Purchasing Division

Invitation for Bid

IFB-4492-18-DH
2018 Sewer Line Replacement Project – Phase A

Responses Due:

Friday, April 13, 2018 prior to 3:30 pm MDT

Accepting Electronic Responses Only

Responses Only Submitted Through the Rocky Mountain E-Purchasing System (RMEPS)

https://www.rockymountainbidsystem.com/default.asp

(Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor MUST contact RMEPS to resolve issue prior to the response deadline. 800-835-4603)

Purchasing Representative:
Duane Hoff, Senior Buyer
duaneh@gjcity.org
970-244-1545

This document has been developed specifically to solicit competitive responses for this solicitation, and may not be the same as previous City of Grand Junction solicitations. All vendors are urged to thoroughly review this solicitation prior to responding. Submittal by **FAX, EMAIL or HARD COPY IS NOT ACCEPTABLE** for this solicitation.

Invitation for Bids

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1. Instructions to Bidders

1.1. **Purpose:** The City of Grand Junction is soliciting competitive bids from qualified and interested companies for all labor, equipment, and materials required for the **2018 Sewer Line Replacement Project – Phase A**. All dimensions and scope of work should be verified by Contractors prior to submission of bids.

IFB Questions:
Duane Hoff, Senior Buyer
duaneh@gjcity.org

1.2. **Mandatory Pre-Bid Meeting:** **Prospective bidders are required to attend a mandatory pre-bid meeting on Wednesday, April 4, 2018 at 11:00 am**. Meeting location shall be in the City Council Auditorium at City Hall, located at 250 North 5th Street. The purpose of this visit will be to inspect and to clarify the contents of this Invitation for Bids (IFB).

1.3. **The Owner:** The Owner is the City of Grand Junction, Colorado and is referred to throughout this Solicitation. The term Owner means the Owner or his authorized representative.

1.4. **Submission:** ***Each bid shall be submitted in electronic format only, and only through the Rocky Mountain E-Purchasing website (https://www.rockymountainbidsystem.com/default.asp).*** *This site offers both "free" and "paying" registration options that allow for full access of the Owner's documents and for electronic submission of proposals. (Note: "free" registration may take up to 24 hours to process. Please Plan accordingly.)* Please view our "**Electronic Vendor Registration Guide"** at http://www.gjcity.org/business-and-economic-development/bids/ for details. (Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor **MUST** contact RMEPS to resolve issue prior to the response deadline. **800-835-4603**)

1.5. **Modification and Withdrawal of Bids Before Opening:** Bids may be modified or withdrawn by an appropriate document stating such, duly executed and submitted to the place where Bids are to be submitted at any time prior to Bid Opening.

1.6. **Printed Form for Price Bid:** All Price Bids must be made upon the Price Bid Schedule attached, and should give the amounts both in words and in figures, and must be signed and acknowledged by the bidder.

The Offeror shall specify a unit price in figures for each pay item for which a quantity is given and shall provide the products (in numbers) of the respective unit prices and quantities in the Extended Amount column. The total Bid price shall be equal to the sum of all extended amount prices. When an item in the Price Bid Schedule provides a choice to be made by the Offeror, Offeror's choice shall be indicated in accordance with the specifications for that particular item and thereafter no further choice shall be permitted.

Where the unit of a pay item is lump sum, the lump sum amount shall be shown in the "extended amount" column and included in the summation of the total Bid.

All blank spaces in the Price Bid Schedule must be properly filled out.

Bids by corporations must be executed in the corporate name by the president or vice president or other corporate office accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown below the signature.

Bids by partnerships must be executed in the partnership name and signed by a partner whose title must appear under the signature and the official address of the partnership must be shown below the signature.

All names must be typed or printed below the signature.

The Offeror's Bid shall contain an acknowledgement of receipt of all Addenda, the numbers of which shall be filled in on the Contractor's Bid Form.

The contact information to which communications regarding the Bid are to be directed must be shown.

1.7. Exclusions: No oral, telephonic, emailed, or facsimile bid will be considered.

1.8. Contract Documents: The complete IFB and bidder's response compose the Contract Documents. Copies of bid documents can be obtained from the City Purchasing website, http://www.gjcity.org/business-and-economic-development/bids/ .

1.9. Additional Documents: The July 2010 edition of the "City Standard Contract Documents for Capital Improvements Construction", Plans, Specifications and other Bid Documents are available for review or download on the Public Works & Planning/Engineering page at www.gjcity.org. Electronic copies may be obtained on a CD format at the Department of Public Works and Planning at City Hall.

1.10. Definitions and Terms: See Article I, Section 3 of the General Contract Conditions in the *Standard Contract Documents for Capital Improvements Construction*.

1.11. Examination of Specifications: Bidders shall thoroughly examine and be familiar with the project Statement of Work. The failure or omission of any Offeror to receive or examine any form, addendum, or other document shall in no way relieve any Offeror from any obligation with respect to his bid. The submission of a bid shall be taken as evidence of compliance with this section. Prior to submitting a bid, each Offeror shall, at a minimum:

a. Examine the *Contract Documents* thoroughly;

b. Visit the site to familiarize themselves with local conditions that may in any manner affect cost, progress, or performance of the Work;

c. Become familiar with federal, state, and local laws, ordinances, rules, and regulations that may in any manner affect cost, progress or performance of the Work;

d. Study and carefully correlate Bidder's observations with the *Contract Documents*, and;

e. Notify the Engineer of all conflicts, errors, ambiguities or discrepancies in or among the *Contract Documents*

On request, the Owner will provide each Offeror access to the site to conduct such investigations and tests as each Bidder deems necessary for submission of a Bid. It shall be the Offeror's responsibility to make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (including without limitation, surface, subsurface and underground utilities) at or contiguous to the site or otherwise which may affect cost, progress or performance of the work and which the Offeror deems necessary to determine its Bid for performing the work in accordance with the time, price and other terms and conditions of the Contract Documents. Location of any excavation or boring made by Offeror shall be subject to prior approval of Owner and applicable agencies. Offeror shall fill all holes, restore all pavements to match the existing structural section and shall clean up and restore the site to its former condition upon completion of such exploration. The Owner reserves the right to require the Offeror to execute an access agreement with the Owner prior to accessing the site.

The lands upon which the Work is to be performed, rights of way, and access thereto, and other lands designated for use by Contractor in performing the Work, are identified on the Drawings.

Information and data reflected in the *Contract Documents* with respect to underground utilities at or contiguous to the site are based upon information and data furnished to the Owner and the Engineer by the owners of such underground utilities or others, and the Owner does not assume responsibility for the accuracy or completeness thereof, unless it is expressly provided otherwise in the *Contract Documents*.

By submission of a Bid, the Offeror shall be conclusively presumed to represent that the Offeror has complied with every requirement of these Instructions to Bidders, that the *Contract Documents* are not ambiguous and are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

1.12. Questions Regarding Statement of Work: Any information relative to interpretation of Scope of Work or specifications shall be requested of the Purchasing Representative, in writing, in ample time prior to the response time.

1.13. Addenda & Interpretations: If it becomes necessary to revise any part of this solicitation, a written addendum will be posted electronically on the City's website at http://www.gjcity.org/business-and-economic-development/bids/ . The Owner is not bound by any oral representations, clarifications, or changes made in the written

specifications by Owner, unless such clarification or change is provided in written addendum form from the City Purchasing Representative.

1.14. Taxes: The Owner is exempt from State retail and Federal tax. The bid price must be net, exclusive of taxes.

1.15. Sales and Use Taxes: The Contractor and all Subcontractors are required to obtain exemption certificates from the Colorado Department of Revenue for sales and use taxes in accordance with the provisions of the General Contract Conditions. Bids shall reflect this method of accounting for sales and use taxes on materials, fixtures and equipment.

1.16. Offers Binding 60 Days: Unless additional time is required by the Owner, or otherwise specified, all formal offers submitted shall be binding for sixty (60) calendar days following opening date, unless the Bidder, upon request of the Purchasing Representative, agrees to an extension.

1.17. Collusion Clause: Each bidder by submitting a bid certifies that it is not party to any collusive action or any action that may be in violation of the Sherman Antitrust Act. Any and all bids shall be rejected if there is evidence or reason for believing that collusion exists among bidders. The Owner may, or may not, accept future bids for the same services or commodities from participants in such collusion.

1.18. Disqualification of Bidders: A Bid will not be accepted from, nor shall a Contract be awarded to, any person, firm, or corporation that is in arrears to the Owner, upon debt or contract, or that has defaulted, as surety or otherwise, upon any obligation to the Owner, or that is deemed irresponsible or unreliable.

Bidders may be required to submit satisfactory evidence that they are responsible, have a practical knowledge of the project bid upon and that they have the necessary financial and other resources to complete the proposed Work.

Either of the following reasons, without limitation, shall be considered sufficient to disqualify a Bidder and Bid:

a. More than one Bid is submitted for the same Work from an individual, firm, or corporation under the same or different name; and

b. Evidence of collusion among Bidders. Any participant in such collusion shall not receive recognition as a Bidder for any future work of the Owner until such participant has been reinstated as a qualified bidder.

1.19. Public Disclosure Record: If the bidder has knowledge of their employee(s) or sub-contractors having an immediate family relationship with a City/County employee or elected official, the bidder must provide the Purchasing Representative with the name(s) of these individuals. These individuals are required to file an acceptable “Public Disclosure Record”, a statement of financial interest, before conducting business with the City/County.

2. General Contract Conditions for Construction Projects

2.1. **The Contract:** This Invitation for Bid, submitted documents, and any negotiations, when properly accepted by the City/County, shall constitute a contract equally binding between the City/County and Contractor. The contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral. The contract may be amended or modified with Change Orders, Field Orders, or Addendums.

2.2. **The Work:** The term Work includes all labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in such construction.

2.3. **Execution, Correlation, Intent, and Interpretations:** The Contract Documents shall be signed in not less than triplicate by the Owner (City/County) and Contractor. City/County will provide the contract. By executing the contract, the Contractor represents that he/she has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents. The Contract Documents are complementary, and what is required by any one, shall be as binding as if required by all. The intention of the documents is to include all labor, materials, equipment and other items necessary for the proper execution and completion of the scope of work as defined in the technical specifications and drawings contained herein. All drawings, specifications and copies furnished by the City/County are, and shall remain, City/County property. They are not to be used on any other project, and with the exception of one contract set for each party to the contract, are to be returned to the owner on request at the completion of the work.

2.4. **The Owner:** The Owner is the City of Grand Junction, Colorado and is referred to throughout the Contract Documents. The term Owner means the Owner or his authorized representative. The Owner shall, at all times, have access to the work wherever it is in preparation and progress. The Contractor shall provide facilities for such access. The Owner will make periodic visits to the site to familiarize himself generally with the progress and quality of work and to determine, in general, if the work is proceeding in accordance with the contract documents. Based on such observations and the Contractor's Application for Payment, the Owner will determine the amounts owing to the Contractor and will issue Certificates for Payment in such amounts, as provided in the contract. The Owner will have authority to reject work which does not conform to the Contract documents. Whenever, in his reasonable opinion, he considers it necessary or advisable to insure the proper implementation of the intent of the Contract Documents, he will have authority to require the Contractor to stop the work or any portion, or to require special inspection or testing of the work, whether or not such work can be then be fabricated, installed, or completed. The Owner will not be responsible for the acts or omissions of the Contractor, and sub-Contractor, or any of their agents or employees, or any other persons performing any of the work.

2.5. **Contractor:** The Contractor is the person or organization identified as such in the Agreement and is referred to throughout the Contract Documents. The term Contractor

means the Contractor or his authorized representative. The Contractor shall carefully study and compare the General Contract Conditions of the Contract, Specification and Drawings, Scope of Work, Addenda and Modifications and shall at once report to the Owner any error, inconsistency or omission he may discover. Contractor shall not be liable to the Owner for any damage resulting from such errors, inconsistencies or omissions. The Contractor shall not commence work without clarifying Drawings, Specifications, or Interpretations.

2.6. Sub-Contractors: A sub-contractor is a person or organization who has a direct contract with the Contractor to perform any of the work at the site. The term sub-contractor is referred to throughout the contract documents and means a sub-contractor or his authorized representative.

2.7. Award of Sub-Contractors & Other Contracts for Portions of the Work: Contractor shall submit with their bid response to the Owner, in writing for acceptance, a list of the names of the sub-contractors or other persons or organizations proposed for such portions of the work as may be designated in the proposal requirements, or, if none is so designated, the names of the sub-contractors proposed for the principal portions of the work. Prior to the award of the contract, the Owner shall notify the successful Contractor in writing if, after due investigation, has reasonable objection to any person or organization on such list. If, prior to the award of the contract, the Owner has a reasonable and substantial objection to any person or organization on such list, and refuses in writing to accept such person or organization, the successful Contractor may, prior to the award, withdraw their proposal without forfeiture of proposal security. If the successful Contractor submits an acceptable substitute with an increase in the proposed price to cover the difference in cost occasioned by the substitution, the Owner may, at their discretion, accept the increased proposal or may disqualify the Contractor. If, after the award, the Owner refuses to accept any person or organization on such list, the Contractor shall submit an acceptable substitute and the contract sum shall be increased or decreased by the difference in cost occasioned by such substitution and an appropriate Change Order shall be issued. However, no increase in the contract sum shall be allowed for any such substitution unless the Contractor has acted promptly and responsively in submitting a name with respect thereto prior to the award.

2.8. Quantities of Work and Unit Price: Materials or quantities stated as unit price items in the Bid are supplied only to give an indication of the general scope of the Work, and are as such, estimates only. The Owner does not expressly or by implication agree that the actual amount of Work or material will correspond therewith, and reserves the right after award to increase or decrease the quantity of any unit item of the Work without a change in the unit price except as set forth in Article VIII, Section 70 of the *General Contract Conditions*. The City also reserves the right to make changes in the Work (including the right to delete any bid item in its entirety or add additional bid items) as set forth in Article VIII, Sections 69 through 71 of the *General Contract Conditions*.

2.9. Substitutions: The materials, products and equipment described in the *Solicitation Documents* shall be regarded as establishing a standard of required performance, function, dimension, appearance, or quality to be met by any proposed substitution. No substitution will be considered prior to receipt of Bids unless the Offeror submits a written request for approval to the City Purchasing Division at least ten (10) days prior to the

date for receipt of Bids. Such requests for approval shall include the name of the material or equipment for which substitution is sought and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for evaluation, including samples if requested. The Offeror shall set forth changes in other materials, equipment, or other portions of the Work including changes of the work of other contracts, which incorporation of the proposed substitution would require to be included. The Owner's decision of approval or disapproval of a proposed substitution shall be final. If the Owner approves a proposed substitution before receipt of Bids, such approval will be set forth in an Addendum. Offerors shall not rely upon approvals made in any other manner.

2.10. Supervision and Construction Procedures: The Contractor shall supervise and direct the work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the work under the contract.

2.11. Warranty: The Contractor warrants to the Owner that all materials and equipment furnished under this contract will be new unless otherwise specified, and that all work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All work not so conforming to these standards may be considered defective. If required by Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. If within ten (10) days after written notice to the Contractor requesting such repairs or replacement, the Contractor should neglect to make or undertake with due diligence to the same, the City may make such repairs or replacements. All indirect and direct costs of such correction or removal or replacement shall be at the Contractor's expense. The Contractor will also bear the expenses of making good all work of others destroyed or damaged by the correction, removal or replacement of his defective work.

2.12. Permits, Fees, & Notices: The Contractor shall secure and pay for all permits, governmental fees and licenses necessary for the proper execution and completion of the work. The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the work. If the Contractor observes that any of the Contract Documents are at variance in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be adjusted by approximate modification. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility and shall bear all costs attributable.

2.13. Responsibility for Those Performing the Work: The Contractor shall be responsible to the Owner for the acts and omissions of all his employees and all sub-contractors, their agents and employees, and all other persons performing any of the work under a contract with the Contractor.

2.14. Use of the Site: The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents, and shall not unreasonably encumber the site with any materials or equipment.

2.15. Cleanup: The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of work, the Contractor shall remove all his waste materials and rubbish from and about the project, as well as all his tools, construction equipment, machinery and surplus materials.

2.16. Insurance: The Contractor shall secure and maintain such insurance policies as will provide the coverage and contain other provisions specified in the General Contract Conditions, or as modified in the Special Contract Conditions.

The Contractor shall file a copy of the policies or Certificates of Insurance acceptable to the City with the Engineer within ten (10) Calendar Days after issuance of the Notice of Award. These Certificates of Insurance shall contain a provision that coverage afforded under the policies shall not be canceled unless at least thirty (30) Calendar Days prior written notice has been given to the City.

2.17. Indemnification: The Contractor shall defend, indemnify and save harmless the Owner, and all its officers, employees, insurers, and self-insurance pool, from and against all liability, suits, actions, or other claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the Contractor, or of any Contractor's agent, employee, sub-contractor or supplier in the execution of, or performance under, any contract which may result from proposal award. Contractor shall pay any judgment with cost which may be obtained against the Owner growing out of such injury or damages.

2.18. Miscellaneous Conditions: Material Availability: Contractors must accept responsibility for verification of material availability, production schedules, and other pertinent data prior to submission of bid. It is the responsibility of the bidder to notify the Owner immediately if materials specified are discontinued, replaced, or not available for an extended period of time. OSHA Standards: All bidders agree and warrant that services performed in response to this invitation shall conform to the standards declared by the US Department of Labor under the Occupational Safety and Health Act of 1970 (OSHA). In the event the services do not conform to OSHA standards, the Owner may require the services to be redone at no additional expense to the Owner.

2.19. Time: Time is of the essence with respect to the time of completion of the Project and any other milestones or deadline which are part of the Contract. It will be necessary for each Bidder to satisfy the City of its ability to complete the Work within the Contract Time set forth in the Contract Documents. The Contract Time is the period of time allotted in the Contract Documents for completion of the work. The date of commencement of the work is the date established in a Notice to Proceed. If there is no Notice to Proceed, it shall be the date of the Contract or such other date as may be established therein, or as established as entered on the Bid Form. The Date of Substantial Completion of the work or designated portions thereof is the date certified by the Owner when construction is sufficiently complete, in accordance with the Contract Documents.

2.20. Progress & Completion: The Contractor shall begin work on the date of commencement as defined in the Contract, and shall carry the work forward expeditiously with adequate forces and shall complete it within the contract time.

2.21. Payment & Completion: The Contract Sum is stated in the Contract and is the total amount payable by the Owner to the Contractor for the performance of the work under the Contract Documents. Upon receipt of written notice that the work is ready for final inspection and acceptance and upon receipt of application for payment, the Owner's Project Manager will promptly make such inspection and, when he finds the work acceptable under the Contract Documents and the Contract fully performed, the Owner shall make payment in the manner provided in the Contract Documents.

2.22. Bid Bond: Each Bid shall as a guaranty of good faith on the part of the Bidder be accompanied by a Bid Guaranty consisting of: a certified or cashier's check drawn on an approved national bank or trust company in the state of Colorado, and made payable without condition to the City; or a **Bid Bond** written by an approved corporate surety in favor of the City. The amount of the Bid Guaranty shall not be less than 5% of the total Bid amount. Once a Bid is accepted and a Contact is awarded, the apparent successful bidder has ten calendar days to enter into a contractor in the form prescribed and to furnish the bonds with a legally responsible and approved surety. Failure to do so will result I forfeiture of the Bid Guaranty to the City as Liquidated Damages.

Each bidder shall guaranty its total bid price for a period of sixty (60) Calendar Days from the date of the bid opening.

2.23. Performance & Payment Bonds: Contractor shall furnish a Performance and a Payment Bond, each in an amount at least equal to that specified for the contract amount as security for the faithful performance and payment of all Contractor's obligations under the Contract Documents. These bonds shall remain in effect for the duration of the Warranty Period (as specified in the Special Conditions). Contractor shall also furnish other bonds that may be required by the Special Conditions. All bonds shall be in the forms prescribed by the Contract Documents and be executed by such sureties as (1) are licensed to conduct business in the State of Colorado and (2) 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 Accounts, U.S. Treasury Department. All bonds singed by an agent must be accompanied by a certified copy of the Authority Act. If the surety on any bond furnished by the Contractor is declared bankrupt, or becomes insolvent, or its rights to do business in Colorado are terminated, or it ceases to meet the requirements of clauses (1) and (2) of this section, Contractor shall within five (5) days thereafter substitute another bond and surety, both of which shall be acceptable to the City.

2.24. Retention: The Owner will deduct money from the partial payments in amounts considered necessary to protect the interest of the Owner and will retain this money until after completion of the entire contract. The amount to be retained from partial payments will be five (5) percent of the value of the completed work, and not greater than five (5) percent of the amount of the Contract. When the retainage has reached five (5) percent of the amount of the Contract no further retainage will be made and this amount will be retained until such time as final payment is made.

2.25. Liquidated Damages for Failure to Enter Into Contract: CITY ONLY Should the Successful Bidder fail or refuse to enter into the Contract within ten Calendar Days from the issuance of the Notice of Award, the City shall be entitled to collect the amount of such Bidder's Bid Guaranty as Liquidated Damages, not as a penalty but in consideration of the mutual release by the City and the Successful Bidder of all claims arising from the City's issuance of the Notice of Award and the Successful Bidder's failure to enter into the Contract and the costs to award the Contract to any other Bidder, to re-advertise, or otherwise dispose of the Work as the City may determine best serves its interest.

2.26. Liquidated Damages for Failure to Meet Project Completion Schedule: CITY ONLY If the Contractor does not achieve Final Completion by the required date, whether by neglect, refusal or any other reason, the parties agree and stipulate that the Contractor shall pay liquidated damages to the City for each such day that final completion is late. As provided elsewhere, this provision does not apply for delays caused by the City. The date for Final Completion may be extended in writing by the Owner.

The Contractor agrees that as a part of the consideration for the City's awarding of this Contract liquidated damages in the daily amount of **$350.00** is reasonable and necessary to pay for the actual damages resulting from such delay. The parties agree that the real costs and injury to the City for such delay include hard to quantify items such as: additional engineering, inspection and oversight by the City and its agents; additional contract administration; inability to apply the efforts of those employees to the other work of the City; perceived inefficiency of the City; citizens having to deal with the construction and the Work, rather than having the benefit of a completed Work, on time; inconvenience to the public; loss of reputation and community standing for the City during times when such things are very important and very difficult to maintain.

The Contractor must complete the Work and achieve final completion included under the Bid Schedule in the number of consecutive calendar days after the City gives is written Notice to Proceed. When the Contractor considers the entire Work ready for its intended use, Contractor shall certify in writing that the Work is substantially complete. In addition to the Work being substantially complete, Final Completion date is the date by which the Contractor shall have fully completed all clean-up, and all items that were identified by the City in the inspection for final completion. Unless otherwise stated in the Special Conditions, for purposes of this liquidated damages clause, the Work shall not be finished and the Contract time shall continue to accrue until the City gives its written Final Acceptance.

If the Contractor shall fail to pay said liquidated damages promptly upon demand thereof after having failed to achieve Final Completion on time, the City shall first look to any retainage or other funds from which to pay said liquidated damages; if retainage or other liquid funds are not available to pay said liquidated damages amounts, the Surety on the Contractor's Performance Bond and Payment Bond shall pay such liquidated damages. In addition, the City may withhold all, or any part of, such liquidated damages from any payment otherwise due the Contractor.
Liquidated damages as provided do not include any sums to reimburse the City for extra costs which the City may become obligated to pay on other contracts which were delayed or extended because of the Contractor's failure to complete the Work within the Contract Time. Should the City incur additional costs because of delays or extensions to other

contracts resulting from the Contractor's failure of timely performance, the Contractor agrees to pay these costs that the City incurs because of the Contractor's delay, and these payments are separate from and in addition to any liquidated damages.

The Contractor agrees that the City may use its own forces or hire other parties to obtain Substantial or Final Completion of the work if the time of completion has elapsed and the Contractor is not diligently pursuing completion. In addition to the Liquidated Damages provided for, the Contractor agrees to reimburse the City for all expenses thus incurred.

2.27. Contingency/Force Account: Contingency/Force Account work will be authorized by the Owner's Project Manager and is defined as minor expenses to cover miscellaneous or unforeseen expenses related to the project. The expenses are not included in the Drawings, Specifications, or Scope of Work and are necessary to accomplish the scope of this contract. Contingency/Force Account Authorization will be directed by the Owner through an approved form. Contingency/Force Account funds are the property of the Owner and any Contingency/Force Account funds, not required for project completion, shall remain the property of the Owner. Contractor is not entitled to any Contingency/Force Account funds, that are not authorized by Owner or Owner's Project Manager.

2.28. Protection of Persons & Property: The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. Contractor shall erect and maintain, as required by existing safeguards for safety and protection, and all reasonable precautions, including posting danger signs or other warnings against hazards promulgating safety regulations and notifying owners and users of adjacent utilities. When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct by the Contractor in the execution of the work, or in consequence of the non-execution thereof by the Contractor, he shall restore, at his own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring as may be directed, or it shall make good such damage or injury in an acceptable manner.

2.29. Changes in the Work: The Owner, without invalidating the contract, may order changes in the work within the general scope of the contract consisting of additions, deletions or other revisions, the contract sum and the contract time being adjusted accordingly. All such changes in the work shall be authorized by Change Order and shall be executed under the applicable conditions of the contract documents. A Change Order is a written order to the Contractor signed by the Owner issued after the execution of the contract, authorizing a change in the work or an adjustment in the contract sum or the contract time. The contract sum and the contract time may be changed only by Change Order.

2.30. Claims for Additional Cost or Time: If the Contractor wishes to make a claim for an increase in the contract sum or an extension in the contract time, he shall give the Owner written notice thereof within a reasonable time after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the work, except in an emergency endangering life or property in which case the Contractor shall precede in accordance with the regulations on safety. No such claim

shall be valid unless so made. Any change in the contract sum or contract time resulting from such claim shall be authorized by Change Order.

2.31. Minor Changes in the Work: The Owner shall have authority to order minor changes in the work not involving an adjustment in the contract sum or an extension of the contract time and not inconsistent with the intent of the contract documents.

2.32. Field Orders: The Owner may issue written Field Orders which interpret the Contract Documents in accordance with the specifications, or which order minor changes in the work in accordance with the agreement, without change in the contract sum or time. The Contractor shall carry out such Field Orders promptly.

2.33. Uncovering & Correction of Work: The Contractor shall promptly correct all work rejected by the Owner as defective or as failing to conform to the contract documents whether observed before or after substantial completion and whether or not fabricated installed or competed. The Contractor shall bear all costs of correcting such rejected work, including the cost of the Owner's additional services thereby made necessary. If within one (1) year after the date of completion or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the contract documents, any of the work found to be defective or not in accordance with the contract documents, the Contractor shall correct it promptly after receipt of a written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discover of condition. All such defective or non-conforming work under the above paragraphs shall be removed from the site where necessary and the work shall be corrected to comply with the contract documents without cost to the Owner. The Contractor shall bear the cost of making good all work of separate Contractors destroyed or damaged by such removal or correction. If the Owner prefers to accept defective or non-conforming work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect an appropriate reduction in the payment or contract sum, or, if the amount is determined after final payment, it shall be paid by the Contractor.

2.30. Amendment: No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All amendments to the contract shall be made in writing by the Owner.

2.31. Assignment: The Contractor shall not sell, assign, transfer or convey any contract resulting from this IFB, in whole or in part, without the prior written approval from the Owner.

2.32. Compliance with Laws: Bids must comply with all Federal, State, County and local laws governing or covering this type of service and the fulfillment of all ADA (Americans with Disabilities Act) requirements.

2.33. Confidentiality: All information disclosed by the Owner to the Contractor for the purpose of the work to be done or information that comes to the attention of the Contractor during the course of performing such work is to be kept strictly confidential.

2.34. Conflict of Interest: No public official and/or City/County employee shall have interest in any contract resulting from this IFB.

2.35. Contract Termination: This contract shall remain in effect until any of the following occurs: (1) contract expires; (2) completion of services; (3) acceptance of services or, (4) for convenience terminated by either party with a written *Notice of Cancellation* stating therein the reasons for such cancellation and the effective date of cancellation.

2.36. Employment Discrimination: During the performance of any services per agreement with the Owner, the Contractor, by submitting a Bid, agrees to the following conditions:

2.36.1. The Contractor shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, handicap, or national origin except when such condition is a legitimate occupational qualification reasonably necessary for the normal operations of the Contractor. The Contractor agrees to post in conspicuous places, visible to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

2.36.2. The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, shall state that such Contractor is an Equal Opportunity Employer.

2.36.3. Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

2.37. Affirmative Action: In executing a Contract with the City, the Contractor agrees to comply with Affirmative Action and Equal Employment Opportunity regulations presented in the General Contract Conditions.

2.38. Immigration Reform and Control Act of 1986 and Immigration Compliance: The Offeror certifies that it does not and will not during the performance of the contract employ illegal alien workers or otherwise violate the provisions of the Federal Immigration Reform and Control Act of 1986 and/or the immigration compliance requirements of State of Colorado C.R.S. § 8-17.5-101, *et.seq.* (House Bill 06-1343).

2.39. Ethics: The Contractor shall not accept or offer gifts or anything of value nor enter into any business arrangement with any employee, official, or agent of the Owner.

2.40. Failure to Deliver: In the event of failure of the Contractor to deliver services in accordance with the contract terms and conditions, the Owner, after due oral or written notice, may procure the services from other sources and hold the Contractor responsible for any costs resulting in additional purchase and administrative services. This remedy shall be in addition to any other remedies that the Owner may have.

2.41. Failure to Enforce: Failure by the Owner at any time to enforce the provisions of the contract shall not be construed as a waiver of any such provisions. Such failure to

enforce shall not affect the validity of the contract or any part thereof or the right of the Owner to enforce any provision at any time in accordance with its terms.

2.42. Force Majeure: The Contractor shall not be held responsible for failure to perform the duties and responsibilities imposed by the contract due to legal strikes, fires, riots, rebellions, and acts of God beyond the control of the Contractor, unless otherwise specified in the contract.

2.43. Independent Contractor: The Contractor shall be legally considered an Independent Contractor and neither the Contractor nor its employees shall, under any circumstances, be considered servants or agents of the Owner. The Owner shall be at no time legally responsible for any negligence or other wrongdoing by the Contractor, its servants, or agents. The Owner shall not withhold from the contract payments to the Contractor any federal or state unemployment taxes, federal or state income taxes, Social Security Tax or any other amounts for benefits to the Contractor. Further, the Owner shall not provide to the Contractor any insurance coverage or other benefits, including Workers' Compensation, normally provided by the Owner for its employees.

2.44. Nonconforming Terms and Conditions: A bid that includes terms and conditions that do not conform to the terms and conditions of this Invitation for Bid is subject to rejection as non-responsive. The Owner reserves the right to permit the Contractor to withdraw nonconforming terms and conditions from its bid prior to a determination by the Owner of non-responsiveness based on the submission of nonconforming terms and conditions.

Items for non-responsiveness may include, but not be limited to:

a. Submission of the Bid on forms other than those supplied by the City;

b. Alteration, interlineation, erasure, or partial detachment of any part of the forms which are supplied herein;

c. Inclusion of unauthorized additions conditional or alternate Bids or irregularities of any kind which may tend to make the Bid incomplete, indefinite, or ambiguous as to its meaning;

d. Failure to acknowledge receipt of any or all issued Addenda;

e. Failure to provide a unit price or a lump sum price, as appropriate, for each pay item listed except in the case of authorized alternative pay items;

f. Failure to list the names of Subcontractors used in the Bid preparation as may be required in the Solicitation Documents;

g. Submission of a Bid that, in the opinion of the Owner, is unbalanced so that each item does not reasonably carry its own proportion of cost or which contains inadequate or unreasonable prices for any item;

h. Tying of the Bid with any other bid or contract; and

i. Failure to calculate Bid prices as described herein.

2.45. Evaluation of Bids and Offeors: The Owner reserves the right to:

- reject any and all Bids,
- waive any and all informalities,
- negotiate final terms with the Successful Bidder, and
- disregard any and all nonconforming, nonresponsive or conditional Bids.

Discrepancies between words and figures will be resolved in favor of words. Discrepancies between Unit Prices and Extended Prices will be resolved in favor of the Unit Prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. The corrected extensions and totals will be shown in the tabulation of Bids.

The Owner may consider the qualifications and experience of Subcontractors and other persons and organizations (including those who are to furnish the principal items of material or equipment) proposed for those portions of the work as to which the identity of Subcontractors and other persons and organizations must be submitted. Operating costs, maintenance considerations performance data, and guarantees of materials and equipment may also be considered by the Owner.

The Owner will conduct such investigations as deemed necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of the Offeror, proposed Subcontractors and other persons and organizations to do the Work in accordance with the *Contract Documents* to the City's satisfaction within the Contract Time.

The Offeror shall furnish the Owner all information and data requested by the Owner to determine the ability of the Offeror to perform the Work. The Owner reserves the right to reject the Bid if the evidence submitted by, or investigation of such Offeror fails to satisfy the Owner that such Offeror is properly qualified to carry out the obligations of the Contract and to complete the Work contemplated therein.

By submitting a Bid, each Offeror authorizes the Owner to perform such investigation of the Offeror as the Owner deems necessary to establish the responsibility, qualifications and financial ability of the Offeror and, by its signature thereon, authorizes the Owner to obtain reference information concerning the Offeror and releases the party providing such information and the Owner from any and all liability to the Offeror as a result of such reference information so provided.

The Owner reserves the right to reject the Bid of any Offeror who does not pass any evaluation to the Owner’s satisfaction.

If the Contract is to be awarded, it will be awarded to the Offeror who, by evaluation, the Owner determines will best meet the Owner's interests.

The Owner reserves the right to accept or reject the Work contained in any of the Price Bid Schedules or alternates, either in whole or in part.

2.46. Award of Contract: Unless otherwise indicated, a single award will be made for all the bid items in an individual bid schedule. In the event that the Work is contained in more than one Bid Schedule, the City may award Schedules individually or in combination. In the case of two Bid Schedules which are alternative to each other, only one of such alternative Schedules will be awarded. Within forty-five (45) Calendar Days of Bid Opening, the City will issue a Notice of Award to the Successful Bidder which will be accompanied by four (4) unsigned copies of the Contract and the Performance and Payment Bond forms. Within ten (10) Calendar Days thereafter, the Successful Bidder shall sign and deliver four (4) copies of the Contract, Performance Bond, Payment Bond and Certificates of Insurance to the City. Within ten (10) Calendar Days thereafter, the City will deliver two (2) fully executed counterparts of the Contract to the Contractor. No contract shall exist between the Successful Bidder and the City and the Successful Bidder shall have no rights at law or in equity until the Contract has been duly executed by the City.

The Successful Bidder's failure to sign and submit a Contract and other documents set forth in this Paragraph within the prescribed time shall be just cause of annulment of the award, and forfeiture of the Bid Guaranty. The award of Contract may then be made to the next qualified Bidder in the same manner as previously prescribed.

2.47. Ownership: All plans, prints, designs, concepts, etc., shall become the property of the Owner.

2.48. Oral Statements: No oral statement of any person shall modify or otherwise affect the terms, conditions, or specifications stated in this document and/or resulting agreement. All modifications to this request and any agreement must be made in writing by the Owner.

2.49. Patents/Copyrights: The Contractor agrees to protect the Owner from any claims involving infringements of patents and/or copyrights. In no event shall the Owner be liable to the Contractor for any/all suits arising on the grounds of patent(s)/copyright(s) infringement. Patent/copyright infringement shall null and void any agreement resulting from response to this IFB.

2.50. Remedies: The Contractor and Owner agree that both parties have all rights, duties, and remedies available as stated in the Uniform Commercial Code.

2.51. Venue: Any agreement as a result of responding to this IFB shall be deemed to have been made in, and shall be construed and interpreted in accordance with, the laws of the City of Grand Junction, Mesa County, Colorado.

2.52. Expenses: Expenses incurred in preparation, submission and presentation of this IFB are the responsibility of the company and cannot be charged to the Owner.

2.53. Sovereign Immunity: The Owner specifically reserves its right to sovereign immunity pursuant to Colorado State Law as a defense to any action arising in conjunction to this agreement.

2.54. Non-Appropriation of Funds: The contractual obligation of the Owner under this contract is contingent upon the availability of appropriated funds from this fiscal year budget as approved by the City Council or Board of County Commissioners from this fiscal year only. State of Colorado Statutes prohibit obligation of public funds beyond the fiscal year for which the budget was approved. Anticipated expenditures/obligations beyond the end of the current Owner's fiscal year budget shall be subject to budget approval. Any contract will be subject to and must contain a governmental non-appropriation of funds clause.

2.55. Cooperative Purchasing: Purchases as a result of this solicitation are primarily for the City/County. Other governmental entities may be extended the opportunity to utilize the resultant contract award with the agreement of the successful provider and the participating agencies. All participating entities will be required to abide by the specifications, terms, conditions and pricings established in this Bid. The quantities furnished in this bid document are for only the City/County. It does not include quantities for any other jurisdiction. The City or County will be responsible only for the award for its jurisdiction. Other participating entities will place their own awards on their respective Purchase Orders through their purchasing office or use their purchasing card for purchase/payment as authorized or agreed upon between the provider and the individual entity. The City/County accepts no liability for payment of orders placed by other participating jurisdictions that choose to piggy-back on our solicitation. Orders placed by participating jurisdictions under the terms of this solicitation will indicate their specific delivery and invoicing instructions.

2.56. Keep Jobs in Colorado Act: Contractor shall be responsible for ensuring compliance with Article 17 of Title 8, Colorado Revised Statutes requiring 80% Colorado labor to be employed on public works. Contractor shall, upon reasonable notice provided by the Owner, permit the Owner to inspect documentation of identification and residency required by C.R.S. §8-17-101(2)(a). If Contractor claims it is entitled to a waiver pursuant to C.R.S. §8-17-101(1), Contractor shall state that there is insufficient Colorado labor to perform the work such that compliance with Article 17 would create an undue burden that would substantially prevent a project from proceeding to completion, and shall include evidence demonstrating the insufficiency and undue burden in its response.

Unless expressly granted a waiver by the Owner pursuant to C.R.S. §8-17-101(1), Contractor shall be responsible for ensuring compliance with Article 17 of Title 8, Colorado Revised Statutes requiring 80% Colorado labor to be employed on public works. Contractor shall, upon reasonable notice provided by the Owner, permit the Owner to inspect documentation of identification and residency required by C.R.S. §8-17-101(2)(a).

2.56.1. "Public project" is defined as:

(a) any construction, alteration, repair, demolition, or improvement of any land, building, structure, facility, road, highway, bridge, or other public improvement suitable for and intended for use in the promotion of the public health, welfare, or safety and any maintenance programs for the upkeep of such projects

(b) for which appropriate or expenditure of moneys may be reasonably expected to be $500,000.00 or more in the aggregate for any fiscal year
(c) except any project that receives federal moneys.

3. Statement of Work

3.1. GENERAL: The City of Grand Junction is soliciting competitive bids from qualified and interested companies for all labor, equipment, and materials required for the **2018 Sewer Line Replacement Project – Phase A.** All dimensions and scope of work should be verified by Contractors prior to submission of bids.

NOTE: The descriptions of the pay items listed in the Price Bid Schedule for this Project may not agree with those listed in the Standard Specifications. Payment for all Work performed, as required in the Contract Documents, will be in accordance with the items and units listed in the Price Bid Schedule.

The performance of the Work for this Project shall conform to the General Contract conditions presented in the City of Grand Junction's Standard Contract Documents for Capital Improvements Construction, revised July 2010, except as specifically modified or supplemented herein or on the Construction Drawings.

3.2. PROJECT DESCRIPTION: The Project generally consists of 815 L.F. of 10" SDR-35 PVC sewer pipe, 3,560 L.F. of 8" SDR-35 PVC sewer pipe, 1,170 L.F. of 8" Fusible PVC pipe, 1,170 L.F. of pipe-bursting installation, 796 L.F. of 4" SDR-35 PVC sewer service lines, 25 48" I.D. sewer manholes, 52 sewer connections, restoration of disturbed areas including; gravel and asphalt road surfaces, driveways, and concrete replacement. Work will also include restoration of disturbed landscape areas.

3.3. SPECIAL CONDITIONS & PROVISIONS:

3.3.1 Mandatory Pre-Bid Meeting: Prospective bidders are required to attend a mandatory pre-bid meeting on Wednesday, April 4, 2018 at 11:00 am. Meeting location shall be in the City Council Auditorium at City Hall, located at 250 North 5th Street. The purpose of this visit will be to inspect and to clarify the contents of this Invitation for Bids (IFB).

3.3.2 QUESTIONS REGUARDING SOLICIATION PROCESS/SCOPE OF WORK:

Duane Hoff, Senior Buyer
City of Grand Junction
duaneh@gjcity.org

3.3.3 Project Manager: The Project Manager for the Project is Lee Cooper, Project Engineer, who can be reached at (970) 256-4155. During Construction, all notices, letters, submittals, and other communications directed to the City shall be addressed and mailed or delivered to:

City of Grand Junction
Department of Public Works and Utilities
Attn: Lee Cooper, Project Manager
333 West Ave., Building C
Grand Junction, CO 81501

3.3.4 Affirmative Action: The Contractor is not required to submit a written Affirmative Action Program for the Project.

3.3.5 Pricing: Pricing shall be all inclusive to include but not be limited to: all labor, equipment, supplies, materials, freight (F.O.B. Destination – Freight Pre-paid and Allowed to each site), travel, mobilization costs, fuel, set-up and take down costs, and full-time inspection costs, and all other costs related to the successful completion of the project.

The Owner shall not pay nor be liable for any other additional costs including but not limited to: taxes, shipping charges, insurance, interest, penalties, termination payments, attorney fees, liquidated damages, etc.

3.3.6 Freight/Shipping: All freight/shipping shall be F.O.B. Destination – Freight Pre-Paid and Allowed to the project site(s), Grand Junction, CO.

Contractor must meet all federal, state, and local rules, regulations, and requirements for providing such services.

3.3.7 Contract: A binding contract shall consist of: (1) the IFB and any amendments thereto, (2) the bidder's response (bid) to the IFB, (3) clarification of the bid, if any, and (4) the City's Purchasing Department's acceptance of the bid by "Notice of Award" or by "Purchase Order". All Exhibits and Attachments included In the IFB shall be incorporated into the contract by reference.

A. The contract expresses the complete agreement of the parties and, performance shall be governed solely by the specifications and requirements contained therein.

B. Any change to the contract, whether by modification and/or supplementation, must be accomplished by a formal contract amendment signed and approved by and between the duly authorized representative of the bidder and the City Purchasing Division or by a modified Purchase Order prior to the effective date of such modification. The bidder expressly and explicitly understands and agrees that no other method and/or no other document, including acts and oral communications by or from any person, shall be used or construed as an amendment or modification to the contract.

3.3.8 Time of Completion: The scheduled time of Completion for the Project is **110 Calendar Days** from the starting date specified in the Notice to Proceed.

Completion is achieved when site cleanup and all punch list items (resulting from the final inspection) have been completed. Completion shall have the meaning set forth in Article I, Section 3 (Definitions and Terms) of the General Contract Conditions.

3.3.9 Working Days and Hours: The working days and hours shall be as stated in the General Contract Conditions, Section VI, or as mutually agreed upon in the preconstruction meeting.

3.3.10 Licenses and Permits: Contractor is responsible for obtaining all necessary licenses and permits required for Construction, at Contractors expense. See Section 2.10. Contractor shall supply to Owner all copies of finalized permits.

3.3.11 Permits: The following permits are required for the Project and will be obtained by the City at no cost to the Contractor:

None

The following permits are required for the Project and shall be obtained and paid for by the Contractor, with the costs included in the total bid price for the Project:

- *Colorado Department of Public Health and Environment Dewatering Permit*. (If necessary due to the presence of groundwater) For more information, contact the Colorado Dept. of Public Health and Environment: www.cdphe.state.co.us/wq/PermitsUnit/wqcdpmt.html Approximately 7 – 10 days is required for processing of the permit application. The Contractor should begin preparing the permit application immediately upon notice of award.

3.3.12 City Furnished Materials: The City will furnish the following materials for the Project:

- AutoCAD sewer line drawings for survey stake-out.
- Variable message boards for upcoming construction locations.
- Door hangers (as necessary)

3.3.13 Project Newsletters: Project newsletters will not be required for this project. The City will handle notifying the public and residents of the project prior to construction starting. During construction, the City may require the help of the Contractor in handing out door hangers and notifying property owners/residents/tenants of the construction schedule.

3.3.14 Project Sign: Project signs, if any, will be furnished and installed by the City.

3.3.15 Authorized Representatives of the City: Those authorized to represent the City shall include the Purchasing Agent, Engineers, and Inspectors employed by the City, only.

3.3.16 Traffic Control: The Contractor shall provide and maintain traffic control in accordance with the approved Traffic Control Plan and the *Manual on Uniform Traffic Control Devices (MUTCD)*. The traffic control plans shall be presented to the Project

Engineer at or prior to the pre-construction meeting for review and approval. The following requirements and limitations shall apply to the traffic control:

No personal driveway and/or access point to a property shall be left inaccessible at the end of each work day or over a weekend; and no construction equipment shall be parked in front of a driveway and/or access point during Contractor's non-working hours. When a driveway and/or access point has to be closed off due to construction activity, the Contractor shall provide advanced notification to the affected resident(s) at least two-days prior to closure and arrange an alternative access point to the property. Refer to General Contract Condition 26 – Maintenance of Access and Services.

Special conditions for traffic control:

1. All trenches shall be backfilled or protected at the end of each working day and access restored to all driveways. If trenches are left open at night, the trenches will be limited to 30 feet in length. The entire perimeter of the excavation shall be barricaded with construction equipment or temporary construction fence.

2. At all times during the project, the contractor must ensure access is available for the U.S. Postal Service, trash collection trucks, school buses, emergency vehicles, etc., per the General Contract Conditions.

3. The Contractor shall adhere to all traffic control requirements when working within City right-of-way.

4. Detours shall be provided when a section of road is closed to through traffic for sewer construction. Residents, employees, property owners shall have access to their respected properties during sewer construction.

3.3.17 **Clean-Up:** The Contractor shall clear the construction site of all trash and on-site waste daily, including scrap from construction materials. The costs for all clean-up work shall be considered incidental and will not be paid for separately.

3.3.18 **Quality Control Testing:** As part of the project, the Contractor shall provide Quality Control testing per Table 1 in the Quality Control (QC) and Quality Assurance (QA) section within the City of Grand Junction's Standard Specifications for Road and Bridge Construction, and Table 101 within the Standard Specifications for the Construction of Underground Utilities. Table 1 and Table 101 provide the testing frequencies.

The Contractor shall provide test frequencies for Full-Time inspection. The testing agency shall meet the minimum requirements as stated in the Standard Specifications section. A submittal of qualified personnel shall be submitted at or before the preconstruction meeting. This submittal shall include all certifications held by the tester assigned to the project. The following items will require QC testing:

- Backfill compaction – Backfill shall be placed in horizontal layers not to exceed 8-inches in loose lift thickness. If the Project Engineer allows the

native material to be used for trench backfill, completion of a Proctor analysis will be required by the QC testing agency on the native backfill material.

- Aggregate Base Course (Class 6) – (If necessary, completion of a Proctor analysis will be required by the QC testing agency)
- Hot Bituminous Pavement
- Concrete

Method of Measurement:

Testing for QC will not be measured, but will be paid for on a Lump Sum basis.

Basis of Payment:

Pay Item	*Pay Unit*
Quality Control Testing	Lump Sum

A report shall be generated by the testing firm that documents all tests including any re-tests results or failed tests. Included in the test reports shall be station locations of each test and the test results. All test results shall be presented to the Project Engineer prior to final payment and/or final acceptance of the project.

The City will perform and/or contract the Quality Assurance (QA) testing for this project.

3.3.19 Schedule of Submittals: Contractor shall provide these specific submittals at or before the preconstruction meeting:

- Construction schedule submitted at or prior to the pre-construction meeting
- Hourly rate table for labor and equipment to be used on this project.
- Pipe (4”, 6”, 8”, & 10”) SDR-35 PVC
- Fusible PVC
- Pipe Bursting Means and Methods
- Service Wye fittings
- Service Saddle Fittings
- Manholes
- Ring and Covers
- Pipe to Manhole Connection
- Invert Epoxy Material
- Bedding Gradation, Type A
- Imported Trench Backfill gradation (Class 3)
- Granular Stabilization Material (Type B)
- Base course gradation, Proctor Curve (Class 6)
- Flow-Fill Material
- Non-woven Geotextile Fabric (If necessary)
- Concrete mix design, CDOT Class D, 4,500 psi mix
- Hot Bituminous Pavement Mix Design
- Concrete Washout Facility

3.3.20 Uranium Mill Tailings: It is anticipated that radioactive mill tailings can be encountered on this Project in the areas south of D Road in the industrial section of town. They include:

- 7th Street
- 10th Street
- Alleys located within this industrial area

3.3.21 Fugitive Petroleum or Other Contamination: It is anticipated that soil contamination from fugitive petroleum or other contaminants will not be encountered with the Project.

3.3.22 Excess Material: All excess materials shall be disposed in accordance with General Contract Condition Section 50.

3.3.23 Existing Utilities and Structures: The location of existing utilities and structures shown on the Plans are approximate. All underground utilities were **not** potholed. It is the responsibility of the Contractor to locate and protect all structures and utilities in accordance with General Contract Condition Section 37. The Contractor shall coordinate with the utility companies any necessary relocation of utilities and schedule his work accordingly. Conflicts between water and gas lines and/or storm drain pipe may be encountered. At such conflicts, the Contractor shall relocate the water and/or gas lines. Payment for waterline relocations will be paid for using the Minor Contract Revision line item assigned to the Project. Payment for gas line and all dry utility relocations will not be paid for separately but shall be included in the total cost of the Project.

If the Contractor discovers a conflict with an existing utility (either horizontal or vertical), the Contractor shall contact the Engineer to assist in resolving the conflict. The Contractor shall be prepared to move to another location on the project and allow the City and Utility provider time to investigate the problem and propose a solution. Relocating the work site from one location to another as a result of vertical or horizontal conflicts with existing utilities shall be considered incidental to the cost of installing the new sanitary sewer main and services.

3.3.24 Incidental Items: Any item of work not specifically identified or paid for directly, but which is necessary for the satisfactory completion of any paid items of work, will be considered as incidental to those items, and will be included in the cost of those items.

3.3.25 Existing Property Pins and Survey Monuments: The City of Grand Junction did not perform an exhaustive search for existing property pins when compiling survey data for this Project. Property pins and survey monuments have been shown on the construction drawings that were found in the field. The Contractor shall be responsible for locating, protecting and resetting property pins when and where necessary, including those shown on the plans, and including those not shown but found in the field during the course of the work. The cost of locating, protecting, referencing and resetting of property pins is incidental to the Construction Surveying pay item. The cost of referencing and resetting of survey monuments shall be paid

for as described in Section 629 – Survey Monumentation within the July 2010 Standard Contract Documents.

3.3.26 Existing Concrete Sidewalks, Pans, Fillets, Curbs and Gutters:
The majority of the existing curb, gutters and sidewalks are in good serviceable condition. The Contractor will need to protect all of the concrete adjacent to the sewer line replacement. If the concrete is damaged during the construction of the sewer line as a result of the Contractor's operation, the Contractor will be responsible for its replacement at no cost to the City. The Contractor, the City Project Inspector, and the City Project Engineer should walk, photograph, and record any concrete that is deemed to be damaged before the sewer line replacement is started in a particular area.

3.3.27 Payment for Damage to Private Property beyond Easement Limits/ROW Limits:
Easement and Rights of Way (ROW) lines are indicated on the Construction Plans. Any and all damage to improvements outside of easements and ROW, and/or outside the Construction Limit lines shall be repaired at the Contractor's expense. There will be no additional payment made for restoration of sod, landscaping, gravel, concrete or asphalt driveways, irrigation systems, decorative borders, fences, etc. beyond the property line or the construction easements as shown on the plan set.

3.3.28 Temporary Steel Plating: If the Contractor chooses to use steel plates to protect an open trench section, the cost for supplying and securely placing the steel plates will not be paid for separately, but shall be included in the work.

