City of Louisville

COLORADO • SINCE 1878

2025 WATER MAIN REPLACEMENT PROJECT
AND
SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

PREPARED BY:
CITY OF LOUISVILLE

April 2025

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Invitation to Bid

Sealed Bids will be received by the

CITY OF LOUISVILLE, STATE OF COLORADO

Hereinafter referred to as OWNER, at 749 Main Street, Louisville, Colorado 80027, until **10:00 a.m.**, MST, **May 13, 2025** for the

2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

At said place and time, all Bids that have been duly received will be publicly opened and read aloud. Bids received after said closing time of 10:00 a.m. MST will not be accepted and be returned unopened. Bids shall be in a sealed envelope plainly marked with the Project Name and Date and addressed to:

City of Louisville
Office of City Engineer
749 Main Street
Louisville, Colorado 80027

The Work for which the Bid is requested consists of but is not limited to demolition, water main replacement and water service line replacement, sanitary sewer backwater preventer valve installation, concrete replacement, asphalt patching, traffic control, incidentals and work appurtenant thereto.

Digital copies of the Bidding Documents will be available after May 30, 2025, online through Rocky Mountain Bid System located at https://www.bidnetdirect.com/ and also viewable via the City of Louisville's website https://www.louisvilleco.gov/doing-business/bidding-opportunities-requests-for-proposals.

Bids will only be accepted from BIDDERS who are prequalified as a General Contractor by the City of Louisville City Engineer, and who are recorded by Rocky Mountain Bid System and by the City Engineer as having received the Bidding Documents. City Engineer will verify with Rocky Mountain Bid System for Plan Holder list. City of Louisville Pre-qualification forms must be received at the office of the City Engineer by close of business (5:00 p.m.) May 9, 2025. Pre-qualification forms received after this date and time are not guaranteed to be approved by the required date.

Bids will be received on a unit and lump sum price basis as described in the Bidding Documents.

When a BIDDER submits a Bid, that Bid shall include the Schedule of Subcontractors, which shall identify each element of the Work to be subcontracted. Traffic control subcontractors shall be prequalified by the City of Louisville. Other subcontractors whose subcontract exceeds five percent of the Total Bid Price shall be prequalified by the City of Louisville, City Engineer for their specific portion of the Work.

Each Bid shall contain evidence of BIDDER'S qualification to do business in the state of Colorado or covenant to obtain such qualification.

Each Bid must be accompanied by a Bid security consisting of a properly Certified Check, Cashier's Check, or Bid Bond, in the amount of five (5) percent of BIDDER'S Total Bid Price, without conditions, payable to the City of Louisville. Bid security will be retained by the City until the seventh day after the Effective Date of the Agreement whereupon Bid security furnished by such Bidder's will be returned. Bid security with Bids, which are not competitive, will be returned within fourteen days after the Bid opening. No Bid will be considered unless accompanied by such Bid security.

The successful BIDDER will be required to furnish a performance bond and a labor and material payment bond to the City of Louisville guaranteeing faithful performance and the payment of all bills and obligations arising from the performance of the Contract.

No Bid may be withdrawn within a period of sixty (60) days after the date fixed for opening Bids.

The City of Louisville reserves the right to award the contract by sections, to reject any or all Bids, and to waive any informalities and irregularities therein.

The City of Louisville assumes no responsibility for payment of any expenses incurred by any respondent to this Invitation to Bid.

Preference is hereby given to materials, supplies, and provisions produced, manufactured, or grown in Colorado, quality and price being equal to articles offered by competitors outside of the State.

A mandatory pre-bid conference with representatives of prospective BIDDERS will be held at **9:00 a.m.**, MST, on **May 6, 2025.** This meeting will be held virtually. Representatives of the City will be present to discuss the Project. Prospective BIDDERS are invited to attend and present their questions relative to this Bid at this conference.

Microsoft Teams Need help?
Join the meeting now
https://teams.microsoft.com/l/meetup-join/19%3ameeting_NzI4OGFjNTYtYWYzYy00OTg0LWJlYWEtMGMwNzNhODY0NjVi%40thread.v2/0?context=%7b%22Tid%22%3a%22bdcd34c2-e919-4b54-b6ba-01080ac35832%22%2c%22Oid%22%3a%2216a4a3f8-b918-48c6-8741-5ee11eac376a%22%7d
Meeting ID: 271 144 851 738 2
Passcode: QT9hb2pq

Dial in by phone
+1 321-430-0794,,556468096# United States, Orlando
Find a local number
Phone conference ID: 556 468 096#
For organizers: Meeting options | Reset dial-in PIN

The City of Louisville is an Equal Opportunity Employer.

City of Louisville, Colorado
City Engineer

1st Publication: April 23, 2025
2nd Publication: April 30, 2025

Instructions to Bidders

1. Defined Terms

Terms used in these Instructions to BIDDERS, which are defined in the General Conditions of this Manual have the meanings assigned to them in the General Conditions.

Certain additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof.

1.1 The term "BIDDER" means one who submits a Bid directly to OWNER, as distinct from a sub-bidder, who submits a bid to a BIDDER.

1.2 The term "ISSUING OFFICE" means the office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

1.3 The term "SUCCESSFUL BIDDER" means the lowest, qualified, responsible, and responsive BIDDER to whom OWNER (on the basis of OWNER's evaluation as hereinafter provided) makes an award.

1.4 The term "Bidding Documents" includes the Invitation to Bid, Instructions to Bidders, the Bid Form, and the Contract Documents (including all Addenda issued prior to receipt of Bids).

2. Copies of Bidding Documents

2.1 Complete sets of Bidding Documents stated in the Invitation to Bid may be obtained from the Issuing Office. No partial sets will be issued. The Bidding Documents may be examined at the locations identified in the Invitation to Bid.

2.2 Complete sets of Bidding Documents shall be used in preparing Bids; neither OWNER nor ENGINEER assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

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

3. Qualification of Bidders

3.1 **Bids will only be accepted from qualified BIDDERs who are prequalified as a General contractor by the City of Louisville, City Engineer, and who are recorded by the City Engineer as having received the Bidding Documents. City of Louisville Prequalification forms must be received at the office of the City Engineer by close of business (5:00 p.m.) on <u>February 26, 2025</u>. Prequalification forms received after this date and time are not guaranteed to be approved by the required date.**

3.2 Each Bid shall contain evidence of BIDDER's qualification to do business in the state of Colorado or covenant to obtain such qualification.

3.3 The apparent low BIDDER shall be required to show that he has handled former work of similar type and that no just claims are pending against such work. No Bid will be awarded to a BIDDER who is engaged in any other work, which would impair his ability to perform or finance this Work.

4. Examination of Contract Documents and Site

4.1 It is the responsibility of each BIDDER before submitting a Bid:

4.1.1 To examine thoroughly the Contract Documents and related data identified in the Bidding Documents;

4.1.2 To visit the site to become familiar with and satisfy BIDDER as to the general, local and site conditions that may affect cost, progress, performance or furnishing of the Work;

4.1.3 To consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work;

4.1.4 To study and carefully correlate BIDDER's knowledge and observations with the Contract Documents and other related data; and

4.1.5 **To promptly notify ENGINEER of all conflicts, errors, ambiguities or discrepancies, which Bidder has discovered in or between the Contract Documents and such other related documents.**

4.2 BIDDERS are responsible for examining and determining for themselves the location and nature of the proposed Work, the amount and character of the labor and materials required therefor, and the difficulties, which may be encountered. BIDDERS may not rely on oral or written representations made by the OWNER, including any reports and drawings identified pursuant to paragraph 4.2.1 and subparagraphs thereof of the General Conditions, unless the OWNER has guaranteed in writing that such representation is factually accurate, and by submitting a Bid, each Bidder waives all liability for any error in any representation made by the OWNER to the BIDDER. BIDDERS shall, at BIDDER'S own expense, inspect the site and its surroundings and conduct such supplementary examinations, investigations, and tests concerning conditions at or contiguous to the site (including surface, and subsurface) which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto for performing the Work in accordance with the Contract Documents. By failing to make such an inspection, the BIDDER waives all rights to claim extra payment or time extensions due to unexpected conditions, which could have been determined had the site been reasonably inspected. If concealed or unknown conditions differ materially from those ordinarily encountered and generally recognized as inherent in the Work or differ materially from the conditions indicated in the Contract Documents, then an equitable adjustment in the Contract Price or in the Contract Time will be allowed by change order as provided in Article 11 or Article 12 respectively of the General Conditions. By submitting a Bid, the BIDDER represents that the BIDDER'S observations at the site are not inconsistent with the requirements of the proposed Contract Documents, unless otherwise noted by the BIDDER.

Refer to General Conditions for identification of those reports of explorations and tests of subsurface conditions at or contiguous to the site, which have been utilized by ENGINEER in preparation of the Contract Documents. BIDDER may not rely upon the general accuracy of the "technical data" contained in such reports or upon non-technical data, interpretations, opinions or information contained in such reports or otherwise relating to the subsurface conditions at the site, nor upon the completeness thereof for the purposes of bidding or construction unless OWNER has guaranteed in writing that such data or representations are accurate.

4.2.1 Refer to General Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface conditions (except Underground Facilities) which are at or contiguous to the site that have been utilized by ENGINEER in preparation of the Contract Documents. BIDDER may not rely upon the general accuracy of the "technical data" contained in such drawings or upon other data, interpretations, opinions or information shown or indicated in such drawings or otherwise relating to such structures, nor upon the completeness thereof for the purposes of bidding or construction unless OWNER has guaranteed in writing that such data or representations are accurate.

Copies of such reports and drawings will be made available by OWNER to any BIDDER on request. Those reports and drawings are not part of the Contract Documents, but the technical data contained therein, upon which BIDDER is entitled to rely upon as factually accurate as provided in Paragraphs 4.2.1 of the General Conditions. BIDDER is responsible for any interpretation or conclusion drawn from any "technical data" or any such data, interpretations, opinions, or information.

4.3 Information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based upon information and data furnished to OWNER by OWNERS of such Underground Facilities or others, and OWNER and ENGINEER do not assume responsibility for the accuracy or completeness thereof.

4.4 On request in advance, OWNER will provide each BIDDER access to the site to conduct such examinations, investigations, explorations, tests, and studies as each BIDDER deems necessary for submission of a Bid. BIDDER shall fill all holes, clean up and restore the site to its former conditions upon completion of such explorations, investigations, tests, and studies.

4.5 Reference is made to the General Conditions for the identification of the general nature of work that is to be performed at the site by OWNER or others (such as utilities and other prime contractors) that relates to work for which a Bid is to be submitted. On request, OWNER will provide to each BIDDER for examination access to or copies of Contract Documents (other than portions thereof related to price) for such work.

4.6 The submission of a Bid will constitute an incontrovertible representation by BIDDER that BIDDER has complied with every requirement of this Article 4, that the BIDDER warrants that it is familiar with all provisions of the Contract Documents, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and applying the specific means, methods, techniques, sequences or procedures of construction that may be shown or indicated in or expressly required by the Contract Documents, **that BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities and discrepancies that BIDDER has discovered in the Contract Documents and the written**

resolutions thereof by ENGINEER is acceptable to BIDDER, and that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing of the Work.

4.7 The provisions of 4.1 through 4.7 of this section, inclusive, do not apply to Asbestos, Polychlorinated biphenyls (PCBs), Petroleum, Hazardous Waste, or Radioactive Material covered by paragraph 4.5 of the General Conditions.

5. Availability of Lands for Work, Etc.

5.1 The lands upon which the Work is to be performed will be in the confines of street rights-of-way and public property. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be obtained and paid for by CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by OWNER unless otherwise provided in the Contract Documents.

6. Interpretations and Addenda

6.1 All questions about the meaning or intent of the Bidding Documents are to be submitted in writing to the ENGINEER. Interpretation or clarifications considered necessary by ENGINEER in response to such questions will be issued only by Addenda mailed or delivered to all parties recorded by ENGINEER as having received Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. **Oral and other interpretations or clarifications will be without legal effect.**

6.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by ENGINEER.

7. Bid Security

7.1 Each Bid must be accompanied by a Bid Security consisting of a properly Certified Check, Cashier's Check, or Bid Bond on the form enclosed herewith, in the amount of five (5) percent of BIDDER's Total Bid Price, without conditions, payable to the City of Louisville, Colorado. The Bid Bond must be executed by a surety meeting the requirements of Paragraph 5.3 of the General Conditions. The cost of the Bid Security shall be included in the bid. The submission of the Bid and Bid Security is a pledge by the BIDDER that he will enter into an Agreement with the Owner on the terms stated in his Bid and will, if required, furnish required insurance certificates and bonds, covering the faithful performance of the Agreement and the payment of all obligations arising thereunder.

7.2 The Bid Security of the Successful BIDDER will be retained until such BIDDER has executed the Agreement, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid Security will be returned. If the successful BIDDER fails to execute, enter into or deliver an Agreement in accordance with an accepted bid proposal, or fails to furnish the required bonds or certificates, within ten (10) days from the mailing of the Notice of Award, or if the BIDDER has been guilty of collusion with other BIDDERS in submitting the Bid, the OWNER may annul the Notice of Award and the Bid Security shall be forfeited to

and retained by the OWNER as liquidated damages and not as a penalty. By submitting the Bid security with the bid proposal, the BIDDER agrees to liquidated damages in the event the BIDDER fails to enter into the Agreement with the OWNER. The OWNER shall not have to prove actual damages suffered in order to retain the Bid Security as liquidated damages. The OWNER and the BIDDER agree that liquidated damages are appropriate because the anticipated actual damages are uncertain in amount and difficult to forecast accurately. The OWNER and the BIDDER agree that the amount of the Bid Security is a reasonable estimate of damages and not disproportionate to the anticipated loss or injury. The Bid Security of other BIDDER'S whom OWNER believes to have a reasonable chance of receiving the award may be retained by OWNER until the seventh day after the Effective Date of the Agreement whereupon Bid Security furnished by such BIDDER'S will be returned. Bid Security with Bids that are not competitive will be returned within fourteen days after the Bid opening.

8. Contract Time

8.1 The number of days within which, or the dates by which, the Work is to be completed (the Contract Time) is set forth in the Agreement.

9. Liquidated Damages

9.1 Provisions for liquidated damages, if any, are set forth in the Agreement and General Conditions.

10. Substitute and "Or Equal" Items

10.1 The Contract, if awarded, will be on the basis of materials and equipment described on the Drawings or specified in the Specifications without consideration of possible substitute or "or equal" items. Whenever it is indicated on the Drawings or specified in the Specifications that a substitute or "or - equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, application for such acceptance will not be considered by ENGINEER until after the Effective Date of the Agreement. The procedure for submission of any such application by CONTRACTOR and consideration by ENGINEER is set forth in paragraphs 6.7.1, 6.7.2, and 6.7.3 of the General Conditions and may be supplemented in the General Requirements.

11. Subcontractors, Suppliers, and Others

11.1 **When a BIDDER submits a Bid, that Bid shall include the Schedule of Subcontractors, which shall identify each element of the Work to be subcontracted. Traffic control subcontractors shall be prequalified and other Subcontractors whose subcontract exceeds five percent of the Total Bid Price shall be prequalified by the City of Louisville, City Engineer for their specific portion of the Work.**

11.2 If OWNER, who after due investigation has reasonable objection to any proposed Subcontractor, other person or organization, may before the Notice of Award is given, request the apparent Successful BIDDER to submit a substitute Subcontractor acceptable to the City without an increase in Bid price. If the apparent Successful BIDDER declines to make any such substitution, OWNER may award the contract to the next lowest BIDDER that proposes to use acceptable Subcontractors and other persons and organizations. The declining to make

requested substitutions will not constitute grounds for sacrificing the Bid security of any BIDDER. Any Subcontractor or other person or organization listed and to whom OWNER does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.8.2. of the General Conditions.

11.3 CONTRACTOR shall not be required to employ any Subcontractor, Supplier, other person, or organization against whom CONTRACTOR has reasonable objection.

11.4 The Contract Documents will take precedence over any nonconforming data submitted. Any Bid specifically conditioned upon furnishing equipment or materials, which are not responsive to the Contract Documents, will not be considered.

12. Bid Form

12.1 The Bid Form is included in the Contract Documents. A spreadsheet is available upon request, but a hard copy must be submitted with the sealed bids.

12.2 All blanks on the Bid Form must be completed by printing in ink or by typewriter. All unit prices including lump sums in the unit price schedule are to be expressed in numerals only.

12.3 Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal shall be affixed and attested by the secretary or an assistant secretary. The state of incorporation shall be shown below the corporate name.

12.4 Bids by partnerships must be executed in the partnership name and signed by a duly authorized general partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature. A partnership shall give the full names and addresses of all partners and their interest and role in the partnership business.

12.5 All names must be typed or printed in ink below the signature.

12.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).

12.7 The BIDDER's business address and telephone number for communications regarding the Bid must be shown.

12.8 Each Bid shall contain evidence of BIDDER's qualification to do business in the state of Colorado or covenant to obtain such qualification.

12.9 No alterations in Bids, or in the printed forms therefor, by erasures, interpolations, or otherwise will be accepted unless each such alteration is signed or initialed by the BIDDER; if initialed, OWNER may require the BIDDER to identify any alteration so initialed.

12.10 Bids will be based on a combination of unit price and lump sum schedules including alternatives. Unit price schedules shall be bid as provided in Paragraph 12.10.1 below. Lump sum schedules shall be bid as provided in paragraph 12.10.2 below.

12.10.1 Bids for unit price schedules shall be based on a unit price basis. The Total Bid Price will be determined as the sum of the products of the estimated quantity of each item and the unit price set forth in the Schedule of Unit Prices. The final Contract Price will be subject to adjustment according to final measured, used, or delivered quantities as provided in the Specifications and the unit prices in the Bid Form will apply to such final quantities except that unit prices may be subject to change by Change Order if quantities vary more than 25 percent.

12.10.2 Bids for lump sum schedules shall be based on a lump sum basis for each lump sum item.

13. Submission of Bids

13.1 Bids shall be submitted at the time and place indicated in the Advertisement of Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the Project Title (and, if applicable, the designated portion of the Project for which the Bid is submitted) and name and address of the BIDDER, and addressed to the City of Louisville as indicated in the Advertisement of Invitation to Bid accompanied by the Bid Security and other required documents. If the Bid is sent through the mail or other delivery system the sealed Bid shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of the separate sealed envelope.

13.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids indicated in the Invitation to Bid, or any extension thereof made by Addendum. Bids received after the time and date for receipt of Bids will be returned unopened. BIDDER shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

13.3 Oral, telephonic, or telegraphic Bids are invalid and will not receive consideration.

13.4 No BIDDER may submit more than one Bid. Multiple Bids under different names will not be accepted from one firm or association.

14. Modification and Withdrawal of Bids

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

14.2 Bids may also be modified or withdrawn in person by the BIDDER or an authorized representative provided he can prove his identity and authority.

14.3 Withdrawn Bids may be resubmitted up to the time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to BIDDERS.

14.4 If, within twenty-four hours after Bids are opened, any BIDDER files a duly signed, written notice with OWNER and promptly thereafter demonstrates to the reasonable satisfaction of OWNER that there was a material and substantial mistake in the preparation of its Bid, that

BIDDER may withdraw its Bid and the Bid security will be returned. Thereafter, that BIDDER will be disqualified from further bidding on the Work to be provided under the Contract Documents.

15. Opening of Bids

15.1 Bids will be opened and (unless obviously non-responsive) read aloud publicly as indicated in the Invitation to Bid. An abstract of the amounts of the base Bids and major alternates (if any) will be made available to BIDDERS.

16. Bids to Remain Open Subject to Acceptance

16.1 All Bids shall remain open for sixty (60) days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the Bid Security prior to that date.

17. Award of Contract

17.1 OWNER reserves the right to reject any or all Bids, including without limitation the rights to reject any or all irregular, nonconforming, nonresponsive, unbalanced or conditional Bids and to reject the Bid of any BIDDER if OWNER believes that it would not be in the best interest of the Project to make an award to that BIDDER, whether because the Bid is not responsive or the BIDDER is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by OWNER. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

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

17.3 OWNER will consider the qualifications and experience of Subcontractors and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors and other persons and organizations must be submitted. OWNER also will consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

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

17.5 If the contract is to be awarded, it will be awarded to the lowest responsible BIDDER based on the combination of Bid Schedules as determined by OWNER and whose evaluation by OWNER indicates to OWNER that the award will be in the best interest of the Project.

17.6 If the contract is to be awarded, OWNER will accept the Bid within sixty days after the Bid

opening and will give the Successful BIDDER a Notice of Award within sixty-five days after the day of the Bid opening. The OWNER's acceptance of the Bid proposal shall bind the successful BIDDER to sign the Contract Documents within ten (10) days after the date of the receipt by the BIDDER of the Notice of Award. The rights and obligations set forth in the Contract Documents shall become effective only with the signature of the **MAYOR** on behalf of the City.

17.7 It is the OWNER's intention to award the entire contract as bid. The OWNER reserves the right to award a contract that is in the best interest of the OWNER and within the amount budgeted. The OWNER has or will have prior to award appropriated monies at least equal to the contract amount. The Total Bid Price, subject to the other considerations herein, shall be the basis of award. Quantities may be reduced in order to reach budget amount, in that case the unit prices shall govern to determine the lowest Total Bid Price, which shall then determine the basis of award. If quantity reductions are required, quantities may be reduced from any item. Bid may be awarded by adding (or subtracting) the base bid plus any add alternatives, at the OWNER's sole discretion.

The BIDDER acknowledges that the OWNER has the right to delete any item of the Schedule of Unit Prices or change quantities and locations in any item at OWNER's sole discretion without affecting the contract prices of any item of the Contract so long as the deletion or change does not exceed twenty-five percent (25%) of the Total Bid Price. Notwithstanding the foregoing, if a reduction is made in Unit Price items or quantities, the lump sum cost for traffic control shall be reduced by the same percentage as the percentage change made from the original unit price cost/quantity to the reduced original unit price cost/quantity.

Quantities listed in the Schedule of Unit Prices are approximate and are for the purpose of comparing bids. These quantities have been estimated and are for the general information of the BIDDER. Quantities are not guaranteed.

17.8 In addition to Paragraph 17.1 of the Instructions to Bidders, in evaluating Bids, the OWNER will consider Bids irregular, and intends to reject Bids, for any of the following substantial reasons:

17.8.1 Unsigned Bid Form;

17.8.2 Bid Forms which have items omitted by the BIDDER;

17.8.3 Altering a Bid as to specified time of commencement of completion of Work;

17.8.4 Bid Forms not accompanied by a Bid Security of character indicated or of an amount less than indicated;

17.8.5 If the Bid Form is on a form other than that provided in Contract Documents, or if the Bid Form is altered;

17.8.6 If there are unauthorized additions, conditional or alternate Bids, or discrepancies of any nature that make the Bid Form incomplete, indefinite, or ambiguous as to its meaning;

17.8.7 If the BIDDER adds any provisions reserving the right to accept or reject an award, or to enter into a Contract pursuant to an award;

17.8.8 If the Schedule of Unit Prices in the Bid Form does not contain a unit price for each item number listed; or

17.8.9 Submitting more than one Bid, where there is evidence that any BIDDER has an interest in more than one Bid for the same work, or where there is evidence of collusion or other illegal activities between BIDDERS. In addition to any other remedies the OWNER may have, the OWNER may retain as liquidated damages for the disruption of the bidding process the Bid Security of all bidders involved in collusion or other illegal activities. The BIDDER and the OWNER agree that the amount of the Bid Security is a reasonable estimate of damages for collusion and other illegal activities on the part of the BIDDER and not disproportionate to the anticipated loss or injury. A person or entity, which has quoted prices to a BIDDER, is not hereby disqualified from quoting prices to other BIDDERS or from submitting a direct bid on its own behalf.

17.8.10 In evaluating Bids, the OWNER may consider Bids informal, and may, in its sole discretion, elect to waive informalities for the following minor reasons:

17.8.11 Omission of dates when signed, or title of person signing;

17.8.12 Failure to acknowledge an addendum, which does not affect quantity, quality, time, or price;

17.8.13 Submission of a Bid in an unsealed envelope;

17.8.14 Unit price Bids which include reconcilable arithmetic errors may be corrected if it does not change the unit price; or

17.8.15 Unit price Bids which include reconcilable arithmetic errors may be corrected, if it does not change the amount on which the award will be based.

18. Contract Security

18.1 Paragraph 5.1 of the General Conditions set forth OWNER's requirements as to performance and payment Bonds. When the Successful BIDDER delivers the executed Agreement to OWNER it shall be accompanied by the required performance and payment Bonds.

19. Signing of Agreement

19.1 When OWNER gives a Notice of Award to the Successful BIDDER, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within ten (10) days after CONTRACTOR's receipt of the Notice of Award, CONTRACTOR shall sign and have notarized the required number of counterparts of the Agreement and attached documents and return them to the OWNER along with the required Bonds, insurance certificates and power of attorney authorizations.

20. Special Legal Requirements

20.1 OWNER's Finances. OWNER has made adequate financial arrangements for the completion of

all Work required by the Contract Documents and welcomes inquiries from prospective BIDDERS on the prime contract.

21. Sales and Use Taxes

21.1 OWNER is exempt from Colorado State Sales and Use Taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Contract Price. Refer to General Conditions 6.15 for additional information.

22. Retainage

22.1 Provisions concerning retainage and CONTRACTORS' rights to deposit securities in lieu of retainage are set forth in the Agreement.

23. Mistakes in Bidding Instructions

23.1 If the OWNER makes a mistake in drafting the Instructions to Bidders or any other Contract Documents, the OWNER reserves the right to reject any or all Bids, or to require that BIDDERS submit an alternate bid proposal with adjustments made to correct the error(s). Such errors will be set forth in an addendum. If the CONTRACTOR has already been selected and has started performing work under the contract, and the OWNER then discovers a mistake in the Contract Documents for which the OWNER is responsible, the OWNER may opt to reform the contract. If the mistake causes the Contractor to receive compensation for materials not used in the Work or for labor, which would not be required for the Work, the Contract Price shall be decreased proportionally. If the mistake causes the CONTRACTOR to fail to bid on work, which must be performed in order to properly complete the contract, the OWNER may increase the Contract Price to equal the proportionate increase in the cost of required materials and labor caused to the CONTRACTOR. In the alternative, the OWNER may solicit bids for such additional work, or the OWNER may reassign such additional work to another CONTRACTOR, as the OWNER deems appropriate. Nothing in this provision shall apply to mistakes made by the CONTRACTOR in completing the Bid Form or in performing the contract.

Bid Form

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

THIS BID IS SUBMITTED TO: 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 ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by ENGINEER 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: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

Base Bid:

WATER BID ITEMS:

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
1	12'' PVC WATER MAIN CLASS 235 DR 18	LF	102		$0.00
2	8'' PVC WATER MAIN CLASS 235 DR 18	LF	2497		$0.00
3	REMOVE FIRE HYDRANT ASSEMBLY	EA	3		$0.00
4	FIRE HYDRANT ASSEMBLY	EA	6		$0.00
5	FIRE HYDRANT EXTENSION (6")	EA	6		$0.00
6	FIRE HYDRANT EXTENSION (12")	EA	6		$0.00
7	12" 45 DEGREE BEND	EA	2		$0.00
8	12”-8” REDUCER	EA	1		$0.00
9	12" SOLID SLEEVE	EA	1		$0.00
10	12"CAP	EA	1		$0.00
11	GATE VALVE AND BOX (8”)	EA	11		$0.00
12	8” x 8” x 8” SWIVEL TEE	EA	6		$0.00
13	8” x 6” x 8” SWIVEL TEE	EA	6		$0.00
14	8'' SOLID X SWIVEL ADAPTER	EA	8		$0.00
15	8" 11 1/4 DEGREE BEND	EA	8		$0.00
16	8'' SOLID SLEEVE	EA	13		$0.00
17	4" CAP	EA	9		$0.00
18	8" CAP	EA	5		$0.00
19	ABANDON EXISTING VALVE AND BOX	EA	8		$0.00
20	WATER SERVICE CONNECTION 3/4'' SHORT	EA	32		$0.00
21	WATER SERVICE CONNECTION 3/4'' LONG	EA	24		$0.00
22	REMOVE AND REPLACE 3/4" WATER SERVICE	EA	8		$0.00

23	REMOVE AND REPLACE 3/4" CURB STOP AND BOX	EA	8		$0.00
24	STRUCTURE BACKFILL (COMPLETE IN PLACE)	TN	225		$0.00
25	POTHOLING	EA	93		$0.00
26	24" VERTICAL CURB AND GUTTER	LF	29		$0.00
27	4” CONCRETE	SF	140		$0.00
28	6’-0" x 6" CURBWALK	LF	20		$0.00
29	8” CONCRETE WITH FIBERMESH	SF	610		$0.00
30	FLOW FILL	CY	61		$0.00
31	HOT ASPHALT PATCH GRADE SX (6'')	SY	2000		$0.00
32	HOT ASPHALT PATCH GRADE SX (9'')	SY	122		$0.00
33	CONSTRUCTION ZONE TRAFFIC CONTROL	LS	1		$0.00
TOTAL WATER BID PRICE				**$0.00**	

SEWER BID ITEMS:

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
34	4" BACKWATER VALVE KIT	EA	4	$	$
35	SCHEDULE 40 PVC PIPE (4")	LF	40	$	$
36	SCHEDULE 40 PVC PIPE (6")	LF	40	$	$
37	SANITARY SEWER SERVICE PIPE SDR 35 (4")	LF	20	$	$
38	STRONG BACK COUPLING (4")	EA	16	$	$
39	FITTINGS SDR 35 (4")	EA	15	$	$
40	24" VERTICAL CURB AND GUTTER	LF	20	$	$
41	4" CONCRETE	SF	40	$	$
42	HOT ASPHALT PATCH GRADE SX (6")	SY	10	$	$
43	CAST IRON CLEAN OUT BOX AND COVER	EA	2	$	$
44	LANDSCAPE RESTORATION	LS	1	$	$
45	CONSTRUCTION ZONE TRAFFIC CONTROL	LS	1	$	$
TOTAL SEWER BID PRICE				**$0.00**	

THE BASIS OF AWARD SHALL BE THE BASE BID TOTAL PRICE.

BID SUMMARY:

BASE BID WATER ITEMS: $_____

SEWER BID ITEMS: $_____

BASE BID TOTAL (WATER + SEWER ITEMS): **$_____**

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 _____, 2025.

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	**SURETY**
_____(Seal)	_____(Seal)
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature and Title	Signature and Title (Attach Power of Attorney)
Attest: _____	Attest: _____
Signature and Title	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 statue 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: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
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: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
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, _____, 2025

NOTARY PUBLIC: _____ MY COMMISSION EXPIRES: _____

Certification of EEO Compliance

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

Instructions: BIDDERs 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: _____

City of Louisville Public Services Contract Addendum

Prohibition Against Employing Workers Without Authorization

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

Prohibition Against Employing Workers Without Authorization. Contractor shall not knowingly employ or contract with a worker without authorization to perform work under this contract. Contractor shall not enter into a contract with a subcontractor that fails to certify to the Contractor that the subcontractor shall not knowingly employ or contract with a worker without authorization to perform work under this contract.

Contractor will participate in either the E-verify program or the Department program, as defined in C.R.S. § § 8-17.5-101(3.3) and 8-17.5-101(3.7), respectively, in order to confirm the employment eligibility of all employees who are newly hired for employment to perform work under the public contract for services. Contractor is prohibited from using the E-verify program or the Department program procedures to undertake pre-employment screening of job applicants while this contract is being performed.

If Contractor obtains actual knowledge that a subcontractor performing work under this contract for services knowingly employs or contracts with a worker without authorization, Contractor shall:

a. Notify the subcontractor and the City within three days that the Contractor has actual knowledge that the subcontractor is employing or contracting with a worker without authorization; 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 worker without authorization; except that the Contractor 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 a worker without authorization.

Contractor 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. § 8-17.5-102(5).

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

Contractor's Pre-Contract Certification

Regarding Employing Workers Without Authorization

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
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: _____

Agreement

THIS AGREEMENT is made and entered into this __ day of _____ in the year 2025 by and between:

CITY OF LOUISVILLE, COLORADO
(hereinafter called OWNER)

and

_____
(hereinafter called CONTRACTOR)

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows.

Article 1. Work

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181

Article 2. Contract Times

2.1. The CONTRACTOR shall substantially complete all work within **102 Contract Days** from the date when the Contract Time commences to run as identified in the Notice to Proceed. The Work shall be completed and ready for final payment in accordance with paragraph 14.13 of the General Conditions.

2.2. LIQUIDATED DAMAGES. The OWNER and the CONTRACTOR agree and recognize that time is of the essence in this contract and that the OWNER will suffer financial loss if the Work is not substantially complete by the date specified in paragraph 2.1 above, plus any extensions thereof allowed in accordance with the Article 12 of the General Conditions. OWNER and CONTRACTOR also agree that such damages are uncertain in amount and difficult to measure accurately. Accordingly, the OWNER and CONTRACTOR agree that as liquidated damages, and not as a penalty, for delay in performance the CONTRACTOR shall pay the OWNER **ONE THOUSAND DOLLARS ($1,000)** for each and every **Contract Day** and portion thereof that expires after the time specified above for substantial completion of the Work until the same is finally complete and ready for final payment. The liquidated damages herein specified shall only apply to the CONTRACTOR's delay in performance, and shall not include litigation or attorneys' fees incurred by the OWNER, or other incidental or consequential damages suffered by the OWNER due to the CONTRACTOR's performance. If the OWNER charges liquidated damages to the CONTRACTOR, this shall not preclude the OWNER from commencing an action against the CONTRACTOR for other actual harm resulting from the CONTRACTOR's performance, which is not due to the CONTRACTOR's delay in performance.

Article 3. Contract Price

3.1. The OWNER shall pay in current funds, and the CONTRACTOR agrees to accept in full payment for performance of the Work, subject to additions and deductions from extra and/or omitted work and determinations of actual quantities as provided in the Contract Documents, the Contract Price of _____dollars $ _____ set forth in the Bid Form of the CONTRACTOR dated _____.

As provided in paragraph 11.9 of the General Conditions estimated quantities are not guaranteed, and determinations of actual quantities and classification are to be made by ENGINEER as provided in paragraph 9.10 of the General Conditions. Unit prices have been computed as provided in paragraph 11.9 of the General Conditions.

Article 4. Payment Procedures

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by OWNER as provided in the General Conditions.

4.1 PROGRESS PAYMENTS. OWNER shall make progress payments on the basis of CONTRACTOR's Applications for Payment as recommended by ENGINEER, on or about the third Wednesday of each month during construction as provided below. All progress payments will be on the basis of the progress of the Unit Price Work based on the number of units completed as provided in the General Conditions.

4.1.1.1 Prior to final completion and acceptance, progress payments will be made in the amount equal to 95 percent of the calculated value of completed Work, and/or 95 percent of materials and equipment not incorporated in the Work (but delivered, suitably stored and accompanied by documentation satisfactory to OWNER as provided in 14.2 of the General Conditions), but in each case, less the aggregate of payments previously made and such less amounts as ENGINEER shall determine, or OWNER may withhold, in accordance with paragraph 14.7 of the General Conditions.

If OWNER finds that satisfactory progress is being made in any phase of the Work, it may, in its discretion and upon written request by the CONTRACTOR, authorize final payment from the withheld percentage to the CONTRACTOR or subcontractors who have completed their work in a manner finally acceptable to the OWNER. Before any such payment may be made, the OWNER must, in an exercise of its discretion, determine that satisfactory and substantial reasons exist for the payment and there must be provided to the OWNER written approval from any surety furnishing bonds for the Work.

Nothing contained in this provision shall preclude the OWNER and CONTRACTOR from making other arrangements consistent with C.R.S. 24-91-105 prior to contract award.

4.2 FINAL PAYMENT. Upon final completion and acceptance of the Work in accordance with paragraph 14.13 of the General Conditions, OWNER shall pay the remainder of the Contract Price as provided in said paragraph 14.13 of the General Conditions.

Article 5. Contractor's Representations

In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

5.1. CONTRACTOR has examined and carefully studied the Contract Documents, (including the Addenda listed in paragraph 6.10) and the other related data identified in the Bidding Documents including "technical".

5.2. CONTRACTOR has inspected the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance or furnishing of the Work.

5.3. CONTRACTOR is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and furnishing of the Work.

5.4. CONTRACTOR has carefully studied all reports of exploration and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions relating to surface or subsurface structures at or contiguous to the site (Except Underground facilities) which have been identified in the General Conditions as provided in paragraph 4.2.1 of the General Conditions. CONTRACTOR accepts the determination set forth in paragraph 4.2 of the General Conditions. CONTRACTOR acknowledges that such reports and drawings are not Contract Documents and may not be complete for CONTRACTOR's purposes. CONTRACTOR acknowledges that OWNER and ENGINEER do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Contract Documents with respect to such reports, drawings or to Underground Facilities at or contiguous to the site. CONTRACTOR has conducted, obtained and carefully studied (or assume responsibility for having done so) all necessary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto. CONTRACTOR does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the performance and furnishing of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.

5.5. CONTRACTOR 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, studies or similar information or data in respect of said Underground Facilities are or will be required by CONTRACTOR 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 the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.

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

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

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

Article 6. Contract Documents

The Contract Documents, which constitute the entire agreement between OWNER and CONTRACTOR concerning the Work, are all written documents, which define the Work and the obligations of the Contractor

in performing the Work and the OWNER in providing compensation for the Work. The Contract Documents include the following:

6.1. Invitation to Bid.
6.2. Instruction to Bidders.
6.3. Bid Form.
6.4. This Agreement.
6.5. General Conditions.
6.6. Supplementary Conditions.
6.7. General Requirements.
6.8. Technical Specifications.
6.9. Change Orders, Addenda and other documents which may be required or specified including:
    6.10.1. Addenda No. __ to ___ exclusive
    6.10.2. Documentation submitted by CONTRACTOR prior to Notice of Award
    6.10.3. Schedule of Subcontractors
    6.10.4. Anti-Collusion Affidavit
    6.10.5. Certification of EEO Compliance
    6.10.6. Notice of Award
    6.10.7. Performance Bond
    6.10.8. Labor and Material Payment Bond
    6.10.9. Certificates of Insurance
    6.10.10. Notice to Proceed
    6.10.11. Contractor's Proposal Request
    6.10.12. Contractor's Overtime Request
    6.10.13. Field Order
    6.10.14. Work Change Directive
    6.10.15. Change Order
    6.10.16. Application for Payment
    6.10.17. Certificate of Substantial Completion
    6.10.18. Claim Release
    6.10.19. Final Inspection Report
    6.10.20. Certificate of Final Completion
    6.10.21. Guarantee Period Inspection Report

6.10. The following which may be delivered or issued after the Effective Date of the Agreement and are attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to paragraphs 3.5 and 3.6 of the General Conditions.

6.11. In the event of conflict between the above documents, the prevailing document shall be as follows:
    1. Permits from other agencies as may be required.
    2. Special Provisions and Detail Drawings.
    3. Technical Specifications and Drawings. Drawings and Technical Specifications are intended to be complementary. Anything shown or called for in one and omitted in another is binding as if called for or shown by both.
    4. Supplementary Conditions.
    5. General Conditions.
    6. City of Louisville Design and Construction Standards.
    7. Reference Specifications.

In case of conflict between prevailing references above, the one having the more stringent requirements shall govern.

There are no Contract Documents other than those listed above in this Article 6. The Contract Documents may only be amended, modified, or supplemented as provided in paragraphs 3.5 and 3.6 of the General Conditions.

Article 7. Miscellaneous

7.1. Terms used in this Agreement, which are defined in Article 1 of the General Conditions, shall have the meanings indicated in the General Conditions.

7.2. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge that assignor from any duty or responsibility under the Contract Documents.

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

7.4. OWNER AND CONTRACTOR consent to the use of electronic signatures on the Contract Documents. This Agreement, and any other Contract Documents requiring a signature hereunder, may be signed electronically by the Parties in the manner specified under the Uniform Electronic Transactions Act, Title 24, Article 71.3, Part 1, C.R.S.; provided that, electronic records of, and electronic signatures on, any required bonds, including required Performance, Labor and Material Payment, and Warranty Bonds, must be acceptable to the Contractor's selected surety. The Parties agree not to deny the legal effect or enforceability of a Contract Document solely because the document is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of a Contract Document in the form of an electronic record, or a paper copy of an electronic document, or a paper copy or electronic record of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

Article 8. Other Provisions

IN WITNESS WHEREOF, OWNER, and CONTRACTOR have signed this Agreement in duplicate. One counterpart each has been delivered to OWNER and CONTRACTOR. All portions of the Contract Documents have been signed, initialed, or identified by OWNER and CONTRACTOR.

This Agreement will be effective on _____, 2025.

OWNER: CITY OF LOUISVILLE, COLORADO

By: _____
Christopher M. Leh, Mayor

(CORPORATE SEAL)

Attest: _____
Meredyth Muth, City Clerk

Address for giving notices:

749 Main Street
Louisville, Colorado
80027

Attention: City Engineer

CONTRACTOR: _____

By: _____

(CORPORATE SEAL)

Attest: _____

Address for giving notices:

_____

_____

_____

Performance Bond

_____ , as Principal, hereinafter called the Contractor, and

_____, as Surety, with general offices in

_____
a Corporation organized under the laws of the State of _____, and authorized to transact business in the State of Colorado, are hereby bound unto the City of Louisville, Colorado, as Obligee, hereinafter called the City, in the penal sum of _____ ($_____) in the United States currency, for the payment of which sum the Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally.

WHEREAS, the Contractor has entered into a written contract with the City dated _____, 2025, for _____ in accordance with plans and specifications contained in the Contract, a copy of which Contract is attached hereto and made a part hereof and is hereinafter referred to as the Contract;

NOW, THEREFORE, the conditions of this performance bond are such that, if the Contractor shall satisfactorily perform the Contract, then this bond shall be null and void; otherwise, the Surety shall promptly remedy the default, or shall promptly 1) Complete the Contract in accordance with its terms and conditions, or 2) Obtain a Bid or Bids for completing the contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or if the City elects, upon determination by the City and the Surety jointly of the lowest responsible bidder, arrange for a Contract between such Bidder and the City, and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the costs of completion plus liquidated damages additional costs pursuant to Section 12.2 of the General Conditions of the Contract less the balance of the contract price, but not exceeding the amount set forth in the first paragraph hereof. The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by the City to the Contractor under the Contract and any amendments thereto, less the amount paid by the City to Contractor.

In addition, if the Contractor or a subcontractor shall fail to duly pay for any labor, materials, team hire, sustenance, provisions, provender, or other supplies used or consumed by such Contractor or subcontractor in performance of the Contract, or shall fail to duly pay any person who supplies rental machinery, tools, or equipment, all amounts due as the result of the use of such machinery, tools or equipment in the prosecution of the Work, then the Surety shall pay the same in the amount not exceeding the sum specified in the bond together with interest at a rate of eight percent per annum.

In addition to the other conditions hereof, this bond shall include all provisions set forth in Section 38-26-106, C.R.S.

THE UNDERSIGNED SURETY for value received hereby agrees that no extension of time, change in, addition to, or other modification of the terms of the Contract of Work to be performed thereunder or the specifications of the Contract Documents shall in any way affect its obligation on this bond and the Surety does hereby waive notice of any such extension of time, change, addition, or modifications.

SIGNED AND SEALED this day of_____ , 20____.

_____	_____
(Contractor)	**(Surety Company)**
By: _____ (President)	Address: _____
_____ (Attest)	By: _____ (Attorney-in-fact)

Labor and Material Payment Bond

BOND NUMBER:

KNOW ALL MEN BY THESE PRESENCES: that

(Firm) _____
(Address) _____
(an Individual), (a Partnership), (a Corporation), hereinafter referred to as "the Principal", and

(Firm) _____
(Address) _____
hereinafter referred to as "the Surety", are held and firmly bound unto the
CITY OF LOUISVILLE, 749 MAIN STREET, LOUISVILLE, COLORADO a Municipal Corporation, hereinafter referred to as "the Owner", in the penal sum of
_____ Dollars
($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION are such that whereas the Principal entered into a certain Agreement with the Owner, dated the _____ day of _____, 2025, a copy of which is hereto attached and made a part hereof for the performance of

---

NOW, THEREFORE, if the Principal shall make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the Work provided for in such Agreement, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, repairs on machinery, equipment and tools, consumed, rented or used in connection with the construction of such work, and all insurance premiums on said Work, and for all labor, performed in such Work whether by Subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Agreement or to the Work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this Bond; and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Agreement or to the Work or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.
In addition to the other conditions hereof, this bond shall include all provisions set forth in Section 38-26-105, C.R.S.

IN WITNESS WHEREOF, this instrument is executed in (3) counterparts, each one of which shall be deemed an original, this _____ day of _____, 20____.

IN THE PRESENCE OF:

PRINCIPAL

_____

_____

(Corporate Seal)

PRINCIPAL:

BY: _____

_____
(Title)

Address:

_____

_____

_____

IN THE PRESENCE OF:

_____

_____

OTHER PARTNERS:

By: _____

By: _____

IN THE PRESENCE OF:

_____

_____

SURETY:

By: _____
(Attorney-in fact)

Address:

_____

_____

(Surety Seal)

NOTE: Date of Bond must not be prior to date of Agreement.
If Contractor is a Partnership, all partners must execute Bond.

IMPORTANT: Surety Company must be authorized to transact business in the state of Colorado and be acceptable to the Owner.

Notice of Award

DATED: _____

TO: _____
_____
_____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

Please be advised that on _____, the City of Louisville, Colorado City Council awarded the 2025 WATER MAIN REPLACEMENT PROJECT & SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT to your company in the amount of $_____ per your low unit price bid. In accordance with the Contract Documents, you are required to execute two copies of the Agreement and return both copies with the required bonds and certificates of insurance within **10 days** of the date of this Notice of Award by _____.

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

CITY OF LOUISVILLE, COLORADO	ACCEPTANCE OF NOTICE
By: _____	By: _____
Tyler Trojan, P.E.	
Title: Civil Engineer III _____	Title: _____

Notice to Proceed

DATED: _____

TO: _____
_____
_____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

You are hereby notified that the Contract Time under the above Contract will commence to run on **_____**. On that date, you are to begin performing the Work in accordance with the Contract Documents and you are to complete the Work within **_____ Contract Days** thereafter. The date of substantial completion of all Work is therefore **_____.**

CITY OF LOUISVILLE, COLORADO

By: _____
Tyler Trojan, P.E.

Title: Civil Engineer III

ACKNOWLEDGEMENT

Receipt of the above Notice to Proceed is hereby acknowledged.

CONTRACTOR: _____

By: _____

Title: _____

Date: _____

Change Order Form

CHANGE ORDER NO. _____

DATED: _____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT AGREEMENT DATE: _____

PROJECT NUMBER: 501498-660181 **OWNER: CITY OF LOUISVILLE, COLORADO**

The following changes are hereby made to the Contract Documents:
Description: _____

			Unit S	$ COST
	TOTAL			

Attachments: _____

ADJUSTMENT TO CONTRACT PRICE:

Original contract price $_____
Set change previous Change Orders No. 0 to 0 $_____
Contract price prior to this Change Order $_____
Net adjustment resulting from this Change Order (+/-) $_____
Current contract price including this Change Order $_____

ADJUSTMENT TO CONTRACT TIME:

Original contract time (days or date) _____
Net change previous Change Orders No. __ to __ (days) _____
Contract time prior to this Change Order (days or date) _____
Net Adjustment Resulting from this Change Order (days) _____
Current contract time including this Change Order (days or date) _____

The Contractor's signature below indicates acceptance of full settlement for the work described, both direct and indirect costs. Any claims for additional costs associated with this Change Order will not be considered.

Recommended:	Approved:	Accepted:
_____	CITY OF LOUISVILLE, COLORADO _____	_____
ENGINEER	OWNER	CONTRACTOR
By: _____	By: _____	By: _____
Date: _____	Date: _____	Date: _____

Field Order Form

FIELD ORDER NO. _____

TO: _____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

DATE ISSUED: _____

You are hereby directed and instructed to execute promptly minor variations in the Work by this Field Order as follows:

Attachments:

This form shall be used to authorize minor variations in the Work from the requirements of the Contract Documents, which do not include an adjustment in the Contract Price or the Contract Times.

CITY OF LOUISVILLE		**ACCEPTED BY CONTRACTOR**	
BY:	_____	BY:	_____
TITLE:	_____	TITLE:	_____
DATE:	_____	DATE:	_____

Work Change Directive Instructions

A. GENERAL INFORMATION

This document was developed for use in situations involving changes in the Work that, if not processed expeditiously, might delay the Project. These changes are often initiated in the field and may affect the Contract Price or the Contract Times. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order.

For supplemental instructions and minor changes not involving a possible change in the Contract Price or the contract Times a Field Order may be used.

B. COMPLETING THE WORK CHANGE DIRECTIVE FORM

Engineer initiates the form, including a description of the items involved and attachments.

Based on conversations between Engineer and Contractor, Engineer completes the following:

METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT PRICE. Mark the method to be used in determining the final cost of Work involved and the estimated net effect on the Contract Price. If the change involves an increase in the Contract Price and the estimated amount is approached before the additional or changed Work is completed, another Work Change Directive must be issued to change the estimated price or Contractor may stop the changed Work when the estimated price is reached. If the Work Change Directive is not likely to change the Contract Price, the space for estimated increase (decrease) should be marked “Not Applicable”.

METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT TIMES: Mark the method to be used in determining the change in Contract Times and the estimated increase or decrease in Contract Times. If the change involves an increase in the Contract Times and the estimated times are approached before the additional or changed Work is completed, another Work Change Directive must be issued to change the times or Contractor may stop the changed Work when the estimated times are reached. If the Work Change Directive is not likely to change the Contract Times, the space for estimated increase (decrease) should be marked “Not Applicable”.

Once authorized by Engineer a copy will be sent to Contractor. Price and Times may only be changed by Change Order signed by Owner and Contractor.

Once the Work covered by this directive is completed or final cost and times are determined, Contractor should submit documentation for inclusion in a Change Order.

THIS IS A DIRECTIVE TO PROCEED WITH A CHANGE THAT MAY AFFECT THE CONTRACT PRICE OR THE CONTRACT TIMES. A CHANGE ORDER, IF ANY, SHOULD BE CONSIDERED PROMPTLY.

Work Change Directive Form

WORK CHANGE DIRECTIVE NO. _____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

DATE ISSUED: _____ EFFECTIVE DATE: _____

You are directed to proceed promptly with the following change(s):

Description:

_____
_____
_____

Purpose of Work Change Directive:

_____
_____
_____

Attachments (List documents supporting change):

_____
_____
_____

If a claim is made that the above change(s) have affected Contract Price of Contract Times any claim for a Change Order based thereon will involve one or more of the following methods of determining the effect of the change(s).

Method of determining change in Contract Price:

____ Unit Prices
____ Lump Sum
____ Other _____
_____
_____

Method of determining change in Contract Times:

____ Contractor's Records
____ Engineer's Records
____ Other _____
_____
_____

Estimated increase (decrease) in Contract Price:
$_____
If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Estimated increase (decrease) in Contract Times
Substantial Completion: _____days;
Ready for final payment: _____days.
If the change involves an increase, the estimated times are not to be exceeded without further authorization.

RECOMMENDED:

_____
ENGINEER

BY: _____

ACCEPTED:

_____
CONTRACTOR

BY: _____

Application for Payment Form

Pay Estimate # | **Project Name**

Date | **Project Number**

AREA DESCRIPTION

ESTIMATED UNITS/CONTRACT UNIT PRICE						WORK COMPLETED					
Bid Item No.	Bid Item	Unit	Quantity	Unit Price	Total Cost	Prior Units	Current Units	Total Units	Previous Cost	Current Cost	Cost to Date
0	0	0	0	$ -	$0.00	0		0.0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0.0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0.0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
0	0	0	0	$ -	$0.00	0		0	$ -	$ -	$ -
					$ -				$ -	$ -	$ -

Base Bid Contract Amount:	$ -
Alternate 1. Contract Amount:	$ -
Total MCR Amount:	$ -
Total Change Order Amount:	$ -
Project Total:	**$ -**

Payment Summary				
Payment #	Date (mo./yr.)	Payment Amount	Total Payment to Date	Project Completion
1		$ -	$ -	
2			$ -	
3			$ -	
4			$ -	
5			$ -	
6			$ -	
7			$ -	
8			$ -	

Project Cost Summary	
Total Earned to Date:	$ -
Contract Retainage:	$ -
Previous Payments:	$ -
TOTAL DUE:	$ -

OWNER:
CITY OF LOUISVILLE
APPROVED FOR PAYMENT BY

NAME: _______________

DATE: _______________

TITLE: _______________

CONTRACTOR:
CONTRACTOR NAME:
TOTAL AMOUNT ACCEPTED FOR COMPLETED WORK DESCRIBED ABOVE.

NAME: _______________

DATE: _______________

TITLE: _______________

Contractor's Proposal Request Form

(Not a Change Order)

Date Submitted: _____ No. _____

TO: _____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

We hereby request the cost of the following proposed change in the Contract. A breakdown of the proposed cost is attached.

Description of the proposed change:

_____

_____

_____

_____

_____

_____

_____

All work shall be in accordance with the terms, stipulations, and conditions of the Contract Documents. If the Work herein requested is approved by Change Order, the time of completion will be (increased), (decreased), (unchanged) by _____ calendar days.

New Substantial Completion Date: _____, 2025.

This change will:

___ Increase the Contract by $ _____
___ Decrease the Contract by $ _____
___ No change in the Contract

SUBMITTED BY CONTRACTOR

BY: _____

DATE: _____

DATE: _____

CITY OF LOUISVILLE

___ Contractor's Proposal Request Accepted

___ Contractor's Proposal Request Not Accepted

BY: _____

DATE: _____

TITLE: _____

Contractor's Overtime Request Form

Date Submitted: _____, 2025

TO: _____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

We hereby request to perform work on overtime in accordance with the terms, stipulations, and conditions of the Contract Documents.

Requested date of overtime work: _____, 2025

Requested hours of overtime work: _____ (a. m./p. m.) to _____ (a. m./p. m.)

Description of proposed overtime work:

_____

_____

_____

No extra payment will be paid to the CONTRACTOR by the OWNER due to labor overtime or other increased costs of performing the Work on Friday afternoons, Saturdays, or at night. Should the CONTRACTOR desire to work on Friday afternoons or at night between the hours of 5:00 p.m. and 8:00 p.m., Monday-Thursday, or from 3:30 p.m. to 8:00 p.m. Friday, the CONTRACTOR shall submit a written request to the ENGINEER 24 hours prior. If approval is given by ENGINEER to CONTRACTOR for authorized overtime work, ENGINEER and ENGINEER's authorized personnel will charge overtime and other incidental administrative expenses necessary for performing inspections on Friday afternoons, or at night between the hours of 5:00 p.m. and 8:00 p.m., Monday-Thursday and 3:30 p.m. to 8:00 p.m. Friday, the CONTRACTOR will be responsible to pay for all such rates and charges, and shall not be granted a Contract Price increase for such charges.

Hours of overtime work shall only be allowed from 5:00 p.m. to 8:00 p.m. Monday thru Thursday, and from 3:30 p.m. to 8:00 p.m. Friday.

SUBMITTED BY CONTRACTOR

BY: _____

TITLE: _____

DATE: _____

CITY OF LOUISVILLE

_____ Contractors Proposal Request Accepted

_____ Contractors Proposal Request Not Accepted

BY: _____

DATE: _____

TITLE: _____

Certificate of Substantial Completion Form

TO: _____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

_____

_____

_____

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on

_____
DATE OF SUBSTANTIAL COMPLETION

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item in the list does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. The items in the tentative list shall be completed or corrected by CONTRACTOR within **twenty (20)** days of the issuance of this Certificate of Substantial Completion.

CONTRACTOR shall maintain all contractual responsibilities until Final Acceptance.

The following documents are attached to and made a part of this Certificate of Substantial Completion:

Attachments:

_____

_____

_____

(For items to be attached see definition of Substantial Completion as supplemented and other specifically noted conditions precedent to achieving Substantial Completion as required by the Contract Documents.)

CERTIFICATE OF SUBSTANTIAL COMPLETION CONTINUED

This certificate does not constitute an acceptance of Work or start of the guarantee period nor its release of CONTRACTOR's obligation to complete the Work in accordance with the Contract Documents. Issuance of Substantial Completion does not commence the guarantee period with this certificate.

CITY OF LOUISVILLE, COLORADO		**ACCEPTED BY CONTRACTOR**	
BY:	_____	BY:	_____
TITLE:	_____	TITLE:	_____
DATE:	_____	DATE:	_____

Final Inspection Report Form

DATE: _____, 2025

TO: _____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

The ENGINEER has performed final inspection of the Work, and accepts the Work subject to the Contractor's performance and completion of the following repairs, corrections and/or replacements:

_____

_____

_____

_____

_____

_____

_____

The ENGINEER does / does not (circle) hereby finally accept the work, and hereby certifies that the Contractor is eligible to receive final payment of the Work.

