Bid Specification

Springfield to Fig Water Main Improvements

Project Number 19009

Prepared By:

City of Sullivan
Engineering Department
210 West Washington
Sullivan, Missouri 63080
(573) 468-8965

July 2020

INTRODUCTION

It is the intent of this document to set forth plans and specifications for a complete and usable project. It shall be the duty of the contractor to bring to the attention of the Engineer any omissions, conflicts or errors which could compromise this aim.

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Invitation to Bid
For
Springfield to Fig Water Main Improvements
Project #19009
For The City of Sullivan
Sullivan, Missouri

Sealed proposals, addressed to City of Sullivan, Missouri will be received until **August 5, 2020 at 10:00 a.m.**, at the office of City Clerk, Janice Koch, 210 West Washington, Sullivan, Missouri 63080, after which they will publicly be opened and read aloud.

This Contract will consist of all necessary work to install approximately 1,000 feet of 8" C-900 DR-14 water main, fire hydrants, and all appurtenances complete as outlined in the plans and specifications. The City of Sullivan will provide all water line, fittings, valves, fire hydrants, etc. All bedding will be the responsibility of the contractor and incidental to installation cost.

Copies of the Contract Documents and Detailed Specifications required for bidding purposes may be obtained from the Engineering Department, City Hall, 210 West Washington, Sullivan, Missouri, 63080. Bidders having questions or requesting additional information should contact Robert Schaffer, P.E., CFM, City Engineer, at the Sullivan Engineering Department, telephone number 573-468-8975.

Effective January 1, 2009 and pursuant to Missouri Revised Statute Section 285.530 (1), "No business entity or employer shall knowingly employ, hire for employment, or continue to employ an unauthorized alien to perform work within the state of Missouri."

Bidders on the work will be required to comply with the State prevailing wage rates which will be included in the Contract Documents. Not less than the prevailing hourly rate of wages specified shall be paid to all workers performing work under the Contract. All bids of less than $75,000 shall be exempt from prevailing wage requirements. Bids shall be accompanied by Bidder's certified check, cashiers check or Bid Bond in the amount of five percent (5%) of the Bid Price.

The City of Sullivan reserves the right to accept or reject any or all bids received and to waive or not to waive any or all irregularities.

By virtue of statutory authority, a preference will be given to materials, products, supplies, provisions and all other articles produced, manufactured, made or grown within the state of Missouri.

INFORMATION FOR BIDDERS
FOR
SPRINGFIELD TO FIG WATER MAIN IMPROVEMENTS
SULLIVAN, MISSOURI

1. BID GUARANTY:

Each bid shall be accompanied by a bid bond, cashier's check or a certified check for an amount not less than five (5) percent of the bid amount, payable unconditionally to the City of Sullivan, Missouri as a guarantee that the bidder will execute a contract and furnish the required bond if his bid is accepted.

2. OPENING OF BIDS:

All bids will be opened publicly and read aloud at the place designated and at the time set in the Advertisement for Bids. The right to reject any or all bids and to waive defects or technicalities in bids is reserved. Collusion between bidders is sufficient cause to disqualify all bidders so involved.

3. RETURN OF BIDDER'S DEPOSITS:

The bid guaranty, whether check or bid bond, of the low bidder will be retained until the contract has been executed by the successful bidder, all insurance requirements met and satisfactory contract bond furnished. The check of the low bidder will then be returned. The bid guaranty of the second low bidder will be returned when the City has determined that the award will not be made to that firm. If errors or irregularities appear in the bid of either of the two apparent low bidders which create doubt as to the status of such bid, the bid guaranties of other bidders may be retained. When the two lowest bidders have been definitely established, the checks of the other bidders will be returned. Any bid bond furnished as a bid guaranty will be returned only upon the request of the bidder furnishing it. If an award is not made, all checks will be returned to the bidders.

4. FORM OF PROPOSAL:

All bids must be made on the attached form of proposal. Bid blanks must be completed and clearly filled in and must be free from alteration either by erasure or interlineations, or otherwise the bid proposal will be voided.

Bids must be properly signed in ink by the bidder or by an authorized official or agent when the bidder is a firm or corporation. When the bid is made by a firm, the signature must include the firm name, and the signature of member thereof. When made by a corporation, the signature must contain the name of the corporation followed by the

signature of the official or person authorized to bind it in the matter and with proof of his authority. When filed, the bid with the accompanying bid security must be enclosed together in a sealed envelope, clearly marked on the outside with the bid number and project name, addressed to the City Clerk, Sullivan, Missouri. The bidder shall designate on the bid blank his official address to which all communications can be mailed. No facsimiles will be accepted.

5. BASIS OF AWARD:

Bids will be compared by the extension and summation of the unit prices submitted in the proposal. The quantities as shown on the proposal form are estimated and are furnished to be used as a basis for calculations and for the preparation of the bid. The quantities are not necessarily exact.

6. AWARD OF CONTRACT:

The City will award the contract within a period not exceeding one hundred twenty days after the date of opening the bids, or else will reject all bids. The City reserves the right to require the successful bidder to file proof by the contract of their successful completion of similar projects.

7. EXECUTION OF CONTRACT:

The bidder to whom the contract has been awarded shall sign the contract payment bond and performance bond and return them to the City within ten (10) days after receipt of the contract. Failure to execute the contract and bonds and return them to the City within ten (10) days after receipt of the contract shall be cause for the annulment of the contract award and the forfeiture of the bid guaranty to the City.

8. PERFORMANCE AND PAYMENT BOND:

A bond will be required for the full amount of the contract price with a surety company authorized to do business in the State of Missouri and satisfactory to the City, conditioned for the faithful performance and payment of this contract and the guarantee of the work.

9. RIGHT RESERVED TO REJECT BIDS:

The City reserves the right to reject any or all bids.

10. COMPLETION TIME:

The Contractor shall commence work within seven (7) days after the date of written notice from the Engineer to begin work, and shall complete all work within the number of days detailed in the Contract Agreement after the expiration date of such seven (7) day period. Progress and completion of work and damage if required for failure to complete the work within the time required shall be further set out in detail in the general conditions and the special provisions.

11. SURVEYS, PERMITS AND REGULATIONS:

The contractor shall make all surveys including all required construction staking. Any property corners disturbed by the construction activities shall be replaced at the contractor's cost. Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the contractor.

The contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. The contractor is required to observe all laws and ordinances relating to the obstructing of streets, maintaining signals, keeping open passageways and protecting them where exposed to danger, and all general ordinances affecting them or their employees or their work hereunder in their relations to the owner or any person, and also to obey all laws and ordinances controlling or limiting the contractor while engaged in the prosecution of the work under this contract. If the contractor observes that the drawings and specifications are at variance with laws and regulations, they shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in the contract for changes in the work. If the contractor performs any work knowing it to be contrary to such laws, ordinances, rules, regulations, or specifications, of local, state or federal authorities without such notice to the Engineer, they shall bear all costs arising therefrom.

See Section 2.2.14 of the General Conditions.

12. NO OTHER INTERESTED PARTIES:

The contractor declares that the only persons interested in this contract as principals are therein named as such; that no official of the municipality and no person acting for or employed by the municipality is directly or indirectly interested in this bid, or in any contract which may be made under it, or in any expected emolument, or profit to arise there from; that their bid and their contract are made in good faith, without fraud, collusion or connection with any other person bidding for the same work.

13. WITHDRAWAL OF BIDS:

Any bidder may withdraw their bid at any time prior to the scheduled closing time for the receipt of bids, but no bid shall be withdrawn for a period of one hundred twenty (120) days after the scheduled closing time for the receipt of bids.

14. CONTRACTOR'S UNDERSTANDING:

It is understood and agreed that the contractor has, by careful examination, satisfied himself as to the nature and location of the work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of the equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work under this contract.

No official, officer, or agent of the owner is authorized to make any representations as to the materials or workmanship involved, or the conditions to be encountered, and the

contractor agrees that no such statement or the evidence of any documents or plans, not a part of this contract, shall constitute any grounds for claim as to conditions encountered. No verbal agreement or conversation with any officer, agent or employee of the owner either before or after the execution of this contract shall affect or modify any of the terms or obligations herein contained.

It is understood and agreed that the contractor has informed themselves fully as to the conditions relating to construction and labor under which the work will be performed, and agrees as far as possible to employ such methods and means in the carrying out of the work as will not cause any interruption or interference with any other contractor.

15. CONDITIONS IN BIDDER'S PROPOSAL:

The bidder shall not stipulate in their proposals any conditions not contained in the form of proposal contained in the contract documents.

16. TAXES:

Bidders shall include in their proposals any sales or use taxes which they are required by law to pay. This project is exempt from all sales taxes for construction materials and suppliers used directly in fulfilling contract requirements. Sales tax shall not be included into the unit costs for this project. The contractor shall follow the regulation as outlined in Missouri 12 CSR 10-3.388 Construction Materials.

The City will issue the contractor a tax exemption letter and a project exemption certificate. These documents are to be given to the applicable suppliers and used only for the project identified and will expire on the date indicated unless otherwise renewed by the City.

17. RIGHTS-OF-WAY:

The City will provide all rights-of-way upon which work is to be done.

18. INSURANCE:

The successful bidder must provide one (1) properly executed certificate of insurance and one (1) copy of the performance and payment bonds after the signing of the contract with the City.

Liability Insurance: The Contractor and any subcontractor shall indemnify and save harmless the City from all suits or action of every name and description brought against the City for or on account of any personal injuries, including accidental or resulting death, or property damages received or claimed to be received or sustained by any person or persons due to the construction of the work, or by or in consequence of any hazard, or of any negligence by the contractor or sub-contractor, their agents or employees or assigns in safeguarding it, or due to any improper material used in the construction, or by or on account of any act or omission of the contractor or subcontractor, their employees, agents or assigns.

The Contractor shall carry adequate public liability and property damage insurance for the joint and several benefit of the contractor and the City with a company licensed to do business in the State of Missouri and satisfactory to the City and in the amounts not less than those specified below. The amounts of coverage required for public liability or property damage shall not be construed to limit the liability of the contractor in protecting the City from damage or injury claims. The City shall have the right to require the contractor to increase any or all such insurance policy limits while the contract work is in progress in the event the engineer determines that unusual or special risks revealed by the work so require and in such amounts as the engineer may determine to be adequate, and without thereby limiting the liability of the contractor in protecting the city from damage or injury claims.

As partial security for the defense of claims and the payments required under such indemnity, the contractor and any subcontractor shall furnish at their cost, an owner's protective insurance policy satisfactory to the city naming the City as insured for amounts not less than the contractor's public liability and property damage insurance covering the work.

The contractor shall comply fully with the requirements of the Workmen's Compensation Act of the State of Missouri and shall furnish evidence that the contractor is insured there under.

The coverage shall insure the City of its officers and employees while acting within the scope of their duties against all claims arising out of or in connection with the work to be performed.

The cost of the insurance shall be included in the prices bid for the various items of work and no additional payment will be made therefore.

The amounts of such insurance shall be not less than the following:

a) Contractor's Bodily Injury Liability and Property Damage Liability Insurance:

1) Injury or death of one person $2,000,000

2) Injury to more than one person in a single accident $2,525,423

3) Property damage $2,000,000

b) Automobile and Truck Public Liability, Bodily Injury, and Property Damage:

1) Injury or death of one person $2,000,000

2) Injury to more than one person in a single accident $2,525,423

3) Property damage $2,000,000

Certificates of insurance sent to the City as evidence of insurance shall contain the following statements, and in their absence the certificates will not be satisfactory to the City.

1) The insurance evidenced by this certificate will not be cancelled or altered except after ten (10) days from receipt by the City of written notice thereof.

2) The insurance evidenced by this certificate expressly includes blanket underground coverage including, but not limited to, injury to or destruction of wires, conduits, pipes, mains, sewers, or other grading of land, paving, backfilling, excavating or drilling, or to injury to or destruction of property at any time resulting there from.

3) The insurance evidenced by this certificate expressly includes person injury or death, or injury to or destruction of any property arising out of blasting or explosion or the collapse of or structural injury to any building or structure due to grading of land, excavation, filling, backfilling, or tunneling.

4) A certificate of insurance must be filed with the City providing builder's risk insurance for the proposed project.

5) The City must be listed on all Certificates of Insurance as additional insured.

6) A statement of the insurance company's A.M. Best rating will be required. A rating of at least A-VI is required.

19. CONTRACTOR'S WORK SCHEDULE:

The contractor shall submit a preliminary work schedule for the Engineer's approval prior to initiation of construction. This schedule must show that steady uninterrupted progress is planned for the improvements and that minimum disruption of local traffic will take place. During school time work will not begin until 8 am and the road must be open by 2:30 pm. This schedule shall be updated monthly through the length of the project.

20. PRICE TO BE WRITTEN:

If space is provided on the bid form, all prices shall be written in words, as well as expressed in figures, where space is provided. In case of a discrepancy between the prices written in words and prices written in figures, the prices written in words will be used.

21. COMPLIANCE:

The successful bidder will be required to comply with the Division of Labor Standards, Wage Determination Rate, which is made a part of this specification.

The successful bidder shall comply with requirements of Section 290.550 to 209.580 RMSo (2000), conclusive, when applicable.

22. TRAFFIC CONTROL / SIGNAGE:

The contractor shall supply the required signage and barricades to give proper warning of this work. The type and amount of signage shall, at a minimum, be as indicated on the drawings, specified or as directed by the Traffic Technician or Engineer. All signage shall be in conformance with the manual on Uniform Traffic Control Devices. Any obstruction left in or upon the street or sidewalk between one hour after sunset to one hour before sunrise shall have a lighted barricade(s) attached to or placed with it. Detour routes and signage must be well marked and approved by the engineer prior to posting. All signage and traffic control is at the contractor's expense unless specifically listed as a pay item, and shall become the City's property at the end of the project.

23. CITY WILL FURNISH:

The City will furnish all water main, fittings, fire hydrants, valves, plans and specifications for this project.

24. CONSTRUCTION COSTS:

All units of construction necessary for the completion of the project shall be performed at no additional costs for the City unless specifically listed as a pay item.

25. UTILITIES:

The Contractor will be required to have all utilities located. Damage to existing utilities due to neglect of the contractor shall be repaired at the contractor's expense.

27. SAFETY:

The contractor is responsible for all job site safety and shall follow all governmental rules and regulations particularly those of the Occupational Safety and Health Administration (OSHA).

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

292.675 RSMo.

28. GOVERNING CONSTRUCTION STANDARDS:

Unless specifically noted otherwise within these Contract Documents, the following construction standards shall be used for and govern the work on this project:

Missouri Standard Specifications for Highway Construction, 2004 edition or latest version thereof by the Missouri Highways and Transportation Commission.

Current City of Sullivan Specifications.

The above noted documents are to be used as construction standards only. Contract language and specifications shall not be modified by these documents. Any part of the Contract or Contract Documents for this project shall take precedence over any contradictory language within the above noted documents.

29. POSTAL DELIVERIES:

The contractor is to make arrangements with the US Post Office to allow for delivery of the mail during the project. The contractor is to provide temporary mailboxes and reset or replace any existing mailboxes disturbed by the construction. This item shall be incidental and the contractor will not receive any direct payment for this item.

30. TRASH COLLECTION:

The contractor is to provide trash collection services if the construction activities prohibit regular collection services. This item shall be incidental and the contractor will not receive any direct payment for this item.

31. INGRESS/EGRESS ACCESS:

The contractor shall provide ingress/egress access to all properties at all times. All temporary roadways and driveways required on the project shall be incidental to the contract (unless otherwise provided) and no additional payment will be made for these items.

32. GROUND RESTORATION:

Unless otherwise provided, all disturbed areas within right-of-way or within established lawns shall be restored using sod or seed to match what was on the property originally, following City Standards.

SUMMARY OF REQUIRED SUBMITTALS

Submittals by Contractor:

Enclosed with Bid

- Proposal P1-P2 Submitted:_____
- Buy American Provisions (BA-1) Submitted:_____
- Immigration Compliance Affidavit and Documentation (P.IC-1 to IC-16) **NOTE: Contractor to sign all sheets in spaces provided.** Submitted:_____

Prior to Construction

- Bid Guaranty (p.IB-1) Submitted:_____
- Contract Agreement Submitted:_____
- Performance Bond (p. IB-2 and 2.7.04) Submitted:_____
- Payment Bond (p. IB-2) Submitted:_____
- Certificate of Insurance (p.IB-4, 2.7.01, 2.7.02, and 2.7.03) Submitted:_____
- Preliminary Work Schedule (p. IB-6 and 2.5.03) Submitted:_____
- Shop Drawings Submitted:_____
- List of Subcontractors (2.3.17) Submitted:_____

During Construction

- Requests for Partial and Final Payment
- Payroll Records (p. CA-2)
- Samples and Results of Tests (2.2.11 and 2.6.14)

Prior to Final Payment

- Payroll Records (p. CA-2) Submitted:_____
- Waiver of Liens (2.6.15) Submitted:_____
- Written Notice that work is ready for Final Inspection
- (p. CA-2) Submitted:_____
- Written Warranty (2.4.08 and CA-2) Submitted:_____
- Sworn Affidavit that all bills have been paid (CA-2) Submitted:_____

Submittals by Engineer:

- Tax Exemption Certificate (p. IB-4) Submitted:_____
- Notice of Award Submitted:_____
- Notice to Proceed (p. CA-1) Submitted:_____

NOTICE AND INSTRUCTIONS TO BIDDERS/VENDORS

REGARDING §§ 285.525 THROUGH 285.550 RSMO, EFFECTIVE JANUARY 1, 2009

Effective January 1, 2009 and pursuant to Missouri Revised Statute Section 285.530(1), "No business entity or employer shall knowingly employ, hire for employment, or continue to employ an unauthorized alien to perform work within the state of Missouri."

As a condition for the award of any contract or grant in excess of five thousand dollars ($5,000) by the state or by any political subdivision of the state (e.g. City of Sullivan, MO) to a business entity, the business entity (Company) shall, by sworn affidavit and provision of documentation, affirm its enrollment and participation in a federal work authorization program with respect to the employees working in connection with the contracted services. Every such business entity shall sign an affidavit affirming that it does not knowingly employ any person who is an unauthorized alien in connection with the contracted services. Section 285.530 (2) RSMo.

"Business Entity" is defined as:

> …[A]ny person or group of persons performing or engaging in any activity, enterprise, profession, or occupation for gain, benefit, advantage, or livelihood. The term "business entity" shall include but not be limited to self-employed individuals, partnerships, corporations, contractors, and subcontractors. The term "business entity" shall include any business entity that possesses a business permit, license, or tax certificate issued by the state, any business entity that is exempt by law from obtaining such a business permit, and any business entity that is operating unlawfully without such a business permit. The term "business entity" shall not include a self-employed individual with no employees or entities utilizing the services of direct sellers as defined in subdivision (17) of subsection 12 of section 288.034 RSMo. See, Sec. 285.525 RSMo

_____

Contractor Signature

_____

Date

The City of Sullivan, Missouri, in order to comply with Sections 285.525 through 285.550 RSMo, has instituted the following procedure:

Required Affidavit for Contracts Over $5,000 (US) – Effective January 1, 2009, business entities desiring to contract with the City for the provision of service shall comply with the provisions of Sectiosn 285.525 through 285.550 RSMo. Contract award is contingent upon Company providing an acceptable notarized affidavit stating:

1. that Company is enrolled in and participates in a federal work authorization program with respect to the employees working in connection with the contracted services; and

2. that Company does not knowingly employ any person who is an unauthorized alien in connection with the contracted services.

A sample affidavit is attached.

Additionally, Company must provide documentation evidencing current enrollment in a federal work authorization program (e.g. electronic signature page from E-Verify program's Memorandum of Understanding (MOU)).

The City of Sullivan encourages companies that are not already enrolled and participating in a federal work authorization program to do so. E-Verify is an example of this type of program. Information regarding E-Verify is available at http://www.dhs.gov/e-verify or by calling 888-464-4218.

_____
Contractor Signature

_____
Date

If you have any questions, please contact the Engineering Department at the City of Sullivan at 573-468-8965.

_____
Contractor Signature

_____
Date

STATE OF MISSOURI)

)ss

COUNTY OF)

AFFIDAVIT

(as required by Section 285.530, Revised Statutes of Missouri)

As used in this Affidavit, the following terms shall have the following meanings:

EMPLOYEE:

Any person performing work or service of any kind or character for hire within the State of Missouri.

FEDERAL WORK AUTHORIZATION PROGRAM:

Any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or an equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, under the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603.

KNOWINGLY:

A person acts knowingly or with knowledge,

(a) with respect to the person's conduct or to attendant circumstances when the person is aware of the nature of the person's conduct or that those circumstances exist; or

(b) with respect to a result of the person's conduct when the person is aware that the person's conduct is practically certain to cause that result.

_____

Contractor Signature

_____

Date

UNAUTHORIZED ALIEN:

An alien who does not have the legal right or authorization under federal law to work in the United States, as defined in 8 U.S.C. 1324a(h)(3).

BEFORE ME, the undersigned authority, personally appeared

_____, who, being duly sworn, states on his oath or affirmation as

follows:

1. My name is _____ and I am currently the President of _____ (hereinafter "Contractor"), whose business address is _____, and I am authorized to make this Affidavit.

2. I am of sound mind and capable of making this Affidavit, and am personally acquainted with the facts stated herein.

3. Contractor is enrolled in and participates in a federal work authorization program with respect to the employees working in connection with the following services contracted between Contractor and

_____

_____

_____

_____

4. Contractor does not knowingly employ any person who is an unauthorized alien in connection with the contracted services set forth above.

_____
Contractor Signature

_____
Date

5. Attached hereto is documentation affirming Contractor's enrollment and participation in a federal work authorization program with respect to the employees working in connection with the contracted services.

Further, Affiant saith not.

_____

Printed Name, Affiant

Subscribed and sworn to before me this _____ day of _____,2009.

_____

Notary Public

My Commission Expires: State of Missouri

Commissioned in _____ County

PLEASE NOTE:

Acceptable enrollment and participation documentation consists of the E-Verify Memorandum of Understanding:

1. A valid, completed copy of the first page identifying the Contractor; and

2. A valid copy of the signature page completed and signed by the Contractor, and the Department of Homeland Security - Verification Division.

_____

Contractor Signature

_____

Date

CONTRACT AGREEMENT

This agreement, made the_____ day of August, 2020, by and between _____, Party of the First Part, hereinafter called the "Contractor", and CITY OF SULLIVAN, MISSOURI, Party of the Second Part, hereinafter called the "Owner".

WITNESSETH: That the Owner and the Contractor for the consideration hereinafter named agree as follows:

ARTICLE 1. Scope of Work:

The Contractor shall furnish all of the labor, materials, machinery, and equipment and perform all of the work outlined in the specifications entitled **Springfield Road to Fig Water Main Improvements,** furnished by the City of Sullivan Engineering Department, 210 West Washington, Sullivan, Missouri.

The Work to be done under this Contract consists of constructing and completing all work described in the proposal, attached.

ARTICLE 2. Time of Completion:

The work to be performed under this Contract shall be commenced seven (7) days after being given written notice to proceed from the City and shall be completed in thirty (30) calendar days.

It is mutually understood and agreed that time is the essence of this Agreement and in the event said work is not completed on or before the date named above for its completion, party of the first part, the Contractor, shall pay liquidated damages to the Owner of $500.00 per day. Those damages shall be used to pay for the extra time required for the completion of the work and for the delays or damages to the traveling public affected by the project. Extra time shall in all cases be construed as the time required for completion after the date herein named. Extensions of time granted by the party of the second part, the Owner, for completion of the Contract on account of fire, strikes, or acts of Providence shall not be construed as extra time. The amount of such expense and services shall be determined by the Engineer, shall be reported to him in writing to the Owner, and shall be withheld from any money due the Contractor and paid to the proper parties.

ARTICLE 3. The Contract Sum:

The Owner shall pay the Contractor for the performance of the Contract a sum not-to-exceed _____(**$ XX,XXX.XX**) for the performance of the Contract, subject to additions and deductions provided herein, in current funds at the prices named in the proposal attached to and a part of these documents and the contract.

ARTICLE 4. Progress Payments:

The Owner shall make payments on account of the Contract as provided therein as follows:

Contractor shall submit pay requests no later the last week of the month to be paid by the third Wednesday of the following month. Contractor shall certify and submit to the Engineer, an estimate of the amount and fair value of the work done, as a basis for partial payments therefore. The ten (10) percent (retainage) which is deducted each month is reserved by the City as partial guaranty of the faithful execution of the Contract by the Contractor.

It is understood and agreed that no partial payment shall be made to the Contractor until the Contractor shall furnish to the Engineer either the original or a duly certified copy of his and each of his subcontractor's payrolls and satisfactory proof of payment of, or satisfactory release thereof of all bills for services, materials, tools, supplies, and subcontractors. (i.e. lien waivers).

Requests shall be submitted on the City of Sullivan standard partial pay and final pay request and payroll forms contained within these documents.

ARTICLE 5. Acceptance and Final Payment:

The Contractor shall submit to the City a sworn affidavit that all bills for labor, service, materials, and subcontractors have been paid and that there are no suits pending in connection with the work done or labor and materials furnished under the Contract. All prior certificates and estimates, being approximate only, are subject to correction in the final estimate and payment. The Contractor with this contract hereby warrants all of the work done under this contract for a period of one (1) year following the completion of the project. Upon completion, the Contractor shall submit to the City a written one (1) year warranty on total project. Failure of the Contractor to submit a written warranty does not release the Contractor of this warranty in any way.

