CONSTRUCTION MANAGER'S MANUAL

Project: Hillcrest HS – City Utilities Waterline

Issue Date: 2/10/2020

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1.00 INVITATION TO BID

Nabholz Construction Corporation (herein after referred to as "Nabholz" or "Construction Manager") is accepting specialty contractor and supplier proposals for the below referenced project. All proposals or bids received shall be submitted in accordance with the requirements of the Construction Manager's Manual (the "CM Manual"). Plans and bidding documents will be available via internet link, or at various reprographic locations. Bidders should contact Nabholz for access to bidding documents.

Bid Packages will be due at the time and date listed below. Additional instructions and details pertaining to bid submission are listed herein.

.01 Project Information

Project Name:	Hillcrest HS – City Utilities Waterline Project
Nabholz Job Number:	09-20-0126
Jobsite Address:	3319 N Grant Ave, Springfield, MO 65803
Job Description:	Relocation of CU Waterline
LEED Certification:	N/A
Approximate Construction Start:	March 2020
Approximate Construction Finish:	June 2020
Are BIM/VDC Practices Required?	No
Is this a "Nothing Hits the Floor" Project?	Yes
Is this a CCIP Project? (Contractor Controlled Insurance Program)	No
Is this an OCIP Project? (Owner Controlled Insurance Program)	No
Is this job prevailing wage?	Yes
Is this job taxable?	No

.02 Bidding Procedure

Bid Date:	2/27/2020
Bid Time:	2 PM
Bid Submission Procedure:	Bids shall be sealed and delivered to the General Services Center - Springfield Public Schools at 1458 E Chestnut Expy, Springfield, MO 65802
Private or Public Opening:	Public
Bid Bond Required:	Bid Security for proposals greater than $100,000 – 5% Bid Bond. Obligee is Nabholz Construction Corporation.
Bid Opening Location:	General Services Center – Springfield Public Schools at 1458 E Chestnut Expy, Springfield, MO 65802
RFI/Bid Question Deadline:	2:00 PM on 2/19/2020
RFI/Bid Question Process:	Bidders shall submit questions in writing (email is preferred) by the established deadline. Questions should reference specific details, plan sheets, specifications, or bid manual sections. Submit to brian.masters@nabholz.com.

.03 Prebid Meeting

Prebid Meeting Date:	2/18/2020
Prebid Meeting Time:	2:00 PM
Prebid Meeting Location:	Hillcrest High School – 3319 N Grant Ave, Springfield, MO 65803
Is the Prebid Mandatory?	Attendance is not mandatory but is strongly encouraged and will be considered in final evaluation of proposals.

.04 Project Team Information

Nabholz Office:	2223 W Sunset St, Springfield, MO 65807
Nabholz Project Manager:	Martha Leahy, 816.398.5922, martha.leahy@nabholz.com.
Nabholz Superintendent:	Rick Fobair, 479.426.3382, rick.fobair@nabholz.com.
Nabholz Estimator(s):	Brian Masters, 479.659.7898, brian.masters@nabholz.com.
Architect:	Brian Kubik, 417.890.5543, bkubik@bk-dc.com
Architect Address:	3100 S National Ave Suite 300, Springfield, MO 65807

.05 Site Specific Safety Considerations

Project Safety Considerations	1.
(in addition to Nabholz Safety Standards)	2.

Construction Manager will use the standard Master Contract, Project Contract, and any amendments thereto, collectively, (the "Subcontract"), for all Subcontractors. Construction Manager will use standard Purchase Order ("PO") for all Suppliers. Copies of these documents are available in electronic or hard copy upon request. We may also require performance and payment bonds for Subcontractors using Consensus 706 and 707 by an acceptable surety company or require other forms of surety.

Job Conditions and Job Safety in accordance with all safety regulations, including, federal (OSHA), state, and local, Construction Manager policy, and Subcontract or Purchase Order shall be required of all personnel on the Project including Subcontractors, Suppliers, and second tier Subcontractors and Suppliers. Reference Site-Specific Safety Considerations (Section 1.05 of this Manual) and Nabholz Safety Standards (Section 5.02 of this Manual). In addition, Construction Manager will enforce a NO SUBSTANCE ABUSE policy, and will not permit the use of tobacco on the Project site.

Construction Manager is an AA/EOE. All Women Owned Businesses (WBE), Minority Owned Businesses (MBE), and Disadvantaged Business Enterprises (DBE), including women, minority, disabled or veteran-owned business, are encouraged to submit a proposal or bid.

2.00 BIDDING INSTRUCTIONS AND SUPPLEMENTAL INFORMATION

.01 Instructions to Bidders

The following instructions apply to all proposals.

1. All bids shall be submitted on the bid form found in section 3.00 of this manual, inclusive of the scope of work specified in the applicable bid package.
2. Bid bonds are required for subcontractor proposals over $100,000, unless stated otherwise in section 1.02.
3. Bidders must fulfill prequalification requirements in accordance with CM's trade contractor procurement policy prior to the award of any Bid Package contract. Prequalification Questionnaires and applicable supporting documents are required annually and are available at https://www.nabholz.com/trade-contractors/ or by contacting the Construction Manager's ("CM's") office.
4. Modification to Bid Packages may be cause for rejection of proposal.
5. Bidders warrant they have visited the Project site prior to submission of proposals or have attended the pre-bid meeting(s) for the purpose of understanding and accepting all conditions in and around the Project site.
6. Bidders warrant that proposals are submitted in accordance with the requirements of CM Manual and Contract Documents. Bidders also warrant that proposals are submitted in accordance with the specification sections and drawings relating to the scope of the Bid Package.
7. Bidders must submit questions in writing to the CM no later than seven (7) days prior to the Bid Date or by the established RFI deadline. Responses to Bidders' RFI(s) will be distributed in the form of an Addendum or Clarification to all Bidders. Addenda may be issued during the bidding period. Bidders must acknowledge all addenda on the Form of Proposal. Addenda become part of the Contract Documents.
8. Bidders must, immediately notify CM in writing of errors, omissions, discrepancies, or noncompliance with applicable codes and regulations within the Contract Documents or any work which will not fit or properly function if installed as indicated in the drawings and specifications. This requirement does not relieve the Architect of design or professional service responsibilities.
9. Bidders must comply with all federal, state, local laws, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Subcontract or Purchase Order ("PO") throughout. Statutes will be deemed to be included in the Subcontract or PO, the same as though herein written out in full.
10. Subcontracts and PO will be awarded based on the lowest responsible qualified proposal, provided it is in the best interest of the Owner and/or CM. The Owner and/or CM reserves the right to reject any and all proposals and to waive any informality in the proposals.
11. To determine the lowest responsible qualified proposal, the CM will evaluate proposals based on the following considerations:

a. Total amount of Bidders' proposal, including Base Bid and Alternate Bids;
b. Acknowledgement of issued Addenda;
c. Bidders' bonding rate and capacity;
d. Sufficiency of Bidders' financial resources;
e. Evaluation of Bidder's labor rates;
f. Bidders' ability to perform in accordance with the Contract Documents;
g. Bidders' ability to perform without delay or interference to other trades or scopes of work;
h. Bidders' history of performance on previous projects with CM or Owner;
i. Responsibility and reputation of Bidders;
j. Evaluation of Bidders' safety record;
k. Bidder's history of compliance with applicable laws, codes, and regulations;
l. Quality and availability of Bidders' personnel and resources; and
m. Amount and nature of Bidders' current or pending litigation.

12. Bidders bonding capacity and rate will be evaluated by CM and Owner. The cost of providing Bidders Performance and Payment Bonds may be added to Base Bid to assist in evaluating the lowest responsible qualified proposal. Bidders will be required to use the ConsensusDocs 706 and 707 for bonds, as provided at https://www.nabholz.com/bidding-and-contract-documents/
13. CM may perform an investigation of Bidders' financial condition. Bidders agree to assist in any such investigation, which may include a request for Bidders most recent audited or reviewed financial statements, a review of Bidders "Business Information Report" as prepared by Dun & Bradstreet, Inc., or discussions with Bidders' surety and banking agents.
14. Bidders are required to provide a price for each specified Alternate Bid, Unit Price, or Price Breakout that affects Bidders' Bid Package.
15. Bidders are required to provide unit prices for all labor classifications that apply to Bidder's Bid Package. Labor unit prices will be used to calculate labor for all change order requests.
16. The Contract Documents will include all documents identified as Contract Documents in the Agreement between the Construction Manager and Owner, The Master Contract & Project Contract between Construction Manager and Subcontractor, as well as the following attachments and any Addenda and Supplementary Conditions.
    a. Exhibit A – Bid Package Description
17. All attachments and exhibits to the Contract between Construction Manager and Owner shall be recognized by Subcontract or PO between Bidders and Construction Manager.
18. Bidders' proposal shall include, but not limited to, the following costs:
    a. All applicable Sales Tax and Freight on Board to Project site unless stated otherwise in the trade specific Bid Package.
    b. Prevailing wage rates and documentation if required by Contract Documents.
    c. Employee orientation, safety training, and photo ID badging, as required.
    d. Attendance at preconstruction and project coordination meetings, as required by specifications and Construction Manager's Quality Management System ("QMS"). Subcontractor is required to

send foreman, project manager or owner to all weekly Project site coordination meetings pertaining to the Scope of Work and/or as required by Construction Manager's Project Superintendent. Employees attending meetings must have the authority to make commitments on Subcontractor's resources (manpower, equipment, tools, etc.) to maintain Project Schedule or meet milestone dates.

e. Delivery of submittals, including but not limited to shop drawings, product data, samples, mock-ups, operating service and maintenance manuals, Material Safety Data Sheets (MSDS), and other documents and submittal materials required by the specifications.
f. All product testing documentation required by specifications, including test certificates
g. Coordination for field testing and inspections required by specifications and Construction Manager's QMS. Laboratory testing by others; any re-testing required due to initial failed testing under Scope of Work is the responsibility of Subcontractor. This requirement does not apply to air test & balance tests
h. Hook-up and consumption charges for temporary utility and telephone services for Bidders' trailers and sheds, including maintenance of temporary services and removal of services when no longer needed.
i. Task lighting and electrical service requirements
j. Telephones, computers, and internet access.
k. Drinking water and ice.
l. Storage sheds, office trailers, and labor sheds.
m. Portable, gas-driven welders.
n. All parking for employees shall be coordinated with Construction Manager's Project Superintendent at Bidders' expense.
o. All material handling equipment, including but not limited to hoisting with certified operators, bracing, shoring, scaffolding as necessary to move materials and complete Scope of Work.
p. Daily clean up and removal of all identifiable debris, including but not limited to:
    i. Site Cleanup. Subcontractor shall keep the Project site and work areas clean at all times and must sweep each work area and remove all debris prior to discontinuing work in each area. If the Subcontractor fails to immediately commence compliance with cleanup duties within forty-eight (48) hours after written notification from the Contractor of noncompliance, the Contractor may implement appropriate cleanup measures without further notice and deduct the cost thereof from any amounts due or to become due the Subcontractor under this Contract. Unless otherwise specified or required by law or regulation, all debris will be sorted as required and deposited on the Project site at a location designated by the project superintendent. Subcontractor shall comply with Contractor's on-site recycling and refuse programs. Subcontractors shall follow any Nabholz sustainability plans and programs regardless of whether the job is certified by the U.S. Green Building Council, Green Globes, or any other building

certification entity. Temporary protection of work and stored materials. Protect adjacent materials and finishes. Damage caused by performing this work will be the responsibility of this trade contractor.

q. Weather protection as required to protect and perform the Work unless specifically excluded in Bid Package.
r. All applicable trade permits, licenses, and inspection fees, including bonds required for the Scope of Work.
s. Engineering layout, professional surveys, grade control and field dimensions associated with the Scope of Work.
t. Touch-up painting of any prefinished items as required.
u. Dewatering of all excavations associated with the Scope of Work, as required, preserving structural integrity and workability.
v. Provide enclosures, temporary heat, blankets, additives, etc. as needed to protect Work and materials from cold weather conditions.
w. Removal of existing materials in existing facilities, if considered part of the Scope of Work and legally dispose of offsite.
x. Provide and install firestopping at penetrations in fire walls resulting from Work in accordance with specifications and code requirements. Allow 5-10% destructive testing. Obtain approved submittal before installing firestopping.

19. Bidders shall strictly comply with Construction Manager's safety policies and OSHA safety regulations. Construction Manager's complete Safety Standards can be reviewed at Construction Manager's offices or https://www.nabholz.com/bidding-and-contract-documents/ Hard hats and safety glasses, and high-visibility clothing are mandatory for all Project site employees during all phases of the project and must be worn at all times. Prior to working on a Construction Manager's Project, the viewing of Construction Manager's Safety Video by the construction personnel of all Bidders is a mandatory requirement. Hardhat stickers will be given to those construction workers who are confirmed to have viewed the safety video. All workers must have the current calendar year hard hat sticker on their hard hats in order to perform work on Construction Manager's Project.
20. Compliance with all requirements of Construction Manager's substance abuse and security policies.
21. Compliance with Construction Manager's insurance requirements. Reference Section 5.01 of the CM Manual.
22. Bidders' work shall strictly comply with all adopted Building Codes. Any code-related conflict in drawings and specifications shall be clarified and approved by the local Code Authority prior to installation.
23. Bidders shall be held responsible for submission of all submittals within three weeks of Notice of Intent to Award, including but not limited to shop drawings, product data, samples, mock-ups, operating, service and maintenance manuals, material safety data sheet information, and other submittals required by the specifications and Construction Manager's QMS. Submittals to be checked and signed off on by Bidders' representative indicating a review has been completed. Shop Drawings should be started upon

Notice of Intent to Award and completed expeditiously to not delay construction. Coordinate with existing conditions and other Subcontractors as needed for locations, sizes and penetrations required. Color samples to be treated as part of the submittal process.

24. Bidders shall provide closeout documents per Contract Documents and Master Contract including, but not limited to, attic stock, as built drawings, testing, warranties and equipment operation manuals before Substantial Completion as a prerequisite to Final Payment. Provide equipment operation instructions to Owner representative, as required.
25. Bidders shall provide warranty from date of Substantial Completion of Subcontractor's Work and for the duration per specification. All Warranty and call-back Work resulting from the Scope of Work shall be at no cost to the Owner or Construction Manager. Temporary use of equipment during construction will not affect the Warranty or call-back periods required by the specifications.
26. Bidders may not remove or replace its Superintendent or Foreman without prior written consent from Construction Manager.
27. Bidders shall coordinate delivery of required materials associated with the Bid Package. Bidders shall provide equipment and personnel necessary to unload, stack, protect, and store materials on Project site. Bidders shall inventory all delivered items and inspect for damage or missing items. Note damaged or missing items on the bill of lading. Construction Manager is not responsible for damaged or misplaced materials or equipment. Bidders shall file all damage claims with insurance carrier(s). Placement of staged items shall be coordinated with Construction Manager's Project Superintendent.
28. Stored materials are to be protected from heat and humidity as required by the manufacturer. All materials must be tagged with Project and Construction Manager's name. The items above are subject to the specifications and Owner requirements. Coordinate location of Project site storage containers with Project Superintendent.
29. Bidders shall coordinate Work with the Construction Manager and other trades affecting their Scope of Work.
30. Bidders shall contact the Project Superintendent if the substrate is unacceptable before installation of the Scope of Work. Installation of materials over substrate implies acceptance of substrate.
31. Time is of the essence. Provide a detailed schedule in bar chart format for the Scope of Work within 10 days of receiving Notice of Intent to Award. Comply with the Project Schedule furnishing necessary resources, including overtime, to maintaining project schedule. Should Bidders fall behind schedule due to conditions within Bidders' control, Bidder shall implement whatever means are necessary to accelerate the Bidders' Scope of Work until it is in compliance with the schedule. The cost of accelerating the Work shall be borne by the Bidders. Certain areas may be completed earlier than originally indicated on schedule. Subcontractor must be prepared for any minor adjustments to the schedule as Work progresses.
32. Time lost due to weather conditions must be made up by Bidders.
33. Bidders shall comply with the established work hours or Owner-specified durations necessary to minimize impact on Owner operations.
34. Construction Manager maintains ownership of all schedule free float.

35. Bidders shall sequence Work as directed by Construction Manager.
36. Bidders must be and have been regularly engaged in Work to be performed for the past 5 years using at least partially their own workforce skilled in that type of work. Project site foreman must be employed directly by Subcontractor and professionally qualified for Work to be performed with at least 10 years' experience.
37. Bidders must participate and comply with the Construction Manager's QMS as relevant to the Scope of Work.
38. Punch lists issued by Construction Manager, Architect, or Owner will be completed within fourteen (14) calendar days from the date of issue. If Bidders fails to comply with this requirement, Construction Manager reserves the right to perform the Work for the Bidders and back-charge the Bidders for the cost of the Work.
39. Prior to commencing work, bidders must provide company specific safety plan and silica exposure plan to superintendent, in either digital or physical copy.

.02 Declaration Regarding Prohibition of Sex Offenders and Convicted Felons on School Premises

(TO BE SUBMITTED PRIOR TO AWARD FOR PROJECTS PERFORMED ON SCHOOL PREMISES)

_____ ("Subcontractor") hereby acknowledges that it has a contract with Nabholz Construction for Work to be performed on the _____ (Name of School District or School Facility Project) premises. This applies to both green field and renovation/expansion school projects. Subcontractor declares that it has verified (and will continue to verify at least annually) that none of its employees and none of their sub-tier subcontractor employees working on the school premises noted above have been convicted, entered a plea of guilty or a plea of nolo contendere, or received a suspended sentence for a crime or an attempt a crime in the State of Arkansas, the United States or any other state for

1. any sex offense subject to a Sex Offenders Registration Act, and/or

2. any felony offense within the last ten (10) years unless such an employee has received a presidential or gubernatorial pardon. This restriction does not apply to persons who have been convicted of a felony within ten (10) years and who are volunteers performing community service hours under court order, or who are performing services under a supervised work release program.

Subcontractor acknowledges that it is unlawful for any person who is a registered pursuant to the Sex Offenders Registration Act to work with children or to work on school premises.

DECLARATION BY SUBCONTRACTOR

The undersigned _____represent that he/she is the Owner or an officer of _____, who has the authority to make this declaration to Nabholz Construction.

I declare under oath that no employee working on school premises under the authority of the above-named company or business has been convicted in this State, United States or another state of any sex offense subject to the Sex Offenders Registration Act or is subject to state or federal sex offender registrations provisions. I further declare that no employee working on school premises under the authority of the above-named company or business has been convicted of a felony offense within the past ten (10) years in this State, the United States, or another state.

DATED this ____day of _____, 20____.

Subcontractor _____

By _____Title _____

Attest: _____

Subscribed and sworn to before me this _____

day of _____, 20_____.