3.3.29 Construction Dewatering: All construction dewatering must meet the requirements specified in the CDPHE Dewatering Permit. Construction dewatering will be considered incidental and will not be measured and paid for separately.

3.3.30 Confined Space Entry: The Contractor is responsible for providing any and all confined space entry safety equipment; including, but not limited to: air testing equipment, fresh air blowers, tripods, harnesses, and SCBA equipment. The Contractor's air monitoring devices shall be calibrated and certified. The cost for all confined space entry equipment shall be incidental to the project cost, and will not be paid for separately.

3.3.31 Sanitary Sewer Service Locations: The location of sewer services shown on the construction drawings are based on TV video inspections of the existing sanitary sewer main. Unfortunately, in some instances, due to poor conditions of the existing sewer main lines, not all services were able to be located. The Contractor shall determine which services are active and which are inactive by using dye, tracing the line with a snake and locator, or smoking the service. The Contractor shall notify and obtain permission from the property owner prior to placing dye or smoke in the service.

3.3.32 Interruption of Utilities and Services: The Contractor shall notify all property owners affected by the interruption of utilities and other services caused by his operation. Such notice shall be given at least 24 hours prior to the interruption. Notice

shall be given for, but not limited to the interruption of domestic water, sanitary sewer, trash pickup, mail delivery and changes in access to the property.

3.3.33 Night Time and Weekend Sanitary Sewer Installation Work: Due to the high discharge flows produced by ALSCO Textile Cleaning (702 South 9th Street), the Contractor will be allowed to work at night and on weekends to avoid the high flows ALSCO discharges into the sewer line. ALSCO's hours of operation are 5 am to 5 pm, Monday through Friday. ALSCO does not work on weekends. Weekend work can be completed during the daytime hours. By working at night and on the weekends, the Contractor can avoid having to deal with these high flows and bypass pumping of sewer flows may not be necessary. The City proposes that this sewer replacement work between sewer manhole C4-262-031 (downstream manhole on 8th Street) and sewer manhole C4-262-063 (upstream manhole on 10th Street) be completed at night and/or on the weekends.

Night time work will only be allowed on the sewer line that serves the ALSCO business, all other sewer line replacements shall occur during the daytime hours on week days.

3.3.34 Bypass Pumping: By-pass pumping will be required for this project. The exact flow rates of the sewer lines being replaced are unknown.

The contractor shall provide and maintain adequate pumping equipment, force main piping and other necessary appurtenances in order to maintain reliable sanitary sewer service in all sanitary sewer lines as required for construction.

The contractor shall be responsible for any damage to personal property as a result of the bypass pumping operation. Refer to the Bypass Pumping Special Provision, Section 104.2.e for more information regarding bypass pumping.

3.3.35 Project Location Work Schedule: The Project shall start in the industrial area along South 7th Street, 10th Street and the alleys associated with this area of town. Once the new sewer lines are installed and in operation in this industrial area of town, the Contractor shall then begin on either Horizon Drive or the North 7th Street sewer line replacement. Where the City's Contractor goes next depends on the status of a Ute Water waterline replacement project. See Special Condition 3.3.36. The City would prefer to have its Contractor to start on Horizon Drive next. However, this will depend of the status and schedule of the Ute Water project.

The reason for this schedule is so the sewer line replacement project stays ahead of the City's asphalt overlay project that will be overlaying South 7th Street, 10th Street, and Horizon Drive.

The following locations shall be done at night or on the weekends to avoid high sewer flows as a result of the discharges from ALSCO Textile Cleaning:

- C4-262-030 to C4-262-031 (South 8th Street)
- C4-262-029 to C4-262-030 (South 8th Street)
- C4-262-045 to C4-262-029 (Alley between 8th St. & 9th St.)
- C4-262-063 to C4-262-045 (Alley between 9th St. & 10th St.)

3.3.36 <u>Ute Water Conservancy District Waterline Replacement:</u> The Contractor shall be aware that Ute Water will be replacing their waterline along Horizon Drive between the CDOT interchange roundabouts and G Road this summer. At the time of bidding this sewer line project, Ute Water didn't know the exact date on when they plan to start Horizon Drive waterline replacement. Ideally, Ute Water will be completed with their waterline replacement before the City's Contractor starts the sewer replacement along Horizon Drive, or Ute Water will start their waterline project after the sewer line replacement is complete.

The City's Contractor will need to be flexible once the sewer in the industrial area of town is completed as to where the Contractor will go next for sewer replacement. The City would prefer the Contractor start on Horizon Drive next, but if Ute Water is under construction on Horizon Drive, then the City's Contractor will need to start on the North 7th Street sewer replacement.

3.3.37 <u>ALSCO Textile Cleaning and Munro Pump:</u> Prior to construction starting along 9th Street and 10th Street, the Contractor shall meet with ALSCO and Munro Pump to discuss these businesses typical operations for deliveries. Both companies have delivery docks on 10th Street that will need to remain in operation during the sewer project.

Munro Pump has an existing small access off of 3rd Avenue that can be used temporarily for Munro to get access to their yard at address 808 S. 9th Street. This access for Munro off of 3rd Avenue can be used when the Contractor is completing the pipe-bursting operations in 9th and 10th Street.

Contacts: **Munro Pump:** Gerald 970-242-6810
ALSCO Textile Cleaning: Kevin McCullah 970-242-6359

3.4. SCOPE OF WORK: The Project generally consists of 815 L.F. of 10" SDR-35 PVC sewer pipe, 3,560 L.F. of 8" SDR-35 PVC sewer pipe, 1,170 L.F. of 8" Fusible PVC pipe, 1,170 L.F. of pipe-bursting installation, 796 L.F. of 4" SDR-35 PVC sewer service lines, 25 48" I.D. sewer manholes, 52 sewer connections, restoration of disturbed areas including; gravel and asphalt road surfaces, driveways, and concrete replacement. Work will also include restoration of disturbed landscape areas.

3.5. Attachments:

- Appendix A: Project Submittal Form
- Appendix B: Project Special Provisions
- Appendix C: Geotechnical Soils Report
- Appendix D: CDPHE's Construction Dewatering Permit **APPLICATION ONLY**
- Construction Plans

3.6. Contractor Bid Documents: For Contractor's convenience, the following is a list of forms/items to be submitted with the Contractor's bid response. However, should a form/item not be listed in this section, but required in the solicitation documents, it is the Contractor's responsibility to ensure all forms/items are submitted.

- Contractor's Bid Form
- Price Bid Schedule

3.7. IFB TENTATIVE TIME SCHEDULE:

Invitation for Bids available:	March 23, 2018
Mandatory Pre-Bid Meeting:	April 4, 2018
Inquiry deadline, no questions after this date:	April 6, 2018
Addendum Posted:	April 10, 2018
Submittal deadline for proposals (Bid Opening):	April 13, 2018
City Council or Board of Commissioners Approval:	May 2, 2018
Notice of Award & Contract Execution:	May 3, 2018
Bonding & Insurance Cert. due:	May 10, 2018
Preconstruction meeting:	May 10, 2018
Work begins no later than:	May 14, 2018
Final Completion	**110 Calendar Days** from Notice to Proceed
City Holidays (No Work):	(Memorial Day & 4th of July)

4. Contractor's Bid Form

Bid Date: _____

Project: IFB-4492-18-DH "2018 Sewer Line Replacement Project – Phase A"

Bidding Company: _____

Name of Authorized Agent: _____

Email _____

Telephone_____ **Address**_____

City_____**State**_____**Zip**_____

The undersigned Bidder, in compliance with the Invitation for Bids, having examined the Instruction to Bidders, General Contract Conditions, Statement of Work, Specifications, and any and all Addenda thereto, having investigated the location of, and conditions affecting the proposed work, hereby proposes to furnish all labor, materials and supplies, and to perform all work for the Project in accordance with Contract Documents, within the time set forth and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this Contractor's Bid Form is a part.

The undersigned Contractor does hereby declare and stipulate that this offer is made in good faith without collusion or connection to any person(s) providing an offer for the same work, and that it is made in pursuance of, and subject to, all terms and conditions of the Instructions to Bidders, the Specifications, and all other Solicitation Documents, all of which have been examined by the undersigned.

The Contractor also agrees that if awarded the Contract, to provide insurance certificates within ten (10) working days of the date of Notification of Award. Submittal of this offer will be taken by the Owner as a binding covenant that the Contractor will be prepared to complete the project in its entirety.

The Owner reserves the right to make the award on the basis of the offer deemed most favorable, to waive any formalities or technicalities and to reject any or all offers. It is further agreed that this offer may not be withdrawn for a period of sixty (60) calendar days after closing time. Submission of clarifications and revised offers automatically establish a new thirty day (30) period.

Prices in the bid proposal have not knowingly been disclosed with another provider and will not be prior to award.

- Prices in this bid proposal have been arrived at independently, without consultation, communication or agreement for the purpose of restricting competition.
- No attempt has been made nor will be to induce any other person or firm to submit a bid proposal for the purpose of restricting competition.
- The individual signing this bid proposal certifies they are a legal agent of the offeror, authorized to represent the offeror and is legally responsible for the offer with regard to supporting documentation and prices provided.
- Direct purchases by the City of Grand Junction are tax exempt from Colorado Sales or Use Tax. Tax exempt No. 98-903544. The undersigned certifies that no Federal, State, County or Municipal tax will be added to the above quoted prices.
- City of Grand Junction payment terms shall be Net 30 days.
- Prompt payment discount of _____ percent of the net dollar will be offered to the Owner if the invoice is paid within _____ days after the receipt of the invoice.

RECEIPT OF ADDENDA: the undersigned Contractor acknowledges receipt of Addenda to the Solicitation, Specifications, and other Contract Documents.

State number of Addenda received: _____.

It is the responsibility of the Bidder to ensure all Addenda have been received and acknowledged.

By signing below, the Undersigned agree to comply with all terms and conditions contained herein.

Company: _____

Authorized Signature: _____

Title: _____

The undersigned Bidder proposes to subcontract the following portion of Work:

Name & address of Sub-Contractor	Description of work to be performed	% of Contract

The undersigned Bidder acknowledges the right of the City to reject any and all Bids submitted and to waive informalities and irregularities therein in the City's sole discretion.

By submission of the Bid, each Bidder certifies, and in the case of a joint Bid each party thereto certifies as to his own organization, that this Bid has been arrived at independently, without collusion, consultation, communication, or agreement as to any matter relating to this Bid with any other Bidder or with any competitor.

Bid Schedule: 2018 Sewerline Replacement Project - Phase A

Item No.	CDOT, City Ref.	Description	Quantity	Units	Unit Price	Total Price
1	108.2	4" Sewer Pipe Service (SDR-35 PVC) (Includes cost of connection to the existing sewer service line)	796.	Lin. Ft.	$ _____	$ _____
2	108.2	6" Gravity Sewer Pipe (SDR-35 PVC) (Includes cost of connection to the existing sewer pipe)	60.	Lin. Ft.	$ _____	$ _____
3	108.2	8" Gravity Sewer Pipe (SDR-35 PVC) (Includes cost of connection to the existing sewer pipe)	3,560.	Lin. Ft.	$ _____	$ _____
4	108.2	8" Gravity Sewer Pipe (Fusible PVC) (Pipe-Bursting Installation Method)	1,170.	Lin. Ft.	$ _____	$ _____
5	108.2	10" Gravity Sewer Pipe (SDR-35 PVC) (Includes cost of connection to the existing sewer pipe)	815.	Lin. Ft.	$ _____	$ _____
6	108.2	Imported Trench Backfill (Class 3) (Includes haul and disposal of unsuitable excavated materail) (Assumed Unit Weight = 133 lbs/ft^3)	3,000.	Ton	$ _____	$ _____
7	108.3	8" x 4" Sewer Service Tap (Full Body Wye) (Includes Wye, clean-out and all fittings required to align and connect the sewer service pipe to the sewer tap)	34.	Each	$ _____	$ _____
8	108.3	8" x 4" Sewer Service Tap (Tapping Saddle) (To be used on the Fusible PVC pipe) (Includes saddle, clean-out and all fittings required to align and connect the sewer service pipe to the sewer tap)	12.	Each	$ _____	$ _____
9	108.3	10" x 4" Sewer Service Tap (Full Body Wye) (Includes Wye, clean-out and all fittings required to align and connect the sewer service pipe to the sewer tap)	6.	Each	$ _____	$ _____
10	108.3	Sewer Service Clean-out Ring and Cover (Castings Inc. CO-8030-CI or Approved Equal) (Includes concrete collar in unpaved areas per City Std. Detail SS-07)	51.	Each	$ _____	$ _____

Bid Schedule: 2018 Sewerline Replacement Project - Phase A

Item No.	CDOT, City Ref.	Description	Quantity	Units	Unit Price	Total Price
11	108.5	Sanitary Sewer Basic Manhole (48" I.D.)	4.	Each	$ _____	$ _____
12	108.5	Sanitary Sewer Basic Manhole (48" I.D.) (Epoxy Coated Inverts)	21.	Each	$ _____	$ _____
13	108.5	Manhole Barrel Section (D>5') (48" I.D.)	39.	Vert. Ft.	$ _____	$ _____
14	108.5	Connect to Existing Manhole (8" pipe)	2.	Each	$ _____	$ _____
15	108.7	Granular Stabilization Material (Type B) (Crushed Rock) (18" Thick Min.) (Includes haul and disposal of unsuitable excavated material) (Assumed Unit Weight = 138 lbs/ft^3)	550.	Ton	$ _____	$ _____
16	202	Removal of Existing Pipe (Size & type as shown on plans)	5,351.	Lin. Ft.	$ _____	$ _____
17	202	Abandon Pipe (Abandon pipe by plugging ends with concrete)	14.	Each	$ _____	$ _____
18	202	Removal of Asphalt Mat (Full Depth)	1,550.	Sq. Yd.	$ _____	$ _____
19	202	Removal of Asphalt Mat (Planing) (2" Thick for T-Top Section)	1,000.	Sq. Yd.	$ _____	$ _____
20	202	Removal of Concrete with Hydronic Heat Tubing (Alley at Munro Pump)	20.	Sq. Yd.	$ _____	$ _____
21	202	Removal of Concrete (Includes, but not limited to, curb, gutter, sidewalk, driveway, slabs, V-pans, curb ramps, intersection corners, aprons, and landscape borders)	220.	Sq. Yd.	$ _____	$ _____
22	202	Removal of Sod	15.	Sq. Yd.	$ _____	$ _____
23	202	Removal of Manhole	24.	Each	$ _____	$ _____
24	202	Abandon Manhole (Remove cone section, ring & cover, and fill remaining barrel sections with flow-fill material)	1.	Each	$ _____	$ _____
25	203	Disposal of Radioactive Material (Dispose at City Shops, 333 West Ave.)	40.	Cu. Yd.	$ _____	$ _____
26	206	Structure Backfill (Flow-Fill)	100.	Cu. Yd.	$ _____	$ _____

Bid Schedule: 2018 Sewerline Replacement Project - Phase A

Item No.	CDOT, City Ref.	Description	Quantity	Units	Unit Price	Total Price
27	208	Storm Drain Inlet Protection (Silt-Sack) (Includes Maintenance & Removal of Debris, & Removal of Inlet Protection)	15.	Each	$ _____	$ _____
28	208	Concrete Washout Facility	1.	Lump Sum	- - -	$ _____
29	210	Repair Damage to Unlocated Irrigation Lines (Various Sizes and Materials) (1" to 15")	3.	Each	$ _____	$ _____
30	210	Reset Landscape Ground Cover (Landscape Rock) (Match in Kind)	25.	Sq. Yd.	$ _____	$ _____
31	210	Reset Sprinkler System (Complete in Place)	2.	Each	$ _____	$ _____
32	210	Reset Fence (6' High Chain-Link)	32.	Lin. Ft.	$ _____	$ _____
33	212	Re-Sod Area as Shown (Includes 4" Thick of Topsoil placed prior to sod placement)	15.	Sq. Yd.	$ _____	$ _____
34	304	Aggregate Base Course (Class 6) (6" thick)	1,250.	Sq. Yd.	$ _____	$ _____
35	304	Aggregate Base Course (Class 6) (15" thick)	1,550.	Sq. Yd.	$ _____	$ _____
36	401	Hot Bituminous Pavement (Patching) (3 " Thick) (Grading SX, PG 64-22) (GYR.=75) (One 3" Lift)	1,550.	Sq. Yd.	$ _____	$ _____
37	401	Hot Bituminous Pavement (Patching) (2" Thick) (Grading SX, PG 64-22) (GYR.=75) (One 2" Top Mat)	1,480.	Sq. Yd.	$ _____	$ _____
38	401	Hot Bituminous Pavement (Patching) (2" Thick) (Grading SX, PG 64-22) (GYR.=75) (One 2" Top Mat) **(T-Top)**	1,150.	Sq. Yd.	$ _____	$ _____
39	407	Emulsified Asphalt (Tack Coat)	285.	Gallon	$ _____	$ _____
40	420	Geotextile (Separator) (Non-Woven) (Wrap stabilization material with fabric) (Minimum Overlap = 24")	1,900.	Sq. Yd.	$ _____	$ _____
41	607	Line Post (Match in Kind) (6' High) (If Necessary)	3.	Each	$ _____	$ _____
42	608	Concrete Sidewalk (4" thick)	14.	Sq. Yd.	$ _____	$ _____

Bid Schedule: 2018 Sewerline Replacement Project - Phase A

Item No.	CDOT, City Ref.	Description	Quantity	Units	Unit Price	Total Price
43	608	Concrete Curb and Gutter (Match in Kind)	170.	Lin. Ft.	$ _____	$ _____
44	608	Concrete Driveway Section (8" Thick) (Includes #5 epoxy coated rebar tie-bars @ 12" spacing) (18" long)	61.	Sq. Yd.	$ _____	$ _____
45	608	Concrete Pavement (Hydronic Heating) (8" Thick) (Includes exposing existing PEX hydronic heat tubing and installing new PEX tubing and connecting new tubing to the existing tubing) (Located at Munro Pump on 9th St.)	20.	Sq. Yd.	$ _____	$ _____
46	608	Concrete Curb, Gutter and Sidewalk (Match in Kind)	130.	Sq. Yd.	$ _____	$ _____
47	608	Concrete Drainage Pan (8" Thick) (See City Standard Detail C-12) (Includes #5 Rebar for Tie-Bars)	8.	Sq. Yd.	$ _____	$ _____
48	608	Cap Top Half of Sewer Pipe in Concrete per City Std. Detail GU-04 (20' long) (If necessary)	3.	Each	$ _____	$ _____
49	608	Encase Sewer Pipe in Concrete per City Std. Detail GU-04 (20' long) (If necessary)	2.	Each	$ _____	$ _____
50	620	Portable Sanitary Facility	1.	Each	$ _____	$ _____
51	625	Construction Surveying (Includes As-Built Drawings)	1.	Lump Sum	- - -	$ _____
52	626	Mobilization	1.	Lump Sum	- - -	$ _____
53	629	Survey Monumentation (Complete in Place) (Reference and Reset)	2.	Each	$ _____	$ _____
54	630	Traffic Control (Complete in Place)	1.	Lump Sum	- - -	$ _____
55	630	Traffic Control Plan	1.	Lump Sum	- - -	$ _____
56	630	Flagging	720.	Hour	$ _____	$ _____
57	SC 3.3.18	Quality Control Testing	1.	Lump Sum	- - -	$ _____

Bid Schedule: 2018 Sewerline Replacement Project - Phase A

Item No.	CDOT, City Ref.	Description	Quantity	Units	Unit Price	Total Price
58	Pump	Bypass Sewage Pumping (At Contractors Discretion)	1.	Lump Sum	- - -	$ _____
MCR		Minor Contract Revisions	- - -	- - -	- - -	$ 125,000.00
				Bid Amount:		**$** _____

Bid Amount:

_____ **dollars**

Contractor Name:
Contractor Address:
Contractor Phone #:

Appendix A

Project Submittal Form

PROJECT SUBMITTAL FORM

PROJECT: **2018 Sewer Line Replacement Project – Phase A**

CONTRACTOR:

PROJECT ENGINEER: Lee Cooper

Description	Date Received	Resubmittal Requested	Resubmittal Received	Date Accepted
CONSTRUCTION				
4", 6" 8" & 10" Gravity Sewer Pipe (SDR-35 PVC)				
Fusible PVC Pipe				
Pipe Bursting Means & Methods and Certifications				
Imported Trench Backfill				
Granular Stabilization Material (Type B)				
Pipe Fittings – Wye Fittings, Saddle Fittings				
48" I.D. Sewer Manhole and barrel sections				
Pipe to Manhole Connection Detail				
Manhole Ring and Covers				
Invert Epoxy Material				
Geotextile Fabric (Non-woven)				
Flow-Fill				
Pipe Bedding Material, Type A				
Aggregate Base Course, Class 6				
Concrete Mix Design, Class D				
Hot Bituminous Pavement Mix Design				
Concrete Washout Structure				
Quality Control Testing Agency and Certifications				
Construction Schedule				
Labor and Equipment hourly rate table				

Appendix B

Project Special Provisions

2018 Sewer Line Replacement Project – Phase A

SPECIAL PROVISIONS

GENERAL:

The descriptions of the pay items listed in the Bid Schedule for this Project may not agree with those listed in the Standard Specifications. Payment for all Work performed, as required in the Contract Documents, will be in accordance with the items and units listed in the Bid Schedule.

STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION:

The ***City of Grand Junction Standard Specifications for Road and Bridge Construction*** are hereby modified or supplemented for this Project by the following modifications to ***The Standard Specifications for Road and Bridge Construction***, State Department of Highways, Division of Highways, State of Colorado:

SECTION 208 – EROSION CONTROL

Section 208 of the Standard Specifications is hereby revised for this project as follows:

Subsection 208.04 shall include the following:

If groundwater within the new water line trenches is encountered and requires dewatering, the dewatering pump shall have a filter sock attached to the end of the discharge hose. This will prevent sediment in the discharge water from entering into the City's storm drainage system. The contractor will be responsible for monitoring the levels of sediment within the filter sock and replacing the filter sock when it reaches 50% of its holding capacity. It will also be the responsibility of the contractor to obtain the Dewatering Permit from the Colorado Department of Public Health and Environment if necessary.

Any of the materials to be installed or used for the installation of the sewer line shall be stored within the construction area where the Contractor is working unless permission is granted to store materials elsewhere. Any glues and/or adhesives necessary shall be contained at all times within a spill proof and waterproof container when not being used.

All vehicle and equipment maintenance and fueling shall be performed in a designated area within the construction area that will not interfere with roadway traffic operations unless traffic control is provided. The fueling area shall exhibit Best Management Practices in order to minimize and/or eliminate the potential of fuel spillage. Any spillage of fuel onto the ground shall be immediately cleaned up and any contaminated soil disposed of properly at the Mesa County Landfill. Documentation of spills, leaks and overflows that result in the discharge of pollutants, including logging and reporting of the spill is required to the Water

Quality Control Division at their toll-free 24-hour environmental emergency spill reporting line – 1-877-518-5608.

The Contractor shall clear the site of all on-site waste daily, including scrap from construction materials.

Concrete trucks will be required to wash out in a portable concrete washout pool supplied by the Contractor or the concrete truck can wait to washout back at the concrete batching facility. The Contractor will be responsible for maintaining the washout pool. The washout pool shall be cleaned out and/or replaced when the washout pool reaches 50% of total capacity. The concrete washout pool needs to be dynamic and durable in its ability to be moved with the progress of construction.

The Contractor shall clear the site of all trash and litter daily. Portable toilets will be maintained (cleaned and emptied) by a local supplier.

SECTION 420 – GEOSYNTHETICS

Section 420 of the Standard Specification is hereby revised for this project as follows:

Subsection 420.02 in the City of Grand Junction's Standard Specifications shall include the following:

> The materials supplied for the "Geotextile (Non-Woven Separator for use with Type B Granular Stabilization Material)" shall be Contech C-60NW or Nilex NW60, or approved equal. Where specified by the Engineer, Geotextile shall be installed per Std. Detail GU-03.

SECTION 601 – STRUCTURAL CONCRETE

Section 601 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 601.02 from the City of Grand Junction Standard Specifications and replace with the following:

Concrete for construction of curbs, gutters, sidewalks, irrigation structures, curb ramps, driveway approaches, corner fillets, drainage pans, median cover, and trails shall be CDOT Class D concrete per the 2017 CDOT Standard Specifications for Road and Bridge Construction (Red Book).

- Minimum field compressive strength: 4,500 psi at 28 days
- Air Content: 6% +/- 1.5%
- Maximum water cement ratio: 0.45
- Maximum slump at delivery shall be 4-inches. In the event that the concrete slump from the first truck of the day exceeds 5-inches the load will be rejected. Subsequent batches shall be adjusted so that the slump at delivery does not exceed 4-inches.

STANDARD SPECIFICATIONS FOR CONSTRUCTION OF WATER LINES, SANITARY SEWERS, STORM DRAINS, UNDERDRAINS AND IRRIGATION SYSTEMS

The City of Grand Junction ***Standard Specifications for Construction of Water Lines, Sanitary Sewers, Storm Drains, Underdrains and Irrigation Systems*** are hereby modified for this Project as follows:

SECTION 102 – MATERIALS

Section 102 of the Standard Specifications is hereby revised for this project as follows:

Subsection 102.9a, PVC Gravity Sewer Pipe, shall include the following:

SECTION 02710 – PLASTIC SEWER MAIN

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section covers construction of PVC sewer lines and other appurtenances. This item shall consist of furnishing and installing pipe, construction and other related work.

1.02 RELATED WORK:

A. Section 02750 – Pipe Bursting

1.03 RESPONSIBILITY FOR MATERIALS:

The CONTRACTOR shall be responsible for all such material furnished by him and shall replace, at his own expense, all such material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishing of all materials and labor required for the replacement of installed material discovered defective prior to the final acceptance of the Work or during the guarantee period.

The CONTRACTOR shall be responsible for the safe storage of material furnished by him or to him, and accepted by him, and intended for or incorporated into the Work. The interior of all pipe and other accessories shall be kept free from dirt and foreign matter at all times.

1.04 SUBMITTALS:

Submittals shall be in accordance with Appendix A and these specifications.

PART 2 - PRODUCTS

2.01 PVC PUSH-ON PIPE:

Refer to Sections 102.9 and 102.9a in the City of Grand Junction's Standard Specifications for the Construction of Underground Utilities.

Pipe shall be free of holes, foreign inclusions, foreign material, surface blemishes or scratches deeper than 10 percent of the wall thickness. Pipe interior shall not be rough. Not less than minimum wall thickness shall be maintained through the entire pipe length. Pipe shall not exhibit excessive weathering or evidence of sun degradation. The CITY may reject any pipe which was manufactured more than one year prior to delivery. Pipe shall be CIP size, except as noted in the next paragraph.

Pipe shall be palleted with protective boards to prevent damage from banding. Bands and boards shall be placed not more than 10 feet apart (5 sets per 40-foot length) or such other manufacturer's standard arrangement as well as provide adequate support for material. No loose or un-palleted pipe shall be delivered.

2.02 FUSIBLE PVC PIPE:

Pipe Supplier shall furnish fusible polyvinylchloride pipe conforming to all standards and procedures, and meeting all testing and material properties as described in this specification.

1. MANUFACTURER REQUIREMENTS
    i. Fusible PVC pipe shall be tested at the extrusion facility for properties required to meet all applicable parameters as outlined in AWWA C900-16 and applicable sections of ASTM D2241, ASTM D3034, or ASTM F679. Testing priority shall be in conformance with AWWA C900, except for pipe made to the ASTM D3034 or ASTM F679 standards, which shall be tested to those standards. All piping shall be made from a PVC compound conforming to cell classification 12454 per ASTM D1784. Pipe shall be DR18, unless another DR is recommended by the pipe manufacturer and fusing company, and approved by the Owner.
2. FUSION TECHNICIAN REQUIREMENTS
    i. Fusion Technician shall be fully qualified by the pipe supplier to install fusible PVC pipe of the type(s) and size(s) being used. Qualification shall be current as of the actual date of fusion performance on the project.
3. SPECIFIED PIPE SUPPLIERS
    i. Fusible PVC pipe shall be used as manufactured under the trade names Fusible C-900®, Fusible C-905®, and FPVC™, for Underground Solutions, Inc., Poway, CA, (858) 679-9551. Fusion process shall be as patented by Underground Solutions, Inc., Poway, CA, Patent No. 6,982,051, or approved equal.
4. PRODUCTS FUSIBLE PVC PRESSURE PIPE

i. Fusible PVC pipe shall conform to AWWA C900. Testing shall be in accordance with AWWA standards for all pipe types.

ii. Rework material shall be allowed per AWWA C900 and standards.

iii. Fusible PVC pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe.

iv. Fusible PVC pipe shall be manufactured in a standard 20', 30' or 40' nominal length.

v. Fusible PVC pipe shall be green in color for sanitary sewer use.

vi. Fusible PVC Pipe generally shall be marked per AWWA C900, and shall include as a minimum:

a. Nominal pipe size

b. PVC

c. Dimension Ratio, Standard Dimension Ratio or Schedule

d. AWWA pressure class or standard pressure rating for non-AWWA pipe

e. NSF-61 mark verifying suitability for potable water service

f. Extrusion production-record code

g. Trademark or trade name

h. Cell Classification 12454 and/or PVC material code 1120 may also be included

i. Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other visible deleterious faults.

5. CONNECTIONS AND FITTINGS

A. Connections shall be defined in conjunction with the coupling of project piping, as well as the tie-ins to other piping systems.

B. PVC GASKETED, PUSH-ON FITTINGS

Acceptable fittings for use with fusible PVC pipe shall include standard PVC pressure fittings conforming to AWWA C900 or AWWA C907.

i. Acceptable fittings for use joining fusible polyvinylchloride pipe, other sections of fusible PVC pipe or other sections of PVC pipe shall include gasketed PVC, push-on type couplings and fittings, including bends, tees, and couplings as shown in the drawings.

ii. Bends, tees and other PVC fittings shall be restrained with the use of thrust blocking or other restraint products as indicated in the construction documents.

iii. PVC gasketed, push-on fittings and mechanical restraints, if used, must be installed per the manufacturer's guidelines.

C. FUSIBLE PVC SWEEPS OR BENDS

i. Fusible PVC sweeps or bends shall conform to the same sizing convention,

diameter, dimensional tolerances and pressure class of the pipe that they are joining together.

ii. Fusible PVC sweeps or bends shall be manufactured from the same fusible PVC pipe being used for the installation, and shall have at least 2 feet of straight section on either end of the sweep or bend to allow for fusion of the sweep to the pipe installation.

iii. Standard fusible PVC sweep or bend angles shall not be greater than 22.5 degrees, and shall be used in diameters ranging from 4- inch through 15 inch.

2.03 FITTINGS:

See City of Grand Junction Standard Specifications for the Construction of Underground Utilities.

PART 3 - EXECUTION

3.01 PIPE INSTALLATION:

A. Handling of Pipe: All pipe furnished by the CONTRACTOR shall be delivered and distributed at the site by the CONTRACTOR. 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 materials be dropped. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground. Handling of pipe is to comply with manufacturer's recommendations

In distributing the material at the site of the Work, each piece shall be unloaded opposite or near the place where it is to be installed. All material shall be stored in a neat and orderly manner.

Pipe with joint rings shall be handled in such a manner that no weight, including the weight of the pipe, will bear on or be supported by the joint rings at any time. Care shall be taken to avoid dragging the spigot ring on the ground or allowing it to come in contact with gravel, crushed stone, rocks, or other hard objects. Joint rings which have been damaged in any way will not be accepted and shall not be incorporated in the Work. Pipe shall be so handled that the coating and lining will not be damaged. If, however, any part of the coating or lining is damaged, the repair shall be made by the CONTRACTOR at his expense in a manner satisfactory to the ENGINEER. All repairs are to comply with manufacturer's recommendations and these Specifications.

B. Laying Pipe: See City of Grand Junction Standard Specifications for the Construction of Underground Utilities.

C. Mechanical Joints: See City of Grand Junction Standard Specifications for the Construction of Underground Utilities.

D. Rubber Gasket Joints: See City of Grand Junction Standard Specifications for the Construction of Underground Utilities.

E. Testing and Disinfection: See City of Grand Junction Standard Specifications for the Construction of Underground Utilities.

F. Separation of Sewers: See City of Grand Junction Standard Specifications for the Construction of Underground Utilities.

3.03 FUSED JOINT PVC PIPE INSTALLATION:

1. Fused joint pipe shall be installed in accordance with Section 02750, as appropriate, and the manufacturer's recommendations. Fusion of PVC pipe shall be performed in accordance with the manufacturer's recommendations by persons certified by the pipe manufacturer. Fusion equipment shall be configured with the appropriate tools and temperatures for use on PVC pipe.

   A technical representative for the fusible PVC pipe manufacturer shall be on site for pipe fusing operations and the fusible pipe installation. The technical representative shall also be present for longer periods or return as necessary to provide training and observe procedures of the CONTRACTOR's pipe installation processes. He shall also return if requested by the ENGINEER, if the ENGINEER believes the processes used have changed from those observed by the representative. His observations shall include but not necessarily be limited to pipe handling and installation, pipe deflection and measurement, bedding placement, installation of fittings, fusion procedures, test methods and repair procedures.

   Following the initial field visit, the pipe manufacturer's representative shall provide a letter to the ENGINEER stating that the CONTRACTOR's installation procedures are acceptable. If any deficiencies in installation are found or changes in methods are required or recommended, these must be put in writing to the CONTRACTOR and ENGINEER. Manufacturer's letter shall itemize and describe changes to the installation procedures which will result in acceptance by the manufacturer. The pipe manufacturer's representative shall also be available to respond to the ENGINEER'S questions regarding this pipe and its installation. The ENGINEER may contact the representative directly and the representative shall respond directly to the ENGINEER. All responses shall be in writing within 3 working days.

3.04 WARRANTY

Warranty: CONTRACTOR'S warranty extends to all fused pipe installation and all appurtenances associated with fused pipe installation.

END OF SECTION 02710

SECTION 103 – REMOVALS, EXCAVATION, BACKFILLING AND RESTORATION

Section 103 of the Standard Specifications is hereby revised for this project as follows:

Subsection 103.10, Cutoff Walls, shall include the following:

> Payment for this work will not be measured or paid for separately and will be considered incidental to the installation of Gravity Sewer Pipe. Refer to Section 108.13 for list of Incidental Construction items.

Subsection 103.16, Earth Backfill Material, shall include the following:

> Native material excavated on site shall be used for backfill on all pipelines and appurtenances above the bedding and haunching material unless the native material is too wet, rocky or otherwise unsuitable for backfill as determined by the Engineer or their representative. In such case, imported trench backfill material, or other approved material, shall be used and paid for per ton of material supplied, placed and compacted. The Contractor will be required to salvage useable materials from the project excavations and mix the useable material with imported trench backfill prior to placing backfill in the trench. The contract price for "Imported Trench Backfill" shall include the disposal of the unsuitable material.

SECTION 104 – INSTALLATION OF PIPE AND APPURTENANCES

Section 104 of the Standard Specifications is hereby revised for this project as follows:

Subsection 104.2.a, Laying Gravity Flow Pipe, shall include the following:

SECTION 02750 – PIPE BURSTING

PART 1 - GENERAL

1.01 WORK INCLUDED:

This specification covers the rehabilitation of sewers lines using pipe bursting. This process will split or fracture the existing pipe while simultaneously installing a new pipe.

The CONTRACTOR shall be responsible for all associated work, including maintaining existing water or sewer service, dealing with existing utilities, reconnecting existing services and protecting existing structures and foundations against damage due to pipe bursting. Any repairs of any damaged utilities or structures during pipe bursting operations must be acceptable to the ENGINEER and OWNER. The completed work must provide a complete and satisfactory installation covering all incidental work necessary for the methods used.

For pipe bursting, the replacement line will follow the existing mainline shown on the project drawings. Pipe bursting must be static; the pneumatic method is NOT allowed. The Contractor will furnish all labor, equipment, materials, tools and appurtenances necessary or proper for the performance and completion of the pipe bursting.

1.02 CONTRACTOR QUALIFICATIONS:

The CONTRACTOR, or the subcontractor performing the work, shall be certified by the pipe bursting system manufacturer as a fully trained user of the pipe bursting system. Operation of the pipe bursting system shall be performed by trained personnel. The CONTRACTOR shall present evidence to prove to the satisfaction of the ENGINEER that he, or the subcontractor performing the work, has had previous experience in sewer pipe installation of this nature. The pipe bursting CONTRACTOR shall have actively engaged in the installation of pipe using pipe bursting for a minimum of three (3) years and have installed, as a company, a minimum of 50,000 LF of pipe bursting in similar conditions. The CONTRACTOR shall employ a superintendent able to furnish similar evidence and shall keep such supervisor continuously employed until the pipe bursting installation on the project is satisfactorily completed.

Presentation of similar experience in the last 3 years shall include:

1. Project name and location, pipe sizes and lengths, Owner's name, address, telephone number, contact person, date and duration of work, additional information on the project, and contents handled by pipeline.

2. Supervisory field personnel and historical information of sewer pipe bursting experience. At least one of the field supervisors listed must be at the site when pipe bursting operations are in progress.

Documentation of experience with butt-fusing fusible PVC (FPVC) or HDPE pipe and in the use of the equipment proposed for this project to accomplish the necessary butt-fusing shall also be provided. Personnel performing the butt-fusing operation shall have experience with at least two (2) similar projects.

1.03 RESPONSIBILITY:

The pipe bursting CONTRACTOR shall have complete responsibility for installation of the new FPVC or HDPE pipe within the existing sewer main, locate and reconnect all services, protect and repair any damage to other existing utilities in the vicinity of the work or any other features or structures that may be damaged during construction, and to supervise all aspects of the work as required by these Contract Documents. If upsizing the existing main to sizes shown on the plans results in the need to bore out a portion of the existing main prior to installing the new pipe, that work shall be included.

The CONTRACTOR shall be responsible for making any investigations into site or soil conditions or any other existing conditions that he deems necessary in order to prepare his bid and execute the work. All work shall be completed within the rights-of-way or easements available, or the CONTRACTOR shall obtain written permission to occupy any additional properties.

The CONTRACTOR shall abide by the conditions of any obtained construction, access or regulatory permits. And shall provide construction traffic control in compliance with City requirements.

1.04 SUBMITTALS:

Submittals will be required for all qualifications, processes, and materials in accordance with this section. Submittals shall include all equipment proposed including that for both pipe bursting and butt-fusing of FPVC or HDPE pipe. A detailed description of the complete process proposed for the replacement of the main by pipe bursting shall also be submitted. This includes excavations, service locations and reconnections, maintaining the design sewer slope, and the process to upsize the space for the new pipe.

Specifically, submittals to be provided must include, but are not necessarily limited to the following:

A. Certifications of training by the pipe bursting systems manufacturer stating the operators have been fully trained in the use of the equipment.
B. Certifications from the pipe manufacturer of training and the proper method of handling and installing the new pipe.
C. Documentation showing that personnel has three (3) years of Pipe Bursting experience with a list of a minimum 50,000 LF installed by the company including 3 sewer main projects similar or greater in scope and value to the project specified in the contract documents.
D. Detailed construction procedures and layout plans, including sequence of construction and how the CONTRACTOR will maintain the pipe slope between manhole locations.
E. Method of installing pipe to the pipe slope shown in the construction plans.
F. Method of locating and reconnecting service lines.
G. Method of establishing and utilizing the launching and receiving pits.
H. Method of bypassing pumping around any sewer bursting operation.
I. Information on all equipment proposed for pipe bursting operations.
J. Any other information required to provide a complete understanding of the proposed construction methods.

PART 2 - PRODUCTS

2.01 PIPE:

Pipe shall be Fusible PVC (FPVC) or high density polyethylene (HDPE) complying with Section 02710. If HDPE pipe is used, it shall have the nominal diameter (as a minimum) as called out in the plans, shall have an ID not more than 1-inch smaller than the FPVC and shall be approved by the ENGINEER from a hydraulic standpoint. HDPE shall have a wall thickness equal to SDR 9 at a minimum; however, the CONTRACTOR shall use a thicker walled pipe if required to properly install the pipe under this particular project with its unique conditions using pipe bursting methods.

All joints shall be fusion welded using equipment that creates a joint that has strength equal to that of the pipe itself. The equipment for fusion welding shall be specifically designed for this purpose and be used according to the manufacturer’s requirements.

PART 3 - EXECUTION

Both the pipe bursting and fusion welding processes shall comply with manufacturer’s requirements and the Specifications. All materials shall be transported, handled and stored as recommended by the manufacturer and so as not to damage them. Any damaged materials shall be replaced by acceptable materials at the CONTRACTOR’s cost.

CONTRACTOR shall employ a static pipe bursting method to satisfactorily install the new pipe. CONTRACTOR shall be responsible for and promptly repair any damage to any existing facilities or structures during the pipe installation.

The pipe bursting tool shall be designed to force its way through the existing pipe materials by fragmenting the pipe and compressing the old pipe sections into the surrounding soil as it progresses. A properly sized bursting unit shall be used to create sufficient room for the new pipe.

CONTRACTOR shall locate all existing services, laterals, and any features that may impact the pipe bursting operation before pipe bursting. It includes a set-up for bypass pumping for sewers, if necessary. Once the bursting is completed all services must be reconnected to the new pipe within the time requirements.

LOCATION AND PROTECTION OF UNDERGROUND UTILITIES

i. Correct location and verification of all underground utilities that may impact the pipe bursting installation is the responsibility of the Contractor, regardless of any locations shown on the drawings or previous surveys completed.
ii. Utility location and notification services shall be contacted by the Contractor prior to the start of construction.
iii. All existing lines and underground utilities shall be positively identified, including exposing those facilities that are located within an envelope of possible impact by the pipe bursting installation as determined for the specific site conditions. It is the Contractor and pipe bursting system operator's responsibility to determine this envelope of safe offset from existing utilities. This will include, but is not limited to, soil conditions, utility proximity and material, and pipe bursting system and equipment.

The pipe bursting unit (head) shall be remotely controlled and locatable, so that its location can be accurately determined at any time. The pipe bursting unit shall be able to data log the pull force. CONTRACTOR shall provide data logs of the pull force required for each bursting segment. The pull force shall not exceed the limits of the Fusible PVC pipe set by the pipe manufacturer.

Insertion pits shall be of sufficient length to allow the bursting head and new Fusible PVC pipe to enter the host pipe at an angle that will maintain the grade of the existing sanitary sewer pipe.

If any newly installed pipe does not satisfactorily comply with these requirements, it shall be removed and replaced by the CONTRACTOR. This includes replacing any defective joints, and any section of pipe with a gash, abrasion or other flaw with a depth equal to 10% of the wall thickness.

Lubrication shall be used if in the opinion of the CONTRACTOR such lubrication is necessary to ensure the successful completion of the job. Any lubricants used shall not negatively impact the environment.

An appropriate relaxation period shall be allowed prior to making service connections and connecting to manholes. The relaxation period shall be appropriate with and dependent upon site conditions, as determined by the CONTRACTOR.

Any material that enters the pipe during the pipe bursting operation shall be removed by the CONTRACTOR. The CITY will video the completed section to verify the construction.

CONTRACTOR shall make excavations as needed to connect to existing pipes, locate, expose and protect utility crossings, or to install appurtenances to the main or other connections, services, laterals, or fittings. This work shall comply with other specification sections as appropriate.

Following completion of the work, the CONTRACTOR shall provide a complete set of as-built drawings to the ENGINEER. These drawings shall accurately show all connections, appurtenances, pipe slope, fittings, services, etc; the depth and location of the pipe, and other details from construction.

PART 4 – TESTING AND ACCEPTANCE

After the new Fusible PVC pipe is installed and all services are reconnected, the line shall be inspected by CCTV. The City will provide the CCTV inspection.

END OF SECTION 02750

Add the following to **Section 104.2.b – Installation of Sewer Service Lines**:

> **Verification of Active Taps.** The Contractor shall verify that the existing sewer taps are active by smoke testing, use of dye, inserting a snake through a clean-out or roof vent and tracing to sewer main, etc. and only connect the active taps. There will be no separate measurement or payment for this work which will be considered incidental to the cost of the Project.

Include the following **Section 104.2.e – Bypass Pumping**

PART 1 – GENERAL

1.1 DESCRIPTION

A. The work covered under this section of the Specifications includes furnishing all plans, labor, equipment, permits, and materials necessary to implement a temporary pumping system for the purpose of diverting existing sewer flow around a work area for the duration of the installation of that particular segment of sewer line replacement. There are multiple sewer line segments that may require the use of bypass pumping.

B. Contractor shall be required to field verify bypass pumping flow and sizing requirements prior to submission of shop drawings. Bypass pumping plan shall be submitted to Project Engineer for approval prior to implementation.

C. The bypass system shall provide provisions for maintaining vehicular and pedestrian access, avoiding damage to public and private property, preventing leakage from hoses and minimizing noise from pumps. Sound attenuation is not necessary.

D. It shall be the responsibility of the Contractor to provide protection for the entire

bypass system including but not limited to piping, piping connections, pumps and ancillary equipment. Materials utilized for bypass pumping shall be appropriate for use for the intended operation and service. The Contractor shall be responsible for any damage caused by the Contractor's failure to provide adequate protection to the bypass system.

E. The Contractor shall conduct field surveys prior to any bypass operations to determine if there are any storm drains, waterways, or other similar areas that could be negatively affected in the event of a spill. Any potential hazards will be described in a narrative and on a bypass map. This narrative and map will be included with the bypass plan that will be submitted to the Engineer for review. The Contractor shall prepare an emergency response plan to be followed in the event of a spill or release of sanitary sewage during the WORK. This plan shall be developed to minimize the impacts of the spill or release and include containment, cleanup collection. The Contractor shall indicate the availability of the required materials and equipment for emergency response.

1.2 SUBMITTALS

A. For the flow bypassing method(s) utilized during the new sewer line installation, the Contractor shall submit the following information specific for each bypass setup 10 days prior to construction:

1. A detailed plan and description outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing pipeline flows. This plan should include schedules, locations, capacities of equipment, materials, sizing and selection data, location of nearby waterways, clean-up procedures, and all other incidental items necessary and/or required to insure the proper protection of these facilities, including protection of the access and bypass pumping locations from damage due to discharge flows. Drawings indicating the location of the equipment, piping layouts and pumping and discharge manholes shall be included.
2. Copy of all permits required to perform the work.
3. Certification of workmen trained for welding and installing HDPE pipe.
4. Record of measurement or verification of sanitary sewer flow rates.
5. Emergency spill or release plan including site specific requirements.

1.3 DESIGN REQUIREMENTS

A. Bypass pumping systems shall have sufficient capacity to pump **50% more than the maximum measured flow**. It shall be the Contractor's responsibility to verify the estimated flows by measuring flows prior to the work and designing the pumping system accordingly.

The Contractor shall provide all pipeline plugs, pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow of the sewer can be safely diverted around the WORK. Bypass pumping systems shall be manned at all times while operating.

B. The Contractor shall have adequate standby equipment available and ready for immediate operation and use in the event of emergency or breakdown. Pumps will be selected per the results of the flow calculations and per site requirements. All bypass systems shall have a fully-operational back-up pump available in the event that a primary pump fails. This information shall be specified in the bypass plans.

C. The bypass pumping system shall be capable of bypassing the flow around the work area and of returning any amount of flow up to full available flow into City's sanitary sewer system as necessary for satisfactory performances of the work.

D. The bypass system shall adhere to all local, state and federal codes and regulations as required by the regulatory agencies having jurisdiction.

E. The Contractor shall maintain sewer flows around the work area in a manner that will protect and not cause surcharging of sewers, drains, damage or flooding to public and private property.

F. The Contractor shall protect water resources, wetlands and other natural resources during the WORK.

1.4 RESPONSIBILITY FOR OVERFLOWS OR SPILLS

A. It shall be the responsibility of the Contractor to schedule and perform the WORK in a manner that does not cause or contribute to incidence of overflows, releases or spills of sewage from the sanitary sewer system or the bypass operation.

B. The Contractor shall develop a site-specific spill response plan for each segment of bypass pumping operations in the event that a spill involving sewage should occur. This plan shall include the following:

1. Emergency contact information for the spill response team.
2. Plan for immediately containing the leak or spill.
3. Plan for immediately addressing the source of the leak or spill.
4. Plan for immediately preventing public exposure to the leak or spill, including procedures for diverting pedestrian and automobile traffic away from the impacted area.
5. Contact information for Vactor truck services.
6. Contact information for a laboratory certified to test water samples for the presence of fecal coliform.
7. Procedures for collecting water quality samples to assess the magnitude and range of impact of any leak or spill.
8. Procedures for washing down all affected areas with chlorinated potable water, including a requirement that all wastewater generated from this process be collected and disposed of in accordance with the applicable law.
9. Procedures for removing and replacing affected soils.

A copy of the spill response plan shall be provided to the Engineer for review and comment prior to the commencement of any work. The Contractor shall submit to the Engineer a list of contact information for all supervisory personnel working on the

project, including a list of emergency contact numbers available for 24-hour assistance. The Contractor shall also coordinate with the Engineer and City to develop a list of individuals and agencies that must be contacted immediately in the event of a spill. Included on the list shall be the Persigo Wastewater Treatment Plant personnel, and the Colorado Department of Public Health and Environment Release and incident Reporting line: 1-877-518-5608. In the event of a spill, the Contractor shall report the spill to CDPHE and conform to all requirements of CDPHE Policy No. WQE-10.

C. In the event that the Contractor's work activities contribute to overflows, releases or spills, the Contractor shall immediately take the appropriate action to contain and stop the overflow, and notify the City of Grand Junction Wastewater Services at 970-256-4180 from 7:30 am to 4:30 pm, at 970-256-8333 after hours and holidays; if that line is busy, call non-emergency police dispatch at 970-242-6707; and as a last resort call police dispatch at 911. Clean up shall include collection and disinfection of the area affected by the spill to the satisfaction of the Engineer. Site-specific materials shall be used to retain and divert solids and divert flow from environmentally sensitive areas. Storm drains shall be covered to ensure that sewage does not reach the storm water system. Emergency response spill kits and other site-specific spill containment material shall be available on site at all times. An incident report including but not limited to cause of the release or spill, actions taken to mitigate the event and cleanup activities performed shall be submitted to the Engineer by the Contractor within 24 hours of completion of the cleanup activities.

PART 2 – MATERIALS

2.1 MATERIALS

A. Discharge piping will be selected according to flow calculations and system operating calculations. Suction piping will be selected according to pump size, flow calculations, and manhole depth based on manufacturer's specifications and recommendations.

B. Flexible hoses and associated couplings and connectors shall be abrasion resistant, suitable for the intended service, and shall be rated for the external and internal loads anticipated including test pressures. External loading design shall incorporate all anticipated traffic loadings, including traffic impact loading.

1. At a minimum, hose subject to traffic loading shall be composed of a system, such as traffic ramps or covers, but not limited to, capable of withstanding H-20 loading criteria. System shall be installed and maintained to meet H-20 loading requirements while in use or as directed by the Engineer.

C. Valves and fittings will be selected according to flow calculations, the pump sizes previously determined, and system operating pressures.

D. Plugs will be selected and installed according to the size of the line to be plugged, pipe and manhole configurations, and on a site-specific basis. All bypass systems

will have additional plugs in the event one plug fails. All plugs will be inspected prior to every use for defects which may lead to failure.

2.2 DELIVERY, STORAGE, AND HANDLING

A. Transportation, handling, and storage of the piping, fittings, pumps and ancillary equipment and materials shall be as recommended by manufacturer.

B. If new materials or equipment become damaged before or during installation, it shall be repaired by the Contractor as recommended by the manufacturer or replaced as required by the Engineer at the Contractor's expense, prior to initiating the WORK.

C. The Contractor shall deliver, store and handle other materials as required to prevent damage. Damaged materials shall be replaced by the Contractor at no additional cost to the City.

D. The Contractor shall inspect all materials and equipment for proper operation prior to initiating the WORK. Any equipment or materials identified by the Engineer which is indicated unsuitable for use by the Contractor for use on this project shall be replaced by the Contractor at no additional cost to the City.