If, after the work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor, the City shall upon certificate without terminating the Contract, make payment of the balance due for that portion of the work fully completed and accepted. Such payment shall be made under the terms and conditions covering final payment, and it shall not constitute a waiver of claims by the City.

ARTICLE 6. The Contract Documents:

The information for and instruction to bidders, the proposal, the bond, the general conditions of the contract, the specifications, and the drawings, together with the agreement, form the contract and they are as fully a part of this contract as if thereto attached or repeated.

ARTICLE 7. Prevailing Wage:

Contractor shall ensure that all labor performed in construction shall be compensated at prevailing wage, in accordance with the Missouri Division of Labor Standards Annual Wage Order No. 24, Section 036, (or the most current version thereof) applicable to Crawford County. Certified Payroll Sheets complying with the current wage order shall be submitted with each request for payment.

ARTICLE 8. Periods of Excessive Unemployment:

Contractor shall ensure that Section 290.550 through 290.580 RMSo (2000), inclusive are satisfied, in that only Missouri laborers or laborers from nonrestrictive states are employed on this project, and shall include these requirements in any subcontract entered by Contractor for this project.

ARTICLE 9. Choice of Law and Venue Provision:

Choice of Law: This contract shall be deemed to have been fully executed, made by the parties in, and governed by the laws of the State of Missouri for all purposed and intents. Venue shall be vested in courts of appropriate jurisdiction in Franklin County, Missouri.

ARTICLE 10. Compliance with City Code:

Contractor shall be in compliance with all City Codes and Ordinances.

IN WITNESS WHEREOF, the parties have hereto executed this Agreement the date of the year first above written.

CITY OF SULLIVAN, MISSOURI

_____

By: Dennis A. Watz, Mayor Date

Attest:

_____

City Clerk, Janice Koch

Contractor

_____

By: Date

Attest:

_____

Secretary

ACKNOWLEDGMENT WHERE THE CONTRACTOR
IS A CORPORATION

STATE OF MISSOURI)
)
COUNTY OF)

On this _____day of _____, 20_____, before me appeared _____, to me personally known, who being by me duly sworn did say that he is the President (other officer or agent), of _____Corporation, a corporation of the State of _____, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said _____ acknowledged said instrument to be the free act and deed of said corporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

_____
Notary Public

My Commission Expires: _____

ACKNOWLEDGMENT WHERE THE CONTRACTOR
IS A PARTNERSHIP

STATE OF MISSOURI)
)
COUNTY OF)

On this _____ day of _____, 20____ before me appeared _____, to me personally know, who being by me duly sworn did say he (she) is a member of the partnership of _____, and that as such partner he (she) has authority to execute the foregoing instrument on behalf of said partnership, ad acknowledge that he (she) executed the same as his (her) free act and deed and as the free act and deed of said partnership.

IN TESTIMONY WHEREOF, I have hereunto set my and affixed my official seal and day and year first above written.

_____
Notary Public

My Commission Expires: _____

EXHIBIT A

THIS FORM MUST BE COMPLETED AND ENCLOSED WITH THE BID

FRANKLIN COUNTY
DOMESTIC PRODUCTS PROCUREMENT ACT (BUY AMERICAN)

The Missouri Domestic Products Procurement Act (34.350-34.359 RSMo) requires that for all bids with a value of $25,000 or more, the goods or commodities purchased by any public agency (which definition includes all political subdivisions of the State, including counties) or used or supplied in the construction, alteration, repair, or maintenance of any public works must be **manufactured or produced** in the United States. As defined in 34.350 RSMo, United States means the United States of America, the District of Columbia, and all territories and possessions subject to the jurisdiction of the United States. The law also requires that the bidder must provide proof of compliance. **Note: In general, if an import tariff is applied to an item, it does not qualify for the Buy American preference. In addition, Most Favored Nation status does not allow application of the preference.**

Section A – All Products Are Manufactured or Produced In U.S.
If all products bid qualify as domestic products under Missouri law, complete only Section A.

I hereby certify that all products qualify as domestic, that the information provided is true and correct, and complies with all provisions of Sections 34.350-34.359 RSMo. I understand that any misrepresentation herein constitutes the commission of a class A misdemeanor pursuant to Section 34.355 of the Revised Statutes of Missouri.
SIGNATURE
COMPANY NAME

If Section A is completed, do not complete Section B.

Section B – Only One Product Line or No Products Are Manufactured or Produced In U.S.
If only one product line or no products are manufactured or produced in the U.S. complete only section B.

I hereby certify that there is only one product line or no product manufactured or produced in the U.S., that the information provided is true and correct, and complies with all provisions of Sections 34.350-34.359 RSMo. I understand that any misrepresentation herein constitutes the commission of a class A misdemeanor pursuant to Section 34.355 of the Revised Statutes of Missouri.
SIGNATURE
COMPANY NAME

Section C – Products May Qualify Because of Qualifying Treaty
If some or all products bid qualify for domestic status because of a trade treaty, etc., then the bidder must identify each product, country and qualifying treaty, etc. below. The bidder must list ALL products which are or may qualify as domestic below. If more space is needed, please copy this form and submit as an attachment.

BID ITEM NUMBER(S)	COUNTRY WHERE MANUFACTURED OR PRODUCED	QUALIFYING TREATY, LAW, AGREEMENT, OR REGULATION

SECTION C

I hereby certify that the specific items listed above are domestic, that the information provided is true and correct, and complies with all provisions of Sections 34.350-34.359 RSMo. I understand that any misrepresentation herein constitutes the commission of a class A misdemeanor pursuant to Section 34.355 of the Revised Statutes of Missouri.

SIGNATURE
COMPANY NAME

NOTICE OF AWARD

TO Contractor

Address

City, State, Zip

Project Description: #19009 SPRINGFIELD ROAD TO FIG WATER MAIN IMPROVEMENTS

The City of Sullivan has considered the Bid submitted by you for the above described Work in response to its Invitation for Bids and Information for Bidders.

You are hereby notified that your Bid has been accepted for items in the amount of $ XX,XXX.XX, _____.

You are required by the Information for Bidders to execute the Contract Agreement and furnish the required Contractors Bonding and Certificates of Insurance within ten (10) calendar days from the date of this Notice.

If you fail to execute said Agreement and to furnish said Bond within ten (10) calendar days from the date of this Notice, said City of Sullivan will be entitled to consider all your rights arising out of the City of Sullivan's acceptance of your Bid as abandoned and as a forfeiture of your Bid Bond. The City of Sullivan will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the City of Sullivan.

Dated this 21st day of March, 2018.

Owner: CITY OF SULLIVAN

By: _____

City Engineer

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

By_____

This the_____ day of _____,_____.

Title_____

Employer Identification Number _____

NOTICE TO PROCEED

TO Contractor

Address

City, State, Zip

Project Description: #19009 SPRINGFIELD ROAD TO FIG WATER MAIN IMPROVEMENTS

You are hereby notified to commence Work in accordance with the Agreement dated April 3, 2018, within **seven (7)** calendar days from the date of this NOTICE TO PROCEED, or, on or before April 18, 2018. You are required to complete the Work in the Contract within **thirty (30)** consecutive calendar days from the date of this Notice. The date of completion of all work is therefore June 18, 2018.

Dated this 11th day of April, 2018.

Owner: CITY OF SULLIVAN

By: _____

City Engineer

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by

_____

(Contractor) Company Name Typed or Printed

_____

Authorized Signature

_____

Name Typed or Printed

This the _____day of _____,_____

Title:_____

Employer identification Number: _____

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS THAT WE, the undersigned, _____ (hereinafter called the "Principal"), an *individual, partnership, or corporation, duly authorized by law to do business as a construction contractor in _____and _____ (hereinafter called the "Surety"), a corporation duly authorized to do a surety business under the laws of the State of Missouri, are held and firmly bound unto
(hereinafter called the "Obligee"), in the penal sum of _____ ($_____) dollars lawful money of the United States, for the payment of which well and truly to be made unto said Obligee, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents, as follows:

The conditions of this obligation are such that whereas on the ____ day of _____, 20__, the said Principal entered into a written agreement, which agreement is hereby made a part hereof, with said Obligee for the construction of _____ located at

_____.

Now, therefore, if the said Principal shall faithfully and properly perform the foregoing Contract according to all the terms thereof, and shall as soon as the work contemplated by said Contract is completed, pay to the proper parties all amount due for material, lubricants, oil, gasoline, grain, hay, food, coal, and coke, repairs on machinery, groceries and foodstuff, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums, both compensation and all other kinds of insurance, on said word, and for all labor performed in such work whether by subcontractor or otherwise, then this obligation to be void, otherwise to remain in full force and effect, and may be sued on for his use and benefit by any person furnishing materials or performing labor, either as an individual, or as a subcontractor for any contractor in the name of said Obligee.

*Mark out the inapplicable designation

Note: Performance Bond may be submitted utilizing Surety Companies standard form.

The said Surety for the value received, hereby stipulates and agrees that no charge, extensions of time, alteration or addition to the terms of the agreement or to the work to be performed thereunder, or the specifications accompanying the same, shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extensions of time, alteration or addition to the terms of the agreement or the work or to the specifications.

IN TESTIMONY WHEREOF, the parties hereunto have cased the execution hereof in _____ original counterparts as of the _____ day of _____, 20____.

_____	_____
PRINCIPAL	SURETY
_____	_____
By	By
_____	_____
Title	Title

ATTEST:

_____ (Seal)

Springfield To Fig Water Main Improvements
Proposal

City of Sullivan
210 West Washington
Sullivan, MO 63080

In accordance with the advertisement inviting proposals regarding the above noted project for the City of Sullivan subject to the conditions, contract documents, specifications, including all addenda, and the plans, which so far as they relate to the proposal are made part of it, the undersigned herewith propose to construct the work specified at the following unit prices: (**Any Items Not Listed In Pay Items Shall Be Considered Incidental To Construction. Solid Rock Class C Excavation shall be paid at $50.00 C.Y. for field measured quantities. Contractor responsible for all rock bedding and disposal of spoils**)

Item No.	Description:	Units	Estimated Quantity	Unit Price	Total Price
1	MOBILIZATION	L.S.	1	$_____	$_____
2	8” C900 DR14 WATER MAIN COMPLETE INSTALLATION ONLY	L.F.	2,025	$_____	$_____
3	6” 3 WAY FIRE HYDRANT ASSEMBLY INSTALLATION ONLY	EA.	2	$_____	$_____

TOTAL BASE BID IN WORDS **$**_____

TOTAL BASE BID IN FIGURES **$**_____

(Signature required on page P2 of P2)

The undersigned bidder proposes and agree, if this bid is accepted, to enter into an agreement with the City in the form included in the Contract Documents to perform and furnish all work as specified or indicated in the contract documents for the contract price and within the contract time indicated in this bid and in accordance the other terms and conditions of the contract documents. The bidder accepts all of the terms and conditions of the advertisement or invitation to bid and instructions to bidders, including with limitation, those dealing with the disposition of bid security. This bid will remain subject to acceptance for 60 days. Bidder will sign and submit the agreement with the bonds and other documents required by the bidding requirements within 10 days after notice of award by the City. In submitting this bid, the bidder represents that he has examined copies of all bidding documents and all addenda (receipt of which is hereby acknowledged) and has attached a signed copy of each hereto.

Bidder has familiarized himself with the nature and extent of the contract documents, work, site conditions, locality, and laws and regulations that in any manner may affect the cost, progress, performance or furnishing of the work. Bidder has performed or obtained any additional examination, investigations, tests, reports, or similar information or data in respect to underground facilities as required to perform and furnish the work at the contract price, within the contract time and in accordance with the other terms and conditions of the contract documents. The bidder has given the City written notice of all conflicts, error, or discrepancies if any that it has discovered in the contract documents.

The bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm, or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation. The bidder has not directly or indirectly induced or solicited any other bidder to submit a false or sham bid. The bidder has not solicited or induced any person, firm, or corporation to refrain from bidding. The bidder has not sought by collusion to obtain for itself any advantage over any other bidder or the City.

The bidder understands and agrees that the City may elect to delete portions of the work before or after the award of the contract, and if the City so elects before the award of the contract, the bidder agrees that the bids will be compared and the contract sum and totals adjusted accordingly to account for deleted portions of the work. The summation of the item prices and item totals must equal the overall total amount. In the event of a discrepancy between the overall total amount and the mathematical summation of such item totals, the mathematical summation of the item totals and accounting for any deletions of portions of the work shall form the basis of the award and the basis for the contract sum.

_____ Mailing Address: _____

Contractor's Company Name _____

_____

_____ _____

Contractor's Authorized Rep. (SIGNATURE)

Date: _____

_____

Authorized Representative's Title Phone Number: _____

GENERAL CONDITIONS OF THE CONTRACT

SECTION 2.1 DEFINITIONS

2.1.01. CONTRACT DOCUMENTS: The Contract comprises of the following documents, including all additions, deletions and modifications incorporated therein before the execution of the Contract.

a) Legal and Procedural Documents

1. Advertisement
2. Information for Bidders
3. Proposal
4. Bid Guaranty
5. Contract
6. Performance Bond
7. Payment Bond

b) Special Provisions

c) General Conditions of the Contract

d) Detailed Specification Requirements

e) Drawings

2.1.02 ENGINEER is the City of Sullivan Engineer.

2.1.03 OWNER is the City of Sullivan, Missouri.

2.1.04 SUB-CONTRACTOR is any person, firm or corporation with a direct contract with the contractor who acts for or in behalf of the contractor in executing any part of the contract, but does not include one who merely furnishes material.

2.1.05 CONTRACTOR is the contractor named in the contract documents.

2.1.06 PROPOSAL: The offer of a bidder to perform the work described by the contract documents when made out and submitted on the prescribed proposal form, properly signed and guaranteed.

2.1.07 BID GUARANTY: The cashier's check or bidder's bond accompanying the proposal submitted by the bidder, as a guaranty that the bidder will enter into a contract with the owner for the construction of the work, if the contract is awarded to them.

2.1.08 CONTRACT is the agreement covering the performance of the work described in the contract documents including all supplemental agreements thereto and all general and special provisions pertaining to the work or material therefore.

2.1.09 PAYMENT BOND is the approved form of security furnished by the contractor and their surety as a guaranty of good faith on the part of the contractor to pay all fees owed for labor and materials required for the project in accordance with the terms of the contract.

2.1.10 PERFORMANCE BOND is the approved form of security furnished by the contractor and their surety as a guaranty of good faith on the part of the contractor to execute the work in accordance with the terms of the contract.

2.1.11 SURETY is the person, firm or corporation who executes the contractor's payment and performance bond.

2.1.12 SPECIFICATIONS shall mean the legal and procedural documents, general conditions of the contract, together with the modifications thereof, and the detailed specification requirements, with all addenda thereto.

2.1.13 DRAWINGS are those listed in the index to specifications and drawings with all addenda thereto.

2.1.14 WRITTEN NOTICE: Written notice shall be considered as served when delivered in person or sent by registered mail to the individual, firm or corporation or to the last business address of such known to those who serve the notice.

a) Change of Address: It shall be the duty of each party to advise the other parties to the contract as to any change in their business address until completion of the contract.

2.1.15 ACT OF GOD means an earthquake, flood, cyclone or other cataclysmic phenomenon of nature. Rain, wind, flood or other natural phenomenon of normal intensity for the locality shall not be construed as an Act of God and no reparation shall be made to the contractor for damages to the work resulting therefrom.

2.1.16 WORKING DAY: A working day is defined as any day when, in the opinion of the Engineer, soil and weather conditions are such as would permit any major operation of the project for six hours or over unless other unavoidable conditions prevent the contractor's operators. If conditions are such as to stop work in less than six hours, the day will not be counted as a working day. Saturdays, Sundays, national holidays and holidays established by the laws of the state will not be counted as working days.

2.1.17 PREVAILING WAGE RATES: The Contractor shall be required to comply with the Requirements of the "Wage Scale Determinations" as provided for each trade.

2.1.18 CITY: is the City of Sullivan, Missouri who is also the OWNER.

SECTION 2.2 DRAWINGS, SPECIFICATIONS AND RELATED DATA

2.2.01 INTENT OF DRAWINGS AND SPECIFICATIONS: The intent of the drawings and specifications is that the contractor furnish all labor and materials, equipment and transportation necessary for the proper execution of the work unless specifically noted otherwise. The contractor shall do all the work shown on the drawings and described in the specifications and all incidental work considered necessary to complete the project in a substantial and acceptable manner, and to fully complete the work or improvements, ready for use, occupancy and operation by the owner.

2.2.02 CONFLICT: If there be conflicting variance between the drawings and the specifications, the provisions of the specifications shall control. In case of conflict between the general conditions of the contract or any modifications thereof and the detailed specification requirements, the detailed specification requirements shall control.

2.2.03 DISCREPANCIES IN DRAWINGS: Any discrepancies found between the drawings and specifications and site conditions or any errors or omissions in the drawings or specifications shall be immediately reported to the Engineer, who shall promptly correct such error or omission in writing. Any work done by the contractor after their discovery of such discrepancies, errors or omissions shall be done at the contractor's risk.

2.2.04 ADEQUACY OF DRAWINGS AND SPECIFICATIONS: Responsibility for adequacy of the design and for sufficiency of the drawings and specifications shall be borne by the engineer. The complete requirements of the work to be performed under the contract shall be set forth in drawings and specifications to be supplied by the owner through the Engineer or by the Engineer as representative of the owner. Drawings and specifications furnished shall be in accordance with the contract documents and shall be true and accurate developments thereof.

2.2.05 ADDITIONAL INSTRUCTIONS: Further instructions may be issued by the Engineer during the progress of the work by means of drawings or otherwise to make more clear or specific the drawings and specifications or as may be necessary to explain or illustrate changes in the work to be done.

2.2.06 COPIES OF DRAWINGS AND SPECIFICATIONS FURNISHED: Except as provided for otherwise, all required copies of drawings and specifications necessary for the execution of the work shall be furnished to the contractor without charge.

2.2.07 DRAWINGS AND SPECIFICATIONS AT JOB SITE: One complete set of all drawings and specifications shall be maintained at the job site and shall be available to the City Engineer at all times.

2.2.08 OWNERSHIP OF DRAWINGS AND SPECIFICATIONS: All original or duplicated drawings and specifications and other data prepared by the Engineer shall remain the property of the Engineer and they shall not be reused on other work, but shall be returned to them upon completion of the work.

2.2.09 DIMENSIONS: Figured dimensions on the plans will be used in preference to scaling the drawings. Where the work of the contractor is affected by finish dimensions, these shall be determined by the contractor at the site, and they shall assume the responsibility therefore.

2.2.10 MODELS: All models prepared for this work shall become the property of the owner at the completion of the work.

2.2.11 SAMPLES: All samples called for in the specifications or required by the Engineer shall be furnished by the contractor and shall be submitted to the Engineer for his (her) approval. Samples shall be furnished so as not to delay fabrication, allowing the Engineer reasonable time for the consideration of the samples submitted. See also 2.6.15.

a.) Samples for Tests: Contractor shall furnish such samples of material as may be required for examination and test. All materials and workmanship shall be in accordance with approved samples. All samples of materials for tests shall be taken according to methods provided in the specifications.

b.) Quality Assurance - Concrete: In order to ensure the quality of the contractor's work, samples of all cast in place concrete shall be collected and tested by an independent testing laboratory. The cost of the collection and testing of such samples will be the contractor's expense. The contractor shall provide enough samples for testing as to ensure that all of the work meets the specifications. The engineer can direct the contractor to do additional testing at the contractor's expense if he/she determines the need for additional sampling.

c.) Quality Assurance – Soils and Base Rock: In order to ensure the quality of the contractor's backfill material, all soil and base rock shall be tested by an independent testing laboratory. The cost of the collection and testing of such samples will be the contractor's expense. The contractor shall provide enough samples for testing as to ensure that all of the work meets the specifications. The engineer can direct the contractor to do additional testing at the contractor's expense if he/she determines the need for additional sampling. The subgrade and base rock shall be proof rolled with a fully loaded tandem dump truck in both driving lanes and down the middle.

2.2.12 SHOP DRAWINGS: The contractor shall provide shop drawings, settings, schedules and such other drawings as may be necessary for the prosecution of the work in the shop and in the field as required by the drawings, specifications or Engineer's instructions. Deviations from the drawings and specifications shall be called to the attention of the Engineer at the time of the first submission of shop drawings and other drawings for approval. The Engineer's approval of any drawings shall not release the contractor from responsibility for such deviations. Shop drawings shall be submitted according to the following schedule:

a) Three copies shall be submitted at least thirty (30) days before the materials indicated thereon are to be needed, or earlier if required to prevent delay of the work.

b) The Engineer shall, within five (5) days of the submittal of any shop drawings, return one copy to the contractor marked with all corrections and changes.

c) The contractor shall then correct the shop drawings to conform to the corrections and changes requested by the Engineer.

d) Following completion of such corrections and changes, the contractor shall furnish the City Engineer one copy of the shop drawings conforming to the required corrections and changes.

2.2.13 QUALITY OF MATERIALS: In order to establish standards of quality, the Engineer has, in the detailed specifications, referred to certain products by name and catalog number. This procedure is not to be construed as eliminating from competition other products of equal or better quality by other manufacturers where fully suitable in design.

a) The Contractor shall furnish the complete list of proposed desired substitutions prior to signing of the contract, together with such engineering and catalog data as the Engineer may require.

b) The contractor shall abide by the Engineer's judgment when proposed substitute materials or items of equipment are judged to be unacceptable and shall furnish the specified material or item of equipment in such case. All proposals for substitutions shall be submitted in writing within a reasonable time. No substitute materials shall be used unless approved in writing.

c) An addendum will be issued prior to bid opening, identifying manufacturers of approved equipment. Only general contractors can request approval of equal equipment.

2.2.14 SURVEYS: The contractor shall establish all base lines for location of the principal component parts of the work together with a suitable number of bench marks adjacent to the work. Based upon the information, the contractor shall develop and make all detail staking necessary for construction, including slope stakes, batter boards, stakes for pile locations, back of curb and other working points, lines and elevations. The contractor shall have the responsibility to carefully preserve bench marks, reference points and stakes, and in the case of destruction thereof by the contractor or resulting from their negligence, the contractor shall be charged with the expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench mark, reference points and stakes.

The contractor shall be responsible at his own cost to replace any property corners, iron pipes, or property pins that are disturbed by his work. The survey work by contractor shall include providing survey information for utility company relocations. All surveying work shall be performed by a licensed surveyor within the State of Missouri.

2.2.15 AS BUILT PLANS: The Contractor is responsible for producing an as-built set of plans for the engineer within 2 weeks of completing the project. There shall be no direct payment for this item of work; it shall be subsidiary to the bid items.

SECTION 2.3 ENGINEER-OWNER-CONTRACTOR RELATIONS

2.3.01 ENGINEER'S RESPONSIBILITY AND AUTHORITY: All work shall be done under the general supervision of the Engineer. The Engineer shall decide any and all questions which may arise as to the quality and acceptability of materials furnished, work performed, rate of progress of work, interpretation of drawings and specifications and all questions as to the acceptable fulfillment of the contract on the part of the contractor.

2.3.02 ENGINEER'S DECISIONS: All claims of the owner or the contractor shall be presented to the Engineer for decision which shall be made in writing within a reasonable time. All decisions of the Engineer shall be final.

2.3.03 SUSPENSION OF WORK: The Engineer shall have the authority to suspend the work, wholly or in part, for such period or periods, as he (she) may deem necessary, due to unsuitable weather, or such other conditions as are considered unfavorable for prosecution of the work, or failure on the part of the contractor to carry out the provisions of the contract or to supply materials meeting the requirements of the specifications. The contractor shall not suspend operation without the Engineer's permission.

2.3.04 INSPECTION OF WORK: All materials and each part or detail of the work shall be subject at all times to inspection by the Engineer, and the contractor will be held strictly to the true intent of the specifications in regard to quality of materials, workmanship and the diligent execution of the contract. Such inspection may include mill, plant, or ship inspection, and any material furnished under these specifications is subject to such inspection. The Engineer shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the contractor as is required to make a complete and detailed inspection.

2.3.05 EXAMINATION OF COMPLETED WORK: If the Engineer requests it, the contractor at any time before acceptance of the work shall remove or uncover such portions of the finished work as may be directed. After examination, the contractor shall restore said portions of the work to the standard required by the specifications. Should the work thus exposed or examined prove acceptable, the uncovering or removing, and the replacing of the covering or making good of the parts removed shall be paid for as extra work, but should the work so exposed or examined prove unacceptable, the uncovering, removing and replacing shall be at the contractor's expense.

2.3.06 CONTRACTOR'S SUPERINTENDENCE: A qualified superintendent, who is acceptable to the Engineer, shall be maintained on the work and give efficient supervision to the work until its completion. The superintendent shall have full authority to act in behalf of the contractor, and all directions given to the superintendent shall be considered given to the contractor. In general, the Engineer's instructions shall be confirmed in writing and always upon written request from the contractor.

2.3.07 LANDS BY OWNER: The owner shall provide the lands shown on the drawings upon which the work under the contract is to be performed and to be used for right-of-way for access. Any delay in furnishing these lands by the owner shall be deemed proper cause for adjustment in the time of completion.

2.3.08 LANDS BY CONTRACTOR: Any additional land and access thereto not shown on the drawings that may be required for temporary construction facilities or for storage of materials shall be provided by the contractor with no liability to the owner. The contractor shall confine their apparatus and storage of materials and operation of their workmen to those areas described in the drawings and specifications and such additional areas which he may provide as approved by the Engineer.

