

ADDENDUM #1

PROJECT: Community Park Irrigation Mainline Replacements Project

PROJECT NUMBER: 201511-630132

OWNER: CITY OF LOUISVILLE, COLORADO

DATE: March 7, 2022

1. Construction drawings, details and specifications have been updated. Please use Version 2 to bid from.
2. Bid Form has been updated to include unit cost measurements. Please use "Community Park Irrigation Mainline Bid Form (Version 2)".
3. BID OPENING – Change from bids are due via email to:

Proposals must be received by March 18, 2022, 10:00 A.M., M.T. Proposals must be submitted in hard copy. Please submit three (3) hard copies of the "Bid Form" and additional information as required or needed. Proposals will not be accepted after the specified due date and time.

- a. Submit Sealed Proposals to:

Louisville City Services
Parks Division
739 S. 104th Street
Louisville, CO 80027

4. QUESTIONS DUE– change from question due on March 8th to 12:00 pm on March 10th.
5. QUESTIONS ANSWERED – change from questions answered on March 14th to March 15th.

This addendum shall become part of the contract documents for this project.

**BID FORM
(Version 2)**

PROJECT: Community Park Irrigation Mainline Replacements Project
PROJECT NUMBER: 201511-630162
OWNER: CITY OF LOUISVILLE, COLORADO

THIS BID IS SUBMITTED TO: THE CITY OF LOUISVILLE, COLORADO

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
2. BIDDER accepts all of the terms and conditions of the Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for sixty days after the day of Bid opening. BIDDER will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within ten days after the date of OWNER's Notice of Award.
3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:
 - (a) BIDDER has examined copies of all the Bidding Documents and of the following Addenda receipt of all which is hereby acknowledged: (List Addenda by Addendum Number and Date):

Date	Number
 - (b) BIDDER has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
 - (c) BIDDER has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions which are identified in the General Conditions as provided in paragraph 4.2, and accepts the determination set forth in paragraph 4.2 of the General Conditions. BIDDER has inspected the site and has obtained conducted and carefully studied (or assumes responsibility for obtaining and carefully studying) all examinations, investigations, explorations, tests and studies which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as BIDDER considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by BIDDER for such purpose.
 - (d) BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports or similar information or data in respect of said Underground Facilities are or will be required by BIDDER in order to perform and furnish the Work at the Contract Price, within the Contract Time and in

accordance with the other terms and conditions of Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.

- (e) BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
 - (f) BIDDER has given OWNER written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by OWNER is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.
 - (g) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for himself any advantage over any other Bidder or over OWNER.
4. BIDDER will complete the Work in accordance with Contract Documents for the following price(s):

SCHEDULE OF UNIT PRICES

PROJECT: Community Park Irrigation Mainline Replacements Project
OWNERS PROJECT NUMBER: 201511-630162
OWNER: CITY OF LOUISVILLE, COLORADO

UNIT COST PRICING INCLUDED MATERIALS, INSTALLATION AND LABOR

ITEM	QUANTITY	UNIT	UNIT COST	EXTENSION
Mobilization	1	EA		
6-inch HDPE DR11 Mainline Pipe and Fittings	400	LF		
4-inch HDPE DR11 Mainline Pipe and Fittings	4,800	LF		
1-inch Control Valve Assembly & Decoder	9	EA		
1.5-inch Control Valve Assembly & Decoder	13	EA		
2-inch Control Valve Assembly & Decoder	46	EA		
1-inch Drip Control Valve Assembly & Decoder	6	EA		
Quick Coupler	16	EA		
4-inch Butt Fusion Resilient Wedge Gate Valve	23	EA		
6-inch Butt Fusion Resilient Wedge Gate Valve	2	EA		
Two-Wire Cable	9,000	LF		
1.5-inch Class 200 PVC Lateral Piping and Fittings	180	LF		
2-inch Class 200 PVC Lateral Piping and Fittings	260	LF		
3-inch Class 200 PVC Lateral Piping and Fittings	920	LF		
3/4-inch Poly Drip Lateral Pipe and Fittings	120	LF		
10-inch HDPE DR11 Sleeve	100	LF		
8-inch HDPE DR11 Sleeve	360	LF		
2-inch HDPE DR11 Wire Sleeve	460	LF		
4-inch Connection to Existing Potable Pipe	6	EA		
New Spray Sprinkler Zones	800	SF		
New Irrigation Controller	1	EA		
Landscape Repairs (Backfill and Sod)	600	SF		
Mainline Repairs	15	EA		

Total for Mainline Replacement Project

\$ _____

Unit Prices have been computed in accordance with paragraph 11.9.2 of the General Conditions.

BIDDER acknowledges that quantities are not guaranteed and final payment will be based on actual quantities determined as provided in the Contract Documents.

5. BIDDER agrees that the Work;

will be substantially complete and completed and ready for final payment in accordance with paragraph 14.13 of the General Conditions on or before the dates or within the number of Contract Days indicated in the Agreement.

BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified in the Agreement.

6. The following documents are attached to and made a condition of this Bid:

- (a) Required Bid Security;
- (b) A list of Subcontractors and other persons and organizations proposed to perform the Work are required to be identified on the Schedule of Subcontractors and submitted in this Bid;
- (c) Anti-Collusion Affidavit; and
- (d) If BIDDER is a partnership, a list of all partners, their addresses, and their interest and role in the partnership business.