Notary Public

_____

.03 Bid Affidavits

(INSERT ADDITIONAL AFFIDAVITS, ETC. HERE)

.04 Wage Requirements

(INSERT WAGE REQUIREMENTS HERE)

3.00 BID PACKAGES AND BID FORMS

.01 General Scope Requirements

All trade specific bid packages shall be inclusive of the General Scope Requirements listed below.

1. Refer to Instructions for Bidders for general requirements.
2. Subcontractor agrees to follow all safety procedures and safety regulations of Nabholz, including those that are more stringent than Subcontractor's own safety policy or OSHA standards.
3. All employees must wear hard hats, eye protection, and high visibility vests at all times on site.
4. Subcontractor is responsible for the protection of the SWPPP devices in place. If Subcontractor is required to move a SWPPP device in order to complete work, Subcontractor must replace that device as installed. Coordinate removal and replacement of SWPPP device with Project Superintendent.
5. Construction Manager will provide layout to building corners. Subcontractor is responsible for layout beyond these points.
6. Coordinate on-site employee parking with Project Superintendent.
7. Coordinate location of on-site storage containers with Project Superintendent
8. Employees shall avoid harassment of students, faculty, or staff. Employees who violate this requirement may be removed from the jobsite by Project Superintendent.
9. Subcontractor will actively participate in the Nabholz Quality Management System.
10. Subcontractor agrees to follow the Project Schedule and meet the milestone dates. Certain areas may be made earlier than originally indicated on Schedule. Subcontractor must be prepared for any minor adjustments to the Schedule as work progresses.
11. Subcontractor must attend weekly coordination meetings. Employees attending meetings must have the authority to make commitments on manpower to maintain Project Schedule or meet milestone dates.
12. All Subcontractors and Suppliers will be required to write a site-specific safety plan to address Nabholz 12 Commitments To Live By (C2LB).
13. The Project will be staged on an existing, occupied, operating school campus. Avoid interaction with owner's employees, students, teachers and/or staff. Any harassment of personnel listed above will not be tolerated. All questions or comments from such should be referred to Project Superintendent. Violation of this requirement will not be tolerated and may be grounds for immediate dismissal from Project and/or legal action.
14. Deliveries of building materials will give right of way to school bus traffic during drop-off and pick-up times.
15. Construction activities that generate high decibel noise levels must be scheduled and coordinated with Construction Manager's Project Superintendent.

16. Construction Manager will coordinate with the school's Principal to work within academic and testing schedules.
17. In accordance with Missouri State Law as described in sections 191.765 – 191.777 R.S. Mo., smoking, the use of tobacco, or the use of products containing tobacco in any form is prohibited on any property owned or leased by a public-school district.
18. Prior to award, Subcontractors will be required to complete the Declaration Regarding Prohibition of Sex Offenders and Convicted Felons on School Premises form located in Section 3.02 or such declarations otherwise required by the Owner.

.02 Bid Form

Date of Bid _____

Submitting Company ("Bidder")

Company Name_____

Project State License Number_____

Company Representative

Name_____

Email Address_____

Cell Phone_____

Scope of Work

Bid Package Number_____

Bid Package Description_____

Addenda
Bidder acknowledges receipt of the following addenda:

Addendum #_____ Dated _____
Addendum #_____ Dated _____
Addendum #_____ Dated _____
Addendum #_____ Dated _____
Addendum #_____ Dated _____
Addendum #_____ Dated _____

Base Bid
By submitting this proposal form, bidder acknowledges receipt of and compliance with Nabholz minimum insurance requirements, Master Contract Agreement, Project Contract Agreement, Performance and Payment Bond requirements, Purchase Order, CCIP Program Addendum, and Safety Standards.
Bidder agrees to complete the Scope of Work listed below for a lump sum of:

$_____

Alternates

1. Alternate Description Add/Deduct $ _____

2. Alternate Description Add/Deduct $ _____

3. Alternate Description Add/Deduct $ _____

4. Alternate Description Add/Deduct $ _____

Voluntary Alternates

1. _____ Add/Deduct $ _____

2. _____ Add/Deduct $ _____

Work in Progress & Project Specific Qualifications

Bidder shall submit with their proposal a Work in Progress (WIP) Report that lists the ten (10) largest projects currently being constructed. Moreover, final evaluation of Bidder's proposal shall be conditional on review of WIP Report, and Bidder's experience with similar scope and projects.

Completion Time

All Work shall be completed within the schedules prepared by and agreed to by Nabholz. Bidder shall provide adequate manpower and submit documentation for approval necessary to work within the timeframe scheduled. Estimated time period for construction is March 2020 – June 2020.

Bonding

Bond Rate Cost in Percent_____

Bidder can provide a Performance and Payment Bond and can meet the requirements set forth in the "Project Contact".
(circle one)

Yes/No

Name of Surety Agent_____

Surety Agent Phone
Number_____

Acceptance of Contract Forms

Bidder acknowledges that they have reviewed and accept the Contract Performance and Administration, Sample Master Contract, Sample Project Contract, Payment and Performance Bonds, Sample Purchase Order, Contractor-Controlled Insurance Program Addendum to Master Contract and the Nabholz Safety Standards forms linked in Section 6.04. Proposed modifications must be submitted with bid.

Signature

Bidder agrees that this proposal remains valid for a period of 60 days. Bidder understands that Nabholz and the Owner reserve the right to reject any or all bids. Bidder acknowledges Nabholz minimum insurance requirements and understands that the Master Contract shall be the basis of any contract offered by Nabholz Construction to Bidder. Proposed modifications of Master Contract language must be submitted with bid. Attach additional sheets if necessary. Upon receipt of notice of acceptance of bid, Bidder agrees to execute and return the contract and required insurance certificates within two weeks of notification.

By _____

Title_____

Printed name of individual signing this proposal_____

Contact phone number_____

Date _____

END OF PROPOSAL FORM

33.1 Site Utilities

SCOPE OF WORK

Subcontractor or Supplier agrees that the Base Bid amount entered above includes the following project-related activities and Scope of Work in accordance with the requirements of the specifications, drawings, and CM Manual. Unless noted otherwise subcontractor will furnish all equipment, materials, labor, supplies, tools, scaffolding, hoisting, transportation, unloading, and handling necessary for the proper installation and completion of this work.

APPLICABLE SPECIFICATIONS

- Division 0 – Project Information
- Division 1 – General Requirements

All General Scope Requirements as outlined in Section 3.01.

Section A: Trade- Specific Requirements

1. Coordinate the procurement of all paperwork, permits, fees and bonds necessary for the work covered under this agreement, bearing all cost associated.
2. Maintain storm water prevention plan in accordance with requirements of the local jurisdiction(s).
3. Provide all barricades, excavation protection, dust control. traffic control, and flagmen as necessary for the work.
4. Provide erosion control, maintenance of positive site drainage, and dewatering as it relates to the work.
5. Verify locations of existing utilities and services prior to commencement of work.
6. Do not interrupt existing utility serving occupied or operating facilities, except when authorized in writing by Owner and authorities having jurisdiction.
7. Provide all layout and construction staking necessary to perform related scope of work.
8. Field engineering and site layout required to perform this scope of work.
9. Provide complete underground utility system from utility service main to location as noted.
10. Provide all excavation and backfill required for underground utilities.
11. Water main complete – Furnish and install all materials including connection to city service, hydrants, thrust blocks, etc.
12. Furnish and install concrete structures as required.
13. Furnish and install backflow preventers and testing.
14. Coordinate testing with Project Superintendent and testing agency.
15. Pay for any retesting in the event of failed compaction test.
16. Provide test certificates for offsite fill if used.
17. Repair paving and sidewalks including re-striping where needed.
18. All cutting, patching, excavation, backfill and boring as required to construct utility lines.
19. Dewatering of the excavations associated with this scope of work as required. Preserve structural integrity and workability.
20. Clean and flush all lines when complete.
21. Dispose of all spoils offsite.
22. Provide all road clean-up required by activities of work.

Section B: Project Specific Requirements:

1. Project specific requirement 1.
2. Project specific requirement 2.
3. Project specific requirement 3.

Section C: Project-Specific Exclusions:

1. Project specific exclusion 1.
2. Project specific exclusion 2.

Section D: Project Alternates:

1. Alternate 1.

Section E: Unit Pricing:

1. Unit Price 1.

END OF BID PACKAGE

4.00 SCHEDULE

1. All activities related to Bidder's Scope of Work shall be completed within the schedules prepared by and agreed to by Construction Manager. All Subcontractors and Suppliers shall procure materials and provide the manpower necessary to meet the Project Construction Schedule. Estimated time periods for construction are:

    a. Material Procurement: March 2020 – April 2020
    b. Site Mobilization: April 2020
    c. Project Completion: June 2020

2. A Preliminary Construction Schedule will be provided to all Subcontractors and Suppliers with Project Contracts. Meetings will then be held with all Subcontractors and Suppliers for the purpose of receiving and coordinating input relating to duration and scheduling of project activities, which will be used to produce the actual Project Construction Schedule.

3. All Subcontractors and Suppliers shall be ready to commence work as required by the Project Construction Schedule and immediately upon receiving Notice to Proceed; and receipt from Subcontractor of executed Master and Project Contract Documents, Insurance that complies with Nabholz requirements, and Performance and Payment bonds (if required). In addition, all Subcontractors and Suppliers shall be prepared to provide shop drawings and/or submittals immediately upon award of contract and in no case no later than 30 days after award of contract.

5.00 OTHER FORMS

.01 Insurance Requirements

CONSTRUCTION MANAGER WILL NOT AUTHORIZE PAYMENTS TO SUBCONTRACTOR UNLESS SUBCONTRACTOR'S CURRENT CERTIFICATE OF INSURANCE AND CERTIFICATE OF SAFETY AND HEALTH IS ON FILE AND APPROVED.

FOLLOWING ARE MINIMAL INSURANCE REQUIREMENTS FOR SUBCONTRACTORS. WHERE THESE GENERAL REQUIREMENTS ARE LESS THAN THE REQUIREMENTS SET BY THE CONTRACT DOCUMENTS, THE CONTRACT DOCUMENTS WILL PREVAIL.

1. **Commercial General Liability**, with limits, no less than:

Each occurrence:	$2,000,000
General aggregate (project specific):	$2,000,000
Products/completed operations aggregate:	$2,000,000

Policy shall contain no less than the following:

a. Policy form ISO CG 00 01, or equivalent.
b. Coverage shall be primary and non-contributory.
c. ISO standard severability of interest's clause and separation of insureds clause.
d. Claims-made policies are not acceptable
e. ISO CG 24 04 10 93, or equivalent endorsement form waiving subrogation.
f. ISO CG 20 10 and CG 20 37, or equivalent endorsement(s) for ongoing and completed operations. Unless prohibited by law, additional insured status shall not be limited to comparative negligence or vicarious liability of the Construction Manager.
g. Additional insured endorsements shall accompany Certificate of Insurance.

2. **Automobile Liability Insurance,** no less than:

Combined single limit:	$2,000,000

Policy shall contain no less than the following:

a. Coverage for "any auto," including owned, non-owned, and hired motor vehicles.
b. Additional insured endorsement or omnibus clause.
c. Waiver of subrogation endorsement.

3. **Workers' Compensation** and **Employer's Liability Insurance**, with limits no less than:

Workers' Compensation:	Per Statute
EL Each Accident	$1,000,000

EL Disease – EA Employee	$1,000,000
EL Disease – Policy Limit	$1,000,000

a. Other States coverage shall be included.
b. Jones Act coverage shall be included, if applicable.
c. USL&H coverage shall be included, if applicable.
d. Workers' compensation policy shall contain a waiver of subrogation endorsement, if permitted by law.

4. Umbrella Liability or Excess Liability Insurance OPTIONAL

Limits may be used to obtain the required limits for commercial general liability, automobile liability, and employer's liability insurance. Such insurance shall follow-form with any primary policies.

5. Other Insurance

Other Insurance coverages may be required based on Scope of Work.

6. Additional Insured Entities.

Each insurance policy (except for workers' compensation and employer's liability insurance) shall include the following entities as additional insured parties:

a. Nabholz Construction Corporation, its parent and affiliated companies;
b. Project Owner;
c. Project Architect and Engineers;
d. Each of their respective employees, agents, and principals; and,
e. Others as required by the Contract Documents

7. Subcontractor must maintain insurance throughout the duration of the Project and such time Subcontractor may be held legally liable for its Work, including the warranty period, or for such longer period as may be required under the terms of the Contract Documents.

8. If permitted by law, the certificate of insurance must include a 30-day written cancellation notice.

9. See sample certificate of insurance at https://www.nabholz.com/bidding-and-contract-documents/

.02 Example Contracts, Forms, and Other Documents

The following documents are available at https://www.nabholz.com/bidding-and-contract-documents/ and should be reviewed prior to bid submission:

1. Contract Performance and Administration
2. Sample Master Contract
3. Sample Project Contract
4. Sample Performance and Payment Bonds
5. Sample Purchase Order
6. Sample Certificate of Insurance
7. Contractor-Controlled Insurance Program Addendum to Master Contract
8. Safety Standards

.04 Nothing Hits the Floor

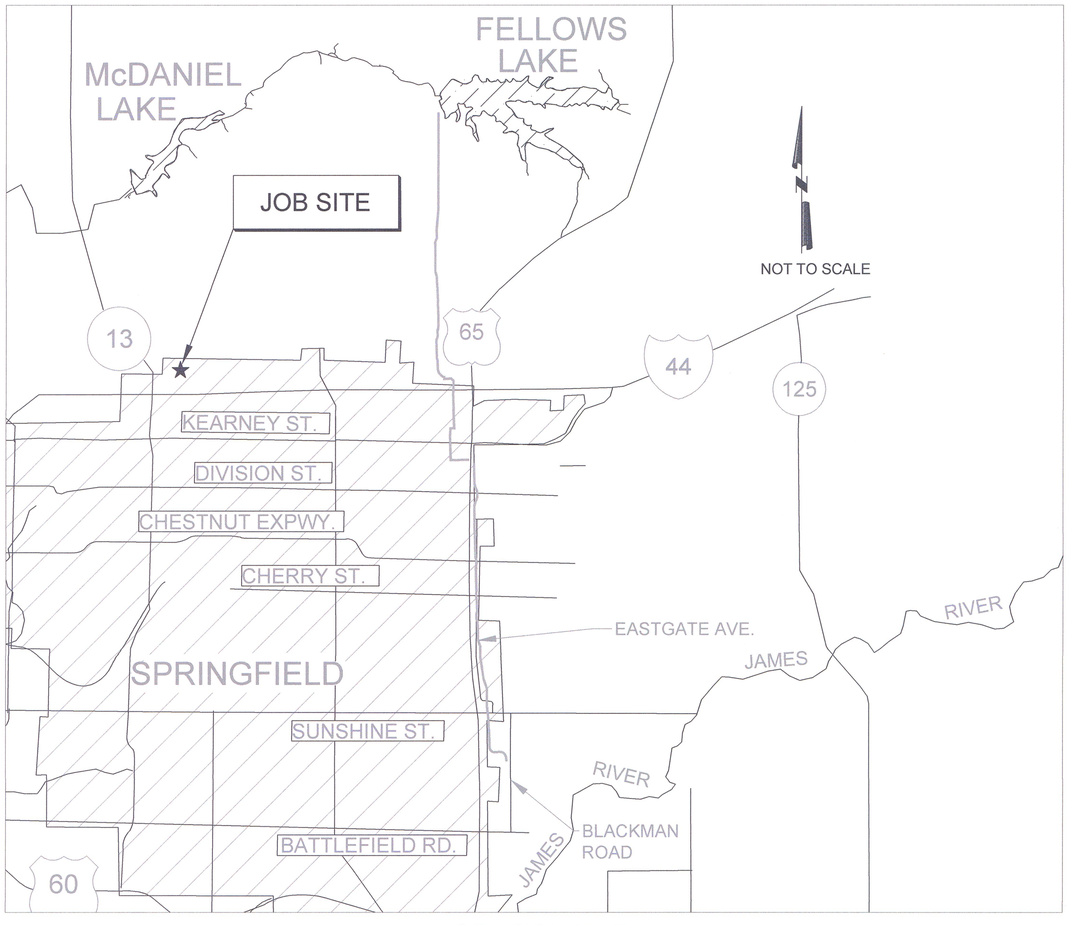
Nothing Hits the Floor is an initiative to improve productivity, reduce waste and construction debris, improve housekeeping, and enhance worker safety on the project. Subcontractor agrees to actively participate in the program, which includes but is not limited to the following activities:

1. All materials brought into the building shall immediately be loaded onto wheeled carts or dollies to allow easy movement and facilitate organization within the work areas.
2. Flow of work activities shall be planned to minimize or eliminate off-cuts, debris, and excess materials from piling up on the floor. Waste and recycling containers in the building shall be wheeled to facilitate efficient placement and ease of debris transport.
3. All work areas shall be kept clean and well organized, and shall be broom swept, with no materials left on the floor at the end of the work day.
4. All materials small tools are to be neatly stored and organized and work areas kept free of waste, debris, surplus equipment and surplus materials.
5. Subcontractor shall participate, at Construction Manager's discretion, in a project-wide cleanup effort to maintain housekeeping of common areas.
6. Right-time material deliveries are encouraged. Materials delivered to jobsite shall be incorporated into the Work within 10 days of delivery. Materials stored on site shall be roped off and labeled with Subcontractor's name, Subcontractor's Foreman's name and phone number, and the date of material delivery.
7. Whenever feasible, assembly of components shall be accomplished at tabletop height to encourage more ergonomically correct posture for craftsmen.
8. Wherever feasible, Subcontractor shall unpackage materials and dispose of packaging waste at his own shop.
9. Wherever feasible, Subcontractor shall endeavor to utilize cordless tools to eliminate the trip hazards associated with electrical extension cords.
10. Wherever feasible, and with the prior approval of the Construction Manager, Subcontractor shall endeavor to prefabricate components off-site in a warehouse or other controlled environment to eliminate jobsite cut-off debris, improve quality, and reduce safety hazards.

CITY UTILITIES OF SPRINGFIELD, MISSOURI

City Utilities℠
Connecting Our Community

HILLCREST HIGH SCHOOL
36" WATER MAIN RELOCATION



LOCATION MAP

LIST OF DRAWINGS

SHEET	TITLE
1.	COVER SHEET
2.	LEGEND, ABBREVIATIONS, AND DETAILS
3.	PLAN & PROFILE

STATE OF MISSOURI
JAMES NYIKAL OKUMU
NUMBER PE-2013019090
2/24/2023
PROFESSIONAL ENGINEER
James Nyikal Okumu
Professional Engineer MO# PE-2013019090

ONLY THE DESIGN OF THE RAW WATER MAIN AND THE ASSOCIATED WATER DISTRIBUTION FACILITIES HAVE BEEN PREPARED UNDER MY DIRECT SUPERVISION AND THE SEAL ABOVE APPLIES ONLY TO THAT DESIGN.