2.3.09 PRIVATE PROPERTY: The contractor shall not enter upon private property for any purpose without obtaining permission, and they shall be responsible for the preservation of all public property, trees, monuments, etc., along and adjacent to the street and/or right-of-way, and shall use every precaution necessary to prevent damage to pipes, conduits, and other underground structures, and shall protect carefully from disturbance or damage all monuments, and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed.

2.3.10 ASSIGNMENT OF CONTRACT: Neither the contractor nor the owner shall sublet, sell, transfer, assign or otherwise dispose of the contract or any portion thereof, or of his right, title or interest therein, or their obligation thereunder, without written consent of the other party.

2.3.11 REMOVAL OF CONSTRUCTION EQUIPMENT, TOOLS AND SUPPLIES: At the termination of this contract, before acceptance of the work by the Engineer, the contractor shall remove all of their equipment, tools and supplies from the property of the owner. Should the contractor fail to remove such equipment, tools and supplies, the owner shall have the right to remove them.

2.3.12 SUSPENSION OF WORK BY THE OWNER: The work or any portion thereof may be suspended at any time by the owner provided that he gives the contractor five (5) days written notice of suspension, which shall set forth the date on which work is to be resumed. The contractor shall resume the work upon written notice from the owner and within ten days after the date set forth in the notice of suspension. If the owner does not give written notice to resume work within ten days of the date fixed in the notice of suspension, the contractor may abandon that portion of the work so suspended and shall be entitled to payment in accordance with Paragraph 2.6.10.

2.3.13 OWNER'S RIGHT TO CORRECT DEFICIENCIES: Upon failure of the contractor to perform the work in accordance with the contract documents, including any requirements with respect to the schedule of completion, and after five days written notice to the contractor and receipt of written approval from the Engineer, the owner may, without prejudice to any other remedy he (she) may have, correct such deficiencies.

2.3.14 OWNER'S RIGHT TO TERMINATE CONTRACT AND COMPLETE THE WORK: The owner shall have the right to terminate the employment of the contractor after giving ten days written notice of termination of the contractor in the event of any default by the contractor and upon receiving written notice from the Engineer certifying the cause for such action. In the event of such termination, the owner may take possession of the work and of all materials, tools and equipment thereon and may finish the work by whatever method and means they select.

It shall be considered a default by the contractor whenever they shall:

a) Declare bankruptcy, become insolvent, or assign their assets for the benefit of their creditors.

b) Disregard or violate important provisions of the contract documents or Engineer's instructions, or fail to prosecute the work according to the agreed schedule of completion, including extensions thereof.

c) Fail to provide a qualified superintendent, competent workmen or sub-contractors, or proper materials, or fail to make prompt payment thereof.

2.3.15 CONTRACTOR'S RIGHT TO SUSPEND WORK OR TERMINATE CONTRACT: The contractor may suspend work or terminate contract upon ten days written notice to the owner and Engineer, for any of the following reasons:

a) If an order of any court, or public authority caused the work to be stopped or suspended for a period of ninety days through no act or fault of the contractor or their employees.

b) If the Engineer should fail to act upon any request for payment within thirty days after it is presented in accordance with the general conditions of the contract.

c) If the owner should fail to pay the contractor any sum within thirty days after its award by arbitrators.

2.3.16 RIGHTS OF VARIOUS INTERESTS: Wherever work being done by the owner's forces or by other contractors is contiguous to work covered by this contract, the respective rights of the various interests involved shall be established by the Engineer, to secure the completion of the various portions of the work in general harmony.

2.3.17 SUBCONTRACTS: At the time specified by the contract documents or when requested by the Engineer, the contractor shall submit in writing to the owner for approval of the Engineer the names of the sub-contractors proposed for the work. Sub-contractors may not be changed except at the request or with the approval of the Engineer. The contractor is responsible to the owner for the acts and omissions of their employees. The contract documents shall not be construed as creating any contractual relation between any sub-contractor and owner. The contractor shall bind every sub-contractor by the terms of the contract documents.

For convenience of reference and to facilitate the letting of contracts and subcontracts, the specifications are separated into titled sections. Such separations shall not, however, operate to make the Engineer an arbiter to establish limits to the contracts between contractor and subcontractor.

2.3.18 WORK DURING AN EMERGENCY: The contractor shall perform any work and shall furnish and install any materials and equipment necessary during an emergency endangering life or property. In all cases they shall notify the Engineer of the emergency as soon as practicable, but he (she) shall not wait for instructions before proceeding to properly protect both life and property.

2.3.19 ORAL AGREEMENTS: No oral order, objection, claim or notice by any party to the others shall affect or modify any of the terms of obligations contained in any of the contract documents, and none of the provisions of the contract documents shall be held to be waived or modified by reason of any act whatsoever, other than by a definitely agreed waiver or modification thereof in writing, and no evidence shall be introduced in any proceeding of any other waiver or modifications.

2.3.20 SAFETY: The contractor shall employ adequate safety procedures and techniques in the performance of their work.

SECTION 2.4 MATERIALS AND WORKMANSHIP

2.4.01 MATERIALS FURNISHED BY THE CONTRACTOR: All materials used in the work shall meet the requirements of the respective specifications, and no material shall be used until it has been approved by the Engineer. All materials not otherwise specifically indicated shall be furnished by the contractor.

2.4.02 STORAGE OF MATERIALS: Materials shall be so stored as to insure the preservation of their quality and fitness for the work. When considered necessary, they shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground, and/or they shall be placed under cover. Stored materials shall be located so as to facilitate prompt inspection. Private property shall not be used for storage purposes without written permission of the owner or lessee.

2.4.03 CHARACTER OF WORKMEN: The contractor shall at all times be responsible for the conduct and discipline of their employees and/or any sub-contractor or persons employed by sub-contractors. All workmen must have sufficient knowledge, skill and experience to perform properly the work assigned to them. Any foreman or workman employed by the contractor or sub-contractor who, in the opinion of the Engineer, does not perform their work in a skilled manner, or appears to be incompetent or to act is a disorderly or intemperate manner shall, at the written request of the Engineer, be discharged immediately and shall not be employed again in any portion of the work without the approval of the Engineer.

2.4.04 REJECTED WORK AND MATERIALS: All materials which do not conform to the requirements of the contract documents are not equal to samples approved by the Engineer, or are in any way unsatisfactory or unsuited to the purpose for which they are intended, shall be rejected. Any defective work whether the result of poor workmanship, use of defective materials, damage through carelessness or any other given cause shall be removed within ten days after written notice is given by the Engineer, and the work shall be re-executed by the contractor. The fact that the Engineer may have previously overlooked such defective work shall not constitute an acceptance of any part of it.

a) Should the contractor fail to remove work or materials rejected within ten days after written notice to do so, the owner may remove them and may store the material.

b) Correction of faulty work after final payment shall be in accordance with Paragraph 2.6.18.

2.4.05 MANUFACTURER'S DIRECTIONS: Manufactured articles, material and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer unless herein specified to the contrary.

2.4.06 CUTTING AND PATCHING: The contractor shall do all necessary cutting and patching of the work that may be required to properly receive the work of the various trades or as required by the drawings and specifications to complete the structure. The contractor shall restore all such cut or patched work as directed by the Engineer. Cutting of existing structure that shall endanger the work, adjacent property, workmen or the public shall not be done unless approved by the Engineer and under his (her) direction.

2.4.07 CLEANING UP: The contractor shall remove from the owner's property, and from all public and private property, all temporary structures, rubbish, and waste materials resulting from their operation or caused by their employees, and shall remove all surplus materials leaving the site smooth, clean and true to line and grade.

2.4.08 GUARANTY PERIOD: The contractor shall warrant all material furnished, equipment furnished and work performed by them for a period of one year from the date of written acceptance of the work. This warranty shall be documented to the City in writing by an authorized representative of the contractor. Failure of contractor to provide written warranty does not absolve contractor of said warranty.

SECTION 2.5 PROGRESS AND COMPLETION OF WORK

2.5.01 NOTICE TO PROCEED: Following the execution of the contract by the owner, written notice to proceed with the work shall be given to the contractor. The contractor shall begin and shall prosecute the work regularly and uninterruptedly thereafter (unless otherwise directed in writing by the owner) with such force as to secure the completion of the work within the time stated in the proposal.

2.5.02 CONTRACT TIME: The contractor shall complete, in an acceptable manner, all of the work contracted for in the time stated in the proposal. Computation of contract time shall commence on the seventh day following the date of mailing, by regular mail, of the notice to proceed.

2.5.03 SCHEDULE OF COMPLETION: The contractor shall submit, at such times as may reasonably be requested by the Engineer, schedules which shall show the order in which the contractor proposes to carry on the work, with dates at which the contractor will start the several parts of the work, and estimated dates of completion of the several parts.

2.5.04 CHANGES IN THE WORK: The Owner may, as the need arises, order changes in the work through additions, deletions or modifications without invalidating the contract. Compensation and time of completion affected by the change shall be adjusted as described in section 2.5.05, "EXTRA WORK".

2.5.05 EXTRA WORK: New and unforeseen items of work found to be necessary and which cannot be covered by any item or combination of items for which there is a contract price shall be classed as extra work. Extra work is further defined as any work required to complete the project that is not already included within the contract documents or incidental to the work that is to be performed on the project within the Contract Documents. The contractor shall do such extra work and furnish such materials as may be required for the proper completion or construction of the whole work contemplated upon written order from the Owner as approved by the Engineer. In the absence of such written order, no claim for extra work shall be considered. Extra work shall be performed in accordance with these specifications or special provisions shall be done in accordance with the best practice as approved by the Engineer. Extra work required in an emergency to protect life and property shall be performed by the Contractor as required.

The Contractor is contracting with a municipality, and as such, the Mayor and Board of Aldermen have the sole authority to execute change orders for Extra Work on behalf of the Owner. The authority direct the performance of Extra Work by the Contractor may be delegated to the Engineer by an ordinance of the Board of Aldermen.

Engineer is authorized to give written orders to the Contractor to perform minor changes in the project <u>not</u> involving an adjustment in the total contract sum, extension of contract time, and not inconsistent with the intent of the Contract Documents. The contractor shall carry out such written orders promptly.

The Contractor must make written notice of all Extra Work claims promptly before conditions change or are disturbed and in no event later than 21 days after first observance of the conditions requiring the Extra Work. The written notice of Extra Work shall include an explanation of the conditions leading to the Extra Work, estimated Extra Work quantities, and cost estimate of the Extra Work and be issued to the Engineer.

2.5.06 EXTENSION OF CONTRACT TIME: A delay beyond the contractor's control occasioned by an Act of God or act of omission on the part of the owner or by strikes, lockouts, fire, etc., may entitle the contractor to an extension of time in which to complete the work as determined by the Engineer, provided, however, that the contractor shall give immediate notice to the Engineer of the cause of such delay. For any single delay in the project in excess of 2 calendar days, the Contractor shall provide the Engineer written notice of such delay and reasons for said delay within 7 days of the occurrence of the delay.

2.5.07 USE OF COMPLETED PORTIONS: The owner shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding that the time for completing the entire work or such portions may not have expired; but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the contract documents. If such prior use increases the cost of or delays the completion of uncompleted work or causes refinishing of completed work, the contractor shall be entitled to such extra compensation, or extension of time or both, as the Engineer may determine.

SECTION 2.6 MEASUREMENT AND PAYMENT

2.6.01 DETAILED BREAKDOWN OF CONTRACT AMOUNT: Except in cases where unit prices form the basis for payment under the contract, the contractor shall within ten days of receipt of notice to proceed, submit a complete breakdown of the contract amount showing the value assigned to each part of the work including an allowance for profit and overhead. Upon approval of the breakdown of the contract amount by the Engineer, it shall be used as the basis of all requests for payment.

2.6.02 REQUESTS FOR PAYMENT: The contractor may submit periodically but not more than once each month a request for payment for work done and materials delivered and stored on the site. All pay requests must be made to the Engineer at least 10 days before the last day of the month. The contractor shall furnish the Engineer all reasonable facilities required for obtaining the necessary information relative to the progress and execution of the work. Payment for materials stored on the site will be conditioned upon evidence submitted to establish the owner title to such materials. Each request for payment shall be computed from the work completed on all items listed in the detailed breakdown of contract amount, less a percentage to be retained as detailed in the Contract Agreement until final completion and acceptance of the work, and less previous payments. Where unit prices are specified, the request for payment shall be based on the quantities completed. See also section 2.6.20 and the Contract Agreement. The Contractor shall submit all pay requests on the forms incorporated in these specifications for all partial and final pay requests.

2.6.03 ENGINEER'S ACTION ON A REQUEST FOR PAYMENT: Within ten days of submission of any request for payment by the contractor, the Engineer shall:

a) Approve the request for payment as submitted.

b) Approve such other amounts as he (she) shall decide is due the contractor, informing the contractor in writing of his (her) reason for approving the amended amount.

c) Withhold the request for payment, informing the contractor in writing of their reasons for withholding it.

2.6.04 OWNER'S ACTION ON AN APPROVED REQUEST FOR PAYMENT: Within fourteen days from the date of approval of a request for payment by the Engineer, the owner shall:

a) Approve the request for payment to be mailed on the third Wednesday of the month following the Contractor’s request for payment.

b) Approve to pay such other amount in accordance with Paragraph 2.6.05 as they shall decide is due the contractor, informing the contractor and the Engineer in writing of their reasons for paying the amended amount. Payment of the amended amount will be mailed on the third Wednesday of the month following the Contractor’s request for payment.

c) Notify the Contractor and the Engineer in writing that payment will be withheld in accordance with Paragraph 2.6.05 and informing the contractor and the Engineer of their

reasons for withholding payment.

2.6.05 OWNER'S RIGHT TO WITHHOLD PAYMENT OF AN APPROVED REQUEST FOR PAYMENT: The owner may withhold payment in whole or in part on an approved request for payment to the extent necessary to protect themselves from loss on account of any of the following causes discovered subsequent to approval of a request for payment by the Engineer.

a) Defective work.

b) Evidence indicating the probable filing of claims by other parties against the contractor.

c) Failure of the contractor to make payments to sub-contractors, material suppliers or labor.

d) Damage to another contractor.

2.6.06 RESPONSIBILITY OF THE CONTRACTOR: Unless specifically noted otherwise, the contractor shall furnish all materials and services and perform all the work described by the contract documents or shall have all materials and services furnished and all the work performed at their expense. It shall be the contractor's responsibility to pay for:

a) Replacement of survey bench marks, reference points and stakes provided by the owner under Paragraph 2.2.14 and all construction staking.

b) Lands by contractor provided in accordance with Paragraph 2.3.08.

c) Insurance obtained in accordance with Paragraphs 2.7.01 and 2.7.02.

d) Fire insurance obtained in accordance with Paragraph 2.7.03.

e) Payment and Performance bond obtained in accordance with Paragraph 2.7.04.

f) Royalties required under Paragraph 2.7.05.

g) Permits and licenses required of the contractor and sub-contractors.

2.6.07 PAYMENT FOR UNCORRECTED WORK: Should the Engineer direct the contractor not to correct work that has been damaged or that was not performed in accordance with the contract documents, an equitable deduction from the contract amount shall be made to compensate the owner for the uncorrected work.

2.6.08 PAYMENT FOR REJECTED WORK AND MATERIALS: The removal of work and materials rejected under Paragraph 2.4.04 and the re-execution of acceptable work by the contractor shall be at the expense of the contractor, and they shall pay the cost of replacing the work of other contractors destroyed or damaged by the removal of rejected work or materials and the subsequent replacement of acceptable work.

a) Removal of rejected work or materials and storage of materials by the owner in accordance with Paragraph 2.4.04 shall be paid by the contractor within thirty days after

written notice to pay is given by the owner. It the contractor does not pay the expenses of such removal and after ten days written notice being given by the owner of their intent to sell the materials at auction or at private sale and shall pay to the contractor the net proceeds therefrom after deducting all the cost and expenses that should have been borne by the contractor.

2.6.09 PAYMENTS FOR EXTRA WORK: Written notice of claims for payments for extra work shall be given by the contractor within ten days after receipt of instructions from the owner as approved by the Engineer to proceed with the extra work and also before any work is commenced, except in emergency endangering the life or property. No claim shall be made valid unless so made. In all cases, the contractor's itemized estimate sheets showing all labor and material shall be submitted to the Engineer. The owner's order for extra work shall specify any extension of the contract time and one of the following methods of payments:

a) Unit prices or combinations of unit prices which formed the basis of the original contract.

b) A lump sum based on the contractor's estimate, accepted by the owner, and approved by the Engineer.

c) Forced account as described in Section 2.6.19.

2.6.10 PAYMENT FOR WORK SUSPENDED BY THE OWNER: If the work or any part thereof shall be suspended by the owner and abandoned by the contractor as provided in Paragraph 2.3.13, the contractor will then be entitled to payment for all work done on the portions so abandoned.

2.6.11 PAYMENT FOR WORK BY THE OWNER: The cost of the work performed by the owner in removing construction equipment, tools and supplies in accordance with Paragraph 2.3.12 and in correcting deficiencies in accordance with Paragraph 2.3.14 shall be paid by the contractor.

2.6.12 PAYMENT FOR WORK BY THE OWNER FOLLOWING HIS TERMINATION OF THE CONTRACT: Upon termination of the contract by the owner in accordance with Paragraph 2.3.14, no further payments shall be due the contractor until the work is completed. If the unpaid balance of the contract amount shall exceed the cost of completing the work including all overhead costs, the excess shall be paid to the contractor. If the cost of completing the work shall exceed the unpaid balance, the contractor shall pay the difference to the owner. The cost incurred by the owner, as herein provided, and the damage incurred through the contractor's default, shall be certified by the owner, and approved by the Engineer.

2.6.13 PAYMENT FOR WORK TERMINATED BY THE CONTRACTOR: Upon suspension of the work or termination of the contract by the contractor within accordance with Paragraph 2.3.15, the contractor shall recover payment from the owner for the work performed.

2.6.14 PAYMENT FOR SAMPLES AND TESTING OF MATERIALS: Samples furnished in accordance with Paragraph 2.2.11 shall be furnished by the contractor at their expense.

a) Testing of samples and materials furnished in accordance with Paragraph 2.2.11 shall be arranged and paid for by the contractor.

2.6.15 RELEASE OF LIENS: The contractor shall deliver to the owner a complete release of all liens arising out of this contract before the retained percentage or before the final request for payment is paid. If any lien remains unsatisfied after all payments are made, the contractor shall refund to the owner such amounts as the owner may have been compelled to pay in discharging of such liens including all costs and a reasonable attorney's fee.

2.6.16 ACCEPTANCE AND FINAL PAYMENT: When the contractor shall have completed the work in accordance with the terms of the contract documents, the Engineer shall certify his (her) acceptance to the owner and his (her) approval of the contractor's final request for payment, which shall be the contract amount plus all approved additions less all approved deductions (including retention) and less previous payments made. The request for final payment shall be made on the form contained in these specifications. The contractor shall furnish evidence that they have fully paid all debts for labor, material, and equipment incurred in connection with the work, following which the owner shall accept the work and release the contractor except as to the conditions of the performance bond, any legal rights of the owner, required guarantees, and corrections of faulty work after final payment, and shall authorize payment of the contractor's final request for payments per the Contract Agreement. The contractor must allow sufficient time between the time of completion of the work and approval of the final request for payment for the Engineer to assemble and check the necessary data.

2.6.17 TERMINATION OF CONTRACTOR'S RESPONSIBILITY: The contract will be considered complete when all work has been finished, the final inspection made by the Engineer, and the project accepted in writing by the owner. The contractor's responsibility shall then cease, except as set forth in their performance bond, as required by the guaranty period in accordance with Paragraph 2.4.08 and as provided in Paragraph 2.6.18.

2.6.18 CORRECTION OF FAULTY WORK AFTER FINAL PAYMENT: The approval of the final request for payment by the Engineer and the making of the final payment by the owner to the contractor shall not relieve the contractor of responsibility for the faulty materials or workmanship. The owner shall promptly give notice of faulty materials or workmanship and the contractor shall promptly replace any such defects discovered within two years from the date of written acceptance of the work. The Engineer shall decide all questions arising under this paragraph, and all such decisions shall be subject to arbitration.

2.6.19 PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK: All extra work done on a force account basis will be paid for in the manner hereinafter described, and the compensation thus provided shall be accepted by the Contractor as payment in full for the use of small tools, superintendent's services, timekeeper's service, premium on bond, and all other overhead expenses incurred in the prosecution of all extra work done on a force account basis. Payment will be made as follows:

a) For all materials purchased by the contractor and used in this specific work, they will receive the actual cost of such materials including freight charges, as shown by original receipted bills for materials and freight, to which will be added an amount equal to 15% of the sum thereof.

b) For all labor and foremen, engaged in the specific operation, the Contractor will receive the prevailing wage and will be paid on the project for each and every hour that said labor and foremen are actually engaged in such work, to which will be added an amount equal to 15% of the sum thereof. In addition the contractor shall be paid a sum equal to the workmen's compensation insurance premium and the actual cost of Social Security taxes, computed on the base rate for the class of work involved for the actual amount of the payroll.

c) For any machine, power, and equipment which it may be deemed necessary or desirable to use, the contractor will be allowed reasonable rental price, which shall be agreed upon before such work is begun for each and every hour that said machinery or equipment is in use on such work, to which sum no percentage shall be added.

The contractor's timekeeper and the inspector shall compare records of extra work on a force account basis at the end of each day. Copies of these records shall be made in duplicate by the inspector and shall be signed by both the inspector and the contractor's timekeeper, one copy being forwarded respectively to the engineer and the contractor.

No extra work will be paid for unless unit prices or wages have been agreed upon in writing before such work is started. Bills for force account work must be sworn to and submitted in triplicate to the Engineer with the current monthly estimate.

2.6.20 REQUEST FOR PAYMENT FORM: All Requests for Payment shall use the City of Sullivan partial and final pay requests. Copies of these forms are contained within these contract documents.

SECTION 2.7 INSURANCE, LEGAL RESPONSIBILITY AND PUBLIC SAFETY

2.7.01 INSURANCE: The contractor shall secure and maintain such insurance from an insurance company authorized to write casualty insurance in the state where the work is located as will protect himself, his sub-contractors, and the owner from claims for bodily injury, death or property damage which may arise from operations under this contract. The contractor shall not commence work under this contract until they have obtained all insurance required under this paragraph and shall have filed the certificate of insurance or the certified copy of the insurance policy with the owner. Each insurance policy shall contain a clause providing that it shall not be cancelled by the insurance company without ten days written notice to the owner of intention to cancel. The amounts of such insurance shall be not less than the following:

a) Contractor's Bodily Injury Liability and Property Damage Liability Insurance:

1)	Property Damage, Injury or death of one person	$2,000,000
2)	Injury to more than one person in a single accident	$2,525,423

b) Automobile and Truck Public Liability, Bodily Injury, and Property Damage:

1)	Property Damage, Injury or death of one person	$2,000,000
2)	Injury to more than one person in a single accident	$2,525,423

Certificates of insurance sent to the City as evidence of insurance shall contain the following statement, and in their absence the certificate will not be satisfactory to the City:

> The insurance evidenced by this certificate will not be cancelled or altered except after ten (10) days from receipt by the City of Written notice thereof.

The Contractor shall ensure that all subcontractors also comply with the requirements of this provision. Insurance are further detailed in the Information for Bidders.

2.7.02 INDEMNITY: The Contractor shall indemnify and save harmless the City of Sullivan from and against all losses and all claims, demands, payments, suits, actions, recoveries and judgements of every nature and description brought or recovered against it by reasons of any omission or act of the contractor, its agents or employees, in the execution of the work or in the guarding of it.

2.7.03 FIRE INSURANCE: In addition to such fire insurance as the contractor elects to carry for their own protection, they shall secure and maintain in the name of the owner policies upon such structures and material and in such amounts as to fully protect the owner. The policies shall be secured from a company which is satisfactory to the owner and delivered to the owner.

2.7.04 PAYMENT AND PERFORMANCE BOND: The Contractor shall, at the time of their execution of the contract, furnish a corporate bond in the sum equal to the contract amount. The form of the bond shall be as the owner may prescribe and with a surety company authorized to do business in the states where the work is located.

2.7.05 PATENTS AND ROYALTIES: If any design, device, material or process covered by letters, patent or copyright is used by the contractor, they shall provide for such use by legal agreement with the owner of the patent or a duly authorized license of such owner, and shall save harmless the owner from any and all loss or expense on account thereof, including its use by the owner.

2.7.07 PERMITS: All permits and licenses necessary for the prosecution of the work shall be secured by the contractor.

2.7.07 LAWS TO BE OBSERVED: The Contractor shall give all notices and comply with all federal, state and local laws, ordinances and regulations in any manner affecting the conduct of the work, and all such orders and decrees as exist, or may be enacted by bodies or tribunals having any jurisdiction or authority over the work, and shall indemnify and save harmless the owner against any claim or liability arising from, or based on the violation of any such law, ordinance, regulation, order or decree, whether by himself or his employees.

2.7.08 WARNING SIGNS AND BARRICADES: The Contractor shall provide adequate signs, barricades, red lights, and watchmen and take all necessary precautions for the protection of the work and the safety of the public. All barricades and obstructions shall be protected at night by amber signal lights which shall be kept burning from sunset to sunrise. Barricades shall be of substantial construction and shall be painted white or white-washed to increase their visibility at night. Suitable warning signs shall be so placed and illuminated at night as to show in advance where construction, barricades or detours exist. See detour plan provided by City for placement of devices.

