall only be entitled to an adjustment in the Contract Price to the extent that such acts or omissions continue after the Contractor's written notice to the Owner of such acts or omissions. The Owner's exercise of any of its rights or remedies under the Contract Documents (including, without limitation, ordering changes in the Work, or directing suspension, rescheduling or correction of the Work) regardless of the extent or frequency of the Owner's exercise of such rights or remedies, shall not be the basis of any Claim for an increase in the Contract Price or Contract Times. In the event Contractor is entitled to an adjustment in the Contract Price for any delay, hindrance, obstruction or other adverse condition caused by the acts or omissions of the Owner, or the Professional, Contractor shall only be entitled to its actual direct costs caused thereby and Contractor shall not be entitled to and waives any right to special, indirect, or consequential damages including loss of profits,

loss of savings or revenues, loss of anticipated profits, labor inefficiencies, idle equipment, home office overhead, and similar type of damages.

B. If the Contractor submits a progress report or any construction schedule indicating, or otherwise expressing an intention to achieve completion of the Work prior to any completion date required by the Contract Documents or expiration of the Contract Times, no liability of the Owner to the Contractor for any failure of the Contractor to so complete the Work shall be created or implied. Further, the Contractor acknowledges and agrees that even if Contractor intends or is able to complete the Work prior to the Contract Times, it shall assert no Claim and the Owner shall not be liable to Contractor for any failure of the Contractor, regardless of the cause of the failure, to complete the Work prior to the Contract Times.

#### 12.04 Liquidated Damages

A. If liquidated damages are prescribed in the Agreement, the Owner may deduct from the Contract Price and retain as liquidated damages, and not as penalty or forfeiture, the sum stipulated in the Contract Documents for each calendar day after the date specified for completion of the Project that the entire Work is not substantially complete and/or finally complete.

B. The Professional shall certify the date of Substantial Completion and Final Completion which shall be conclusive and binding on the Owner and Contractor for the purpose of determining whether or not liquidated damages shall be assessed under terms hereof and the total amount due.

C. Liquidated damages or any matter related thereto shall not relieve the Contractor or his surety of any responsibility or obligation under this Contract.

### **ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

#### 13.01 Access to Work

A. Professional and Professional's representatives, other representatives of Owner, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. Contractor shall provide proper and safe conditions for such access.

#### 13.02 Tests and Inspections

A. Contractor shall give Professional timely notice of readiness of the Work for all required inspections, tests or approvals.

B. Contractor shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests or approvals required by Laws and Regulations or the Contract Documents, except:

1. those costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.03. B. shall be paid as provided in Paragraph 13.03. B.; and
2. as otherwise specifically provided in the Contract Documents.

C. Without limiting the generality of Paragraph 13.03. B., Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for Professional's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

D. All inspections, tests or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to Owner and Professional.

E. Neither observations, inspections, tests or approvals by Professional or others, shall relieve Contractor from Contractor's obligations to perform the Work in accordance with the Contract Documents.

F. If any Work (including the work of others) that is to be inspected, tested, or approved is covered without written concurrence of Professional, it must, if requested by Professional, be uncovered for observation. Such uncovering shall be at Contractor's expense unless Contractor has given Professional timely notice of Contractor's intention to cover the same and Professional has not acted with reasonable promptness in response to such notice.

#### 13.03 Uncovering Work

A. If any Work is covered contrary to the written request of Professional, it must, if requested by Professional, be uncovered for Professional's observation and replaced at Contractor's expense.

B. If Professional considers it necessary or advisable that covered Work be observed by Professional or inspected or tested by others, Contractor, at Professional's request shall uncover, expose or otherwise make available for observation, inspection or testing as Professional may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, Contractor shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, Professionals, attorneys and other professionals), and Owner shall be entitled to an appropriate decrease in the Contract Price. If, however, such Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction: and, if the parties are unable to agree as to the amount or extent thereof, Contractor may make a claim therefor as provided in Articles 11 and 12.

#### 13.04 Owner May Stop the Work

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor or any Subcontractor, Supplier or any other entity, or any surety for, or employee or agent of any of them.

#### 13.05 Correction or Removal of Defective Work

A. Contractor shall correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by Professional, remove it from the Site and replace with nondefective Work. Contractor shall bear all direct, indirect and consequential costs, losses and damages (including but not limited to fees and charges of engineers, attorneys and other professionals) arising out of or relating to such correction or removal (including, but not limited to, all costs of repair and replacement of work of others).

#### 13.06 Guarantee Period

A. If within one year after the date of Substantial Completion or longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents, and/or Change Orders ("Guarantee Period"), any Work is found to be defective, Contractor shall promptly, without cost to the Owner and in accordance with Owner's written instructions, either correct such defective Work, or, if it has been rejected by Owner, remove it from the site and replace it with nondefective Work. If Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, attorneys and other professionals) will be paid by Contractor. Nothing contained in this Section 13.06 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the one (1) year Guarantee Period as described in this Paragraph 13.06 relates only to the specific obligation of the Contractor to correct, remove or replace the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations under the Contract Documents. The requirements of Article 13 are in addition to and not in limitation of any of the other requirements of the Contract for warranties or conformance of the Work to the requirements of the Contract Documents.

B. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph 13.06, the correction period hereunder with respect to such Work will be extended for an additional period of one (1) year after such correction or removal and replacement has been satisfactorily completed.

C. Contractor's obligations under this paragraph 13.06 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.06 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

#### 13.07 Acceptance of Defective Work

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and if, prior to Professional's recommendation of final payment, also Professional) prefers to accept it, Owner may do so. Contractor shall bear all direct, indirect and consequential costs attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Professional as to reasonableness and to include but not be limited to fees and charges of engineers, Professionals, attorneys and other professionals). If any such acceptance occurs prior to Professional's recommendation of final payment, a Change Order will be issued

incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

#### 13.08 Owner May Correct Defective Work

A. If Contractor fails within a reasonable time after written notice of Professional to proceed to correct defective Work or to remove and replace rejected Work as required by Professional, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph, Owner shall proceed expeditiously.

B. To the extent necessary to complete corrective and remedial action, Owner may exclude Contractor from all or part of the site, take possession of all or part of the Work, and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owners, agents and employees such access to the site as may be necessary to enable Owner to exercise such rights and remedies under this paragraph.

C. All direct, indirect and consequential costs, losses and damages of Owner in exercising the rights and remedies under this Paragraph 13.08 will be charged against Contractor. Such direct, indirect and consequential costs, losses and damages will include, but not be limited to, fees and charges of consultants, Professional, attorneys and other professionals, all court and arbitration costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of Contractor's defective Work. Contractor shall not be allowed an extension of the Contract Times because of any delay in performance of the Work attributable to the exercise by Owner of Owner's rights and remedies hereunder.

D. In the event that the defective Work, equipment or material creates a hazard or an emergency situation, the requirement of seven days written notice may be reduced to notification by telephone or attempt thereof. Hazardous or emergency situations include but are not limited to: defective traffic control devices, flood control structures and devices; or excavations.

### **ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION**

#### 14.01 Contract Price

A. The Owner shall compensate Contractor for all Work described herein and, in the Contract, Documents the Contract Price set forth in the Agreement, subject to additions and deletions as provided hereunder.

#### 14.02 Basis Of Progress Payments

A. The Schedule of Values, if any, established as provided in the Agreement, shall serve as the basis for progress payments for a lump sum contract and will be incorporated into a form of Application for Payment acceptable to Owner. The values set forth in such schedule shall not be used in any manner as fixing a basis for additions or deletions from the Contract Price. Progress payments on account of Unit Price Work will be based on the number of units completed.

#### 14.03 Applications For Payment

A. In the time set forth in Paragraph 14.06 B., the Contractor shall submit to the Owner and the Professional an itemized Application for Payment in accordance with the Contract Documents. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Professional may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage as provided for herein.

B. Such applications may not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

C. Each Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner:

1. Contractor's updated schedule and a progress report setting forth in detail the actual progress to date (in terms of percent complete) and the scheduled or planned progress, a listing of the value of material on hand included in the Application and other data specified in the Specifications;

2. Weekly employee payrolls for Contractor and all Subcontractors. Each Application for Payment shall be accompanied by a certified copy of employee payrolls, submitted on Federal Form WH-347 and covering the Work performed during the time covered by the Application. No payment will be due

and no Application for Payment processed by the Owner until all pertinent payroll documents have been completed and approved;

3. Beginning with the second Application for Payment, a current Contractor's Receipt and Partial Release in the form provided by Owner, and, if requested by Owner, similar Receipt and Partial Releases from Subcontractors and Suppliers; and

4. All information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Professional.

D. In addition to the requirements set forth in Paragraph 14.03 C., Owner shall not be obligated to make any progress payments until the Contractor has provided Owner and Professional:

1. certificate(s) of insurance or policies as required herein;
2. a signed copy of this Contract;
3. evidence that performance and payment bonds have been purchased as required herein;
4. an approved Schedule of Values;
5. an approved construction schedule and schedule for Submittals; and
6. other documents and certifications required by the Contract Documents.

E. The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment, free and clear of any liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, Suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work. The Contractor further expressly undertakes to defend and hold harmless the Owner, at the Contractor's sole expense, against any such claims, liens, actions, lawsuits or proceedings.

F. The Application for Payment shall constitute a representation by the Contractor to the Owner that the Work has progressed to the point indicated; the quality of the Work covered by the Application for Payment is in accordance with the Contract Documents; and the Contractor is entitled to payment in the amount requested.

#### 14.04 Approval For Payment

A. The Professional will, within fifteen (15) days after receipt of the Contractor's Application for Payment, either approve Contractor's Application for Payment for such amount as the determines is properly due or notify the Contractor in writing of the reasons for withholding certification in whole or in part as provided in Section 14.05.

#### 14.05 Decisions To Withhold Approval

A. The Professional may decide not to certify payment and may withhold approval in whole or in part, to the extent reasonably necessary to protect the Owner. If the Professional is unable to approve payment in the amount of the Application, the Professional will notify the Contractor as provided in Paragraph 14.04 A. If the Contractor and Professional cannot agree on a revised amount, the Professional will promptly issue approval for payment for the amount for which the Professional is able to determine is due Contractor. The Professional may also decide not to approve payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of approval for payment previously issued, to such extent as may be necessary in the opinion to protect the Owner from loss because of:

1. defective Work not remedied or damage to completed Work;
2. failure to supply sufficient skilled workers or suitable materials;
3. third party claims filed or reasonable evidence indicating probable filing of such claims;
4. failure of the Contractor to make payments properly to Subcontractors or Suppliers for labor, materials or equipment;
5. reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;
6. damage to the Owner or another contractor;
7. reasonable evidence that the Work will not be completed within the Contract Times or an unsatisfactory rate of progress made by Contractor;

8. Contractor's failure to comply with applicable Laws and Regulations; or
9. failure to carry out the Work in strict accordance with the Contract Documents.

B. When the above reasons for withholding approval are removed, approval will be made for amounts previously withheld.

#### 14.06 Progress Payments

A. Based upon Applications for Payment submitted to the Owner and Professional by the Contractor and approvals issued by the Professional, the Owner shall make progress payments on account of the Contract Price to the Contractor as provided below and elsewhere in the Contract Documents.

B. Applications for Payment shall be submitted to Owner not later than the tenth (10<sup>th</sup>) day of the month unless otherwise indicated in the Special Conditions. The period covered by each Application for Payment shall be one (1) calendar month ending on the last day of the previous month.

C. The Owner shall make payment to Contractor for amounts due and approved by Professional not later than thirty (30) days after the Owner receives a properly detailed Application for Payment which is in compliance with the Contract Documents. The Owner shall not have the obligation to process or pay such Application for Payment until it receives an Application for Payment satisfying such requirements. Payments by Contractor and all tiers of Subcontractors to all of their subcontractors and suppliers shall be made in accordance under similar terms as contained in this Paragraph 14.06 C. Contractor shall require that this term be incorporated in all tiers of subcontracts.

D. The Contractor shall promptly pay each Subcontractor and Supplier, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's or supplier's portion of the Work, the amount to which said Subcontractor or supplier is entitled, reflecting percentages actually retained from payments to the Contractor on account of each Subcontractor's or supplier's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor or supplier, require each Subcontractor or supplier to make payments to Sub-subcontractors in similar manner.

E. Neither the Owner nor Professional shall have an obligation to pay or to see to the payment of money to a Subcontractor of any tier or a laborer or employee of Contractor except to the extent required by Laws and Regulations. Retainage provided for by the Contract Documents are to be retained and held for the sole protection of Owner, and no other person, firm or corporation shall have any claim or right whatsoever thereto.

#### 14.07 Failure Of Payment

A. If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment by Contractor shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the Owner shall have an absolute right to offset such amount against the Contract Price and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that to which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner, or (2) issue a written notice to the Contractor reducing the Contract Price by an amount equal to that to which the Owner is entitled.

#### 14.08 Substantial Completion

A. Substantial Completion is the stage in the progress of the Work as defined in Paragraph 1.01 A.45. as certified by the Professional.

B. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner and the Professional a comprehensive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the Contractor's list, Professional will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Professional's inspection discloses any item, whether or not included on the Contractor's list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall complete or correct such item upon notification by Professional. The Contractor shall then submit a request for another inspection by Professional to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Professional will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the Punch List accompanying the Certificate which shall identify all non-conforming, defective and incomplete Work. In

no event shall Contractor have more than thirty (30) days to complete all items on the Punch List and achieve Final Completion. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Warranties required by the Contract Documents shall commence on the date of Final Completion and acceptance of the entire Work.

C. At the date of Substantial Completion, the Contractor may apply for, and if approved by Owner's Representative, the Owner, subject to the provisions herein, shall increase total payments to one hundred percent (100%) of the Contract Price less two hundred percent (200%) of the value of any incomplete Work and unsettled claims, as determined by Professional.

#### 14.09 Partial Occupancy Or Use

A. The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities, if any, having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, security, maintenance, heat, utilities, damage to the Work and insurance. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a Punch List to the Professional and Owner as provided under Paragraph 14.09 B. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by Professional.

B. Immediately prior to such partial occupancy or use, the Owner, Contractor and Professional shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

#### 14.10 Final Completion And Final Payment

A. Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, Professional will promptly make such inspection and, when Professional finds the Work acceptable under the Contract Documents and the Contract fully performed, the will promptly issue a final approval for payment; otherwise, will return Contractor's Final Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application. Submission of a Final Application for Payment shall constitute a further representation that conditions listed in Paragraph 14.10 B. as precedent to the Contractor's being entitled to final payment have been fulfilled. All warranties and guarantees required under or pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the as part of the final Application for Payment. The final approval for payment will not be issued by the until all warranties and guarantees have been received and accepted by the Owner.

B. Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Professional and the Owner (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work have been paid and satisfied; (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) days' prior written notice has been given to the Owner; (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents; (4) consent of surety to final payment, (5) data establishing payment or satisfaction of obligations, such as receipts, releases and waivers, to the extent and in such form as may be designated by the Owner; (6) reproducible record and marked-up drawings; (7) a certification that all Punch List Work has been completed; (8) all applicable maintenance and operating instructions and warranties and guarantees have been received and accepted by Owner; (9) subject to final payment, a final release of the Owner relating to any and all claims related to the Project; (10) a certification that all operating systems and equipment have passed all tests required by the Contract Documents; and (11) all documents required by the Contract Documents and such data and other documents as Professional may reasonably require.

C. Final Payment constituting the entire unpaid balance due shall be paid by the Owner to the Contractor within thirty (30) days after Owner's receipt of Contractor's Final Application for Payment which satisfies all the requirements of the Contract Documents and Owner's receipt of all information and documents set forth in Section 14.10.

D. The acceptance by Contractor of its Final Payment shall be and operate as a release of all claims of Contractor against Owner for all things done or furnished or relating to the Work and for every act or alleged neglect of Owner arising out of the Work.

E. No payment under this Contract, including but not limited to final payment, shall constitute acceptance by Owner of any Work or act not in accordance with the requirements of the Contract Documents.

#### **ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION**

##### **15.01 Termination by Owner for Cause**

A. In addition to other rights and remedies granted to Owner under the Contract Documents and by law, the Owner may terminate the Contract if the Contractor:

1. if Contractor commences a voluntary case under any chapter of the Bankruptcy code (Title 11, United States Code), as now or hereafter in effect, or if Contractor takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to bankruptcy or insolvency;
2. if a petition is filed against Contractor under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against Contractor under any other federal or state law in effect at the time relating to bankruptcy or insolvency;
3. if Contractor makes a general assignment for the benefit of creditors;
4. if a trustee, receiver, custodian or agent of Contractor is appointed under applicable law or under contract, whose appointment or authority to take charge of property of Contractor is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of Contractor's creditors;
5. if Contractor admits in writing an inability to pay its debts generally as they become due;
6. refuses or fails to supply enough properly skilled workers, superintendents, foremen or managers;
7. refuses or fails to supply sufficient or proper materials;
8. fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
9. breaches any warranty or representations made by the Contractor under or pursuant to the Contract Documents;
10. fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with all the requirements of the Contract Documents;
11. fails after commencement of the Work to proceed continuously with the construction and completion of the Work for more than ten (10) days, except as permitted under the Contract Documents;
12. fails to maintain a satisfactory rate of progress with the Work or fails to comply with approved construction schedules or Schedule of Submittals;
13. fails to correct defective Work.
14. if Contractor fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the approved Schedule as revised from time to time);
15. if Contractor disregards Laws or Regulations of any public body having jurisdiction;
16. if Contractor disregards the authority of Professional; or
17. if Contractor otherwise violates in any substantial way any provisions of the Contract Documents;

##### **15.02 Notice of Termination**

A. Owner may, without prejudice to any other rights or remedies, after giving Contractor and the surety, seven days written notice terminate the Contract and exclude Contractor from the site and take possession of the Work and of all Contractor's tools, appliances, construction equipment and machinery at the site Contractor (without liability to Contractor for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which Owner has paid Contractor but which are stored elsewhere, and finish the Work as Owner may deem expedient. In such case, Contractor shall not be entitled to receive any further payment until the Work is finished.



B. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work and damages, costs and expenses caused thereby (including but not limited to fees and charges of engineers, Professionals, attorneys and other professionals and court and arbitration costs) such excess will be paid to Contractor. If such costs exceed such unpaid balance, Contractor shall pay the difference to Owner. Such costs incurred by Owner will be approved as reasonable by Professional and incorporated in a Change Order, but when exercising any rights or remedies under this Article Owner shall not be required to obtain the lowest price for the Work performed.

C. In exercising the Owner's right to secure completion of the Work under any of the provisions hereof, the Owner shall have the right to exercise the Owner's sole discretion as to the manner, methods, and reasonableness of costs of completing the Work.

D. The rights of the Owner to terminate pursuant to Section 15.01 will be cumulative and not exclusive and shall be in addition to any other remedy provided by law or the Contract Documents.

#### 15.03 Suspension by the Owner for Convenience

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

B. An adjustment to the Contract Price will be made for increases in the cost of performance of the Contract caused by suspension, delay or interruption. However, in the event of a suspension under this Section 15.02, Contractor hereby waives and forfeits any claims for payment of any special, indirect, incidental or consequential damages such as lost profits, loss of savings or revenue, loss of anticipated profits, idle labor or equipment, home office overhead, and similar type damages. No adjustment will be made to the extent:

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

#### 15.04 Owner's Termination For Convenience

A. The Owner may, at any time, terminate the Contract in whole or in part for the Owner's convenience and without cause. Termination by the Owner under this Section 15.04 shall be by a notice of termination delivered to the Contractor specifying the extent of termination and the effective date.

B. Upon receipt of a notice of termination for convenience, the Contractor shall immediately, in accordance with instructions from the Owner, proceed with performance of the following duties regardless of delay in determining or adjusting amounts due under this Paragraph:

1. cease operation as specified in the notice;
2. place no further orders and enter into no further subcontracts for materials, labor, services or facilities except as necessary to complete Work not terminated;
3. terminate all subcontracts and orders to the extent they relate to the Work terminated;
4. proceed to complete the performance of Work not terminated; and
5. take actions that may be necessary, or that the Owner may direct, for the protection and preservation of the terminated Work.

C. Upon such termination, the Contractor shall recover as its sole remedy payment for Work properly performed in connection with the terminated portion of the Work prior to the effective date of termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the Owner's instructions and for all claims, costs, losses and damages incurred in settlement of terminated contracts with Subcontractors and suppliers. The Contractor hereby waives and forfeits all other claims for payment and damages, including, without limitation, anticipated profits, consequential damages and other economic losses.

D. The Owner shall be credited for (1) payments previously made to the Contractor for the terminated portion of the Work, (2) claims which the Owner has against the Contractor under the Contract and (3) the value of the materials, supplies, equipment or other items that are to be disposed of by the Contractor that are part of the Contract Price.

E. Upon determination that termination of Contractor pursuant to Paragraph 15.01 was wrongful, such termination will be deemed converted to a termination for convenience pursuant to Paragraph 15.04, and Contractor's

sole and exclusive remedy for wrongful termination is limited to recovery of the payments permitted for termination for convenience as set forth in Paragraph 15.04.

## **ARTICLE 16 – DISPUTE RESOLUTION**

### **16.01 Methods and Procedures**

A. All Claims, disputes, and other matters in question between the Contractor and the Owner arising out of or relating to this Agreement or breach thereof shall be subject to and decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect unless the parties mutually agree otherwise. At the Owner's sole option, and only upon the exercise of that sole option by the Owner, together or separately as the Owner sees fit, any dispute or other matter in question as described above may be submitted, prior to any arbitration, to nonbinding mediation in accordance with the then-current mediation rules of the American Arbitration Association. The mediation may include by consolidation, joinder or in any other manner, at the Owner's sole option, any other persons whom the Owner believes to be substantially involved in a common question of fact or law.

B. Any arbitration arising out of or relating to this Agreement or the breach thereof may include, by consolidation, joinder, or in any other manner, at the Owner's sole option, any other entities or persons whom the Owner believes to be substantially involved in a common question of fact or law.

C. A demand for arbitration shall be provided in writing to the other party to this Agreement and filed with the American Arbitration Association. A demand for arbitration shall be made within a reasonable time after the claim, dispute, or other matter in question has arisen. In no event shall the demand for arbitration be made after the date when institution of legal or equitable proceedings based on such claim, dispute, or other matter in question would be barred by the applicable statutes of limitations. If the Owner shall elect to proceed with nonbinding mediation, such election shall be made, in writing, to the Contractor and the American Arbitration Association. Such election may be made before or after either party files any demand for arbitration, but the Owner's unilateral right to proceed with mediation shall be forfeited upon the final designation of an arbitrator by the American Arbitration Association. The election to proceed with nonbinding mediation shall not prejudice the right of either party to proceed with arbitration.

D. Unless the parties agree otherwise, discovery as provided by the Federal Rules of Civil Procedure shall be allowed in the arbitration, provided, that the arbitrator(s) shall have the authority to restrict unduly burdensome and onerous discovery. The parties shall exchange documents the parties intend to use at the hearing and disclose witnesses they anticipate testifying at the hearing. If a party intends to use an expert, such party shall provide the other party an expert report disclosing the expert's opinions and the reasons for the opinion.

E. The place of the arbitration shall be Grain Valley, Missouri.

F. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. Any award rendered by the arbitrator(s) shall be final and enforceable by any party to the arbitration, and judgment may be rendered upon it in accordance with applicable law in any court having jurisdiction thereof.

### **16.02 Continuing Performance**

A. Unless otherwise agreed in writing, and notwithstanding any other rights or obligations of either of the parties under this Agreement, the Contractor shall carry on with the performance of its Services hereunder during the pendency of any claim, dispute, or other matter in question or arbitration or other proceeding to resolve any claim, dispute, or other matter in question, and the Owner shall continue to make payments of undisputed amounts to the Contractor in accordance with this Agreement, but the Owner shall be under no obligation to make payments to the Contractor on or against such claims, disputes, or other matters in question, during the pendency of any arbitration, nonbinding mediation, or other proceeding to resolve such claims, disputes, or other matters in question.

### **16.03 Exceptions**

A. Regardless of any term or provision herein to the contrary, claims arising out of actions on claims filed or asserted by third parties on account of personal injury or death of any person shall not be subject to the terms and provisions of this Article 16.

## **ARTICLE 17 - MISCELLANEOUS**

### **17.01 Notice**

All notices required to be given under the terms of this Contract shall be made in writing and shall be deemed to have been made and given if sent by registered or certified mail, postage prepaid or hand-delivered (hand delivery to include by air courier services such as Federal Express, Airborne Express, or Purolator or other reputable delivery service

guaranteeing delivery and providing a receipt) to the party to receive such notice at the addresses specified below or to such other address as any party hereto may subsequently specify by written notice to the other party:

If to Owner: Person and address contained in the Agreement

If to Contractor: Address contained in the Agreement or the temporary office of Contractor at the Site.

#### 17.02 Rights and Remedies

A. Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law. No action or failure to act by the Owner or Professional will constitute a waiver of a right or duty afforded to Owner under the Contract Documents, nor will such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing. The terms of this Contract and all representations, indemnifications, warranties and guarantees made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Work and shall remain in effect so long as the Owner is entitled to protection of its rights under applicable law. Contractor shall carry out the Work and adhere to the current construction schedule during all disputes or disagreements with the Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements except as the Owner and Contractor may otherwise agree to in writing.

#### 17.03 Buy American Requirements

A. Pursuant to the Missouri Domestic Product Procurement (Buy American) Act, RSMo. §§ 34.350 to 34.359, any manufactured goods or commodities used or supplied either in the performance of this Contract or of any subcontract thereto shall be manufactured, assembled or produced in the United States unless one of the exceptions contained in that Act applies. The Contractor shall comply with such requirements and shall provide proof of compliance with this provision both at the time of bid and before any payment is made on the Contract. Pursuant to RSMo. § 71.140, preference shall be given to materials, products, supplies, provisions and all other articles produced, manufactured, compounded, made, or grown in the State of Missouri. The Contractor shall comply with such requirements and shall provide proof of compliance with this provision at the time of bid and before any payment is made on the Contract.

#### 17.04 Successors and Assigns

A. The Contractor hereby binds itself, its partners, successors, assigns and legal representatives to the Owner in respect to covenants, agreements and obligations contained in the Contract Documents. Contractor shall not assign the Contract or proceeds hereof without written consent of the Owner. If Contractor attempts to make such an assignment without such consent, it shall be void and confer no rights on third parties, and Contractor shall nevertheless remain legally responsible for all obligations under the Contract. The Owner's consent to any assignment is conditioned upon Contractor entering into a written assignment which contains the following language: "it is agreed that the funds to be paid to the assignee under this assignment are subject to performance by the Contractor and to claims and to liens for services rendered or materials supplied for the performance of the Work required in said Contract in favor of all persons, firms, corporations rendering such services or supplying such materials."

#### 17.05 Records

A. The Owner, or any parties it deems necessary, shall have access to and the right to examine any accounting or other records of the Contractor involving transactions and Work related to this Contract for five (5) years after final payment or five (5) years after the final resolution of any on going disputes at the time of final payment. All records shall be maintained in accordance with generally accepted accounting procedures, consistently applied. Subcontractors of any tier shall be required by Contractor to maintain records and to permit audits as required of Contractor herein.

#### 17.06 General

A. The Contract Documents are the exclusive statement of the agreement of the parties with respect to its subject matter and the Contract Documents supersedes and replaces all prior agreements, discussions and representations, whether written or oral, relating to the subject matter hereof. The Contract Documents may only be amended, modified or changed by a Modification.

B. All headings, titles and paragraph captions are inserted in this Contract for convenience of reference only, are descriptive only and shall not be deemed to add or detract from or otherwise modify the meaning of the paragraphs.

C. Contractor acknowledges and agrees that time and exact performance are of the essence of this Contract.

D. Contractor and Owner agree to do all acts and things and to make, execute and deliver such written instruments, as shall from time to time be reasonably required to carry out the terms and provisions of the Contract Documents.

E. Any specific requirement in this Contract that the responsibilities or obligations of the Contractor also apply to a Subcontractor is added for emphasis and are also hereby deemed to include a Subcontractor of any tier. The omission of a reference to a Subcontractor in connection with any of the Contractor's responsibilities or obligations shall not be construed to diminish, abrogate or limit any responsibilities or obligations of a Subcontractor of any tier under the Contract Documents or the applicable subcontract.

F. This Contract shall be interpreted, construed, enforced and regulated under and by the laws of the State of Missouri. Whenever possible, each provision of this Contract shall be interpreted in a manner as to be effective and valid under applicable law. If, however, any provision of this Contract, or a portion thereof, is prohibited by law or found invalid under any law, only such provision or portion thereof shall be ineffective, without invalidating or affecting the remaining provisions of this Contract or valid portions of such provision, which are hereby deemed severable. Contractor and Owner further agree that in the event any provision of this Contract, or a portion thereof, is prohibited by law or found invalid under any law, this Contract shall be reformed to replace such prohibited or invalid provision or portion thereof with a valid and enforceable provision which comes as close as possible to expressing the intention of the prohibited or invalid provision.

G. Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the written application of either party the Contract shall forthwith be physically amended to make such insertion or correction.

H. Owner's total liability to Contractor and anyone claiming by, through, or under Contractor for any Claim, cost, loss, expense or damage caused in part by the fault of Owner and in part by the fault of Contractor or any other entity or individual shall not exceed the percentage share that Owner's fault bears to the total fault of Owner, Contractor and all other entities and individuals as determined on the basis of comparative fault principles.

I. Contractor agrees that Owner shall not be liable to Contractor for any special, indirect, incidental, or consequential damage whatsoever, whether caused by Owner's negligence, fault, errors or omissions, strict liability, breach of contract, breach of warranty or other cause or causes whatsoever. Such special, indirect, incidental or consequential damages include, but are not limited to loss of profits, loss of savings or revenue, loss of anticipated profits, labor inefficiencies, idle equipment, home office overhead, and similar types of damages.

J. Nothing contained in this Contract or the Contract Documents shall create any contractual relationship with or cause of action in favor of a third party against the Owner.

K. Any provision or provisions of this Contract to the contrary notwithstanding, Contractor and Owner intend that the relationship between Owner and Contractor shall be that of a project owner and an independent contractor.

L. Payments and amounts due and unpaid by Contractor to Owner under the Contract Documents shall bear interest from the date payment is due at the rate of one and one-half percent (1.5%) per month.

M. The terms "hereof," "herein," and "hereunder" and words of similar import shall be construed to refer to this Contract as a whole, and not to any particular paragraph, section or provision unless expressly so stated.

N. Should Owner be required to institute any action, including, any arbitration proceeding, to enforce any of its rights set forth in the Contract Documents, then Owner shall be entitled to reimbursement from Contractor for all reasonable attorneys' fees and costs incurred. In the event Contractor institutes any action, including any arbitration proceeding, against Owner and in the further event Owner prevails in such action, Contractor shall pay Owner the amount of its reasonable attorneys' fees incurred in such action.