81145-D

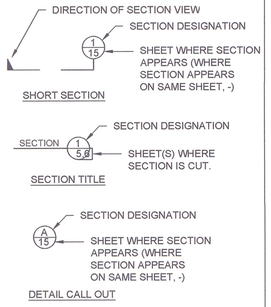
LEGEND

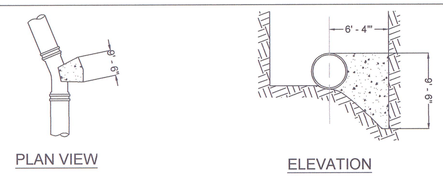
CP	CONTROL POINT
IP	FOUND IRON PIN
IP	SET IRON PIN
P.O.B	POINT OF BEGINNING
P.O.C.	POINT OF COMMENCEMENT
RWM	RIGHT-OF-WAY MARKER
PP GY	POWER POLE W/ GUY
MH	MANHOLE
SCO	SEWER CLEANOUT
GM	GAS METER
LP	LIGHT POLE
	SIGN
WM	WATER METER
WV	WATER VALVE
GV	GAS VALVE
FH	FIRE HYDRANT
TR	TELEPHONE RISER
	BUMPER POST
	GRATE INLET
	TREELINE
	BUSH
ER	ELECTRICAL RISER
TS	TRAFFIC SIGNAL BOX
MB	MAIL BOX
	PROPERTY LINE
SS	SANITARY SEWER
SW	STORM SEWER
T	TELEPHONE LINE
UT	UNDERGROUND TELEPHONE
G	GAS LINE
W	WATER LINE
E	ELECTRIC LINE
UE	UNDERGROUND ELECTRIC
x x	BARBED WIRE FENCE
o o	CHAIN LINK FENCE
	WOOD FENCE
	RETAINING WALL

LIST OF ABBREVIATIONS

BO	-	WATER BLOWOFF
CI	-	CAST IRON
CL	-	CENTER LINE
CS	-	COATED STEEL
DI	-	DUCTILE IRON
EOP	-	EDGE OF PAVEMENT
ESMT	-	EASEMENT
GM	-	GAS METER
HP	-	HIGH PRESSURE
IP	-	INTERMEDIATE PRESSURE
JT	-	JOINT TRENCH
LP	-	LOW PRESSURE
MJ	-	MECHANICAL JOINT
PE	-	PLAIN END
PL	-	PLASTIC (POLYETHYLENE GAS PIPE)
PP	-	POWER POLE
PVC	-	POLYVINYL CHLORIDE (WATER PIPE)
R/W	-	RIGHT OF WAY
SP	-	STANDARD PRESSURE
SW	-	SIDEWALK
WI	-	WROUGHT IRON
WM	-	WATER METER
WS	-	WELDED STEEL
PCC	-	POINT OF COMPOUND CURVATURE
PRC	-	POINT OF REVERSE CURVATURE
PC	-	POINT OF CURVATURE
PT	-	POINT OF TANGENCY

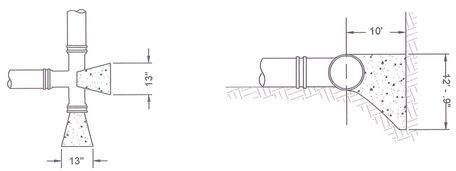
DETAIL DESIGNATION





DETAIL C
36" - 45° BENDS
NO SCALE

DETAIL B
36" - 22-1/2° & 11-1/4° BENDS
NO SCALE



DETAIL A
36" x 36" TEE
NO SCALE

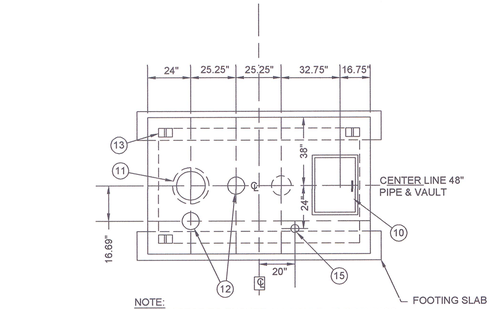
GENERAL NOTES

1 DESIGNED FOR 250 PSI WORKING PRESSURE WITH 3000 PSF SOIL RESISTANCE.

2 BLOCK TO BE POURED AGAINST UNDISTURBED EARTH & BLOCKEDAGAINST EXISTING CONCRETE PIPE.

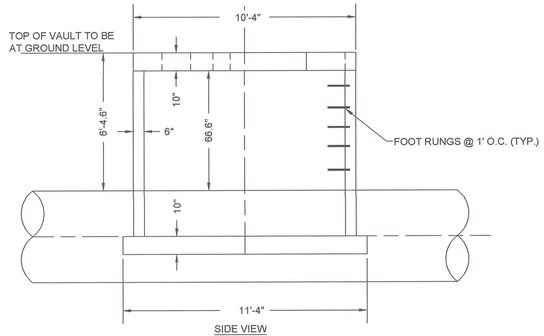
3 PROTECT JOINTS & BOLTS FROM CONCRETE.

CONCRETE THRUST BLOCK DIMENSIONS (2/1)
NOT TO SCALE

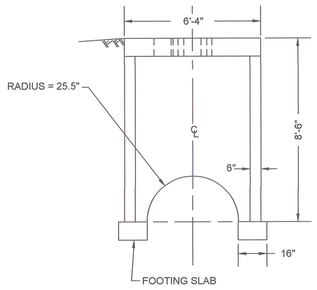


NOTE:
CONTRACTOR TO ENSURE ALL VAULT LID OPENINGS ALIGN WITH CORRESPONDING VALVE NUTS.

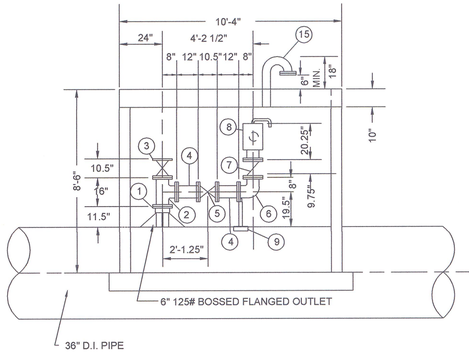
PLAN VIEW*



SIDE VIEW



END VIEW

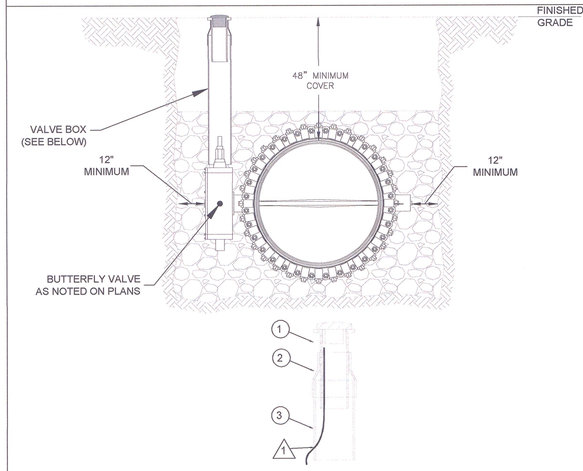


SIDE VIEW W/ PIPING*

*DIMENSION NOTE:
VAULT DIMENSIONS, ESPECIALLY DIMENSIONS FOR COVERS AND VALVE CAPS, ARE BASED ON THE PRODUCT MANUFACTURERS GIVEN ABOVE. CONTRACTOR SHALL ADJUST VAULT DIMENSIONS TO FIT. FOR EXAMPLE, ADJUST POSITION OF ITEM 13 TO MATCH DIMENSIONS OF VALVE ACTUATOR SELECTED FOR VALVE IN ITEM 3. CONTRACTOR TO ENSURE ALL VAULT LID OPENINGS ALIGN WITH CORRESPONDING VALVE NUTS.

1. 6" FORD UNIFLANGE SERIES 400 ADAPTER FLANGE FOR STEEL AND DUCTILE IRON PIPE, FLANGE DRILLING ANSI B16.1 125 LB. 250 PSI WORKING PRESSURE. CATALOG NO. UFA400-C-6.
2. 6"X6" DUCTILE IRON FLANGED TEE, ANSI/AWWA 110/A21.10 FACED AND DRILLED TO 125 LB TEMPLATE.
3. 6" FLANGE X FLANGE RESILIENT WEDGE GATE VALVE. MEETS ANSI/AWWA C509. FLANGED ENDS PER ANSI B16.1, CLASS 125. OPEN RIGHT WITH BEVEL GEAR OPERATOR W/ 2" SQUARE NUT DIRECTED UPWARD. 250 PSIG MAXIMUM WORKING PRESSURE. EPOXY COATED INTERIOR AND EXTERIOR SURFACES PER ANSI/AWWA C550 AND ANSI/NSF 61.
4. 6" DUCTILE IRON FLANGED PIPE. LENGTH 1'-0". CEMENT MORTAR LINING: ANSI/AWWA C104/A21.4. FLANGES: ANSI/B16.1 DUCTILE IRON. DUCTILE IRON FLANGED PIPE: ANSI/AWWA C115/A21.15. DUCTILE IRON PIPE: ANSI/AWWA C151/A21.51 CLASS 53 MINIMUM.
5. 6" FLANGE X FLANGE RESILIENT WEDGE GATE VALVE. MEETS ANSI/AWWA C509. FLANGED ENDS PER ANSI B16.1, CLASS 125. OPEN RIGHT, 250 PSIG MAXIMUM WORKING PRESSURE. EPOXY COATED INTERIOR AND EXTERIOR SURFACES PER ANSI/AWWA C550 AND ANSI/NSF 61.
6. 6" FLANGED DUCTILE IRON 90° BEND, ANSI/AWWA C111/A21.10 FACED AND DRILLED TO 125 LB TEMPLATE.
7. 6" ANTI-SLAM CHECK VALVE. CWP 200 PSI. ANSI CLASS 125, CAST IRON BODY ASTM A126, CLASS B. VALMATIC MODEL NO. 206C.
8. 6" COMBINATION AIR VALVE, ANSI CLASS 125 LB FLANGES, 150 CWP. VALMATIC MODEL 1206.
9. STANDON MODEL S-89 FLANGE SUPPORT. 6" FLANGE SIZE. MATERIAL SOURCES, INC.
10. 30" SQUARE TRAFFIC RATED ALUMINUM ACCESS DOOR, OPEN TO CENTER OF VAULT.
11. NEENAH R-6008 FRAME AND COVER.
12. CLAY AND BAILEY VALVE BOX CAP AND SHORT INSIDE SLEEVE PER WS-110. TO ALIGN VERTICALLY WITH BEVEL GEAR ACTUATOR NUT AND GATE VALVE ACTUATOR NUT PER NOTE 3 AND 5.
13. FOUR EMBEDDED LIFTING RINGS IN VAULT TOP. NEENAH R-3490-A.
14. REINFORCEMENT:
    TOP: UPPER LAYER: EQUIVALENT TO #4 @ 10" O. C. E. W.
    LOWER LAYER:EQUIVALENT TO #4 @ 5" O. C. E. W.
    WALLS: EQUIVALENT TO #4 @ 5" O. C. E. W.
    SLAB: UPPER AND LOWER LAYERS: EACH LAYER EQUIVALENT TO #4 @ 10" O. C. E. W.
15. 4" STEEL VENT PIPE WITH FLANGE, COMPANION FLANGE AND STAINLESS STEEL INSECT SCREEN BETWEEN FLANGES.

AIR COMBINATION VALVE VAULT DETAIL (1/1)
NOT TO SCALE



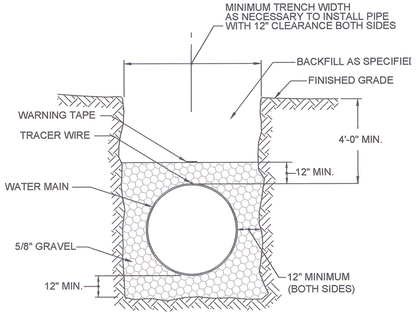
MATERIAL LIST

	QTY	DESCRIPTION	MANUFACTURER (PART NUMBER)
1	1	TOP PIECE AND LID	CLAY & BAILEY MFG. (01113-01-6400) OR EQUAL
2	1	PVC ADAPTER, 8" DIPS X 6" IPS	GPK PRODUCTS, INC. (HY09-00863H) OR EQUAL
3	--	8" C900 PIPE (AMOUNT AS NEEDED)	

△ GENERAL NOTES

1 FOR VALVE BOXES THAT ARE TO BE INSTALLED IN PAVEMENT CUT A HOLE BELOW THE TOP PIECE TO ROUTE THE TRACER WIRE TO THE INSIDE OF THE VALVE BOX

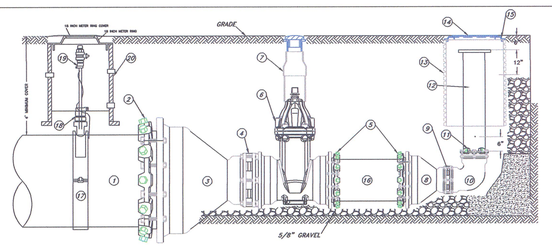
BUTTERFLY VALVE AND VALVE BOX (3/1)
NOT TO SCALE



GENERAL NOTES

1. TAPE TRACER WIRE TO TOP OF WATER MAIN.
2. TRACER WIRE SHALL CONFORM TO #10 SOLID COPPER SOFT TEMPER INSULATED TRACER WIRE-30 MILS LDPE, ASTM B-3, ASTM D-1248, BLUE INSULATION. SUPPLY IN 500 FT. SPOOLS.

WATER MAIN CROSS SECTION (4/1)
NOT TO SCALE



MATERIAL LIST

	DESCRIPTION		DESCRIPTION
1	RETAINED 36" D.I PIPE	11	8" D.I. RETAINER GLAND
2	36" D.I. RETAINER GLAND	12	8" FLANGE X PE NIPPLE, 60" LONG
3	36" MJ X 16" MJ REDUCER	13	24" METER TILE
4	36" MJ X MJ ADAPTER KIT	14	18" CLAY & BAILEY LID
5	16" D.I. RETAINER GLAND	15	24" - 18" ADAPTER FLANGE
6	16" GATE VALVE	16	16" D.I. PIPE
7	VALVE BOX ASSEMBLY	17	36" X 1" TAPPING VALVE
8	16" MJ X 8" MJ REDUCER	18	1" CORP STOP AWWA X PJ
9	RETAINED 36" D.I PIPE	19	1" FIP X PVC PJ CURB STOP
10	36" D.I. RETAINER GLAND	20	18" METER TILE

16" TEMPORARY BLOW OFF & WATER SAMPLE ASSEMBLY DETAIL (5/1)
NOT TO SCALE

ONLY THE DESIGN OF THE RAW WATER MAIN AND THE ASSOCIATED WATER DISTRIBUTION FACILITIES HAVE BEEN PREPARED UNDER MY DIRECT SUPERVISION AND THE SEAL ABOVE APPLIES ONLY TO THAT DESIGN.

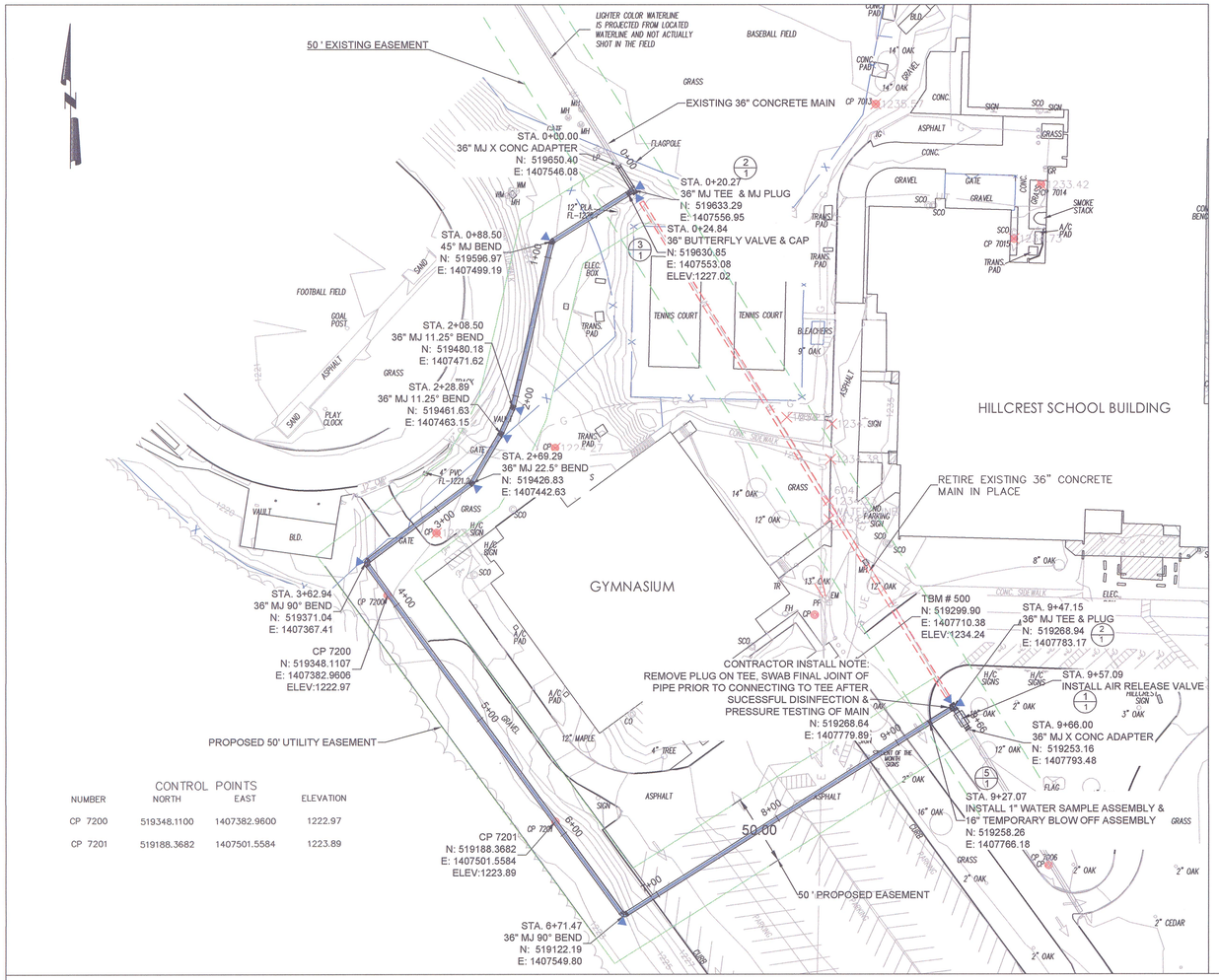
JAMES NYIKAL OKUMU NUMBER PE-2013019090 2/6/2020 PROFESSIONAL ENGINEER
James Nyikal Okumu
Professional Engineer MOE PE–2013019090