2.7.09 PUBLIC SAFETY AND CONVENIENCE: The Contractor shall at all times so conduct their work as to insure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the work, and to insure the protection of persons and property in a manner satisfactory to the Engineer. No road or street shall be closed to the public except with the permission of the Engineer and proper governmental authority. Fire hydrants on or adjacent to work shall be kept accessible to fire fighting equipment at all times. Temporary provisions shall be made by the Contractor to insure the use of sidewalks and the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches, which shall not be obstructed except as approved by the Engineer.

2.7.10 CROSSING UTILITIES: When new construction crosses highways, railroads, streets or utilities under the jurisdiction of state, county, city or other public agency, public utility or private entity, the contractor shall secure written permission from the proper authority before executing such new construction. A copy of this written permission must be filed with the owner before any work is done. The Contractor will be required to furnish a release from the proper authority before final acceptance of the work.

2.7.11 SANITARY PROVISIONS: The Contractor shall provide and maintain such sanitary accommodations for the use of their employees and those of their sub-contractors as may be necessary to comply with the requirements and regulations of the local and state departments of health and as directed by the Engineer.

JOB SPECIAL PROVISIONS

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(Job Special Provisions shall take precedence over the plans, specifications, and General Conditions whenever in conflict therewith).

All items of work either previously stated or described herein shall include all materials, labor and equipment necessary to complete the work at the locations shown on the plans in accordance with the specifications and the special provisions.

1. GOVERNING SPECIFICATIONS AND DEFINITION CHANGES

Unless specifically noted otherwise within these Contract Documents, the following specifications shall be used for and govern the work on this project:

Roadway Construction: "Missouri Standard Specifications for Highway Construction" latest edition and "Standard Plans for Highway Construction" latest edition by the Missouri Highway and Transportation Commission (MHTC).

Specifications of the City of Sullivan.

2. WORK ZONE TRAFFIC MANAGEMENT PLAN

All traffic control shall conform to the latest version of the Manual of Uniform Traffic Control Devices (MUTCD).

Contractor must maintain access to all residential and commercial properties at all times unless otherwise agreed upon by the engineer in writing. At least one lane of traffic will remain open at all times unless otherwise agreed upon by the engineer in writing.

Basis of Payment. Payment for the above mentioned work will be at the contracts unit bid price for "Traffic Control."

3. UTILITIES

For informational purposes only, the following is a list of names, addresses, and telephone numbers of the known utility companies in the area of the construction work for this improvement:

Utility Name	**Known Required Adjustment**	**Anticipated Relocation Completion Date**
Electric City of Sullivan 210 West Washington Sullivan, MO 63080 Telephone (573) 468-4612		
Telephone Fidelity Cablevision, Inc. 52 North Clark Sullivan, MO 63080 Telephone (573) 364-5206		
Gas Missouri Natural Gas 6 Progress Parkway Union, MO 63084 Telephone (636) 584-8440		

Sewer
City of Sullivan
210 West Washington
Sullivan, MO 63080
Telephone (573) 468-4612

Water
City of Sullivan
210 West Washington
Sullivan, MO 63080
Telephone (573) 468-4612

Cable
Fidelity Cablevision, Inc.
52 North Clark
Sullivan, MO 63080
Telephone (573) 364-5206

The City does not warrant that the above information or the depiction of utility lines or facilities on other bidding documents are complete or accurately reflect either all utilities or their precise locations within or adjacent to the project limits or the status of any relocation work. The bidder is solely responsible to plan and execute its sequence of work only in reliance on information obtained by it from utility companies.

UTILITY COMPANY WORK SCHEDULES: Contractors assume all risk in bidding or planning their work in reliance on this information. By submitting its bid and executing this contract the contractor represents it has taken into account all possible effects of these relocations and its need to coordinate its work with that of the utilities in its planned timing and sequence of work and its manpower and equipment loading. Contractor agrees that it shall have no claim for damages by reason of any direct or indirect effect, by way of delay or otherwise, of any of these utility relocations.

By submitting a bid on this project, contractors certify that they have taken into account in their planned order of work, personnel and equipment loading and schedule all effects of the presence of the utilities, their relocation and all effects, cost and impacts of the same in their bid prices.

Therefore, contractors agree that any effects of the presence of the utilities, their relocation shall not be compensable as a suspension of work, extra work, a change in the work, as a differing site condition or otherwise including without delay, impact, cumulative impact, incidental or consequential damages. Contractor's SOLE REMEDY for the effects of the presence of utilities, delay or any other effects shall be in an excusable delay as provided in Missouri Standard Specifications Section 105.7.3. The contractor waives, itself, its subcontractors and suppliers the compensability of the presence of the utilities, delay in their relocation and any cost to the contractor, its subcontractors and suppliers in any claim or action arising out of or in relation to the work under the contract.

The Contractor's Progress Schedule, required as a part of this section and in conformance with Section 108.4 of the Missouri Standard Specifications shall reflect coordination of the contractor's work with that of the utility relocation including, without limitation, all dependencies of the contractor's or its subcontractors work upon relocation of utility lines and facilities and the effects of the utility relocation on the order of work provided in other parts of the contract documents.

The contractor shall be solely responsible and liable for and hold and save harmless the City from all damages, including incidental and consequential damages, to any utility lines or facilities or interruption of service caused by its subcontractor's operations in the event the contractor or any of its subcontractors begin to work in areas where utility relocations have not been completed.

No direct payment will be made for the contractor's compliance with above section.

4. AS BUILTS

1.0 Description. This specification covers the requirements, deliverables, standards, and basis of payment for the preparation and delivery of construction as-built plans.

1.1 Requirements. The as-built plans shall include the following: the size, type and manufacturer information of material used, horizontal and vertical coordinates of all utilities visible from the surface, alignment of underground facilities, flowline elevations of all sewers, all permanent improvements, and all changes/deviations from the plans. As-built plans shall be prepared by a licensed surveyor in the State of Missouri.

2.0 Basis of Payment. Unless otherwise provided in the contract documents, there shall be no direct payment for this item of work; it shall be subsidiary to the bid items.

5. GENERAL SITE ITEMS

Contractor is to maintain and be responsible for drainage throughout the project duration. The contractor will plate any new or existing structures that may be required due to phasing/construction work.

The Contractor shall keep the work site in an orderly manner, free from trash and other debris. All work materials removed from the site shall be removed by the end of each workday.

Mailboxes within the limits of operations shall be removed, as needed, by the contractor. They shall be set temporarily where they will be accessible to both the carrier and the patron, and shall be properly reset by the contractor at designated locations before final acceptance of the work by the City. Mailboxes damaged by the contractor shall be replaced by the contractor. All mailbox supports set by the contractor shall comply with AASHTO guidelines.

The contractor will maintain access for local trash services.

6. QUALITY ASSURANCE - TESTING

The contractor will be responsible for hiring an independent testing firm that will report directly to the City, in order to obtain and perform all required material testing per the MoDot Materials Manual specifications.

Basis of Payment. Payment for the above mentioned work will be per the MoDot Specifications for Highway Construction and be incidental to the various bid items where testing is required.

7. SITE ACCESS

The Contractor shall access the work area directly for this project. The Contractor, shall be responsible for coordinating his operations with the property owner(s) and returning the area disturbed to its pre-construction condition.

8. PROPERTY OWNER ISSUES

The Contractor is to provide temporary mailboxes and reset or replace any existing mailboxes disturbed by the construction. Arrangements are to be made with the US Post Office to allow for delivery of mail.

The Contractor is to provide trash collection services if the construction activities prohibit regular trash collection.

The Contractor is to provide ingress/egress access to all property owners at all times by whatever temporary means is available.

These items shall be incidental and the Contractor will not receive any direct payment for these items.

9. DAMAGE TO EXISTING IMPROVEMENTS NOT TO BE DISTURBED

The Contractor shall be responsible for the replacement of all items damaged outside the construction limits or not noted to be removed or adjusted. Any area beyond the temporary construction easement that is disturbed shall be sodded at contractor's sole expense. There is no direct payment for this work; it shall be subsidiary to the bid items.

TECHNICAL SPECIFICATIONS

No direct payment will be made for incidental items necessary to complete the work as described unless specifically provided as a pay item in the contract. Missouri Standard Specifications for Highway Construction shall be utilized except as amended in the Job Special Provisions or the technical specifications below and attached as part of this document.

ITEM NO. 1 MOBILIZATION

This work shall be performed in accordance with Missouri Standard Specifications for Highway Construction. This work shall be paid lump sum.

ITEM NO. 2 8" C900 DR14 WATER MAIN COMPLETE INSTALLATION ONLY

This work shall be performed in accordance with included specifications. This item shall include all necessary equipment and labor to install the owner provided material complete, including all fittings, valves, anchor couplings, valve boxes, locking collars, alpha couplers, trace wire, and snake pits. Contractor shall be responsible for hauling and legal disposal of all excess excavated material. All items of surface restoration shall be incidental to this item. All required rock bedding shall be incidental to this bid item. This work shall be paid per linear foot.

ITEM NO. 3 6" 3 WAY FIRE HYDRANT ASSEMBLY INSTALLATION ONLY

This work shall be performed in accordance with included specifications. This item shall include all necessary equipment and labor to install owner provided fire hydrants complete. Contractor shall be responsible for hauling and legal disposal of all excess excavated material. All items of surface restoration shall be incidental to this item. All required rock bedding shall be incidental to this bid item. This work shall be paid per each fire hydrant assembly installed.

NOTE: DISPOSAL OF EXCESS MATERIAL

This City has various projects going on that need various qualities and quantities of fill that may be the closest and most economical haul for disposal. It should be possible to coordinate disposal locations with the City. Contact City Engineer at 573-468-8975 if you have interest in exploring this option further.

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TECHNICAL SPECIFICATIONS

SECTION 1000 - COORDINATION AND SITE CONDITIONS

1. GENERAL

   A. Requirements for coordinating and sequencing the work under the Contract and requirements regarding existing site conditions.

2. SITE CONDITIONS

   A. Information on Site Conditions:

      1. General: Information obtained by the Owner regarding site conditions, topography and subsurface information obtained by the Engineer's investigation of surface and subsurface conditions, shall be considered part of the Contract Documents. Neither the Engineer nor the Owner assumes any responsibility for its accuracy or completeness or for the Contractor's interpretation of such information.

      2. Existing Elevations: Elevations are expected to vary ±0.1 feet from the elevations shown. The Contractor shall verify existing elevations prior to start of new work.

   B. Existing Utilities and Facilities:

      1. Location:

         a. Known utilities and facilities adjacent to or within the work area are shown on the Drawings. The locations shown are taken from existing records and the best information available from existing utility plans; however, it is expected that there may be some discrepancies and omissions in the locations and quantities shown. Those shown are for the convenience of the Contractor only, and no responsibility is assumed by either the Owner or the Engineer for their accuracy or completeness. Contractor's request for additional compensation or Contract time resulting from encountering utilities not shown will be considered incidental to the contract. Excessive delays that affect the “critical path” of project scheduling shall be considered for contract time extensions and additional compensation. This decision shall be made by the Owner.

         b. Contractor shall exercise reasonable care to verify locations of utilities and facilities shown on the drawings and to determine the presence of those not shown. Immediate and adjacent areas where excavations are to be made shall be thoroughly checked by visual examination for indications of underground facilities, and also checked with electronic metal and pipe detection equipment. Where there is reasonable cause to verify the presence or absence of an underground facility, make exploratory excavations prior to proceeding with major excavation in the area.

      2. Preconstruction Survey and Monitoring:

         a. After the Contract is awarded and before starting the work, the Contractor shall perform a preconstruction survey of the site. Make a thorough examination, providing color photographs, and a color videotape in VHS format of all existing buildings, structures and other improvements which might be damaged by the Contractor's operations. The examination shall be made jointly by representatives of the Contractor, the Owner and the Engineer. The scope of the examination and photographs shall include cracks in structures, settlement, leakage, and similar conditions. The Contractor shall be responsible for all documentation, including videocassettes, photos, etc.

         b. The Contractor shall establish vertical and horizontal survey control points on all structures and improvements located in the vicinity of the work prior to beginning work and shall periodically check the points for movements. The Contractor shall furnish the Engineer with copies of the survey notes for each survey and a copy of the layout of the survey control points.

         c. Records of all observations shall be prepared in triplicate by the Contractor. Two copies of each document and photograph and one copy of the videotape shall be provided to the Engineer.

         d. The above records and photographs are intended for use as evidence in ascertaining the extent of any damage, which may occur as a result of the Contractor's operations and are for the protection of the Contractor and the Owner. The records will provide a means of determining whether and to

what extent damage may have occurred as a result of the Contractor's operations. The records will also be utilized to guide the restoration phase of this project.

3. Contractor's Responsibilities:

   a. Where Contractor's operations could cause damage or inconvenience to railway, telegraph, telephone, television, power, oil, gas, water, sewer, or irrigation systems, the Contractor shall make arrangements necessary for the protection of these utilities and services. Replace existing utilities removed or damaged during construction, unless otherwise provided for in these Contract Documents.

   b. Notify utility offices that are affected by construction operations at least 72 hours in advance. Under no circumstances expose any utility without first obtaining permission from the appropriate agency. Once permission has been granted, locate, expose, and provide temporary support for the utilities.

   c. Contractor shall be solely and directly responsible to Owner and operator of such properties for damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of injuries or damage which may result from construction operations under this Contract.

   d. Neither Owner nor its officers or agents shall be responsible to Contractor for damages as a result of Contractor's failure to protect utilities encountered in the work.

   e. In event of interruption to domestic water, sewer, storm drain, or other utility services as a result of accidental damage due to construction operations, promptly notify the proper authority. Cooperate with said authority in restoration as promptly as possible and pay for repair. Prevent interruption of utility service unless granted by the utility owner.

   f. In the event Contractor encounters water service lines that interfere with trenching, obtain prior approval of the water utility, cut the service, dig through, and restore service to previous conditions using equal materials.

C. Interfering Structures:

   1. Take necessary precautions to prevent damage to existing structures whether on the surface, aboveground, or underground. An attempt has been made to show major structures on the drawings. While the information has been compiled from the best available sources, its completeness and accuracy cannot be guaranteed.

   2. Protect existing structures from damage, whether or not they lie within limits of easements obtained by the Owner. Where existing property corners, fences, gates, barns, sheds, buildings, or other structure must be removed to properly carry out work, or are damaged during the work, restore them to original condition and to the satisfaction of property Owner.

   3. Contractor may remove and replace in equal or better than original condition, to the Owner’s satisfaction, small structures such as fences, and signposts that interfere with Contractor's operations, with the prior notification and approval of the Owner.

CI. Connecting to Existing Facilities: Unless otherwise shown or specified, determine methods of connecting new work to existing facilities, and obtain Engineer's review and acceptance of connections.

   1. Determine location, elevation, nature, materials, dimensions, and configurations of existing facilities where necessary for connecting new work.

   2. Inspect existing record drawings and shop drawings, conduct exploratory excavations and field inspections, and conduct similar activities as needed.

   3. Shutdown of Owner's existing facility prior to connection, if necessary, shall be by Owner or as specified.

   4. Prior to beginning connection work, the Contractor shall meet the notice requirements specified herein.

3. PROJECT MEETINGS

A. Preconstruction Conference: See Section 1200, PROGRESS SCHEDULES.

B. Progress Meetings: Engineer will schedule regular progress meetings to review work progress, schedules, and other matters needing discussion and resolution. See Section 1200, PROGRESS SCHEDULES for details on progress meetings.

C. Coordination Meetings: The Engineer will conduct weekly coordination meetings between the Contractor, Owner, and the Engineer for the purposes of discussing and resolving various project elements requiring interface or coordination with the Owner's treatment.

1. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.

D. Time of Work: No work shall be done between 8:00 p.m. and 6:00 a.m., or on Sundays or legal holidays, without notification of the Owner. However, maintenance or emergency work during these hours may be done without prior permission.

E. Overtime Notice: If Contractor for convenience should desire to carry on work at night or outside regular hours, submit written notice to the Engineer and allow ample time for satisfactory arrangements to be made for inspecting work in progress.

4. PAYMENT

A. General:

1. Payment for work in this section will be considered as incidental to the contract.

2. Any extension of contract time that may be granted by the Owner will not of itself constitute a claim for additional payment for work under this section.

END SECTION 1000

SECTION 1100 - SUBMITTALS

1. GENERAL

   A. Requirements and procedures necessary for scheduling, preparation, and submission of submittals.

   B. Individual specifications sections in these Contract Documents contain additional and special submittal requirements.

2. SUBMITTAL PROCEDURES

   A. Owner reserves the right to modify the procedures and requirements for submittals, as necessary to accomplish the specific purpose of each submittal. Direct inquires to Engineer regarding the procedure, purpose, or extent of any submittal.

   B. Review, acceptance, or approval of substitutions, schedules, shop drawings, lists of materials, and procedures submitted or requested by Contractor shall not add to the Contract amount, and additional costs, which may result therefrom, shall be solely the obligation of Contractor.

   C. Owner is not precluded, by virtue of review, acceptance, or approval, from obtaining a credit for construction savings resulting from allowed concessions in the work or materials therefore.

   D. Owner is not responsible to provide engineering or other services to protect Contractor from additional costs accruing from such approvals.

   E. The Contractor shall submit four (4) copies of all technical shop drawings unless otherwise indicated.

3. ADMINISTRATIVE SUBMITTALS

   A. Provide administrative submittals required by the Instructions to Bidders, General Conditions, Job Special Provisions, and as may be specifically required in other parts of the Contract Documents.

4. SCHEDULES

   A. General:

      1. Submit estimated progress schedule and preliminary schedule of submittals to Engineer.

      2. Revise and resubmit as specified, and identify all changes made from previous schedule submittal.

   B. Progress Schedule: See Section 1200, PROGRESS SCHEDULES for requirements.

   C. Schedule of Submittals:

      1. Submit Preliminary and Finalized Schedules of Submittals, in triplicate to the Engineer. Preliminary Schedule of Submittals shall be submitted within 10 days after the date of Notice to Proceed. The Finalized Schedule of Submittals shall be submitted no later than 10 days after the Contractor receives the Engineer's review comments on the Preliminary Schedule of Submittals.

      2. Preliminary Schedule of Submittals: Indicate submittals required by specification section number with brief description, starting and completion dates for respective submittal preparation, and submittal review by Engineer.

      3. Finalized Schedule of Submittals: Furnish sub network to the progress schedule indicating respective progress schedule activity, which sequentially follows the submittal activity.

5. SHOP DRAWINGS

   A. General:

      1. Shop drawings, as defined herein, consist of all drawings, diagrams, illustrations, schedules, and other

data which are specifically prepared by or for the Contractor to illustrate some portion of the work; and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams, and other information prepared by a manufacturer and submitted by Contractor to illustrate material or equipment for distinct portions of the work. The Contractor shall submit, as applicable, the following for all prefabricated or manufactured structural, mechanical, electrical, plumbing, process systems, and equipment:

a. Shop drawings or equipment drawings, including dimensions, size and location of connections to other work, and weight of equipment.

b. Catalog information and cuts.

c. Wiring and control diagrams of systems and equipment.

d. Complete manufacturer's specifications, including materials description and paint system.

e. Suggested spare parts list with current price information.

f. List of special tools required for checking, testing, parts replacement, and maintenance (special tools are those which have been specifically designed or adapted for use on parts of the equipment, and which are not customarily and routinely carried by maintenance mechanics).

g. List of special tools furnished with the equipment.

h. List of materials and supplies furnished with the equipment.

i. Samples of finish colors for selection.

j. Special handling and lubrication instructions.

k. Requirements for storage and protection prior to installation.

l. Requirements for installation and recommended installation procedures.

m. List of all spare parts and tools that shall be provided to the Owner.

2. Submittal of incomplete or unchecked shop drawings will not be acceptable. Shop drawing submittals, which do not clearly show Contractor's review stamp or specific written indication of Contractor review will be returned to Contractor for resubmission.

3. Submittal of shop drawings not required under these Contract Documents and not shown on the schedule of submittals will be returned to Contractor unreviewed and unstamped by Engineer.

4. Shop drawing submittals processed by Engineer do not become Contract Documents and are not Change Orders; the purpose of shop drawing review is to establish a reporting procedure and is intended for Contractor's convenience in organizing the work and to permit Engineer to monitor Contractor's progress and understanding of the design.

5. Delays caused by the need for resubmittal shall not constitute basis for claim.

6. Each submittal will receive up to two reviews by the Engineer at no cost to the Contractor. If a given submittal fails to reach a completed status (reviewed and marked "No Exceptions Taken" or "Make Corrections Noted") on the second submittal, the Contractor shall have the costs associated with further reviews by the Engineer deducted from the contract amount. These costs will be computed based on the Engineer's actual direct labor costs, indirect labor costs, plus profit.

7. Sequentially number the transmittal forms; resubmittals to have original number with an alphabetic suffix.

8. Identify project, Contractor, specification section number, pertinent drawing sheet and detail number(s), products, units and assemblies, and the system or equipment identification or tag number as shown.

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

10. Transmit submittals in accordance with finalized schedule of submittals, and deliver to:

City of Sullivan
Attn: Robert Schaffer, PE
210 West Washington
Sullivan, Missouri 63080

11. Provide space for Engineer review stamp.

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

13. Submittals will be acted upon by Engineer and transmitted to Contractor not later than 10 working days after receipt by Engineer.

14. When shop drawings have been reviewed by Engineer, two copies will be returned to Contractor appropriately annotated. When required by the Engineer's review comments, correct and resubmit the shop drawings in the same manner and quantity as specified for the original submittal.

15. If major changes or corrections are necessary, shop drawings may be rejected and one set will be returned to Contractor with general direction on the requirements of a reviewable submittal.

B. Material and Equipment Colors: Engineer will provide a schedule of selected colors within 30 days after approval of submittals and after receiving samples of the manufacturers' standard colors for those items requiring Owner's selection.

6. SAMPLES AND TEST SPECIMENS

A. Where required in the specifications, and as determined necessary by Engineer, submit test specimens or samples of materials, appliances, and fittings to be used or offered for use in connection with the work. Include information as to their sources, prepay cartage charges, and submit such quantities and sizes for proper examination and tests to establish the quality or equality thereof, as applicable.

B. Submit samples and test specimens in ample time to enable Engineer to make tests or examinations necessary, without delay to the work.

C. Submit additional samples required by Engineer to ensure equality with the original approved sample and/or for determination of specification compliance.

D. Tests required by the specifications to be performed by an independent laboratory shall be made by a laboratory licensed or certified in accordance with state statutes.

1. Submit certified test results of specified tests in duplicate to Engineer.

E. Samples and laboratory services shall be at the expense of Contractor and included in the prices bid for the associated work.

F. Approved sample items (fixtures, hardware, etc.) may be incorporated into the work upon approval and when no longer needed by Engineer for reference.

7. QUALITY CONTROL SUBMITTALS

A. Manufacturers' Certificate(s): Where Manufacturers' Certificate(s) are required in the specifications, the manufacturer shall provide certification stating the following:

1. The product or system has been installed in accordance with the manufacturer's recommendations.

2. The product or system has been inspected by a manufacturer's authorized representative.

3. Applicable safety equipment has been properly installed.

4. Proper electrical and mechanical connections have been made.

5. Proper adjustments have been made and the product or system is ready for functional testing and operation.

B. Certification and Compliance:

1. Where specified, furnish certification of compliance for products specified to a recognized standard or code prior to the use of such products in the work.

a. Engineer may permit use of certain materials or assemblies prior to sampling and testing if accompanied by a certification of compliance.

b. Certifications shall be signed by the manufacturer of the product; state that the components involved comply in all respects with the requirements of the specifications.

c. Furnish certification of compliance with each lot delivered to the jobsite and clearly identify the lot so certified.

2. Products used on the basis of a certification of compliance may be sampled and tested at any time. The fact that a product is used on the basis of a certification of compliance shall not relieve Contractor of responsibility for incorporating products in the work, which conforms to requirements of the Contract Documents. Products not conforming to such requirements will be subject to rejection whether in-place or not.

3. Engineer reserves the right to refuse permission for use of products on the basis of a certification of compliance.

C. Functional Test Certification: Where functional testing is specified for certain equipment, Contractor (as applicable to the equipment furnished) shall state in writing that:

1. Necessary electrical and piping systems have been successfully tested.

2. In completing the recommended spare parts list portion of the Equipment Data Form, the data provided in the "Part No." and "Description" columns shall be consistent with the terminology used in the equipment manufacturer's Bill of Material/Parts List provided with the O & M Manuals. Spare parts provided by this Contract must be identified by placing two asterisks after the part number. The term "Unit" is the unit of measure for ordering the part, e.g. each, lot of 3, box of 100, etc. The term "Quantity" is the number of units recommended. The term "Unit Cost" is the purchase price of a unit at the time the Equipment Data Form is completed.

8. CONTRACT CLOSEOUT SUBMITTALS

A. Record Drawings:

1. Submit complete sets of reproducible final shop drawings before, or at the time of, delivery of equipment to the site.

2. Submit complete set of “As-Built” drawings recording all changes made during construction. “As-Built” drawings shall be reproducible and in good condition.

B. O & M Manuals:

1. Submit final revised O & M Manual incorporating field testing results and additional instructions deemed necessary by Engineer after testing and startup.