CITY OF LOUISVILLE, COLORADO		**CONTRACTOR**	
BY:	_____	BY:	_____
TITLE:	_____	TITLE:	_____
DATE:	_____	DATE:	_____

Certificate of Final Completion Form

DATE: _____, 2025

TO: _____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

This Certificate of Final Completion applies to all Work under the Contract Documents, or to the following specified parts thereof:

(specify) _____

_____

_____

The Work to which this Certificate applies has been inspected by authorized representatives of the ENGINEER and the Work is hereby declared to be complete in accordance with the Contract Documents on

_____
DATE OF FINAL COMPLETION

In consideration therefor, the OWNER agrees to make Final Payment to Contractor of all amounts retained by OWNER, except such amounts that are subject to verified claims pursuant to Section 38-26-107, C.R.S, if any.

CITY OF LOUISVILLE, COLORADO		**CONTRACTOR**	
BY:	_____	BY:	_____
TITLE:	_____	TITLE:	_____
DATE:	_____	DATE:	_____

Guarantee Period Inspection Report Form

DATE: _____, 2025

TO: _____

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

The ENGINEER's authorized representative performed the guarantee period inspection on _____, 20 ___, which guarantee was originally due to expire on _____, 20___.

The ENGINEER hereby determines that the project has ___/ has not ___ satisfactorily met the conditions required to pass the guarantee period inspection.

The identified following items of Work are defective and must be repaired, corrected, and/or replaced:

_____

_____

_____

_____

_____

The guarantee period shall be extended for the items listed above until the following date:

_____, 2025

CITY OF LOUISVILLE, COLORADO		**CONTRACTOR**	
BY:	_____	BY:	_____
TITLE:	_____	TITLE:	_____
DATE:	_____	DATE:	_____

Final Claim Release & Acceptance Form

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

Application for Payment Number: _____
Application for Payment Amount: _____
Application for Payment Date: _____

For valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the undersigned hereby releases the City of Louisville, Colorado, and waives all rights of the undersigned to file a claim for material, equipment, tools, machinery, or services heretofore furnished for use in and for labor heretofore performed upon the construction, alteration, addition to or repair of the structure or improvements described in the Contract Documents as:

Project: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

Description of Property: VARIOUS LOCATIONS, CITY OF LOUISVILLE

Owner: CITY OF LOUISVILLE, COLORADO

We acknowledge that the foregoing is an adequate description of the real property and improvements to which this Claim Release pertains inasmuch as the foregoing description is the description given in the Contract Documents, which govern the performance of the Work for which consideration has been received.

In executing this release, we certify that all claims for labor or materials, or both, furnished or performed by the undersigned or on our behalf by our material suppliers or subcontractors have been paid or that satisfactory arrangements for payment have been made and we hereby waive and release any and all rights, claims and liens which the undersigned may now or hereafter have, claim or assert against the project, the Owner, or any funds in Owner's possession or control concerning the project, or against all land and any improvements and appurtenances to the land improved by the project.

In consideration of the final payment made or to be made to the undersigned and to induce said payment, we hereby further release and forever discharge the City of Louisville, its officers and employees, from any and all liability, actions, causes of action, claims, demands, damages, costs, loss of services, loss of properties, expenses, compensation and any and all consequential damages or injuries, which the undersigned may now or hereafter have, claim or assert on account of, relating to, or in any way arising out of the above described project.

In further consideration of the payment made or to be made to the undersigned and to induce said payment, we agree to defend and indemnify the City of Louisville, its officers and employees from any claim or claims on the part of our material suppliers, laborers, employees, servants, and agents, or subcontractors arising from our work on this project, and we further agree to fully satisfy any such claim brought against the City of Louisville and reimburse the City of Louisville for any and all costs, including reasonable attorney fees, which it may incur as a result of such claims.

FINAL CLAIM RELEASE & ACCEPTANCE CONTINUED

As contactor on the above described project, we further accept the pay quantities and final payment indicated on the final payment application as correct. The above noted final payment of $_____ results in total cumulative payment of $_____ for this project. By accepting this final payment, we accept that the final payment application is full and complete, that no other or further amounts are due to the undersigned, and we hereby waive and release all rights, claims, and liens arising from the completion of work under the Contract Documents.

The undersigned representative certifies to have full authority to execute this instrument and to bind the contractor to all statement and provisions herein contained.

PRIME CONTRACTOR

By: _____

President

Date: _____

Claim Release – Subcontractor/Supplier

PROJECT: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT
PROJECT NUMBER: 501498-660181
OWNER: CITY OF LOUISVILLE, COLORADO

For valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the undersigned hereby releases the City of Louisville, Colorado, and waives all rights of the undersigned to file a claim for material, equipment, tools, machinery, or services heretofore furnished for use in and for labor heretofore performed upon the construction, alteration, addition to or repair of the structure or improvements described in the Contract Documents as:

Project: 2025 WATER MAIN REPLACEMENT PROJECT & SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

Description of Property: VARIOUS LOCATIONS, CITY OF LOUISVILLE

Owner: CITY OF LOUISVILLE, COLORADO

We acknowledge that the foregoing is an adequate description of the real property and improvements to which this Claim Release pertains inasmuch as the foregoing description is the description given in the Contract Documents, which govern the performance of the Work for which consideration has been received.

In executing this release, we certify that all claims for labor or materials, or both, furnished or performed by the undersigned or on our behalf by our material suppliers or subcontractors have been paid or that satisfactory arrangements for payment have been made, and we hereby waive and release any and all rights, claims and liens which the undersigned may now or hereafter have, claim or assert against the project, the Owner, or any funds in Owner's possession or control concerning the project, or against all land and any improvements and appurtenances to the land improved by the project.

In consideration of the final payment made or to be made to the undersigned and to induce said payment, we hereby further release and forever discharge the City of Louisville, its officers and employees, from any and all liability, actions, causes of action, claims, demands, damages, costs, loss of services, loss of properties, expenses, compensation and any and all consequential damages or injuries, which the undersigned may now or hereafter have, claim or assert on account of, relating to, or in any way arising out of the above described project.

In further consideration of the payment made or to be made to the undersigned and to induce said payment, we agree to defend and indemnify the City of Louisville, its officers and employees from any claim or claims on the part of our material suppliers, laborers, employees, servants, and agents, or subcontractors arising from our work on this project, and we further agree to fully satisfy any such claim brought against the City of Louisville and reimburse the City of Louisville for any and all costs, including reasonable attorney fees, which it may incur as a result of such claims.

SUPPLIER OR SUBCONTRACTOR	**PRIME CONTRACTOR**
By: _____	By: _____
President	President
Date: _____	Date: _____

General Conditions

Article 1. Definitions

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

1.0 **Abnormal Weather** - Snowfall, rainfall, freezing temperatures, or wind conditions, in excess of those encountered in the project area of Boulder County during the past 10 years that necessitates cessation of Work and causes consequence to the project.

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

1.2 **Agreement** - The written contract between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

1.3 **Application for Payment** - The form accepted by ENGINEER which is to be used by CONTRACTOR in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

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

1.5 **Bid** - The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

1.6 **Bidding Documents** - The advertisement or invitation to Bid, instructions to Bidders, the Bid form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

1.7 **Bidding Requirements** - The advertisement or invitation to Bid, instructions to bidders, and the Bid form.

1.8 **Bonds** - Performance and Payment bonds and other instruments of security.

1.9 **Change Order** - A document recommended by ENGINEER, which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

1.10 **Contract Day** - A Contract Day specifies that construction will be completed Monday through Sunday, excluding OWNER-observed holidays and Abnormal Weather days.

1.11 **Contract Documents** - The Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and ENGINEER's written interpretations and clarifications issued pursuant to paragraphs 3.5, 3.6.1, and 3.6.3 on or after the Effective Date of the Agreement. Shop Drawing submittals approved pursuant to paragraphs 6.26 and 6.27 and the reports and drawings referred to in paragraphs 4.2.1.1 and 4.2.2.2 are not Contract Documents.

1.12 **Contract Price** - The monies payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.9.1 in the case of Unit Price Work).

1.13 **Contract Times** - The numbers of days or the dates stated in the Agreement: (i) to achieve Substantial Completion, and (ii) to complete the Work so that it is ready for final payment as evidenced by ENGINEER's written recommendation of final payment in accordance with paragraph 14.13.

1.14 **CONTRACTOR** - The person, firm, or corporation with whom OWNER has entered into the Agreement.

1.15 **Defective** - An adjective which when modifying the work refers to Work that is unsatisfactory, faulty or deficient, in that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER's recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.8 or 14.10).

1.16 **Drawings** - The drawings that show the scope, extent, and character of the Work to be furnished and performed by CONTRACTOR and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents. Shop drawings are not Drawings as so defined.

1.17 **Effective Date of the Agreement** - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

1.18 **ENGINEER** - The word "ENGINEER" refers to the City of Louisville, Director of Public Works or his authorized representative, designated by the OWNER as its Engineering representative.

1.19 **OWNER's Consultant** - A person, firm, or corporation having a contract with OWNER to furnish services as OWNER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

1.20 **Field Order** - A written order issued by ENGINEER which orders minor changes in the Work in accordance with paragraph 9.5 but which does not involve a change in the Contract Price or the Contract Times.

1.21 **General Requirements** - Sections of Division 1 of the Specifications.

1.22 **Hazardous Waste** - The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

1.23 **Laws and Regulation: Laws or Regulations** - Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

1.24 **Liens** - Liens, charges, security interests, or encumbrances upon real property or personal property.

1.25 **Milestone** - A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

1.26 **Notice of Award** - The written notice by OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.

1.27 **Notice to Proceed** - A written notice given by OWNER to CONTRACTOR (with a copy to ENGINEER) fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR's obligations under the Contract Documents.

1.28 **OWNER** - The public body or authority, corporation, association, firm, or person with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be provided.

1.29 **Partial Utilization** - Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

1.30 **PCBs** - Polychlorinated biphenyls.

1.31 **Petroleum** - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

1.32 **Plans** - The term plans as used in these Contract Documents shall have the same meaning as Drawings.

1.33 **Product** - Includes materials, equipment, and systems.

1.34 **Project** - The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

1.35 **Provide** - Furnish and install specified materials and equipment unless the context requires otherwise.

1.36 **Radioactive Material** - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

1.37 **Resident Project Representative** - The authorized representative of ENGINEER who may be assigned to the site or any part thereof.

1.38 **Samples** - Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

1.39 **Shop Drawings** - All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.

1.40 **Specifications** - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

1.41 **Subcontractor** - An individual, firm, or corporation having a contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.

1.42 **Substantial Completion** - The Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER as evidenced by ENGINEER's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if no such certificate is issued, when the Work is complete and ready for final payment as evidenced by ENGINEER's written recommendation of final payment in accordance with paragraph 14.13. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

1.43 **Supplementary Conditions** - The part of the Contract Documents which amends or supplements these General Conditions.

1.44 **Supplier** - A manufacturer, fabricator, supplier, distributor, material man, or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or any Subcontractor.

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

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

1.47 **Work** - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by

the Contract Documents.

1.48 **Work Change Directive** - A written directive to CONTRACTOR, issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by ENGINEER, ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in paragraph 4.2 or 4.3 or emergencies under paragraph 6.23. A Work Change Directive will not change the Contract Price or the Contract Times, but is evidence that the parties expect that the change directed or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times as provided in paragraph 10.2.

1.49 **Written Amendment** - A written amendment of the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the non-engineering or non-technical rather than strictly construction-related aspects of the Contract Documents.

Article 2. Preliminary Matters

Delivery of Bonds

2.1 When CONTRACTOR delivers the executed Agreement to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds and Certificates of Insurance as CONTRACTOR may be required to furnish in accordance with Article 5.

Copies of Documents

2.2 OWNER shall furnish to CONTRACTOR up to four copies of the contract documents for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

Commencement of Contract Times; Notice to Proceed

2.3 The Contract Times will commence to run on the day indicated in the Notice to Proceed. Timing and completion of the **2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT** is based on 102 contract days, assuming a notice to proceed issued on March 29, 2025. The OWNER has set the proposed project schedule and plans to implement the following schedule for this project. The CONTRACTOR shall be required to start construction on or before the start date listed below:

Proposed Project Schedule

Advertisement..... .....April 23 & April 30, 2025
Pre-Bid Conference ..... May 6, 2025
Deadline for Questions.....May 8, 2025
Prequalification Deadline..... May 9, 2025
Bid Opening..... May 13, 2025

Contract Award by City Council ..... June 3, 2025
Notice of Award Issued ..... June 4, 2025
Pre-Construction Conference ..... June 10, 2025
Bonds & Insurance Certificates due ..... June 16, 2025
Contract Agreement Executed ..... June 17, 2025
Notice to Proceed Issued ..... June 18, 2025
Contract Time Commences to run ..... June 23, 2025
Substantial Completion ..... October 3, 2025

Starting the Work

2.4 CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run, but no Work shall be done at the site prior to the date on which the Contract Times commence to run.

Before Starting Construction

2.5 Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents, unless CONTRACTOR knew or reasonably should have known thereof.

2.6 Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for review:

2.6.1 A preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestone specified in the Contract Documents;

2.6.2 A preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing and processing such submittal.

Preconstruction Conference

2.7 Before any Work at the site is started, a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.6, procedures for handling Shop Drawings and other submittal(s), processing Applications for Payment, and maintaining required records.

Initially Acceptable Schedules

2.8 Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to review the Application for Payment for acceptability to ENGINEER. No progress payment shall be made to CONTRACTOR until the schedules are submitted to and acceptable to ENGINEER as provided below. The progress schedule will be acceptable to ENGINEER as providing an orderly progression of the Work to completion within any specified Milestones and the Contract Times, but such acceptance will neither impose on ENGINEER responsibility for the sequencing, scheduling, or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor. CONTRACTOR's schedule of Shop Drawing and Sample submissions will be acceptable to ENGINEER as providing a workable arrangement for reviewing and processing the required submittals.

Article 3. Contract Documents: Intent, Amending, Reuse

Intent

3.1 The Contract Documents comprise the entire agreement OWNER and CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

3.2 It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed whether or not specifically called for. When words or phrases, which have a well-known technical or construction industry or trade meaning, are used to describe Work, materials or equipment, such words or phrases shall be interpreted in accordance with that meaning. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in paragraph 9.4.

Reference to Standards & Specifications of Technical Societies; Reporting and Resolving Discrepancies

3.3

3.3.1. Reference to standards, specifications, manuals, or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

3.3.2 If, during the performance of the Work, CONTRACTOR discovers any conflict, error ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such Law or Regulation applicable to the performance of the Work or of any such standard, specification, manual or code or of any instruction of any Supplier referred to in paragraph 6.5,

CONTRACTOR shall report it to ENGINEER in writing at once, and, CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as authorized by paragraph 6.23) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.5 or 3.6; provided, however, that CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity or discrepancy unless CONTRACTOR knew or reasonably should have known thereof. Upon notification to the ENGINEER, the CONTRACTOR shall proceed with other parts of the Work not affected by the conflict, error, ambiguity, or discrepancy.

3.3.3 Except as otherwise specifically stated in the Contract Documents or as may be provided by amendment or supplement thereto issued by one of the methods indicated in paragraph 3.5 or 3.6, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract Documents and:

3.3.3.1 The provisions of any such standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

3.3.3.2 The provisions of any such Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

No provision of any such standard, specification, manual, code, or instruction shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR, or ENGINEER, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to OWNER, ENGINEER, or any of ENGINEER's Consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of paragraph 9.13 or any other provision of the Contract Documents.

3.4 Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved", or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper", or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review, or judgment of ENGINEER as to the Work, it is intended that such requirement, direction, review, or judgment will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.13 or any other provision of the Contract Documents.

Amending and Supplementing Contract Documents

3.5 The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

3.5.1 a formal Written Amendment,

3.5.2 a Change Order (pursuant to paragraph 10.4), or

3.5.3 a Work Change Directive (pursuant to paragraph 10.1).

3.6 In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways:

3.6.1 a Field Order (pursuant to paragraph 9.5),

3.6.2 ENGINEER's approval of a Shop Drawing or Sample (pursuant to paragraphs 6.26 and 6.27), or

3.6.3 ENGINEER's written interpretation or clarification (pursuant to paragraph 9.4).

Reuse of Documents

3.7 CONTRACTOR, and any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's Consultant, and (ii) shall not reuse any of such Drawings, Specifications, other documents or copies on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaption by ENGINEER.

Article 4. Availability of Lands; Subsurface and Physical Conditions, Reference Points

Availability of Lands

4.1 OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of CONTRACTOR. OWNER shall identify any encumbrances or restrictions not of general application but specifically related to use of lands so furnished with which CONTRACTOR will have to comply in performing the Work. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise provided in the Contract Documents. If CONTRACTOR and OWNER are unable to agree on entitlement to or the amount or extent of any adjustments in the Contract Price or the Contract Times as a result of any delay in OWNER's furnishing these lands, rights-of-way or easements, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

Subsurface and Physical Conditions

4.2 BIDDERs are responsible for examining and determining for themselves the location and nature of the proposed Work, the amount and character of the labor and materials required therefor, and the difficulties, which may be encountered. BIDDERs may not rely on oral or written representations made by the OWNER, including reports and drawings identified pursuant to 4.2.1 and subparagraphs thereof, unless the OWNER has guaranteed in writing that such representation is factually accurate, and by submitting a Bid, each BIDDER waives all liability for any error in any representation made by the OWNER to the BIDDER. BIDDERs shall inspect the site and its surroundings and conduct such supplementary examinations, investigations, and tests concerning conditions at or contiguous to the site (including surface, and subsurface) which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto for performing the Work in accordance with the Contract Documents. By failing to make such an inspection, the BIDDER waives all rights to claim extra payment or time extensions due to unexpected conditions, which could have been determined had the site been reasonably inspected. If concealed or unknown conditions differ materially from those ordinarily encountered and generally recognized as inherent in the Work, or differ materially from the conditions indicated in the Contract Documents, then an equitable adjustment in the Contract Price or in the Contract Time will be allowed by change order as provided in Article 11 or Article 12 respectively. By submitting a Bid, the BIDDER represents that the BIDDER's observations at the site are not inconsistent with the requirements of the proposed Contract Documents, unless otherwise noted by the BIDDER.

Reports and Drawings

4.2.1 Reference is made to the Supplementary Conditions for identification of:

The following reports of explorations and tests of subsurface conditions at the site of the Work:

Subsurface Conditions

4.2.1.1 Those reports of explorations and tests of subsurface conditions at or contiguous to the site that have been utilized by ENGINEER in preparing the Contract Documents; and

Report dated **N/A**, prepared by **N/A** entitled: **N/A**. The technical data contained in such report upon which CONTRACTOR may rely is **N/A**.

Copies of these reports that are not included with Bidding Documents may be examined at ENGINEER's office during regular business hours. Please call for appointment. Copies of such reports are not available for distribution. These reports and drawings are not part of the Contract Documents, but the technical data contained therein upon which CONTRACTOR is entitled to rely as provided in GC-4.2 and as identified and established above are incorporated therein by reference.

Physical Conditions

4.2.1.2 Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) that have been utilized by ENGINEER in preparing the Contract Documents.

Limited Reliance by CONTRACTOR authorized; Technical Data

4.2.2 Reports and drawings identified pursuant to paragraph 4.2 are not Contract Documents. Unless otherwise set forth in the Contract Documents or OWNER has otherwise guaranteed in writing that such representation is factually accurate, CONTRACTOR may not rely upon or make any claim against the OWNER, ENGINEER, or ENGINEER's consultants with respect to the accuracy of any "technical data" contained in reports and drawings and CONTRACTOR may not rely upon or make any claim against the OWNER, ENGINEER, or ENGINEER's consultants with respect to:

4.2.2.1 The completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto, or

4.2.2.2 other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings, or

4.2.2.3 any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such data, interpretations, opinions, or information.

4.2.3 CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Times if:

4.2.3.1 CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of Contract Price and Contract Times by the submission of a bid or becoming bound under a negotiated contract; or

4.2.3.2 the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTORs making such final commitment.

If OWNER and CONTRACTOR are unable to agree on entitlement to or as to the amount or length of any such equitable adjustment in the Contract Price or Contract Times, a claim may be made therefor as provided in Articles 11 and 12. However, OWNER, ENGINEER, and ENGINEER's Consultants shall not be

liable to CONTRACTOR for any claims, costs, losses, or damages sustained by CONTRACTOR on or in connection with any other project or anticipated project.

Physical Conditions - Underground Facilities

4.3

Shown or Indicated

4.3.1 The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities or by others.

4.3.1.1 OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and

4.3.1.2 The cost of all of the following will be included in the Contract Price and CONTRACTOR shall have full responsibility for: (i) reviewing and checking all such information and data, (ii) locating all Underground Facilities shown or indicated in the Contract Documents, (iii) coordination of the Work with the owners of such Underground Facilities during construction, and (iv) the safety and protection of all such Underground Facilities as provided in paragraph 6.20 and repairing any damage thereto resulting from the Work.

Not Shown or Indicated

4.3.2 If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.23), identify the owner of such Underground Facility and give written notice to that owner and to OWNER and ENGINEER. CONTRACTOR shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. If OWNER and CONTRACTOR are unable to agree on entitlement to or the amount or length of any such adjustment in Contract Price or Contract Times, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12. However, OWNER, ENGINEER, and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses, or damages incurred or sustained by CONTRACTOR on or in connection with any other project or anticipated project.

Reference Points

4.4 OWNER shall provide engineering surveys to establish baseline and benchmarks for construction, which in ENGINEER's judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points, and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

OWNER shall provide survey reference points, construction stakes, lines and grades required for the completion of the work specified in the specifications, on the plans, or in the Special Conditions. Additional staking requested by the Contractor will be at the CONTRACTOR's expense. When the CONTRACTOR requires staking, he shall notify the OWNER of his requirements in writing a reasonable length of time in advance of starting work that require construction staking. Under no circumstances shall a notice of less than 2 contract days be considered a reasonable length of time. Failure of the CONTRACTOR to provide 2 contract days written notice to the OWNER of his staking requests shall relieve the OWNER from any responsibility for additional costs or delays caused by such failure. The CONTRACTOR shall carefully preserve stakes set by the OWNER. When stakes are destroyed or damaged, the CONTRACTOR will be charged for the cost of necessary replacement or restoration of stakes. The charge for replacement and restoration of stakes will be deducted from any moneys due or to become due the CONTRACTOR.

Asbestos, PCBs Petroleum, Hazardous Waste, or Radioactive Material

4.5

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

4.5.2 CONTRACTOR shall immediately: (i) stop all Work in connection with such hazardous condition and in any area affected thereby (except in an emergency as required by paragraph 6.23), and (ii) notify OWNER and ENGINEER (and thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such hazardous condition or take corrective action, if any. CONTRACTOR shall not be required to resume Work in connection with such hazardous condition or in any such affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR special written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of such Work stoppage or such

special conditions under which Work is agreed by CONTRACTOR to be resumed, either party may make a claim therefor as provided Articles 11 and 12.

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

4.5.4 The provisions of paragraphs 4.2 and 4.3 are not intended to apply to Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material uncovered or revealed at the site.

Article 5. Bonds and Insurance

Performance, Payment, and Other Bonds

5.1 CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act. The CONTRACTOR shall furnish the performance and payment bond in the form provided in the Contract Documents or approved by the OWNER; the earlier of ten (10) days after the OWNER has issued the notice of award or delivery of the executed Agreement. The OWNER reserves the right to exclude any Surety Company on any ground it deems appropriate. The cost of the bonds shall be included in the bid.

5.2 If the surety on any Bond furnished by CONTRACTOR is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.1, CONTRACTOR shall within ten days thereafter substitute another Bond and surety, both of which must be acceptable to OWNER.

Licensed Sureties and Insurers; Certificates of Insurance

5.3

5.3.1 All Bonds and insurance required by the Contract Documents to be purchased and maintained by CONTRACTOR shall be obtained from surety or insurance companies acceptable to OWNER that are duly licensed to transact business in the State of Colorado and to issue Bonds or insurance policies for the limits and coverage so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.3.2 CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain accordance with paragraph 5.4. The certificates shall be reviewed and approved by OWNER prior to execution of the Agreement. The OWNER shall have the right to request and obtain copies of any insurance policies required under paragraph 5.4 of the General Conditions. The completed certificates of insurance shall be sent to: City of Louisville, 749 Main Street, Louisville, Colorado 80027, ATTN: City Engineer.

CONTRACTOR's Liability Insurance

5.4 (a) The CONTRACTOR agrees to procure and maintain, at its own cost, a policy or policies of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by the CONTRACTOR pursuant to paragraphs 6.12, 6.16, 6.31, 6.32 and 6.33, and 6.5 in addition to any other insurance requirements imposed by the Contract Documents or by law. The CONTRACTOR shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to paragraphs 6.12, 6.16, 6.31, and 6.33 by reason of its failure to procure or maintain insurance, or by reason of its failure to procure or maintain insurance in sufficient amounts, durations, or types.

(b) CONTRACTOR shall procure and maintain, and shall cause any Subcontractor or Supplier of the CONTRACTOR to procure and maintain or insure the activity of his Subcontractors and Suppliers in his own policy, the minimum insurance coverages listed below. Such coverages shall be procured and maintained with forms and insurers acceptable to the OWNER. All coverages shall be continuously maintained from the date of commencement of the Work to cover all liability, claims, demands, and other obligations assumed by the CONTRACTOR pursuant to paragraphs 6.31 and 6.33. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage.

(1) Workers' Compensation insurance to cover obligations imposed by the Workers' Compensation Act of Colorado and any other applicable laws for any employee engaged in the performance of Work under this contract, and Employers' Liability insurance with minimum limits of FIVE HUNDRED THOUSAND DOLLARS ($500,000) each accident, FIVE HUNDRED THOUSAND DOLLARS ($500,000) disease - policy limit, and FIVE HUNDRED THOUSAND DOLLARS ($500,000) disease - each employee. Evidence of qualified self-insured status may be substituted for the Workers' Compensation requirements of this paragraph.

(2) Comprehensive General Liability insurance with minimum combined single limits of ONE MILLION DOLLARS ($1,000,000) each occurrence and TWO MILLION DOLLARS ($2,000,000) aggregate. The policy shall be applicable to all premises and operations. The policy shall include coverage for bodily injury, broad form property damage (including completed operations), personal injury (including coverage for contractual and employee acts), blanket contractual, independent contractors, products, and completed operations. The policy shall include coverage for explosion, collapse, and underground hazards. The policy shall contain a severability of interests' provision.

(3) Comprehensive Automobile Liability insurance with minimum combined single limits for bodily injury and property damage of not less than ONE MILLION DOLLARS ($1,000,000) each occurrence and ONE MILLION DOLLARS ($1,000,000) aggregate with respect to each of CONTRACTOR's owned, hired or non-owned vehicles assigned to or used in performance of the services. The policy shall contain a severability of interests' provision.

(4) The CONTRACTOR shall provide and maintain builder's risk insurance upon the entire project equal to one hundred percent (100%) of the insurable value thereof. Such insurance shall cover any and all physical damage including, without limitation, damage caused by fire, vandalism, malicious mischief, blasting, excessive surface runoff or storm water, high winds, and other occurrences covered in a standard extended coverage endorsement. The policy shall remain in effect until the Work is accepted as substantially complete.

(c) The policy required by paragraph (2) above, by paragraph (3) and by (4) above shall be endorsed to include the OWNER, the ENGINEER and its consultants, and each of their officers, agents, and employees as additional insureds. Every policy required above shall be primary insurance, and any insurance carried by the OWNER, its officers, or its employees, shall be excess and not contributory insurance to that provided by CONTRACTOR. No additional insured endorsement to the policy required by paragraph (1) above shall contain any exclusion for bodily injury or property damage arising from completed operations. The CONTRACTOR shall be solely responsible for any deductible losses under any policy required above.

(d) The certificate of insurance provided to OWNER shall be completed by the CONTRACTOR's insurance agent as evidence that policies providing the required coverages, conditions, and minimum limits are in full force and effect, and shall be reviewed and approved by the OWNER prior to commencement of the contract.

(e) Failure on the part of the CONTRACTOR to procure or maintain policies providing the required coverages, conditions, and minimum limits shall constitute a material breach of contract upon which the OWNER may immediately terminate this contract, or at its discretion may procure or renew any such policy or any extended reporting period thereto and may pay any and all premiums in connection therewith, and all monies so paid by the OWNER shall be repaid by CONTRACTOR to the OWNER upon demand, or the OWNER may offset the cost of the premiums against any monies due to CONTRACTOR from the Owner.

(f) The OWNER reserves the right to request and receive a certified copy of any policy and any endorsement thereto.

(g) The parties hereto understand and agree that the OWNER, the City of Louisville, is relying on, and does not waive or intend to waive by any provision of this contract, the monetary limitations (presently $150,000 per person and $600,000 per occurrence) or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, § 24-10-101 et seq., 10 C.R.S., as from time to time amended, or otherwise available to the City of Louisville, its officers, or its employees.

(h)

OWNER's Liability Insurance

5.5 In addition to the insurance required to be provided by CONTRACTOR under paragraph 5.4, OWNER, at OWNER's option, may purchase and maintain at OWNER's expense OWNER's own liability insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

Property Insurance

5.6 The OWNER shall be responsible for maintaining its own property insurance and, at its option, may maintain such insurance as will protect it against claims which may arise from operations under the Contract Documents.

Article 6. CONTRACTOR's Responsibilities

Supervision and Superintendence

6.1 CONTRACTOR shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of others in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

6.2 CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications to the superintendent shall be as binding as if given to CONTRACTOR.

Labor, Materials, and Equipment

6.3 CONTRACTOR shall provide competent, suitably qualified personnel to survey, layout, and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. Except as otherwise required for the safety or

protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER's written consent given after prior written notice to ENGINEER. No extra payment will be paid to the CONTRACTOR by the OWNER due to labor overtime or other increased costs of performing the Work on Saturdays, Sundays, OWNER-observed holidays, or at night. Should the CONTRACTOR desire to work on Saturdays, Sundays, OWNER-observed holidays, or at night between the hours of 5:00 p.m. and 7:00 a.m. on **Contract Days** the CONTRACTOR shall submit a written request to the ENGINEER 24 hours prior. If approval is given by ENGINEER to CONTRACTOR for authorized overtime work, ENGINEER's and ENGINEER's authorized personnel will charge overtime and other incidental administrative expenses necessary for performing inspections on Saturdays, Sundays, OWNER-observed holidays, or at night between the hours of 5:00 p.m. and 7:00 a.m., the CONTRACTOR will be responsible to pay for all such rates and charges, and shall not be granted a Contract Price increase for such charges. Overtime and other incidental administrative expenses for Engineer and Engineer's authorized personnel are as follows:

DESCRIPTION	HOURLY RATE
Engineer	$60.00
Construction Inspector	$45.00
Operations Supervisor	$45.00
Maintenance Worker	$30.00
Clerical	$25.00
Vehicle	$15.00

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

6.5 All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of OWNER. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

Progress Schedule

6.6 CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.8 as it may be adjusted from time to time as provided below:

6.6.1 CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.8) proposed adjustments in the progress schedule that will not change the Contract Times (or Milestones). Such adjustments will conform

generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

6.6.2 Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of paragraph 12.1. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

Substitutes and "Or-Equal" Items

6.7

6.7.1 Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment of other Suppliers may be accepted by ENGINEER under the following circumstances:

"Or-Equal"

6.7.1.1 If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER's sole discretion, be accomplished without compliance with some or all of the requirements for acceptance of proposed substitute items.

Substitute Items

6.7.1.2 If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under subparagraph 6.7.1.1, it will be considered a proposed substitute item. CONTRACTOR shall submit sufficient information as provided below to allow ENGINEER to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. The procedure for review by the ENGINEER will include the following as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances. Requests for review of proposed substitute items of material or equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall first make written application to ENGINEER for acceptance thereof, certifying that the proposed substitute will perform

adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair, and replacement service will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by ENGINEER in evaluating the proposed substitute. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute.

CONTRACTOR's Expense

6.7.1.3 All data to be provided by CONTRACTOR in support of any proposed "or-equal" or substitute item will be at CONTRACTOR's expense.

Substitute Construction Methods or Procedures

6.7.2 If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction acceptable to ENGINEER. CONTRACTOR shall submit sufficient information to allow ENGINEER, in ENGINEER's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in subparagraph 6.7.1.2.

ENGINEER's Evaluation

6.7.3 ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.7.1.2 and 6.7.2. ENGINEER will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed, or utilized without ENGINEER's prior written acceptance, which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any "or-equal" or

substitute. ENGINEER will record time required by ENGINEER and ENGINEER's Consultants in evaluating substitutes proposed or submitted by CONTRACTOR pursuant to paragraphs 6.7.1.2 and 6.7.2 and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER accepts a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute item.

Concerning Subcontractors, Suppliers, and Others

6.8

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

6.8.2 The Contract Documents require the identity of certain Subcontractors, Suppliers, or other persons or organizations (including those who are to furnish the principal items of materials or equipment) to be submitted to OWNER with the Bid in the Bid Form prior to the Effective Date of the Agreement for acceptance by OWNER and ENGINEER, and if CONTRACTOR has submitted a list thereof in accordance with the Contract Documents, OWNER's or ENGINEER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in Contract Documents) of any such Subcontractor, Supplier, or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute. No acceptance by OWNER or ENGINEER of any such Subcontractor, Supplier, or other person or organization shall constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.

6.8.3 Subletting of Contract. The Contractor shall not sublet, sell, transfer, assign, or dispose of the Contract or Contracts, or any portion thereof without written consent of the Engineer. The Contractor will be permitted to sublet a portion of the Contract, however, the Contractor's organization shall perform work amounting to not less than 50 percent of the total contract cost.

The calculation of the percentage of subcontracted work shall be based on the prime contract unit prices rather than subcontract unit prices. Proportional value for a subcontracted partial contract item shall be verified by the Engineer. For the purpose of calculating the value of subcontracted work, the cost of procuring materials and manufactured products can be included in either the prime contract or subcontract. However, when a firm both sells material to a prime contractor and performs the work of incorporating the materials into the project, these two phases shall be considered in combination and as constituting a single subcontract.

Subcontracts, or transfer of Contract shall not release the Contractor of liability under the Contract and bonds.

6.8.4 CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors. Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. OWNER or ENGINEER may furnish to any such Subcontractor, Supplier, or other person or organization, to the extent practicable, evidence of amounts paid to CONTRACTOR in accordance with CONTRACTOR's Applications for Payment. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other person or organization any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier, or other person or organization, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other person or organization except as may otherwise be required by Laws and Regulations.

6.8.5 CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR. CONTRACTOR shall require all Subcontractors, Suppliers, and such other persons and organizations performing or furnishing any of the Work to communicate with the ENGINEER through CONTRACTOR.

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

6.10 All Work performed for CONTRACTOR by a Subcontractor or Supplier will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor or Supplier, which specifically binds the Subcontractor or Supplier to the applicable terms and, conditions of the Contract Documents for the benefit of OWNER and ENGINEER.

Patent Fees and Royalties

6.11 CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants and the officers, directors, employees, agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the

Work of any invention, design, process, product, or device not specified in the Contract Documents.

Permits

6.12 Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

6.12.1 Prior to the commencement date for the Work set forth in the Notice to Proceed, The CONTRACTOR, and all subcontractors shall be or shall become a CONTRACTOR licensed in accordance with the applicable ordinance of the City of Louisville, Colorado.

6.12.2 If water is required for the project, CONTRACTOR shall obtain a bulk water permit from the City of Louisville, Public Works Department in accordance with the permit requirements.

6.12.3 CONTRACTOR shall obtain a Right-of-Way Permit from the City of Louisville, Public Works Department for all Work to be completed within the City right-of-way.

6.12.4 CONTRACTOR shall obtain and pay for all other necessary construction permits and licenses.

Laws and Regulations

6.13

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

6.13.2 If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses, and damages caused by, arising out of, or resulting therefrom; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under paragraph 3.3.2.

Taxes

6.14 CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project, which are applicable during the performance of the Work. City of Louisville municipal taxes shall be waived upon application for and acceptance of "tax exemption".

The CONTRACTOR shall apply for and receive a Certificate of Exemption from the Colorado Department of Revenue for construction materials to be physically incorporated into the Work. This Certificate of Exemption provides that the CONTRACTOR shall neither pay nor include in his bid prices Sales and Use Taxes collected by the State of Colorado on those building and construction materials physically incorporated into the Work. Sales and Use Taxes of the State of Colorado, RTD, and the County are collected by the State of Colorado. All applicable Sales and Use Taxes (including State collected taxes) on any items other than construction and building materials physically incorporated into the Work are to be paid by the Contractor and are to be included in the appropriate bid items. CONTRACTOR and any Subcontractor assume all liability for the nonpayment of taxes, or the payment of exempt taxes resulting from a failure to use the Certificate of Exemption required by this paragraph.

Use of Premises

6.15 CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any adjacent land or areas, resulting from the performance of the Work. Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultant, and anyone directly or indirectly employed by any of them from and against all claims, costs, losses, and damages arising out of or resulting from any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, ENGINEER, or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.

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

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

Record Documents

6.18 CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon completion of the Work, these record documents, Samples and Shop Drawings will be delivered to ENGINEER for OWNER.

Safety and Protection

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

6.19.1 all persons on the Work site or who may be affected by the Work;

6.19.2 all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

6.19.3 other property at the site or adjacent thereto, including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures, fences, gates, ditches, utilities, and underground facilities not designated for removal, relocation, or replacement in and during the course of construction.

6.19.4 The CONTRACTOR shall take all measures necessary to mitigate the impact of weather so that the project may continue on schedule. In no event shall OWNER be liable for extra costs incurred on materials and any part of the Work due to CONTRACTOR's failing to take all measures necessary protect the Work from weather and CONTRACTOR shall not be entitled to such claims. Also, no extension of the Contract Time shall be allowed if the CONTRACTOR is able, notwithstanding the weather, to proceed with other Work of the Contract.

CONTRACTOR shall comply with all applicable Laws and Regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury or loss to any property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier, or any other person or organization directly or employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR. CONTRACTOR's duties and responsibilities for safety and for protection of the work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.13 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

Safety Representative

6.20 CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

Hazard Communication Programs

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

Emergencies

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

Shop Drawings and Samples

6.23

6.23.1 After checking and verifying all field measurements, CONTRACTOR shall submit to ENGINEER for review and approval in accordance with the accepted schedule of shop drawings and sample submittal (see paragraph 2.8), three copies (or at ENGINEER's option, one reproducible copy) of all shop drawings, which shall have been checked and approved by the CONTRACTOR. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show ENGINEER the materials and equipment CONTRACTOR proposes to provide and to enable ENGINEER to review the information for the limited purposes required by paragraph 6.26.

6.23.2 CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with said accepted schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review the submittal for the limited purposes required by paragraph 6.24. The numbers of each Sample to be submitted will be as specified in the Specifications.

Submittal Procedures

6.24

6.24.1 Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

6.24.1.1 all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

6.24.1.2 all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work, and

6.24.1.3 all information relative to CONTRACTOR's sole responsibilities in respect of means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto.

CONTRACTOR shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

6.24.2 Each submittal will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of that submittal.

6.24.3 At the time of each submission, CONTRACTOR shall give ENGINEER specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to ENGINEER for review and approval of each such variation.

6.25 ENGINEER will review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals accepted by ENGINEER as required by paragraph 2.8. ENGINEER's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make corrections required by ENGINEER, and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.

6.26 ENGINEER's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of submission as required by paragraph 6.24.3 and ENGINEER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.24.1.

6.27 Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submissions accepted by ENGINEER as required by paragraph 2.8, any related Work performed prior to ENGINEER's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

Continuing the Work

6.28 CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.5 or as OWNER and CONTRACTOR may otherwise agree in writing.

CONTRACTOR's General Warranty and Guarantee

6.29

6.29.1 CONTRACTOR warrants and guarantees to OWNER, ENGINEER, and ENGINEER's Consultants that all Work will be in accordance with the Contract Documents and will not be **defective**. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

6.29.1.1 abuse, modification, or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, or Suppliers; or

6.29.1.2 normal wear and tear under normal usage.

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

6.29.2.1 observations by ENGINEER;

6.29.2.2 recommendation of any progress or final payment by ENGINEER;

6.29.2.3 the issuance of a certificate of Substantial Completion or any payment by OWNER to CONTRACTOR under the Contract Documents;

6.29.2.4 use or occupancy of the Work or any part thereof by OWNER;

6.29.2.5 any acceptance by OWNER or any failure to do so;

6.29.2.6 any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER pursuant to paragraph 14.13;

6.29.2.7 any inspection, test, or approval by others; or

6.29.2.8 any correction of **defective** Work by OWNER.

6.29.3 The CONTRACTOR warrants that, unless otherwise specified in the Contract Documents, the materials and equipment installed in the Work will be new, merchantable, and fit for the purpose for which they are intended, and that the Work will be performed in a workmanlike manner. The CONTRACTOR also warrants the workers who perform the Work will be sufficiently skilled to produce a high quality product which is free of blemishes (surface defects) and flaws (internal defects).

The CONTRACTOR is under a continuing duty to warn the OWNER and ENGINEER of any possible defect in the design of the Work and materials incorporated in the Work and against potentially unsafe uses of products incorporated in the Work which may cause personal injury or property damage as soon as the CONTRACTOR discovers the possible defect or has notice that the product may be unsafe. The CONTRACTOR's duty under this paragraph shall be continuing and shall not expire when the OWNER accepts the Work or when the CONTRACTOR's guarantee expires. If the CONTRACTOR fails to warn the Owner of a design or product defect of which the CONTRACTOR is aware, and if personal or property damage thereafter results from such design or product defect, the CONTRACTOR shall be liable jointly and severally with any other party responsible at law for all damages resulting from such defect.

Indemnification

6.30

The CONTRACTOR agrees to indemnify and hold harmless the OWNER (City of Louisville), ENGINEER, ENGINEER's consultants, and their officers, employees, agents, and insurers, from and against all liability, claims, and demands, on account of injury, loss, or damage, including without limitation claims arising from bodily injury, personal injury, sickness, disease, death, property loss or damage, or any other loss of any kind whatsoever, which arise out of or are in any manner connected with this contract, if such injury, loss, or damage is caused in whole or in part by, or is claimed to be caused in whole or in part by, the act, omission, error, professional error, mistake, negligence, or other fault of the CONTRACTOR, any Subcontractor of the CONTRACTOR, or any officer, employee, representative, or agent of the CONTRACTOR or of any Subcontractor of the CONTRACTOR, or which arise out of any workers' compensation claim of any employee of the

CONTRACTOR or of any employee of any subcontractor of the CONTRACTOR. The CONTRACTOR agrees to investigate, handle, respond to, and to provide defense for and defend against, any such liability, claims or demands at the sole expense of the CONTRACTOR. The CONTRACTOR also agrees to bear all other costs and expenses related thereto, including court costs and attorney fees, whether or not any such liability, claims, or demands alleged are groundless, false, or fraudulent.

6.31 In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors, or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.30 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier, or other person or organization under workers' compensation acts, disability benefit acts, or other employee benefit acts.

Survival of Obligations

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

Article 7. Other Work

Related Work at Site

7.1 OWNER may perform other work related to the Project at the site by OWNER's own forces, or let other direct contracts therefor which shall contain General Conditions similar to these, or have other work performed by utility owners. If the fact that such other work is to be performed was not noted in the Contract Documents, then: (i) written notice thereof will be given to CONTRACTOR prior to starting any such other work, and (ii) CONTRACTOR may make a claim therefor as provided in Articles 11 and 12 if CONTRACTOR believes that such performance will involve additional expense to CONTRACTOR or requires additional time and the parties are unable to agree as to the amount or extent thereof.

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

paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

7.3 If the proper execution or results of any part of CONTRACTOR's work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure so to report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent or non-apparent defects and deficiencies in such other work.

Coordination

7.4 Unless otherwise provided in the Supplementary Conditions, OWNER shall have sole authority and responsibility in respect of such coordination.

Should CONTRACTOR cause damage to the Work or property of any separate CONTRACTOR at the site, or should any claim arising out of CONTRACTOR's performance of the Work at the site be made by any separate contractor against CONTRACTOR, OWNER, ENGINEER, or any other person, CONTRACTOR shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws, and Regulations, indemnify and hold OWNER and ENGINEER harmless from and against all claims, damages, losses, and expenses (including, but not limited to, fees of engineers, architects, attorneys, and other professionals and court and arbitration costs) arising directly, indirectly, or consequentially out of any action, legal or equitable, brought by any separate contractor against OWNER or ENGINEER to the extent based on a claim arising out of CONTRACTOR's performance of the Work. Should a separate contractor cause damage to the Work or property of CONTRACTOR or should the performance of Work by any separate CONTRACTOR at the site give rise to any other claim, CONTRACTOR shall not institute any action, legal or equitable, against OWNER or ENGINEER or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from OWNER or ENGINEER on account of any such damage or claim. If CONTRACTOR is delayed at any time in performing or furnishing Work by any act or neglect of a separate contractor and OWNER and CONTRACTOR are unable to agree as to the extent of any adjustment in Contract Time attributable thereto, CONTRACTOR may make a claim for an extension of time in accordance with Article 12. An extension of the Contract Time shall be CONTRACTOR's exclusive remedy with respect to OWNER and ENGINEER for any delay, disruption, interference, or hindrance caused by any separate contractor. This paragraph does not prevent recovery from OWNER or ENGINEER for activities that are their respective responsibilities.

Article 8. Owner's Responsibilities

8.1 Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.2 In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer whose status under the Contract Documents shall be that of the former ENGINEER.

8.3 OWNER shall furnish the data required of OWNER under the Contract documents promptly and shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.4 and 14.13.

8.4 OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4.

8.5 OWNER is obligated to execute Change Orders as indicated in paragraph 10.4.

8.6 OWNER's responsibility in respect of certain inspections, tests, and approvals is set forth in paragraph 13.4.

8.7 In connection with OWNER's right to stop Work or suspend Work, see paragraphs 13.10 and 15.1. Paragraph 15.2 deals with OWNER's right to terminate services of CONTRACTOR under certain circumstances.

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

8.9 OWNER's responsibility in respect of undisclosed Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Materials uncovered or revealed at the site is set forth in paragraph 4.5.

8.10 If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

Article 9. Engineer's Status During Construction

OWNER's Representative

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

Visits to Site

9.2 ENGINEER will make visits to the site at intervals appropriate to the various stages of construction as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of

CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER will endeavor for the benefit of OWNER to determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous onsite inspections to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and onsite observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against **defective** Work. ENGINEER's visits and onsite observations are subject to all the limitations on ENGINEER's authority and responsibility set forth in paragraph 9.13 and particularly, but without limitation, during or as a result of ENGINEER's onsite visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work.

Project Representative

9.3 ENGINEER will furnish a Resident Project Representative, assistants, and other field staff to assist ENGINEER in observing the performance of the Work of the CONTRACTOR. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.13 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the site who is not ENGINEER's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other person will be as provided in the Supplementary Conditions.

9.3.1 Resident Project Representative is ENGINEER's Agent and will act as directed by and under the supervision of ENGINEER, and will confer with ENGINEER regarding his actions. His dealings in matters pertaining to the onsite Work will in general be with ENGINEER and CONTRACTOR keeping the ENGINEER advised as necessary. His dealings with Subcontractors will only be through or with the full knowledge and approval of CONTRACTOR.

Duties and Responsibilities

Resident Project Representative will:

Schedules

Review the progress schedule, schedule of Shop Drawing submittal, schedule of values and other schedules prepared by CONTRACTOR and consult with ENGINEER concerning acceptability.

Conferences and Meetings

Attend meetings with CONTRACTOR, such as preconstruction conferences, progress meetings and other job conferences, and other project-related meetings.

Liaison

Serve as ENGINEER's liaison with CONTRACTOR, working principally through CONTRACTOR's superintendent and assist him in understanding the intent of the Contract Documents. Assist ENGINEER in serving as OWNER's liaison with CONTRACTOR when CONTRACTOR's operations affect OWNER's onsite operations.

Assist in obtaining from ENGINEER additional details or information, when required for proper execution of the Work.

Shop Drawings and Samples

Record date of receipt of Shop Drawings and samples.
Receive samples, which are furnished at the site by CONTRACTOR for ENGINEER's review, and notify ENGINEER of their availability for examination.

Advise ENGINEER and CONTRACTOR of the commencement of any Work requiring a Shop Drawing or sample submission if the submission has not been approved by ENGINEER.

Review of Work, Rejection of Defective Work, Inspections, and Tests

Conduct onsite observations of the Work in progress to assist ENGINEER in determining that the Work is proceeding in accordance with the Contract Documents.

Report to ENGINEER whenever he believes that any Work is unsatisfactory, faulty or defective, or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspections, tests, or approvals required to be made; and advise ENGINEER when he believes Work should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection, or approval.

Verify that tests, equipment, and systems startups and operating and maintenance training are conducted in presence of the appropriate personnel, and that CONTRACTOR maintains adequate records thereof; observe, record, and report to ENGINEER appropriate details relative to the test procedures and start-ups.

Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to ENGINEER.

Interpretation of Contract Documents

Report to ENGINEER when clarifications and interpretations of the Contract Documents are needed and Transmit to CONTRACTOR clarification and interpretation of the Contract Documents as issued by ENGINEER.

Modifications

Consider and evaluate CONTRACTOR's suggestions for modification in Drawings or Specifications and report with his recommendations to ENGINEER. Transmit to CONTRACTOR decisions issued by ENGINEER.

Records

Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and samples, reproductions or original Contract Documents including all Work Directive Changes, Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Agreement, ENGINEER's clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.

Keep a diary, daily report form, or log book, recording hours on the job site, weather conditions, data relative to questions of Work Directive Changes, Change Orders, or changed conditions, list of job site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures.

Record names, addresses, and telephone numbers of all CONTRACTORs, subcontractors, and major suppliers of equipment and materials.

Reports

Furnish ENGINEER periodic reports as required of progress of the Work and of CONTRACTOR's compliance with the progress schedule and schedule of Shop Drawings and sample submittal.

Consult with ENGINEER in advance of scheduled major tests, inspections or start of important phases of the Work.

Draft proposed Change Orders and Work Directive Changes, obtaining backup material from CONTRACTOR and recommend to ENGINEER Change Orders, Work Directive Changes, and Field Orders.

Report immediately to ENGINEER upon the occurrence of any accident.

Payment Requests

Review applications for payment with CONTRACTOR for compliance with the established procedure for their submission and forward with his recommendations to ENGINEER, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the site but not incorporated in the Work.

Certificates, Maintenance, and Operations Manuals

During the Course of Work verify that certifications, maintenance, and operation manuals and other data required to be assembled and furnished by CONTRACTOR are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to ENGINEER for review and forwarding to OWNER prior to final payment of the Work.

Completion

Before ENGINEER issues a Certificate of Substantial Completion, submit to CONTRACTOR a list of observed items requiring correction or completion.

Conduct final inspection in the company of ENGINEER and CONTRACTOR and prepare a final list of items to be corrected or completed.

Observe that all items on final list have been corrected or completed and make recommendations to ENGINEER concerning acceptance.

Limitation of Authority

Resident Project Representative shall not:

Authorize any deviations from the Contract Documents or accept any substitute materials or equipment, unless authorized by ENGINEER.

Exceed limitations of ENGINEER's authority as set forth in the Contract Documents.

Undertake any of the responsibilities of CONTRACTOR, Subcontractors, or CONTRACTOR's superintendent.
Advise on, or issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences, or procedures for construction unless such is specifically called for in the Contract Documents.

Advise on or issue directions regarding or assume control over safety precautions and programs in connection with the Work.

Shall not accept Shop Drawings or sample submittals from anyone other than CONTRACTOR.

Authorize OWNER to occupy the Work in whole or in part.

Participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by ENGINEER.

Clarifications and Interpretations

9.4 ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as ENGINEER may determine necessary, which shall be consistent with the intent of and reasonably inferable from Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER or CONTRACTOR believes that a written clarification or interpretation justifies an adjustment in the Contract Price or the Contract Times and the parties are unable to agree to the amount or extent thereof, if any, OWNER or CONTRACTOR may make a written claim therefor as provided in Article 11 or Article 12.

Authorized Variations in Work

9.5 ENGINEER may authorize minor variations in the work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER and also on CONTRACTOR who shall perform the Work involved promptly.

Rejecting Defective Work

9.6 ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be **defective**, or that ENGINEER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER will also have authority to require special inspection or testing of the work as provided in paragraph 13.9, whether or not the work is fabricated, installed or completed.

Shop Drawings, Change Orders and Payments

9.7 In connection with ENGINEER's authority as to Shop Drawings and Samples, see paragraphs 6.24 through 6.28 inclusive.

9.8 In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

9.9 In connection with ENGINEER's authority as to Applications for Payment, see Article 14.

Determinations for Unit Prices

9.10 ENGINEER will have authority to determine the actual quantities and classifications of items of Unit Price Work performed by CONTRACTOR, and the written decisions of ENGINEER on such matters will be final, binding on OWNER and CONTRACTOR and not subject to appeal (except as modified by ENGINEER to reflect changed factual conditions).

Decisions on Disputes

9.11 ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes, and other matters relating to the

acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and Claims under Articles 11 and 12 in respect of changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing with a request for a formal decision in accordance with this paragraph. Written notice of each such claim, dispute or other matter will be delivered by the claimant to ENGINEER and the other party to the Agreement promptly (but in no event later than fifteen days) after the start of the occurrence or event giving rise thereto, and written supporting data will be submitted to ENGINEER and the other party within thirty days after the start of such occurrence or event unless ENGINEER allows an additional period of time for the submission of additional or more accurate data in support of such claim, dispute of other matter. The opposing party shall submit any response to ENGINEER and the claimant within thirty days after receipt of the claimant's last submittal (unless ENGINEER allows additional time). ENGINEER will render a formal decision in writing within thirty days after receipt of the opposing party's submittal, if any, in accordance with this paragraph. ENGINEER's written decision on such claim, dispute or other matter will be final and binding upon OWNER and CONTRACTOR.

9.12 When functioning under paragraphs 9.10 and 9.11, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to paragraphs 9.10 or 9.11 with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.15) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations.

Limitations on ENGINEER's Authority and Responsibilities

9.13

9.13.1 Neither ENGINEER's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by ENGINEER shall create, impose or give rise to any duty owned by ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them.

9.13.2 ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work. ENGINEER will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

9.13.3 ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

9.13.4 ENGINEER's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds and certificates of inspection, tests and approvals, and other documentation required to be delivered by paragraph 14.12 will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests and approvals that the results certified indicate compliance with, the Contract Documents.

9.13.5 The limitations upon authority and responsibility set forth in this paragraph 9.13 shall also apply to ENGINEER's Consultants, Resident Project Representative, and Assistants.

Article 10. Changes in the Work

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

10.2 If OWNER and CONTRACTOR are unable to agree as to the extent, if any, of an adjustment in the Contract Price or an adjustment of the Contract Times that should be allowed as a result of a Work Change Directive, a claim may be made therefor as provided in Article 11 or Article 12.

10.3 CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any Work performed that is not required by the Contract Documents as amended, modified, and supplemented as provided in paragraphs 3.5 and 3.6 except in the case of an emergency as provided in paragraph 6.23 or in the case of uncovering Work as provided in paragraph 13.9.

10.4 OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by ENGINEER (or Written Amendments) covering:

10.4.1 changes in the Work which are (i) ordered by OWNER pursuant to paragraph 10.1., (ii) required because of acceptance of **defective** Work under paragraph 13.13 or correcting **defective** Work under paragraph 13.14, or (iii) agreed to by the parties;

10.4.2 changes in the Contract Price or Contract Times which are agreed to by the parties; and

10.4.3 changes in the Contract Price or Contract Times, which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 9.11.

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

provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

Article 11. Change of Contract Price

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

11.2 The Contract Price may only be changed by a Change Order or by a Written Amendment. Any claim for an adjustment in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than fifteen days) after the start of the occurrence or event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within thirty days after the start of such occurrence or event (unless ENGINEER allows additional time for claimant to submit additional or more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the adjustment claimed covers all known amounts to which the claimant is entitled as a result of said occurrence or event. ENGINEER shall determine all claims for adjustment in the Contract Price in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree on the amount involved. No claim for ad adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.

11.3 The value of any Work covered by a Change Order or of any claim for an adjustment in the Contract Price will be determined as follows:

11.3.1 where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of paragraphs 11.9.1 through 11.9.3 inclusive);

11.3.2 where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 11.6.2);

11.3.3 where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under paragraph 11.3.2, on the basis of the Cost of the Work (determined as provided in paragraphs 11.4 and 11.5) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 11.6).