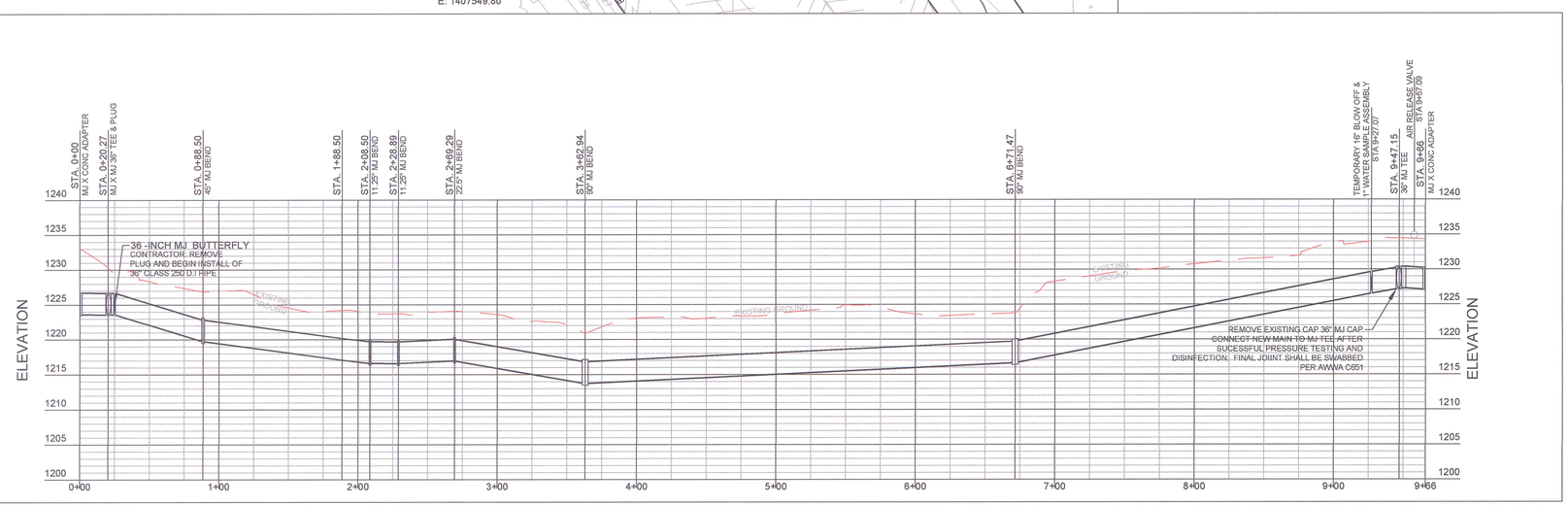
WATER TREATMENT AND SUPPLY

City Utilities — Connecting Our Community

HILCREST HIGH SCHOOL
36" MAIN RELOCAITON
LEGENDS, ABBREVIATIONS AND DETAILS

DESIGNER: JAMES OKUMU	APPROVED BY:	MAP NO.: NW–H01
PLOT DATE: 2.5.2020	APPLICATION NO.: B92118	SCALE: NOT TO SCALE
CONSTRUCTED BY: CU/CONTRACTOR	CONSTRUCTION COMPLETE DATE:	SHEET 1 OF 2	DRAWING NO.: 81145–D





GENERAL NOTES:

1. ALL NATURAL GAS AND WATER WORK SHALL BE INSTALLED IN ACCORDANCE WITH CITY UTILITIES CONSTRUCTION STANDARDS AND TECHNICAL SPECIFICATIONS.
2. OWNER PERFORMING INSTALLATION FROM STATION 0+00 TO TEE & PLUG AT STATION 0+24.84 AND STATION 9+47.15 TO 9+66. CONTRACTOR TO INSTALL ALL OTHER PIPE AND FITTINGS. MJ PLUGS REMOVED FROM BOTH ENDS OF THE PROJECT TO BE REMOVED BY CONTRACTOR AND RETURNED TO OWNERS LOT LOCATED AT 1402 N NEWTON RD SPRINGFIELD MO.
3. EXISTING TREES AND LANDSCAPING MAY NOT BE SHOWN ON THE PLANS. CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND PROTECT ALL EXISTING TREES AND LANDSCAPING UNLESS OTHERWISE NOTED ON THE PLANS. ROOTS ENCOUNTERED DURING CONSTRUCTION SHALL BE CUT FLUSH WITH THE SIDE OF TRENCH WITH A SHARP SAW TO PROMOTE HEALING. CONTRACTOR SHALL CONTACT CITY OF SPRINGFIELD ARBORIST WHEN TREE ROOTS EXCEED 2" IN DIAMETER.

   CONTRACTOR MAY TEMPORARILY REMOVE ORNAMENTAL TREES AND LANDSCAPING AS REQUIRED FOR CONSTRUCTION. ITEMS TEMPORARILY REMOVED MUST BE REPLACED TO AS GOOD OR BETTER THAN ORIGINAL CONDITION.
4. WHERE THERE IS EXCAVATION NEAR EXISTING CITY UTILITIES POWER POLES, CONTRACTOR SHALL CONTACT CITY UTILITIES (BRAD BUTLER @ 417-527-0476) AT LEAST TWO BUSINESS DAYS PRIOR TO EXCAVATION TO DETERMINE POLE SUPPORT REQUIREMENTS (IF ANY) AND TO PLAN / SCHEDULE TO PROVIDE POLE SUPPORT ACCORDINGLY.
5. ALL FITTINGS SHALL BE RESTRAINED WITH THRUST BLOCKS AND RETAINER GLANDS..
6. ALL PIPE JOINTS BETWEEN THE FOLLOWING STATIONS SHALL BE RESTRAINED.

   STA. 0+20.27 TO STA. 1+48.50
   STA. 1+88.50 TO STA. 4+86.00
   STA. 5+48.47 TO STA. 9.47.15
7. ALL RESTRAINED MECHANICAL JOINTS (MJ) SHALL BE MEGALUG SERIES 1100 MECHANICAL RESTRAINTS (EBBA IRON INC.).

   OTHER DEFLECTIONS REQUIRED DUE TO DIFFERING FIELD CONDITIONS SHALL REQUIRE ADDITIONAL THRUST RESTRAINT MEASURES. VARIATIONS SHALL BE COORDINATED WITH ENGINEER PRIOR TO INSTALLATION. THRUST BLOCKS SHALL BE INSTALLED AS SHOWN ON THE TEE & PLUG (BRACED TO THE ABANDONED CONCRETE MAIN).

LOCATION SKETCH
SEC. 2, T29N, R22W

LEGEND

#	WORK LOCATION OR WL
GS	GAS SERVICE LOCATION
	GAS SHORT STOP
	GAS TRANSITION
	GAS VALVE
	GAS EMERGENCY VALVE
	GAS ELL
	GAS REDUCER
	GAS VERTICAL ELL
	GAS MAIN OR SERVICE TAPPING TEE
	GAS MAIN OR SERVICE TEE
	GAS END CAP
	GAS COUPLING
A OR	GAS CP ANODE
	GAS CP TEST STATION
	GAS MAIN LINE
G	GAS SERVICE LINE
	GAS CASING
	EXISTING GAS MAIN OR SERVICE
	GAS AND WATER JOINT TRENCH
	ABANDONED GAS OR WATER
G/W	GAS AND WATER JOINT TRENCH LATERAL
W	EXISTING WATER MAIN OR SERVICE
	WATER SERVICE LOCATION
	WATER MAIN OR SERVICE TAPPING TEE
	WATER MAIN OR SERVICE TEE
	WATER VALVE
	WATER BLOWOFF VALVE
	WATER AIR RELEASE VALVE
	WATER ELL
	WATER VERTICAL ELL
	WATER REDUCER
	WATER HYDRANT
	WATER TRANSITION
	WATER COUPLING
	WATER END CAP
	WATER SOLID SLEEVE
	WATER PLUG
W	WATER MAIN
W	WATER SERVICE LINE
	WATER CASING
	WATER THRUST COLLAR
	WATER THRUST BLOCK
P/L	PROPERTY LINE
R/W	RIGHT-OF-WAY LINE
SAN	SANITARY SEWER LINE
	SANITARY SEWER MANHOLE
FO	FIBER OPTIC LINE
COM	COMMUNICATION LINE
OHE	OVERHEAD ELECTRIC LINE
	UTILITY POLE
	LIGHT POLE
	POLE ANCHOR
ACM	ASBESTOS CONTAINING MATERIAL

MISSOURI ONE CALL SYSTEM, INC. 1-800-DIG-RITE OR 811 CALL ON GLEN 3 DAYS BEFORE YOU DIG! mo1call.com

ONLY THE DESIGN OF THE RAW WATER MAIN AND THE ASSOCIATED WATER DISTRIBUTION FACILITIES HAVE BEEN PREPARED UNDER MY DIRECT SUPERVISION AND THE SEAL ABOVE APPLIES ONLY TO THAT DESIGN.

UTILITY DISCLAIMER:

EXISTING UNDERGROUND UTILITIES AND BURIED STRUCTURES IN THE VICINITY OF THE WORK TO BE PERFORMED HEREIN ARE INDICATED ON THE DRAWINGS ONLY TO THE EXTENT THAT SUCH INFORMATION HAS BEEN MADE AVAILABLE TO OR DISCOVERED BY THE ENGINEER IN THE PREPARATION OF THE DRAWINGS. THERE IS NO GUARANTEE AS TO THE ACCURACY OR THE COMPLETENESS OF SUCH INFORMATION AND ALL RESPONSIBILITY FOR THE ACCURACY AND COMPLETENESS THEREOF IS EXPRESSLY DISCLAIMED.

James Nyikal Okumu
JAMES NYIKAL OKUMU
NUMBER PE-2013019090
2/6/2020
PROFESSIONAL ENGINEER
James Nyikal Okumu
Professional Engineer MO# PE-2013019090

CU FACILITY DESIGN BASED ON PLANS PROVIDED BY:
DESIGN FIRM: ANDERSON ENG
PLAN NO.: 19SP10131
DATE SEALED: 11/18/19
REV. DATE: MM/DD/YYYY

CONTRACTOR/CITY UTILITIES
NAME:
DATE STARTED:
DATE COMPLETED:
INSPECTOR/SUPERVISOR
SIGNATURE

WATER PIPE MANUFACTURER AND BATCH NUMBER

SEGMENT	MANUFACTURER	BATCH NUMBER
1		
2		
3		
4		
5		

WATER PRESSURE TEST

SEGMENT	TEST PRESSURE (PSIG)	LENGTH OF TEST (MIN)	ACTUAL LEAKAGE (GPH)	ALLOWABLE LEAKAGE (GPH)	DATE OF TEST	TESTED BY
A	225 psi	903 ft		3.30 g/h		
B						
C						
D						

PIPE JOINING QUALIFICATIONS

CHECK ALL WORK THAT WAS PERFORMED PER PERSON HEAT FUSION(HF), ELECTROFUSION(EF), WELDING(W).

JOINERS NAME	GAS HF	GAS EF	GAS W	WATER HF	WATER EF
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

GAS PIPE MANUFACTURER AND BATCH NUMBER

SEGMENT	MANUFACTURER	BATCH NUMBER
1		
2		
3		
4		
5		

GAS PRESSURE TEST

SEGMENT	TEST PRESSURE (PSIG)	LENGTH OF TEST (MIN)	DATE OF TEST	TESTED BY	TEST RESULTS
A					☐ NO LEAKS
B					☐ NO LEAKS
C					☐ NO LEAKS
D					☐ NO LEAKS

☐ ALL FINAL TIE-INS LEAK TESTED BY:

WATER TREATMENT & SUPPLY

City Utilities — Connecting Our Community

3319 N GRANT AVE
HILCREST HIGH 36" MAIN
WATER MAIN RELOCATION
Sec. 2 T 29 N, R 22 W

DESIGNER: JAMES OKUMU		APPROVED BY:	MAP NO.: NW-H01
PLOT DATE: 2/5/2020		APPLICATION NO.: B92118	SCALE: 1" = 50'
CONSTRUCTED BY: CU/CONTRACTOR	CONSTRUCTION COMPLETE DATE:	SHEET 2 OF 2	DRAWING NO.: DWG # 81145

HILCREST HIGH SCHOOL 36" WATER MAIN RELOCATION

TECHNICAL SPECIFICATIONS

February 6, 2020

The following seal applies to the Specifications listed in the following Index to Specifications.

James Okumu – Engineer
MO# 2013019090
February 6, 2020

INDEX TO SPECIFICATIONS

DIVISION 3 – CONCRETE

03200 CONCRETE REINFORCEMENT

03300 CONCRETE

DIVISION 15 – MECHANICAL

15103 GATE AND BUTTERFLY VALVES

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01110 – SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Summary of Work

B. Location of Project

C. Contractor Furnished Materials

1.02 SUMMARY OF WORK

A. Work includes the installation and connection of approximately 900 LF of 36" inch ductile iron pipe distribution water main and appurtenances as indicated in the drawings, pressure testing & coordinating with owner on disinfection of the main.

B. Except as specifically noted otherwise, provide and pay for:

1. Insurance and bonds.
2. Labor, materials, and equipment.
3. Tools, equipment, and machinery required for construction.
4. Utilities required for construction.
5. Temporary facilities.
6. Traffic control and dust control measures.
7. Other facilities and services necessary for proper execution and completion of the Work.
8. All permits, government fees, and licenses not specifically listed as obtained by Owner.

C. Comply with codes, ordinances, regulations, orders, and other legal requirements of public authorities having bearing on the performance of the Work.

1.03 LOCATION OF PROJECT

A. The work is generally located on easement within the property of the Hilcrest High school. The school property is located at 3319 N Grant Avenue, Springfield Missouri.

1.04 CONTRACTOR FURNISHED MATERIALS

A. CONTRACTOR will furnish all materials and equipment to be incorporated into the Work. The mechanical joint plugs at the beginning and end of the project shall be removed by the contractor and returned to the OWNERS storeroom located at 1402 N Newton Rd.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01140 – COORDINATION AND PERMITTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Requirements for sequencing and scheduling the Work, overall coordination of Work, customer notification, permits, coordination with others, and coordination between construction operations and plant operations.

1.02 SEQUENCE AND SCHEDULING OF WORK

A. Conduct the work such that the OWNER's ability to meet its customer's demands for treated drinking water shall not be impaired or reduced in terms of require quantity or quality.

B. Do not disturb existing facilities that are not part of the project during construction.

C. Coordinate with Owner regarding connection to existing facilities. OWNER shall operate all main line valves during filling and flushing of contractor installed lines.

1.03 COORDINATION

A. Coordinate the work of all trades under this contract.

B. Coordinate with existing operations on-site to access and use construction area during normal working hours.

C. Coordinate all activities through the Inspector.

D. Coordination with Others

1. The Contractor, by agreeing to perform work under these Contract Specifications, hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work.

2. Other Contracts may be awarded during this Contract time. Some of these Contracts may involve on-site activity which must be coordinated with this Contract. In addition, City Utilities crews may perform other work involving on-site construction which must be coordinated with this Contract.

E. Inclusive in the Work is close coordination with all appropriate jurisdictional agencies. No additional payment will be made for compliance to jurisdictional requirements. Contractor is responsible for coordinating the Work as described herein.

1.04 WORK BY OTHERS

A. OWNER, utilities, and others may perform activities within Project area while work is in progress.

B. OWNER's personnel shall operate all main line water valves and provide labor and equipment for disinfection, flushing and sampling of all water mains. Such work shall require a 48-hour advance notification.

1.05 NOTIFICATION AND CUSTOMER RELATIONS:

A. Notify all residents affected by work done under this Contract at least 48 hours, but no more than 7 days, prior to starting work in the affected area. Notification shall be of a form and format approved by the Inspector. Execute the work in a customer/neighborhood friendly manner. In addition, notify adjacent utility customers and property owners of proposed location of work equipment parked overnight and of proposed material storage areas and stockpiles of sand, gravel and dirt. Adjust parking and material storage to maximize customer satisfaction and to minimize traffic congestion.

B. Only one drive on any property may be closed at a time. Give all property owners 48 hours advance notification prior to closing driveways.

1.06 PERMITS

A. CONTRACTOR will obtain City land disturbance and land disturbance permits. Contractor must obtain all other necessary permits.

B. A SWPPP is not required for this project. The contractor shall be required to submit a plan of their best management practices to be implemented at the various sections of the project. Contractor shall submit his plans and procedures for pressure testing the water main 48 hours prior to the testing.

C. Contractor shall comply with the conditions of all permits related to the project whether obtained by Owner or Contractor.

1.07 STORMWATER MANAGEMENT

A. Provide a complete narration of Best Management Practices (BMP's)that shall be implemented at the project.

B. BMP's shall be reviewed during the submittals phase. Resident Engineer shall make comments, additions and recommendations to the submittals to ensure that construction activities do not interfere or cause damage downstream.

C. Install and maintain BMPs as necessary. Modify BMPs as necessary throughout the course of work. Perform inspections on BMP's to ensure they continue to perform as expected and make changes where necessary.

D. On completion of the project, the CONTRACTOR shall remove all BMP's once vegetation is established.

E. City of Springfield BMPs Narratives and Details can be found at the following URL:

1. http://www.springfieldmo.gov/2122/Best-Management-Practices

F. City of Springfield Land Disturbance Permit requirements can be found at the following URL:

1. http://www.springfieldmo.gov/2124/Land-Disturbance-Permit

G. Contractor shall include cost of preparing BMP's and maintaining them in their bids.

1.08 AGENCY COORDINATION

A. Inclusive in the work is close coordination with all appropriate jurisdictional agencies. The Contractor is responsible for determining paving requirements not specifically shown on the drawings (temporary and permanent), construction standards, boring requirements and traffic control and safety requirements of these agencies. No additional payment will be made for compliance to jurisdictional requirements. Contractor is responsible for coordinating the work as described herein.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01201 – PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes procedures for submitting applications for payment and means used as a basis for Progress Payments, including:
   1. Cost Summaries
   2. Payment request forms.
   3. Payment for Mobilization.
   4. Final Approval and Demobilization.

1.02 RELATED SECTIONS

A. General Conditions

B. Section 01770 – Project Closeout

1.03 PAYMENT REQUESTS

A. On a monthly schedule submit requests for partial payment based on work completed and material on hand. The quantities shown on the drawings are estimates only and no guarantees are given as to actual quantities.