PART 3 – EXECUTION

3.1 PREPARATION

A. The Contractor is responsible for locating any existing utilities in the area that the Contractor selects to locate bypass pipelines. The Contractor shall locate bypass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from the City. The Contractor is responsible for all costs associated with relocating utilities and obtaining permits.

B. The Contractor shall protect existing facilities from damage during pumping activities.

3.2 INSTALLATION

A. General

1. Plugging or blocking of flows in the line segments to be bypassed shall incorporate a primary and secondary plugging device. When plugging is no longer required for performance of the work, it is to be removed in a manner that permits flows to slowly return to normal without surge, surcharge or other major disturbance.
2. The bypass piping shall be located off streets and sidewalks as required. Where bypass piping crosses, or is installed in driveways, sidewalks and/or other public or private ways, the Contractor shall provide and maintain facilities to permit normal pedestrian and vehicular traffic reasonable access to concourses in accordance with the Contractor's approved traffic control plan from the

jurisdictional or governing authority.

3. Upon completion of the bypass pumping operations, the Contractor shall remove all piping and complete restoration, restoring all property to preconstruction condition including but not limited to pavement. The Contractor is responsible for obtaining any permits and/or permission for placement of the temporary pipeline within public and private properties.
4. Contractor shall not divert flow to new sewer or manhole prior to completion of the work as identified in the Contract Documents and as approved by the Engineer.

B. Piping

1. The pipe shall be assembled and joined at the site using couplings or flanges to provide a leak proof joint in strict accordance with the manufacturer's instructions and ASTM D 2657. Threaded or solvent cement joints and connections are not permitted.
2. All equipment and procedures used shall be used in strict compliance with the manufacturer's instructions and recommendations.
3. All joints shall be subject to acceptance by the Engineer prior to insertion.
4. Any section of the pipe having other defects of manufacturing or handling as determined by the Engineer shall be discarded and not used.

C. Cleanup and system removal

1. The Contractor shall restore bypass pump areas to pre bypass condition including any cleanup measures necessary due to fuel, coolant, oil, and sewage leaks. The Contractor shall document any cleanup measures that were necessary. The Contractor’s bypass plan and methods shall ensure that all sewage in the bypass pipes, pumps, and fittings has been emptied into the sanitary sewer and flushed with potable water or scrubbed with a “pig” device before system removal.

PART 4 – MEASUREMENT AND PAYMENT

1. MEASUREMENT

A. Measurement shall be by the lump sum to include all locations.

2. PAYMENT

Payment shall be by the lump sum and shall include payment for all design costs of bypass pumping system, pumping equipment, pipes, labor, valves, spill prevention plan and equipment, labor, mobilization, fuel, potable water for hydrostatic testing of bypass lines, road crossing devices, costs to restore area to existing condition and all other items necessary to conduct bypass pumping.

SECTION 105 – PIPELINE TESTING

Delete **Section 105.2**. The City of Grand Junction will not require the new sanitary sewer main to be pressure or leakage tested.

All sanitary sewer mains shall be deflection tested using a Mandrel and will be closed captioned (CCTV) inspected prior to final acceptance.

Appendix C

Geotechnical Soils Report

GEOTECHNICAL REPORT

CITY OF GRAND JUNCTION
2018 SEWER LINE REPLACEMENTS PHASE A
GRAND JUNCTION, COLORADO

March 21, 2018

Prepared for:

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TABLE OF CONTENTS

1.0 INTRODUCTION

DOWL conducted an evaluation of subsurface and site conditions on January 29, 2018 at selected locations along the Phase A sewer line route to be representative of the soil conditions in Grand Junction, Colorado. Our services were performed at the request of the City of Grand Junction (hereafter, "City"), to evaluate existing soil and groundwater conditions in support of DOWL's design of replacement sewer lines. The investigation consisted of a site reconnaissance, drilling of seven boreholes, logging and testing of representative materials, and analysis of available data. This report presents the findings of our evaluation and our geotechnical engineering recommendations for site preparation, excavation and design of the sewer line.

2.0 CONSTRUCTION PLANS

According to the City's RFP-4445-18-DH, the City's 2018 Sewer Line Replacement Phase A project involves the replacement of approximately 7,208 feet of sewer lines and appurtenances within the City limits, as indicated on Map 1 (Appendix A) and in Table 1 below (from page 13 of the RFP). According to plans provided to us, the depths of the existing sewer lines range from roughly 4.4 feet to 13.1 feet deep.

Table 1. Sewer Line Segments

Area	Main line Desc	Upstream	Upstream Desc	Downstream	Downstream Desc	Size	Footage
N. 7th Street	7th Street	E4-262-012	Wellington Ave.	E4-262-013	7th St. & Center Ave.	8"	295
N. 7th Street	7th Street	E4-262-017	North of Bookcliff	E4-262-013	7th St. & Center Ave.	8"	218
Center Ave.	Center Ave	E4-262-013	7th Street	E4-261-079	N. 6th Street	8"	306
S. 7th Street	Alley north of Winters	C3-262-011	830 Winters	C3-262-017	South 7th St	8"	660
Alley north of Winters	Alley north of Winters	C3-262-122	Alley north of Winters	C3-262-011	Alley north of Winters Ave.	8"	600
Alley north of 3rd Ave.	Alley north of 3rd Ave.	C4-262-072	1101 3rd Ave.	C4-262-045	9th Street	8"	960
Alley north of 3rd Ave.	Alley north of 3rd Ave.	C4-262-045	9th Street	C4-262-029	8th Street	10"	480
S. 8th Street	S. 8th Street	C4-262-029	8th & Alley north of 3rd Ave.	C4-262-031	8th St. at alley south of 3rd Ave.	10"	332
10th Street	10th Street	C3-262-068	Near 10th & Winters Ave.	C4-262-064	10th St. at alley north of 4th Ave.	8"	400
Alley north of 4th Ave.	Alley north of 4th Ave.	C4-262-064	10th St. at alley north of 4th Ave.	C4-262-048	9th Street	8"	480
Horizon Dr.	Horizon Dr.	G1-272-053	723 Horizon Dr.	G1-271-041	708 Horizon Dr.	8"	867
15th Street	15th Street	C4-271-021	D Road	C3-271-013	Winters Ave.	12"	1610
Total Footage							**7208**

3.0 SITE CONDITIONS

3.1 Site Overview

The project area is in the city limits of the City of Grand Junction, located in the Grand Valley of western Colorado, with the Colorado River on the southern side and I-70 on the northern margin of the project area. As seen on the Vicinity Map and Geotechnical Borehole Location Map (Map 1, Appendix A), the sewer line segments to be replaced are in three general areas: Horizon Drive near G Road, North 7th Street near Center Avenue, and the industrial area south of D Road between South 7th Street and South 15th Street. The table on Map 1 shows the five areas of sewer line replacements and the seven borehole locations chosen for subsurface testing within these segments. The following photographs were taken of two of the borehole locations to show typical conditions at the time of our field evaluation and the drill rig used for the investigation.

Photo 1 (left) is of borehole BH#1 along Horizon Drive near the Rodeway Inn and Photo 2 (right) is of borehole BH#3 in the alley that passes through the Munro Pump property.

All seven boreholes (BH#1-BH#7) were in commercial or industrial areas within the City. The following Table 2 summarizes the boreholes which represent the five (5) groups of sewer line segments shown on Map 1 (Appendix A).

TABLE 2
BOREHOLE LOCATIONS IN SEWERLINE SEGMENTS

Segment Group #	Segment Group Name	Borehole Number
1	Horizon Drive	BH#1
2	North 7th Street	BH#2
3	South 7th Street	BH#6
4	South 10th Street	BH#3, BH#4
5	South 15th Street	BH#5, BH#7

3.2 Geologic Setting

According to the *Geologic Map of the Grand Junction Quadrangle, Mesa County, Colorado* (USGS Map MF-2363, by Scott et al. 2002), most of the study area is mapped as undivided alluvium and colluvium of Holocene and late Pleistocene age (map unit Qac). The underlying bedrock is the Cretaceous Mancos Shale (Km), which is a gray to black, fissile, marine shale with thin beds of siltstone to fine sandstone. The thickness of this unit in the Grand Valley is about 4,000 feet and can be prone to landsliding and debris flows where steep slopes are exposed to concentrated runoff. Soils derived from the Mancos Shale can have moderate to high swelling potential due to the presence of expansive clays, but they can also be weak when saturated or dominated by silt. The undivided alluvium colluvium includes fine-grained (silt, clay and fine sand) slopewash deposits derived from nearby outcrops of Mancos Shale and coarser (sand and gravel) alluvium associated with river deposits. The soils found in our boreholes were consistent with this mapping and are discussed in the *Soil Characteristics* section of this report.

3.3 Site Topography

The project area is generally flat to gently sloping urban terrain. The elevation at the north end of the project area is 4,722 feet along Horizon Drive near I-70 and 4,572 feet at the south end along South 7th Street near the Colorado River. This is an elevation loss of 150 feet from north to south. Since this is an urban setting, most of the natural terrain has been modified from its original topography.

4.0 SOIL CHARACTERISTICS

4.1 Field & Laboratory Methods

Fieldwork conducted on January 29, 2018 consisted of site observations and drilling seven (7) exploratory boreholes using a CME 55 track-mounted drill rig. Boreholes were drilled along the existing sewer line alignments to depths ranging from 10.5 to 16.5 feet to determine subgrade conditions and collect representative samples. Drilling was performed using 4-inch diameter continuous flight solid-stem augers. Drilling and field sampling were performed in general accordance with the following standard specifications:

- "Standard Practice for Soil Exploration and Sampling by Auger Borings," ASTM D1452.
- Sampling with a two-inch O.D. split-barrel (split-spoon) per ASTM D1586, "Penetration Test and Split-Barrel Sampling of Soils."
- "Standard Practice for Description and Identifications of Soils (Visual-Manual Procedure)," ASTM D2488.

Soil type, thickness, consistency, and relative moisture content were observed and documented by a DOWL Geologist. Split-spoon samples and bulk samples were collected. As the drilling progressed, soil samples were taken for field classification and groundwater levels were measured after drilling and sampling were complete. All soil borings were backfilled with drill cuttings and patched with cold-mix asphalt, where needed. Soil samples were transported to

the DOWL laboratory where engineering property tests were conducted. Moisture contents were determined for every sample (taken at 3-foot intervals) and index testing of representative soil samples were performed according to the most recent ASTM or other procedures standard to the industry, listed in Table 3 below. Approximate boring locations are shown on Map 1 (Appendix A), borehole logs are in Appendix B, and laboratory results are in Appendix C.

TABLE 3
LABORATORY TEST METHODS

Test	Purpose of Test
Unified Soil Classification System ASTM D2487	Classifies soils based on general index testing.
Natural Moisture Content ASTM D2216	Provides a measure of natural (in-situ) water content.
Atterberg Limits ASTM D4318	Provides an indicator of the consistency and swell potential of clay soils.
Particle-Size Distribution ASTM C117/136/D421	Provides a measure of grain sizes of the soils for classification and identification of physical characteristics.
Sulfates and Chlorides CDOT CP-L 2103 and 2104 Method B	Provides measures of corrosive effects of the soils on buried metals and concrete.
pH and Electroconductivity ASTM G51	

During the augering process, Standard Penetration Tests (SPT) were performed every 3 feet starting at a depth of 3 feet below existing grade using a standard 1.375-inch inside diameter (I.D.) split-spoon sampler without liners driven with a 140-pound hammer in general accordance with ASTM D1586. During the tests, samples were obtained by driving the sampler 18 inches into the soil with a hammer free falling 30-inches. The number of blows required for each 6-inches of penetration was recorded. The field N-value of the soil is recorded as the number of blows required for the final 12-inches of penetration. The field N-value provides a measure of relative density of granular soils and estimation of relative consistency of cohesive soils. It should be noted that the presence of cobbles or boulders may result in relatively high blow counts that may not properly characterize the in-situ relative density.

Site conditions may be variable and actual soil conditions encountered in excavations may differ somewhat from those represented in the borehole logs. Final borehole logs contain factual and interpretive information. Horizontal lines on these borehole logs, designating the interface between differing materials encountered, represent approximate boundaries. The transition between soil layers is typically gradual.

4.2 Subsurface Exploration

The seven (7) borings (BH#1 - BH#7) were drilled to depths of 10.5 to 16.5 feet at the approximate locations shown on Map 1 (Appendix A). The locations of the borings were selected to be representative of each of the sewer line segments and the depths were related to anticipated sewer line embedment depths. Our findings and recommendations are based on materials found within these profile depths. Soil conditions may change between boreholes and below these depths. During construction, DOWL should verify continuity of soil conditions and the validity of our recommendations.

As seen in the borehole logs (Appendix B), the soil conditions in the three general areas of sewer line segments are somewhat different. The following is a summary of the soils found in these three areas:

1. **Horizon Drive Near G Road** – (BH#1) In the borehole BH#1 on the north side of Horizon Drive near the eastern entrance to Rodeway Inn, we found 6.5 feet of firm to stiff, reddish-brown silty/sandy clay that transitioned to very stiff to hard, gray, formational Mancos Shale to 16.5 feet. An N-value of 7 blows per foot (bpf) was recorded in the soil at 3 feet, while N-values of 29 to 78 bpf were recorded in the weathered shale. No groundwater was found in this borehole and the hole was terminated at a depth of 16.5 feet.

2. **North 7th Street near Center Avenue** – (BH#2) In the borehole BH#2 at the southwest corner of North 7th Street and Center Avenue, we found 3-inches of asphalt underlain by about 6-inches of roadbase gravels near the edge of the parking lot. This fill was underlain by reddish-brown clay with some gravel that was possible fill to 2 feet. From 2 to 6 feet was brown, soft to very soft, moist to very damp, clay with a wet seam at 4 feet. From 6 to 13.5 feet was brown, soft to firm, moist, clayey silt with fine sand. An N-value of less than 1 bpf was recorded above 6 feet, which indicates very soft conditions. N-values below 6 feet were 4 to 5 bpf, which is also soft. No groundwater or shale bedrock was found in this borehole and the hole was terminated at a depth of 13.5 feet.

3. **Industrial Area between S. 7th and S. 15th** – (BH#3 – BH#7) for the five boreholes in the industrial area, we generally found silty clay, lean clay and fat clay in the upper 4 to 10.5 of the soil profile underlain by silty sand, sand and sandy gravel. N-values in the clayey and sandy soils ranged from less than 1 to 11 bpf, but it was typically around 4 bpf. The sandy gravels found near the bottom of boreholes BH#3 and BH#4 had N-values of 40 and 28 bpf, respectively. No large gravels, cobbles, or shale bedrock was found in any of the boreholes to a depth of 10.5 feet, which is the depth that all boreholes in this area were terminated. No groundwater was found in BH#7, but groundwater was measured to be at 6.5 feet in BH#3, 5.0 feet in BH#4, 9.5 feet in BH#5, and 6.5 feet in BH#6.

The following photographs are representative of the native soils obtained during our drilling of the sewer line.


Photo 1 (left) shows the weathered shale found below 6.5 feet in BH#1 along Horizon Driver and Photo 2 (right) is the clay soil from a depth of 3 to 4 feet in BH#4 in the industrial portion of the project.

4.3 Bedrock

As mentioned in the Geologic Setting section, the Mancos Shale Formation is a marine shale with minor strata of siltstone and limestone. Shale bedrock was only encountered in the northern-most borehole (BH#1) at a depth of approximately 6.5 feet below grade. Mancos Shale in the region is generally thinly bedded and highly weathered in the upper 5 to 10 feet, as was found in BH#1, and is typically moderately plastic with moderate to high swell potential. The residual bedrock soils typically exhibit low to high swell and moderate to high collapse potential due to the fine-grained silty clay to clayey silt soils.

4.4 Groundwater

Groundwater was not encountered in BH#1, BH#2 and BH#7. However, it was measured in the other four boreholes as summarized in Table 4.

TABLE 4
GROUNDWATER SUMMARY

Borehole	Segment	Depth to Groundwater
BH#3	S. 10th Street	6.5 feet
BH#4	S. 10th Street	5.0 feet
BH#5	S. 15th Street	9.5 feet
BH#6	S. 7th Street	6.5 feet

Groundwater and soil moisture conditions will likely fluctuate in response to seasonal precipitation, runoff, snowmelt, and landscape irrigation. Additionally, pavement construction restricts air/soil moisture transfer (evapotranspiration) in arid climates and subsequently increases soil moisture.

4.5 Laboratory testing

Laboratory tests were performed on the predominant native soil types to evaluate the range of physical and chemical soil characteristics (Appendix C and summarized in Table 5 below). The borehole logs (Appendix B) also contain the laboratory results shown at each depth the samples were obtained. In-situ moisture contents were determined at 3-foot increments in all boreholes and Atterberg limits, gradation analyses, and corrosivity series tests were performed at various depths on representative samples. Borehole BH#1 was the only borehole with formational shale encountered at 6.5 feet, while all other boreholes contained primarily fine-grained soils such as clays to silty clays, silty to clayey sand, and some clayey to sandy gravel at depth.

Table 5 - Laboratory Results Summary

Bore-hole #	Sewer segment	Sample ID	Sample Depth (ft)	Ground-water (ft)	N-value (blows per foot)	USCS Soil Classi-fication	In-Situ Moisture Content	Atterberg Limits			Gradation Analysis				Chemical Properties			
											%	%	%	%	Water Soluble Sufates	Chlor-ides	Electro-conduc-tivity	pH
							(%)	LL	PL	PI	Gravel	Sand	Silt	Clay	(%)	(%)	(uS/cm)	
BH#1	Horizon Dr	DS1	3-4.5		7	CL	13.9											
		DS2	6-7.5		29	CL/shale	13.9	41	21	20	0.1	19.7	35.5	44.7				
		DS3	9-10.5		78	shale	12.8								0.70	0.021	320	6.9
		DS4	12-13.5		53	shale	11.9											
		DS5	15-16.5	NG	54	shale	10.9											
BH#2	N. 7th St	DS6	3-4.5		<1	CL	22.4											
		DS7	6-7.5		4	SC	13.6								0.03	0.001	50	7.4
		DS8	9-10.5		5	SM/CL	18.2	24	16	8	0.0	15.2	54.0	30.8				
		DS9	12-13.5	NG	4	CL	18.6											
BH#3	S. 10th St	DS13	3-4.5		11	CH	20.9	52	19	33	0.0	1.4	18.6	80.0				
		DS14	6-7.5	6.5	<1	CL	14.5											
		DS15	9-10.5		40	GC	13.2											
BH#4	S. 10th St	DS16	3-4.5		7	CL	20.2	45	18	27	0.0	1.7	23.9	74.4	0.69	0.024	412	7.7
		DS17	6-7.5	5	1	SM	28.4											
		DS18	9-10.5		28	SC	13.5											
BH#5	S. 15th St	DS19	3-4.5		4	CL	20.8											
		DS20	6-7.5		6	CL	26.4	38	17	21	0.0	4.4	29.3	66.2				
		DS21	9-10.5	9.5	6	SC	25.5											
BH#6	S. 7th St	DS10	3-4.5		4	CL	31.7											
		DS11	6-7.5	6.5	4	CL	NR											
		DS12	9-10.5		5	SM	34.0	NP	NP	NP	0.0	66.6	22.6	10.8				
BH#7	S. 15th St	DS22	3-4.5		6	CL	24.8											
		DS23	6-7.5		9	CL	25.7	47	19	28	0.0	0.6	14.9	84.5				
		DS24	9-10.5	NG	7	CL	24.0											

NOTES: LL=Liquid Limit PL=Plastic Limit PI=Plasticity Index NP=Non-Plastic NR=No Recovery NG=No Groudwater

Five of the seven samples classify as lean to fat clays (CL to CH) and have liquid limits (LL) of 38 to 52, plastic limits (PL) of 17 to 21, and plasticity indices (PI) of 20 to 33. Gradation analyses performed on these samples indicate that the fine-grained soils common in all the boreholes are composed of 45 to 85% clay, 15 to 35% silt, 1 to 20% sand. A sandier sample from BH#2 has a liquid limit of 24, a plastic limit of 16, and a PI of 8, while another sandy sample from BH#6 was found to be non-plastic. A soil with a PI over 30 and a Liquid Limit over 50 is a fat clay and can be expected to have a high probability of changing volume with changes in moisture content. The sample DS13 from BH#3 was the only soil tested to be a fat clay, while all other clayey samples were found to be lean clays (CL) with low to moderate swell potential. A soil with a PI of between 15 and 30 is considered to have moderate potential for swelling or shrinking, a soil with a PI of less than 15 is considered to have a low potential for swelling when wetted and shrinking when dried, and a soil that is non-plastic has very low potential for swelling and shrinking with changes in moisture content and has little or no

cohesion. This wide range of PI's and swelling potential is typical of the fine-grained soils in the Grand Valley that are derived from Mancos Shale.

SPT N-values of the weathered shale of BH#1 range from 29 to 78 blows per foot (bpf), which indicates hard conditions, despite the thinly bedded nature of the shale. However, the weathered Mancos Shale is generally rippable with an excavator and weathers/degrades rapidly upon exposure to air and water. The dominant fine-grained soils (CL, CH, SM, SC) have much lower N-values, as seen in Table 6, and are typically on the order of 1 to 6 bpf. This indicates very soft to firm conditions. When groundwater was encountered, the N-values dropped, sometimes to "weight of hammer," which means very soft conditions that do not provide resistance to the loaded weight of the sampler. It is important to note that most of the moisture contents, taken at 3-foot intervals, indicate soil moistures that exceed their plastic limit, indicating they are in an expanded, soft and plastic state. These are winter time moisture contents and it is anticipated that moisture contents will be even higher during the spring and summer months when there is regional irrigation and more precipitation. When clayey to sandy gravels were encountered at a depth of 8.5 feet in BH#3 and BH#4, N-values of 28 and 40 bpf were recorded, indicating moderately dense to dense conditions.

A series of geochemical tests were conducted on bulk soil sample DS1, taken from BH#1, BH#2 and BH#4. The soil samples had water-soluble sulfate concentrations of 0.03% to 0.70%, chloride contents of .001 to 0.024 ppm, electro-conductivities of 50 to 412 µS/cm, and pH ranging from 6.9 to 7.7. The water-soluble sulfates content and electro-conductivity are indicators of relative soil corrosivity. Recommendations for addressing the corrosive nature of the soil are presented below.

5.0 ENGINEERING ANALYSES & RECOMMENDATIONS

Based upon our limited site evaluation and results of our subsurface testing, the following results of our analyses and recommendations are offered to enhance the long-term performance of the sewer line soils and site improvements.

5.1 Utility Excavations

Based on the materials encountered in the soil borings, conventional earthmoving equipment should be capable of excavating the site soils along the proposed sewer line alignments. Even the local bedrock (Mancos Shale), found in the northern BH#1 along Horizon Drive, is anticipated to be excavated using conventional equipment.

5.1.1 Trench Excavations

1. Depending on the time of year, groundwater or very moist soil conditions from capillary rise and poor surface drainage may be encountered at planned excavation depths along the alignments. We strongly recommend dewatering in all areas where wet or saturated soil conditions are encountered prior to pipeline installation. Dewatering may require installation of sumps, shallow wells, or well points. Groundwater must be lowered below the trench bottom to allow for compaction of subgrade and bedding material. All excavations should be approved by a qualified observer prior to backfill placement.

2. Trench floor instability may include soft or yielding conditions due to saturated clay soil, or by loss of support of granular soils due to saturated conditions. Generally, trench floor instability is not a problem if groundwater is not present. Instability can be minimized by properly dewatering prior to excavation. If saturated granular soils are encountered, the trench should be dewatered to a minimum of 2-feet below the trench bottom elevation and the granular soils compacted or replaced with suitable backfill materials. If soft or yielding clay soils are encountered, the clay should be removed from the trench and replaced with suitable backfill materials. Alternately, trench floor instability may be limited by over-excavation of the trench bottom an additional 2-feet followed by replacement with pit run structural fill. A separation/stabilization fabric is recommended at the base of the 2-foot over-excavation to prevent fines migration into the pit-run gravel. A geotextile fabric such as Mirafi 140N or equivalent is recommended for this purpose.

3. The above-described over-excavation and replacement with structural fill and geotextile fabric may also be considered to reduce potential vertical soil movement beneath pipelines.

4. Where excavations are dewatered from within the trench, the trench floors and walls will remain saturated, increasing the risk for trench collapse. Therefore, extreme caution should be used during construction dewatering to ensure that adjacent structures are not damaged. Dewatering saturated fine-grained soils may initiate consolidation of load bearing soils and contribute to potential differential settlement of foundations. We strongly recommend pre-construction surveys be conducted on nearby structures to document existing structural conditions prior to dewatering. Observation wells may be needed to monitor water levels prior to construction and anticipate water conditions that may be encountered during trench excavation.

5. All excavations must conform to OSHA *Standards for Excavations*, 29 CFR Part 1926.652 Appendix B to Subpart P. Based on our evaluation, most of the soils across the site are classified as Type C using the OSHA classification system due to the predominately weak, fine-grained soils that are moist to wet. However, soil types may vary over the project area. In fact, the dry shale soils encountered in BH#1, would classify as OSHA Type A soils due to their cohesive nature and dry conditions. The remainder of the project area should be considered to have Type C soils, which require excavation slope angles not to exceed 1½H:1V (Horizontal to Vertical). Our assessment is based upon the soil and groundwater conditions found in our limited evaluation and sampling. The contractor's "competent person" (defined by OSHA as "an individual capable of identifying existing and predictable hazards…and who has the authorization to take prompt corrective measures to eliminate or manage these hazards and conditions") should evaluate the soil materials exposed during excavation based on composition, structure, and environmental conditions per 29 CFR 1926 and recommend appropriate slope laybacks or shoring, as required. Refer to OSHA's Technical Manual on *Excavations: Hazard Recognition in Trenching and Shoring* (*www.osha.gov*) for further excavation guidelines.

6. Due to space constraints or to minimize excavation extents, trench boxes may be utilized. Trench boxes must conform and be utilized according to OSHA regulations.

7. In locations where the proposed pipeline alignment is near existing structures, temporary shoring may be required. If temporary shoring is required, shoring methods should be designed by a Professional Engineer registered in Colorado.

5.1.2 Special Soil Conditions

At various locations along the existing sewer line alignments, soils were encountered that have the potential for vertical movement upon increases in moisture content, specifically swell-related heave. Even with subgrade improvement, swell related movement may be experienced by the sewer lines and/or appurtenances if water can saturate the underlying expansive soils.

Expansive Soils - Expansive soils were encountered throughout the project area. In most locations, potential movement should be minimized by overburden pressure or the presence of groundwater. However, in locations where fat clays are the predominant soil type and in-situ moisture contents are relatively low (compared to saturated moisture contents), differential vertical movement of the pipelines or associated appurtenances such as manholes on the order of ½-inch can be expected in the upward direction if water infiltrates the soils beneath the pipeline and/or appurtenances. Fat clays were encountered in BH#3 and clays with high liquid limits were also found in BH#4 and BH#7. It should be noted that the magnitude of vertical movement is highly dependent upon depth of bury and in-situ soil swell pressures.

If anticipated vertical movements due to swelling soils are beyond the tolerable limits of the pipeline, we recommend the following to limit potential vertical movement.

1. Water accumulation in bedding material must be prevented. Failure to prevent water accumulation in bedding soils may result in swell-related movement.

2. If water infiltration/accumulation cannot be adequately controlled, we recommend subgrade improvement consisting of removal of moisture sensitive soils to a minimum depth of 2-feet below the bottom of the pipeline or appurtenances or to non-expansive material, whichever is less and replacement with structural fill or other approved non-expansive material.

5.1.3 Fill Material

1. Excavated site soils, excluding organic topsoil, deleterious materials, debris, and high plasticity clays (CH classification per USCS), may be utilized as trench backfill.

2. Care will be required to separate different soil types during excavation. Failure to properly separate distinctly different soil types will result in a variable soil mixture that may be difficult to place in accordance with moisture and density requirements.

3. Due to in-situ moisture contents it may also be necessary to dry excavated soils prior to backfilling operations.

4. Due to potential construction difficulties and vertical soil movement or if compaction testing is not possible at deeper excavation depths, importing select granular material in place of the potentially problematic fine-grained site soils should be considered.

5. Imported fill should be comprised of relatively well graded sand and gravel mixtures meeting the following requirements:

TABLE 6
GRANULAR/STRUCTURAL FILL RECOMMENDATIONS

Gradation	% finer by weight
2-inch	100
No. 4 sieve	50–100
No. 200 sieve	25 maximum
Liquid Limit/Plasticity Index	25/10 maximum

6. Additionally, past fill areas that are encountered during construction may create exceptions to the soil conditions identified herein.

5.1.4 Fill Placement and Compaction

1. Fill material should be placed in 6 to 8-inch loose lifts, moisture-conditioned to near optimum moisture content, and compacted to at least 95% of ASTM D 698 maximum dry density.

2. A representative of DOWL should be called out to the site to observe placement of structural fill and verify the compacted density. The City should contact DOWL in advance of the excavations to discuss the specific testing requirements, budget, and scheduling needed for these services

3. If density tests taken in the fill indicate compaction is not being achieved, fill should be scarified or removed, moisture-conditioned to within ±2 percent of optimum moisture content, and re-compacted and re-tested.

4. No fill should be placed in a frozen condition or over frozen ground.

5.1.5 Pipe Bedding

1. Competent pipe bedding material serves to support the pipe and the overlying trench backfill material and provides protection to the pipe from large rocks and construction equipment during backfilling of the trench. As such, the pipe bedding material should have the following characteristics:
    - High strength and low compressibility - to minimize pipe deflections from loading by the backfill materials; and
    - Easily placed and compacted - to facilitate placement of the material

under the haunches of the pipe where access with compacting equipment is difficult.

2. The bedding material should have no large stones that could damage the pipe during placement, and it should be non-moisture sensitive so that moisture that may be present in the bottom of the trench will not adversely affect the bedding.

3. A minimum of 6 inches of imported bedding material should be placed under the pipe, across the entire width of the trench, up to 9 inches above the top of the pipe, and a minimum of 1 to 1½ feet on each side of the pipe as specified for the pipe type.

4. Imported bedding material should consist of clean sand, washed, or crushed stone or gravel having 100% passing ¾ inch sieve and 5% maximum passing the #200 sieve or be approved by the project engineer. The bedding material should be workable enough to allow for proper installation at the design grade and position.

5. The aggregate shall be free from organic matter, lumps or balls of clay or other matter which would allow vertical movement upon saturation.

6. Bedding placement should conform to the City of Grand Junction specifications and any project special provisions.

7. Pipe joints should be held secure during the initial backfilling to help maintain the desired alignment and integrity of the system.

8. Bedding should be placed to fill any voids adjacent to the pipe, leveled, and thoroughly compacted by tamping, vibration, rodding, or by a combination of these methods.

9. Special effort may be required to compact the material under the pipe "haunches", to provide adequate support to the pipe. Hydro-compaction methods are not recommended.

10. As an alternate to granular pipe bedding, flowable fill lean concrete may be utilized, provided the following precautions are taken:

    - Flowable fill should not be allowed to freeze before attaining adequate strength.
    - Flowable fill should not be placed on frozen ground.
    - A pipe flotation analysis should be performed and proper anchors utilized, as necessary.
    - An approved mix design should be utilized to ensure adequate strength.
    - Proper cement type should be utilized in areas prone to sulfate attack.
    - Flowable fill should not be placed below groundwater without proper dewatering.

5.2 Street Considerations

5.2.1 Pavement Section

1. The existing road section specified by the City of Grand Junction should be replicated over the replaced sewer line segments with special care to achieve sufficient compaction to minimize fill settlement.

2. Due to the low strength and poor support characteristics exhibited by the subgrade soils, the native soils are susceptible to environmental effects such as swelling and frost heave. These environmental effects must be accounted for in the pavement section.

3. A combination of separation/stabilization fabric and geogrid is strongly recommended between the pavement section and subgrade to both reduce the potential for fines migration into pit-run and crushed aggregate base and to provide an increased level of support for the pavement section. Due to the ability to provide high strength at small strains, a woven fabric such as Mirafi RS 280i or equivalent is recommended.

4. In areas that are to be patched due to construction within an existing street, the appropriate geotextile/geogrid should be placed beneath a street patch conforming to the recommended pavement section specific for the given location or matching the existing pavement section, whichever is greater. The existing pavement should be saw-cut a minimum of 2 feet from the excavation edge and the pavement and base course removed. A geotextile/geogrid should be placed from pavement edge to pavement edge. If existing geotextile/geogrid is encountered beneath the pavement section, care should be taken to cut the material at the excavation edge, allowing for the existing and new geotextile/geogrid to overlap the above described distance. Geotextile/geogrid utilized beneath street patches should be continuous in the longitudinal direction. If more than one roll of material is required, rolls should be overlapped a minimum of 2 feet.

5.2.2 Street Site Clearing and Subgrade Preparation

1. Site preparation should consist of stripping the existing vegetation and loose surficial materials adjacent to the pavement area and removing the existing asphalt. Low ground pressure equipment may be required depending on field conditions during the time of construction.

2. All exposed subgrade surfaces should be free of mounds and depressions, which could prevent uniform compaction. If previously placed fills, obstructions, or deleterious materials are encountered during site clearing or grading, such features should be completely removed and the excavation thoroughly cleaned prior to placement of fill. Existing fill comprised of dense coarse-grained soils will not require removal provided such fills are free of organics and deleterious materials.

3. Subgrade, pit-run, and crushed aggregate base should be graded to drain. Saturation of base materials will substantially reduce the pavement life expectancy.

4. A collection system with proper grading should be incorporated into the streets to collect and convey surface water and prevent ponding.

5. All exposed soils that will receive base materials should be scarified to a minimum depth of 6 inches, conditioned to near optimum moisture content, and re-compacted to 95% of ASTM D 698. Materials which do not exhibit a typical well defined moisture density curve, should be compacted to 70% relative density according to ASTM D 4253 and D 4254. Fill or paving should not be placed on frozen or improperly moisture conditioned subgrade.

6. Temporary dewatering may be required during placement of base materials if shallow groundwater is encountered. We strongly recommend dewatering prior to construction if this situation arises. Dewatering may require installation of sumps, shallow wells, or well points. The groundwater surface elevation should be controlled to a minimum of 2-feet below the bottom of all subgrade finish elevations to ensure proper compaction of natural subgrade and fill materials.

7. Depending on final grades, subgrade soils may be soft and moist to wet, particularly during times of elevated precipitation. The use of heavy equipment may cause rutting or pumping of the wet subsoils.

8. If compaction or proof-rolling (static wheel rolling to an unyielding state) of subgrade soils is not practical due to excessive moisture or if the contractor's use of excessively heavy equipment causes pumping/rutting or an otherwise "failed" subgrade, the subsoils should be over-excavated with low-ground pressure equipment to a depth of 2 feet and replaced with compacted pit-run type material.

9. A geogrid meeting the following specifications in conjunction with a woven separation/ stabilization fabric such as Mirafi RS 280i is recommended at the base of the 2-foot over-excavation to both provide increased support and to prevent fines migration into the pit-run gravel. An intermediate geogrid layer may be considered at the midpoint of the pit-run material to provide additional support as determined by the Geotechnical Engineer during construction. The recommended pavement section may be placed on the improved subgrade. If the above-described conditions are anticipated over the majority of the project site, the aforementioned subgrade improvement may be incorporated into the selected pavement section for the entire street.

5.2.3 Street Fill Materials

1. In general, pit-run gravel composed of well-graded sand and gravel mixtures and free of organics and deleterious materials may be used as street fill. Particles larger than 2-inches in diameter will impede compaction and should be removed.

2. As an alternative, site soils consisting of low plasticity clay, silt, and sand may be used as fill material; however, use of these materials may reduce the life of the proposed street due to vertical soil movement because of moisture and loading sensitivity.

3. Table 7 offers a specification for street fill material:

TABLE 7 PIT RUN/STREET FILL SPECIFICATION	
Gradation	**% finer by weight**
2-inch	100
No. 4 sieve	50–100
No. 200 sieve	25 maximum
Liquid Limit/Plasticity Index	25/10 maximum

4. Crushed aggregate base should conform to the following requirements in Table 8 or be approved by the project Geotechnical Engineer:

TABLE 8 CRUSHED AGGREGATE BASE SPECIFICATION	
Gradation	**% finer by weight**
1½ inch	100
1 inch	90-100
½ inch	60-85
No. 4 sieve	45-65
No. 8 sieve	33-53
No. 200 sieve	3-12
Liquid Limit/Plasticity Index	25/6 maximum

5. Coarse-grained aggregate associated with fill should consist of hard, durable particles that do not breakdown when alternately frozen and thawed or due to moisture content increases.

5.2.4 Street Fill Placement and Compaction

1. Fill material should be placed in 6 to 8-inch loose lifts, moisture-conditioned to near optimum moisture content, and compacted to at least 95% of ASTM D 698.

2. If density tests taken in the fill indicate compaction is not being achieved, fill should be scarified or removed, moisture-conditioned to within ±2% of optimum moisture content, and re-compacted and re-tested. No fill should be placed over frozen ground.

5.2.5 Street Minimum Maintenance Program

To facilitate reaching the desired performance period, we strongly recommend an engineered maintenance program. This program should include items such as crack sealing, chip/slurry sealing, milling and replacement, and concrete slab replacement. The following Table 9 is a general maintenance program that should be followed, at a minimum. Following construction, we recommend development of a more detailed and project specific maintenance program.

TABLE 9 STREET MAINTENANCE PROGRAM		
Year	**Flexible Alternatives**	**Rigid Alternatives**
0	construction	construction
5	Chip/slurry seal	--
10	seal cracks	reseal joints
15	Chip/slurry seal	--
20	mill and replace 2 inches – full width	5% slab replacement and reseal joints
25	seal cracks	--

5.3 Soil Corrosivity & Concrete Protection

1. The water-soluble sulfates tests on three samples of native soil collected in BH#1, BH#2 and BH#4 indicate negligible to severe corrosive potential (0.03 to 0.70%) according to the Portland Cement Association. Therefore, we recommend that the cementitious material requirements for Class 0 sulfate exposure in Section 601.04 of CDOT's *Specifications for Road and Bridge Construction* publication be consulted and followed for any concrete used at this site.

2. We recommend all exterior concrete contain 5% to 7% entrained air to provide resistance to freeze-thaw deterioration. If constructed during cold weather, concrete should not be allowed to freeze until adequately cured and necessary strength is attained.

5.4 Construction Observations

A representative of DOWL should observe construction of any utility or pavement elements recommended in this report. Recommendations in this report are contingent upon our involvement. If any unexpected soils or conditions are revealed during construction, Geotechnical personnel of DOWL should be notified immediately to observe conditions and make necessary modifications.

6.0 CLOSING CONSIDERATIONS

6.1 Standard of Care and Interpretation of Subsurface Data

These services have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the geotechnical engineering profession currently practicing in this area under similar time and budgetary constraints. Evaluation of environmental contaminants was not part of our scope of services performed at this site. The classification of soils and interpretation of subsurface conditions is based on our training and years of experience, but is necessarily based on limited subsurface observation and testing. As such, inferred ground conditions cannot be guaranteed to be exact. No other warranty, express or implied, is made.

Observations of the excavation(s) subgrade by DOWL prior to erection of the foundation system are integral parts of these recommendations. If subsurface conditions differing from those described herein are discovered during excavation, construction should be stopped until the situation has been assessed by a representative of DOWL. Construction should be resumed only when remedies or design adjustments, as necessary, have been prescribed.

Samples of soil and rock collected during our geotechnical evaluation(s) are routinely held in our laboratory for a period of three months from the date of the evaluation and then are discarded. A written request by the City is required for samples to be stored for a longer period.

6.2 Limitations

The conclusions and recommendations presented in this report assume that the nature of the project is consistent with assumptions presented herein and that site conditions are not substantially different from those exposed by the explorations. If during construction, subsurface conditions are observed or appear to be present that are different from those encountered in the explorations, DOWL geotechnical staff should be advised promptly so that those conditions can be reviewed and recommendations reevaluated, where necessary. DOWL geotechnical personnel should review all final designs to verify that recommendations provided herein have been properly implemented.

If there is a substantial lapse of time between submission of this report and the start of work, and if conditions have changed due to natural causes or construction operations, DOWL should review this report to determine the applicability of the conclusions and recommendations considering the changed conditions.

This report was prepared for use by the City and their representatives. It should be made available to prospective contractors for information on factual data only and not as a warranty of subsurface conditions.

This report, including engineering analyses, recommendations, figures, and design schematics are exclusive to the above referenced site. Under no circumstances shall the figures or

subsurface logs be separated from the text and used independently. Recommendations in this report are not applicable to other construction sites.

Any conclusions by a construction contractor or bidder relating to construction means, methods, techniques, sequences, or costs based upon the information provided in this report are not the responsibility of the Client or DOWL.

6.3 Additional Services

To provide continuity and consistency from project start to finish, we should be retained to make observations and carry out material testing as a service to the owner. As noted above, we recommend the owner contact DOWL to discuss required services and scheduling in advance of the construction phase. DOWL is a full-service engineering firm. Please visit **www.dowl.com** for a full description of our services.

Thank you for the opportunity to perform this geotechnical evaluation for you. If you require any of the above services or have any questions regarding this report, please contact us.

Respectfully Submitted
ELECTRONICALLY,
DOWL, LLC

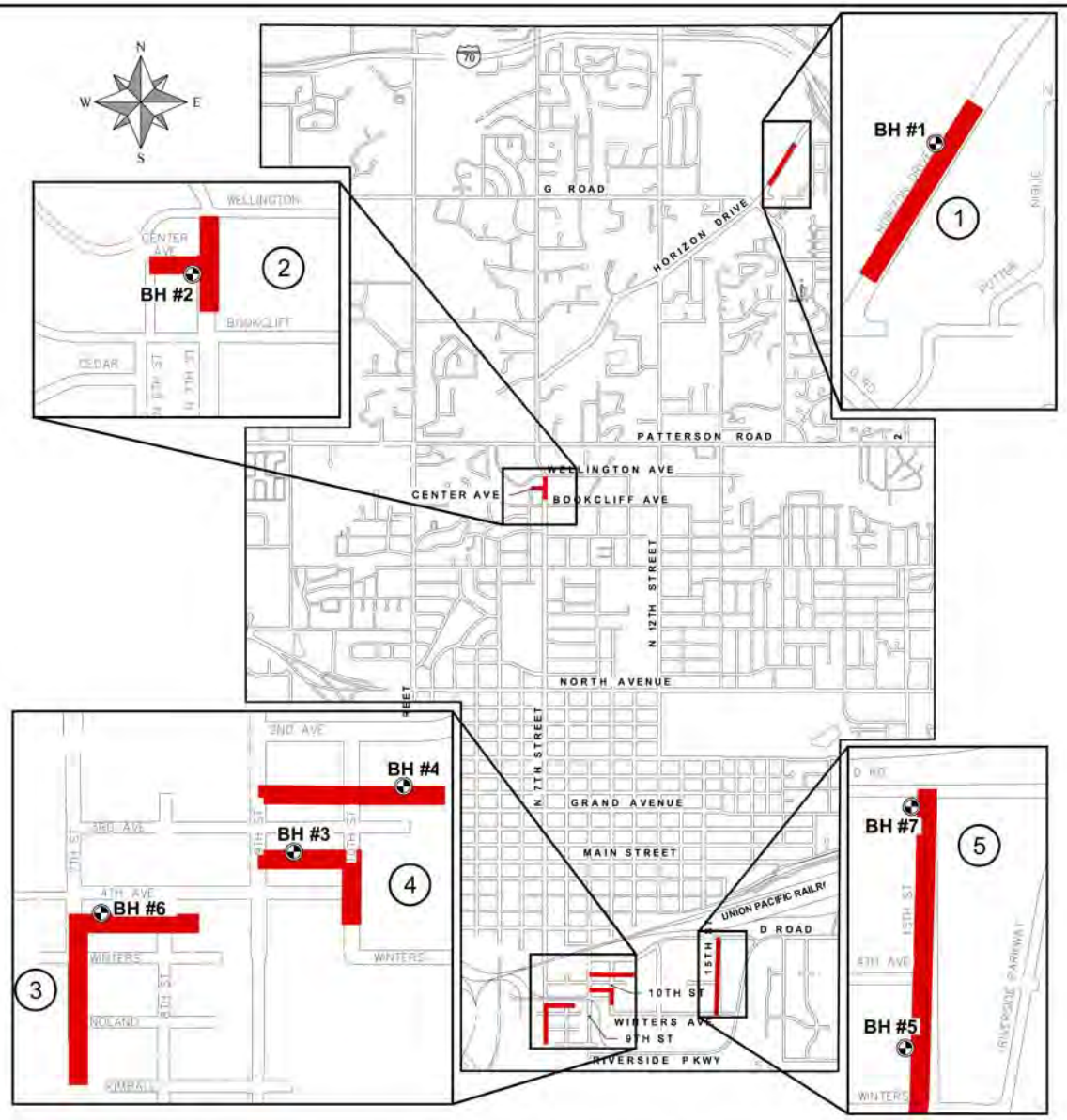
Laurie J. Brandt, C.P.G.
Certified Professional Geologist

Reviewed by:

Daniel C. Quigley, P.E.
Professional Engineer

APPENDIX A - PROJECT MAPS

PROJECT NO. 4445-18-DH



PROJECT LOCATION KEY NOTES

	Project Description and Location	Borehole No.
1	Horizon Drive Sewer Replacement • From 723 Horizon Drive to 708 Horizon Drive	BH #1
2	7th Street Sewer Replacement (North) • From Wellington Avenue to North of Bookcliff Avenue • West along Center Avenue	BH #2
3	7th Street Sewer Replacement (South) • Alley north of Winters Avenue and south along S. 7th Street	BH #6
4	10th Street Sewer Replacement • Alley north of 3rd Avenue and east of 9th Street • Alley north of 4th Avenue and east of 9th Street to 10th Street and along 10th Street to alley north of Winters Avenue	BH #4 BH #3
5	15th Street Sewer Replacement • From Winters Avenue to D Road	BH #5 BH #7

FIELD DATE: JANUARY 29, 2018

0 300 600 1200

SCALE: 1" = 1200'

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City of Grand Junction Colorado

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENTS – PHASE A
VICINITY MAP AND
GEOTECHNICAL BOREHOLE LOCATION MAP

MAP 1

APPENDIX B - BOREHOLE LOGS

Log of Borehole #1 (BH#1)

BOREHOLE LOCATION: Horizon Drive at Rodeway Inn by Shell Station (in grassy area by sidewalk)

DRILLING COMPANY: HRL / Chancy | DRILL RIG: CME 55

SAMPLER: Standard SSS | DRILL STEM: 4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							reddish-brown, dry, firm to stiff, silty/sandy CLAY (0-6.5')	
		STD	DS1	4, 4, 3	7	7		DS1 @3-4.5' (CL) MC=13.9%
5							harder drilling at 5' (possibly weathered shale)	
		STD	DS2	13, 13, 16	29	29		DS2 @6-7.5' (CL) LL=41 PL=21 PI=20 gravel=0.1% sand=19.7% silt=35.5% clay=44.7% MC=13.9%
		STD	DS3	23, 28, 50	78	78		DS3 @9-10.5' (CL) water soluble sulfates=0.70% chlorides=0.021% Electro-conductivity=320 µS/cm pH=6.9 MC=12.8%
10							dry, v. stiff to hard, gray, weathered Mancos SHALE, salts (6.5-16.5')	
		STD	DS4	16, 24, 29	53	53		DS4 @12-13.5' (CL) MC=11.9%
15								
		STD	DS5	24, 24, 30	54	54		DS5 @15-16.5' (CL) MC=10.9%
							shale bedrock at 6.5' end of hole at 16.5' no groundwater encountered	
20								
25								

Borehole Log 1 of 7	Field Staff	LB/JLH	2018 Sewer Line Replacement Phase A Grand Junction, Colorado
	Drafting Staff	SJ	
	Field Date	1/29/2018	
	Project #	7122.74831.01	

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Log of Borehole #2 (BH#2)

BOREHOLE LOCATION: southwest corner of N. 7th & Center Ave.

DRILLING COMPANY: HRL / Chancy | DRILL RIG: CME 55

SAMPLER: Standard SSS | DRILL STEM: 4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							~3" asphalt ~6" road base	
2							reddish brown CLAY, some gravel, possible fill above 2' (0.75-2')	
4		STD	DS6	push/1	<1	<1	brown, soft to very soft, moist to very damp, CLAY (2-6') wet seam @4' (~2" thick)	DS6 @3-4.5' (CL) MC=22.4%
6		STD	DS7	2, 2, 2	4	4		DS7 @6-7.5' (SC) water soluble sulfates=0.03% chlorides=0.001% Electro-conductivity=50µS/cm pH=7.4 MC=13.6%
8								
10		STD	DS8	2, 2, 3	5	5	brown, soft, moist, soft to firm, sandy/clayey SILT (6-12.25')	DS8 @9-10.5' (SM/CL) LL=24 PL=16 PI=8 gravel=0.0% sand=15.2% silt=54.0% clay=30.8% MC=18.2%
12		STD	DS9	2, 1, 3	4	4	brown, very soft, very moist, brown CLAY with silt (12.25-13.5') end of hole @13.5'	DS9 @12-13.5' (CL) MC=18.6%
14							no groundwater or bedrock encountered	

Borehole Log 2 of 7	Field Staff: LB/JLH Drafting Staff: SJ Field Date: 1/29/2018 Project #: 7122.74831.01	2018 Sewer Line Replacement Phase A Grand Junction, Colorado

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Log of Borehole #3 (BH#3)

BOREHOLE LOCATION: alley behind Munro Pump

DRILLING COMPANY: HRL / Chancy | DRILL RIG: CME 55

SAMPLER: Standard SSS | DRILL STEM: 4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							parking lot GRAVEL (0-8")	
2								
							dark brown, stiff, damp, fat CLAY with silt (8"-6.5')	DS13 @3-4.5' (CH) LL=52 PL=19 PI=33 gravel=0.0% sand=1.4% silt=18.6% clay=80.0% MC=20.9%
4		STD	DS13	3, 5, 6	11	11		
6								
▽		STD	DS14	push/1	<1	<1	groundwater @6.5'	DS14 @6-7.5' (CL) MC=14.5%
8							brown, wet, very soft to soft, fine, silty SAND (6.5-9')	
		STD	DS15	8, 12, 28	40	40	gray, wet, dense, sandy GRAVEL (9-10.5')	DS15 @9-10.5' (GC) MC=13.2%
10							end of hole at 10.5'; groundwater @6.5' no bedrock encountered	
12								
14								

Borehole Log		
3 of 7	Field Staff	LB/JLH
	Drafting Staff	SJ
	Field Date	1/29/2018
	Project #	7122.74831.01

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Log of Borehole #4 (BH#4)

BOREHOLE LOCATION: alley behind 1101 3rd Ave.