# TECHNICAL SPECIFICATIONS



**CITY OF GRAIN VALLEY, MO**

**TECHNICAL SPECIFICATIONS**

**BUCKNER TARSNEY  
WATERLINE EXTENSION PROJECT**

**LAMP RYNEARSON PROJECT NO. 0322006.02**

**TABLE OF CONTENTS**

<b>SECTION</b>	<b>PAGE</b>
SECTION 01 10 00 - SUMMARY OF WORK - GENERAL.....	1
SECTION 01 20 00 - MEASUREMENT AND PAYMENT .....	5
SECTION 01 25 00 - SUBSTITUTIONS AND PRODUCT OPTIONS .....	12
SECTION 01 29 76 - APPLICATIONS FOR PAYMENT .....	14
SECTION 01 31 19 - PROJECT MEETINGS .....	15
SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES .....	17
SECTION 01 45 29 - TESTING LABORATORY SERVICES.....	21
SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS .....	23
SECTION 01 73 29 - CUTTING AND PATCHING .....	25
SECTION 01 74 00 - CLEANUP .....	27
SECTION 01 77 00 - PROJECT CLOSEOUT .....	29
SECTION 01 78 39 - PROJECT RECORD DOCUMENTS.....	31
SECTION 01 89 00 - SPECIAL CONSTRUCTION REQUIREMENTS .....	33
SECTION 02 30 00 - SUBSURFACE CONDITIONS.....	39
SECTION 03 30 00 - CAST-IN-PLACE CONCRETE .....	40
SECTION 31 11 00 - CLEARING AND GRUBBING (GENERAL) .....	50
SECTION 31 23 16 - EXCAVATION, BACKFILL, AND SITE GRADING .....	53
SECTION 31 23 16.13 - TRENCHING, BACKFILLING AND COMPACTION.....	59
SECTION 31 25 00 - EROSION CONTROL .....	69
SECTION 32 01 26 - STREET REPAIR AND DRIVEWAY REPAIR.....	75
SECTION 32 92 19 - SEEDING, FERTILIZING, AND MULCHING.....	78
SECTION 33 01 10.58 - WATER MAIN DISINFECTING.....	82
SECTION 33 01 12 - WATER MAIN PRESSURE AND LEAKAGE TEST.....	85
SECTION 33 05 09.53 - WATER MAIN - POLYETHYLENE ENCASEMENT FOR DUCTILE IRON FITTINGS .....	89
SECTION 33 05 31.13 - WATER MAIN - PVC PRESSURE PIPE .....	92
SECTION 33 14 19 - WATER MAIN - VALVES, HYDRANTS, AND ACCESSORIES .....	98
SECTION 33 14 24 - PRESSURE REDUCING VALVE VAULT .....	100
SECTION 46 63 00 - SCADA (ALTERNATE BID).....	108





## SECTION 01 10 00 - SUMMARY OF WORK - GENERAL

### PART 1 - GENERAL

#### 1.01 SECTION INCLUDES:

- A. Work covers construction of 0322006.02 PWS Grain Valley MO Buckner Tarsney Road Waterline Extension, located in Grain Valley, Missouri.
- B. Related requirements specified elsewhere:
  1. Section 01 50 00 - Temporary Facilities and Controls
  2. Section 01 25 00 - Substitutions and Product Options
- C. Contractor's duties:
  1. Except as specifically noted, provide and pay for:
    - a. Labor, materials, and equipment.
    - b. Tools, construction equipment, and machinery.
    - c. Water, heat, and utilities required for construction.
    - d. Other facilities and services necessary for proper execution and completion of work.
  2. Pay legally required taxes.
    - a. Owner will furnish Contractor a state sales tax number for use by the Contractor.
    - b. Other use taxes shall be paid by the Contractor.
  3. Secure and pay for, as necessary, for proper execution and completion of work and as applicable at time of receipt of bids:
    - a. Permits
    - b. Government fees
    - c. Licenses
  4. Give required notices.
  5. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on performance of work.
  6. Promptly submit written notice to Engineer of observed variance of Contract Documents from legal requirements.

It is the Contractor's responsibility to make certain that drawings and specifications comply with codes and regulations.

    - a. Appropriate modifications to Contract Documents will adjust necessary changes.
    - b. Assume responsibility for work known to be contrary to such requirements, without notice.
  7. Enforce strict discipline and good order among employees. Do not employ on work:
    - a. Unfit persons.
    - b. Persons not skilled in assigned task.
  8. Pay minimum wages and comply with prevailing wage law requirements.
  9. Comply with nondiscrimination requirements.

10. Perform all supervision and work necessary to provide safe working conditions for completion of all required excavation and construction work.
11. Verify dimensions indicated on drawings with field dimensions before fabrication or ordering of materials. Do not scale drawings.
12. Notify Owner of existing conditions differing from those indicated on the Drawings. Do not remove or alter structural components without prior written approval.
13. Contractor to obtain all required permits.

## **1.02 CONTRACTOR USE OF SITE AND PREMISES**

- A. Confine Operations at site to areas permitted by:
  1. Law.
  2. Ordinances.
  3. Permits.
  4. Contract Documents.
  5. Owner.
- B. Do not unreasonably encumber site with materials or equipment.
- C. Do not load structure with weight that will endanger structure.
- D. Assume full responsibility for protection and safekeeping of products stored on premises.
- E. Move any stored products which interfere with operations of Owner.
- F. Obtain and pay for use of additional storage or work areas needed for operations.
- G. Use of site.

Exclusive and complete for execution of work, except:

  1. Contractor shall maintain access to existing facilities.
  2. Owner shall have access to existing facilities.
- H. Operation of the existing facilities:
  1. It is essential that the existing facilities be kept in operation during the construction period. Short periods of shutdown will be possible to permit modifications or connections to or tie in with existing facilities. The time period will vary with Owner usage at different times of the day.
  2. In some instances, it will be necessary to complete and put new facilities into operation prior to commencing work on existing facilities which would require their removal from service.
  3. Where interruption of existing facilities is necessary, the Contractor is to plan their work in cooperation with facility operating personnel for the least possible disruption of service. Night or weekend work may be necessary. When facility operation must be suspended because of the Contractor's work, the Contractor shall have all necessary materials and equipment on hand and have ample work force available prior to beginning the work.

### **1.03 POSITION, GRADIENT, AND ALIGNMENT**

- A. All construction work shall be done to the lines and grades shown on the Plans. Detailed survey and staking for location and grade of individual structures or other construction, as well as measurements and elevations within structures, shall be performed by the Contractor.
- B. Any work done without being properly located and established by base lines, offset stakes, benchmarks, or other basic reference points, may be ordered removed and replaced at the Contractor's expense.

### **1.04 PROTECTION AND MAINTENANCE OF PUBLIC AND PRIVATE PROPERTY**

- A. Protect, shore, brace, support, and maintain all underground pipes, conduits, drains, and other underground construction uncovered or otherwise affected by the construction work performed. All pavement, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires, and other surface structures affected by construction operations in connection with the performance of the Contract shall be restored to the original condition thereof as determined and approved by the Engineer. All replacements of such underground construction and surface structures or parts thereof shall be made with new materials conforming to the requirements of these Specifications or, if not specified, as approved by the Engineer.
- B. The Contractor shall be responsible for all damage to streets, roads, highways, railroads, shoulders, ditches, embankments, culverts, bridges, power transmission lines, oil lines, gas lines, or other public or private property or facility, regardless of location or character, which may be caused by moving, hauling, or otherwise transporting equipment, materials, or workers to or from the work or any part or site thereof, whether by the Contractor, or their subcontractor(s). The Contractor shall make satisfactory and acceptable arrangements with the owner of, or the agency or authority having jurisdiction over, the damaged property or facility concerning its repair or replacement, or payment of costs incurred in connection, with said damage.

### **1.05 INSPECTION BY PUBLIC AGENCIES**

- A. Authorized representatives of the Engineers, MDNR, and Owner shall have access to the work wherever it is in preparation or progress. The Contractor shall provide proper facilities for such access and inspection.

### **1.06 CONTRACTOR'S RESPONSIBILITY FOR MATERIALS**

- A. The Contractor shall be responsible for the condition of all materials furnished by them, and the Contractor shall replace at their own cost and expense, any and all such material found to be defective in design or manufacture, or which has been damaged after delivery. This includes the furnishing of all materials and labor required for replacement of any installed material which are found to be defective at any time prior to the expiration of one year from the date of final payment.

### **1.07 EXPLANATION OF PROPOSAL**

- A. The Owner reserves the right to select any or all alternates. The best and lowest bid will be determined by bidder's qualifications and the low total price for the base bid and the alternate bid items selected by the Owner.

- B. Base bid: the base bid includes complete construction of the project, ready for use, except for items specifically listed as alternate bid items.

**1.08 "OR EQUAL" STATEMENT**

- A. When a manufacturer's name is used in these Specifications it is used to establish a standard and the words "or equal", if not stated, are implied.

**PART 2 - PRODUCTS**

Not applicable to this section.

**PART 3 - EXECUTION**

Not applicable to this section.

**END OF SECTION**

## **SECTION 01 20 00 - MEASUREMENT AND PAYMENT**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Method of measurement.
- B. Basis of payment.

#### **1.02 RELATED SECTIONS**

- A. Section 01 10 00 - Summary of Work - General
- B. Section 01 77 00 - Project Closeout

#### **1.03 UNIT PRICES**

- A. Additions to unit quantities can only be made with an approved Change Order.
- B. Various items of work are bid on a unit price basis to provide flexibility for change in quantities during construction. Unless a change in the indicated limits is made during construction, final payment will be based on the item total listed in the Proposal, as if it was a Lump Sum amount.
- C. If changes are made in the indicated limits during construction, payment for the item will be adjusted upward or downward, in accordance with the actual change in plan quantity, using the unit price for the item listed in the Proposal.
- D. The Contract unit prices bid in the Proposal shall be full compensation for furnishing, preparing, transporting, delivering, and placing all materials, and for all labor, equipment, tools, and incidentals, as well as all subsidiary items, necessary to complete the Work.
- E. All items shown on the Plans or covered by these Specifications but for which there are no unit or Lump Sum prices, will not be paid for directly but will be considered as subsidiary items in connection with items for payment. The Contractor shall include allowance for all such items in their unit prices bid.
- F. Quantities of unit price items can be adjusted upward or downward by the Owner to the extent that the final Contract amount for that section is between 80 and 120 percent of the original estimated Contract price. Amounts of individual items may be varied to any extent and individual items may be omitted entirely as long as the above limits are met.
- G. In the event that the total quantity of work is adjusted upward or downward beyond the above limits, that portion of the work may be performed at the original bid unit prices if agreed by the Owner and Contractor, or in accordance with provisions for additional, omitted or changed work.

### **PART 2 - PRODUCTS**

Not applicable to this section.



## PART 3 - EXECUTION

### 3.01 GENERAL

- A. The method of measurement and basis of payment for each item as listed in the Bid Form shall be as stipulated in each of the following items.
1. Mobilization
    - a. This item will be paid for as a lump sum item. This item shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to the project site; for the establishment of all offices, buildings and other facilities necessary for work on the project, and for all other work and operations which must be performed or costs incurred prior to beginning work on the various items on the project site.
    - b. Payment shall be based on the contract lump sum bid price for Mobilization, when payments become due partial payments will be made as follows:
      - 1) When less than 100% of the original contract amount is completed, the amount paid for Mobilization will be based on the percentage of the original contract completed.
      - 2) When the project is complete and accepted, 100% of the original amount bid for Mobilization may be paid.
    - c. No adjustment will be made in the Lump Sum Bid Price because of overruns in original contract items developed in the process of construction.
  2. Clearing, Grubbing, and Demolition
    - a. This item will be paid for as a lump sum item. This item shall include all costs for labor, equipment, disposal of all resulting refuse and debris, and all incidental and appurtenant Work required to complete this item, which includes, but is not limited to, grading berms, clearing scrub trees/bushes, tree removal, stump grinding, grading swales, and all other appurtenances required for the completion of the construction Work and acceptance of the project.
    - b. Payment shall be based on the contract lump sum bid price for Clearing, Grubbing, & Demolition, when payments become due partial payments will be made as follows:
      - 1) When less than 100% of the original contract amount is completed, the amount paid for Clearing, Grubbing, & Demolition will be based on the percentage of the original contract completed.
      - 2) When the project is complete and accepted, 100% of the original amount bid for Clearing, Grubbing, & Demolition may be paid.
    - c. No adjustment will be made in the Lump Sum Bid Price because of overruns in original contract items developed in the process of construction.

### 3.02 WATER LINES

- A. Non-payment items:
1. Bond and insurance:  
No direct payment will be made for these items.

2. Subsidiary items:

Certain items of work required for completion of the project are not listed in the Proposal as pay items. Such items will be considered subsidiary to the Work and no direct payment will be made for them. The bidder shall include in the bid price of other items all cost of the subsidiary items.

B. Measurement:

If the pipeline route has not been measured by surveying, the pipe installed shall be measured for payment along the road parallel and adjacent to water lines. Direct measurements shall be multiplied by 1.005 to determine lengths for payment. Segments which cannot be measured in this manner will be chained along the trench. Calibration of measuring equipment shall be made immediately prior to each day's measurements. Calibration and measurement shall be done by the Owner's representative and the Contractor or their representatives. If Contractor elects not to be present during measurement, Contractor shall not contest results thereof.

C. Pipe and related items:

The pipe installed will be paid for based on a measured pipeline length as measured by the Owner's representative. The Contract unit price shall include all materials, excavation and trenching, labor, tools, thrust restraint, flushing, pigging, disinfection, and pressure testing necessary to install complete water lines.

This includes the following:

1. Repair to damaged culverts, curbs, sidewalks, paved areas, utilities, signs, and sodded areas.
2. Crossing and repair of streets, parking areas, and drive-ways that are not designated as separate bid items in the Proposal.
3. Stream or ditch crossings not designated as separate bid items in the Proposal. This includes road crossings not designated as pay items in other parts of the Proposal.
4. Rock excavation and pipe bedding as per the detailed Specifications. Also included is off-site disposal of any material that is unsuitable for backfill. All excavation on the project is unclassified.
5. Pipeline or cable crossings. Crossings shall comply with the requirements of the utility company. Notify the company 72 hours in advance of crossing.
6. Trenching under fences or repair of fences to the satisfaction of the land Owner.
7. Initial and final cleanup. Where un-compacted backfill is specified, initial cleanup shall include mounding of backfill over trench, unless it is contrary to the desires of the property Owner, and removal of material unsuitable for backfill. After sufficient settlement has occurred, in the opinion of the Engineer, final cleanup shall be done. This method shall be used unless modified by other sections of these Specifications.
8. Crushed rock for repair of roads, driveways, and parking areas. The material, labor, hauling, and disposal of material displaced by the crushed rock are subsidiary items to the pipeline installation and will not be paid for separately unless bid as a



separate item. Crushed rock shall be placed as directed by the Construction Representative.

9. Seeding and Restoration. Seeding as detailed in Section 32 92 19 - Seeding, Fertilizing, and Mulching will be considered a subsidiary item for which no direct payment will be made.
10. Skips. Reduction of amounts due Contractor will be made for sections of line, 500 feet or less, that are left because of rock excavation being required or other difficult conditions. Deductions in amounts otherwise due Contractor will be the Engineer's estimate of the cost to complete the Skip. The Contractor is urged to make lines continuous as soon as possible so that this deduction will not be made.
11. Fittings specified for use on the pipeline, the cost of these fittings shall be figured in the unit cost of the pipeline.
12. Temporary Flushing Assemblies shall be considered a subsidiary item for which no direct payment will be made.
13. Crushed rock pipe bedding.
14. Open-cut and crossings not called out as bid items.

D. Connections:

1. Connection to existing pipeline:

Contractor shall field verify size and type of existing lines before ordering materials. Payment for connection made to existing pipeline shall include all labor, tools, and materials necessary for a complete working connection. The Contractor is to include all subsidiary materials required, as well as the major items called for on the Plans, when preparing the bid. No additional amount or adjustment in other items listed on the bid form will be made to obtain a complete connection. Example: A lump sum price for connection to existing includes the valve at the connection fitting, if called for (often, but not always, may be a tapping valve). Also included are any additional valves within detail, straddle blocks, plugs, fittings, and temporary flushing fittings listed on the bid form or within the connecting detail. Hydrants shown in the connection detail drawing are paid for at contract unit price in the Bid Form. The Contractor should verify the size of pipe, type of pipe, and orientation before acquiring the materials and beginning the connection. No additional payment will be paid for connections that must be made to pipeline under pressure. Coordination with the Owner's personnel is mandatory and to be considered a part of this item. It is possible that some connections will have to be made at off-peak usage periods.

E. Polyethylene encasement (fittings):

The polyethylene encasement where DIP fittings are called for will be subsidiary to the pipeline items. The price for pipe shall include the encasement on all DIP and fittings along the route.

F. Crushed rock for road repair:

Crushed rock for roadway and driveway repair, if bid as a separate item, shall be paid for at the Contract unit price as specified in the Proposal, when proper weight certificates are submitted. Rock shall be spread as directed by the Engineer and payment shall

include all labor and tools to perform the necessary spreading operations. Payment shall include the cost associated with properly disposing material displaced by the crushed rock.

G. Straddle Blocks will be considered a subsidiary item for which no direct payment will be made.

H. Locator Wire:

Payment for No. 12 solid insulated locator wire shall be paid for at the contract unit price as specified in the Proposal. Payment shall include all materials, labor and tools necessary for a complete installation including the locator wire to be installed with the pipe in the trench.

I. Utility location:

Contractor shall locate and protect all utilities by pot holing or other methods. This is a subsidiary item to the pipe. No additional payment will be made for this work.

J. Valve and box:

The payment for valves and valve boxes shall include labor, tools, and materials required for a complete installation. The materials include valve as specified, specified valve box with required length and other incidentals. The bidder shall note that no deduction is made in the pipeline length to account for valves which are paid for separately.

K. Seeding, Fertilizing, and Mulching

1. The Engineer will measure seeding of specified type by the acre.
2. Payment for Seeding at the contract unit price bid is full compensation for the specified work, including bed preparation, fertilizer, planting, mulching, and crimping

L. Erosion Control

1. This item will be paid for as a lump sum item. This item shall include all costs in connection with furnishing and properly maintaining all erosion and sedimentation control devices to adequately protect existing downstream features in accordance with City, State, and Federal requirements, and other precautionary measures as required by the project drawings, specifications, and specific job conditions, including such costs as securing proper permits and approvals. This item shall include the periodic maintenance and cleanout of the erosion control devices as needed during the construction of the project. The contractor will install new erosion control devices if existing erosion control devices are damaged during construction. This item shall include temporary seeding of areas where no Work will occur for more than 14 days, unless permanent seeding or other vegetation can be installed.
2. Payment shall be based on the contract lump sum bid price for Erosion Control, when payments become due partial payments will be made as follows:
  - a. When less than 100% of the original contract amount is completed, the amount paid for Erosion Control will be based on the percentage of the original contract completed.

- b. When the project is complete and accepted, 100% of the original amount bid for Erosion Control may be paid.
  3. No adjustment will be made in the Lump Sum Bid Price because of overruns in original contract items developed in the process of construction.

#### M. Traffic Control

1. This item will be measured for as a lump sum item. This item shall include all costs in connection with developing certified plans, furnishing and properly maintaining all barricades, signs (with high intensity reflective sheeting), and other precautionary measures as required by the project drawings, specifications, and specific job conditions, including such costs as securing proper permits and approvals. This item shall include the removal and re- installation of street signs removed for construction. The Contractor will install new signs if existing signs are damaged during construction.
2. Payment shall be based on the contract lump sum bid price for Traffic Control, when payments become due partial payments will be made as follows:
  - a. When less than 100% of the original contract amount is completed, the amount paid for Traffic Control will be based on the percentage of the original contract completed.
  - b. When the project is complete and accepted, 100% of the original amount bid for Traffic Control may be paid.
3. No adjustment will be made in the Lump Sum Bid Price because of overruns in original contract items developed in the process of construction.

#### N. Contractor Construction Staking

1. This item will be paid for as a lump sum item. This item shall consist of establishing or re-establishing the project centerline; referencing or re-referencing all necessary control points; running a level circuit to check or reestablish plan bench marks; set other bench marks as needed; take any original cross sections needed that are not incorporated in the plans; stake rights-of-way or re- stake rights-of-way where needed if it has not been previously staked and perform all construction layout and reference staking necessary for the proper control and satisfactory completion of all structures, grading, paving, drainage and all other appurtenances required for the completion of the construction work and acceptance of the project.
2. Payment shall be based on the contract lump sum bid price for Construction Staking, when payments become due partial payments will be made as follows:
  - a. When less than 100% of the original contract amount is completed, the amount paid for Construction Staking will be based on the percentage of the original contract completed.
  - b. When the project is complete and accepted, 100% of the original amount bid for Construction Staking may be paid.
3. No adjustment will be made in the Lump Sum Bid Price because of overruns in original contract items developed in the process of construction.

#### O. Force Account (Set)

1. The Engineer will measure each Force Account item as defined in the proposed price approved in accordance with Force Account Section.

2. Payment for each Force Account item will be in accordance with the pre-approved proposed price. Payment for Force Account (SET) shall be paid for on an extra work basis not to exceed the contract set price.

P. Steel Casing Pipe

1. For open cut and casing pipe installation called for on the Plans, the price paid shall be at the Contract unit price for furnished and installed casing pipe as called out in the Proposal. Smooth wall casing pipe shall be of welded steel construction and shall be new material with a minimum yield point of 35,000 psi. The pipe shall have a wall thickness of 0.188 inches.

Q. Pressure Reducing Valve Vault

1. The pressure reducing valve vaults will be paid for at the Contract unit price as stated in the Proposal. Payment shall include all materials, labor, and tools necessary for a complete installation including precast vault, ring and lid, pressure reducing valve, valve setter, reducers, restrainers, other piping required, and all appurtenances as called for on the plans and within these specifications.

**END OF SECTION**

## **SECTION 01 25 00 - SUBSTITUTIONS AND PRODUCT OPTIONS**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Substitutions and product options.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 01 33 23 - Shop Drawings, Product Data, and Samples

#### **1.03 PRODUCTS LIST**

- A. Within 30 days after date of Contract, submit to Engineer five (5) copies of complete list of all products which are proposed for installation.
- B. Tabulate list by each Specification section.
- C. For products specified under reference standards, include with listing of each product:
  - 1. Name and address of manufacturer.
  - 2. Trade name.
  - 3. Model or catalog designation.
  - 4. Manufacturer's data:
    - a. Performance and test data.
    - b. Reference standards.

#### **1.04 CONTRACTOR'S OPTIONS**

- A. For products specified only by reference standards, manufacturer shall submit data for approval 10 days prior to bid date.
- B. For products specified by naming several products or manufacturers, select any product and manufacturer named.
- C. For products specified by naming one (1) product, Contractor must submit a request, as required for substitution, for any product not specifically named.

#### **1.05 SUBSTITUTIONS**

- A. During bidding, Engineer will consider written requests from prime Bidders for substitutions, received at least 10 days prior to bid date; requests received after that time will not be considered.
- B. Submit five (5) copies of request for substitution. Include in request:
  - 1. Complete data substantiating compliance of proposed substitution with Contract Documents.
  - 2. For products:
    - a. Product identification, including manufacturer's name and address.
    - b. Manufacturer's literature.
      - 1) Product description.
      - 2) Performance and test data.
      - 3) Reference standards.
    - c. Samples.

- d. Name and address of similar projects on which product was used, and date of installation.
  3. For construction methods:
    - a. Detailed description of proposed method.
    - b. Drawings illustrating methods.
  4. Itemized comparison of proposed substitution with product or method specified.
  5. Data relating to changes in construction schedule.
  6. Relation to separate contracts.
- C. In making request for substitution, Bidder represents:
1. They have personally investigated proposed product or method and determined that it is equal or superior in all respects to that specified.
  2. They shall provide the same guarantee for substitution as for product or method specified.
  3. They shall coordinate installation of accepted substitution into work, making such changes as may be required for work to be complete in all respects.
  4. They waive all claims for additional costs related to substitution which consequently becomes apparent.
  5. Cost data is complete and includes all related costs under their contract, but excludes:
    - a. Costs under separate contracts.
    - b. Engineer's redesign.
- D. Substitutions will not be considered if:
1. They are indicated or implied on Shop Drawings or Project Data submittals without formal requests submitted in accord with Paragraph 1.04.
  2. Acceptance will require substantial revision of Contract Documents.
- E. Engineer will notify Bidders of all approved substitutions by Addendum listing manufacturers of each item.

## **PART 2 - PRODUCTS**

Not applicable to this section.

## **PART 3 - EXECUTION**

Not applicable to this section.

## **END OF SECTION**

## **SECTION 01 29 76 - APPLICATIONS FOR PAYMENT**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Progress payment and final payment.

#### **1.02 RELATED SECTIONS**

- A. EJCDC Section C-410: Bid Forms
- B. EJCDC Section C-700: Standard General Conditions

#### **1.03 QUALITY ASSURANCE**

- A. Prior to start of construction, secure the Engineer's approval of the schedule of values to be submitted under the Regulations of the Contract and further described in these Specifications.
- B. During progress of the Work, modify the schedule of values for approval by the Engineer to reflect changes in the contract sum due to change orders or other modifications of the Contract or Work schedule.
- C. Base requests for payment on the approved Work completed, not to exceed the schedule of values.

#### **1.04 SUBMITTALS**

- A. Progress payment submittal:
  - 1. Make formal submittal by typing in the agreed data, on EJCDC C-620 – Contractor's Application for Payment, plus continuation sheet or sheets.
  - 2. Included with certificate for payment shall be properly executed bills of sale for materials and equipment upon which payment is being requested.
  - 3. Sign and notarize the application and certificate for payment.
  - 4. Submit the original and three (3) copies to the Engineer for payment approval.
  - 5. Payments shall be submitted to the Engineer on the 20<sup>th</sup> of each month for approval. Owner will process payment submittal within 30 days after Engineer approval.
- B. Final payment:
  - 1. Final payment shall be processed as described within these specifications.

### **PART 2 - PRODUCTS**

Not applicable to this Section.

### **PART 3 - EXECUTION**

Not applicable to this Section.

### **END OF SECTION**





## **SECTION 01 31 19 - PROJECT MEETINGS**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Project meeting.
- B. Delays in meeting schedules shall not constitute an allowable extension of time when determining liquidated damages.

#### **1.02 RELATED SECTIONS**

- A. Section 01 33 23 - Shop Drawings, Product Data, and Samples
- B. Section 01 78 39 - Project Record Documents

#### **1.03 PRE-CONSTRUCTION MEETING**

- A. Schedule after date of notice to proceed.
- B. Attendance:
  - 1. Owner.
  - 2. Engineer.
  - 3. General Contractor.
  - 4. Subcontractors.
  - 5. Representatives of governmental or other regulatory agencies.
- C. Minimum agenda:
  - 1. Distribute and discuss:
    - a. List of major subcontractors.
    - b. Tentative construction schedule.
  - 2. Critical work sequencing.
  - 3. Relation and coordination of prime contractors.
  - 4. Designation of responsible personnel.
  - 5. Processing of field decisions and Change Orders.
  - 6. Adequacy of distribution of Contract Documents.
  - 7. Submittal of Shop Drawings, Project Data and Samples.
  - 8. Procedures for maintaining record documents.
  - 9. Use of premises:
    - a. Office and storage areas.
    - b. Owner's requirements.
  - 10. Major equipment deliveries and priorities.
  - 11. Safety and first-aid procedures.
  - 12. Security procedures.
  - 13. Housekeeping procedures.

#### **1.04 PROJECT MEETINGS**

- A. Hold called meetings as progress of work dictates.
- B. Location of meetings:  
Job Site, or as indicated in notice.
- C. Attendance:
  - 1. Engineer or Engineer's representative.
  - 2. General Contractors.
  - 3. Subcontractors as pertinent to agenda.
- D. Minimum agenda:
  - 1. Review work progress since last meeting.
  - 2. Note field observations, problems, and decisions.
  - 3. Identify problems which impede planned progress.
  - 4. Revise construction schedule as indicated.
  - 5. Plan progress during next work period.
  - 6. Coordinate projected progress with other prime contractors.
  - 7. Review submittal schedules, expedite as required to maintain schedule.
  - 8. Maintaining of quality and work standards.
  - 9. Review changes proposed by Owner for:
    - a. Effect on construction schedule.
    - b. Effect on completion date.
  - 10. Complete other current business.

#### **PART 2 - PRODUCTS**

Not applicable to this Section.

#### **PART 3 - EXECUTION**

Not applicable to this Section.

#### **END OF SECTION**

## **SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Shop Drawings, Product Data, and Samples required by specification sections.

#### **1.02 RELATED SECTIONS**

- A. Section 01 45 29 - Testing Laboratory Services
- B. Section 01 77 00 - Project Closeout
- C. Section 01 78 39 - Project Record Documents

#### **1.03 SHOP DRAWINGS**

- A. Original drawings, prepared by Contractor, subcontractor, supplier or distributor, which illustrate some portion of the Work; showing fabrication, layout, setting or erection details.
- B. Prepared by a qualified detailer.
- C. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
- D. All submittals shall be hard copies unless approval is given by the Engineer to provide electronic submittals.
- E. Reproductions for hard copy submittals:
  - Opaque diazo prints or blueprints, or black-lines on bond.

#### **1.04 PRODUCT DATA**

- A. Manufacturer's standard schematic drawings:
  - 1. Modify drawings to delete information which is not applicable to project.
  - 2. Supplement standard information to provide additional information applicable to project.
- B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data.
  - 1. Clearly mark each copy to identify pertinent materials, products or models.
  - 2. Show dimensions and clearances required.
  - 3. Show performance characteristics and capacities.
  - 4. Show wiring diagrams and controls.

#### **1.05 SAMPLES**

- A. Physical examples to illustrate materials, equipment or workmanship, and to establish standards by which completed work is judged.
- B. Office samples: of sufficient size and quantity to clearly illustrate:
  - 1. Functional characteristics of product or material with integrally related parts and attachments devices.
  - 2. Full range of color samples.
  - 3. After review, samples may be used in construction of Project.

- C. Field samples and mock-ups:
  - 1. Erect at Project site at location acceptable to Engineer.
  - 2. Construct each sample or mock-up complete, including work of all trades required in finished work.

#### **1.06 CONTRACTOR RESPONSIBILITIES**

- A. Review Shop Drawings, Product Data, and Samples prior to submission.
- B. Verify:
  - 1. Field measurements.
  - 2. Field construction criteria.
  - 3. Catalog numbers and similar data.
- C. Coordinate each submittal with requirements of Work and of Contract Documents.
- D. Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals.
- E. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Engineer's review of submittals, unless the Engineer gives written acceptance of specific deviations.
- F. Notify Engineer, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.
- G. Begin no work which requires submittals until submittal approval.
- H. After Engineer's review, distribute copies.

#### **1.07 SUBMISSION REQUIREMENTS**

- A. Schedule submissions at least 10 days before dates approved submittals will be needed.
- B. Hard Copy Submittals:

Submit number of copies of Shop Drawings, Product Data, and Samples that Contractor requires for distribution plus three (3) copies which will be retained by the Engineer.

Electronic Submittals:

Submit Shop Drawing and Product Data in electronic (PDF) format, one (1) file per submission. Files shall be titled using CSI format to match specification section and paragraph. Electronic files shall include all information as required by this specification.
- C. Submit number of Samples specified in each Specification section.
- D. Accompany submittals with transmittal letter, in duplicate for hard copy submittals, containing:
  - 1. Date.
  - 2. Project title and number.
  - 3. Contractor's name and address.
  - 4. The number of each Shop Drawing, Product Data, and Sample submitted.
  - 5. Notification of deviations from Contract Documents.
  - 6. Other pertinent data.

E. Submittals shall include:

1. Date and revision dates.
2. Project title and number.
3. The names of:
  - a. Engineer.
  - b. Contractor.
  - c. Subcontractor.
  - d. Supplier.
  - e. Manufacturer.
  - f. Separate detailer when pertinent.
4. Identification of product or material.
5. Relation to adjacent structure or materials.
6. Field dimensions, clearly identified.
7. Specification section number.
8. Applicable standards, such as ASTM number or Federal Specification.
9. A blank space, 3 inches by 5 inches, for the Engineer's stamp.
10. Identification of deviations from Contract Documents.
11. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements, and compliance with Contract Documents.