B. Base requests on unit costs for each bid item and the quantity complete.

C. Indicate total dollar amount of work completed to date. Indicate dollar amount paid to date. Indicate amount due for work completed.

D. Materials not yet incorporated into work may only be paid for if stored on site and covered by CONTRACTOR's insurance. Payment amounts for material stored on site shall only be CONTRACTOR's cost. Material invoices must accompany payment request.

E. Payment for materials or work by OWNER does not indicate OWNER's acceptance of work or materials.

F. Payment Requests shall be submitted using the OWNER's Estimate for Payment form, or another form approved by OWNER prior to commencement of Work.

G. Retainage shall be in accordance with the General Conditions.

1.04 MEASUREMENT AND PAYMENT

A. GENERAL:
   1. Payment for bid items shall be measured as follows for "Complete in Place" installations.
   2. The prices bid for the listed bid items will be the only items paid for.
   3. Minor dimensional and routing changes are to be expected as part of the work. Changes in horizontal and vertical dimensions as well as minor changes requiring additional fittings or additional depth shall not constitute sufficient grounds for extra payment other than for the additional footage or quantities as described in the bid items.
   4. Any work not itemized on the bid form shall be considered part of and incidental to the bid items listed unless noted as an exception to the initial bid.

B. BONDS AND INSURANCE: Payment shall be for the ACTUAL cost of bonds and insurance up to the amount bid. Contractor shall provide documentation of costs when applying for payment.

C. BMP NARRATIVE PREPARATION: Cost for preparation of BMP shall be included in the bid items for the various sections of the project. Activities associated with implementation, maintenance, and monitoring of the BMP are not part of any individual line item. The cost shall be distributed over all the line items.

D. WATER MAIN RESTRAINED:

1. General. Measurement shall be the actual linear feet of new pipeline, measured through the centerline of valves and fittings.

2. Payment will be made at the unit price bid for each size and type of pipe as stated in the Contract, and will be compensation in full for furnishing and installing the necessary materials and work as follows:

   a. Removal of obstructions, site clearing,

   b. All excavation, trench shoring and bracing,

   c. Pipe as called for in the Drawings,

   d. Fittings, plugs and dead-end materials,

   e. Ductile iron pipe joint bonding and polyethylene encasement, as required in the project design plans and specifications,

   f. Thrust resistant, as required by design plans or specifications

   g. Bedding and backfilling using approved, suitable material and compacted, if necessary, per standards and specifications,

   h. Testing,

   i. Existing asphalt or Portland cement concrete pavement saw cutting, milling, removal, and disposal including aggregate base course, as required,

   j. Removal and replacement of concrete, brick, stone, asphalt, or any other kind of sidewalks, and all driveways, curbs and other obstructions,

   k. Abandoning and plugging of existing mains as required or shown on the plans,

   l. All permits not obtained by OWNER required for construction/installation and the costs associated with those permits,

   m. Installation, maintenance, and monitoring of BMPs and other storm water controls included in the approved SWPPP,

   n. All soils and materials testing as requested by the specification, Inspector, and/or Engineer,

   o. Removal, transportation, and delivery of material salvaged to location designated by OWNER's Engineer,

   p. Removal and disposal of non-salvaged materials including, but limited to: concrete asphalt, soil, rock, vegetation, construction debris, and trash,

   q. Bracing and support of existing utilities,

   r. Plant protection prior to and during constructing, including placing of fencing for plant protection,

   s. Replacement of pavement and paved surfaces to the same condition or better than surfaces removed or to the standards of the agency with jurisdiction of the pavement, whichever is more stringent,

   t. Revegetation and landscape restoration as called for on the plans including private driveways and rip-rap,

   u. Removal and replacement of fence as called for on the plans,

   v. Installation of tracer wire and, and

   w. All work not specifically covered in other items,

3. Partial payment for this item will be made on the basis of the length of pipe that has been installed, backfilled, and tested.

E. TEMPORARY BLOWOFF ASSEMBLIES. Measure and payment shall be made per each blowoff assembly as shown on the Design Plans or as directed by the Engineer to install complete, including all appurtenances and related work. Payment shall include all costs for furnishing material and labor to install the blowoff and appurtenances not otherwise paid for in other bid items, including but not limited to clearing and grubbing, surface preparation, excavating, shoring and bracing, temporary erosion controls, pre-cast concrete vault and cover, piping, fittings, gate valve, ball valve, valve box and cover, concrete, and gravel, backfill and compaction, testing, removal and replacement of concrete, brick, stone, or any other kind of sidewalks, curbs, and all work not specifically shown covered in other items. CONTRACTOR may use owners temporary blow off assembly which begins at the 16" valve. A 36" x 16" MJ reducer and retained fittings would need to be provided by the contractor to use the assembly.

1.05 OTHER ITEMS

A. INCIDENTAL ITEMS: No additional payment shall be made for the following activities and other activities not specifically itemized above and shall be considered incidental to construction:

1. Surface restoration, including paving, revegetation, fencing, and landscape restoration.
2. Extra Fittings. Extra cast iron fittings not called for on the Plans.
3. Additional Depth Not Called for on Plans.

1.06 FINAL PAYMENT

A. Prior to final payment, comply with all requirements of Section 01770 and General Conditions.

B. With final payment request, submit affidavit certifying compliance with wage rate determination.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01312 – PROJECT MEETINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Requirements for conducting conferences and meetings for the purposes of addressing issues related to the Work, reviewing and coordinating progress of the Work and other matters of common interest, and includes the following:
   1. Qualifications of Meeting Participants.
   2. Preconstruction Conference.
   3. Progress Meetings.
   4. Post Construction Meeting.

1.02 QUALIFICATIONS OF MEETING PARTICIPANTS:

A. Representatives of entities participating in meetings shall be qualified and authorized to act on behalf of entity each represents.

1.03 PRECONSTRUCITON CONFERENCE

A. Upon issuance of Notice to Proceed, or earlier when mutually agreeable, Owner will arrange preconstruction conference in convenient place for most persons invited, in accordance with the General Conditions. Preliminary conference location is the Fulbright WTP Conference Room located at 3920 N Farmer Ave, Springfield MO 65803.

B. Attending Preconstruction Conference: CONTRACTOR's superintendent, OWNER, representatives of utilities, major subcontractors and others involved in performance of the Work, and others necessary to agenda.

C. CONTRACTOR will preside at conference.

D. Purpose of conference: To establish working understanding between parties and to discuss Construction Schedule, shop drawing and other submittals, cost breakdown of major lump sum items, processing of submittals and applications for payment, and other subjects pertinent to execution of the Work.

E. Agenda may include:
   1. Adequacy of distribution of Contract Documents.
   2. Distribution and discussion of list of major subcontractors and suppliers.
   3. Proposed progress schedules and critical construction sequencing.
   4. Major material deliveries and site access.
   5. Project coordination.
   6. Designation of responsible personnel.
   7. Procedures and processing of:
      a. Field decisions.
      b. Proposal requests.
      c. Submittals.
      d. Change Orders.
      e. Applications for Payment.
      f. Record Documents.
      g. Use of premises:

h. Office, construction, and storage areas.

i. OWNER's requirements.

j. Construction facilities, controls, and construction aids.

k. Temporary utilities and facilities.

l. Security and site access procedures.

8. Housekeeping procedures.

1.04 PROGRESS MEETINGS

A. Progress meetings may be required once per month at OWNER's discretion.

B. CONTRACTOR shall conduct progress meetings once every month, at OWNER's discretion, in CONTRACTOR's field office, ENGINEER's field office, or other mutually agreed upon place.

1. Require attendance of CONTRACTOR's superintendent and subcontractors who are or are proximate to be actively involved in the Work, or who are necessary to agenda.

2. Invite OWNER, ENGINEER, utility companies when the Work affects their interests, and others necessary to agenda.

3. Prepare and distribute agenda.

4. Preside at meetings.

C. Purpose of progress meetings:

1. To expedite work of subcontractors or other organizations that are not meeting scheduled progress, resolve conflicts, and coordinate and expedite execution of the Work.

2. Inform and update OWNER of status of project schedule.

3. Discuss potential problems which may impede scheduled progress and corrective measures.

1.05 POST CONTSTRUCTION MEETINGS

A. Meet with and inspect the Work 11 months after date of Substantial Completion with OWNER and ENGINEER.

B. Arrange meeting at least 7 days before meeting.

C. Meet in OWNER's office or other mutually agreed upon place.

D. Inspect the Work and draft list of items to be completed or corrected.

E. Complete or correct defective work and extend correction period accordingly.

F. Require attendance of Superintendent and affected subcontractors.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01324 – PROGRESS SCHEDULES AND REPORTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Preparation, submittal, and maintenance of computerized progress schedule and reports, contract time adjustments, and payment requests, including the following:
   1. Preliminary Schedule.
   2. Baseline Schedule.
   3. Four Week "look ahead" schedule.
   4. Monthly Schedule Updates and Revisions.

1.02 RELATED SECTIONS

A. Article 2 of the General Conditions.

B. Article 14 of the General Conditions.

1.03 RESPONSIBLE PERSON

A. Designate, in writing and within 5 calendar days after Notice of Award, person responsible for preparation, maintenance, updating and revision of all schedules.

1.04 PREPARATION

A. Preparation and submittal of Progress Schedule represents CONTRACTOR's intention to execute the Work within specified time and constraints. Failure to conform to requirement may result in termination for cause as specified in the General Conditions, under Suspension of Work and Termination.

B. CONTRACTOR's bid covers all costs associated with the execution of the Work in accordance with the Progress Schedule.

C. Failure to include an activity required for execution of the Work does not excuse CONTRACTOR from completing the Work and portions thereof within specified times and at price specified in Agreement. Contract requirements are not waived by failure of CONTRACTOR to include required schedule constraints, sequences, or milestones in schedule. Contract requirements are not waived by OWNER's acceptance of the schedule. In event of conflict between accepted schedule and Contract requirements, terms of Contract govern at all times, unless requirements are waived in writing by the OWNER.

D. Schedule logic: Assembled to show order in which CONTRACTOR proposes to carry out Work, indicate restrictions of access, availability of Work areas, and availability and use of manpower, materials, and equipment. Form basis for assembly of schedule logic on the following criteria:
   1. Which activities must be completed before subsequent activities can be started?
   2. Which activities can be performed concurrently?
   3. Which activities must be started immediately following completed activities?
   4. What major facility, equipment, or manpower restrictions are required for sequencing these activities?

1.05 SUBMITTAL OF PROGRESS SCHEDULES

A. Submit preliminary and baseline schedule.

B. Submit, on a monthly basis, updated schedules as specified.

C. Submit revised schedules and time impact analyses as required.

D. Submit schedules in the media and number of copies as follows:

E. One electronic secured PDF copy of the CPM network and/or bar chart (as specified by the OWNER).

F. Submit electronic copies via CONTRACTOR provided File Transfer Protocol site or email (as specified by OWNER). FTP site or email must require receipt notification to ensure delivery to the OWNER.

1.06 SCHEDULE OF SHOP DRAWING AND SAMPLE SUBMITTALS

A. After Preliminary Schedule has been submitted and accepted by OWNER, submit a list of all shop drawings and sample submittals anticipated in first 90 calendar days after Notice to Proceed.

1.07 WEATHER DAYS ALLOWANCE

A. Include as a separate identifiable activity on the critical path, an activity labeled "Weather Days Allowance." Insert this activity at the end of the schedule.

B. Weather Days are defined as a day when the CONTRACTOR is prevented by inclement weather, or conditions resulting there from, from proceeding with at least 75 percent of the normal labor and equipment force for at least 5 hours toward completion of the current critical path item, or items.

C. Duration of Weather Days Allowance is 5 working days per Section awarded.

D. Insert an activity in critical path to reflect weather day occurrences when weather days are experienced and accepted by ENGINEER. Identify this activity as a weather delay.

E. Unusual weather conditions resulting in delay of work greater than the Weather Days Allowance must be addressed according to the Change Order process as described in Article 12 of the General Conditions.

F. An approved increase in the contract time does not indicate additional monetary reimbursement is due the CONTRACTOR.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01330 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Requirements and procedures for submittals.

1.02 GENERAL INSTRUCTIONS

B. Provide submittals that are specified or reasonably required for construction, operation, and maintenance of the Work.

C. Edit all submittals so that the submittal specifically applies to only the equipment furnished. Neatly cross out all extraneous text, options, models, etc. that do not apply to the equipment or material being furnished, and clearly indicate what is being furnished.

D. Legibility: All submittals and all pages of all copies of a submittal shall be completely legible. Submittals which, in the Engineer's sole opinion, are illegible will be returned without review. D. Prepare submittals in the English language. Do not include information in other languages.

E. Present measurements in customary American units (feet, inches, pounds, etc).

F. Show dimensions, construction details, wiring diagrams, controls, manufacturers, catalog numbers, and all other pertinent details.

1.03 SHOP DRAWINGS

A. Cover Sheet: Provide a typical cover sheet for each submittal including the following minimum information:

1. OWNER NAME
2. CONTRACTOR NAME
3. PROJECT NAME
4. SUBMITTAL NUMBER AND TITLE
5. DATE SUBMITTED
6. STATEMENT OF COMPLIANCE
7. CONTRACTOR'S REVIEW AND APPROVAL
8. SIGNATURE OF CONTRACTOR

B. Submittal Numbering: Number Submittals sequentially starting with 01.

C. Statement of compliance shall in indicate compliance with Contract Requirements with exceptions, if any, listed on the Cover Sheet.

D. Contractor's Review and Approval

1. Certification statement shall be applied to the letter of transmittal.
2. Clearly identify the person who reviewed the submittal and the date it was reviewed.
3. Shop Drawing submittal statement shall read "(Contractor's Name) has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval."

E. Submittals shall be in electronic media format:

1. Provide all documents and manufacturer's literature using current version of Adobe Acrobat (i.e. PDF extension).
2. Do not password protect or lock the PDF document.
3. Rotate sheets that are normally viewed in landscape mode so that when the PDF file is opened the sheet is in the appropriate position for viewing.

4. Submit to an approved email address.

F. Resubmittals

1. Number with original Specification Section and series number with a suffix letter starting with "A" and increasing for each subsequent resubmittal on a (new) duplicate transmittal form.

2. Do not change the scope of any prior transmittal.

3. Provide cover letter indicating how each action item from previous submittal was addressed and where the correction is found in the resubmittal.

4. Account for all components of prior transmittal.

5. Obtain Engineer's approval to exclude items.

1.04 ENGINEER'S REVIEW ACTION

A. Shop Drawings:

1. Items within transmittals will be reviewed for overall design intent and will receive one (1) of the following actions:

a. A - FURNISH AS SUBMITTED.

b. B - FURNISH AS NOTED (BY ENGINEER).

c. C - REVISE AND RESUBMIT.

d. D - REJECTED.

e. E - ENGINEER'S REVIEW NOT REQUIRED.

2. Submittals received will be initially reviewed to ascertain inclusion of Contractor's approval stamp. Submittals not stamped by the Contractor or stamped with a stamp containing language other than that specified herein will not be reviewed for technical content and will be returned rejected.

3. In relying on the representation on the Contractor's review and approval stamp, Owner and Engineer reserve the right to review and process poorly organized and poorly described submittals as follows:

4. Submittals transmitted with a description identifying a single item and found to contain multiple independent items will not be reviewed and will be returned rejected.

5. Engineer, at Engineer's discretion, may revise the transmittal letter item list and descriptions, and conduct review.

6. Submittals returned with Action "A" or "B" are considered ready for fabrication and installation.

7. Submittals returned with Action "C" or "D" shall be revised, corrected, or updated in accordance with the review comments and resubmitted.

8. If for any reason a submittal that has an "A" or "B" Action is resubmitted, it must be accompanied by a letter defining the changes that have been made and the reason for the resubmittal.

9. In this case, some Drawings may contain relatively few or no comments or the statement, "Resubmit to maintain a complete package."

10. Failure to include any specific information specified under the submittal paragraphs of the Specifications will result in the submittal being returned to the Contractor with "C" or "D" Action.

11. Calculations required in individual Specification Sections will be received for information purposes only, as evidence calculations have been stamped by the professional as defined in the specifications and for limited purpose of checking conformance with given performance and design criteria. The Engineer is not responsible for checking the accuracy of the calculations and the calculations will be returned stamped "E. Engineer's Review Not Required" to acknowledge receipt.

12. Transmittals of submittals which the Engineer considers as "Not Required" submittal information, which is supplemental to but not essential to prior submitted information, or items of information

in a transmittal which have been reviewed and received "A" or "B" action in a prior submittal, will be returned with action "E. Engineer's Review Not Required."

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01350 - ENVIRONMENTAL PROTECTION PROCEDURES

PART I GENERAL

1.01 SUMMARY

A. Conduct all construction activities in conformance with all federal, state and local laws, regulations and ordinances for the protection of the environment.

B. The work under this Contract may affect the City of Springfield's drinking water supply. Under no circumstances shall the Contractor or any of his subcontractors allow any debris, fuel, chemicals, liquids or other materials to enter this water supply through direct or indirect means. Contain and dispose of all materials by means acceptable to the appropriate jurisdictional agency. Have materials on-site for containment of spills such as hydraulic hose breaks, etc.

PART II MATERIALS

2.01 No hazardous or toxic materials will be allowed in any phase of the work.

2.02 Drilling mud used shall not be harmful to the environment and shall comply with all applicable regulations.

PART III EXECUTION

3.01 When required, City Utilities will acquire a Land Disturbance Permit and provide a Storm Water Pollution Prevention Plan (SWPPP) that the contractor is to comply with for the duration of the project.

3.02 Contractor shall comply with all requirements of the Land Disturbance Permit and/or Storm Water Pollution Prevention Plan (SWPPP), if applicable.

3.03 Contractor shall install and maintain Best Management Practices (i.e. mulch logs, silt fences, etc.) for storm water sediment and erosion control during construction in accordance with construction standards to meet jurisdictional agency requirements. Best Management Practices shall also be utilized on projects when a SWPPP is not required.

3.04 All drilling mud shall be contained and reclaimed. Contractor is responsible for any spilled drilling mud.

END OF SECTION

SECTION 01420 - WATER AND NATURAL GAS CONSTRUCTION STANDARDS

PART I GENERAL

1.01 Construction Standards may be found at **http://www.cityutilities.net/business/construction.htm.** Any other construction details otherwise encountered will be provided by Resident Engineer. Copies of Construction Standards are available at City Utilities' Gas and Water Operations Center, 1321 W. Calhoun. Construction Standards and other instructions specified in the Contract Drawings shall be followed for all work on the project. City Utilities may make substitutions of equivalent materials or assemblies for those shown in the Construction Standards at no additional cost.

PART II MATERIALS - NOT USED

PART III EXECUTION - NOT USED

END OF SECTION

SECTION 01450 – QUALITY CONTROL

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Quality control requirements and procedures for products and workmanship.