2. Revise and resubmit manuals, or portions of manuals, found to be missing or incomplete from Engineer's punch list.

9. CONSTRUCTION PHOTOGRAPHS

A. The Owner and/or his authorized agents will take construction progress photographs as the work progresses. The Contractor will be advised of the Owner's schedule and may accompany the Owner's photographer. One copy of the construction progress photographs will be provided to the Contractor upon request. The Owner/Engineer reserves all rights to take other photographs and videotapes of the construction work.

10. PAYMENT

A. General:

1. Payment for work in this section will be considered as incidental to the contract.

2. Any extension of contract time that may be granted by the Owner will not of itself constitute a claim for additional payment for work under this section.

END SECTION 1100

SECTION 1200 - PROGRESS SCHEDULES

1. GENERAL

   A. Detailed scheduling requirements and procedures including preparation and overall schedule.

   B. Preconstruction conference requirements.

   C. Monthly progress report requirements.

2. SUBMITTALS

   A. Submit the following items as specified in this section:

      1. Overall schedule
      2. Network diagrams
      3. Progress reports
      4. Cash flow summary

3. PROGRESS OF THE WORK

   A. General:

      1. Execute work with such progress as necessary to prevent delay to the overall completion of the project.

      2. Execute work at such times and on such parts of the project, and with such forces, materials, and equipment, to assure completion in the time established by the Contract.

4. PRECONSTRUCTION CONFERENCE

   A. A preconstruction conference shall be held as soon as possible after the award of the Contract but before the Notice to Proceed. Contractor shall meet with Owner and Engineer for discussion of scheduling requirements, procedures for handling shop drawings and other submittals, processing application for payment, and establishing a working understanding among the parties. The conference shall be held at the jobsite or at a location selected by the Owner. The conference shall be attended by:

      1. Contractor's office representative.

      2. Contractor's general superintendent.

      3. Subcontractor's representative whom Contractor may desire or Engineer may request to attend.

      4. Engineer's representative.

      5. Owner's representative.

      6. Representative of utility companies.

5. OVERALL SCHEDULE

   A. General:

      1. Contractor shall prepare and submit, within 10 days after the award of Contract, an Overall Schedule comprised of all construction operations in connection with the Contract.

      2. Overall Schedule shall indicate the sequence of work and the time of starting and completion of each activity. Activities shall include, but not be limited to, the following items as they pertain to the Contract.

         a. Each subcontractor's items of work.

b. Shop drawing submittal from Contractor, checking and coordination, submittal to the Engineer, review, and return to Contractor.

c. Material and equipment order, manufacture, delivery, installation, and checkout.

d. Move in and site preparation.

e. Concrete placement sequence.

f. Backfilling, grading, seeding, paving, etc.

g. Electrical activities.

h. Plumbing and piping activities.

i. Final cleaning.

j. Allowable for inclement weather.

3. The Overall Schedule shall show all stipulated milestone dates, constraints, substantial completion and final completion dates.

B. Network Diagram:

1. The Contractor shall submit a time-scaled network diagram as part of the Overall Schedule. Draw or print the network diagram on reproducible paper, not larger than 24 inches by 36 inches, and show the sequence and interdependence of activities required for complete performance of all items of work.

2. Produce a legible and accurate diagram. Group activities related to a specific physical area of the project for ease of understanding and simplification. Label each activity with a complete description as well as estimated duration in working days.

3. Activity durations shall be not less than 1 day or more than 30 working days, unless otherwise approved by the Engineer, except for Engineer's submittal review and material and equipment fabrication/delivery.

4. Indicate critical path of activities on the network diagram.

5. Contractor(s) shall not be permitted to sequester shared float through such strategies as extending duration estimates to consume available float time, extensive crew/resource sequencing, etc.

C. Schedule Reports:

1. Prepare schedule listings of the information in the network diagram in tabular format, sorted according to:

a. Early-start, within responsibility.

b. Early-start.

c. Activity number sequence.

d. Activity number sequence with predecessor and successor activity.

2. Schedule listings shall show activity numbers, description, responsibility, total duration in workdays, percent complete, early-start date, late-start date, early-finish date, and total float for each activity in the network diagram.

3. Overall Schedule and subsequent revisions shall reflect actual progress of the project to within 5 working days prior to submittal. The Contractor shall sign and submit three copies of the initial Overall Schedule and each revision.

4. If initial submittal or a subsequent revision does not meet the requirements specified, Contractor shall

revise the Overall Schedule and resubmit until it is acceptable to the Engineer. Failure to submit and adequately update the Overall Schedule, including network diagram and schedule reports, will be considered cause for withholding partial payments otherwise due under the Contract.

D. Progress Reports:

1. Once each month on a date mutually agreed upon by the Contractor, Owner and Engineer, a jobsite progress meeting will be held at which time the schedule will be reviewed. Immediately prior to the meeting, Contractor shall obtain the necessary information to update the Overall Schedule to reflect progress to date. Furnish sufficient copies of the updated schedule at the meeting for review.

2. In updating the schedule, progress will be reviewed:

   a. To identify those activities started and completed during the previous period.

   b. For remaining duration, from the date of update, required to complete each activity started but not completed.

   c. For review of remaining durations for selected activities not yet started.

   d. For addition of Change Orders and proposed sequencing changes to the network diagram and schedule listings.

3. At least once each month, and utilizing data accumulated during the previous joint Owner-Engineer-Contractor reviews, the Contractor shall revise the network diagram and the Overall Schedule and generate updated schedule reports. Also, revise and submit the network diagram and schedule reports when one of the following conditions occur:

   a. Delay in completion of a work item or sequence of work items causes an estimated extension of project completion by 15 or more working days.

   b. Delays in submittals, deliveries, or work stoppages are encountered which require replanning rescheduling of work.

   c. Schedule no longer represents actual prosecution and progress of work.

4. Whenever revised scheduling documents are submitted, they shall be accompanied by a written Narrative Report which shall:

   a. Describe amount of progress since the last revision in terms of activities started, continuing, and completed.

   b. Describe problem areas, current and anticipated delay factors, and their estimated impact on performance of other activities and completion dates.

   c. Explain corrective action taken or proposed.

E. Acceleration:

1. If at any time during the project the Contractor fails to complete an activity by its latest scheduled completion date, which late completion will impact the end date of the work part of the Contract completion date, submit within 7 calendar days plans to reorganize the work force to return to the current schedule.

2. The Owner may require Contractor to add construction forces, as well as increase working hours, if operations fall behind schedule at any time.

3. Addition of equipment or construction forces, increasing working hours, or other method, manner, or procedure to return to the contractually required completion date will not be justification for Contract modification or treated as an acceleration.

4. Contractor shall plan, schedule, and coordinate construction operations and activities in a manner that will facilitate progress of work.

6. CASH FLOW

A. Contractor shall submit a cash flow summary with the initial Overall Schedule submittal and each monthly update. Cash flow summary shall be based on the submitted Overall Schedule and equal in total the Contractor's bid plus approved Contract modifications. Include expected payment requests for each month, as well as cumulative payment requests to date after deducting retainage. Failure to submit and adequately update an acceptable cash flow summary will be considered cause for withholding partial payments otherwise due under the Contract.

7. PAYMENT

A. General:

1. Payment for work in this Section will be considered incidental to the contract.

2. Any extension of contract time that may be granted by the Owner will not of itself constitute a claim for additional payment for work under this section.

END SECTION 1200

SECTION 1300 - PRODUCT SHIPMENT, HANDLING, STORAGE & PROTECTION

1. GENERAL

   A. Requirements and procedures for work necessary for shipment handling, storage, and protection of material and equipment products.

2. SUBMITTALS

   A. Contractor shall submit the following:

      1. Assembly instructions for parts shipped unassembled.

      2. Manufacturer's instructions for unloading, handling, storage, and protection prior to installation, with each shipment of each product type.

      3. Copy of manufacturer's notice of shipment for products critical to project schedule.

      4. Statements of new products delivered each week.

      5. Documentation of products in storage, submitted with each progress payment request.

3. PREPARATION FOR SHIPMENT

   A. When practical, products shall be factory assembled.

      1. Furnish assembly instructions for parts and assemblies that are shipped unassembled.

      2. Mark or tag the separate parts and assemblies for field assembly.

      3. Cover machined and unpainted parts that may be damaged by the elements with a strippable protective coating.

   B. Package or crate products to provide protection from damage during shipping, handling, and storage.

      1. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, name of project and Contractor, equipment number, and approximate weight.

   C. Mark spare parts and special tools to identify the associated products by name, equipment, and part number. Package parts for protection against damage from the elements during shipping, handling, and storage. Ship in boxes or containers marked to indicate the contents and as stated above. Deliver spare parts and special tools before the associated equipment is scheduled for the initial test run.

   D. Where specified for specific product, factory test results shall be reviewed and accepted before such product is shipped.

4. RECEIVING, INSPECTION, AND UNLOADING

   A. Contractor shall record the receipt of products at the jobsite.

   B. Upon receipt of products at the jobsite, Contractor shall inspect for completeness and evidence of damage during shipment.

      1. Owner or Engineer and manufacturer's representative may be present for inspection.

      2. Should there appear to be damage, notify the Engineer immediately and inform the manufacturers and the transportation company.

      3. Expedite replacement of damaged, incomplete, or lost items.

   C. After completion of inspection, unload products in accordance with manufacturer's instructions for unloading,

or as specified. Do not unload damaged or incomplete products to be returned to manufacturer for replacement, except as necessary to expedite return shipment.

5. HANDLING, STORAGE, AND MAINTENANCE

A. Handle products in accordance with the manufacturer's written recommendations, and in a manner to prevent damage.

B. Store products prior to installation as recommended by the manufacturer.

1. Store products such as pipe and reinforcing steel off the ground in approved storage yards.

2. Store items subject to damage by the elements, vandalism, or theft in secure buildings.

3. Provide environmentally controlled storage facilities for items requiring environmental control for protection.

C. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by Owner.

6. PAYMENT

A. General:

1. Payment for work in this section will be considered as incidental to the contract.

2. Any extension of contract time that may be granted by the Owner will not of itself constitute a claim for additional payment for work under this section.

END SECTION 1300

SECTION 1400 - CONTRACT CLOSEOUT

1. GENERAL

   A. Procedures to be followed in closing out the Contract.

2. FINAL SUBMITTALS

   A. No Contract will be finalized until all of the following have been submitted as required in Section 1100, SUBMITTALS:

      1. Final shop drawings.
      2. Record drawings.
      3. Interface information.
      4. Operation and Maintenance Manuals.
      5. Equipment maintenance summaries.
      6. Manufacturer's certification of proper installation.
      7. Material certification for each item provided stating that it meets the requirements of the Specifications.
      8. Sewer “as-builts” as specified by the Metropolitan St. Louis Sewer District (if required).

   B. No Contract will be finalized until all guarantees, bonds, certifications, licenses, and affidavits required for work or equipment as specified are satisfactorily filed with the Engineer and Owner.

3. RELEASE OF LIENS OR CLAIMS

   A. No Contract will be finalized until satisfactory evidence of release of liens has been submitted to Owner as required by the General Conditions.

4. PRODUCTS

   (Not Used)

5. EXECUTION

   A. FINAL CLEANING. At completion of work and immediately prior to final inspection, clean entire project according to the following provisions:

      1. Clean, sweep, wash, and polish work and equipment provided under the Contract, including finishes. Leave the structures and site in a complete and finished condition to the satisfaction of the Engineer.

      2. Should Contractor not remove rubbish or debris or not clean the facilities and site as specified above, the Owner reserves the right to have final cleaning done at the sole expense of the Contractor.

   B. The Contractor shall:

      1. Employ experienced workers or professional cleaners for final cleaning.

      2. Conduct final inspection of exposed interior and exterior surfaces and of concealed spaces.

      3. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from exposed interior and exterior finished surfaces; polish surfaces designed to shine finish.

      4. Repair, patch, and touch up marred surfaces to specified finish, and match adjacent surfaces.

      5. Broom clean paved surfaces; rake clean other surfaces.

      6. Remove from the Owner's property temporary structures and materials, equipment, and appurtenances not required as part of, or appurtenant to, the completed work.

7. Leave watercourses, gutters, and ditches open and in condition satisfactory to Engineer.

6. FINAL INSPECTION

A. After final cleaning and upon written notice from Contractor that the work is completed, Engineer will make preliminary inspection with the Owner and Contractor present. Upon completion of preliminary inspection, Engineer will notify Contractor in writing of particulars in which the completed work is defective or incomplete.

B. Upon receiving written notice from Engineer, Contractor shall immediately undertake work required to remedy defects and complete the work to the satisfaction of Engineer.

C. After the items as listed in Engineer's written notice are corrected or completed, inform Engineer in writing that required work has been completed. Upon receipt of this notice, Engineer, in the presence of Owner and Contractor, will make final inspection of the project.

7. PAYMENT

A. General:

1. Payment for work in this section will be considered as incidental to the contract.

2. Any extension of contract time that may be granted by the Owner will not of itself constitute a claim for additional payment for work under this section.

END SECTION 1400

SECTION 1500 – MOBILIZATION

1. MOBILIZATION

Mobilization 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 except as provided in the contract as separate pay items; 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.

A. GENERAL

1. QUALITY ASSURANCE. The Engineer shall have the right to reject construction tools, equipment, materials, and supplies that are, in their opinion, unsafe, improper, or inadequate. The contractor shall bring rejected tools, equipment, materials, and supplies to acceptable conditions or remove them from the project site.

2. DELIVERY. Delivery to the project site of construction tools, equipment, materials, and supplies shall be accomplished in conformance with local governing regulations.

B. EXECUTION

Provide personnel, construction tools, equipment, materials, and supplies that will facilitate the timely execution of the work. Upon completion of the work, remove construction tools, apparatus, equipment, unused materials and supplies, plants, and personnel from the project site.

2. MEASUREMENT

This work will not be measured for payment, but will be considered a lump sum unit. The work will include the removal of all items, regardless of whether the items are shown on the plans or encountered during construction.

3. PAYMENT

A. These prices shall be full compensation for the execution of the pay items indicated including all material, equipment, labor and incidentals necessary to complete these items, including disposal off site.

B. Mobilization: Partial payments will be allowed on the payment estimates as follows:

1. When 5 percent or more of the original contract amount is earned, 25 percent.

2. When 10 percent or more of the original contract amount is earned, an additional 25 percent.

3. When 25 percent or more of the original contract amount is earned, an additional 25 percent.

4. When 50 percent or more of the original contract amount is earned, the final payment.

Nothing herein shall be construed to limit or preclude partial payments otherwise provided by the contract.

C. Any extension of contract time that may be granted by the Owner will not of itself constitute a claim for additional payment for work under this section.

ITEM: 1500.1 MOBILIZATION – LUMP SUM

END SECTION 1500

SECTION 2000 – CLEARING, GRUBBING AND STRIPPING

1. GENERAL

   A. This section covers the work necessary to removal all interfering or objectionable material from the designated areas of work as shown on the drawings or designated in the specifications.

   B. This work shall also include the preservation from injury or defacement of all vegetation and existing objects designated to remain, as shown or as specified herein.

   C. Review with the Engineer the location, limits, and methods to be used prior to commencing the work under this section.

   D. Provide all equipment and materials, suitable and in adequate quantity, required to accomplish the work as specified herein.

2. DEFINITIONS

   A. Clearing. Clearing shall consist of cutting, removing, and disposing of trees, snags, stumps, shrubs, brush, limbs, and other vegetative growth, and shall be performed in such a manner as to remove all evidence of their presence from the surface and shall be inclusive of sticks and branches greater than 2 inches in diameter or thickness.

   B. Grubbing. Grubbing shall consist of the removal and disposal of wood or root matter up to 18” below the ground surface remaining after clearing and shall include stumps, trunks, roots or root systems greater than 2 inches in diameter or thickness.

   C. Stripping shall include the removal and disposal of all organic sod, topsoil, grass and grass roots, and other objectionable material remaining after clearing and grubbing from the areas designated to be stripped. The exact depth of stripping will be adjusted to minimize the amount of topsoil in the strippings.

   D. Disposal. The contractor shall dispose of all trees, stumps, brush, roots and all other objectionable matter removed in the clearing grubbing and stripping process. Open burning will not be allowed.

3. MEASUREMENT

   A. This work will not be measured for payment, but will be considered a lump sum unit. The work will include the removal of all items, regardless of whether the items are shown on the plans or encountered during construction.

4. PAYMENT

   A. Payment for work specified in this section will be made as part of the lump sum bid amount stated in the Contract. If no lump sum unit price is included in the contract, the work required to complete the contract, or as directed by the engineer, will be considered incidental to the work and no direct payment for the work will be made. Any work as described in this section that is performed outside of the limits shown in the drawings is considered incidental and must be approved by the Owner prior to starting the work.

ITEM: 2000.1 CLEARING, GRUBBING AND STRIPPING – LUMP SUM

END SECTION 2000

SECTION 2350 – EROSION CONTROL

1. GENERAL

A. This work shall consist of furnishing, installing, maintaining and removing temporary pollution, erosion and sediment control measures; furnishing and placing permanent erosion control features; or a combination of both as shown on the plans or as directed by the engineer.

2. SUBMITTALS

A. Prior to the preconstruction conference and the start of construction, the contractor shall submit schedules for the implementation of temporary and permanent erosion control work, as applicable, for construction operations. No work shall start until the erosion control schedules and methods of operations have been approved by the Engineer.

3. GENERAL CONSTRUCTION

A. The engineer may direct the contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other bodies of water. Such work may involve the construction of temporary berms, dikes, dams, sediment basins and slope drains, and use of temporary mulches, seeding or other control devices or methods as necessary to control erosion and pollution.

B. If the engineer determines ditch checks, as shown on the plans, are not suitable due to site conditions, a combination of ditch checks and erosion control blankets or rock blankets shall be designed to effectively reduce flow velocities.

C. The contractor shall exercise effective management practices throughout the life of the project to control pollution. Pollutants such as chemicals, fuels, lubricants, bitumen, raw sewage or other harmful material shall not be discharged on or from the project. Temporary pollution control measures, such as storage and handling of petroleum products and other pollutants, shall be coordinated with temporary and permanent erosion control features specified in the contract to ensure economical, effective and continuous erosion and pollution control. These requirements will also apply to work within easements designated by the Owner.

D. The contractor shall incorporate all permanent erosion and pollution control features into the project at the earliest practical time. Temporary measures shall be used to correct conditions that develop during construction which were not foreseen during the design stage, that are needed prior to installation of permanent pollution control features, or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

E. Clearing and grubbing operations shall be scheduled and performed such that grading operations and erosion control features will follow immediately thereafter.

F. Erosion from construction operations and pollution control measures shall not cause water pollution. In the event of conflict between these requirements and the pollution control laws, rules or regulations of other federal, state or local agencies, the more restrictive laws, rules or regulations will apply.

G. Unless otherwise specified, or directed by the engineer, all temporary erosion control measures shall be removed by the contractor after permanent erosion control measures are established.

4. TEMPORARY BERMS

Temporary berms shall consist of graded material from within the project limits or any other suitable material approved by the engineer and shall be constructed to the approximate dimensions shown on the plans.

A. Type A Berms: shall be machine compacted with a minimum of one pass over the entire width of the berm.

B. Type B Berms: shall be machine compacted with a minimum of three passes over the entire width of the berm. Material removed from Type B berms shall be incorporated in the embankment when possible. The contractor shall remove and dispose of any excess or unsuitable material to a location approved by the engineer.

Type A and Type B Berms. Temporary berms shall drain to a compacted outlet at a slope drain. On transverse berms, the top width of the berms may be wider and the sideslopes flatter to allow equipment to pass over these berms with minimal disruption.

C. Type C Berms: shall be constructed of rock base material as approved by the engineer. Vegetative mulch or an equivalent erosion control blanket shall be placed on the upslope side of the Type C berm. The vegetative mulch shall be placed in such a manner that the final compacted thickness is 2 inches. The straw layer or equivalent erosion control blanket shall be removed and replaced as directed by the engineer.

5. TEMPORARY SLOPE DRAINS

This work shall consist of constructing and maintaining temporary slope drains to carry water down slopes and to reduce erosion. The method selected shall be approved by the engineer prior to construction.

A. The contractor shall provide temporary, impermeable slope drains to carry water or water with suspended solids down fill slopes until permanent erosion control measures are established. The contractor shall provide temporary slope drains on fill slopes at approximately 500-foot intervals or as directed by the engineer. All temporary slope drains shall be adequately anchored to the slope to prevent disruption of flow. Inlet ends shall be properly constructed to channel water into the temporary slope drain. Outlet ends shall have some means of dissipating the energy of the water to reduce erosion downstream. The contractor shall restore the site of the slope drains to the satisfaction of the engineer.

6. TEMPORARY DITCH AND INLET CHECKS

This work shall consist of constructing and maintaining temporary ditch and inlet checks, removing sediment deposits from these checks and disposing of the sediment at a location approved by the engineer.

A. Materials

1. Posts: Wood, steel or synthetic posts may be used. Posts shall be of sufficient length, but no less than 4 feet, to ensure adequate embedment while fully supporting the silt fence and shall have sufficient strength to resist damage during installation and to support applied loads while in service.

2. Support Fence: All geotextile silt fences shall be supported either externally by wire or other approved mesh to a height of at least 24 inches or by a suitably designed support system capable of keeping the material erect. Either method shall be strong enough to withstand applied loads.

B. Type I Ditch Checks: shall be constructed of straw bales, silt fence or an approved alternative erosion control measure as specified in the contract. Type I ditch checks shall not be used where drainage areas exceed 3 acres or where ditch slopes exceed 10 percent. Type II ditch checks may be substituted for Type I ditch checks at the contractor’s expense. Straw bale and silt fence ditch checks shall be constructed as shown on the plans in accordance with the contract documents. Approved alternate Type I ditch checks shall be installed and maintained according to the manufacturer's recommendations.

C. Ditch Checks: Approved alternate Type II ditch checks may be used as shown in the contract. Type II ditch checks shall not be used where drainage areas exceed 50 acres or where ditch slopes exceed 10 percent.

D. Rock Ditch Checks: shall be constructed with clean rock. A minimum of 50 percent of the rock shall have a diameter of 6 inches or greater, with a maximum size of 9 inches. Silt fence or an equivalent filter fabric shall be placed beneath the rock ditch check as shown on the plans.

E. Sand Bag Ditch Checks: Sand or rock for sand bags shall be a uniform granulation with a maximum aggregate size of 2 inches, shall be clean to allow percolation of water through the sand bag and shall meet the approval of the engineer. Sand bags shall be of tightly woven burlap or other material that is sufficiently durable to remain intact for the time intended. Sand bags shall be filled approximately three-fourths full, shall laid in horizontal courses, and successive courses shall break joints with preceding ones. The bags shall be packed against each other and tamped to provide a uniform surface.

F. Drop Inlet Checks: shall be constructed adjacent to the drop inlet as shown on the plans or as directed by the engineer, as necessary to prevent sediment from entering the inlet. Material shall be in accordance with the requirements of the Type II Ditch Checks or as approved by the engineer.

G. Maintenance: The contractor shall replace checks as directed by the engineer. Periodic sediment removal shall include removal and disposal of sediment to a location where sediment will not erode into construction areas, streams or other bodies of water. The contractor shall inspect the ditch checks for sediment accumulation after each storm event and shall remove the sediment when deposits reach approximately

one-half the original height of the check. Alternate temporary erosion control methods shall be maintained in accordance with the manufacturer and as directed by the engineer.

7. SEDIMENT BASINS

This work shall consist of constructing sediment basins as shown on the plans or as directed by the engineer to detain sediment. This work shall also include disposal of excavated material, sediment and basin removal and site restoration.

A. The area where a sediment basin is to be constructed shall be cleared of vegetation to enable sediment removal. The sediment basin shall be an excavated or dammed storage area with defined side slopes. Inlet and outlet areas shall be lined with rock riprap.

B. The inlet of a sediment basin shall be constructed with a wide cross-section and a minimum grade to prevent turbulence and to allow deposition of soil particles. When the depth of sediment reaches one-half the original depth of the sediment basin in any part of the pool, all accumulation shall be removed.

C. The contractor shall dispose of accumulated sediment and excavated material removed during the construction of the sediment basin in locations where the material will not erode into the construction areas, streams or other bodies of water.

D. Sediment basins shall remain in service until all disturbed areas draining into the structure have been satisfactorily stabilized. When use of a temporary sediment basin is to be discontinued, the contractor shall remove any sediment and backfill, properly compact all excavations, restore the area to the existing ground's natural or intended condition, and sod.

8. TEMPORARY SEEDING AND MULCHING

This work shall consist of furnishing and applying fertilizer, seed, vegetative mulch or other acceptable cover authorized by the engineer. This work shall produce a quick ground cover to reduce erosion in disturbed areas expected to be redisturbed at a later date. Finish grading of areas will not be required. Hydraulic seeding and fertilizing will be permitted.

A. Seeding and mulching shall be a continuous operation on all cut and fill slopes, excess material sites and borrow pits during the construction process. All disturbed areas shall be seeded and mulched as necessary to eliminate erosion.

B. The contractor shall provide permanent sodding as shown on the plans following temporary seeding.

C. Temporary seeding mixtures of cereal grains shall be applied at a rate of 100 pounds per acre (110 kg/ha). All erodible seeded areas shall provide a minimum of 20 plants of the species planted per square foot on at least two random counts per acre in representative areas of the field. For areas with a large percentage of rock, the number of living plants shall be proportional to the percentage of erodible surface, as determined by the engineer. The counts will be conducted 60 days after the species is planted.