7. Communications concerning this Bid shall be addressed to:
The address of BIDDER indicated below.

8. Terms used in this Bid, which are defined in the General Conditions of the Construction Contract included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.

SUBMITTED on _____, 2022.

If BIDDER is:

An Individual

By _____
(Individual's Name)

(SEAL)

doing business as _____

Business address: _____

Phone No.: _____

A Partnership

By _____
(Firm Name)

(SEAL)

(General Partner)

Business address: _____

Phone No.: _____

A Corporation

By _____
(Corporation Name)

(State of incorporation)

By _____
(Name of person authorized to sign)

(Title)

(CORPORATE SEAL)

Attest _____
(Secretary)

Business address: _____

Phone No.: _____

Date of Qualification to do business: _____

A Joint Venture

By _____

(Name)

(Address)

By

(Name)

(Address)

Phone Number and Address for receipt of official communications

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above.)

BID BOND

BIDDER (Name and Address):

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

OWNER (Name and Address):

BID:

BID DUE DATE: _____

PROJECT (Brief Description Including Location):

BOND:

BOND NUMBER: _____

DATE: (Not later than Bid Due Date): _____

PENAL SUM: _____

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

BIDDER

_____(Seal)
Bidder's Name and Corporate Seal

By: _____
Signature and Title

Attest: _____
Signature and Title

SURETY

_____(Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Note: (1) Above addresses are to be used for giving requiring notice.
(2) Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents the properly executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents.
3. This obligation shall be null and void if:
 - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents, or
 - 3.2. All bids are rejected by Owner, or
 - 3.3. Owner fails to issue a notice of award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within thirty (30) calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue notice of award agreed to in writing by Owner and Bidder, provided that the time for issuing notice of award including extensions shall not in the aggregate exceed 120 days from Bid Due Date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to thirty (30) calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety, and in no case later than one year after Bid Due Date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notice required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirements of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of the Bond conflicts with any applicable provision of any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "bid" as used herein includes a bid, offer or proposal as applicable.

SCHEDULE OF SUBCONTRACTORS

PROJECT: Community Park Irrigation Mainline Replacements Project
OWNER'S PROJECT NUMBER: 201511-630162
OWNER: CITY OF LOUISVILLE, COLORADO

This Bid is based on subcontracting certain portions of the work to subcontractors as listed below.

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

ANTI-COLLUSION AFFIDAVIT

PROJECT: Community Park Irrigation Mainline Replacements Project
OWNER'S PROJECT NUMBER: 201511-630162
OWNER: CITY OF LOUISVILLE, COLORADO

I hereby attest that I am the person responsible within my firm for the final decision as to the price(s) and amount of this Bid or, if not, that I have written authorization, enclosed herewith, from that person to make the statements set out below on his or her behalf of my firm.

I further attest that:

1. The price(s) and amount of this bid have been arrived at independently, without consultation, communication or agreement for the purpose or with the effect of restricting competition with any other firm or person who is a BIDDER or potential prime BIDDER.
- 2A. Neither the price(s) nor the amount of this Bid have been disclosed to any other firm or person who is a BIDDER or potential prime BIDDER on this project, and will not be so disclosed prior to bid opening.
- 2B. Neither the prices nor the amount of the Bid of any other firm or person who is a BIDDER or potential prime BIDDER on this project have been disclosed to me or my firm.
- 3A. No attempt has been made to solicit, cause or induce any firm or person who is BIDDER or potential prime BIDDER to refrain from bidding on this project, or to submit a Bid higher than the Bid of this firm, or any intentionally high or noncompetitive Bid or other form of complementary Bid.
- 3B. No agreement has been promised or solicited for any other firm or person who is a BIDDER or potential prime BIDDER on this project to submit an intentionally high, noncompetitive or other form of complementary bid on this project.
4. The Bid of my firm is made in good faith and not pursuant to any consultation, communication, agreement or discussion with, or inducement or solicitation by or from any firm or person to submit any intentionally high, noncompetitive or other form of complementary bid.
5. My firm has not offered or entered into a subcontract or agreement regarding the purchase or sale of materials or services from any firm or person, or offered, promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from bidding or to submit any intentionally high, noncompetitive or other form of complementary bid or agreeing or promising to do so on this project.
6. My firm has not accepted or been promised any subcontract or agreement regarding the sale of materials or services to any firm or person, and has not been promised or paid cash or anything of value by any firm or person, whether in connection with this or any other project, in consideration for my firm's submitting any intentionally high, noncompetitive or other form of complementary bid, or agreeing or promising to do so, on this project.
7. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval or submission of my firm's bid on this project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, or other conduct inconsistent with any of the statements and representations made in this affidavit.
8. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as a fraudulent concealment from the OWNER of the true facts relating to submission of bids for this contract.