Cost of the Work

11.4 The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality

of the Project, shall include only the following items and shall not include any of the costs itemized in paragraph 11.5:

11.4.1 Certified payroll record costs for employees in the direct employment of CONTRACTOR in the performance of the Work under schedules of job classifications shall be submitted to the ENGINEER with the claim. Such employees shall include without limitation superintendents, foremen, and other personnel employed full-time at the site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work after regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by OWNER.

11.4.2 Invoices for cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith shall be submitted to the ENGINEER with the claim. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates, refunds, and returns from sale of surplus materials and equipment shall be in accordance with the State Department of Highways, Division of Highways, and State of Colorado Standard Specifications for Road and Bridge Construction 2005 Edition. If the materials used in performing the extra Work are taken from the CONTRACTOR's stock, then in lieu of invoices the CONTRACTOR shall furnish an affidavit, certifying that such materials were taken from its stock, that the quantity claimed was actually used in the Work, and that the price and transportation claimed represent the actual cost to the CONTRACTOR shall be submitted to the ENGINEER with the claim.

11.4.3 Payments made by CONTRACTOR to the Subcontractors for Work performed or furnished by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of ENGINEER, which bids, if any, will be accepted. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided in paragraphs 11.4, 11.5, 11.6 and 11.7. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

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

11.4.5 Supplemental costs including the following:

11.4.5.1 The proportion of necessary transportation, travel, and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

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

11.4.5.3 Rentals rates of all construction equipment and machinery and the parts thereof which has been authorized by the ENGINEER, the CONTRACTOR will be paid for the use of equipment in the manner hereinafter specified. Rental rates will be from the current edition of the Rental Rate Blue Book for Construction Equipment and will be determined as follows:

Hourly rate: RR = (ADJ BB/176)(RF)(SAF)+EOC

Where:	RR	=	Hourly rental rate
	ADJ BB/176	=	Blue Book Monthly Rate adjusted for year of manufacture/176
	RF	=	Regional Factor of 1.06
	SAF	=	State Adjustment Factor of 1.05
	EOC	=	Estimated Hourly Operating Costs from Blue Book

With each claim, the CONTRACTOR shall submit the rental rate calculations including copies of the appropriate pages of the Blue Book for each piece of equipment listed in the claim.

Rental of equipment not owned by the CONTRACTOR will be paid for by invoice cost plus operating cost (EOC). Copies of the applicable pages of the Rental Rate Blue Book for Construction Equipment shall be submitted to the ENGINEER with the claim.

The costs of transportation, loading, unloading, installation, dismantling, and removal thereof all in accordance with the terms of said rental agreements. If equipment is used intermittently and when not in use could be returned to its rental source at less expense to the OWNER than holding it at the Work site, it shall be returned unless the CONTRACTOR elects to keep

it at the Work site at no expense to the OWNER. The rental of any such equipment, machinery, or parts shall cease when the use of the equipment is no longer necessary for the Work. No payment will be made for the use of tools, which have a replacement value of $200.00 or less. Operators will be paid for separately as provided in paragraph 11.4.1. Certified invoices for rental cost of all construction equipment and machinery incorporated in the Work shall be submitted to the ENGINEER with the claim.

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

11.4.5.5 Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable.

11.4.5.6 Losses and damages (and related expenses) caused by damage to the work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance and furnishing of the Work, (except losses and damages within the deductible amounts of property insurance established by OWNER in accordance with paragraph 5.9), provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraph 11.6.2.

11.4.5.7 The cost of utilities, fuel, and sanitary facilities at the site.

11.4.5.8 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage, and similar petty cash items in connection with the Work.

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

11.5.1 Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the Work and not specifically

included in the agreed upon schedule of job classifications referred to in paragraph 11.4.1 or specifically covered by paragraph 11.4.4: all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

11.5.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.

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

11.5.4 Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 11.4.5.9 above).

11.5.5 Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of **defective** Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

11.6 The CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

11.6.1 a mutually acceptable fixed fee; or

11.6.2 if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the work:

11.6.2.1 for costs incurred under paragraphs 11.4.1 and 11.4.2, the CONTRACTOR's fee shall be fifteen percent;

11.6.2.2 for costs incurred under paragraph 11.4.3, the CONTRACTOR's fee shall be five percent;

11.6.2.3 where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of paragraphs 11.4.1, 11.4.2, 11.4.3, and 11.6.2 is that the Subcontractor who actually performs or furnishes the Work, at whatever tier, will be paid a fee of fifteen percent of the costs incurred by such Subcontractor under paragraphs 11.4.1 and 11.4.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

11.6.2.4 no fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5, and 11.5;

11.6.2.5 the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and

11.6.2.6 when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 11.6.2.1 through 11.6.2.5, inclusive.

11.7 Whenever the cost of any Work is to be determined pursuant to paragraphs 11.4 and 11.5, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

Cash Allowances

11.8 It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be furnished and performed for such sums as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:

11.8.1 the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and

11.8.2 CONTRACTOR's costs for unloading and handling on the site, labor, installation costs, overhead, profit, and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances and no demand for additional payment on account of any of the foregoing will be valid.

Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

Unit Price Work

11.9

11.9.1 Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual

quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER in accordance with paragraph 9.10.

11.9.2 Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.

11.9.3 OWNER or CONTRACTOR may make a claim for an adjustment in the contract Price in accordance with Article 11 if:

11.9.3.1 the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

11.9.3.2 there is no corresponding adjustment with respect to any other item of Work; and

11.9.3.3 if CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense of, OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

11.9.4 In no event shall a claim be made or an adjustment of Unit Price allowed if a variation in actual quantities used does not equal or exceed 25 percent (25%) of the total Bid Price.

Article 12. Change of Contract Times

12.1 The Contract Times (or Milestones) may only be changed by a Change Order or a Written Amendment. Any claim for an adjustment of the Contract Times (or Milestones) shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than fifteen days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within thirty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Times (or Milestones) shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Times (or Milestones) will be valid if not submitted in accordance with the requirements of this paragraph 12.1.

12.2 Liquidated damages. The OWNER and the CONTRACTOR agree and recognize that time is of the essence for every time period set forth in the Contract Documents and that the OWNER will suffer financial loss if the Work is not substantially complete within the time set forth in the Contract Documents, plus any extensions thereof allowed in accordance with this Article 12 of the General Conditions. If the CONTRACTOR fails to perform the Work within the specified time set forth in

the Contract Documents as adjusted pursuant to Article 12, the OWNER and CONTRACTOR agree that as liquidated damages, and not as a penalty, for delay in performance the Contractor shall pay OWNER in the amount stipulated below for each and every contract day that expires after the time set forth in the Contract Documents for Substantial Completion of the Work until the same is finally complete and ready for Final Payment. The OWNER shall have the right to deduct liquidated damages from any amount due or that may become due to the CONTRACTOR, or to collect such liquidated damages from the CONTRACTOR or the Surety. The OWNER has the option to enforce liquidated damages or to waive such damages. The liquidated damages herein specified shall only apply to the CONTRACTOR's delay in performance. Liquidated damages are intended only to compensate the OWNER for additional OWNER personnel efforts in administering the Contract after normally scheduled completion dates, and for City governmental and citizen inconvenience, lost opportunities, and lost confidence in government and morale of government when work is not completed on time. Such damages are uncertain in amount and difficult to measure and prove accurately. By executing this contract, the CONTRACTOR agrees that the liquidated damages specified in the Contract Documents are reasonable in amount and are not disproportionate to actual anticipated damages. Liquidated damages do not include any sums of money to reimburse the OWNER for extra costs which the OWNER may become obligated to pay on other contracts which are delayed or extended because of CONTRACTOR's failure to complete the Work within the time periods set forth in the Contract Documents. Liquidated damages are not intended to include litigation or attorneys' fees incurred by the OWNER, or other incidental or consequential damages suffered by the OWNER due to CONTRACTOR's performance. If the OWNER charges liquidated damages to the CONTRACTOR, this shall not preclude the Owner from commencing an action against the CONTRACTOR for other actual harm resulting from the CONTRACTOR's performance, which is not due to the CONTRACTOR's delay in performance. In order to recover liquidated damages, OWNER is under no obligation to prove the actual damages sustained by OWNER due to the CONTRACTOR's delay in performance. In no event shall the CONTRACTOR be assessed liquidated damages if the contract is suspended or terminated for events beyond the control of the CONTRACTOR for which a time extension beyond the original schedule of performance could be granted under 12.3.

The parties agree that liquidated damages shall be in the amount set forth in Article 2 of the Agreement.

12.3 Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a claim is made therefor as provided in paragraph 12.1. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions or acts of God. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

12.4 The CONTRACTOR specifically waives any and all claims against the OWNER for damages resulting from any hindrance or delay caused by circumstances beyond the control of CONTRACTOR that prevents completing any part of the Work within the Contract Times (or Milestones), whether or not caused by the OWNER. The CONTRACTOR may instead be granted an extension of the Contract Times for which the OWNER will not claim liquidated damages, provided that the hindrance or delay is beyond the control of the CONTRACTOR. An extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole

and exclusive remedy for such delay. In no event shall OWNER be liable to CONTRACTOR, any subcontractor, any supplier, any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from delays caused by or within the control of Contractor, or delays beyond the control of CONTRACTOR whether or not caused by the OWNER.

Article 13. Tests and Inspections; Correction, Removal, or Acceptance of Defective Work

Notice of Defects

13.1 Prompt notice of all **defective** Work of which OWNER or ENGINEER has actual knowledge will be given to CONTRACTOR. All **defective** Work may be rejected, corrected, or accepted as provided in this Article 13.

Access to Work

13.2 OWNER, ENGINEER, ENGINEER's Consultants, other representatives and personnel of OWNER, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's site safety procedures and programs so that they may comply therewith as applicable.

Tests and Inspections

13.3 CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

13.4 OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

13.4.1 for inspections, tests, or approvals covered by paragraph 13.5 below:

13.4.2 that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.9 below shall be paid as provided in said paragraph 13.9; and

13.4.3 as otherwise specifically provided in the Contract Documents.

13.4.4 Any and all retesting of soil necessitated by the CONTRACTOR's operations or inability to obtain specified density test results on the first attempt shall be the sole responsibility and costs of the CONTRACTOR to achieve required passing test results. Retesting required because of non-conformance to specified requirements shall be performed by the independent firm employed by the OWNER. Payment for retesting will be charged to the CONTRACTOR by deducting inspection, testing and administrative charges from the Contract Price.

13.5 If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection, or approval. CONTRACTOR shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for OWNER's and ENGINEER's acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work.

13.6 If any Work (or the work of others) that is to be inspected, tested, or approved is covered by CONTRACTOR without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation.

13.7 Uncovering Work as provided in paragraph 13.6 shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

Uncovering Work

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

13.9 If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose or otherwise make available for observation, inspection or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is **defective,** CONTRACTOR shall pay all claims, costs, losses and damages caused by, arising out of or resulting from such uncovering, exposure, observation, inspection and testing and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefor as provided in Article 11.

OWNER May Stop the Work

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

Correction or Removal of Defective Work

13.11 If required by ENGINEER, CONTRACTOR shall promptly, as directed, either correct all **defective** Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by ENGINEER, remove it from the site and replace it with Work that is not **defective.** CONTRACTOR

shall pay all claims, costs, losses, and damages caused by or resulting from such correction or removal (including but not limited to all costs of repair or replacement of work of others).

Correction Period
13.12

13.12.1 If within one year after the date of Final Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, CONTRACTOR shall within seven calendar days after receiving notice from OWNER, without cost to OWNER and in accordance with OWNER's written instructions: (i) correct such defective Work, or if it has been rejected by OWNER, remove it from the site and replace it with WORK that is not defective, and (ii) satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If CONTRACTOR does not within seven calendar days after receiving notice from OWNER comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or the rejected Work removed and replaced, and all claims, costs, losses, and damages caused by or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

13.12.2 In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

13.12.3 Where **defective** Work (and damage to other Work resulting therefrom) has been corrected, removed, or replaced under this paragraph 13.12, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

Acceptance of Defective Work

13.13 If, instead of requiring correction or removal and replacement of **defective** Work, OWNER (and, prior to ENGINEER's recommendation of final payment, also ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall play all claims, costs, losses, and damages attributable to OWNER's evaluation of and determination to accept such **defective** Work (such costs to be approved by ENGINEER as to reasonableness). If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. If the acceptance occurs after such recommendation, CONTRACTOR will pay an appropriate amount to OWNER.

OWNER May Correct Defective Work

13.14 If CONTRACTOR fails within a reasonable time after written notice from ENGINEER to correct **defective** Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.11, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph OWNER shall proceed expeditiously. In connection with such corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend CONTRACTOR's services related thereto, take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER's representatives, agents and employees, OWNER's other contractors and ENGINEER and ENGINEER's Consultants access to the site to enable OWNER to exercise the rights and remedies under this paragraph. All claims, costs, losses, and damages incurred or sustained by OWNER in exercising such rights and remedies will be charged against CONTRACTOR and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. Such claims, costs, losses, and damages will include but not be limited to all costs of repair or replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR's **defective** Work. CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies hereunder.

Article 14. Payments to Contractor and Completion

Schedule of Values

14.1 Progress payments on account of Unit Price Work will be based on the number of units completed.

Application for Progress Payment

14.2 At least twenty days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens, claims, security interests, or encumbrances and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER's interest therein, all of which will be satisfactory to OWNER. The amount of retainage with respect to progress payments will be as stipulated in the

Agreement. With each application for payment the CONTRACTOR shall submit a notarized waiver(s) of claim signed by the CONTRACTOR acceptable in form to the ENGINEER. The waiver of claim for payment for the work of the CONTRACTOR shall equal the amount of the previous payment distributed to the CONTRACTOR for work of the CONTRACTOR and the amount of the total previous payment distributed to the CONTRACTOR.

CONTRACTOR's Warranty of Title

14.3 CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

Review of Applications for Progress Payment

14.4 ENGINEER will, within ten days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER, or return the Application to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application. Ten days after presentation of the Application for Payment to OWNER with ENGINEER's recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by OWNER to CONTRACTOR.

14.5 ENGINEER's recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER's onsite observations of the executed Work as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules, that to the best of ENGINEER's knowledge, information and belief:

14.5.1 the Work has progressed to the point indicated,

14.5.2 the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.10 and to any other qualifications stated in the recommendation), and

14.5.3 the conditions precedent to CONTRACTOR's being entitled to such payment appear to have been fulfilled insofar as it is ENGINEER's responsibility to observe the Work.

However, by recommending any such payment ENGINEER will not thereby be deemed to have represented that: (i) exhaustive or continuous onsite inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents or (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

14.6 ENGINEER's recommendation of any payment, including final payment, shall not mean that ENGINEER is responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of Work, or for any failure of CONTRACTOR to perform or furnish Work in accordance with the Contract Documents.

14.7 ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make the representations to OWNER referred to in paragraph 14.5. ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

14.7.1 the Work is **defective**, or completed Work has been damaged requiring correction or replacement,

14.7.2 the Contract Price has been reduced by Written Amendment or Change Order,

14.7.3 OWNER has been required to correct **defective** Work or complete Work in accordance with paragraph 13.14, or

14.7.4 ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.3 inclusive.

In addition to the retainages set forth in the Contract Documents, the Owner may retain one hundred percent (100%) of all progress payments for any unsatisfactory performance of the Work and any payment recommended by the ENGINEER, including without limitation:

Defective work or failure to repair or replace defective work;

Claims filed against the CONTRACTOR, or reasonable evidence indicating probable filing of such claims;

Failure of the CONTRACTOR to make adequate or proper payments to subcontractors or suppliers for materials, equipment or labor;
Failure to obtain necessary permits or licenses, or to comply with applicable laws, ordinances, codes, or regulations, unless such noncompliance is due to reasons beyond the control of the CONTRACTOR, or due to act of the OWNER or and ENGINEER hired by the OWNER, or agents or employees thereof;

Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price then unpaid;

Reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

Persistent failure to carry out the Work in accordance with the Contract Documents;

As a set off for amounts due the Owner on other items;

Collusion with other bidders in preparing the bid;

Actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.7.1 through 14.7.3 or paragraphs 15.2.1 through 15.2.3, inclusive.

When the above reasons for withholding payment are removed and corrected to the OWNER's satisfaction, OWNER shall make payment to the CONTRACTOR of the sums withheld pursuant to this paragraph, subject to the amounts required to be retained by the Contract Documents.

Progress Payments to Suppliers and Subcontractors. The CONTRACTOR shall make partial payments of the amount due to each of the CONTRACTOR's suppliers and subcontractors in the same manner as the OWNER is required to pay the CONTRACTOR under Article 4 of the Agreement and Article 14 of the General Conditions, provided that the suppliers and subcontractors are performing to the CONTRACTOR's satisfaction. If the OWNER is notified that the CONTRACTOR is in arrears in payments to the CONTRACTOR's suppliers or subcontractors, the OWNER shall notify the CONTRACTOR and determine why such funds are being withheld. If the OWNER determines that no legitimate basis exists for the CONTRACTOR's withholding of such payments, the OWNER may, five (5) days after the mailing of written notice to the CONTRACTOR, make such payments directly to the CONTRACTOR's suppliers or subcontractors from funds which otherwise would be due the CONTRACTOR.

Substantial Completion

14.8 When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion, which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within fourteen days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said fourteen days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion, ENGINEER

will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

14.9 OWNER shall have the right to exclude CONTRACTOR from the Work after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

Partial Utilization

14.10 Use by OWNER at OWNER's option of any substantially completed part of the Work which: (i) has specifically been identified in the Contract Documents or (ii) OWNER, ENGINEER, and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

14.10.1 OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraphs 14.8 and 14.9 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof land access thereto.

Final Inspection

14.11 Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or **defective.** CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

Final Application for Payment

14.12 After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance required by paragraph 5.4, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) and other documents. CONTRACTOR may make application for final payment following the procedure for progress payments. The final application for payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence satisfactory to the OWNER of the continuation of completed operations insurance and any insurance coverage written on a claims-made basis at final payment and one year thereafter; (ii) the consent of surety to final payment and that the performance bond shall remain in effect throughout the guarantee period; (iii) complete and legally effective claim releases signed by all suppliers and subcontractors in the form provided in the Contract Documents certifying that all outstanding claims for payment have been paid. The CONTRACTOR shall not receive final payment due under the Agreement until the CONTRACTOR obtains and files the foregoing items (i), (ii), and (iii).

14.12.1 LIENS. Colorado Statutes do not provide for any right of lien against public buildings. In lieu thereof, §38-26-107, Colorado Revised Statutes, as amended, provides adequate relief for any claimant having furnished labor, materials, rental machinery, tools, equipment, or services toward construction of the particular public work in that final payment may not be made to a CONTRACTOR until all such creditors have been put on notice by publication of such pending payment and given opportunity to stop payment to the CONTRACTOR in the amount of such claims. Pursuant to §38-26-107, C.R.S., any supplier may bring a suit and file a notice of lis pendens against the OWNER within ninety (90) days after the date set for final settlement. If any such supplier or person files any such claim and notice of lis pendens, the OWNER shall withhold retained amounts from final payments to the CONTRACTOR as are necessary to satisfy fully such claims. References to liens appearing in Article 14 shall be deemed as references to claims made pursuant to C.R.S §38-26-101 et seq. unless the context requires otherwise.

Final Payment and Acceptance

14.13 If, on the basis of ENGINEER's observation of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application to OWNER for payment. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.15. Otherwise, ENGINEER will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application. Upon receipt of the ENGINEER's recommendation for payment and the final Application for Payment, OWNER shall order the publication of Notice of Final Payment as

required by C.R.S. §38-26-107(1) and shall make final payment in accordance with C.R.S. 38-26-107(3).

14.14 If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.1, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

Waiver of Claims

14.15 The making and acceptance of final payment will constitute:

14.15.1 a waiver of all claims by OWNER against CONTRACTOR, except claims arising from unsettled Liens, from **defective** Work appearing after final inspection pursuant to paragraph 14.11, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

14.15.2 a waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

Article 15. Suspension of Work and Termination

OWNER May Suspend Work

15.1 At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and ENGINEER, which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes an approved claim therefor as provided in Articles 11 and 12.

OWNER May Terminate

15.2 Upon the occurrence of any one or more of the following events:

15.2.1 if CONTRACTOR persistently fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.8 as adjusted from time to time pursuant to paragraph 6.6);

15.2.2 if CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;

15.2.3 if CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving CONTRACTOR (and the surety, if any,) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of CONTRACTOR, exclude CONTRACTOR from the site and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment, and machinery at the site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages sustained by OWNER arising out of or resulting from completing the Work such excess will be paid to CONTRACTOR. If such claims, costs, losses, and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses, and damages incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and when so approved by ENGINEER incorporated in a Change Order, provided that when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

15.3 Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

15.4 Upon seven days' written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Agreement. In such case, CONTRACTOR shall be paid (without duplication of any items):

15.4.1 for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

15.4.2 for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

15.4.3 for all claims, costs, losses and damages incurred in settlement of terminated contracts with Subcontractors, Suppliers and others; and

15.4.4 for reasonable expenses directly attributable to termination.

CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

CONTRACTOR May Stop Work or Terminate

15.5 If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within thirty days after it is submitted or OWNER fails for thirty days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days' written notice to OWNER and ENGINEER, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Agreement and recover from OWNER payment on the same terms as provided in paragraph 15.4. In lieu of terminating the Agreement and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within thirty days after it is submitted, or OWNER has failed for thirty days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may upon seven days' written notice to OWNER and ENGINEER stop the Work until payment of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.5 are not intended to preclude CONTRACTOR from making claim under Articles 11 and 12 for an increase in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping Work as permitted by this paragraph.

Article 16. Miscellaneous

Giving Notice

16.1 Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

Computation of Times

16.2.1 When any period of time is referred to in the Contract Documents by days, it will be computed to include the first and the last day of such period.

Notice of Claim

16.3 Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 16.3 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

Cumulative Remedies

16.4 The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees, and obligations imposed upon CONTRACTOR by paragraphs 6.12, 6.16, 6.30, 6.31, 6.32, 13.1, 13.12, 13.14, 14.3, and 15.2 and all of the rights and remedies available to OWNER and

ENGINEER thereunder, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

Professional Fees and Court Costs Included

16.5 Whenever reference is made to "claims, costs, losses, and damages," it shall include in each case, but not be limited to, all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs.

Interest

16.6 In the event that any payment of interest is to be made pursuant to any provision of the Contract Documents, excluding any bid bond, labor and materials bond or performance bond entered into by the CONTRACTOR, interest shall be paid at the average rate earned by the City of Louisville on its invested funds during the quarterly fiscal period prior to the period during which the interest was accrued.

Third Parties

16.7 The contract is not intended to create any right in or for the public or any member thereof, any subcontractor or supplier, or any other third party, or to authorize anyone not a party to the contract to maintain a suit to enforce its terms. The duties, obligations, and responsibilities of the parties to the contract, with respect to third parties, shall remain as imposed by law. This paragraph shall not apply to any surety to the extent it is acting under any labor and materials bond or performance bond entered into by the CONTRACTOR.

Severability

16.8 To the extent that the performance of the parties' obligations may be accomplished within the intent of the contract, the terms of the contract are severable, and should any term or provision of the contract be declared invalid or become inoperative for any reason, such invalidity or failure shall not affect the validity of any other contract term or provision.

Equal Opportunity Employer

16.9 The CONTRACTOR will not discriminate against any employee or applicant for employment because of race, color, religion, age, sex, disability, or national origin. The CONTRACTOR will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard for their race, color, religion, age, sex, disability, or national origin. Such action shall include but not be limited to the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment,

notice to be provided by an agency of the federal government, setting forth the provisions of the Equal Opportunity Laws.

The CONTRACTOR shall be in compliance with the appropriate areas of the Americans with Disabilities Act of 1990 as enacted and from time to time amended and any other applicable federal regulation. A signed, written certificate stating compliance with the Americans with Disabilities Act may be requested at any time during the life of any contract and with any contract entered by the OWNER.

Supplementary Conditions

CONDITIONS OF THE CONTRACT

These Supplementary Conditions amend or supplement the General Conditions of the Project Manual as indicated below. All provisions, which are not so amended or supplemented, remain in full force and effect.

1. GC-1 DEFINITIONS

A. Section 1.9.1, **CONTRACT DAY** of Article 1 of the General Conditions, delete the definition in its entirety and add the following language:

CONTRACT DAY – A calendar day of 24 hours each, excluding Saturdays, Sundays, OWNER-observed holidays and Abnormal Weather days.

B. Section 1.41, **SUBSTANTIAL COMPLETION** of Article 1 of the General Conditions, add the following language:

The Work will not be considered suitable for Substantial Completion review until all project Bid Items and incidentals in the Work are completed and operational as designed, all designated or required governmental inspections and certifications have been made and posted, designated instruction of Owner's personnel in the operation of systems has been completed, and all final finishes within the Contract are in place. In general, the only remaining work shall be minor in nature, so that the Owner could occupy the building or utilize the improvements on that date and the completion of the Work by the Contractor would not materially interfere or hamper the Owner's normal operations. As a further condition of Substantial Completion acceptance, the Contractor shall certify that all remaining "punch list" work will be completed within twenty (20) Contract Days after receipt of notification or as agreed upon following the date of issuance of Certificate of Substantial Completion.

2. GC-2 PRELIMINARY MATTERS

A. Add the following language to Section 2.3 of Article 2 of the General Conditions:

- Contractor shall not park equipment and employee vehicles on abutting side streets that can be used by residents that are directly impacted by the reconstruction.

- Construction Phasing for the project shall be as follows:

All Locations

a. Provide ingress, egress to private drives and single access developments. No additional payment will be made to provide access. All closures must be communicated to the property owners 5-days in advance of driveway closures.

No work shall be performed on the following City observed Holidays without prior authorization:

- New Year's Day
- Martin Luther King Jr. Day
- President's Day
- Memorial Day - No work after 12 PM Friday before through Monday
- Juneteenth
- Independence Day
- Labor Day – No work after 12 PM Friday before through Monday
- Veteran's Day
- Thanksgiving Day
- Day after Thanksgiving
- Christmas Eve
- Christmas Day

3. GC-4 AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS

A. Section 4.4, **REFERENCE POINTS,** of Article 4 of the General Conditions, delete the second paragraph in its entirety and add the following language:

The OWNER shall not provide survey reference points, construction stakes, lines and grade for the work unless otherwise noted.

4. GC-5 BONDS AND INSURANCE

A. Delete paragraph 5.1 in its entirety and insert the following:

5.1 CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACT-OR's obligations under the Contract Documents. These Bonds shall remain in effect at least until two years after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act. The CONTRACTOR shall furnish the performance and payment bond in the form provided in the Contract Documents or approved by the OWNER; the earlier of ten (10) days after the OWNER has issued the notice of award or delivery of the executed Agreement. The OWNER reserves the right to exclude any Surety

Company on any ground it deems appropriate. The cost of the bonds shall be included in the bid."

4. GC-6 CONTRACTOR'S RESPONSIBILITIES- Labor, Materials and Equipment

A. **Labor, Materials and Equipment**, delete paragraph 6.3 in its entirety and insert the following:

6.3 CONTRACTOR shall provide competent, suitably qualified personnel to survey, layout and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. Except as otherwise required for the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, or at night without OWNER's written consent given after prior written notice to ENGINEER. No extra payment will be paid to the CONTRACTOR by the OWNER due to labor overtime or other increased costs of performing the Work on Friday afternoons, or at night. Should the CONTRACTOR desire to work at night between the hours of 5:00 p.m. and 8:00 p.m., Monday-Thursday, from 3:30 p.m. to 8:00 p.m. Friday, the CONTRACTOR shall submit a written request to the ENGINEER 24 hours prior. If approval is given by ENGINEER to CONTRACTOR for authorized overtime work, ENGINEER's and ENGINEER's authorized personnel will charge overtime and other incidental administrative expenses necessary for performing inspections between the hours of 5:00 p. m. and 8:00 p.m., Monday-Thursday and 3:30 p.m. to 8:00 p.m. Friday, the CONTRACTOR will be responsible to pay for all such rates and charges, and shall not be granted a Contract Price increase for such charges. Overtime and other incidental administrative expenses for Engineer's and Engineer's authorized personnel are as follows:

DESCRIPTION	HOURLY RATE
Engineer	$70.00
Construction Inspector	$55.00
Operations Supervisor	$55.00
Operations Technician	$40.00
Clerical	$35.00
Vehicle	$25.00

5. GC-6 CONTRACTOR'S RESPONSIBILITIES-Permits

B. **Permits**

a. Paragraph 6.13.2, add the following language:

A deposit is required for the 2" water meter in an amount of $2500 and the deposit is reimbursed when the 2" meter is returned, in good condition. Charges for water consumption are waived when water is used for this project. Bulk Water Permit and meter are available from the City of Louisville Operations Division, located at 739 S. 104th St.

b. Paragraph 6.13.3, add the following language:

.

Right of Way Permit fee is waived for this project.

6. GC-7 OTHER WORK

A. Section 7.1 of Article 7 of the General Conditions, add the following language:

The OWNER has employed an asphalt contractor to resurface various streets. The concrete replacement work in this contract shall be completed prior to the asphalt resurfacing. Asphalt patching may take place at the same time as the concrete replacement work in the same location(s). It is critical for CONTRACTOR to maintain the phasing schedule identified in the Supplementary Conditions. CONTRACTOR shall coordinate their activities with the asphalt contractor to allow completion of concrete flatwork prior to asphalt resurfacing.

7. ARTICLE 9 ENGINEER'S STATUS DURING CONSTRUCTION

A. Section 9.3.1 **CONFERENCES AND MEETINGS** of the General Conditions, add the following language:

NEIGHBORHOOD MEETING

At least 10 days prior to the start of construction, CONTRACTOR will be required to coordinate and have a representative at a meeting with the residents of the neighborhood. CONTRACTOR is required to hand out notices to all affected residents at least 5 days prior to the meeting. A template for the notice is below. ENGINEER must review and approve the notice prior to delivery. ENGINEER shall be notified by CONTRACTOR after notices are distributed. At this meeting CONTRACTOR will be required to define the schedule for construction and to address any special needs and concerns of the residents. ENGINEER shall be present at this meeting.

Construction Notification / Neighborhood Meeting Invite

[CONTRACTOR NAME] has been contracted by the City of Louisville to perform the Storm System Maintenance Project in 2025. The intent of this work is to replace aging, cracked, broken storm system infrastructure, and clean existing storm sewer main lines effected by the Marshall Fire. This work will begin in [MONTH] and will be completed by [MONTH]

A neighborhood meeting is scheduled for [DATE] at [TIME]. The meeting will be located in the Council Chambers at City Hall at 749 Main Street. See map on back of this notice for 2025 System Maintenance Project work locations. Representatives from the City and [CONTRACTOR] will be present to discuss the project.

Topics that will be covered at the meeting will include coordination of work, and time frames.

Construction will begin at 7 AM and should be completed by 5 PM. Note that delays during the day could require the contractor to work beyond 5 PM on some days. All vehicles will need to be removed from the street by 7:00 AM if "NO PARKING" signs are on your street to allow the contractors access to the area. The "NO PARKING" signs will be placed on your street at least 24 hours prior to work beginning. When work is being performed in front of your address, the process will require that your street/driveway be closed for parking most of the day, so please make arrangements to park any vehicles you need outside the work area. Every effort will be made to have the street open by 5:00 PM.

We hope the coordination will reduce your inconvenience and allow for you to plan accordingly. We appreciate your patience as we repair the street near your address. If you have any questions or concerns or need immediate assistance, please contact [CONTRACTOR] Project Manager [NAME] at [CONTRACTOR PM PHONE NUMBER].

In the event that weather or other delays occur, we may need to reschedule the work and will attempt notify affected residents of any changes.

Attendees can request interpretation services at least 7 days in advance of the meeting (Los asistentes podrán solicitar los servicios de un intérprete con 7 días de anticipación a la fecha una reunion) by contacting Derek Cosson at dcosson@louisvilleco.gov or 303-335-4814.

8. GC-12 CHANGES OF CONTRACT TIMES

A. Section 12.2 **LIQUIDATED DAMAGES** of Article 12 of the General Conditions, add the following language:

PHASE TIMES – The work is broken into Phases as specified in the Supplementary Conditions with a specific road closure or lane closure limit, described work item with respective day limit, and Substantial Completion date for each Phase. Failure to perform the phase work described in Section 2.3 of the General Conditions will result in liquidated damages. The CONTRACTOR shall pay OWNER **ONE THOUSAND DOLLARS ($1,000.00)** for each and every **Contract Day** and portion thereof that expires after the specified road or lane closure limit days, described work item with respective day limit and Substantial Completion date until the same is finally complete.

B. Add the following language to Article 12 of the General Conditions:

12.4 EXTENSIONS OF TIME

a. The OWNER and CONTRACTOR are both aware that construction will be conducted during spring and summer and that variable weather conditions are typical for the site of the work.

b. The CONTRACTOR expressly agrees that the Contract Price is based on completion of the work within the times specified in the Agreement and under weather conditions typically encountered during the contemplated construction period at the site of the work.

c. For purposes of evaluating requests for extensions of time due to abnormal weather conditions, the following conditions, and no others, will be considered unusually severe:

   1) Precipitation volume exceeding the historical mean for the *months* of the construction period by more than one standard deviation.

   2) Isolated abnormal weather occurrences of a severely destructive nature, which in fact, cause such destruction at the site of the work.

d. For the purpose of determining mean conditions, all available data contained in the records of the National Weather Service for reporting from Denver, as well as data available from the State Climatologist for the same areas.

e. The CONTRACTOR further agrees that should a request for time extension due to abnormal weather conditions, the CONTRACTOR shall submit all necessary historical and detailed daily data during the construction period to support the claim.

9C-13 TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

A. Section 13.11, **CORRECTION OR REMOVAL OF DEFECTIVE WORK** of Article 13 of the General Conditions, add the following language:

Failure or neglect on the part of the ENGINEER to condemn unsatisfactory material or reject inferior workmanship will in no way release the CONTRACTOR, nor shall it be construed to mean the acceptance of such work, nor shall Final Acceptance bar the OWNER from recovering damages in case fraud was practiced, or for defective work resulting from the CONTRACTOR's dishonesty.

Work done contrary to or regardless of the instructions of the ENGINEER, work done without lines, grade, and/or cross section stakes and grades shown on the Plans or as given by the ENGINEER, or any deviation made from the Plans and Specifications without written authority will be considered unauthorized and at the expense of the CONTRACTOR and will not be measured or paid for by the OWNER. Any and all work so done may be ordered removed and replaced immediately at the CONTRACTOR's expense.

- END OF SECTION -

GENERAL REQUIREMENTS

SECTION 01010 – SUMMARY OF WORK

SECTION 01025 – MEASUREMENT AND PAYMENT

SECTION 01091 – REFERENCE STANDARDS

SECTION 01300 – SUBMITTALS

SECTION 01410 – TESTING AND INSPECTIONS

SECTION 01500 – TEMPORARY FACILITIES, CONTROLS, AND SERVICES

SECTION 01700 – CONTRACT CLOSEOUT

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY:

1.1.1 PROJECT NAME: 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

1.1.2 PROJECT NUMBER: 501498-660181
PROJECT LOCATION: Louisville, Colorado

1.1.3 OWNER: City of Louisville

1.1.4 WORK INCLUDED: The Work consists of the demolition, water main replacement and water service line replacement, sanitary sewer backwater preventer valve installation, concrete replacement, asphalt patching, traffic control, incidentals and work appurtenant thereto on specified streets or within public property.

Water Scope of Work:

DESCRIPTION	UNIT	QUANTITY
12'' PVC WATER MAIN CLASS 235 DR 18	LF	102
8'' PVC WATER MAIN CLASS 235 DR 18	LF	2497
REMOVE FIRE HYDRANT ASSEMBLY	EA	3
FIRE HYDRANT ASSEMBLY	EA	6
FIRE HYDRANT EXTENSION (6")	EA	6
FIRE HYDRANT EXTENSION (12")	EA	6
12" 45 DEGREE BEND	EA	2
12”-8” REDUCER	EA	1
12" SOLID SLEEVE	EA	1
12"CAP	EA	1
GATE VALVE AND BOX (8”)	EA	11
8” x 8” x 8” SWIVEL TEE	EA	6
8” x 6” x 8” SWIVEL TEE	EA	6
8'' SOLID X SWIVEL ADAPTER	EA	8
8" 11 1/4 DEGREE BEND	EA	8
8'' SOLID SLEEVE	EA	13
4" CAP	EA	9
8" CAP	EA	5
ABANDON EXISTING VALVE AND BOX	EA	8
WATER SERVICE CONNECTION 3/4'' SHORT	EA	32
WATER SERVICE CONNECTION 3/4'' LONG	EA	24
REMOVE AND REPLACE 3/4" WATER SERVICE	EA	8

REMOVE AND REPLACE 3/4" CURB STOP AND BOX	EA	8
STRUCTURE BACKFILL (COMPLETE IN PLACE)	TN	225
POTHOLING	EA	93
24" VERTICAL CURB AND GUTTER	LF	29
4” CONCRETE	SF	140
6’-0" x 6" CURBWALK	LF	20
8” CONCRETE WITH FIBERMESH	SF	610
FLOW FILL	CY	61
HOT ASPHALT PATCH GRADE SX (6'')	SY	2000
HOT ASPHALT PATCH GRADE SX (9'')	SY	122
CONSTRUCTION ZONE TRAFFIC CONTROL	LS	1

Sewer Scope of Work:

DESCRIPTION	**UNIT**	**QUANTITY**
4" BACKWATER VALVE KIT	EA	4
SCHEDULE 40 PVC PIPE (4")	LF	40
SCHEDULE 40 PVC PIPE (6")	LF	40
SANITARY SEWER SERVICE PIPE SDR 35 (4")	LF	20
STRONG BACK COUPLING (4")	EA	16
FITTINGS SDR 35 (4")	EA	15
24" VERTICAL CURB AND GUTTER	LF	20
4" CONCRETE	SF	40
HOT ASPHALT PATCH GRADE SX (6")	SY	10
CAST IRON CLEAN OUT BOX AND COVER	EA	2
LANDSCAPE RESTORATION	LS	1
CONSTRUCTION ZONE TRAFFIC CONTROL	LS	1

SECTION 01025 - MEASUREMENT AND PAYMENT

1.1 GENERAL

A. Measurement and payment criteria applicable to (portions of) the Work performed under a unit price payment method.

B. Defect assessment and non-payment for rejected work.

1.2 AUTHORITY

A. Measurement methods delineated in the individual specification sections complements the criteria of this section. (In the event of conflict, the requirements of the individual specification section govern.)

B. Take all measurements and compute quantities. ENGINEER will verify measurements and quantities.

1.3 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by ENGINEER determine payment.

B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit/lump sum prices contracted.

C. If the actual Work requires a change that is equal to an increase or decrease that is 25 percent (25%) or more of the Bid Price, then OWNER or CONTRACTOR may claim for a Contract Price adjustment.

D. The City reserves the right to remove work from the Contract. If an item is removed from the contract, no payment will be made for said item.

1.3.1 LUMP SUM SCHEDULES

A. There will be no measurement for lump sum items included in the lump sum schedule.

1.3.2 FORCE ACCOUNT – MINOR CONTRACT REVISIONS

A. Force account items include the Project Manager's estimate for items included in the Contract. The estimated amounts marked with "AL" will be added to the total bid to determine the amount of performance and payment bonds. Force Account work shall be performed as directed and approved by the City's Project Manager. This is not a lump sum bid item, but rather an allowance for work not reasonably anticipated in the above items.

B. Payment will be made in accordance with the General Conditions. If additional work as described above is not encountered, this item will not be used.

C. Force Account Descriptions

i. F/A Minor Contract Revisions – This work consists of minor work and approved by the Project Manager, which is not included in the Contract drawings or specifications, and is necessary to accomplish the scope of work of this contract.

1.4 MEASUREMENT OF QUANTITIES

A. Measurement by volume: Measured by cubic dimension using mean length, width, and height or thickness.

B. Measurement by area: Measured by square dimension, using mean length and width or radius.

C. Linear measurement: Measured by linear dimension, at the item centerline or mean chord.

D. Measurement by weight: The term “ton” will mean the short ton consisting of 2000 pounds avoirdupois.

Materials measured or proportioned by weight shall be weighed on accurate scales. Scales shall be accurate within the allowable tolerances as prescribed by State law. The scales shall be sealed by the measurement Standards Section of the Colorado Department of Agriculture at least once each year, each time the scales are relocated, and as often as ENGINEER may deem necessary. Scales shall be furnished by CONTRACTOR or CONTRACTOR may utilize commercial scales.

Scales shall be operated according to the Colorado Department of Agriculture’s regulations. Weighers, scales, scale tickets, scale house, and verification of the scale’s accuracy will not be measured and paid for separately but shall be included in the work.

CONTRACTOR may use either certified hopper scales or certified platform scales.

When platform scales are used to weigh vehicles carrying material paid for by weight, each vehicle shall be weighed by a certified weigher. Hopper scales used to directly measure material paid for by weight shall be operated by certified weighers and provide an accurate net weight.

The operator of each vehicle carrying material measured and paid for by weight shall obtain a scale ticket (certificate of correct weight) from the certified weigher and deliver the ticket to ENGINEER at the point of delivery of the material.

The scale ticket shall include the following information:

1. Project Number
2. Date
3. Ticket Number

4. Haul Unit Number
5. Gross weight
6. Tare Weight
7. Net Weight
8. Material Type
9. Certified Weigher's Name

1.5 PAYMENT

A. Payment includes: Full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

B. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by ENGINEER multiplied by the unit price for Work which is incorporated in or made necessary by the Work.

1.6 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

1.7 NON-PAYMENT FOR REJECTED PRODUCTS

A. Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected Products.

2.0 PRODUCTS - Not Used

3.0 EXECUTION - Not Used

SECTION 01091 - REFERENCE STANDARDS

PART 1 - SUMMARY

1.1 SUMMARY:

1.1.1 WORK INCLUDED:

A. This Section contains a summary of industry-accepted and recognized standards published by trade associations, government, and institutional organizations, which are referred to in the various sections of these specifications or elsewhere in the Contract Documents.

B. Standards listed herein are included in the Contract Documents by this reference, and become a part of the Contract Documents to the same extent as though included in their entirety unless specific limitations are noted in the individual Specifications Sections.

C. Listings of reference standards include name and address of the organization publishing the standard, plus the full name and designator of each of the standards referenced herein.

D. If a publication date or edition number is listed with the reference standard, that publication date or edition number shall apply; otherwise, the publication date of edition number in effect at the Contract Date shall apply.

E. Inclusion of reference standards herein does not make the Engineer an agent of the publishing agency, nor does it obligate the Engineer to perform inspections required by or enforce rules or regulations contained in the reference standards.

1.2 REFERENCES:

1.2.1 RELATED DOCUMENTS: General Conditions, Supplementary Conditions, and applicable provisions of other Division 1 sections apply to this section.

1.2.2 PRECEDENCE OF REQUIREMENTS: In the event of a conflict between the requirements of a published reference standard and the specific requirements of the general conditions, supplementary conditions, or other Contract Documents, or between one reference standard and another reference standard, the more stringent requirements shall take precedence.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1.1 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

444 North Capital Street NW, Suite 225, Washington, DC 2002

M103 -- Mild to medium strength carbon-steel castings for general application

M105 -- Gray iron castings
M111 -- Zinc (Hot-Galvanized) coatings on products fabricated from rolled, pressed, and forged steel shapes, plates, bar, and strip
M183 -- Structural steel
T166 -- Bulk specific gravity of compacted bituminous mixtures

3.1.2 AMERICAN CONCRETE INSTITUTE (ACI)

P.O. Box 19150, Redford Station, Detroit, MI 48219
(313) 372-9800

ACI 211.1 -- Standard practice for selecting proportions for normal, heavyweight, and mass concrete
ACI 211.2 -- Standard practice for selecting proportions for structural lightweight concrete
ACI 301 -- Specifications for structural concrete for buildings
ACI 304 -- Recommended practice for measuring, mixing, transporting, and placing concrete
ACI 304.2R -- Placing concrete by pumping methods
ACI 305R -- Hot weather concreting
ACI 306R -- Cold weather concreting
ACI 315 -- Details and detailing of concrete reinforcement
ACI 318 -- Building codes requirements for reinforced concrete
Note: Reference to ACI 318 may be limited by more stringent requirements of local building code
ACI 347 -- Recommended practice for concrete formwork
ACI SP-66 -- ACI detailing manual (synopsis)

3.1.3 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

1916 Race Street, Philadelphia, PA 19103
(215) 299-5585

ASTM A27 -- Specification for steel castings, carbon, for general application
ASTM A36 -- Standard specification for structural steel
ASTM A48 -- Specification for gray iron castings
ASTM A53 -- Specification for pipe, steel, black and hot-dipped, zinc-coated, welded and seamless
ASTM A82 -- Specifications for steel wire, plain, for concrete reinforcement.
ASTM A120 -- Specification for pipe, steel, black and hot-dipped zinc-coated (galvanized) welded and seamless, for ordinary uses
ASTM A123 -- Specification for zinc (hot dipped-galvanized) coatings on iron and steel products
ASTM A185 -- Specifications for steel welded wire, fabric, plain, for concrete reinforcement
ASTM A283 -- Specification for low and intermediate tensile strength carbon steel plates, shapes, and bars
ASTM A307 -- Specification for carbon steel externally threaded standard fasteners
ASTM A325 -- Specification for high-strength bolts for structural steel joints
ASTM A366 -- Specification for steel, carbon, cold-rolled sheet, commercial quality
ASTM A416 -- Specification for uncoated seven-wire stress-relieved steel strand for pre-stressed concrete
ASTM A421 -- Specification for uncoated stress-relieved wire for pre-stressed concrete

ASTM A446 -- Specification for steel sheet, zinc-coated (galvanized) by the hot-dip process, structural (physical) quality
ASTM A490 -- Specification for heat-treated, steel structural bolts, 150 ksi (1035 map) tensile strength
ASTM A500 -- Specification for cold-formed welded and seamless carbon steel structural tubing in rounds and shapes
ASTM A501 -- Specification for hot-formed welded and seamless carbon steel structural tubing
ASTM A525 -- Specification for general requirements for steel sheet, zinc-coated (galvanized) by the hot-dip process
ASTM A526 -- Specification for sheet steel, zinc-coated (galvanized) by the hot-dip process, commercial quality
ASTM A536 -- Specification for ductile iron castings
ASTM A568 -- Specification for general requirements for steel, carbon, and high-strength, low-alloy hot-rolled sheet and cold-rolled sheet
ASTM A570 -- Specification for hot-rolled carbon steel sheet and strip, structural quality
ASTM A572 -- Specification for high-strength low-alloy columbium-vanadium steels of structural quality
ASTM A588 -- Specification for high-strength low-alloy structural steel with 50 ksi (345MPa) minimum yield point to 4 inches thick
ASTM A611 -- Specification for steel, cold-rolled sheet, carbon, structural
ASTM A615 -- Specification for deformed and plain billet-steel bars for concrete reinforcement
ASTM A663 -- Specification for steel bars, carbon, merchant quality, mechanical properties
ASTM A775 -- Specification for epoxy-coated reinforcing steel bars
ASTM B32 -- Specification for solder metal
ASTM B88 -- Specification for seamless copper water tube
ASTM B209 -- Specification for aluminum and aluminum-alloy sheet and plate
ASTM B221 -- Specification for aluminum-alloy extruded bars, rods, wire, shapes, and tubes
ASTM C31 -- Methods of making and curing concrete test specimens in the field
ASTM C33 -- Specification for concrete aggregates
ASTM C36 -- Specification for gypsum wall board
ASTM C39 -- Test method for compressive strength of cylindrical concrete specimens
ASTM C42 -- Method of obtaining and testing drilled cores and sawed beams of concrete
ASTM C67 -- Method of testing brick and structural clay tile
ASTM C76 -- Specification for reinforced concrete culvert, storm drain, and sewer pipe
ASTM C79 -- Test method for gypsum sheathing board
ASTM C94 -- Specification for ready mixed concrete
ASTM C109 -- Test method for compressive strength of hydraulic cement mortars (using 2-inch or 50 mm cube specimens)
ASTM C110 -- Methods for physical testing of quicklime, hydrated lime, and limestone
ASTM C136 -- Method for sieve analysis of fine and coarse aggregates
ASTM C138 -- Test method for unit weight, yield, and air content (gravimetric) of concrete
ASTM C140 -- Method of sampling and testing concrete masonry units
ASTM C143 -- Test method for slump or Portland cement concrete
ASTM C144 -- Specification for aggregate for masonry mortar
ASTM C150 -- Specification for Portland cement

ASTM C171 -- Specification for sheet materials for curing concrete
ASTM C172 -- Method of sampling fresh concrete
ASTM C173 -- Test method for air content of freshly mixed concrete by the volumetric method
ASTM C207 -- Specification for hydrated lime for masonry purposes
ASTM C231 -- Test method for a content of freshly mixed concrete by the pressure method
ASTM C260 -- Specification for air entraining admixtures for concrete
ASTM C270 -- Specification for mortar for unit masonry
ASTM C309 -- Specification for liquid membrane-forming compounds for curing concrete
ASTM C330 -- Specification for lightweight aggregated for structural concrete
ASTM C425 -- Specification for compression joints for vitrified clay pipe and fittings
ASTM C476 -- Specification for grout for masonry
ASTM C478 -- Specification for precast reinforced concrete manhole sections
ASTM C494 -- Specification for chemical admixtures for concrete
ASTM C506 -- Specification for reinforced concrete arch culvert, storm drain, and sewer pipe
ASTM C507 -- Specification for reinforced concrete elliptical culvert, storm drain, or sewer pipe
ASTM C578 -- Specification for performed, cellular polystyrene thermal insulation
ASTM C612 -- Specification for mineral fiber block and board thermal insulation
ASTM C630 -- Specification of water-resistant gypsum backing board
ASTM C641 -- Test method for staining materials in lightweight concrete aggregates
ASTM C645 -- Specification for non-load (axial) bearing steel studs, runners (track), and furring channels for screw application of gypsum board
ASTM C665 -- Specification for mineral fiber blanket thermal insulation for light frame construction and manufactured housing
ASTM C672 -- Test method for scaling resistance of concrete surfaces exposed to deicing chemicals
ASTM C700 -- Specification for vitrified clay pipe, extra strength, standard strength, and perforated
ASTM C726 -- Specification for mineral fiber and mineral fiber, rigid cellular, polyurethane composite roof insulation board
ASTM C803 -- Test method for penetration resistance of hardened concrete
ASTM C805 -- Test method for rebound number of hardened concrete
ASTM C828 -- Recommended practice for low-pressure air test of vitrified clay pipe lines
ASTM C834 -- Specification for latex sealing compounds
ASTM C920 -- Specification for elastomeric joint sealants
ASTM C936 -- Specification for solid concrete interlocking paving units
ASTM D41 -- Specification for asphalt primer used in roofing and waterproofing
ASTM D312 -- Specification for asphalt used in roofing
ASTM D422 -- Test method for particle size analysis of soils
ASTM D448 -- Specification for standard sizes of coarse aggregate for highway construction
ASTM D698 -- Test method for moisture density relations of soils and soil-aggregate mixtures using 5.5-lb rammer and 12-inch drop
ASTM D1188 -- Test method for bulk specific gravity and density of compacted bituminous mixtures using paraffin-coated specimens

ASTM D1227 -- Specification for emulsified asphalt used as a protective coating for built-up roofing
ASTM D1556 -- Test method for density of soil in place by the sand-cone method
ASTM D1557 -- Method for moisture density relations of soils and soil-aggregate mixtures using 10-lb rammer and 18-inch drop
ASTM D1559 -- Test method for resistance to plastic flow of bituminous mixtures using marshal apparatus
ASTM D1667 -- Specification for flexible cellular materials - vinyl chloride polymers and copolymers (closed-cell vinyl)
ASTM D1751 -- Specification for preformed expansion joint fillers for concrete paving and structural construction (non-extruding and resilient bituminous types)
ASTM D1752 -- Specification for preformed sponge rubber and cork expansion joint fillers for concrete paving and structural construction
ASTM D1784 -- Specification for rigid poly (vinyl chloride) (PVC) compounds and chlorinated poly (vinyl chloride) (CPVC) compounds
ASTM D1785 -- Specification for poly (vinyl chloride) (PVC) pipe, schedules 40, 80, and 120
ASTM D2000 -- Classification for rubber products in automotive applications
ASTM D2167 -- Test method for density of soil in place by the rubber-balloon method
ASTM D2172 -- Test method for quantitative extraction of bitumen from bituminous paving mixtures
ASTM D2178 -- Specification for asphalt glass (felt) used in roofing and waterproofing
ASTM D2216 -- Method for laboratory determination of water (moisture) content of soil, rock, and soil-aggregate mixtures
ASTM D2241 -- Specification for poly (vinyl chloride) (PVC) plastic pipe (SDR-PR)
ASTM D2287 -- Specification for nonrigid vinyl chloride polymer and copolymer molding and extrusion compounds
ASTM D2487 -- Test method for classification of soils for engineering purposes
ASTM D2564 -- Specification for solvent cements for poly (vinyl chloride) (PVC) plastic pipe and fittings
ASTM D2729 -- Specification for poly (vinyl chloride) (PVC) sewer pipe and fittings
ASTM D2855 -- Recommended practice for making solvent cemented joints with poly (vinyl chloride) (PVC) pipe and fittings
ASTM D2898 -- Accelerated weathering of fire-retardant-treated wood for fire testing
ASTM D2922 -- Test method for density of soil and soil-aggregate in place by nuclear method
ASTM D2950 -- Test method for density of bituminous concrete in place by nuclear method
ASTM D3017 -- Test method for moisture content of soil and soil-aggregate in place by nuclear methods (shallow depth)
ASTM D3034 -- Specification for type PSM poly (vinyl chloride) (PVC) sewer pipe and fittings
ASTM D3909 -- Specification for asphalt roll roofing (glass mat) surfaced with mineral granules
ASTM D4253 -- Test method for maximum index density of soils using a vibratory table

ASTM D4254 -- Test methods for minimum index density of soils and calculation of relative density
ASTM D4318 -- Test method for liquid limit, plastic limit, plasticity index of soils
ASTM D4397 -- Specification for polyethylene sheeting for construction, industrial, and agricultural applications
ASTM E84 -- Test method for surface burning characteristics of building materials
ASTM E96 -- Test methods for water vapor transmission of materials
ASTM E136 -- Test method for behavior of materials in a vertical tube furnace at 750°C
ASTM E283 -- Test method for rate of air leakage through exterior windows, curtain walls, and doors
ASTM E329 -- Recommended practice for inspection and testing agencies for concrete, steel, and bituminous materials as used in construction
ASTM E331 -- Test method for water penetration of exterior windows, curtain walls, and doors by uniform static air pressure difference
ASTM E605 -- Test method for thickness and density of sprayed fire-resistive material applied to structural members
ASTM E759 -- Test method for effect of deflection of sprayed fire-resistive material applied to structural members
ASTM E760 -- Test method for effect of impact on bonding of sprayed fire-resistive material applied to structural members
ASTM E761 -- Test method for compressive strength of sprayed fire-resistive material applied to structural members
ASTM E859 -- Test method for air erosion of sprayed fire-resistive material applied to structural members
ASTM F567 -- Practice for installation of chain link fence
ASTM F679 -- Specification for poly (vinyl chloride) (PVC) large diameter plastic gravity sewer pipe and fittings

3.1.4 AMERICAN WATER WORKS ASSOCIATION (AWWA)

6666 W. Quincy Ave., Denver, CO 80235
(303) 794-7711

Specifications and Test Methods Specifically Referenced Herein.

3.1.5 PORTLAND CEMENT ASSOCIATION (PCA)

5420 Old Orchard Road, Skokie, IL 60077
(312) 966-6200

Design and Control of Concrete Admixtures.

3.1.6 CITY OF LOUISVILLE

Department of Public Works - Engineering Division
749 Main Street, Louisville, Colorado 80027
(303) 335-4608

Design and Construction Standards, 1994 Edition

3.1.7 COLORADO DEPARTMENT OF TRANSPORTATION (CDOT)

4201 E. Arkansas Avenue, Denver, CO 80222
(303) 757-9011

Standard Specification for Road and Bridge Construction, current Edition.

- END OF SECTION -

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY:

1.1.1 WORK INCLUDED:

A. This section contains a summary of submittals required by the Contract Documents, and establishes the general procedures and requirements for submittals.

B. Submittals covered under this section include, but are not necessarily limited to, schedules, notifications, reports, product data, shop drawings, samples, and miscellaneous data specifically prepared for the work by CONTRACTOR or any subcontractor, manufacturer, or supplier, to illustrate some portion of the work.

1.1.2 RELATED WORK: Specific requirements for submittals are included in the individual specification sections.

1.2 REFERENCES:

1 .2.1 RELATED DOCUMENTS: General conditions, supplementary conditions, and applicable provisions of Division 1 sections apply to this section.