D. Fertilizer shall be applied at a rate of 40 pounds nitrogen (N) per acre.

9. SILT FENCE

This work shall consist of furnishing, installing, maintaining, removing and disposing of a silt fence designed to remove suspended particles from sheet flow passing through the fence and to prevent sediment from polluting nearby streams or other bodies of water. At the engineer's discretion, the location may be modified to fit field conditions. Such variations in quantity will not be considered as a change in work.

A. Materials

1. Posts: Wood, steel or synthetic posts may be used. Posts shall be of sufficient length, but no less than 4 feet, to ensure adequate embedment while fully supporting the silt fence and shall have sufficient strength to resist damage during installation and to support applied loads while in service.

2. Support Fence: All geotextile silt fences shall be supported either externally by wire or other approved mesh to a height of at least 24 inches or by a suitably designed support system capable of keeping the material erect. Either method shall be strong enough to withstand applied loads.

3. Prefabricated Fence: Prefabricated fence systems may be used if the systems meet all of the above material requirements.

B. Straw Bales: The contractor shall place bales at the bottom of embankment slopes or on the lower side of cleared areas to divert runoff and to detain sediment from sheet flow. When used to divert runoff or detain sediment, the bales shall be adequately anchored to withstand the applied load.

C. Fabric Fence: The contractor shall install silt fence as shown on the plans and at other locations directed by the engineer. Fence construction shall be adequate to handle the stress from hydraulic and sediment loading. Fabric at the bottom of the fence shall be buried a minimum of 6 inches to prevent flow under the barrier. The trench shall be backfilled, and the soil compacted over the fabric. Fabric splices with a minimum 2-footoverlay shall be located only at a support post. Any installation method acceptable to the engineer will be allowed as long as the effectiveness and intent of the silt fence is achieved.

D. Post spacing shall not exceed 5 feet. Posts shall be driven a sufficient depth into the ground or placed on closer spacing as necessary to ensure adequate resistance to applied loads.

E. The silt fence shall be fastened securely to the upslope side of the post. When wire support fence is used, the wire shall extend into the trench a minimum of 2 inches.

F. Maintenance: The contractor shall maintain the integrity of silt fences as long as the fences are necessary to contain sediment runoff. The contractor shall inspect all silt fences immediately after each rainfall and at least daily during prolonged rainfalls. Any deficiencies shall be immediately corrected by the contractor. In addition, the contractor shall make a daily review of the silt fences in areas where construction activities have changed the natural contour and drainage runoff to ensure the silt fences are properly located for effectiveness. Where deficiencies exist, additional silt fences shall be installed as approved or directed by the engineer.

G. Sediment: The contractor shall remove and dispose of sediment when accumulations reach approximately one-half the fence height, or sooner when directed by the engineer. If required by heavy sediment loading, a second silt fence shall be installed as directed by the engineer.

H. Removal: The silt fence shall remain in place until removal is directed by the engineer. Upon removal, the contractor shall remove and dispose of any excess silt accumulation, grade and dress the area to the satisfaction of the engineer, and establish vegetation on all bare areas in accordance with the contract requirements. The fence material shall remain the property of the contractor.

10. TEMPORARY PIPE

This work shall consist of installing and removing temporary pipe utilized to carry water under temporary roadways, silt fences, berms or other locations determined by the engineer and to prevent the contractor's equipment from coming in direct contact with water when crossing an active stream, intermittent streams created during heavy rainfalls or other bodies of water. Any pipe approved by the engineer may be used.

A. Installation of temporary pipe shall be in accordance with the specifications for permanent pipe and shall prevent water from causing erosion around the pipe. All backfill material for pipes shall be placed in 6-inch lifts and mechanically compacted. Compaction tests will not be required. Temporary pipe placed in intermittent or active streams shall be backfilled with clean rock.

11. TEMPORARY EROSION CONTROL BLANKETS

This work shall consist of furnishing and placing erosion control blankets on slopes or ditches for short-term or long-term protection of seeded areas at locations shown on the plans or as directed by the engineer.

A. Erosion control blankets shall be used as designated in the contract or as approved by the engineer. The contractor shall provide prequalified erosion control blankets of the class and type specified in the contract documents or as approved by the engineer. Erosion control blankets shall be installed and maintained according to the manufacturer's recommendations.

12. TEMPORARY STREAM CROSSING

This work shall consist of constructing a temporary stream crossing to facilitate the movement of equipment across a stream.

A. The contractor shall be responsible for the design, installation, maintenance and removal of the temporary stream crossing and any structures installed for the construction of the temporary stream crossing. Appropriate measures shall be taken to maintain near normal downstream flows and to minimize flooding upstream. The temporary stream crossing shall be constructed to permit the free movement of the stream's aquatic life.

B. Prior to construction of the temporary stream crossing, all information shall be submitted to the engineer as needed for the issuance or modification of the Corps of Engineer permit. The contractor shall not begin construction on any temporary stream crossing without written permission from the engineer.

C. All approaches to the temporary stream crossing shall be maintained such that all storm water runoff is diverted to retention devices.

D. When the temporary stream crossing is no longer needed, the crossing shall be removed as soon as possible and the area shall be restored to pre-project conditions or to the satisfaction of the engineer.

13. GENERAL MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

14. METHOD OF MEASUREMENT

A. Erosion Control. This work will not be measured for payment, but will be considered a lump sum unit. The work will include all items, regardless of whether the items are shown on the plans or encountered during construction.

15. PAYMENT

A. If there is no quantity shown in the bidding schedule, the work covered by this section shall be considered as a subsidiary obligation of the Contractor covered under the other contract items.

B. Erosion Control. Payment shall be at the unit price or lump sum price as herein indicated. This price shall be full compensation for the execution of the pay items indicated including all material, furnishing equipment, labor, tools and incidentals necessary to complete these items.

ITEM: 2350.1 EROSION CONTROL – LUMP SUM

END OF SECTION 2350

SECTION 02630 - STORM DRAINAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Storm sewer drainage piping, fittings, and accessories.
2. Storm drainage structures.

1.2 Related Requirements:
1. Section 02300 – Earthwork: Excavation, trenching, backfill, and compaction.
2. Section 02350 – Erosion and Sedimentation Control.

1.3 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

B. American Association of State Highway and Transportation Officials (AASHTO):
1. AASHTO M 190 - Bituminous Coated Corrugated Metal Culvert Pipe and Arches.

C. ASTM International (ASTM):
1. ASTM A 760 - Corrugated Steel Pipe, Metallic-Coated For Sewers And Drains.
2. ASTM A 796 - Structural Design Of Corrugated Steel Pipe, Pipe-Arches, And Arches For Storm And Sanitary Sewers And Other Buried Applications.
3. ASTM A 798 - Factory-Made Corrugated Steel Pipe For Sewers And Other Applications.
4. ASTM A 929 - Steel Sheet, Metallic-Coated By The Hot-Dip Process For Corrugated Steel Pipe.

1.4 SUBMITTALS

A. Project Record Documents:
1. Accurately record actual locations of pipe runs, connections, catch basins, cleanouts, and invert elevations.
2. Identify and describe unexpected variations to subsoil conditions and location of uncharted utilities.

1.5 PROJECT CONDITIONS

A. Coordinate work with the Owner.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Pipe and joint materials specified below for storm drainage shall be strictly limited to the extent shown or allowed on the drawings or as specified in Part 3 hereinafter.

B. Corrugated Steel (Metal) Pipe (CSP or CMP): ASTM A 760, pipe gauge shall be as shown on the drawings. Galvanized, aluminized (Type 1R), or bituminous coated as specified on Drawings. Use only where specifically indicated on Drawings. Corrugated steel pipe may be round pipe, arch pipe, or slotted drainpipe as indicated on Drawings. Slotted drainpipe shall have 1.75-inches wide drain waterway openings and 6 inches minimum height drain guide.
1. CSP, bands and appurtenances shall be uniformly coated inside and outside with a 0.05 inch minimum thickness bituminous coating in accordance with AASHTO M 190.
2. CSP shall be supplied with paved inverts or fully lined to provide a smooth interior, smooth flow lining only as indicated on the drawings.
3. Joint Material:
   a. Semi-corrugated “Hugger” type bands and “O” ring gaskets.
   b. Semi-corrugated “Hugger” type bands.

C. Spiral Rib Metal Pipe: ASTM A760 Type 1R or Type IIR. Coatings shall meet requirements of ASTM A 929 and shall be galvanized, aluminized, or bituminous coated as specified on Drawings. Use only where specifically indicated on Drawings.

1. Pipe gauge shall be as shown on the construction drawings. Standard corrugated steel pipe (CMP or CSP) shall not be substituted for Spiral Rib Metal Pipe.
2. Acceptable manufacturers: Provide the following or approved equal:
   a. Ultra Flo or Ultra Flo II by Contech, Inc.
   b. Max Flow by Southeast Culvert, Inc.
   c. Max Flow by St. Regis Culvert, Inc.
   d. Max Flow by Thompson Culvert, Inc.
3. Joint Material: Provide joints to the extent allowable in Part 3 Joints.
   a. Semi-corrugated “Hugger” type bands and “O” ring gaskets.
4. Semi-corrugated “Hugger” type bands.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that trench cut and excavation is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

A. Hand trim excavations to required elevations. Correct over-excavation with bedding material.

B. Remove large stones or other hard matter that could damage piping or impede consistent backfilling or compaction.

C. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.

3.3 INSTALLATION – PIPE

A. Install type of pipe shown on the drawings. Where type of pipe material is not shown or restricted on the drawings, provide only RCP or DIP. Installation provisions herein shall apply to the extent as applicable to the pipe and joints allowed.

B. Inspect pipe for defects and cracks before being lowered into the trench, piece by piece. Remove and replace defective, damaged or unsound pipe or pipe that has had its grade disturbed after laying. Protect open ends with a stopper to prevent earth or other material from entering the pipe during construction. Remove dirt, excess water, and other foreign materials from the interior of the pipe during the pipe laying progress.

C. Excavate pipe trench and place bedding material in accordance with Section 02300.

D. Install pipe in accordance with manufacturer’s written recommendations.

E. Corrugated or Spiral Rib Metal Pipe: Install as indicated on the drawings, as recommended by the manufacturer, and in accordance with ASTM A 798 and A 796 as they apply.

F. HDPE Pipe: Install pipe in accordance with pipe manufacturer's installation Guidelines for Culvert Storm Drainage Applications and as indicated on the drawings.

G. Commence installation at the lowest point for each segment of the route. Lay RCP with the groove or bell end upstream. Place riveted CSP with the inside circumferential laps pointing downstream. Repair damaged bituminous coating on CSP by applying bituminous material conforming to AASHTO M190.

H. Lay pipe to the required line and slope gradients with the necessary fittings, bends, manhole, risers and other appurtenances placed at the required location as noted on Drawings.

I. Do not displace or damage pipe when compacting.

J. Do not place pipe in water or when trench conditions are unsuitable for such work.

K. Joints:
Construct joints as described herein and in accordance with manufacturer’s installation instructions. Provide pipe joint type for soiltight, silttight, or watertight only silttight or watertight only watertight joint performance in accordance

with the following table. The table applies only to the extent as applicable to the pipe and joint type and the joint performance as shown or specified.

Pipe and Joint Type	Joint Performance		
	Watertight	Silttight	Soiltight
CMP or Spiral Rib Aluminum Pipe			
Hugger Band w/ O Ring Rubber Gasket		x	x
Hugger Band			x

3.4 INSTALLATION – FLARED END SECTIONS

A. Construct flared end structures in accordance with details shown on Drawings.

3.5 INSPECTION AND TESTING

A. General:
1. Clean, inspect, and test Strom sewer systems and culverts, upon completion or at such time as directed. The system or culvert shall have a true grade and line. Actual elevations shall be within 0.08 feet of the elevations given on the drawings.
2. After completion of the Work, or any part thereof, the job shall be tested to determine that it has been installed in accordance with the drawings and specifications. In general, the Work shall prove to be in good condition, installed in accordance with the drawings and specifications and ready for use.

B. Cleaning and Testing:
1. Visibly inspect and remove all debris and obstructions from storm pipe.

C. Alignment Test: After backfill has been placed and compacted to a depth not less than one foot above top of pipe, a visual inspection shall be made by flashing a light between ends of pipe. Correct displacement or misalignment of invert.

END OF SECTION 02630

SECTION 3150 – WATER DISTRIBUTION SYSTEM

1. GENERAL

A. The work covered by this Section of the specifications, shall consist of furnishing all specified materials with all necessary equipment, machinery, tools, and labor, and performing all work required to install and/or construct the water system extensions or changes with all connections and appurtenances as required; in accordance with all directives or modifications and these specifications, all to be- complete, in place, accepted, and ready for use.

B. Materials for use at any location in the water distribution system (extensions or existing) shall meet the requirements as set forth in the following Articles under this Section.

2. MATERIALS

A. PIPE, PIPE JOINTS AND FITTINGS

Ductile iron Pipe, Joints & Fittings: Pipe for use under this heading shall consist of durable, solid, cast iron materials with the matrix being predominately ferrite. This material shall meet the following minimum physical strength requirements of; 60,000 psi tensile, 42,000 psi yield, and ten (10) percent maximum elongation. Each piece of pipe shall have the; weight, thickness, class manufacturer's mark, the year of manufacture, and the letters DI or word “DUCTILE” clearly stamped on the pipe. The pipe materials and construction shall be in accordance with all the requirements of A.S.A. Standard A21.51 (A.W.W.A. C-151). Minimum thickness class shall be Class 52 (Class 53 for flanged pipe). The pipe may be furnished with mechanical, push on, or flange joint ends as required.

1. Mechanical Joint Pipe & Fittings: Pipe and fittings of this joint type shall be furnished complete with all glands, gaskets, tee head bolts, hex nuts, etc., all properly sized and manufactured for the required pipe and fitting sizes. All nuts, bolts, trim, etc., shall be stainless steel. All fittings and bends shall be constructed of cast or ductile iron. Materials for this service shall consist of durable, solid, cast or ductile iron meeting the minimum physical requirements of 18,000 psi tensile strength and 40,000 psi modulus of rupture. Fittings and bend items shall be designed and tested to permit a minimum working pressure of 250 psi prior to being shipped from the factory. All mechanical joint fittings, bends, and joint accessory materials shall conform to A.S.A. Standard A 2 1.1 0 and A 2 1.1 1. All mechanical joint fittings to include gland packs, mechanical joint restraints and accessory packs (Mega-Lug Kit) with locking collar.

2. Slip Joint Pipe & Fittings: Slip joint pipe shall be made of ductile iron as previously specified. The plain end of the pipe shall be tapered to permit easy assembly. The pipe joint gasket shall meet all applicable requirements of A.S.A. Standard A 21.1 0 with joints in accordance with Section 11-2.3 of A.S.A. Standard A 21.1 1. Fittings and bends for use with slip joint piping shall be mechanical joint as previously specified.

3. Flanged Pipe & Fittings: Pipe for use with flanged ends shall be ductile iron as previously specified. Threads for the screwed-on flanges shall be designed in accordance with A.S.A. Standard B 2. 1. Flanges for use shall be faced and drilled in accordance with A.S.A. Standard B 16.1, 125 lb. All joint and joint materials shall be designed and tested for a minimum working pressure of 250 psi. Flanged branch fittings and bends shall meet or exceed the pipe and joint materials requirements. The flange joint bolt circle and drilled holes shall match those of A.S.A. Standard B 16.1, 125 lb. All pipe and fittings shall be furnished with the properly sized, stainless steel, bolts and nuts, and best quality, 1/8 inch thick rubber gaskets.

4. Mechanical Joint Retainer Glands: Mechanical Joint Retainer Glands shall be cast from ductile iron no less than grade 70-50-5, and shall comply with all applicable provisions of AWWA/ANSI C110/A21.10 and C111/A21.11. Set screws shall be 5/8” NC thread with torque-set head, or 5/8” square head bolts, with knurled cup-point, made of 4140 steel and shall be hardened to Rockwell “C” scale 45-47.

The pipe and fittings shall be cement-lined and seal-coated in conformance with A.S.A. Standard A21.4 (A.W.W.A. C-104).

B. RIGID PLASTIC PIPE, JOINTS & FITTINGS – Pipe for use under this heading shall be approved and accepted by Underwriter’ Laboratories, Inc.

1. Class 200, standard dimension ratio (S.D.R.) 21, P.V.C.:

   A. Materials: Pipe for use under this heading shall be manufactured from clean, virgin, N.S.F. approved, Type 1, Grade 1, 1120 P.V.C. conforming to A.S.T.M. specification D2241. The pipe shall be pressure rated for a hydrostatic working pressure of 200 psi. at 73.4 degrees F. and shall meet all applicable requirements as set forth under Commercial Standard (CS) 256-63. The pipe shall also conform to the following tests conducted at 73.4 degrees F.

      1. Hydrostatic Integrity: The pipe shall withstand without failure, a pressure of 420 psi. for at least 1,000 hours, in accordance with A.S.T.M. Specifications 1598-63T. The pipe shall withstand without failure, a pressure of 630 psi. applied in 60 to 90 seconds in accordance with Specifications 2599-62T.

I.D. Size	Minimum Wall Thickness	
	Barrel	Bell or Coupling
4 in.	.267 in.	.507
6	.383	.623
8	.503	.806
10	.617	.955
12	.733	1.108

      Concentricity: The outer diameter of the pipe shall be concentric within .003 of an inch.

   B. Slip Joint Pipe: All pipe shall be joined by means of a rubber ring slip joint. Cement weld or glued joints will not be permitted. The slip joint may be formed by either a bell joint or a double ring coupling. The bell joint where used, shall be an integral and homogenous part of the pipe formed by extrusion, with a ring groove for seating the rubber ring gasket. The rubber ring gasket shall be partially split or perforated to permit expansion and contraction with respective increased or decreased pressure in the main. The double ring coupling shall be extruded from pipe materials as previously specified. The coupling interior shall be machined for two square-bottom gaskets and a center tapered stop. The double ring coupling shall be used with plain end pipe on which all ends are tapered to permit pushing the pipe into the coupling. The rubber ring gasket to be used with this coupling shall have a squared seating edge for placement in the coupling grooves. The rubber ring gasket shall also be partially split or perforated to permit expansion and contraction with main pressure changes.

   C. Markings: Pipe markings shall include the following, marked continuously down the length:

      1. Manufacturer's name.
      2. Nominal Size.
      3. Class Pressure Rating
      4. Dimension Ratio Number.
      5. PVC 1120.
      6. NSF Logo.
      7. Identification Code.

   D. Lubrication: Lubrication shall be water soluble, non-toxic, be non-objectionable in taste and odor imparted to the fluid, be non-supporting of bacteria growth and have no deteriorating effect on the PVC or rubber gaskets.

   E. Pipe Fittings: Branch, bend, transition, or cap type fittings to be used with rigid plastic shall be flanged or mechanical joint cast or ductile iron as previously specified. The fitting item shall be furnished with and include all; bolts, glands, transition gasket, etc., as required to fully make up the fitting connection joints.

2. C900 PVC Water Mains: Water mains may be AWWA conforming C900 DR 14. Pipe must bear the seal of approval of the National Sanitation Foundation. Net laying lengths shall be 20 feet. Joints shall be integral bell position joints with single rubber gasket, making a pressure tight seal. C900 PVC water main shall be manufactured by PWEagle, Inc., or preapproved equal.

3. HDPE, DR 7 Water Mains:

a) Materials: Black PE materials used for the manufacture of polyethylene pipe, tube and fittings shall be PE 4710 high density polyethylene meeting ASTM D3350 cell classification 445574C (formerly PE 3408 meeting 345464C per ASTM D3350-02) and shall be listed in the name of the pipe and fitting Manufacturer in PPI (Plastics Pipe Institute) TR-4 with a standard grade HDB rating of 1600 psi at 73°F. The material shall be listed and approved for potable water in accordance with NSF/ANSI 61.
Gray PE material, when used, shall be the same except for meeting ASTM D 3350 cell classification 445574E. When requested on the order, the Manufacturer shall certify that the materials used to manufacture pipe and fittings meet these requirements.

b) Polyethylene Pipe: Polyethylene pipe shall be manufactured in accordance with AWWA C901-96 for sizes 1-1/4" thru 3" IPS diameters and to the requirements of ASTM D3035. Pipe 4"IPS and DIPS sizes 4" and above shall be manufactured to the requirements of ASTM F714 and AWWA C906-99. 2" and smaller water service pipe and tubing shall be manufactured in accordance with ASTM D2239 for inside diameter control IPS size or ASTM D2737 for outside diameter control CTS size.

c) Service Identification Stripes for DIPS Sized Pipe: DIPS sized pipes shall have three equally spaced pairs of longitudinal blue color stripes co-extruded into the pipe outside surface. Stripes printed on the outside surface shall not be acceptable.

d) Marking: Pipe shall be marked in accordance with ASTM F714 and/or AWWA C906. Marking shall indicate the pipe's Pressure Rating (PR) and/or Pressure Class (PC).

3.1 Joining of HDPE Pipe/Fittings:

a) Heat Fusion Joining: Joints between plain end pipes and fittings shall be made by butt fusion. Joints between the main and saddle branch fittings shall be made using saddle fusion. The butt fusion and saddle fusion procedures used shall be procedures that are recommended by the pipe and fitting Manufacturer. The Contractor shall ensure that persons making heat fusion joints have received training in the Manufacturer's recommended procedure. The Contractor shall maintain records of trained personnel, and shall certify that training was received not more than 12 months before commencing construction. External and internal beads shall not be removed.

b) Butt Fusion of Unlike Wall Thickness: Butt fusion shall be performed between pipe ends, or pipe ends and fitting outlets that have the same outside diameter and are not different in wall thickness by more than one Standard DR, for example, SDR 13.5 to SDR 17, or SDR 11 to SDR 13.5. Transitions between unlike wall thickness greater than one SDR shall be made with a transition nipple (a short length of the heavier wall pipe with one end machined to the lighter wall) or by mechanical means or electrofusion. SDR's for polyethylene pipe are 7.3, 9, 11, 13.5, 17, 21, 26, 32.5 and 41.

c) Joining by Other Means: Polyethylene pipe and fittings may be joined together or to other materials by means of (a) flanged connections (flange adapters and back-up rings), (b) mechanical couplings designed for joining polyethylene pipe or for joining polyethylene pipe to another material, (c) MJ Adapters or (d) electrofusion. When joining by other means, the installation instructions of the joining device manufacturer shall be observed.

d) ID Stiffener and Restraint: A stiffener shall be installed in the bore of the polyethylene pipe when an OD compression mechanical coupling is used and when connecting plain end PE pipe to a mechanical joint pipe, fitting or appurtenance. External clamp and tie rod restraint shall be installed where PE pipe is connected to the socket of a mechanical joint pipe, fitting or appurtenance except where an MJ Adapter is used.

3.2 Installation:

a) General: When delivered, a receiving inspection shall be performed and any shipping damage shall be reported to the manufacturer within 7 days. Installation shall be in

accordance with ASTM D 2774, Manufacturer's recommendations and this specification. All necessary precautions shall be taken to ensure a safe working environment in accordance with all applicable safety codes and standards.

b) Excavation: Trench excavations shall conform to the plans and drawings, as authorized in writing by the Project Engineer or his Approved Representative and in accordance with all applicable codes. The Contractor shall remove excess groundwater. Where necessary, trench walls shall be shored or reinforced, and all necessary precautions shall be taken to ensure a safe working environment.

c) Large Diameter Fabricated Fittings: Not more than one plain-end connection of 16" IPS and larger fabricated directional fittings (elbows, tees, etc.) shall be butt fused to the end of a pipe length before placing the assembly into the trench. The remaining fitting connections shall be made in the trench using butt fusion, flange or other connection means in accordance with 3-c. Flange and other mechanical connections shall be assembled, and tightened in accordance with the connection manufacturer's instructions and 4-d. Handling, lifting, moving or lowering a 16" IPS or larger fabricated fitting that is connected to more than one pipe length is prohibited. The installing contractor at his expense shall correct fitting damage caused by such improper handling.

d) Mechanical Joint & Flange Installation: Mechanical joint and flange connections shall be installed in accordance with the Manufacturer's recommended procedure. MJ Adapters and flanges shall be centered and aligned to the mating component before assembling and tightening bolts. In no case shall MJ gland or flange bolts be used to draw the connection into alignment. Bolt threads shall be lubricated, and flat washers should be used under the nuts. Bolts shall be evenly tightened according to the tightening pattern and torque step recommendations of the Manufacturer. At least 1 hour after initial assembly, flange connections shall be re-tightened following the tightening pattern and torque step recommendations of the Manufacturer. Connections shall be retightened a second time after at least 4 hours in accordance with Manufacturer's recommendations. The final tightening torque shall be as recommended by the gasket Manufacturer.

e) Foundation & Bedding: Pipe shall be laid on grade and on a stable foundation. Unstable trench bottom soils shall be removed, and a 6" foundation or bedding of compacted Class I material shall be installed to pipe bottom grade. Excess groundwater shall be removed from the trench before laying the foundation or bedding for the pipe. A trench cut in rock or stony soil shall be excavated to 6" below pipe bottom grade, and brought back to grade with compacted Class I bedding. All ledge rock, boulders and large stones shall be removed.

f) Pipe Handling: When lifting with slings, only wide fabric choker slings capable of safely carrying the load shall be used to lift, move, or lower pipe and fittings. Wire rope and chain are prohibited. Slings shall be of sufficient capacity for the load, and shall be inspected before use. Worn or damaged equipment shall not be used.

g) Backfilling: Embedment material soil type and particle size shall be in accordance with ASTM D 2774. Embedment shall be placed and compacted to at least 90% Standard Proctor Density in 6" lifts to at least 6" above the pipe crown. During embedment placement and compaction, care shall be taken to ensure that the haunch areas below the pipe springline are completely filled and free of voids.

h) Protection against shear and bending loads: In accordance with ASTM D 2774, connections shall be protected where an underground polyethylene branch or service pipe is joined to a branch fitting such as a service saddle, branch saddle or tapping tee on a main pipe, and where pipes enter or exit casings or walls. The area surrounding the connection shall be embedded in properly placed, compacted backfill, preferably in combination with a protective sleeve or other mechanical structural support to protect the polyethylene pipe against shear and bending loads.

i) Final Backfilling: Final backfill shall be placed and compacted to finished grade. Native soils may be used provided the soil is free of debris, stones, boulders, clumps, frozen clods or the like larger than 8" in their largest dimension.