1.02 PRODUCTS AND WORKMANSHIP

A. Provide new products and materials of specified quality, and equal to accepted samples when samples were submitted.

B. Perform and complete work in thorough manner.

C. Call OWNER's attention to apparent errors, conflicts, discrepancies, or omissions in Contract Documents and request instructions before proceeding with the Work. OWNER will issue written clarification or interpretation of requirements of the Contract Documents.

D. When specified, products will be tested and inspected either at point of origin or at work site:

1. Notify OWNER in writing well in advance of when products will be ready for testing and inspection at point of origin.

2. Do not construe that satisfactory tests and inspections at point of origin as final acceptance of products. Satisfactory tests or inspections at point of origin do not preclude retesting or reinspection at work site.

3. Do not ship products which require testing and inspection at point of origin prior to testing and inspection.

E. Establish a quality control system to ensure conformance of all items of work, including that of subcontractors, to applicable specifications and drawings with respect to the materials, workmanship, construction, finish, functional performance and identification. Provide the controls adequate to cover all layout and construction operations and keyed to the proposed construction sequence. Establish this control for all construction. City Utilities may perform inspections or tests for quality assurance as deemed necessary by Resident Engineer. Provide an outline of this quality control system and periodic reports of status upon request.

F. The Contractor's Resident Superintendent, to the extent qualified, may be used for quality control, supplemented as necessary by additional personnel for surveillance, special technicians or testing facilities to provide capability for the controls required by the specifications.

G. Provide for inspection of all work to ensure that materials and supplies are placed and installed in accordance with the drawings and specifications. Do not build upon or conceal any feature of work containing uncorrected defects.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01500 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:
   1. Furnishing, maintaining, and removing construction facilities and temporary controls, including temporary utilities, construction aids, barriers and enclosures, security, access roads, temporary controls, project sign, field offices and sheds, and removal after construction.
   2. CONTRACTOR shall provide design of Best Management Practices (BMPs) as required.

1.02 RELATED SECTIONS:

A. Sections 14.2.1 and 11.5.5.2 of the General Conditions.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 FIELD OFFICES AND SUPERVISION

A. No field offices will be required unless otherwise specified in the Contract Documents. Provide Inspector with telephone numbers at which Contractor and his Resident Superintendent may be contacted at any time. Designate a minimum of two people as after hour contacts.
B. Furnish storage space, sanitary facilities, trash disposal and utilities.
C. The Contractor will be responsible for access to and from the site without causing damage to any adjacent facilities or surrounding land.
D. Provide gate locks to interlock with CU's locks, if applicable. If locks are inappropriately secured prohibiting CU access, they will be forcibly removed.
E. Workers' vehicles are to be parked legally in an area designated by the Contractor.
F. Maintain the continuity of security systems.

3.02 USE OF PREMISES

A. Limit use of the premises to the work indicated.

B. Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction.

C. Do not encumber the site with materials or equipment. Do not use driveways and entrances for parking or storage of materials. Confine stockpiling of materials to the areas indicated. Limit materials stored to those needed for the job.

3.03 TEMPORARY UTILITIES

A. General: Cost or use charges for temporary utility facilities are not chargeable to the OWNER and shall be included in the Contract Sum unless otherwise noted.

B. Water Service:
   1. Use water from the OWNER's existing water system.
   2. CONTRACTOR shall pay for all required materials and installation costs of temporary water service; including meter assembly for OWNER's tracking purposes. Water usage will be recorded for OWNER's purposes but will not be charged to CONTRACTOR.
   3. A hydrant near the construction site may be used for water service if outdoor temperatures are above freezing or the CONTRACTOR protects the hydrant and service lines from freezing. A hydrant meter would be required.

C. Electric Power Service:

1. CONTRACTOR may elect to install temporary electric service from the utility's existing distribution lines. CONTRACTOR shall pay for all costs for removal, installation, and usage rates for the duration of usage.
2. Contact Developer Services at 417.831.8888 to establish electric service.
3. Installation and removal costs will depend on field office site to be determined by CONTRACTOR.

D. Sanitary Facilities:
1. Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
2. Provide containers or holding tanks to remove and dispose of effluent off-site in a sanitary and lawful manner.

3.04 MATERIAL DELIVERY, HANDLING, AND STORAGE

A. For OWNER furnished materials:
1. The Inspector will order materials from City Utilities storeroom for contractor as needed for the project. Requests for materials should be submitted to the Inspector at least 24 hours in advance.
2. Contractor shall pick up requisitioned materials at the City Utilities stores facility designated by the Inspector. Provide adequate transportation and labor to load and receive materials, except that City Utilities will provide a forklift and operator as necessary to load heavier items. Provide wood blocking, straps, tarps, etc. required for hauling the materials. Materials may be picked up from 9:00 a.m. to 3:00 p.m. Monday through Friday, except holidays.
3. Consider all labor, tools, equipment and incidentals necessary to complete the work, as well as any materials not specifically provided by City Utilities, to be completely covered by the prices bid.
4. Contractor shall be responsible for the material, and for the replacement of lost, broken or stolen material. Contractor shall examine all material upon receipt, and by acceptance, certify suitability for use. Make objections to issued materials to the Inspector.
5. Pick up items normally packaged in bulk quantities in such bulk quantities. Unused quantities will be returned to the stores facility by the Contractor or transferred to the next job as long as additional work continues. The Inspector will make appropriate requisitions, transfers and returns for each project.
6. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

B. Store fabricated products above ground, on blocking or skids, to prevent soiling or staining. Store loose granular materials in a well-drained area on solid surfaces. Arrange storage in a manner to provide easy access for inspection or inventory by either the Contractor or the Inspector.

C. Do not damage public or private property in handling or storage of materials. Do not hinder access to fire hydrants, fire and police alarms, mailboxes, water valves, gas valves and manholes.

D. Do not use private property for storage of materials without express written permission of property owner. Provide Inspector with documentation of permission to store materials.

E. Do not store any material, equipment, buildings, tools, vehicles or any other items owned by the Contractor on property owned by City Utilities except at the specific sites designated by the Inspector or as shown on the drawings for storage and use by the Contractor. If no sites are designated, then the Contractor is responsible for locating and procuring any required site or sites.

F. Make periodic inspection of stored products to ensure that products are maintained under specific conditions, and free from damage or deterioration.

3.05 ENVIRONMENTAL PROTECTION

A. Conduct all construction activities in conformance with all federal, state and local laws, regulations and ordinances for the protection of the environment.

SECTION 01720 – FIELD ENGINEERING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Field engineering to establish lines and grades for the Work.

B. Related Sections:

1. Sections 4.4, 6.3, and 11.5.4 of the General Conditions

1.02 QUALITY ASSURANCE

A. Qualifications of surveyor or ENGINEER: Registered civil engineer or land surveyor in state where Project is located.

B. Accuracy of stakes, alignments, and grades may be checked randomly by ENGINEER:

1. Notice of when checking will be conducted will be given.

2. When notice of checking is given, postpone parts of the Work affected by stakes, alignments, or grades to be checked until checked.

3. Do not assume that ENGINEER's check substitutes or complements required field quality control procedures.

1.03 CONSTRUCTION STAKES, LINES, AND GRADES

A. Execute the Work in accordance with the lines and grades indicated.

B. Make distances and measurements on horizontal planes, except elevations and structural dimensions.

1.04 SURVEY REFERENCE POINTS

A. Two horizontal control points and a benchmark will be provided by OWNER as indicated on the drawings.

B. From these reference points, establish other control and reference points as required to properly lay out the Work.

C. Locate and protect control points prior to starting site work, and preserve permanent reference points during construction:

1. Make no changes or relocations without prior written notice.

2. Replace Project control point, when lost or destroyed, in accordance with original survey control.

D. Set monuments for principal control points and protect them from being disturbed and displaced;

1. Re-establish disturbed monuments.

2. When disturbed, postpone parts of the Work that are governed by disturbed monuments until such monuments are re-established.

1.05 PROJECT SURVEY REQUIREMENTS

A. Establish minimum of 2 permanent benchmarks on site referenced to data established by survey control points.

B. Record permanent benchmark locations with horizontal and vertical data on Project Record Documents.

C. Assume responsibility for accuracy of stakes, alignments, and grades by performing verifications and checking in accordance with standard surveying practice.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 SUMMARY

A. The Contractor is solely responsible for locating all existing underground installations including, without limitation, service connections, in advance of excavating or trenching, by contacting the owners thereof, prospecting, and the use of the Missouri One-Call System and other appropriate locating services. The Contractor shall use its own information and shall not use the Drawings to locate underground facilities, since they may not accurately represent the locations of underground facilities or even the existence of all underground facilities. Contractor shall use all reasonable means necessary to avoid damage to underground facilities including, without limitation, hand digging.

B. Damages to existing City Utilities gas or water mains should be reported to the Inspector, 911, and City Utilities central dispatching (417) 863-9000. City Utilities will repair all gas and water lines broken by tear-out, poor construction, blasting or any other reason due to the construction of these facilities. City Utilities crews will not perform service or meter box relocation work for the Contractor.

C. When blasting is to be performed, Contractor shall notify City Utilities 24 hours in advance so that the Inspector may be present to inspect gas and water facilities and arrange for a gas and water leak survey prior to blasting.

3.02 INSTRUCTIONS FOR UTILITY STAKING

A. General

1. Staking is the responsibility of the Contractor unless otherwise specified in the Contract Documents. All utility staking shall be done under the direct supervision of a Professional Land Surveyor. All utilities shall be staked as shown on the individual project drawings issued with each staking assignment. Center line stakes, off-set stakes and stakes at each valve, fire hydrant, laterals, pedestals, junction boxes, street lights and other major fitting shall be set.

2. The entire electric/water/gas line shall be staked. On joint trench projects, gas and water fitting locations, valves, beginning and end of main will require staking. Respective flagging colors shall be used as required.

3. Stakes shall be sufficient size to contain all required information legibly. The minimum size stake used for gas and water staking will be 1" x 2" x 18". Laths will be used in high grass or brush.

B. OFFSETS – DEPTH

1. Stake all utilities as shown on the project drawings with offset staking at 50' intervals. Offset stakes shall be set at nearest R/W or easement line to main but no less than 6 feet off centerline and perpendicular to line at points where the line changes direction. Centerline shall be staked at 50' intervals to correspond with offset stakes. Stakes shall also be placed and appropriately marked at all valves, fire hydrants, tees, taps, meter pit locations, property corners on main sides, lateral/street crossing locations, easement lines and as needed to insure intervisibility along long runs of main or rough terrains.

2. All cuts shown on stakes are to be to bottom of trench from existing grade at base of offset stake. Necessary cuts shall be calculated based on required cover over gas/water main when site is finished grade. Cover is 3'-0" for electric conduit. On joint trench installations, the required cover for water mains shall be used to determine the necessary cut.

C. CENTERLINE STAKING

1. Water main stakes shall be marked "Centerline Water" on one side and tie with blue flagging.

D. OFFSET STAKING

1. Offset stakes shall have the offset distance in a circle and the word Water, Gas, or Electric marked on the front side with the cut. Backside of stake is to show the station (if applicable). All cuts will be figured from the ground elevation at the base of the offset stake unless otherwise directed by City Utilities. Tie the flagging colors as per Centerline Staking.

E. CUT SHEETS

1. Cut Sheets shall be kept on all construction staking and copies must be furnished to the City Utilities' Inspector upon request.

END OF SECTION

SECTION 01770 – PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Project closeout procedures.

1.02 GENERAL

A. Prior to City Utilities making final payments a continuous signal must be verified on the tracer wire.

B. Within ten days after Substantial Completion of construction, City Utilities shall notify the Contractor in writing (i.e. punch list) of any defects or defaults in performance which may have been discovered upon final inspection. The Contractor shall remedy promptly all such defects or defaults before the Construction Project shall be accepted by City Utilities.

C. In the event the Contractor fails to remedy such defects or defaults within 30 days after notification, City Utilities may elect to correct these defects or defaults and deduct the cost of such corrections from any reimbursements due the Contractor, or may bill the Contractor for such corrections. In addition, the Contractor shall be removed from the list of City Utilities approved Contractors for a period of not less than one year from date of completion of project on which deficiencies occurred.

D. Completely remove all traces of equipment, excess materials and debris from the site after all punchlist items have been completed, inspected and approved by Inspector.

E. Clean-up site to Inspector's satisfaction and leave site as good as or better than original conditions.

1.03 EXCESS AND SALVAGE MATERIALS

A. At the end of the project, return all excess and/or salvage materials (used or new) to the City Utilities stores facility designated by the Inspector in a form (broken down into stock item components) and conditions suitable to the Storekeeper.

B. Upon completion of project, remove all traces of temporary utilities unless instructed otherwise by the Inspector.

C. Upon completion of the project, remove all traces of temporary facilities. Fill all disturbed grass areas, grade and seed in conformance with Section 02900.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02220 – DEMOLITION AND CLEARING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Removal of designated items.
   2. Protection of items not designated to be removed.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 URBAN FOREST MANAGEMENT POLICY

A. In an effort to responsibly manage the urban forest, guide all work performed under this contract to reduce damage to any trees. Perform all work in accordance with the guidelines in the booklet "Trenching and Tunneling Near Trees - A Field Pocket Guide for Qualified Utility Workers." Copies of this booklet are available for inspection at City Utilities Forester located at 828 N. Prince Lane, Springfield, MO. Copies are also available from the National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410.

3.02 CONSTRUCTION LIMITS

A. Inspector will establish the construction limits and designate items to be removed and may designate items to remain.

3.03 REMOVAL OF ITEMS

A. Completely clear, grub and remove tree stumps, brush, hedge and other items within the construction limits not designated to remain.

B. Existing structures, including, but not limited to, pavement, curbs, sidewalks or other similar objects where portions of these objects are to be left in place, shall be removed to an existing joint or a new joint sawed to a minimum depth of one inch with a true line and vertical face.

C. Completely remove and dispose of all debris.

D. Disposal of concrete and other materials – all concrete and masonry, drainage pipes, reinforcement steel, structural steel, castings or timbers not salvageable shall be disposed of by the Contractor at his own expense and to the satisfaction of the Inspector at a location provided by the Contractor outside the limits of City Utilities property. Any of the above materials deposited adjacent to the project shall be deposited with written approval of the property owner. Submit written approval of the property owner to the Inspector.

3.04 PROTECTION OF REMAINING ITEMS

A. The Inspector may designate existing above-ground structures, trees, shrubs and plants that are to remain. Contractor shall preserve without damage these items throughout the construction period.

B. Contractor shall restore fences to original condition or better upon completion of the work. Make temporary closures during construction.

C. Contractor shall protect and restore ornamental trees and shrubs.

END OF SECTION

SECTION 02315 – EXCAVATION AND BACKFILLING FOR PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:
   1. Trenching and trench backfilling.
   2. Blasting and rock excavation.
   3. Rough and finish grading.
   4. Furnishing and installing granular fill.

1.02 RELATED SECTIONS

A. 01140 – Coordination and Permitting

B. 02510 – Water Pipelines

C. 02900 – Landscaping

1.03 REFERENCED STANDARDS:

A. ASTM International (ASTM):
   1. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
   2. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
   3. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

B. American Association of State Highway and Transportation Officials (AASHTO) 1. T104, Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate.

PART 2 - PRODUCTS

2.01 PIPE BEDDING MATERIALS

A. Bed all buried pipe with the materials indicated on the Drawings as specified below.

B. Granular Pipe Embedment 1. Material: Crushed limestone.

2. Gradation (5/8" Commercial Aggregate):

Percent Passing	Sieve
100	5/8"
70-90	1/2"
0-10	No. 4

3. Soundness: Loss of less than 15% after five cycles when tested with sodium sulfate in accordance with AASHTO T104.

C. Sand Pipe Embedment
   1. Material: Crushed limestone sand
   2. Gradation: 100% passing No. 4 sieve

2.02 BACKFILL IN NON PAVED AREAS

A. Above pipe bedding and below topsoil, backfill with suitable materials excavated from trench and processed as required, or borrowed from locations arranged and paid for by CONTRACTOR. Material shall be free from organic matter, refuse, ashes, cinders or other unsuitable materials, and shall not be frozen. Materials shall be free from gravel, stone or shale particles greater in any dimension than four inches. Backfill material shall contain sufficient fines to provide a dense mass capable of being compacted. Top six inches of backfill shall be topsoil in accordance with Section 02900.

2.03 BACKFILL IN PAVED AREAS

A. Other than pipe bedding as called out in the applicable Construction Standards, backfill trenches in designated area with material that meets the appropriate jurisdictional agency's requirements.

B. Casing piping installed by open trenching of roadways shall be bedded and backfilled full depth with granular material meeting the specifications of the appropriate jurisdictional agency.

C. This material will be required under sidewalks, existing paved areas, proposed paved areas, unpaved "driven-over" areas utilized as drives or parking lots, and as necessary on excavations paralleling proposed or existing streets and drives to avoid settlement of curbs or paving. D. When flowable fill is required, gas or water lines shall be covered with rock shield.

PART 3 - EXECUTION

3.01 TRENCHING

A. Centerline: Maintain centerline of the trench in a straight line with minimum bends or changes in direction. When trenching in pavement, saw cut the pavement in a straight line on both sides of the future excavations.

B. Length: Minimize the amount of open trench length at any time on the same street. Fill trenches as soon as practical after pipe is placed in the ditch and placement and bedding is approved by the Inspector. Coordinate closing of driveways with the individual property owners. Provide adequate access to all businesses during their operating hours.

C. Width: Maintain width of trench ample to permit pipe to be laid and jointed properly, and backfill to be placed and compacted as specified in accordance with applicable construction standards.

D. Depth: Depth shall be as shown in construction standards, unless otherwise indicated on the construction drawings. Measurements shall be made from the low side of the trench. Areas where design depth differs from standard depth will be noted on construction drawings however minor deviations in grade are to be expected in order to avoid other infrastructure and shall not constitute as additional work or payment due the contractor.

E. Where crossing roadways, piping shall be installed as required by the jurisdictional agency's permit.

F. Adjacent Structures, Water, Sewer, Gas Line and Telephone Cable Crossings:

1. Follow such method of course as may be approved by the Inspector in passing all underground structures.

2. Exercise extreme care in crossing or paralleling water, sewer, gas lines and telephone cables. Cross or parallel all structures at Contractor's sole risk and responsibility. Should any damage occur to such lines, Contractor is fully liable and will pay full cost of repairing same.

3. Make all arrangements and pay for relocation and bracing where poles or anchors are affected by the trenching operation.

G. Foundation for Pipe:

1. Grade the trench bottom as required to achieve uniform and continuous bearing and support for the pipe on solid and undisturbed earth free from rocks and other obstructions that could cause point loads throughout the length of pipe. Finish subgrade to a straight line between pipe joints.