1.3 DEFINITIONS:

1 .3.1 PRODUCT DATA: As used herein, the term "product data" includes standard printed information published by the manufacturer describing materials, products, systems, and installation instruction not specifically prepared for this project, other than designation of selections from among available choices printed.

1.3.2 SHOP DRAWINGS: As used herein, the term "shop drawings" includes specially prepared technical data forms including drawings, diagrams, performance curves, data sheets, schedules templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for application to more than one project. Supplier's standard component drawings may be submitted if they clearly show the exact items required for the work, in context with adjacent materials and with such relationships clearly shown. Shop drawings are not part of Contract Documents.

1 .3.3 SAMPLES: As used herein, the term "samples" includes fabricated and unfabricated physical examples of materials, products, and units of work; as complete units or smaller portions of units of work; either for limited visual inspection or, where in indicated, for more detailed testing and analysis.

1.3.4 MOCK-UPS: As used herein, the term "mock-ups" means special on-site of off-site forms of samples, which are too large or otherwise inconvenient for handling in transmittal or submittal form.

1.3.5 MISCELLANEOUS DATA: As used herein, the term "miscellaneous data" means various documents related directly to the work, including project notifications, photographs, survey data and reports, physical work records, statements of applicability, copies of certificates, bonds, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operation and maintenance materials, overrun stock, security/protection/safety keys, and similar information, devices, materials, which are applicable to the work but not processed as shop drawings, product data, or samples.

1.4 QUALITY ASSURANCE:

1.4.1 GENERAL

A. No extension of time will be granted, nor will consideration be given to claims arising out of CONTRACTOR's failure to submit shop drawings, product data, samples, or related submittals which do not allow adequate lead time for Engineer's review, and also do not allow ample time for revision, resubmission, and subsequent review by Engineer as required.

1.4.2 PERFORMANCE: Promptly check each submittal for accuracy, completeness, and applicability, and review, approve, and submit - in sequence according to the submittal schedule so as to cause no delay in the work or in the work of the OWNER or any separate Contractor - all submittals required by the Contract Documents. Identify each submittal to include name of project, specification section, supplier, source, finish, and location of use in the project.

1.4.3 VERIFICATION:

A. By making a submittal to ENGINEER, CONTRACTOR represents that he has approved such submittals and has determined and verified:

1. The applicability of the submittal to the project,
2. all quantities and sizes of materials, detailed fabricating dimensions, temporary erection connections or closures, tolerances and the proper fit and mating with adjacent materials,
3. related field measurements and field construction criteria, and
4. information pertaining to fabrication process and techniques of construction and erection.

B. CONTRACTOR further represents that he has checked and coordinated information contained within such submittal with requirements of the work and of the Contract Documents.

1.4.4 RESPONSIBILITY: CONTRACTOR shall not be relieved of responsibility for any deviation from requirements of the Contract Documents by ENGINEER review of submittals, unless CONTRACTOR has specifically informed ENGINEER in writing of such deviation at the time of submission, and ENGINEER has taken no written exception to the specific deviation. CONTRACTOR shall not be relieved from responsibility for errors or omissions in submittals by ENGINEER's review of or action upon such submittals.

1.4.5 SUBMITTAL VALIDITY: Submittals submitted which are not required to be submitted or are submitted without CONTRACTOR's approval will not be processed by ENGINEER,

but will be returned to CONTRACTOR for his compliance with Contract Document requirements, in which event it shall be deemed that CONTRACTOR has not complied with requirements of the Contract Documents, and CONTRACTOR shall bear responsibility for all delays as if no submittals had been submitted.

1.4.6 COMMENCEMENT OF WORK: No portion of the work requiring submittals shall be commenced until submittals have been acted on by ENGINEER. All such portions of the work shall be in accordance with appropriate, required submittals. **All submittals shall be submitted to ENGINEER prior to commencement of project construction**.

1.5 GENERAL SUBMITTAL REQUIREMENTS:

1.5.1 SCHEDULING: Where appropriate in various required administrative submittals (listing of products, manufacturers, suppliers, subcontractors, and in the progress schedule), show principal work-related submittal requirements and time schedules for coordination and integration of submittal activity with related work.

1.5.2 COORDINATION AND SEQUENCING: Coordinate preparation and processing of submittals with performance of work so that the work will not be delayed by submittals. Coordinate and sequence different categories of submittals for the same work, and for interfacing units of work, so that one will not be delayed by coordination with another. No extension of time will be allowed because of failure to properly coordinate and sequence submittals.

1.5.3 PREPARATION OF SUBMITTALS: Provide permanent marking on each submittal to identify project, date, Contractor, subcontractor, submittal name, applicable specification section, and similar information to distinguish it from other submittals. Show evidence of CONTRACTOR’s review by clearly exhibiting check marks and stamped approval marking acceptance and provide space for ENGINEER’s and ENGINEER’s consultant's review or action marking. Package each submittal appropriately for transmittal and handling.

1.5.4 SPECIFIC CATEGORY SUBMITTAL REQUIREMENTS: Except as otherwise indicated in individual specifications sections, comply with general requirements specified herein for each indicated submittal category. Furnish and process intermediate submittals, where required between initial and final, similar to initial submittals(s).

1.5.5 PROGRESS SCHEDULE: Refer to supplementary conditions for progress schedule requirements.

1.5.6 DAILY REPORTS: Furnish copies of each daily report prepared by CONTRACTOR’s Project Superintendent to ENGINEER and the OWNER. Transmit reports on a daily basis.

1.5.7 SHOP DRAWINGS:

A. Furnish newly-prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated), with name of preparer (firm name) indicated thereon. Affix seal of Contractor's or fabricator's design engineer where applicable. Show all dimensions, and note which are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards, and special coordination requirements.

B. Where shop drawings are normally required, and where specifically called for in the specifications, submit to ENGINEER four (4) blueline or blackline prints of each shop drawing and/or schedule required. Two prints will be returned.

C. Subsequent submittal(s), if required for correction or confirmation of corrective items, shall be same as initial submittal except as otherwise requested by ENGINEER or specified in conditions of the contract.

D. Shop drawings and schedules will be reviewed for general conformance with the design concept contained within the Contract Documents.

E. Do not allow shop drawing copies into field without appropriate final markings by ENGINEER.

1.5.8 PRODUCT DATA:

A. Collect required data into one submittal for each unit of work or system. Mark each copy in a legible and reproducible manner to show which choices and options are applicable to the project; "highlighting" with colored markers not acceptable. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements.

B. Do not submit product data, or allow its use on the project, until compliance with requirements of Contract Documents has been confirmed by CONTRACTOR. Submittals of product data are for information and record, unless otherwise indicated.

C. The initial submittal will be the only submittal required unless returned promptly by ENGINEER, marked with an action which indicated an observed noncompliance. Submit 4 copies, each marked or labeled with project name, date, Contractor, subcontractor, submittal name, applicable specification section, and similar information to distinguish it from other submittals. Provide sufficient space for ENGINEER’s action stamp. ENGINEER will retain two copies for himself and return the rest.

D. Do not proceed with installation of materials, products, or systems, until a copy of applicable product data is in the possession of the installer.

E. Maintain one set of product data for each submittal at the project site.

1.5.9 PUBLISHED STANDARDS: Where submittal of published standards is required, except where specified integrally with "Product Data" submittals, submit a single copy for ENGINEER’s use. Where workmanship at the project site and elsewhere is governed by published standards, furnish additional copies to fabricators, installers, and others involved in performance of the work.

1.5.10 CONSTRUCTION PHOTOGRAPHS: Unless otherwise provided in the Contract Documents, OWNER will arrange and pay for construction photographs, and/or videotapes.

PART 2- PRODUCTS - (Not Used)
PART 3 - EXECUTION

3.1 SCHEDULES:

3.1.1 SUBMITTAL SCHEDULE: The following scheduled is included as a checklist for convenience only, and may not include all submittals required. Failure to include submittals in this schedule does not relieve CONTRACTOR from providing submittals if required by individual specification sections.

General Requirements		
Section	Title	Submittals Required
1410	Testing and Inspections	N/A - City to provide Testing Services
1010	Notifications	• Door Hanger • Neighborhood Meeting Letter, • Plan for Notifying Trash and Bus companies.
1010	Photos/Videos	• Existing photos and videos of areas adjacent to concrete work prior to beginning work.
1700	Contract Closeout	Record documents, Certificates of Compliance, Certificates of Inspection, Warranties, Guaranties, Bonds, Insurance Certificates, Consent of Surety, Releases of Liens, List of subcontractors and suppliers Acknowledgment of date of commencement of warranties and guaranties
Technical Specifications		
Section	Title	Submittals Required
2000	PIPELINE EXCAVATION, BEDDING AND COMPACTION	Product Data, Samples, Gradation
2100	WATER MAIN REPLACEMENT	Product Data, Shop Drawings, Test Reports, Certificates, Resident-Business Notification,
2200	SANITARY SEWER REPLACEMENT	Product Data, Test Reports, Certificates of Compliance.

2400	CONCRETE	Product data, Concrete Mix Designs, Test Reports, Certificates of Compliance
2500	ASPHALT	Mix Design Certificates of Compliance, Product Data, Test Reports
2600	CONSTRUCTION ZONE TRAFFIC CONTROL	Traffic Control Plan, Method for Handling Traffic (MHT)
2800	LANDSCAPE RESTORATION	Product Data

- END OF SECTION-

SECTION 01410 - TESTING AND INSPECTIONS

PART 1 - SUMMARY:

1.1.1 WORK INCLUDED:

A. This section defines the responsibilities of the various agencies or parties performing testing and inspection services as specified herein or required by the Contract Documents.

B. Quality assurance testing and inspections will be provided by an independent testing and inspections agency selected and paid for by OWNER.

C. Cooperate with the selected testing and inspections agency and all others who may be responsible for testing and inspection of the work.

1.1.2 RELATED WORK: Specific testing and inspection requirements are described in the various sections of these specifications. Failure to list specific testing or inspection requirements does not relieve CONTRACTOR from providing all tests, which are indicated to be his responsibility, or from cooperating with the testing and inspections agency.

1.1.3 LIMITATION OF AUTHORITY: The testing and inspections agency is not authorized to release, revoke, or alter the requirements of the Contract Documents, or to approve or accept any portion of the work without ENGINEER's written consent.

1.2 REFERENCES:

1.2.1 RELATED DOCUMENTS: General conditions, supplementary conditions, and applicable provisions of other Division 1 Sections apply to this Section.

1.2.2 REFERENCE STANDARDS: Comply with the requirements of all reference standards, codes, ordinances, rules, and regulations contained in the various sections of these specifications, except where more stringent requirements are listed herein or otherwise required by the Contract Documents. A complete listing of applicable reference standards, including full name of publishing agency and date or number is contained in section 01091.

1.3 DEFINITIONS:

1.3.1 QUALITY ASSURANCE TESTS AND INSPECTIONS: All tests and inspections specified herein or elsewhere in the Contract Documents which are performed by an independent testing and inspections agency to determine compliance of materials, products, equipment, or completed work with the requirements of the Contract Documents.

1.3.2 CODE COMPLIANCE TESTS AND INSPECTIONS: Mandatory tests or inspections required by codes or ordinances, or other authorities having jurisdiction over the work.

1.3.3 CONTRACTOR'S CONVENIENCE TESTS AND INSPECTIONS: Tests or inspections informed exclusively for the CONTRACTOR's convenience or information.

1.3.4 RE-TESTING: Subsequent testing or inspections of the work or any portion of the work for which initial testing has indicated non-compliance with the Contract Documents or with applicable codes, ordinances, rules, and regulations.

1.4 SUBMITTALS:

1.4.1 TEST AND INSPECTION REPORTS: Copies of all test and inspection reports will be promptly delivered by the testing and inspections agency directly to OWNER and ENGINEER.

1.5 PAYMENT FOR TESTS AND INSPECTIONS:

1.5.1 INITIAL QUALITY ASSURANCE TESTS AND INSPECTIONS: Paid for by OWNER.

1.5.2 CODE COMPLIANCE TESTS AND INSPECTION: Paid for by CONTRACTOR**.**

1.5.3 CONTRACTOR'S CONVENIENCE TESTS AND INSPECTIONS: Paid for by CONTRACTOR.

1.5.4 ADDITIONAL OR ALTERNATIVE TESTS AND INSPECTIONS: Paid for by OWNER if the materials or work tested is found to be in compliance with the Contract Documents; otherwise paid for by CONTRACTOR.

1.5.5 RE-TESTING: Paid for by CONTRACTOR.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 COOPERATION WITH TESTING AND INSPECTIONS AGENCY:

3.1.1 ACCESS TO THE WORK: Representatives of the testing and inspections agency or other legally constituted testing or inspections personnel shall have unrestricted access to the site and all other locations where the work is in progress, including borrow pits, batch plants, material yards, or other locations where materials are being obtained, fabricated, or stored.

3.1.2 FACILITIES FOR TESTING: Provide all necessary facilities required for testing and inspecting the work, including but not limited to, lifts, and suitable safe storage areas for freshly poured concrete test cylinders.

3.1.3 NOTIFICATION: Notify ENGINEER not less than forty-eight (48) hours prior to tentative date or time when testing and inspection services will be required. Re-confirm date and time not less than twenty-four (24) hours prior to time when such services will be required. ENGINEER will schedule testing and inspection agency.

3.2 TEST AND INSPECTION PROCEDURES:

3.2.1 GENERAL: Gathering of specimens or samples, measuring, and testing of all materials, products, or other work shall be performed according to the procedures of the referenced standard test method.

3.2.2 TAKING SPECIMENS: Unless otherwise indicated, all specimens and samples for testing will be taken by the testing and inspections agency personnel, either at the source of the material or at the site for work in progress.

3.2.3 DELIVERY OF SPECIMENS: Unless otherwise indicated, pick-up and delivery of specimens or samples to the testing and inspections agency's laboratory will be done by the agency's personnel. This includes concrete test cylinders, which have been stored on site for the initial curing period.

3.2.4 RE-TESTING: When initial tests or inspections indicate non-compliance of the work or any portion thereof, the non-complying portion shall be removed, replaced, or reworked (re-compacted in the case of subgrade, fill, or backfill material), and re-tested by the same agency performing the initial test or inspection. Do not proceed with additional work until the non-complying work has re-tested and found to be in compliance.

3.2.5 ADDITIONAL OR ALTERNATIVE TESTS:

A. OWNER and ENGINEER reserve the right to require additional or alternative tests or inspections of materials or work for which either has reason to believe may not be in compliance with the requirements of the Contract Documents.

B Examples of such additional tests may include, but are not limited to, additional sieve analysis of aggregates or granular fill material; additional field density tests of subgrade, fill, or backfill materials; additional slump tests of concrete as it is being placed; core tests of in-place structural concrete; load testing of concrete structures; x-ray or other non-destructive testing of structural steel; and field-cut test strips of membrane roofing.

C. Payment for additional or alternative tests will be determined as provided herein above.

3.3 SCHEDULES:

3.3.1 SCHEDULE OF QUALITY CONTROL TESTS AND INSPECTIONS:

A. The following schedule is included for information only, as a convenience to CONTRACTOR, and is not intended to limit the number and type of tests to be performed by the testing and inspections agency.

B. Carefully examine the individual sections of these specifications for additional or complete quality control testing and inspections requirements. Failure to include any test or inspection in this schedule does not relieve CONTRACTOR from the testing and inspection requirements contained in the individual sections of the specifications.

C. This schedule includes quality control tests and inspections only, which will be performed by the selected testing and inspections agency and paid for as previously mentioned in Article 13 of the General Conditions. Code compliance tests and inspections, Contractor's convenience tests and inspections, and additional or alternative tests and inspections requested by the City are not included.

Section	Description of Test or Inspection	Test Qty/Interval
Earthwork	Fill and Backfill Material (Lab): Moisture Content – ASTM D2216	1 each test/soil type

	Max. Index Density – ASTM D4253 Moisture/Density Rel. – ASTM D698 or ASTM D1557 Plasticity Index – ASTM D4318 Particle Size Analysis – ASTM D422 Field Density Tests – ASTM D1556, D2167, or D2922 Field Moisture Tests – ASTM D3017 Subgrade: Fill, Bldg., and Paved Areas: Backfill: Site and Misc. Fills:	 One/500 sf One/500 sf per lift One/250 sf/2 ft vert. One/500 sf/1 ft vert.
Utilities	Bedding Material (Lab): Particle Size Analysis – ASTM D422 Backfill Material (Lab): Moisture/Density Relation – ASTM D698 or D1557 Field Density Tests – ASTM D1556, D2167, or D2922 Field Moisture Tests – ASTM D3017:	1/soil type 1/soil type One/150 lf @ trench bottom at 2 ft vert. intervals, and at top
Paving	Asphalt Content – ASTM D2172 Asphalt Gradation – ASTM C136 Bulk Specific Gravity – ASTM D1188 AASHTO T166 Marshall Test – ASTM D1559	One each/500 tons, min. 2/day
Concrete	Concrete Quality: Fresh Concrete – ASTM C172 Compressive Strength – ASTM C39 Unit Weight – ASTM C138 Slump – ASTM C142 Air Content – ASTM C173 or C231 Hardened Concrete (failings only): ASTM C42, C803, C805, or load tests	One each/50 CY or major fraction thereof; min. 1/pour One each/truck As determined by ENGINEER

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY:

1.1.1 WORK INCLUDED: Provide temporary utilities and miscellaneous temporary facilities required during construction, including installation, maintenance, and removal upon completion of the work.

1.2 REFERENCES:

1.2.1 RELATED DOCUMENTS:

A. General conditions, supplementary conditions, and applicable provisions of other Division 1 sections apply to this section.

B. Section 02600 Construction Zone Traffic Control.

PART 2 - PRODUCTS

2.1 TEMPORARY CONSTRUCTION FACILITIES:

2.1.1 STORAGE STRUCTURES: Provide enclosed, weather tight storage facilities for materials and equipment, which require protection from the elements.

2.1.2 SANITARY FACILITIES:

A. Provide temporary toilet facilities for duration of work, for use by any and all employees engaged in the work. Comply with requirements of applicable codes, regulations, laws, and ordinances.

B. **ENGINEER shall approve locations of all temporary toilet facilities for the work. CONTRACTOR shall instruct any and all employees engaged in the work to use the designated temporary toilet facility or other approved toilet facility**.

2.1.3 FENCES AND BARRICADES:

A. Provide temporary orange fences along the property owner side of the construction limits as shown on the plans. In the remaining work areas and streets provide traffic control devices as may be specified elsewhere within certain sections of the specifications, and as may be required by local code or authority and as required to maintain safety of work place.

B. Maintain temporary fences, bulkheads, and other protective facilities in good condition throughout the term of the work. Remove at completion of the work and replace or repair all work damaged thereby. Repair or replace on a daily basis safety facilities or devices damaged or removed during the course of the work.

2.1.4 CONSTRUCTION STAGING

A. Coordinate construction activities with the property and business owners to minimize impacts.

B. CONTRACTOR will not be permitted to operate trucks and equipment or store equipment and supplies on private property unless he has written permission to do so.

2.1.5 STORAGE OF MATERIALS/EQUIPMENT, ETC.

A. CONTRACTOR shall not be allowed to park any vehicles (including worker's personal vehicles) or equipment in any on-street parking spaces that are open to traffic.

B. No construction trailers or storage yards will be allowed in the work area and neighborhood. CONTRACTOR shall locate trailer/storage yard subject to approval of ENGINEER.

2.3 TEMPORARY CONTROLS

A. Noise Control. Equip construction machinery and vehicles with practical sound and muffling devices and operate in a manner to minimize noise consistent with efficient performance of the work.

B. Dust Control.

1. Take reasonable measures to prevent unnecessary dust.

2. Moisten dirt roads used for transportation and haul with water or apply a chemical dust suppressant to control dust.

3. Cover dusty material in transit when necessary to prevent blowing.

C. Pollution Control.

1. Prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris, and other substances resulting from construction activities.

2. Retain all spent oils, hydraulic fluids, and other petroleum fluids in containers for disposal off the site.

3. Do not perform equipment maintenance or fueling within 50 feet of any water course.

D. Erosion Control.

1. Take such measures as are necessary to prevent erosion of soil on the site and adjacent properties that might result from construction activities.

2. Provide temporary materials such as hay bales, sand bags, or plastic sheets, to prevent the erosion of banks or excavation where runoff may be increased or concentrated due to construction activities.

3. Take such measures as are necessary to prevent soil, mud, debris, etc. from entering the storm sewer system. CONTRACTOR shall be responsible for cleaning existing storm sewer downstream of the site if any soil, mud, debris, etc. enter it from the site. ENGINEER shall inspect system prior to final inspection and required cleaning will be noted on the punch list. CONTRACTOR shall clean to the satisfaction of ENGINEER.

2.4 OTHER TEMPORARY SERVICES:

2.4.1 CLEANING:

A. Provide daily sweeping and cleanup of dust, debris, litter, trash containers, and other items required to maintain a clean, orderly, and accessible site. Hauling of debris to legal dump or landfill is required daily as a minimum.

B. Provide daily sweeping or cleaning of adjacent streets and walkways as required to prevent accumulation of mud, dust, or soil thereon from construction traffic and personnel.

C. CONTRACTOR shall at his/her own expense clean up and remove all refuse and unused materials of any kind resulting from the work. Upon failure to do so within seventy-two (72) hours after request by ENGINEER, the work may be done by OWNER and the cost thereof be charged to CONTRACTOR and deducted from his/her final estimate.

2.4.2 ACCESS RAMPS:

A. During resurfacing activities (milling and leveling) provide hard surface ramps as directed by ENGINEER to access private property, public property, pedestrian crossings, streets, and alleys.

2.4.3 OWNER-MAINTAINED FACILITIES:

A. During construction activities including but not limited to demolition, unclassified excavation, subgrade cement treatment, and asphalt paving, CONTRACTOR shall protect from damage all OWNER-maintained facilities. Street signage, storm sewer inlets and manholes, sanitary sewer manholes, water main valve boxes, and water service curb stop boxes damaged or backfilled during construction shall be repaired, replaced, and made accessible. Backfilled manholes and inlets shall be cleaned immediately. Upon failure to repair, replace, or clean OWNER-maintained facilities promptly, the work may be completed by OWNER and the cost thereof be charged to CONTRACTOR and deducted from his/her final estimate.

PART 3 - EXECUTION

3.1 MAINTENANCE OF TEMPORARY FACILITIES:

3.1.1 TEMPORARY STRUCTURES: Maintain temporary offices, storage facilities, sanitary facilities, fire protection facilities, trailers, fences, barricades, and other structures in a neat, orderly appearance for the duration of the work.

3.1.2 REMOVAL OF TEMPORARY FACILITIES: Remove temporary facilities and structures from the site as soon as practicable or when no longer required by CONTRACTOR or subcontractors. Restore areas occupied by temporary facilities to like new condition, or to match surrounding areas.

PART 4 - MEASUREMENT AND PAYMENT

4.1 SUMMARY

4.1.1 Temporary Facilities and Controls and Services will not be paid for separately but shall be included in the work.

- END OF SECTION -

SECTION 01700 - CONTRACT CLOSEOUT

1.0 GENERAL

2.0 PRODUCTS

3.0 EXECUTION

4.0 MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY:

1.1.1 WORK INCLUDED: This section includes administrative procedures and closeout submittals required at substantial completion and final completion of the work.

1.1.2 RELATED WORK: Additional specific requirements are specified in the various sections of these specifications.

1.2 REFERENCES:

1.2.1 RELATED DOCUMENTS: General conditions, supplementary conditions, and applicable provisions of these specifications apply to this section.

1.3 DEFINITIONS:

1.3.1 CONTRACT CLOSEOUT: Contract closeout is defined to include general administrative requirements near the end of the contract time, in preparation for final acceptance, final payment, normal completion of the contract, occupancy by OWNER, and similar actions evidencing completion of the work. Time of closeout is directly related to substantial completion, and therefore may be either a single time period for the entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates. That time variation, if any, shall be applicable to other provisions of this section.

1.4 SUBMITTALS

1.4.1 RECORD DOCUMENTS - GENERAL:

A. Additional or specific requirements for record documents are indicated in individual sections of these specifications.

B. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire resistive location.

C. Provide access to record documents for ENGINEER’s or OWNER’s reference during normal working hours.

D. Review record documents for progress and accuracy at regularly scheduled job progress meetings.

E. Upon completion of mark-up, submit record documents to the ENGINEER for the OWNER’s records.

1.4.2 RECORD DRAWINGS (FIELD SET):

A. Maintain at the project site during the course of the work a white print set (blueline or blackline) of contract drawings and shop drawings in clean, undamaged condition, with mark-ups of actual installations which vary substantially form the work as originally shown.

B. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark up, record a cross reference at corresponding locations on the contract drawings.

C. Mark changes or deviations with red erasable pencil. Where feasible, use other colors to distinguish between variations in separate categories of work.

D. Record new information, which is recognized to be of importance to the OWNER but was not shown on either the contract drawings or shop drawings. Give particular attention to concealed work which would be difficult to measure and record at a later date. Note related change order or field order numbers where applicable.

E. Record all deviations in sizes, locations, or other features of work from the Contract Documents. It shall be possible, using these drawings, to correctly and easily locate, identity, and establish sizes of all piping, directions of flow, and other features of the work which will be concealed in finished work or underground.

F. Establish locations of concealed and underground work by accurate dimensions to column lines or permanent walls, locating all bends or turns, and properly referencing invert elevations and rates of fall.

G. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on cover of each set.

1.4.3 FINAL RECORD DRAWINGS (AS-BUILTS):

A. Submit the final marked-up field copy of record drawings to the ENGINEER for review and approval.

1.4.4 RECORD SPECIFICATIONS:

A. Maintain one copy of specifications, including addenda, change orders, and similar modifications issued in printed form during construction. Mark up variations of substance in actual work in comparison with text of specifications and modifications as issued.

B. Give particular attention to substitutions, selection of options, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation.

C. Note related record drawing information and product data where applicable.

D. Label record specifications with the words "RECORD COPY" and the date submitted, stamped or neatly printed in block letters on the cover.

1.4.5 OTHER DOCUMENTS: Submit the required number of the following additional documents, which may be required by the various specification sections:

1) Certificates of compliance with applicable reference standards.
2) Certificates of inspection or other evidence of compliance with governmental agencies or authorities having jurisdiction over the work.
3) Warranties, guarantees, and bonds.

4) Certificates of insurance for products and completed operations.
5) Written consent of surety.
6) Evidence of payment and release of liens for subcontractors, suppliers, and other goods and services (Claims Release Forms).
7) Certificate of substantial completion form signed by CONTRACTOR accepting the date of substantial completion.
8) Final Inspection report signed by CONTRACTOR.
9) Certificate of final completion signed by the CONTRACTOR acknowledging the date of final completion.
10) Operations and maintenance manuals as required.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PREREQUISITES:

3.1.1 FINAL COMPLETION: Prior to requesting the City's final observation for certification of final acceptance and payment, as required by the general and supplemental conditions, complete the following:

1) Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required. List known exceptions to final completion of the work, if any, in the request.

2) Submit updated final statement, accounting for additional changes to contract sum.

3) Submit certified copy of final punch list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance.

4) Submit written consent of surety.

5) Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements.

PART 4 - MEASUREMENT AND PAYMENT

4.1 SUMMARY

4.1.1 Contract Closeout will not be paid for separately but shall be included in the work.

- END OF SECTION -

TECHNICAL SPECIFICATIONS

SECTION 02000 – PIPELINE EXCAVATION, BEDDING AND COMPACTION TECH SPECIFICATIONS

SECTION 02070 – DEMOLITION

SECTION 02100 – WATER MAIN REPLACEMENT TECHNICAL SPECIFICATIONS

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SECTION 02800 – LANDSCAPE RESTORATION

SECTION 02000 - PIPELINE EXCAVATION, BEDDING AND COMPACTION TECHNICAL SPECIFICATIONS

PIPELINE EXCAVATION, BEDDING AND COMPACTION

PIPELINE EXCAVATION, BEDDING AND COMPACTION

1.0 PIPELINE EXCAVATION, AND BEDDING

The minimum class of bedding shall be granular bedding material in accordance with these specifications. The Contractor may select a higher class bedding at his option and approved by the Engineer. In the event the Contractor does not comply with the minimum bedding requirements, the next higher class of bedding shall be used.

2.0 GRANULAR BEDDING MATERIAL

Granular bedding material shall comply with the following sieve analysis. Alternative bedding must be approved by the Engineer prior to construction.

SQUEEGEE

SIEVE SIZE	PERCENT PASSING
3/8	85-100
#4	10-30
#8	0-10
#16	0-5

ALTERNATIVE BEDDING

PEA GRAVEL

SIEVE SIZE	PERCENT PASSING
1/2	100
3/8	85-100
#4	10-30
#8	0-10
#16	0-5

COMPACTION OF GRANULAR BEDDING MATERIAL

Granular bedding material shall be compacted with a hand-operated, vibratory device to a minimum density of 95% of the optimum density determined by AASHTO T180.

3.0 COMPACTION OF BACKFILL MATERIAL FOR THE BEDDING SECTION

Compaction of backfill material for the bedding section shall mean that AI to A5 soils shall be compacted to 95% of the optimum density determined by AASHTO T180 and A6 and A7 soils shall be compacted to 95% of the optimum density determined by AASHTO T99.

COMPACTION TESTING

Compaction testing shall be in accordance with ANSI/ASTM D 1556. The compaction of the bedding and the backfill shall be tested at a rate of at least ten (10) tests per 1,000 feet or portions thereof or as directed by the Engineer. The testing shall be at varying depths and locations as determined by the Engineer. Testing around manholes and valve boxes shall be taken.

Test results shall be certified by a Registered Professional Engineer specializing in soils analysis, to be correct and shall be submitted to the City within 24 hours of the test or the next City working day. Compaction testing shall be as indicated in these specifications.

4.0 CLASSES OF BEDDING

GRANULAR BEDDING MATERIAL: The trench shall be excavated to a depth below the established grade a minimum of 6 inches. Granular bedding material shall be placed and compacted under the pipe and around the sides of the pipe and to the minimum depth over the top of pipe as shown on the plans and Standard Details. The granular bedding material shall be consolidated and compacted by hand operated mechanical vibrators.

5.0 BACKFILL AND COMPACTION

Backfilling shall be performed as soon as practicable, but only when authorized by the Engineer. The amount of open trench or uncompacted backfill or sum of both shall not be more than 500 feet at any time. Jetting or ponding shall not be allowed.

Unless specified otherwise, all excess backfill shall be disposed of off the rights-of-way and public property by the Contractor at his expense. Special care shall be taken to insure proper compaction around valve boxes and manholes.

Backfilling of acceptable material shall not be placed in lifts exceeding eight inches (8") in depth (uncompacted).

ORDINARY BACKFILL MATERIAL

Ordinary backfill shall consist of material which has been excavated from the trench except for rubbish, frozen material, broken pavement, other debris, stones greater than 3 inches in diameter, organic material, or other materials considered deleterious by the Engineer. When in the opinion of the Engineer, the excavated material is not satisfactory for use as backfill, whenever there is a shortage of satisfactory backfill material from any approved source. The Contractor shall furnish all necessary suitable backfill material and shall dispose of the rejected excavated material at the Contractor's expense.

Clay and similar material with a plasticity index as determined by ASTM in excess of 10 shall not be considered suitable for backfilling the trenches located in improved streets, roads, highways and thoroughfares.

SELECT BACKFILL MATERIAL

Select backfill shall be used in roadways whenever ground water of clay soil with a plasticity index as determined by ASTM in excess of 10 is encountered within three feet of the surface per the recommendation of a Geotechnical Engineer and approval of the Engineer. Select backfill shall be pit run, as approved by the Engineer.

COMPACTING ORDINARY BACKFILL

Ordinary backfill shall be placed from one foot above the pipe to the surface, compacted in 8" maximum lifts. Backfill shall be placed to a minimum depth of 30 inches above the top of the pipe before vibratory roller is used over the pipe.

The use of an excavator compaction wheel or vibrating plate is strictly prohibited.

Compaction shall be achieved with the use of a remote control vibrating sheepsfoot compactor or self-propelled vibrating sheepsfoot compactor.

Ordinary backfill in roadways shall be compacted as follows: A1 to A5 soils shall be compacted 95% of the optimum density as determined by AASHTO T180. A6 and A7 shall be compacted to 95% of the optimum density as determined by AASHTO T99. Maximum dry density of all soil types encountered or to be used will be determined in accordance with AASHTO T99, or AASHTO T 180. The amount of water to be used in compacting all materials shall not deviate from optimum on the dry side by more than two percentage points as determined by AASHTO T99 or T180.At the discretion of the Engineer, compaction in unimproved areas (out of the R.O.W.) may be reduced to 90% of optimum density as determined by AASHTO T180 or T99 as applicable for the said soil type. The backfill may be tested at any depth and shall be properly compacted at all depths. The time and depth of testing shall be at the discretion of the Engineer. Testing shall be in accordance with these specifications.

6.0 IMPROVEMENTS WITHIN EXISTING STREETS

Whenever favorable weather conditions do not exist or the surface settles or is displaced by traffic, the Contractor shall immediately maintain the surface of the trench section in all paved streets until the placement of permanent asphalt patching.

7.0 BASIS OF PAYMENT - PIPELINE EXCAVATION, BEDDING AND COMPACTION

The entire cost of the work and material necessary to complete all items shown or implied on the drawings or specified herein shall be included and merged into the pay items shown in the Schedule of Unit Prices. All associated work necessary for the proper and complete installation of this project and associated bonding, maintenance and guarantees shall be merged into the pay items shown in the Schedule of Unit Prices. All payments shall be subject to the conditions of these specifications.
All pay items shall include sales tax, licenses, permits, and other taxes required to complete the work. No additional compensation will be allowed for any item unless a change order is issued by
the Engineer.

Minor items and minor details are not listed but shall be part of the complete contract.

No separate payment will be made for excavating, silt tree fence, bedding, backfill and compacting but will be considered as subsidiary obligation of the Contractor under the bid item requiring the work.

STRUCTURE BACKFILL (COMPLETE IN PLACE)

1. Scope of Work

This work shall consist of furnishing all labor, materials, equipment, loading, haul, and disposal for STRUCTURE BACKFILL (COMPLETE IN PLACE) to remove unsuitable backfill material. Upon direction of the Engineer, the Contractor shall remove and dispose of existing unsuitable backfill material. The provisions of STRUCTURE BACKFILL (COMPLETE IN PLACE) will only be implemented in areas designated by the Engineer where existing backfill material is determined unsuitable. All material removed shall become the property of the Contractor and shall be properly disposed of outside the limits of the project at no additional cost.

This work shall also include furnishing all labor, material, equipment, loading, haul, placing and compaction of STRUCTURE BACKFILL (COMPLETE IN PLACE). Structure backfill shall have a liquid limit not exceeding 35 and a plasticity index of not over 6 when determined in conformity with AASHTO T89 and T90 respectively. Structure Backfill shall be a combination of **one part** CLASS 6 Recycled Concrete Recycled Base Course and **one part** Class 4 recycled concrete base course Specifications for Road and Bridge Construction, 2011 Edition, Classification for Aggregate Base Course Section 703. Samples and test data on material to be used shall be submitted to the Engineer stating the structure backfill meets these requirements.

All locations shall be compacted as follows: A1 to A5 soils shall be compacted 95% of the optimum density as determined by AASHTO T180. A6 and A7 shall be compacted to 95% of the optimum density as determined by AASHTO T99.

2. Method of Measurement and Payment

Payment will be made on a per TON basis for STRUCTURE BACKFILL (COMPLETE IN PLACE) and shall be full compensation for all work necessary to complete the item.

- END OF SECTION -

SECTION 02070 - DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY:

1.1.1 WORK INCLUDED: Work of this section generally includes demolition and removal of certain items within, the limits of the project, in order to accommodate new or retrofit construction.

1.1.2 Demolition includes but is not limited to the following: demolition of existing pavements, curbs and gutters, alley ramps, sidewalks, miscellaneous concrete slabs, aggregate base course, shrubs, sod, signs and posts, tree roots, stumps when within structure or pipe excavation, water service line, ductile iron pipe, valves, fittings, vitrified clay pipe, water pipe and appurtenances, reinforced concrete pipe, corrugated metal pipe, inlets, fencing, miscellaneous equipment and appurtenances and all other elements scheduled to be so demolished or removed or that may be reasonably implied to complete the site improvements. It also includes all saw cutting required and/or specified on the drawings. Demolition also includes hauling away of all materials described on the plans or that may be reasonably implied to be hauled away. Demolition also includes excavation, backfill, and compaction at elements not scheduled for replacement.

1.2 REFERENCES:

1.2.1 RELATED DOCUMENTS: General Conditions, General Requirements, Supplementary Conditions, and applicable provisions of Division 1 section supply to this section.

1.2.2 ORDINANCES AND STANDARDS: Perform the work in accordance with requirements of all applicable laws, codes, and ordinances.

1.3 JOBSITE CONDITIONS:

1.3.1 SALVAGED MATERIALS: Items of salvage value to the Contractor that are not indicated to remain the property of the City may be removed from the property as work progresses. Salvaged items must be transported from site as they are removed. Storage or sale of removed items on site will not be permitted.

1.3.2 EXPLOSIVES: Use of explosives will not be permitted.

1.3.3 PROTECTION OF PERSONS AND PROPERTY:

A. Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, improvements and utilities designated to remain, and persons.

B. Provide interior and exterior temporary shoring, bracing, or support as required to prevent movement, settlement or collapse of structures to be demolished, or of adjacent facilities and pavements indicated to remain.

C. Comply with all applicable regulations of the Occupational Safety and Health Administration (OSHA) concerning the safety of workers and authorized visitors to the site.

1.3.6 DAMAGES: Promptly report damages caused to adjacent facilities and improvements by demolition operations to the City and Engineer. Repair damage at no additional cost to the City.

1.3.7. UTILITY SERVICES:

A. Utility locations and sizes indicated on the drawings incorporate best available information; however, it shall be the responsibility of the Contractor to make an accurate survey of existing conditions and verify locations with utility companies prior to commending demolition work.

B. Maintain existing utilities serving adjacent occupied facilities and protect against damage during demolition operations.

C. Notify proper utility agencies to confirm or arrange for shut-off of affected utilities. Disconnect and seal indicated utilities before starting demolition operations.

D. In case of damage to existing utility lines caused by the execution of this work, immediately notify the appropriate utility agency, and repair said damage according to the requirements of the utility agency, at no additional cost to the City.

PART 2 - PRODUCTS

(Not applicable to this Section)

PART 3 - EXECUTION

3.1 EXAMINATION:

3.1.1 VERIFICATION OF CONDITIONS: Examine areas and conditions under which the work of this section will be performed. Commencement of work implies acceptance of all areas and conditions.

3.2 DEMOLITION:

3.2.1 POLLUTION CONTROLS: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt raising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection. Provide and pay for all water and necessary connections therefore.

3.2.2 GENERAL PROCEDURES:

A. By careful examination of the plans, determine the location and extent of the demolition required.

B. In company of the Engineer, visit the site and verify the extent and location of the demolition required.

1. Carefully identify limits of demolition.

2. Mark interface surfaces as required to enable workmen to identify items to be removed and items to be left in place intact.

C. Prepare and follow an organized plan for demolition and removal of items.

1. Demolition plan shall be in accordance with the construction phasing/staging requirements set forth in the Supplementary Conditions.

2. Where existing concrete sidewalk is to be retained for use, that portion shall not be damaged during the removal operations. Where designated on the plans, existing concrete and asphalt shall be sawcut to the lines and dimensions shown on the plans or as designated by the engineer.

D. Demolish concrete in sections of limited size and area to minimize hazards.

E. Break up and remove concrete slabs-on-grade, sidewalks ramps, driveways, parkways and miscellaneous placements within limit lines shown. Saw cut edges where adjacent materials are designated to remain.

F. Unless otherwise noted, demolished material shall be considered to be property of the Contractor and shall be completely removed from the project and disposed of by the Contractor.

G. Use means necessary to prevent dust becoming a nuisance to the public, to businesses, and to other work being performed on or near the site.

3.2.3 PROTECTION OF ITEMS TO REMAIN OR BE REINSTALLED

A. Those items designated to be removed and reinstalled shall be carefully removed, stored and protected from damage.

B. Protection Trees to remain:

1. Trees not designated to be removed shall be protected at all times during the entire contract period. No material or equipment shall be stockpiled in a manner that could cause damage to the trees.

2. Any trees damaged or scarred during construction shall be repaired immediately by an approved tree surgeon. Where separating, exposing or damage to the root systems of trees designated to remain, remedial measures shall be taken immediately at the direction of the Engineer to insure the health of the tree. Trees designated to remain, but damaged beyond repair in the opinion of the Engineer, shall be replaced with a similar size and species chosen by the Engineer at the Contractor's expense.

3.2.4 CLEANING: Clean adjacent finishes, structures, and improvements of dust, dirt and debris caused by demolition operations, as directed by Engineer or governing authorities. Return adjacent areas to conditions existing prior to start of work.

3.2.5 BELOW-GRADE CONSTRUCTION:

3.2.6 GENERAL: Demolish and remove indicated below-grade improvements and non-soil materials encountered, except where specifically identified as items to remain.

3.2.7 BACKFILLING:

A. Completely fill below-grade utility trenches, excavations, and voids resulting from demolition of structures, using material as specified in these specifications.

B. Prior to placement of fill materials, ensure that areas to be filled are free of standing water, trash and debris.

C. Place materials in horizontal layers not exceeding 8" in loose depth. Compact each layer of fill material to density required by these specifications.

D. After fill placement, grade surface to meet adjacent contours.

3.3 DISPOSAL OF DEMOLISHED MATERIALS:

3.3.1 GENERAL: Remove debris, rubbish, and other materials resulting from demolition operations from site. Transport materials removed from demolished structures and legally dispose of off site.

3.3.2 BURNING: On-site burning of removed materials from demolished structures will not be permitted.

3.4 REPLACEMENTS

A. In the event of demolition of items not so scheduled to be demolished, contractor shall promptly replace such items to the approval of the Engineer and at no additional cost to the Owner.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Demolition will not be paid for separately but shall be included in the work.

- END OF SECTION -

SECTION 02100 – WATER MAIN REPLACEMENT TECHNICAL SPECIFICATIONS
WATER MAIN REPLACEMENT

1.0 SCOPE OF WORK

2.0 CITY DESIGN CONSTRUCTION STANDARDS AND SPECIFICATIONS

3.0 MATERIALS

1.0 SCOPE OF WORK

The work shall consist of, but not limited to, the installation of PVC AWWA C900, CL235, and DUCTILE IRON CLASS 50 water main, appurtenances and incidentals. Water main replacement shall occur at the following locations within the City of Louisville:

- LOIS DR. FROM DEAD END TO ROOSEVELT AVE.
- ALINE ST. FROM BELLA VISTA DR. TO LOIS DR.
- BARBARA ST. FROM BELLA VISTA DR. TO LOUIS DR.
- ROSE ST. FROM BELLA VISTA DR. TO LOIS DR.

LOIS DRIVE - DEAD END TO ROOSEVELT AVE.

ITEM	DESCRIPTION	UNIT	QUANTITY
1A	12'' PVC WATER MAIN CLASS 235 DR 18	LF	102
2A	8'' PVC WATER MAIN CLASS 235 DR 18	LF	747
3A	REMOVE FIRE HYDRANT ASSEMBLY	EA	1
4A	FIRE HYDRANT ASSEMBLY	EA	3
5A	FIRE HYDRANT EXTENSION (6")	EA	3
6A	FIRE HYDRANT EXTENSION (12")	EA	3
7A	12" 45 DEGREE BEND	EA	2
8A	12”-8” REDUCER	EA	1
9A	12" SOLID SLEEVE	EA	1
10A	12"CAP	EA	1
11A	GATE VALVE AND BOX (8”)	EA	6
12A	8” x 8” x 8” SWIVEL TEE	EA	3
13A	8” x 6” x 8” SWIVEL TEE	EA	3
14A	8'' SOLID X SWIVEL ADAPTER	EA	6
15A	8" 11 1/4 DEGREE BEND	EA	2
16A	8'' SOLID SLEEVE	EA	4
17A	4" CAP	EA	0
18A	8" CAP	EA	5
19A	ABANDON EXISTING VALVE AND BOX	EA	5
20A	WATER SERVICE CONNECTION 3/4" SHORT	EA	13
21A	WATER SERVICE CONNECTION 3/4" LONG	EA	6
22A	REMOVE AND REPLACE 3/4" WATER SERVICE	EA	2
23A	REMOVE AND REPLACE 3/4" CURB STOP AND BOX	EA	2
24A	STRUCTURE BACKFILL (COMPLETE IN PLACE)	TN	75
25A	POTHOLING	EA	39
26A	24" VERTICAL CURB AND GUTTER	LF	29
27A	4” CONCRETE	SF	140

28A	6’-0" x 6" CURBWALK	LF	0
29A	8” CONCRETE WITH FIBERMESH	SF	0
30A	FLOW FILL	CY	0
31A	HOT ASPHALT PATCH GRADE SX (6")	SY	679
32A	HOT ASPHALT PATCH GRADE SX (9")	SY	61

ALINE STREET - BELLA VISTA DR. TO LOIS DR.

ITEM	DESCRIPTION	UNIT	QUANTITY
1B	12" PVC WATER MAIN CLASS 235 DR 18	LF	0
2B	8" PVC WATER MAIN CLASS 235 DR 18	LF	719
3B	REMOVE FIRE HYDRANT ASSEMBLY	EA	1
4B	FIRE HYDRANT ASSEMBLY	EA	1
5B	FIRE HYDRANT EXTENSION (6")	EA	1
6B	FIRE HYDRANT EXTENSION (12")	EA	1
7B	12" 45 DEGREE BEND	EA	0
8B	12”-8” REDUCER	EA	0
9B	12" SOLID SLEEVE	EA	0
10B	12"CAP	EA	0
11B	GATE VALVE AND BOX (8”)	EA	2
12B	8” x 8” x 8” SWIVEL TEE	EA	1
13B	8” x 6” x 8” SWIVEL TEE	EA	1
14B	8" SOLID X SWIVEL ADAPTER	EA	1
15B	8" 11 1/4 DEGREE BEND	EA	2
16B	8" SOLID SLEEVE	EA	3
17B	4" CAP	EA	4
18B	8" CAP	EA	0
19B	ABANDON EXISTING VALVE AND BOX	EA	1
20B	WATER SERVICE CONNECTION 3/4" SHORT	EA	8
21B	WATER SERVICE CONNECTION 3/4" LONG	EA	6
22B	REMOVE AND REPLACE 3/4" WATER SERVICE	EA	2
23B	REMOVE AND REPLACE 3/4" CURB STOP AND BOX	EA	2
24B	STRUCTURE BACKFILL (COMPLETE IN PLACE)	TN	61
25B	POTHOLING	EA	23
26B	24" VERTICAL CURB AND GUTTER	LF	0
27B	4” CONCRETE	SF	0
28B	6’-0" x 6" CURBWALK	LF	6
29B	8” CONCRETE WITH FIBERMESH	SF	256

30B	FLOW FILL	CY	28
31B	HOT ASPHALT PATCH GRADE SX (6")	SY	520
32B	HOT ASPHALT PATCH GRADE SX (9")	SY	21

BARBARA STREET - BELLA VISTA DR. TO LOIS DR.

ITEM	DESCRIPTION	UNIT	QUANTITY
1C	12" PVC WATER MAIN CLASS 235 DR 18	LF	0
2C	8" PVC WATER MAIN CLASS 235 DR 18	LF	583
3C	REMOVE FIRE HYDRANT ASSEMBLY	EA	0
4C	FIRE HYDRANT ASSEMBLY	EA	1
5C	FIRE HYDRANT EXTENSION (6")	EA	1
6C	FIRE HYDRANT EXTENSION (12")	EA	1
7C	12" 45 DEGREE BEND	EA	0
8C	12”-8” REDUCER	EA	0
9C	12" SOLID SLEEVE	EA	0
10	12"CAP	EA	0
11C	GATE VALVE AND BOX (8”)	EA	1
12C	8” x 8” x 8” SWIVEL TEE	EA	1
13C	8” x 6” x 8” SWIVEL TEE	EA	1
14C	8" SOLID X SWIVEL ADAPTER	EA	0
15C	8" 11 1/4 DEGREE BEND	EA	2
16C	8" SOLID SLEEVE	EA	3
17C	4" CAP	EA	3
18C	8" CAP	EA	0
19C	ABANDON EXISTING VALVE AND BOX	EA	1
20C	WATER SERVICE CONNECTION 3/4" SHORT	EA	6
21C	WATER SERVICE CONNECTION 3/4" LONG	EA	7
22C	REMOVE AND REPLACE 3/4" WATER SERVICE	EA	2
23C	REMOVE AND REPLACE 3/4" CURB STOP AND BOX	EA	2
24C	STRUCTURE BACKFILL (COMPLETE IN PLACE)	TN	50
25C	POTHOLING	EA	18
26C	24" VERTICAL CURB AND GUTTER	LF	0
27C	4” CONCRETE	SF	0
28C	6’-0" x 6" CURBWALK	LF	4
29C	8” CONCRETE WITH FIBERMESH	SF	230
30C	FLOW FILL	CY	20
31C	HOT ASPHALT PATCH GRADE SX (6")	SY	446
32C	HOT ASPHALT PATCH GRADE SX (9")	SY	22

ROSE STREET - BELLA VISTA DR. TO LOIS DR.

ITEM	DESCRIPTION	UNIT	QUANTITY
1D	12'' PVC WATER MAIN CLASS 235 DR 18	LF	0
2D	8'' PVC WATER MAIN CLASS 235 DR 18	LF	448
3D	REMOVE FIRE HYDRANT ASSEMBLY	EA	1
4D	FIRE HYDRANT ASSEMBLY	EA	1
5D	FIRE HYDRANT EXTENSION (6")	EA	1
6D	FIRE HYDRANT EXTENSION (12")	EA	1
7D	12" 45 DEGREE BEND	EA	0
8D	12”-8” REDUCER	EA	0
9D	12" SOLID SLEEVE	EA	0
10D	12"CAP	EA	0
11D	GATE VALVE AND BOX (8”)	EA	2
12D	8” x 8” x 8” SWIVEL TEE	EA	1
13D	8” x 6” x 8” SWIVEL TEE	EA	1
14D	8'' SOLID X SWIVEL ADAPTER	EA	1
15D	8" 11 1/4 DEGREE BEND	EA	2
16D	8'' SOLID SLEEVE	EA	3
17D	4" CAP	EA	2
18D	8" CAP	EA	0
19D	ABANDON EXISTING VALVE AND BOX	EA	1
20D	WATER SERVICE CONNECTION 3/4" SHORT	EA	5
21D	WATER SERVICE CONNECTION 3/4" LONG	EA	5
22D	REMOVE AND REPLACE 3/4" WATER SERVICE	EA	2
23D	REMOVE AND REPLACE 3/4" CURB STOP AND BOX	EA	2
24D	STRUCTURE BACKFILL (COMPLETE IN PLACE)	TN	39
25D	POTHOLING	EA	13
26D	24" VERTICAL CURB AND GUTTER	LF	0
27D	4” CONCRETE	SF	0
28D	6’-0" x 6" CURBWALK	LF	10
29D	8” CONCRETE WITH FIBERMESH	SF	124
30D	FLOW FILL	CY	13
31D	HOT ASPHALT PATCH GRADE SX (6'')	SY	355
32D	HOT ASPHALT PATCH GRADE SX (9'')	SY	18

2.0 CITY DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS

Any and all materials required for this project shall be pursuant to the requirements of the City of Louisville, Colorado "Design and Construction Standards, adopted February 15, 1994 and the latest revisions thereto except as modified by these plans and/or specifications.

3.0 MATERIALS

ALIGNMENT AND DEPTH

A minimum cover of **(5.0') five** feet below final grade shall be maintained over all water mains.

When water mains cross sanitary sewer mains, the water main must be installed above the sanitary sewer main with 24 inches minimum vertical separation between the outside of the water main and the outside of the sanitary sewer main.

If the water main separation is less than 24 inches, concrete encasement of the sanitary sewer main ten feet each side of centerline of the water main shall be required.

In the case where the water main can not be installed above the sanitary sewer main, both the water main and sanitary sewer main shall be encased in concrete ten feet each side of centerline.

When water mains cross above or below storm sewer mains, the minimum vertical separation shall be 18 inches. If 18 inches of vertical separation cannot be maintained, the crossing shall be installed as directed by the Engineer.

Water transmission mains and mains larger than 12 inches in diameter shall be strictly laid to approved grades to allow proper installation of air relief and air vacuum valves and blow-off valves. All pipe shall be constructed to the lines, grades and elevations shown on the approved drawings. All pipe shall be laid to straight lines as staked between specified or otherwise authorized angles, bends or points of tangency of horizontal or vertical curves. **Deflection at field joints shall not exceed half of the maximum deflection recommended in AWWA C600.**

DUCTILE IRON

All material, manufacturing operations, installation, testing, inspection and marking of ductile iron pipe shall be in conformity with the requirements of ANSI A21.51, AWWA C600, and in accordance with any special requirements of the Engineer. All material shall be new.

MARKINGS ON THE PIPE

Water pipe and fittings shall be marked by the manufacture with the appropriate AWWA designations. Any pipe and fittings not properly marked will be rejected and removed from the site. All materials shall be clearly marked on the exterior surface of the pipe and fittings with the following:

1. AWWA designation
2. Size and class
3. Date of manufacture
4. Name and trademark of manufacturer

DIAMETER OF PIPE

The diameter indicated on the drawings shall mean the nominal inside diameter of the pipe.

WALL THICKNESS DESIGN OF PIPE

The minimum wall thickness for each section of the pipe line shall conform to ANSI Standard A21.50 for the specified laying condition and for 150 psi minimum working pressure. The following are the minimum allowable thickness of pipe that may be installed.

Pipe Size	**Thickness Class**
4”	52
6”	50
8”	50
12”	50
16”	50

GRADE OF IRON

The grade of iron shall be 60-42-10 having a minimum tensile strength of 60,000 psi, a minimum yield strength of 42,000 psi and a minimum percent of elongation of 10%.

PIPE LENGTHS

Pipe sections shall be furnished in not less than 18-foot nominal lengths, except bends, reducers, and specials which may be of shorter lengths.

FITTINGS AND SPECIALS

Fittings shall be new and conform to ASA Standard A21.10 (AWWA C110) and shall be cast iron or ductile iron. Fittings shall be Class 250 through 12" mains, and Class 150 for 16" and larger mains.

Contractor shall use corrosion Resistant T-head Bolts and Nuts which shall be 45,000 psi minimum steel with a fluoropolymer coating and shall be either “Cor-Blue” by NSS Industries or “Blue Bolt” by Birmingham Fasteners or approved equal.

The designer shall furnish for approval by the Engineer, details of all specials, and other fittings, which are not covered by ANSI A21.10. All fittings shall be mechanical joints, with MEGALUGS.

FIELD JOINTS

For this project, all fittings and valves shall be restrained with MEGALUG restraint glands.

1) MEGALUG - The material to be used shall meet or exceed the following requirements for EBAA Iron, Inc. MEGALUG unless approved equal by the Engineer.

   - EBAA Iron, Inc. MEGALUG
   - For PVC Pipe Series 2000PV
   - For Ductile Iron Pipe Series 1100

   Glands: Ductile iron conforming to ASTM A 536-80. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA A21.11 and ANSE/AWWA C153/A21.53 of latest revision. Twist of nuts shall be used for proper actuating of the restraint devices.

   The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGALUG or approved equal.

2) MECHANICAL AND PUSH-ON JOINTS - Mechanical & push-on joints shall conform to ASA Standard A21.11 (AWWA C111).

3) BOLTS - Bolts for flanged and mechanical joints shall be of as specified herein.

PROTECTIVE COATINGS

The surface coatings of all ductile iron pipe shall conform to the following:

1) EXTERIOR The exterior coating shall be the standard outside bituminous coating as specified in ASA Standard A21.51 (AWWA C151).

2) INTERIOR Normally, no interior coating other than a cement mortar coating as specified in ASA Standard A21.4 (AWWA C104) will be required.

CORROSION PROTECTION

Cast and ductile iron pipe and all fittings shall be wrapped in polyethylene tubing to prevent corrosion. Polyethylene tubing tape and installation shall meet the requirements of AWWA C105 and these specifications:

Thickness	8 mills
Pigmentation	1) Natural where exposure to ultra-violet light (sunlight, for example) will be or short duration (less than 48 hours). 2) Black - 2.0 to 2.5% well-dispersed carbon black with stabilizers-where exposure to ultraviolet light (sunlight) may be prolonged (2-10 days). 3) The polyethylene materials shall be of virgin polyethylene produced from DuPont Alathon resin or USI Petrothene resin or equal.
Tape	2" approved #900, Scotchrap #50 or approved equal.