**1.08 RESUBMISSION REQUIREMENTS**

A. Shop Drawings:

1. Revise initial drawings as required and resubmit as specified for initial submittal.
2. Indicate on drawings any changes which have been made other than those requested by Engineer.
3. Product Data and Samples:  
Submit new data and samples as required for initial submittal.

**1.09 DISTRIBUTION OF SUBMITTALS AFTER REVIEW**

A. Distribute copies of Shop Drawings and Product Data which carry Engineer's stamp, to:

1. Contractor's file.
2. Job-site file.
3. Record Documents file.
4. Subcontractors.
5. Supplier.
6. Fabricator.

B. Distribute samples as directed.

**1.10 ENGINEER'S DUTIES**

- A. Review submittals with reasonable promptness.

- B. Review for:
  - 1. Design concept of project.
  - 2. Information given in Contract Documents.
- C. Review of separate item does not constitute review of an assembly in which item functions.
- D. Affix stamp and initials or signature indicating review of submittal.
- E. Return submittals to Contractor for distribution.

**PART 2 - PRODUCTS**

Not applicable to this Section.

**PART 3 - EXECUTION**

Not applicable to this Section.

**END OF SECTION**

## **SECTION 01 45 29 - TESTING LABORATORY SERVICES**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

A. Testing:

From time to time during progress of the work, the Owner may require that testing be performed to determine that materials provided for the work meet the specified requirements.

#### **1.02 RELATED SECTIONS**

- A. Requirements for testing may be described in various Sections of these Specifications. Where no testing requirements are described, but the Owner decides that testing is required, the Owner may require testing to be performed under current pertinent standards for testing.

#### **1.03 QUALITY ASSURANCE**

A. Qualifications of testing laboratory:

The testing laboratory will be qualified to the Owner's approval.

B. Codes and standards:

Testing will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.

#### **1.04 TEST REPORT DISTRIBUTION**

- A. Promptly process and distribute all required copies of test reports and related instructions to ensure all necessary retesting and/or replacement of materials with the least possible delay in progress of the work. The testing laboratory shall distribute copies of the test results as follows:

Owner	1 copy
Engineer (Lamp Rynearson)	1 copy
Contractor office	1 copy
Project Representative	1 copy
Job Superintendent	1 copy

#### **1.05 PAYMENT FOR TESTING SERVICES**

A. Initial services:

1. The Contractor shall pay for all initial testing services for concrete testing during construction. All cost required for mix design shall be paid by Contractor.
2. The Contractor will pay for all initial testing services for soil and compaction testing.
3. Testing not called for but required by Owner will be paid by the Owner.
4. The Contractor shall pay all delivery cost on concrete cylinders.
5. The Contractor shall pay all cost for concrete and asphalt mix design requirements. This cost is not part of testing allowance.

B. Re-testing:

When initial tests indicate non-compliance with the Contract Documents, all subsequent retesting occasioned by the non-compliance shall be performed by the same testing laboratory and the costs thereof will be paid by the Contractor.

### **1.06 CODE COMPLIANCE TESTING**

Inspections and tests required by codes or ordinances, or by a plan approval authority, and made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

### **1.07 CONTRACTOR'S CONVENIENCE TESTING**

Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

## **PART 2 - PRODUCTS**

Not applicable to this Section.

## **PART 3 - EXECUTION**

### **3.01 COOPERATION WITH TESTING LABORATORY**

- A. Representatives of the testing laboratory shall have access to the Work at all times. Provide facilities for such access in order that the laboratory may properly perform its functions.

### **3.02 SCHEDULES FOR TESTING**

- A. Establishing schedule:

1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.
2. Provide all required time within the construction schedule.

- B. Revising schedule:

When changes of construction schedule are necessary during construction, coordinate all such changes of schedule with the testing laboratory as required.

- C. Adherence to schedule:

When the testing laboratory is ready to test according to the determined schedule but is prevented from testing or taking specimens due to incompleteness of the Work, all extra costs for testing attributable to the delay may be backcharged to the Contractor and shall not be borne by the Owner.

### **3.03 TAKING SPECIMENS**

- A. All specimens and samples for testing, unless otherwise provided in these Contract Documents, will be taken by the testing laboratory; all sampling equipment and personnel will be provided by the testing laboratory; and all deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.
- B. Concrete specimens for test cylinders shall be taken by the Contractor. Four (4) cylinders shall be made for each concrete placement exceeding five (5) cubic yards. Cylinders shall be made in accordance with ACI recommended procedure. Contractor shall deliver samples to the laboratory.

## **END OF SECTION**



## **SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Temporary facilities and controls that are required for this Work but not necessarily limited to:
  - 1. Temporary utilities such as gas, water, electricity, and telephone.
  - 2. Sanitary facilities.
  - 3. Enclosures such as tarpaulins, barricades, and canopies.
  - 4. Schedule of work and plant operation.
  - 5. Field offices and sheds.

#### **1.02 RELATED SECTIONS**

- A. Section 01 73 29 - Cutting and Patching
- B. Section 01 78 00 - Closeout Submittals
- C. Utility hook-up: Installation and hook-up of the various utility lines are described in other pertinent sections of these Specifications.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

#### **1.04 PRODUCT HANDLING**

- A. Protection:

Use all means necessary to maintain temporary facilities and controls in proper and safe condition throughout progress of the Work.
- B. Replacements:

In the event of loss or damage, immediately make all repairs and replacements necessary at no additional cost to the Owner.

### **PART 2 - PRODUCTS**

#### **2.01 UTILITIES**

- A. Temporary utilities:
  - 1. General

Provide and pay all costs for all gas, water, and electricity required for the performance of the Work.
  - 2. At start-up Contractor shall provide and pay for all costs associated with filling basins with water.
  - 3. Temporary piping:

Furnish and install all necessary temporary piping and, upon completion of the Work, remove all such temporary piping.

4. Temporary electricity:
  - a. Furnish and install all necessary temporary wiring and associated equipment.
  - b. Furnish and install area distribution boxes so located that the individual trades may use their own construction-type extension cords to obtain proper power and artificial lighting at all points where required by inspectors and for safety.

## **2.02 SANITARY FACILITIES**

- A. Furnish and install all required temporary toilet buildings with sanitary toilets for use by all personnel. Comply with all minimum requirements of all public agencies having jurisdiction. Maintain in a sanitary condition at all times.

## **2.03 ENCLOSURES**

- A. Furnish, install, and maintain for the duration of construction all required scaffolds, tarpaulins, barricades, canopies, warning signs, steps, bridges, platforms, and other temporary construction necessary for proper completion of the Work in compliance with all pertinent safety and other regulations.

## **2.04 FIELD OFFICE AND SHEDS**

- A. Not required as long as Contractor Superintendent is readily available by cellular telephone.

## **2.05 CONSTRUCTION FENCE**

- A. Fence shall be a minimum of four (4) feet high and constructed from snow fence, chain link or plastic safety fence. Fence shall be constructed completely around project.

## **2.06 TREE PROTECTION**

- A. Trees inside project limits shall be protected with barricades. Barricades shall be same material as construction fence and located at tree drip line.

# **PART 3 - EXECUTION**

## **3.01 REMOVAL**

- A. Maintain all temporary facilities and controls as long as needed for the safe and proper completion of the Work. Remove all such temporary facilities and controls as rapidly as progress of the Work will permit or as directed by the Engineer.

## **3.02 SAFETY**

- A. Erection and maintenance of all safety barricades, shoring, fences, and other devices necessary for safe conditions to protect the Work, equipment, workers, public, and others, shall be the responsibility of the Contractor. The Contractor shall erect or construct such devices as conditions may require and shall maintain them to provide safe conditions throughout the construction period.

## **END OF SECTION**

## **SECTION 01 73 29 - CUTTING AND PATCHING**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Coordination of work under the Contract; work under separate contracts, and coordination of various parts of work.

#### **1.02 RELATED SECTIONS**

- A. Section 22 10 00 - Plumbing
- B. Section 26 00 00 - Electrical
- C. Section 31 23 16 - Excavation, Backfill, and Site Grading

#### **1.03 SUBMITTALS**

- A. Prior to cutting, submit notice requesting consent to proceed with cutting, including:
  - 1. Identification of project.
  - 2. Description of affected work.
  - 3. Necessity for cutting.
  - 4. Effect on other work, on structural integrity of Project.
  - 5. Description of proposed work. Designate:
    - a. Scope of cutting and patching.
    - b. Contractor and trades to execute work.
    - c. Products proposed to be used.
    - d. Extent of refinishing.
  - 6. Alternatives to cutting and patching.
  - 7. Designation of party responsible for cost of cutting and patching.
- B. Prior to cutting and patching inform Construction Observer.
- C. Should conditions of work, or schedule, indicate change of materials or methods, submit written recommendation, including:
  - 1. Conditions indicating change.
  - 2. Recommendations for alternative materials or methods.
  - 3. Submittals as required for substitutions.
- D. Submit notice designating time worked will be uncovered to provide for observation.

#### **1.04 SYSTEM DESCRIPTION**

- A. Execute cutting (including excavating), fitting, or patching of work required to:
  - 1. Make several parts fit properly.
  - 2. Uncover work to provide for installation of ill-timed work.
  - 3. Remove and replace defective work.
  - 4. Remove and replace work not conforming to requirements of Contract Documents.
  - 5. Remove samples of installed work as specified for testing.
  - 6. Install specified work in existing construction.
- B. In addition to Contract requirements, upon written instructions of Engineer:
  - 1. Uncover work to provide for Engineer's observation of covered work.
  - 2. Remove samples of installed materials for testing.
  - 3. Remove work to provide for alteration of existing work.

- C. Do not endanger any work by cutting or altering work or any part of it.
- D. Do not cut or alter work of another Contractor without written notice.

### **1.05 PAYMENT FOR COSTS**

- A. Costs caused by ill-timed or defective work, or work not conforming to contract documents, including costs for additional services of Engineer shall be paid by the Contractor.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Match existing materials for cutting and patching work with new materials conforming to Project requirements.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

- A. Inspect existing conditions of work, including elements subject to movement or damage during:
  - 1. Cutting and patching.
  - 2. Excavating and backfilling.
- B. After uncovering work, inspect conditions affecting installation of new products.

### **3.02 PREPARATION (PRIOR TO CUTTING):**

- A. Provide shoring, bracing, and support to maintain structural integrity of project.
- B. Provide protection for other portions of project.
- C. Provide protection from elements.

### **3.03 PERFORMANCE**

- A. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances and finishes.
- B. Execute cutting and demolition by methods which shall prevent damage to other work and shall provide proper surfaces to receive installation of repairs and new work.
- C. Execute excavating and backfilling as specified in Section 31 23 16 - Excavation, Backfill, and Site Grading.
- D. Restore work which has been cut or removed. Install new products to provide completed work in accordance with requirements of Contract Documents.
- E. Refinish entire surfaces as necessary to provide an even finish.
  - 1. Continuous surfaces: to nearest intersections.
  - 2. Assembly: entire refinishing.
- F. Use cutting tools, not chopping tools. Make neat holes. Minimize damage to adjacent work. Check for concealed utilities and structure before cutting.

## **END OF SECTION**

## **SECTION 01 74 00 - CLEANUP**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Project cleanup.

#### **1.02 RELATED SECTIONS**

- A. Section 01 50 00 - Temporary Facilities and Controls
- B. Section 01 77 00 - Project Closeout
- C. Cleaning for Specific Products or Work: Specification Section for that work.

#### **1.03 SAFETY REQUIREMENTS**

- A. Hazards Control:
  - 1. Store volatile wastes in covered metal containers and remove from premises daily.
  - 2. Prevent accumulation of wastes which create hazardous conditions.
  - 3. Provide adequate ventilation during use of volatile or noxious substances.
- B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
  - 1. Do not burn or bury rubbish and waste materials on project site.
  - 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
  - 3. Do not dispose of wastes into streams or waterways.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

- A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. Maintain premises and public properties free from accumulations of waste, debris, and rubbish caused by operations.
- B. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

#### **3.02 DURING CONSTRUCTION**

- A. Execute cleaning to ensure that building, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
- B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.

- C. At reasonable intervals during progress of Work, clean site and public properties, and dispose of waste materials, debris, and rubbish.
- D. Provide on-site dump containers for collection of waste materials, debris, and rubbish.
- E. Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off Owner's property.
- F. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
- G. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
- H. Remove from the Owner's property and from all public and private property, at Contractor's expense, all temporary structures, rubbish, excess excavation, and waste material resulting from his operations.
- I. Clean all dirt from paved surfaces, not allowing same to pack on the roadway or to create a traffic nuisance. Insofar as practicable, clean all dirt from gravel and oil aggregate surfaces.
- J. All existing sod areas shall be hand raked to remove earth deposited on or in them during construction.
- K. All ditches shall be graded and properly sloped.
- L. Shoulders where sodding, seeding, or surfacing is not required shall be bladed and shaped.

### **3.03 FINAL CLEANING**

- A. Employ experienced workers or professional cleaners for final cleaning.
- B. Broom clean paved surfaces; rake clean other surfaces of grounds.
- C. Maintain cleaning until project, or portion thereof, is occupied by Owner.

**END OF SECTION**

## **SECTION 01 77 00 - PROJECT CLOSEOUT**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Administrative procedures, closeout submittals, and forms to be used at substantial completion and at final completion of the Work.

#### **1.02 RELATED SECTIONS**

- A. EJCDC Section C-700: Standard General Conditions
- B. Section 01 74 00 - Cleanup
- C. Section 01 78 39 - Project Record Documents

#### **1.03 FINAL PROJECT REVIEW**

- A. Contractor shall submit written certification that:
  - 1. Contract Documents have been reviewed.
  - 2. Project has been reviewed for compliance with Contract Documents.
  - 3. Work has been completed in accordance with Contract Documents.
  - 4. Equipment and systems have been tested in presence of Owner's representative and are operational.
  - 5. Project is completed, and ready for final review.
- B. Engineer will make final project review within seven days after receipt of certification.
- C. Should the Engineer consider that work is finally complete in accordance with requirements of Contract Documents the Project will be closed.
- D. Should the Engineer consider that work is not finally complete:
  - 1. The Engineer will notify Contractor, in writing, stating reasons.
  - 2. Contractor shall take immediate steps to remedy the stated deficiencies and send second written notice to the Engineer certifying that work is complete.
  - 3. Engineer will review work.

#### **1.04 CLOSEOUT SUBMITTALS**

- A. Project record documents:
  - To requirements of Section 01 78 39 - Project Record Documents.
- B. Deliver evidence of compliance with requirements of governing authorities.
- C. Deliver Certificate of Insurance for products and completed operations.

#### **1.05 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS**

- A. Contractor's affidavit of payment of debts and claims.
- B. Contractor's affidavit of release of liens, with:
  - 1. Consent of surety of final payment.
  - 2. Contractor's release of waiver of liens.
  - 3. Separate releases of waivers of liens for subcontractors, suppliers, and others with lien rights against property of Owner, together with list of those parties.
- C. All submittals shall be duly executed before delivery.

#### **1.06 INSTRUCTION**

- A. Instruct Owner's personnel in operation of all systems, mechanical, electrical, and other equipment.

#### **1.07 FINAL ADJUSTMENT OF ACCOUNTS**

- A. Submit final statement of accounting to Engineer.
- B. Statement shall reflect all adjustments.
  - 1. Original Contract Sum.
  - 2. Additions and deductions resulting from:
    - a. Previous Change Orders.
    - b. Cash Allowances.
    - c. Other Adjustments.
    - d. Deductions for uncorrected Work.
    - e. Deductions for liquidated damages.
    - f. Deductions for Re-inspection Payments.
  - 3. Total Contract Sum, as adjusted.
  - 4. Previous payments.
  - 5. Sum remaining due.
- C. Engineer will prepare final Change Order, reflecting approved adjustments to Contract Sum not previously made by Change Orders.

#### **1.08 FINAL APPLICATION FOR PAYMENT**

- A. Contractor shall submit final application in accordance with requirements of Regulations of the Contract.

#### **1.09 FINAL CERTIFICATE FOR PAYMENT**

- A. Engineer will issue final certificate in accordance with provisions of Regulations of the Contract.
- B. Should final completion be materially delayed through no fault of Contractor, Engineer may issue, for Owner's approval, a Semi-Final Certificate for Payment, in accordance with provisions of Regulations of the Contract.

#### **1.10 POST-CONSTRUCTION PROJECT REVIEW**

- A. Prior to expiration of one (1) year from Date of Substantial Completion, the Owner may request a visual review of Project in company with Engineer and Contractor to determine whether correction of Work is required, in accordance with provisions of Regulations of the Contract. The Contractor shall be present for the review and be ready to promptly correct any noted deficiencies. The Contractor will also provide equipment as necessary to facilitate this review.
- B. The Engineer will promptly notify Contractor in writing of any observed deficiencies.

#### **PART 2 - PRODUCTS**

Not applicable to this Section.

#### **PART 3 - EXECUTION**

Not applicable to this Section.

#### **END OF SECTION**



## **SECTION 01 78 39 - PROJECT RECORD DOCUMENTS**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Record documents.

#### **1.02 RELATED SECTIONS**

- A. Section 01 33 23 - Shop Drawings, Product Data, and Samples

#### **1.03 MAINTENANCE OF DOCUMENTS**

- A. Maintain at job site, one copy of:
  - 1. Contract Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Reviewed Shop Drawings.
  - 5. Change Orders.
  - 6. Other Modifications to Contract.
  - 7. Field Test Records.
- B. Maintain documents in clean, dry, legible condition.
- C. Do not use record documents for construction purposes.
- D. Make documents available at all times for inspection by Engineer, appropriate State and Federal Regulatory Agencies, and Owner.
- E. Store documents in temporary field office apart from documents used for construction.
- F. Provide files and racks for storage of documents.
- G. File documents in accordance with Project Filing Format of Uniform Construction Index.

#### **1.04 RECORDING**

- A. Label each document "PROJECT RECORD" in two (2) inch high printed letters.
- B. Keep record documents current.
- C. Do not permanently conceal any work until required information has been recorded.
- D. Contract Drawings: Legibly mark to record actual construction:
  - 1. Depths of various elements of sewer pipe and manholes in relation to survey datum.
  - 2. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
  - 3. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
  - 4. Field changes of dimension and detail.
  - 5. Changes made by Change Order or Field Order.
  - 6. Details not on original contract drawings.

- E. Specifications and Addenda: Legibly mark up each section to record:
  - 1. Manufacturer, trade name, catalog number, and Supplier of each product and item of equipment actually installed.
  - 2. Changes made by Change Order or Field Order.
  - 3. Other matters not originally specified.
- F. Shop Drawings: Maintain as record documents; legibly annotate following drawings to record changes made after review.
  - 1. Electrical controls.
  - 2. Equipment.
  - 3. Structural.
  - 4. Mechanical.

#### **1.05 SUBMITTAL**

- A. At completion of project, deliver record documents to the Engineer.
- B. Accompany submittal with transmittal letter, in duplicate, containing:
  - 1. Date.
  - 2. Project title and number.
  - 3. Contractor's name and address.
  - 4. Title and number of each record document.
  - 5. Certification that each document as submitted is complete and accurate.
  - 6. Signature of Contractor, or their authorized representative.

#### **PART 2 – PRODUCTS**

Not applicable to this Section.

#### **PART 3 – EXECUTION**

Not applicable to this Section.

#### **END OF SECTION**

## **SECTION 01 89 00 - SPECIAL CONSTRUCTION REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.01 FOREWORD**

- A. The provisions of this Section supplement the other provisions in these Specifications.

#### **1.02 INSURANCE**

- A. The insuring company shall deliver to the Owner all the certificates of required insurance.
- B. The Contractor may not begin work of any nature until all insurance requirements are met.
- C. Contractor shall also supply a General Liability Insurance Certificate with the Missouri Department of Transportation as the Certificate holder. This Certificate shall be for \$3,000,000 per occurrence or as required by MoDOT.

#### **1.03 GENERAL CONDITIONS**

General Conditions are general in scope and may refer to conditions not encountered on or in connection with the work covered by this Contract. Any provisions of the General Conditions which pertains to a nonexistent condition and is not applicable to the work to be performed hereunder, or which conflicts with any provision of the General Construction Requirements, shall have no meaning in the Contract and shall be disregarded.

#### **1.04 SPECIFICATIONS**

- A. The specifications which shall govern the materials and equipment to be furnished and the work to be performed in the construction of the work under this Contract are identified and indexed in the Table of Contents at the beginning of this volume of the Contract Documents.
- B. No attempt has been made in the designated specifications to segregate work to be performed by any trade or subcontract under any one specification or part thereof. Any segregation between the trade or craft jurisdictional limits will be solely a matter of agreement between the Contractor and their employees and their subcontractors.

#### **1.05 CHANGES, APPROVAL OF MATERIALS, AND AUTHORITY OF CONSTRUCTION REPRESENTATIVE**

- A. Wherever the words "or equal" appear in the Plans and Specifications the Engineer shall be the sole judge as to whether an alternate product is equal to the product or trade name mentioned.
- B. The Contractor shall submit to the Engineer at least six (6) copies of shop drawings, catalog data, supporting data, specifications, etc., on all items of equipment and materials before ordering same. No equipment or material of any kind may be placed in the work until the Contractor and the Construction Representative have received written approval either by letter or by drawings, etc., stamped "Approved-Final." It shall also be the Contractor's responsibility to point out any variations from the Engineer's specifications in any items submitted for approval.
- C. The project shall be constructed in accordance with the Contract Plans and Specifications unless a Change Order is received in writing from the Kansas City office

of Lamp Rynearson. The Construction Representative will make general inspection of the construction but will have no authority to make or to allow changes in design or construction. Request for changes desired by the Contractor shall be submitted by them in writing to the Engineer sufficiently in advance to allow proper investigation and consideration. Otherwise, the Engineer will not be responsible for delays.

#### **1.06 MAINTENANCE OF TRAFFIC**

- A. The Contractor shall conduct their work so as to interfere as little as possible with public travel, whether vehicular or pedestrian; whenever it is necessary to cross, obstruct, or close roads, driveways, and walks, whether public or private. The Contractor shall at their own expense provide and maintain suitable and safe bridges, detours, or other temporary expedients for the accommodation of public and private travel, and shall give reasonable notice to owners of private drives before interfering with them; provided however, that such maintenance of traffic will not be required at any point where the Contractor has obtained permission from the owner and tenant of private property, or from the authority having jurisdiction over the public property involved, to obstruct traffic at any designated point thereon and for the duration of whatever period of time as may be agreed upon.

#### **1.07 EXISTING UNDERGROUND INSTALLATIONS AND STRUCTURES**

- A. Pipe lines and other existing underground installations and structures in the vicinity of the work to be done hereunder are indicated on the plans according to the best information available to the Owner. The Owner does not guarantee the accuracy of such information. The Contractor shall make every effort to locate all underground pipe lines, conduits and structures by contacting owners of underground utilities and by prospecting in advance of trench excavation.
- B. Any delays or extra cost to the Contractor caused by pipe lines or other underground structures or obstructions not shown by the plans, or found in locations different than those indicated, shall not constitute a claim for extra work, additional payment, or damages.

#### **1.08 SUBSURFACE CONDITIONS**

- A. Contractor is to satisfy themselves as to the nature of the material to be encountered, including rock excavation and possible ground water and take all conditions into account in their bid.

#### **1.09 EROSION CONTROL**

- A. The Contractor will be required to exercise reasonable erosion control of disturbed areas during the construction period through the use of check dams, siltation pools, mulching, etc.

#### **1.10 HISTORICAL/ARCHEOLOGICAL**

- A. If, during the course of construction, evidence of deposits of historical or archeological interest is found, the Contractor shall cease operations affecting the find and shall notify the Owner, who shall notify the **Missouri** Department of Natural Resources and the Director, Division of Parks & Historical Preservation, P.O. Box 176, 205 Jefferson Street, Jefferson City, MO 65102, phone (573) 751-7858.
- B. No further disturbance of the deposits shall ensue until the Contractor has been notified by the Owner that they may proceed. The Owner will issue a notice to proceed only after

the state official has surveyed the find and made a determination to the Environmental Protection Agency and the Owner. Compensation to the Contractor, if any, for lost time or changes in construction to avoid the find, shall be determined in accordance with changed conditions or Change Order provisions of these Specifications.

#### **1.11 COMPLIANCE WITH LAWS**

- A. The Contractor shall comply with all applicable Federal, State, and local laws and ordinances.

#### **1.12 "OR EQUAL" STATEMENT**

- A. When a manufacturer's name is used in these Specifications it is used to establish a standard and the words "or equal," if not stated, are implied.

#### **1.13 PAYMENT TO CONTRACTOR**

- A. The field representative and Contractor shall prepare and submit a monthly pay estimate to the Engineer for approval on or before the 20th day of each month. Request for payment received after the first day of the month will not be considered. This will ensure that no unnecessary delays in payment to contractors will result.
- B. The Engineer will recommend or reject pay estimates within a period of five (5) days after receipt of these estimates. The Owner shall pay the contractor the approved amount due within a period of 30 days from the Engineer's approval.
- C. If the Owner fails to make payment 30 days after approval by the Engineer, in addition to other remedies available to the contractor, then shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the Contractor. The legal rate of interest shall be as specified in 34.057 RSMo, latest revision.

#### **1.14 CONSTRUCTION SCHEDULE**

- A. The Contractor shall provide a schedule of construction activities within 30 days after initiation of construction. This schedule must show anticipated progress and the estimated dollar amount that will be requested each month. This schedule must be periodically updated to ensure accuracy. The schedule shall be revised if a variation of more than 10 percent occurs.

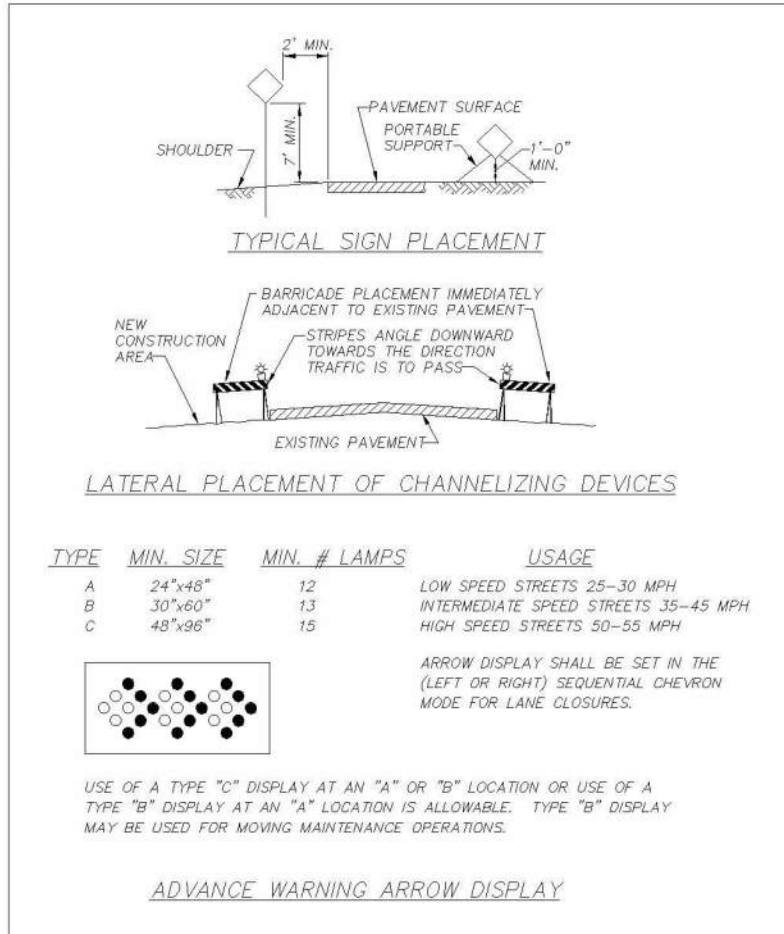
#### **1.15 ONE HUNDRED PERCENT PERFORMANCE AND PAYMENT BOND**

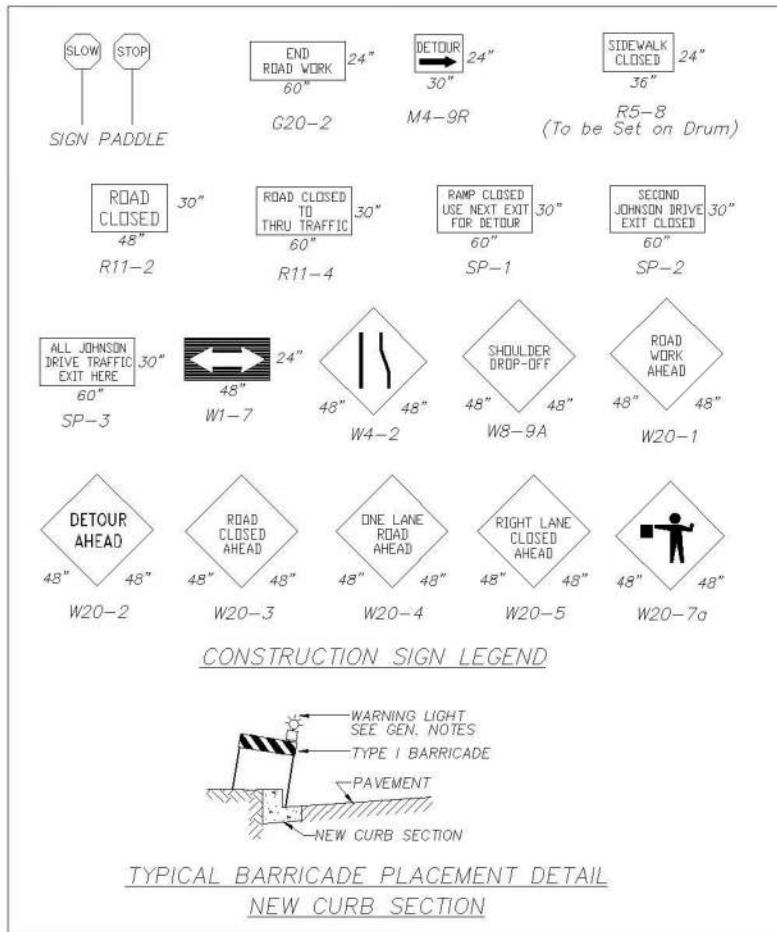
- A. The Contractor shall provide separate Performance and Payment Bonds, each in the amount of 100 percent of the contract amount.