DRILLING COMPANY: HRL / Chancy | DRILL RIG: CME 55

SAMPLER: Standard SSS | DRILL STEM: 4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							gravelly roadbase FILL (0-0.5')	
2							dark brown, moist, soft to firm CLAY (0.5' - 5')	DS16 @3-4.5' (CL) LL=45 PL=18 PI=27 gravel=0.0% sand=1.7% silt=23.9% clay=74.4% MC=20.2% water soluble sulfates=0.69% chlorides=0.024% Electro-conductivity=412 µS/cm pH=7.7
4		STD	DS16	2, 3, 4	7	7		
▽							groundwater @5'	
6		STD	DS17	push/1	1	1	brown, wet, very soft, silty fine SAND with occasional gravel and some clay (5-8.5')	DS17 @6-7.5.5' (SM) MC=28.4%
8								
		STD	DS18	8, 14, 14	28	28	wet, moderately dense, sandy GRAVEL (8.5-10.5')	DS18 @9-10.5' (SC) MC=13.5%
10							end of hole at 10.5'; groundwater @5'	
							no bedrock encountered	
12								
14								

Borehole Log 4 of 7	Field Staff	LB/JLH	2018 Sewer Line Replacement Phase A Grand Junction, Colorado
	Drafting Staff	SJ	
	Field Date	1/29/2018	
	Project #	7122.74831.01	

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Log of Borehole #5 (BH#5)

BOREHOLE LOCATION: 1031 S. 15th north of Kitchen Center along west side of road

DRILLING COMPANY: HRL / Chancy | DRILL RIG: CME 55

SAMPLER: Standard SSS | DRILL STEM: 4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							1" GRAVEL on surface (1-2")	
4		STD	DS19	2, 1, 3	4	4	reddish-brown, damp, soft to firm, CLAY with silt (0-9.5')	DS19 @3-4.5' (CL) MC=20.8%
8		STD	DS20	3, 3, 3	6	6		DS20 @6-7.5' (CL) LL=38 PL=17 PI=21 gravel=0.0% sand=4.4% silt=29.3% clay=66.2% MC=26.4%
▽ 10		STD	DS21	push / 3 /3	6	6	groundwater @9.5' brown, wet, v. soft to firm, silty SAND to SAND (9.5-10.5')	DS21 @9-10.5' (SC) MC=25.5%
							end of hole at 10.5'; groundwater @9.5' no bedrock encountered	
12								
14								

Borehole Log 5 of 7	Field Staff	LB/JLH	2018 Sewer Line Replacement Phase A Grand Junction, Colorado
	Drafting Staff	SJ	
	Field Date	1/29/2018	
	Project #	7122.74831.01	

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Log of Borehole #6 (BH#6)

BOREHOLE LOCATION: South side of alley behind Orkin

DRILLING COMPANY: HRL / Chancy | DRILL RIG: CME 55

SAMPLER: Standard SSS | DRILL STEM: 4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
2							damp, dense, GRAVEL and sandy roadbase FILL (0-2')	
4		STD	DS10	push /4	4	4	brown, moist to wet, v. soft to soft, silty CLAY; mottled with charcoal flecks, some is possible FILL (2-8') petroleum smell in last 4" of sampler	DS10 @3-4.5' (CL) MC=31.7% (organics)
6 ▽		STD	DS11	push / 2 / 2	4	4	groundwater encountered at 6.5'; very soft	DS11 @6-7.5' (no recovery)
8							caving at 8'	
10		STD	DS12	3, 2, 3	5	5	brown, wet, soft to firm, silty fine SAND, trace gravels (8-10.5') end of hole at 10.5'; groundwater @6.5' no bedrock encountered	DS12 @9-10.5' (SM) LL=NP PL=NP PI=NP gravel=0.0% sand=66.6% silt=22.6% clay=10.8% MC=34.0%
12								
14								

Borehole Log		
6	Field Staff	LB/JLH
of 7	Drafting Staff	SJ
	Field Date	1/29/2018
	Project #	7122.74831.01

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Log of Borehole #7 (BH#7)

BOREHOLE LOCATION: southwest corner of D Road and S. 15th

DRILLING COMPANY: HRL / Chancy | DRILL RIG: CME 55

SAMPLER: Standard SSS | DRILL STEM: 4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							asphalt ~3"	
2								
4		STD	DS22	push / 2, 4	6	6	brown, damp to moist, firm to stiff, CLAY with some silt/sand (0.25-10.5')	DS22 @3-4.5' (CL) MC=24.8%
6		STD	DS23	1, 4, 5	9	9		DS23 @6-7.5' (CL) LL=47 PL=19 PI=28 gravel=0.0% sand=0.6% silt=14.9% clay=84.5% MC=25.7%
8								
10		STD	DS24	2, 3, 4	7	7	small seeps at 10-10.5' end of hole at 10.5' no bedrock or groundwater encountered	DS24 @9-10.5' (CL) MC=24.0%
12								
14								

Borehole Log 7 of 7	Field Staff	LB/JLH	2018 Sewer Line Replacement Phase A Grand Junction, Colorado
	Drafting Staff	SJ	
	Field Date	1/29/2018	
	Project #	7122.74831.01	

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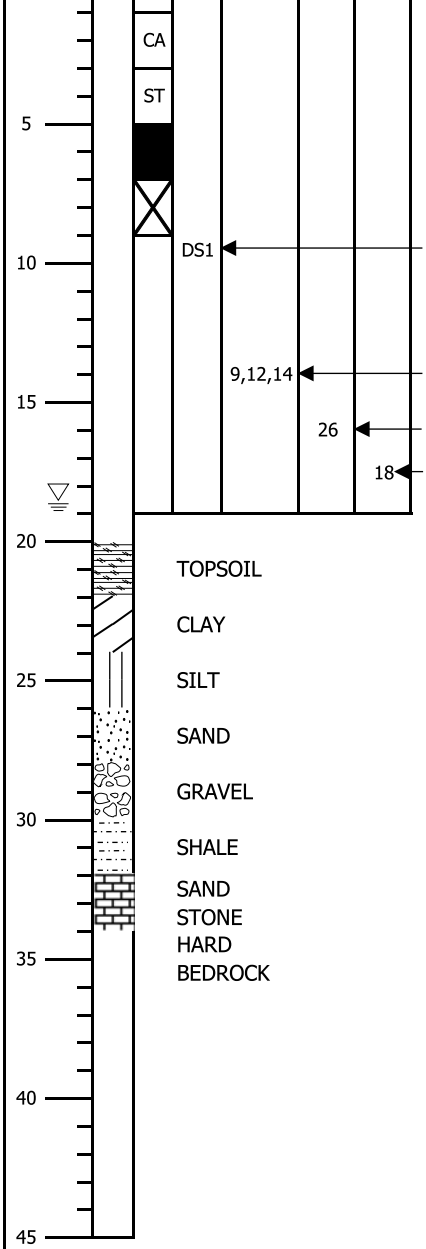
BOREHOLE LOG KEY

BOREHOLE LOCATION:

DRILLING COMPANY: DRILL RIG:

SAMPLER DRILL STEM:



drive sample, California sampler

drive sample, standard sampler

core sample

bulk sample, obtained from augers

Sample identifier: DS = Drive sample
BS = Bulk sample from augers
CS = Core sample
GS = Grab sample

Blows required to drive sampler 6" three times; first 6" is considered to be the "seating" drive

Indicates 26 blows required to drive the sampler 12 inches

Indicates blows/foot (BPF) using a 140-lb hammer falling 30" free water depth at time of drilling

Unified Soil Classification System (ASTM D-2487)

CL = lean clay to sandy/gravelly lean clay
ML = silt to sandy/gravelly silt
CH = high plasticity clay to sandy/gravelly high plasticity clay
MH = high elasticity silt to sandy/gravelly high elasticity silt
SW = well-graded sand or well-graded sand with gravel
SP = poorly graded sand or poorly graded sand with gravel
SM = silty sand to silty sand with gravel
SC = clayey sand to clayey sand with gravel
GW = well-graded gravel or well-gravel with sand
GP = poorly graded gravel or poorly graded gravel with sand
GM = silty gravel or silty gravel with sand
GC = clayey gravel or clayey gravel with sand

Rock Weathering Classification

W1 = Fresh
W2 = Slightly weathered
W3 = Moderately weathered
W4 = Highly weathered
W5 = Completely weathered
W6 = Residual soil, no structure
RQD = Rock Quality Designation

Intact Rock Strength Classification

R0 = Extremely weak rock, 35-150 psi
R1 = Very weak rock, 150-725 psi
R2 = Weak rock, 725-3,625 psi
R3 = Medium strong rock, 3,625-7,250 psi
R4 = Strong rock, 7,250-14,500 psi
R5 = Very strong rock, 14,500-36,000 psi
R6 = Extremely strong rock, >36,000 psi

FIELD & LABORATORY TEST RESULTS

Notes in this column indicate tests performed and test results:

DD: dry density, pcf
MC: moisture content, %
LL: liquid limit
PL: plastic limit
PI: plasticity index
GF: gravel fraction, %
SF: sand fraction, %
Fines: silt/clay, %
Sh: Shear resistance
P: Penetration resistance
CBR: California Bearing Ratio
SP: swelling pressure
TM: total movement
UCS: unconfined compressive strength
psf: pounds per square foot
pcf: pounds per cubic foot
psi: pounds per square inch

N value	Relative density
sands (non-cohesive soils)	
0-4	very loose
4-10	loose
10-30	medium
30-50	dense
>50	very dense
clays (cohesive soils)	
<2	very soft
2-4	soft
4-8	medium
8-15	stiff
15-30	very stiff
>30	hard

Borehole Log	Field Staff	Borehole Log Key
	Drafting Staff	
	Field Date	
of	Project #	

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FIELD SOIL IDENTIFICATION TERMS

Relative Density of Cohesionless Soils

Description	Field Identification	N Value
Very Loose	Easily penetrated with hand shovel	0-4
Loose	Easily penetrated with 1/2" rebar pushed by hand; easily excavated with hand shovel	4-10
Moderately Dense	Easily penetrated with 1/2" rebar driven with 5 lb. hammer; difficult to excavate with hand shovel	10-30
Dense	Penetrated 1 ft. with driven rebar; must be loosened with pick to excavate	30-50
Very Dense	Penetrated only a few inches with driven rebar; very difficult to excavate even with pick	>50

Consistency & Relative Density of Cohesive Soils

Description	Field Identification	Undrained Shear Strength (psf)	N Value (Approx.)
Very Soft	Extrudes between fingers when squeezed	<250	0-2
Soft	Molded by light finger pressure	250-500	2-4
Firm	Molded by strong finger pressure	500-1,000	4-8
Stiff	Indented by thumb	1,000-2,000	8-15
Very Stiff	Indented by thumbnail	2,000-4,000	15-30
Hard	Difficult to indent with thumbnail	>4,000	>30

Soil Constituents

Modifier	trace	little	some	-ey or -y	and
% (by weight)	0 - 5	5 - 12	12 - 20	20 - 30	>30

Sheet	Field Staff	Field Soil Identification Terms
	Drafting Staff	
1	Field Date	
of 1	Project #	

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APPENDIX C - LABORATORY RESULTS

Table 5 - Laboratory Results Summary

Bore-hole #	Sewer segment	Sample ID	Sample Depth (ft)	Ground-water (ft)	N-value (blows per foot)	USCS Soil Classi-fication	In-Situ Moisture Content (%)	Atterberg Limits			Gradation Analysis				Chemical Properties			
								LL	PL	PI	% Gravel	% Sand	% Silt	% Clay	Water Soluble Sufates (%)	Chlor-ides (%)	Electro-conduc-tivity (uS/cm)	pH
BH#1	Horizon Dr	DS1	3-4.5		7	CL	13.9											
		DS2	6-7.5		29	CL/shale	13.9	41	21	20	0.1	19.7	35.5	44.7				
		DS3	9-10.5		78	shale	12.8								0.70	0.021	320	6.9
		DS4	12-13.5		53	shale	11.9											
		DS5	15-16.5	NG	54	shale	10.9											
BH#2	N. 7th St	DS6	3-4.5		<1	CL	22.4											
		DS7	6-7.5		4	SC	13.6								0.03	0.001	50	7.4
		DS8	9-10.5		5	SM/CL	18.2	24	16	8	0.0	15.2	54.0	30.8				
		DS9	12-13.5	NG	4	CL	18.6											
BH#3	S. 10th St	DS13	3-4.5		11	CH	20.9	52	19	33	0.0	1.4	18.6	80.0				
		DS14	6-7.5	6.5	<1	CL	14.5											
		DS15	9-10.5		40	GC	13.2											
BH#4	S. 10th St	DS16	3-4.5		7	CL	20.2	45	18	27	0.0	1.7	23.9	74.4	0.69	0.024	412	7.7
		DS17	6-7.5	5	1	SM	28.4											
		DS18	9-10.5		28	SC	13.5											
BH#5	S. 15th St	DS19	3-4.5		4	CL	20.8											
		DS20	6-7.5		6	CL	26.4	38	17	21	0.0	4.4	29.3	66.2				
		DS21	9-10.5	9.5	6	SC	25.5											
BH#6	S. 7th St	DS10	3-4.5		4	CL	31.7											
		DS11	6-7.5	6.5	4	CL	NR											
		DS12	9-10.5		5	SM	34.0	NP	NP	NP	0.0	66.6	22.6	10.8				
BH#7	S. 15th St	DS22	3-4.5		6	CL	24.8											
		DS23	6-7.5		9	CL	25.7	47	19	28	0.0	0.6	14.9	84.5				
		DS24	9-10.5	NG	7	CL	24.0											

NOTES: LL=Liquid Limit PL=Plastic Limit PI=Plasticity Index NP=Non-Plastic NR=No Recovery NG=No Groudwater

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Laboratory Data Sheet: In-Situ Moisture Content

ASTM D-2216

Project Name	2018 Sewer Line Replacement Phase A	Date	1/30/2018
Project Location	Grand Junction, CO	Project #	7122.74831.01
Client	City of Grand Junction	Test By	SJ
		Test for	LB

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS1	BH#1 @3-4.5'		brown sandy CLAY (some shale layers)	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.3	146.6	133.1	13.9%

Sample #	Sample Location		Soil Description	
DS2	BH#1 @6-7.5'		gray lean CLAY with sand	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.0	153.2	138.9	13.9%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS3	BH#1 @9-10.5'		light brown with gray layering sandy CLAY (some shale and visible layers of salts)	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.1	156.6	142.9	12.8%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS4	BH#1 @12-13.5'		light brown to gray sandy CLAY (some shale and visible layers of salts)	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.8	167.8	153.9	11.9%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS5	BH#1 @15-16.5'		brown sandy CLAY (SHALE) (visible layers of salts)	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.4	146.4	135.6	10.9%

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Laboratory Data Sheet: In-Situ Moisture Content

ASTM D-2216

Project Name	2018 Sewer Line Replacement Phase A	Date	1/30/2018
Project Location	Grand Junction, CO	Project #	7122.74831.01
Client	City of Grand Junction	Test By	SJ
		Test for	LB

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS6	BH#2 @3-4.5'		brown silty CLAY with very fine sand	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.0	145.9	125.8	22.4%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS7	BH#2 @6-7.5'		brown silty, clayey SAND	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.5	159.0	144.3	13.6%

Sample #	Sample Location		Soil Description	
DS8	BH#2 @9-10.5'		brown lean CLAY with sand	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.3	161.7	142.4	18.2%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS9	BH#2 @12-13.5'		brown silty CLAY with fine sand	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.9	156.3	137.6	18.6%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS10	BH#6 @3-4.5'		brown to gray CLAY (black organics; strong odor)	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	37.6	153.4	125.5	31.7%

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Laboratory Data Sheet: In-Situ Moisture Content

ASTM D-2216

Project Name	2018 Sewer Line Replacement Phase A	Date	1/30/2018
Project Location	Grand Junction, CO	Project #	7122.74831.01
Client	City of Grand Junction	Test By	SJ
		Test for	LB

Sample #	Sample Location		Soil Description	
DS12	BH#6 @9-10.5'		brown silty SAND	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	37.7	206.0	163.3	34.0%

Sample #	Sample Location		Soil Description	
DS13	BH#3 @3-4.5'		brown FAT CLAY	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.1	136.1	118.8	20.9%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS14	BH#3 @6-7.5'		brown sandy CLAY with gravel	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	37.9	140.8	127.8	14.5%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS15	BH#3 @9-10.5'		brown clayey GRAVEL with sand	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.3	278.8	250.5	13.2%

Sample #	Sample Location		Soil Description	
DS16	BH#4 @3-4.5'		brown lean CLAY (pockets of salts)	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.6	133.1	116.9	20.2%

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Laboratory Data Sheet: In-Situ Moisture Content

ASTM D-2216

Project Name	2018 Sewer Line Replacement Phase A	Date	1/30/2018
Project Location	Grand Junction, CO	Project #	7122.74831.01
Client	City of Grand Junction	Test By	SJ
		Test for	LB

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS17	BH#4 @6-7.5'		brown clayey fine SAND	
	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
	36.1	170.9	141.1	28.4%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS18	BH#4 @9-10.5'		brown clayey SAND with gravel	
	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
	36.2	242.6	218.0	13.5%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS19	BH#5 @3-4.5'		brown to reddish brown sandy CLAY	
	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
	36.2	143.5	125.0	20.8%

Sample #	Sample Location		Soil Description	
DS20	BH#5 @6-7.5'		brown lean CLAY	
	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
	37.9	146.6	123.9	26.4%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS21	BH#5 @9-10.5'		brown clayey SAND	
	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
	36.2	197.0	164.3	25.5%

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Laboratory Data Sheet: In-Situ Moisture Content

ASTM D-2216

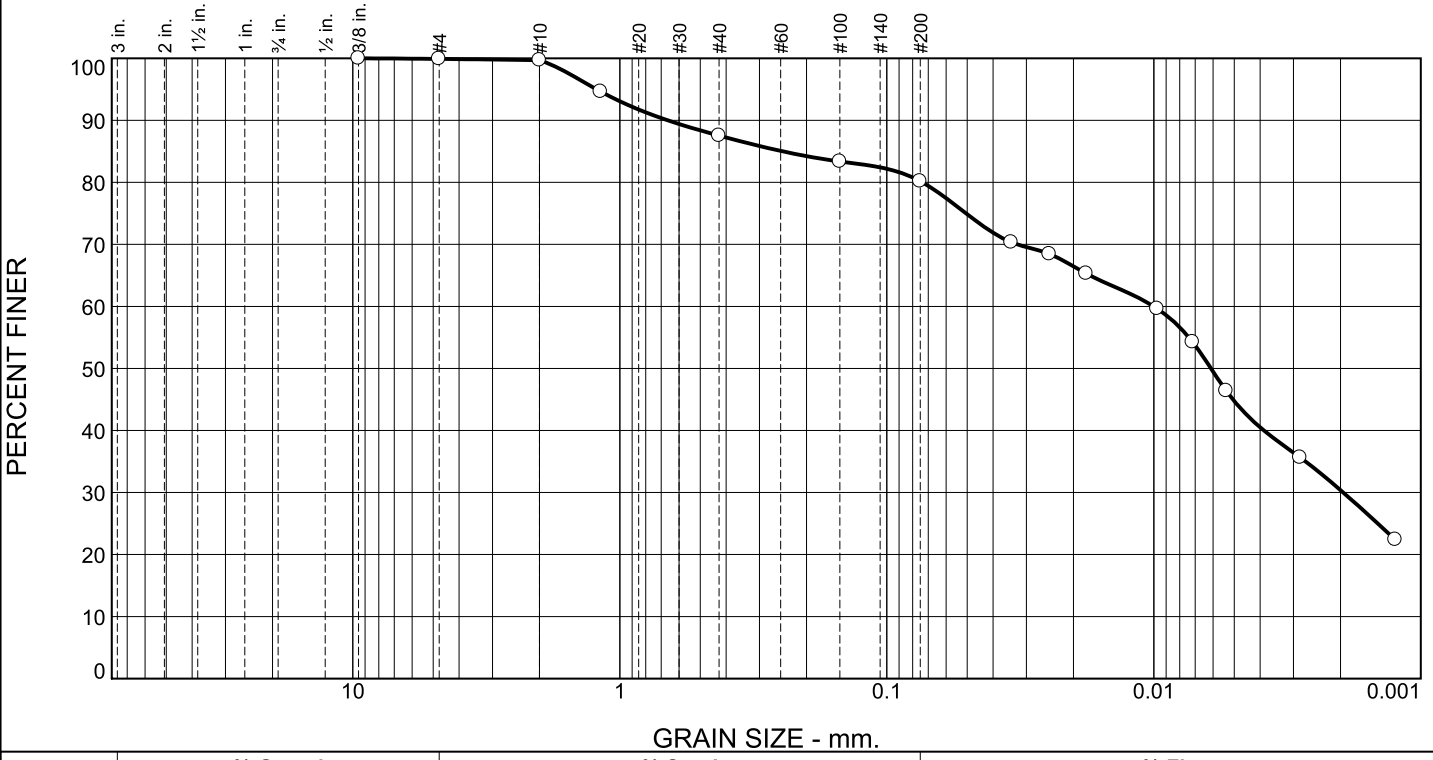
Project Name	2018 Sewer Line Replacement Phase A	Date	1/30/2018
Project Location	Grand Junction, CO	Project #	7122.74831.01
Client	City of Grand Junction	Test By	SJ
		Test for	LB

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS22	BH#7 @3-4.5'		brown silty CLAY with fine sand	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	36.3	134.8	115.2	24.8%

Sample #	Sample Location		Soil Description	
DS23	BH#7 @6-7.5'		brown lean CLAY	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	38.0	136.2	116.1	25.7%

Sample #	Sample Location		Soil Description (ASTM D2488)	
DS24	BH#7 @9-10.5'		brown CLAY	
	Tare (g)	**Tare + wet (g)**	**Tare + dry (g)**	**% Moisture**
	37.9	148.9	127.4	24.0%

Particle Size Distribution



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	12.2	7.3	35.5	44.7

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.9		
#10	99.7		
#16	94.6		
#40	87.5		
#100	83.4		
#200	80.2		
0.0341 mm.	70.3		
0.0246 mm.	68.4		
0.0179 mm.	65.3		
0.0097 mm.	59.6		
0.0072 mm.	54.3		
0.0054 mm.	46.4		
0.0028 mm.	35.6		
0.0012 mm.	22.4		

* (no specification provided)

Material Description

gray lean CLAY with sand

Atterberg Limits (ASTM D 4318)

PL= 21 **LL=** 41 **PI=** 20

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-7-6(16)

Coefficients

D_{90}= 0.6618 D_{85}= 0.2454 D_{60}= 0.0100
D_{50}= 0.0061 D_{30}= 0.0020 D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural Moisture Content = 13.9%

Date Received: 1/30/18 **Date Tested:** 2/2/18

Tested By: SJ

Checked By: JLH

Title: Laboratory Manager

Source of Sample: BH#1 **Depth:** 6-7.5'

Sample Number: DS2

Date Sampled: 1/29/18

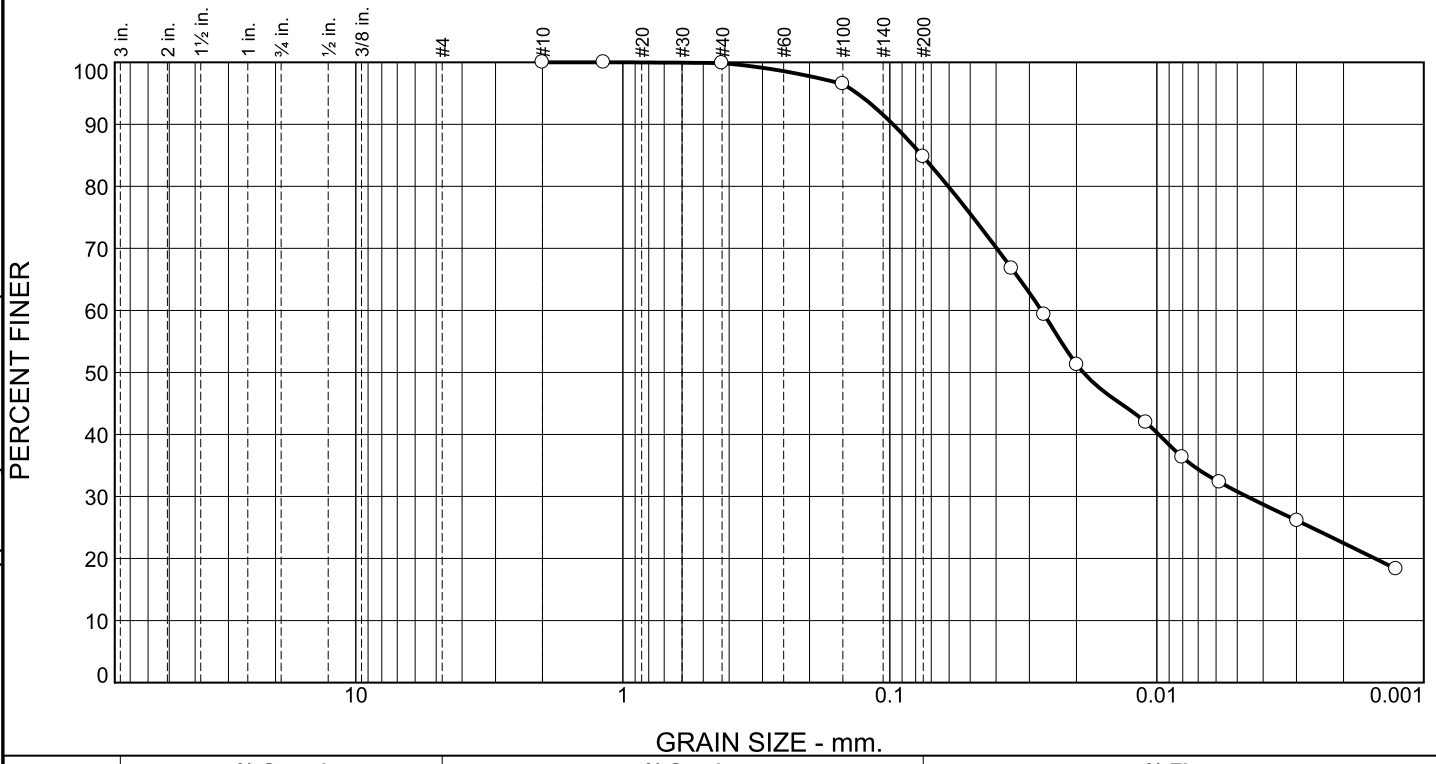
DOWL

Client: City of Grand Junction

Project: 2018 Sewer Line Replacements Phase A
Grand Junction, CO

Project No: 7122.74831.01

Particle Size Distribution



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	15.1	54.0	30.8

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#16	100.0		
#40	99.9		
#100	96.5		
#200	84.8		
0.0350 mm.	66.8		
0.0264 mm.	59.3		
0.0199 mm.	51.3		
0.0110 mm.	41.9		
0.0080 mm.	36.3		
0.0058 mm.	32.3		
0.0030 mm.	26.1		
0.0013 mm.	18.3		

* (no specification provided)

Material Description

brown lean CLAY with sand

Atterberg Limits (ASTM D 4318)

PL= 16 **LL=** 24 **PI=** 8

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-4(5)

Coefficients

D_{90}= 0.0973 D_{85}= 0.0758 D_{60}= 0.0271
D_{50}= 0.0188 D_{30}= 0.0046 D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural Moisture Content = 18.2%

Date Received: 1/30/18 **Date Tested:** 2/2/18

Tested By: SJ

Checked By: JLH

Title: Laboratory Manager

Source of Sample: BH#2 **Depth:** 9-10.5' **Date Sampled:** 1/29/18

Sample Number: DS8

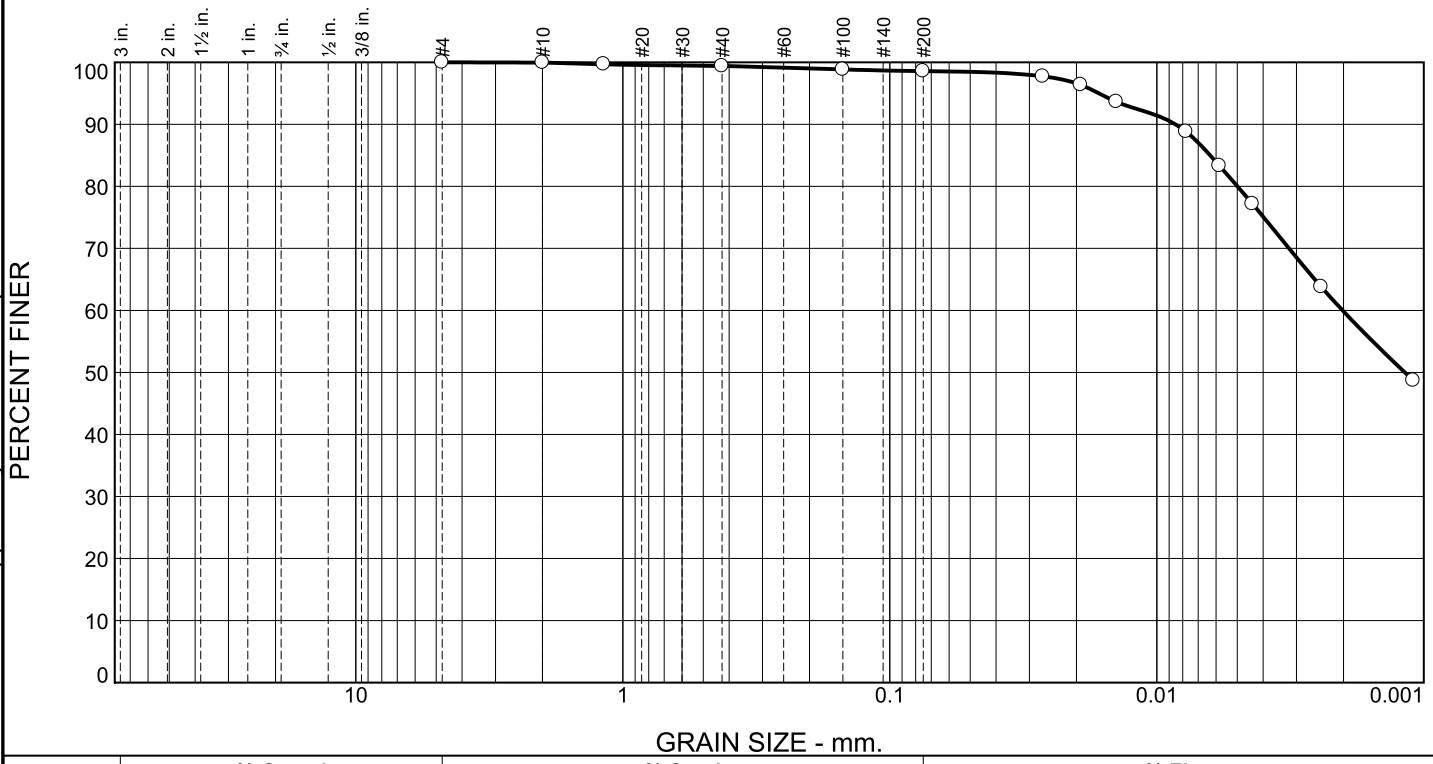
DOWL

Client: City of Grand Junction

Project: 2018 Sewer Line Replacements Phase A
Grand Junction, CO

Project No: 7122.74831.01

Particle Size Distribution



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.6	0.8	18.6	80.0

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	100.0		
#16	99.7		
#40	99.4		
#100	98.8		
#200	98.6		
0.0267 mm.	97.7		
0.0193 mm.	96.4		
0.0142 mm.	93.6		
0.0078 mm.	88.8		
0.0058 mm.	83.3		
0.0044 mm.	77.2		
0.0024 mm.	63.8		
0.0011 mm.	48.7		

* (no specification provided)

Material Description

brown FAT CLAY

Atterberg Limits (ASTM D 4318)

PL= 19 **LL=** 52 **PI=** 33

Classification

USCS (D 2487)= CH **AASHTO (M 145)=** A-7-6(36)

Coefficients

D_{90}= 0.0085 D_{85}= 0.0063 D_{60}= 0.0020
D_{50}= 0.0012 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural Moisture Content = 20.9%

Date Received: 1/30/18 **Date Tested:** 2/2/18

Tested By: SJ

Checked By: JLH

Title: Laboratory Manager

Source of Sample: BH#3 **Depth:** 3-4.5'

Sample Number: DS13

Date Sampled: 1/29/18

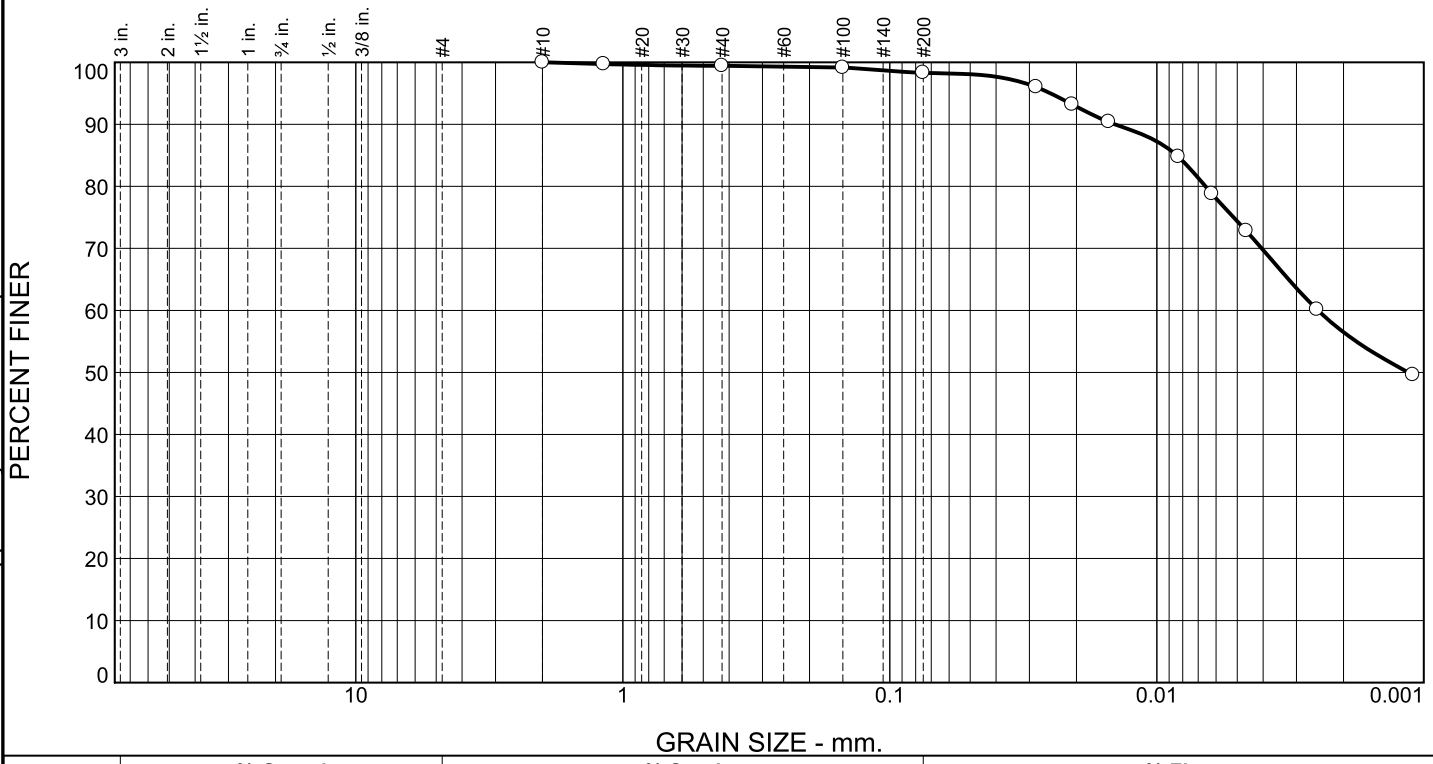
DOWL

Client: City of Grand Junction

Project: 2018 Sewer Line Replacements Phase A
Grand Junction, CO

Project No: 7122.74831.01

Particle Size Distribution



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.6	1.1	23.9	74.4

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#16	99.7		
#40	99.4		
#100	99.2		
#200	98.3		
0.0283 mm.	96.0		
0.0207 mm.	93.2		
0.0152 mm.	90.4		
0.0083 mm.	84.8		
0.0062 mm.	78.8		
0.0046 mm.	72.8		
0.0025 mm.	60.1		
0.0011 mm.	49.6		

* (no specification provided)

Material Description

light brown to brown lean CLAY

Atterberg Limits (ASTM D 4318)

PL= 18 **LL=** 45 **PI=** 27

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-7-6(28)

Coefficients

D_{90}= 0.0144 D_{85}= 0.0084 D_{60}= 0.0025
D_{50}= 0.0011 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural Moisture Content = 20.2%

Date Received: 1/30/18 **Date Tested:** 2/2/18

Tested By: SJ

Checked By: JLH

Title: Laboratory Manager

Source of Sample: BH#4 **Depth:** 3-4.5'

Sample Number: DS16

Date Sampled: 1/29/18

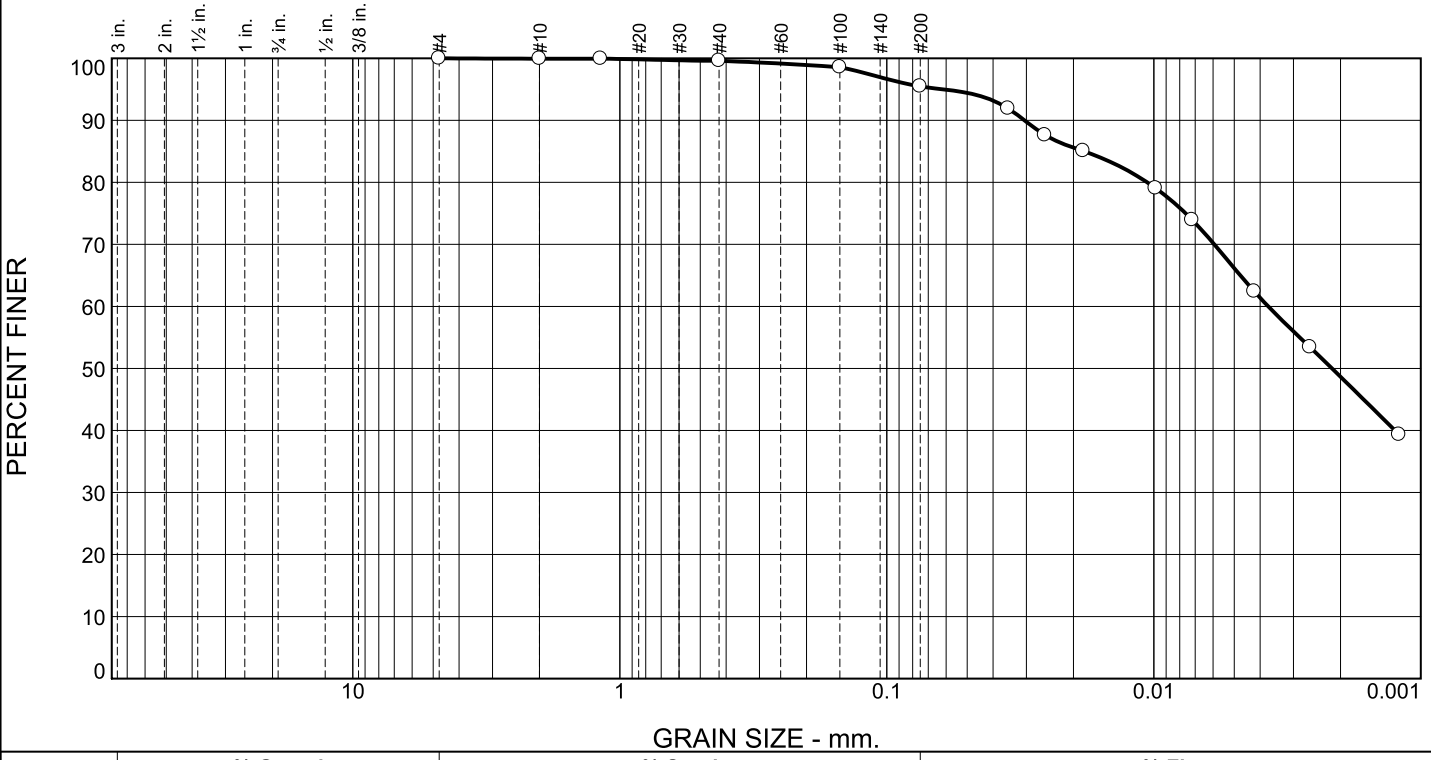
DOWL

Client: City of Grand Junction

Project: 2018 Sewer Line Replacements Phase A
Grand Junction, CO

Project No: 7122.74831.01

Particle Size Distribution



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.3	4.1	29.3	66.2

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.9		
#16	99.9		
#40	99.6		
#100	98.6		
#200	95.5		
0.0351 mm.	91.9		
0.0256 mm.	87.6		
0.0184 mm.	85.1		
0.0099 mm.	79.1		
0.0072 mm.	73.9		
0.0042 mm.	62.4		
0.0026 mm.	53.4		
0.0012 mm.	39.3		

* (no specification provided)

Material Description

brown lean CLAY

Atterberg Limits (ASTM D 4318)

PL= 17 **LL=** 38 **PI=** 21

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-6(20)

Coefficients

D_{90}= 0.0305 D_{85}= 0.0182 D_{60}= 0.0037
D_{50}= 0.0022 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural Moisture Content = 26.4%

Date Received: 1/30/18 **Date Tested:** 2/7/18

Tested By: SJ

Checked By: JLH

Title: Laboratory Manager

Source of Sample: BH#5 **Depth:** 6-7.5'

Sample Number: DS20

Date Sampled: 1/29/18

DOWL

Client: City of Grand Junction

Project: 2018 Sewer Line Replacements Phase A
Grand Junction, CO

Project No: 7122.74831.01

Particle Size Distribution

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.1	63.5	22.6	10.8

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#16	99.9		
#40	96.9		
#100	51.8		
#200	33.4		
0.0471 mm.	25.2		
0.0341 mm.	21.0		
0.0243 mm.	19.8		
0.0129 mm.	15.0		
0.0091 mm.	13.8		
0.0050 mm.	10.8		
0.0030 mm.	8.4		
0.0013 mm.	6.9		

* (no specification provided)

Material Description

brown silty SAND

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NP **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 0.3444 D_{85}= 0.3054 D_{60}= 0.1814
D_{50}= 0.1430 D_{30}= 0.0624 D_{15}= 0.0128
D_{10}= 0.0043 C_u= 42.25 C_c= 5.00

Remarks

Natural Moisture Content = 34.0%

Date Received: 1/30/18 **Date Tested:** 2/7/18

Tested By: SJ

Checked By: JLH

Title: Laboratory Manager

Source of Sample: BH#6 **Depth:** 9-10.5'

Sample Number: DS12

Date Sampled: 1/29/18

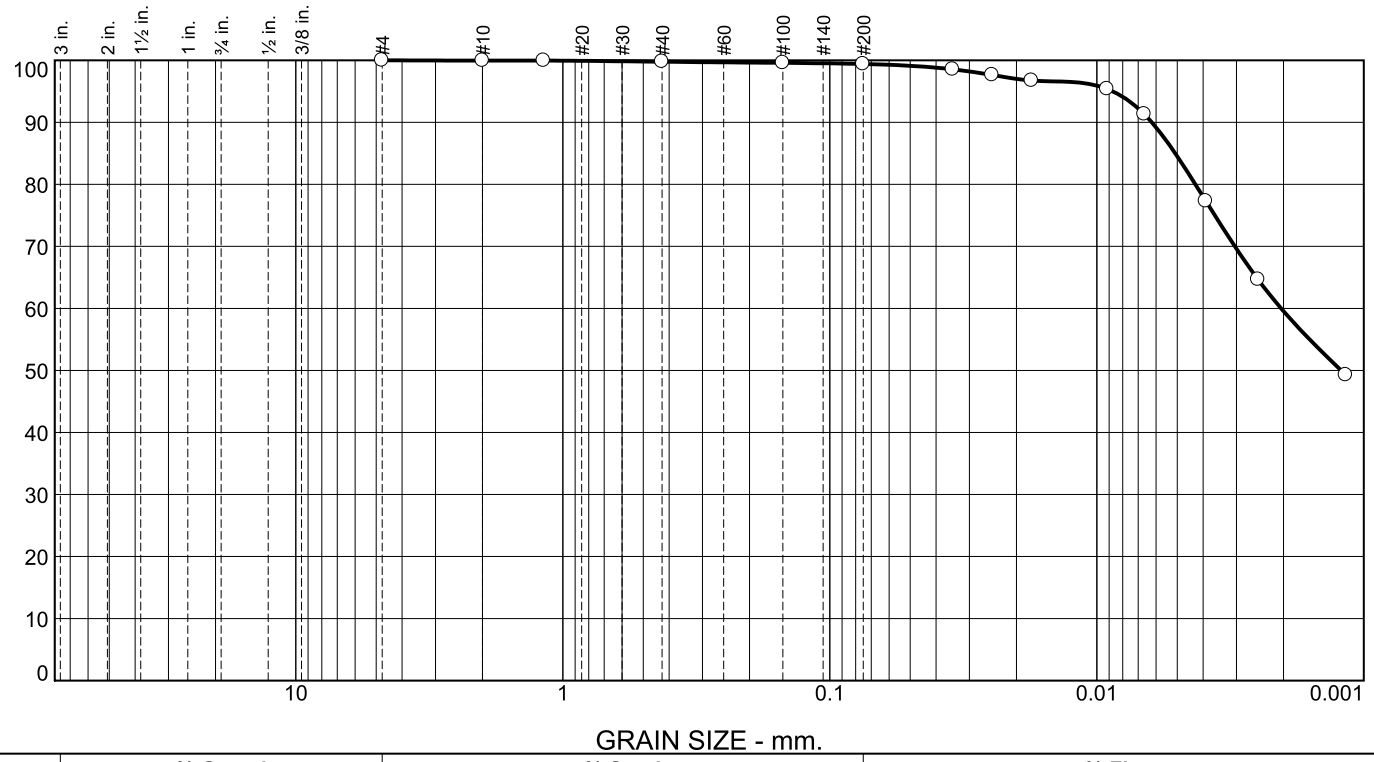
DOWL

Client: City of Grand Junction

Project: 2018 Sewer Line Replacements Phase A
Grand Junction, CO

Project No: 7122.74831.01

Particle Size Distribution



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	0.4	14.9	84.5

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	100.0		
#16	100.0		
#40	99.8		
#100	99.6		
#200	99.4		
0.0347 mm.	98.5		
0.0247 mm.	97.6		
0.0176 mm.	96.7		
0.0091 mm.	95.4		
0.0066 mm.	91.3		
0.0039 mm.	77.3		
0.0025 mm.	64.6		
0.0012 mm.	49.3		

* (no specification provided)

Material Description

brown lean CLAY

Atterberg Limits (ASTM D 4318)

PL= 19 **LL=** 47 **PI=** 28

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-7-6(30)

Coefficients

D_{90}= 0.0062 D_{85}= 0.0051 D_{60}= 0.0020
D_{50}= 0.0012 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural Moisture Content = 25.7%

Date Received: 1/30/18 **Date Tested:** 2/7/18

Tested By: SJ

Checked By: JLH

Title: Laboratory Manager

Source of Sample: BH#7 **Depth:** 6-7.5'

Sample Number: DS23

Date Sampled: 1/29/18

DOWL

Client: City of Grand Junction

Project: 2018 Sewer Line Replacements Phase A
Grand Junction, CO

Project No: 7122.74831.01

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Corrosivity Series

Project Name	2018 Sewer Line Replacements Phase A	Date Sampled	1/29/2018
Project Location	Grand Junction, CO	Sampled By	LB
Project #	7122.74831.01	Date Received	1/30/2018
Client	City of Grand Junction	Tests For	LB
Source/Depth	BH#1 @9-10.5' Sample # DS3	Date Tested	2/6/2018
Soil Description	light brown with gray moddling sandy SHALE (ASTM D2488)	Tested By	SJ

Water-soluble sulfates, dry soil basis	**0.70**	**%**	CDOT CP-L 2103 - Method B
Chlorides	**0.021**	**%**	CDOT CP-L 2104- Method B
pH	**6.9**		ASTM G51
Electroconductivity	**320**	**µS/cm**	

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Corrosivity Series

Project Name	2018 Sewer Line Replacements Phase A	Date Sampled	1/29/2018
Project Location	Grand Junction, CO	Sampled By	LB
Project #	7122.74831.01	Date Received	1/30/2018
Client	City of Grand Junction	Tests For	LB
Source/Depth	BH#2 @6-7.5' Sample # DS7	Date Tested	2/6/2018
Soil Description	brown silty, clayey SAND (ASTM D2488)	Tested By	SJ

Water-soluble sulfates, dry soil basis	**0.03**	**%**	CDOT CP-L 2103 - Method B
Chlorides	**0.001**	**%**	CDOT CP-L 2104- Method B
pH	**7.4**		ASTM G51
Electroconductivity	**50**	**µS/cm**	

970-249-6828 ■ 800-865-9847 (fax) ■ 222 South Park ■ Montrose, Colorado 81401 ■ www.dowl.com
Alaska ■ Arizona ■ Colorado ■ Montana ■ North Dakota ■ Oregon ■ Washington ■ Wyoming

Corrosivity Series

Project Name	2018 Sewer Line Replacements Phase A			Date Sampled	1/29/2018
Project Location	Grand Junction, CO			Sampled By	LB
Project #	7122.74831.01			Date Received	1/30/2018
Client	City of Grand Junction			Tests For	LB
Source/Depth	BH#4 @3-4.5'	Sample #	DS16	Date Tested	2/6/2018
Soil Description	brown lean CLAY			Tested By	SJ

Water-soluble sulfates, dry soil basis	**0.69**	**%**	CDOT CP-L 2103 - Method B
Chlorides	**0.024**	**%**	CDOT CP-L 2104- Method B
pH	**7.7**		ASTM G51
Electroconductivity	**412**	**µS/cm**	

Appendix D

CDPHE Construction Dewatering Permit (Application Only)

COLORADO
Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

For Agency Use Only:
Permit Number Assigned
COG07 - _____
COG315 -_____
COG316 -_____

Application for COLORADO DISCHARGE PERMIT SYSTEM (CDPS) General Permits:

- **Construction Dewatering** (COG070000)
- **Remediation Activities Discharging To Surface Water** (COG315000), or
- **Remediation Activities Discharging To Groundwater** (COG316000)

Please print or type. Original signatures are required. Photo, faxed, pdf or email copies will not be accepted.

This combined permit application is designed to streamline the application process for the three types of discharge permits listed in Part A below, and includes an *Application Guidance Document* to help applicants complete the application and select the right permit coverage for their activity. Please note that **one** application is intended to cover **one** project and **one** type of permit. Where multiple projects or types of permits are required, please submit an appropriate number of permit applications.

The application must be submitted to the Water Quality Control Division at least 30 days (for Construction Dewatering) or 45 days (for Remediation) prior to the anticipated date of discharge, and must be considered complete by the division before the review and approval process begins. The division will notify the applicant if additional information is needed to complete the application. If more space is required to answer any question, please attach additional sheets to the application form. Applications must be submitted by mail or hand delivered to:

Colorado Department of Public Health and Environment
Water Quality Control Division, WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

IMPORTANT: *Please read the Application Guidance Document (Guidance) for this permit application prior to completing this application. The Guidance provides specific and important instructions required for completing this application correctly.*

A. PERMIT INFORMATION

Reason for Application: □ NEW CERT

□ RENEW CERT EXISTING CERT # _____

Applicant is: □ Property Owner □ Contractor/Operator

Application is for the following discharge permit (select ONE). See Guidance.

□ Construction Dewatering (COG070000)

□ Remediation Activities Discharging to Surface Water (COG315000)

□ Remediation Activities Discharging to Groundwater (COG316000)

Note: This application is designed for processing each of the three permit types listed above. The division may request additional characterization of the proposed discharge to ensure that the appropriate permit coverage is requested and the appropriate permit certification is issued. The division may deny or change the requested type of discharge permit after review of the submitted application and will notify the applicant of the changes. Coverage under the "Subterranean Dewatering or Well Development" General Permit COG6030000 is not available using this application form.

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B. CONTACT INFORMATION

1. Permittee Information

Organization Formal Name: _____

Permittee Name: the person **authorized to sign and certify** the permit application. This person receives all permit correspondences and is **responsible** for ensuring compliance with the permit.

Responsible Position (Title): _____

Currently Held By (Person): _____

Telephone No: _____

Email address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

This form must be signed by the permittee to be considered complete. **Per Regulation 61**, in all cases, it shall be signed as follows:

a) In the case of corporations, by a responsible corporate officer. For the purposes of this section, the responsible corporate officer is responsible for the overall operation of the facility from which the discharge described in the application originates.
b) In the case of a partnership, by a general partner.
c) In the case of a sole proprietorship, by the proprietor.
d) In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

2. DMR Cognizant Official (i.e. authorized agent) the person or position authorized to sign and certify reports required by permits including Discharge Monitoring Reports [DMR's], Annual Reports, Compliance Schedule submittals, and other information requested by the division. The division will transmit pre-printed DMR's to this person. If more than one, please add additional pages.

□ Same as 1) Permittee

Responsible Position (Title): _____

Currently Held By (Person): _____

Telephone No: _____

Email address: _____

Organization: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Per Regulation 61: All reports required by permits, and other information requested by the Division shall be signed by the permittee or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a) The authorization is made in writing by the permittee
b) The authorization specifies either an individual or **a position having responsibility for the overall operation of the regulated facility or activity** such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position)
c) Submitted in writing to the Division

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B. CONTACT INFORMATION (cont.)