1) INSTALLATION Prior to installing polyethylene tubes clumps of mud or other contaminants shall be brushed off the pipe surface. Polyethylene tubes shall be installed in accordance with ANSI A21.5 Method A. Method A requires tubes to be overlapped one (1') foot and secured with tape, and the slack width to be taken up on top of the pipe and taped at the quarter points.

   All rips, punctures or other damage to the polyethylene shall be repaired with tape or with a short piece of tubing cut open, wrapped around the pipe and secured in place.

POLYVINYL CHLORIDE PIPE

All polyvinyl chloride (PVC) pipe shall be new, manufactured and designed according to A.W.W.A. Standard C 900, "Polyvinyl Chloride (PVC) Pressure Pipe, 4" through 12", for water, unless otherwise noted in these Design and Construction Standards. No PVC over 12" in diameter will be installed. Water mains larger than 12" shall be ductile iron.

JOINING OF PIPE AND TYPE

Pipe joints shall be made using an integral bell with an elastomeric gasket push-on type joint. Push on joints shall be accomplished in accordance with AWWA M-23 "PVC Pipe - Design and Installation".

Mechanical joints shall be accomplished in accordance with AWWA C-600 "Installation of Ductile Iron Water Mains and Their Appurtenances".

CLASS AND TYPE

All sizes of pipe shall be minimum of Class 235, dimension ratio 18 (DR 18) minimum. The Engineer may require under certain circumstances Class 305 be installed.

TAPPING OF PVC WATER MAIN

Tapping of PVC water mains from 3/4" up to and including two (2) inch services shall be installed only with an approved double brass tapping saddle. The double brass tapping saddle must be preapproved by the Engineer prior to installation and tightened with a torque wrench to the manufacturers specifications. The Contractor will be responsible for the supplying and installation of the double brass tapping saddle, corporation stops, and the physical tap on the main. Taps shall be machine tapped so that the core or plug is removed from the main. Inspection of all taps is required prior to backfilling.

Tapping Saddles shall be Ford Brass Saddles Styles 202 B CC (AWWA) thread or approved equal. Corporation Stops shall be Ford Ballcorp Coporation Stops FB600-3-NL/FB600-4-NL or approved equal.

LOCATOR WIRE

Locator wire shall be installed on the top of the pipe and taped every ten (10) feet. Locator wire shall be 12 AWG Type UF for direct burial.

All locator wire shall be continuous. Splices shall be completed with 3M DBY Direct Bury Splice Kit or approved equal, using Scotchlok electrical spring connectors and gel-filled insulator tubes.

The locator wire shall form a continuous electrical circuit throughout all PVC water main piping installed including branch laterals, blowoffs and fire hydrants. Where PVC water mains connect to existing ductile iron water mains, the locator wire shall be attached to the ductile iron pipe by thermite weld. Royston Roskote Rubberized Mastic R28 or approved equal shall be installed on the thermite weld in two (2) applications.

Locator wire shall be extended to each fire hydrant and blowoff to a test station terminal. The test station terminal shall be two and one-half inch (2½”) inside diameter by eighteen inch (18”) C.P. mini box, two point terminal, Glenn series or approved equal with cast iron collar and cast iron locking cap. For installation of test station terminals at fire hydrants and blowoffs, refer to the standard details.

Inspection of all locator wire splices and C.P. test station terminals are required prior to backfill. After trench backfill is complete, the contractor may contact the Engineer to conduct a preliminary continuity test on the locator wire. A continuity test on the locator wire is required prior to any placement of asphalt paving. The Engineer will perform the continuity test. A 48-hour notice is required for scheduling the locator wire continuity test.

LOCATOR TAPE

Warning locator tape with WATER LINE BURIED BELOW printed on the tape shall be installed on top of the bedding material. **WATER PIPE HANDLING, STORAGE AND INSTALLATION**

Water pipe shall be handled, stored and installed in accordance with the following specifications. The more stringent requirements shall govern in the event of a conflict.

1) American Water Works Standard C600.
2) American Water Works Standard C601.
3) City of Louisville, Colorado, Design and Construction Standards.
4) The Water Works Manufacturer Recommendations.

CONTAMINATION

Contamination shall be considered as the presence of any visible foreign material that will be in contact with the potable water supply. Contamination shall include, but not be limited to dust, dirt, mud, petroleum products, trench water, paint, pesticides, stones, animals, and insects.

MATERIAL STORAGE

All materials shall be delivered to the construction site free of contamination. All materials shall be stored in a manner that will prevent contamination of the surfaces, which will be in contact with the potable water supply. Storage shall include protection from the weather at all times. To prevent contamination, materials shall be distributed along the project only to the extent that the materials will be installed on that same day.

MATERIAL HANDLING

The Contractor shall have proper implements, tools and facilities for the safe and convenient prosecution of work. Precautions shall be taken to prevent contamination of the materials. The Inspector shall stop all work when he deems the work to be unsafe, inconvenient or when proper contamination control is not exercised.

Pipe fittings and accessories shall be handled in a manner that will avoid shock or damage. No pipe, fittings or accessories shall be dropped from any height. Pipe handled on skid ways shall not be skidded or rolled against pipe already on the ground. If the coating or lining is damaged, it shall be repaired to the satisfaction of the Engineer or removed from the construction site.

PROGRESSION OF WORK

The laying of pipe shall commence so that the pipe is laid with the bell ends facing in the direction of laying and at the correct grade and alignment. Pipe shall be placed in such a manner that the specific bedding provides a solid uniform bearing surface for the full length of the barrel.

Bell holes shall be provided at all joints. Equipment used in handling and jointing the pipe shall have adequate capacity to handle the pipe smoothly and assure the proper closure of joints. Pipe shall be laid accurately to the grade and alignment specified on the drawings. Blocking or wedging of the pipe to achieve proper positioning and grade shall not be permitted, except where

required for the proper construction cradles of encasement. When pipe laying is not in progress, all open ends of pipe shall be closed by a watertight plug.

The plugging of pipe shall apply to noontime, breaks, as well as overnight. The cutting of pipe for inserting fittings or closure pieces shall be done in a neat and workmanlike manner without damaging the pipe coating or lining and so as to leave a smooth end at right angles to the long axis of the pipe. Flame cutting of pipe not be allowed.

FITTING AND SPECIALS

Fittings and specials shall be new and installed as detailed on the drawings and shall be properly anchored against thrust and uplift forces.

RUBBER GASKET JOINTS

Rubber gasket joints shall be in accordance with AWWA Standard C111 and these Specifications.

1) LUBRICANT The lubricant shall be suitable for lubricating the parts of the joint in assembly. The lubricant shall be non- toxic, shall not support the growth of bacteria, and shall not have deteriorating effects on the gasket material. It shall not impart taste or odor to water in the pipe. The lubricant containers shall be labeled with the trade name or trademarks and the pipe manufacturer's name. The lubricant shall be supplied by the pipe manufacturer and approved by the Engineer.

2) GASKETS Gaskets shall at all times be protected from damage and contamination. Gaskets that display any imperfection in manufacturing, any damage, or any contamination shall not be used.

3) INSTALLATION All surfaces in contact with the rubber gasket shall be thoroughly cleaned just prior to installation to such an extent that it is free of all visible contamination. All contaminants, excess coating, rust or any other foreign material shall be removed from the gasket groove and the spigot end to be installed.

WATER MAIN VALVES

All valves shall be manufactured in accordance with AWWA Standards and **shall open by turning counter clockwise (left).** Valve ends shall be mechanical joint and shall be equipped with a two-(2) inch square operating nut. Valves and flanges shall be a minimum of Class 150 unless otherwise specified.

Water main operator valves shall be installed in the distribution system so that no more than 600 feet of water main will be shut off in the event of a water main failure. Operator valves shall also be installed at other places as designated by the Engineer. Operator valves shall also be located so that any extension can proceed, be pressure tested and chlorinated without affecting the existing system. Temporary blow-offs shall be installed as required by the Engineer for

chlorination and flushing. Temporary blow-offs shall be constructed using copper or brass piping only.

GATE VALVES

Gate valves shall be used on all water mains of six- (6) inch to twelve- (12) inch size. Gate valves shall be furnished with mechanical end connections and be manufactured in accordance with AWWA Standard C-500. Gate valves shall be resilient wedge. All material shall be new. Gate valve exterior hex head bolts and nuts shall be stainless steel.

BUTTERFLY VALVES

All valves having a nominal inside diameter of greater than 12 inches will be geared butterfly valves designed for direct burial and shall conform to AWWA C-504. Valves will be tight closing rubber seat type with the seats bonded to the body. No metal to metal surfaces will be permitted. All valves will open left (counterclockwise). The Engineer may require Butterfly valves to be installed in a vault.

BLOW-OFF VALVES

A 2" blow-off valve assembly is required at the end of mains. Temporary blow-offs shall be installed in those portions of the water mains, which could not be chlorinated, flushed or tested by other means. Temporary blow-offs shall be installed on existing mains during new water main installations.

Blow-off assemblies consist of all valves, pipe and material necessary to install the blow-off valve complete in place, and shall be constructed in accordance with the Standard Details.

INSTALLATION

Valves in water mains shall be installed where possible, at a point on the main just off tees or crosses at intersections. Valves shall be installed so the operator is in a vertical position and can easily be operated from above ground. Valves shall be adjusted to seat properly. Valves shall not be placed in a crosspans or curb and gutter.

VALVE BOXES

All gate valves shall be provided with a 6-inch cast iron valve box Buffalo type. The valve box shall be of a design which will not transmit shock or stress to the valve and shall be centered and plumb over the operating nut of the valve, with the box cover flush with the surface of the pavement. Special care shall be taken to insure proper compaction around valve boxes. Compaction tests are required around the valve boxes.

FIRE HYDRANTS

PLACEMENT

Fire hydrants shall be placed with the pumper nozzle facing the street. In single family residential areas the fire hydrant shall be a minimum of 1 1/2 foot behind the back of walk, and no closer than one (1) foot to the edge of the street right of way.

HYDRANT

Hydrants shall conform to AWWA C502. Only approved traffic model fire hydrants shall be installed. The hydrant shoe shall have a mechanical connection to the lateral line, and shall be properly thrust blocked. The word OPEN and an arrow showing the hydrant opens left shall be embossed on every fire hydrant. **Mueller "Centurion."**

NOZZLES

All fire hydrants shall have two (2) hose nozzles and one (1) pumper nozzle. The hose nozzles shall be 2 1/2" in diameter with National Standard threads.

The pumper nozzle shall be 4 1/2" diameter with National Standard threads. The nozzle caps shall have chains attaching the cap to the hydrant. The centerline of the hose nozzles shall be set a minimum of 18 inches and a maximum of 21 inches above finished grade.

MATERIAL

All fire hydrants, risers, laterals, and valves shall be constructed of new materials. The hydrant, riser, and **lateral shall be ductile iron.**

VALVES

All valves shall open left (counter clockwise). The hydrant valve opening shall be 5 1/4 inches.

LATERAL

The lateral from the main to the riser shall be constructed of **six- (6) inch Ductile Iron Class 50.**

COLOR

All exposed body and dome sections shall be painted fire hydrant red.

OPERATING NUT

The operating nut shall be one and one half-inch (1 1/2") brass pentagon.

CRADLES AND ENCASEMENTS

Prior to placing concrete for cradles or encasement, temporary supports consisting of concrete blocks or bricks shall be used to support the pipe in place. Not more than two supports shall be used for each pipe length, one adjacent to the shoulder of the bell and the other near the spigot end.

THRUST BLOCKS

All bends, tees, fire hydrants, plugs, and plugs with blow-offs at dead-ends, shall be protected from thrust using concrete thrust blocks. When a main is wet tapped a thrust block shall be installed. All concrete thrust blocks shall be designed for shape and size as required by the internal pressure of the pipe being 250-psi minimum.

Standard sizes and shapes of thrust blocks are shown in the standard details.

The thrust blocks shall be constructed of six and a half - (6.5) sack concrete with a 4,500 strength after 28 days. Care shall be taken not to block outlets or to cover bolts, nuts, clamps or other fittings or to make them inaccessible. A bond breaker shall be installed between the pipe or fittings and the thrust block to aid in ease of future removal.

CONCRETE PROPORTIONING

The proportions of materials to be used shall produce a workable concrete having a slump of 1" to 4" with air content of 6% ± 1 and minimum 28-day compressive strength. Minimum cement content shall be 660 lb. (7 sacks) per cubic yard with a maximum 33.7 gallons of water (including surface water on the aggregates) per cubic yard of concrete (Max Water/Cement ratio = 0.51). Concrete shall not contain fly ash or water reducer in the mix. Where "Water Tight" concrete is specified, the water/cement ratio shall not exceed 0.48.

Care shall be taken not to block outlets or to cover bolts, nuts, clamps or other fittings or to make them inaccessible. A bond breaker shall be installed between the pipe or fittings and the thrust block to aid in ease of future removal.

If in the opinion of the Engineer, the soil bearing capacity is not sufficient to provide adequate restraint based on minimum bearing areas, then the minimum bearing area shall be increased to a size that will ensure adequate restraint or the Engineer may require restrained pipe be installed. In every instance, the thrust block shall bear against undisturbed earth.

RESTRAINED FITTINGS

Fittings shall be restrained with MEGALUGS at all bulkheads, horizontal bends, branches and valves or as directed by the Engineer. Under certain circumstances the Engineer may require that restrained pipe be installed.

UTILITIES COORDINATION

The Contractor shall at all times coordinate his work with the City of Louisville. When it is necessary to close existing portions of any water or sewer system due to construction operations, at least 24 hours prior notification must be given to the City. **All water valves that are in service shall be operated only by authorized City Water Department Personnel.**

EXCAVATION BEDDING AND BACKFILLING

The minimum bedding requirements for all classes of pipe are given in these specifications. Excavation, backfilling and compaction are specified in these specifications.

DISINFECTION OF WATER MAINS

All potable water lines shall be disinfected and pressure tested prior to being put into service or being tapped. Disinfection shall be accomplished by the Chlorine Concentration Test followed by the Bacteria Test, as hereafter specified.

All chlorine and bacteria testing shall be conducted by the City.

A. CHLORINE CONCENTRATION TEST The chlorine concentration shall be tested at accessible locations and as required by the Engineer. This shall include but not be limited to fire hydrants, blow-offs and stubs lines. Chlorine shall be tested by either Amperometric Titration[1] or the DPD Test[2]. Orthotolidine colorimetric testing shall not be an acceptable means of testing the chlorine concentration.

B. TABLET METHOD Calcium Hypochlorite Tablets shall only be used for chlorination when contamination control has been exercised during installation of the pipe because the line cannot be flushed prior to chlorination. The tablet method shall not be used when trench water or foreign materials have entered the water main or the temperature is below 5 degrees centigrade (41 degrees F.). The tablets shall be secured to the pipe wall by use of Permatex No. 1[3] or other adhesive, which had been approved by the Engineer.

The tablets shall be at the top of the water main after installation of the pipe and the pipe shall be marked to assure that the tablets are so located.

1) Number of Tablets after the water main has been filled, the concentration of chlorine shall be at least 50 milligrams per liter at all test locations. After the main has set for 24 hours, the chlorine concentration shall be at least 25 milligrams per liter. Under normal conditions, the following table should produce the required concentrations using 3 3/4 grams available chlorine per gram tablet.

Diameter of Pipe (inches)	6	8	10	12	16
Length of Pipe Section (Feet)	Number of Tablets				
Less than 18	2	2	3	5	9
18	2	3	5	6	12
20	2	3	5	7	14
30	3	5	7	10	20
40	4	6	9	14	25

1. Standard Methods for Water & Wastewater Examination, 14th Ed., 1975.
2. IBID, Page 329.
3. A product of the Permatex Company, Brooklyn, New York and Kansas City, Kansas.

2) FILLING THE MAIN The main shall be filled with potable water at a velocity of less than 1-ft./sec. **The Inspector must be notified 24 hours in advance of filling the main.** When the main is full, all valves shall be operated to insure total chlorination.

3) FLUSHING THE MAIN When the chlorine test has been successfully completed, the main shall be flushed until the chlorine residual is less than one milligram per liter. **The Inspector must be notified 24 hours in advance of any flushing.** Care shall be taken to prevent erosion or to kill desirable vegetation during flushing procedures.

C. CONTINUOUS FEED METHOD This method shall be used if it is necessary to flush the water main prior to chlorination or for rechlorination if the tablet method fails.

1) APPLICATION OF CHLORINE Water from the existing distribution system shall be made to flow at a constant rate through the main to be disinfected. **The Inspector must be notified 24 hours in advance of filling the main.** Chlorine is then pumped into the main at the source of fresh water at a rate which will result in a chlorine concentration of at least 50 milligrams per liter measured at all accessible locations and as required by the Engineer.

All valves shall then be operated to insure total chlorination. After setting in the main for 24 hours, the chlorine residual shall be not less than 25 milligrams per liter measured at all accessible locations and as required by the Engineer. The following table should meet these requirements under normal conditions.

CHLORINE REQUIRED TO PRODUCE 50 MG/L CHLORINE CONCENTRATION PER 100 FEET OF PIPE

Pipe Size	100 per cent	1 per cent Chlorine

(Inches)	Chlorine (lb.)	Solution (gal.)
6	0.061	0.74
8	0.108	1.30
10	0.170	2.04
12	0.240	2.88

2) FLUSHING THE MAIN When the chlorine test has been successfully completed, the main shall be flushed until the chlorine residual is less than 1 milligram per liter. **The Inspector must be notified 24 hours in advance of flushing.** Care shall be taken to prevent erosion or to kill desirable vegetation during the flushing process.

D. SLUG METHOD The slug method shall be used for large mains when continuous feed or tablet methods are not practical.

1) CHLORINE APPLICATION Chlorine shall be applied continuously at a rate so that all interior surfaces will be exposed to a concentration of at least 300 milligrams per liter of chlorine for at least 3 hours. All valves, fire hydrants and blow-offs shall be operated as the slug passes to insure total chlorination.

2) FLUSHING THE MAIN The main shall be flushed until the chlorine residual at all required locations is less than 1 milligram per liter. **The Inspector must be notified 24 hours in advance of flushing.** Care shall be taken to prevent erosion or killing of desirable vegetation during the flushing.

E. SPECIAL CONDITIONS When water mains are cut into or repaired, precautions shall be taken to avoid contamination. When it is possible to isolate the section of main, the continuous feed or slug methods of chlorination shall be used, followed and preceded by thorough flushing. The absolute minimum amount of disinfection shall be swabbing all couplings, tapping sleeves and any other materials to be used with a 5 percent Sodium Hypochlorite solution or a 350 mg/l available Chlorine solution made from Calcium Hypo-chlorite* just prior to being installed.

**One 5g tablet of Calcium Hypochlorite (70% available Chlorine) per 10 liter of water is equal to 150 mg/l of available Chlorine.*

F. BACTERIA TEST Following chlorination, all treated water shall be thoroughly flushed from the main at its extremities until the replacement water throughout its length shall, upon tests, be proved comparable in quality to the water served the public from the existing water supply system as required by law. **The Inspector must be notified 24 hours in advance to obtain samples for testing.** If there is undesirable bacteria present, the main shall be re-chlorinated as directed by the Engineer. No main shall be placed in service until test results are received and approved by the Engineer.

G. FLUSHING THE MAIN Water mains shall be flushed at a velocity of at least 2.5 feet per second through the main. Flushing shall be performed after the tablet method but prior to the continuous feed method and the slug method. **The Inspector must be notified 24 hours in advance of flushing.** Flushing shall always be performed prior to pressure testing to expel all air from the main.

PRESSURE TEST

After the pipe has been laid and backfilled except for the joints, or completely backfilled when so directed by the Engineer, the pipe shall be filled with water and all air expelled from the pipe. If hydrants or blow-offs are not available at high points, the Contractor shall make the necessary taps at high points to expel the air and insert plugs after the air is expelled. The hydrostatic test pressure shall be 150 psi at the lowest point in the main or section under test and shall be maintained for two hours. Pressure shall be applied in a manner satisfactory to the Engineer with all testing apparatus furnished by the Contractor.

CONCRETE WORK FOR UTILITY STRUCTURES

All concrete work shall comply with the Contract Documents.

WATER SERVICE LINES AND FIRE LINES

All water service lines and fire line construction connecting to the City of Louisville Water System shall be constructed in accordance with the contract documents and Louisville Fire Protection District. Standards shall cover all new and replacement water service lines from the water main to the right-of-way property line.

MATERIALS

All materials used on water service line installations from the water main to the property line or curb stop shall be in accordance with this section and the standard details.

All piping shall be new, installed clean and shall be of the following materials:

1. Copper tubing type “K” (soft drawn) shall be used.
2. Only flared fittings permitted, no compression or sweated joints allowed, unless, otherwise noted.
3. Curb stops shall be buffalo type and installed within 12" behind the sidewalk or curb.
4. All brass and copper fittings shall be lead free.

CROSSING SIDEWALK OR CURB EXISTING OR PROPOSED

In no instance, shall a trench extend beneath an existing sidewalk or curb. The pipe must be bored or jacked, or tunneled through the earth under the curb or sidewalk.

TAPPING PVC WATERLINE

Contractor shall perform the water tap and install the appropriate corporation stop on new PVC and ductile iron mains.

ADDITIONAL REQUIREMENTS FOR WATER SERVICES

3/4" WATER SERVICES

1. Backfill in the trench shall be compacted to 95% of the maximum density per AASHTO T180 or T99 as applicable to soil type.
2. All bends in the service line shall have a minimum radius of 12".
3. The copper service shall be bedded 6" below to 12" over the top of the service with granular bedding material.

4.1 SPECIAL CONDITIONS

CONNECTIONS TO EXISTING WATER MAINS

Connections: Connections to the Owner's water system shall be completed with the Engineer present at all times during the construction of the connection.

The connection is subject to approval by the Engineer. Under no circumstances shall a non-disinfected main, which cannot be isolated, be connected to an existing disinfected main.

The Owner is not responsible for water tightness of its existing valves on existing facilities. If existing valves leak, the Contractor shall use methods at his own disposal to work with the resulting leakage at no extra cost to the contract.

Valves on the existing system that must be operated to make a connection shall be operated by the Owner's personnel only. The Engineer shall be given 24 hours notice by the contractor for operation of valves and shall be present during their operation, except in the case of an emergency.

Owner’s overtime and incidental administrative expenses will be charged for work involved with connections to existing water mains, past contract regular working hours.

RESIDENT/BUSINESS NOTIFICATION

Installation of a connection that will require closing existing valves may cause an outage of water service to existing customers. Affected customers must be notified 24 hours in advance in writing. The notices shall be delivered by hand to each residence. An attempt shall be made at each residence to deliver the notice personally to the occupant. If the occupant cannot be contacted, the written notice shall be left at the door. The Contractor shall deliver notices.

The notification shall include a description of work, the date and approximate time the water service will be shut down and the approximate time the water service will be resumed and the name and phone number of the Contractor's contact person. The notification format shall be approved by the Engineer prior to distribution.

The local Fire Department for the affected area shall be notified 48 hours in advance. A description of the boundaries of the affected area and the location of all fire hydrants in that area shall be provided to the Fire Department.

A normal outage shall be a maximum of four (4) hours. If the outage will be greater than four (4) hours, then work shall be done in a manner to minimize the inconvenience to customers, such as working at night in a continuous operation until service is restored. A connection which will require an outage longer than four hours shall require the approval of the Engineer as to the appropriate timing of the connection.

Existing fire lines may not have a method for releasing air after connecting to the new fire line. In these instances, a tap shall be installed on the fire line riser prior to the backflow prevention device for purging air. The building owners shall be notified prior to the installation of the air release tap.

CLOSURE OF THE ROADWAY

The Engineer will allow the Contractor a partial/complete closure of the roadway to through traffic during daylight hours, except for emergency and local traffic on those streets designated by the Engineer. During non-construction periods, provide two way traffic with 12' wide lanes minimum with no parking. Access to residential driveways shall be provided and maintained with a temporary ramp overnight when work has terminated for the day and when work is not in progress. There will be no separate payment for this work, all the costs for completing the work shall be incidental to the other items of the contract.

Once the Engineer has allowed construction to begin on any portion of the roadway (one block), the Contractor shall progress continuously until the patching has been completed and the roadway open to through traffic on a daily basis. Continuous progress shall be defined as a minimum or six (6) hours per day Monday through Friday by the minimum sized crew required to continue progress on the controlling operations.

ACCEPTANCE AND RELEASE FOR TAPS

A. General: A main shall be accepted by the Owner and released for taps when the following conditions have been met.

The main and all appurtenances have been installed to the satisfaction of the Engineer and all pertinent notes and measurements have been made.

The main has been successfully disinfected, pressured tested and bacteria test successfully completed to the satisfaction of the Engineer.

Dry taps will not be permitted.

SALVAGEABLE MATERIALS

If any (including but not limited to) existing pipe, valves and boxes, fire hydrant assemblies, fittings, and appurtenances removed during construction are determined to be salvageable by the Engineer, the items shall not be removed from the construction site.
Items determined salvageable by the Engineer shall be stock piled and be removed from the construction site by the Owner.

FLOWFILL

1. Flowfill
    a. Flowfill is a self-leveling concrete material composed of cement, fly ash, aggregates, water, chemical admixtures and/or cellular foam for air-entrainment.
    b. Flowfill shall have a slump of 7 to 10 inches, when tested in accordance with ASTM C143 or a minimum flow consistency of 6 inches when tested in accordance with ASTM D6103.
    c. Flowfill shall have a minimum compressive strength of 50 psi at 28 days, when tested in accordance with ASTM D4832.
    d. Flowfill shall be thoroughly mixed combination of the following ingredients:

CLSM - Flowfill	
Ingredients	LBS/CY
Cement	50
Coarse Aggregate	1700 (AASHTO No. 57 or 67)
Fine Aggregate	1845 (AASHTO M6)
Water	325 (or as needed)

    e. The amount of water shall be such that the Flowfill material flows into place properly without excessive segregation.
    f. Approximately 39 gallons of water per cubic yard of flowfill is normally needed.
    g. The Contractor may use aggregate which does not meet the above specifications if the cement is increased to 100 pounds per cubic yard and the aggregate conforms to the following gradation:

Sieve Size	Percent Passing
1 inch	100 %
No. 200	0-10%

    h. The Contractor may substitute 30 pounds per cubic yard of cement and 30 pounds per cubic yard of fly ash for 50 pounds per cubic yard of cement.
    i. The Contractor may substitute 60 pounds per cubic yard of cement and 60 pounds per cubic yard of fly ash for 100 pounds per cubic yard of cement.
    j. Cement shall conform to TYPE I-II
    k. CHRYSO TURBO CAST NCT or approved equal non-chloride accelerator shall be used for

accelerated set and early strength. Accelerator shall not be paid for separately but shall be included in the cost of Flowfill.

5.1 BASIS OF PAYMENT - WATER MAIN REPLACEMENT

The entire cost of the work and material necessary to complete all terms shown or implied on the drawings or specified herein shall be included and merged into the pay items shown in the Schedule of Unit Prices. All associated work necessary for the proper and complete installation of this project and associated bonding, maintenance and guarantees shall be merged into the pay items shown in the Schedule of Unit Prices. All payments shall be subject to the conditions of these specifications. All pay items shall include sales tax, licenses, permits, and other taxes required to complete the work. No additional compensation will be allowed for any item unless a change order is issued by the Engineer.

The Contractor shall include the cost of temporary blowoff assemblies, removal of temporary blowoff assemblies including the blowoff stack and plugging with cap at the existing main shall not be paid for separately but shall be included in the work. Temporary blowoff assemblies shall not be made of PVC.

Pressure testing, chlorination, and flushing as required for this project shall not be paid for separately but shall be included in the work.

All labor, materials and equipment for highway rated steel plates and temporary patching shall be included in the unit prices and no additional compensation shall be provided by the Owner to the Contractor for this work.

MEGALUGS for fittings shall not be paid for separately but shall be included in the work.

3" diameter adjustable steel column jacks shall not be paid for separately but shall be included in the work.

Corrosion Resistant T-head Bolts and Nuts shall be 45,000 psi minimum steel with a fluoropolymer coating and shall be either "Cor-Blue" by NSS Industries or "Blue Bolt" by Birmingham Fasteners or approved equal.

Minor items and minor details are not listed but shall be part of the complete contract.

The following items in this section are representatives of all work items required and therefore are not referred to by proposal or item number for each individual work item.

PVC WATER MAIN CLASS 235 DR 18 (8")(12'')

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to the installation of PVC WATER MAIN CLASS 235 DR 18 (8")(12'') and appurtenances per the plans and specifications.

Work shall include asphalt saw cutting and removal, loading, haul and disposal of existing asphalt and miscellaneous material for water main installation. Work shall include pipe and appurtenances, polyethylene wrap, locator wire and tape, test stations, bedding material, excavation, extra depth excavation under existing water mains and other utilities to install new water main, backfill, compaction, pushing or tunneling under existing utilities and concrete and connections to existing mains and items incidental. Drainage of existing water mains, pumping and trench dewatering shall be included as part of the work. Removal of existing piping, valves, fittings, thrust blocks and appurtenances, loading, haul, removal, and disposal of excess trench material as required shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on an installed field measured Lineal Foot basis for PVC WATER MAIN CLASS 235 DR 18 (8")(12''). MAIN measured from valve centerline to valve centerline and or fitting centerline to fitting centerline and shall be full compensation for all work necessary to complete the item.

REMOVE FIRE HYDRANT ASSEMBLY

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to REMOVE FIRE HYDRANT ASSEMBLY and appurtenant fittings per the plans and specifications.

Work shall include asphalt and concrete saw cutting and removal, loading, haul, and disposal of existing asphalt, concrete and other miscellaneous material. Work shall include excavation, backfill and compaction. Work shall include removal of the fire hydrant, lower barrel, hydrant shoe, thrust block, loading, haul, removal and disposal of excess trench material, as required and shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on a per each installed basis for REMOVE FIRE HYDRANT ASSEMBLY and shall be full compensation for all work necessary to complete the item.

FIRE HYDRANT ASSEMBLY

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to the installation of FIRE HYDRANT ASSEMBLY. The FIRE HYDRANT ASSEMBLY shall include the fire hydrant, 6" CL50 ductile iron pipe length as required, 6" Gate Valve, MEGALUGS, and concrete thrust blocks and appurtenant fittings, per the plans and specifications.

Work shall include asphalt and concrete saw cutting and removal, loading, haul, and disposal of existing asphalt, concrete and other miscellaneous material. Work shall include excavation, bedding material, polyethylene wrap, locator wire, locator wire test station, thrust blocks, backfill and compaction. Removal of any existing fire hydrant, piping, valves, fittings and appurtenances, loading, haul, removal and disposal of excess trench material, as required shall be part of the work.

Replacement and or restoration of residential landscape and irrigation materials disturbed or damaged within the work area shall be replaced or restored to equal or better condition prior to commencement of the work and to the satisfaction of the Engineer and shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on a per each installed basis for FIRE HYDRANT ASSEMBLY and shall be full compensation for all work necessary to complete the item.

FIRE HYDRANT EXTENSION (6")

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to the installation of FIRE HYDRANT EXTENSION (6"). The FIRE HYDRANT EXTENSION (6") shall include 6" extension, hardware and appurtenant fittings, per the plans and specifications.

Work shall include excavation, polyethylene wrap, backfill and compaction. Loading, haul, removal and disposal of excess trench material, as required shall be part of the work.

Replacement and or restoration of residential landscape and irrigation materials dsturbed or damaged within the work area shall be replaced or restored to equal or better condition prior to commencement of the work and to the satisfaction of the Engineer and shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on as per each installed basis for FIRE HYDRANT EXTENSION (6") and shall be full compensation for all work necessary to complete the item.

FIRE HYDRANT EXTENSION (12")

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to the installation of FIRE HYDRANT EXTENSION (12”). The FIRE HYDRANT EXTENSION (12”) shall include 12” extension, hardware and appurtenant fittings, per the plans and specifications.

Work shall include excavation, polyethylene wrap, backfill and compaction. Loading, haul, removal and disposal of excess trench material, as required shall be part of the work.

Replacement and or restoration of residential landscape and irrigation materials disturbed or damaged within the work area shall be replaced or restored to equal or better condition prior to commencement of the work and to the satisfaction of the Engineer and shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on as per each installed basis for FIRE HYDRANT EXTENSION (12”) and shall be full compensation for all work necessary to complete the item.

WATER MAIN FITTINGS AND SPECIALS (4”)(8")(12’’)

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to the installation of miscellaneous WATER MAIN FITTINGS AND SPECIALS (4)(8”)(12’’) more thoroughly described in the Schedule of Unit Prices and per the plans and specifications.

Work shall include asphalt saw cutting and removal, loading, haul, and disposal of existing asphalt and other miscellaneous material. Work shall include excavation, bedding material, polyethylene wrap, MEGALUGS, 3" diameter adjustable steel column jacks, caps, thrust blocks, backfill and compaction. Removal of any existing piping, valves, valve boxes, fittings and appurtenances, loading, haul, removal and disposal of excess trench material, as required shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on a per each installed basis for miscellaneous WATER MAIN FITTINGS AND SPECIALS (4)(8”)(12’’) and shall be full compensation for all work necessary to complete the item.

GATE VALVE AND BOX (8")

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to the installation of GATE VALVE AND BOX (8")(12") and appurtenant fittings per the plans and specifications.

Work shall include asphalt saw cutting and removal, loading, haul, and disposal of existing asphalt and other miscellaneous material for GATE VALVE AND BOX (4")(6")(8")(12") installation. Work shall include excavation, bedding material, polyethylene wrap, backfill and compaction. Removal of any existing piping, valves, fittings and appurtenances, loading, haul, removal and disposal of excess trench material, as required shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on a per each installed basis for GATE VALVE AND BOX (8")(12") and shall be full compensation for all work necessary to complete the item.

ABANDON EXISTING VALVE AND BOX

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to ABANDON EXISTING VALVE AND BOX and appurtenant fittings per the plans and specifications.

Work shall include asphalt saw cutting and removal, loading, haul, and disposal of existing asphalt and other miscellaneous material. Work shall include excavation, backfill and compaction. Work shall include removing the top section and bottom section of the existing valve box to the valve top nut and loading, haul, removal and disposal of excess trench material, as required shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on a per each basis for ABANDON EXISTING VALVE AND BOX and shall be full compensation for all work necessary to complete the item.

WATER SERVICE CONNECTION 3/4" SHORT - WATER SERVICE CONNECTION 3/4" LONG

1. Scope of Work

Where existing 3/4" water services are excavated and found copper and at the direction of the Engineer:

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to the installation of WATER SERVICE CONNECTION 3/4" SHORT,

WATER SERVICE CONNECTION 3/4" LONG, and appurtenant fittings per the plans and specifications.

WATER SERVICE CONNECTION 3/4" SHORT (where the service connection is intersected by the new water main).

WATER SERVICE CONNECTION 3/4" LONG (where the service connection has to be extended from the existing water main to the new water main).

Work shall include asphalt saw cutting and removal, loading, haul and disposal of existing asphalt and other miscellaneous material. Work shall include excavation, tapping, bedding material, polyethylene wrap, backfill and compaction. Removal of any existing piping, valves, fittings and appurtenances, loading, haul, removal and disposal of excess trench material, as required shall be part of the work.

Work shall include installation of the required fittings, 3/4" Corporation, double brass tapping saddle (for PVC water main applications), and Type K soft drawn copper piping, flared fittings and appurtenances. Disconnecting the existing service from the existing water main and making the new service connection to the new water main. The Contractor will be responsible for making the physical tap on the new installed PVC water mains.

2. Method of Measurement and Payment

Payment will be made on a per each installed basis for WATER SERVICE CONNECTION 3/4" SHORT, WATER SERVICE CONNECTION 3/4" LONG, and shall be full compensation for all work necessary to the item.

REMOVE AND REPLACE 3/4" WATER SERVICE

Where existing 3/4" water services are excavated and found galvanized and at the direction of the Engineer:

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to the installation of new Type K soft drawn copper piping, flared fittings, and appurtenances to the curb stop valve per the plans and specifications.

Work shall include asphalt saw cutting and removal, loading, haul and disposal of existing asphalt and other miscellaneous material. Work shall include excavation, tapping, bedding material, polyethylene wrap, backfill and compaction. Removal of any existing piping, valves, fittings and appurtenances, loading, haul, removal and disposal of excess trench material, as required shall be part of the work.

Work shall include supplying and installation of the required fittings, Ford Brass Saddles Styles 202 B CC (AWWA) thread or approved equal, Ford Ballcorp Coporation Stops FB600-3-NL/FB600-4-NL or approved equal. Type K soft drawn copper piping, flared fittings and appurtenances. Disconnecting the existing service from the existing water main and making the new service connection to the new water main. The Contractor will be responsible for making the physical tap on the new installed PVC water mains.

Replacement and or restoration of residential landscape materials disturbed or damaged within the work area shall be replaced or restored to equal or better condition prior to commencement of the work and to the satisfaction of the Engineer, shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on a per each basis for REMOVE AND REPLACE 3/4" WATER SERVICE and shall be full compensation for all work necessary to the item.

REMOVE AND REPLACE ¾" CURB STOP AND BOX

Where existing 3/4" water services are excavated and found galvanized and at the direction of the Engineer:

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, for the construction, and construction necessary relating to REMOVE AND REPLACE ¾" CURB STOP AND BOX and appurtenant fittings per the plans and specifications.

Work shall include asphalt saw cutting and removal, loading, haul, and disposal of existing asphalt and other miscellaneous material. Work shall include excavation, bedding material, polyethylene wrap, backfill and compaction. Removal of any existing piping, valves, fittings, and appurtenances, curb stops, curb stop boxes and appurtenances, loading, haul, removal and disposal of excess trench material, as required shall be part of the work.

Work shall include installation of the required fittings, Ford ¾" B22-333-NL curb stop or approved equal, Tyler 6500 2 piece screw type curb stop box or approved equal, Ford Quick Joint Coulpling – C45-33-Q-NL, 12" Type K soft drawn copper piping, flared fittings and appurtenances to complete the connection. Work shall include the connection to the existing residential service at the location of the quick joint coupling.

Replacement and or restoration of residential landscape materials disturbed or damaged within the work area shall be replaced or restored to equal or better condition prior to commencement of the work and to the satisfaction of the Engineer, shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on a per each basis for REMOVE AND REPLACE ¾" CURB STOP AND BOX and shall be full compensation for all work necessary to complete the item.

POTHOLING

1. Scope of Work

This work shall include furnishing all labor, material, equipment, excavation, coring, squeegee, pothole backfill with flowfill, asphalt patching and compaction for potholing. Potholing shall be at locations the Contractor determines necessary to confirm potential conflicting utilities with water main installation grade and alignment. Potholing shall only be completed with hydro-vac equipment.

2. Method of Measurement and Payment

Payment will be made on a per each basis for POTHOLING and shall be full compensation for all work necessary to complete the item.

FLOWFILL

1. Scope of Work

This work shall consist of furnishing all labor, materials, equipment, excavation, loading, haul, and disposal for FLOWFILL. The Contractor shall remove and dispose of excavated trench material. All material removed shall become the property of the Contractor and shall be properly disposed of outside the limits of the project at no additional cost.

This work shall also include furnishing all labor, material, delivery, equipment, loading, haul, and placing to complete FLOWFILL.

Flowfill shall meet the following requirements for mix design:

2. Flowfill
    a. Flowfill is a self-leveling concrete material composed of cement, fly ash, aggregates, water, chemical admixtures and/or cellular foam for air-entrainment.
    b. Flowfill shall have a slump of 7 to 10 inches, when tested in accordance with ASTM C143 or a minimum flow consistency of 6 inches when tested in accordance with ASTM D6103.
    c. Flowfill shall have a minimum compressive strength of 50 psi at 28 days, when tested in accordance with ASTM D4832.
    d. Flowfill shall be thoroughly mixed combination of the following ingredients:

CLSM - Flowfill	
Ingredients	LBS/CY
Cement	50
Coarse Aggregate	1700 (AASHTO No. 57 or 67)
Fine Aggregate	1845 (AASHTO M6)

Water	325 (or as needed)

e. The amount of water shall be such that the Flowfill material flows into place properly without excessive segregation.
f. Approximately 39 gallons of water per cubic yard of flowfill is normally needed.
g. The Contractor may use aggregate which does not meet the above specifications if the cement is increased to 100 pounds per cubic yard and the aggregate conforms to the following gradation:

Sieve Size	Percent Passing
1 inch	100 %
No. 200	0-10%

h. The Contractor may substitute 30 pounds per cubic yard of cement and 30 pounds per cubic yard of fly ash for 50 pounds per cubic yard of cement.
i. The Contractor may substitute 60 pounds per cubic yard of cement and 60 pounds per cubic yard of fly ash for 100 pounds per cubic yard of cement.
j. Cement shall conform to TYPE I-II
k. CHRYSO TURBO CAST NCT or approved equal non-chloride accelerator shall be used for accelerated set and early strength. Accelerator shall not be paid for separately but shall be included in the cost of Flowfill.

3. Method of Measurement and Payment

Payment will be made on an actual installed per cubic yard basis for FLOWFILL, delivery tickets will confirm the amount of flowfill installed and shall be full compensation for all work necessary to complete the item.

- END OF SECTION -

SECTION 02200 – SANITARY SEWER REPLACEMENT TECHNICAL SPECIFICATIONS
SANITARY SEWER REPLACEMENT

1.0 SCOPE OF WORK

The work shall consist of, but not limited to, new construction of sanitary sewer backwater preventer valve, fittings and service pipe and incidentals at the following location within the City of Louisville:

- 732 MEAD STREET
- 317 ROOSEVELT AVENUE
- 1101 SPRUCE STREET
- 721 MEAD STREET

SANITARY SEWER BACKWATER PREVENTER VALVE

ITEM	DESCRIPTION	UNIT	QUANTITY
34	4" BACKWATER VALVE KIT	EA	4
35	SCHEDULE 40 PVC PIPE (4")	LF	40
36	SCHEDULE 40 PVC PIPE (6")	LF	40
37	SANITARY SEWER SERVICE PIPE SDR 35 (4")	LF	20
38	STRONG BACK COUPLING (4")	EA	16
39	FITTINGS SDR 35 (4")	EA	15
40	24" VERTICAL CURB AND GUTTER	LF	20
41	4" CONCRETE	SF	40
42	HOT ASPHALT PATCH GRADE SX (6")	SY	10
43	CAST IRON CLEAN OUT BOX AND COVER	EA	2
44	LANDSCAPE RESTORATION	LS	1

2.0 CITY DESIGN AND CONSTRUCTION STANDARDS

Any and all materials required for this project shall be pursuant to the requirements of the City of Louisville, Colorado “Design and Construction Standards”, adopted February 15, 1994 and the latest revisions thereto except as modified by these plans and/or specifications.

3.0 MATERIALS

POLYVINYL CHLORIDE PLASTIC GRAVITY SEWER PIPE

All material, manufacturing operations, testing and inspection of PVC sewer pipe shall be in conformity with the requirements of ASTM D 3034. All pipe shall be new.

WALL THICKNESS DESIGN OF PIPE

The standard dimension ratio of the diameter to the wall thickness shall not be greater than SDR 35 for 4" PVC Pipe and SDR 35 for pipes larger than 4" and conforming to ASTM D 3034.

PIPE, FITTINGS AND SPECIALS

All fittings and specials shall conform to the requirements set forth in ASTM D 3034, shall have the same structural properties, and the same bell and/or spigot configurations as an adjoining pipe.

All sewer fittings associated with the construction of new sewer pipe, including wyes, bends, and plugs shall be manufactured of the same material, to the same specifications, and with the same specified joints as is the installed sewer main. All materials shall be clearly marked on the exterior surface of all pipe and fittings with the following:

1) ASTM designation
2) Class and size
3) Date of manufacture
4) Name or trade mark of manufacturer

JOINTS

All PVC joints shall be of bell and spigot type. The bell shall conform to ASTM D 3034. The rubber ring shall be in accordance with ASTM D 1869. The joint shall meet the requirements of ASTM D 3212. Spigot and bell ends shall be smooth and free of burrs, and foreign particles prior to making the joint.

An approved lubricant shall be applied to the sealing ring to prevent damage to the ring and aid in making a tight joint. The gasket shall comply with ASTM F 477.

MATERIAL TESTING

All PVC Gravity sewer pipe shall be capable of passing all of the following tests at 73^{o} F (plus or minus 3^{o} degrees F).

A. STIFFNESS The minimum "pipe stiffness: (F/ Y) at 5% deflection shall be 46 psi. For all sizes, when tested in accordance with ASTM Method of Testing D-2412, External Loading Properties of Plastic Pipe by Parallel-Plate Loading.

B. FLATTENING There shall be no evidence of splitting, cracking, or breaking when a section of pipe six inches long is compressed between parallel plates until the distance between the plates is forty percent of the outside diameter of the pipe. The loading shall be a uniform rate and shall be completed between two to five minutes.

C. DROP IMPACT TEST A six inch long section of pipe shall be subjected to a free falling tup in accordance with ASTM Method Testing D-2444. No shattering or splitting shall be evident when the following energy is impacted:

Nominal Size (inches)	4	6	8	10	12
Ft. - lbs.	150	210	210	220	220

HANDLING AND INSTALLATION FOR SANITARY SEWER PIPES

Unless otherwise specified all pipe handling, laying and jointing shall be based upon the manufacturer's recommended practice for installation of each specified type of pipe. Provisions of this section shall augment those recommendations.

MATERIAL HANDLING

Pipe, fittings, and accessories shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground. If any part of the coating or lining is damaged, the Contractor shall repair or replace the material affected at his expense as required by the Engineer or Inspector. All pipe and culverts shall be handled in accordance with the appropriate AWWA and ASTM Standards.

Proper implements, tools, and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. Every precaution shall be taken to prevent foreign material from entering the pipe.

If the pipe-laying crew cannot put the pipe in the trench and in place without getting earth in it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly-woven canvas bag of suitable size be placed over each end and left there until the connection is to be made to the adjacent pipe. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe.

MATERIAL STORAGE

Care shall be taken to store all pipe and fittings to maintain the condition of the pipe as manufactured new. Pipe shall be stored on a flat surface to prevent the pipe from deformation due to temperature fluctuations and stress fatigue. Pipe shall be stored to prevent dirt or mud from entering the pipe and necessitating extensive cleaning procedures. Pipe shall, at all times, be protected from exposure to ultraviolet radiation (sunlight). Any discoloration of the pipe material shall be evidence of ultraviolet damage and the pipe shall be rejected and removed from the project.

MISCELLANEOUS

1) The Contractor shall be responsible for removal and disposal of the existing sanitary sewer main, service piping, bedding material and excavated earth materials as required to complete the project.

2) During construction, the Contractor shall take whatever measures required to facilitate a continuous flow of wastewater around the project. If required, the Contractor shall pump these flows. Additionally, a temporary connection between the new PVC pipe and existing pipe shall be provided whenever the Contractor is not on the construction site.

3) Responsibility for any damages incurred during construction by homeowners and businesses with service connections along the project reach and upstream on the project shall be the sole responsibility of the Contractor.

4) At no time shall wastewater flow be pumped at night through the project.

5) Tap locations shown on the plans are general locations. The tap locations have been provided for general information. The Contractor is responsible for locating all existing sanitary sewer taps and services during construction.

INSTALLATION

Pipe shall be installed in full compliance with the Recommended Practice for "Underground Installation of Flexible Thermoplastic Sewer Pipe", ASTM Standard D 2321.

Pipe shall be installed with Granular Bedding Material. Bedding shall be installed 6" below the pipe and to a minimum of 12" depth over the top of the pipe. Bedding material shall be hand placed under haunches of pipe to insure uniform support. Bell holes shall be made at each joint. Bottom of trench shall be firm and on grade.

Pipe installation shall start and end at manholes. Connections to pipe of other than PVC material shall be accomplished by matching plain ends of each pipe and by use of an adaptor or such method that will insure a smooth water tight, air tight transition of the invert at the connection as approved by the Engineer.

Backfilling of acceptable material shall not be placed in lifts to exceed eight inches (8'') and shall be compacted to City of Louisville Standards. Random tests for compaction shall be made at all elevations of the trench sections to insure firm support around the pipe and the backfill above the pipe.

Bell grooves and gasket shall be cleaned of dirt or foreign matter before the lubricant is applied to the joint. The spigot end of the pipe shall be thoroughly cleaned and lubricated before insertion of the bell end. Cut ends of pipe shall be filed to an approximate angle of 30 degrees before being inserted into the bell end. All gaskets and fittings used in the sewer line installation shall have the same cleaning and care before insertion into the line.

Sufficient backfill shall be placed on the barrel of each pipe section to secure the pipe against flotation from water in the trench or subsurface water.

Care shall be taken to insure a clean line. Pipe plugs shall be used in each end of the sections of pipe as installed, whenever pipe laying is not in progress. A wooden bulkhead shall be installed at the upper end of the project in addition to the pipe plug.

LOCATOR WIRE

Locator wire shall be installed on the top of the pipe and taped every ten (10) feet. Locator wire shall be 12 AWG Type UF for direct burial.

All locator wire shall be continuous. Splices shall be completed with 3M DBY Direct Bury Splice Kit or approved equal, using Scotchlok electrical spring connectors and gel-filled insulator tubes.

The locator wire shall form a continuous electrical circuit throughout all PVC sewer main piping installed including branch laterals and services.

Locator wire shall be extended to each manhole per the plan details.
Inspection of all locator wire splices required prior to backfill. After trench backfill is complete, the contractor may contact the Engineer to conduct a preliminary continuity test on the locator wire. A continuity test on the locator wire is required prior to any placement of asphalt paving. The Engineer will perform the continuity test. A 48-hour notice is required for scheduling the locator wire continuity test.

LOCATOR TAPE

Warning locator tape with SEWER LINE BURIED BELOW printed on the tape shall be installed on top of the bedding material.

PROGRESSION OF WORK

The laying of pipe shall commence at the lowest point and proceed upgrade so that the pipe is laid with the bell ends facing in the direction of laying and at the correct grade and alignment. The pipe shall be placed in such a manner that the specified bedding provides a solid, uniform bearing surface for the full length of the barrel. Bell holes shall be provided at all joints. Equipment used in handling and jointing the pipe shall have adequate capacity to handle the pipe smoothly and assure the proper closure of joints.

All pipe shall be carefully constructed so that when joined together they will form a conduit with a smooth, uniform invert. The pipe shall be laid accurately to the grade and alignment specified on the drawings. Blocking or wedging of the pipe to achieve proper positioning and grade shall not be permitted, except where required for proper construction of cradles or encasements.

SANITARY SEWER MANHOLES

Manholes shall be constructed of precast concrete.

BARREL SIZE

The internal diameter of the manhole barrel shall not be less than 48 inches for sanitary sewers.

MATERIALS

The materials to be used in the construction of manholes shall conform to the following requirements:

CONES

All cones shall be eccentric. Flat top sections may be used, upon written permission of the Engineer, on shallow lines where standard cone sections will not conform to specified elevations. Flat top sections shall be designed for H-20 loadings and conform to ASTM C 478.

PRECAST MANHOLES

Precast manhole risers and cones shall be manufactured to conform with ASTM C 478.

CAST IN PLACE MANHOLES

Cast in place manholes will not be allowed.

CEMENT

All cement used in concrete and mortar shall conform to ASTM Designation C 150 Type II, Type IIA or when deemed necessary, Type V.

AGGREGATE

Aggregate shall conform to Standard Specifications for Concrete Aggregates ASTM Designation C 33.

CONCRETE FOR MANHOLES

Concrete used in precast manhole sections shall conform to ASTM C 478 and the manhole foundation shall have a 28 day strength of 3750 psi and shall have a maximum water cement ratio of 0.45.

MANHOLE STEPS

Manhole steps shall be corrosion resistant and shall be M.A. Industries Inc. PS2-PF or approved equal. Manhole steps shall be no more than 24 inches or less than 18 inches from the top of the manhole ring or from the bench of the manhole.

RING AND COVER

Manhole rings and covers shall be 24 inch diameter for 48 inch diameter manhole barrels. The word "SEWER" shall be marked with raised lettering on sanitary sewer covers. Construction castings #J-1361 or approved equal shall be used. Metal used for castings shall conform to ASTM A48 83 Class 25B gray cast iron, no aluminum castings or riser rings shall be allowed.

The cover shall be machined to fit the ring to exclude surface water and be level with the top of the ring. Covers shall have one lifting notch of 1" x 1 1/4".

The ring shall be held in place by being set on ramneck and by asphalt being placed over the ring from the edge of the support structure to the top edge of the ring. A maximum of 12" of concrete adjustment rings will be allowed between the last manhole section and finished grade.

FLEXIBLE JOINT SEALING COMPOUND

Kent-Seal No. 2 as manufactured by Hamilton-Kent Company, or other approved plastic joint material shall be used in all concrete joints and between the cast iron ring and cover and cone section. Sealing compounds shall conform to Federal Specifications SS-S-00210 and shall remain pliable to -20 degrees Fahrenheit and shall not become excessively pliable at +120 degrees Fahrenheit.

EPOXY COATING

Where required or shown on the drawings, the epoxy coating shall be similar or equal to "PREBOUND CONCRETE BONDING AGENT ET-150H".

CONSTRUCTION

Manholes shall be constructed at the locations and to the elevations indicated on the drawings.

Manholes shall be constructed so as to form a circle in a horizontal plane. The internal diameter of manhole barrels shall be maintained to a distance of not more than five (5) feet below finished grade and vertically plumb. From that point the manhole barrel shall be tapered to the 24 inch internal diameter for 4 foot diameter manholes, and 30 inch internal diameter for 5 foot diameter manholes and larger as shown on the standard manhole drawings. The manhole barrels shall be watertight at all joints.

All manholes under construction shall be sealed tightly to prevent storm or other non-sewage flows from entering the sanitary sewer system.

HORIZONTAL JOINTS

Flexible plastic joint sealing compound in accordance with Section 208.13 of the Design and Construction Standards shall be applied to all manhole joints. The application of the priming compound and the sealing compound shall be accomplished in strict conformance with the manufacturer's instructions. The joint materials shall conform to the approximate manufactured shape at the time of installation. The joint materials shall not be stretched or in any other way distorted.

MANHOLE BASES

Except as otherwise shown on the approved plans, the manhole bases shall be constructed as shown on the Manhole Base Detail. **Precast manhole bases are preferred** over cast-in place manhole bases. Changes in direction of flow through the manhole shall be made with a smooth curved channel having as large a radius as possible. The change in size of channels shall be made gradually and evenly and shall be formed directly in the concrete. The floor of the manhole outside of the channel shall be finished to a smooth surface and shall slope to the channel. The thickness of the base shall not be less than eight (8) inches no more than twelve (12) inches under the invert of the channel and have a mat of #4 rebar 12" o.c. each way. The elevation of the subgrade for the manhole shall not vary more than 0.05 feet.

Concrete bases shall be placed on undisturbed ground. The ground surface below the precast concrete base shall be excavated three inches below the elevation of the bottom of the base and backfilled with 1 1/2" fractured rock or other material approved by the Engineer.

The 1 1/2" rock shall be carefully leveled to give uniform support to the precast base over the entire area. The precast base shall be set at the proper location to center the manhole.

CONNECTIONS TO EXISTING MANHOLES

Sewer pipe connections, to existing manholes where there are no existing pipes stubbed out, shall be made in such a manner that the finished work will conform to the requirements specified for new manholes. The Contractor shall remove existing piping in the manhole and break out as small an opening in the existing manhole as necessary to insert the new water stop gasket and sewer pipe. The existing concrete foundation bench shall be chipped to the cross-section of the new pipe in order to form a smooth continuous invert similar to what would be formed in a new concrete base. Non-shrink, non-metallic grout 3M 5600 or an approved equal shall be used to smoothly finish the new invert and to seal the new line so the junction is watertight.

TRENCH BACKFILLING

Backfilling shall be in accordance with these specifications, with the exception that compaction tests on the service trench within City R.O.W. must be reviewed by the Engineer prior to patching the street.

TESTING AFTER CONSTRUCTION

PVC gravity sewer pipe shall be tested in accordance with this section as well as in accordance with other sections of the Design and Construction Standards. The Engineer may require that alignment, infiltration, exfiltration and deflection tests be completed by the Contractor at the Contractor's expense. **In addition, the Engineer will require the Contractor at the Contractor's expense, to jet the sewer mains and have the pipe inspected with TV equipment (a copy of the DVD must be supplied to the City).**

MAXIMUM DEFLECTION TEST (NOT APPLICABLE)

PVC gravity sewer pipe shall not deflect more than 5% of the diameter of the pipe. The deflection shall be tested in every section by the Contractor with a Pin-Type Go-No-Go Gauge, in no case shall the deflection test be performed within 30 days after the completion of the air test. When the test fails, the line shall be repaired and retested at the Contractors expense. The Inspector shall be present during the test and shall verify the accuracy of the equipment.