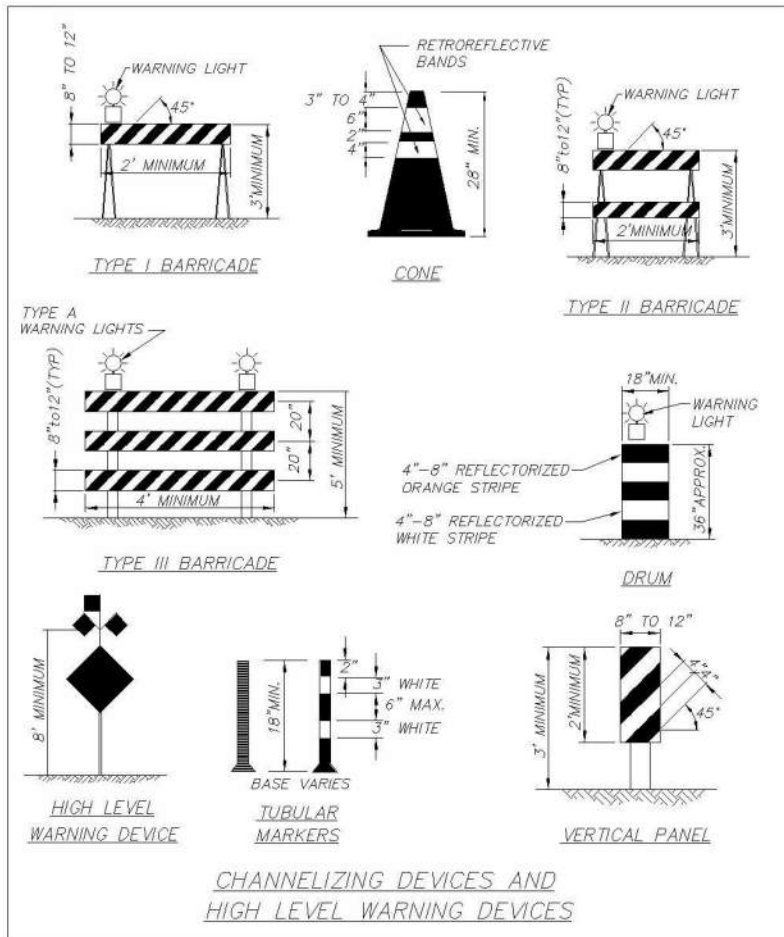
#### **1.16 GENERAL TRAFFIC CONTROL REQUIREMENTS (ATTACHED SIGNING SHEETS)**

- A. All signing and traffic control devices shall conform to the "Manual on Traffic Control Devices."
- B. The attached detail signing sheet(s) apply to a restricted roadway width caused by the Contractor's construction activities. If construction activity of the Contractor is located off the roadway, then the minimum signing will be required. W 20-1 ROAD WORK AHEAD and G 20-2 END OF ROAD WORK.
- C. Extended work areas may require additional signing.

- D. A minimum of one (1) lane in each direction must be provided at the end of each work day.
- E. All roadways which are closed due to the Contractor's construction activities shall be provided with Detour signing and appropriate barricades.
- F. **All City of Grain Valley, MoDOT, and State of Missouri** procedures and regulations shall be followed. Contractor shall be responsible for all roadway crossing permits, erosion control permitting and permits to install waterline within road right-of-way.







**PART 2 – PRODUCTS**

Not applicable to this Section.

**PART 3 – EXECUTION**

Not applicable to this Section.

**END OF SECTION**



## **SECTION 02 30 00 - SUBSURFACE CONDITIONS**

### **PART 1 - GENERAL**

#### **1.01 DESCRIPTION**

- A. An investigation of subsoil has not been made for this project. Ground water and rock may be encountered in excavations. Depth of ground water may vary seasonally.

#### **1.02 ADDITIONAL INFORMATION**

- A. The Contractor should visit the site and acquaint themselves with all existing conditions. Prior to bidding, bidders may make their own subsurface investigations to satisfy themselves as to site and subsurface conditions, but such subsurface investigations shall be performed only under time schedules and arrangements approved in advance by the Owner. Such exploratory excavation shall be made in a manner and location that will not disturb piping or other buried utilities or facilities.
- B. The Contractor shall satisfy themselves as to the nature of the material to be excavated and the amount of rock or water to be handled. The Contractor shall include in their unit prices bid all costs in connection with excavation, dewatering and difficulties encountered and shall assume full risk in the matter.

### **PART 2 – PRODUCTS**

Not applicable to this Section.

### **PART 3 – EXECUTION**

Not applicable to this Section.

### **END OF SECTION**



## **SECTION 03 30 00 - CAST-IN-PLACE CONCRETE**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Cast-in-place concrete.

#### **1.02 RELATED SECTIONS**

- A. Section 01 45 29 - Testing Laboratory Services

#### **1.03 REFERENCE STANDARDS**

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete 1991 (Reapproved 2009).
- B. ACI 318 - Building Code Requirements for Structural Concrete 2019, with Errata (2021).
- C. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field 2021a.
- D. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2018.
- E. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 2021.
- F. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2021b.
- G. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete 2020.
- H. ASTM C150/C150M - Standard Specification for Portland Cement 2021.
- I. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete 2017.
- J. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete 2010a (Reapproved 2016).
- K. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete 2019.

#### **1.04 QUALITY CONTROL**

- A. Supervision:
  - 1. Provide full time superintendent on the project who is qualified and experienced in concrete construction. Superintendent shall direct all work in connection with concrete construction.
  - 2. Finishers shall be experienced concrete finishers experienced in concrete finish work.
- B. Codes and standards:

Work covered by this specification shall be as specified herein and as specified in "Building Code Requirements for Structural Concrete," ACI 318.

#### **1.05 TESTING**

- A. Laboratory and field testing shall be made on all concrete material including compression yield, air content, and slump test to the following ASTM Test and Specifications.

1. ASTM C31/C31M: Making and Curing Concrete Compressive and Flexural Strength Test Specimens in the Field.
  2. ASTM C33/C33M: Specification for Concrete Aggregate.
  3. ASTM C39/C39M: Test for Compressive Strength of Cylindrical Concrete Specimens.
  4. ASTM C87: Test for Effect of Organic Impurities in Fine Aggregate on Strength of Mortar.
  5. ASTM C143/C143M: Test for Slump of Portland Concrete.
  6. ASTM C150/C150M: Specification for Portland Concrete.
  7. ASTM C172/C172M: Sample Fresh Concrete.
  8. ASTM C231: Test for Air Content of Freshly Mixed Concrete by Pressure Method.
  9. ASTM C260/C260M: Specification for Air Entraining Admixtures for Concrete.
  10. ACI 211.1-70: Recommended Practice for Selecting Proportions for Normal Weight Concrete.
  11. ACI 214-65: Recommended Practice for Evaluation of Compression Test Results of Field Practice.
- B. Concrete test cylinders shall be made at the job site by the Contractor. Concrete sample shall be taken from concrete being placed. Four (4) cylinders shall be made for each pour over five (5) cubic yards. Two (2) cylinders shall be made for each pour for minor structural concrete as manholes, walks, etc.
- Identify test cylinders to area concrete was placed. Cure cylinders same as job concrete. Deliver three (3) cylinders at four (4) days. Test one (1) at seven (7) days, moist cure other and test two (2) at 28 days. Hold fourth cylinder for backup. Job cylinder tests are the basis for acceptance of concrete.
- C. Air content shall be measured at the job site by the pressure method ASTM C231. Each test shall be recorded and identified to area concrete was placed. Test results shall be submitted to the Engineer. Air tests shall be made for all pours over five (5) cubic yards and as directed by Engineer.
- D. Slump test shall be made on all concrete pours. Each test shall be recorded and identified to area concrete was placed. Test results shall be submitted to the Engineer.

#### **1.06 SUBMITTALS AND CERTIFICATES**

- A. Contractor shall submit name and location of transit mix company for approval.
- B. Submit complete laboratory testing data on aggregate gradation, deleterious substances, and durability of mix additives and cement.
- C. Delivery tickets shall be required with each load indicating mix design and information listed under ASTM C94/C94M-16.

#### **1.07 PRODUCT HANDLING**

- A. Transit mix:

Concrete shall be handled and preserved in its "batched" proportion during transportation. Mixing time shall not exceed 45 minutes.

Concrete improperly cared for or mixed in the truck longer than 45 minutes shall be disposed of away from the project. Water shall not be added at any time during transit or at the job site.

B. Defective concrete:

Damaged or defective concrete shall be repaired or removed and replaced immediately as directed by the Engineer.

C. Batch adjustment:

Cement, aggregate, or water, shall not be added to the truck after batching in an attempt to adjust slump or other batch characteristics.

**PART 2 - PRODUCTS**

**2.01 STRUCTURAL CONCRETE**

A. General:

1. All concrete used in the project shall be furnished by a reputable permanent concrete plant using transit mix trucks. The plant shall be located within a reasonable distance from the project, so travel time is 30 minutes or less. Supplier shall have adequate bins that weigh material by approved scale system. The supplier shall have an adequate number of modern trucks to ensure delivery of concrete as required for placing schedule. Supplier shall be subject to approval of the Engineer.
2. The Contractor shall use whatever means necessary to ensure concrete delivered to the project is properly batched with approved kinds and quantities of materials.
3. All admixtures used in concrete mix shall contain no chlorides.

B. Cement:

All cement shall be Type 1 Portland cement conforming to ASTM C150/C150M.

C. Fine aggregate:

1. Fine aggregate shall consist of natural sand conforming to ASTM C33/C33M. Sand shall be well graded, washed, and shall conform to the following sieve analysis:

Sieve Size	Percent Passing
½ Inch	100
3/8 inch	99-100
No. 4	95-100
No. 8	85-95
No. 16	66-85
No. 30	30-60
Sieve Size	Percent Passing
No. 50	10-30
No. 100	0-5

2. The sand shall not have more than 35 percent retained between any two (2) consecutive sieve sizes. Fineness modules shall not be less than 2.5 nor more than 3.1.
3. The amount of deleterious substances in fine aggregate, each determined on independent samples complying with the grading requirements of Division 3, shall not exceed the following limits:
4. Table 1. - Limits for Deleterious Substances in Fine Aggregate for Concrete:

Item	Maximum percent by Weight of Total Sample
Clay Lumps	0.25
Material Finer than No. 200 Sieve	2.00
Coal & Lignite	0.06
Sticks, Leaves & Other Deleterious Material	0.25

5. Fine aggregate shall be free of injurious amounts of organic impurities. Except as herein provided, aggregates subjected to ASTM test No. C40-56T for organic impurities and producing a color darker than the standard shall be rejected.
6. Fine aggregate shall be free of material that could react harmfully with alkali in the cement. If such materials are present in injurious amounts, the fine aggregate shall be rejected, or shall be used with cement containing less than 0.6 percent alkali calculated as sodium oxide or with the addition of a material that has been shown to inhibit undue expansion due to the alkali-aggregate reaction.
7. Except as provided above, fine aggregate subjected to five (5) cycles of the soundness test (ASTM C88-59T), shall show a loss, weighted in accordance with the grading of a sample complying with the limitations set forth above, not greater than 10 percent when sodium sulfate is used or 15 percent when magnesium sulfate is used.

**Note: Submittals that do not address all of the above requirements will be returned "Revise and resubmit."**

D. Coarse aggregate:

1. Coarse aggregate shall be crushed limestone having an established history of sound material conforming to ASTM C33/C33M and shall be approved by the Engineer. Furnish soundness test results for approval of source. Coarse aggregate source shall not contain chert deposits.

Gradation	
Sieve Size	Percent Passing
1½ inch	100
1 inch	95-100
½ inch	25-60
No. 4	0-10
No. 8	0-5

2. Satisfactory experience record shown for durability, otherwise pass soundness test ASTM C88-5 cycles using magnesium sulfate without splitting or losing more than 15 percent weight.
3. Contractor shall arrange and pay for testing if adequate history is not available.

**Note: Submittals that do not address all of the above requirements will be returned "Revise and resubmit."**

E. Water:

1. Water for mixing and curing concrete shall be clean, and free from injurious amounts of sewage, oil, acid, alkali, salt, or organic matter. Only potable water shall be used.

F. Concrete Mix:

1. All concrete for the project shall conform to the design mix listed in the table below. The concrete mix shall include water reducing agent and air entrainment of six (6) percent air plus or minus 1.5 percent. 28 day design strength shall be 4500 psi. The total aggregate volume is based on 60 percent coarse aggregate and 40 percent fine aggregate by volume. In the event the percentage of fine aggregate is increased, the amount of cement shall be increased as directed to provide equivalent strength.

Maximum aggregate size	- 1 inch
Maximum water	- 250 lb/cy
W/C weight ratio (maximum)	- 0.410
Cement	- 6.49 sacks/cy
Fibrous concrete reinforcement	- 1.5 lbs./cy

2. The supplier may submit complete data mix to accomplish the above design with which they have had a history of success for the Engineer's approval. The Contractor shall furnish laboratory design mix for the approved materials if a "history" mix is not available.
3. Water reducing agent shall conform to ASTM C494/C494M, Type A. Acceptable agents include Euclid "Eucon WR 91" or "Eucon MR"; Grace "WRDA with Hycol" or "Daracem 65"; Masterbuilders "Pozzolith" or "Polyheed 997"; or approved equal.
4. Air entraining agent shall conform to ASTM C260/C260M. Acceptable agents include Euclid "Air Mix 250"; W.R. Grace "Daravair 1000"; Masterbuilders "Microair" or "AE90," or approved equal. Proportions shall be a prescribed by the manufacturer and testing laboratory.
5. All admixtures shall be the product of a single manufacturer.

G. Super Plasticizer:

1. Contractor may, at their option, add previously reviewed super plasticizer at the job site after slump has been taken in the event the concrete supplier is unable to deliver concrete to the jobsite within spec. In this event, slump as delivered must be 3" ± 1". Super plasticizer may be added to increase slump to eight (8) inches maximum. If super plasticizer is added to increase slump beyond six (6) inches, then air shall be increased by 1%.

H. Fibrous concrete reinforcement:

1. Fibrous material shall be 100 percent virgin polypropylene, fibrillated fibers.
2. Physical characteristics:
  - a. Specific gravity: 0.91
  - b. Tensile strength: 80-110 lbs.
  - c. Fiber length graded per manufacturer.
3. Fibers shall be Fibermesh, Euclid "Fiberstrand 150 ML", Grace "Microfiber" or approved equal.

**2.02 CURING MEMBRANES AND JOINTS**

A. Curing membranes:

Curing membranes shall be six (6) mil clear sheet polyethylene, Vis-Queen or equal.

**PART 3 - EXECUTION**

**3.01 GENERAL**

A. Inspection:

Inspect all work of other trades to ensure installation is complete and ready for concrete placement. Verify all items are in place.

B. Conflicts:

Consult Engineer in case of conflict between placing and other equipment or material.

**3.02 PREPARATION**

A. General:

1. Clean all forms and correct all fine grade damage.
2. Wet down all subgrades.
3. Verify all needed equipment for placing concrete is on hand: vibrators, crane or pump, tremies, flumes, finishing equipment.
4. All keyways are to be in place.
5. Dry up excavation if any water is present.
6. Have cold weather equipment on hand if applicable.
7. Notify Engineer at least 48 hours in advance of placing concrete.

**3.03 PLACING OF CONCRETE**

A. General:

1. Only those methods and arrangements of equipment shall be used which will reduce to a minimum any segregation of coarse aggregate from the concrete.
2. Sufficient capacity of manpower and placing equipment shall be provided so that the work may be kept free from cold joints and other defects in the finished product.
3. Concrete shall be deposited into the forms or on the grade as nearly as practicable in its final position, and in such manner that the concrete will completely fill the forms.



4. Vibration shall not be used to move concrete in a horizontal direction after initial placement.
  5. Placement of concrete on a slope shall begin at the lower end of the slope and progress upward.
  6. Concrete that has partially hardened or has been contaminated by foreign material shall not be deposited in the work but shall be discarded.
  7. Inclined chutes beyond the mixer chute shall not be permitted. Only concrete pumps or crane with concrete bucket will be approved method of placing concrete beyond chutes on mixers.
  8. No water shall be added to the concrete, for any reason, at the job site.
  9. Care shall be taken to fill the forms and to finish the concrete, so the top surface is true to line and grade.
  10. Concrete shall not be placed on muddy or frozen ground.
  11. Dry subgrade shall be wetted in advance of concrete placement.
  12. Care shall be taken to assure proper concrete coverage of reinforcing steel and mesh, as designed.
  13. Care shall be taken to maintain the proper location of all joint material, dowels, embedded items, etc., during concrete placement.
  14. No mud or other foreign materials shall be tracked into the concrete during placement operations, and all contaminated concrete shall be removed.
  15. Laitance or soft layers of mortar shall be removed from the top or face of previously hardened concrete prior to placing additional concrete in contact with the surfaces.
  16. Immediately before placing concrete walls, concrete fill shall be placed on top of the previously placed concrete.
  17. Extreme care shall be taken to avoid damage to surfaces of forms for all exposed concrete work.
  18. Keyway shall be clean with no standing water.
  19. Concrete shall be placed so as to prevent a free fall of greater than eight (8) feet.
- B. Vibrating:
1. Mechanical internal vibrators shall be used whenever possible in all formed concrete work.
  2. Vibrators shall be inserted at uniform spacing of 12 to 20 inches to assure thorough consolidation of all concrete.
  3. Vibrators shall be inserted and withdrawn vertically, to a depth which will assure penetration into the previous lift, with vibration periods of from five (5) to 15 seconds.
  4. Form vibration and hand spading will be required at points inaccessible for thorough internal vibration.
  5. During placement of concrete, stand-by vibrators shall be immediately available in the event of mechanical failure in the vibrators being used.

- C. Maximum acceptable slump for all structural concrete shall be three (3) inches ( $\pm 1$  inch). Maximum slump for concrete fill shall be (6) inches.
- D. Cold Weather Requirements
1. Do not place concrete on ice or frozen subgrade.
  2. Concrete ingredients shall be heated when the air temperature is below 40 degrees F or forecast to drop below that temperature within 24 hours of the time concrete is to be placed.
  3. Heating shall be accomplished by heating either the aggregate or the mixing water, or both. Maximum temperature of the water or aggregates shall be 150 degrees F.
  4. Temperature of concrete at time of delivery shall be not less than 60 degrees F nor greater than 80 degrees F.
  5. During the placing and finishing phase, concrete shall be maintained at a temperature of 50 degrees Fahrenheit or above, but not more than 80 degrees Fahrenheit.
  6. During placing and finishing, the concrete shall be protected from wind to prevent loss of heat and rapid drying.
  7. Heating of enclosures for flat slab finishing shall be done by vented heating methods. Open flame heating will not be permitted.
  8. Adequate facilities shall be provided prior to beginning concrete placement, for maintaining the ambient air temperature at the surface of the concrete or forms at 70 degrees Fahrenheit for five (5) days.
  9. Protective measures shall be maintained for at least four (4) days beyond the heating period, to prevent sudden cooling of the concrete. During this time, the concrete shall not be allowed to drop in excess of 20 degrees F in any 24 hour period with a minimum temperature of 40 degrees Fahrenheit.
  10. Newly finished flatwork shall be covered and protected for at least 14 days against exposure to rain, snow, sleet, and ice.
  11. During the entire protection period adequate means shall be provided to prevent loss of moisture from the concrete surface.
  12. All methods for protecting and heating concrete shall be subject to approval of the Engineer.
  13. See Part 3.05 for curing requirements.
- E. Hot weather requirements:
1. Concrete exposed to direct weather shall not be placed at temperatures above 100° Fahrenheit.
  2. Temperature of concrete when placed shall not exceed 85 degrees Fahrenheit.
  3. In dry, hot or windy weather, sunshades and wind breakers shall be required during finishing operations.
  4. As soon as practical and without damage to the surface finish, all exposed concrete shall be covered and kept continuously wet. Maintain concrete below 100° F.
  5. See Part 3.05 for curing requirements.

### **3.04 FINISHING CONCRETE**

#### **A. General:**

1. All slabs, walks, and decks shall be sloped uniformly to drain to floor drains or to finish grade and shall drain completely without ponding water.
2. Finish shall be of specified texture and uniform in color and appearance. Approval of each type of finish is required on four (4) foot square test panels. Test panels shall be located in protected area away from actual project. Test panels shall be made and approved prior to first concrete placement.
3. All voids in slabs and horizontal surfaces are to be filled during finishing operation. Voids in formed surfaces are to be repaired immediately at the time forms are removed.
4. Avoid over finishing, late finishing, re-watering, and other techniques that may cause "crazing."
5. Provide adequate workforce and equipment for finishing prior to placing concrete.
6. Initiate curing process as soon as surface strength will permit.

#### **B. Pavement:**

1. Screed and float to eliminate coarse aggregate in surface material. Steel trowel to produce dense surface.
2. Final finish to be applied with a medium stiff broom, or with canvas strip dragged back and forth across concrete surface. Finished texture is to be medium coarse but not to expose coarse aggregate or voids in surface.

#### **C. Construction joints:**

1. All keyed and other construction joints shall be constructed as shown on the plans. Construction joint concrete contact surfaces shall be finished with a wood float. Keyways in floors shall be tied in place before placing concrete.

#### **D. Sawcut joints:**

1. Sawcut joints shall be made within 24 hours of concrete placement.
2. All sawcut residue shall be completely removed the same day each sawcut joints are made.

### **3.05 CURING**

#### **A. General:**

1. All concrete shall be continuously moist cured a minimum of five (5) days after placing and finishing or five (5) days after repairing.
2. Protect all concrete surfaces from damage during and after curing period.

#### **B. Horizontal surfaces:**

1. Cover with six (6) mil polyethylene sheet. Lap edges six (6) inches and seal. Hold in place with 2x4's at four (4) foot centers or similar method. Placement shall not let air circulate under sheets.
2. Place polyethylene sheets as soon as finish can be walked on without damage. Sheets must be in place within six (6) hours after finish.

3. Leave polyethylene sheets in place five days.

### **3.06 DEFECTIVE WORK**

#### **A. General:**

1. Defective concrete work shall be removed and replaced immediately.
2. Work built outside tolerances listed in Section 03 10 00 - Concrete Form Work shall be considered defective.
3. Concrete of inadequate strength or having surface conditions indicating poor durability such as crazing, severe "map cracking," crumbling, or other evidence shall be considered defective.
4. Engineer shall be notified immediately when such conditions become apparent.

#### **B. Repairing:**

1. The repair of minor faults such as small "honeycomb" areas and voids may be patched. Repairs shall be made as described in 3.04D above.
2. Cure patched areas five days.

### **3.07 SPECIAL CONSTRUCTION**

#### **A. Joints:**

1. Joints shall be constructed as designed unless approved by the Engineer. Where water stop is specified in joint, waterstop shall be securely fixed in place to prevent voids or "fold-over" of waterstop. Vibrate around waterstop to ensure water tight seal with no voids.
2. All construction joints shall be made with canted 2x4 at least 2.5 inches from wall face. All construction joint contact surfaces shall be finished with wood float finish.
3. All horizontal and vertical construction joints shall incorporate 2x4 in keyway. Finish surface of joints with wood float. Keyways shall be filled with grout or concrete fill immediately ahead of placing concrete in walls above horizontal joints.

**END OF SECTION**

## **SECTION 31 11 00 - CLEARING AND GRUBBING (GENERAL)**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Removal of trees, stumps, vegetation and unusable material.
- B. Clearing and grubbing.

#### **1.02 RELATED SECTIONS**

- A. Section 02 30 00 - Subsurface Conditions
- B. Section 31 23 16 - Excavation, Backfill, and Site Grading

#### **1.03 SUPERVISION AND QUALITY**

- A. This work shall comply with all codes governing and all insurance requirements. Work shall be undertaken only when the construction superintendent is present and supervising the work.

### **PART 2 - PRODUCTS**

Not applicable to this section.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. Clear and grub trees, stumps, vegetation, debris, rubbish, and designated improvements from site.
- B. Protect trees, landscaping, site improvements, and other items not scheduled for clearing, or that might be damaged by construction activities.
- C. Strip topsoil and stockpile at approved location on-site.
- D. Provide temporary erosion and dust control.
- E. Do not disturb benchmarks or monuments.
- F. Tree removal will be limited to the period between October 1 and April 1.

#### **3.02 PREPARATION**

- A. Notification:  
Notify the Owner and secure approval at least three (3) days prior to beginning work.
- B. Investigation:
  - 1. Investigate the site and locate all objects to be removed or protected.
  - 2. Locate all existing utility and pipe lines and determine the status of each.
  - 3. Relocate all existing piping that must remain in service but conflicts with new construction.
- C. Plans:
  - 1. Plans may not show all existing or exact location of utilities or pipelines.
- D. Removal of debris:

1. Remove all debris and dispose of away from the site.
- E. The Engineer will designate all trees, shrubs and plants within the construction limits that are to remain. All other vegetation within the construction limits shall be removed and disposed of properly.

### **3.03 CLEARING**

- A. Prevent damage to existing improvements indicated to remain, including improvements on and off site. Protect existing trees and vegetation indicated to remain. Do not stockpile materials within drip line of trees. Provide and maintain temporary guards to encircle trees or groups of trees; obtain approval before beginning work.
- B. Water vegetation as required to maintain health. Cover temporarily exposed roots with wet burlap and backfill as soon as possible. Coat cut plant surface with approved emulsified asphalt plant coating.
- C. Repair or replace vegetation which has been damaged. Remove heavy growths of grass before stripping. Stockpile satisfactory topsoil without stones, foreign matter and weeds in location directed.
- D. Completely remove all improvements including stumps and debris except for those indicated to remain. Remove below grade improvements at least 12 inches below finish grade and to the extent necessary to not interfere with new construction. Remove abandoned mechanical and electrical work as required.
- E. Prevent erosion and siltation of streets, catch basins and piping. Control windblown dust. Remove waste materials and unsatisfactory topsoil from site and dispose of in a legal manner.

### **3.04 BLASTING:**

- A. Blasting will not be allowed.

### **3.05 GRUBBING**

- A. Grubbing shall consist of the removal of all stumps, roots, buried logs, foundations, drainage structures, abandoned water wells and other objectionable materials below the ground surface.
  1. Limits of grubbing:

The area to be grubbed shall include all area within the construction site limits.
  2. Materials:

All tap roots, lateral roots or other projections over two (2) inches in diameter shall be removed to a depth of two (2) feet below the natural ground surface. Grubbing of Osage Orange or Locust hedge shall include removal of roots.
  3. Filling of holes:

All holes caused by grubbing operations shall be backfilled and compacted in accordance with the applicable provision of Section 31 23 16 - Excavation, Backfill, and Site Grading and to the level of the surrounding ground surface.
  4. Disposal:

Products of grubbing shall be disposed of away from the site.

### **3.06 BURNING**

- A. When burning is permissible under controlling air pollution regulations, all burning of products of clearing and grubbing shall be done under the care of a competent watchperson at such times and in such manner that neither vegetation on adjacent property nor that designated to remain will be jeopardized. The burial of stumps and debris will not be permitted.

### **3.07 CLEARING**

- A. The contractor shall scalp all areas where excavation or embankment is to be made. Scalping shall include the removal of material such as sod, grass residue of agricultural crops, sawdust, and decayed vegetable matter from the surface of the ground without removing more earth than is necessary. The products of scalping shall be disposed of away from the project site. All such disposal shall be at the Contractor's sole expense.

### **3.08 REMOVAL**

- A. Pavements, abandoned sewers, pipe lines, or other obstructions to the project construction within the construction limits or street right-of-way not designated or permitted to remain, shall be removed and disposed of by the Contractor away from the site of the work.
- B. In removing pavement, curb, curb and gutter, gutters, sidewalk, and other similar improvements, and where a portion of such improvements are to be left in place, they shall be removed to an existing joint or to a joint sawed to a minimum depth of one (1) inch with a true line and vertical face. Sufficient removal shall be made to provide for proper grade and connections in the new work regardless of any limits which may be indicated on the plans.
- C. All sewers, drainage pipes and floor drains which have been or are to be abandoned shall be permanently sealed at the ends with bulkheads constructed of concrete or brick masonry, having a minimum thickness of eight (8) inches. The use of salvaged brick will be permitted for construction bulkheads provided the brick are clean and sound.

**END OF SECTION**





## **SECTION 31 23 16 - EXCAVATION, BACKFILL, AND SITE GRADING**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Excavation, backfilling and site grading required to construct the project. Includes but is not necessarily limited to the following:
  - 1. Excavation for footings, foundations, and structures.
  - 2. Structure backfill.
  - 3. Subgrade preparation for structures, slabs & pavements.
  - 4. Controlled fill.
  - 5. Embankments and site grading.
  - 6. Roadway.

#### **1.02 RELATED SECTIONS**

- A. Section 01 45 29 - Testing Laboratory Services
- B. Section 02 30 00 - Subsurface Conditions
- C. Section 31 11 00 - Clearing and Grubbing (General)
- D. Section 31 23 16.13 - Trenching, Backfilling and Compaction: Excavating for utility trenches outside the building to utility main connections.
- E. Section 32 92 19 - Seeding, Fertilizing, and Mulching

#### **1.03 REFERENCE STANDARDS**

- A. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)) 2012 (Reapproved 2021).
- B. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method 2015.
- C. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) 2017, with Editorial Revision (2020).

#### **1.04 QUALITY ASSURANCE**

- A. Testing laboratory:
  - 1. Soil compaction testing and other required testing will be performed by a testing laboratory selected by the Owner.
  - 2. Frequency of testing and location of tests shall be determined by the Owner's representative and testing laboratory personnel to assure compliance with specification requirements.
- B. Standards: (Tests shall comply with the latest revisions)
  - 1. ASTM C136, Sieve or Screen Analysis of Fine and Coarse Aggregates.
  - 2. ASTM D2922, Density of Soil in Place and Soil Aggregate in Place by Nuclear Methods.
  - 3. ASTM D2167, Density of Soil in Place by the Rubber Balloon Method.

4. ASTM D698, Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using a 5.5 lb. Rammer and 12 in. drop.
  5. ASTM D2487, Classification of Soils for Engineering Purposes.
- C. Compliance:  
Contractor shall correct all deficiencies disclosed by test results promptly.

**1.05 PROTECTION OF WORK**

- A. Protect materials and preserve specification requirements in previously accepted materials.
- B. Remove and replace all materials that have been damaged or do not meet specification requirements.
- C. Control dust or mud that may interfere with operations or become a nuisance to the surrounding area.

**1.06 LINES AND GRADES**

- A. Excavations and embankments shall be constructed to the lines and grades indicated unless otherwise directed.
- B. Final grades shall be within three (3) inches of indicated elevations. Horizontal alignments shall be within three (3) inches of theoretical location.
- C. Finished surfaces shall be bladed and aligned to present a neat and uniform appearance.

**PART 2 - MATERIALS**

**2.01 GENERAL**

- A. Fill materials shall be obtained from approved borrow sources.
- B. Fill material shall be free of trash, debris, cinders, organic matter or other deleterious materials.
- C. All fill materials shall be subject to the Engineer's approval.

**2.02 FILL MATERIALS**

- A. Controlled structural fill material:

1. Soil:

Soil fill material shall be clay soils of medium to low plasticity (CL) non-frost susceptible, with a liquid limit less than 45 percent, a plasticity index less than 20 and containing less than 10 percent shale, or rock particles larger than three (3) inches in greatest dimension.

2. Crushed stone:

Crushed stone shall be washed clean, free-draining, durable crushed rock with the following gradation limits:

Sieve Size	Percent Passing
1 inch	100%
<sup>3</sup> / <sub>4</sub> inch	90%
<sup>1</sup> / <sub>2</sub> inch	60-70%
<sup>3</sup> / <sub>8</sub> inch	15-25%

#4	0-5%
----	------

B. Non-structural fill material:

1. Soil:

Non-structural fill material may be clay soils of medium to low plasticity (CL or ML) non-frost susceptible excavated from site or borrow area.

**2.03 TOPSOIL**

- A. Topsoil shall consist of fertile, friable loamy soil of uniform quality, free from subsoil, hard clods, stiff clay, hard pan, stones, crushed rock and other similar impurities. Topsoil shall be free from grass, roots, weeds and other materials harmful to plant life or which will prevent formation of suitable seed bed. Topsoil depth shall be minimum of four (4) inches.

**2.04 OTHER MATERIALS**

- A. Materials not specifically described above, but required for construction, or proposed substitutions for materials described above, shall be submitted to the Engineer for approval prior to incorporation into the work.