3. **Site/Local Contact (**contact for questions relating to the facility & discharge authorized by this permit.)
   □ Same as 1) Permittee

   Responsible Position (Title): _____
   Currently Held By (Person): _____
   Telephone No: _____
   Email address: _____
   Organization: _____
   Mailing Address: _____
   City: _____ State: _____ Zip: _____

4. **Operator in Responsible Charge Required for Groundwater Remediation COG315000 or COG316000**
   □ Same as 1) Permittee □ Same as 3) Site/ Local Contact

   **Note: Where the division determines that coverage under the construction dewatering permit is appropriate, an ORC is not required.*

   Operator Number _____ Legal Name: _____
   Telephone No: _____Email address: _____
   Company: _____

5. **Billing Contact** □ Same as 1) Permittee
   Responsible Position (Title): _____
   Currently Held By (Person): _____
   Telephone No: _____
   Email address: _____
   Organization: _____
   Mailing Address: _____
   City: _____ State: _____ Zip: _____

6. Other Contact Types (check below) Add pages if necessary:
   Responsible Position (Title): _____
   Currently Held By (Person): _____
   Telephone No: _____
   Email address: _____
   Organization: _____
   Mailing Address: _____
   City: _____ State: _____ Zip: _____

   □ Environmental Contact
   □ Facility Inspection Contact
   □ Consultant
   □ Compliance Contact
   □ Property Owner
   □ Other _____

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C. PERMITTED FACILITY INFORMATION

Facility or Project Name _____

Street Address (or cross streets) _____

City_____ Colorado, Zip Code _____

County _____

Type of Facility Ownership

□ City Government □ Corporation □ Private □ Municipal or Water District

□ State Government □ Mixed Ownership _____

Facility or Project Latitude/Longitude — List the latitude and longitude of the excavation resulting in the discharge(s). If the exact excavation location(s) are not known, list the latitude and longitude of the center point of the construction project. If using the center point, be sure to specify that it is the center point of construction activity.

Latitude _____. _____ Longitude _____. _____
Provide coordinates in decimal degrees to 6 decimal places (e.g., 39.703345°,-104.933567°)

Horizontal Collection Method: □ GPS Unspecified □ Interpolation Map – Map Scale Number_____
Reference Point: □ Project/Facility Entrance □ Project/Facility Center/Centroid

Horizontal Reference Datum: _____

Standard Industrial Classification (SIC) Code(s) for this FACILITY (include up to 4, in order of importance)

1_____ **2**_____**3**_____**4**_____

Receiving Water_____

D. PROJECT DESCRIPTION

D.1. Description of Activity:

a) Provide a brief overview of the project and dewatering activity (e.g., highway, bridge and tunnel construction, storm drain expansion, etc.).

b) Is the dewatering and discharge in-stream? (The dewatering operation is considered in-stream where the dewatering activity is conducted within approximately the ordinary high water mark of the stream and/or on the bank of the stream and the discharge is back to the same water body.)

□ Yes * □ No

**If yes, you must provide a description of how your project meets this definition in the box below. If no description is provided, the work will not be considered in-stream. Please note that in-stream work activities may also require a separate Clean Water Act Section 404 Permit and Colorado 401 Certification.*

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c) Will the project involve a temporary stream diversion (e.g. diversion channel, pump-around, piped diversion, coffer dam) to reroute water around the construction area?

□ Yes * □ No

**By checking yes, the applicant understands that temporary water diversions are not covered under the permit certification and may require coverage under a Clean Water Act Section 404 Permit. Only dewatering discharge outfalls associated with construction-related activities may be covered under the permit certification.*

d) Will dewatering be conducted in areas that involve work on (e.g. replacing, repairing, making connections to, etc...) existing sanitary sewer lines, conveyances, or vessels, or in proximity to septic disposal systems?

□ Yes □ No

If yes, is there the potential that sewage or septage could be in the effluent to be discharged?

□ Yes □ No *

**If no, you must provide a description of the control measures that will be implemented to prevent sewage or septage from entering the discharge (use the box below). The division may add effluent limits for E. coli and/or Total Coliform if the applicant does not demonstrate that adequate measures will be in place.*

D.2 Description of Discharge:

a) Is the discharge to a ditch or storm sewer system? □ Yes* □ No

**If yes, the applicant must contact the owner of the ditch or storm sewer system prior to discharging to address any local ordinances and to determine if additional requirements will be imposed by the owner.*

b) Is the discharge to an impoundment? □ Yes* □ No

c) Discharge Frequency and Duration:

- Estimated discharge start date: _____
- Estimated discharge duration: Years _____ Months _____ Days _____
- Upon completion of construction phase dewatering, will there be long-term subterranean dewatering at the site (e.g. foundation, footer, toe drains, etc...)? □ Yes* □ No

  **If yes, note that construction phase dewatering and long-term subterranean dewatering cannot be covered under the same permit certification.*

d) Provide a brief description of the Best Management Practices (BMPs) to be used in the box below.

D.3 Discharge Outfalls (Limit 20 outfalls):

- Total number of **defined** outfalls requested: _____
- Total number of **undefined** outfalls requested:_____ (construction dewatering only)
- Complete Table 2a (for discharges to surface water) and/or 2b (for discharges to land with percolation to groundwater) to identify your defined and undefined outfall locations. Attach additional pages as necessary.

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Table 2a - Requested Outfalls for Discharges to Surface Water (Discharges that may reach surface water through direct discharge or through a conveyance such as a ditch or a storm sewer system)				
OUTFALL NUMBER[1]	**NAME OF RECEIVING STREAM(S)** (e.g., Cherry Creek, Boulder Creek, Arkansas River)	**ESTIMATED MAXIMUM FLOW RATE[2] (gpm)**	**DESCRIPTION OF DISCHARGE LOCATION[3]** (e.g., Discharge enters storm sewer located at the corner of Speer and 8th Ave. with flow to Cherry Creek)	**LATITUDE/LONGITUDE OF EACH DISCHARGE OUTFALL**
Defined Discharges to Surface Water				
001-A				
002-A				
003-A				
004-A				
Undefined Discharges to Surface Water *(Available for construction dewatering only) (Provide **estimated** lat/long only for undefined outfalls)*				
001-AU				
002-AU				
003-AU				
004-AU				

1 Identify up to 20 defined or undefined outfalls (undefined for construction dewatering only). Use additional pages as necessary.
2 For construction dewatering the maximum flow limit will be equal to twice the estimated maximum flow rate provided in the permit application. For groundwater remediation the 30-day average flow limit will be based on the design capacity of the treatment as provided in the permit application.
3 The discharge location is the point where effluent sampling will occur. This location must be at a point after treatment and before the effluent joins or is diluted by any other waste stream, body of water, or substance. If the discharge is to a ditch or storm sewer system, include the name of the ultimate receiving waters where the ditch or storm sewer discharges.

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Table 2b - Requested Outfalls for Discharges to Land with the Potential to Percolate to Groundwater (These discharges do not have the potential to reach surface water either directly or through a conveyance.)[4]			
OUTFALL NUMBER[1]	**ESTIMATED MAXIMUM FLOW RATE[2] (gpm)**	**DESCRIPTION OF DISCHARGE LOCATION[3]** (e.g., Discharge to a field south of project site and East of I-25)	**LATITUDE/LONGITUDE OF EACH DISCHARGE OUTFALL**
Defined Discharges to Land with Potential Percolation to Groundwater			
G001-A			
G002-A			
G003-A			
G004-A			
Undefined Discharges to Land with Potential Percolation to Groundwater *(Available for construction dewatering only) (Provide **estimated** lat/long only for undefined outfalls)*			
G001-AU			
G002-AU			
G003-AU			
G004-AU			

1 Identify up to 20 defined or undefined outfalls (undefined for construction dewatering only). Use additional pages as necessary.

2 For construction dewatering the maximum flow limit will be equal to twice the estimated maximum rate flow rate provided in the permit application. For groundwater remediation the 30-day average flow limit will be based on the design capacity of the treatment as provided in the permit application.

3 The discharge location is the point where effluent sampling will occur. This location must be at a point after treatment and before the effluent joins or is diluted by any other waste stream, body of water, or substance.

4 For discharges of uncontaminated groundwater to land, please review and consider the applicability of the division's *Low Risk Discharge Guidance: Discharges of Uncontaminated Groundwater to Land* before submitting a permit application to the division. This policy is available for download at https://www.colorado.gov/pacific/cdphe/clean-water-construction-compliance-assistance-and-guidance.

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E. ADDITIONAL INFORMATION

E.1 Nearby Sources of Potential Groundwater Contamination:

a) Has the proposed dewatering area been reviewed for possible groundwater contamination, such as plumes from leaking underground storage tanks (LUSTs), hazardous waste sites, or additional sources other than what is normally encountered at excavation and construction sites? *Applicants are expected to exercise due diligence in evaluating their project sites prior to applying for a discharge permit.*

□ Yes □ No

b) Is an open LUST located within **one-half mile** of the site?

□ Yes* □ No

**If yes, BTEX analytical data for a source water sample representative of the proposed discharge at the site must be included with the permit application. Failure to include this data may result in delays in processing the permit application until such data is submitted to the Division. See Guidance.*

c) Is a Superfund site or National Priorities List (NLP) site located within **one mile** of the site?

□ Yes* □ No

**If yes, analytical data for all parameters shown in Table 1 of this application (or an alternate list of constituents approved by the division) for a source water sample representative of the proposed discharge must be included with the permit application. Failure to include this data may result in delays in processing the permit application until such data is submitted to the Division. See Guidance.*

d) Is any other (non-LUST, non-Superfund, non-NPL site) known source of contamination, such as a Voluntary Cleanup (VCUP), Environmental Covenant, open RCRA Corrective Action site, or brownfields site located within **one-half mile** of the site?

□ Yes* □ No

**If yes, analytical data for all parameters shown in Table 1 of this application (or an alternate list of constituents approved by the division) for a source water sample representative of the proposed discharge must be included with the permit application. Failure to include this data may result in delays in processing the permit application until such data is submitted to the Division. See Guidance.*

e) If known sources of contamination are located near the site, provide an overview of the source and nature of contamination including:

- The nature of the contamination of the groundwater, alluvial water, stormwater, and/or surface water (the source water) for which treatment and/or remedial activities will occur,
- The primary industrial activities which resulted in the source water contamination,
- The source of the contamination (pipes, leaking underground storage tank, up gradient sources, etc.) or state "unknown."

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f) For contaminated discharges (remediation), provide a narrative description of the type(s) of treatment proposed for use at each identified outfall.

E.2 Chemical Additions

List any chemical additives or other materials to be used in the water or to treat water prior to discharge. Include the Material Safety Data Sheet (MSDS) for each chemical with the application.

CHEMICAL NAME	MANUFACTURER	PURPOSE	DOSAGE

E.3 Site Maps and Schematics

Are required maps and schematics attached? □ Yes
□ No-Application cannot be processed without required maps

✓ **Location Map(s) for Outfalls** – Application must include a location map(s) that shows the location of the project/facility, the limits of the construction activity, the approximate location of the requested discharge point(s)/outfalls, and the location of potential receiving water(s). If known, the map should also include the approximate location(s) where dewatering is to occur and the location of proposed BMP(s) to be used. A north arrow must be shown. **Maps must be on paper that can be folded to 8 ½ x 11 inches.**

E.4 Associated Permits

Does the applicant have a Stormwater Permit for Construction Activities? □ YES □ NO □ PENDING
If Yes, Stormwater Construction Permit Number: COR-_____

Does the applicant have a Clean Water Act Section 404 Permit? □ YES □ NO □ PENDING

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E.5 Water Rights

The State Engineers Office (SEO) has indicated that any discharge that does not return water directly to surface waters (i.e. land application, rapid infiltration basins, etc.) has the potential for material injury to a water right. As a result, the SEO needs to determine that material injury to a water right will not occur from such activities. To make this judgment, the SEO requests that a copy of all documentation demonstrating that the requirements of Colorado water law have been met, be submitted to their office for review. The submittal should be made as soon as possible to the following address:

Colorado Division of Water Resources ● 1313 Sherman Street, Room 818 ● Denver, Colorado 80203

Should there be any questions on the issue of water rights; the SEO can be contacted at (303) 866-3581. It is important to understand that any CDPS permit issued by the division does not constitute a water right. Issuance of a CDPS permit does not negate the need to also have the necessary water rights in place. It is also important to understand that even if the activity has an existing CDPS permit, there is no guarantee that the proper water rights are in place.

F. REQUIRED CERTIFICATION SIGNATURE [Reg 61.4(1)(h)]

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature (Legally Responsible Party (Page 2 item 1) _____

Date _____

Name (printed) _____Title_____

This form must be signed by the permittee to be considered complete. **Per Regulation 61**, in all cases, it shall be signed as follows:

a) In the case of corporations, by a responsible corporate officer. For the purposes of this section, the responsible corporate officer is responsible for the overall operation of the facility from which the discharge described in the application originates.
b) In the case of a partnership, by a general partner.
c) In the case of a sole proprietorship, by the proprietor.
d) In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

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ATTACHMENT 1
Please Submit the Laboratory Data Package for any Required Analysis with the Permit Application
(See Important Table Notes)

Required Water Quality Data			
Metals	**PQL (ug/l) [1]**	**Metals**	**PQL (ug/l) [1]**
Aluminum-Trec	15	Lead-PD	0.5
Antimony-Trec	2	Manganese-PD	2
Arsenic-Trec	1	Manganese-Diss	2
Arsenic-PD	1	Molybdenum-Trec	0.5
Barium-Trec	1	Nickel-Trec	1
Beryllium-Trec	2	Nickel-PD	1
Cadmium-Trec	0.5	Selenium-Trec	1
Cadmium-PD	0.5	Selenium-PD	1
Chromium III-Trec	20	Silver-Trec	0.5
Chromium III-PD	20	Silver-PD	0.5
Chromium VI-Diss	20	Thallium-Trec	0.5
Chromium-Trec	20	Thallium-PD	0.5
Copper-Trec	2	Uranium-PD	1
Copper-PD	2	Uranium-Trec	1
Iron-Trec	20	Zinc-Trec	10
Iron-Diss	20	Zinc-PD	10
Lead-Trec	0.5		
Volatiles	**PQL (ug/l) [1]**	**Volatiles**	**PQL (ug/l) [1]**
acrolein	15	ethylbenzene	75
benzene	3	methyl bromide	5
bromoform	3	methyl chloride	4.5
carbon tetrachloride	3	1,1,2,2-tetrachloroethane	2
chlorobenzene	60	tetrachloroethylene	2.3
chlorodibromomethane	3	toluene	60
2-chloroethylvinyl ether	0.65 *	1,2-trans-dichloroethylene	0.5 *
chloroform	3	1,1,1-trichloroethane	5
1,2-dichlorethane	3	1,1,2-trichloroethane	2.0
1,1-dichlorethylene	5	trichloroethylene	2.3
1,2-dichlorpropane	2	vinyl chloride	3
1,3-dichlorpropylene	2 *	1,4-Dioxane	0.15 *
Semi-Volatile Organic Compounds	**PQL (ug/l) [1]**	**Semi-Volatile Organic Compounds**	**PQL (ug/l) [1]**
acenaphthene	20	1,2-diphenylhydrazine (as azobenzene)	5 *
acenaphthylene	30	fluorene	20
anthracene	20	fluoranthene	25
benzidine	170	hexachlorobenzene	16
benzo(a)anthracene	12	hexachlorobutadiene	9
benzo(a)pyrene	20	hexachlorcyclopentadiene	50
benzo(b)fluoranthene	35	hexachloroethane	16
benzo(ghi)perylene	20	indeno(1,2,3-cd)pyrene	20
benzo(k)fluoranthene	25	isophorone	25
bis(2-chloroethyl)ether *(or Dichloroethyl ether)*	15	naphthalene	20
bis(2-chloroisopropyl)ether *(or 2,2-dichloroisopropyl ether)*	60	nitrobenzene	19
bis(2-ethylhexyl)phthalate	25	N-nitrosodimethylamine	30

Semi-Volatile Organic Compounds	PQL (ug/l) [1]	Semi-Volatile Organic Compounds	PQL (ug/l) [1]
Butyl benzyl phthalate	25	N-nitrosodi-n-propylamine	30
2-chloronaphthalene	20	N-nitrosodiphenylamine	19
chrysene	18	pyrene	10
dibenzo(a,h)anthracene	20	1,2,4-trichlorobenzene	20
1,2-dichlorobenzene	2.5	2-chlorophenol	35
1,3-dichlorobenzene	2.5	2,4-dichlorophenol	30
1,4-dichlorobenzene	3.5	2,4,-dimethylphenol	30
3,3-dichlorobenzidine	18	4,6-dinitro-o-cresol	17
diethyl phthalate	20	2,4-dinitrophenol	100
dimethyl phthalate	20	4-nitrophenol	25
di-n-butyl phthalate	25	pentachorophenol	36
2,4-dinitrotoluene	17	phenol	15
2,6-dinitrotoluene	20	2,4,6-trichlorophenol	25
xylene	10 *	1,4-Dioxane	0.15 *

[1] PQLs are as listed in the division's *Practical Quantitation Limits Policy* (CW 6) unless noted otherwise.

* This is a recommended PQL based on EPA approved methods. The division's *Practical Quantitation Limits Policy (CW 6)* does not provide a 40 CFR 136 based PQL for this parameter.

Trec = Total Recoverable

PD = Potentially Dissolved

Diss = Dissolved

PQL = Practical Quantitation Limit

Important table notes:

1) Please refer to the permit application Guidance to determine whether analytical data is required with the permit application, and if so, what specific type of data is required.

2) Parameter names match the names as they appear in the general permit or, as italicized, as they appear in the division's *Practical Quantitation Limits Policy* (CW-6).

3) The division may require analytical data for additional parameters where the project site is located in close proximity to potential sources of contamination for parameters not included in this Attachment 1, including but not limited to pesticide, PCB, radionuclide contamination.

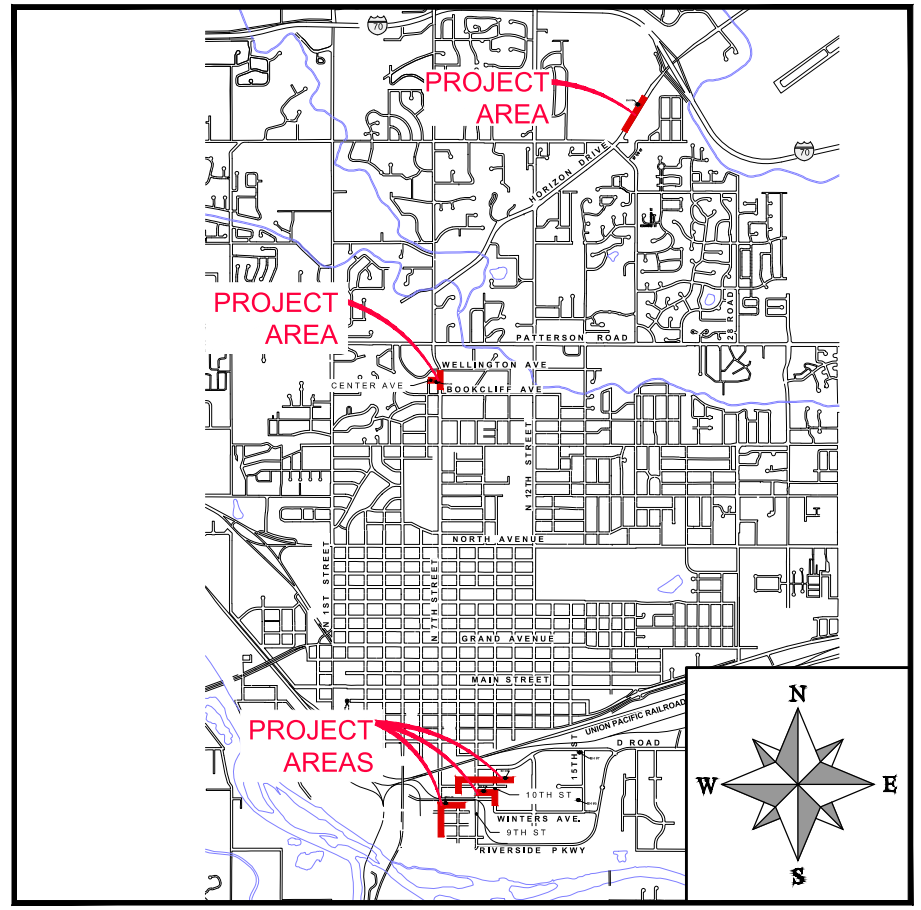
4) Applicants applying under the General Permit for Remediation Activities Discharging to Groundwater (COG316000) are encouraged to contact the division prior to sample collection to ensure that the correct metal speciation is included in the sample analysis.

5) For the permit application, all sampling should be performed according to specified methods in 40 CFR 136, methods approved by EPA pursuant to 40 CFR 136, or methods approved by the division, in the absence of a method specified in or approved pursuant to 40 CFR 136. In addition, the PQLs listed in Attachment 1 should be met unless otherwise approved by the division.

PROJECT NO. 902-F001633

2018 SEWER LINE REPLACEMENTS
PHASE A
MARCH, 2018

VICINITY MAP



0 2500 5000 10,000

(IN FEET)
1 inch = 5000 feet

811
Know what's **below.**
Call before you dig.

UTILITIES AND AGENCIES

AGENCY	NAME	POSITION	ROLE	MAILING ADDRESS	STREET ADDRESS	CITY, STATE	VOICE-WK	FAX
CITY OF GRAND JUNCTION	BILL ETCHEVERRY	COLLECTIONS SUPERVISOR	SANITARY SEWER	2145 RIVER ROAD	2145 RIVER ROAD	GRAND JCT., CO 81501	(970) 256-4167	(970) 256-4022
CITY OF GRAND JUNCTION	LEE COOPER	PROJECT ENGINEER	SANITARY SEWER	333 WEST AVE BLDG C	333 WEST AVE BLDG C	GRAND JCT., CO 81501	(970) 256-4155	(970) 256-4022
UNION PACIFIC RAILROAD	JUSTIN O. CORDOVA		UPRR REVIEW				(970) 628-6019	
GRAND VALLEY IRRIGATION CO.	PHIL BERTRAND	MANAGER	IRRIGATION	688 26 RD	688 26 RD	GRAND JCT., CO 81506	(970) 242-2762	
SPECTRUM	JEFF VALDEZ	MANAGER	CABLE TV	2502 FORESIGHT CIRCLE	2502 FORESIGHT CIRCLE	GRAND JCT., CO 81504	(970) 245-8750	(970) 245-6803
CENTURYLINK	CHRIS JOHNSON	ENGINEER	TELEPHONE	2524 BLICHMANN AVE	2524 BLICHMANN AVE	GRAND JCT., CO 81504	(970) 244-4311	(970) 240-4349
UTE WATER	JUSTIN BATES	SUPERVISOR	WATER	PO BOX 460	2190 H ¼ RD	GRAND JCT., CO 81502	(970) 242-7491	(970) 242-9189
XCEL	STEVE PIBURN	UNIT MANAGER	ELECTRIC	2538 BLICHMANN AVE	2538 BLICHMANN AVE	GRAND JCT., CO 81506	(970) 244-2664	(970) 244-2664
XCEL	SARAH BARRICAU	UNIT MANAGER	GAS	2538 BLICHMANN AVE	2538 BLICHMANN AVE	GRAND JCT., CO 81506	(970) 244-2656	(970) 244-2656

NOTE: NOTIFY AFFECTED UTILITY VENDOR 48 HOURS PRIOR TO EXCAVATIONS THAT WILL EXPOSE UTILITY LINES. THE COVER SHEET WILL HAVE A LISTING OF UTILITY VENDORS AND TELEPHONE NUMBERS.

DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

CITY OF Grand Junction COLORADO

Public Works
Engineering Division

DOWL
WWW.DOWL.COM
222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

DRAWING STATUS:
- PROGRESS
- FINAL CONSTRUCTION DRAWINGS
- ASBUILT

DESIGNED BY:
BRENDAN HINES, PROJECT ENGINEER 2018

REVIEWED BY:
DAN QUIGLEY, ENGINEERING MANAGER 2018

AUTHORIZED FOR CONSTRUCTION
RANDI KIM, UTILITIES DIRECTOR 2018

ACCEPTED FOR CONSTRUCTION
LEE COOPER, PROJECT ENGINEER 2018

2018 SEWER LINE REPLACEMENTS PHASE A, MARCH, 2018

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS
ABC	AGGREGATE BASE COURSE
AC	ASBESTOS CEMENT
AP	ANGLE POINT
ASB	ANCHORED STRAW BALES
ASP	ALUMINIZED STEEL PIPE
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS
AWWA	AMERICAN WATER WORKS ASSOCIATION
BC	BACK OF CURB
BF	BUTTERFLY VALVE
BOW	BACK OF WALK
BCR	BEGIN CURB RETURN
BOT	BOTTOM
BSWMP	BETTER STORM WATER MANAGEMENT PRACTICES
CH	CHORD
CAP	CORRUGATED ALUMINUM PIPE
CDOT	COLORADO DEPARTMENT OF TRANSPORTATION
CI	CAST IRON
C,G,& SW	CURB, GUTTER & SIDEWALK
℄	CENTER LINE
CL	CLEAR
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
COMB	COMBINATION (AS IN STORM SEWER AND SANITARY SEWER)
CONC	CONCRETE
CSM	CITY SURVEY MONUMENT
CSP	CORRUGATED STEEL PIPE
CU	COPPER
DI	DUCTILE IRON
DWY	DRIVEWAY
E	ELECTRIC
ECR	END CURB RETURN
EG	EDGE OF GUTTER
EL	ELEVATION
EP	EDGE OF PAVEMENT
EX	EXISTING
FB	FULL BODY
FC	FACE OF CURB
FG	FINISHED GRADE
℉	FLOW LINE
FL	FLANGE
FM	FORCE MAIN
FO	FIBER OPTICS
FS	FAR SIDE
FTG	FOOTING
G	GAS
GB	GRADE BREAK
GM	GAS METER
GV	GATE VALVE
HBP	HOT BITUMINOUS PAVEMENT
HDPE	HIGH DENSITY POLYETHYLENE
INV	INVERT
IRR	IRRIGATION
L	LENGTH OF ARC
LC	LONG CHORD
LF	LINEAR FEET
LL	LONG ARC
LS	SHORT ARC
LT	LEFT
MB	MAILBOX
MCSM	MESA COUNTY SURVEY MONUMENT
MH	MANHOLE
MJ	MECHANICAL JOINT
MW	MILL WRAP
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NOP	NO ONE PERSON
NRCP	NON-REINFORMATIONRCED CONCRETE PIPE
NS	NEAR SIDE
NTS	NOT TO SCALE
OHP	OVERHEAD POWER
OHT	OVERHEAD TELEPHONE
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PE	POLYETHYLENE
PERF	PERFORATED
PI	POINT OF INTERSECTION
PIP	PLASTIC IRRIGATION PIPE
POC	POINT ON CURVE
POT	POINT ON TANGENT
PR	PROPOSED
PRC	POINT OF REVERSE CURVATURE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
R	RADIUS
RCP	REINFORMATIONRCED CONCRETE PIPE
REQ'D	REQUIRED
RG	RESTRAINED GLANDS
RL	LONG RADIUS
ROW	RIGHT OF WAY
RP	RADIUS POINT
RR	RAIL ROAD
RS	SHORT RADIUS
RT	RIGHT
S	SLOPE
SAN	SANITARY
SC	SHORT CHORD
SCD	STANDARD CONTRACT DOCUMENTS
SCH	SCHEDULE
SF	SILT FENCE
SL	SECTION LINE
SSRB	STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION
SSUU	STANDARD SPECIFICATIONS FOR CONSTRUCTION OF UNDERGROUND UTILITIES
STA	STATION
STL	STEEL
STM	STORM
T	TELEPHONE
TAN	LENGTH OF TANGENT
TC	TOP OF CURB
TH	TEST HOLE
TV	TELEVISION
(TYP)	TYPICAL
UU	UNDERGROUND UTILITIES
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VPC	VERTICAL POINT OF CURVATURE
VPCC	VERTICAL POINT OF COMPOUND CURVATURE
VPRC	VERTICAL POINT OF REVERSE CURVATURE
VPI	VERTICAL POINT OF INTERSECTION
VPT	VERTICAL POINT OF TANGENCY
W	WATER
△	DELTA ANGLE

LEGEND

BSWMP DRAINAGE BASIN BOUNDARY

BSWMP ANCHORED STRAW BALES — ASB ASB ASB ASB ASB ASB ASB ASB

BSWMP SILT FENCE — SF SF SF SF SF SF SF SF

BUILDING

CONCRETE CURB AND GUTTER — 2' CURB AND GUTTER

CONCRETE CURB,GUTTER, & SIDEWALK — 7' C, G, & SW

CONCRETE DITCH — CONCRETE

CONCRETE SIDEWALK — 4" SW

CULVERT — 18" RCP

EARTH DITCH — EARTH . . . EARTH . . . EARTH . . .

EDGE OF GRAVEL

EDGE OF PAVEMENT

FENCE (BARBED WIRE)

FENCE (CHAIN LINK)

FENCE (IRON)

FENCE (PLASTIC)

FENCE (TEMPORARY CONSTRUCTION)

FENCE (WOOD)

FENCE (WOVEN WIRE)

GUARD RAIL

HATCHING: INDICATES ASPHALT REMOVAL

HATCHING: INDICATES CONCRETE REMOVAL

HATCHING: INDICATES STAGING AREA — ~STAGING AREA~

LINE (CENTER OF IMPROVEMENTS) — CENTERLINE

LINE (CITY LIMITS) — CITY LIMITS

LINE (CONTROL) — CONTROL LINE

LINE (EASEMENT)

LINE (MONUMENT/SECTION) — MONUMENT/SECTION LINE

LINE (PROPERTY)

LINE (RIGHT OF WAY)

MATCH LINE — MATCH LINE SEE SHEET NO ?

PIPE (IRRIGATION) — 4" IRR

PIPE (SIPHON) — 4" SIPHON

PROPOSED CONCRETE CURB AND GUTTER

PROPOSED CONCRETE CURB,GUTTER,& SIDEWALK

PROPOSED CONCRETE SIDEWALK

PROPOSED "WET" UTILITIES (CONSTRUCTION NOTE WILL INDICATE TYPE, SIZE, AND MATERIAL OF NEW MAIN) — 8" PVC SANITARY SEWER

PROPOSED SEWER PIPE BURSTING LIMITS

ALL PROPOSED FEATURES NOT SHOWN IN LEGEND WILL BE SHOWN THE SAME AS THEIR EXISTING COUNTERPART, BUT INDICATED BY BOLDER LINETYPE

RAIL ROAD

RETAINING WALL — 1' RETAINING WALL

STRIPING (CONTINUOUS WHITE) — WHITE

STRIPING (DASHED WHITE) — WHITE

STRIPING (CONTINUOUS YELLOW) — YELLOW

STRIPING (DASHED YELLOW) — YELLOW

TOP OF SLOPE — 4570

CONTOUR LINES (SHOWN BETWEEN TOP & TOE) — 4580

TOE OF SLOPE — 4570

TRAFFIC DETECTOR LOOP

UTILITY LINE (ABANDON) (THIS CASE A WATER LINE) — W (ABANDON) 8" W

UTILITY LINE (CABLE TV) — TV TV

UTILITY LINE (ELECTRIC) — E E

UTILITY LINE (FIBER OPTIC) — FO QWEST FO

UTILITY LINE (GAS) — G 1 1/4" MW G

UTILITY LINE (HIGH VOLTAGE OVERHEAD POWER) — HVOHP

UTILITY LINE (OVERHEAD POWER) — OHP

UTILITY LINE (OVERHEAD TELEPHONE) — OHT

UTILITY LINE (SANITARY SEWER) — 8" SAN

UTILITY LINE (SANITARY SEWER FORCE MAIN) — 8" FM

UTILITY LINE (SANITARY SEWER SERVICE) — SS SS

UTILITY LINE (STORM SEWER) — 8" STM

UTILITY LINE (STORM SEWER, PERFORATED) — 6" PERF

UTILITY LINE (STORM/SANITARY SEWER SEWER COMBINATION) — 18" COMB

UTILITY LINE (TELEPHONE) — T T

UTILITY LINE (WATER) — W 8" W

SYMBOLS

BENCH MARK — A

CATCH BASIN

CLEAN OUT — SSCO

CURB STOP

FIRE HYDRANT

GUY WIRE ANCHOR

HEADGATE

IRRIGATION PUMP — P

MAILBOX — MB

MANHOLE (ELECTRIC) — E

MANHOLE (GAS) — G

MANHOLE (SANITARY/STORM)

MANHOLE (TELEPHONE) — T

MANHOLE (TV) — TV

MANHOLE (WATER) — W

METER (GAS) — GM

METER (WATER)

PEDESTAL (TELEPHONE)

PEDESTAL (TV) — TV

PROPERTY PIN

PULL BOX

REDUCER FITTING

SIGN OR POST (SIGN TYPE NOTED) — STOP

SPRINKLER HEAD

STREET LIGHT

SURVEY MONUMENT (CITY) — CSM

SURVEY MONUMENT (TYPE NOTED) — MCSM

TEST HOLE — TH #1

TRAFFIC PAINT MARKING

TRAFFIC SIGNAL POLE AND MAST ARM

UTILITY POLE

VALVE (GAS) — GV

VALVE (IRRIGATION) — IRR

VALVE (WATER)

VEGETATION (HEDGE OR BUSH)

VEGETATION (TREE STUMP)

VEGETATION (TREE) (CALIPER SIZE NOTED)

WATER HYDRANT — WH

WEIR

YARD LIGHT

BAR SCALE:

0 5 10 20

(IN FEET)
1 inch = 20 feet

NORTH ARROW: N W E S

DESCRIPTION	DATE
REVISION △	–
REVISION △	–
REVISION △	–
REVISION △	–

DRAWN BY BCH DATE 03/20/18
DESIGNED BY BCH DATE 03/20/18
CHECKED BY ALC DATE
APPROVED BY ALC DATE

SCALES: PLAN & PROFILE
HORIZONTAL: 1" = NA
NA NA NA NA
VERTICAL: 1" = NA
NA NA NA NA

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENTS – PHASE A
STANDARD ABBREVIATIONS, LEGEND, AND SYMBOLS

Bid Schedule: 2018 Sewerline Replacement Project - Phase A

Item No.	CDOT, City Ref.	Description	Quantity	Units
1	108.2	4" Sewer Pipe Service (SDR-35 PVC) (Includes cost of connection to the existing sewer service line)	796.	Lin. Ft.
2	108.2	6" Gravity Sewer Pipe (SDR-35 PVC) (Includes cost of connection to the existing sewer pipe)	60.	Lin. Ft.
3	108.2	8" Gravity Sewer Pipe (SDR-35 PVC) (Includes cost of connection to the existing sewer pipe)	3,560.	Lin. Ft.
4	108.2	8" Gravity Sewer Pipe (Fusible PVC) (Pipe-Bursting Installation Method)	1,170.	Lin. Ft.
5	108.2	10" Gravity Sewer Pipe (SDR-35 PVC) (Includes cost of connection to the existing sewer pipe)	815.	Lin. Ft.
6	108.2	Imported Trench Backfill (Class 3) (Includes haul and disposal of unsuitable excavated materail) (Assumed Unit Weight = 133 lbs/ft3)	3,000.	Ton
7	108.3	8" x 4" Sewer Service Tap (Full Body Wye) (Includes Wye, clean-out and all fittings required to align and connect the sewer service pipe to the sewer tap)	34.	Each
8	108.3	8" x 4" Sewer Service Tap (Tapping Saddle) (To be used on the Fusible PVC pipe) (Includes saddle, clean-out and all fittings required to align and connect the sewer service pipe to the sewer tap)	12.	Each
9	108.3	10" x 4" Sewer Service Tap (Full Body Wye) (Includes Wye, clean-out and all fittings required to align and connect the sewer service pipe to the sewer tap)	6.	Each
10	108.3	Sewer Service Clean-out Ring and Cover (Castings Inc. CO-8030-CI or Approved Equal) (Includes concrete collar in unpaved areas per City Std. Detail SS-07)	51.	Each
11	108.5	Sanitary Sewer Basic Manhole (48" I.D.)	4.	Each
12	108.5	Sanitary Sewer Basic Manhole (48" I.D.) (Epoxy Coated Inverts)	21.	Each
13	108.5	Manhole Barrel Section (D>5') (48" I.D.)	39.	Vert. Ft.
14	108.5	Connect to Existing Manhole (8" pipe)	2.	Each
15	108.7	Granular Stabilization Material (Type B) (Crushed Rock) (18" Thick Min.) (Includes haul and disposal of unsuitable excavated material) (Assumed Unit Weight = 138 lbs/ft3)	550.	Ton
16	202	Removal of Existing Pipe (Size & type as shown on plans)	5,351.	Lin. Ft.
17	202	Abandon Pipe (Abandon pipe by plugging ends with concrete)	14.	Each
18	202	Removal of Asphalt Mat (Full Depth)	1,550.	Sq. Yd.
19	202	Removal of Asphalt Mat (Planing) (2" Thick for T-Top Section)	1,000.	Sq. Yd.
20	202	Removal of Concrete with Hydronic Heat Tubing (Alley at Munro Pump)	20.	Sq. Yd.
21	202	Removal of Concrete (Includes, but not limited to, curb, gutter, sidewalk, driveway, slabs, V-pans, curb ramps, intersection corners, aprons, and landscape borders)	220.	Sq. Yd.
22	202	Removal of Sod	15.	Sq. Yd.
23	202	Removal of Manhole	24.	Each
24	202	Abandon Manhole (Remove cone section, ring & cover, and fill remaining barrel sections with flow-fill material)	1.	Each
25	203	Disposal of Radioactive Material (Dispose at City Shops, 333 West Ave.)	40.	Cu. Yd.
26	206	Structure Backfill (Flow-Fill)	100.	Cu. Yd.
27	208	Storm Drain Inlet Protection (Silt-Sack) (Includes Maintenance & Removal of Debris, & Removal of Inlet Protection)	15.	Each
28	208	Concrete Washout Facility	1.	Lump Sum
29	210	Repair Damage to Unlocated Irrigation Lines (Various Sizes and Materials) (1" to 15")	3.	Each
30	210	Reset Landscape Ground Cover (Landscape Rock) (Match in Kind)	25.	Sq. Yd.
31	210	Reset Sprinkler System (Complete in Place)	2.	Each
32	210	Reset Fence (6' High Chain-Link)	32.	Lin. Ft.
33	212	Re-Sod Area as Shown (Includes 4" Thick of Topsoil placed prior to sod placement)	15.	Sq. Yd.
34	304	Aggregate Base Course (Class 6) (6" thick)	1,250.	Sq. Yd.
35	304	Aggregate Base Course (Class 6) (15" thick)	1,550.	Sq. Yd.
36	401	Hot Bituminous Pavement (Patching) (3 " Thick) (Grading SX, PG 64-22) (GYR.=75) (One 3" Lift)	1,550.	Sq. Yd.
37	401	Hot Bituminous Pavement (Patching) (2" Thick) (Grading SX, PG 64-22) (GYR.=75) (One 2" Top Mat)	1,480.	Sq. Yd.
38	401	Hot Bituminous Pavement (Patching) (2" Thick) (Grading SX, PG 64-22) (GYR.=75) (One 2" Top Mat) (T-Top)	1,150.	Sq. Yd.
39	407	Emulsified Asphalt (Tack Coat)	285.	Gallon
40	420	Geotextile (Separator) (Non-Woven) (Wrap stabilization material with fabric) (Minimum Overlap = 24")	1,900.	Sq. Yd.
41	607	Line Post (Match in Kind) (6' High) (If Necessary)	3.	Each
42	608	Concrete Sidewalk (4" thick)	14.	Sq. Yd.
43	608	Concrete Curb and Gutter (Match in Kind)	170.	Lin. Ft.
44	608	Concrete Driveway Section (8" Thick) (Includes #5 epoxy coated rebar tie-bars @ 12" spacing) (18" long)	61.	Sq. Yd.
45	608	Concrete Pavement (Hydronic Heating) (8" Thick) (Includes exposing existing PEX hydronic heat tubing and installing new PEX tubing and connecting new tubing to the existing tubing) (Located at Munro Pump on 9th St.)	20.	Sq. Yd.
46	608	Concrete Curb, Gutter and Sidewalk (Match in Kind)	130.	Sq. Yd.
47	608	Concrete Drainage Pan (8" Thick) (See City Standard Detail C-12) (Includes #5 Rebar for Tie-Bars)	8.	Sq. Yd.
48	608	Cap Top Half of Sewer Pipe in Concrete per City Std. Detail GU-04 (20' long) (If necessary)	3.	Each
49	608	Encase Sewer Pipe in Concrete per City Std. Detail GU-04 (20' long) (If necessary)	2.	Each
50	620	Portable Sanitary Facility	1.	Each
51	625	Construction Surveying (Includes As-Built Drawings)	1.	Lump Sum
52	626	Mobilization	1.	Lump Sum
53	629	Survey Monumentation (Complete in Place) (Reference and Reset)	2.	Each
54	630	Traffic Control (Complete in Place)	1.	Lump Sum
55	630	Traffic Control Plan	1.	Lump Sum
56	630	Flagging	720.	Hour
57	SC 3.3.18	Quality Control Testing	1.	Lump Sum
58	Pump	Bypass Sewage Pumping (At Contractors Discretion)	1.	Lump Sum
MCR		Minor Contract Revisions	---	---

BID AMOUNT:_____

CONTRACTOR NAME: _____

CONTRACTOR ADDRESS: _____

CONTRACTOR PHONE: _____

DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

DRAWN BY BCH DATE 03/20/18
DESIGNED BY BCH DATE 03/20/18
CHECKED BY ALC DATE
APPROVED BY ALC DATE

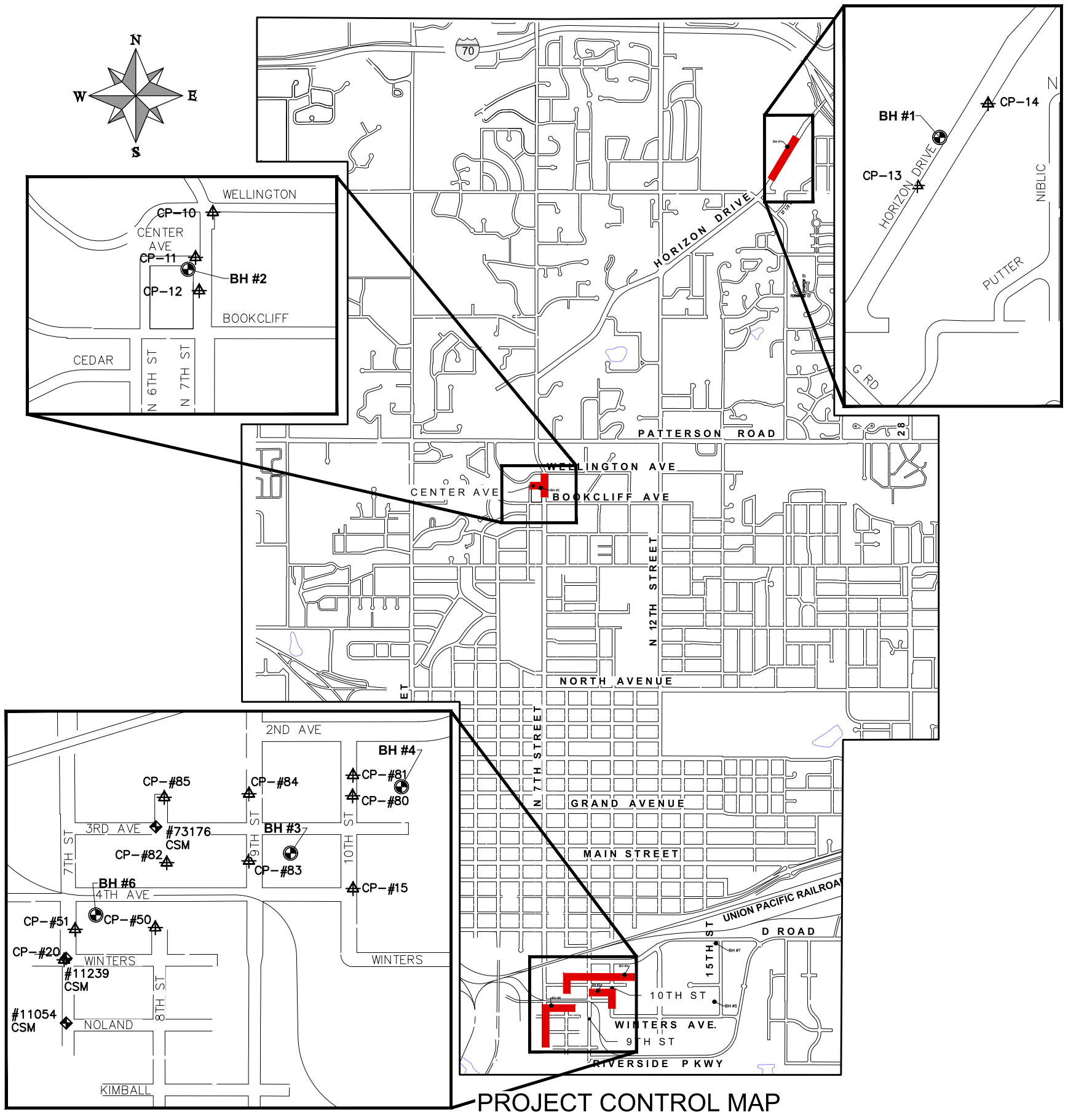
SCALES: PLAN & PROFILE
HORIZONTAL: 1" = NA
0 NA NA NA
VERTICAL: 1" = NA
0 AN NA NA

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENTS – PHASE A
SUMMARY OF APPROXIMATE QUANTITIES

PROJECT NO. 902-F001633



PROJECT CONTROL MAP

PROJECT CONTROL TABLE

POINT #	EASTING	NORTHING	ELEVATION	DESCRIPTION
10	92296.8610	44026.653	4644.22	CP /PK-W 2352/
11	92208.8840	43797.128	4639.97	CP /PK-W CENTER/
12	92227.3340	43628.175	4638.82	CP /PK-W 2335/
13	97288.0100	50718.990	4713.06	CP /PK CORPLEX/
14	97647.3600	51135.320	4718.27	CP /PK LOCO/
15	93704.9190	32906.056	4576.49	CP /PK/
20	92236.7670	32543.653	4568.63	CP PK /WINT/
40	96013.6840	32870.506	4581.20	CP /PK AT16THCOR/
41	96012.0220	33194.554	4582.47	CP /PK 4TH/
42	96008.9050	33693.391	4584.31	CP /PK PARKY/
43	95950.2510	34131.306	4587.50	CP /PK D RD/
50	92700.2290	32707.940	4570.10	CP /60D/
51	92292.7850	32698.942	4569.69	CP /6PK/
80	93702.5340	33377.715	4578.10	CP /PK/
81	93704.6520	33482.374	4578.26	CP /PK/
82	92758.1400	33037.764	4573.30	CP
83	93175.8630	33046.465	4575.08	CP
84	93176.0500	33387.564	4576.16	CP /PK/
85	92745.6220	33369.555	4574.75	CP /PK/
11054	92247.7190	32222.056	4567.14	CSM
11239	92246.9930	32551.257	4568.50	CSM

DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

DRAWN BY BCH DATE 03/20/18
DESIGNED BY BCH DATE 03/20/18
CHECKED BY ALC DATE
APPROVED BY ALC DATE

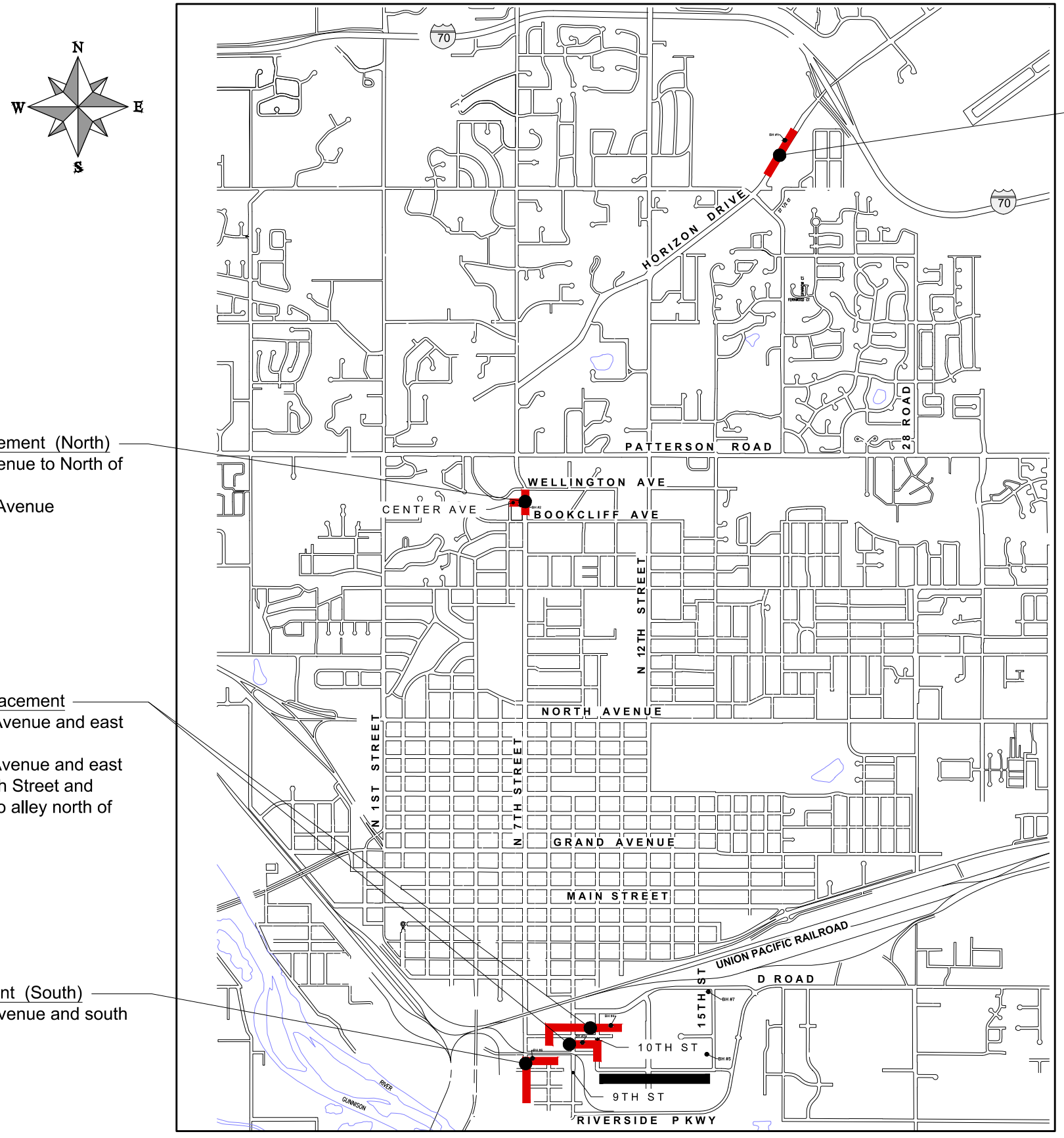
INDIVIDUAL CONTROL MAPS
HORIZONTAL: 1" = 600'
0 300 600 1200
VERTICAL: 1" = NA
0 NA NA NA

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENTS - PHASE A
PROJECT CONTROL MAP

PROJECT NO. 902-F001633



Horizon Drive Sewer Replacement
- From 723 Horizon Drive to 708 Horizon Drive

(Sheet 18 to Sheet 19)

7th Street Sewer Replacement (North)
- From Wellington Avenue to North of Bookcliff Avenue
- West along Center Avenue

(Sheet 15 to Sheet 17)

10th Street Sewer Replacement
- Alley north of 3rd Avenue and east of 9th Street
- Alley north of 4th Avenue and east of 9th Street to 10th Street and along 10th Street to alley north of Winters Avenue

(Sheet 6 to Sheet 11)

7th Street Sewer Replacement (South)
- Alley north of Winters Avenue and south along S. 7th Street