211.2 AIR TEST

All lines shall be tested for exfiltration by low pressure air testing in accordance with ASTM C 828. Testing must be completed with the Inspector present.

211.3 MANHOLE LEAKAGE TEST

At the discretion of the Engineer vacuum testing manholes may be required. All pipes entering the manhole shall be plugged and braced and a vacuum of ten inches (10") of mercury shall be drawn. The vacuum pump shall be turned off and the time monitored as the vacuum drops on inch (1"). The vacuum must not drop more than one inch (1") for the duration of the time indicated in the following table:

Specified Test Duration for Diameter of Manhole
(duration indicated in min:sec)

Manhole Diameter (inches)		
48"	60"	72"
1:00	1:15	1:30

Manholes which fail the vacuum test shall have the defects located and repaired and the test shall be repeated. Repair and retesting shall be continued until the test meets the requirements.

In lieu of vacuum testing of manholes the Engineer may require water testing of manholes. Manholes shall be tested separately from the pipe. The sewer pipe in the manhole will be plugged. If the ground water table is below the invert, the manhole shall be filled to a depth of five (5) feet above the invert. If the ground water level is above the invert of the manhole, then the manhole will be filled to level at least three (3) feet above the ground water level or to the top of the upper most precast manhole section whichever is less, but not less than five (5) feet above the invert. After soaking for one hour, the manhole shall be filled to the original level. It shall then be tested for two hours. The allowable drop of water shall be one quarter (1/4) inch.

No manhole will be accepted when there is any visible infiltration when empty.

At the discretion of the Engineer, at least twenty (20) percent of all manholes installed will be tested. Based on these tests, and visual inspection of all the manholes, additional tests may be required for other manholes. Any manhole whose test is unsatisfactory shall be repaired and retested until satisfactory results are obtained.

Failure of either test is considered failure of the section involved.

RETESTING OF PIPE AFTER WARRANTY

The City, may at its option, re-inspect the project and use closed circuit television, air test, and Pin-Type Go-No-Go Gauge to verify that the line is free of defects prior to the warranty expiration and granting final acceptance. The Contractor shall be responsible for replacing all defective sections of pipe at no expense to the City.

A defective section shall be any section with excessive infiltration or exfiltration, any section with deflection in excess of 5% of the diameter, any section with structural failure, any section with a defect that prevents the designed discharge from flowing through the pipe or any section that would cause an abnormal amount of maintenance due to construction. The Inspector shall witness each repair or replacement.

CLEANING THE LINE

When all of the pipes have been installed, the line and manholes shall be cleaned and be free of sand, dirt and debris. If the line must be flushed, it shall be done by the use of a high pressure jet or sewer balling method. Care shall be taken to insure that no non-sewage water enters the existing sanitary system. Should the Contractor allow water to enter the existing system, damages to the system, costs of treating the water, and fines in accordance with the City Code shall be at the Contractor's expense.

MISCELLANEOUS

1. The Contractor shall be responsible for removal and disposal of the existing sanitary sewer main, service piping, bedding material, asphalt, concrete, and excavated earth materials as required to complete the project.

2. During construction, the Contractor shall take whatever measures required to facilitate a continuous flow of wastewater around the project. If required, the Contractor shall pump these flows. Additionally, a temporary connection between the new PVC pipe and existing pipe shall be provided whenever the Contractor is not on the construction site.

3. Responsibility for any damages incurred during construction by homeowners and businesses with service connections along the project reach and upstream on the project shall be the sole responsibility of the Contractor.

4. At no time shall wastewater flow be pumped at night through the project.

5. Tap locations shown on the plans are general locations. The tap locations have been provided for general information. The Contractor is responsible for locating all existing sanitary sewer taps and services during construction.

4.0 BASIS OF PAYMENT - SANITARY SEWER

The entire cost of the work and material necessary to complete all terms shown or implied on the drawings or specified herein shall be included and merged into the pay items shown in the Schedule of Unit Price. All associated work necessary for the proper and complete installation of this project and associated bonding, maintenance and guarantees shall be merged into the pay items shown in the Schedule of Unit Prices. All payments shall be subject to the conditions of these specifications. All pay items shall include sales tax, licenses, permits, and other taxes required to complete the work. No additional compensation will be allowed for any item unless the Engineer issues a change order.

Minor items and minor details are not listed but shall be part of the complete contract.

Potholing any potential conflicting utilities to determine construction grade and alignment shall be part of the work and shall be included in the unit prices and no additional compensation shall be provided by the owner to the contractor for this work.

Contractor shall provide a DVD inspection of all constructed Sewer mains as part of the completed work. The cost for the DVD inspection shall not be paid for separately but shall be included in the work.

The following items in this section are representatives of all work items required and therefore are not referred to by proposal or item number for each individual work item.

4" BACKWATER VALVE KIT

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment for the construction, and construction necessary relating to the installation of 4" BACKWATER VALVE KIT and appurtenances per the plans and specifications.

Work shall include asphalt and concrete saw cutting and removal, loading, haul and disposal of existing asphalt and concrete, and miscellaneous material for 4” backwater valve kit. **The 4” backwater valve kit shall be CLEAN CHECK 97034 4” PVC WITH ADAPTER AND PLUG.** Work shall include excavation, backfill, compaction, bedding material, connection to existing piping, and other items incidental. Removal of existing piping, loading, haul, removal, and disposal of excess trench material as required shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on a per each installed basis for 4” BACKWATER VALVE KIT and shall be full compensation for all work necessary to complete the item.

SCHEDULE 40 PVC PIPE (4”)(6”)

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment for the construction, and construction necessary relating to the installation of SCHEDULE 40 PVC PIPE (4”)(6”) and appurtenances per the plans and specifications.

Work shall include miscellaneous material for SCHEDULE 40 PVC PIPE (4”)(6”) installation. Work shall include excavation, backfill, compaction, bedding material, schedule 40 cement and connection to existing piping, and other items incidental. Removal of existing piping, loading, haul, removal, and disposal of excess trench material as required shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on an installed field measured Lineal Foot basis for SCHEDULE 40 PVC PIPE (4”)(6”) measured along the centerline of pipe, and shall be full compensation for all work necessary to complete the item.

SANITARY SEWER SERVICE PIPE SDR 35 (4")

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment for the construction, and construction necessary relating to the installation of SANITARY SEWER SERVICE PIPE SDR 35 (4") and appurtenances per the plans and specifications.

Work shall include concrete and asphalt saw cutting and removal, loading, haul and disposal of existing asphalt and concrete, sewer service pipe and appurtenances and miscellaneous material for sanitary sewer service replacement. Work shall include pipe from the fitting to the strong back coupling. Work shall include, excavation, backfill,

compaction, bedding material, and other items incidental. Removal of existing piping, loading, haul, removal, and disposal of excess trench material as required shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on an installed field measured Lineal Foot basis for SANITARY SEWER SERVICE PIPE SDR 35 (4") measured along the centerline of pipe, and shall be full compensation for all work necessary to complete the item.

STRONG BACK COUPLING (4")

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment for the construction, and construction necessary relating to the installation of STRONG BACK COUPLING (4") and appurtenances per the plans and specifications.

Work shall include miscellaneous material and appurtenances including fernco strong back couplings including but not limited to connecting schedule 40 pipe to SDR 35 pipe, schedule 40 pipe to clay pipe, schedule 40 pipe to orangeburg pipe, SDR 35 pipe to SDR pipe, SDR 35 pipe to clay pipe, SDR 35 pipe to orangeburg pipe. Work shall include, excavation, bedding material backfill, compaction, and other items incidental. Removal of existing piping, loading, haul, removal, and disposal of excess trench material as required shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on a per each installed basis for STRONG BACK COUPLING (4") and shall be full compensation for all work necessary to complete the item.

FITTINGS SDR 35 (4")

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment for the construction, and construction necessary relating to the installation of FITTINGS SDR 35 (4") and appurtenances per the plans and specifications.

Work shall include material and appurtenances including but not limited to 45 degree, 22½ degree or 11¼ degree bends. Work shall include concrete, excavation, bedding material, backfill, and compaction and other items incidental. Removal of existing piping, loading, haul, removal, and disposal of excess trench material as required shall be part of the work.

2. Method of Measurement and Payment

Payment will be made on a per each installed basis for FITTINGS SDR 35 (4”) and shall be full compensation for all work necessary to complete the item.

CAST IRON CLEAN OUT BOX AND COVER

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment for the construction, and construction necessary relating to the installation of CAST IRON CLEAN OUT BOX AND COVER
and appurtenances per the plans and specifications.

Work shall include asphalt and concrete saw cutting and removal, loading, haul and disposal of existing asphalt and miscellaneous material for CAST IRON CLEAN OUT BOX AND COVER. **The cast iron clean out box shall be D&L Foundry H-8030-06-I** or approved equal. **The cover shall be D&L Foundy H-8030-R1I sewer** or approved equal. Work shall include excavation, backfill, compaction, and other items incidental.

2. Method of Measurement and Payment

Payment will be made on a per each installed basis for CAST IRON CLEAN OUT BOX AND COVER
and shall be full compensation for all work necessary to complete the item.

- END OF SECTION -

SECTION 02400 – CONCRETE TECHNICAL SPECIFICATIONS
CONCRETE

1.0 SCOPE OF WORK

The work shall consist of, but not be limited to removal and replacement of sidewalks, vertical curb and gutter, drive ramps, crosspans, on all streets and alleys specified within the project.

2.0 CITY DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS

Any and all materials required for this project shall be pursuant to the requirements of the City of Louisville, Colorado "Design and Construction Standards, adopted February 15, 1994 and the latest revisions thereto except as modified by these plans and/or specifications.

3.0 MATERIALS

CEMENT

All cement used in concrete work shall be Portland cement Type II or Type IIA conforming to all requirements of AASHTO M85. **Fly ash shall not be permitted to be used as a substitute for any portion of the cement content required in the mix.**

The concrete mix shall not contain less than 660 lbs. (7 sacks) of cement per cubic yard.

WATER

Water used in mixing shall be reasonably clean and free of oil, salt, acid, alkali, sugar, organic matter, or other substance injurious to the finished product. Water shall be in accordance with and shall meet the suggested requirements of AASHTO T-26. Where the source of water is relatively shallow, the intake shall be so enclosed as to exclude silt, mud, grass, or other foreign materials. In addition the pH shall be between 4.5 and 8.5. Neutralization by chemical additives will not be permitted. Water known to be of potable quality may be used without test.

The water to cement ratio including surface water on the aggregates shall not exceed 0.51 upon placement of the concrete.

ADMIXTURES

Chemical admixtures (water reducing agent, etc.) shall not be permitted or included in the mix without the written approval of the Engineer.

AIR-ENTRAINING AGENTS

An air-entraining agent shall be added to the concrete mixture. Air entraining admixtures shall conform to ASTM C 260. All air-entraining agents shall be reasonably new material,

thoroughly mixed and protected at all times from freezing. The air content in the concrete mix shall be 5 to 7 percent as determined by ASTM C 231 or ASTM C 173.

FINE AGGREGATE

1) Composition: Fine aggregate shall consist of natural sand, composed of clean, hard, durable, uncoated grains, preferably of siliceous materials.

	Maximum Percent by Weight
Clay Lumps	1.0
Coal, Lignite, or Shale	1.0
Material Passing No. 200 Sieve	4.0

The sum of the above materials and other deleterious substances such as shale, alkali, mica, coated grains or soft and flaky particles shall not exceed four percent by weight.
2) Deleterious Substances: The maximum percentage of deleterious substances shall not exceed the following values:

Material finer than 200 mesh sieve	3% by weight
Shale	1% by weight
Coal and lignite	1/4% by weight
Clay lumps	1% by weight
Other deleterious substances	2% by weight

The sum of the percentages of the above deleterious substances shall not exceed five per cent (5%) by weight. All fine aggregate shall be free from injurious amounts of alkali and organic impurities.

3) Grading: Fine aggregate shall be well graded from coarse to fine, and when tested by standard laboratory sieves, shall conform to the following:

	Percent by Weight
Passing 3/8"	100
Passing No. 4 Sieve	95-100
Passing No. 16 Sieve	45-80
Passing No. 50 Sieve	10-30
Passing No. 100 Sieve	2 -10

4) Other Requirements: The fine aggregate shall conform to AASHTO M6.

COARSE AGGREGATE

1) Composition: Coarse aggregate shall consist of crushed limestone, trap rock, granite, washed gravel or other approved inert materials having clean, hard, strong, durable pieces, free from adherent coatings and conforming to the requirements of these specifications.

2) Deleterious Substances: The maximum percentage of deleterious substances shall not exceed the following values:

Material finer than 200 mesh sieve	1% by weight
Coal and lignite	1/4% by weight
Clay lumps	1/4% by weight
Soft fragments	3% by weight
Other deleterious substances	2% by weight

The sum of the percentages of the above deleterious substances shall not exceed five per cent (5%) by weight.

3) Grading: Coarse aggregate shall be well graded between the limits specified and shall conform to the following requirements:

Nominal Maximum	Percentages by Weight Passing Standard Laboratory Sieve having Square Openings				
Maximum Size	1 1/2"	1"	3/4"	1/2"	3/8"	No. 4
3/4"		100	90-100		20-55	0-10

Not more than 5% shall pass a No. 8 sieve.

4) Wear and Soundness: Coarse aggregates for concrete shall have a percentage of wear of not more than 40 when tested in accordance with AASHTO T-96 or show a sodium sulfate loss not to exceed 12 percent (12%) when tested in accordance with AASHTO T-104. The wear and soundness requirements may be waived, or modified, by the Engineer provided that the coarse aggregate has a proven service record for similar service and exposure.

5) Other Requirements: Coarse aggregate shall conform to the requirements of AASHTO M80.

MIX DESIGN

A mix design is required to be made by a certified testing laboratory, and submitted to the Engineer for approval two weeks prior to the placing of any concrete. The minimum 28 day compressive strength shall be 4,500 psi based on field cast cylinders. Compressive strength shall be as determined by ASTM C 39 and the slump shall be 1 to 4 inches as determined by ASTM C 143. Batching proportions shall conform to the approved mix design. If any concrete fails to conform to the proportions of the approved mix design, such concrete shall not be incorporated in the work, but shall be discarded off the project site as waste material at the Contractor's expense.

4.0 EXECUTION

CONCRETE REMOVAL

The Engineer will delineate the limits to which the existing concrete is to be removed and replaced. Removal and replacement of existing concrete beyond the limits designated by the Engineer shall be at the Contractor's expense. The minimum length of replacement concrete shall be 5 feet on vertical curb and gutter and curbwalk and 4 feet on sidewalk. All removals shall be full depth saw cut or removed at existing cold or expansion joints. Sections of concrete that are removed shall be replaced the same day. When weather conditions restrict replacing sections of concrete the same day, lighted barricades must be provided.

Where repairs are made in existing concrete all edges of the existing concrete and asphalt to remain shall be a full depth saw cut. No rough or broken edges will be permitted where new construction joins old. The Contractor shall maintain a straight, true break line. The Contractor shall be responsible for removal and replacement of all over break. The Contractor will be responsible for damage to existing asphalt and concrete adjacent to concrete replacement. Damages to existing asphalt and concrete due to Contractor's operations, shall be removed and replaced by the Contractor at his expense.

Contractor shall not remove asphalt adjacent concrete unless approved by the Engineer.

Prior to concrete removal the Contractor shall locate all water service and sewer service crossings where previously designated or inscribed on the curb and gutter. Owner will paint water and sanitary sewer service crossings on non-inscribed concrete. Contractor shall inscribe on the curb face the service crossing locations with "W" for water services and "S" for sewer service.

If construction involves a driveway, the Contractor shall schedule arrangements of construction with the resident.

The Contractor shall properly dispose of broken concrete, unusable materials and surplus excavated materials due to concrete replacement off site the same day and the construction site shall be left clean and orderly. All parts of the construction site shall be left in a condition acceptable to the Engineer. The Contractor shall make all necessary arrangements for obtaining suitable disposal locations.

COMPACTION

All areas in which concrete has been removed shall receive compaction by vibrating, tamping, or combination to achieve the degree of compaction specified.

Maximum dry density of all soil types encountered or to be used will be determined in accordance with AASHTO T99, or AASHTO T 180.

The amount of water to be used in compacting all materials shall not deviate from optimum by more than two percentage points as determined by AASHTO T 99 or T 180.

The percent of compaction specified shall be equal to or greater than minimum values as shown in the following table for the various classes of soil and type of compaction.

Soil Classification (AASHTO M 145)	AASHTO T 99 Minimum Relative (Percent)	AASHTO T 180 Minimum Relative (Percent)
A-1 through A-5		95
All Others	95	

Density testing will be performed by an independent soils testing firm employed by the Owner. Any and all retesting of soil to achieve required passing test results necessitated by the Contractors operations or inability to obtain specified results on the first attempt shall be the sole responsibility and costs of the Contractor.

AIR QUALITY

The Contractor shall be responsible to see that dust from waste concrete be kept to a minimum during removal, loading, transferring and disposal of concrete.

EXCAVATION

Excavation on concrete replacement shall be made to an average depth of 6 inches to 8 inches below the proposed concrete subgrade to provide a stable, uniform subgrade. All soft and yielding material shall be removed and replaced with acceptable material. **No separate payment will be made for replacing unacceptable material.** All excess excavated materials shall become the property of the Contractor.

SUBGRADE PREPARATION AND FILL

Fill shall be placed in lifts, brought to proper moisture and compacted to the percent specified. The Contractor will provide backfill material if required. The Contractor will be responsible for loading, haul, installation and placing fill material, subgrade preparation, compaction and grading.

BACKFILL AND LANDSCAPE RESTORATION

Upon removal of the forms all concrete improvements shall be backfilled with suitable material (topsoil) and landscaping restored. Contractor shall restore the entire surface area that has been disturbed by the Work to match the condition that existing prior to the construction.
Should the Contractor fail to backfill and restore landscaping within ten (10) days after receiving written notice from the Engineer, the Owner may backfill and restore landscaping at the Contractor's expense.

The landscaped area to be restored shall be 18” wide or as determined by the Engineer. The Contractor shall clean the area of all debris (i.e. concrete spoils, rocks, etc.) to a minimum depth of six (6) inches, prepare all edges to be clean and vertical and backfill (place topsoil), compact, grade and restore landscaping (e.g. topsoil, sod, mulch, gravel, etc.).

Topsoil shall consist of loose friable loam free of subsoil, refuse, stumps, roots, rocks, brush, weeds, heavy clay, hard clods, toxic substances, or other material which would be detrimental to its use for landscaping restoration. The topsoil placed shall be fine graded to eliminate rough and low areas, match existing levels profiles, contours and ensure positive drainage prior to re-sodding.

Sod shall be placed behind all replaced concrete where it abuts existing grassed areas, as directed by the ENGINEER. The minimum width of sodded areas (as measured perpendicular to the replaced concrete) shall be 18”, unless otherwise approved by the ENGINEER.

Sod shall be Colorado-grown, 100% certified Kentucky Bluegrass, or a mixture approved by the OWNER. The sod source shall be made known to and approved by the OWNER prior to installation.

Re-sodding shall be completed with sod of high quality and shall not be dried out or dying when placed. Re-sodding shall be rolled and thoroughly watered once by the Contractor. The Contractor shall notify the property owner in writing of the nature of the work that has been performed and inform the property owner that the sod will only be watered once. The notification format shall be approved by the Engineer prior to distribution to the property owner.

Mulch and gravel shall be replaced with similar material.

STREET BACKFILL

Excavations in paved streets caused by concrete replacement work shall be backfilled with 8" of fill material provided by the Contractor. The Contractor will be responsible for loading, haul, installation and placing fill material, compaction and grading to the existing street surface within 24 hours of concrete repair.

READY-MIXED CONCRETE

All concrete shall be ready-mixed in accordance with ASTM C 94 and shall conform to the requirements of these specifications.

Ready-mixed concrete shall be continuously mixed or agitated from the time the water is added until the time of use. The concrete shall be completely discharged from the truck mixer or truck agitator within one and one half (I 1/2) hours or before the drum has revolved 300 revolutions after the cement comes in contact with the mixing water, or with the aggregates (retempered concrete shall not be allowed).

The 90 minute time limit for mixer or agitating trucks may be extended to 120 minutes if:

1. No water is added after 90 minutes
2. The concrete temperature prior to placement is less than 90° F.

The Contractor shall collect delivery or batch tickets from the ready-mix driver for all concrete used on the project and submit them to the Engineer daily. Batch tickets shall provide the following information: Weight and type of cement, weights of fine and coarse aggregates, weight (or gallons) of water, including surface water of aggregates and water added by the truck, quantity (cu. yd.) of batch, times of batching and discharging of the concrete, name of batch plant, name of Contractor, starting revolution count, name and amount of all admixtures used, date and truck number. Deletion of any item listed above for inclusion on the batch ticket shall be cause for rejection of the entire load of concrete.

PLACING CONCRETE

Before placing concrete, debris shall be removed from the space to be occupied by the concrete, and the forms, including any existing concrete surfaces, shall be thoroughly wetted. Concrete shall not be placed until all forms and reinforcing steel have been inspected and approved by the Engineer.

The concrete temperature shall be between 50 degrees F and 90 degrees F at time of placement. If the concrete does not fall within the specified temperature range, the concrete shall not be used or placed on the project and shall be immediately returned to the batch plant or an appropriate dumpsite.

Concrete shall be placed in a manner that will avoid segregation and shall not be dropped freely more than five (5) feet. If segregation occurs, the Engineer will require the concrete to be removed and replaced at the Contractor's expense. Concrete shall be placed monolithically in one continuous operation, except where keyed or doweled construction joints are shown on the plans or as approved by the Engineer. Delays in excess of 30 minutes shall require removal and replacement of that pour, at the Contractor's expense.

Concrete shall not be placed on soft, spongy, frozen, or otherwise unsuitable subgrade. The finished subgrade shall be kept smooth and compacted prior to placing concrete.

WORKABILITY

The consistency of concrete shall be kept uniform for each class of work and shall be checked by means of slump tests conforming to ASTM C 143. **NO WATER MAY BE ADDED AT THE JOB SITE WITHOUT THE PERMISSION OF THE ENGINEER.** If

approval is obtained and water is added at the job site, the concrete shall be mixed for not less than 20 revolutions. The added water shall not cause the water/cement ratio to exceed 0.51 and shall not cause the maximum slump to be exceeded. Slump tests shall be run and test cylinders cast following the addition of the water as required by the Engineer. Any expense incurred, in excess of ordinary tests, in such testing will be borne by the Contractor.

PUMPING CONCRETE

Pumping of concrete shall not be permitted.

SAMPLING

1) AGGREGATE: The Contractor shall, before starting concrete work, furnish representative samples of concrete aggregate proposed for use to a testing laboratory designated by the Engineer and sampled in accordance with ASTM D 75.

2) CONCRETE: Concrete shall be sampled in accordance with ASTM C 172, "Sampling Fresh Concrete".

FIELD QUALITY CONTROL

1. General: An approved testing laboratory shall perform all testing, with the exception of slump tests. The following tests and procedures are subject to change during construction at the discretion of the Owner's Representative.

2. Test Priority: Control tests shall be used to determine the concrete quality throughout the project, however, special tests shall have precedence over control tests, and core tests shall have precedence over all previous tests.

3. Control Tests: Control tests of concrete work shall be made at such times and in such manner as directed by the Owner's Representative at the expense of the Owner. Each test shall consist of 4 standard 6" test cylinders cast and cured in accordance with C31 and C172. One cylinder shall be broken at the end of 7 days after placing, two cylinders shall be broken at the end of 28 days after placing and the remaining cylinder shall be stored until their disposition is determined by the Owner's Representative. The two remaining cylinders will be broken only when the previous test reports indicate unsatisfactory results. The Owner's Representative reserves the right to stop all future concrete work when the 7 or 28 day tests indicate unsatisfactory results; until, in his opinion, proper corrective measures have been taken to assure quality concrete in future work. Tests shall be made at the time test cylinders are taken, and recorded on the reports to determine the slump, air content, unit weight, and temperature of the concrete. All tests shall be made in accordance with C39, C138 or C231. Minimum 28-day compressive strength shall be 4500 psi, based on field cast cylinders.

CONCRETE THICKNESS

It is the intent of the specifications that Concrete shall be constructed in accordance with the thickness requirements of the plans and specifications. Tolerances allowed for subgrade construction and other specification provisions, which may affect thickness, shall not be construed to modify such thickness requirements. Thickness measurements will be made at the rate of not less than one measurement for each one 500 linear feet or fraction thereof, of concrete placed. Insufficient thickness' from 0.20 to 0.60 inches will be price reduced for each lot of 500-foot, in accordance to PRICE REDUCTIONS.

If the concrete is deficient by more than 0.6 inches, additional measurements will be made to identify the boundary of insufficient thickness. The boundary shall be at longitudinal or transverse joints and pavement edges. After the deficient area is identified the Engineer will determine as to whether the concrete shall remain in place or be removed in accordance with the following procedures:

a. The CONTRACTOR shall, at his expense, remove and replace the concrete in the area determined by the Engineer with new concrete meeting the thickness requirements. Subgrade shall be lowered as necessary to meet full thickness requirements.

b. The CONTRACTOR shall leave the concrete in place without payment, if it meets all of the other requirements.

COMPRESSIVE STRENGTH

When a compressive strength test fails below the specified 28-day compressive strength on field cast cylinders, the Engineer to shall make a determination whether the concrete shall be removed and replaced or allowed to remain in place. This determination shall be based on an evaluation of the durability and other qualities of the concrete necessary to the integrity of the pavement. If after review, the concrete is allowed to remain in place, price reductions for each lot of 100 cubic yards or fraction thereof, will be in accordance with PRICE REDUCTIONS.

REINFORCING STEEL (DOWELS)

Reinforcing steel dowels are required at all concrete replacement items.
1) Bars: Reinforcing steel bars shall conform to the requirements of the "Standard Specifications for Deformed Billet-Steel Bars for Concrete Reinforcement" of ASTM. Bars shall be new billet steel conforming to AASHTO M31. Bars shall be #4 rebar with minimum lengths of 18 inches.
2) Placing: Reinforcing steel, before being placed, shall be thoroughly cleaned of coatings that will destroy or reduce bond. A light coating of rust may be allowed by the Engineer. Reinforcement shall be carefully formed to the dimensions indicated on the Plans. It shall not be bent or straightened in a manner that will injure the material. THE USE OF HEAT IN BENDING BARS SHALL NOT BE PERMITTED. Bars with kinks or bends not shown on the plans shall not be used. All reinforcing steel shall be placed in the position and at the spacing shown on the plans with the tolerance specified in ACI 301 Section 5.4.

FIBERMESH

1) Fibermesh: Concrete Engineered Reinforcing Fibers shall be commercial grade, 100% virgin polypropylene, collated, fibrillated fibers from Fibermesh Co. or approved equal. Fibermesh shall be used in all concrete as indicated on the detail drawings or as specified. Fibermesh fibers shall be added to the concrete mix at the rate of 1 1/2 lbs. per cubic yard of concrete.

FORMS

Forms shall be straight and true and conform to the shape, lines and dimensions as shown on the plans. Damaged forms shall be rejected and replaced. Approved flexible forms shall be used for construction where the radius is 150 feet or less. Unexposed surfaces shall have forms of No. 2 common (or better) lumber. Forms shall not be disturbed until the concrete has adequately hardened. In no case shall the minimum time between placing concrete and removal of forms be less than 12 hours.

JOINTS

EXPANSION JOINTS

Expansion joint materials: expansion joints shall be constructed with preformed cork expansion joint filler, conforming to Federal Specification MR-F-341, or wood fiberboard conforming to AASHTO Designation M59. Expansion shall extend to the full depth of the concrete sections. All expansion joints shall be one-half inch (1/2") thick, unless otherwise stated.

Expansion joint material shall be one half inch preformed joint filler (Bituminous Type) and shall be provided as shown on the plans or as directed by the Engineer. Expansion joints shall be installed at existing joints, structures, PCR's, every 100 feet, and as shown on the plans or as directed by the Engineer.

CONTRACTION JOINTS

Transverse joints shall be placed at maximum intervals of ten (10) feet to control random cracking. The joints shall be formed, sawed or tooled to a minimum depth of one-quarter (1/4) of the total thickness.
If divider plates are used, the maximum depth of plates shall not be greater than one-half (1/2) the total thickness.

The joints shall be finished with a jointer having a width no greater than 5/16 inch and a depth not less than 3/4 inch. A maximum joint width at the finished surface shall be no greater than 5/16 inch. **Jointing tools shall be in good condition. Worn or damaged jointing tools shall be rejected and replaced.**

Contraction joints must be straight (± 1/4") and perpendicular (± 1/2") to the longitudinal axis of work. If contraction joints are not provided as specified, Contractor shall saw cut contraction joints as directed by Engineer.

TOOL JOINTS

Tool joints shall be spaced as follows:

1) Not more than ten (10) feet nor less than five (5) feet apart in curb and gutter and curbwalk.
2) Not more than five (5) feet nor less than four (4) feet apart in sidewalk.
3) In ramp drives as shown on the details.
4) To match existing adjacent concrete.
5) As directed by the Engineer.

FINISHING

Exposed faces of concrete shall be finished to true lines and grade as shown on the plans. The surface shall be floated, troweled, edged and broomed. The completed surface shall have a light/medium broomed surface.

No dusting or topping of the surface, or sprinkling with water to facilitate finishing shall be permitted.

All concrete spoils and overburden that accumulates on existing concrete and asphalt from concrete replacement shall be removed immediately after concrete finishing.

MARKINGS

The letters "W" and "S" shall be stamped in the face of the curb at the locations marked by the Engineer. The letters shall be 3 inches long by 1/2 inch deep.

CURING

All concrete, regardless of temperature, weather or season, shall be protected from premature drying for a period of not less than seven (7) days after the concrete is placed, except that where concrete is being protected from freezing, the time period for concrete saturation shall be one (1) day less than that of the frost protection.

The application rate shall be as per manufacturer's recommendation (approximately 150 sq. ft./gal.). Curing will not be required longer than 72 hours if high-early strength concrete is used. It shall be the Contractor's responsibility to protect the concrete being cured, from the elements, traffic, and vandalism. Curing methods applied to other surfaces shall be applied to those surfaces covered by forms as soon as the latter are removed. Inadequate protection by the Contractor shall be cause for suspension of the Work and damaged concrete shall be replaced at the expense of the Contractor.

CURING NON PIGMENTED CONCRETE

Clear pigmented Liquid Membrane-forming compounds shall conform to ASTM C-309, Type I, Class A and B, AASHTO M148, and meet local, state and federal VOC and air quality regulations.

CURING PIGMENTED CONCRETE

All pigmented concrete shall be cured with Clear pigmented Liquid Membrane-forming compounds that shall conform to ASTM-309, Type I, Class A and B, AASHTO M148, and meet local, state and federal VOC and air quality regulations.

HOT AND COLD WEATHER REQUIREMENTS - COLD WEATHER PROTECTION

When concrete is placed when ambient temperatures are expected to fall below 40 degrees F, the Contractor shall provide satisfactory methods and means to protect the mix from injury by freezing.

Aggregates and mixing water shall be heated to a temperature of at least 70 degrees F., but not more than 150 degrees F., the aggregates may be heated by either steam or dry heat. Heating equipment or methods which alter or prevent the entrainment of the required amount of air or which develop hot spots in the aggregate shall not be used. Placing of concrete may be started in the morning if the contractor desires, but shall be discontinued at 3 P.M. of the same day if freezing weather threatens. The concrete or aggregates shall be protected during transit, mixing and before and after placing, as directed by the Engineer, to retain all heat possible in the concrete mix.

After the concrete has been placed, the contractor shall provide sufficient protection such as insulating blankets, canvas, framework, heating apparatus, etc., to enclose and protect the concrete and maintain the temperature of the concrete at not less than 50^{o} F. For 7 days.

Except as provided above, cold weather concreting shall be in accordance with ACI 306. If in the opinion of the Engineer, the protection provided is inadequate, concreting shall cease until conditions or procedures are satisfactory to the Engineer.

HOT WEATHER CONCRETING

The placement of concrete in hot weather shall comply with ACI 305.

MISCELLANEOUS

FINAL SURFACE TEST

Prior to acceptance of the work, the Contractor shall test the surfaces with a 10' straightedge. All surfaces varying more than 1/8" from line and grade of the correct surface shall be removed and replaced by the Contractor at his expense.

Any areas, which hold or cause water to pond shall be removed and replaced at the expense of the Contractor.

REPAIRS

If after stripping of forms any concrete is found to be not formed as shown on the plans, or is out of alignment or level, or shows a defective surface, it shall be considered as not conforming with the intent of these Specifications and shall be removed and replaced by the Contractor at his expense.

CONNECTION WITH EXISTING SIDEWALKS

Where new sidewalk construction abuts existing sidewalks, the work shall be accomplished so that no change in grade results.

OPENING TO TRAFFIC

Walks shall not be opened to pedestrian traffic for at least twenty-four (24) hours after placement. Driveways, curb-gutter, and crosspans shall not be opened to vehicular traffic for at least seven (7) days after placement. The Contractor shall provide and maintain suitable barricades to comply with foregoing requirements.

The Contractor, with approval of the Engineer may use high early for ramp drives. There will be no additional payment to the Contractor for the use of high early concrete.

PRICE REDUCTIONS

Insufficient Thickness' and compressive strengths shall be subjected to price reductions at the following rates:

Average Thickness Deficiency (inches)	Price Reduction* %
0.00 to 0.20	0
0.21 to 0.30	10
0.31 to 0.40	15
0.41 to 0.50	25
0.51 to 0.60	30

* Price reduction is equal to the full price of the entire pavement system. Price reductions reflect reduced fatigue life as a result of the deficiency.

Percent of Specified 28-Day Compressive Strength*	Price Reduction** %
100	0
95	0
94	3
93	6
92	9
91	12
90	15
89	18
88	21
87	24
86	27
85	30

* Strengths less than 85 percent of the design strength shall be removed and replaced.

** Price reduction is equal to the full price of the entire pavement system. Price reductions reflect reduced fatigue life as a result of the deficiency.

5.1 SPECIAL CONDITIONS

TREE ROOT REMOVAL

When any tree roots are encountered during construction operations, the Contractor shall immediately notify the Engineer prior to the disturbance of any of the roots. The Engineer and the City Forester's representative shall then make a determination regarding removal. In the locations where trees roots are anticipated, the Contractor shall take the necessary precautions to prevent any damage to the root with tools or equipment.

Tree roots shall not be removed or disturbed unless directed by the Engineer. Tree roots shall be removed with a sharpened, sanitized saw to leave the freshly cut root surface in a clean and smooth condition. Axes, backhoes, bobcats and other blunt objects shall not be used to remove the tree roots.

CONCRETE CROSSPANS

Regarding repair of crosspans, only one half of a crosspan shall be closed to traffic at anytime unless secondary access is available to the streets and businesses impacted or unless otherwise approved by the Engineer. When individual panels or when one half of a crosspan is constructed, Contractor shall provide high early strength concrete at no additional compensation.

JOINT SEALER

Cold-applied joint sealer shall be of such character that a homogeneous mix can be obtained by combining the separate substances, either mechanically or manually, without having to heat the blended material above a temperature of 100° F. The material shall pour or extrude readily at a temperature of 70° F immediately after preparation for use and shall remain in a condition suitable for application for at least one hour. Joint sealant shall be Sonolastic SL1 or approved equal.

RESIDENT/BUSINESS NOTIFICATION

At least 48 hours prior to the start of construction at each location, the Contractor shall notify in writing the residents or businesses adjacent to the work. The notification shall include a description of the work, a schedule for completion of the work and the name and phone number of the Contractor's contact person. The notification format shall be approved by the Engineer prior to distribution.

6.1 BASIS OF PAYMENT – CONCRETE

The entire cost of the work and material necessary to complete all items in the Schedule of Unit Prices, shown or implied or specified herein shall be included and merged into the pay items shown in the Schedule of Unit Prices. All associated work necessary for the proper and complete installation of this project and associated bonding, maintenance and guarantees shall be merge into the pay items shown in the Schedule of Unit Prices. All payments shall be subject to the conditions of these specifications.

Work shall consist of furnishing all labor, materials, equipment, removal, excavation, loading, haul and disposal for the construction and construction necessary relating to remove and replace concrete. Work shall include concrete removal, subgrade preparation, loading, haul, disposal, installation and placing of fill material, compaction, backfill, grading, concrete, admixtures, fibermesh, expansion material, steel reinforcement, curing compound, and sealant. On all streets, unless otherwise mentioned, restoration of existing landscaping including but not limited to backfilling, replacing topsoil, grading, re-sodding and sprinkler system repairs due to concrete replacement is incidental and shall be merged into the pay items shown in the Schedule of Unit Prices.

Forms shall be used for concrete vertical curbhead.

The Engineer will delineate the limits to which the existing concrete is to be removed and replaced. Removal beyond the limits marked will be at the expense of the Contractor. Minor items and minor details are not listed but shall be part of the complete contract.

PAYMENT

The Contract Price paid for concrete improvements mentioned above shall be paid per lineal foot or square foot as specified. The Contract unit price shall be full compensation for furnishing all labor, materials, tool, equipment and incidentals and for performing all Work necessary to complete the items as specified in the Contract Documents and no additional compensation will be allowed therefor.

No payment will be made for any removal beyond the limits marked by the Engineer.

No additional payment will be made for high early strength concrete.

Payment for concrete shall include the cost of fibermesh reinforcement at crosspans, ramp drives and alley aprons. 8" Concrete Fibermesh shall include the use of high early strength concrete.

No separate payment will be made for inscribing curb face at water and sewer service crossings but will be included in the work.

No separate payment will be made for expansion material, curing compound, sealant and incidentals but shall be included in the Work.

24" VERTICAL CURB AND GUTTER

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, demolition, saw cutting, removal of subgrade material, excavation, load, haul, disposal, furnish and install fill material, compaction, backfill, grading, concrete, admixtures, expansion material, curing compound, sealant, incidentals and construction necessary to provide 24" VERTICAL CURB AND GUTTER to the limits as shown on the plans and as directed by the Engineer.

2. Method of Measurement and Payment

Payment for 24" VERTICAL CURB AND GUTTER will be made on a field measured lineal foot basis and shall be full compensation for all work necessary to complete the item.

4" CONCRETE

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, demolition, saw cutting, removal of subgrade material, excavation, concrete removal, subgrade preparation, load, haul, disposal, compaction, furnish and install fill material, backfill, grading, concrete, admixtures, expansion material, steel reinforcement, curing compound, sealant, incidentals and construction necessary to provide 6" CONCRETE to the limits as shown on the plans and as directed by the Engineer.

2. Method of Measurement and Payment

Payment for 6" CONCRETE will be made on a field measured square foot basis and shall be full compensation for all work necessary to complete the item.

6'-0"x6" CURBWALK

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, demolition, saw cutting, removal of subgrade material, excavation, load, haul, disposal, furnish and install fill material, compaction, backfill, grading, concrete, admixtures, expansion material, curing compound, sealant, incidentals and construction necessary to provide 6'-0"x6" CURBWALK to the limits as shown on the plans and as directed by the Engineer.

2. Method of Measurement and Payment

Payment for 6'-0''x6" CURBWALK will be made on a field measured lineal foot basis and shall be full compensation for all work necessary to complete the item.

8" CONCRETE WITH FIBERMESH

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, demolition, saw cutting, removal of subgrade material, excavation, concrete removal, subgrade preparation, load, haul, disposal, compaction, furnish and install fill material, backfill, grading, concrete, admixtures, fibermesh, expansion material, steel reinforcement, curing compound, sealant, incidentals and construction necessary to provide 8" CONCRETE WITH FIBERMESH to the limits as shown on the plans and as directed by the Engineer.

2. Method of Measurement and Payment

Payment for 8" CONCRETE WITH FIBERMESH will be made on a field measured square foot basis and shall be full compensation for all work necessary to complete the item.

- END OF SECTION -

SECTION 02500 – ASPHALT TECHNICAL SPECIFICATIONS
ASPHALT

1.0 SCOPE OF WORK

The scope of work shall consist of but not be limited to the following:

- Hot Asphalt Patch Grade SX (6")
- Hot Asphalt Patch Grade SX (9")

2.0 CITY DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS

Any and all materials required for this project shall be pursuant to the requirements of the City of Louisville, Colorado "Design and Construction Standards, adopted February 15, 1994 and the latest revisions thereto except as modified by these plans and/or specifications.

3.0 PRELIMINARY WORK

REMOVAL OF PAVEMENTS, SIDEWALKS, CURBS, ETC.

Concrete or asphalt that is to remain shall be in a straight and true line with a vertical face. Concrete or asphalt shall be cut with a cutting wheel, jackhammer, saw or broken to the directed point of removal.

The Contractor shall be responsible for replacement of all overbreak. The Contractor shall maintain a straight, true break line. The sawing shall be done carefully, and all damages to concrete or asphalt to remain in place, due to Contractor's operation, shall be repaired by the Contractor. The minimum depth of saw cut in concrete shall be 2 inches.

DISPOSAL

Unusable materials and surplus excavated materials shall be properly disposed of off site by the Contractor. All private and public property occupied by the Contractor in connection with the work and construction shall be cleared of all rubbish, debris, and excess materials. All parts of the construction site shall be left in a condition acceptable to the Engineer. The Contractor shall make all necessary arrangements for obtaining suitable disposal locations.

BACKFILL

Except in areas to be excavated, all cavities left by structure removal shall be backfilled with suitable material and compacted in accordance with applicable sections in the Design and Construction Standards. Jetting or puddling will not be allowed.

TOLERANCES

Where bituminous surfacing materials are to be placed directly on the subgrade, the subgrade plane shall not vary more than .04 ft. Excavation operations shall be conducted so that material outside of the limits of slopes will not be disturbed.

PREPARATION OF SUBGRADE

All subgrade preparation shall conform to the standards and requirements herein. Work in this section shall pertain to the preparation of natural, excavated, or embankment subgrade areas prior to the placement of road base material, pavement, curb and gutter, driveways, sidewalks or structures.

CONSTRUCTION OF EMBANKMENT AND TREATMENT OF CUT AREAS WITH MOISTURE AND DENSITY CONTROL

The plans will show the areas in which embankments are to be constructed with moisture and density control, and the distance below subgrade to which such methods shall be applied.

Within the areas indicated on the plans and to the designated depth below subgrade, for the full width of roadbed in all cut sections, earth shall be thoroughly scarified and the moisture content increased or reduced, as necessary, to bring the moisture to the content specified. This scarified layer shall then be compacted to the degree of compaction specified.

Maximum dry density of all soil types encountered or to be used will be determined in accordance with AASHTO T99, or AASHTO T 180. The amount of water to be used in compacting all materials shall not deviate from optimum on the dry side by more than two percentage points as determined by AASHTO T 99 or T 180.

The percent of compaction specified shall be equal to or greater than minimum values as shown in the following table for the various classes of soil and type of compaction.

Soil Classification (AASHTO M 145)	AASHTO T 99 Minimum Relative (Percent)	AASHTO T 180 Minimum Relative (Percent)
A-1 through A-5		95
All Others	95	

PREPARATION OF SUBGRADE

All subgrade preparation shall conform to the standards and requirements herein. Work in this section shall pertain to the preparation of natural, excavated, or embankment subgrade areas prior to the placement of road base material, pavement, curb and gutter, driveways, sidewalks or structures.

SUBGRADE SCARIFICATION, BLENDING, AND COMPACTION

Subgrade preparation in both excavation and embankment areas shall consist of scarifying, blending, mixing, blading, shaping, and compacting the subgrade with moisture and density control. A minimum of the top 12-inches of the entire width of the roadway subgrade shall be thoroughly scarified unless otherwise specified, the moisture content adjusted as necessary to meet density requirements.

The scarified layers shall then be compacted with the appropriate labor and equipment to the compaction specified. Compaction test results on utility trenches must be on file with the City prior to placing any layer of roadbase or pavement section on the subgrade. Compaction tests shall be taken by a Geotechnical Engineer on the subgrade. Compaction test results on the subgrade shall be submitted to the Engineer within 24 hours after the tests have been taken for review and approval.

Formal compaction test reports shall be submitted as soon as possible during applicable construction phases. The Geotechnical Engineer shall take a sufficient number of compaction tests to assure himself that the street subgrade is ready for roadbase or paving and shall so certify on his compaction report. Formal compaction reports shall be signed and sealed by a registered professional Engineer.

Compaction tests shall include but not be limited to trenches for water main, sanitary sewer main, storm sewer main, water services trenches, sanitary sewer service trenches, gas mains, and service trenches, electric trenches and services, sleeve or conduit trenches, around manholes, water valve boxes, inlets, and under curb, gutter and sidewalk. If the subgrade does not have the specified density and moisture content prior to placing roadbase or pavement, the Geotechnical Engineer shall require scarifying, wetting, rerolling, and retesting.

If more than 24 hours has elapsed between the time compaction tests are taken and the time the next layer in the pavement sections is placed, the area shall be retested.

SUBGRADE TOLERANCES

After scarifying and compaction has been completed, the subgrade surface shall not vary above or below the lines and grades as staked by more than 0.08 foot, if roadbase is to be installed. Where asphalt pavement is to be installed directly on the subgrade, the subgrade plane shall not vary more than 0.04 foot.

Prior to installation of hot asphalt pavement, ENGINEER to confirm and approve line and grade of subgrade.

Bluetop stakes are required to set street centerline grade and verify tolerances.

PROOF ROLLING SUBGRADE

Proof rolling will be required on the subgrade and aggregate base course surfaces. Proof rolling shall be completed after specified compaction has been obtained. Areas found to be weak and those areas which failed shall be reworked or repaired or other measures taken to correct subgrade problems per the recommendations of the Geotechnical Engineer and approval of the Engineer.

Satisfactory results of the proof roll do not relieve Contractor of his responsibility to provide suitable subgrade, and aggregate base course surfaces for roadway construction activities. Subgrade and aggregate base course failures that occur prior to paving activities, such as soft or yielding areas (as designated by the Engineer) will be removed and either reworked or replaced.

Proof rolling shall be performed by the City. A 24-hour notification is required for scheduling a proof roll. **Proof rolling on streets requiring subgrade cement treatment shall occur prior to and after the application of subgrade cement.**

4.0 ASPHALT CEMENT CONCRETE PAVEMENT

1. DESIGN INTENT

These specifications include general requirements applicable to all types of plant mix, asphalt cement concrete pavements (ACCP). This work consists of one or more courses of asphalt mixture constructed

on a prepared foundation in accordance with specifications. The design intent is to provide pavement with adequate thickness and quality to provide a serviceable life of 20 years. It is also the intent to provide construction in accordance with these specifications and with a high standard of practice. This item shall include all labor, equipment, materials to manufacture, place and compact asphalt cement concrete for pavement purposes.

2. MATERIALS

The asphalt plant mix shall be composed of a mixture of aggregate, filler, hydrated lime, asphalt cement, polymer and reclaimed asphalt pavement (RAP).

Aggregate – Aggregates for ACCP shall be of uniform quality, composed of clean, hard, durable particles of crushed stone, crushed gravel, or crushed slag. Excess of fine material shall be wasted before crushing. The material shall not contain clay balls, vegetable matter, or other deleterious substances and shall meet the following requirements.

TABLE 2.1.1 - AGGREGATE PROPERTIES

Aggregate Test Property	Course: Retained on #4	Fine: Passing the #4
Fine Aggregate Angularity, ASTM C-1252 Method A		
Traffic Level 1 & 2	- -	42% Min.
Traffic Level 3 to 5	- -	45% Min.
Two Fractured Faces, CP 45		
Top and Middle Lifts	80% Min.	- -
Bottom Lifts	70% Min.	- -
LA Abrasion, AASHTO T 96	45% Max.	- -
Flat and Elongated (Ratio 3:1) %, AASHTO M 283	10% Max.	- -
Adherent Coating (Dry Sieving) ASTM D 5711	0.5% Max.	- -
Sand Equivalent, AASHTO 176	- -	45 % Min.

Reclaimed Asphalt Pavement material (RAP) shall be used only where specifically allowed as shown on the plans and shall be of uniform quality and gradation with a maximum size no greater than the nominal aggregate size of the mix. Mixes shall not contain more than 20 percent RAP. **RAP is not permitted in Asphalt Top Lifts and Overlays, unless otherwise approved by the Engineer.**

The ACCP gradation shall be wholly within the control point gradation range set forth in the following table. The gradation of the design job mix shall report all sieve sizes listed in the table.

TABLE 2.1.2 - GRADATION RANGE
(Percent by Weight Passing Square Mesh Sieves, AASHTO T 11 & T 27)

	SX*		S*		SG*	
Sieve Size	Control Points	Restricted Zone	Control Points	Restricted Zone	Control Points	Restricted Zone
1 1/2	---	---	---	---	100	---
1"	---	---	100	---	90-100	---
3/4"	100	---	90-100	---	---	---

1/2"	90-100	---	---	---	---	---
3/8"	---	---	---	---	---	---
#4	---	---	---	---	---	39.5
#8	25-58	39.1	23-49	34.6	19-45	26.8-30.8
#16	---	25.6-31.6	---	23.3-28.3	---	18.1-24.1
#30	---	19.1-23.1	---	16.7-20.7	---	13.6-17.6
#50	---	15.5	---	13.7	---	11.4
#200**	2.0-7.0	---	2.0-7.0	---	1.0-7.0	---

* The gradation should pass above the restricted zone boundaries, on the "fine" side.

** These limits shall include the weight of lime at 1.0%

VMA shall be based on tests of the Bulk Specific Gravity of the Compacted Mix (CP-L 5103) and Aggregate (T 84 & T 85), and calculated according to CP-48. All mixes shall meet the minimum VMA specified in the table below.

TABLE 2.1.3 - MINIMUM VMA, %

	Air Voids	
Nominal Maximum** Particle Size	4%	5%
1 1/2	12	13.0
1"	13.0	14.0
3/4"	14.0	15.0
1/2"	15.0	16.0

** **Nominal Maximum Particle Size is defined as one sieve size larger than the first sieve to retain more than 10%, but shall not exceed the 100% passing size.**

Maximum Particle Size can vary during mix production even when the 100% passing size is constant.

Minimum VMA criteria applies to both design and plant produced mix. The VMA minimum shall be interpolated based on actual air voids.

2.2 Asphalt Cement

The Contractor shall provide to the Owner compete laboratory test results of supplied asphalt cement along with "Certifications of Compliance". A minimum of three working days shall be allowed for this review prior to mixture design. Upon non-conformance with the specifications the asphalt cement may be rejected as directed by the Owner.
Asphalt Cement binder shall meet the requirements of the Superpave Performance-Graded Binders (PG) as presented in Table 2.2.1 below:

TABLE 2.2.1 – PROPERTIES OF SUPERPAVE PERFORMANCE GRADED BINDERS

Property	PG 58-28	PG 64-22	PG 76-28
Traffic Level	1 or 2	1 or 2	3 to 5

Flash Point Temperature, °C, AASHTO T 48	230 Min	230 Min	230 Min.
Viscosity at 135 °C, Pas, ASTM D 4402	3 Max.	3 Max.	3 Max.
Dynamic Shear, Temperature °C, where C*/Sin ð @ 10rad/sec. ≥ 1.00 Kpa, AASHTO TP5	58	64	76
Rolling Thin Film Oven Residue Properties, AASHTO T 240			
Mass Loss, %, AASHTO T240	1.00 Max.	1.00 Max	1.00 Max.
Dynamic Shear, Temperature °C Where G*/Sin ð @ 10 rad/sec. ≥2.20 Kpa, AASHTO TP 5	58	64	76
Elastic Recovery[1], 25° C, % Min.*	N/A	N/A	50 Min.
Pressure Aging Vessel Residue Properties, Aging Temperature 100° C AASHTO PP1			
Dynamic Shear, Temperature °C Where G*/Sin ð @ 10 rad/sec. ≤ 5,000 Kpa AASHTO TP 5	19	25	28
Creep Stiffness, @ 60 Sec. Test Temperature in °C, AASHTO TP 1	-18	-12	-18
S, Mpa, AASHTO TP 1	300 Min.	300 Min.	300 Min.
m-value, AASHTO TP 1	0.300 Max	0.300 Max	0.300 Max
Direct Tension Temperature in °C, @ 1.0 mm/min., Where Failure Strain > 1.0%, AASHTO TP 3	-18	-12	-18

* Elastic Recovery by Task Force 31, Appendix B Method

Asphalt Cement binder shall be as described on the drawings and specified on MGPEC, Form #9 Mixture Design Requirements for Hot Mix Asphalt Pavements (HMAP).

2.3 Additives

Lime shall be added at the rate of 1% by dry weight of the aggregate and shall be included in the amount of material passing the No. 200 sieve. Hydrated lime for aggregate pretreatment shall conform to the requirements of ASTM C 207, Type N. In addition, the residue retained on a 200-mesh sieve shall not exceed 10% when determined in accordance with ASTM C 110. (Drying of the residue in an atmosphere free from carbon dioxide will not be required.)

2.4 Tack Coat

An emulsified asphalt tack coat shall be applied to existing surfaces as shown on the plans. The emulsified asphalt shall be CSS-1 h or SS-1 h and conform to AASHTO M208 or Ml 40**,** respectively.

3. MIX DESIGN AND PLANT PRODUCED MIXTURE REQUIREMENTS

The mixture shall be designed to produce an acceptable mixture at an optimum air void content of 4.0 percent (96.0 percent density) in the total mix. The mix design shall be performed using the materials listed in Section 9.3 and used in the field. No substitutions are allowed.

Level of compaction for local and collector streets is N=75, level of compaction for arterial streets is N=100.

3.1 Marshall Mixture Design Method

The **CONTRACTOR** shall submit a proposed design job mix for each mixture required by the Contract. The design AC content shall be determined using the Marshall Method of Mixture Design as described in "Mix Design Methods for Asphalt Concrete" Manual Series 2 (MS-2) published by the Asphalt Institute. Grading SG (1-inch nominal aggregate) shall not be designed using the Marshall method. Mix design shall meet the following:

TABLE 3.1 – MARSHALL MIXTURE PROPERTIES

Traffic Level	I	II
Traffic Loading 18 kip ESALs Over 20 years	<300,000	300,000 to 1,000,000
Property	Specification	
Compaction Number of Blow, Each End	50	70
Stability, lb.	1,800 Min.	2,000 Min.
Flow, 0.01 in.	8-18	8-16
Air Voids, %	4.0-5.0	4.0-5.0
Voids Filled with Asphalt, % MS-2	70-80	65-78
Tensile Strength Ratio, % Retained CP-L 5190	80 Min.	80 Min.
Dry Tensile Strength, psi CP-L 5109	30 Min.	30 Min.
VMA %, CP 48	Table 2.1.3	Table 2.1.3

3.2 Superpave Mixture Design

The Contractor shall submit a design job mix for each mixture required by the Contract. The design shall be determined using Colorado Procedure CP-L 5115 for the Superpave Method of Mixture Design. Other guidance is provided in "Superpave Level 1 Mix Design "SP-2 published by the Asphalt Institute. Mix designs shall meet the following:

TABLE 3.2 – SUPERPAVE MIXTURE PROPERTIES

Traffic Level	1	2	3	4	5
Traffic Loading, Total 18 kip ESALs Over Design Life (Usually 20 Years)	<300,000	300,000 to 1.0 Million	1.0-3.0 Million	3.0-10.0 Million	>10.0 Million
Initial (Air Void > 11.0%)	7	7	7	8	8
Design (Air Void 4.0 to 5.0%)	68	76	86	96	109
Max (Air Void > 2.0%)	104	117	134	152	174
Hveem Stability (100 mm Plugs)	35	39	39	42	42
Voids Filled with Asphalt, % MS-2	70-80	65-78	65-78	65-75	65-75
Tensile Strength Ratio, % Retained	80 Min.	80 Min.	80 Min.	80 Min.	80 Min.
Dry Tensile Strength, Min. psi	30 Min.	30 Min	30 Min	30 Min	30 Min
VMA %, CP 48	Table 2.1.3				

4. MIXTURE DESIGN SUBMITTALS

The Contractor shall submit all mixture designs, certificates, refinery reports, and laboratory data to the Owner for approval at least 7 days before construction is to begin. The job mix formula may be rejected as directed by the Owner on the basis of incompleteness, timeliness or changes in materials. Submittals shall be in a timely fashion such that rejection will not delay completion of the project.

Mixture designs shall be performed in a materials laboratory under the direct supervision of and shall be stamped and signed by a Professional Engineer licensed in Colorado and practicing in this field. In addition, the Contractor shall submit as part of the mixture design, document to verify the following:

1. Source of materials.
2. Gradation, specific gravity, source and description of individual aggregates and the final blend.
3. Aggregate physical properties
4. Asphalt cement properties
5. Design Job Mix
6. Mixing and compaction temperatures used.
7. Mixture properties determined at a minimum of four asphalt contents and interpolated at optimum and graphs showing mixture properties versus asphalt content.