**PART 3 - EXECUTION**

**3.01 GENERAL**

- A. Excavation is unclassified and includes excavation to subgrade regardless of materials encountered. Repair excavations beyond elevations and dimensions indicated.
- B. Do not perform work without written authorization from the Owner if subgrade material is unsuitable for intended use.
- C. Maintain stability of excavations; coordinate shoring and bracing as required by authorities having jurisdiction. Prevent surface and subsurface water from accumulating in excavations. Stockpile satisfactory materials for reuse, allow for proper drainage and do not stockpile materials within drip line of remaining trees.
- D. Compact materials at the optimum moisture content as determined by ASTM D698 by aeration or wetting.
- E. Place acceptable materials in layers not more than eight (8) inches loose depth for materials compacted by heavy equipment and not more than four (4) inches loose depth for materials compacted by hand equipment.
- F. Grade to within ½ inch above or below required subgrade and within a tolerance of ½ inch in 10 feet.
- G. Protect newly graded areas from traffic and erosion. Re-compact and re-grade settled, disturbed and damaged areas as necessary to restore quality, appearance, and condition of work.
- H. Control erosion and wind-blown dust. Dispose of waste and unsuitable materials off site in a legal manner.
- I. The soils at the site will be susceptible to disturbance due to construction activity and water seepage. Care shall be taken during excavation and construction of the structures to minimize disturbance to the bearing soils. The base of all excavations shall be free of

water and loose soil prior to placing concrete. Concrete shall be placed as soon as possible after excavation.

### **3.02 SITE PREPARATION**

- A. Site stripping in the building and fill embankment areas and paved areas shall include the removal of vegetation, topsoil, and any other soft, loose, or unsuitable materials. Stripping depths of six (6) inches to 12 inches minimum should be expected over the site. Stripped topsoil shall be stockpiled for later use as surface dressing in landscaped areas.
- B. Major root systems of trees shall be thoroughly removed from the building areas and to a minimum of two (2) feet below pavement subgrades.

### **3.03 SUBGRADE PREPARATION AND STABILIZATION**

- A. Subgrades for concrete structures, floor slabs, and pavements, shall be firm, dense, and properly compacted in accordance with applicable specification requirements. All subgrades shall be sufficiently stable to remain firm and intact under construction traffic.
- B. Excessively dry subgrades shall be scarified and moistened to within specification limits and re-compacted prior to placement of footings, slabs or pavements.
- C. Subgrade soils which have become excessively wet and mucky shall be removed. Free draining crushed stone or gravel shall be used to bring grade up to the bottom of slabs. This material shall be compacted as it is placed.
- D. Prior to placement of fill material, the subgrade shall be scarified to a depth of eight (8) inches and recompact to at least 95 percent of maximum density as determined by ASTM D698. Areas which cannot be re-compacted to this degree shall be undercut and replaced with stable material. Care shall be taken to maintain the prepared condition of the subgrades prior to construction. If the subgrades become saturated, frozen, or disturbed, they shall be reworked prior to construction.

### **3.04 EMBANKMENTS AND AREA FILL**

- A. Strip all areas to receive compacted fill, of topsoil, organic or excessively wet soil or other unsuitable soils prior to placing fill. Stockpile topsoil and other usable materials for reuse in final site grading.
- B. Place approved fill materials in uniform layers not exceeding eight (8) inches in loose thickness. Compact with suitable equipment to a minimum of 90 percent of maximum density as determined by ASTM D698. Moisture content shall be suitable for good compaction but not less than three (3) percent below or more than three (3) percent above optimum moisture as determined by ASTM D698.
- C. After final finish rolling and blading, the surface shall be smooth and even and conform with the indicated lines and grades within specified tolerances.

### **3.05 BORROW MATERIAL**

- A. If borrow material is required, the Contractor shall supply this material from a borrow area off the site. The borrow area shall be obtained by the Contractor at their sole expense. Borrow materials shall be approved by the Engineer before they are transported to the site of the Project. One borrow site will be inspected for approval at no cost to the

Contractor. If they need to use additional sites, testing of such sites shall be at their sole cost.

- B. Materials shall be similar to soils found on the Project. Soils showing high swell potentials will not be approved.

### **3.06 DRAINAGE**

- A. Control grading in vicinity of excavations to prevent excess surface drainage from running into excavations. Remove water promptly to avoid softening of subgrade soils.
- B. Provide for removal of seepage or ground water from excavations by pumping from sumps or other appropriate means.
- C. Excavations shall be kept dry during subgrade preparation and continually thereafter until construction is complete, to the extent that no damage from hydrostatic pressure, flotation or other causes will result.

### **3.07 SHORING AND BRACING**

- A. Adequate shoring and bracing shall be provided to protect and maintain the stability of existing structures and facilities and prevent sliding of the sides of excavations, until they are backfilled.
- B. Sheeting, bracing and shoring shall be designed and constructed to withstand all earth and equipment loads and shall remain rigid and maintain shape and position under all circumstances.
- C. Avoid hazardous and dangerous conditions. Maintain safety of personnel and existing work at all times.

### **3.08 BLASTING**

- A. Blasting will not be permitted.

### **3.09 WASTE FILL**

- A. Any extra fill material produced by the earthwork for this project and not required for the construction of the project shall be disposed of off the site of the work by and at the expense of the Contractor. Arrangements for waste fill sites shall be the sole responsibility- of the Contractor.

### **3.10 GRADING**

- A. Rough grade:  
Grade entire area as indicated by finish contours. Grading shall be performed to provide uniform appearing surface that will drain all surface water. Obtain approval by Engineer.
- B. Topsoil:  
Subsoil shall be scarified to a two (2) inch depth for bonding of topsoil with subsoil. Spread topsoil over all graded area to a depth of four (4) inches. Existing topsoil may have to be supplemented by hauled-in material as required.
- C. Fine grade:  
Fine grade site using light roller and drag to leave surface in condition for seeding. Finish grade shall be one (1) inch below all pavement unless otherwise specified. Repair eroded areas at time of project acceptance by the Owner.

### **3.11 ROCK EXCAVATION**

#### **A. General:**

Should rock be encountered in two (2) or more ledges, each ledge being more than six (6) inches thick and with inner lying strata of earth clay, shale, or gravel not more than 12 inches thick in each stratum, the entire volume between the top ledge and bottom of the bottom ledge will be classified as rock.

#### **B. Definition:**

Rock is defined as being sandstone, limestone, chert, granite, sill stone, quartzite, slate or shale, occurring in its natural undisturbed state, hard and un-weathered or similar material in masses more than 1½ cubic yards in volume, in ledges six (6) inches more in thickness.

### **3.12 CLEAN UP**

- A. Remove all rubbish, trash, debris, stones, concrete waste, crushed rock and sand pockets from site.**

**END OF SECTION**

## **SECTION 31 23 16.13 - TRENCHING, BACKFILLING AND COMPACTION**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Trenching and Trench Backfilling.
- B. Pipe embedment.

#### **1.02 RELATED SECTIONS**

- A. Section 02 30 00 - Subsurface Conditions
- B. Section 31 11 00 - Clearing and Grubbing (General)
- C. Section 31 23 16 - Excavation, Backfill, and Site Grading
- D. Section 33 05 07.23 - Bored Excavation

#### **1.03 REFERENCE STANDARDS**

- A. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18 in.) Drop 2021, with Errata (2022).
- B. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 2019.
- C. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)) 2012 (Reapproved 2021).
- D. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)) 2012 (Reapproved 2021).
- E. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method 2015.
- F. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) 2017, with Editorial Revision (2020).
- G. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth) 2017a, with Editorial Revision (2021).
- H. AWWA C150/A21.50 - Thickness Design of Ductile-Iron Pipe 2021.

#### **1.04 QUALITY ASSURANCE**

- A. Testing laboratory:
  - 1. Soil compaction testing and other required testing will be performed by a testing laboratory selected by the Owner.
  - 2. Frequency of testing and location of tests shall be determined by the Owner's representative and testing laboratory personnel to assure compliance with Specification requirements.
- B. Compliance:
  - 1. Contractor shall correct all deficiencies disclosed by test results promptly upon being notified of deficiencies.

## PART 2 - PRODUCTS

### 2.01 FILL AND PIPE EMBEDMENT MATERIAL

#### A. Embedment material:

1. Material shall be clean river gravel or sound crushed limestone, free of cementitious, shaly or flat and flaky particles in an amount which would cause the material to cake or pack or otherwise form an unyielding support for the pipe. Gradation shall be:

¾ "	square mesh sieve - 100% passing
½ "	square mesh sieve - 90-100% passing
No. 4	square mesh sieve - 0-15% passing
No. 8	square mesh sieve - 0-5% passing

2. Where bedding rock is not required, bedding material shall be same as fill material.

#### B. Fill material:

Backfill material shall be selected earth or granular fill material, free from sod, sticks and roots over ½ inch in diameter, and free from hard lumps, clods or rock in such quantity or concentration as to interfere with the specified compaction. Material shall be of proper moisture content for specified compaction.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- #### A. Verify that survey bench marks and intended elevations for the work are as indicated.

### 3.02 GENERAL

- #### A. Trenching work shall be performed in a safe and proper manner, with suitable precautions being taken against hazards of every kind. Trenching shall provide adequate working space and clearances for the work to be performed therein.
- #### B. Trenching and backfilling during freezing weather shall not be done except by permission of the Engineer. No backfill materials shall be installed on frozen surfaces or will frozen materials, snow or ice be placed in any backfill.
- #### C. When operating on pavements or walks all equipment shall be rubber tired, except for excavation equipment. Excavating equipment, in such cases, shall not have grousers, cleats or lugs on the tracks. The Contractor shall take all precautions necessary to protect the existing pavements and walks.
- #### D. No classification of excavated materials will be made. Trenching and trenching work shall include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the contract work, regardless of the type, character, composition or condition thereof.
- #### E. Pipe lines and other existing underground installations and structures in the vicinity of the work to be done hereunder are indicated on the Plans according to the best information available to the Owner. The Owner does not guarantee the accuracy of such information. The Contractor shall make every effort to locate all underground pipe lines, conduits and structures by contacting Owners of underground utilities and by prospecting in advance of trench excavation. Damage to any existing underground



installation caused by the Contractor's operation shall be repaired at the Contractor's expense.

- F. Any delays or extra cost to the Contractor caused by pipe lines or other underground structures or obstructions not shown by the Plans, or found in locations different than those indicated, shall not constitute a claim for extra work, additional payment or damages.
- G. Erosion control of disturbed areas will be required during the construction period through the use of check dams, siltation pools, mulching, etc.
- H. Operation:
  - 1. Use all means necessary to control dust or mud that may interfere with operation.
  - 2. Maintain all streets and driveways free of dirt and materials from Contractor's operation.
- I. Protection:
  - 1. Use all means necessary to protect material and preserve Specification requirements.
  - 2. Replace all damaged material or material that has lost Specification requirements.

### **3.03 TRENCH EXCAVATION**

- A. General:
  - 1. The Contractor shall not open more trench in advance of pipe laying than is necessary to expedite the work. One (1) block or 400 feet (whichever is the shorter) shall be the maximum length of open trench permitted on any line under construction.
  - 2. Except where tunneling is permitted by the Engineer or called for on the Plans, all trench excavation shall be open cut from the surface.
  - 3. Trench walls shall be vertical, and braced where necessary, in streets or improved area unless otherwise authorized by Engineer.
- B. Alignment and Grade:
  - 1. Water lines:

Trenches shall be carefully excavated so that the minimum cover over top of pipe will be 42 inches to existing street or ground surface, or to future surface when indicated. Greater cover at some locations along the line may be required due to street or ground profile and clearance of culverts, structures, utility lines, etc.
- C. Minimum trench widths and pipe clearances:
  - 1. Trenches shall be excavated to a width which will provide adequate working space and pipe clearances for proper pipe installation, jointing and embedment.
  - 2. Below an elevation of 12 inches from ground level to the top of the installed pipe, the trench width shall be maintained as narrow as possible.
  - 3. Where necessary to reduce the earth load on trench banks to prevent sliding and caving, the banks may be cut back on slopes which shall not extend lower than one (1) foot above the top of the pipe.

D. Mechanical excavation:

1. The use of mechanical equipment will not be permitted in locations where its operation would cause damage to buildings, culverts, or other existing property, utilities, or structures above or below ground; in all such locations, hand excavating tools and methods shall be used.
2. Mechanical equipment used for trench excavation shall be of a type, design and construction and shall be so operated, that the rough trench excavation bottom elevation can be controlled, that uniform trench widths and vertical side walls are obtained at least from an elevation one (1) foot above the top of the installed pipe to the bottom of the trench, and that the trench alignment is such that the pipe, when accurately laid to specified alignment, will be centered in the trench with adequate clearance between the pipe and side walls of the trench. Undercutting of the trench sidewall to obtain clearance will not be permitted.

E. Excavation below pipe subgrade:

Except where otherwise required, pipe trenches shall be excavated below pipe subgrade elevations to provide for the installation of granular fill pipe foundation material.

F. Unauthorized trench widths:

Where the width of the lower portion of the trench as excavated at any point exceeds the maximum permitted, either pipe of adequate strength, classification or gauge, special pipe embedment, or Class A concrete arch encasement (for concrete pipe only), as required by loading conditions and as determined by the Engineer, shall be furnished and installed by and at the expense of the Contractor.

G. Grubbing:

Grub out live roots for a distance of at least six (6) inches below and eight (8) inches on sides of outside surface of pipe.

H. Bell holes:

Bell holes shall provide adequate clearance for the tools and methods used in installing the pipe. No part of any bell or coupling shall be in contact with the trench bottom, trench walls, or the granular fill when the pipe is jointed.

I. Cutting concrete pavement and walks:

1. Cuts in concrete and asphalt pavements shall be no larger than necessary to provide adequate working space for proper installation of pipe and pipe line appurtenances. Cutting shall be started with a concrete saw (or by other cutting method approved by the Engineer) and in a manner which will provide a clean groove at least 1½ inches deep along each side of the trench and along the perimeter of cuts for structures.
2. Pavement and base pavement over trenches excavated for pipe lines shall be removed so that a shoulder not less than six (6) inches in width at any point is left between the cut edge of the pavement and the top edge of the trench. The trench width at the bottom shall not be greater than at the top and no undercutting will be permitted. Pavement cuts shall be made to and between straight or accurately marked curved lines which, unless otherwise required, shall be parallel to the center line of the trench.

### **3.04 SHEETING AND SHORING**

- A. Except where banks may be cut back on a stable slope, excavation for trenches shall be properly and substantially sheeted, braced and shored, as necessary, to prevent caving or sliding, to provide protection for the workers and the work, and to provide protection for existing structures and facilities. Sheeting, bracing and shoring shall be designed and built to withstand all loads that might be caused by earth movement or pressure, and shall be rigid, maintaining its shape and position under all circumstances.

### **3.05 STABILIZATION**

#### A. General:

1. Trench bottoms shall be firm, dense and thoroughly compacted and consolidated; shall be free from mud and muck; and shall be sufficiently stable to remain firm and intact under the feet of the workers.
2. Trench bottoms which are otherwise solid, but which become mucky on top due to construction operations, shall be reinforced with one or more layers of granular fill material or other crushed stone or gravel embedded therein. Not more than ½ inch depth of mud or muck shall be allowed to remain on stabilized trench bottoms when the pipe bedding material is placed thereon. The finished elevation of stabilized subgrades for concrete structures shall not be above the subgrade elevations.
3. All stabilization work hereunder shall be performed by and at the expense of the Contractor.
4. If the subgrade for pipe can be stabilized with a thickness of granular fill of 12 inches or less below bottom of pipe, or subgrade of structure, such stabilization will be at the Contractor's expense.

### **3.06 BLASTING**

- A. Blasting will not be permitted.

### **3.07 REMOVAL OF WATER**

- A. The Contractor shall provide and maintain adequate dewatering equipment to remove and dispose of all surface and ground water entering excavations, trenches, or other part of the work. Each excavation shall be kept dry during subgrade preparation and continually thereafter until the structure to be built, or the pipe line to be installed, therein is completed to the extent that no damage from hydrostatic pressure, flotation, or other causes will result.

### **3.08 STANDARD COMPACTION AND FIELD DENSITY TESTS**

#### A. General:

Wherever the terms, "\_\_\_\_% of Maximum Density" or "Optimum Moisture", are used, Maximum Density and Optimum Moisture shall be determined by the standard compaction test described below.

#### B. Standard compaction test:

1. The standard compaction test shall be in accordance with AASHTO Desig. T99, except as modified below.

2. For samples containing no material retained on the No. 4 sieve, use Method A or B. When the plasticity index of the soil is greater than 25 (heavy clays), the soil shall be placed in the mold in four (4) layers, each compacted as outlined in the test method used.
3. For samples containing material retained on the No. 4 sieve, use Method D, preferably, or Method C. The amount retained on the  $\frac{3}{4}$  inch sieve shall be weighed and discarded. To prepare the sample for the compaction test, the same amount of  $\frac{3}{4}$  inch to No. 4 sieve material shall be substituted for the portion discarded.

C. Field density test:

Field density shall be obtained using the sand cone method (AASHTO Desig. T-147), by the balloon method, or by use of any satisfactory materials or equipment suitable to the conditions prevailing in the material being tested. The calculated density obtained in this test is divided by the Maximum Density as determined by the Standard Compaction Test to determine the percent compaction obtained.

D. Rock correction:

When the amount of material retained on the No. 4 sieve is different in the field density tests than that in the sample used in the Standard Compaction Test, the actual degree of compaction shall be determined by applying a correction factor to the apparent percent compaction. This correction factor may be arrived at by any well-established engineering procedure or by the recommendations of the State Highway Commission, "Geology and Soils Manuals," said recommendations being made a part of this Contract by reference.

E. Comparison with surrounding soil density:

It will be assumed that undisturbed surrounding soil in its natural state will have a field density of 87 percent of maximum density. On this basis, where 90 percent of maximum density is specified, the required density will be 103.5 percent of density of the surrounding soil. Where 95 percent of maximum density is specified, the required density will be 109 percent of the density of the surrounding soil.

### 3.09 PIPE EMBEDMENT

A. General:

1. Place pipe embedment material on a suitably prepared subgrade in lifts not exceeding six (6) inches and bring up evenly on both sides of pipe. Do not dump over side of trench in any manner that will bring earth into the embedment material or displace the pipe. Compact, vibrate, or slice with a shovel, in such manner that material fill will take its final compaction and provide uniform and solid bearing under the pipe and its haunches.

B. Water line pipe bedding:

1. Where rock has been excavated, selected earth or granular material shall be placed under the sides and around the pipe to a point six (6) inches above the top of the pipe. Embedment material shall be deposited simultaneously on each side of the pipe to prevent lateral displacement of the pipe.
2. When not in rock excavation, all buried pipe shall be installed under Laying Condition Type 2 as described in AWWA C150/A21.50, latest edition. This condition

calls for flat-bottom trench with backfill lightly consolidated to the centerline of the pipe.

### **3.10 TRENCH BACKFILL COMPACTION**

#### **A. General:**

All trench backfill above pipe embedment shall conform to one of the following Specifications:

1. All County and City gravel surface roads shall be backfilled entirely with approved crushed rock or river gravel. The disposal of unsuitable material excavated will be the responsibility of the Contractor.
2. Ninety percent compacted backfill. Under streets, drives or state or county highways surfaced with gravel, crushed stone, "blacktop" or other low or intermediate type surfacing. In street, road, highway, railway or alley rights-of-way. In traveled ways. In established lawns. Any line within five (5) feet of back of curb or five (5) feet of street surfacing if no curb, either perpendicular to or parallel to the street shall be considered as under the street surfacing, and 90 percent compaction shall apply.
3. 95 percent compacted backfill. Under concrete, asphaltic concrete, brick, concrete structures or other high type pavements. Under concrete walks, curbs, gutters and culverts. Under all types of street surfacing where trench cut is approximately at right angle to roadway.
4. In areas not listed above, backfill shall be compacted to a density equal to the surrounding ground.
5. Six (6) inches of topsoil shall be placed in the top of trenches that are to be covered with sod or to be seeded.
6. If specified density cannot be obtained with available earth, the Contractor shall furnish and haul granular fill material or suitable earth at their expense. Unsuitable earth shall be disposed of at the Contractor's expense.
7. The Engineer will call for density tests to be made whenever deemed necessary. The specified density will be the minimum allowed and the obtainment thereof will be entirely the Contractor's responsibility.
8. Thickness of backfill layers will be determined by the coordination of test results with field performance and equipment used. The Contractor will be expected to maintain established procedures except where unusual conditions arise. If greater than 12 inch thick compacted layers are used, the Contractor shall hand excavate to the test level as directed by the Engineer and then refill the test excavation with compacted backfill to the specified density.
9. All completed lines shall be returned, in the opinion of the Engineer, as nearly as possible to original condition, including reseeding, resodding or repaving.

### **3.11 DRAINAGE MAINTENANCE**

- #### **A. Trenches across roadways, driveways, walks, or other traffic way's adjacent to drainage ditches or water courses shall not be backfilled prior to completion of backfilling the trench on the upstream side of the traffic-way, to prevent impounding water after the**

pipe has been laid. Bridges and other temporary structures required to maintain traffic across such unfilled trenches shall be constructed and maintained by the Contractor. Backfilling shall be done so that water will not accumulate in unfilled or partially filled trenches. All material deposited in roadway ditches or other water courses crossed by the line of trench shall be removed immediately after backfilling is completed and the section, grades, and contours of ditches or water courses shall be restored to their original condition. Surface drainage shall not be obstructed longer than necessary.

### **3.12 FINAL GRADING AND DISPOSAL OF EXCESS EXCAVATED MATERIALS**

#### **A. General:**

1. Except as otherwise indicated, all excess excavated materials shall be disposed of by the Contractor away from the site of the work.
2. Pavement and pavement base material, excavated rock in excess of the amount permitted to be and actually installed in trench backfill, junk and debris encountered in excavation work, and other similar waste materials shall be disposed of away from the site of the work.
3. The disposal of waste and excess excavated materials, including hauling, handling, leveling and surfacing, shall be at the Contractor's expense.

#### **B. Other types of backfill:**

For all types of backfill other than un-compacted, the Contractor shall dispose of excess excavated material above the surface of the ground or subgrade of pavement walks, etc., unless otherwise directed. Where directed, the Contractor shall leave all or a portion of the excess earth and grade smoothly along and adjacent to the trench in the manner prescribed by the Engineer. If directed, they shall grade excess earth into adjacent low areas, fine grading and sloping to drain.

#### **C. Final grading:**

1. Just prior to completion and acceptance of the project, the Contractor shall final grade over all pipe trenches and around structures, filling in any places that may have settled during the period between construction of each line and the completion of the entire Contract. Finished surface shall be bladed and aligned to a neat and uniform appearance.
2. Improved yards and lawns:  
Fine grade, suitable for seeding or sodding. Hand rake earth off grass in established lawn areas, unless directed to leave excess earth as outlined above.

#### **D. Deficiency of backfill:**

Wherever there is a deficiency of material required to backfill to the specified surface or subgrade, the Contractor shall furnish the necessary amount of suitable earth at their expense.

#### **E. Restoration of disturbed earth:**

The Contractor shall restore all earth areas disturbed from the original condition by their operations. Restoration will be by seeding, fertilizing and mulching or by appropriate pavement and street repair.

### **3.13 RESPONSIBILITY OF CONTRACTOR FOR BACKFILL SETTLEMENT**

- A. The Contractor shall be responsible financially and otherwise, for:
  - 1. All settlement of trench and other backfill which may occur from time of original backfilling until the expiration of one (1) year after the date of final payment for the entire contract under which the backfilling work was performed.
  - 2. The refilling and repair of all backfill settlement and the repair or replacement to the original or a better condition of all pavement, top surfacing's, driveways, walks, surface structures, utilities, drainage facilities and sod which may have been damaged as a result of backfill settlement or which have been removed or destroyed in connection with backfill replacement operations.
  - 3. All damage claims or court actions against the Owner for any damage directly or indirectly caused by backfill settlement.
- B. The Contractor shall make all necessary backfill replacements and repairs, or replacements appurtenant thereto, within 30 days after notification by the Owner or Engineer. Upon the Contractor's failure to do so, the Owner may do, or have done, the necessary work and charge the cost to the Contractor.

### **3.14 BARRICADES AND LIGHTS**

- A. All streets, roads, highways and other public thoroughfares which are closed to traffic shall be protected by means of effective barricades on which shall be placed acceptable warning signs. Barricades shall be located at the nearest intersecting public highway or street on each side of the blocked section.
- B. All open trenches and other excavations shall be provided with suitable barriers, signs, and lights to the extent that adequate protection is provided to the public. Obstructions such as material piles and equipment, shall be provided with similar warning signs and lights.
- C. All barricades and obstructions shall be illuminated by means of warning lights at night. All lights used for this purpose shall be kept on from sunset to sunrise. Materials stored shall be so placed, and the work at all times shall be so conducted, as to cause the minimum obstruction and inconvenience to the public.
- D. All barricades, signs, lights and other protective devices shall be installed and maintained in conformity with applicable statutory requirements, and where within highway rights-of-way, as required by the authority having jurisdiction.

### **3.15 MAINTENANCE OF TRAFFIC**

- A. The Contractor shall conduct their work so as to interfere as little as possible with public travel, whether vehicular or pedestrian; whenever it is necessary to cross, obstruct, or close roads, driveways, and walks, whether public or private, the Contractor shall at their own expense provide and maintain suitable and safe bridges, detours, or other temporary expedients for the accommodation of public and private travel, and shall give reasonable notice to Owners of private drives before interfering with them; provided however, that such maintenance of traffic will not be required at any point where the Contractor has obtained permission from the Owner and tenant of private property, or from the authority having jurisdiction over the public property involved, to obstruct traffic at any designated point thereon and for the duration of whatever period of time as may be agreed upon.

### **3.16 CROSSINGS:**

#### **A. Road crossings - open cut:**

Work shall include all materials, labor, and tools necessary for a complete crossing and repair of the street. This will include surface removal, trenching, disposal of excess material, crushed rock backfill, replacement of surfacing, casing pipe and all other necessary items. The carrier pipe shall be paid for separately.

**END OF SECTION**



## SECTION 31 25 00 - EROSION CONTROL

### PART 1 - GENERAL

#### 1.01 SECTION INCLUDES

- A. Temporary sediment barrier.
- B. Temporary ditch checks.

#### 1.02 RELATED SECTIONS

- A. Section 31 11 00 - Clearing and Grubbing (General)
- B. Section 31 23 16 - Excavation, Backfill, and Site Grading

#### 1.03 QUALITY ASSURANCE

- A. Regulatory Requirements:  
Erosion controls shall meet all requirements of the EPA.

#### 1.04 SYSTEM DESCRIPTION

##### A. Definitions

###### 1. Silt Fence

A temporary sediment barrier consisting of filter fabric buried at the bottom, stretched, and supported by posts.

###### 2. Ditch Checks

A barrier installed across, or at the toe of, a slope to intercept and detain sediment.

##### B. Purpose

###### 1. Silt Fence

To retain sediment from small disturbed areas by reducing the velocity of sheet flows to allow sediment deposition.

###### 2. Ditch Checks

To intercept and detain small amounts of sediment from unprotected areas of less than ½ acre.

##### C. Location

###### 1. Silt Fence

- a. Below small disturbed areas.
- b. Where runoff can be stored behind the sediment fence without damaging the fence or the submerged area behind the fence.
- c. Do not install sediment fences across streams, ditches, or waterways.

###### 2. Ditch Checks

- a. Where contributing area is approximately ½ acre, or less.
- b. Where there is no concentration of water in a channel above the barrier.
- c. Where erosion would normally occur in form of sheet erosion.
- d. Where length of slope above the barrier is less than 100 feet.

- e. Straw bales shall not be used on high sediment producing areas, above "high risk" areas, where water concentrates, or where there would be a possibility of a washout.

#### D. Planning

1. A sediment fence is a permeable barrier that shall be planned as a system to retain sediment on the construction site. The fence retains sediment primarily by retarding flow and promoting deposition. In operation, generally the fence becomes clogged with fine particles, which reduce flow rate. This causes a pond to develop more quickly behind the fence. Anticipate ponding and provide sufficient storage areas and overflow outlets to prevent flows from overtopping the fence. Since sediment fences are not designed to withstand high heads, locate them so that only shallow pools can form. Tie the ends of a sediment fence into the landscape to prevent flow around the end of the fence before the pool reaches design level. Provide stabilized outlets to protect the fence system and release storm flows that exceed the design storm.
2. Deposition occurs as the storage pool forms behind the fence. Plan deposition areas at accessible points to promote routine cleanout.

#### E. Design Criteria

1. Silt Fence
  - a. Ensure that the drainage area is no greater than ¼ acre per 100 ft. of fence.
  - b. Make the fence stable for the 10 yr. peak storm runoff.
  - c. Ensure that the depth of impounded water does not exceed 1.5 ft. at any point along the fence.
  - d. Provide a riprap splash pad or other outlet protection device for any point where flow may overtop the sediment fence, such as natural depressions or swales. Ensure that the maximum height of the fence at a protected, reinforced outlet does not exceed one (1) ft. and that support post spacing does not exceed four (4) ft.
  - e. The design life of a synthetic sediment fence should be six (6) months.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

#### A. Silt Fence

1. Use a synthetic filter fabric or a pervious sheet of polypropylene, nylon, polyester, or polyethylene yard, which is certified by the manufacturer or supplier as conforming to the requirements shown in Table below.
2. Synthetic filter fabric should contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 to 120 degrees F.
3. Posts for sediment fences shall be either four (4) inch diameter pine, two (2) inch diameter oak, or 1.33 lb/linear ft. steel with a minimum length of four (4) ft. Make sure that steel posts have projections to facilitate fastening the fabric.

4. For reinforcement of standard strength filter fabric, use wire fence with a minimum 14 gauge and a maximum mesh spacing of six (6) inches.
5. Sediment Fence Fabric Specifications

<u>Physical Property</u>	<u>Minimum Requirements</u>
Filtering Efficiency	85%
Tensile Strength at 20%	Standard Strength @ (max.) Elongation 30 psi Extra Strength @ 50 psi
Slurry Flow Rate	0.3 gal/sq ft/min

B. Straw Bales

1. Straw shall be locally baled material.
2. Anchors shall be #5 reinforcing bars or 2"x2" oak stakes.

### PART 3 - EXECUTION

#### 3.01 CONSTRUCTION

A. Silt Fence

1. Construct the sediment barrier of standard strength or extra strength synthetic filter fabrics.
2. Ensure that the height of the sediment fence does not exceed 18 inches above the ground surface. (Higher fences may impound volumes of water sufficient to cause failure of the structure.)
3. Construct the filter fabric from a continuous roll cut to the length of the barrier to avoid joints. When joints are necessary, securely fasten the filter cloth only at a support post with overlap to the next post.
4. Support standard strength filter fabric by wire mesh fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, or tie wires. Extend the wire mesh support to the bottom of the trench.
5. When a wire mesh support fence is used, space posts a maximum of eight (8) ft. apart. Support posts should be driven securely into the ground to a minimum of 18 inches.
6. Extra strength filter fabric with six (6) ft. post spacing does not require wire mesh support fence. Staple or wire the filter fabric directly to the posts.
7. Excavate a trench approximately four (4) inches wide and eight (8) inches deep along the proposed line of posts and upslope from the barrier.
8. Backfill the trench with compacted soil or gravel placed over the filter fabric.
9. Do not attach filter fabric to existing trees.

B. Ditch Checks

1. Bales will be placed in a single row, lengthwise, on the contour and embedded in the soil to a depth of three (3) inches.
2. Bales must be securely anchored in place by stakes or re-bars driven through the bales or by other acceptable means to prevent displacement.