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS THAT THE STATEMENTS MADE ON THIS DOCUMENT ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

CONTRACTOR'S FIRM OR COMPANY NAME		SECOND CONTRACTOR'S FIRM OR COMPANY NAME (IF JOINT VENTURE)	
BY: _____		BY: _____	
TITLE: _____		TITLE: _____	
DATE: _____		DATE: _____	

SWORN BEFORE ME THIS _____ DAY OF, _____, 2015

NOTARY PUBLIC: _____ MY COMMISSION EXPIRES: _____

CERTIFICATION OF EEO COMPLIANCE

PROJECT: Community Park Irrigation Mainline Replacements Project
OWNER'S PROJECT NUMBER: 201511-630162
OWNER: CITY OF LOUISVILLE, COLORADO

Instructions: BIDDER's and Subcontractors must complete and submit this form with the Bid Form. This is required by the Equal Employment Opportunity Regulations 41 CFR 1.7 (b) (1).

- | | |
|---|---|
| 1. ☐ Yes ☐ No | I have developed and have on file at each establishment an affirmative action program as required by 41 CFR Chapter 60, Part 60-2. |
| 2. ☐ Yes ☐ No | I have participated in a previous contract/subcontract subject to the equal opportunity clause. |
| 3. ☐ Yes ☐ No | I have filed with the Joint Reporting Committee, the Director, or the Equal Employment Opportunity Commission all reports due under the applicable filing requirements. |
-

I declare under penalty of perjury in the second degree and any other applicable state or federal laws that the statements made in this document are true and complete to the best of my knowledge.

CONTRACTOR

☐ **BIDDER** ☐ **PROPOSED SUBCONTRACTOR**

BY: _____

TITLE: _____

DATE: _____

Prohibition Against Employing Illegal Aliens

PROJECT: Community Park Irrigation Mainline Replacements Project
OWNER'S PROJECT NUMBER: 201511-630162
OWNER: CITY OF LOUISVILLE, COLORADO

Consultant shall not knowingly employ or contract with an illegal alien to perform work under this contract. Consultant shall not enter into a contract with a subcontractor that fails to certify to the Consultant that the subcontractor shall not knowingly employ or contract with an illegal alien to perform work under this contract.

Contract has verified or attempted to verify through participating in the basic pilot program as defined in C.R.S. Section 8-17.5-101(1) ("Program") that Consultant does not employ any illegal aliens and, if Consultant is not accepted into the Program prior to entering into this contract, that Consultant shall apply to participate in the Program every three months until Consultant is accepted or the contract has been completed, whichever is earlier. This provision shall not be required or effective if the Program is discontinued. Consultant is prohibited from using the Program procedures to undertake pre-employment screening of job applicants while this contract is being performed.

If Consultant obtains actual knowledge that a subcontractor performing work under this contract for services knowingly employs or contracts with an illegal alien, Consultant shall:

- a. Notify the subcontractor and the City within three days that the Consultant has actual knowledge that the subcontractor is employing or contracting with an illegal alien; and
- b. Terminate the subcontract with the subcontractor if within three days of receiving the notice required pursuant to this paragraph the subcontractor does not stop employing or contracting with the illegal alien; except that the Consultant shall not terminate the contract with the subcontractor if during such three days the subcontractor provides information to establish that the subcontractor has not knowingly employed or contracted with an illegal alien.

Consultant shall comply with any reasonable request by the Department of Labor and Employment made in the course of an investigation that the Department is undertaking pursuant to the authority established in C.R.S. Section 8-17.5-102(5).

If Consultant violates a provision of this Contract required pursuant to C.R.S. Section 8-17.5-102, the City may terminate the contract for breach of contract. If the contract is so terminated, the Consultant shall be liable for actual and consequential damages to the City.

**Contractor's Pre-Contract Certification
Regarding Employing Illegal Aliens**

PROJECT: Community Park Irrigation Mainline Replacements Project
OWNER'S PROJECT NUMBER: 201511-630162
OWNER: CITY OF LOUISVILLE, COLORADO

The proposer of public services to the City of Louisville identified below (hereafter "the Proposer"), hereby certifies as follows:

That at the time of providing this certification, Proposer does not knowingly employ or contract with an illegal alien; and that Proposer has participated in or attempted to participate in the Basic Pilot Program administered by the United States Department of Homeland Security in order to verify that it does not employ any illegal aliens.

Dated this ____ day of _____, 20____.

Proposer: _____

By: _____

Title: _____

TECHNICAL SPECIFICATIONS

SECTION 328400

COMMUNITY PARK MAIN LINE IRRIGATION REPLACEMENT PROJECT

PART 1 - GENERAL

1.01 WORK INCLUDED - Work of this Section generally includes provisions for the renovation and installation of an underground landscape irrigation system including the following:

- A. Static pressure verification and coordination of irrigation system installation with landscape material installation.
- B. Trenching, stockpiling excavation materials, refilling and compacting trenches.
- C. Irrigation system renovation including but not limited to replacement of PVC mainline with HDPE DR11, replacement of all control valves, control wires, quick couplers, pipe and wire sleeves, and isolation gate valves; new connections to existing lateral pipes and installation of new steel discharge pipe from the pump house to the HDPE mainline connection, connection of an existing 2" water meter with removable spool to the new HDPE mainline.
- D. Installation of new two-wire irrigation controller, two-wire cable and spare two-wire cable routed with new mainline to serve all replaced control valves and installation of spare wires and commons as shown on the plans.
- E. This is a reclaimed water system and equipment: valve box lids, piping and valve handles shall be purple as required by the local reclaimed water purveyor.
- F. The HDPE mainline installation and equipment replacement on the site shall be completed in construction phases so that the public has safe access to park during construction. All equipment and landscape repairs must be completed in the construction phase before moving onto the next phase. Phases shall be determined by the City of Louisville and the Irrigation Contractor.
- G. The existing irrigation system must remain operational from the pump station water source and from the controller during construction. As the irrigation equipment is replaced in phases, the new HDPE mainline shall be connected to the existing PVC mainline as necessary to maintain the operation of the existing and new irrigation system.
- H. Securing of the job site and tree protection as required by the City of Louisville.
- I. Excavation and salvage of all existing control valves, quick couplers and isolation gate valves and turn-over of this equipment to the City of Louisville.
- J. The Contractor is responsible for coordination of public and private utility locates.

- K. The Contractor shall obtain all required permits.
- L. Replacement of unsatisfactory materials.
- M. Clean-up, Consultant Reviews, and Project Acceptance.
- N. Tests.
- O. Landscape repairs shall be complete as each phase of construction is completed, landscape repairs shall include and not be limited to backfill and sodding new pipe excavations and old valve box location, new matching mulch in shrub beds, confirm all landscape repairs with the City of Louisville.

1.02 REFERENCES

- A. Perform Work in accordance with requirements of these Specifications, Irrigation Drawings and Details, and the City of Louisville's Project Manual for the Park Irrigation Mainline Replacements Project - As well as provisions of all applicable laws, codes, ordinances, rules, and regulations.
- B. Conform to requirements of reference information listed below except where more stringent requirements are shown or specified in Contract Documents.
 - 1. American Society for Testing and Materials (ASTM) - Specifications and Test Methods specifically referenced in this Section.
 - 2. Underwriters Laboratories (UL) - UL Wires and Cables.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications - Installer shall have had considerable experience and demonstrate ability in the installation of irrigation system(s) of specific type(s) with HDPE piping, in a neat orderly, and responsible manner in accordance with recognized standards of workmanship. To demonstrate ability and experience necessary for this Project, and financial stability, submit if requested by Consultant, prior to contract award the following:
 - 1. Proof of certification for HDPE DR11 butt fusion, electrofusion, and underground HDPE pipe installation.
 - 2. List of 3 projects completed in the last 2 years of similar complexity, with HDPE DR11 installation, to this Project. Description of projects shall include:
 - a. Name of project.
 - b. Location.
 - c. Owner.
 - d. Brief description of work and project budget.
- B. Special Requirements:

1. Work involving substantial plumbing for installation of copper piping, backflow preventer(s), and related work shall be executed by licensed and bonded plumber(s). Secure a permit at least 48 hours prior to start of installation.
 2. Tolerances - Specified depths of mains and laterals and pitch of pipes are minimums. Settlement of trenches is cause for removal of finish grade treatment, refilling, compaction, and repair of finish grade treatment.
 3. Coordination with Other Contractors - Protect, maintain, and coordinate Work with Work under other Section.
 4. Damage To Other Improvements - Contractor shall replace or repair damage to grading, soil preparation, seeding, sodding, or planting done under other Sections during Work associated with installation of irrigation system at no additional cost to Owner.
 5. Experience and certification using butt fusion and electrofusion equipment, and handling of HDPE DR11 piping for underground installation.
- C. Pre-Construction Conference - Contractor shall schedule and conduct a conference to review in detail quality control and construction requirements for equipment, materials, and systems used to perform the Work. Conference shall be scheduled not less than 10 days prior to commencement of Work. All parties required to be in attendance shall be notified no later than 7 days prior to date of conference. Contractor shall notify qualified representatives of each party concerned with that portion of Work to attend conference, including but not limited to Architect, Consultant, Contractor's Superintendent, and Installer.
1. Minutes of conference shall be recorded and distributed by Contractor to all parties in attendance within five days of conference.

1.04 SUBMITTALS - Prepare and make submittals in accordance with conditions of the Contract.

- A. Materials List - Submit six copies of a complete materials list indicating manufacturer, model number, and description of all materials and equipment to be used. Show appropriate dimensions and adequate detail to accurately portray intent of construction.
- B. Record Drawings (As-Built):
1. At onset of irrigation installation secure Autocad files of original irrigation design from Hydrosystems-KDI. At the end of every day, revise as-built prints for work accomplished that day in red ink. As-built field prints shall be brought up-to-date at the close of the working day every Friday by a qualified draftsman. A print of record plan(s) shall be available at Project Site. Indicate zoning changes on weekly as-built drawings. Indicate non-pressure piping changes on as-built. Upon completion of Project, but prior to scheduling of substantial acceptance walk-through, submit for review a final set of as-built mylars and an Autocad disk copy. Dimensions, from two permanent points of reference (building corners, sidewalk, road intersections or permanent structures), location of following items:
 - a. Connection to existing water lines.

- b. Routing of sprinkler pressure lines (dimension maximum 100 feet along routing).
 - c. Sprinkler and drip control valves and zone number.
 - d. Quick coupling valves.
 - e. Control wire routing if not with pressure mainline.
 - f. Gate valves.
 - g. Control wire and communication cable splices
 - h. Water meters
 - i. Locations of all sleeving including size, quantity and depth of sleeve
2. Owner's Representative will not certify any pay request submitted by the Contractor if the as-built drawings are not current, and processing of pay request will not occur until as-builts are up-dated.