(Sheet 12 to Sheet 14)

PROJECT LOCATION MAP

DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

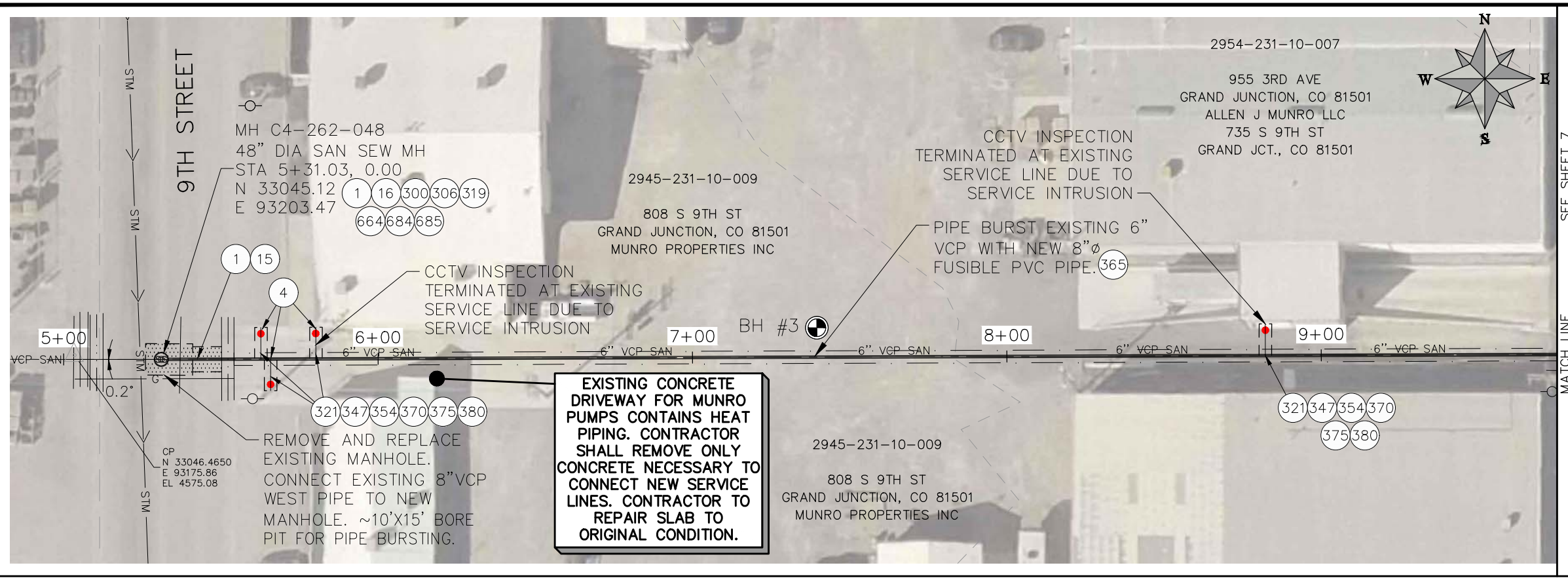
DRAWN BY DDC DATE 2018
DESIGNED BY BCH DATE 2018
CHECKED BY ALC DATE
APPROVED BY ALC DATE

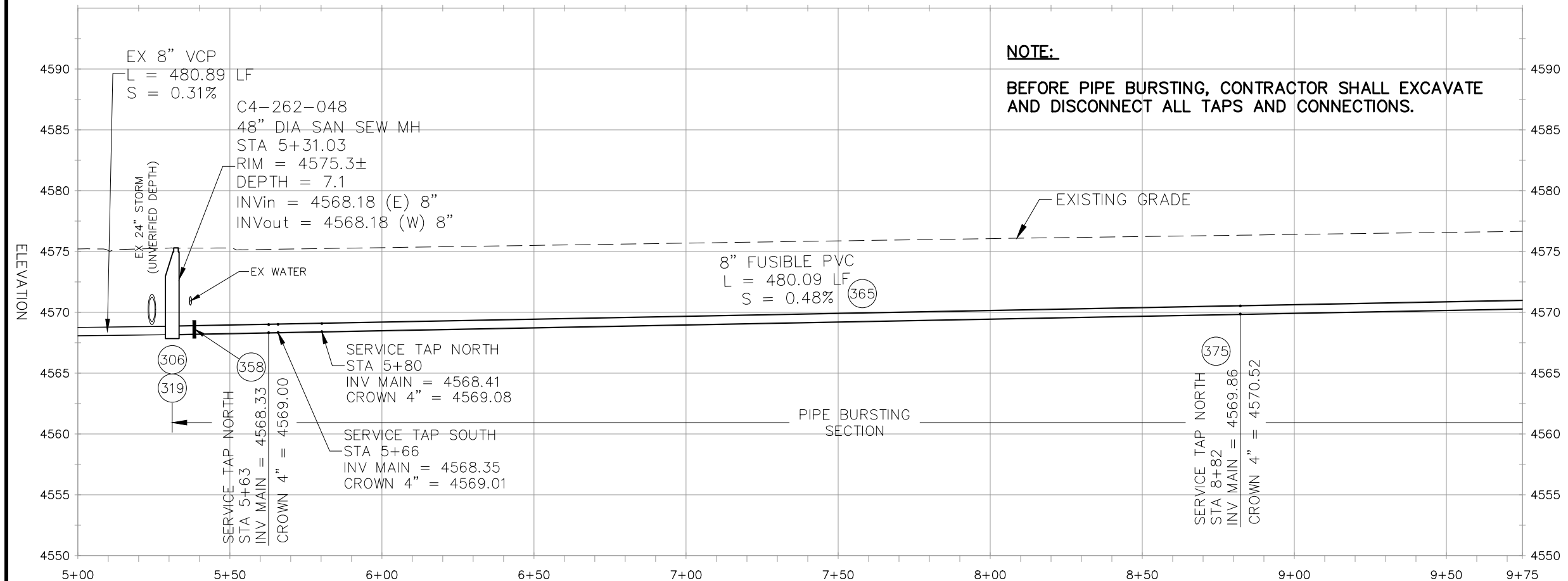
PROJECT CONTROL MAP
HORIZONTAL: 1" = 2500'
0 2500 1250 5000
VERTICAL: 1" = NA
0 NA NA NA

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENTS – PHASE A
PROJECT LOCATION MAP





PROJECT NO. 902-F001633

CONSTRUCTION NOTES

1. 202 – REMOVAL OF ASPHALT MAT. CUT AND REMOVE ASPHALT AS SHOWN. (INDICATED BY DOT HATCH PATTERN)
4. 202 – REMOVAL OF CONCRETE WITH HYDRONIC HEAT PIPING (SAW CUT AND REMOVE CONCRETE AS SHOWN)
15. 202 – REMOVAL OF PIPE AS SHOWN. (SIZE AND TYPE AS SHOWN ON PLAN)
16. 202 – REMOVAL OF MANHOLE. CONTRACTOR SHALL SALVAGE RING AND COVER AND DELIVER TO CITY SHOPS
300. 102.11/108.5 – SANITARY SEWER BASIC MANHOLE (48" I.D.). INCLUDES CONNECTION OF ADJACENT SEWER LINE, FORMING INVERTS AND ADJUSTING TO FINAL GRADE. (SEE CITY OF GRAND JUNCTION STANDARD DETAIL SS-02).
306. 102.11/108.5 – MANHOLE BARREL SECTION (D>5') (48" I.D.).
319. EPOXY COAT MANHOLE INVERT. COST IS INCIDENTAL TO COST OF MANHOLE INSTALLATION.
321. 102.9/108.2 – 4" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.
347. 102/103/104 – CONTRACTOR SHALL FIELD VERIFY EXISTING SEWER SERVICE LOCATIONS (SEWER SERVICE LOCATIONS AND CONNECTION POINTS TO EXISTING SERVICES ARE SHOWN FOR ESTIMATING PURPOSES ONLY AND MAY VARY FROM WHAT IS SHOWN).
358. 103 – CLAY CUT-OFF WALL (INCIDENTAL TO SEWER INSTALLATION PAY ITEM)
354. 104.20 – INSTALL 2-WAY SANITARY SEWER SERVICE CLEANOUT (STD. DETAIL SS-07). INCLUDES CLEANOUT RING AND COVER AND CONCRETE COLLAR IN UNPAVED AREAS (SEE STD. DETAIL SS-07).
365. 102.9B – INSTALL NEW 8" FUSIBLE PVC (FPVC) PIPE FOR PIPE BURSTING
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375. 102.9/104.2/108.2 – 4" SEWER SERVICE TAP TO INCLUDE: DISCONNECTING EXISTING SERVICE AND INSTALLING NEW SERVICE TAP. NEW TAP SHALL BE (W/ APPROVAL OF ENGINEER OR INSPECTOR ON CASE-SPECIFIC BASIS): FULL BODY WYE W/ STREET 45 (PIPE STUBS AND COUPLINGS INCLUDED), INSERTA-TEE, OR SADDLE; ALL BENDS AND FITTINGS, CLEANOUT, VERTICAL PIPING, CLEANOUT RING & COVER AND CONCRETE COLLAR, AS REQUIRED, TO ALIGN AND CONNECT TO EXISTING SERVICE AT ROW LINE. FOR 4" SERVICE PIPE (SEE CITY OF GRAND JUNCTION STD. DETAIL "TYPICAL SERVICE "Y" CONNECTION" SS-06 AND SS-07).
380. CONNECT TO EXISTING SEWER PIPE. THE CONTRACT PRICE FOR SEWER PIPE SHALL INCLUDE THE COST OF CONNECTION TO EXISTING PIPELINE
664. 304 – AGGREGATE BASE COURSE (CLASS 6) (15" THICK)
684. 401.08 – HOT BITUMINOUS PAVEMENT (PATCHING) (3" THICK) (GRADING SX, PG 64-22, GYR.=75) (ONE 3" LIFT BOTTOM MAT)
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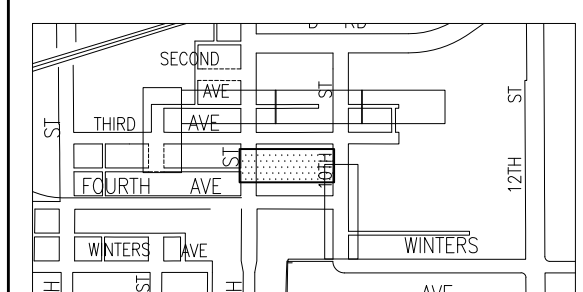

KEYMAP

DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

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SCALES: PLAN & PROFILE
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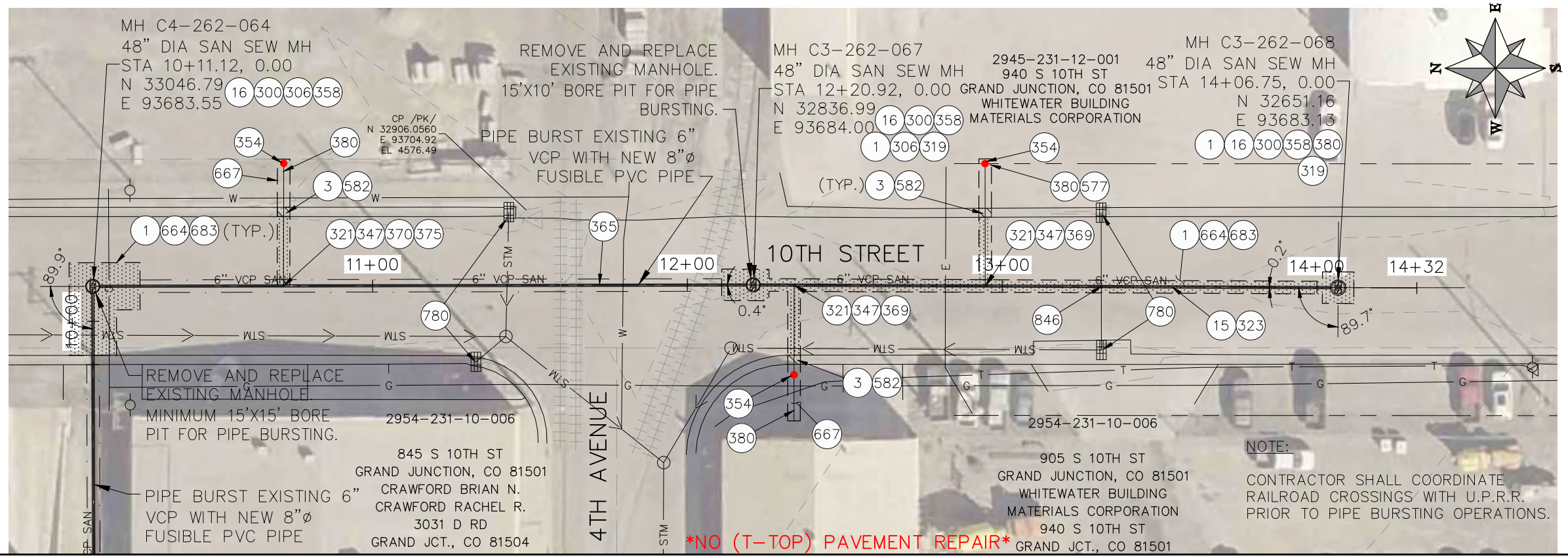
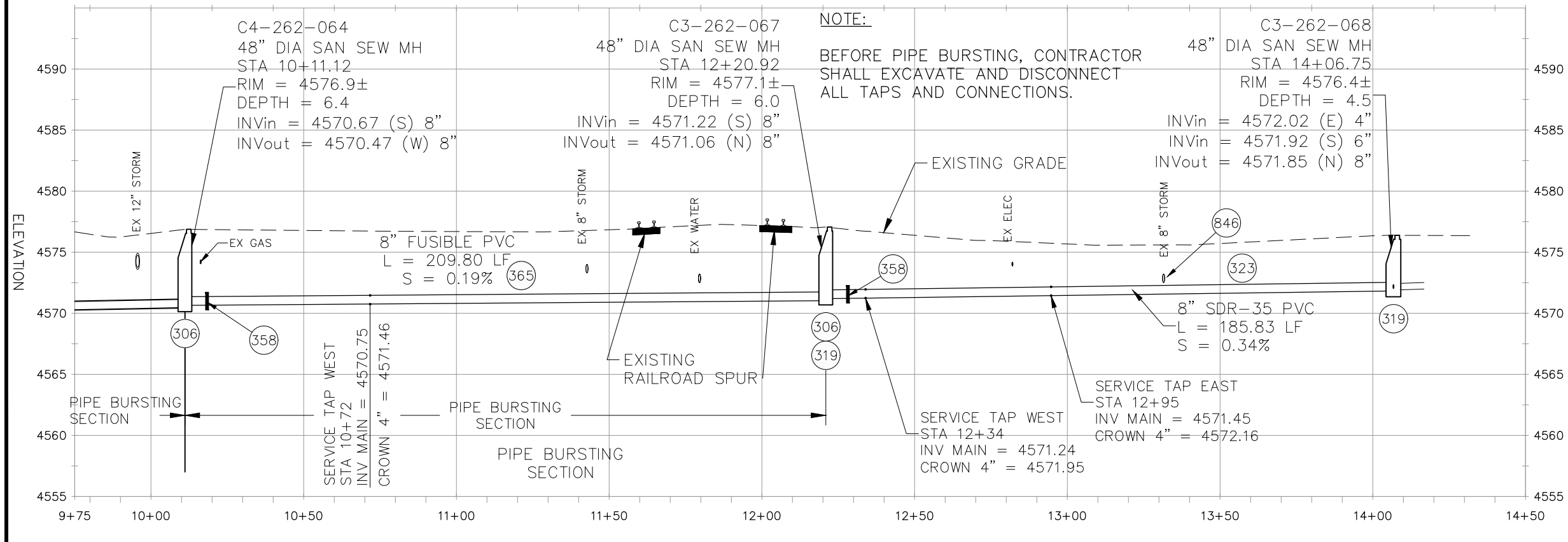
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
4TH AVENUE ALLEY PLAN AND PROFILE
STA 5+00 TO STA 9+75



MATCH LINE SEE SHEET 6



PROJECT NO. 902-F001633

CONSTRUCTION NOTES

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3. 202 – REMOVAL OF CONCRETE. SAW CUT AND REMOVE CONCRETE AS SHOWN. (INDICATED BY CROSS HATCH PATTERN) INCLUDES BUT NOT LIMITED TO CURB, GUTTER, SIDEWALK, DRIVEWAY, SLABS, V-PAN, CURB RAMPS, INTERSECTION CORNERS, APRONS, AND LANDSCAPE BORDERS.
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323. 102.9/108.2 – 8" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.
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380. CONNECT TO EXISTING SEWER PIPE. THE CONTRACT PRICE FOR SEWER PIPE SHALL INCLUDE THE COST OF CONNECTION TO EXISTING PIPELINE
577. 608.06 – CONCRETE DRIVEWAY SECTION (MATCH IN KIND) (INCLUDES #5 REBAR TIE-BARS @ 12" O.C.) (EPOXY COATED TIE-BARS) (18" LONG)
582. 608.06 – CONCRETE DRAINAGE PAN (MATCH IN KIND)
664. 304 – AGGREGATE BASE COURSE (CLASS 6) (15" THICK)
667. 304 – AGGREGATE BASE COURSE (CLASS 6) (6" THICK)
683. 401.08 – HOT BITUMINOUS PAVEMENT (PATCHING) (5" THICK) (GRADING SX, PG 64-22, GYR.=75) (TWO LIFTS)
780. 208 – STORM DRAIN INLET PROTECTION (SILT-SACK) (INCLUDES MAINTENANCE AND REMOVAL OF DIRT AND DEBRIS)
846. POTHOLE EXISTING UTILITY AHEAD OF CONSTRUCTION. COORDINATE ANY NEEDED DESIGN CHANGES WITH PROJECT ENGINEER SO AS TO AVOID UTILITY CONFLICTS.

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CITY OF Grand Junction COLORADO

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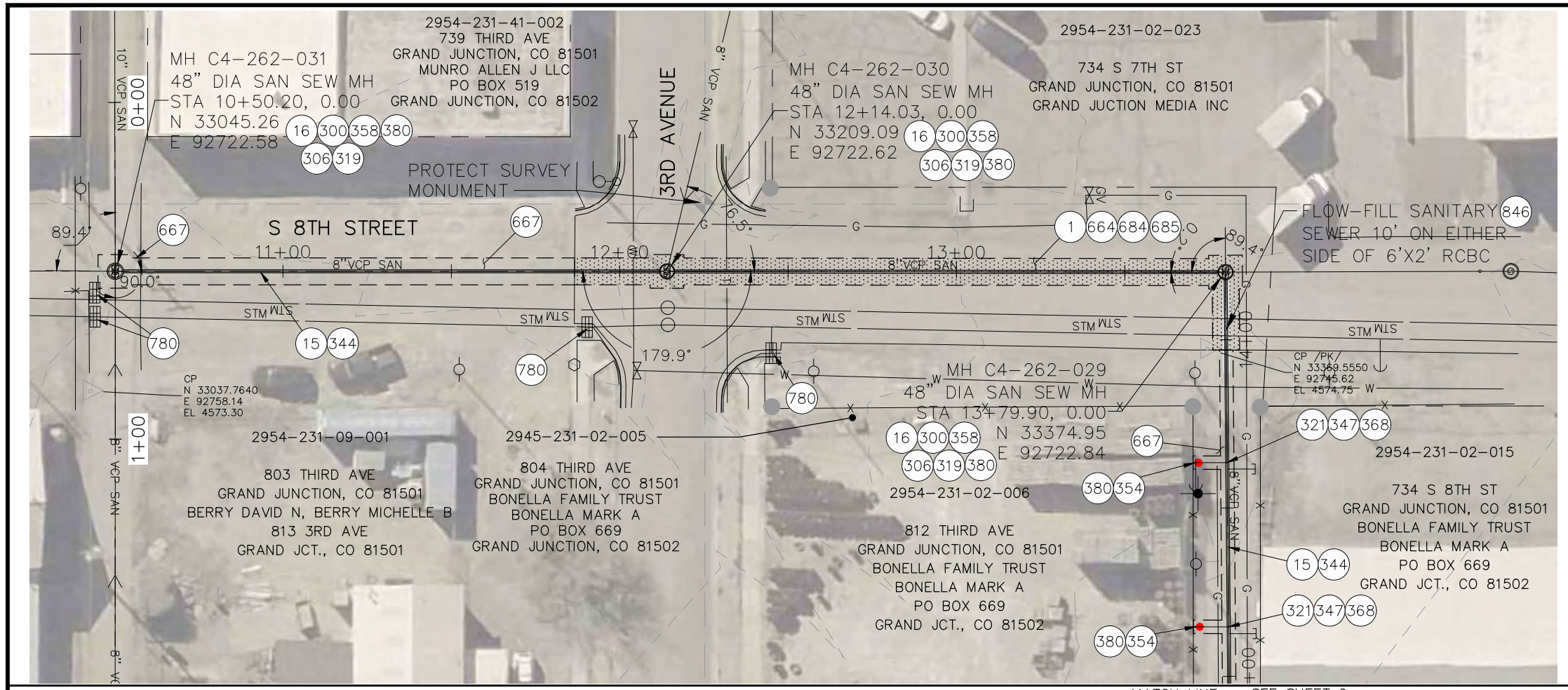
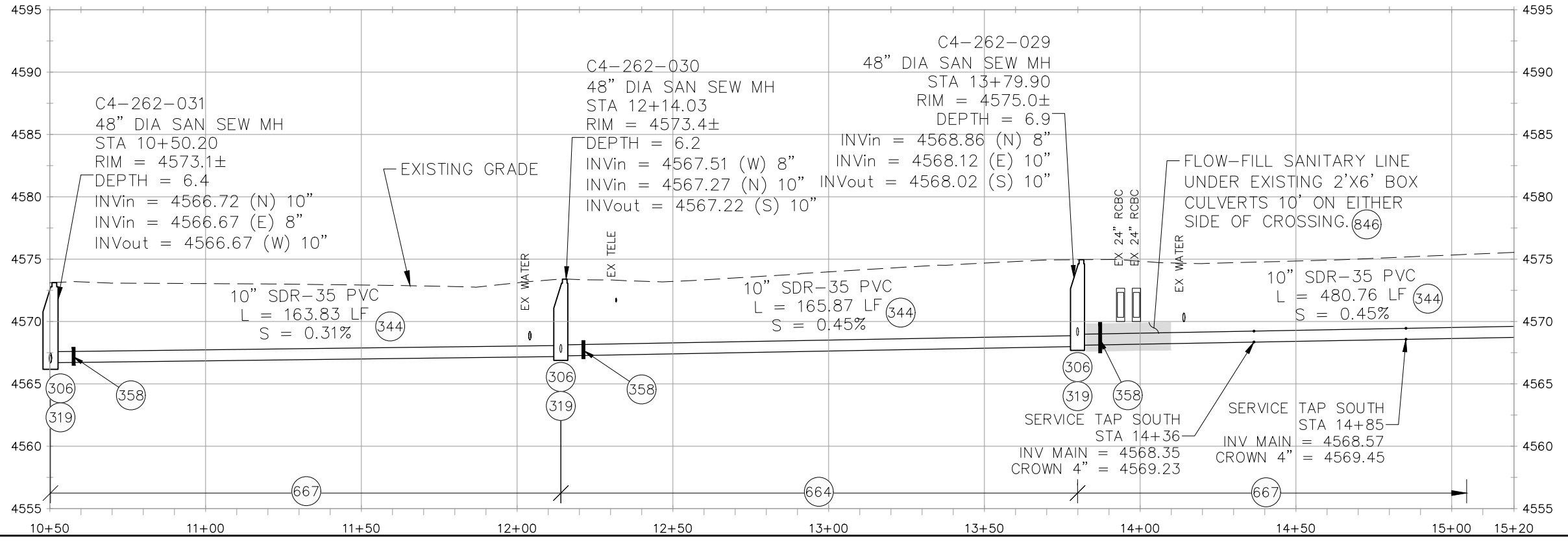
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
S 10TH STREET PLAN AND PROFILE
STA 9+75 TO STA 14+50



MATCH LINE SEE SHEET 9



PROJECT NO. 902-F001633

CONSTRUCTION NOTES

(1) 202 – REMOVAL OF ASPHALT MAT. CUT AND REMOVE ASPHALT AS SHOWN. (INDICATED BY DOT HATCH PATTERN)

(15) 202 – REMOVAL OF PIPE AS SHOWN. (SIZE AND TYPE AS SHOWN ON PLAN)

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(344) 102.9/108.2 – 10" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.

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(354) 104.20 – INSTALL 2-WAY SANITARY SEWER SERVICE CLEANOUT (STD. DETAIL SS-07). INCLUDES CLEANOUT RING AND COVER AND CONCRETE COLLAR IN UNPAVED AREAS (SEE STD. DETAIL SS-07).

(358) 103 – CLAY CUT-OFF WALL (INCIDENTAL TO SEWER INSTALLATION PAY ITEM)

(368) 102.9/108.3 – 10" x 4" SEWER SERVICE TAP. FULL BODY WYE (SEE STD. DETAIL SS-06).

(380) CONNECT TO EXISTING SEWER PIPE. THE CONTRACT PRICE FOR SEWER PIPE SHALL INCLUDE THE COST OF CONNECTION TO EXISTING PIPELINE

(664) 304 – AGGREGATE BASE COURSE (CLASS 6) (15" THICK)

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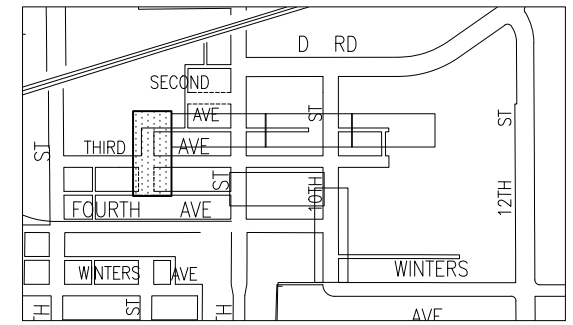

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CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
S 8TH STREET PLAN AND PROFILE
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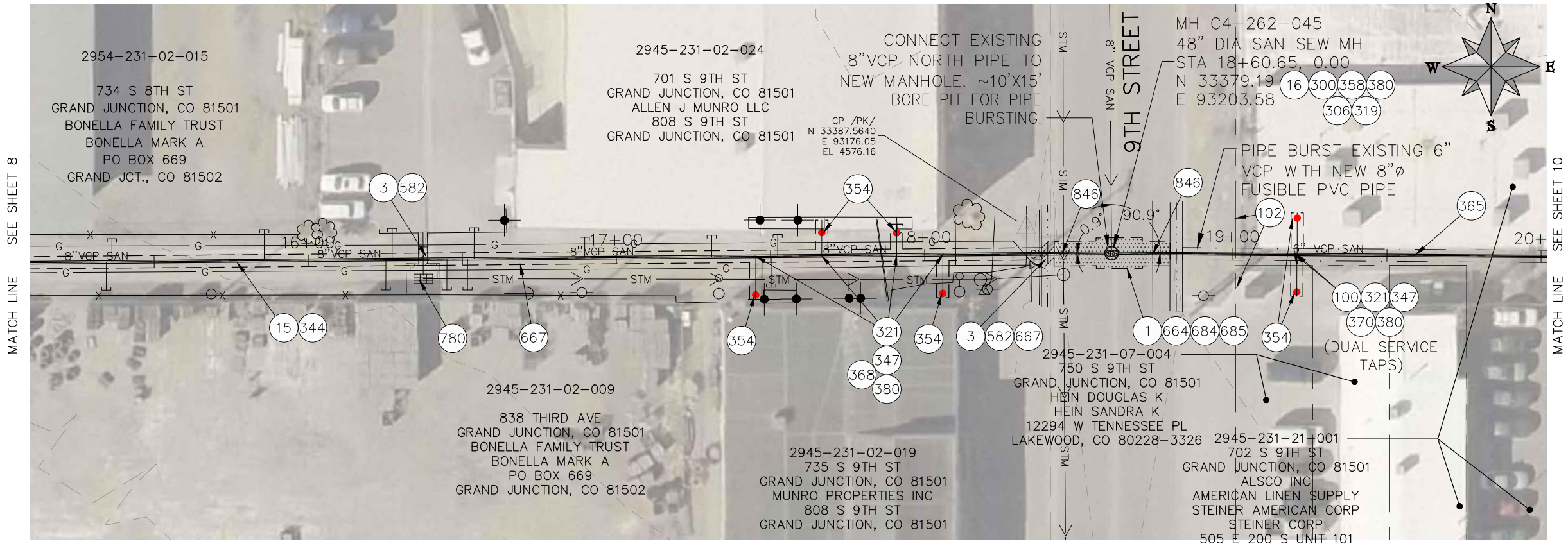

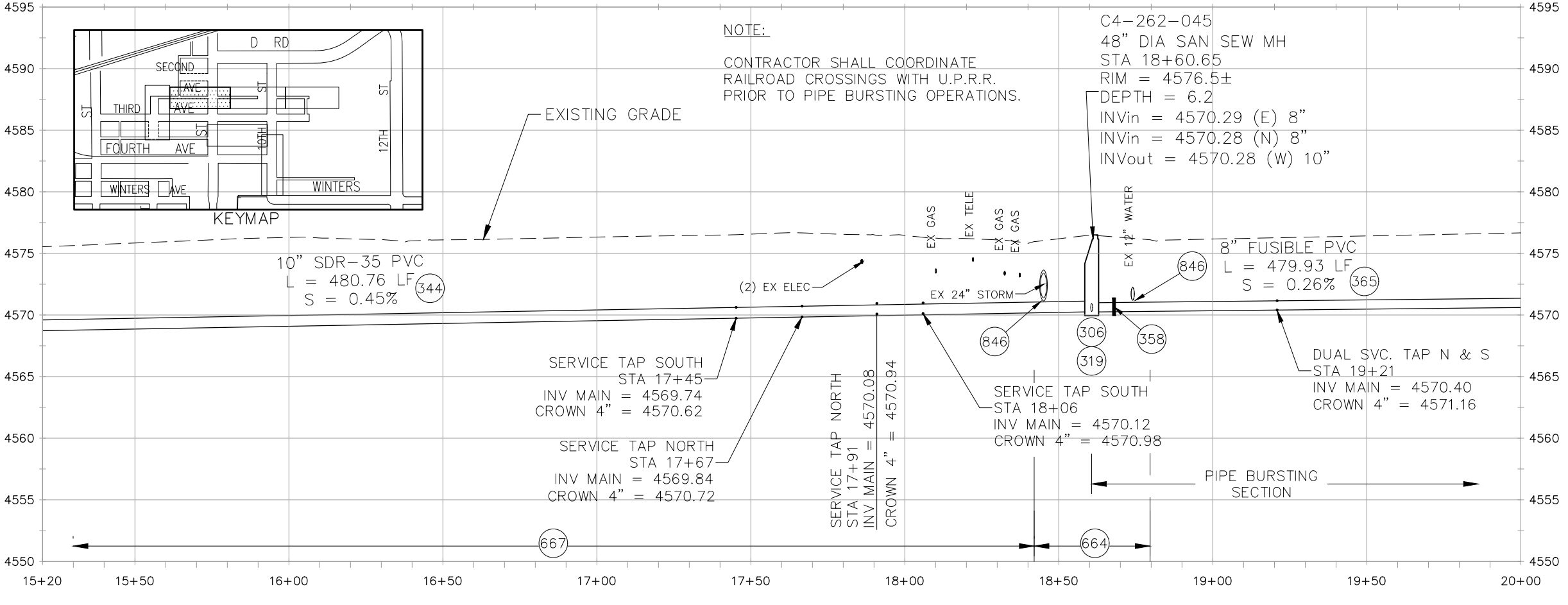

PROJECT NO. 902-F001633

CONSTRUCTION NOTES

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16. 202 – REMOVAL OF MANHOLE. CONTRACTOR SHALL SALVAGE RING AND COVER AND DELIVER TO CITY SHOPS
100. 210 – RESET LANDSCAPE GROUND COVER (ROCK)
102. 210 – RESET FENCE. CONTRACTOR TO SUPPLY AND INSTALL ANY NEW MATERIALS REQUIRED TO RESTORE THE FENCE TO ACCEPTABLE CONDITION EXCEPT FOR NEW POSTS. (HEIGHT AND MATERIAL AS SHOWN ON PLAN)
300. 102.11/108.5 – SANITARY SEWER BASIC MANHOLE (48" I.D.). INCLUDES CONNECTION OF ADJACENT SEWER LINE, FORMING INVERTS AND ADJUSTING TO FINAL GRADE. (SEE CITY OF GRAND JUNCTION STANDARD DETAIL SS-02).
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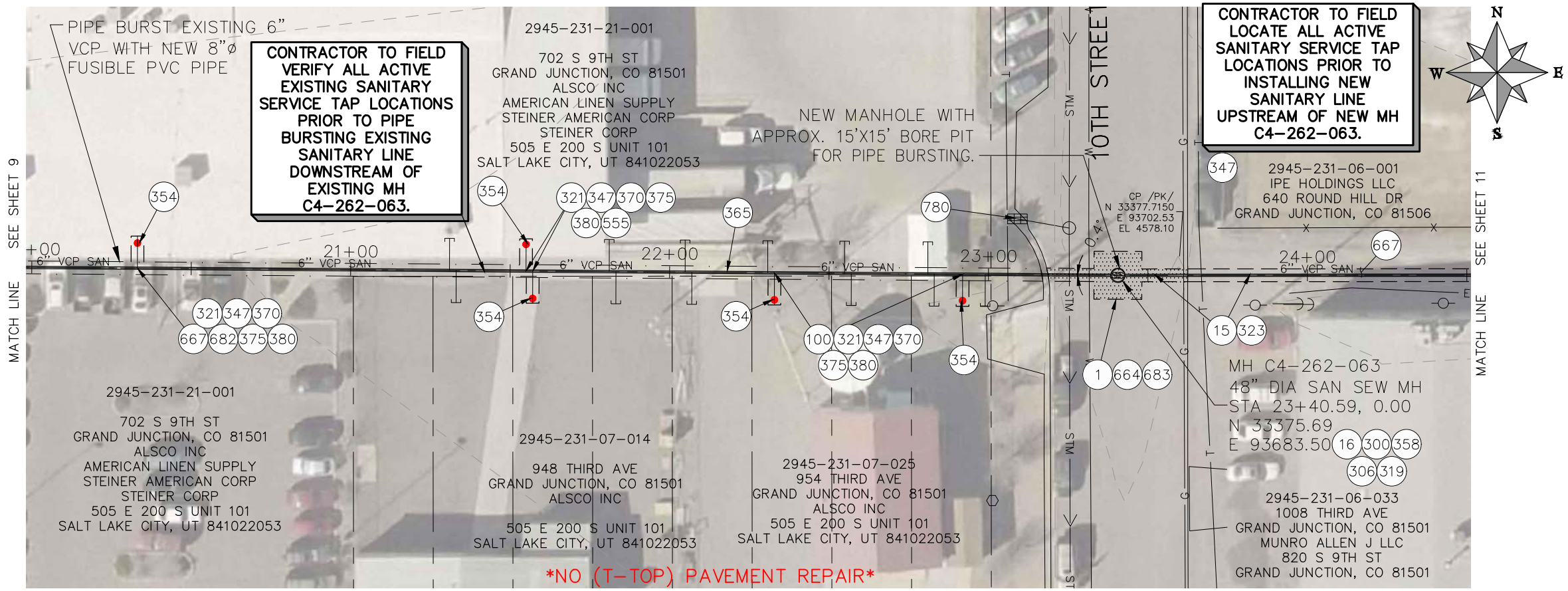
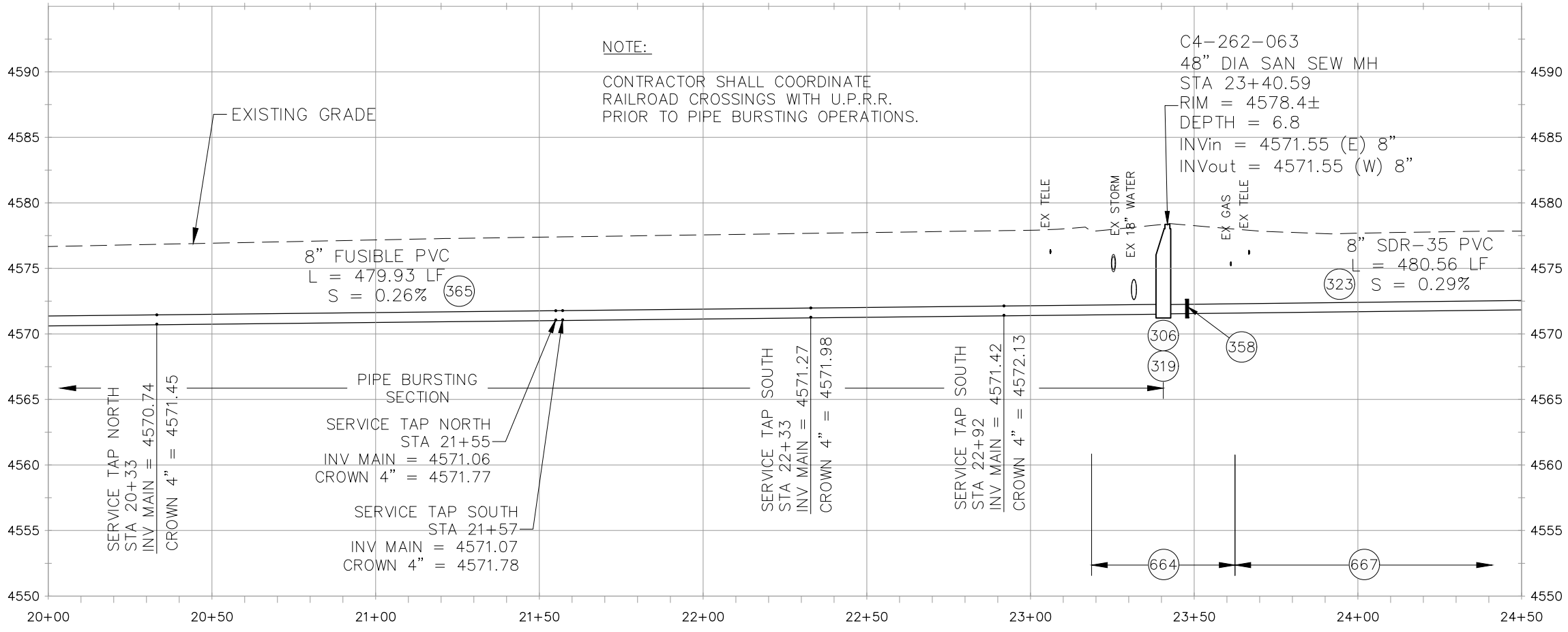
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
3RD AVENUE ALLEY PLAN AND PROFILE
STA 15+20 TO STA 20+00





PROJECT NO. 902-F001633

CONSTRUCTION NOTES

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380. CONNECT TO EXISTING SEWER PIPE. THE CONTRACT PRICE FOR SEWER PIPE SHALL INCLUDE THE COST OF CONNECTION TO EXISTING PIPELINE
555. 608.06 – CONCRETE SIDEWALK (4" THICK) (MATCH IN KIND)
664. 304 – AGGREGATE BASE COURSE (CLASS 6) (15" THICK)
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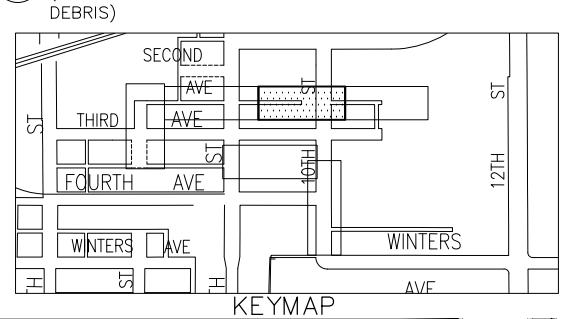

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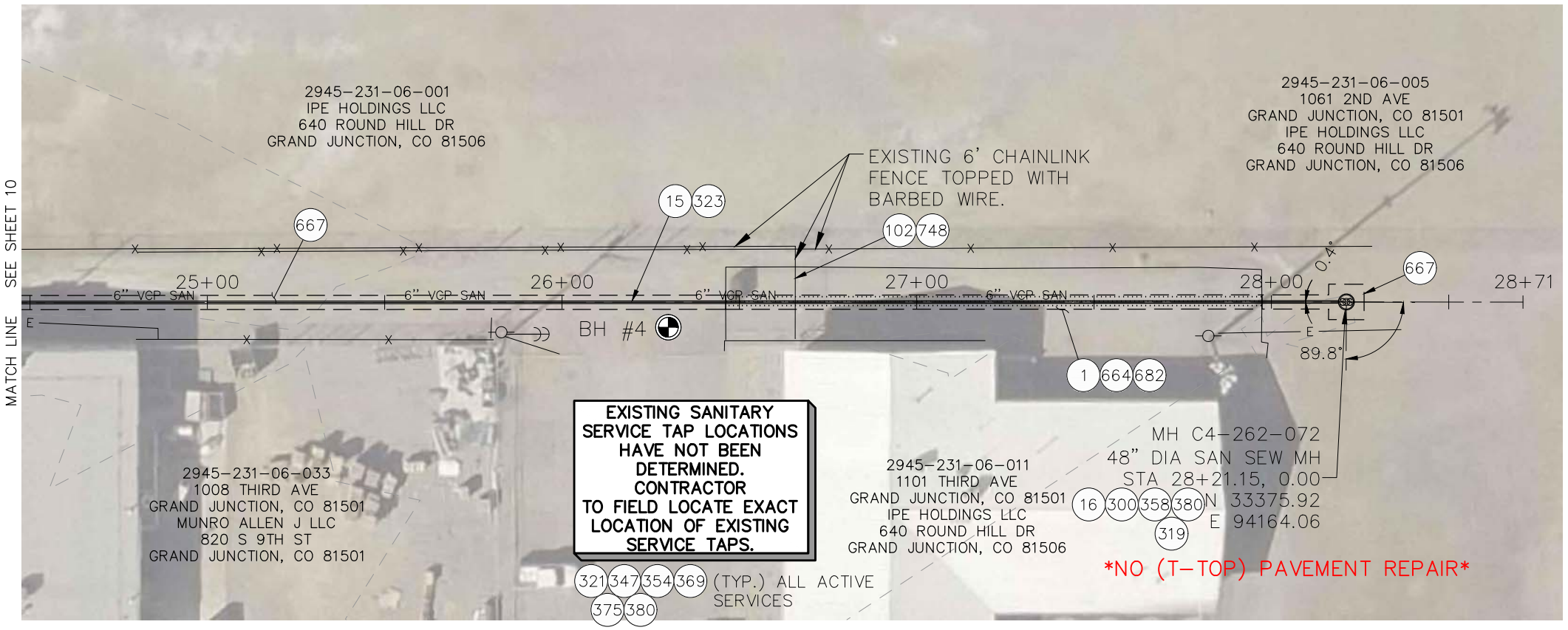
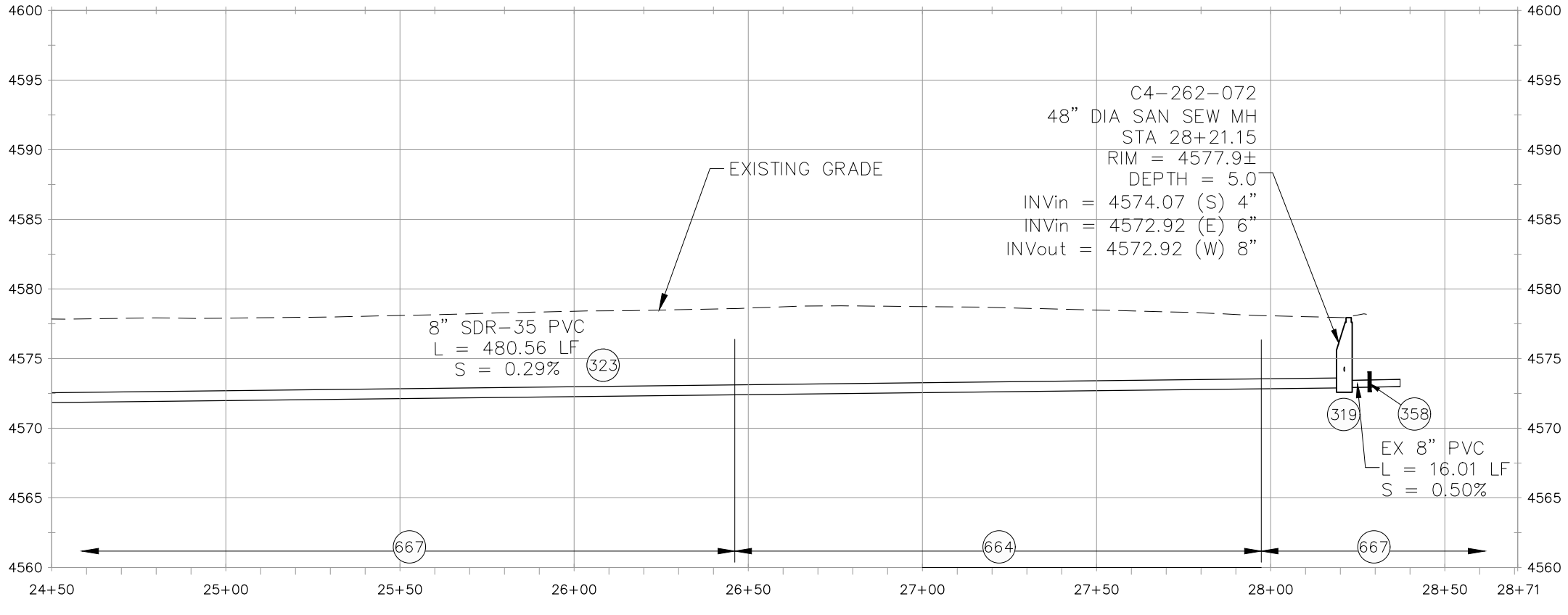
2018 SEWER LINE REPLACEMENT – PHASE A
3RD AVENUE ALLEY PLAN AND PROFILE
STA 20+00 TO STA 24+50

10

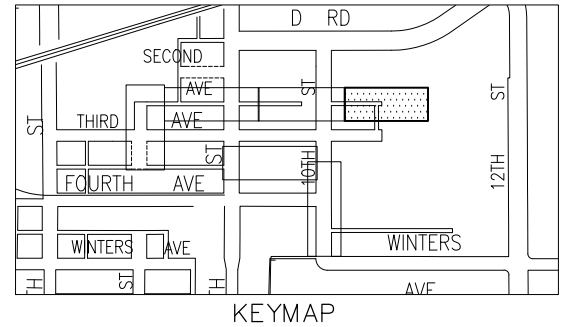




PROJECT NO. 902-F001633

CONSTRUCTION NOTES

1. 202 – REMOVAL OF ASPHALT MAT. CUT AND REMOVE ASPHALT AS SHOWN. (INDICATED BY DOT HATCH PATTERN)
15. 202 – REMOVAL OF PIPE AS SHOWN. (SIZE AND TYPE AS SHOWN ON PLAN)
16. 202 – REMOVAL OF MANHOLE. CONTRACTOR SHALL SALVAGE RING AND COVER AND DELIVER TO CITY SHOPS
102. 210 – RESET FENCE. CONTRACTOR TO SUPPLY AND INSTALL ANY NEW MATERIALS REQUIRED TO RESTORE THE FENCE TO ACCEPTABLE CONDITION EXCEPT FOR NEW POSTS. (HEIGHT AND MATERIAL AS SHOWN ON PLAN)
300. 102.11/108.5 – SANITARY SEWER BASIC MANHOLE (48" I.D.). INCLUDES CONNECTION OF ADJACENT SEWER LINE, FORMING INVERTS AND ADJUSTING TO FINAL GRADE. (SEE CITY OF GRAND JUNCTION STANDARD DETAIL SS-02).
319. EPOXY COAT MANHOLE INVERTS. COST IS INCIDENTAL TO COST OF MANHOLE INSTALLATION.
321. 102.9/108.2 – 4" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.
323. 102.9/108.2 – 8" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.
347. 102/103/104 – CONTRACTOR SHALL FIELD VERIFY EXISTING SEWER SERVICE LOCATIONS (SEWER SERVICE LOCATIONS AND CONNECTION POINTS TO EXISTING SERVICES ARE SHOWN FOR ESTIMATING PURPOSES ONLY AND MAY VARY FROM WHAT IS SHOWN).
354. 104.20 – INSTALL 2-WAY SANITARY SEWER SERVICE CLEANOUT (STD. DETAIL SS-07). INCLUDES CLEANOUT RING AND COVER AND CONCRETE COLLAR IN UNPAVED AREAS (SEE STD. DETAIL SS-07).
358. 103 – CLAY CUT-OFF WALL (INCIDENTAL TO SEWER INSTALLATION PAY ITEM)
369. 102.9/108.3 – 8" x 4" SEWER SERVICE TAP. FULL BODY WYE (SEE STD. DETAIL SS-06).
375. 102.9/104.2/108.2 – 4" SEWER SERVICE TAP TO INCLUDE: DISCONNECTING EXISTING SERVICE AND INSTALLING NEW SERVICE TAP. NEW TAP SHALL BE (W/ APPROVAL OF ENGINEER OR INSPECTOR ON CASE-SPECIFIC BASIS): FULL BODY WYE W/ STREET 45 (PIPE STUBS AND COUPLINGS INCLUDED), INSERTA-TEE, OR SADDLE; ALL BENDS AND FITTINGS, CLEANOUT, VERTICAL PIPING, CLEANOUT RING & COVER AND CONCRETE COLLAR, AS REQUIRED, TO ALIGN AND CONNECT TO EXISTING SERVICE AT ROW LINE. FOR 4" SERVICE PIPE (SEE CITY OF GRAND JUNCTION STD. DETAIL "TYPICAL SERVICE "Y" CONNECTION" SS-06 AND SS-07).
380. CONNECT TO EXISTING SEWER PIPE. THE CONTRACT PRICE FOR SEWER PIPE SHALL INCLUDE THE COST OF CONNECTION TO EXISTING PIPELINE
664. 304 – AGGREGATE BASE COURSE (CLASS 6) (15" THICK)
667. 304 – AGGREGATE BASE COURSE (CLASS 6) (6" THICK)
682. 401.08 – HOT BITUMINOUS PAVEMENT (PATCHING) (3" THICK) (GRADING SX, PG 64-22, GYR.=75) (ONE 3" LIFT)
748. 607 – LINE POST (MATCH IN KIND)(IF NECESSARY)



KEYMAP

DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

DRAWN BY BCH DATE 03/20/18
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HORIZONTAL: 1" = 40'
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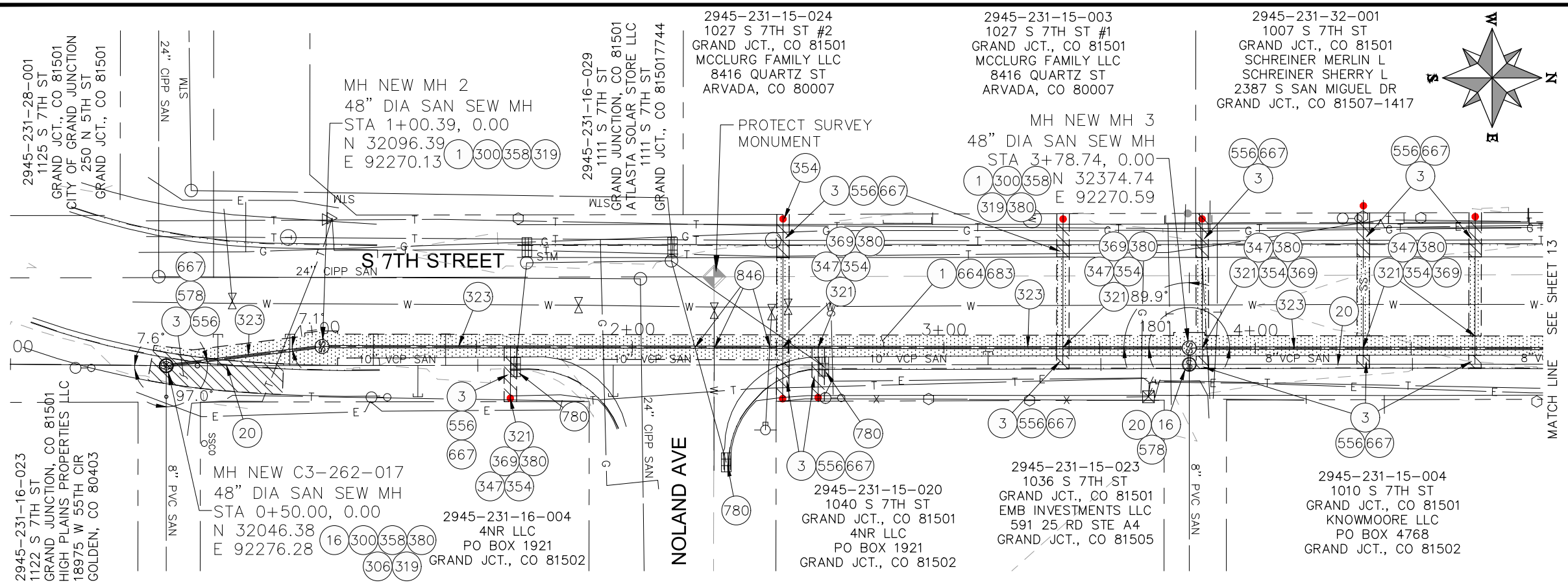
VERTICAL: 1" = 10'
0 2.5 5 10

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
3RD AVENUE ALLEY PLAN AND PROFILE
STA 24+50 TO STA 28+71

11



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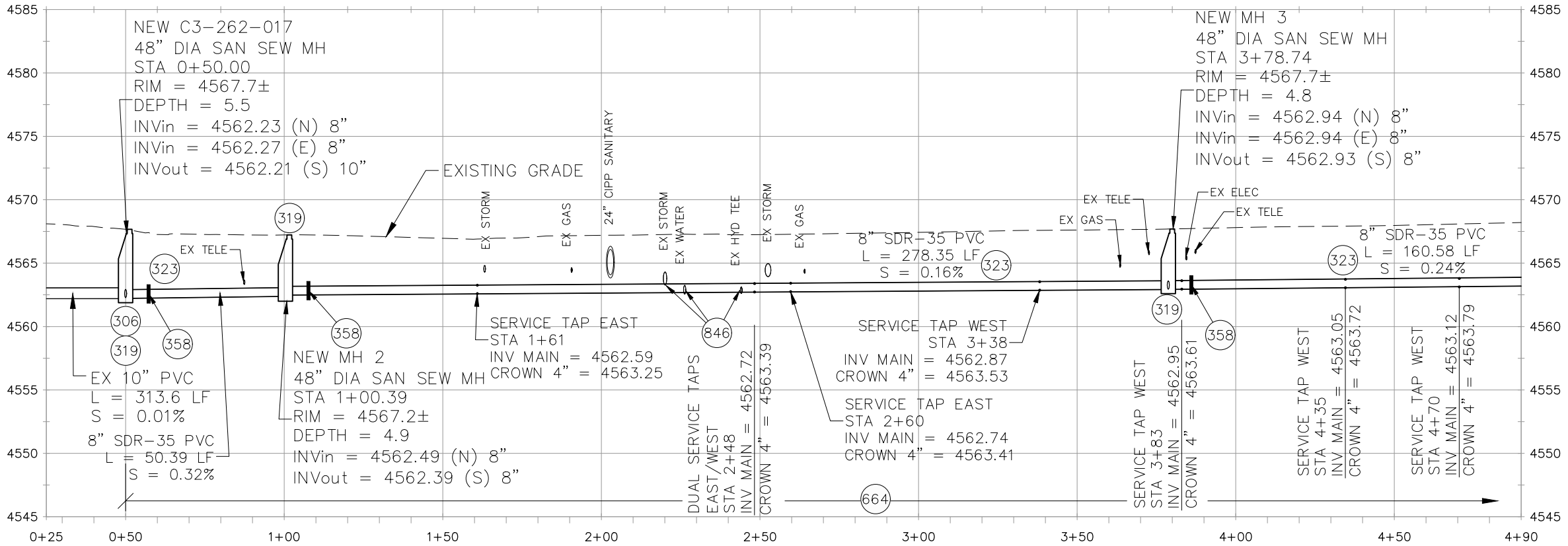

PROJECT NO. 902-F001633

CONSTRUCTION NOTES

(1) 202 – REMOVAL OF ASPHALT MAT. CUT AND REMOVE ASPHALT AS SHOWN. (INDICATED BY DOT HATCH PATTERN)

(3) 202 – REMOVAL OF CONCRETE. SAW CUT AND REMOVE CONCRETE AS SHOWN. (INDICATED BY CROSS HATCH PATTERN) INCLUDES BUT NOT LIMITED TO CURB, GUTTER, SIDEWALK, DRIVEWAY, SLABS, V-PAN, CURB RAMPS, INTERSECTION CORNERS, APRONS, AND LANDSCAPE BORDERS.