3. Inspection must be frequent, and repair or replacement must be made promptly as needed.

### **3.02 MAINTENANCE**

#### **A. Silt Fence**

1. Inspect sediment fences at least once a week and after each rainfall. Make any required repairs immediately.
2. Should the fabric of a sediment fence collapse, tear, decompose, or become ineffective, replace it promptly.
3. Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the fence. Take care to avoid undermining the fence during cleanout.
4. Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

#### **B. Ditch Checks**

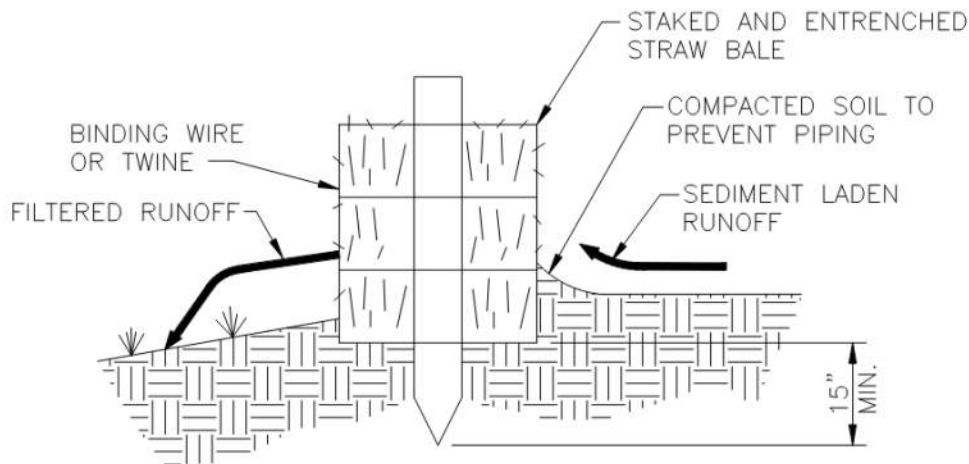
1. Inspect straw bale barriers at least once a week and after each rainfall. Make any required repairs immediately.
2. Should the barrier collapse, decompose or become ineffective, replace it promptly.
3. Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the barrier.
4. Remove the barrier and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

### **3.03 CLEANUP**

#### **A. General**

1. Remove all silt and other debris from project site.
2. Remove all silt fence and ditch check materials from project site.
3. Grade area for uniform slope to blend with existing or finish contours.

## EROSION CONTROL - DITCH CHECK



SECTION VIEW

### Notes:

*Straw bales shall not be used longer than a time period of three months. If construction continues beyond this time period, replace bales with new.*

*Excavate a trench along the areas that the straw bales will be used as erosion control to a depth of 4 inches and to the width of one straw bale. The straw bales then shall be placed in the trench. Place excavated material on upstream side of the trench.*

*Straw bales shall be anchored with a min. of 2 stakes or rebar driven into the underlying soil, making sure that the binding wire or twine is facing the sides and not touching the soil. The first stake into each bale shall be driven toward the previously laid bale to force them together.*

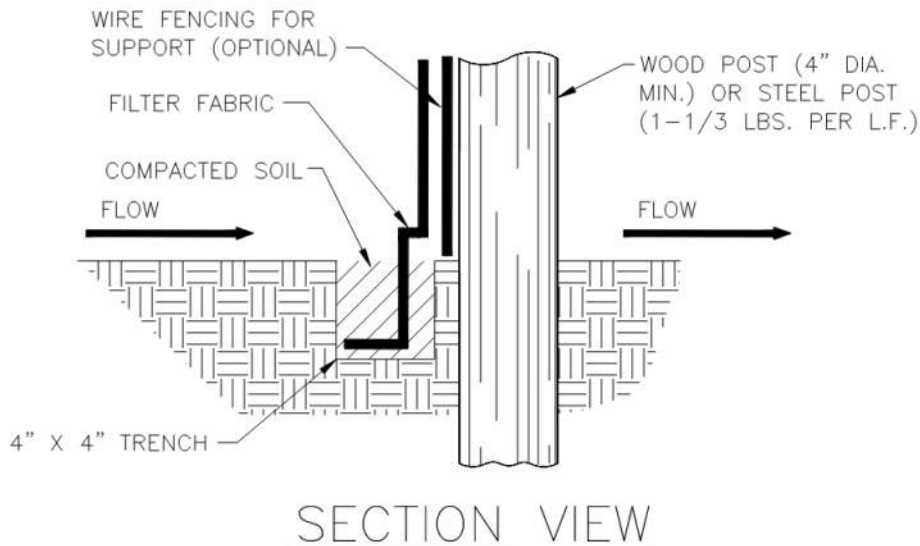
*Spacing between the bales shall be tightly chinked with loose straw.*

*After straw bales are in place the excavated soil shall be backfilled against the upslope side of the straw bales to a height of 4 inches after compacting.*

*Straw bales shall be inspected after each rainfall to determine if any repairs or replacements to the straw bales are needed. If it is determined that the straw bales need to be repaired or replaced, the work will occur immediately. Sediment accumulations must be removed when they reach  $\frac{1}{2}$  the barrier height.*

## EROSION CONTROL – SILT FENCE

# EROSION CONTROL – STRAW BALES



### Notes:

*The filter fabric shall have a minimum filtering efficiency of 75% a minimum tensile strength of 30 lbs. per linear inch and a flow rate of 0.3 gallons per square foot per minute. The filter fabric shall also have ultraviolet ray inhibitors to assure a life use expectancy of 6 months at 0 to 100 degrees Fahrenheit.*

*The filter fabric shall be 36 inches or less in height. Joints shall occur only at posts with 6 inch minimum overlap. Posts shall be spaced 10 feet on center when wire mesh support is included or 6 feet on center without wire mesh support. A minimum of 8 inches of fabric will be buried in the 4" x 4" trench.*

*The silt fence shall be inspected after every rainfall to determine if any part of the fence needs to be repaired or replaced. If it is determined that the fence needs any repair or replacement, this work will occur immediately.*

*Sediment deposits shall be removed after each rainfall or before they accumulate to 1/3 of the fence height.*

**END OF SECTION**

## **SECTION 32 01 26 - STREET REPAIR AND DRIVEWAY REPAIR**

### **PART 1 - GENERAL**

#### **1.01 SELECTION INCLUDES**

Removing and replacement of various pavement surface required for this project.

#### **1.02 RELATED SECTION:**

Section 31 23 16.13 - Trenching, Backfilling and Compaction

#### **1.03 JOB CONDITION:**

##### **A. Operation:**

1. Use all means necessary to control dust or mud that may interfere with the neighborhood.
2. Traffic access shall be maintained.

##### **B. Protection:**

1. Use all means necessary to protect material and preserve all Specification requirements.
2. Replace all damaged material or material that has lost Specification requirements.

### **PART 2 - PRODUCTS**

Not applicable to this section.

### **PART 3 - EXECUTION**

#### **3.01 STREET REPAIR AND DRIVEWAY REPAIR**

##### **A. General:**

These Specifications provide a minimum standard for the removing of various pavement surfaces, open trenches, excavating, method of backfilling, and replacement of various pavement surfaces. These Specifications meet the requirements of the Owner as a standard to be followed in all cases where street surfaces are disturbed in the process of any and all excavation work.

##### **B. Class "A" Street (Portland cement concrete pavement):**

1. Prior to replacement of the concrete pavement, the concrete surface shall be scored with a saw on each side of the required excavation to a minimum depth of two (2) inches. The size of the area cut shall be one (1) foot greater in all directions than the size of the excavation. This is to provide a minimum six (6) inch shoulder of undisturbed subgrade surrounding the excavation.
2. All broken concrete shall be removed from the site and not used for backfill material.
3. The walls of the excavation shall be vertical for the full length. Sufficient bracing or shoring shall be provided to hold the excavation walls in vertical plane and to prevent undercutting of the undisturbed pavement. Sloping of trench walls in deep

excavations may be permitted by the Owner or his authorized representative. Bracing or shoring may be omitted where, in the opinion of the Owner's authorized representative, depth of excavation and soil conditions warrant.

4. All excavated materials shall be removed and disposed of after work within the excavated area is complete. The excavation shall be backfilled with clean  $\frac{1}{2}$  inch aggregate ( $\frac{3}{8}$  inch minimum to  $\frac{3}{4}$  inch maximum) or type as specified in Section 109 and 109.1 and 109.2 of the Standard Specifications for State Road and Bridge Construction, State Highway Commission of Missouri, current edition, to the bottom of the concrete paving.
  5. The pavement removed shall be replaced with high early strength Class A concrete having a compressive strength of 3,750 pounds per square inch at 27 days. The new finish shall be flush with the present street surface.
- C. Class B Street (Hot mix asphaltic concrete or brick surface):
1. Conform to paragraphs (1) through (4) inclusive of the specifications for Class A Street (Portland cement concrete pavement).
  2. All removed paving shall be removed from the site and not used for backfill material. The minimum six (6) inch shoulder shall be excavated to a point no less than nine (9) inches below the existing street surface. Across the backfilled excavation and resting on the six (6) inch shoulders shall be poured a six (6) inch slab of high early strength Class A concrete having a compressive strength of 3,750 pounds per square inch at 27 days. After 48 hours, this slab shall be covered with three (3) inches of hot mix asphalt and rolled. The new finish shall be flush with the present street surface.
- D. Class C Street (D.A.S.T., double asphalt surface treatment roads with base):
1. Conform to paragraphs (1) through (4) inclusive of the specifications for Class D Streets below, except final six (6) inches of backfill shall be rolled stone base material. The crushed rock base shall be replaced by applying two (2) lifts of three (3) inch each of crushed rock to state highway specifications. Each lift shall be saturated with water and rolled. When compaction has been attained, and surface moisture evaporated, double asphalt surface treatment shall be applied. Penetration course shall be MC-0 at the rate of 0.20 gallon per square yard. Surface course shall be RC-3 at the rate of 0.35 per gallon per square yard and to be covered with clean  $\frac{3}{8}$  inch to  $\frac{1}{2}$  inch crushed aggregate at the rate of 20 pounds per square yard with a lap of one (1) foot outside the disturbed area. Surface course shall be applied twice.
- E. Class D Street: (Surface asphalt treatment roads and earth base):
1. Initial cutting will be permitted by excavating machinery.
  2. Excavation wall shall be vertical and shall be braced and shored to prevent undercutting or crumbling. Sloping of trench walls in deep excavations may be permitted by the Owner's authorized representative, if depth of excavation and soil conditions warrant.
  3. Backfill shall consist of clean  $\frac{1}{2}$  inch aggregate or of rolled stone base material, to the level of the existing paving.



4. Surface treatment shall conform to penetration and surface course for Class C Streets. Surface course shall be applied once.
- F. Crushed Stone Streets or Drives:
1. Type AB-3 aggregate shall be placed over all disturbed areas, except final six (6) inches of backfill be rolled stone base material.
  2. Crushed stone shall be placed and compacted in two (2) lifts.
  3. All County and City gravel surface roads shall be backfilled entirely with approved crushed rock. The disposal of unsuitable material excavated will be the responsibility of the Contractor.

**END OF SECTION**



## **SECTION 32 92 19 - SEEDING, FERTILIZING, AND MULCHING**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Seed
- B. Mulch
- C. Fertilizer
- D. Preparation
- E. Maintenance

#### **1.02 RELATED SECTIONS**

- A. Section 31 23 16: Excavation, Backfill, and Site Grading

#### **1.03 ALTERNATE METHODS AND PRODUCTS**

- A. Alternate methods from those specified will be considered for use, provided that in the Engineer's opinion the end product will be equal to or exceed that which would result from the specified methods and products.

#### **1.04 DEFINITIONS**

- A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

#### **1.05 REGULATORY REQUIREMENTS**

- A. Comply with regulatory agencies for fertilizer and herbicide composition.

#### **1.06 QUALITY ASSURANCE**

- A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

#### **1.07 MAINTENANCE DATA**

- A. Submit maintenance data for continuing Owner maintenance.
- B. Include maintenance instruction, cutting method, maximum grass height, types, application frequency, and recommended coverage of fertilizer.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

## **PART 2 - PRODUCTS**

### **2.01 AGRICULTURAL LIMESTONE**

- A. Shall be agricultural limestone with not less than 90 percent passing the No. 4 sieve and containing not less than 40 percent calcium carbonate equivalent. Lime shall be applied at the rate recommended by soil test.

### **2.02 FERTILIZER**

- A. Shall be a standard commercial product which when applied at the proper rate will supply the equivalent quantity of total nitrogen, available phosphoric acid and soluble potash specified. Fertilizer shall be delivered to the site in bags or other suitable containers, each fully labeled, conforming to applicable state fertilizer laws, and bearing the name, trade name or trademark, and warranty of the producer.
- B. Requirements per acre:
  - 1. 600 pounds of 17-17-17 grade fertilizer or equivalent.

### **2.03 MULCH**

- A. Shall be vegetative mulch consisting of cereal straw from stalks of oats, rye, wheat or barley. Straw shall be free of prohibited weed seeds as stated in State Seed Law and shall be relatively free of all other noxious and undesirable seeds. Straw shall be clean and bright, relatively free of foreign material and be dry enough to be spread properly.

### **2.04 SEED**

- A. Seed shall be tall turf type fescue blend, with a minimum of three fescue varieties included in the mix or shall be chosen to match the primary grass type in the surrounding area with approval of the engineer. Selection should also take planting season into consideration. To match planting seasons, alternative seed types may be used with the permission of the Engineer.
- B. Seed shall be labeled in accordance with USDA regulations. Care shall be taken during transportation to avoid segregation of seed mixtures.
- C. Seed shall be sown at a rate per the supplier's recommendations.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. The application of fertilizer, seed, and mulch shall follow each other in successive sequence as closely as possible. Seeding shall be accomplished in the first of the following two periods after completion of earthwork.
  - February 15 to May 1st
  - September 1st to October 1st
- B. Seeding outside the specified seeding periods may be permitted at the Engineer's option, provided the Contractor is willing to make appropriate modifications to their seeding operations, and will guarantee the crop.

### 3.02 INSPECTION

- A. Contractor must request that Engineer inspect site grading, clean-up and surface preparation to determine if site is ready for the seeding, fertilizing and mulching operations.
- B. Upon Engineer's approval operations may begin.

### 3.03 SURFACE PREPARATION

- A. Immediately in advance of fertilizing, the surface to be seeded shall be repaired, if necessary, to eliminate all damage from erosion or construction operations. The surface shall then be loosened and thoroughly pulverized by discing, harrowing and raking or other approved methods, to such an extent that it is free from sod, stones, clods, or roots. All growth of vegetation that will seriously interfere with planting operations shall be removed and disposed of as directed. The final surface shall be smooth and uniform and left in such a condition as to prevent formation of low places and pockets.

### 3.04 FERTILIZING

- A. Fertilizer and lime shall be dressed evenly over the areas to be seeded using approved mechanical type spreading equipment.
- B. Fertilizer and lime after spreading shall be immediately incorporated into the soil to a depth of approximately two (2) inches, by chisel, spike tooth harrow, or other approved methods.

### 3.05 SEEDING METHODS

- A. General methods:

The Contractor shall employ a satisfactory method of sowing by use of either approved mechanical hand seeders or mechanical power-driven drills. When delays in operation carry the work beyond the specified planting seasons, or when conditions are such that by reason of drought, high winds, excessive moisture, or other factors, satisfactory results are not likely to be obtained, seeding shall stop. It will be resumed only where the desired results are probable or when approved alternate procedures have been adopted.

- B. Broadcast seeding:

When broadcast seeding is utilized, the seed shall be uniformly broadcast by mechanical hand seeder, in two directions at right-angles to each other and at  $\frac{1}{2}$  of the specified rate per acre in each direction. After the seed is broadcast it shall be covered by an approved method to a depth of  $\frac{1}{3}$  inch to  $\frac{3}{4}$  inch. Broadcast seeding shall not be done in windy weather.

- C. Drill seeding:

When drilling is utilized, it shall be done with approved equipment best suited to perform the work under prevailing conditions. The seed shall be uniformly drilled to a depth of  $\frac{1}{3}$  inch to  $\frac{3}{4}$  inch at the rate per acre specified. Drill seeding may be required in windy weather.

- D. Prior to start of seeding, the Contractor shall demonstrate that the application of seed is being made at the specified rate. A final check of the total quantity of seed used shall be made against the area seeded. If the check shows that the Contractor has not applied

seed at the specified rate, they shall uniformly distribute seed at a rate calculated to meet the shortage.

- E. The Contractor shall maintain the seeded areas until all fertilizing, seeding and mulching is complete, and the work accepted by the Engineer. Areas damaged from the Contractor's own operations shall be repaired at their expense. After acceptance of the work the Contractor will not be held responsible for erosion due to weather, or conditions not due to the Contractor's own operations or negligence. The Contractor is not required to guarantee a crop, if seeding is done during the specified seeding periods.

### **3.06 MULCHING**

- A. Immediately after seeding, the Contractor shall apply vegetative mulch at a rate between 1½ and 2½ tons per acre to all seeded areas. Quantity of mulch shall be adjusted within the above limits, as directed by the Engineer, to the particular area or slope being mulched. Total application of mulch for the project shall average approximately two (2) tons per acre. Mulch shall be applied by mechanical mulch spreaders equipped to eject by means of a constant air stream controlled quantities of the vegetative mulch.
- B. Mulch shall be embedded by a disc type roller having flat serrated discs spaced not more than 10 inches apart, with cleaning scrapers for each disc.
- C. Where indicated, or in areas of the project where soil conditions are not suitable for satisfactory crimping, asphalt emulsion shall be applied with the mulching operation. The normal rate of application shall be 100 gallons per ton of straw; however, this rate may be varied as directed by the Engineer to suit the particular area or slope conditions.
- D. All mulch shall be distributed evenly over the areas to be mulched within 24 hours after the seeding operation. Following the mulching operation, suitable precautions shall be taken to prohibit traffic over mulched areas. Displaced mulch shall be replaced immediately, including repair of the underlying seed bed, if damaged as well.

### **3.07 MAINTENANCE**

- A. The Contractor shall maintain all seeded areas until the grass is properly established (not less than 90 days) until satisfactory development. Maintenance shall be continued until final acceptance of the work.
- B. Maintenance of seeded areas shall include protecting, watering, mowing, fertilizing, and such other work as may be necessary to establish a permanent lawn. The Contractor shall reseed those seeded areas in which a satisfactory growth is not obtained and shall refill any areas which become eroded prior to final acceptance of the work.
- C. Paved areas shall be kept clean while maintenance operations are in progress.

### **3.08 REPLACEMENT**

- A. The Contractor shall replace all trees, shrubs, and flowers damaged by construction activities in the areas designated on the construction plans. The replacement trees and shrubs shall be equal in size to the damaged or removed specimen.

**END OF SECTION**

## **SECTION 33 01 10.58 - WATER MAIN DISINFECTING**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Disinfecting water lines and determining the bacteriologic quality by laboratory test after disinfection.

#### **1.02 RELATED SECTIONS**

- A. Section 33 05 31.13 - Water Main - PVC Pressure Pipe
- B. Section 33 14 19 - Water Main - Valves, Hydrants, and Accessories

#### **1.03 REFERENCE STANDARDS**

- A. AWWA B300 - Hypochlorites 2018.
- B. AWWA B301 - Liquid Chlorine 2018.
- C. AWWA B302 - Ammonium Sulfate 2016.
- D. AWWA B303 - Sodium Chlorite 2018.
- E. AWWA C651 - Disinfecting Water Mains 2014, with Addendum (2020).

#### **1.04 QUALITY CONTROL**

- A. Supervision:

Provide full time superintendent on the project who is qualified and experienced in disinfection procedures. Superintendent shall direct all work in connection with the disinfection.

- B. Codes and standards:

Testing shall comply with AWWA C651 or latest revision thereto.

#### **1.05 SUBMITTALS**

- A. Test Reports:
- B. Submit certified copies of test reports on each section of pipe tested.

### **PART 2 - PRODUCTS**

#### **2.01 CHLORINE**

- A. Calcium hypochlorite (70 percent available chlorine).

### **PART 3 - EXECUTION**

#### **3.01 FLUSHING**

- A. Water lines shall be flushed prior to disinfection at a velocity of not less than 2.5 feet per second.
- B. Discharge point shall have adequate drainage to prevent flooding of surrounding area. Discharge point to be approved by Owner.

#### **3.02 CHLORINE APPLICATION**

- A. Continuous feed method:

1. This method is suitable for general application.

**TABLE 2**

Chlorine Required to Produce 50 milligrams per liter Concentration in 100 feet of Pipe - by Diameter

Pipe Size	100% Chlorine lb.	1% Chlorine Solutions gal
4	0.027	0.33
6	0.061	0.73
8	0.108	1.30
10	0.170	2.04
12	0.240	2.88
14	0.334	4.01
16	0.436	5.24
18	0.552	6.63
24	0.981	11.78
30	1.533	18.40

2. Water from the existing distribution system or other approved sources of supply shall be made to flow at a constant measured rate into the newly-laid pipeline. The water shall receive a dose of chlorine, also fed at a constant measured rate. The two (2) rates shall be proportioned so that the chlorine concentration in the water in the pipe is maintained at a minimum of 50 milligrams per liter available chlorine. To assure that this concentration is maintained, the chlorine residual should be measured at regular intervals in accordance with the procedures described in the current edition of Standard Methods and AWWA M12 - Simplified Procedures for Water Examination. Prior to the start of the disinfection process, the new source shall be flushed.
3. In the absence of a meter, the rate may be determined either by placing a pitot gauge at the discharge or by measuring the time to fill a container of known volume.
4. Table 2 gives the amount of chlorine residual required for each 100 feet of pipe of various diameters. Solutions of one (1) percent chlorine may be prepared with sodium hypochlorite or calcium hypochlorite. The latter solution requires approximately one (1) lb. of calcium hypochlorite in 8.5 gallons of water.
5. During the application of the chlorine, the supply valve shall be closed to prevent the treatment dosage from flowing back into the line supplying the water. Chlorine application shall not cease until the entire main is filled with the chlorine solution. The chlorinated water shall be retained in the main for at least 24 hours, during which time all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. At the end of this 24 hour period, the treated water shall contain no less than 25 milligrams per liter chlorine throughout the length of the main.

### 3.03 FINAL FLUSHING

- A. After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine concentration in the water leaving the main is no higher than that generally prevailing in the system, or less than one (1) milligram per liter. Chlorine



residual determination shall be made to ascertain that the heavily chlorinated water has been removed from the pipe line. Heavily chlorinated water shall be de-chlorinated with sodium thiosulfate prior to discharge to the water course or sanitary/storm sewers. The sodium thiosulfate concentration shall be equal to 1.43 mg/L per 1 mg/L of residual chlorine concentration to be removed.

### **3.04 BACTERIOLOGIC TEST**

- A. After final flushing, and before the water main is placed in service, a sample or samples shall be collected from the end of the line and tested for bacteriologic quality and shall show the absence of coliform organisms. If the number and frequency of samples is not prescribed by the public health authority having jurisdiction, at least one (1) sample shall be collected from chlorinated supplies where a chlorine residual is maintained throughout the new main. From unchlorinated supplies at least two (2) samples shall be collected at least 24 hours apart.
- B. In the case of extremely long mains, it is desirable that samples be collected the length of the line as well as at its end.
- C. Samples for bacteriologic analysis shall be collected in sterile bottles treated with sodium thiosulphate. No hose or fire hydrant shall be used in collection of samples. A suggested sampling tap consists of a standard corporation cock installed in the main with a copper tube gooseneck assembly. After samples have been collected the gooseneck assembly may be removed and retained for future use.

### **3.05 REPETITION OF PROCEDURE**

- A. If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated until satisfactory samples have been obtained. When the samples are satisfactory, the main may be placed in service.

**END OF SECTION**



## **SECTION 33 01 12 - WATER MAIN PRESSURE AND LEAKAGE TEST**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Testing of water lines, fire hydrants, and valves.

#### **1.02 RELATED SECTIONS**

- A. Section 31 23 16 - Excavation, Backfill, and Site Grading
- B. Section 33 01 10.58 - Water Main Disinfecting
- C. Section 33 05 31.13 - Water Main - PVC Pressure Pipe
- D. Section 33 14 19 - Water Main - Valves, Hydrants, and Accessories

#### **1.03 QUALITY CONTROL**

- A. Supervision:

Provide full time superintendent on the project who is qualified and experienced in testing procedures. Superintendent shall direct all work in connection with the testing.

- B. Codes and standards:

Testing shall comply with AWWA C605 Section 7 - Hydrostatic Testing.

#### **1.04 SUBMITTALS**

- A. Test reports:

Submit certified copies of test reports on each section of pipe tested.

### **PART 2 - PRODUCTS**

Not applicable to this section.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. The Contractor shall provide all necessary piping connections, pumping equipment, pressure gauges, flow meters, manpower and other equipment necessary for the required test.
- B. Pressure and leakage test may be coordinated with the disinfection of the pipeline, subject to conditions of Section 33 01 10.58 - Water Main Disinfecting.
- C. The Owner will furnish at the nearest available source, all water required for filling the lines and making the required test. The pipe shall be filled with water at a velocity not to exceed one (1) foot per second. Air shall be expelled from pipeline during filling.
- D. Where practical, pipelines shall be tested in lengths of not more than 1,500 feet.
- E. All pipe, fittings and other materials found to be defective, shall be removed and replaced with new materials by the Contractor.
- F. All lines that fail to meet tests shall be repaired and retested as necessary until test requirements are satisfied.

- G. Testing prior to backfilling in no way relieves the Contractor of the responsibility of repairing leaks which become evident after the main is put into service or during the one (1) year guarantee period.

### **3.02 TESTING AFTER BACKFILL**

- A. If the Contractor chooses to test after backfilling, they shall comply with all requirements shown for testing before backfilling, except that the duration of the test shall be for four (4) hours. All surface indications of leaks shall be immediately corrected even though the total leakage is less than allowed.
- B. In the event the leakage is more than permissible, the system shall be corrected as found necessary to bring it within the allowed limits. It shall be subject to as many four (4) hour tests as necessary to obtain the desired result. If a section of pipe fails the four (4) hour test, then a 24 hour test may be required by the Project Engineer.

### **3.03 TESTING BEFORE BACKFILL**

- A. All thrust blocks and anchors shall have been in place at least 48 hours prior to testing.
- B. The test pressure shall be maintained for two (2) hours or longer as is necessary for time to inspect the pipeline for visible leaks and as is required to obtain a reasonable time for leakage measurement.

### **3.04 PRESSURE TEST**

- A. Test pressure:
  - 1. All newly installed piping shall be hydrostatic pressure tested at not less than 1.5 times the sustained working pressure at the lowest elevation of the test section. Contractor is to request the sustained working pressure for each segment from the Engineer. (Not to exceed 80 percent of rated pressure for IPS SDR 26 or 21PVC pipe or rated pressure of C900 PVC or C905 PVC or DIP).
  - 2. Pressure shall not vary by more than plus or minus five (5) psi.
  - 3. Pressurization:
    - a. Each valved section of pipe shall be filled with water slowly and the specified test pressure shall be applied by means of a pump connected to the pipe. Test shall begin after pipe is filled with water and the air expelled.
  - 4. The contractor shall furnish all equipment and manpower to conduct the test. Written results on each test shall be submitted to the Engineer. Test duration shall not be less than two (2) hours. Engineer may request longer test duration for any necessary retests.

- B. Air removal:

Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed, and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged, or left in place at the discretion of the Owner.

C. Examination:

All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves, or hydrants that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated until it is satisfactory to the Owner.

**3.05 LEAKAGE TEST**

A. General:

A leakage test shall be conducted concurrently with the pressure test.

B. Leakage defined:

Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within five (5) psi of the specified test pressure during the test and to restore test pressure at the end of the test. Testing to be done after the pipe has been filled with water and after air in the pipeline has been expelled.

C. Acceptance of installation:

Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than that specified, the Contractor shall, at their own expense, locate and repair the defective material until the leakage is within the specified allowance.

D. Allowable leakage:

1. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = (ND \sqrt{P})/7400$$

L = allowable leakage, in gallons per hour

N = number of joints in the length of pipeline tested

D = nominal diameter of the pipe, in inches

P = average test pressure during the leakage test, in psi gauge.

2. The table below shows the allowable leakage in gallons per hour at 150 psi per 1,000 feet in 20-foot nominal lengths.

Pipe Size	Allowable Leakage
2	0.17
3	0.25
4	0.34
6	0.50
8	0.67
10	0.83
12	1.00
14	1.16
16	1.33
18	1.49
20	1.66
24	1.99

3. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.078 gallons per hour per inch of nominal valve size shall be allowed.
4. When hydrants are in the test section, the test shall be made against the closed hydrant valves.
5. All visible leaks shall be repaired, regardless of the amount of leakage.

E. Acceptance of installation:

Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than that specified, the Contractor shall, at their own expense, locate and repair the defective material and retest until the leakage is within the specified allowance.

**END OF SECTION**

**SECTION 33 05 09.53 - WATER MAIN - POLYETHYLENE ENCASEMENT FOR DUCTILE IRON FITTINGS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Polyethylene encasement.

**1.02 RELATED SECTIONS**

- A. Section 31 23 16.13 - Trenching, Backfilling and Compaction

**1.03 QUALITY CONTROL**

- A. Supervision:  
Provide full time supervisor trained and familiar with the work to be undertaken.
- B. Workmanship:  
All workers shall be skilled and experienced in the specified work.

**1.04 SUBMITTALS**

- A. Shop drawings:  
Submit shop drawings to the Engineer within 30 days after award of Contract in accordance with Section 01 33 23 - Shop Drawings, Product Data, and Samples.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

- A. Polyethylene encasement materials shall be manufactured of virgin polyethylene possessing the following characteristics:  
Type, Class, Grade, in accordance with ASTM Specification.  
Other Characteristics D-1248-68 or latest revision thereof.

Type	1
Class C	Black where exposure to weather (including sunlight) may be more than 48 hours.
	Exposure to weather shall be kept to a minimum and in no case shall it exceed 10 days.
Grade	E-1
Flow Rate	0.4 Maximum
Tensile Strength	1200 psi Minimum
Elongation	300 percent (%) Minimum
Dielectric Strength	Volume resistivity, ohm-Cm <sup>3</sup> = 10 <sup>15</sup> , 800 volts per mil thickness

- B. Polyethylene tube material shall have a thickness of 0.008 inches (8 mils). The minus tolerance on thickness shall not exceed 10 percent of the nominal thickness.

- C. The minimum tube size for each pipe diameter shall be as listed in Table 1. For pipe sizes greater than 24 inches, tube size may be determined by multiplying the nominal pipe diameter by 2.25 to obtain minimum flat tube width.

TABLE 1	
NOMINAL PIPE DIAMETER (INCHES)	POLYETHYLENE FLAT TUBE WIDTH (INCHES)
4	16
5	20
8	24
10	27
12	30
14	34
16	37
18	41
20	45
24	53

- D. Adhesive tape shall be a general purpose adhesive tape one (1) inch wide and approximately eight (8) mils thick, such as Scotch Tape No. 50, Pol. No. 900, Tapecoat CT or approved equal.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

A. General:

Polyethylene encasement shall be installed on all ductile iron pipe, hydrants and fittings at location specified on the construction drawings. Although not intended to be a completely air- and water-tight enclosure, the polyethylene shall prevent contact between the pipe and the surrounding backfill.

B. Pipe:

This standard includes two (2) different methods for the installation of polyethylene encasement.

1. Method A:

- a. Cut polyethylene tube to a length approximately two (2) feet longer than the length of the pipe section. Slip the tube around the pipe, centering it to provide a one (1) foot overlap on each adjacent pipe section, and bunching it accordion-fashion lengthwise until it clears the pipe ends.
- b. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at joints to facilitate installation of the polyethylene tube.
- c. After assembling the pipe joint, make the overlap of the polyethylene tube. Pull the bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe, and secure in place with one (1) circumferential turn of adhesive tape plus enough overlap to assure a firm adhesion. Then slip the end of the polyethylene from the new pipe section over the end of the



polyethylene from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Tape it in place. Take up the slack width to make a snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points with adhesive tape.