2. Place, grade and compact to a uniform depth a minimum of six inches of specified bedding material in the ditch bottom prior to placing any pipe in the ditch.

3. Where trench excavation is inadvertently carried below specified grade, backfill with approved trench excavated material in 6-inch lifts compacted to provide a firm and unyielding subgrade.

4. Where the bottom of trench at subgrade is found to be unstable or include ashes, cinders, refuse or other organic material, excavate and remove such unsuitable material and fill according to Item 3, above.

H. Trench Bracing and Shoring: Support all trenches in accordance with all pertinent and applicable codes, rules and regulations.

I. Protect the public from any excavations left open during times when Contractor is not working.

3.02 SPOIL AREAS

A. Store no spoil off the right-of-ways or easements unless prior written permission has been obtained from the property owner and a copy of said agreement provided to the Inspector.

B. Locate and maintain off-site spoil areas for excess excavated materials. Restore these areas to satisfactory condition before final payment is approved. Provide a certificate of acceptance from the owner of the spoil area to the Inspector.

3.03 PIPE BEDDING

A. Pipe bedding shall conform to all applicable construction standards.

3.04 BACKFILL AND COMPACTION

A. Do not backfill trench until work is inspected and approval to proceed with backfill has been given by the Inspector. Complete backfilling promptly after approval to proceed.

B. Place material in six inch lifts and compact as necessary to avoid settlement of ditch line. Fill any settled areas for a period of one year after date of acceptance by City Utilities. Restore surface as needed.

3.05 ROCK EXCAVATION

A. All blasting is performed at the Contractor's sole risk. The Contractor is solely responsible for any and all damages caused by blasting to any adjacent structure or any other underground facilities. If damage does occur to any above or below ground facilities, including other City Utilities facilities, the Contractor is fully liable.

B. All excavation is considered unclassified. Presence of rock shall not relieve Contractor of depth requirements given in paragraph 3.01. There shall be no change in the Contract Price due to rock, regardless of type or hardness unless provided for in the Bid Documents.

C. In high hazard areas, remove rock by jackhammering as necessary. Make determination of whether or not rock can be blasted, but Contractor shall be fully liable for any damages.

D. Perform all blasting in accordance with the City of Springfield's General Ordinance #4714, even for areas outside the jurisdiction of the City of Springfield. Only persons holding blasting licenses as issued by the Springfield Fire Department may perform blasting. Contractor must present areas desired to be blasted to Resident Engineer for prior approval. Upon approval contractor must obtain any necessary blasting permits and submit a copy to the Resident Engineer.

3.06 TRAFFIC CONTROL

A. Control traffic in accordance with the latest edition of the Manual on Uniform Traffic Control Devices and with the approval of the jurisdictional agency.

END OF SECTION

SECTION 02510 – WATER PIPELINES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Ductile iron pipe, joints, fittings, gaskets, and pipe linings and coatings.

1.02 RELATED WORK DESCRIBED ELSEWHERE:

A. Work by Others, Section 01110.

B. Field Engineering, Section 01720.

C. Demolition and Clearing, Section 02220.

D. Excavation and Backfilling, Section 02315.

E. Disinfection and Testing, Section 02515.

F. Paving and Surfacing, Section 02700.

G. Concrete, Section 03300.

1.03 REFERENCES

A. American Society of Mechanical Engineers (ASME):
   1. B16.1 – Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.

B. American Water Works Association (AWWA):
   1. C104 – Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
   2. C105 – Polyethylene Encasement for Ductile-Iron Pipe Systems.
   3. C110 – Standard for Ductile-Iron and Gray-Iron Fittings.
   4. C111 – Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   5. C115 – Flanged Ductile Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
   6. C150 – Standard for Thickness Design of Ductile-Iron Pipe.
   7. C151 – Standard for Ductile-Iron Pipe, Centrifugally Cast.
   8. C153 – Standard for Ductile-Iron Compact Fittings for Water Service.
   9. C600 – Installation of Ductile Iron Water Mains and Their Appurtenances.
   10. C606 – Standard for Grooved and Shouldered Joints.

C. American Welding Society (AWS):
   1. D11.2 – Guide for Welding Iron Castings.

D. ASTM International (ASTM):
   1. A 47 – Standard Specifications for Ferritic Malleable Iron Castings.
   2. A 183 – Standard Specifications for Carbon Steel Track Bolts and Nuts.
   3. A 536 – Standard Specifications for Ductile Iron Castings.
   4. A 536 – Standard Specifications for Ductile Iron Castings.
   5. C 283 – Standard Test Methods for Resistance of Porcelain Enameled Utensils to Boiling Acid.
   6. D 792 – Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.

E. Ductile Iron Pipe Research Association (DIPRA):
   1. Thrust Restraint Design Manual.

F. NACE International (NACE):

   1. SP0188 – Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.

G. National Association of Pipe Fabricators, Inc. (NAPF):
   1. 500-03 – Surface Preparation Standard for Ductile Iron Pipe and Fittings in Exposed Locations Receiving Special External Coatings and/or Special Internal Linings.

H. Society for Protective Coatings (SSPC):
   1. PA-2 – Measurement of Dry Coating Thickness with Magnetic Gages.

1.04 SUBMITTALS

A. Product data: Photographs, drawings, and descriptions of fittings, gaskets, couplings, grooving of pipe, fittings, pipe linings, and coatings.

B. Shop Drawings:

   1. Detailed layout drawings showing alignment of pipes, location of valves, fittings, and appurtenances, types of joints, connections to structures, and thrust restraint system layouts.

   2. Thrust restraint systems: Calculations and layout for restrained joint thrust restraint systems.

C. Test reports:

   1. Submit Coating Manufacturer's Technical Representative's reports.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Block piping and associated fittings for shipment to prevent damage to coatings and linings.

B. Carefully handle piping and associated fittings during loading, unloading, and installation.

   1. Do not drop piping material from cars or trucks.

   2. Lower piping by mechanical means.

   3. Do not drop or pound pipe to fit grade.

   4. Pipe must be secured so that it cannot fall while being handled. Conventional chains, chain hooks and non-padded forklifts are expressly forbidden.

   5. No forks, chains, straps, hooks, or other lifting device shall be placed inside the pipe or fittings for lifting, positioning, or laying.

C. Repair damaged cement mortar lining to match quality, thickness, and bonding of original lining in accordance with AWWA C104. When lining cannot be repaired or repairs are defective, replace defective piping with undamaged piping.

D. Protect gaskets from long-term exposure to sunlight.

E. Store piping, fittings, and other accessories such that they do not accumulate and hold rainwater, dirt, and debris.

F. In the event of damage, Contractor shall immediately make all repairs and replacements to the approval of the Inspector.

PART 2 - PRODUCTS

2.01 DUCTILE IRON PIPE

A. General: Conform to the following, as applicable:

   1. AWWA/ANSI C115/A21.15

   2. AWWA/ANSI C150/A21.50

3. AWWA/ANSI C151/A21.51

4. Pressure Class 250

B. Fittings and Flanges: Conform to the following, as applicable:

1. AWWA/ANSI C110/A21.10

2. AWWA/ANSI C115/A21.15

3. AWWA/ANSI C153/A21.53

C. Joints:

1. Push On Joints

a. American Pipe: Fastite

b. U.S. Pipe: Tyton

2. Mechanical Joints

a. ANSI/AWWA C111/A21.11

3. Restrained Joints:

a. American Pipe:
1) Fastite – 4" to 24"

2) Flex-Ring – 4" to 54"

b. U.S. Pipe
1)Field LOK 350 – 4" to 24"

2)HP-Lok – 30" to 54"

4. Restrained Mechanical Joints:
a. Conform to AWWA C111.

b. All restrained mechanical joints shall be Series 1100 Megalug, no equal.

D. Fittings:

1. Ductile iron in accordance with AWWA C110 or AWWA C153.

2. Joint type: Restrained or Restrained MJ as shown on drawings meeting joint requirements of pipe

E. Lining:

1. Cement-mortar lining:
a. In accordance with AWWA C104, apply cement-mortar on clean bare metal surfaces. Extend to faces of flanges, ends of spigots, and shoulders of hubs.

b. Minimum lining thickness: Standard in accordance with AWWA C104.

c. Type of cement: Type II.

F. Coating

1. Asphaltic seal coat: Apply to outside surface of pipes that will not receive another coating. Apply in accordance with AWWA C151.

PART 3 - EXECUTION

3.01 INSTALLATION – GENERAL

A. Install pipe in strict accordance with the manufacturers' installation instructions and laying schedules. Run true to grade and alignment as shown on the drawings with fittings and valves at the required locations. Match and make connections to existing fittings at the points of termination of the piping system. Make tie-ins onto existing live water mains under the supervision of the Inspector using approved equipment and materials. Do not operate any valves, blowoffs or similar equipment on the existing water system of City Utilities without prior approval by the Inspector.

B. Install ductile iron piping in accordance with AWWA C600.

C. Install to the line and grade on the Drawings.

D. Laying condition: Type 5 in accordance with AWWA C150 as modified here. Where not encased in concrete, pipe shall have a minimum of 12" gravel bedding and 12" gravel on sides and top of pipe.

3.02 INSTALLATION METHODS

A. Install pipe by trenching as specified in Technical Specifications, Section 02315.

3.03 EXISTING UTILITIES

A. Contractor to verify the location of all underground utilities.

B. Omission from, or the inclusion of utility locations on the drawings is not to be considered as the nonexistence of or a definite location of existing underground utilities.

C. A representative of the underground utilities shall be notified in accordance with Missouri One-Call requirements.

D. Adjust water line elevation as required during construction. No separate payment will be made for field verification or adjustment of main depths as required.

E. Contractor will restore all existing structures or services damaged by Contractor's operations at no cost to Owner.

3.04 CONNECTION TO EXISTING FACILITIES

A. Coordinate service interruptions in accordance with Section 01140.

B. Prepare for connection to existing draw/fill line so as to minimize the amount of time the line is out of service.

3.05 PIPE CLEANING AND PREPARATION

A. Thoroughly clean and inspect all pipe and fittings for damage before placing in the trench. If damage to pipe is found during inspection, repair or replace the pipe as directed by the Inspector.

B. Prevent foreign material from entering the pipe while it is being installed. Allow no debris, tools, clothing or other materials in the pipe.

C. When pipe laying is not in progress for an extended period of time such as nights and weekends, close the open ends of pipe with a water tight plug. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry. Chlorine tablets may be added to the ditch water per AWWA C651 to avoid additional contamination as further described in section 2515. Do not use hypochlorite intended for use in swimming pools. Do not lay pipe in water or when trench conditions are unsuitable.

D. At close of day's work or whenever workmen are absent from jobsite, plug, cap or otherwise provide watertight seal from open ends of pipe to prevent ingress of foreign material.

E. If water is in trench, seal shall remain in place until trench is pumped dry.

3.06 REPAIR OF COATING

A. In case of damage to the protective coating or lining of ductile iron pipe, repair the pipe in accordance with AWWA C104. Repair of coating damage to epoxy coated surfaces shall be made with petrolatum wax tape.

3.07 PIPE SUPPORT AND EMBEDMENT

A. Support the barrel of the pipe by the granular leveling course with bell holes excavated for the bell end. Having so supported the pipe, embed it with granular material after joining pipe.

3.08 JOINING PIPE

A. Push-on Joints – In accordance with manufacturers recommendations, lay pipe with bell ends facing in the direction of laying unless directed otherwise by the Inspector. After placing a length of pipe in the trench, clean and lubricate the gasket and gasket groove. Center the spigot end in the bell. Force pipe home giving care to not over-bell the pipe, and bring to correct line and grade. Prevent dirt from entering the joint space.

B. Threaded Joints - Pipe dope or thread tape shall be applied to the threads prior to joining. threaded joints are only to be used on 2" and smaller water lines.

C. Compression (Pack or Mechanical) Joints - Install and tighten compression fittings per manufacturer's instructions.

D. Flange joints - assemble joints above ground and lower into trench, unless otherwise acceptable to the Inspector. Tighten bolts per manufacturer's instructions.

E. Solvent Cement Joints - Shall not be used unless indicated on the design drawings.

F. Restrained Joints - Install per manufacturer's instructions and as detailed on the drawings.

3.09 PERMISSIBLE DEFLECTION AT JOINTS

A. Wherever it is necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructions or plumb valve stems, or where long-radius curves are permitted, deflect in accordance with the manufacturer's recommendations and construction standards for satisfactory joining.

3.10 TIE-IN POINTS AND CROSSINGS

A. Expose existing casings, mains, storm drains, other utilities, and other obstacles well in advance of trenching and pipe laying to avoid abrupt changes in vertical alignment and the use of unnecessary fittings at tie-in points and crossings.

3.11 CUTTING OF PIPE

A. Cut pipe for inserting valves, fittings or closure pieces without damage to the pipe or cement lining and leave a smooth end at right angles to the axis of the pipe. Make all cuts in accordance with the manufacturer's instructions. Only cut 16" or larger ductile iron pipe after it has been gauged to determine if the diameter of the pipe is within tolerance at the proposed cut location.

3.12 VALVE AND FITTING INSTALLATION

A. Valves and Fittings - Set and join valves, fittings, plugs and caps to pipe in accordance with the manufacturer's recommendation. Valves shall be installed so operating nut is plumb so valve key will easily operate the valve within the box. Valve extension shafts shall not be used unless called for specifically on the design drawings. Valves shall be installed so that the operating nut is no more than eight feet below finished grade unless approved by the Inspector.

B. Valve Boxes - Install the valve box as to not transfer surface loads directly onto the valve. Center and plumb valve box over the operating nut of the valve, with the box cover flush with the surface of the finished pavement or such other level as may be directed by the Inspector.

C. Anchorage for Valves and Fittings - All fittings shall have suitable thrust protection as indicated on the design drawing or in the construction standards.

3.13 LOCATOR WIRE & WARNING TAPE

A. Install #10 AWG LDPE solid copper locator wire blue in color on all trenched water piping. Install #12 AWG LDPE steel/copper clad blue locate wire on all tunneled water piping.

B. Install tracer wire per Construction Standards.

C. Secure tracer wire to main by tape every 20 feet. Connect wire to existing locator wire where present. Do not connect wire to any existing metal mains. Connect wire utilizing approved epoxy filled connectors.

D. At ends of main, bring tracer wire to surface using a valve box per construction standards. Bring wire up for locating purposes at all meter pits, fire hydrants and valve installations per applicable construction standards.

E. Warning tape shall be installed with all water mains and services that are installed by trenching per applicable construction standards.

F. Install blue warning tape 6 inches above top of pipe within gravel fill, except where encased in concrete.

3.14 TESTING

A. Preventative Measures During Construction

1. During construction, the interior as well as all sealing surfaces of pipe, fittings, and other accessories should be kept as clean as possible. Inspect the interior of all pipes prior to installation. If dirt enters the pipe, it shall be removed.

2. All openings in pipelines should be closed with watertight plugs whenever the trench is unattended.

3. Sealing, lubricating, or gasket materials used in pipe installation shall be stored and handled in a manner that avoids contamination and be suitable for use with potable water.

B. Preliminary Flushing of Mains

1. Before pressure testing, the main should be completely filled with water from the low point to the high point when possible, to eliminate air pockets and then flushed to purge the line of dirt and debris.

2. The initial fill should be done slowly in order to eliminate all air pockets. The flow rate should not exceed 1 ft/s. All air relief valves, hydrants, and other access points should be opened during initial fill in order to ensure all air has been expelled. The initial fill shall be performed by the contractor.

3. If elected to be performed by OWNER, Preliminary flushing should follow the initial slow fill and should be done to achieve a flow rate of at least 2.5 ft/sec to scour the main and remove all foreign material. Preliminary flushing shall be performed by CU Water Operations. Times shall be recorded for calculation of the amount of water used.

C. The following table shows the required flow rate to obtain a velocity of 2.5 ft/sec in commonly used sizes of pipe.

Flow Rates for Filling & Flushing

Pipe Size (inches)	1.0 ft/s Fill Velocity Flowrate (gpm)	2.5ft/s Flushing Velocity Flowrate (gpm)
36	3,171	7,927

D. Hydrostatic Testing

1. The purpose of the hydrostatic test is both to test for the ability of the pipeline to withstand the applied pressure and to test for leakage.

2. Pipe Material Criteria: Ductile Iron AWWA C600 & Manual M41

3. Pressure testing shall not begin until all concrete thrust blocks, collars and restraint have cured to achieve the desired compressive strength. After the pipe has been laid, the main shall be filled slowly from the low point to the high point when possible and all air purged from the line through available hydrants, blow offs, and air relief valves. Once all air has been removed close air reliefs and other valves. The maximum length of piping to be tested at once shall be 2500 feet unless approved by Resident Engineer.

4. The main shall be tested at the test pressure indicated in the drawings as measured at the highest elevation of the water main under test or corrected for the elevation of the test gauge if not at the high point. A calibrated liquid filled gauge shall be used that has increments of 2 psi or less.

5. If extreme terrain differences are encountered on the project the piping pressure test shall be done in segments to ensure that no segment is pressure tested more than 1.5 times the systems design pressure rating.

6. Procedure for PVC and DI Water Mains:

   a. Gradually pressurize the test section to the test pressure at the highest point of the test section and maintain that pressure for two (2) hours or for the duration called for by the Resident Engineer. Add and measure make-up water as required to maintain test pressure. Clean potable water from an uncontaminated container shall be used for makeup water. Monitor and record the amount of make-up water utilized and document on the asbuilt drawing. Ensure that the amount of makeup water used to maintain the test pressure does not exceed the maximum allowable leakage in the applicable AWWA standards or as calculated for each pipe size in the test section based on length.

Maximum Allowable Make up Water PVC or DI Mains

Main Size	Gallons per hour
36	3.3

7. Maximum Allowable makeup water (gal/hr) = {(length)*(diameter)* $\sqrt{}$(test pressure)}/ 148,000

8. If the test indicates leakage greater than the maximum allowable rate, locate and repair the defect. Run tests again after correction is made until leakage is within the allowable rate. Furnish all necessary labor and equipment for testing.

9. Contractor shall repair all visible leaks regardless of test results.

E. Repair damaged cement mortar lining to match quality, thickness, and bonding of original lining in accordance with AWWA C104.

1. When lining cannot be repaired or repairs are defective, replace defective piping with undamaged piping.

F. Tracer Wire Testing

1. Test tracer wire to verify a continuous signal on the wire. Contractor shall dig up and repair tracer wire where the signal isn't continuous.