1.05 DELIVERY, STORAGE, AND HANDLING - Deliver, unload, store, and handle materials, packaging, bundling, products in dry, weatherproof, condition in manner to prevent damage, breakage, deterioration, intrusion, ignition, and vandalism. Deliver in original unopened packaging containers prominently displaying manufacturer's name, volume, quantity, contents, instructions, and conformance to local, state, and federal law. Remove and replace cracked, broken, or contaminated items or elements prematurely exposed to moisture, inclement weather, snow, ice, temperature extremes, fire, or jobsite damage.

- A. Handling of HDPE/PVC Pipe - Exercise care in handling, loading and storing, of HDPE/PVC pipe. All HDPE/PVC pipe shall be transported in a vehicle that allows length of pipe to lie flat so as not to subject it to undue bending or concentrated external loads. All sections of pipe that have been dented or damaged shall be discarded, and if installed, shall be replaced with new piping.

1.06 JOBSITE CONDITIONS:

A. Protection of Property:

- 1. Preserve and protect all trees, plants, monuments, structures, and paved areas from damage due to Work of this Section. In the event damage does occur, all damage to inanimate items shall be completely repaired or replaced to satisfaction of Owner, and all injury to living plants shall be repaired by Owner. All costs of such repairs shall be charged to and paid by Contractor.
- 2. Protect buildings, walks, walls, and other property from damage. Flare and barricade open ditches. Damage caused to asphalt, concrete, or other building material surfaces shall be repaired or replaced at no cost to Owner. Restore disturbed areas to original condition.

B. Existing Trees:

- 1. All trenching or other Work under limb spread of any and all evergreens or low branching deciduous material shall be done by hand or by other methods so as to prevent damage to limbs or branches.
- 2. Where it is necessary to excavate adjacent to existing trees use all possible care to avoid injury to trees and tree roots. Excavation, in areas where 2

inch and larger roots occur, shall be done by hand. Roots 2 inches or larger in diameter, except directly in the path of pipe or conduit, shall be tunneled under and shall be heavily wrapped with burlap to prevent scarring or excessive drying. Where a trenching machine is operated close to trees having roots smaller than 2 inches in diameter, wall of trench adjacent to tree shall be hand trimmed, making clean cuts through roots. Trenches adjacent to trees shall be closed within 24 hours, and when this is not possible, side of trench adjacent to tree shall be kept shaded with moistened burlap or canvas.

C. Protection and Repair of Underground Lines:

1. Contractor shall request proper utility company to stake exact location (including depth) of all underground electric, gas, or telephone lines. Take whatever precautions are necessary to protect these underground lines from damage. If damage does occur, Utility Owner shall repair all damage. Contractor shall pay all costs of such repairs unless other arrangements have been made.
2. Contractor shall subcontract utility locate firm to locate all private utilities (i.e., electrical service to outside lighting) before proceeding with excavation. If, after such request and necessary staking, private utilities that were not staked are encountered and damaged by Installer, Installer shall repair them at no cost to the Owner. If Contractor damages staked or located utilities, they shall also be repaired at Contractor's expense unless other arrangements have been made.

D. Replacement of Paving and Curbs - Where trenches and lines cross existing roadways, paths, curbing, etc., damage to these shall be kept to a minimum and shall be restored to original condition.

1.07 WARRANTY/GUARANTY: - Installer/Manufacturer shall warrant materials against defects for a period of one year from date of Final Completion. Installer shall guaranty workmanship for one year.

- A. Settling of backfilled trenches that may occur during guaranty period shall be repaired at no expense to Owner, including complete restoration of damaged property.
- B. Expenses due to vandalism before substantial completion shall be borne by Contractor.
- C. Owner will maintain turf and planting areas during warranty period, so as not to hamper proper operation of irrigation system.

1.08 MAINTENANCE:

- A. Furnish the following maintenance items to Owner prior to final Acceptance:
 1. Two Sets of special tools required for removing, disassembling, and adjusting each type of valve supplied on this Project.

2. Two six foot valve keys for operation of gate valves.
 3. Two quick coupler keys and two matching hose swivels for each type of quick coupling valve installed.
- B. Winterization – Contractor shall provide oversight and support to City Personnel during the winterization procedure.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. General Piping:

1. Pump Discharge Pipe (from point of connection to Miner's Field Connection and to new HDPE DR11 mainline) – Epoxy Coated Schedule 40 Steel (3" and larger).
2. Pressure Supply Mainline – HDPE DR11 (6" – 4").
3. Non-pressure Lines – Class 200 PVC, 1" minimum size allowed.
4. PVC Sleeving – HDPE DR11.

B. Plastic Pipe and Fittings:

1. Identification Markings:
 - a. Identify all pipe with following indelible markings:
 - 1) Manufacturer's name.
 - 2) Nominal pipe size.
 - 3) Schedule of class.
 - 4) Pressure rating.
 - 5) NSF (National Sanitation Foundation) seal of approval.
 - 6) Date of extrusion.
2. HDPE Pipe - Pipe shall be manufactured from a pipe resin which meets ASTM D 3350-05 with a minimum cell classification of 445474C. Pipe shall be manufactured to the dimensions of ASTM F-714. The service factor to determine the pressure rating shall be 0.63. Pipe shall be have a minimum pressure ratings of: DR 11, 200 psi. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.