- d. Repair any rips, punctures, or other damage to the polyethylene with adhesive tape or with a short length of polyethylene tube cut open, wrapped around the pipe, and secured with adhesive tape. Proceed with installation of the next section of pipe in the same manner.

2. Method B:

- a. Cut polyethylene tube to a length approximately one (1) foot shorter than the length of the pipe section. Slip the tube around the pipe, centering it to provide six (6) inches of bare pipe at each end. Make polyethylene snug, but not tight. Tape down and secure ends as described in B,1.
- b. Before making up a joint, slip a three (3) foot length of polyethylene tube over the end of the preceding pipe section, bunching it accordion-fashion lengthwise. After completing the joint, pull the three (3) foot length of polyethylene over the joint, overlapping the polyethylene previously installed on each adjacent section of pipe by at least one (1) foot. Make snug, tape down, and secure each end as described in B,1.
- c. Repair any rips, punctures, or other damage to the polyethylene as described in B,1. Proceed with installation of the next section of pipe in the same manner.

C. Pipe-shaped appurtenances:

Bends, reducers, offsets, and other pipe-shaped appurtenances shall be covered with polyethylene in the same manner as the pipe.

D. Odd-shaped appurtenances:

Valves, tees, crosses, and other odd-shaped pieces which cannot practically be wrapped in a tube shall be wrapped with a flat sheet or split length of polyethylene tube. The sheet shall be passed under the appurtenance and brought up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Slack width and overlaps at joints shall be handled as described in B,1. Tape polyethylene securely in place at valve stem and other penetrations.

E. Openings in encasement:

Openings for branches, service taps, blow-offs, air valves, and similar appurtenances shall be made by making an x-shaped cut in the polyethylene and temporarily folding the film back. After the appurtenance is installed, tape the slack securely to the appurtenance and repair the cut as well as any other damaged areas in the polyethylene with tape.

F. Junctions between wrapped and unwrapped pipe:

Where polyethylene wrapped pipe joins a pipe which is not wrapped, extend the polyethylene tube to cover the unwrapped pipe a distance of at least two (2) feet. Secure the end with circumferential turns of tape.

**END OF SECTION**



## **SECTION 33 05 31.13 - WATER MAIN - PVC PRESSURE PIPE**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Polyvinyl chloride pressure pipe required for project.

#### **1.02 RELATED SECTIONS**

- A. Section 31 23 16.13 - Trenching, Backfilling and Compaction
- B. Section 33 01 10.58 - Water Main Disinfecting
- C. Section 33 01 12 - Water Main Pressure and Leakage Test
- D. Section 33 14 19 - Water Main - Valves, Hydrants, and Accessories

#### **1.03 QUALITY ASSURANCE**

- A. Supervision:
  - 1. Provide full time superintendent on the project who is qualified and experienced in the installation of PVC pipe.
  - 2. The superintendent shall direct all work in the execution of this portion of the work to insure proper and adequate installation.
- B. Codes and standards:
  - 1. Installation shall comply with the applicable specifications of the AWWA and manufacturer.

#### **1.04 SUBMITTALS**

- A. Shop drawings:

Submit shop drawings to the Engineer within 30 days after award of Contract in accordance with Section 01 33 23 - Shop Drawings, Product Data, and Samples, showing all the plumbing system and plumbing materials to be furnished and installed.
- B. As-built drawings:

During progress of the work, maintain an accurate record of all changes made in the plumbing installation from the layout and materials shown on the approved shop drawings.

### **PART 2 - PRODUCTS**

#### **2.01 FITTINGS FOR DIP, CIP, OR C900 PVC THAT IS DUCTILE IRON O.D.**

- A. Ductile Iron Fittings shall be "mechanical joint" conforming to AWWA C153/A21.53.
- B. Fittings on pipe thru 12 inch size shall be compact type conforming to AWWA C153/A21.53. All other sizes shall be normal dimension.

#### **2.02 PLASTIC PIPE - DUCTILE IRON O.D.**

- A. The pipe shall be produced according to AWWA C900 specification. The pipe shall be produced by an extrusion process using resin complying with ASTM D1784. Unless designated otherwise on the plans, the pipe shall conform to all the requirements of Specifications AWWA C900 with a standard dimension ratio of DR of 18 (235 psi) for

barrel, bell or coupling. All pipe shall bear the AWWA seal of approval and designation. Certificates of compliance with these specs shall be furnished upon request.

- B. Only elastomeric ring seals are to be used for joining pipes. Thrust blocks will be necessary at bends, tees, and reducers.
- C. The elastomeric gaskets for plastic pressure pipe shall conform with the requirements of ASTM F477. The joint shall have been tested and approved by the National Sanitation Foundation and certification of said approval shall be submitted.
- D. Prior to use, Engineer shall be given opportunity for examination and testing. Any pipe found to be injured, damaged or to have defects shall be removed. The pipe shall then be delivered along the line in which the pipe is to be laid. The pipe shall be handled in a manner as recommended by the manufacturer so that minimum damage results.

### 2.03 JOINT RESTRAINERS

- A. All water main materials are to be restrained at all joints, valves, hydrants, couplings, and fittings. Restrained joint pipe shall be C900 PVC DR18. Acceptable products are North American Specialty Products Certa-LOK Restrained Joint PVC Pressure Piping System, North American Specialty Products Certa-LOK Yelomine, JM Eagle Eagle Loc, or approved equal. Restrained joint pipe shall meet the ASTM D2241 Standard Specifications for Poly Vinyl Chloride (PVC), Pressure Rated pipe (SDR Series). At tees and crosses, all valves shall be installed utilizing anchor couplings. If pipe used does not have integral restraining system, use a pipe restraining system as called out below:

- B. Restrainer for PVC pipe joints, that are without an integral restraining system, shall be EBAA Split Serrated Restraint Harness.

The split serrated restraint harness for PVC pipe bells consists of two (2) split serrated rings and fastened together into a harness by thrust rods.

- C. Restrainer for fittings, valves, hydrants, and/or couplings:
  - 1. Shall be EBAA Iron Series 2000 Megalug.
  - 2. Restrainer shall be Romac Industries RomaGrip for PVC, Romac Grip-Ring, or EBAA Iron 65MJ00 - Split Serrated Restraint for IPS PVC Pipe or approved equal. Both Romac Industries products replace the conventional follower gland on a mechanical joint connection.
  - 3. The EBAA Iron Series 65MJ00 restrainer is designed for restraining Mechanical Joint Follower Glands on IPS (class) PVC Pipe. The restraint is a split serrated ring with thrust rods that rod back to the fitting.

### 2.04 RESTRAINED JOINT PVC PIPE

- A. Where restrained joint PVC is indicated on plan sheets, pipe shall be North American Specialty Products Certa-LOK Tapered Bell Restrained Joint PVC Pressure Piping System, Aquamine, or approved equal. Restrained joint pipe shall meet the "ASTM D2241 Standard Specifications for Poly Vinyl Chloride (PVC), Pressure Rated pipe (SDR Series)."
- B. Installation of pipe shall follow manufacturer's recommended procedure and is to be in accordance with Missouri Department of Natural Resources guidelines.
- C. Restrained Joint pipe shall have the following:
  - 1. DR 14, Class 305 psi pressure rating
  - 2. Designed for permanent use

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Maximum allowable bends in PVC pipe:

The following table gives the maximum distance from the center line of any length of PVC pipe to a chord line from the center of the joints at either end (mid-ordinate distance).

Pipe Size	20-Ft. Length	40-Ft. Length
1 in	1.0 Ft.	4.0 Ft.
2 in.	0.5 Ft.	2.0 Ft.
3 in.	0.33 Ft.	1.33 Ft.
4 in.	0.25 Ft.	1.0 Ft.
6 in.	0.16 Ft.	.67 Ft.
8 in.	0.125 Ft.	
10 in.	0.10 Ft.	
12 in.	0.082 Ft.	

Bends greater than the above require fittings. Use long radius elbow bends where possible.

- B. Plastic pipe shall be kept shaded and shall be covered with backfill immediately after installation. Pipe shall be installed in accordance with manufacturer's instructions.  
No rock or debris shall be placed in trench within six (6) inches of the pipe.
- C. The interior of all pipe and fittings shall be thoroughly cleaned of all foreign matter before being installed and shall be kept clean until the work has been accepted. All joint contact surfaces shall be kept clean until the jointing is completed.
- D. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being installed. No debris, tools, clothing, or other materials shall be placed in the pipe.
- E. Whenever pipe laying is stopped, the open end of the line shall be sealed with a watertight plug. All water that may have entered the trench shall be removed prior to removing the plug. It is essential that no mud, trench water, or other foreign matter be permitted to enter the pipe line at any time.
- F. Pipe lines or runs intended to be straight shall be laid straight. Deflections from a straight line taken in joints or in pipe shall not be greater than that recommended by the pipe manufacturer.
- G. Either shorter pipe sections, or special bends shall be installed where the alignment or grade requires them.
- H. Pipe shall be protected from lateral displacement by means of pipe embedment material installed as provided in the trench backfill specification.
- I. Under no circumstances shall pipe be laid in water and no pipe shall be laid under unsuitable weather or trench conditions.
- J. Pipe shall be laid with the bell ends facing the direction of laying except when making closures.

- K. Mechanical joints shall be carefully assembled in accordance with the manufacturer's recommendations. If effective sealing is not obtained, the joint shall be disassembled, thoroughly cleaned and reassembled. Overtightening bolts to compensate for poor installation practice will not be permitted.
- L. Boltless gasket joints shall be assembled following all instructions and recommendations of the pipe manufacturer, relative to gasket installation and other jointing operations, and shall be observed and followed by the Contractor. All joint surfaces shall be lubricated with heavy vegetable soap solution immediately before the joint is completed.

### **3.02 CONNECTIONS WITH EXISTING PIPE LINES**

- A. Where connections are made between new work and existing piping, such connections shall be made using suitable and proper fittings to suit the conditions encountered. Each connection with an existing water pipe shall be made at a time and under conditions which will least interfere with water service to customers affected thereby, and as authorized by the Owner. Suitable facilities shall be provided for proper dewatering, drainage and disposal of all water removed from the dewatered lines and excavations, without damage to adjacent property.
- B. Great care shall be taken to prevent pipe line contamination when dewatering, cutting into, and making connections with, existing pipe lines used for the conveyance or distribution of water for domestic or public use. No trench water, mud, or other contaminating substance shall be permitted to get into the connected line or lines at any time during the progress of the work. The interiors of all pipe, fittings, and valves, both new and re-used, installed in such connections, shall be thoroughly cleaned before installation.

### **3.03 REACTION ANCHORAGE AND BLOCKING**

- A. All un-lugged bell and spigot or all-bell tees, Y-branches and bends deflecting 11¼ degrees or more which are installed in piping subjected to internal hydrostatic heads in excess of 15 feet in exposed, or 30 feet in buried, piping shall be provided with suitable reaction blocking, struts, anchors, clamps, joint harness, or other adequate means for preventing any movement of the pipe caused by unbalanced internal liquid pressure.

### **3.04 SEPARATION OF WATER MAINS, SANITARY SEWERS AND COMBINED SEWERS - MODNR**

When buried water mains are in close proximity to non-potable pipelines, the water mains are vulnerable to contamination that can pose a risk of waterborne disease outbreaks. For example, sewers (sanitary sewer mains and sewage force mains) frequently leak and saturate the surrounding soil with sewage due to structural failure, improperly constructed joints, and subsidence or upheaval of the soil encasing the sewer. If a nearby water main is depressurized and no or negative pressure occurs, that situation is a public health hazard. The public health hazard is compounded if an existing sewer is broken during the installation or repair of the water main. Further, failure of a water main in close proximity to other pipelines may disturb their bedding and cause them to fail. To protect the public health, the following requirements shall be met. These requirements apply to horizontally directionally drilled pipe or pipe installed through other trenchless methods as well as pipe installed by conventional open-cut methods.

#### A. General

The following factors should be considered in providing adequate separation:

1. Materials and type of joints for water and sewer pipes;
2. Soil conditions;
3. Service and branch connections into the water main and sewer line;
4. Compensating variations in the horizontal and vertical separations;
5. Space for repair and alterations of water and sewer pipes; and
6. Off-setting of water mains around manholes.

#### B. Parallel installation

The water main shall be located at least 10 feet horizontally from any existing or proposed line carrying non-potable fluids such as, but not limited to drains, storm sewers, sanitary sewers, combined sewers, sewer service connections, and process waste or product lines. The distance shall be measured edge to edge.

In cases where it is not practical to maintain a 10 foot separation, the department may allow deviation on a case by case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a non-potable fluid line, provided that the water main is laid in a separate trench located as far away from the non-potable line as feasible and meets other specific construction requirements. Locating a water main on an undisturbed earth shelf located on one side of the non-potable line is not recommended and requires justification by the engineer and specific case-by-case approval of the department. In either case, an elevation shall be maintained such that the bottom of the water main is at least 18 inches above the top of the non-potable line while meeting minimum cover requirements.

In areas where the recommended separations cannot be obtained, either the waterline or the non-potable line shall be constructed of mechanical or manufactured restrained joint pipe, fusion welded pipe, or cased in a continuous casing. Casing pipe must be a material that is approved for use as water main. Conventional poured concrete is not an acceptable encasement.

#### C. Crossings

Water mains crossing sewers, or any other lines carrying non-potable fluids shall be laid to provide a minimum vertical clear distance of 18 inches between the outside of the water main and the outside of the non-potable pipeline. This shall be the case where the water main is either above or below the non-potable pipeline. An 18 inch separation is a structural protection measure to prevent the sewer or water main from settling and breaking the other pipe. At crossings, the full length of water pipe shall be located so both joints will be as far from the non-potable pipeline as possible but in no case less than 10 feet or centered on a 20 foot pipe. In areas where the recommended separations cannot be obtained either the waterline or the non-potable pipeline shall be constructed of mechanical or manufactured restrained joint pipe, fusion, welded pipe, or cased in a continuous casing that extends no less than 10 feet on both sides of the crossing. Special structural support for the water and sewer pipes may be required. Casing pipe must be a material that is approved for use as water main. Conventional poured concrete is not an acceptable encasement.

D. Exception

Any exception from the specified separation distances in paragraphs B and C must be submitted to the department for approval.

E. Force mains

There shall be at least a 10 foot horizontal separation between water mains and sanitary sewer force mains or other force mains carrying non-potable fluids and they shall be in separate trenches. In areas where the recommended separations cannot be obtained, either the waterline or the non-potable line shall be constructed of mechanical joint pipe or be jointless or fusion welded pipe. Where possible, the waterline shall also be at such an elevation that the bottom of the water main is at least 18 inches above the top of the non-potable line. Casing pipe must be a material that is approved for use as water main. Conventional poured concrete is not an acceptable encasement.

F. Sewer manholes

No waterline shall be located closer than 10 feet to any part of a sanitary or combined sewer manhole. Where the separation cannot be obtained, the waterline shall be constructed of mechanical or manufactured restrained joint pipe, fusion welded pipe, or cased in a continuous casing. Casing pipe must be a material that is approved for use as water main. The full length of water pipe shall be located so both joints will be as far from the manhole as possible, but in no case less than ten feet or centered on a 20 foot pipe. No water pipe shall pass through or come into contact with any part of a sanitary or combined sewer manhole.

G. Disposal facilities

No water main shall be located closer than 25 feet to any wastewater disposal facility, agricultural waste disposal facility, or landfill. Water mains shall be separated by a minimum of 25 feet from septic tanks and wastewater disposal areas such as cesspools, subsurface disposal fields, pit privies, land application fields, and seepage beds.

**END OF SECTION**



## **SECTION 33 14 19 - WATER MAIN - VALVES, HYDRANTS, AND ACCESSORIES**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Valves
- B. Fire Hydrants
- C. Valve Boxes
- D. Related Items

#### **1.02 RELATED SECTIONS**

- A. Section 33 05 31.13 - Water Main - PVC Pressure Pipe

#### **1.03 QUALITY CONTROL**

- A. Supervision:  
Provide full time supervisor trained and familiar with the work to be undertaken.
- B. Workmanship:  
All workers shall be skilled and experienced in the specified work.
- C. Standards  
All components that come into contact with potable water shall be NSF 372 approved.

#### **1.04 SUBMITTALS**

- A. Shop drawings:  
Submit shop drawings to the Engineer within 30 days after award of Contract in accordance with Section 01 33 23 - Shop Drawings, Product Data, and Samples.

### **PART 2 - PRODUCTS**

#### **2.01 VALVES**

- A. Gate valves 12 inches and smaller:
  1. All gate valves shall comply with requirements of "Standard Specifications for Resilient Seated Gate Valves for Ordinary Water Works Service" AWWA C515 except as amended herein. All valves shall be resilient seated wedge type.
  2. All gate valves unless noted otherwise on the plans shall have ends of standard mechanical joints conforming to AWWA C111/A21.11. Bolts and nuts are to be stainless steel. Flanged end valves shall conform to ANSI B16.1 Class 125.
  3. All gate valves shall be mounted in the line in a vertical position unless noted otherwise on the plans.
  4. All gate valves shall be provided with "O" rings for sealing of the valve stem.
  5. All gate valves shall be equipped with two (2) inch square operating nuts. Valves shall close on clockwise rotations.
  6. All valves shall be designed for operation at a working pressure of not less than 200 psi.

## **2.02 VALVE BOXES**

### **A. Traffic areas:**

Valve boxes shall be Clay & Bailey, or equal, three-piece, slip type 5¼ inch shaft for roadway service. Cover shall have the word "Water" cast on its top.

### **B. Non-traffic areas:**

Use six (6) inch PVC C1.160 and extend 24 inches above grade. Install Clay and Bailey 2194 cover and 1108 lid or approved equal.

## **2.03 LOCATOR WIRE/ACCESS TESTING PORTS**

A. Locator wire shall be 12 AWG solid copper insulated wire or 12 AWG copper clad steel wire as manufactured by Copperhead Industries, LLC, or approved equal. Install wire in the trench with the main. All wire connections shall be Copperhead Snake Bite Connectors, dry conn direct bury lug or snake bite wire nuts or approved equal.

B. Install access ports at 1,000 feet max. intervals as detailed on plans. All valves, air release vaults, hydrants, flushing assemblies and blow-offs shall have access ports as well as every 1,000 feet. Access port shall be Copperhead, LP Test services or above ground posts shall be "Internal Terminal Style" with standard board with two terminals. Post shall be Rhino TriView Flex Tracing Station Model TVTI 72-BB2 or equal.

C. Contractor to field verify continuity of wire between access ports after installation. Payment for locator wire will be subject to successful continuity test and report.

D. When directional drilling or boring is required, only Copperhead Extra High Strength (EHS), #1245B with 45 mil High Density Polyethylene (HDPE) jacket with minimum 1150# break load, will be used.

## **2.04 RESTRAINED JOINT FITTINGS**

Where called out on plans, all fittings shall be restrained by EBAA Iron Series 2000 Iron Mega Lugs or equal.

## **PART 3 - EXECUTION**

### **3.01 VALVES AND VALVE BOXES**

A. Valves and valve boxes shall be set plumb. Each valve box shall be placed directly over the valve it serves, with the top of the box brought flush with the finished grade. After being placed in proper position, earth shall be filled in around each valve box and thoroughly tamped for a distance on each side of the box of four (4) feet at the top of the pipe and two (2) feet measured at the top of the trench.

B. Each valve shall be inspected before installation to ensure that all foreign substances have been removed from within the valve body and shall be opened and closed to see that all parts are in first-class working condition.

### **END OF SECTION**

## **SECTION 33 14 24 – PRESSURE REDUCING VALVE VAULT**

### **PART 1 - GENERAL**

#### **1.01 SCOPE OF WORK**

- A. The contractor shall furnish and install one below ground pressure reducing valve vault, in a pre-cast concrete structure with all necessary internal piping, valves, fittings, supports, and other necessary appurtenances as shown on the plans and specified herein.
- B. The contractor shall be required to set the vault on-site as directed by the engineer and as shown in the plan set. The vault will be delivered in sections, if applicable due to the size of the structure.

#### **1.02 SUBMITTAL**

- A. The electronic copy will be complete with data sheets covering all major components that make up the vault. The submittal shall include a drawing specific to the project.

#### **1.03 QUALITY ASSURANCE**

- A. The vault furnished shall be designed, constructed, and installed in accordance with the best practices and methods and shall operate satisfactorily when installed as shown on the contract drawings and operated per manufacturer's recommendations.

#### **1.04 SHIPPING AND DELIVERY**

- A. The vault shall be delivered by the manufacturer FOB DESTINATION. The manufacturer shall hold the full responsibility for the condition and completeness of the equipment upon its delivery.

#### **1.05 REPLACEMENT COST**

- A. Upon determination that work covered by a warranty has failed. Replace or rebuild the work to an acceptable condition complying with requirements of Contract Documents. Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether Owner has benefited from use of the work through a portion of its anticipated useful service life.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

- A. Cement shall conform to ASTM C150. Evidence of conformance shall be a certified mill test report. Test reports shall be kept on file by the precast plant.
- B. Fine aggregates and course aggregates shall conform to ASTM C33. Aggregate supplier shall test aggregates for gradation and deleterious substances.
- C. Water used in mixing concrete shall be potable and free of deleterious amounts of oils, acids, alkalis, salts organic material or other substances which may adversely affect the properties of fresh or hardened concrete.

#### **2.02 REINFORCEMENT**

- A. Steel reinforcing bars shall conform to ASTM A615.
- B. Steel reinforcing wire shall conform to ASTM A185.

- C. Welded wire fabric shall conform to ASTM A185.
- D. Spacers for reinforcement, inserts, form ties and similar accessories incidental to the manufacture of precast concrete shall be adequate for their intended purposes. All reinforcement spacers must be either plastic, plastic coated steel, galvanized or stainless steel.

### 2.03 CONCRETE

- A. The aggregates, cement and water shall be proportioned and mixed to produce concrete that will achieve the required strength.
- B. The compressive strength of the concrete as determined from test specimens shall be equal to or greater than that specified by design. The following compressive strengths are required:
  - Shipping = 4,000 PSI
  - 28 Day = 5,000 PSI

### 2.04 FABRICATION

- A. Forms for manufacturing precast products shall be designed and constructed so that no product damage shall be caused by the forces and vibrations to which the forms shall be measured periodically for dimensional conformance with ASTM C890.
- B. Holes shall be permitted in the product for lifting and moving the product.
- C. Cages of reinforcement shall be fabricated either by tying the bars, wires or welded wire fabric into rigid assemblies or by welding where permissible.
- D. Reinforcing steel shall be positioned as specified and so the concrete cover conforms to requirements. The tolerance on concrete cover shall be  $-3/8"$  to  $+1/2"$ , this cover tolerance does not apply at the joints.
- E. Blockouts may be positioned before or after reinforcement and embedded items are positioned. Blockout shall be held rigidly in place so that they do not move significantly during casting operations.
- F. Concrete may be transported from the mixer to the casting location by a means that does not contaminate the concrete or cause excessive segregation.
- G. Concrete shall be consolidated in such a manner that segregation of the concrete and honeycombed areas are minimized. Vibrators used to consolidate concrete shall have frequencies and amplitudes sufficient to produce well-consolidated concrete.
- H. Preventing moisture from evaporation from the exposed surfaces of a precast product shall be considered an effective method of curing. Forms shall be considered effective in preventing evaporation from the contact surfaces. The use of a membrane curing compound conforming to ASTM C309 shall be applied to all exposed surfaces and to the entire surface of a product if the 28-day design strength is not achieved when the forms are removed.
- I. Defects, which will not impair the functional use or expected life of a precast concrete product, shall be considered a minor defect. Minor defects may be repaired by any method as long as it does not impair the product.

- J. Defects in precast concrete products, which impair the functional use or the expected life of products, shall be considered major defects. Unless major defects are repaired the product shall be rejected. Major defects shall be evaluated by qualified personnel to determine if repairs are feasible and, if so, establish the repair procedure. The products should be inspected while the repairs are made to assure that the established repair procedures and curing are followed.

## **2.05 ENTRANCE MANWAY HATCH**

- A. The entrance manway shall have a clear inside opening of thirty-six (36) inches by thirty-six (36) inches. The frame shall be ¼" thick, mill finish, aluminum designed for surface mounting. Door panel shall be ¼" aluminum diamond plate, reinforced to withstand approximately 625 lbs. psf. load rating. The door shall incorporate a 90 degree return flange around the perimeter. Stainless steel pressure locks shall be provided to work in conjunction with a ¼" thick neoprene compression gasket, mounted to the underside of the door, to insure minimal water intrusion and/or odor resistance. Door shall open to 90 degrees and automatically lock with a T-316 stainless steel hold open arm with aluminum release handle. Hinges and all fastening hardware shall be T-316 stainless steel. Unit shall lock with pad lock lugs. Unit shall carry a lifetime guarantee against defects in material and/or workmanship.

## **2.06 ACCESS LADDER**

- A. The vault will be complete with ladder as shown on the plans with an extendable safety post.

## **2.07 DUCTILE IRON PIPE**

- A. Ductile Iron Pipe shall be designed in accordance with the latest revision of ANSI/AWWA C150/A21.50 for a minimum 150 psi rated working pressure plus a 100 psi surge allowance.
- B. Ductile Iron Pipe shall be manufactured in accordance with the latest revision of ANSI/AWWA C151/A21.51. Each pipe shall be subjected to a hydrostatic pressure test of at least 500 psi at the point of manufacture.
- C. Pipe shall have standard coating on the exterior. Pipe shall also have a cement-mortar lining on the interior in accordance with ANSI/AWWA C104/ A21.4, of latest revision.
- D. The class or nominal thickness, net weight without lining, and casting period shall be clearly marked on each length of pipe. Additionally, the manufacturer's mark, country where cast, year in which the pipe was produced, and the letters "DI" or "Ductile" shall be cast or stamped on the pipe.
- E. Fittings shall be ductile iron. Fittings shall conform to the latest revision of either ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53. Fitting shall be flanged and adequate for water service of 250 psi working pressure. The bolt circle and the bolt holes match those of ANSI B16.1 Class 125.

## **2.08 FLANGE ADAPTERS**

- A. Flange adapters shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C110/A21.10.

- B. Restraint for the flange adapter shall consist of a plurality of individual actuated gripping wedges to maximize restraint capability. Torque limiting actuating screws shall be used to insure proper initial set of gripping wedges.
- C. The flange adapter shall be capable of deflection during assembly, or permit lengths of pipe to be field cut, to allow a minimum of 0.6" gap between the end of the pipe and the mating flange without affecting the integrity of the seal.
- D. For PVC pipe, the flange adapter will have a pressure rating equal to the pipe.
- E. For ductile iron pipe, the flange adapter shall have a safety factor of 2:1 minimum.
- F. All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat.
- G. All casting bodies shall be surface pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied, and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.
- H. The flange adapter shall be the SERIES 2100 MEGAFLANGE adapter, as produced by EBAA Iron, Inc., or approved equal.

**2.09 PRESSURE REDUCING CONTROL VALVES**

- A. The Pressure Reducing Control Valve shall automatically throttle to reduce a higher incoming pressure and maintain an accurate and constant lower downstream pressure regardless of changing flow rate and/or inlet pressure. If downstream pressure increases above the pilot spring setting, the valve shall close. When the outlet pressure is greater than the inlet pressure, the valve shall permit return flow.
- B. Material Specification for the Pressure Reducing Control Valves Main Valve as follows:

<b><u>Component</u></b>	<b><u>Material</u></b>
Body & Cover	Ductile Iron ASTM A536
Main Valve Trim	Stainless Steel
Seat	Stainless Steel
Stem, Nut, and Spring	Stainless Steel
Seal Disc	Buna-N Rubber
Diaphragm	Nylon Reinforced Buna-N Rubber
Internal Trim Parts	Stainless Steel
End Detail	Flanged
Pressure Rating	Class 150 lb.
Temperature Range	Water to 180° F
Any other wetted metallic parts	Stainless Steel
Coating	Fusion Bonded Epoxy Coating (Interior and Exterior); ANSI/NSF 61 Approved/AWWA coating specifications C116-03
Accessories	Position Indicator, Opening Speed Controls, Isolation Valves, Gauges

- C. The main valve shall be hydraulically operated, single diaphragm actuated, globe pattern. The valve shall consist of three major components; the body with seat installed, the cover with bearing installed and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating the operating pressure from line pressure. Packing glands, stuffing boxes and/or rolling diaphragm technology will not be permitted and there shall be no pistons operating the main valve or pilot controls. No fabrication or welding shall be used in the manufacturing process. Y-pattern valves shall not be permitted. Main valve shall comply with NSF/ANSI Standard 61 and certified lead free to NSF/ANSI 372 as a safe drinking water system component.
- D. End Connections for control valve shall be flanged per ASME/ANSI B16.42, Class 150.
- E. No separate chamber(s) below the diaphragm shall be allowed between the main valve cover and body. No fabrication or welding shall be used in the manufacturing process.
- F. The valve shall contain a resilient, synthetic rubber disc with a rectangular cross-section contained on three and one half sides by a disc retainer and forming a tight seal against a single removable seat insert. No O-ring type discs (circular, square, or quad type) shall be permitted as the seating surface. The disc guide shall be of the contoured type to permit smooth transition of flow and shall hold the discs firmly in place. The disc retainer shall be of a sturdy one-piece design capable of withstanding opening and closing shocks. It must have straight edge sides and a radius at the top edge to prevent excessive diaphragm wear as the diaphragm flexes across this surface. No hours-glass shaped disc retainers shall be permitted, and no V-type or slotted-type disc guides shall be used.
- G. The diaphragm assembly containing a non-magnetic stainless steel stem; of sufficient diameter to withstand high hydraulic pressures and shall be fully guided at both ends by a bearing in the main valve cover and an integral bearing in the valve seat. The valve seat shall be a solid, one-piece design and shall have a minimum five-degree taper on the seating surface for a positive, drip-tight shut off. No center guides shall be permitted. The stem shall be drilled and tapped in the cover end to receive and affix such accessories as may be deemed necessary. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating the operating pressure from the line pressure. No bolts or cap screws shall be permitted for use in the construction of the diaphragm assembly.
- H. The flexible, non-wicking, FDA approved diaphragm shall consist of nylon fabric bonded with synthetic rubber compatible with the operating fluid. The diaphragm's center hole for the main valve stem must be sealed by the vulcanized process or a rubber grommet sealing the center stem hole from the operating pressure. The diaphragm must withstand a Mullins Burst Test of a minimum of 600 X per layer of nylon fabric and shall be cycled tested 100,000 times to insure longevity. The diaphragm shall not be used as the seating surface. The diaphragm shall be fully supported in the valve body and cover by machined surfaces which support no less than one-half of the total surface area of the diaphragm in either the fully opened or fully closed position. Bellofram type rolling diaphragms shall not be permitted.
- I. The main valve seat and stem bearing in the valve cover shall be removable. The main valve seat shall be retained by flat head machine screws for ease of maintenance. The

lower bearing of the valve stem shall be contained concentrically within the seat and shall be exposed to the flow on all sides to avoid deposits. To insure proper alignment of the valve stem, the valve body and cover shall be machined with a locating lip. No "pinned" covers to the valve body shall be permitted. Cover bearing, disc retainer and seat shall be made of the same material. All necessary repairs and/or modifications other than replacement of the main valve body shall be possible without removing the valve from the pipeline. The valve shall be designed such that both the cover assembly and internal diaphragm assembly can be disassembled and lifted vertically straight up from the top of a narrow opening/vault. Y-pattern valves shall not be permitted. The seat shall be of the solid one piece design. Two piece seats or seat inserts shall not be permitted. Packing glands and/or stuffing boxes shall not be permitted.