(16) 202 – REMOVAL OF MANHOLE. CONTRACTOR SHALL SALVAGE RING AND COVER AND DELIVER TO CITY SHOPS

(20) 202 – ABANDON PIPE. ABANDON BY PLUGGING REMAINING ENDS WITH CONCRETE.

(300) 102.11/108.5 – SANITARY SEWER BASIC MANHOLE (48" I.D.). INCLUDES CONNECTION OF ADJACENT SEWER LINE, FORMING INVERTS AND ADJUSTING TO FINAL GRADE. (SEE CITY OF GRAND JUNCTION STANDARD DETAIL SS-02).

(306) 102.11/108.5 – MANHOLE BARREL SECTION (D>5') (48" I.D.).

(319) EPOXY COAT MANHOLE INVERT. COST IS INCIDENTAL TO COST OF MANHOLE INSTALLATION.

(321) 102.9/108.2 – 4" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.

(323) 102.9/108.2 – 8" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.

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(354) 104.20 – INSTALL 2-WAY SANITARY SEWER SERVICE CLEANOUT (STD. DETAIL SS-07). INCLUDES CLEANOUT RING AND COVER AND CONCRETE COLLAR IN UNPAVED AREAS (SEE STD. DETAIL SS-07).

(358) 103 – CLAY CUT-OFF WALL (INCIDENTAL TO SEWER INSTALLATION PAY ITEM)

(369) 102.9/108.3 – 8" x 4" SEWER SERVICE TAP. FULL BODY WYE (SEE STD. DETAIL SS-06).

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(556) 608.06 – CONCRETE CURB, GUTTER, AND SIDEWALK (MATCH IN KIND)

(578) 608.06 – CONCRETE DRIVEWAY SECTION (8" SECTION)

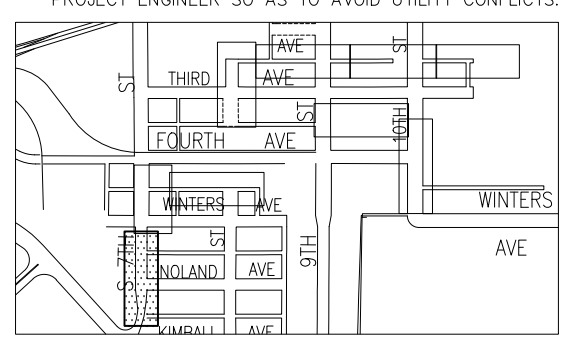
(664) 304 – AGGREGATE BASE COURSE (CLASS 6) (15" THICK)

(667) 304 – AGGREGATE BASE COURSE (CLASS 6) (6" THICK)

(683) 401.08 – HOT BITUMINOUS PAVEMENT (PATCHING) (5" THICK) (GRADING SX, PG 64-22, GYR.=75) (TWO LIFTS)

(780) 208 – STORM DRAIN INLET PROTECTION (SILT-SACK) (INCLUDES MAINTENANCE AND REMOVAL OF DIRT AND DEBRIS)

(846) POTHOLE EXISTING UTILITY AHEAD OF CONSTRUCTION. COORDINATE ANY NEEDED DESIGN CHANGES WITH PROJECT ENGINEER SO AS TO AVOID UTILITY CONFLICTS.



KEYMAP

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REVISION 2	
REVISION 3	
REVISION 4	

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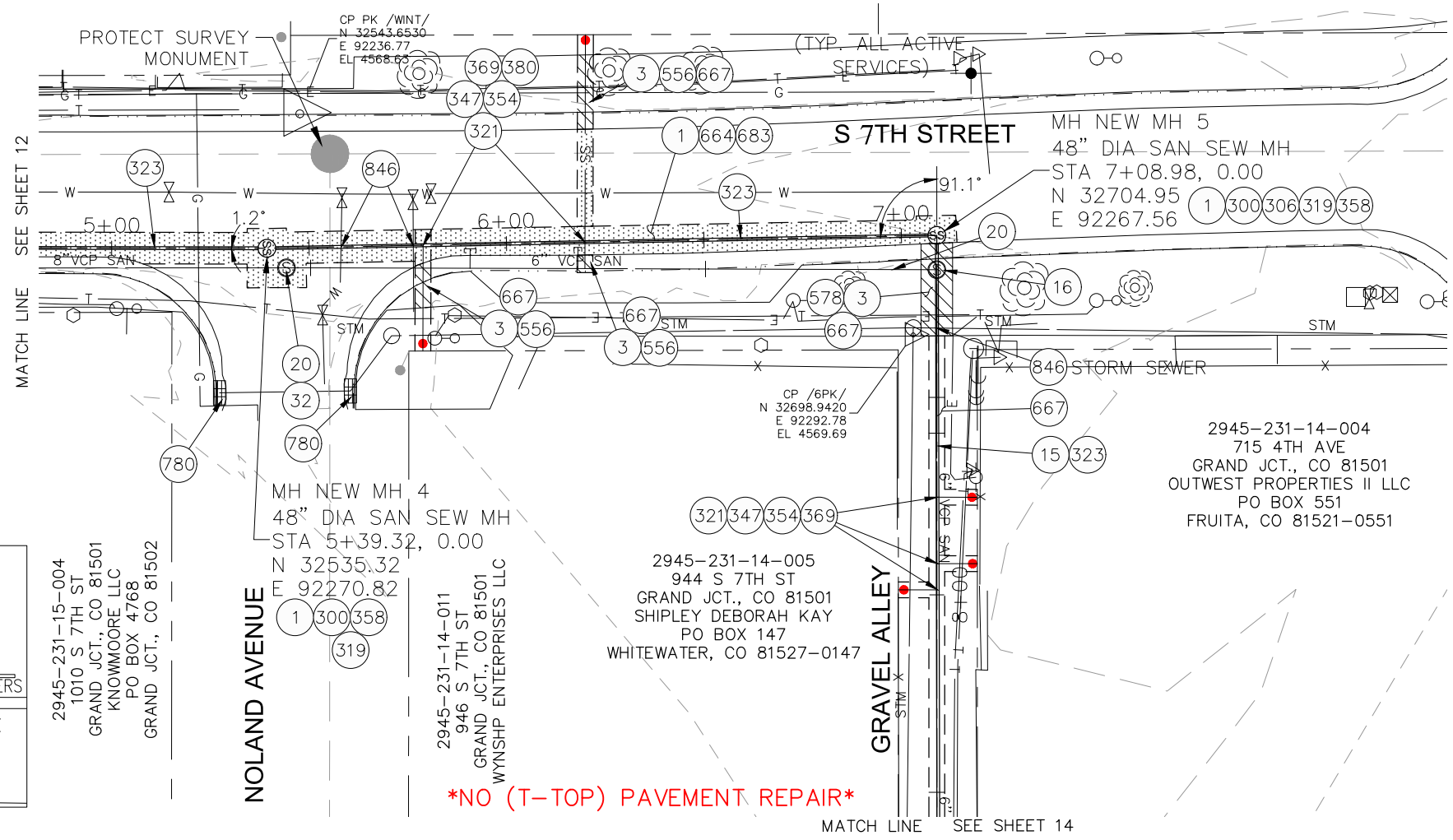
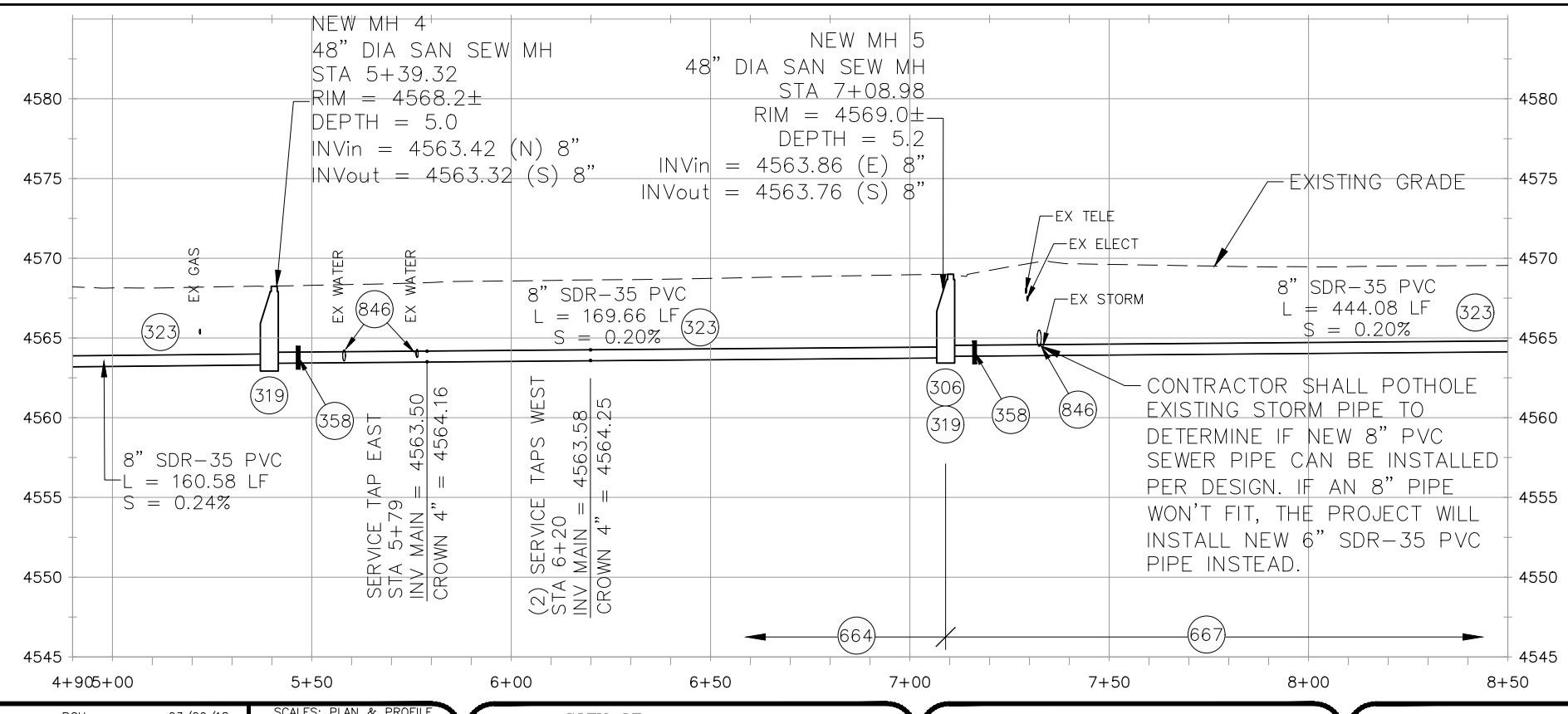
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
S 7TH STREET PLAN AND PROFILE
STA 0+00 TO STA 4+90





PROJECT NO. 902-F001633

CONSTRUCTION NOTES

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(20) 202 – ABANDON PIPE. ABANDON BY PLUGGING REMAINING ENDS WITH CONCRETE.

(32) 202 – ABANDON MANHOLE. REMOVE RING COVER AND CONE SECTION. BACKFILL WITH IMPORTED PIT RUN.

(300) 102.11/108.5 – SANITARY SEWER BASIC MANHOLE (48" I.D.). INCLUDES CONNECTION OF ADJACENT SEWER LINE, FORMING INVERTS AND ADJUSTING TO FINAL GRADE. (SEE CITY OF GRAND JUNCTION STANDARD DETAIL SS-02).

(306) 102.11/108.5 – MANHOLE BARREL SECTION (D>5') (48" I.D.).

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(321) 102.9/108.2 – 4" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.

(323) 102.9/108.2 – 8" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.

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(354) 104.20 – INSTALL 2-WAY SANITARY SEWER SERVICE CLEANOUT (STD. DETAIL SS-07). INCLUDES CLEANOUT RING AND COVER AND CONCRETE COLLAR IN UNPAVED AREAS (SEE STD. DETAIL SS-07).

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0 10 20 40
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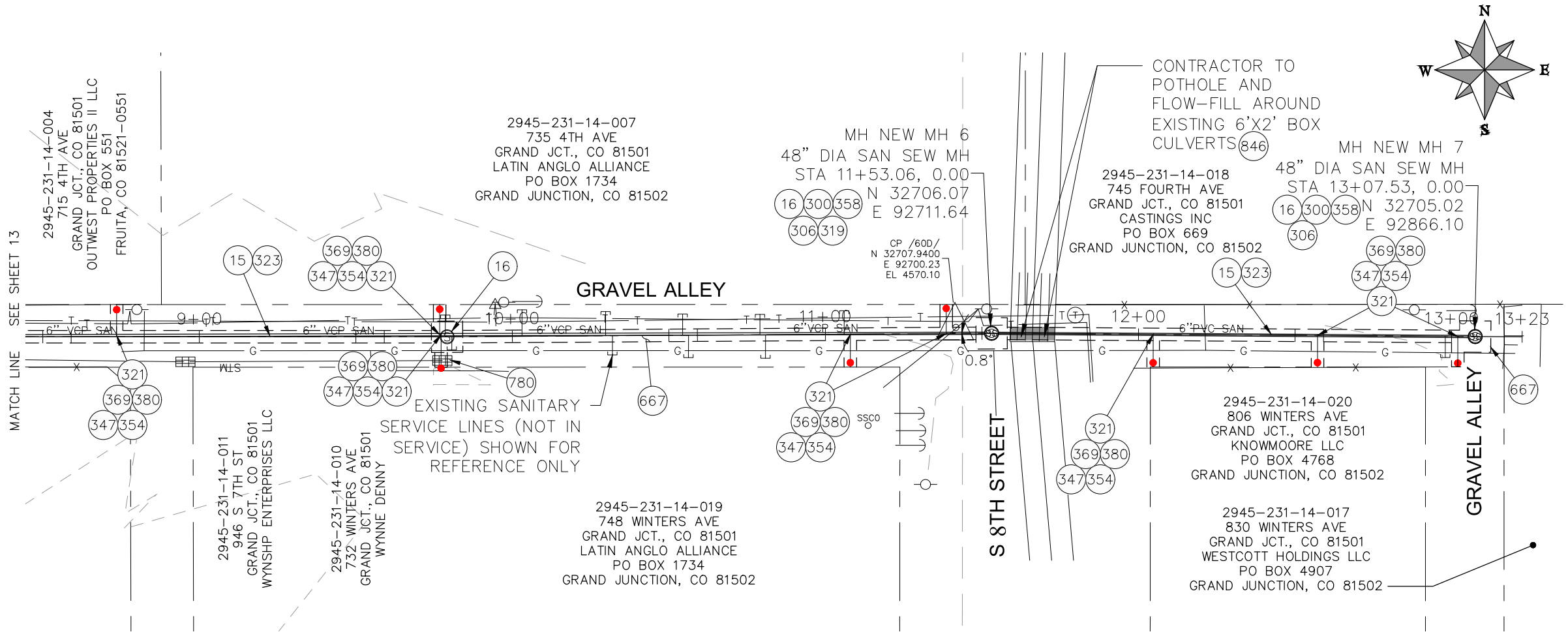
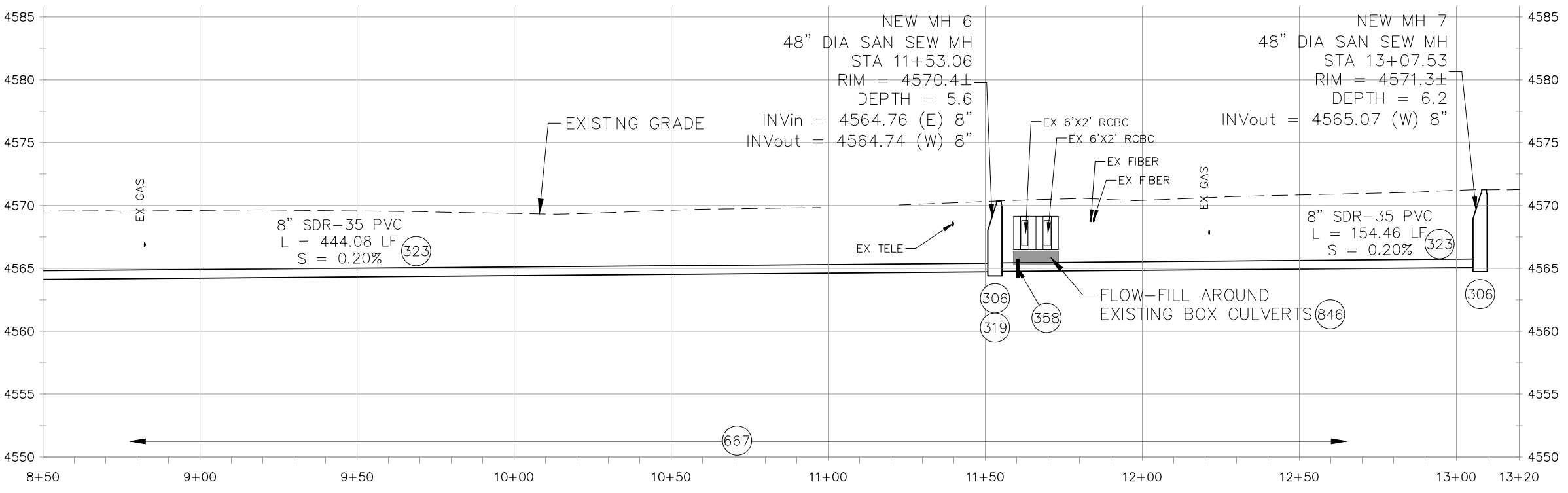
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
S 7TH STREET PLAN AND PROFILE
STA 4+90 TO STA 8+50

13





PROJECT NO. 902-F001633

CONSTRUCTION NOTES

(15) 202 – REMOVAL OF PIPE AS SHOWN. (SIZE AND TYPE AS SHOWN ON PLAN)

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(300) 102.11/108.5 – SANITARY SEWER BASIC MANHOLE (48" I.D.). INCLUDES CONNECTION OF ADJACENT SEWER LINE, FORMING INVERTS AND ADJUSTING TO FINAL GRADE. (SEE CITY OF GRAND JUNCTION STANDARD DETAIL SS-02).

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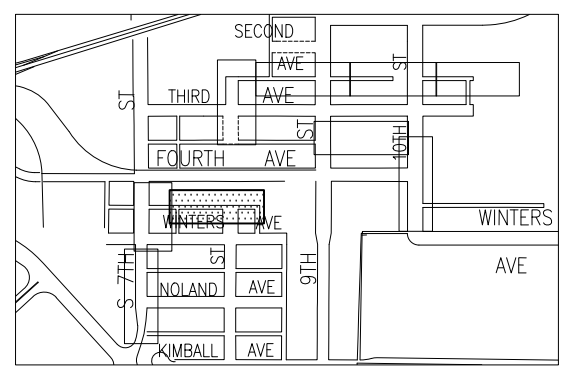

KEYMAP

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0 10 20 40
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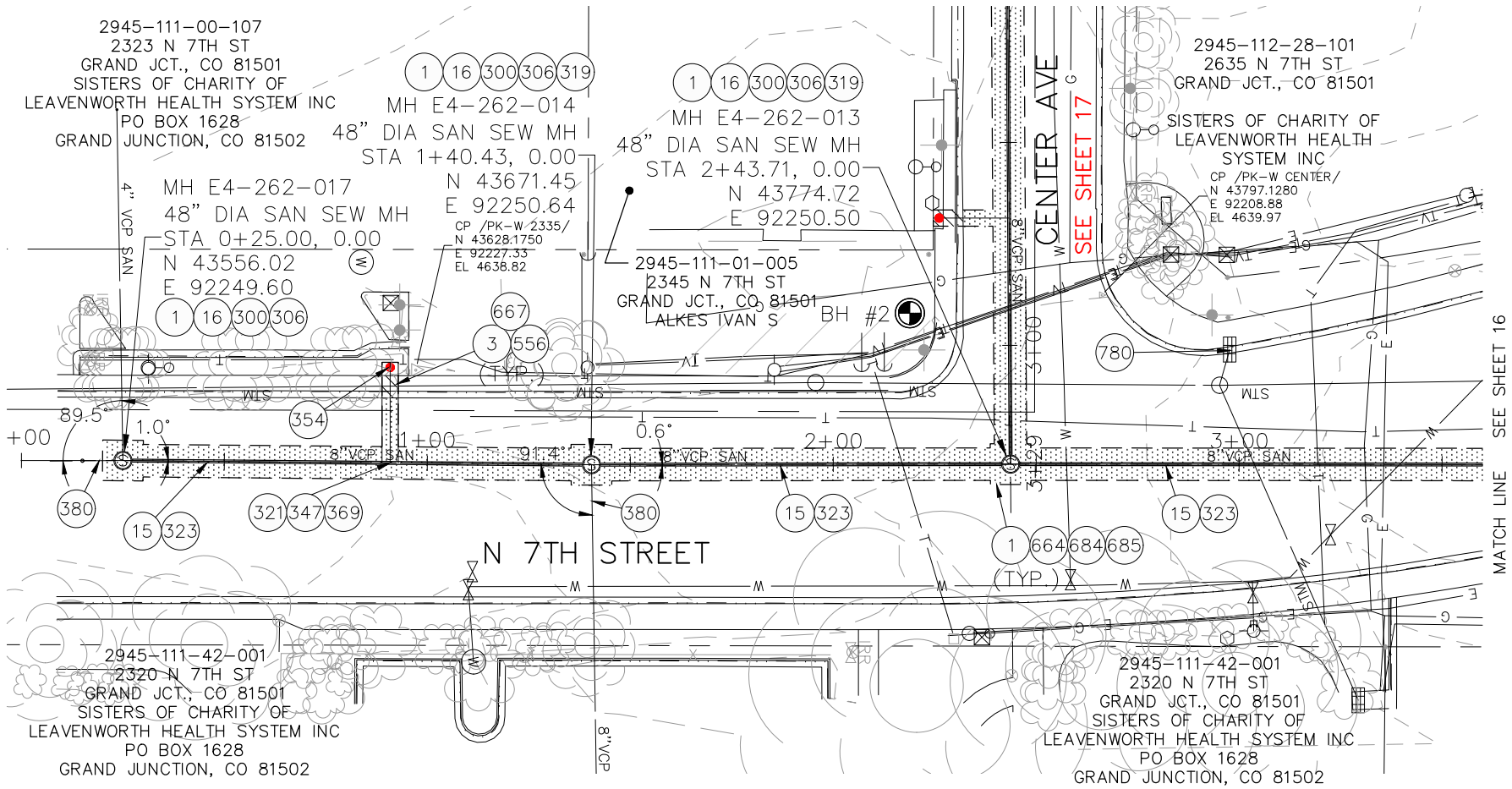
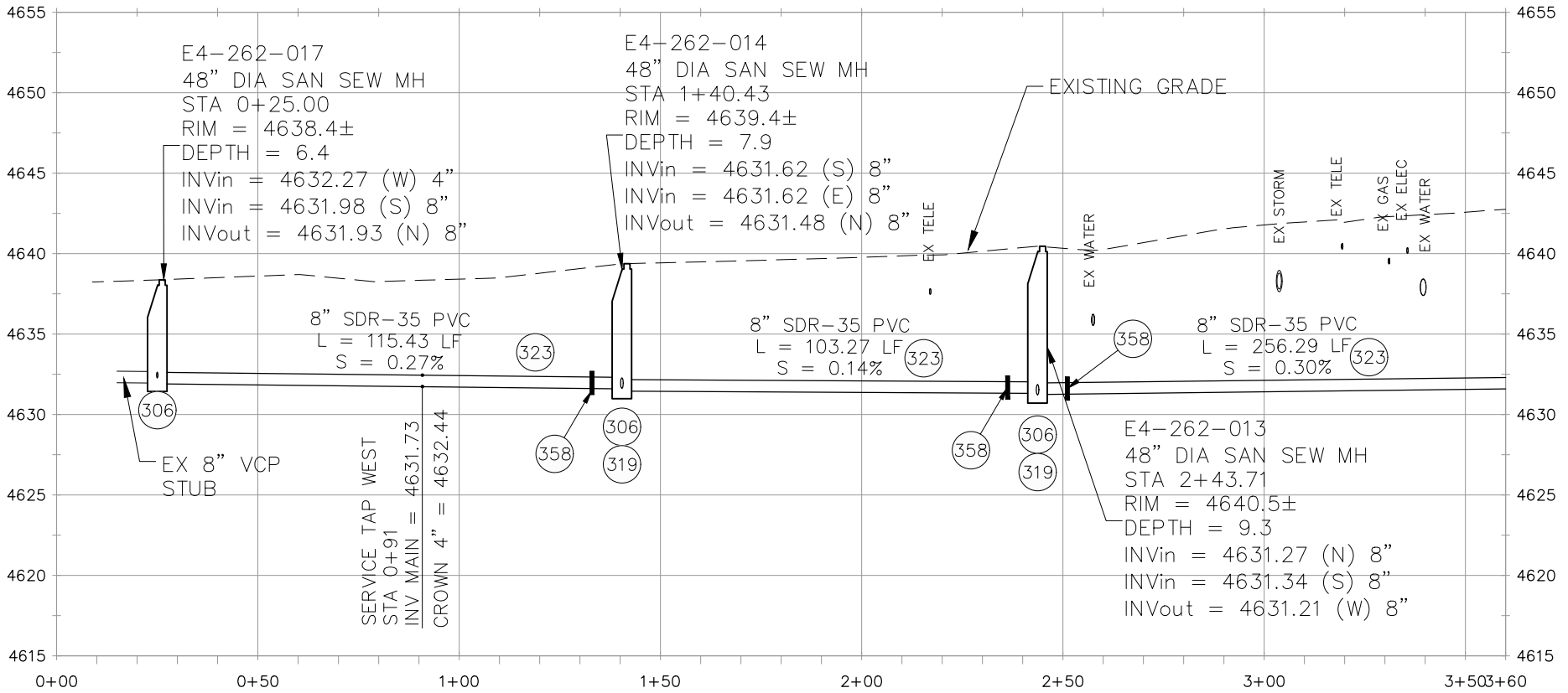
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
S 7TH STREET/ALLEY PLAN AND PROFILE
STA 8+50 TO STA 13+20





PROJECT NO. 902-F001633

CONSTRUCTION NOTES

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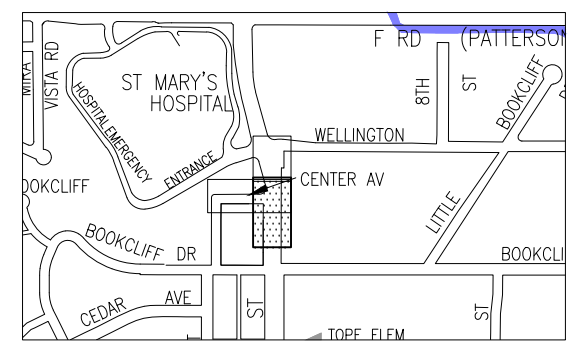

KEYMAP

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REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

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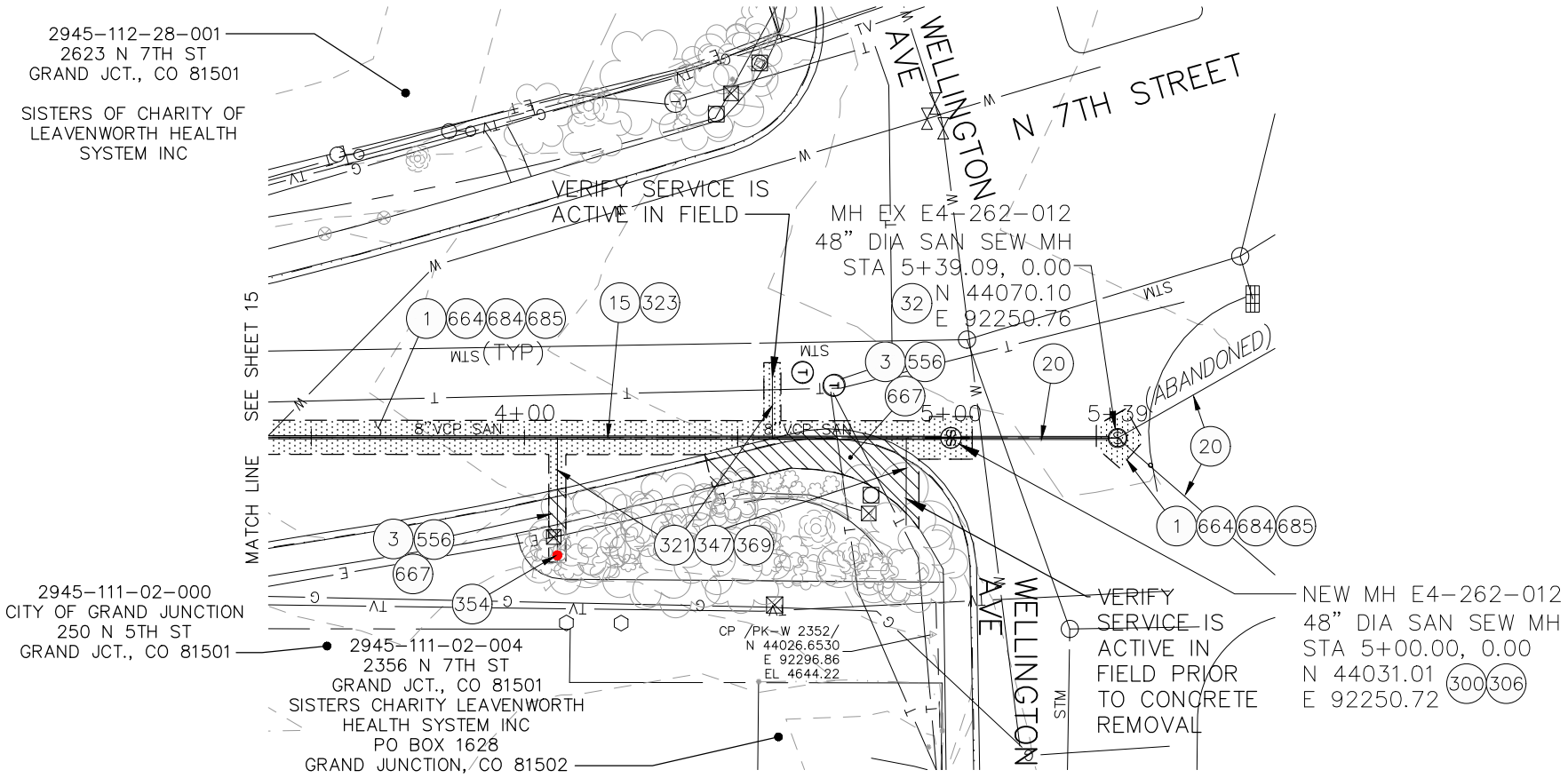
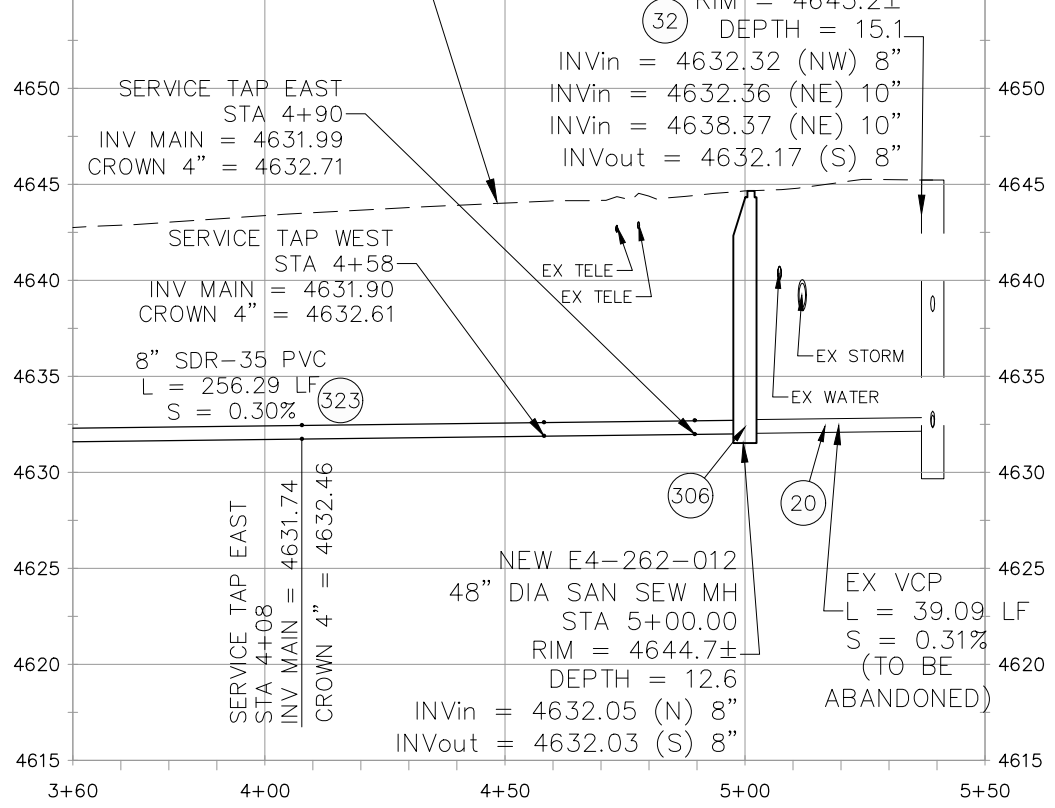
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
N 7TH STREET PLAN AND PROFILE
STA 0+00 TO STA 3+60

15





PROJECT NO. 902-F001633

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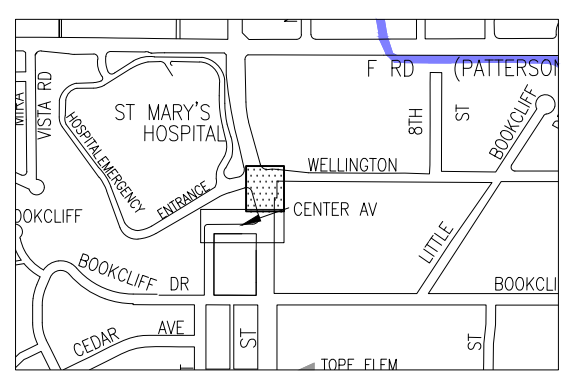
300. 102.11/108.5 – SANITARY SEWER BASIC MANHOLE (48" I.D.). INCLUDES CONNECTION OF ADJACENT SEWER LINE, FORMING INVERTS AND ADJUSTING TO FINAL GRADE. (SEE CITY OF GRAND JUNCTION STANDARD DETAIL SS-02).
306. 102.11/108.5 – MANHOLE BARREL SECTION (D>5') (48" I.D.).
321. 102.9/108.2 – 4" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.
323. 102.9/108.2 – 8" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.
347. 102/103/104 – CONTRACTOR SHALL FIELD VERIFY EXISTING SEWER SERVICE LOCATIONS (SEWER SERVICE LOCATIONS AND CONNECTION POINTS TO EXISTING SERVICES ARE SHOWN FOR ESTIMATING PURPOSES ONLY AND MAY VARY FROM WHAT IS SHOWN).
354. 104.20 – INSTALL 2-WAY SANITARY SEWER SERVICE CLEANOUT (STD. DETAIL SS-07). INCLUDES CLEANOUT RING AND COVER AND CONCRETE COLLAR IN UNPAVED AREAS (SEE STD. DETAIL SS-07).
369. 102.9/108.3 – 8" x 4" SEWER SERVICE TAP. FULL BODY WYE (SEE STD. DETAIL SS-06).
556. 608.06 – CONCRETE CURB, GUTTER, AND WALK (MATCH IN KIND)
664. 304 – AGGREGATE BASE COURSE (CLASS 6) (15" THICK)
667. 304 – AGGREGATE BASE COURSE (CLASS 6) (6" THICK)
684. 401.08 – HOT BITUMINOUS PAVEMENT (PATCHING) (3" THICK) (GRADING SX, PG 64-22, GYR.=75) (ONE 3" LIFT BOTTOM MAT)
685. 401.08 – HOT BITUMINOUS PAVEMENT (PATCHING) (2" THICK) (GRADING SX, PG 64-22, GYR.=75) (ONE 2" LIFT TOP MAT) (T-TOP PATCH)



KEYMAP

DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

DRAWN BY BCH DATE 03/20/18
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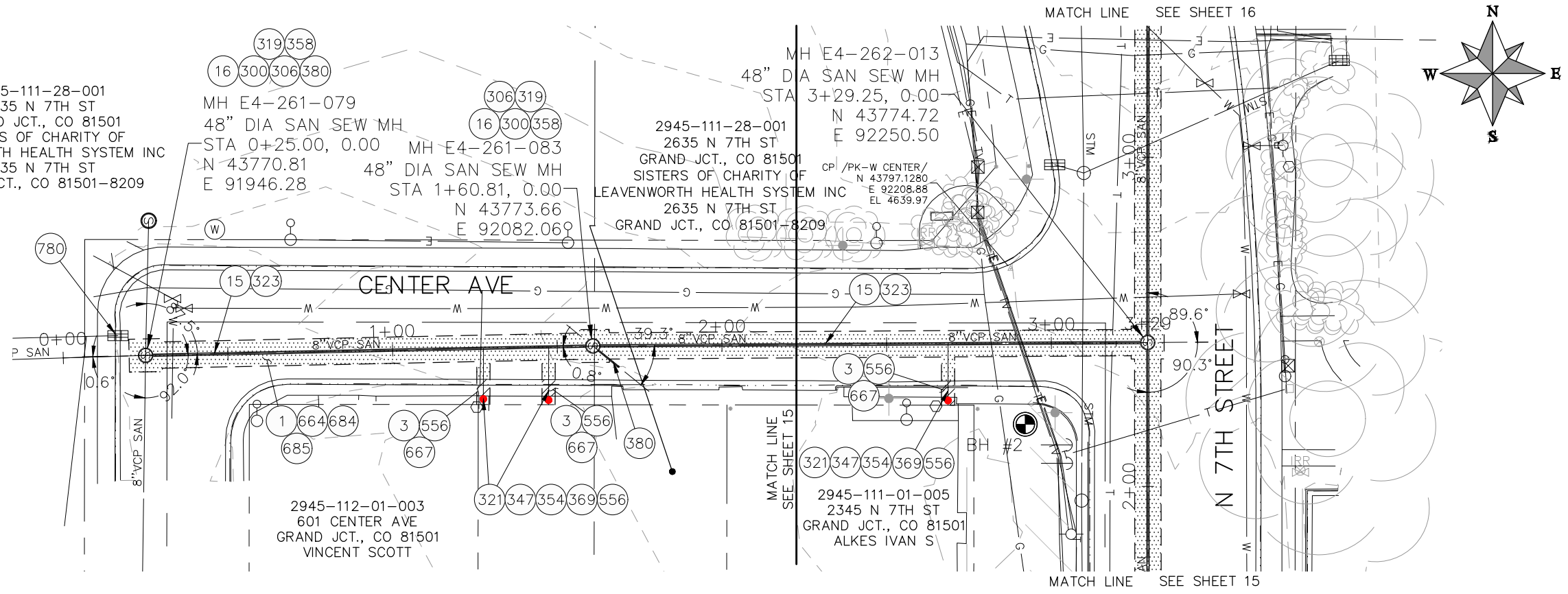
SCALES: PLAN & PROFILE
HORIZONTAL: 1" = 40'
0 10 20 40
VERTICAL: 1" = 10'
0 2.5 5 10

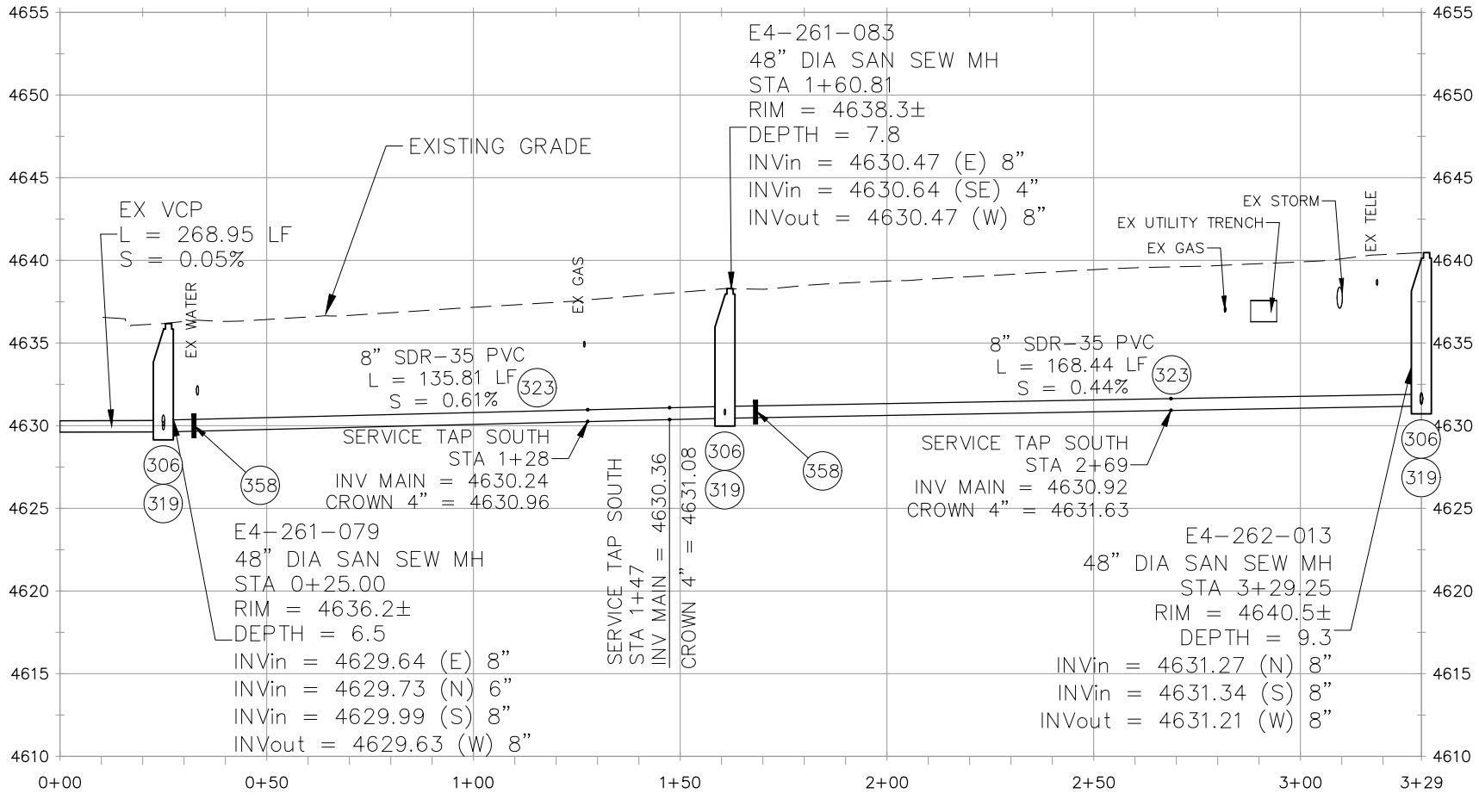
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
N 7TH STREET PLAN AND PROFILE
STA 3+60 TO STA 5+60

16





PROJECT NO. 902-F001633

CONSTRUCTION NOTES

(1) 202 – REMOVAL OF ASPHALT MAT. CUT AND REMOVE ASPHALT AS SHOWN. (INDICATED BY DOT HATCH PATTERN)

(3) 202 – REMOVAL OF CONCRETE. SAW CUT AND REMOVE CONCRETE AS SHOWN. (INDICATED BY CROSS HATCH PATTERN) INCLUDES BUT NOT LIMITED TO CURB, GUTTER, SIDEWALK, DRIVEWAY, SLABS, V-PAN, CURB RAMPS, INTERSECTION CORNERS, APRONS, AND LANDSCAPE BORDERS.

(15) 202 – REMOVAL OF PIPE AS SHOWN. (SIZE AND TYPE AS SHOWN ON PLAN)

(16) 202 – REMOVAL OF MANHOLE. CONTRACTOR SHALL SALVAGE RING AND COVER AND DELIVER TO CITY SHOPS

(300) 102.11/108.5 – SANITARY SEWER BASIC MANHOLE (48" I.D.). INCLUDES CONNECTION OF ADJACENT SEWER LINE, FORMING INVERTS AND ADJUSTING TO FINAL GRADE. (SEE CITY OF GRAND JUNCTION STANDARD DETAIL SS-02).

(306) 102.11/108.5 – MANHOLE BARREL SECTION (D>5') (48" I.D.).

(319) EPOXY COAT MANHOLE INVERT. COST IS INCIDENTAL TO COST OF MANHOLE INSTALLATION.

(321) 102.9/108.2 – 4" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.

(323) 102.9/108.2 – 8" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.

(347) 102/103/104 – CONTRACTOR SHALL FIELD VERIFY EXISTING SEWER SERVICE LOCATIONS (SEWER SERVICE LOCATIONS AND CONNECTION POINTS TO EXISTING SERVICES ARE SHOWN FOR ESTIMATING PURPOSES ONLY AND MAY VARY FROM WHAT IS SHOWN).

(354) 104.20 – INSTALL 2-WAY SANITARY SEWER SERVICE CLEANOUT (STD. DETAIL SS-07). INCLUDES CLEANOUT RING AND COVER AND CONCRETE COLLAR IN UNPAVED AREAS (SEE STD. DETAIL SS-07).

(358) 103 – CLAY CUT-OFF WALL (INCIDENTAL TO SEWER INSTALLATION PAY ITEM)

(369) 102.9/108.3 – 8" x 4" SEWER SERVICE TAP. FULL BODY WYE (SEE STD. DETAIL SS-06).