3.15 CONTINUITY OF SERVICE

A. Prior to closing any valves, notify all affected customers 24 hours in advance and state how long the service will be curtailed. Cause no customer to be without service for more than eight hours. Schedule all tie-ins and other operations affecting customer service only as approved by the Inspector. Carefully plan such operations in advance, verify materials and conditions, and work continuously until all customers are in service. Some off-hour work and overtime labor may be required to avoid causing unnecessary hardship for business, schools, etc. Contractor shall bid accordingly.

END OF SECTION

SECTION 02700 – PAVING AND SURFACING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Includes, but is not limited to, pavement replacement in streets, driveways and sidewalks. Pavement repairs required due to potholing for utilities are to be performed per this specification and are considered inclusive in the per foot pipe prices established in the contract.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

A. Excavation and Backfilling; Section 02315.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Meet appropriate jurisdictional agency paving standards.

PART 3 - EXECUTION

3.01 GENERAL PAVING REPLACEMENT:

A. All paving replacements and associated costs are the sole responsibility of the Contractor. Paving must be restored according to the appropriate jurisdictional agency's requirements and be performed to their satisfaction.
B. When trench excavations are made in existing paving in streets, parking lots or driveways, backfill immediately with compacted granular material according to excavation specifications to restore access. Install a smooth final asphalt repair within 30 days of the trench backfill.
C. Install a smooth temporary asphalt patch across streets the same day as the trench is backfilled. Final asphalt repair shall be completed within 30 days of the trench being backfilled.
D. Make all repairs to pavement surfaces to the Inspector's satisfaction.

3.01 DRIVEWAY REPLACEMENTS:

A. Cut paved driveways in a straight line along both sides of the area to be excavated.
B. REGULATORY COMPLIANCE:

1. Comply with all applicable jurisdictional requirements.

END OF SECTION

SECTION 02900 - LANDSCAPING

PART 1 - GENERAL

1.01. DESCRIPTION:

A. Section includes, but is not limited to, the items listed below.
   1. Performing preliminary cleanup
   2. Applying topsoil to disturbed areas on right-of-way and easements.
   3. Hydraulic seeding of disturbed areas.
   4. Re-seeding during specified seeding windows.

1.02 WORK ON THE HILCREST PROPERTY

A. Compact trench backfill to 95% Standard Proctor.

B. Contractor shall restore disturbed areas back to grade with a minimum of 4-inches of top soil.

PART 2 - PRODUCTS

2.01 TOPSOIL:

A. Fertile, friable soil of loamy character, free of sub-soil, stumps, refuse, and other foreign material with any dimension greater than 1-inch.

B. Normal amount of natural humus and reasonably free of roots, hard dirt, heavy or stiff clay, coarse sand, noxious weeds, noxious weed seeds, sticks, brush, and other litter.

C. Obtained from well-drained, arable land, and be of an even texture.

D. Not infested with nematodes nor with any other noxious animal life or toxic substances.

E. Sandy loam of low fertility, even though mixed with leaf mold, manure, or other fertilizers is not acceptable.

2.02 GRASS SEED:

A. Clean, dry, new crop seed.

B. Provide grass seed for established areas in a blend as specified below, unless directed otherwise by the landowner or Resident Engineer:

   1. 75% by weight of a three-way blend (equal parts) of turf fescues, consisting of any three of the following varieties: Olympic, Falcon, Bonanza, Rebel, Hound Dog, Astro 2000, Eldorado, Wrangler, FineLawn One, Anthem, Apache, Zanzibar, Houndog 5, 2nd Millenium, Olympic Gold, Pyramid, Floridian, Blackwatch, Serengeti, Crossfire II, Dynasty, Cayenne, Mustang 3, and Kal.
   2. 15% by weight of Perennial Rye, consisting of one or more of the following varieties: Affinity, Derby, Regal, Manhattan, Chateau, Cabo, Kokomo, Manhattan 4, Amazing, Pizzazz, Brightstar II, Edge, Express, Seville II, Fiesta 3, and Blazer 4.
   3. 10% by weight of Bluegrass, consisting of either Kentucky Bluegrass, Park Bluegrass, or both.
   4. Purity 98%.
   5. Germination 85%.

C. Complies with standards of the Official Seed Analysis of North America.

D. Recommended for full sun exposure in Springfield, Missouri.

E. Seed shall be free from Johnson Grass, Canadian Thistle, or field bind weed seed.

F. As approved by Resident Engineer.

2.03 FERTILIZER:

A. Provide a mixture containing 13 pounds each of soluble nitrogen, phosphate, and potash per 100 pounds.

2.04 MULCH FOR HYDRAULICALLY SEEDED AREAS:

A. Provide a mixture of 50% recycled slick paper mulch and 50% ground corrugated paper mulch by weight. The recycled slick paper mulch shall be produced from printers slick paper containing wood cellulose and kaolin clay. Newsprint is not allowed. The slick paper mulch shall have a maximum moisture content of 8% by weight, and shall have a pH of 4.5 to 6.5. The corrugated paper mulch shall have a moisture capacity of 700 grams water per 100 grams dry mulch minimum, a dry moisture content of 12% maximum, and a pH of 5.0 - 8.0. All mulch materials must be free of any germination or growth-inhibiting substances, green in color, and have the property of being evenly dispersed and suspended when agitated in water.

B. Clean wheat straw shall be material applied over the hydraulic mulch.

PART 3 - EXECUTION

3.01 PRELIMINARY CLEANUP:

A.. Clear disturbed areas, including those disturbed by excavation, storing of dirt, pipe laying, material storage, movement of equipment, and other work of all rubbish, brush, rock, trash, and excess dirt in a timely manner, depending upon associated activity and testing requirements prior to backfill. Rake surface as necessary to remove all above items, including all rock measuring two-inches or more in its greatest dimension. Tractor-drawn equipment, including rock rakes and steel roller drum are allowed.

3.02 PLANTING:

A.. Replace individual trees, plants, and shrubs. Plant in accordance with "Planting Trees and Shrubs" by the University of Missouri - Columbia Extension Division (Publication No.6850). Replacement trees, plants, and shrubs with the same type, strain, and value as those removed. Plant replacement trees, plants, and shrubs as soon as possible after installation of mains, with due consideration given to optimal times of the year to plant the given species.

3.03 APPLICATION OF TOPSOIL:

A.. Established lawn and parkway areas:

B. After preliminary cleanup has been performed, apply topsoil meeting the requirements of PART 2, MATERIALS AND EQUIPMENT to a minimum depth of four inches to disturbed areas. Pulverize topsoil and grade to match existing terrain. Rake surface smooth to provide a good seedbed for hydraulic seeding as specified below.

3.04 SEEDING:

A. Perform initial seeding as soon as practical after preliminary cleanup and application of topsoil. Seeding windows are specified as follows: Perform autumn seeding between August 15 and October 15, and spring seeding between March 15 and May 15. If initial seeding is performed within either of the specified seeding windows, the only additional work required of the Contractor shall be warranty work.

B. HYDRAULIC SEEDING: Restore all disturbed areas by hydraulic seeding. Mix seed, fertilizer, and mulch with water and constantly agitate so that a uniform mixture can be applied hydraulically to the specified areas. Do not add the seed to the water more than four hours before application. Calculate ratios of seed, fertilizer, mulch, and water so that seed will be applied at the rate of twelve pounds minimum per 1000 square feet of area, fertilizer will be applied at the rate of eight pounds minimum per 1000 square feet of area, and mulch will be applied at the rate of 1000 pounds minimum dry weight per acre. Wet application rate of the mixture shall be 2000 pounds per acre minimum. Blow wheat straw mulch onto the hydraulic mulch within one hour of application of the hydraulic mulch.

END OF SECTION

SECTION 15103 -GATE AND BUTTERFLY VALVES

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Gate and Butterfly valves, actuators, and appurtenances.

1.02 RELATED SECTOIONS

A. Section 01110 – Summary of Work

1.03 QUALITY ASSURANCE

A. Referenced standards:
   1. ASTM International (ASTM):
      a. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
      b. A276, Standard Specification for Stainless Steel Bars and Shapes.
      c. A536, Standard Specification for Ductile Iron Castings.
   2. American Water Works Association (AWWA):
      a. C500, Standard for Metal-Seated Gate Valves for Water Supply Service.
      b. C504, Standard for Rubber-Seated Butterfly Valves.
      c. C542, Standard for Electric Motor Actuators for Valves and Slide Gates.
      d. C550, Standard for Protective Coatings for Valves and Hydrants.
   3. American Water Works Association/American National Standards Institute (AWWA/ANSI):
      a. C111/A21.11, Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   4. National Electrical Manufacturers Association (NEMA):
      a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
      b. MG 1, Motors and Generators.

1.04 SUBMITTALS

A. Shop drawings:
   1. See Specification Section 01330 for requirements for the mechanics and administration of the submittal process.
   2. Product technical data including:
      a. Acknowledgement that products submitted meet requirements of standards referenced.
      b. Manufacturer's installation instructions.
      c. Valve pressure and temperature rating.
      d. Valve material of construction.
      e. Special linings.
      f. Valve dimensions and weight.
      g. Valve flow coefficient.
      h. Wiring and control diagrams for electric or cylinder actuators.
   3. Test reports.
   4. Operation and Maintenance Manuals.

B. Informational submittals:

1. Verification from valve actuator manufacturer that actuators have been installed properly, that all limit switches and position potentiometers have been properly adjusted, and that the valve actuator responds correctly to the valve position command.

PART 2 - PRODUCTS

2.01 OWNER FURNISHED

A. OWNER is furnishing the 16" gate valve and the blow off assembly to be used for temporary flushing of the new main.

B. All other equipment, materials, and accessories are to be provided by CONTRACTOR

C. Submit request for substitution in accordance with Specification Section 01330.

2.02 BUTTERFLY VALVES

A. Rubber seated butterfly valves

1. General - Butterfly valves shall be manufactured in accordance with the latest revision of AWWA Standard C504 Class 250B, shall be suitable for a differential pressure of 250 psig, and be certified to NSF Standard 61. Valves shall be Henry Pratt Model HP250 or approved equal and comply with the following details.
2. Valve body - The body shall be constructed of Ductile Iron ASTM A536 Gr. 65-45-12, with mechanical joint ends. The body wall thickness shall be in strict accordance with AWWA C504.
3. Valve Disc shall be made from cast iron ASTM A-126 Class B or ductile iron ASTM A-536. Discs shall be furnished with 316 stainless steel seating edge to mate with the rubber seat.
4. Valve Seat shall be BUNA-N rubber located on the valve body. Seats shall be retained in the valve body by mechanical means without retaining rings, segments, screws, or hardware of any kind in the flow stream.
5. Valve Shaft shall be made of ASTM A-564 Type 630 condition H-1150. The shaft seals shall be "V" type packing. Shaft seals shall be of a design allowing replacement without removing the valve shaft. No O-ring or "U" cup packing shall be allowed. The bearing shall be a stainless steel backed teflon material. Bearing load shall not exceed 1/5 of the compressible strength of the bearing or shaft material.
6. Valve Actuator – Manual actuators shall be of the traveling nut, self-locking type and shall be designed to hold the valve in any intermediate position between fully open and fully closed without fluttering or creeping. The actuator shall have mechanical stops that will withstand an input torque of 450 lb./ft. against each stop. The actuators shall have a built in packing leak bypass to eliminate possible packing leakage into the actuator housing. VALVE ACTUATORS MUST BE OPEN RIGHT (CLOCKWISE). Direction of opening and the word OPEN to be cast in handwheel or valve bonnet. Manual actuators shall conform to AWWA Standard C504 and shall be Pratt MDT or an approved equal.
7. The valve interior and exterior surfaces except for seating shall be coated with two coats of asphalt varnish in accordance with TT-C-494A and AWWA C504 latest edition.
8. Gearing:
   a. Provide power gearing consisting of heat treated steel helical gears, carburized and hardened alloy steel worm, and alloy bronze worm gear, all grease or oil bath lubricated, designed for 100 percent overload, and effectively sealed against entrance of foreign matter.
   b. Provide gearing mechanism constructed to permit field changes of reduction gear ratio.
   c. Limit switch gearings and feedback device reduction gearing:
      1) Steel or bronze.
   d. Support rotating shafts with anti-friction bearings.
   e. Provide separate drive nut/thrust bearing assembly:
      1) Mounted to base of actuator.
      2) High tensile bronze.

3) Quarter turn actuator: Provide 90 degree mounting intervals.

4) Provide grease fitting on drive assembly.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install valves and other products in accordance with manufacturer's instructions.

B. Support exposed valves and piping adjacent to valves independently to eliminate pipe loads being transferred to valve and valve loads being transferred to the piping.

C. Gate Valves shall be operated by OWNER or by CONTRACTOR with OWNER's prior approval. OWNER shall be present for operation of valves.

3.02 ADJUSTMENT

A. Operate valve, open and close at system pressures.

3.03 MAINTENANCE

A. Inspect the disk and seal for damage.
B. CONTRACTOR shall have repair kit handy to replace and or repair damaged seal.
C. Remove any scale that may interfere with valve traveling and clean wedges on gate valves.
D. Cycle valve to verify operation

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART I GENERAL

1.01 Furnish all labor, materials and equipment necessary to complete the work as specified in this section.

1.02 This section covers details related to concrete reinforcement.

1.03 Comply with the provisions of the Concrete Reinforcing Steel Institutes "Manual of Standard Practice" unless more stringent requirements are shown.

PART II MATERIALS AND EQUIPMENT

2.01 Reinforcing bars will be sized according to the plans and will be ASTM A615, Grade 60, deformed bars.

2.02 Steel wire will be plain, cold-drawn and will conform to ASTM A82.

2.03 Use bolsters, chairs, spacers or other devices for spacing, supporting and fastening the reinforcing bars in place.

PART III EXECUTION

3.01 The reinforcement will be fabricated to the shapes and dimensions shown and placed where indicated. Lap splices will be made in conformance with ACI Standard 318.

3.02 The reinforcement will be free from all substances that would reduce or destroy the bond. After a substantial delay, steel left exposed will be inspected and cleaned.

3.03 Reinforcement detailing and placement, including concrete protection for steel reinforcement, unless otherwise indicated, will conform to ACI Standards 318 and 315 and will match reinforcement as shown on the drawings.

3.04 Wire mesh reinforcement will be continuous between crack-control joints in slabs-on-grade. Laps will be at least one full mesh, staggered in both directions, and secured with wire or standard clips. Wire mesh will extend to within 2 inches of joints but not through joints.

3.05 Supports will be installed and intersections of reinforcement securely tied with steel wire to limit displacement to the tolerances permitted by ACI Standard 315. The number, type and spacing of supports will conform to ACI Standard 315, unless otherwise indicated.

3.06 Reinforcement for slabs-on-grade will be supported on precast concrete blocks. Size and spacing of blocks will be as required to provide firm support and the clearance specified or indicated. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

3.07 Reinforcement and other fixed metal items shall not be continuous through expansion or control joints.

END OF SECTION

SECTION 03300

CONCRETE

PART I GENERAL

1.01 DESCRIPTION

This section covers all cast-in-place concrete, including reinforcing steel, forms, finishing and other appurtenant work for thrust blocks, thrust collars and other items shown on the drawings. Also see Section 03200, Concrete Reinforcement.

1.02 RELATED WORK DESCRIBED ELSEWHERE

Water Piping, Section 02510.

PART II MATERIALS AND EQUIPMENT

2.01 MATERIALS:

Cement	ASTM C150, Type I or ASTM C715, Type IA.
Fine Aggregate	Clean natural sand, ASTM C33.
Coarse Aggregate	Crushed rock, washed gravel or other inert granular material conforming to ASTM C33.
Water	Potable
Reinforcing Steel Bars	ASTM A615, Grade 60

2.02 PRELIMINARY REVIEW

Submit the source and quality of concrete materials and the concrete mix along with test data proposed for the work to the Inspector for review, before any concrete is placed.

2.03 SLUMP

Keep concrete slump as low as possible consistent with proper handling and thorough compaction. Unless otherwise authorized by the Inspector, slump shall not exceed 4 inches except for flowable fill. Add no water to mix after the slump test without approval by Resident Engineer.

2.04 STRENGTH

The minimum acceptable compressive strengths as determined by ASTM C39 shall be as follows:

Age Minimum Strength
7 days 2500 psi
28 days 3750 psi

Very high early strength concrete shall achieve a 2500 psi compressive strength within 3 hours. Contractor shall submit mix design for high early strength concrete to Inspector for review prior to placement along with compressive strength documentation.

Flowable fill compressive strength shall be demonstrated by failure to deform or crush under foot traffic.

2.05 STORAGE OF MATERIALS

Store cement in suitable moisture proof enclosures. Do not use cement which has become caked or lumpy. Store aggregates so that segregation and the inclusion of foreign materials are prevented. Do not use the bottom 6 inches of aggregate piles in contact with the ground.

Reinforcing steel shall be carefully handled and shall be stored on supports which will keep the steel from contact with the ground.

2.06 REINFORCEMENTS

Reinforcements shall be accurately formed and shall be free from loose rust, scale and contaminants which reduce bond.

PART III EXECUTION

3.01 BATCHING AND MIXING

Furnish concrete from an acceptable ready-mix concrete supplier or mix at the site. Concrete shall at a minimum conform to ASTM C94.

3.02 PLACING CONCRETE

Thrust blocks and thrust collars shall be placed between solid, undisturbed earth and the fitting or piping to be anchored. Thrust blocks shall be so placed that the pipe and joints will be accessible for repair and installed per construction standards. The minimum compressive strength for the concrete shall be achieved prior to relying on the concrete for any thrust restraint. The use of very high early strength concrete is permissible for installations where time constraints exist. Very high early strength concrete mix shall have 3 hour compressive strength that is a minimum of 2500 psi.

When the contract drawings call for flowable fill or contractor wishes to utilize flowable fill in lieu of compacted backfill, no additional payment will be made. Contractor shall make requests to utilize flowable

fill to the Resident Engineer. Flowable fill mix and placement shall conform to specifications of local jurisdictional agency or at a minimum the Missouri standards specifications for highway construction latest edition.

3.03 FINISHING

No surface treatment will be required for buried concrete not forming an integral part of a structure except that required to obtain the surface elevations or contours and surfaces free of laitance.

3.04 INSPECTION

No concrete shall be covered until installation has been approved by City Utilities.

3.05 REPAIR OF DEFECTIVE WORK

In the event that concrete installation is found to be sub-standard, the Contractor shall be required to remove and replace installation with proper materials and execution.

END OF SECTION

GENERAL CONDITIONS

Any order arising from these TECHNICAL SPECIFICATIONS will be subject to the following WHICH ARE INCORPORATED HEREIN BY REFERENCE:

☐ City Utilities of Springfield Missouri General Conditions (Rev 8-2016)

The referenced documents are available at https://www.cityutilities.net/purchasing/general/ or upon request.

DRAWING LIST

1. **Drawing # *81145-D***