HDPE FITTINGS:

- a. Butt Fusion Fittings - Fittings shall be made from HDPE pipe resin meeting ASTM D 3350-05 with a minimum cell classification of 445474C, Molded Butt Fusion Fittings shall have a manufacturing standard of ASTM D-3261. Molded & fabricated fittings shall have the same pressure rating as the pipe unless otherwise specified on the plans. Fabricated fittings must have the same pressure rating as the pipe; a DR less than the pipe shall be used. Fabricated fittings are to be manufactured using a Data Logger to record temperature, fusion pressure, and a graphic

representation of the fusion cycle shall be part of the Quality Control records.

- b. Electrofusion Fittings - Fittings shall be made from resin or pipe meeting ASTM D 3350-05 with a minimum cell classification of 445474C.; Electrofusion Fittings shall meet the manufacturing standard of ASTM F-1055. Fittings shall have the same pressure rating as the pipe or higher unless otherwise specified on the plans.
- c. Flanged and Mechanical Joint Adapters - Flanged and Mechanical Joint Adapters shall be made from materials containing resin that meets ASTM D 3350-05 with a minimum cell classification of 445474C.
- d. Transitional Fittings- steel pipe to HDPE shall be per details and irrigation equipment schedule. Any substitutions must be approved by the project Engineer or City Personnel.

C. Gate Valves:

- 1. Gate Valves for 3 Inch and Larger Pipe - Iron body, brass or bronze mounted AWWA gate valves with a clear waterway equal to full nominal diameter of valve; HDPE butt fusion connections only. Valves shall be able to withstand a continuous working pressure of 200 psi and be equipped with a square operating nut and resilient wedge. Provide pipe restraints on gate valves 3 inches or larger as detailed.

D. Quick Coupling Valves - Brass two-piece body designed for working pressure of 150 PSI; operable with quick coupler. Equip quick coupler with locking rubber cover.

E. Valve Boxes:

- 1. Gate Valves, Quick Coupling Valves, Drain Valves, Drip Line Blow-out Stubs, and Wire Splice or Stub Box – Carson/Oldcastle #910-10, box as detailed, with purple lid
- 2. 1 inch through 2 inch Control Valves – Carson/Oldcastle #1730-12 box as detailed with purple lid.
- 3. Drip Valve Assemblies and Flow Sensors – Carson/Oldcastle #1730-12 box as detailed with purple lid.
- 4. Owner shall provide traffic rated valve boxes if deemed necessary by the City of Louisville

F. Electrical Control Wiring:

- 1. Two-Wire Cable:
 - a. Two-wire cable shall be provided per Toro Sentinel specifications, parallel 14/12 UF two-wire cable.
 - b. Control Wire connections and splices shall be made with 3M DBY direct bury splice.
- 2. High Voltage - Type required by local codes and ordinances, of proper size to accommodate needs of equipment serviced.

- G. Electric Control Valves - Size and type shown on Drawings having manual flow adjustment and manual bleed nut. All female threaded fittings shall be Spears SR stainless steel reinforced schedule 80 fittings.
- H. Two-Wire Controller – As called out on the plans, requiring valve decoders and sensor decoders, and cellular communication

PART 3 - EXECUTION

3.01 SITE CONDITIONS AND COORDINATION

- A. Contractor is responsible for demolition, salvage of equipment, removal of equipment if in conflict with new installations and new equipment routing and locations as coordinated and approved by the City of Louisville, the Contractor will be required to relocate the irrigation equipment, as necessary, at Contractor's expense.
- B. Contractor is responsible to notify Consultant of any field conditions that vary from the conditions shown on the Irrigation Construction Documents. If Contractor fails to notify Consultant of these conditions, Contractor will be held responsible for all costs associated with system adjustments required due to the change in field conditions.

3.03 INSPECTION: - Examine areas and conditions under which Work of this Section is to be performed. Do not proceed with Work until unsatisfactory conditions have been corrected.

- A. Grading operations, with the exception of final grading, shall be completed and approved by Owner before staking or installation of any irrigation system begins.
- B. Underground Utilities shall be installed prior to installation of irrigation system. If irrigation installation takes place prior to utility installation, Contractor shall notify Owner of this condition in writing prior to commencement of irrigation installation.

3.04 PREPARATION:

- A. Staking shall Occur as Follows:
 - 1. Mark, with powdered lime, routing of pressure supply line. Contact Consultant 48 hours in advance and request review of staking. Proposed locations of all trees shall be field staked by Contractor and approved by Owner prior to Consultant review of irrigation staking. Consultant will advise installer as to the amount of staking to be prepared. Consultant will review staking and direct changes if required. Review does not relieve installer from coverage problems due to improper placement of heads after staking.
 - 2. Contractor shall contact Consultant if field spacing varies by +/- 10% of the spacing shown on the irrigation plans. If Contractor fails to notify Consultant of variances exceeding 10%, Contractor assumes full responsibility for the costs associated with any required system modifications deemed necessary by the Consultant or Owner.