The Owner reserves the right to test the Contractor's mix for each hot asphalt pavement grading utilizing materials actually produced and stockpiled. Contractor shall provide a sufficient quantity of each aggregate, mineral filler, RAP, and additive for the required laboratory tests, if required by the Owner.

Should a change in the source of Asphalt Cement (AC) or Lime occur, a one point verification 34 test (at optimum asphalt content) of the mix must be performed to verify that the applicable Table 2.1.3, 3.1 and 3.2 criteria is still met. If this testing shows noncompliance, a new design job mix shall be established before the new AC or Lime source is used.

Prior to the start of the project, a sample shall be submitted to an independent laboratory to verify the volumetric properties of the mix. If the mix has been produced for another project within the last month, data from that project can be submitted for verification if testing was performed by an independent laboratory. If volumetric properties are not within the following tolerances, the mixture shall be redesigned and retested.

Air Voids	1.0%
VMA	1.0%
Asphalt Content	0.3%

5. EQUIPMENT

5.1 Mixing Plant

The mixing plant shall be capable of producing a uniform material, have adequate capacity, and be maintained in good mechanical condition. Defective parts shall be replaced or repaired immediately if they adversely affect the proper functioning of the plant or plant units, or adversely affect the quality of the hot bituminous plant mix.
Dust, smoke, or other contaminants shall be controlled at the plant site to meet all air quality requirements in the "Colorado Air Quality Control Act," Title 25, Article 7, CRS and regulations promulgated thereunder.

Acceptable safety equipment, approved by the Owner**,** shall be provided by the

CONTRACTOR to accommodate sampling and testing.

The Contractor shall provide the Owner with results from Contractor's quality control testing at the plant and in the field during paving operations.

5.2 Hauling Equipment

Trucks used for hauling ACCP shall have tight, clean, smooth metal beds thinly coated with a minimum amount of paraffin oil, lime solution, or other approved release agent. **Petroleum distillates such as kerosene, diesel or fuel oil are not approved release agents.** Each truck shall have and use a cover of canvas or other suitable material to protect the mixture from the weather and excessive temperature loss or cooled layers of mix in truck.

Asphalt haul trucks delivering material for overlay and top lift operations shall not be allowed to "clean out" in the paving area. Contractor shall provide, maintain, and clean an area for haul truck "clean out". The location of the "clean out" area shall be approved by the ENGINEER.

5.3 Bituminous Pavers

Self-propelled pavers shall be provided and equipped with an activated screed assembly, heated if necessary, capable of spreading and finishing the bituminous plant mix material in full lane widths applicable to the typical section and thicknesses shown in the Contract. Pavers used for shoulders and similar construction shall be capable of spreading and finishing courses of asphalt plant mix material in widths shown in the Contract.

The paver's receiving hopper shall have sufficient capacity for a uniform spreading operation and shall have an automatic distribution system that will place the mixture uniformly in front of the screed.

The paver shall be capable of operating at forward speeds consistent with uniform and continuous laying of the mixture. Stop and go operations of the paver shall be avoided.

The screed or strike-off assembly shall produce the specified finished surface without tearing, shoving, or gouging the mixture. Pavers shall be equipped with automatic screed controls with sensors capable of sensing grade from an outside reference line, and maintaining the screed at the specified longitudinal grade and transverse slope. The sensor shall be constructed to operate from either or both sides of the paver and shall be capable of working with the following devices:

(1) Ski-type device at least 30 feet in length.
(2) Short ski or short shoe.
(3) At least 5,000 feet of control line and stakes.

Device 2 shall not be used on the surface course when the length to be paved is greater than 600 feet.

The controls shall be capable of maintaining the screed at the specified transverse slope within plus or minus 0.1 percent. Automatic mode should be used where possible. If the automatic controls fail or malfunction the equipment may be operated manually for the remainder of the normal working day, provided specified results are obtained. If the Contractor fails to obtain and maintain the specified surface tolerances, the paving operations shall be suspended until satisfactory corrections, repairs, or equipment replacements are made.

Placement of ACCP on a waterproofed bridge deck shall be accomplished with equipment that will not damage the membrane or protective covering.

6. MANUFACTURE

6.1 Preparation of Aggregates

Heating and drying of the aggregates shall be accomplished without damaging the aggregate. Lime shall be added to achieve complete and uniform coating of the aggregate. When hydrated lime is used it shall be added to the aggregate in accordance with one of the following methods:

a. Lime Slurry Added to Aggregate: The hydrated lime shall be added to the aggregate in the form of a slurry and then thoroughly mixed in an approved pugmill. The slurry shall contain a minimum of 70 percent water by weight.
b. Dry Lime Added to Wet Aggregate: The dry hydrated lime shall be added to wet aggregate (a minimum of three percent above saturated surface dry) and then thoroughly mixed in an approved pugmill.

The lime-aggregate mixture may be fed directly into the hot plant after mixing or it may be stockpiled for not more than 90 days before introduction into the plant for mixing with the asphalt cement. The hydrated lime may be added to different sized aggregates and stockpiled, by adding 75 percent of the lime to the aggregate passing the No. 4 sieve and 25 percent to the aggregate retained on the No. 4 sieve.

6.2 Mixing

The dried aggregates and asphalt cement shall be combined in the mixer in the quantities required to meet the design job mix. The materials shall be mixed until the aggregate is completely and uniformly coated, and the asphalt cement is uniformly distributed throughout the aggregate. The output rate shall not exceed the manufacturer's capacity rating.

Baghouse fines shall be fed back to the mixing plant in a uniform and continuous manner so as to maintain uniformity in the mixture. The Baghouse, fines feeder, auger, and related equipment, shall be in good working condition and operated in accordance with manufacturer’s recommendation. If the Owner determines that non-uniform operation of the equipment is detrimental to the mixture, he may halt all construction until the Contractor takes appropriate action.

The minimum temperature of the mixture when discharged from the mixer shall be as shown in the following table:

TABLE 6.2.1 – MIXTURE DISCHARGE TEMPERATURES

Asphalt Grade	Minimum Mix Discharge Temperature, º F*	Minimum Delivered Mix Temperature º F**
PG 58-28	275º F	235º F
PG 64-22	290º F	235º F
PG 76-28	320º F	280º F

** The maximum mix discharge temperature shall not exceed the minimum discharge temperature by more than 30 º F.*
*** Delivered mix temperature shall be measured behind the paver screed.*

ACCP mix shall be produced at the lowest temperature within the specified temperature range that produces a workable mix and provides for uniform coating of aggregates (95 percent minimum in accordance with AASHTO T 195), and that allows the required compaction to be achieved.

ACCP mix shall not be stored longer than 9 hours, unless additional protective measures are used and approved. If storing or holding of the mixture causes segregation, excessive heat loss, or adversely affects the quality of the finished product, corrective action shall be taken. Unsuitable mixture shall be disposed of at the Contractor's expense.

When placing hot bituminous mixture over bridge decks covered by waterproofing membrane, the minimum temperature of the mixture when rolling operations begin shall be 250° F. The job mix temperature may be increased up to 300° F to obtain this temperature.

6.4 Hauling

Each truck shall use covers to protect the mix during transport. The Owner can reject mix, which is hauled without a cover. Should the mixture show an excess or deficiency of asphalt cement, damage due to burning or overheating, or an improper gradation shall be rejected.

7. TACK COAT

Prior to placement of ACCP, a tack coat shall be applied. The material shall be in accordance with Section 2.4. The emulsified asphalt shall be diluted 1: 1 with water and applied at 0.10 $\pm$ 0.01 gallons per square yard of diluted material. The Owner may direct other application rates to match the age of condition of the surface.

All work shall be done at locations and with the grade and quantities of material designated on the plans. The surface to receive the tack coat shall be dry and cleaned by sweeping or other approved method until dust, debris, and foreign matter are removed. The tack coat shall then be applied uniformly by distributor as specified below. Prior to paving, all water must have evaporated from the tack coat. Contaminated areas shall be cleaned and tack coat shall be reapplied.

WEATHER LIMITATIONS

Prime coat and tack coat shall not be applied under the following conditions:

1. When the surface is wet.
2. When weather conditions would prevent the proper penetration or curing of the prime or tack coat.
3. When the temperature in the shade is below 55 degrees F.

EQUIPMENT

The Contractor shall provide necessary equipment for heating and uniformly applying bituminous material and blotter material when required.

The distributor and equipment shall be capable of uniformly distributing bituminous material at even temperature and uniform pressure on variable widths of surface up to 15 feet at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard. The allowable variation from any specified rate shall not exceed plus or minus 0.02 gallon per square yard.

Distributor equipment shall include a tachometer, pressure gauges, accurate volume measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. Distributors shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and

vertically. The distributor for rejuvenating agent shall conform to the foregoing and shall also be equipped with the following:

1. Heating facilities with controls to reach a temperature of 130 degrees F.
2. Circulating system to maintain proper mixture of the rejuvenating agent.

The use of a pull behind tack pot with wand will not be permitted except for applying tack next to the curb or crosspans or edge of asphalt patch.

PREPARATION OF SURFACE

Preparation of the surface to be treated shall include all work necessary to provide a smooth, dry, uniform surface. Work shall include patching, brooming and shaping to the required grade and section, compaction removal of unstable corrugated areas and removal of all vegetation. The edges of existing pavements, which are to be adjacent to new pavement, shall be cleaned to permit the adhesion of bituminous materials.

APPLICATION OF BITUMINOUS MATERIAL

Bituminous material shall be applied to the width of the section to be coated by means of a pressure distributor in a uniform and continuous spread. When traffic is maintained, not more than 1/2 of the width of the section shall be treated in one application, or sufficient width shall be left to adequately handle traffic. Care shall be taken that the application of bituminous material at the junctions of spreads is not in excess of the specified amount. Excess bituminous material shall be removed or distributed as directed. Skipped areas or deficiencies shall be corrected. Bituminous material shall not be placed on any surface where traffic will be forced to travel upon the freshly applied material.

APPLICATION RATES AND CURING

A cutback-tacked surface shall cure, or break. Surfaces tacked with asphalt emulsion shall be free from residual moisture before placing any bituminous surface. Coating sprayed on the exposed surfaces of curbs, walks, or other structures shall be cleaned by the Contractor.

Tack coat shall be applied to the vertical gutter surface and 12" in on the subgrade the entire length of the roadway where bituminous material will be placed directly on a subgrade surface. Tack coat shall be applied prior to placing any bituminous material.

Tack coat shall be applied to the entire surface of the roadway between asphalt lifts at a rate of not more than 0.10 gal. per square yard unless otherwise directed by the Engineer. Application temperature of bituminous material shall be between 80 degrees F. and 130 degrees F.

8. PLACEMENT

Asphalt concrete shall be placed only on approved, properly constructed surfaces that are free from loose material, water, frost, snow or ice. The asphalt concrete mixtures and tack coat shall be placed in accordance with the temperature limitations of Table 8.1 and only when weather conditions permit the pavement to be property placed and finished as determined by the Owner.

TABLE 8.1 - PLACEMENT AIR AND SURFACE TEMPERATURE LIMITATIONS

Compacted Layer Thickness	Top Layer of Pavement*		Lower Layer	
	PG 58-28 PG 64-22	PG 76-28	PG 58-28 PG 64-22	PG 76-28
2 inches	50° F	65° F	40° F	50° F
>3 inches	50° F	60° F	40° F	40° F

* Air temperature is taken in the shade. Surface temperature is taken on the subgrade or base. The Owner may not wave the above temperature limitations for PG 76-22.

The mixture shall not be placed at a temperature lower than 245**°** F or 290° F for mixes containing polymer modified asphalt. Mix which is too cold or damaged by weather will be rejected.

The mixture shall be laid upon an approved surface, spread and struck off to obtain the required grade and elevation after compaction. The minimum lift thickness shall be four times the nominal particle size. The mixture shall be placed approximately 25 percent thicker than the existing surrounding mat thickness' to account for compaction. Raking will be required at longitudinal and transverse joints. Casting or raking that causes segregation will not be permitted. Utility trench patching shall be performed by a licensed, experienced personnel pre-approved by the City capable of providing a final product that matches existing surfaces without sags or crests greater than 3/16'' across the width of a trench and across a 10 foot straight edge along the length of a trench.

Mixtures made with modified asphalt cement requires more rapid completion of handwork areas than for normal mixtures. Hauling and placement sequences shall be coordinated so that the power is in constant motion. Starting and stopping shall not be allowed. A construction joint shall be placed at any time the power stops. Bituminous pavers shall be used to distribute the mixture either over the entire width or over such partial width as may be practicable. Echelon paving will be permitted.

The hopper wings of the paver shall not be folded during paving operations. The Contractor shall remove and dispose of the asphalt from the hopper wings at the end of each day's paving operations.

If an unsatisfactory mix has been placed, it shall be removed, disposed of and replaced as directed. No compensation will be allowed for rejected material.

9. LONGITUDINAL JOINTS

9.1 Joint Placement

The longitudinal joints in both a new pavement and an overlay pavement layer shall offset the joint in the layer immediately below by 6 inches. The joints in any pavement layer shall not fall in a wheel track. The joints in the top layer of new pavement not built on top of an existing pavement shall be located as follows:

(1) For two-lane roadways, at the centerline of the pavement and at the outside edge of the travel lanes.
(2) For roadways of more than two lanes, at the lane lines and at the outside edge of the travel lanes.

9.2 Joint Construction

Where paving operations occur on a multi lane traveled roadway, the Contractor shall arrange his paving operations so that there will be no exposed longitudinal joints between adjacent travel lanes at the end of a day's run. Asphalt overlays and top lifts shall not be applied when

weather conditions or the threat of rain may prevent completion of the full width asphalt mat.

The new compacted mat shall overlap the previously placed mat no more than 1½ inches. The new uncompacted mat should be placed approximately 25 percent thicker than the existing cold side. Excess overlap or thickness shall not be raked or cast onto the new mat, but shall be wasted by pulling back and removing. The hot edge shall be raked, blocked or bumped in a smooth line consistent with the previous longitudinal edge. The longitudinal joint shall be rolled from the hot side, and overlap the joint by approximately 6 inches on the cold side.

The longitudinal joints shall be compacted to a target density of 92 percent of the maximum specific gravity. The tolerance shall be ± 4 percent. Maximum specific gravity will be that shown for the asphalt mix used in construction of the joint. Density (percent relative compaction) will be determined in accordance with Colorado (CDOT) Procedure 44.

The Contractor shall obtain one 7-inch diameter core at a random location within each longitudinal joint sampling section for determination of the joint density. The Contractor shall drill the cores at the location directed by the Engineer and in the presence of the Engineer. The Engineer will take possession of the cores for testing. The Contractor may take additional cores at the expense of the Contractor. Coring locations shall be centered on the line where the joint between the two adjacent lifts abut at the surface. Core holes shall be repaired by the Contractor using materials and methods approved by the Engineer.

Coring for longitudinal joint density testing, core hole repair and associated expenses will not be paid for separately but shall be included in the work. Traffic control for this work will be paid for in accordance with the contract.

10. TRANSVERSE JOINTS

Placing of the ACCP shall be continuous with a minimum transverse joints, and rollers shall not pass over the unprotected end of a freshly laid mixture.

Transverse joints shall be formed by offsetting on the previous run to expose the full depth of the course, 10 feet in length and offset 10 feet to the adjacent pavement. When directed by the Engineer, a coat of bituminous material shall be used on contact surfaces of all joints just before additional mixture is placed against the previously rolled material.

Where the final lift of asphalt is being installed and terminates where a final lift is not installed the transverse joints will be formed by offsetting on the previous run to expose the full depth of the course 10 feet in length and offset 10 feet to the adjacent pavement. A paper resin joint or wood bulkhead with a ramp will be installed where the final lift terminates to the lower lift.

Provide burlap or paper resin joint with ramp at asphalt replacement/asphalt mill and overlay limits. Prior to paving, the burlap or paper resin joint with ramp shall be removed. Dirt joints are strictly prohibited.

Where paving begins at a transverse joint that has allowed to cool, the entire joint shall be heated with a propane burner creating a uniform heated material tie-in.

When a tapered joint is required for traffic access, the ramp shall be removed back to a full depth from segregated section before paving is restarted.

When restarting paving operations, the paver screed shall be placed on starter block on the completed side of the transverse joint. Starter block should be approximately 25% of the thickness of the existing completed mat, so that adequate grade and compaction can be achieved on staring the paving operation. The screed should be nulled when on starting blocks and an up angle of attack set. Proper head of mix should be introduced into the paver prior to starting. The new compacted (downstream) side of the joint may be up to 3/16 inches higher than the old (upstream) side.

11. SEGREGATION

The asphalt mixture shall be transported and placed on the roadway without segregation. All segregated areas shall be removed immediately and replaced with specification material before the initial rolling. If more than 50 square feet of segregated pavement is removed and replaced in any continuous 500 linear feet of paver width laydown, operations shall be discontinued until the source of the segregation has been determined and corrected.

The Owner will determine the extent of the segregation. The Contractor will not be allowed additional compensation for correction of segregated areas.

12. COMPACTION

The temperature of the mixture immediately behind the screed be at least 245° F (290° F for PG76-28) and breakdown compaction shall be completed before the mixture temperature falls 20**°** F.

The ACCP shall be compacted by rolling. Both steel wheel and pneumatic tire rollers are required. The number, weight, and type of rollers furnished shall be that which is sufficient to obtain the required density while the mixture is in a workable condition. Compaction shall begin immediately after the mixture is placed and be continuous until the required density is obtained.
If the required density is not achieved and the surface temperature falls below 185° F, or there is obvious surface distress or breakage, no further compaction effort will be permitted unless approved by the Owner**.** The criteria for mixtures containing PG76-28 asphalt cements shall be 235° F. Pavement operations shall be suspended when density requirements are not met, and the problem resolved prior to continuing paving operations.

All roller marks shall be removed with the finish rolling. Use of vibratory rollers with the vibrator on will not be permitted during surface course final rolling and will not be permitted on any rolling on bridge decks covered with waterproofing membrane.

All ACCP paving shall be compacted to between 92 and 96 percent of Maximum Theoretical Density (AASHTO T-209: Maximum Specific Gravity of Bituminous Paving Mixtures) with the average of five random and consecutive density tests equaling at least 93 percent of T-209. If more than three random density tests fall below 93 percent of T-209, corrective measures shall be taken by the Contractor**.** Compaction of less than 90 percent of T-209 will be cause for removal and replacement. The most recent T-209 Rice value shall be used in calculating Relative Compaction according to CP-44.

The Contractor shall core the pavement as required by the Owner for field density tests in accordance with Colorado Procedure 44, Method B (AASHTO T-230), or for field calibration of nuclear density equipment in accordance with the Appendix of Colorado Procedure 81 (ASTM D- 2950). At a minimum, cores for nuclear density equipment calibration shall be taken at the beginning of placement of each pavement layer or change of mixture materials or gradation. Untested areas during placement will also require cores to be taken to verify compaction.

Along forms, curbs, headers, walls, and all other places not accessible to the rollers, the mixture shall be thoroughly compacted with mechanical tampers.
Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective, shall be immediately removed and replaced with fresh hot mixture, and compacted to conform with the surrounding area.

Except for leveling courses, the minimum compacted depth of pavement placed in one layer shall be 1½ inches, unless approved by the Engineer. The maximum compacted depth shall be three (3) inches.

13. TOLERANCES

13.1 Roadway Smoothness

Roadway smoothness testing and corrective work shall be performed as described below. Corrective work and the associated traffic control as described below will not be measured and paid for separately, but shall be included in the work.

a. *Smoothness Testing* – The Contractor's smoothness testing results will be used for acceptance. If a re-test is required, the Contractor shall be responsible for all traffic control costs and re-testing costs.

i. Utility Trench patching tapers, turn slots, acceleration lanes and deceleration lanes will be measured using a 10 foot straightedge. The Contractor shall furnish an approved 10 foot straightedge and depth gauge and provide an operator to aid the Engineer in testing the finished pavement surface. Areas to be measured shall be as directed by the Engineer. Areas showing high or low spots of more than 3/16 inch in ten feet shall be marked and corrected until the high spot does not exceed 3/16 inch in ten feet. Deficient areas shall be milled and resurfaced as directed by the city.

ii. Patching surface tolerances: the variation between any two contacts with the surface shall not exceed 3/16 inch in 10 feet. All humps or depressions exceeding the specified tolerance shall be corrected by removing defective work and replacing it with new material or by overlaying (not patching) as directed by the Engineer. For new streets the final surface pavement adjacent to concrete gutter shall be finished from 1/8 inch to ¼ inch above the lip of the gutter into which it drains. Any surface pavement that is above the lip more than ¼ inch shall be removed and replaced to the specified height. Any surface pavement that is below the lip of the gutter shall be corrected as specified above, for new street construction. For street overlays the surface pavement may be ½'' inch above the lip.

13.2 Gradation and Asphalt Cement Tolerances

The gradation shall not deviate from the design job mix by more than the following:

TABLE 13.2.1 - GRADATION TOLERANCES

Item	
Passing No. 3/8" and Larger[1]	± 6%
Passing No. 4 and No. 8	± 5%
Passing No. 30	± 4%

Item	
Passing No. 50	± 3%
Passing No. 200[2]	± 2%
Asphalt Content	±0.3 %
Asphalt Content, Mixes with >10% RAP	±0.4%

[1]There is 0 percent tolerance for the maximum sieve size.
[2]Mixes with -No. 200 sieve material produced over 7.0 percent is allowed only when Air Voids are kept within 3.0 percent to 5.0 percent and VMA still meets requirements.

When disagreements concerning determination of specification compliance occur between sampling and testing procedures, solvent extracted aggregate testing shall take precedence over burnoff oven extracted aggregate, which shall take precedent over cold feed belt testing.

15. PRICE REDUCTION

The materials and construction shall be price reduced for density and thickness in accordance with the following.

Price reductions shall be per lot based upon a Lot encompassing 250 lineal lane feet and shall be at the cost of the entire pavement system.

TABLE 15.1 – PRICE REDUCTION

Price Reduction	0%	25%	45%	Remove & Replace
Thickness Deficiency	0-0.5 inch	0.51-1.0 inch	1.01-1.5 inches	>1.5 inches
Density	92-96%	91.9-91%	90.9-90%	+97% or below 90%

16. TESTING AND INSPECTION

Test	Standard	Minimum Frequency
Density	ASTM D 2950	One Test for Each 250 Lineal Feet/Lane
Thickness (Core)		One Test for Each 250 Lineal Feet/Lane
VMA	CP 48	One for Each Day
Gradation	AASHTO T 27	One for Each Day
Hveem/Marshall Stability	CP-L 5105	One for Each Day
AC Content	CP-L 5120 or AASHTO T 164	One for Each Day
Maximum Theoretical Density	AASHTO T 200	One for Each Day

Inspectors shall be responsible for checking pavement temperatures, segregation, rolling patterns and other construction means and method which affect the performance of the pavement system. The Contractor shall provide assistance in sampling and testing at all facilities and at the job

WEATHER LIMITATIONS

Bituminous plant mix shall be placed only on properly constructed surfaces that are free from water, frost, snow or ice. The bituminous mixtures shall be placed within the air temperature limitations of the following table, when the temperature is rising and only when weather conditions otherwise permit the pavement to be properly placed and finished as determined by the Engineer.

Placement Air Temperature Limitations

Compacted Thickness	Top Layer	Layers Below Top
1" or less	60 Deg. F.	50 Deg. F.
>1" to 3”	50 Deg. F.	40 Deg. F.
Greater than 3"	50 Deg. F.	40 Deg. F

Placement temperatures as stated in the above table shall be increased by 5 Degrees for each 10 miles-per-hour wind velocity to a maximum of 70 degrees F.

When it is in the public interest and taking in consideration the construction season, the Engineer may waive minimum temperature requirements for placing prime coats and layers of bituminous mixtures below the top layer of the completed pavement. Pavement operations will be suspended when density requirements are not met.

Asphalt overlays and top lifts shall not be applied when weather conditions or the threat of rain may prevent completion of the full width asphalt mat.

SURFACE TOLERANCES

For new streets the final surface pavement adjacent to concrete gutter shall be finished from 1/8 inch to 1/4 inch above the lip of the gutter into which it drains.
Any surface pavement that is above the lip more than 1/4 inch shall be removed and replaced to the specified height. Any surface pavement that is below the lip of the gutter shall be corrected as specified above; for new street construction. For street overlays the surface pavement may be 1/2" above the lip.

MANHOLES AND VALVE BOXES

All manholes, valve boxes and survey range boxes shall be 1/4" below the final compacted asphalt surface. Only cast iron riser rings will be permitted. Any manhole covers, water valve covers or survey range boxes which do not conform to 1/4" below the final finished asphalt surface shall be removed and corrected.

5.0 SPECIAL CONDITIONS

RAISING MANHOLE COVERS AND VALVE BOXES

The Contractor shall provide all necessary adjustment rings. The Contractor shall furnish all other materials, labor and equipment for the adjustment of all existing manhole covers and valve boxes to the proper elevation as determined by the Engineer. Manhole covers and valve boxes shall be adjusted to finish grade prior to asphalt top lift and overlays.

If Contractor removes or lowers manhole rings and covers and valve boxes and installs asphalt bottom lift, Contractor shall saw cut through asphalt bottom lift to access buried manhole rings and covers and valve boxes. Asphalt patching shall be completed at least 3 days prior to asphalt top lift paving.

There will be no separate payment for this work; all the costs for completing the work shall be incidental to the other items of the contract.

CLOSURE OF THE ROADWAY

The Engineer will allow the Contractor to close the roadway to traffic during daylight hours, except for emergency and local traffic only on those streets designated by the Engineer. Access to residential driveways shall be provided and maintained with a temporary ramp overnight when work has terminated for the day and when work is not in progress. There will be no separate payment for this work; all the costs for completing the work shall be incidental to the other items of the contract.

Local access shall be maintained by the Contractor at all times or as directed by the Engineer.

Once the Engineer has allowed construction to begin on any portion of the roadway (one block), the Contractor shall progress continuously until the final paving has been completed and the roadway open to through traffic on a daily basis. Continuous progress shall be defined as a minimum or six (6) hours per day Monday through Friday by the minimum sized crew required to continue progress on the controlling operations.

6.0 BASIS OF PAYMENT - ASPHALT

The entire cost of the work and material necessary to complete all terms shown or implied on the drawings or specified herein shall be included and merged into the pay items shown in the Bid Proposal. All associated work necessary for the proper and complete installation of this project and associated bonding, maintenance and guarantees shall be merged into the pay items shown in the Bid Proposal. All payments shall be subject to the conditions of these specifications. All pay items shall include sales tax, licenses, permits, and other taxes required to complete the work. No additional compensation will be allowed for any item unless a change order is issued by the Engineer.

Minor items and minor details are not listed but shall be part of the complete contract.

The depths of hot asphalt patching shall be depth after compaction.

Contractor shall provide 3" deep temporary cold mix asphalt patch over compacted trench backfill.

Contractor shall maintain the temporary cold mix asphalt patch until permanent hot asphalt patch is complete. Temporary cold mix asphalt patch shall not be paid for separately but shall be included in the work.

Labor and equipment required to load and haul bulk water will not be paid for separately but shall be included in the work.

Storm water management will not be paid for separately but shall be included in the work.

The following items in this section are representatives of all work items required and therefore are not referred to by proposal or item number for each individual work item.

HOT ASPHALT PATCH GRADE SX (6")(9")

1. Scope of Work

This work shall consist of furnishing all labor, materials and equipment to install a HOT ASPHALT PATCH GRADE SX (6")(9") to the limits and depths on the plans and specifications.

This work shall consist of saw cutting, removing, loading, haul, and disposal of existing asphalt, subgrade flowfill and roadbase material, preparing and compacting the subgrade and installing hot asphalt patching.

Contractor to schedule permanent patching operations so as not to leave more than 300 feet of unpatched trench open at any given time. There will be no separate payment for mobilizations and shall be part of the work.

2. Removal of Asphalt

The areas to be patched shall be cut out and removed leaving neat straight edges. All removed material shall become the property of the Contractor and will be disposed of properly. Prior to removal the Engineer will mark out the limits of the patch, only the marked area is to be removed, any additional removal will not be paid for and will be corrected at the Contractor's expense.

3. Proof Rolling Trench Subgrade

Proof rolling will be required on the trench subgrade surfaces prior to asphalt placement. Proof rolling shall be completed after specified compaction has been obtained. Areas found to be weak and those areas which failed shall be reworked or repaired to correct subgrade problems at the contractors expense.

Satisfactory results of the proof roll do not relieve Contractor of his responsibility to provide suitable subgrade, for patching activities. Subgrade failures that occur prior to paving activities, such as soft or yielding areas (as designated by the Engineer) will be removed and either reworked or replaced.

Proof rolling shall be performed by the City. A 24-hour notification is required for scheduling a proof roll.

4. Acceptable Methods of Patching

Acceptable methods for the installation of asphalt patching shall include, but not be limited to, with the use of a self-propelled leeboy paver or approved equal, to uniformly spread the hot bituminous materials in lifts, prior to rolling. The self-propelled leeboy paver or approved equal is required for the final lift installation. The area to be patched shall be adequately tacked. Compaction of the hot asphalt shall be completed in lifts and conform to the City of Louisville Design and Construction Standards.

5. Method of Measurement and Payment

Payment will be made on field measured installed square yard basis for HOT ASPHALT PATCH GRADE SX (6")(9"), except that the area will be marked and measured prior to construction. Payment for removing existing asphalt, subgrade and roadbase material, preparing subgrade flowfill and replacing asphalt with a hot asphalt patching and shall be full compensation for all work necessary to complete the item.

6. MGPEC FORM

Agency: Louisville Project Number: 501498-660181
Date:_____ Project Name: 2025 Water Main Replacement Project

MGPEC Form # 9 (2003) **Mixture Design Requirements for Hot Mix Asphalt Pavements (HMAP)**

Project Special Provision Sheet for Hot Mix Asphalt Pavements (HMAP)

This MGPEC Form #9 is a **mandatory part of the bid documents**, and ***** shall be filled out by the AGENCY for each mix specified. The Contractor shall include a copy of this form with each Mix Design submittal after the contract is awarded.

***** Street Classification: Patching Local (6",9")
(examples: Residential, Collector, Arterial, Industrial, Parking Lot)

***** Construction Application: ☒ Top Lift ☒ Intermediate Lift(s) ☒ Bottom Lift(s)
☒ Patching ❑ Other _____

***** Aggregate Gradation: ☒ Grading SX ❑ Grading S ❑ Grading SG

	Any Lift only when		Top Lift only when Bottom Lifts only when
2" thick lift	2" to 3" thick lifts	3" to 4" thick lifts	

***** RAP Quantity, Maximum: ❑ 0% ☒ 20%

***** Mix Design Method & Compaction Level: Choose Lab Compaction Level (N_{design}=) from Traffic Level

Superpave Gyratory, N_{design} (See Table 9.3.2)

❑ N_{design}=50	♦ new category	(new 2001 Traffic Category Level 0: Paths & non-Vehicular)
☒ N_{design}=75	♦ N=68	(Traffic Level 1, Traffic Loading: 0 to <300,000 ESALs)
	♦ N=76	(Traffic Level 2, Traffic Loading: 300,000 to <1 Million ESALs)
	♦ N=86	(Traffic Level 3, Traffic Loading: 1 Million to <3 Million ESALs)
❑ N_{design}=100	♦ N=96	(Traffic Level 4, Traffic Loading: 3 Million to <10 Million ESALs)
	♦ N=109	(Traffic Level 5, Traffic Loading: 10 Million to <30 Million ESALs)

***** Asphalt Binder:

❑ PG 58-28 (For Traffic Levels 1, 2 or 3)⇒ help reduce low temperature cracks

☒ PG 64-22 (For Traffic Levels 3, 4 or 5) ⇒ for higher axle load traffic

❑ PG 76-28 (For Traffic Levels 3, 4 or 5) ⇒ for high priority roads, high axle loads, slow moving or stop & go traffic flow conditions)

***** Target Job Mix Optimum Asphalt Content Selection (see 4-8-03 advisory):

❑ **Standard = *Choose Target Optimum %AC at 3.5 % to 4.5 % Air Voids*** (per MGPEC 2001 version & CDOT 2001~2002). **Also, all mix design VMA requirements of Table 9.2.1.3 are reduced by 0.3%**

❑ **CDOT Modification = Choose Target *Optimum %AC* at Air Voids of 1.0 % below Optimum established in Standard Method above.** (Procedure per CDOT Revision to Section 403, June 6, 2002). **VMA as above. Field Air Voids to be MINIMUM 3.0%. Bid Price to include all Asphalt Cement.**

A completed MGPEC Form #9 shall supplement the MGPEC Construction Specifications defining the contract specific requirements of Item 9: Hot Mix Asphalt Pavement (HMAP). Refer to the Specifications for details.

- END OF SECTION -

SECTION 02600 - CONSTRUCTION ZONE TRAFFIC CONTROL

1.0 GENERAL

2.0 PRODUCTS

3.0 EXECUTION

4.0 MEASUREMENT AND PAYMENT

PART 1.0 - GENERAL

1.1 DESCRIPTION

Construction zone traffic control shall apply to any and all construction and related construction on the 2025 WATER MAIN REPLACEMENT PROJECT AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT to complete the work.

This work consist of furnishing, installing, moving, maintaining and removing temporary traffic signs, advance warning arrow panels, variable message boards, flashing portable beacons, barricades, channelizing devices, delineators, masking and unmasking existing signs in construction zones, and flagging as required by the Manual on Uniform traffic Control Devices for Streets and Highways and the Colorado Supplement thereto, in accordance with the plans and these specifications. When a device is not in use, the contractor may remove it from the project for the period it is not needed. Devices temporarily not in use shall not be stored in the roadway or walkways.

1.2 GENERAL REQUIREMENTS

Pertinent provisions of the following listed documents shall apply to this work, except as they may be modified herein, and are hereby made a part of this specification to the extent required.

A. Standard Specifications for Road and Bridge Construction by the Colorado Department of Transportation (CDOT), Section 630, Construction Zone Traffic Control, and Section 627, Pavement Marking.

B. Manual on Uniform Traffic Control Devices for Streets and Highways, FHWA, and the latest revision of the Colorado Supplement thereto.

C. CDOT Standard Plan S-630-1 (sheets 8 and 9), S-630-2 and S-630-3.

1.3 SUBMITTALS

A. Five (5) CONTRACT DAYS prior to the start of any construction activity, submit copies of the following:

1. Proposed detour plan and traffic control elements as described under Section 3.2.
2. Schedule of proposed duration and sequence of operations.

PART 2.0 - PRODUCTS

2.1 MATERIALS

A. In accordance with CDOT Section 627.02 regarding pavement marking tape.
B. In accordance with CDOT Section 630.02 regarding signs and barricades.
C. In accordance with CDOT Section 630.05 regarding traffic cones.

PART 3.0 - EXECUTION

3.1 GENERAL

In accordance with CDOT, Subsection 630.09 through Subsection 630.13, Construction Zone Traffic Control - Construction Requirements, except as modified herein.

In accordance with CDOT, Section 627.10, Pavement Marking Tape.

3.2 METHOD OF HANDLING TRAFFIC

Delete the second paragraph of Subsection 630.09.

Subsection 630.08 shall include the following:

ALL TRAFFIC CONTROL DEVICES MUST BE IN GOOD AND CLEAR CONDITION, INSTALLED PRIOR TO ALL AND ANY CONSTRUCTION ACTIVITY. THE ENGINEER MAY DIRECT MINOR MODIFICATIONS TO THE APPROVED TRAFFIC CONTROL PLAN BASED ON OBSERVATIONS OF FIELD CONDITIONS AT ANY TIME OR SUSPEND WORK UNTIL APPLICABLE SAFETY MEASURES ARE TAKEN WITHOUT ANY CHANGES TO THE COST OF THE PROJECT.

DEFICIENCIES IN TRAFFIC CONTROL SHALL BE CORRRECTED IMMEDIATELY OR WORK SHALL BE SUSPENDED. THE OWNER WILL REQUEST A REDUCTION IN COST IF TRAFFIC CONTROL IS NOT PROVIDED PER APPROVED METHOD OF HANDLING TRAFFIC.

The City Engineer must approve all street closures. At least 24 hours before a street closure, it shall be the responsibility of the Contractor to notify the following agencies:

1. Police Department 303-441-4444
2. Louisville Fire Protection District 303-666-8809
3. City of Louisville Operations and Maintenance Department 303-335-4750
4. AMR Ambulance Service 303-665-6623
5. Boulder Valley School District 303-447-1010
6. Boulder County Communications 303-441-4444
7. Regional Transportation District 303-443-0100
8. Republic Trash Service ..... Email the following:
   Nick Scharrer ..... nscharrer@republicservices.com
   Mike Allarid .....mallarid@republicservices.com
   Blair Van Hoeven ..... blair.vanhoveven@republicservices.com
   Susan Roundy .....sroundy@republicservices.com

In addition to the above agencies and organizations, CONTRACTOR shall notify the Post Office.

At the completion of work, the agencies must be notified of resumption of normal service.

Changes to the approved traffic control plan necessitated by unforeseen circumstances, such as utility conflicts, must be reviewed and authorized by the Engineer.

"NO PARKING" signs shall be placed not less than 24 hours in advance of commencement of work in a work zone. The sign shall state, for example "No Parking 7 a.m. to 7 p.m.", together with the day of the week.

A copy of the Right of Way Permit and the approved MHT shall be available at the project site in order that City personnel may verify compliance with the specified traffic control requirements.

The specified elements of the MHT shall also include the number of flag persons to be used.

Approval of the proposed MHT does not relieve the Contractor of liability specifically assigned to him under the contract. The Contractor shall erect and maintain warning lights, signs, barricades, and sufficient safeguards around all excavations, embankments, and obstructions.

The Contractor shall coordinate and cooperate fully with agents of the City of Louisville, utility owners, and other contractors. He shall also coordinate and cooperate fully with agents of other entities to assure adequate and proper traffic control is provided.

The Contractor is advised that other significant construction might be occurring in the area and that he shall cooperate fully with the City of Louisville and all other contractors occupying public right-of-way in terms of work location, work schedule and traffic control requirements.

Through traffic shall be carried on a paved surface at all times unless otherwise approved by the Engineer. The Contractor shall maintain at his own expense that portion of the existing roadway being used to carry traffic so that traffic may readily pass over it.

All traffic control devices supplied by the contractor must be maintained in good and clear condition and meet minimum national standards for reflectivity. Devices shall comply with minimum size and shape as specified in the MUTCD. **No bent, broken, damaged, defaced, dented, dirty, discolored, faded, non-conforming traffic control devices and/or supports shall be used in this project.**
All traffic control devices shall bear the name, address, and phone number of the barricade company that owns them. The phone number shall be a 24-hour a day dispatched hotline in the event an emergency situation occurs where additional devices are needed or existing devices must be removed.

The Contractor shall install construction traffic control devices in locations that do not block or impede sidewalks for pedestrians, or bicyclists or other existing traffic control devices. This strategy shall include, but is not limited to, strapping signs to streetlight or utility poles. Devices may only be attached to wooden street light and utility poles.

All existing traffic control devices, including traffic signs and pavement markings that are compatible with the construction zone traffic control shall remain visible and fully operational. If any devices are incompatible with the temporary construction traffic control devices, they shall be covered, relocated or removed.

The Contractor shall not be allowed to begin operations, which require traffic control until the setup of traffic control devices is completed. Also, the Contractor shall clear his operations allowing 30 minutes for removals of traffic control devices in accordance with the designated hours of work and roadway closures.

During non-working hours, the roadways shall be restored to safe pre-construction travel conditions for the free flow of traffic. Any maintenance required to restore the roadways to this condition, including pavement patching and grading, shall be done prior to opening the areas to traffic or completing work for the day. Temporary pavement markings shall be placed at the direction of the Engineer. All costs incidental to the foregoing requirements in this paragraph shall be included in the original contract prices for the project, including any additional traffic control items required for haul routes into or away from the project.

Any existing signs damaged due to Contractor operations shall be replaced in kind or repaired to the satisfaction of the Engineer by the Contractor at no cost to the project.

Any existing traffic signs removed or relocated during construction as part of the approved traffic control plan are the responsibility of the Contractor to reset upon completion of construction, unless noted otherwise in the plans or specifications. Existing signs may not be removed without prior approval of the Engineer.

The Contractor shall not have construction equipment or materials in the lanes open to traffic at any time. Brief lane closures (of 5 minutes or less), as approved by the Engineer, may be permitted for moving construction equipment. Flaggers will be required for such operations. All personal vehicles and construction equipment parking will be prohibited where it conflicts with safety, access, or flow of traffic.

During non-construction periods (evenings, weekends, holidays, etc.) all work shall be adequately protected to ensure the safety of vehicular and pedestrian traffic, using materials meeting the approval of the Engineer.
Lane widths in work zones shall be 12 feet, minimum.

The vertical cut or fill, including rotomilling over 1" height differences resulting from construction operations adjacent to traffic lanes shall be temporarily sloped at a 3:1 or flatter slope, or as shown on the typical plan section, and barrier protected, or delineated at 25-foot intervals immediately after grading or removal operations. The 3:1 slope requirement applies to roadway construction projects and would not generally apply to utility construction or rehabilitation projects. Slope or shoring requirements for these type projects shall be reviewed on a project by project basis.

The Contractor shall equip all vehicles operating within the moving lanes with flashing amber lights visible from all directions.

Any portable device that requires weight to prevent overturning shall be weighted with appropriate sized sand bags. Rocks, asphalt, or any other debris will not be permitted.

MAINTENANCE OF ACCESS

The Contractor shall maintain access to all roadways, side streets, and alleyways, at all times unless otherwise approved by the Engineer. During non-working hours the Contractor shall maintain access to the roadways and driveways within the construction zone with temporary ramps.

Protection of Adjacent Property and Drives. The Contractor shall use extra care so as to minimize disruption to adjacent property and drives and shall leave the construction site clean, with all debris and concrete removed. If the Engineer determines that the Contractor did not exercise reasonable care to protect the parking areas or street sections from unnecessary damage while accomplishing his work, the Contractor will be required to restore the damaged items to their original condition at his own expense. The Contractor will not be permitted to operate trucks and equipment or store equipment and supplies on private property unless he has written permission to do so.

Work Limits. Work limits shall be marked by the Contractor with orange plastic fencing in pedestrian areas and other suitable materials in the street prior to beginning work. He shall confine all work to within these limits except as provided in the contract documents. If work limits are not established by permit or contract documents, said limits shall be determined by the Engineer and shall be suitably marked by the Contractor, prior to beginning work.

Should the Contractor be unable to obtain written approval of property owners or occupants, documentation of a "Good Faith Effort" to obtain said approval must be submitted.

CONTACTS

The Contractor shall notify the following 72 hours prior to beginning construction and 48 hours prior to changing traffic patterns. The Contractor shall also notify these persons in case of an emergency.

City of Louisville Public Works – Cameron Fowlkes, P.E. 303-335-4600
City of Louisville Public Works – Tyler Trojan, P.E. 303-335-4611
City of Louisville Operations Div. – Ben Francisco 303-335-4750
City of Louisville Police Department – Boulder Dispatch 303-441-4444
City of Louisville Fire Department - Fire Marshal 303-666-6595

3.3 TRAFFIC CONTROL MANAGEMENT

Subsection 630.10(6) shall include the following: A day shall be defined as the time from 12:00 midnight to 12:00 midnight. The log shall list all devices and personnel deployed within the limits of construction for each day and shall be available for review by the Engineer at all times.

In subsection 630.09, first paragraph, delete the first sentence and replace with the following:

The Contractor shall designate an individual, other than the superintendent, to be the traffic control supervisor.

In subsection 630.09, second paragraph, delete parts (1), (5) and (6) and replace with the following:

(1) Preparing, revising, and implementing each required method of handling traffic in accordance with the traffic control plan.

(5) Preparing traffic control diary on every calendar day traffic control devices are in use. This dairy shall be submitted to the Engineer daily and become a part of the Department's project records.

(6) Inspecting traffic control devices on every calendar day that traffic control devices are in use, masked, or turned away from traffic. These inspections shall include at least one night inspection per week. These inspections shall be performed by the traffic control supervisor or another representative who is certified as a worksite traffic supervisor.

(10) Supervising the cleaning and maintenance of all traffic control devices.

In subsection 630.09, delete the third paragraph and replace with the following:

Traffic control management shall be provided by a certified traffic control supervisor on a 24-hour-per-day basis. The traffic control supervisor or another representative who is certified as a worksite traffic supervisor shall be available and reasonably accessible to the job site on every working day, on call at all times, and available upon The Engineer's request at other than normal working hours. During non-work periods, the traffic control supervisor or another representative shall respond to the job site within 45 minutes. The traffic control supervisor or another representative who is certified as a worksite traffic control supervisor shall arrive at the job site within two hours after notification. The Contractor shall maintain a 24-hour telephone number at which the traffic control supervisor can be contacted. The traffic control supervisor shall not act as a flagger except in an emergency or in relief for short periods of time.

In subsection 630.11, delete the first paragraph and replace with the following:

630.11 General. Portable construction traffic signs shall be removed when temporarily not required. Permanently mounted construction traffic signs shall be masked or turned away form traffic when temporarily not required. When work is suspended, or the project is in free time, and there is no condition requiring traffic control devices or construction traffic signs, all of the construction traffic signs shall be masked or turned away from traffic. If this condition is to exist for more than 30 days, all construction traffic signs shall be removed. When storing portable signs or supports within the project they shall be stored laying flat and the location shall be at least four feet outside the edge of the shoulder and not on landscaped areas or sidewalks. When masking is used, it shall be done in accordance with subsection 630.10.

The retroreflective surfaces of all signs and other traffic control devices shall be cleaned as frequently as necessary to preserve their legibility and retroreflectivity. However, all devices shall be cleaned a minimum of once every two weeks.

In subsection 630.12, first paragraph, delete the fifth sentence and replace with the following:

When storing portable signs or supports within the project they shall be removed beyond the clear zone and shall not be visible to traffic. All storage areas shall be approved. The minimum clear zone distance shall be 18 feet, measured from the

edge of traveled way. If the signs cannot be stored at least 18 feet from the traveled way, they shall be removed. Under no circumstances shall signs be stored on the paved surface.

3.4 FLAGGING

Subsection 630.13(a) shall include the following:

The flagger's STOP/SLOW sign paddle shall be 18 inches with letters six inches high.

Delete Subsection 630.13(a) and replace with the following:

(a) The Contractor shall provide all flagging through the project necessary to assure proper safety to traffic. All flagging personnel shall be certified by the American Traffic Safety Services Association (ATSSA).

PART 4.0 - MEASUREMENT AND PAYMENT

4.1 Delete Subsection 630.14, 630.15 and replace with the following:

4.2 CONSTRUCTION ZONE TRAFFIC CONTROL (WATER MAIN) (SANITARY SEWER) (CONCRETE REPLACEMENT) (ASPHALT)

Construction Zone Traffic Control shall be paid for at the lump sum price indicated in the Schedule of Unit Prices. The lump sum price shall be full compensation for flagging and for furnishing, erecting, cleaning, maintaining, moving, removing and disposing of construction traffic control devices, including labor, material equipment and incidentals necessary to complete the work. All construction traffic control devices, which are not permanently incorporated into the project, will remain the property of the Contractor.

Traffic Control Supervisor will not be paid for separately, but shall be included in the work.

Temporary roadway/driveway ramps will not be paid for separately, but shall be included in the work.

Preparation of the MHT will not be paid for separately but shall be included in the work.

Construction fencing and temporary walkways will not be paid for separately but shall be included in the work.

Construction phasing and staging will not be paid for separately but shall be included in the work.

- END OF SECTION -

SECTION 02800 – LANDSCAPE RESTORATION
LANDSCAPE RESTORATION

1.0 Scope of Work

Work shall consist of furnishing all labor, materials, equipment, removal of subgrade material, excavation, subgrade preparation, load, haul, disposal, compaction, grading, rock mulch, fabric, topsoil, sod, seeding, sprinkler repair and incidentals and construction necessary to provide LANDSCAPE RESTORATION to the limits as shown on the plans and as directed by the Engineer.

CONTRACTOR shall restore the entire surface area that has been disturbed by the Work to match or improve the condition that existed prior to the construction.

Damaged sprinklers must be repaired by CONTRACTOR **within two (2) business** days of notification from ENGINEER or resident.

The landscaped area to be restored shall be determined by the Engineer. The Contractor shall clean the area of all debris (i.e. concrete spoils, rocks, etc.) to a minimum depth of six (6) inches, prepare all edges to be clean and vertical and backfill (place topsoil), compact, grade and restore landscaping (e.g. topsoil, sod, mulch, rock mulch, seed etc.).

Topsoil shall consist of loose friable loam free of subsoil, refuse, stumps, roots, rocks, brush, weeds, heavy clay, hard clods, toxic substances, or other material which would be detrimental to its use for landscaping restoration. The topsoil placed shall be fine graded to eliminate rough and low areas, match existing levels profiles, contours and ensure positive drainage prior to re-sodding or seeding.

Sod shall be Colorado-grown, 100% certified Kentucky Bluegrass, or a mixture approved by the
OWNER. The sod source shall be made known to and approved by the OWNER prior to installation.

Re-sodding shall be completed with sod of high quality and shall not be dried out or dying when placed. Re-sodding shall be rolled and thoroughly watered once by the Contractor. The Contractor shall notify the property owner in writing of the nature of the work that has been performed and inform the property owner that the sod will only be watered once. The notification format shall be approved by the Engineer prior to distribution to the property owner.

Rock mulch shall be washed river rock matching similar material including fabric Typar #3401 thermally spun bonded polypropylene, non-woven, thin geotextile weed control fabric, 4.0 oz. / lineal yard weight American Excelsior Co.

2.0 Method of Measurement and Payment

Payment for LANDSCAPE RESTORATION will be made on a lump sum basis and shall be full compensation for all work necessary to complete the item.

- END OF SECTION -

2025 WATER MAIN REPLACEMENT PROJECT

AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

City *of* Louisville

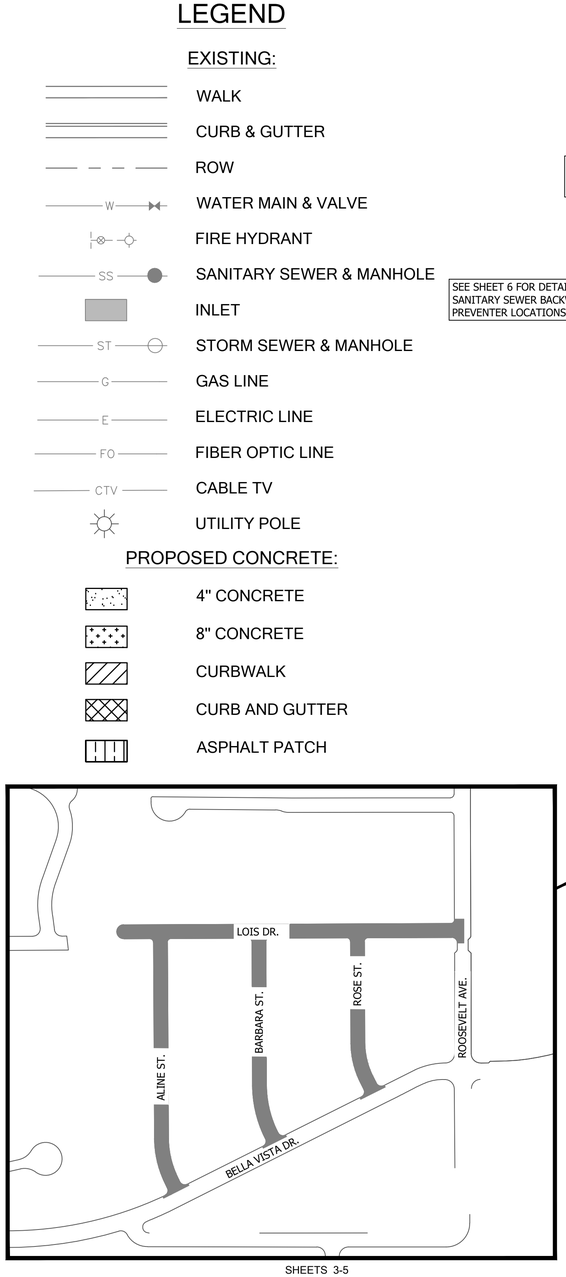
LEGEND

EXISTING:

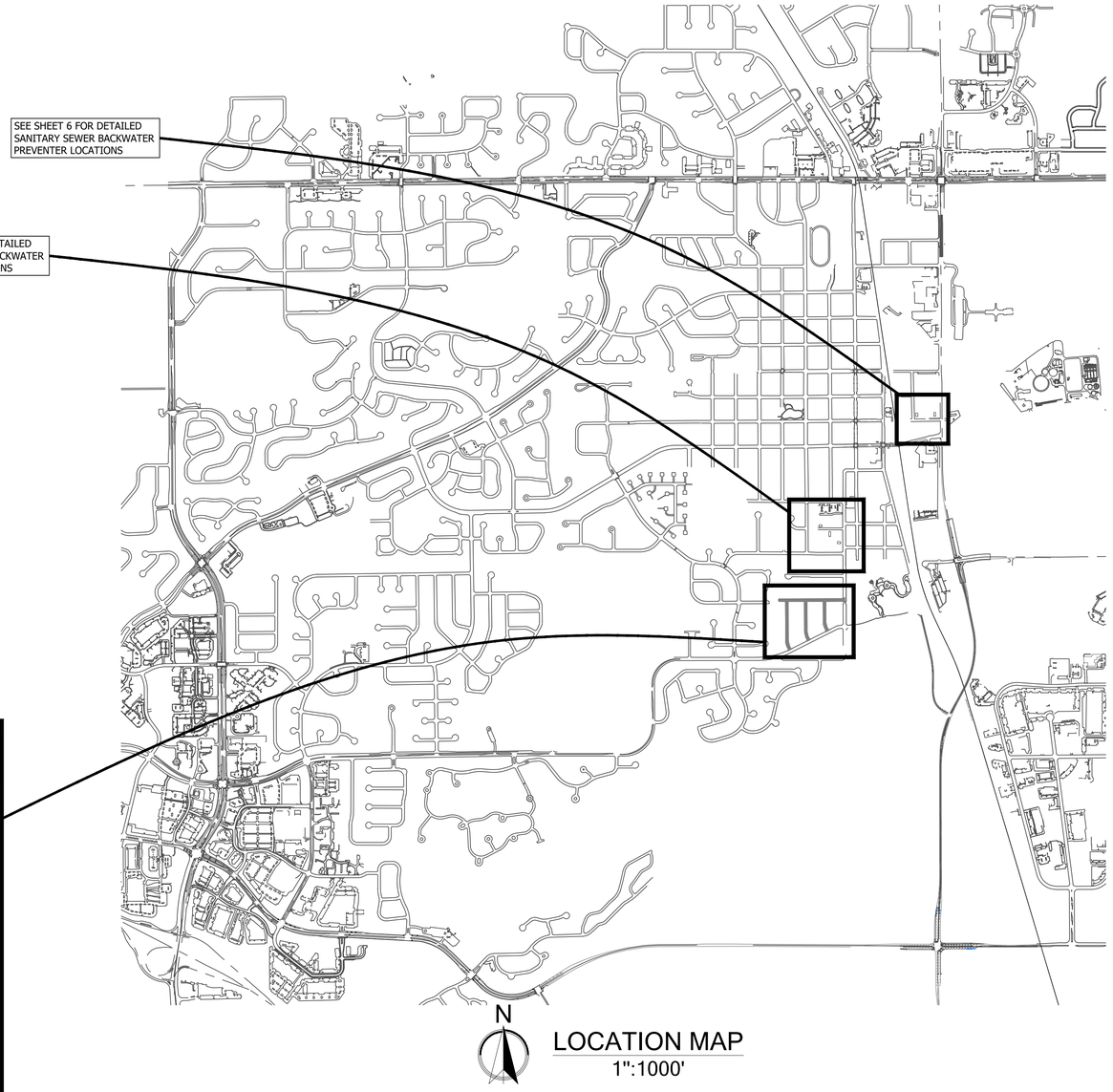
- WALK
- CURB & GUTTER
- ROW
- W — WATER MAIN & VALVE
- FIRE HYDRANT
- SS — SANITARY SEWER & MANHOLE
- INLET
- ST — STORM SEWER & MANHOLE
- G — GAS LINE
- E — ELECTRIC LINE
- FO — FIBER OPTIC LINE
- CTV — CABLE TV
- UTILITY POLE

PROPOSED CONCRETE:

- 4" CONCRETE
- 8" CONCRETE
- CURBWALK
- CURB AND GUTTER
- ASPHALT PATCH



SHEETS 3-5



N

LOCATION MAP
1":1000'

SHEET INDEX

WATER LEGEND

PROPOSED:

- 90° BEND
- 45° BEND
- 22.5° BEND
- 11.25° BEND
- FIRE HYDRANT
- CROSS
- TEE W/ THRUST BLOCK
- GATE VALVE
- CAP
- REDUCER
- SOLID SLEEVE
- SOLID X SWIVEL ADAPTER

1" = 1'

1' 0 0.5' 1' 2'
GRAPHIC SCALE IN FEET

City of Louisville
COLORADO - SINCE 1878

DESIGN BY: MW
DRAWN BY: RH
CHECKED BY: MW
APPROVED BY: TT
ISSUE DATE: 05/25/2025
REVISIONS:

COVER SHEET

2025 WATER MAIN REPLACEMENT PROJECT
AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

SHEET 1 OF 9

G:\CIPS\CIPS_2025\2025 WATER MAIN REPLACEMENT PROJECT-SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT\DRAWINGS\SHEETS\2025 WATER REPLACEMENT_COVER.DWG

GENERAL NOTES (ALL CONSTRUCTION):

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN CONFORMANCE WITH THE DESIGN AND CONSTRUCTION STANDARDS OF THE CITY OF LOUISVILLE AND THESE CONTRACT SPECIFICATIONS. THE CONTRACTOR SHALL HAVE IN HIS POSSESSION AT ALL TIMES ONE (1) SIGNED COPY OF THE PLANS, STANDARDS, AND CONTRACT SPECIFICATIONS AS APPROVED BY THE CITY. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ANY VARIANCE TO THE ABOVE DOCUMENTS.