3.3 Testing:

a) Fusion Quality: The Contractor shall ensure the field set-up and operation of the fusion equipment, and the fusion procedure used by the Contractor's fusion operator while on site. Upon request by the Owner, the Contractor shall verify field fusion quality by making and testing a trial fusion for pipe sizes 12" and smaller. The trial fusion shall be allowed to cool completely before conducting a Bent Strap Test. The bent test straps shall be cut out and tested in accordance with ASTM F2620. If the bent strap test of the trial fusion fails at the joint, the field fusions represented by the trial fusion shall be rejected. (For pipe sizes greater than 12" there are several QA/QC controls for fusion joint quality. 1) Operator training in identifying a properly made fusion. 2) McElroy Data Logger; to log and verify proper fusion procedure was conducted. 3) Field tensile testing of the joint. 4) Hydrostatic testing. Contact McElroy Mfg. for testing apparatus and procedures.) The Contractor at his expense shall make all necessary corrections to equipment, set-up, operation and fusion procedure, and shall re-make the rejected fusions.

b) Leak Testing: Hydrostatic leak testing for HDPE Mains shall be conducted in accordance with the latest AWWA Standard, and the recommended practice of the Plastic Pipe Institute. Pneumatic pressure testing is prohibited.

C. COPPER PIPE & FITTINGS

1. Copper pipe for all underground use as service or main lines, shall be "Type K". All copper pipe produced for this service shall be in accordance with A.W.W.A. Specifications 75-CR. Fittings for use with the copper pipe material shall be constructed of brass or bronze, of the joint type as required for the specific connections and are subject to City of Sullivan approval.

D. VALVES AND VALVE BOXES

Gate Valves:

1. Valves shall be American Flow Control's Series 2500 Ductile Iron Resilient Wedge Gate Valve with stainless steel bolts.

2. Valves shall be resilient wedge type rated for 250 p.s.i.g. cold water working pressure. All ferrous components shall be ductile iron, ASTM A536. Valves shall be in full compliance with AWWA C515. The words "D.I." or "Ductile Iron" shall be cast on the valve.

3. The wedge shall be ductile iron. The wedge shall be symmetrical and seal equally well with flow in either direction.

4. The gate valve stem and wedge nut shall be copper alloy in accordance with Section 4.4.5.1 of the AWWA C515 Standard. The NRS stem must have an integral thrust collar in accordance with Section 4.4.5.3 of AWWA C515 Standard. The wedge nut shall be independent of the wedge and held in place on three sides by the wedge to prevent possible misalignment.

5. Valves shall be certified by NSF to Standard 61. Bolting materials shall develop the physical strength requirements of ASTM A307 and may have either regular square or hexagonal heads with dimensions conforming to ANSI B18.2.1. All nuts, bolts and trim to be stainless steel.

6. The operating nut shall be constructed of ductile iron and shall have four flats at stem connection to ensure even input torque to the stem. The operating nut shall be 2" square and operate parallel to the waterway. The valve shall open to left (c.c.w.) and be capable of being turned by a standard gate valve key for buried valves.

7. Stem shall be sealed by three O-Rings. The top two O-Rings shall be replaceable with valve fully open and while subject to full rated working pressure.

8. Valve shall have thrust washers located with (1) above and (1) below the thrust collar to ensure trouble free operation of the valve.

9. All internal and external surfaces of the valve body and bonnet shall have a fusion-bonded-epoxy coating, complying with ANSI/AWWA C550, applied electrostatically prior to assembly.

10. The valve shall have mechanical joint accessories with restraints, locking collar gland and Mega-Lug kit.

11. Each buried valve located within a paved area shall have a cast-iron (bituminous coated) valve box. Valve box shall be American Flow Control Trench Adapter, Tyler Pipe 564-S, or approved equal.

12. Each buried valve, which is not located within pavement, shall have a valve box consisting of a length of six inch PVC pipe topped with a Clay and Bailey model 2194 cast iron valve box cover with a Carsonite vinyl utility stake. Blue with buried water line marked on it.

E. CONCRETE FOR THRUST BLOCKING AND PIPE ENCASEMENT

Concrete to be used for thrust blocking the various bends, tees, valves, fire hydrants, etc. shall consist of ingredients designed to produce a mixture having a 3,500 psi compressive strength at 28 days curing time. The mix shall be as "dry" as possible using only sufficient water to permit mixing and placement. Excessive water will not be permitted. Cement for use shall be the "high early" type to provide initial set as soon as possible. Concrete may be placed and covered with earth fill to prevent freezing during periods of cold weather. However, frozen ingredients will not be permitted for use. All concrete used and placed for this purpose shall be given at least three (3) days curing time before being placed under stress. Installation shall be in strict accordance with the applicable Articles under the following Section of these specifications.

Concrete for pipe encasement shall be a 8 bag, high early design in accordance with Missouri Standard Specifications of Highway Construction. Placement of the concrete shall be performed in such a manner so as to insure provision of a bed or cradle under the entire pipe length.

Where joints are to be encased, the piping shall be tested prior to concrete placement to maintain a pressure 50 percent greater than normal working pressure for a period of 4 hours. The Contractor shall provide all necessary equipment for conducting the pressure test as directed by the City. All necessary precautions shall be taken to prevent flotation of the piping during or following placement of the encasement materials.

F. PIPE BEDDING (1-INCH MINUS)

Materials to be used for this purpose shall consist of fine, durable particles of crushed stone. Stone used for this purpose shall consist of materials passing only 1-inch sieve to dust.

G. WATER MAIN TRACER TAPE

Water main tracer tape shall be installed with all water main. The materials to be installed for this purpose shall consist of three (3) inch wide tape made of bonded layer plastic with a metallic foil core. Tape splices shall be knotted to prevent tensile pressure on the splice. The material to be used for this service shall be "Terra Tape D" as manufactured by the Griffolyn Company of Houston, Texas, or approved equal. The metallic tape shall be colored blue to contrast with the soil and shall bear an imprint identifying the line below, such as; "Caution, Water Main Buried Below".

Installation of the tracer tape shall be in accordance with applicable Articles of these specifications.

H. WATER MAIN LOCATOR WIRE

Water main locator wire shall be installed with all water main, fittings, and valve installation. The material to be installed for this purpose shall consist of standard electric service wire, a single No. 12 U. L. approved copper wire of the solid type with insulation for 600 volts. Insulated wire for this service shall be provided in standard rolls of not less than five hundred (500) foot lengths.

1. Splices: The splices shall be made inside a snakepit valve box. Where required, due to roll termination or necessary contact location, the locator wire shall be spliced using wire connectors as designated by the City of Sullivan. The connector opening shall be sealed using a P.V.C. joint sealant material to prevent moisture entrance. After splicing and sealing the connection, the splice location shall be loosely knotted to prevent stress on the connector joint.

2. Wire Contact: In order to make use of the wire for water main location purposes, a splice point shall be placed adjacent to fire hydrants, valve boxes and in release valve structures. The wire shall be brought to the ground surface at these locations so a power source can be connected in a snakepit by Copperhead Industries with Carsonite marker.

   For wire contacts at fire hydrants, the wire shall be brought to the surface in a Snakepit, either left or right of the hydrant.

   For wire contacts at air release valve manholes, run wire up inside of manhole, leaving 6 feet of slack for pigtails. Tie to manhole steps. See plans for further details.

   Water main locator wire installation shall be in accordance with applicable Sections of these specifications.

I. CONNECTIONS TO PRESENT SYSTEM

Materials to be used for connections to the present water distribution system shall be in accordance with the preceding Articles as applicable, under this Section of these specifications. Installation, testing and sterilization of all items shall be in strict accordance with the following Section of these specifications. Under all circumstances, extreme care must be exercised when connecting to the present system. Foreign materials of whatever nature, must not be permitted to enter the system. All direct connection fittings and valves shall be thoroughly rinsed or washed with a chlorine solution just prior to installation and connection. The chlorine solution to be used shall be mixed as stated in the Specifications.

The Contractor shall notify the City when system shut-down is required so that proper notification to those affected by the shut-down can be provided. Where system segment shut-down is required, the actual shut-down is not to be done until all connection materials, equipment, and personnel are at the site, and the existing system point of connection has been exposed, thoroughly cleaned, and prepared for immediate installation of the connection materials. All personnel shall be thoroughly instructed as to the procedure to be followed and ready for work. All connections are then to be made in an efficient manner requiring the least amount of time and maximum amount of care.

J. ROAD CROSSING MATERIALS

State highway and permanent surfaced County road crossings shall be made in strict accordance with the State and County Highway Department rules and regulations. The required excavation permit shall be provided and displayed for each location. At a minimum, materials to be used for all crossings shall meet the following requirements.

1. Water Main: Pipe used for this purpose shall be as previously specified in this Section of these specifications. Fittings for use in the right-of- ways shall be of the joint type as shown and as detailed on the plans. All fittings shall meet the requirements of these specifications.

2. Pipe Encasement: All water main for use at the crossing locations shall be placed in or through an encasement tube consisting of over-sized steel pipe. The encasement tube inside diameter shall be eight (8) inches larger than the inside diameter of the water main to be placed through the encasement tube. Materials to be used for this purpose shall consist of new steel pipe in not less than ten (10) foot lengths. The materials used for the encasement tube construction shall have a minimum yield strength of 35,000 psi. All joint ends shall be cut at 90 degrees to the longitudinal axis of the pipe. Each end shall be beveled and joints shall be butt welded around the entire perimeter of the pipe. The encasement tube shall have a minimum wall thickness of 0.250 inches. (See detail sheet for thickness)

   The annular space between the water main and the encasement tube shall have approved encasement spacers in accordance with applicable articles of these specifications.

   All encasement tube installation shall be in accordance with applicable Articles of these specifications. Concrete for thrust blocking where required, shall be in accordance with applicable Articles of these specifications.

3. Encasement Spacers: Casing spacers shall be stainless steel band casing insulators, Model M-33 S/S as manufactured by J-Four Pipeline Products, Inc. (Broken Arrow, OK, (918) 251-8646), or preapproved equal.

K. FIRE HYDRANTS

Fire and flush hydrants permitted for use on all water system mains shall be the Mueller "Super Centurion". Each hydrant shall be of the traffic model type and manufactured to withstand a working pressure of 200 psi in full compliance with the A.W.W.A. standard specifications C-502 of the latest revision. Hydrant shall be Model A-423, 5 ¼", three-way, 2 hose nozzles and 1 pumper nozzle, complete with locking nipples and accessory packs, anchor couplings, mega lugs, MJ restraints, etc. All hydrants shall be "red" in color.

1. Auxiliary Valves: Fire hydrants are to be installed with auxiliary valves. Valves to be used for this purpose shall meet the requirements as stated in these specifications. Hydrants and valves shall have MJ connections with MJ restraints, Mega-Lugs and gland packs with stainless steel bolts and nuts.

2. All fire hydrants, auxiliary valves shall be furnished and installed in accordance with the plan details, the detail notations, and applicable Articles of these specifications.

3. INSTALLATION

A. SITE AND WORK PREPARATION

Prior to starting the various water main route installations, connections, and/or changes as required, the Contractor shall notify the City a minimum of twenty-four (24) hours prior to the start of construction. After so doing, the Contractor shall clear the route of all trees, shrubs, and other objects or materials, which may directly interfere with the construction. All vegetation shall be disposed of off-site or by other means as approved by the Engineer. All other utility companies or organizations shall be notified for location of their respective facilities prior to starting any work. All trees, shrubs, bushes, etc., which will not interfere with the construction shall be protected from damage. Work preparations shall include having all necessary material items, equipment, and an adequate labor force at the site in working condition, and completely instructed and prepared to perform the work to completion as required.

B. DRAINAGE

The Contractor shall control the grading in the vicinity of the pipe trenches so that the surface of the ground will be properly sloped to prevent water from running into the excavated areas. Any water or other liquid wastes which accumulate in the excavated areas shall be promptly removed.

C. TRENCH EXCAVATION

1. General: The Contractor shall perform all excavation necessary for or incidental to the proper installation and construction of the work shown and detailed on the drawings, or as directed by the City. Excavation shall include the removal of trees, shrubs, paving, and undesirable materials. Excavation shall be done along the lines as indicated on the plans and shall be continuous without improper bends or kinks. Trenches shall be of sufficient width to provide a working space on each side of the materials being installed. During excavation, materials to be used for backfill shall be stock piled, in an orderly manner, a sufficient distance from the edge of the excavation to avoid overloading which might cause slides or cave-ins, and in such manner so as not to interfere with public travel whenever possible. The Contractor shall provide all barricades, lights, temporary crossing, warning signs, etc., that may be necessary to protect the public and the work from injury or damage.

2. Depth: Trenches for water main and appurtenances shall be excavated to a sufficient depth to obtain a minimum of forty-two (42) inches of cover over the top of the pipe, except as otherwise required to make taps and connections to existing mains. All excavation shall be made so as to provide a continuous bearing for the barrel of the pipe. Holes of sufficient size shall be excavated to permit ample room for making joints. The bottom of trenches shall be free from rocks, clods, debris, and all other unsuitable materials, and shall consist of tamped granular material as specified in these specifications. The Contractor shall take care not to excavate below grade except to remove undesirable material, or as directed by the City.

3. Rock Excavation: Where rock is encountered in the trenching operation, the excavation shall be carried to a depth of six (6) inches below the pipe bottom depth assuming proper cover as specified under the preceding paragraph. All excavation shall be considered incidental.

When solid rock is encountered, the Contractor shall not refill any trench until told to do so by the City.

Excess materials resulting from the rock excavations shall be spread over or adjacent to the trench area where acceptable, or shall be picked up and removed from the site for disposal at a suitable location. It may also be necessary to place a 8” thick layer of earth over the rock backfill areas. This may be hauled in from a stockpile location. This 8” earth layer must be able to support the growth of vegetation. All loose rock and debris shall be thoroughly cleaned up and disposed of. The excavated areas shall be left in a neat, clean, acceptable condition.

D. HANDLING OF MATERIALS

All pipe, fittings, valves, and other accessories, shall be unloaded, stored rehandled, and installed by methods in such a manner as to insure their final location in a sound and undamaged condition, conforming in all respects to specified requirements. Under no circumstances shall pipe, fittings, valves, or other accessories, be dropped to the ground, or otherwise subjected to possible damage from impact or shock. Such materials shall be loaded by lifting with machine or hoist, or by skidding. Pipe handled on skidways shall not be skidded or rolled against other pipe.

Under all circumstances, all materials for use shall be handled in a workman-like manner, using the necessary manpower and equipment to perform the task in accordance with the manufacturer's recommendations.

1. Protection of Materials, Coatings, and/or Linings: All materials shall be handled in such manner that neither the coatings or the linings are damaged. Hooks for insertion into the ends of the pipes, fittings, valves, and other accessories, shall have broad, well-padded contact surfaces, and shall be of such design and size that uniform support will be provided. Under most circumstances, damage to outside coatings are repairable, and the necessary repairs shall be properly made prior to installation. Damage to interior linings are not considered repairable, and therefore, the damaged item shall be replaced at the Contractor's expense.

2. Handling Materials Into Trench: Proper equipment, tools, facilities, and methods satisfactory to the City, shall be provided and used by the Contractor for the safe handling, of all materials. Fittings, valves, and other accessories shall be carefully lowered into the trench or excavation, piece by piece to protect coatings and linings. Under no circumstances shall any materials be dropped or dumped into the trench.

E. PIPE LAYING

Laying of the pipe shall commence immediately after the excavation is started, and the Contractor shall use every possible means to keep the completed pipe installation closely behind the trenching. The City may stop the trenching if it appears that the trench is open too far in advance of the pipe laying operation. The Contractor may lay pipe in the best manner adapted to securing speed and good results.

1. Pipe Joints: The Contractor shall have the necessary equipment and tools available for making the joints for the specific materials being used. In accordance with applicable items under these specifications, acceptable joints for the various pipe line and fitting materials are listed as follows:

   Ductile Iron Pipe: Ring or fluid-tite joint with mechanical joint for fittings, valves, and adapters.

   P.V.C. Pipe: Ring-tite joint with necessary transition gaskets for connection to mechanical joint fittings, valves, and adapters.

   HDPE Pipe: Pipe joints shall be butt-fused.

2. Pipe Joint Adapters: The Contractor shall provide the necessary adapters for all connection changes from ring-tite, slip, or mechanical joint to flanged joint as and where required.

   All pipe spigot ends shall be visibly marked to fully "make-up" the joint. With exception of field cut pipe, all "make-up" marks shall be placed on the pipe at the factory. Field cut pipe shall be marked for full joint depth prior to insertion.

3. Pipe Cutting: Cutting of pipe for closure pieces with installation of valves or fittings, or for any other reason, shall be done in a neat and workman-like manner without damage to the pipe or linings. The cutting operation shall leave a smooth cut end at right angles to the longitudinal axis of the pipe. The exterior surface of the cut end shall be beveled, and the interior surface shall be reamed or filed free of

all rough edges and protrusions. All pipe cutting shall be done by saw or mechanical pipe cutters of an approved type. Upon completion of the cutting and trimming operation, the pipe end or ends shall be marked for "make- up" depth. Prior to insertion, the pipe shall be thoroughly cleaned of all foreign materials, including filing and cutting debris.

4. Pipe Alignment: Pipe lines intended to be straight shall be laid straight. Deflections from a straight line shall not exceed the manufacturer's recommendations for joint deflections. Pipe shall be deflected at the joints only. Pipe barrel shall not be deflected. Should the planned or specified alignment require deflections in excess of the maximum recommended for the type of pipe being installed, when using a standard pipe length within the limits of available space, then either shorter pipe sections, or additional bends shall be installed.

5. Thrust Blocking: All mechanical or push-on (ring-tite) joint water main and connection installations, shall be thrust blocked for all bends of 11-¼ degree or more. Thrust blocking shall be performed at areas where water main changes direction. All bends, tees, crosses, valves, tapping sleeve, and fire hydrant locations shall be thrust blocked in accordance with City requirements. Bearing areas are determined on the basis of bearing against solid undisturbed earth. Concrete to be used for this purpose shall be designed for compressive strength as described in the previous Section of these specifications. All joint and fitting bolts shall remain accessible. Forming for thrust blocks to obtain the necessary bearing area shall be provided as required. All accessible form materials shall be removed from the trench prior to backfill.

SQUARE FEET OF THRUST BLOCK AREA REQUIRED			
Pipe Size	**Dead End Tee Or In-Line Valve**	**45° Elbow**	**22-1/2° Elbow**
2”	Min.	Min.	Min.
4”	Min.	Min.	Min.
6”	Min.	Min.	Min.
8”	2’3” X 2’3”	Min.	Min.
10”	2’10” X 2’10”	2’6” X 2’6”	Min.
12”	3’0” X 4’0”	3’0” X 3’0”	2’3” X 2’3”
MINIMUM THRUST BLOCK BEARING TO BE 2 SQ. FT.			

6. Existing Utilities: Existing utilities shall be protected during the construction period. Where necessary, the existing utility shall be removed or temporarily relocated, and replaced upon completion of that phase of the work creating this requirement. Under all circumstances, the utility involved and the parties being affected by the disrupted service shall be notified in advance of the proposed operation. All changes and work shall be subject to the approval and acceptance of the utility involved and the City.

7. Quality: Damaged or unsound pipe, fittings, and accessories of whatever nature shall be rejected and removed from the work. All joints shall be made as previously specified. Each piece of pipe and all fittings, valves, etc., shall be checked and cleared of debris prior to being put in place. All gaskets shall be checked and cleaned of oil, grease, dirt, etc., before being inserted. All bolted joints shall be rechecked for operation and bolt tightness prior to installation. All open ends of pipe, fittings, etc., shall be carefully plugged or sealed at the end of each days work to prevent entrance of animals, water, and other foreign matter. All excavation shall be made to neat line and grade.

   All personnel involved in any way with the work must be made aware of the fact that the work shall result in a first-class, professional job.

F. Separation of Water Mains, Sanitary Sewers, and Combined Sewers:

1. Parallel Installation: Water mains shall be laid at least ten feet horizontally from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten-foot separation, deviations may be allowed on a case-by-case basis. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer and on either case, at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer. In areas where the recommended separations cannot be obtained, either the waterline or the sewer line shall be constructed of mechanical joint pipe or cased in a continuous casing.

2. Crossings: Water mains crossing sewers 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 sewer. This shall be the case where the water main is either above or below the sewer. At crossings, the full length of water pipe shall be located so both joints will be as far from the sewer as possible but in no case less than ten feet. Special structural support for the water and sewer pipes may be required. In areas where the recommended separations cannot be obtained either the waterline or the sewer line shall be constructed of mechanical joint pipe or cased in a continuous casing that extends no less than ten feet on both sides of the crossing.

3. Force mains: There shall be at least a ten-foot horizontal separation between water mains and sanitary sewer force mains and they shall be in separate trenches. In areas where these separations cannot be obtained, either the waterline or the sewer line shall be cased in a continuous casing.

4. Sewer Manholes: No waterline shall be located closer than ten feet to any part of a sanitary or combined sewer manhole.

5. Disposal facilities: No waterline shall be located closer than 25 feet to any on-site wastewater disposal facility, agricultural waste disposal facility, or landfill.

G. WATER MAIN TRACER TAPE INSTALLATION

The Contractor shall furnish all materials and install the water main tracer tape as specified in these specifications. The three (3) inch wide detectable tape shall be installed directly above the water main locations as the trench backfill progresses, to permit an earth cover of 12 to 18 inches over the tape. The tape material shall be installed in accordance with the manufacturer's recommendations. The tape is to be placed in a manner such that trench backfill settlement will not place an excessive tensile stress on the material.

H. WATER MAIN LOCATOR WIRE INSTALLATION

1. The Contractor shall furnish all materials and install the water main locator wire as specified under these specifications. The No. 12 solid copper insulated wire shall be duct taped to the bottom of the water main at the bottom of the trench or wrapped around the water main. The wire shall be brought up in a Tracer Box as specified in these Specifications. The wire shall be spliced at these locations using a standard plastic or rubberized wire connector. This will permit placing a power source on the wire for both directions in order to use same for locating the water main. Where intermediate splices are required, the wire connector opening shall be sealed using a P.V.C. joint sealant material to prevent moisture from entering the connection. The wire shall be loosely knotted at each splice location to prevent direct stress on the connection. The wire shall be laid slack in the trench so same will not be subject tensile stress as the trench is being backfilled. Submit Shop Drawings of wire splice devices to the City of Sullivan for their approval, prior to ordering any material. Prior to final acceptance by the City, Contractor shall demonstrate that the locator wire works to the satisfaction of the City and or their representative.

2. Copperhead® Snake Pit® Specifications

Direct
I. TITLE:
Index of Valve Box Material Standards: Copperhead® SnakePit®, Magnetized Tracer Boxes, Test and Monitoring Stations.

II. SCOPE:
Specifications apply to materials, design and performance requirements for plastic tracer boxes, herein referred to as box(es), which provide access to underground service and mainline corrosion or locator/tracer wire systems.

III. MATERIAL REQUIREMENTS:
1. Materials used to construct products in above specifies scope shall be non-corrosive or corrosion resistant.
2. Tube material shall be of high grade ABS, or equivalent rigid plastic that meets or exceeds ASTM D-1788, Type 1 requirements.
3. Lid material shall be of cast iron or ductile iron. Tensile strength or ductility of such material shall be equal or superior to hi-tensile cast iron ASTM A-126-B requirements.
4. Lid-locking bolt material shall be made of aluminum material equal or superior to ASTM B-253.
5. Lid-locking mechanism material shall be made of plastic to meet or exceed ASTM A-126-B requirements.