- B. Install sleeving under asphalt paving and concrete walks, prior to concreting and paving operations, to accommodate piping and wiring. Compact backfill around sleeves to 95% Modified Proctor Density within 2% of optimum moisture content in accordance with STM D1557.
- C. Trenching - Trench excavation shall follow, as much as possible, layout shown on Drawing. Dig trenches straight and support pipe continuously on bottom of trench. Trench bottom shall be clean and smooth with all rock and organic debris removed.
 - 1. Clearances:
 - a. Piping 3 Inches and Larger - Make trenches of sufficient width (14 inches minimum) to properly assemble and position pipe in trench. Minimum clearance of piping 3 inches or larger shall be 5 inches horizontally on both sides of the trench.
 - b. Piping Smaller than 3 Inches - Trenches shall have a minimum width of 7 inches.
 - c. Line Clearance - Provide not less than 6 inches of clearance between each line and not less than 12 inches of clearance between lines of other trades.
 - 2. Pipe and Wire Depth:
 - a. Pressure Supply Piping - 24 inches from top of pipe.
 - b. PVC Sleeving – To match depth of sleeved material.
 - c. Non-pressure Piping (rotor) - 18 inches from top of pipe.
 - d. Non-pressure Piping (pop-up) - 12 inches from top of pipe.
 - e. Control Wiring/Communication Cable - Side of pressure main or at 18 inch depth if installed in a separate trench with no mainline piping..
 - f. Drip Tubing - 12 inches from top of pipe.

3.05 INSTALLATION - Locate other equipment as near as possible to locations designated. Consultant shall review deviations prior to installation.

- A. HDPE/POLY Piping - Snake pipe in trench as much as possible to allow for expansion and contraction. Do not install pipe when air temperature is below 40 degrees F. When pipe installation is not in progress, or at end of each day, close pipe ends with tight plug or cap. Perform Work in accordance with good practices prevailing in piping trades.
 - 1. HDPE Pipe - Lay pipe and make all plastic to plastic, fusion joints in accordance with manufacturer's recommendations.
 - a. FUSION:

Sections of polyethylene pipe should be joined into continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe supplier's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe supplier. The butt fusion joining will produce a joint weld strength equal to or greater than the tensile strength of the pipe itself. All field welds shall be made with fusion equipment equipped with a Data Logger. Temperature, fusion

pressure and a graphic representation of the fusion cycle shall be part of the Quality Control records.

- b. Mechanical joining may be used where the butt fusion method can not be used. Mechanical joining will be accomplished by either using a HDPE flange adapter or a substitute method as approved by the Consultant.
- c. Hot gas fusion, threading, solvents, and epoxies will not be used to join HDPE pipe.

B. Control Wiring:

1. Two-Wire Cable:

- a. Bury control wiring between controller and electric valves in pressure supply line trenches, strung as close as possible to main pipe lines with such wires to be consistently located below and to one side of pipe, or in separate trenches.
- b. Bundle all 24 volt wires at 10 foot intervals and lay with pressure supply line pipe to one side of the trench.
- c. Provide an expansion loop at every pressure pipe angle fitting, every electric control valve location (in valve box), and every 500 feet. Form expansion loop by wrapping wire at least 8 times around a 3/4 inch pipe and withdrawing pipe.
- d. Make all splices and E.C.V. connections using 3M DBY connectors or similar dry splice method.
- e. Install all control wire splices not occurring at control valve in a separate splice valve box.
- f. Install one control valve decoder in valve box with each control valve.
- g. Maintenance spare wires – Install spare two-wire cable
- h. two-wire cable shall be installed with grounding/surge protection every 500' or every 5th valve decoder.

C. Electric Control Valves - Install cross-handle four inches below finished grade where shown on Drawings as detailed. When grouped together, allow minimum of 12 inches between valve box sides. Install each remote control valve in a separate valve box. Install valve box flush with grade or when present flush with surfacing material (rock mulch). When parallel to roadway, sidewalk or other permanent element or structure, control valve and box to be installed perpendicular to element or structure, spaced equally.

D. Quick Coupling Valves - Install quick couplers on swing-joint assemblies as indicated on construction details; plumb and flush to grade. Angled nipple relative to pressure supply line shall be no more than 45 degrees and no less than 10 degrees.

E. Valve Boxes:

- 1. Install one valve box for each type of valve installed as detailed. Valve box extensions are not acceptable except for master valves and flow sensors. Install gravel sump after compaction of all trenches. Place final portion of gravel inside valve box after valve box is backfilled and compacted.
- 2. Brand controller letter and station number on lid of each valve box. Letter

and number size shall be no smaller than 1 inch and no greater in size than 1 1/2 inches. Depth of branding shall be no more than 1/8 inch into valve box lid.