2. THE CONTRACTOR SHALL MAINTAIN ONE RECORD COPY OF ALL DRAWINGS WHICH ARE TO BE READILY AVAILABLE TO THE ENGINEER AT ALL TIMES. THE FINAL RECORD DRAWINGS (AS-BUILTS) SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO FINAL PAYMENT.

3. CONTRACTOR SHALL OBTAIN, AT HIS OWN EXPENSE, ALL APPLICABLE CODES, LICENSES, STANDARDS, SPECIFICATIONS, PERMITS, BONDS, ETC. WHICH ARE NECESSARY TO PERFORM THE PROPOSED WORK. THE CONTRACTOR, ALONG WITH ALL SUBCONTRACTORS SHALL BE LICENSED IN THE CITY OF LOUISVILLE. CONTRACTOR SHALL SUBMIT A LIST OF ALL SUBCONTRACTORS INVOLVED IN THE PROJECT AND THEIR LICENSE NUMBERS TO THE ENGINEER. THE CONTRACTOR SHALL OBTAIN A RIGHT OF WAY PERMIT FROM THE CITY OF LOUISVILLE PUBLIC WORKS DEPARTMENT FOR THE PROJECT. A COPY OF THE RIGHT OF WAY PERMIT SHALL BE ON SITE AT ALL TIMES AND THE CONTRACTOR SHALL FORWARD A COPY TO ALL SUBCONTRACTORS.

4. IF WATER IS REQUIRED FOR THE PROJECT, THE CONTRACTOR SHALL OBTAIN A BULK WATER PERMIT FROM THE CITY OF LOUISVILLE PUBLIC WORKS DEPARTMENT IN ACCORDANCE WITH THE PERMIT REQUIREMENTS.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING STREETS, CURBS, SIDEWALKS, BUILDINGS, DRIVEWAYS, ALLEYS, LAWNS, PARKING LOTS, ETC. ADJACENT TO THE PROJECT FROM DAMAGE BY THE CONTRACTOR. ANY DAMAGES CAUSED BY THE CONTRACTORS OPERATIONS SHALL BE RECONSTRUCTED OR REPAIRED WITH LIKE MATERIALS TO THE SATISFACTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.

6. THE CONTRACTOR SHALL PROVIDE DAILY CLEANUP OF THE SITE INCLUDING, BUT NOT LIMITED TO, REMOVAL OF ALL TRASH AND DEBRIS AND REMOVAL OF MUD, DIRT, ETC. FROM SIDEWALK AND PAVEMENT SURFACES WITHIN AND ADJACENT TO THE SITE. CLEANUP WILL INCLUDE SWEEPING ADJACENT SURFACES ACCESSIBLE TO THE GENERAL PUBLIC.

7. THE CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS/RESIDENTS TO PHASE WORK SUCH THAT EMERGENCY ACCESS IS PROVIDED AT ALL TIMES AND RESIDENCE ACCESS IS AVAILABLE DURING NON-WORKING HOURS.

8. WHERE IT IS REQUIRED TO CUT EXISTING ASPHALT OR CONCRETE, THE CUTTING SHALL BE DONE TO NEAT, STRAIGHT LINE BY SAW CUTTING.

9. COMPACTION FOR THE PROJECT SHALL BE AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS.

10. WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. LOCATIONS SHALL BE AS ORDERED BY THE ENGINEER. THIS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.

11. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE CITY ENGINEER AND PROJECT ENGINEER OF ANY PROBLEM IN CONFORMING TO THE APPROVED PLANS OR ANY ELEMENT OF THE PROPOSED IMPROVEMENTS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING BOULDER COUNTY COMMUNICATION AND THE LOUISVILLE FIRE DEPARTMENT OF ALL STREETS CLOSINGS AND OF EXISTING FIRE HYDRANTS TAKEN OUT OF SERVICE AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION.

13. THE CONTRACTOR SHALL NOTIFY ALL PUBLIC UTILITY COMPANIES AND DETERMINE THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO PROCEEDING WITH CONSTRUCTION. ALL WORK PERFORMED IN THE AREA OF PUBLIC UTILITIES SHALL BE PERFORMED ACCORDING TO THE REQUIREMENTS OF THESE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ANY EXISTING UTILITY (INCLUDING DEPTH) WHICH MAY CONFLICT WITH THE PROPOSED CONSTRUCTION, 72 HOURS PRIOR TO COMMENCEMENT OF THE IMPROVEMENTS DESCRIBED IN THE PROJECT. THE CONTRACTOR SHALL PROTECT, AT HIS OWN EXPENSE, ALL EXISTING UTILITIES AND BE RESPONSIBLE FOR THEIR REPAIR IF THEY ARE DAMAGED DURING CONSTRUCTION. ALL KNOWN EXISTING UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ON THE PLANS. THE ACTUAL LOCATION MAY VARY FROM THE PLANS, ESPECIALLY IN THE CASE OF UNDERGROUND UTILITIES. WHENEVER THE CONTRACTOR DISCOVERS A DISCREPANCY IN LOCATIONS, HE SHALL CONTACT THE ENGINEER IMMEDIATELY.

14. ANY CONSTRUCTION DEBRIS OR MUD TRACKED ONTO EXISTING ROADWAYS SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR. THE CONTRACTOR SHALL REPAIR ANY EXCAVATIONS OR PAVEMENT FAILURES CAUSED BY HIS CONSTRUCTION.

15. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGMEN, OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

16. EXCEPT WHERE OTHERWISE PROVIDED FOR IN THESE PLANS AND SPECIFICATIONS, THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, 2011 EDITION, AND THE CITY OF LOUISVILLE DESIGN AND CONSTRUCTION STANDARDS, 1994 EDITION, SHALL APPLY.

17. DRAWINGS ARE NOT INTENDED TO BE SCALED, BUT ARE SUPPLIED FOR GENERAL INFORMATION TO THE CONTRACTOR.

18. NO WORK SHALL BE BACKFILLED UNTIL THE CONSTRUCTION HAS BEEN INSPECTED AND APPROVED FOR BACKFILLING BY THE CITY OF LOUISVILLE.

19. PRIOR TO THE PLACEMENT OF ANY CONCRETE, THE CONTRACTOR SHALL CONFIRM THAT THE GRADE AND CROSS SLOPE OF THE CURB AND GUTTER OR SIDEWALK FORMS PROVIDE PROPER DRAINAGE. GRADE STAKES SHALL BE SET WITH A SURVEYING LEVEL AND TRIPOD. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY SECTION WHICH DOES NOT CONFORM TO THE DESIGN OR THE TYPICAL SECTION.

20. THE CONTRACTOR IS REQUIRED TO PROVIDE AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE STATE OF COLORADO, URBAN DRAINAGE AND FLOOD CONTROL DISTRICT "URBAN STORM DRAINAGE CRITERIA MANUAL VOLUME 3", AND THE M-STANDARD PLANS OF THE COLORADO DEPARTMENT OF TRANSPORTATION. DURING ALL WET OR DRY CONCRETE SAW CUTTING OPERATIONS ALL RESIDUAL SHALL BE VACUUMED. ENGINEER MAY REQUIRE THE CONTRACTOR TO PROVIDE ADDITIONAL EROSION CONTROL MEASURES DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE PLANS DO NOT FUNCTION AS INTENDED. THE CONTRACTOR IS RESPONSIBLE FOR PROHIBITING SILT AND DEBRIS LADEN RUNOFF FROM LEAVING THE SITE, AND FOR KEEPING ALL PUBLIC AREAS FREE OF MUD AND DEBRIS. THE CONTRACTOR IS RESPONSIBLE FOR REESTABLISHING FINAL GRADES AND FOR REMOVING ACCUMULATED SEDIMENTATION FROM ALL AREAS INCLUDING SWALES AND DETENTION/WATER QUALITY AREAS.

BEST MANAGEMENT PRACTICES FOR STORMWATER MANAGEMENT

1. SEDIMENT CONTROL SHALL BE PROVIDED AT STORM SEWER INLETS AND/OR DOWNSTREAM OF STREET OR AS DIRECTED USING CURB SOCKS WITH $1\frac{1}{2}$" CLEAN GRAVEL AND $\frac{1}{4}$" STEEL MESH. IMPLEMENTING THESE MEASURES SHOULD MINIMIZE NUISANCE SILT AND SEDIMENTATION EXITING THE SITE AND PREVENT CLOGGING EXISTING STORM SEWERS AND STREET GUTTERS.

2. APPLICATION OF THESE BMPS FOR STORMWATER MANAGEMENT ARE FOR CONSTRUCTION PERIODS AND ARE CONSIDERED TEMPORARY. POST-CONSTRUCTION STORMWATER MANAGEMENT IS PROVIDED THROUGH STORM COLLECTION SYSTEM.

INSPECTION AND MAINTENANCE:

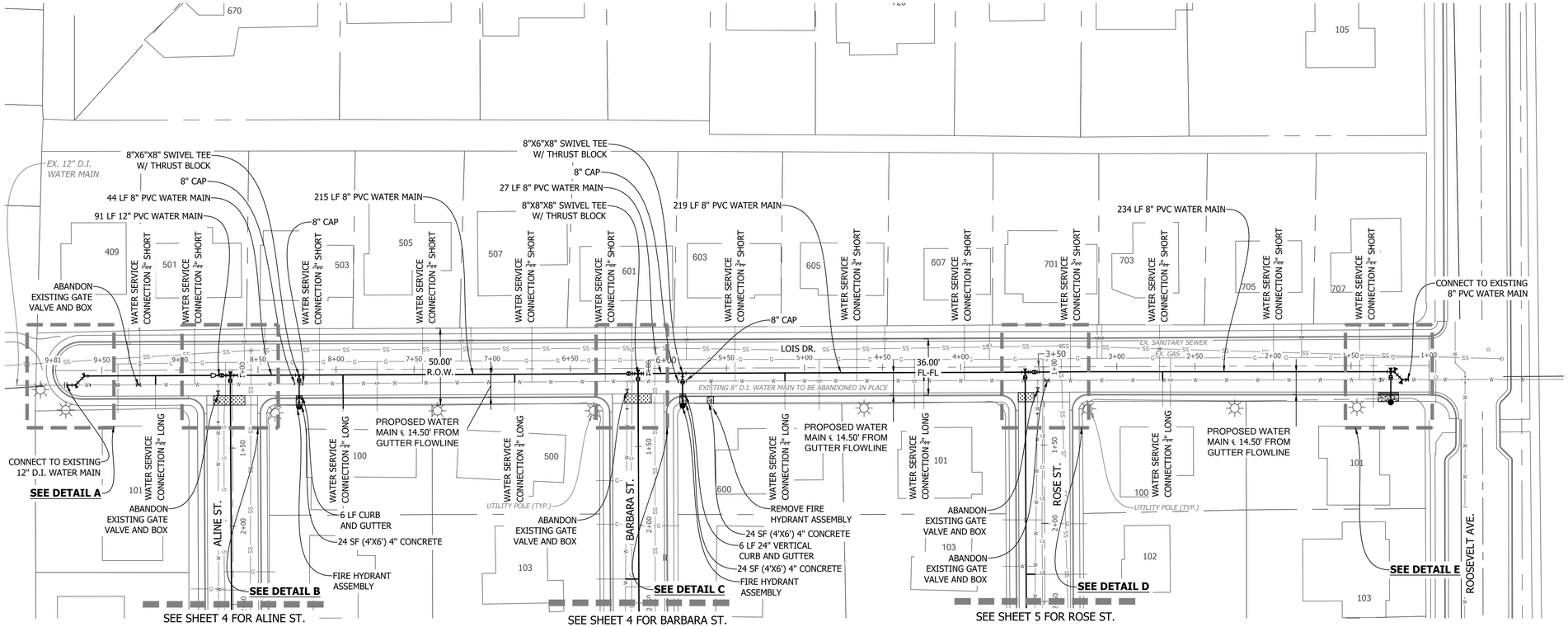
SEDIMENTS DEPOSITED IN THE PUBLIC RIGHTS-OF-WAY WILL BE REMOVED IMMEDIATELY. AT MINIMUM THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL BMPS EVERY 14 DAYS AND AFTER SIGNIFICANT PRECIPITATION EVENTS. INSTALLATIONS AND MODIFICATIONS AS REQUIRED BY THE CITY WILL BE IMPLEMENTED WITHIN 48 HOURS OF NOTIFICATION.

City of Louisville
COLORADO - SINCE 1878

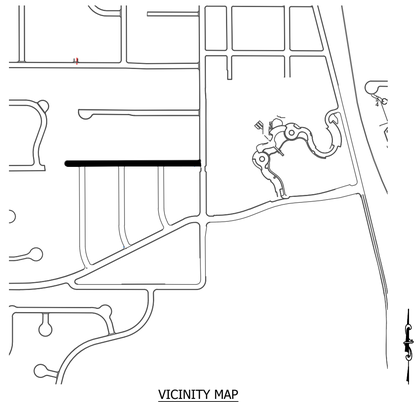
DESIGN BY: MW
DRAWN BY: RH
CHECKED BY: MW
APPROVED BY: TT
ISSUE DATE: 05/25/2025
REVISIONS:

NOTES

2025 WATER MAIN REPLACEMENT PROJECT
AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT



LOIS DR. PLAN
1" = 40'

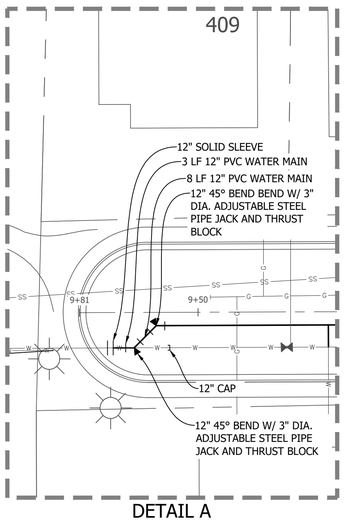


VICINITY MAP
1"=500'

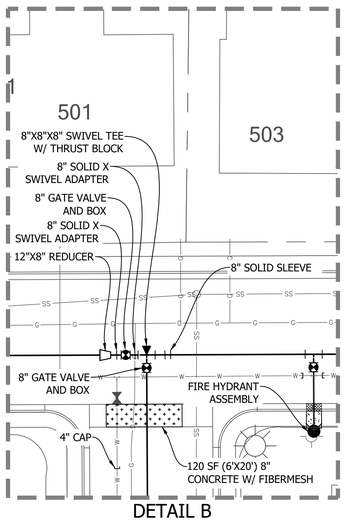
NOTES

1. LOCATIONS OF ALL SERVICES, MAINS, DRY AND WET UTILITIES ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL CONFLICTING UTILITIES PRIOR TO CONSTRUCTION.
2. JOINT DEFLECTIONS TO BE LESS THAN .5% UNLESS DIRECTED BY THE ENGINEER.
3. PIPE DEFLECTION TO OCCUR AT THE JOINT AND NOT BY LONGITUDINAL DEFLECTION BY BENDING THE PVC.
4. OFFSET DIMENSIONS ARE FROM FLOW LINE.

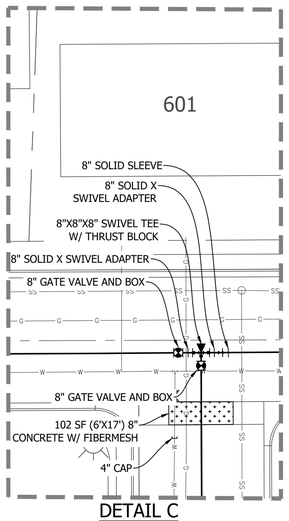
LOIS DR.
679 SY HOT ASPHALT PATCH GRADE SX (6")



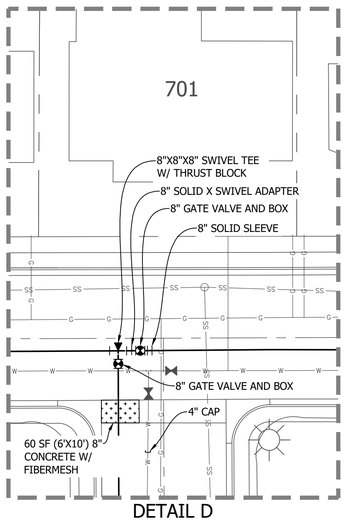
DETAIL A
1" = 20'



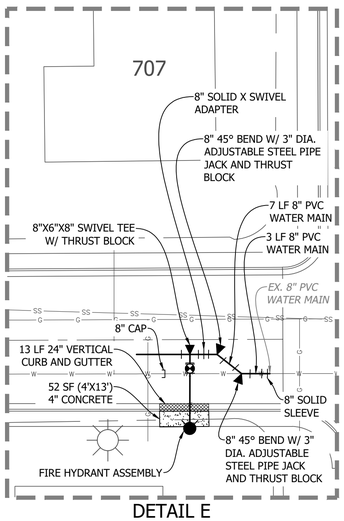
DETAIL B
1" = 20'



DETAIL C
1" = 20'



DETAIL D
1" = 20'



DETAIL E
1" = 20'

1" = 40'
GRAPHIC SCALE
40' 0 20' 40' 80'
IN FEET

City of Louisville
COLORADO - SINCE 1878

DESIGN BY: MW
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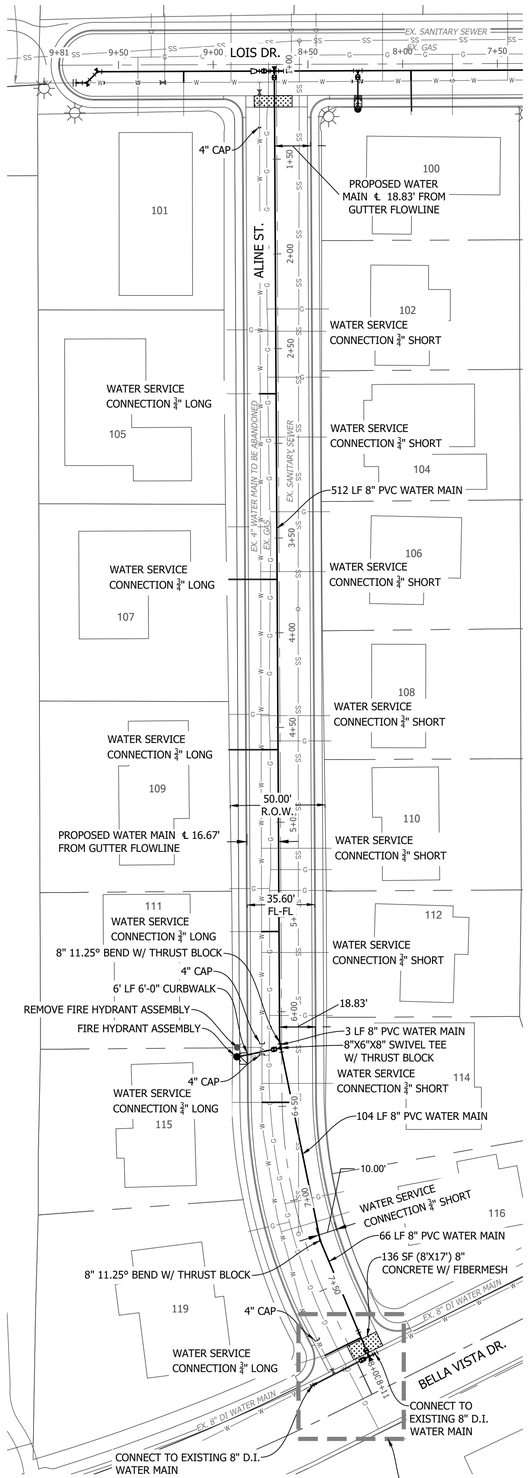
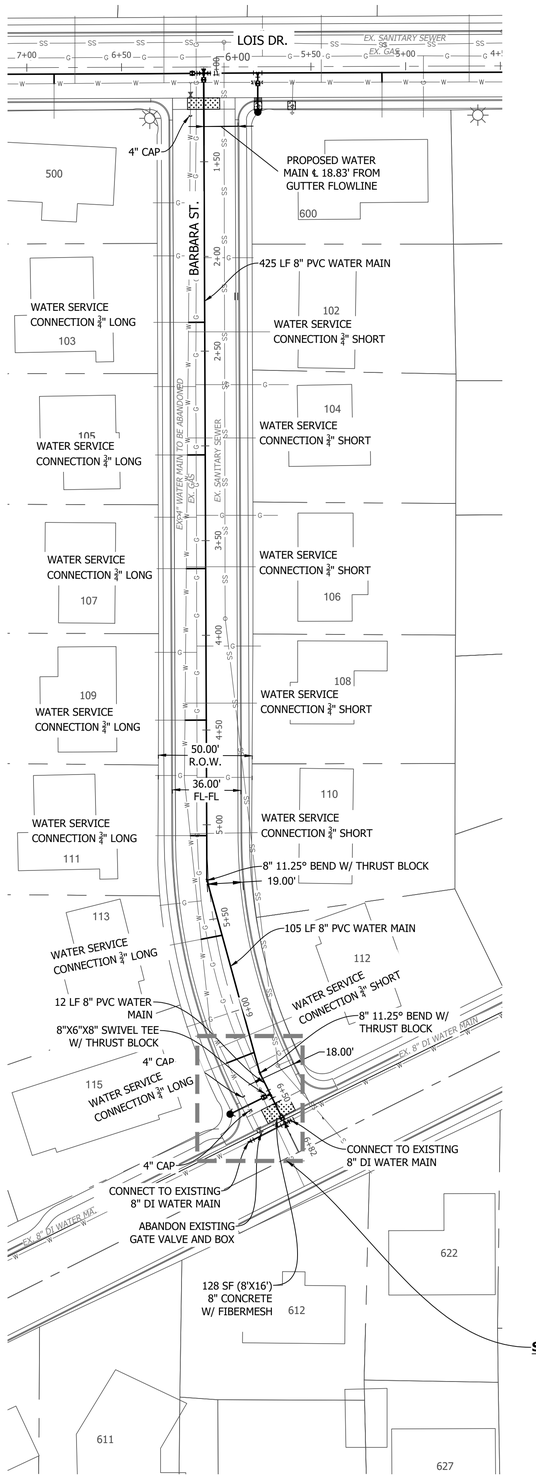
LOIS DR.
2025 WATER MAIN REPLACEMENT PROJECT
AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

SHEET 3 OF 9

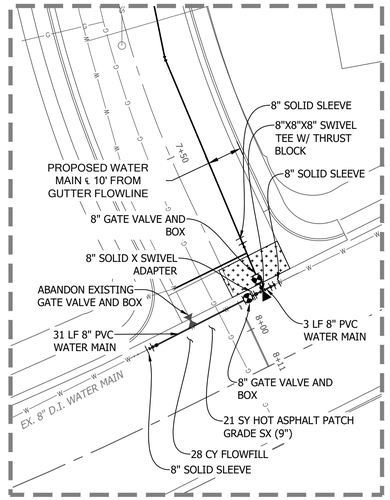
G:\CIPS\CIPS_2025\2025 WATER MAIN REPLACEMENT PROJECT-SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT\DRAWINGS\SHEETS\2025 WATER REPLACEMENT_PLAN.DWG



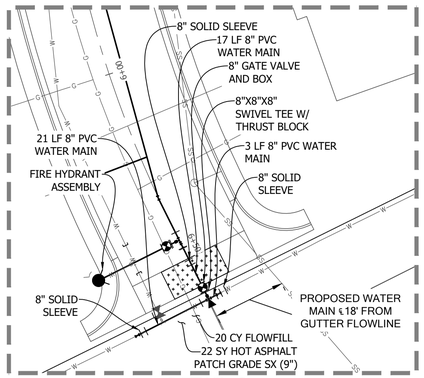
ALINE ST. PLAN
1" = 40'



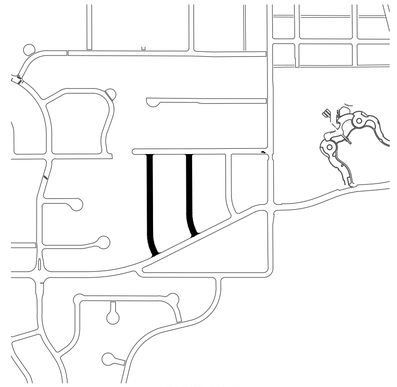
BARBARA ST. PLAN
1" = 40'



DETAIL F
1" = 20'



DETAIL G
1" = 20'



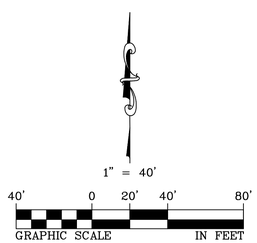
VICINITY MAP
1"=500'

NOTES

1. LOCATIONS OF ALL SERVICES, MAINS, DRY AND WET UTILITIES ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL CONFLICTING UTILITIES PRIOR TO CONSTRUCTION.
2. JOINT DEFLECTIONS TO BE LESS THAN .5% UNLESS DIRECTED BY THE ENGINEER.
3. PIPE DEFLECTION TO OCCUR AT THE JOINT AND NOT BY LONGITUDINAL DEFLECTION BY BENDING THE PVC.
4. OFFSET DIMENSIONS ARE FROM FLOW LINE.

ALINE ST.
520 SY HOT ASPHALT PATCH GRADE SX (6")
21 SY HOT ASPHALT PATCH GRADE SX (9")

BARBARA ST.
446 SY HOT ASPHALT PATCH GRADE SX (6")
22 SY HOT ASPHALT PATCH GRADE SX (9")



City of Louisville
COLORADO - SINCE 1878

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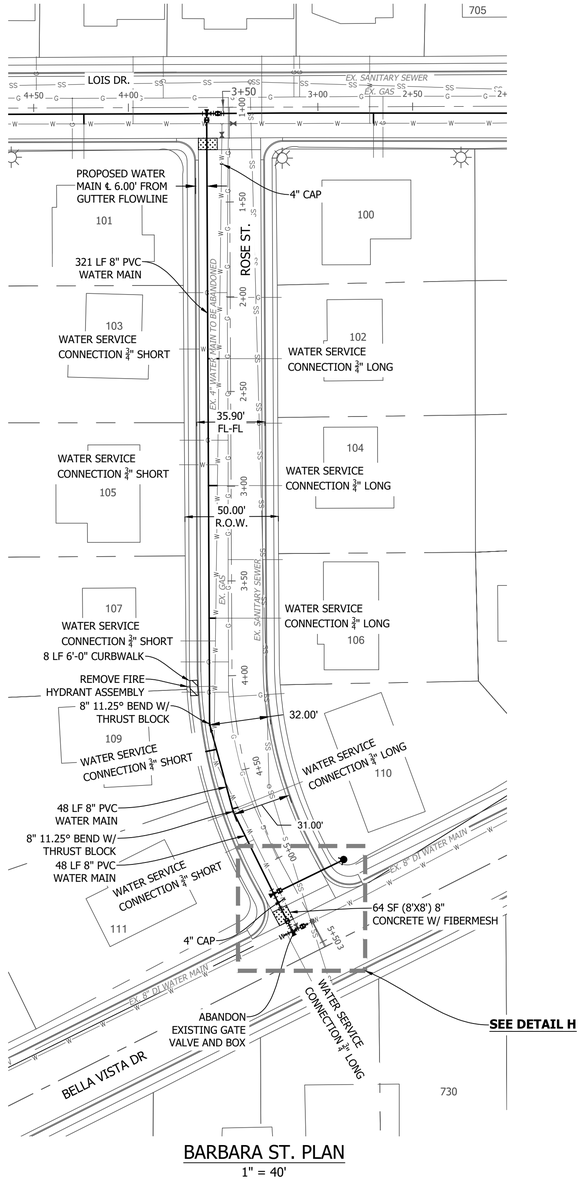
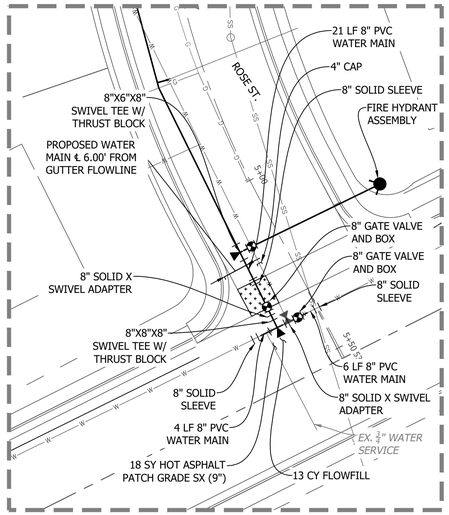
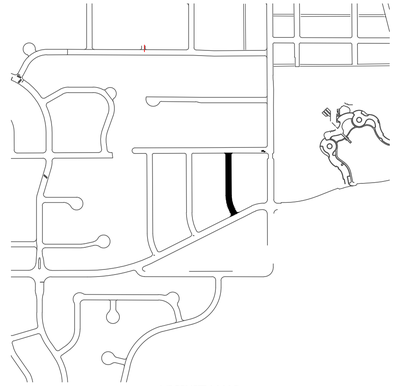
ALINE ST. AND BARBARA ST.
2025 WATER MAIN REPLACEMENT PROJECT
AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT



BARBARA ST. PLAN
1" = 40'



DETAIL H
1" = 20'



VICINITY MAP
1"=500'

NOTES

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2. JOINT DEFLECTIONS TO BE LESS THAN .5% UNLESS DIRECTED BY THE ENGINEER.
3. PIPE DEFLECTION TO OCCUR AT THE JOINT AND NOT BY LONGITUDINAL DEFLECTION BY BENDING THE PVC.
4. OFFSET DIMENSIONS ARE FROM FLOW LINE.

ROSE ST.
355 SY HOT ASPHALT PATCH GRADE SX (6")
18 SY HOT ASPHALT PATCH GRADE SX (9")

1" = 40'
40' 0 20' 40' 80'
GRAPHIC SCALE IN FEET

City of Louisville
COLORADO - SINCE 1878

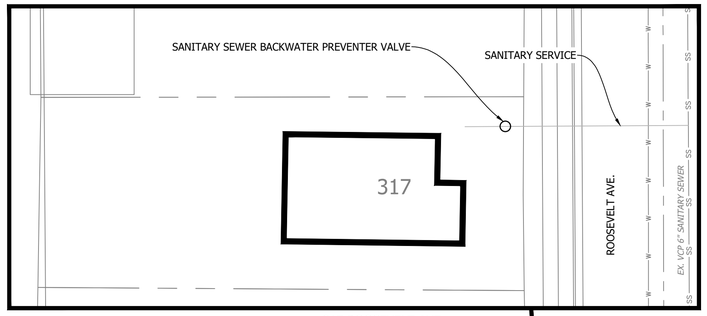
DESIGN BY: MW
DRAWN BY: RH
CHECKED BY: MW
APPROVED BY: TT
ISSUE DATE: 05/25/2025
REVISIONS:

ROSE ST.
2025 WATER MAIN REPLACEMENT PROJECT
AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

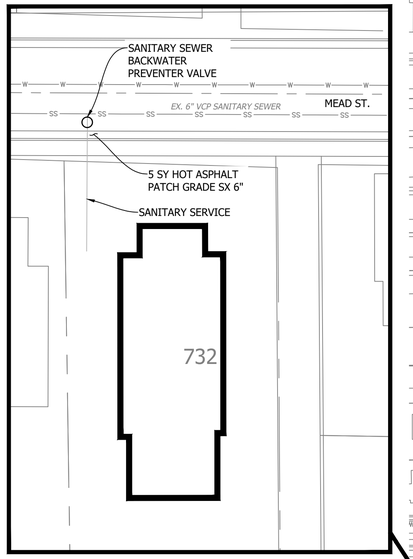
SHEET 5 OF 9

G:\CIPS\CIPS_2025\2025 WATER MAIN REPLACEMENT PROJECT-SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT\DRAWINGS\SHEETS\2025 WATER REPLACEMENT_PLAN.DWG

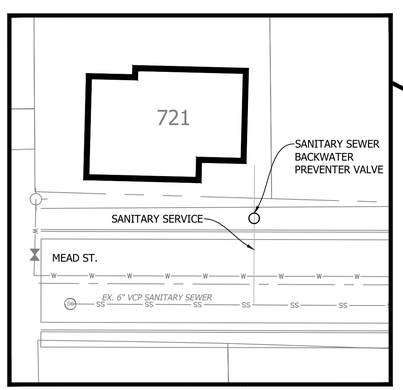
SANITARY SEWER BACKWATER PREVENTER VALVE LOCATIONS



317 ROOSEVELT AVE.
SCALE: 1'=20"



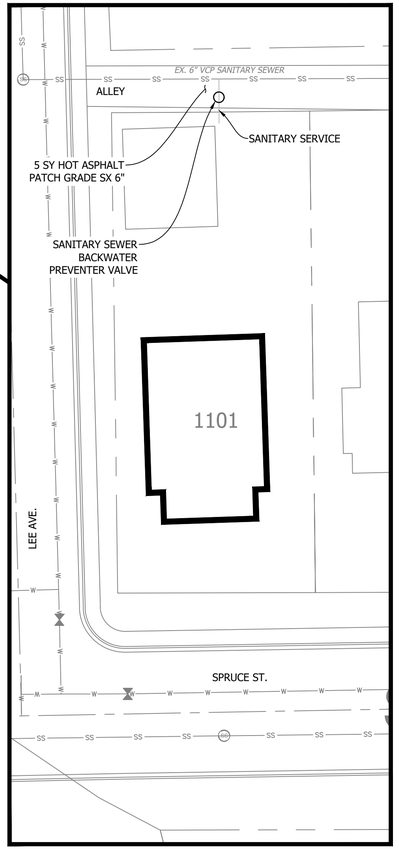
732 MEAD ST.
SCALE: 1'=20"



721 MEAD ST.
SCALE: 1'=20"

NOTES:

1. SEE SHEET 9 FOR BACKFLOW PREVENTER VALVE DETAILS.
2. BACKFLOW PREVENTER TO BE INSTALLED AT LOCATION DETERMINED BY THE ENGINEER.
3. ENGINEER SHALL FIELD VERIFY LOCATION OF SANITARY SEWER SERVICE.



1101 SPRUCE ST.
SCALE: 1'=20"

N

LOCATION MAP
1":100'

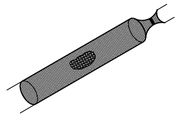
City of Louisville
COLORADO - SINCE 1878

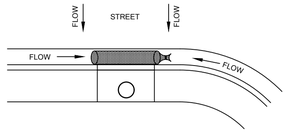
DESIGN BY: CF
DRAWN BY: RH
CHECKED BY: RH
APPROVED BY: RH
ISSUE DATE: 05/25/2025
REVISIONS:

SANITARY SEWER BACKWATER PREVENTER VALVE LOCATIONS
2025 WATER MAIN REPLACEMENT PROJECT
AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

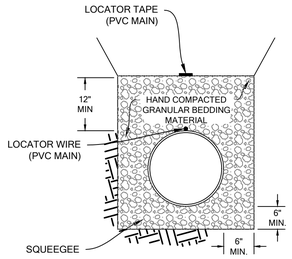
SHEET 6 OF 9

G:\CIPS\CIPS_2025\2025 WATER MAIN REPLACEMENT PROJECT-SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT\DRAWINGS\SHEETS\2025 WATER REPLACEMENT_SANITARY BACKFLOW PREVENTERS.DWG

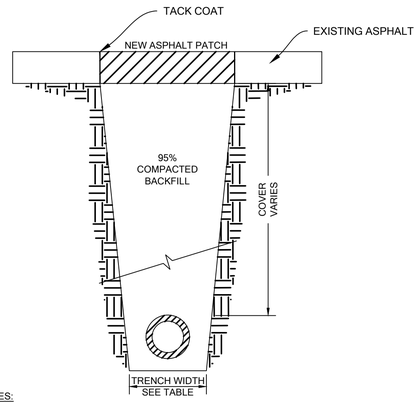




CURB SOCK



TYPICAL WATER GRANULAR BEDDING SECTION

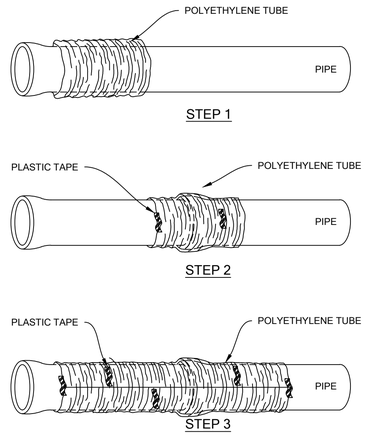


NOTES:

1. TRENCH TO BE SLOPED OR BRACED AND SHORED AS REQUIRED.
2. ASPHALT PATCH IN LIFTS AND COMPACT TO 95% MIN.

PIPE DIAMETER	6"	8"	12"
MINIMUM WIDTH	1' 10"	2' 0"	2' 4"
MAXIMUM WIDTH	2' 6"	2' 8"	3' 0"

TYPICAL TRENCH PATCH SECTION



STEP 1 - PLACE TUBE OF POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING IT INTO TRENCH.

STEP 2 - PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.

STEP 3 - OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF THE PIPE AND TAPED IN PLACE.

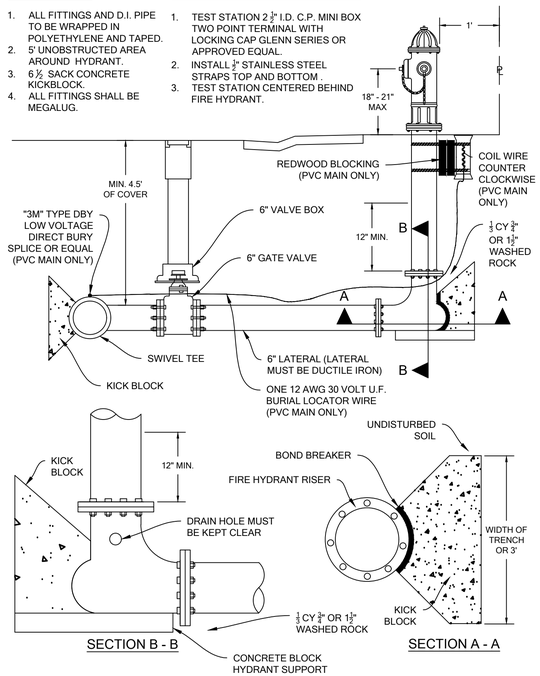
FIELD INSTALLATION - POLYETHYLENE WRAP

HYDRANT NOTES:

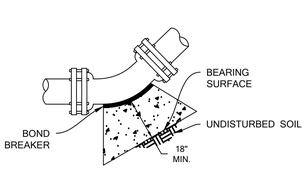
1. ALL FITTINGS AND D.I. PIPE TO BE WRAPPED IN POLYETHYLENE AND TAPED.
2. 5' UNOBSTRUCTED AREA AROUND HYDRANT.
3. 6 ½ SACK CONCRETE KICKBLOCK.
4. ALL FITTINGS SHALL BE MEGALUG.

TEST STATION NOTES (PVC MAIN ONLY):

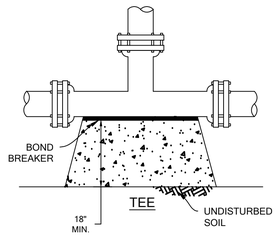
1. TEST STATION 2 ½" I.D. C.P. MINI BOX TWO POINT TERMINAL WITH LOCKING CAP GLENN SERIES OR APPROVED EQUAL.
2. INSTALL ½" STAINLESS STEEL STRAPS TOP AND BOTTOM .
3. TEST STATION CENTERED BEHIND FIRE HYDRANT.

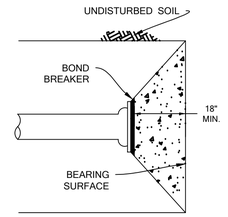


FIRE HYDRANT INSTALLATION

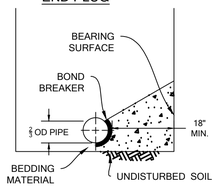


45° AND 90° BENDS





END PLUG

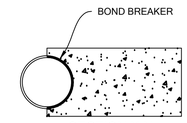


TYPICAL CROSS SECTION

NOTES:

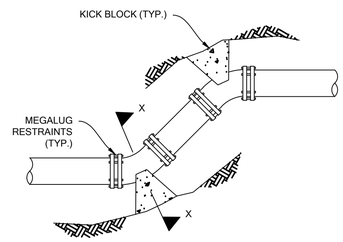
1. ALL FITTINGS SHALL BE MEGALUG.
2. BEARING SURFACES SHOWN IN CHART ARE MINIMUM.
3. 6.5 SACK CONCRETE SHALL BE REQUIRED.
4. ALL DUCTILE & CAST IRON SHALL BE WRAPPED IN POLYETHYLENE.

BEARING DIMENSIONS FOR PIPE 250 P.S.I. SURGE 3000 LB/SQ FT. SOIL PRESSURE = 3K					
OUTSIDE DIAMETER	CAP, TEE, PLUG & DEAD END	BENDS			
		90°	45°	22 1/2°	11 1/4°
4" 3K	1.5	1.5	1.0	1.0	1.0
6" 3K	2.5	3.5	2.0	1.0	1.0
8" 3K	4.5	6.0	3.5	2.0	1.0
12" 3K	9.5	13.5	7.5	4.0	2.0
16" 3K	7.0	24.0	13.0	7.0	3.5
24" 3K	38.0	53.5	29.0	15.0	7.5



SECTION X-X

NOTES:
1. ALL FITTINGS SHALL BE RESTRAINED WITH MEGALUGS.
2. ALL METAL SHALL BE WRAPPED IN POLYETHYLENE.



THREE PIECE HORIZONTAL OFFSET

City of Louisville
COLORADO - SINCE 1878

DESIGN BY: MW
DRAWN BY: RH
CHECKED BY: MW
APPROVED BY: TT
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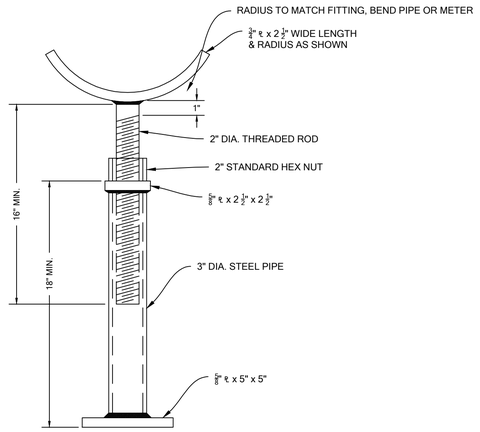
REVISIONS:

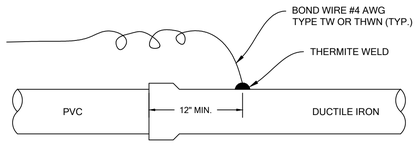
DETAILS

2025 WATER MAIN REPLACEMENT PROJECT
AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

SHEET
7
OF
9



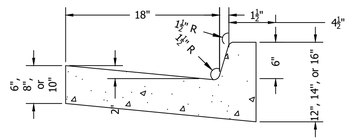
3" DIA. ADJUSTABLE STEEL COLUMN JACK



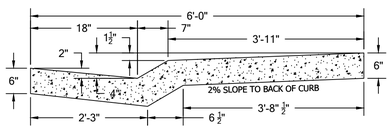
NOTE: BOND WIRES SHALL BE ATTACHED TO THE PIPE, VALVE OR FITTING TOP CENTERLINE.

PVC/DI JOINT BOND INSTALLATION

(WHERE PVC WATER MAIN TERMINATES AT DUCTILE IRON WATER MAIN)



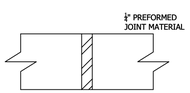
24" VERTICAL CURB & GUTTER



6'- 0" X 6" CURBWALK

ATTACHED OR DETACHED WALK

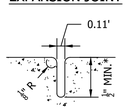
- 4' OR 5' WIDE WALKS SHALL BE AS NOTED ON PLAN (4" OR 6").
- 8' WIDE WALKS SHALL BE 6" THICK
- ALL WALKS AT DRIVEWAYS SHALL BE 6"



NOTES:

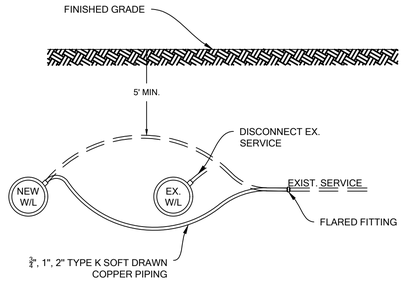
A. PROVIDE SEALENT AT 8' BIKE PATH EXPANSION JOINT LOCATIONS.
B. PROVIDE SAW CUT JOINT AT 8' BIKE PATH CONTRACTION JOINT LOCATIONS.
C. PROVIDE SAW CUT JOINT AT 6' WALK CONTRACTION JOINT LOCATIONS

EXPANSION JOINT



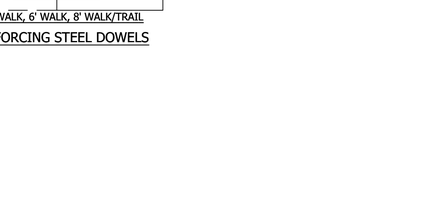
* 1/4"D. IF TEMPLATES ARE NOT USED

CONTRACTION OR WEAKENED PLANE JOINT

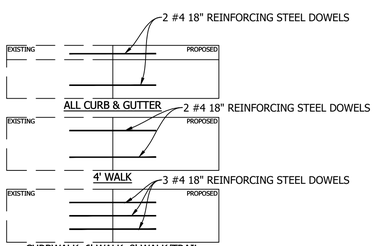


NOTE: IF THE EXISTING WATERLINE IS AT SUCH A DEPTH THAT THE NEW LONG SERVICE CAN BE INSTALLED OVER THE EXISTING WATERLINE AND STILL MAINTAIN THE 4'6" MINIMUM GROUND COVER,THE SERVICE MAY BE CONNECTED AS SHOWN IN THE DETAIL. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO CONSTRUCTING THE SERVICE CONNECTION IN THIS MANNER.

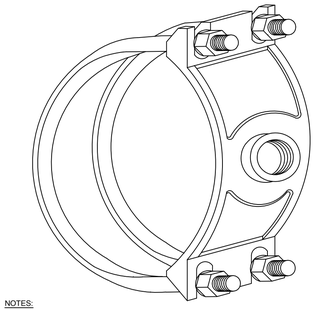
WATER SERVICE CONNECTION (LONG)



WATER SERVICE CONNECTION (SHORT)



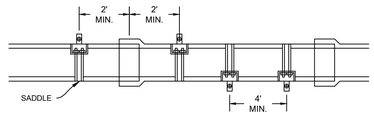
REINFORCING STEEL DOWELS



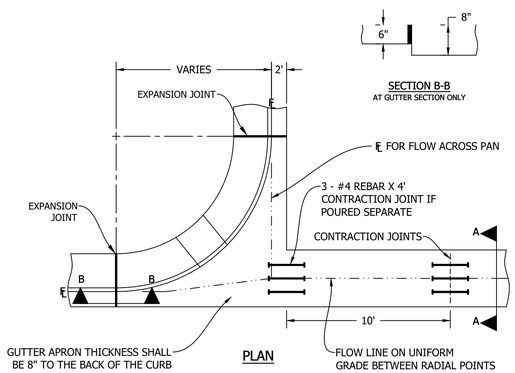
NOTES:

1. ONLY SOLID BRASS DOUBLE STRAP TAPPING SADDLES WITH AN "O" RING SEAL ARE APPROVED FOR PVC WATER MAINS. NO DIRECT TAPS SHALL BE MADE.
2. DOUBLE BRASS TAPPING SADDLES SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
3. CONTRACTOR SHALL TAP ALL PVC WATER MAIN CONNECTIONS

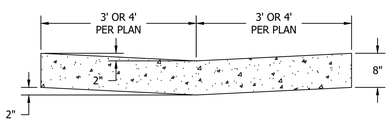
BRASS TAPPING SADDLE



PVC WATER TAP SPACING



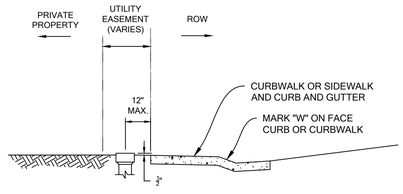
PLAN



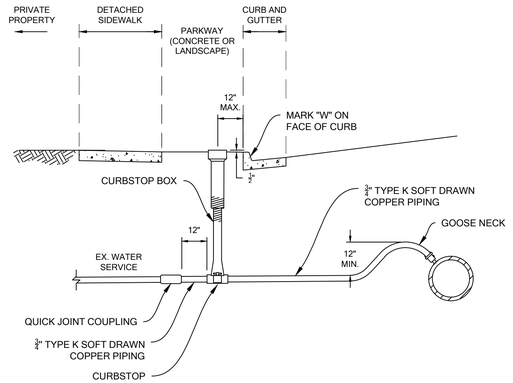
SECTION A-A

NOTES:

1. 6 ½ SACK CONCRETE MIX WITH FIBERMESH REQUIRED.
2. CONTRACTION JOINTS SHALL BE PLACED EVERY 10' MAXIMUM IN CROSSPAN.



PLACEMENT FOR CURBWALK OR ATTACHED SIDEWALK



NOTES:

1. CURB STOP BOX SHALL BE ADJUSTABLE BUFFALO TYPE AND BE INSTALLED VERTICALLY PLUMB AND CENTERED ABOVE CURB STOP VALVE.
2. PARKWAY SHALL BE RESTORED TO PREEXISTING CONDITIONS.

GALVANIZED WATER SERVICE REPLACEMENT

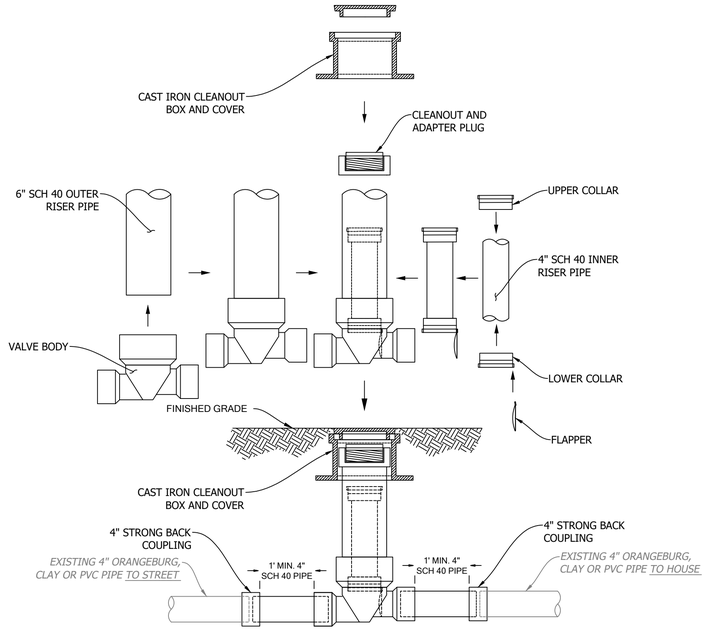
City of Louisville
COLORADO - SINCE 1878

DESIGN BY: MW
DRAWN BY: RH
CHECKED BY: MW
APPROVED BY: TT
ISSUE DATE: 05/25/2025
REVISIONS:

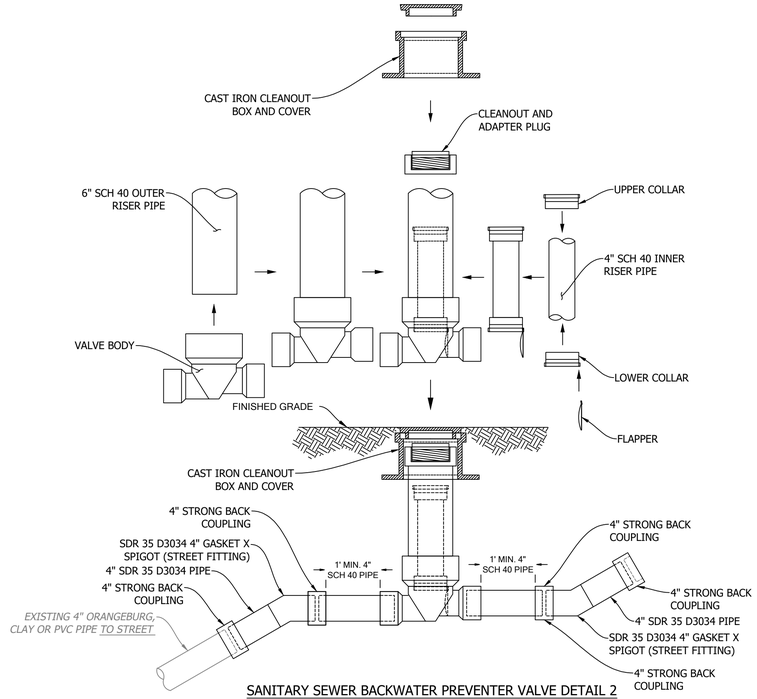
DETAILS

2025 WATER MAIN REPLACEMENT PROJECT
AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

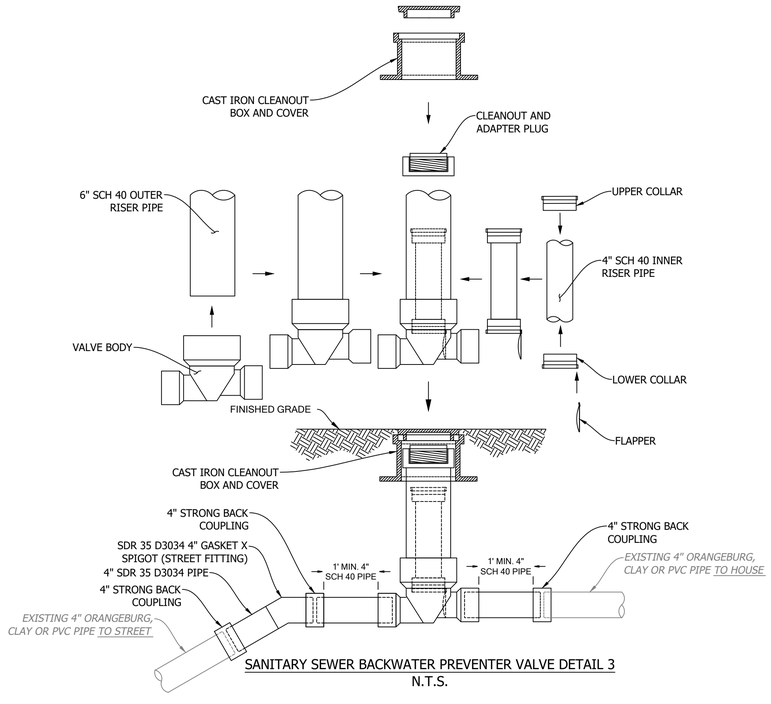
SHEET 8 OF 9



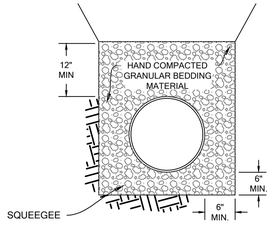
SANITARY SEWER BACKWATER PREVENTER VALVE DETAIL 1
N.T.S.



SANITARY SEWER BACKWATER PREVENTER VALVE DETAIL 2
N.T.S.



SANITARY SEWER BACKWATER PREVENTER VALVE DETAIL 3
N.T.S.



TYPICAL SANITARY SEWER GRANULAR BEDDING SECTION

City of Louisville
COLORADO - SINCE 1878

DESIGN BY:	MW
DRAWN BY:	RH
CHECKED BY:	MW
APPROVED BY:	TT
ISSUE DATE:	05/25/2025
REVISIONS:	

DETAILS

2025 WATER MAIN REPLACEMENT PROJECT
AND SANITARY SEWER BACKWATER PREVENTER VALVE PROJECT

SHEET 9 OF 9

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