- J. The pressure reducing pilot control shall be a direct-acting, adjustable, spring-loaded, normally open, diaphragm valve designed to permit flow when controlled pressure is less than the spring setting. The pilot control is held open by the force of the compression on the spring above the diaphragm and it closes when the delivery pressure acting on the underside of the diaphragm exceeds the spring setting. The pilot control system shall include a strainer and a fixed orifice closing speed. No variable orifices shall be permitted. The pilot system shall include an opening speed control on all valves sizes 3" and smaller as standard equipment. The pilot control shall have a second downstream sensing port which can be utilized to install a pressure gauge. A full range of spring settings shall be available in ranges of 0 to 400 psi. Pilot shall comply with NSF/ANSI 61 and certified lead free to NSF/ANSI 372 as a safe drinking water system component.
- K. The pilot control system shall include a strainer and a fixed orifice closing speed. No variable orifices shall be permitted. The pilot system shall include an opening speed control on all valves sizes 3" and smaller as standard equipment. A full range of spring settings shall be available in ranges of 0 to 400 psi. Pilot to be manufactured by control valve manufacturer.
- L. Material Specification for Pilot Control:

<u>Component</u>	<u>Material</u>
Body & Cover	Bronze, Low Lead CuZn21Si3P or UNS C87850
Pilot Trim	Stainless Steel 303
Rubber	Buna-N
Connections	FNTP
Pressure Rating	400 psi Max.
Temperature Range	Water to 180° F
Control Tubing	Stainless Steel
Control Fittings	Stainless Steel

- M. The Control Valve manufacturer shall warrant the valve to be free of defects in material and workmanship for a period of three years from date of shipment provided the valve is installed and used in accordance with all applicable instructions. Electrical components shall have a one-year warranty.



N. The control valve shall be CLA-VAL Company Model No. 90-01, Pressure Reducing Control Valve, as manufactured by Cla-Val Co., Costa Mesa, CA 92627-4416.

**2.10 H-STYLE STRAINER**

A. The H-style Strainer shall be capable of preventing unwanted debris and sold particles from passing through the internal mesh and continuing downstream. The strainer shall have a compact H-style pattern. The strainer shall have a flow area equal to or greater than 150 percent of the inlet flow area of the strainer. The H-style Strainer shall be designed for installing with cover up for easy maintenance and cleaning of the strainer mesh screen and support frame.

B. Material Specification for the H-style Strainer as follows:

<u>Component</u>	<u>Material</u>
Body & Cover	Ductile Iron ASTM A536
Support Frame	Ductile Iron ASTM A536
Strainer	316 Stainless Steel
Strainer Mesh	10 mesh/2000 Micron/Opening 0.078"
Cover Fasteners	Stainless Steel
Cover Vent	Stainless Steel
Drain Blow-Off Plug	Stainless Steel
Seal	Buna-N Rubber
End Detail	Flanged
Pressure Rating	Class 150 lb.
Temperature Range	Water to 180° F
Any other wetted metallic parts	Stainless Steel; Bronze; Brass
Coating	Fusion Bonded Epoxy Coating; ANSI/NSF 61 Approved/AWWA coating specifications C116.03

C. The body shall have a compact H-Style pattern with internal locating ribs for locating strainer mesh screen and support frame perpendicular to the flow direction. The strainer shall have a flow area equal to or greater than 150 percent of the inlet flow area of the strainer. A rectangular cover shall be provided with a stainless-steel air elimination valve. The strainer cover seal shall be Buna-N O-ring. Strainer body shall have two blow-off drain ports, with pipe plugs located perpendicular to the flow, one on each side of the strainer body. The strainer shall have threaded side boss ports for optional accessories.

D. End Connections for H-style Strainer shall be flanged per ASME/ANSI B16.42, Class 150.

E. A removable, mesh-support frame shall be located behind the strainer mesh screen to support it during normal flow use and constructed of same material as strainer body. The mesh-support frame shall have sufficiently large openings to allow full flow without deformation of the strainer mesh screen. Strainer mesh screen and support frame shall be installed from the top into the internal locating ribs of the strainer body, perpendicular to the flow, to minimize pressure drop.

F. The strainer mesh screen shall have contoured arch design to withstand flowing pressure distortions. The standard 10 mesh (2000 Micron) screen element shall have 0.078 inch openings and the manufacturer shall offer optional mesh elements. All

strainer mesh screen elements shall be constructed of 316 SS and be of rectangular-trapezoidal shape with a one-piece 316 SS reinforcement edge covering and securely fastened to the entire screen. All necessary inspection and/or cleaning of the strainer screen shall be possible by removing the top cover only; without removing the H-style Strainer from the pipeline. Screen shall also be capable of being cleaned with the cover attached by reverse fluid flow thru the strainer to atmosphere through one of the two provided blow-off drain plug ports.

- G. The H-style Strainer shall be CLA-VAL Company Model No. X43H, H-style Strainer, as manufactured by Cla-Val Co., Costa Mesa, CA 92627-4416.

## **2.11 GATE VALVES**

- A. Gate Valves shall conform to the latest version of AWWA Standard C-515 covering Resilient Seated Gate Valves for Water Supply Service.
- B. The valves shall be 150# flanged with a ductile iron body and bonnet. The wedge shall be totally encapsulated with rubber. The sealing rubber shall be permanently bonded to the wedge to meet ASTM tests for rubber metal bond ATSM D249. Working pressure for valve sizes 2"-12" shall be 250 PSI.

## **2.12 VALVES SHALL BE SUPPLIED WITH O-RING SEALS AT ALL JOINTS. NO FLAT GASKETS SHALL BE ALLOWED.**

- A. The valves shall be non-rising, opening by turning left to right. The handwheel shall have the "Open" and an arrow cast in the metal to indicate the direction to open.
- B. Stems for NRS assemblies shall be cast bronze with integral collars in full compliance with AWWA. The stem shall operate with bronze stem nuts, independent of stem. The stem shall have (2) O-Rings located above thrust collar and (1) O-Ring below. O-Rings shall be replaceable with valve fully opened and subjected to full pressure. Stems shall also have (2) low torque thrust bearings located above and below stem collar to reduce friction during operation.
- C. Waterway shall be smooth, unobstructed and free of all pockets, cavities and depressions in the seat area.
- D. The body, bonnet and stuffing plate shall be coated with fusion bonded epoxy, both interior and exterior on body and bonnet. Epoxy shall be applied in accordance with AWWA C550 and be NSF61 and NSF372 certified.
- E. Each valve shall have a maker's name, pressure rating, and year in which it was manufactured cast in the body. Prior to shipment from the factory, each valve shall be tested by hydrostatic pressure equal to requirements of AWWA.
- F. Valves shall have all brass components cast and assembled in the USA and shall be manufactured by Kennedy Valve, M&H, Clow or equal.

## **2.13 MANUFACTURER**

- A. The precast check valve station shall be provided by ESI of Olathe, KS, Mr. Robb White, telephone 816-468-9119.

## **PART 3 - EXECUTION**

Not Applicable to this Section.

## **END OF SECTION**

## SECTION 46 63 00 - SCADA (ALTERNATE BID)

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

A. Scope of Work:

This section covers a radio telemetry-based SCADA and Instrumentation System Modification to include addition of one Remote Telemetry SCADA Units (RTU) for monitor and control of the proposed PRV station and software modification to the existing Micro-Comm Central Unit PLC and Office computer SCADAview software located at the Public Works Building.

B. Description of Work:

The work to be accomplished under this section shall consist of furnishing the equipment necessary for a complete automatic control and monitoring system to function as specified herein. The system integrator shall furnish a completely integrated all solid-state radio telemetry based Supervisory Control and Data Acquisition (SCADA) system. It shall be the system integrator's responsibility to supply a system that is compatible with existing Micro-Comm, Inc. SCADA equipment. The complete system shall be designed, fabricated, programmed, tested, started up, and warranted by a single supplier to insure a single source of responsibility.

C. General/Electrical Contractor

Shall supply all materials, equipment, and labor required in other sections of the specifications, and as described herein and shown on the drawings necessary to complete the SCADA System Addition Installation. The General/Electrical Contractor shall be responsible for conduits and wiring interface between the 120VAC power source and RTU, the PRV Solenoids/Limit Switches and RTU, the integrator supplied transducers and RTU, Antenna Tower installation and erection, conduit from the RTU to the Antenna Tower.

D. System Integrator

Shall Supply the following: engineering submittal and shop drawings prior to installation, operation and maintenance manuals, as detailed in this section, all start-up labor and services, as required for equipment specified in this section and operator training as detailed in this section.

E. Owner/General Contractor

Shall supply access and easements as needed for all sites and 120VAC power at all sites.

#### 1.02 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

The system specified herein shall be the product of a manufacturer who can demonstrate at least 10 years of satisfactory experience in furnishing and installing comparable radio-based telemetry/control systems for water and wastewater installations. The manufacturer of this system shall maintain a 24-hour available inventory of all replaceable modules to assure the Owner of prompt maintenance service and a single source of responsibility. The manufacturer shall certify this to the Engineer in writing at the time of bidder pre-qualification.

B. Approved System Integrator

**Micro-Comm, Inc. Olathe, Kansas; 913-390-4500**

C. Approval Agencies

The control system and its components shall comply will all applicable requirements of the following:

The control system and its components shall comply will all applicable requirements of the following:

Electrical Code Compliance (National & Local)

NEMA Compliance

IEEE Compliance

EIA Compliance

FCC Compliance

### 1.03 SUBMITTALS

A. Complete electrical and dimensional drawings shall be provided for approval by the consulting Engineer prior to equipment fabrication. The submittal data shall include the following:

1. Product Data:

Provide product data sheets for each instrument and component supplied in the system. The data sheets shall show the component name as used on reference drawings, manufacturer's model number or other product designator, input and output characteristics, scale or ranges selected, electrical or mechanical requirements, and materials compatibility.

2. Shop Drawings:

Provide drawings for each panel showing the wiring diagrams for control circuits and interconnections of all components. The drawings shall include wiring diagrams for all remote devices connected to the panel.

3. Panel Layout Drawings:

A front panel and sub-panel layout shall be included as part of each control panel drawing. Components shall be clearly labeled on the drawing.

4. Installation Drawings:

Typical installation drawings applicable to each site in the system shall be included.

### 1.04 O&M MANUALS/RECORD DRAWINGS

A. Maintenance Data Manuals

Submit maintenance manuals and "As Built" drawings on all items supplied with the system. The manuals and drawings are to be bound into one or more books as needed. In addition to "As Built" engineering submittal data and drawings, the manual shall include trouble shooting guides and maintenance and calibration data for all adjustable items.

### 1.05 JOB CONDITIONS

A. All instruments and equipment shall be designed to operate under the environmental conditions where they are to perform their service. The equipment shall be designed to handle lightning and transient voltages as normal environmental hazards. The environmental conditions are as follows:

1. Outdoor - The equipment will be exposed to direct sunlight, dust, rain, snow, ambient temperatures from -20 to +120 degrees F, relative humidity of 10 to 100 percent, and other natural outdoor conditions. The installations shall be hardened to with stand normal vandalism.
2. Indoor - The equipment will be capable of operating in ambient temperatures of +32 to +130 degrees F and relative humidity of 20 to 100 percent.

#### **1.06 DELIVERY, STORAGE, & HANDLING**

- A. All items shall be stored in a dry sheltered place, not exposed to the outside elements, until ready for installation. All items shall be handled with appropriate care to avoid damage during transport and installation.

#### **1.07 SEQUENCING & SCHEDULING**

- A. Coordinate:

Coordinate with other electrical and mechanical work including wires/cables, raceways, electrical boxes and fittings, controls supplied by others, and existing controls, to properly interface installation of the control system.

- B. Sequence:

Sequence installation and start-up work with other trades to minimize downtime and to minimize the possibility of damage and soiling during the remainder of the construction period.

### **PART 2 - PRODUCTS**

#### **2.01 PROGRAMMABLE LOGIC CONTROLLERS & LOCAL I/O EQUIPMENT**

- A. General

Industrial Programmable Logic Controllers (PLCs) shall be used at all locations. The PLCs shall have an operational range of 0-60degC and 5-95% relative humidity. The PLCs shall all be from the same family of controllers, scalable from very small to very large applications, and programmed from identical programming software used for all processors. The PLCs shall be readily available on and directly purchasable online from the manufacture's WEB page. The PLCs shall be Allen-Bradley CompactLogix or Micro-Comm M1600 Series controllers.

The software at all locations shall be stored in a user removable non-volatile CompactFlash or similar type ROM memory that can be exchanged under power, used to upgrade sites in the field, and store historical data (local trends, accumulators, etc.) for retrieval locally or by the central unit. The memory modules shall store all site-specific logic and configurations including communication parameters, control algorithms, analog input/output scaling, PID control parameters. The module shall be programmed via the CPU and without the use of external adapters. The PLCs shall include "watch-dog" circuitry and be "self-initializing" without operator intervention. In the event that the program or configuration data is corrupted, the CPU shall reload the program and configuration data from the EEPROM memory module.

The PLCs shall be fully online programmable while the PLC continues to communicate with the rest of the system and performs its assigned control tasks. The PLCs shall support "fill-in-the-blank" type configuration for basic operation and to set-up common

features such as COM port set-up, peer-to-peer data collections, local back-up control set points, input and output setup, output on/off time delay settings, front panel display setup, etc. The PLC shall also support a process script language or ladder logic type programming for site-specific customizations including special input and output manipulations, local sequential control, math functions, and PID control.

## B. Construction

The PLC shall use modular construction. The base unit shall be composed of the power supply, CPU, communications modules, and basic inputs and outputs (I/O). The unit shall have expandable inputs and outputs using a "rack-less" DIN rail mount design and capable of supporting local I/O (via an integrated high-performance serial I/O bus) and remote I/O via a industrial serial bus. All terminations shall use removable, NEMA-style "finger-safe" terminal blocks so that individual modules may be removed without disturbing adjacent modules.

The PLC shall be capable of being powered from AC, DC, or solar sources. DC and solar powered PLCs shall have an integral battery charging circuit that protects the external battery from over and under voltage conditions and provides automatic charging of the battery after power failures. The back-up power supply shall be either 12VDC with 24VDC DC/DC converter or 24VDC with a 12VDC DC/DC converter to run the 12VDC radio and 24VDC to power external sensors from a single battery source. Series tapped 24VDC batteries for 12VDC will not be allowed. Back-up batteries shall be rechargeable sealed lead-acid type batteries as manufactured by PowerSonic or equal. The back-up battery shall provide for 24 hours of back-up operation at water tower remote units and 3 hours at all other sites.

The PLC shall have a minimum of three communications ports. The first shall be used primarily for CTU-RTU and RTU-RTU communications. It shall support baud rates of 110-19,200 baud and have a plug-in standard 25-pin or 9-pin sub-D connector that provides a full RS232 interface and radio modem interface. The second communications port shall provide programming, operator front panel interface, multiple PLC interconnect and other local communications. It shall support baud rates of 110-19,200 baud and have a 9-pin sub-D interface. The communications ports shall include LED's to show the status of all control lines. The PLC shall also optionally support Ethernet communications as detailed in the specifications.

The PLC shall utilize a rack-less design and provide for sufficient installed and configured spare inputs and outputs (I/O) to meet the site requirements as detailed and provide for 25% spares of each type. The unit shall have a minimum of four discrete (relay) outputs, eight discrete inputs (DI), four analog inputs (AI), and two analog outputs (AO). The analog inputs shall provide for sensor excitation with separate fuses for each input. The fuses may be the self-resetting type. All input and output connections to the PLC shall be via Nema "finger-safe" plug-in terminal blocks.

The PLC shall support both local and remote I/O. Input/Output cards shall be mounted on a DIN rail channel. The PLC inputs, outputs, and operator interface shall be as follows:

1. DISCRETE OUTPUTS - The discrete outputs shall be isolated relay outputs rated at 5.0A continuous @ 240VAC. LEDs on the front of the PLC base unit or expansion module shall indicate the status of each output point. Interposing relays shall be provided if the voltage or current of the external load on a contact exceed the 5.0A

240VAC ratings. Each output shall be provided with operator settable software ON and OFF time delays.

2. DISCRETE INPUTS - The discrete inputs shall be optically isolated and provide for 24VDC excitation to remote sensors and switches. Each input shall be separately fused or current limited such that accidental grounding shall not render the other inputs non-functional. LEDs on the front of the input module shall indicate the status of each input point.
3. ANALOG INPUTS - The analog inputs shall provide filtered and scalable analog to digital conversion of input signals. The analog inputs shall be switch selectable from 0-5VDC to 0-20mADC and provide a minimum of 0.3% resolution and 0.5% accuracy over the temperature range of 0-70 degrees C. The PLC shall provide separately fused 24VDC excitations to the remote sensors.
4. ANALOG OUTPUTS - The analog outputs shall provide a 4-20mA isolated signal to other panels and devices as specified.
5. PULSE INPUTS - The high-speed counter/pulse inputs shall provide for pulse rates up to 1KHz direct from flow meter transmitter heads without interposing equipment. The pulse input shall include fused 12VDC excitation to the meter transmitter.
6. POWER SUPPLY - Each PLC assembly shall include an integral power supply. Power supplies shall be designed for 12VDC or 24VDC input power and suitable for use in battery back-up operations. DC/DC converters shall be required to insure that both the 12VDC and 24VDC are regulated separately from the common source.
7. KEYPAD & DISPLAY UNIT - The optional keypad & display unit shall have a 4x20 back-lighted LCD display to display the status of all local inputs and the tank level of the associated control water tower level. The 5x5 keypad shall provide for operator input of set points and timer settings. The operator interface shall be menu driven and provide for dedicated keys for cursor position and input functions. The operator interface shall provide for up to 50 screens of data display. The keypad & display unit shall be supplied and mounted on the front of the PLC enclosure if detailed in the specific PLC I/O requirement list. The keypad & display unit shall maintain the Nema 4 rating of the PLC enclosure.

#### C. Standard Control Software Features

The supplied software shall not be a one-of-a-kind system, but rather a comprehensively designed software platform that provides several built-in features that monitor local & remote inputs combined with standard software algorithms to provide an integrated system as follows:

Monitor local Hand/Off/Automatic (HOA) selector switch positions (i.e., on existing pump control panels) and integrate the switch position into the control logic such that a HOA in HAND or OFF shall be considered by the control system as 'un-available'.

Provide for High Discharge Cut-off and Low Suction Cut-off control of pumps from locally entered setpoints at RTUs equipped with suction and discharge pressure transmitters and/or from existing pressure switches.

Provide automatic Pressure/Flow pump staging operation of pumps of different sizes (including variable speed pumps) from local discharge pressure and discharge flow inputs in a closed-loop system. The pumps shall be up-staged on decreasing discharge

pressure and down-staged on decreasing flow rate. The control shall include PID (Proportional Integral Derivative) loop control of variable speed pumps mixed with constant speed pumps for the various stages required.

Provide "Compound Loop" PID control of final devices (i.e. chemical feeders) from multiple inputs (i.e. flow rate and a chemical process analyzer, such as chlorine residual).

D. Project Specific Control Operation

In general, the PLC/RTU shall be programmed to provide generic control functions as detailed earlier and to work in concert with the CTU. The integrator shall be responsible to meet with the owner and the engineer to develop the automatic control strategy required for the system.

Refer to Appendix for special input and output control requirements.

**2.02 INDUSTRIAL ENCLOSURES**

- A. Remote site installations requiring RTU equipment to be mounted outside shall be mounted inside a lockable NEMA 3R enclosure. The NEMA 3R enclosure shall be constructed of 14-gauge galvanized steel, with a drip shield top and seems free sides front and back, and a stainless-steel hinge pin. The enclosure finish shall be gray polyester powder coating inside and out over phosphatized surfaces. The NEMA 3R enclosure shall be Hoffman Bulletin A-3.

**2.03 REMOTE SITE RADIO TRANSCEIVER & ACCESSORIES**

A. General

The radio transceivers shall be standard "un-modified" radios that can be tuned, aligned, and repaired at any two-way radio shop. Interface to external data modems shall be through the front panel microphone jack. The radios shall be synthesized and fully field programmable and include a built-in time-out timer to disable the transmitter after 0-60seconds. The units shall be tuned to FCC specifications for the specific frequency assigned. The radio equipment shall be FCC type approved and the system capable of operation on the 3KHz ot 6KHz narrow band splinter frequencies (154 or 173MHz) in the Industrial/Business radio service.

B. UHF Radio Transceiver (450Mhz)

The system manufacturer shall supply a 2-watt UHF radio transceiver to insure a high level of quality and reliability. The radios shall be adjustable to 2 watts output power as may be required by the FCC for ERP (Effective Radiated Power) restrictions. All connections to the radio shall be plug-in. The UHF radio transceiver shall have the following specifications:

Transmitter:

RF Output power	25 watts (adjustable to 4)
Spurious & Harmonics	16 dBm (25uW) (or -50dBc)
Frequency stability	±0.0005% (-30 to +60 degrees C)
Emission (VHF)	6F2 (with 2.5kHz DEV max) or 3F2 (with 1.2kHz DEV max)
FM hum and noise	-40 db



Receiver:

Sensitivity	0.35uV @ 12 dB SINAD (.5uV @ 20db quieting)
Selectivity	-65 dB
Spurious image rejection	-50 dB
Intermodulation	-65 dB
Frequency stability	±0.00025% (-30 to +60 degrees C)
Receive bandwidth	*6kHz (or 3kHz) as required to match the transmitter

\*The receiver bandwidth shall be reduced to match the transmit bandwidth of the transmitter and provide a minimum adjacent channel rejection of -50db.

The radio transceivers shall be a Motorola Radius CM200D to match the existing Micro-Comm SCADA System.

C. Antenna & Coaxial Cable

The radio antennas at all locations shall be a five element Yagi, constructed with 3/8-inch diameter solid aluminum rod elements and 1-1/16-inch" diameter aluminum pipe element support with a type N coaxial connector. The antenna shall have a minimum 8.0db forward gain with a 20.0db front-to-back ratio. The antenna shall be wind rated for a 100-MPH wind speed. The UHF antennas shall be MC-Yagi or Celwave PD688S.

Antennas shall be cabled to the transmitter enclosure connection by a RG/8U type low loss (less than 1.8db per 100ft @ 100MHz) coaxial cable with cellular polyethylene (foam) dielectric. The coaxial cable shall have a braided copper shield coverage of 97% and a long-life weather resistant polyvinyl chloride jacket. The antenna coaxial cable connection shall be a constant impedance weatherproof Type N connector, taped with a weather resistant electrical tape to insure a lifetime watertight assembly. The coaxial cable shall be Belden 8214 or 9913 cable.

D. Antenna Lightning Protection

Coaxial connection to remote and central unit enclosures shall be by means of a coaxial type bulkhead lightning arrestor. The units shall be rated at 1 kilowatt with a minimum 500V and maximum 2000V-breakdown voltage. Coaxial lightning arrestors shall be a PD-593 or PolyPhaser IS-B50LN-C1.

E. Antenna Mounting Systems

Antennas shall be mounted at a height above ground that is consistent with FCC rules and regulations and provides adequate signal fade margin as described earlier. Antennas must be a minimum of 15 feet above ground and mounted as follows:

**2.04 ANTENNA TOWER**

- A. A free-standing antenna tower shall be supplied where specifically noted on the plans or in the RTU site descriptions. The tower shall be assembled from 10-foot sections built on a 12-1/2" equilateral triangle design. Tower sections shall be constructed of 1-1/4" steel tubing with continuous solid steel rod "zigzag" cross bracing electrically welded to the tubing. The entire 10' sections shall be Hot-Dip Galvanized after fabrication for long life. The antenna towers shall be ROHN Model 25G (for unsupported heights of up to 33 feet).

- B. The tower shall be installed by the Contractor in accordance with the manufacturer's specifications, clear of overhead obstruction such as power lines, overhead phone or cable utilities.

## 2.05 INSTRUMENTATION & ACCESSORIES

### A. General:

All items in the control system (electronic cards, power supplies, radios, time delays, relays, etc.) shall be of plug-in construction, make use of a plug-in wiring harness, use plug-in terminal blocks, and be interchangeable without recalibration. To ensure field repair-ability by non-technical personnel, equipment that must be un-wired for replacement will not be accepted. The following instrumentation devices and techniques shall be used as specifically called for in the RTU input/output sections of this specification.

### B. Power Supplies:

The DC power supplies shall provide  $\pm 0.1\%$  line and load regulation with  $\pm 10\%$  input variations. They shall have a temperature coefficient of  $\pm 0.02\%$  per degree C. The input/output isolation shall be 100 Mohms DC (900Volts AC) with output transient response of 50 microseconds maximum. The power supplies shall be sized to operate the remote unit equipment with or without the back-up battery in place. Power Supplies shall be a Power One Series MAP130, Sola SLS, or approved equal.

### C. Battery Back-up Operation:

The remote units indicated shall be supplied with battery back-up operation. The rechargeable batteries shall be the sealed solid gelled electrolyte types, designed for float or standby service. Unless noted otherwise in the RTU descriptions, batteries shall be sized to maintain 24-hour service at water tower remotes and 8-hour service at pump stations and other remotes. The remote shall include a charging module to recharge the battery when power is resumed, maintain the charge between outages, and provide a low voltage cut-off to protect the battery from excessive discharge during prolonged outages. All discrete, analog, and pulse inputs (i.e., switch closures, pressure, level, flows, etc.) shall continue to function on battery backup. Batteries shall be Globe Gel/Cell or approved equal.

### D. Single Phase 120VAC Power Line Lightning Protection:

Every site in the system shall be equipped with AC line filtering and lightning protection. The equipment shall provide 2-stage lightning/transient protection including inductive and capacitive filtering and MOV over-voltage protection.

### E. Level & Pressure Transducers:

Level & pressure transducers shall be of the all solid-state two-wire transmitter type with a 4-20mA output from a 10.5-24VDC excitation. The units shall be powered from the RTU power supply. The transducers shall have a combined error (linearity and hysteresis) of  $\pm 0.25\%$  full scale and be temperature compensated to  $\pm 2.5\%$  per 100 degrees Fahrenheit. Zero and span adjustments shall be standardized so that transducers are interchangeable without recalibration. All exposed or wetted parts shall be series 316 stainless steel, PVC, or Buna-N. The units shall be capable of a three times full scale over pressure without damage or change of calibration.

The transducers shall be mounted at the sensing point and wired to the enclosure. The transducers shall have a 1/4" or 1/2" NPT process pressure connection. Transducers for above ground mounting shall have a 1/2" conduit connection for cable entry. Transducers at water towers (and other outside locations) shall be mounted below grade and below frost line to prevent freezing. Below grade mounted units shall have factory signal cabling and be suitable for a minimum of 100' submerged duty.

Pressure/Level transducers shall be Micro-Comm L5N series, Consolidated A300 Model 221GEE, or Ametek Model 57S.

F. Station Flooding Float Switches

The station flooding sensors shall be wall bracket mounted float switches capable of sensing less than 1-1/2" of water on the floor. The units shall be constructed with a Buna N float, 304 stainless steel float guides, a clear plastic protective shield, and a sealed neoprene cable connection. The float switch shall be Omega LV-70 or approved equal.

G. Magnetic Entry Alarm Switch

The Vault Door Hatch sensor shall be a magnetic type door switch, two piece. Max working voltage 100V, contact rating of .5A, screw mounted, 1 NO/NC contact.

## **PART 3 - EXECUTION**

### **3.01 EQUIPMENT EXAMINATION**

The control system shall be completely tested prior to shipment. The entire control system shall be "Burned In" at the factory for a period of at least 20 days. The component equipment shall be computer tested and temperature cycled at zero degrees and at fifty degrees centigrade.

### **3.02 SYSTSTART-UP**

The manufacturer shall supply "Factory" personnel for start-up service as needed to insure satisfactory operation. Subsequent trips to the job site to correct defects shall be made at no charge to the Owner during the warranty period.

### **3.03 SUBSTANTIAL COMPLETION**

The Engineer will grant substantial completion only after completion of the start-up and initial training phase of the project. The Engineer shall make an inspection of the system to determine the status of completion. Substantial completion will be awarded only when the system is providing usable service to the Owner. If the system is commissioned in phases, the Contractor may request substantial completion for the completed phases.

### **3.04 WARRANTY/SUPPORT PROGRAM**

The control system manufacturer shall supply a one year parts and labor warranty and comprehensive support program for all items and software supplied under this section (except as noted below). Power surges and lightning damage shall be included as part of the warranty.

The warranty shall begin from the time of "substantial completion" as issued by the engineer. The manufacturer shall provide a 24-hour response to calls from the Owner. The manufacturer, at his discretion, may dispatch replacement parts to the Owner by next-day delivery service for field replacement by the Owner. Any damage to the control system caused by the actions of the Owner in attempting these field replacements shall

be the sole responsibility of the manufacturer. If, during the warranty period, satisfactory field repair cannot be attained by field replacement of parts by the Owner, the manufacturer shall dispatch "factory" personnel to the job site to complete repairs at no cost to the Owner.

### **3.05 BASIS OF PAYMENT**

The following Basis of Payment will apply to unit price contracts only. Where this item is a part of a lump sum contract or item, this Basis of Payment will not apply.

Payment shall be made based on the contract unit price per each SCADA System Additions with respect to site location as listed on the accepted proposal or bid form.

This single payment shall be full and final compensation for each SCADA System Additions, complete and in-place, ready for service.

### **APPENDIX: DETAILED EQUIPMENT DESCRIPTION**

#### **PRV REMOTE UNIT REQUIREMENTS:**

##### **A. Installation Requirements:**

1. The PRV RTU transceiver shall be furnished in a NEMA 3R enclosure as specified. The installation shall be detailed in the submittal process.
2. The two pressure transducers shall be a two-wire transmitter suitable for below ground mounting as specified earlier. The transducers shall be installed in the PRV vault. The pressure connection shall be equipped with a corporation stop providing a 1/4" NPT female connection for the transducer. The contractor shall run 3/4" rigid conduit from the vault to the RTU enclosure for the transducer signal cable (included with the transducers).
3. The integrator supplied Vault Hatch Door Switch shall be installed at the hatch opening, consistent with the installation diagrams. The integrator supplied Vault Flood Float Switch shall be installed near the floor of the vault. The contractor shall run 3/4" rigid conduit from the vault to the RTU enclosure for the hatch door switch, vault flood float switch, PRV limit switches and PRV solenoids (by others).
4. The contractor shall install the 29ft ROHN antenna tower provided by the integrator per detailed ROHN installation diagrams detailing concrete footing requirements. The contractor shall run a 3/4" rigid conduit with a weather-head from the RTU to the base of the antenna tower and install the integrator provided antenna and coax.

##### **B. Front Panel Display Requirements:**

1. Micro-Comm Keypad Display (mounted inside enclosure)

##### **C. Discrete Outputs:**

1. 6 inch PRV Valve Call
2. 2 inch PRV Valve Call

##### **D. Discrete Inputs:**

1. 6 inch PRV Valve Open (limit switch by ESI)
2. 2 inch PRV Valve Open (limit switch by ESI)
3. Vault Hatch Open (magnetic switch by Micro-Comm)
4. Vault Flood (flood switch by Micro-Comm)
5. RTU Power Fail
6. Future Station Flow Rate/Total

E. Analog Inputs:

1. Inlet Pressure (transducer by Micro-Comm)
2. Outlet Pressure (transducer by Micro-Comm)
3. Future 6 inch Valve Position% Transmitter by others
4. Future 2 inch Valve Position% Transmitter by others
5. Future Station Flow Rate/Total

**MANUFACTURER**

The precast check valve station shall be provided by ESI Fab Systems of Olathe, KS, Mr. Robb White, telephone 816-468-9119.

**END OF SECTION**