- F. Gate Valves - Install where shown on Drawings as detailed.
- G. Backfilling - Do not begin backfilling operations until required system tests have been completed. Backfill shall not be done in freezing weather except with review by Consultant. Leave trenches slightly mounded to allow for settlement after backfilling is completed. Trenches shall be finish graded prior to walk-through of system by Consultant.
 - 1. Materials - Excavated material is generally considered satisfactory for backfill purposes. Backfill material shall be free of rubbish, vegetable matter, frozen materials, and stones larger than 1 inch in maximum dimension. Do not mix subsoil with topsoil. Material not suitable for backfill shall be hauled away. Contractor shall be responsible for providing suitable backfill if excavated material is unacceptable or not sufficient to meet backfill, compaction, and final grade requirements.
 - 2. Do not leave trenches open for a period of more than 48 hours. Open excavations shall be protected in accordance with OSHA regulations.
 - 3. Compact backfill to 90% maximum density, determined in accordance with ASTM D155-7 utilizing the following methods:
 - a. Mechanical tamping.
 - b. Puddling or ponding. Puddling or ponding and/or jetting is prohibited within 20'-0" of building or foundation walls.
- H. Piping Under Paving:
 - 1. Provide for a minimum cover of 18 inches between the top of the pipe and the bottom of the aggregate base for all pressure and non-pressure piping installed under asphaltic concrete or concrete paving.
 - 2. Piping located under areas where asphalt or concrete paving will be installed shall be bedded with sand (a layer 6" below pipe and 6" above pipe).
 - 3. Compact backfill material in 6" lifts at 90% maximum density determined in accordance with ASTM D155-7 using manual or mechanical tamping devices.
 - 4. Set in place, cap, and pressure test all piping under paving, in presence of Owner prior to backfilling and paving operations.
 - 5. Piping under existing walks or concrete pavement shall be done by jacking, boring, or hydraulic driving, but where cutting or breaking of walks and/or concrete is necessary, it shall be done and replaced at not cost to Owner. Obtain permission to cut or break walks and/or concrete from Owner.
- I. Water Supply and Point of Connection - Water supply shall be extended as shown from water supply lines.
- J. Two-Wire Controller- installed as shown on plans and per manufacturer specifications, install controller with cellular modem and set up communication with City of Louisville Toro Sentinel network.

3.06 FIELD QUALITY CONTROL:

- A. Flushing - After piping, risers, and valves are in place and connected, but prior to installation of sprinkler heads, quick coupler assemblies, and hose valves, thoroughly flush piping system under full head of water pressure from dead end fittings. Maintain flushing for 5 minutes through furthestmost valves. Cap risers after flushing.
- B. Conduct tests in presence of Owners Representative. Arrange for presence of Owners Representative 48 hours in advance of testing. Supply force pump and all other testing equipment.
 - 1. After backfilling and installation of all control valves, temporarily cap / isolate new mainline sections fill new pressure supply line with water, and pressurize to 120 PSI.
 - 2. Leakage, Pressure Loss - Test is acceptable if pressure stabilizes for four (4) hours during the eight (8) hour testing duration and no water has passed the water meter during the eight (8) hour testing duration.
 - 3. Leaks - Detect and repair leaks. Using caulk or pipe sealant is not an approved method for repairing leaks
 - 4. Retest system until test pressure can be maintained for four (4) hours.
 - 5. Before final acceptance, pressure supply line shall remain under pressure for a period of 48 hours.
 - 6. Pressure test shall be scheduled and passed prior to scheduling of Substantial Completion Walk-through.
- C. Walk-Through for Substantial Completion:
 - 1. Arrange for Consultant's presence 48 hours in advance of walk-through.
 - 2. Entire system shall be completely installed and operational prior to scheduling of walk-through.
 - 3. Operate each zone in its entirety for Consultant at time of walk-through and additionally, open all valve boxes if directed.
 - 4. Generate a list of items to be corrected prior to Final Completion.
 - 5. Furnish all materials and perform all work required to correct all inadequacies of coverage due to deviations from Contract Documents.
 - 6. During walk-through, expose all drip emitters under operations for observation by Consultant to demonstrate that they are performing and installed as designed, prior to placing of all mulch material. Schedule separate walk-through if necessary.
 - 7. Supply Consultant with prints of irrigation as-builts prior to scheduling substantial completion walk-through.
- D. Walk-Through for Final Completion:

1. Arrange for Consultant's presence 48 hours in advance of walk-through.
2. Show evidence to Consultant that Owner has received all accessories, charts, record drawings, and equipment as required before Final Completion walk-through is scheduled.
3. Operate each zone, in its entirety for Consultant at time of walk-through to insure correction of all incomplete items.
4. Items deemed not acceptable by Consultant shall be reworked to complete satisfaction of Consultant.
5. If after request to Consultant for walk-through for Final Completion of irrigation system, Consultant finds items during walk-through which have not been properly adjusted, reworked, or replaced as indicated on list of incomplete items from previous walk-through, Contractor shall be charged for all subsequent walk-throughs. Funds will be withheld from final payment and/or retainage to Contractor, in amount equal to additional time and expenses required by Consultant to conduct and document further walk-throughs as deemed necessary to insure compliance with Contract Documents.

3.07 ADJUSTING - Upon completion of installation, fine-tune entire system by adjusting patterns and break-up pins, and setting pressure reducing valves at proper and similar pressure to provide optimum and efficient coverage. Coordinate flow control and zone pressure adjustments with City of Louisville.

3.08 CLEANING - Maintain continuous cleaning operation throughout duration of work. Dispose of, off-site at no additional cost to Owner, all trash or debris generated by installation of irrigation system.

END OF SECTION