IV. DESIGN REQUIREMENTS:
1. Detection
a. Box shall be designed to be easily detected by magnetic and electronic locators even when box is covered by a minimum of four (4) inches of soil, sod and / or paving material.
b. A magnet shall be securely attached at the top of the upper tube of the box for locating purposes. Material used to retain magnet in place shall remain effective at minus 15 degrees Fahrenheit.
NOTE: A MAGNETIZED LID OR MAGNET ATTACHED TO THE LID IS NOT ACCEPTABLE.
2. Security
a.Locking Mechanism:
i. Lid of valve box shall be designed to employ a locking mechanism that will clamp it to the box collar in a closed position.

ii. Locking mechanism shall incorporate a standard pentagon-shaped head bolt which when measured from flat to vertex shall not be less than 0.830 inches or greater than 0.875 inches.
iii. Locking mechanism shall be such that the lid cannot be removed without using the proper wrench.
Collar:
i. Collar is designed for support of the lid and shall be securely attached to the upper tube to prevent separation after installation.
ii. Collar shall be designed to withstand an applied impact force of two (2) foot pounds without failure at -15 degrees Fahrenheit.
3. Shape
a. Box shall be of a tubular construction (cylindrical) with removable round lid.
b. Box shall have a support flange at the base of the lower tube bell at least one-half (1/2) inch wide. If box is designed for use with an integral valve support, flange may be omitted.
4. Length Adjustment
a. Box shall have be of telescoping design with upper and lower tubes overlapping three (3) inches when the box is extended to its maximum overall length. b. Box of sliding design shall be made to maintain tension in the range of 40-80 pounds at any length between minimum and maximum lengths.
c. Tension system shall be designed to allow upper portion of lower tube to be sawed off without loss of tension.
d. Tension requirements must be met after box has been removed from storage and telescoped ten (10) times.
5. Wire connection
a. Brass screw running through brass wire harness will be used as connection for locator transmitter hook-up.
b. Brass wire harness shall be used to secure tracer wire leads to brass screw enabling locator equipment hoop-up.
c. Petrolatum wax tape incorporated with magnetized tracer box to encapsulate tracer wire leads and brass wire harness.
i. Petrolatum wax tape must be formed around brass wire harness connection after tracer wire leads are connected to prevent oxidation of wire ends.
ii. In order to ensure proper long term locatibility and signal strength, the petrolatum wax tape must be utilized to prevent oxidation.
6. Access Box shall be designed for operational access to underground tracer wire systems.
7. Lid
a. Box shall be designed so that when installed, the collar will be flush with the surface and contain the lid so that it will not be in contact with the adjoining backfill or pavement.
b. The cavity which holds the lid shall be designed so that water drains into the inside of the box.
c. The top surface of the box lid shall be flush with the top of the box. The top of the bolt or locking device when in the locked position shall be flush with or below the lid surface.

VIII. QUALITY ASSURANCE: The materials furnished to these specifications shall be manufactured under a quality control system that assures the items shall be free of defects and have a workmanlike finish conforming to the requirements of these specifications. Such materials shall be fit and safe for their intended use.

I. VALVE INSTALLATION

Prior to installation, all valves shall be checked for bolt tightness and operation. All foreign matter, dirt, and debris, shall be removed from inside the valve body. The valve gate and guide shall be cleaned free of grease and dirt. After thoroughly cleaning and checking the valve for operation, the valve gate shall be closed, and the valve shall be installed in place. Following placement and connection to both sides of the valve, excavation for the valve bearing thrust block shall be made. The thrust block shall then be poured of concrete, in accordance with the previous Section of these specifications. The valve holding clamps, No. 4 reinforcing bars, shall then be placed over the valve with embedment in the concrete thrust block.

Following initial set of the concrete, the valve box shall be placed over the valve body. The valve box shall be set plumb and earth shall be thoroughly tamped around the box to maintain the plumb position. The top of the valve box shall be adjusted for height to the level of the adjacent pavement if in a paved area, or shall be adjusted to stand four (4) inches above ground level, if located in an unpaved area. The lid or cover shall then be placed on the valve box. The valve box may require vertical adjustment from time to time as trench settling occurs. It is intended that upon final project completion, all valve boxes shall be left in a vertical plumb, usable position.

J. WORK ADJACENT TO-AND/OR CROSSING STATE OR COUNTY HIGHWAYS

1. General: All work to be performed within the right-of-way limits of the State and/or County Highways shall be performed in strict accordance with the Highway Department requirements. The Contractor shall obtain the necessary permits for all work prior to starting any construction. All permits must be displayed as required. The Contractor shall comply with all requirements such as; signals, flagmen, and watchmen; performance of work in such a manner so as not to interfere with traffic, highway entrances, highway maintenance, highway drainage, etc., and methods of placing materials, backfill compaction, and all such other requirements, which may differ from or may be in addition to those specified for work other than that within the highway right-of-way limits.

2. Highway Crossings: Highway crossings shall be constructed in accordance with all permit requirements. The Contractor will be held responsible for any and all expense incurred by the Highway Department in protecting the highway while construction is in progress, or as a result of said construction. The Contractor will also be held responsible for all damages to the highway due to operations during construction of the crossings including replacement of damaged pavement. Encasement shall extend from ditch line to ditch line, toe of slope to toe of slope.

   a) Boring or Jacking: The crossing shall be machine bored with simultaneous installation of the encasement. Boring without the concurrent installation of the encasement tube will not be permitted. All joints of the encasement tube shall be welded as specified and the encasement tube shall extend to the required dimensions.

   b) Open Trench Encasement: Water main encasement may be placed in open trench where allowed or permitted. Encasement shall be installed to grade as shown on the plan profile sections. It is recommended that the cut installations be coordinated with the road construction to rough sub-grade. The entire encasement length shall be excavated to sub-grade. The encasement pipe shall then be placed over 4 to 6 inches of 1-inch clean stone. Following placement, the entire trench shall be backfilled with 1-inch clean stone to the road sub-grade level or to the top of the trench.

   c) Backfill: Following completion of the machine bored crossing, all bore pit or other required excavation shall be suitably backfilled to grade. All debris, of whatever nature, shall be picked up and removed from the site. After clean-up, the disturbed area shall be smoothed to grade, seeded, and covered with straw. The entire work area shall be left in an orderly and acceptable condition.

K. TESTING WATER LINES

All newly laid water lines shall be tested prior to flushing and sterilization. Trenches may be backfilled as the pipe and accessories are installed, or where practicable and at the option of the Contractor. Trenches over the joint locations may be left open for visual inspection during tests. Prior to making tests, all air shall be expelled from the lines. If hydrants or blow-offs are not available, suitable taps shall be provided by the Contractor for this purpose at or near the end points of the installation.

1. Hydrostatic Tests: A two (2) hour test shall be made on each segment of the water lines between end points at a test pressure of at least 50% in excess of normal maximum operating pressure, not to exceed 200 psi. The test pressure shall be determined by the City and suitable gauges for checking same shall be supplied and connected by the Contractor. A gate valve or pressure relief valve shall be supplied and connected by the Contractor. A gate valve or pressure relief fitting shall be placed at each end of the segment being tested unless otherwise directed. Allowable pressure drop during the two (2) hour test shall be limited to 3% of the test pressure.

   Any leaks evident at the surface shall be uncovered, repaired, and/or replaced. All leaking joints shall be tightened, or remade, or replaced, and re-tested. All pipe, fittings, valves, or other accessories found defective under this test shall be removed and replaced at the Contractor's expense.

2. Leakage Test: In the event that the pressure test indicates leakage, a leakage test shall be conducted as follows:

   The Contractor shall furnish the gauge and measuring device for the leakage test, as well as the pump, pipe, connections and all other necessary apparatus, and shall furnish all necessary labor to conduct the test. The duration of each leakage test shall be one hour, and during the test, the piping shall be subjected to a hydrostatic pressure of 1.5 times the working pressure or rated pressure of the pipe, whichever of is greater. No pipe installation will be accepted until the leakage is less than ten (10)

gallons per mile of pipe per inch diameter per 24 hours. Should any tests of pipe laid disclose leakage greater than that specified, the Contractor shall, at his own expense, locate and repair the defective joints until the leakage is within the specified allowance.

L. FLUSHING AND STERILIZING WATER LINES

After an acceptable hydrostatic test, the lines shall again be flushed. After flushing the lines, the pressure valve shall be closed, and enough water drained from the segment to permit replacement of a chlorine solution. The chlorine solution shall consist of a powdered chlorine compound such as H.T.H. (calcium hypochlorite 65% available chlorine) thoroughly mixed with water. The chlorine solution shall be poured into the upstream test connection point. The amount of the chlorine compound to be used shall be determined by the City if the Contractor so desires. The chlorine solution shall yield 50 p.p.m. available chlorine. After pouring the required amount of solution into the water line segment, the connection shall be plugged, and the pressure valve opened. Water shall be flushed through the line until chlorine odor is detected at the opposite end of the installation. At this time, the pressure valve shall be closed and the segment shall be allowed to stand for a period of 24 hours.

Following the 24 hour period, a chlorine residual level of a minimum of 10 p.p.m. must remain in the segment. If an acceptable residual level is determined, the pressure valve shall again be opened and the segment flushed until all traces of chlorine over and above normal line levels have been eliminated.

Should a leak occur during the sterilization procedure, it will be repaired and the sterilization and flushing will be repeated.

Upon successful completion of the testing and sterilization of each water main segment, and prior to placing same in service, the Contractor shall collect and submit two (2) separate standard bacteriological samples, taken a minimum of 24 hours apart, for analysis, to a State of Missouri certified laboratory. The collection of the sample must be witnessed by the City. Upon receipt of satisfactory test results, the water main segment may be placed in permanent service. Should the initial treatment fail to result in the condition specified in the proceeding paragraph, the sterilization procedure shall be repeated until such results are obtained.

The following tables are provided for reference purposes. This table shows the amount of chlorine needed to maintain 500 p.p.m. chlorine.

Product	**Amount of Compound**	**Quantity of Water to Add to Make 1% Solution**
High Test Calcium Hypo-Chlorite (65-70% Chlorine, HTH Parachloron, etc.)	1 lb.	7.5 gal.
Chlorinated Lime (32-35% Chlorine)	2 lbs.	7.5 gal.
Liquid Laundry Bleach (Purex or Chlorox)	1 gal.	4.25 gal.

Pipe Size (in)	**Volume of 100 ft. Length (gal)**	**Amount Required to Give 50 ppm Chlorine**	
		100% Chlorine (lb)	**1% Chlorine/Water (gal)**
2	16.4	0.0034	1/12
4	65.3	0.0135	1/3
6	146.5	0.0305	3/4
8	261.0	0.054	1 1/3
10	408.0	0.085	2

12	588.7	0.123	3

M. TRENCH BACKFILL

After placing the piping in the trench, the Contractor shall backfill under and around the pipe simultaneously filling and tamping on both sides with sufficient earth to firmly hold the pipe in position. Extreme care must be exercised with the backfill operations to insure that no sizable stones or rocks come into contact with the pipe surfaces. After carefully placing and tamping the initial backfill in place to at least twelve (12) inches over the top of the pipe barrel, the remaining materials may be pushed into the trench. No boulders, broken pavement, or large pieces of blasted rock shall be used in the trench backfill. Any trench improperly bedded or backfilled shall be excavated, examined, and replaced at the Contractor's expense. All non-usable materials shall be picked up and removed from the site to an acceptable disposal location. Upon completion of the initial backfill, the backfill surface shall be either "jetted" with water or neatly mounded to allow for settlement. As the work progresses and settlement occurs, the trenching surface shall continue to be graded and shaped so as to secure a final condition where no further settlement shall occur.

In areas where pavement or permanent surfacing is removed and is to be replaced, the entire backfill shall be made using 1-inch clean stone in accordance with the previous Section of these specifications.

Initial clean-up, in accordance with this Section of these specifications shall occur as the trench backfill operation proceeds. Before final acceptance of the work is made, the Contractor shall travel the lines with the City, and any settlement or unsightly areas shall be repaired or corrected as directed. Upon acceptance, the Contractor shall proceed with the final clean-up, grading, and seeding operation, in accordance with this Section of these specifications.

N. FIRE HYDRANT AND AUXILIARY VALVE INSTALLATION

The fire hydrants, valves, and all connection items shall be furnished and installed by the Contractor. All materials used for this purpose shall be as specified under these Specifications. The installation shall include all; excavation as required, installation of the water main tee fitting, auxiliary valve, connection pipe, hydrant, gravel fill, thrust or kick block, backfill, and surface replacement as required. The fire hydrants shall be installed to the proper "bury" depth, to stand in an exactly "plumb" position. Hydrant extension pieces may be used to adjust to proper grade as required. Clean gravel fill as specified and detailed, shall be placed to the proper depth and dimension to provide the necessary "weep" volume for water contained in the hydrant barrel after the hydrant is shut off. Care must be exercised when pouring the hydrant thrust or kick block, to assure that cement paste does not plug or block the hydrant weep hole or the gravel fill under and around the weep hole.

The earth backfill shall be hand tamped around the hydrant base and barrel to assure the plumb position. The hydrants may be braced or wired in place until sufficient settlement has occurred to retain the plumb position. Upon completion, all bracing and debris shall be removed from the site. Each site shall then be thoroughly cleaned-up and restored equal to or better than its original condition. All installation sites shall be left in a neat, clean, acceptable condition.

O. INITIAL CLEAN UP, GRADING, AND REPLACEMENT

The Contractor shall provide the necessary labor and equipment to permit initial clean-up as the water main is being installed. Immediately following trench backfill, all areas disturbed by excavation shall be graded to conform to the adjacent ground levels. Earth shall be neatly mounded over the trench location. All debris, of whatever nature, due to the water main and service installation, shall be picked up and disposed of. All walks, driveways, roads, streets, etc., shall be replaced to original condition.

P. FINAL CLEAN-UP, FINISH GRADING, SEEDING, AND STRAW

Following completion of the various routes and initial trench settlement, the Contractor shall go over the routes and clean-up all remaining debris. Following completion of the final clean-up, all areas in any way disturbed by the installation, shall be graded to conform to the adjacent ground areas. After final grading, the graded areas shall be seeded and covered with straw.

Upon completion of the final grading and seeding, the Contractor shall locate and paint the tops of all valve boxes the color "blue", and other accessories having covers, so that they are plainly visible for use.

All service boxes for valves, future connection items. etc., shall be firmly in place in a plumb position, ready and usable for the intended service. Following final completion of all items, the Contractor and City shall again go over the various routes to determine final acceptance.

Q. GUARANTEE

The Contractor shall guarantee all materials and workmanship in any way involved with this project for a period of one year from the date of final acceptance. Date of final acceptance is hereby defined as the date on which the City accepts the new water mains.

END SECTION 3150

SECTION 9000 - RESTORATION

1. GENERAL

   A. This section covers the work necessary for the finish grading and lawn establishment, complete, including furnishing and delivery of material, seed or sod, and maintenance of lawns.

   B. All areas disturbed by the Contractor's operations shall be restored by seeding, mulching and fertilizing. Areas to be sodded shall be indicated on the Drawings.

2. TOPSOIL

   A. Selected topsoil stripped at the site, properly stored and protected, free from roots, sticks, hard clay, and stones, which will not pass through a 1-inch square opening. Remove existing grass before topsoil is excavated. Provide imported topsoil if required to accomplish the work.

3. IMPORTED TOPSOIL

   A. Imported topsoil shall be a natural, friable soil, representative of productive soils in the vicinity. It shall be obtained from well-drained areas, free from admixture of subsoil and foreign matter, and objects larger than 2 inches in diameter, toxic substances, and any other deleterious material which may be harmful to plant growth and be a hindrance to grading, planting, and maintenance operations.

   B. Topsoil shall meet, or shall be improved to meet, the following mechanical requirements by adding sand and/or peat or manure and incorporating into the topsoil:

COMPONENT	MAX. PERCENTAGE
Sand	65 percent
Silt	50 percent
Clay	25 percent

   C. Topsoil shall be pulverized prior to being brought to the jobsite. It shall be pulverized to a size of 3/8 inches in diameter as the largest cross section.

4. PH CONTROL

   A. The following amendments shall be included in soils where required by the soils analysis tests:

      1. Soil sulfur
      2. Commercially packaged gypsum
      3. Ground dolomitic limestone

5. LIME

   A. Ground dolomitic limestone not less than 85 percent total carbonates and magnesium, ground so that 50 percent passes 100-mesh sieve and 90 percent 20-mesh sieve. Coarser material will be acceptable provided the specified rates of application are increased proportionately on the basis of quantities passing the 100-mesh sieve.

6. FERTILIZER

   A. Commercial Fertilizer: A complete plant food containing 6 percent nitrogen, 24 percent available phosphoric acid, and 24 percent potash, at a rate of 50 lbs./5,000 sq. ft., conforming to applicable state fertilizer laws, availability of plant nutrients conforming to standards of the Association of Official Agricultural Chemists (AOAC), uniform in composition, dry, free-flowing, and delivered in original, unopened containers bearing manufacturer's guaranteed analysis.

B. Superphosphate: Ammonium phosphate (16-20-0) containing 1.4 percent sulphur; granular, dry, free-flowing delivered in original bags.

7. TEXTURAL SOIL AMENDMENTS

A. Peat: A natural residue formed by decomposition of reeds, sedges, or mosses from freshwater site, free from lumps, roots, and stones, absorbing at least four times its dry weight of water, organic matter not less than 90 percent on a dry weight basis. The maximum moisture content at time of delivery shall be 65 percent by weight.

B. Manure: Well rotted, unleached stable or cattle manure, reasonably free from weed seed and refuse, containing no chemicals or materials harmful to plant life; not less than 4 months nor more than 2 years old. Sawdust or shavings shall not exceed 50 percent content.

C. Sand: As specified in Section 2300, EARTHWORK.

8. SEED

A. Seed Mixture:
20% Adventure Fescue
20% Jaguar II Fescue
20% Olympic Fescue
20% Arid Fescue
20% Regal Perennial

Apply at the rate of 350 pounds per acre.

Seed shall be labeled in accordance with U. S. Department of Agriculture Rules and Regulations under the Federal Seed Act. All seed shall be furnished in sealed standard containers unless exception is granted in writing by the Owner's Representative. Seed, which has become wet, moldy or otherwise damaged in transit or in storage, will not be acceptable.

9. MULCH

A. Straw Mulch: Threshed straw of oats, wheat, or rye, free from seed of obnoxious weeds.

10. NETTING

A. Jute Netting: Heavy, twisted jute netting, weighing 1 lb. per square yard. Openings between strands approximately 1-inch square.

B. Tackifier: Arn-Tak, as manufactured by American Excelsior or equal. Emulsion designed to retain moisture and heat in the soil. Mulch shall be chemically inert, nontoxic to plants, humans, and animals.

11. SOD

A. Sod shall be a species recommended by an experienced local A.N.A. - certified nursery. Sod to be strongly rooted, weed-disease and pest free and uniform in thickness.

B. All slopes greater than 3:1 shall be pegged to hold sod in place.

12. CHEMICAL SOILS TESTS

A. Have chemical analysis of topsoil performed by the County of State Soil Testing Service to determine lime and fertilizer requirements. Testing frequency shall be one test per 200 cubic yards of used topsoil.

B. Submit one copy of the fertilizer and liming recommendation report to the Engineer within 5 calendar days of commencement of spreading topsoil.

13. MECHANICAL SOILS TEST

A. Have gradation test, as specified in Section 2300, EARTHWORK, performed on the topsoil by a qualified, commercial soils testing laboratory to determine conformance to specified physical properties.

B. Submit one copy of the test results to the Engineer within 5 calendar days of commencement of spreading topsoil.

14. PROJECT SCHEDULE

A. Within 20 calendar days of the date specified for commencement of work, submit to the Engineer a proposed time schedule indicating dates for beginning and completion of the following operations:

1. Delivery and source of materials.
2. Preparation of sod/seed bed.
3. Placing sod/seed.
4. Maintenance.

15. CONSTRUCTION METHODS

A. Preparation of Subgrade. After rough grading is completed and before topsoil is spread, thoroughly scarify ground to a minimum depth of 8 inches with a toothed ripping machine by running in two directions at right angles over the entire surface to be planted.

B. Spreading of Topsoil. Spread topsoil and textural soil amendments, if required based on the results of the gradation test, over the prepared rough grade using a rubber-tired tractor with grader blade or equivalent not weighing more than 3-1/2 tons. Spread materials to make a finished thickness of a minimum of 4 inches.

C. Liming and Fertilizing

1. Apply lime uniformly with a mechanical spreader to the entire area for grass at the rate determined from soil test.

2. Apply commercial fertilizer uniformly with a mechanical spreader at a rate of 50 pounds per 5,000 square feet, or at rate determined from soil test.

D. Finish Grading

1. Thoroughly mix the applied materials to a depth of 4 inches by running a rototiller over the entire area in two directions at right angles.

2. Rake the top soiled area to a uniform grade so that all areas drain, as indicated on the grading plan.

3. Lightly compact with a cultipacker before placing sod.

4. Remove all trash and stones exceeding 1 inch in diameter from area to a depth of 2 inches prior to preparation and placing sod.

E. Sodding

1. Sod shall be cut and laid on site the same day. Only healthy vigorous growing sod is to be laid.

2. Always lay sod across slope and tightly together so as to make a solid area.

3. Roll or firmly but lightly tamp with suitable wooden or metal tamper all new sod sufficiently to set or press sod into underlaying soil.

4. After sodding has been completed, clean up and thoroughly moisten by sprinkler newly sodded areas.

F. Seeding

1. No seeding shall be done except in favorable weather conditions during the planting seasons as follows:

Spring Planting Season: March 1 through May 15
Fall Planting Season: August 15 through October 1

2. The seed shall be uniformly distributed over the designated areas. All areas disturbed by the Contractor's operations shall be restored.

3. A method of sowing using mechanical power-drawn drills or seeders shall be employed, unless otherwise approved by the Engineer.

4. Care shall be taken to ensure that successive seeded strips shall overlap.

5. Half the seed shall be sown with the sower moving in one direction, and the remainder of the seed shall be sown with the sower moving at right angles to the first sowing.

6. The seed shall be covered to an average depth of 1/2-inch by means of a brush harrow, spike-tooth harrow, chain harrow, cultipacker, or other approved device.

G. Mulching

1. Mulch all areas by spreading a uniform light cover of straw mulch over the seeded area at a rate of 3-1/2 tons per acre no later than the day after seeding has been performed.

2. Mulch all areas with a slope steeper than 20 percent by placing jute netting in strips paralleling the slope to completely cover newly seeded areas. Pin mulch to ground with 6-inch long wire staples at 5-foot intervals immediately after seeding.

3. Mulch all areas with a slope steeper than 25 percent with a uniform cover of straw at the rate of 2-1/2 tons per acre not later than 2 days after seeding has been performed and tackify by applying tackifier at rate of 50 lbs. of tackifier per acre mixed with a minimum of 1,600 gallons of water per acre.

H. Protection

1. Protect newly seeded/sodded areas from pedestrian traffic by erecting a fence on 2-inch by 2-inch posts 4 feet high spaced 10 feet on center and strung with a single strand of No. 12-gauge wire marked with cloth strips at 3-foot intervals between posts.

16. GUARANTEE

A. If, at the end of the 8-week lawn maintenance period, a satisfactory stand of lawn has not been produced, the Contractor shall renovate and re-sod or re-seed the lawn according to the original treatment or unsatisfactory portions thereof immediately. If it is not accepted, a complete restoration will be required during the planting season meeting all of the requirements specified under CONSTRUCTION METHODS.

B. A satisfactory stand is defined as a lawn grass or section of lawn of 2,000 square feet or larger that has:

1. No bare spots larger than 3 square feet.

2. Not more than 10 percent of total area with bare spots larger than 1 square foot.

3. Not more than 15 percent of total area with bare spots larger than 6 inches square.

17. INSPECTION FOR ACCEPTANCE

A. Eight weeks after the start of maintenance on the last section of completed lawn, and on written notice from the Contractor, the Engineer will, within 15 days of such written notice, make an inspection to determine if a satisfactory stand has been produced. If a satisfactory stand has not been established, another inspection will be made after written notice from the Contractor that the lawn grass is ready for inspection following the next growing season.

18. MEASUREMENT

This work will not be measured for payment, but will be considered a lump sum unit. The work will include the restoration of all disturbed grassy areas, whether or not they are shown on the plans.

19. PAYMENT

A. Restoration - Lump Sum. Payment for the work in this Section will be included as part of the lump sum bid amount stated in the Proposal. This item shall also include backfilling behind curbs, sidewalks and pavements, grading behind the curb line to assure positive drainage, sod, seeding, mulching, relocation of mailboxes (temporary and permanent), and all other appurtenances not covered by unit prices.

ITEM: 9000.1 RESTORATION – LUMP SUM

END SECTION 9000

Missouri
Division of Labor Standards
WAGE AND HOUR SECTION

MICHAEL L. PARSON, Governor

Annual Wage Order No. 27

Section 036
FRANKLIN 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
Taylor Burks, Director
Division of Labor Standards

Filed With Secretary of State: **March 10, 2020**

Last Date Objections May Be Filed: **April 9, 2020**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$34.67
Boilermaker	$69.25
Bricklayer	$57.93
Carpenter	**$57.11**
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$53.39
Plasterer	
Communications Technician	*$24.61
Electrician (Inside Wireman)	$65.71
Electrician Outside Lineman	*$24.61
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	*$24.61
Glazier	**$61.92**
Ironworker	$62.11
Laborer	**$46.60**
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	*$24.61
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	**$62.93**
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	**$48.71**
Plumber	$69.32
Pipe Fitter	
Roofer	**$51.99**
Sheet Metal Worker	**$67.64**
Sprinkler Fitter	$61.55
Truck Driver	*$24.61
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received less than 1,000 reportable hours for this occupational title.
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.

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	$55.33
Millwright	
Pile Driver	
Electrician (Outside Lineman)	*$24.61
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	**$46.67**
General Laborer	
Skilled Laborer	
Operating Engineer	**$63.02**
Group I	
Group II	
Group III	
Group IV	
Truck Driver	$41.47
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 less than 1,000 reportable hours for this occupational title. 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.

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.