(380) CONNECT TO EXISTING SEWER PIPE. THE CONTRACT PRICE FOR SEWER PIPE SHALL INCLUDE THE COST OF CONNECTION TO EXISTING PIPELINE

(556) 608.06 – CONCRETE CURB, GUTTER, AND WALK (MATCH IN KIND)

(664) 304 – AGGREGATE BASE COURSE (CLASS 6) (15" THICK)

(667) 304 – AGGREGATE BASE COURSE (CLASS 6) (6" THICK)

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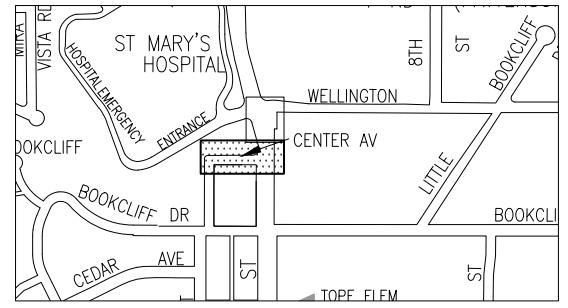
(685) 401.08 – HOT BITUMINOUS PAVEMENT (PATCHING) (2" THICK) (GRADING SX, PG 64-22, GYR.=75) (ONE 2" LIFT TOP MAT) (T-TOP PATCH)

(780) 208 – STORM DRAIN INLET PROTECTION (SILT-SACK) (INCLUDES MAINTENANCE AND REMOVAL OF DIRT AND DEBRIS)



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REVISION 4	

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SCALES: PLAN & PROFILE
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0 10 20 40
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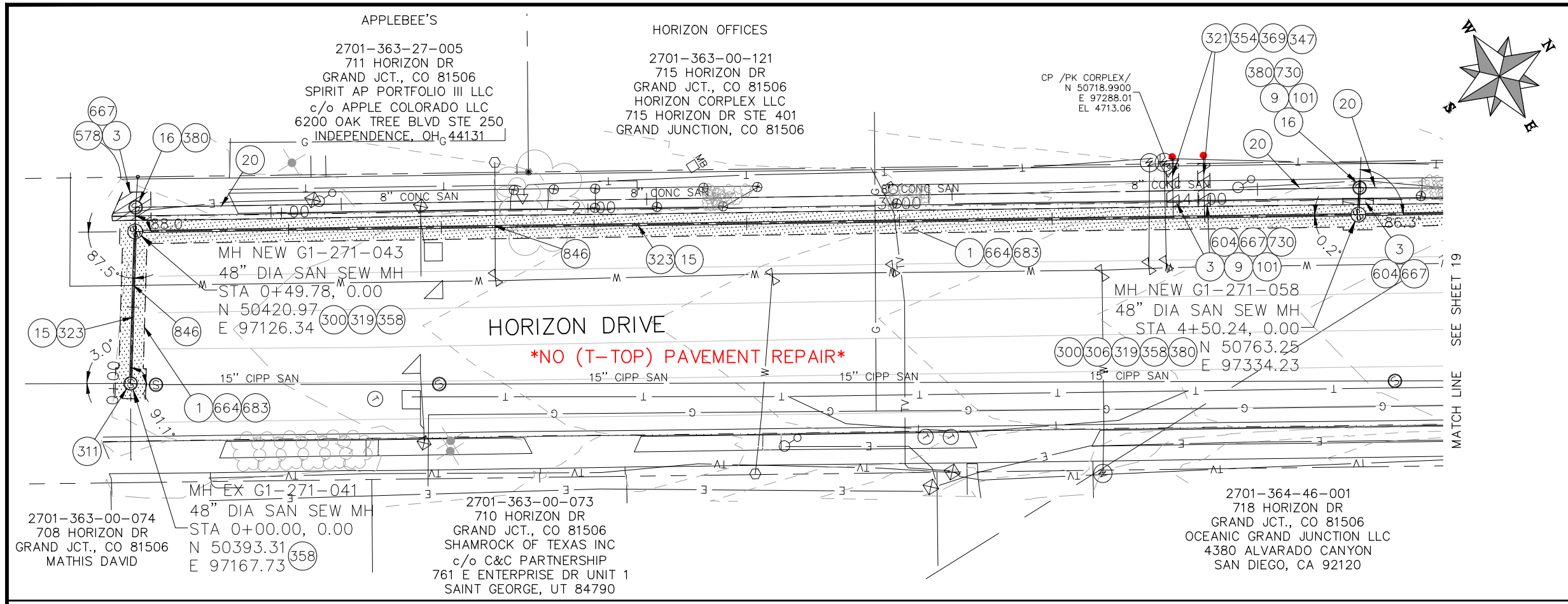
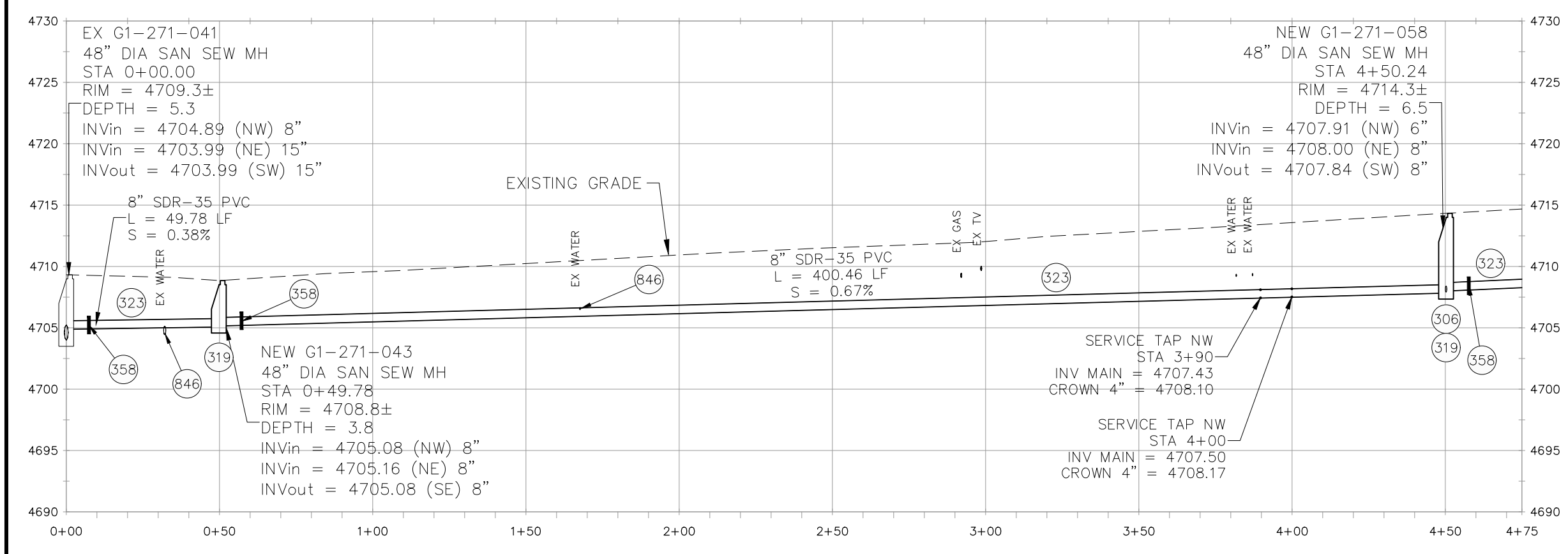
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
N 7TH ST/CENTER AVE PLAN AND PROFILE
STA 0+00 TO STA 3+30





PROJECT NO. 902-F001633

CONSTRUCTION NOTES

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9. 202 – REMOVAL OF SOD
15. 202 – REMOVAL OF PIPE AS SHOWN. (SIZE AND TYPE AS SHOWN ON PLAN)
16. 202 – REMOVAL OF MANHOLE. CONTRACTOR SHALL SALVAGE RING AND COVER AND DELIVER TO CITY SHOPS
20. 202 – ABANDON PIPE. ABANDON BY PLUGGING REMAINING ENDS WITH CONCRETE.
101. 210 – RESET SPRINKLER SYSTEM (COMPLETE IN PLACE)
300. 102.11/108.5 – SANITARY SEWER BASIC MANHOLE (48" I.D.). INCLUDES CONNECTION OF ADJACENT SEWER LINE, FORMING INVERTS AND ADJUSTING TO FINAL GRADE. (SEE CITY OF GRAND JUNCTION STANDARD DETAIL SS-02).
306. 102.11/108.5 – MANHOLE BARREL SECTION (D>5') (48" I.D.).
311. 102.11/108.5 – CONNECT TO EXISTING MANHOLE (SEE CITY OF GRAND JUNCTION STD. DETAIL SS-08)
319. EPOXY COAT MANHOLE INVERT. COST IS INCIDENTAL TO COST OF MANHOLE INSTALLATION.
321. 102.9/108.2 – 4" GRAVITY SEWER PIPE (SDR 35 PVC). INCLUDES TYPE A BEDDING AND HAUNCHING MATERIAL AND BACKFILL OF TRENCH WITH NATIVE MATERIALS MEETING 103.16 EARTH BACKFILL MATERIAL.
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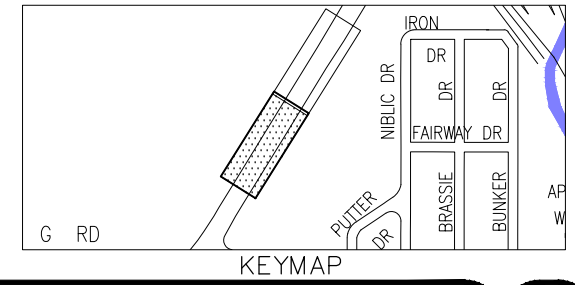
604. 608.06 – CONCRETE CURB AND GUTTER (MATCH IN KIND)
664. 304 – AGGREGATE BASE COURSE (CLASS 6) (15" THICK)
667. 304 – AGGREGATE BASE COURSE (CLASS 6) (6" THICK)
683. 401.08 – HOT BITUMINOUS PAVEMENT (PATCHING) (5" THICK) (GRADING SX, PG 64-22, GYR.=75) (TWO LIFTS)
730. 212 – RESOD AREA AS SHOWN
846. POTHOLE EXISTING UTILITY AHEAD OF CONSTRUCTION. COORDINATE ANY NEEDED DESIGN CHANGES WITH PROJECT ENGINEER SO AS TO AVOID UTILITY CONFLICTS.



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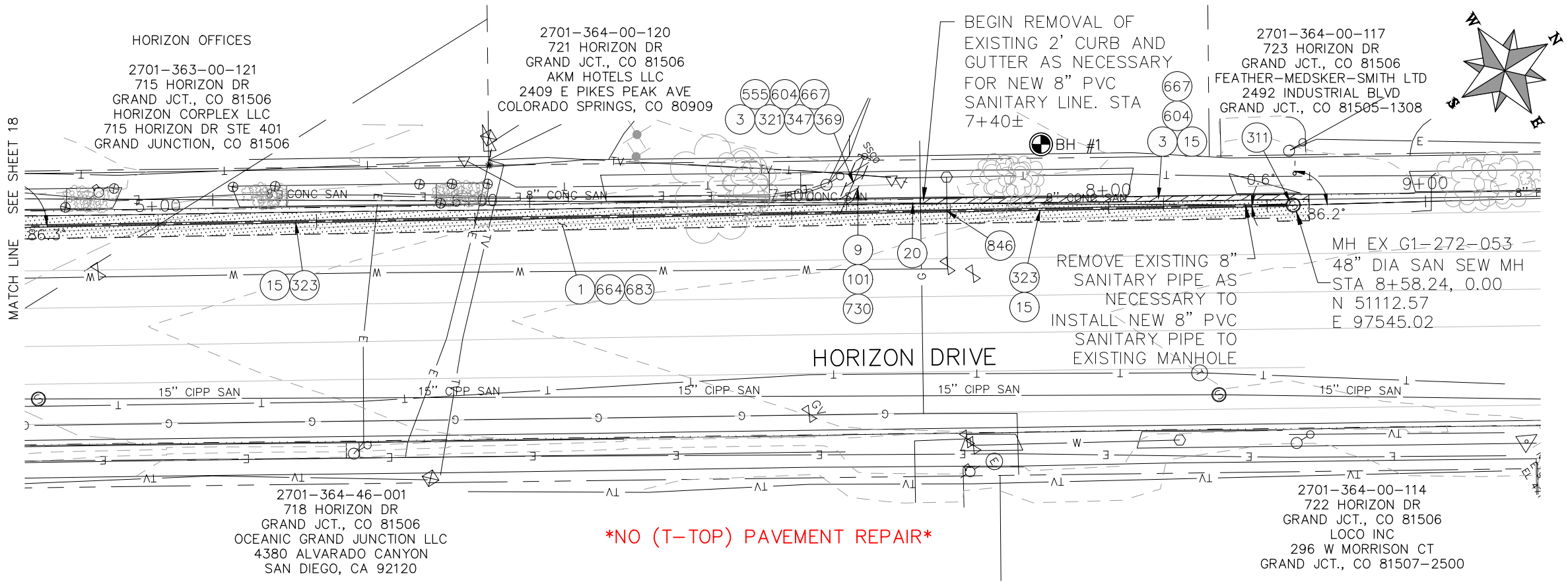
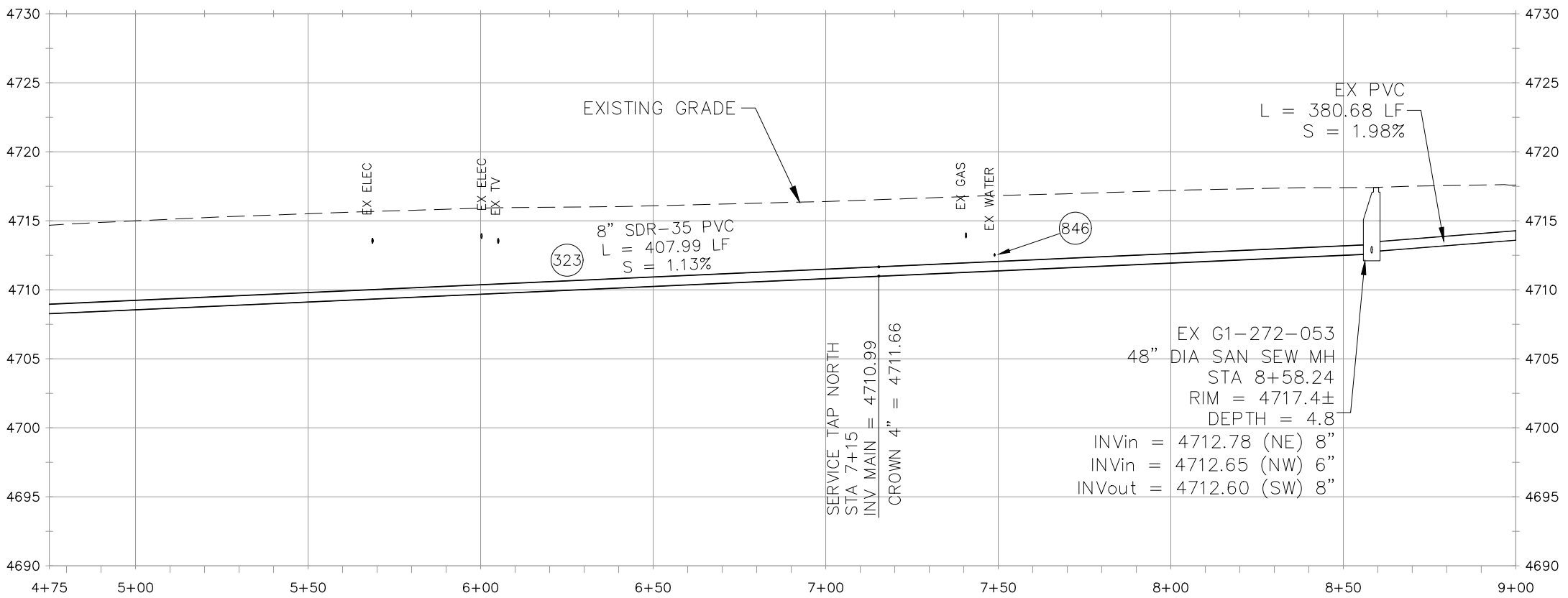
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
HORIZON DRIVE PLAN AND PROFILE
STA 0+00 TO STA 4+75





PROJECT NO. 902-F001633

CONSTRUCTION NOTES

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555. 608.06 – CONCRETE SIDEWALK (4" THICK) (MATCH IN KIND)
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664. 304 – AGGREGATE BASE COURSE (CLASS 6) (15" THICK)
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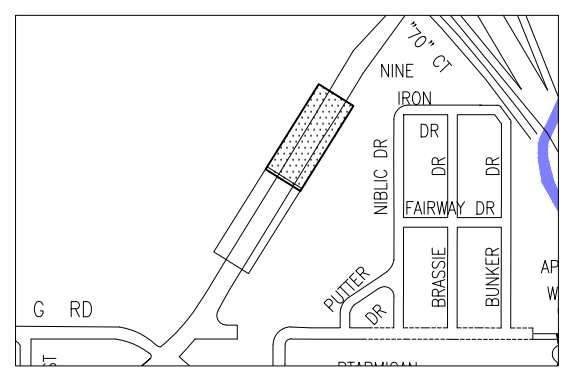
846. POTHOLE EXISTING UTILITY AHEAD OF CONSTRUCTION. COORDINATE ANY NEEDED DESIGN CHANGES WITH PROJECT ENGINEER SO AS TO AVOID UTILITY CONFLICTS.



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CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

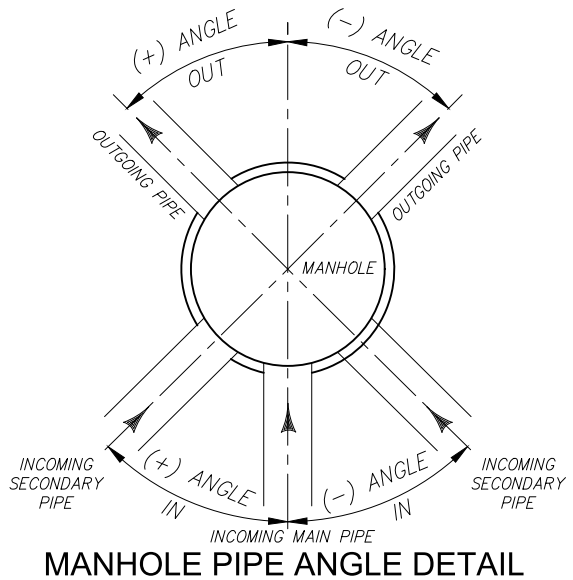
2018 SEWER LINE REPLACEMENT – PHASE A
HORIZON DRIVE PLAN AND PROFILE
STA 4+75 TO STA 9+00

S 10TH ST AREA SANITARY MANHOLE SCHEDULE

SANITARY SEWER			
NAME	DETAILS	DEPTH	ANGLE
C3-262-067	STA = 12+20.92 DIA = 48" RIM = 4577.07 INV. OUT = 4571.06 (N), PIPE DIA = 8" FPVC INV. IN = 4571.22 (S), PIPE DIA = 8" PVC	6.01'	0.4° OUT
C3-262-068	STA = 14+06.75 DIA = 48" RIM = 4576.39 INV. OUT = 4571.85 (N), PIPE DIA = 8" PVC INV. IN = 4572.02 (E), PIPE DIA = 4" PVC Pipe *(EXISTING)* INV. IN = 4571.92 (S), PIPE DIA = 6" PVC Pipe *(EXISTING)*	4.54'	-0.2° OUT -89.7° IN
C4-262-029	STA = 13+79.90 DIA = 48" RIM = 4574.96 INV. OUT = 4568.02 (S), PIPE DIA = 10" PVC INV. IN = 4568.86 (N), PIPE DIA = 8" VCP *(EXISTING)* INV. IN = 4568.12 (E), PIPE DIA = 10" PVC	6.95'	89.4° OUT -0.2° IN
C4-262-030	STA = 12+14.03 DIA = 48" RIM = 4573.40 INV. OUT = 4567.22 (S), PIPE DIA = 10" PVC INV. IN = 4567.51 (W), PIPE DIA = 8" VCP *(EXISTING)* INV. IN = 4567.27 (N), PIPE DIA = 10" PVC	6.18'	0.1° OUT -76.5° IN
C4-262-031	STA = 10+50.20 DIA = 48" RIM = 4573.12 INV. OUT = 4566.67 (W), PIPE DIA = 10" VCP *(EXISTING)* INV. IN = 4566.72 (N), PIPE DIA = 10" PVC INV. IN = 4566.67 (E), PIPE DIA = 8" VCP *(EXISTING)*	6.45'	-89.4° OUT 90.0° IN
C4-262-045	STA = 18+60.65 DIA = 48" RIM = 4576.50 INV. OUT = 4570.28 (W), PIPE DIA = 10" PVC INV. IN = 4570.29 (E), PIPE DIA = 8" FPVC INV. IN = 4570.28 (N), PIPE DIA = 8" VCP *(EXISTING)*	6.23'	0.9° OUT -90.9° IN
C4-262-048	STA = 5+31.03 DIA = 48" RIM = 4575.30 INV. IN = 4568.18 (E), PIPE DIA = 8" FPVC INV. OUT = 4568.18 (W), PIPE DIA = 8" VCP *(EXISTING)*	7.12'	-0.2° OUT
C4-262-063	STA = 23+40.59 DIA = 48" RIM = 4578.36 INV. OUT = 4571.55 (W), PIPE DIA = 8" FPVC INV. IN = 4571.55 (E), PIPE DIA = 8" PVC	6.81'	-0.4° OUT
C4-262-064	STA = 10+11.12 DIA = 48" RIM = 4576.88 INV. OUT = 4570.47 (W), PIPE DIA = 8" FPVC INV. IN = 4570.67 (S), PIPE DIA = 8" FPVC	6.40'	89.9° OUT
C4-262-072	STA = 28+21.15 DIA = 48" RIM = 4577.94 INV. OUT = 4572.92 (W), PIPE DIA = 8" PVC INV. IN = 4574.07 (S), PIPE DIA = 4" PVC *(EXISTING)* INV. IN = 4572.92 (E), PIPE DIA = 6" PVC *(EXISTING)*	5.02'	0.4° OUT 89.8° IN

S 7TH STREET SANITARY MANHOLE SCHEDULE

SANITARY SEWER			
NAME	DETAILS	DEPTH	ANGLE
NEW C3-262-017	STA = 0+50 DIA = 48" RIM = 4567.67 INV. IN = 4562.23 (N), PIPE DIA = 8" PVC INV. OUT = 4562.21 (S), PIPE DIA = 10" PVC INV. IN = 4562.27 (E), PIPE DIA = 8" PVC	5.46'	-7.6° OUT 97.0° IN
NEW MH 2	STA = 1+00.39 DIA = 48" RIM = 4567.23 INV. OUT = 4562.39 (S), PIPE DIA = 8" PVC INV. IN = 4562.49 (N), PIPE DIA = 8" PVC	4.84'	7.1° OUT
NEW MH 3	STA = 3+78.74 DIA = 48" RIM = 4567.69 INV. OUT = 4562.93 (S), PIPE DIA = 8" PVC INV. IN = 4562.94 (N), PIPE DIA = 8" PVC INV. IN = 4562.94 (E), PIPE DIA = 8" PVC *(EXISTING)*	4.76'	0.0° OUT 90.0° IN
NEW MH 4	STA = 5+39.32 DIA = 48" RIM = 4568.24 INV. OUT = 4563.32 (S), PIPE DIA = 8" PVC INV. IN = 4563.42 (N), PIPE DIA = 8" PVC	4.98'	-1.2° OUT
NEW MH 5	STA = 7+08.98 DIA = 48" RIM = 4569.00 INV. OUT = 4563.76 (S), PIPE DIA = 8" PVC INV. IN = 4563.86 (E), PIPE DIA = 8" PVC	5.24'	91.0° OUT
NEW MH 6	STA = 11+53.06 DIA = 48" RIM = 4570.35 INV. OUT = 4564.74 (W), PIPE DIA = 8" PVC INV. IN = 4564.76 (E), PIPE DIA = 8" PVC	5.62'	0.8° OUT
NEW MH 7	STA = 13+07.53 DIA = 48" RIM = 4571.28 INV. OUT = 4565.07 (W), PIPE DIA = 8" PVC	6.20'	OUT ONLY



MANHOLE PIPE ANGLE DETAIL

DESCRIPTION	DATE
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DRAWN BY BCH DATE 03/20/18
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SCALES: PLAN & PROFILE
HORIZONTAL: 1" = NA
0 NA NA NA
VERTICAL: 1" = NA
0 NA NA NA

CITY OF Grand Junction COLORADO

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ENGINEERING DIVISION

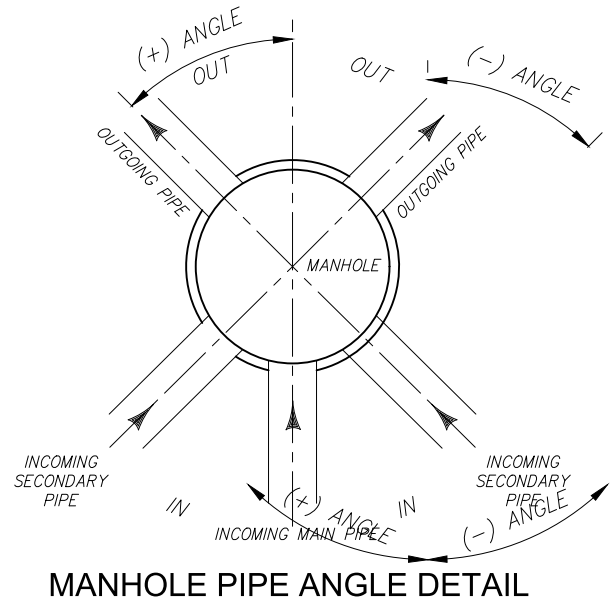
2018 SEWER LINE REPLACEMENT - PHASE A
SEWER MANHOLE STRUCTURE SCHEDULE 1

N 7TH ST SANITARY MANHOLE SCHEDULE

SANITARY SEWER			
NAME	DETAILS	DEPTH	ANGLE
E4-261-079	STA = 0+25 DIA = 48" RIM = 4636.17 INV. IN = 4629.64 (E), PIPE DIA = 8" PVC INV. OUT = 4629.63 (W), PIPE DIA = 8" VCP *(EXISTING)* INV. IN = 4629.73 (N), PIPE DIA = 6" RCP *(EXISTING)* INV. IN = 4629.99 (S), PIPE DIA = 8" VCP *(EXISTING)*	6.54'	0.6° OUT -87.5° IN 92.0° IN
E4-261-083	STA = 1+60.81 DIA = 48" RIM = 4638.29 INV. IN = 4630.47 (E), PIPE DIA = 8" PVC INV. OUT = 4630.47 (W), PIPE DIA = 8" PVC INV. IN = 4630.64 (SE), PIPE DIA = 4" VCP *(EXISTING)*	7.82'	0.8° OUT 39.3° IN
E4-262-013	STA = 2+43.71 DIA = 48" RIM = 4640.46 INV. IN = 4631.27 (N), PIPE DIA = 8" PVC INV. OUT = 4631.21 (W), PIPE DIA = 8" PVC INV. IN = 4631.34 (S), PIPE DIA = 8" PVC	9.25'	-89.6° IN 90.3° IN
E4-262-014	STA = 1+40.43 DIA = 48" RIM = 4639.37 INV. IN = 4631.62 (S), PIPE DIA = 8" PVC INV. OUT = 4631.48 (N), PIPE DIA = 8" PVC INV. IN = 4631.62 (E), PIPE DIA = 8" VCP *(EXISTING)*	7.89'	0.6° OUT -91.4° IN
E4-262-017	STA = 0+25 DIA = 48" RIM = 4638.37 INV. IN = 4632.27 (W), PIPE DIA = 4" VCP *(EXISTING)* INV. OUT = 4631.93 (N), PIPE DIA = 8" PVC INV. IN = 4631.98 (S), PIPE DIA = 8" VCP *(EXISTING STUB)*	6.44'	89.5° IN -1.0° OUT
NEW E4-262-012	STA = 5+00 DIA = 48" RIM = 4644.66 INV. IN = 4632.05 (N), PIPE DIA = 8" VCP INV. OUT = 4632.03 (S), PIPE DIA = 8" PVC	12.63'	OUT ONLY

HORIZON DRIVE SANITARY MANHOLE SCHEDULE

SANITARY SEWER			
NAME	DETAILS	DEPTH	ANGLE
EX G1-271-041	STA = 0+00 DIA = 48" RIM = 4709.32 INV. IN = 4704.89 (NW), PIPE DIA = 8" PVC INV. OUT = 4703.99 (SW), PIPE DIA = 15" CIPP *(EXISTING)* INV. IN = 4703.99 (NE), PIPE DIA = 15" CIPP *(EXISTING)*	5.33'	-91.1° IN 3.0° OUT
EX G1-272-053	STA = 8+58.24 DIA = 48" RIM = 4717.41 INV. IN = 4712.78 (NE), PIPE DIA = 8" PVC *(EXISTING)* INV. IN = 4712.65 (NW), PIPE DIA = 6" PVC *(EXISTING)* INV. OUT = 4712.60 (SW), PIPE DIA = 8" PVC	4.81'	-86.2° IN -0.6° OUT
NEW G1-271-043	STA = 0+49.78 DIA = 48" RIM = 4708.85 INV. OUT = 4705.08 (SE), PIPE DIA = 8" PVC INV. IN = 4705.08 (NW), PIPE DIA = 8" RCP *(EXISTING)* INV. IN = 4705.16 (NE), PIPE DIA = 8" PVC	3.77'	87.5° OUT -88.0° IN
NEW G1-271-058	STA = 4+50.24 DIA = 48" RIM = 4714.33 INV. IN = 4707.91 (NW), PIPE DIA = 6" PVC *(EXISTING)* INV. OUT = 4707.84 (SW), PIPE DIA = 8" PVC INV. IN = 4708.00 (NE), PIPE DIA = 8" PVC	6.49'	-86.3° IN -0.2° OUT



MANHOLE PIPE ANGLE DETAIL

DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

DRAWN BY BCH DATE 03/20/18
DESIGNED BY BCH DATE 03/20/18
CHECKED BY ALC DATE
APPROVED BY ALC DATE

SCALES: PLAN & PROFILE
HORIZONTAL: 1" = NA
0 NA NA NA
VERTICAL: 1" = NA
0 NA NA NA

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT - PHASE A
SEWER MANHOLE STRUCTURE SCHEDULE 2

BOREHOLE LOG KEY

BOREHOLE LOCATION:

DRILLING COMPANY: DRILL RIG:

SAMPLER DRILL STEM:

DEPTH (ft) / WATER LEVEL | GRAPHIC | SAMPLE | SAMPLE # | FIELD BLOW COUNTS | FIELD "N" VALUE (BPF) | SPT "N" VALUE (BPF) | SUBSURFACE DESCRIPTION | FIELD & LABORATORY TEST RESULTS

CA drive sample, California sampler

ST drive sample, standard sampler

core sample

bulk sample, obtained from augers

DS1 ← Sample identifier: DS = Drive sample, BS = Bulk sample from augers, CS = Core sample, GS = Grab sample

9,12,14 ← Blows required to drive sampler 6" three times; first 6" is considered to be the "seating" drive

26 ← Indicates 26 blows required to drive the sampler 12 inches

18 ← Indicates blows/foot (BPF) using a 140-lb hammer falling 30"

free water depth at time of drilling

TOPSOIL
CLAY
SILT
SAND
GRAVEL
SHALE
SAND
STONE
HARD
BEDROCK

Unified Soil Classification System (ASTM D-2487)
CL = lean clay to sandy/gravelly lean clay
ML = silt to sandy/gravelly silt
CH = high plasticity clay to sandy/gravelly high plasticity clay
MH = high elasticity silt to sandy/gravelly high elasticity silt
SW = well-graded sand or well-graded sand with gravel
SP = poorly graded sand or poorly graded sand with gravel
SM = silty sand to silty sand with gravel
SC = clayey sand to clayey sand with gravel
GW = well-graded gravel or well-gravel with sand
GP = poorly graded gravel or poorly graded gravel with sand
GM = silty gravel or silty gravel with sand
GC = clayey gravel or clayey gravel with sand

N value	Relative density
sands (non-cohesive soils)	
0-4	very loose
4-10	loose
10-30	medium
30-50	dense
>50	very dense
clays (cohesive soils)	
<2	very soft
2-4	soft
4-8	medium
8-15	stiff
15-30	very stiff
>30	hard

Rock Weathering Classification
W1 = Fresh
W2 = Slightly weathered
W3 = Moderately weathered
W4 = Highly weathered
W5 = Completely weathered
W6 = Residual soil, no structure
RQD = Rock Quality Designation

Intact Rock Strength Classification
R0 = Extremely weak rock, 35-150 psi
R1 = Very weak rock, 150-725 psi
R2 = Weak rock, 725-3,625 psi
R3 = Medium strong rock, 3,625-7,250 psi
R4 = Strong rock, 7,250-14,500 psi
R5 = Very strong rock, 14,500-36,000 psi
R6 = Extremely strong rock, >36,000 psi

Notes in this column indicate tests performed and test results:

DD: dry density, pcf
MC: moisture content, %
LL: liquid limit
PL: plastic limit
PI: plasticity index
GF: gravel fraction, %
SF: sand fraction, %
Fines: silt/clay, %
Sh: Shear resistance
P: Penetration resistance
CBR: California Bearing Ratio
SP: swelling pressure
TM: total movement
UCS: unconfined compressive strength
psf: pounds per square foot
pcf: pounds per cubic foot
psi: pounds per square inch

Borehole Log	Field Staff	
	Drafting Staff	
	Field Date	
of	Project #	

Borehole Log Key

DOWL
222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

Log of Borehole #1 (BH#1)

BOREHOLE LOCATION: Horizon Drive at Rodeway Inn by Shell Station (in grassy area by sidewalk)

DRILLING COMPANY: HRL / Chancy DRILL RIG: CME 55

SAMPLER: Standard SSS DRILL STEM: 4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
0		STD	DS1	4, 4, 3	7	7	reddish-brown, dry, firm to stiff, silty/sandy CLAY (0-6.5')	DS1 @3-4.5' (CL) MC=13.9%
5		STD	DS2	13, 13, 16	29	29	harder drilling at 5' (possibly weathered shale)	DS2 @6-7.5' (CL) LL=41 PL=21 PI=20 gravel=0.1% sand=19.7% silt=35.5% clay=44.7% MC=13.9%
10		STD	DS3	23, 28, 50	78	78		DS3 @9-10.5' (CL) water soluble sulfates=0.70% chlorides=0.021% Electro-conductivity=320 µS/cm pH=6.9 MC=12.8%
15		STD	DS4	16, 24, 29	53	53	dry, v. stiff to hard, gray, weathered Mancos SHALE, salts (6.5-16.5')	DS4 @12-13.5' (CL) MC=11.9%
		STD	DS5	24, 24, 30	54	54		DS5 @15-16.5' (CL) MC=10.9%
20							shale bedrock at 6.5' end of hole at 16.5' no groundwater encountered	
25								

Borehole Log	Field Staff	LB/JLH
1	Drafting Staff	SJ
of 7	Field Date	1/29/2018
	Project #	7122.74831.01

2018 Sewer Line Replacement
Phase A
Grand Junction, Colorado

DOWL
222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

Log of Borehole #2 (BH#2)

BOREHOLE LOCATION: southwest corner of N. 7th & Center Ave.

DRILLING COMPANY: HRL / Chancy DRILL RIG: CME 55

SAMPLER: Standard SSS DRILL STEM: 4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
0							~3" asphalt ~6" road base	
2							reddish brown CLAY, some gravel, possible fill above 2' (0.75-2')	
4		STD	DS6	push/1	<1	<1	brown, soft to very soft, moist to very damp, CLAY (2-6') wet seam @4' (~2" thick)	DS6 @3-4.5' (CL) MC=22.4%
6		STD	DS7	2, 2, 2	4	4		DS7 @6-7.5' (SC) water soluble sulfates=0.03% chlorides=0.001% Electro-conductivity=50µS/cm pH=7.4 MC=13.6%
8								
10		STD	DS8	2, 2, 3	5	5	brown, soft, moist, soft to firm, sandy/clayey SILT (6-12.25')	DS8 @9-10.5' (SM/CL) LL=24 PL=16 PI=8 gravel=0.0% sand=15.2% silt=54.0% clay=30.8% MC=18.2%
12		STD	DS9	2, 1, 3	4	4	brown, very soft, very moist, brown CLAY with silt (12.25-13.5')	DS9 @12-13.5' (CL) MC=18.6%
14							end of hole @13.5' no groundwater or bedrock encountered	

Borehole Log	Field Staff	LB/JLH
2	Drafting Staff	SJ
of 7	Field Date	1/29/2018
	Project #	7122.74831.01

2018 Sewer Line Replacement
Phase A
Grand Junction, Colorado

DOWL
222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

DRAWN BY BCH DATE 03/20/18
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CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
SOIL BORING LOG DETAIL 1

Log of Borehole #3 (BH#3)

BOREHOLE LOCATION: alley behind Munro Pump

DRILLING COMPANY: HRL / Chancy — DRILL RIG: CME 55

SAMPLER: Standard SSS — DRILL STEM: 4" SSA

DEPTH (ft)	WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
0								parking lot GRAVEL (0-8")	
2									
4			STD	DS13	3, 5, 6	11	11	dark brown, stiff, damp, fat CLAY with silt (8"-6.5')	DS13 @3-4.5' (CH) LL=52 PL=19 PI=33 gravel=0.0% sand=1.4% silt=18.6% clay=80.0% MC=20.9%
6	▽		STD	DS14	push/1	<1	<1	groundwater @6.5'	DS14 @6-7.5' (CL) MC=14.5%
8								brown, wet, very soft to soft, fine, silty SAND (6.5-9')	
10			STD	DS15	8, 12, 28	40	40	gray, wet, dense, sandy GRAVEL (9-10.5')	DS15 @9-10.5' (GC) MC=13.2%
12								end of hole at 10.5'; groundwater @6.5' no bedrock encountered	
14									

Borehole Log	Field Staff	LB/JLH	2018 Sewer Line Replacement Phase A Grand Junction, Colorado
3	Drafting Staff	SJ	
of 7	Field Date	1/29/2018	
	Project #	7122.74831.01	

DOWL
222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

Log of Borehole #4 (BH#4)

BOREHOLE LOCATION: alley behind 1101 3rd Ave.

DRILLING COMPANY: HRL / Chancy — DRILL RIG: CME 55

SAMPLER: Standard SSS — DRILL STEM: 4" SSA

DEPTH (ft)	WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
0								gravelly roadbase FILL (0-0.5')	
2								dark brown, moist, soft to firm CLAY (0.5' - 5')	DS16 @3-4.5' (CL) LL=45 PL=18 PI=27 gravel=0.0% sand=1.7% silt=23.9% clay=74.4% MC=20.2% water soluble sulfates=0.69% chlorides=0.024% Electro-conductivity=412 µS/cm pH=7.7
4			STD	DS16	2, 3, 4	7	7		
6	▽							groundwater @5'	
8			STD	DS17	push/1	1	1	brown, wet, very soft, silty fine SAND with occasional gravel and some clay (5-8.5')	DS17 @6-7.5.5' (SM) MC=28.4%
10			STD	DS18	6, 14, 14	28	28	wet, moderately dense, sandy GRAVEL (8.5-10.5')	DS18 @9-10.5' (SC) MC=13.5%
12								end of hole at 10.5'; groundwater @5' no bedrock encountered	
14									

Borehole Log	Field Staff	LB/JLH	2018 Sewer Line Replacement Phase A Grand Junction, Colorado
4	Drafting Staff	SJ	
of 7	Field Date	1/29/2018	
	Project #	7122.74831.01	

DOWL
222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

Log of Borehole #6 (BH#6)

BOREHOLE LOCATION: South side of alley behind Orkin

DRILLING COMPANY: HRL / Chancy — DRILL RIG: CME 55

SAMPLER: Standard SSS — DRILL STEM: 4" SSA

DEPTH (ft)	WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	SPT "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
0								damp, dense, GRAVEL and sandy roadbase FILL (0-2')	
2									
4			STD	DS10	push /4	4	4	brown, moist to wet, v. soft to soft, silty CLAY; mottled with charcoal flecks, some is possible FILL (2-8') petroleum smell in last 4" of sampler	DS10 @3-4.5' (CL) MC=31.7% (organics)
6	▽		STD	DS11	push / 2 / 2	4	4	groundwater encountered at 6.5'; very soft	DS11 @6-7.5' (no recovery)
8								caving at 8'	
10			STD	DS12	3, 2, 3	5	5	brown, wet, soft to firm, silty fine SAND, trace gravels (8-10.5')	DS12 @9-10.5' (SM) LL=NP PL=NP PI=NP gravel=0.0% sand=66.6% silt=22.6% clay=10.8% MC=34.0%
12								end of hole at 10.5'; groundwater @6.5' no bedrock encountered	
14									

Borehole Log	Field Staff	LB/JLH	2018 Sewer Line Replacement Phase A Grand Junction, Colorado
6	Drafting Staff	SJ	
of 7	Field Date	1/29/2018	
	Project #	7122.74831.01	

DOWL
222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

DRAWN BY BCH DATE 03/20/18
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SCALES: PLAN & PROFILE
HORIZONTAL: 1" = NA
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CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENT – PHASE A
SOIL BORING LOG DETAIL 2

PROJECT NO. 902-F001633

GENERAL NOTES

A. CONTRACTOR SHALL HAVE ONE SIGNED COPY OF PLANS AND A COPY OF THE CITY OF GRAND JUNCTION'S STANDARD SPECIFICATIONS AT THE JOB SITE AT ALL TIMES.

B. ALL SEWER MAINS SHALL BE PVC SDR 35 (ASTM 3034) UNLESS OTHERWISE NOTED.

C. ALL SEWER MAINS SHALL BE LAID TO GRADE UTILIZING A PIPE LASER.

D. ALL SERVICE LINE CONNECTIONS TO NEW MAINS SHALL BE ACCOMPLISHED WITH FULL BODY WYES OR TEES. TAPPING SADDLES WILL NOT BE ALLOWED.

E. SERVICE LINE CONNECTIONS TO EXISTING NON-PVC MAINS SHALL BE ACCOMPLISHED USING "INSERTA TEES" MANUFACTURED BY FOWLER MANUFACTURING COMPANY OF HILLSBORO, OREGON. FOR EXISTING PVC MAINS, TAPPING SADDLES SHALL BE USED.

F. 4-INCH SERVICES SHALL NOT BE CONNECTED DIRECTLY INTO MANHOLES. ALL 6 INCH SERVICES SHALL BE CONNECTED TO THE MAIN AT A MANHOLE.

G. THE CONTRACTOR SHALL NOTIFY THE CITY INSPECTOR 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

H. THE CONTRACTOR IS RESPONSIBLE FOR ALL REQUIRED SEWER LINE TESTING TO BE COMPLETED IN THE PRESENCE OF THE ENGINEER OR HIS REPRESENTATIVE. PRESSURE TESTING WILL BE PERFORMED AFTER INSTALLATION OF DRY UTILITIES, AFTER ALL COMPACTION OF STREET SUBGRADE AND PRIOR TO STREET PAVING. FINAL LAMPING WILL ALSO BE ACCOMPLISHED AFTER PAVING IS COMPLETED. THESE TESTS SHALL BE THE MINIMUM BASIS OF ACCEPTANCE OF THE SEWER LINE EXTENSION.

I. THE CONTRACTOR SHALL OBTAIN CITY OF GRAND JUNCTION STREET CUT PERMIT FOR ALL WORK WITHIN EXISTING CITY RIGHT-OF-WAY PRIOR TO CONSTRUCTION.

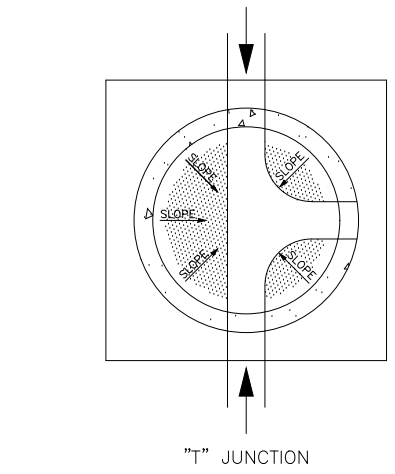
J. A CLAY CUT-OFF WALL SHALL BE PLACED 10 FEET UPSTREAM FROM ALL NEW MANHOLES UNLESS OTHERWISE NOTED. THE CUT-OFF WALL SHALL EXTEND FROM 6 INCHES BELOW TO 6 INCHES ABOVE GRANULAR BACKFILL MATERIAL AND SHALL BE 2 FEET WIDE. IF NATIVE MATERIAL IS NOT SUITABLE, THE CONTRACTOR SHALL IMPORT MATERIAL APPROVED BY THE ENGINEER.

K. SEWER SERVICE STUB OUTS SHALL BE CAPPED AND PLUGGED. STUB OUT SHALL BE MARKED WITH A 4X4 INCH POST PAINTED GREEN BURIED WITH 3 FEET ABOVE GRADE. AS-BUILT SURVEYING FOR VERTICAL GRADE OF STUB OUT REQUIRED PRIOR TO BACKFILL.

L. RED LINE AS-BUILTS SHALL BE SUBMITTED TO THE CITY UTILITY ENGINEER AT LEAST 72 HOURS PRIOR TO PAVING FOR REVIEW.

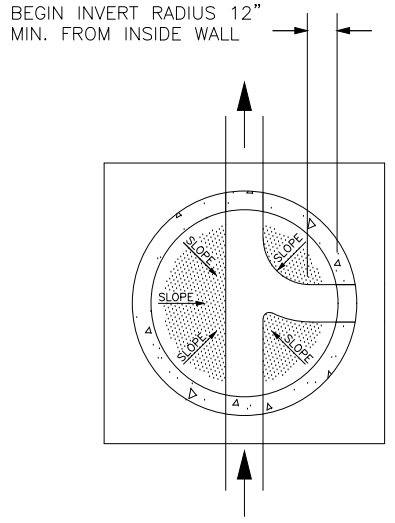
MANHOLE NOTES

1. ALL PROPOSED MANHOLES SHALL BE PRE-CAST CONCRETE.
2. CONCRETE SHALL BE COLORADO DEPARTMENT OF TRANSPORTATION CLASS "B" (SECTION 601.02).
3. ALL CEMENT USED IN MORTAR, CONCRETE BASES, GRADE RINGS, RISER SECTIONS AND CONES FOR SANITARY SEWER MANHOLES, SHALL BE TYPE V OR MODIFIED TYPE II PORTLAND CEMENT WITH LESS THAN 5% TRICALCIUM ALUMINATE.
4. MANHOLE RISER SECTIONS, CONES AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE CONFORMING TO ASTM C-478 OR AASHTO M-199.
5. BACKFILL AROUND MAHHOLES AND OTHER PIPELINE STRUCTURES SHALL BE PLACED IN 8" MAX. LIFTS AND COMPACTED TO 95% AASHTO T-99 WITH HAND OPERATED MECHANICAL EQUIPMENT.
6. ALL WORK SHALL BE IN ACCORDANCE WITH APPROVED PLANS AND CITY SPECIFICATION.
7. THE MANHOLE CONE AND BARREL SECTIONS SHALL BE POSITIONED SUCH THAT THE MANHOLE RING AND STEPS ARE AT A 45° ANGLE FROM THE INLET PIPE (SEE SHEET D4).
8. MANHOLE RING AND COVER SHALL BE SET TO FINISH GRADE USING NON-SHRINK GROUT TO ADJUST RIM ELEVATION. GROUT SHALL NOT EXCEED 2". THICKNESS. GROUT SHALL BE PLACED BETWEEN TOP OF CONCRETE GRADE RING AND RING AND COVER. STEEL GRADE ADJUSTMENT RINGS MAY BE USED FOR ADJUSTMENT OF MANHOLE COVERS ONLY WHEN STREETS ARE OVERLAID.
9. INVERTED MANHOLE RINGS WILL NOT BE ALLOWED UNLESS APPROVED BY THE ENGINEER.
10. WHERE REQUIRED, EPOXY SHALL BE APPLIED AT THE FACTORY.



"T" JUNCTION

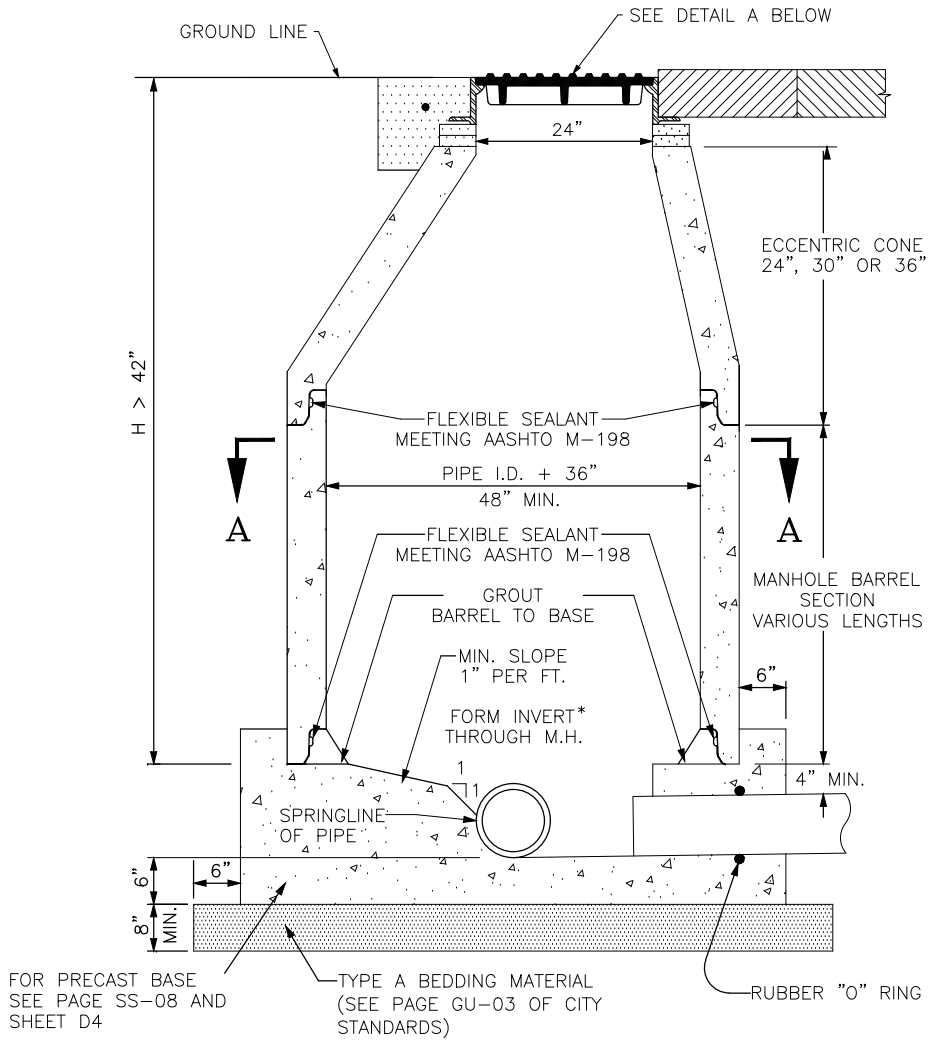
BEGIN INVERT RADIUS 12" MIN. FROM INSIDE WALL



"Y" JUNCTION

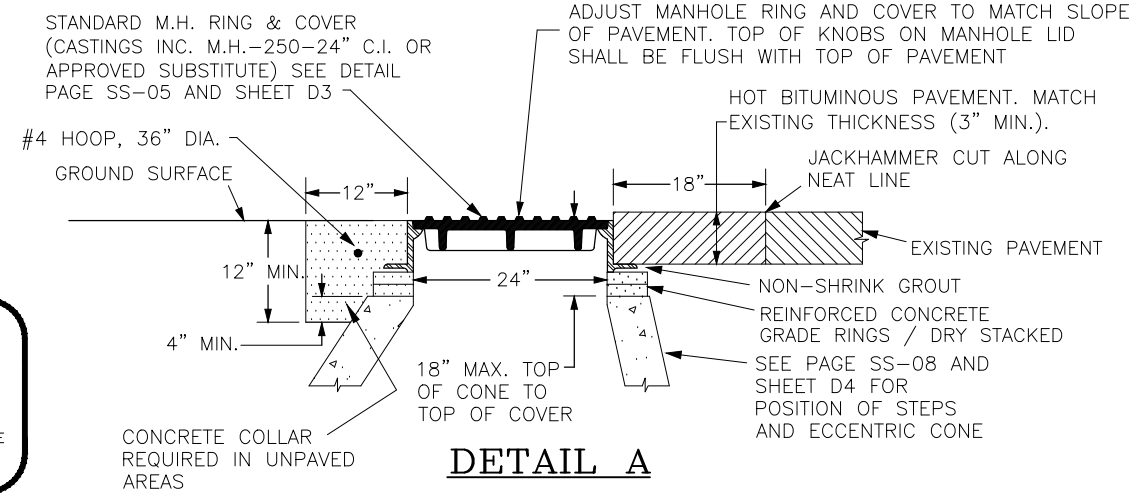
INVERTS SHALL BE FORMED TO PROVIDE A 12" MIN. APPROACH IN LINE WITH EACH PIPE FOR MAINTENANCE EQUIPMENT.

ALL PRECAST MANHOLE SECTIONS SHALL CONFORM TO ASTM C-478 OR AASHTO M-199



* FOR IN LINE MANHOLES THE PIPE MAY BE INSTALLED THROUGH THE MANHOLE BASE AND THE TOP HALF REMOVED.

SECTION A-A



DETAIL A

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

GENERAL SEWER NOTES

CITY STANDARD SANITARY SEWER DETAIL - PAGE SS-01

STANDARD MANHOLE - CAST IN PLACE BASE

CITY STANDARD SANITARY SEWER DETAIL - PAGE SS-02

DESCRIPTION	DATE
REVISION △	
REVISION △	
REVISION △	
REVISION △	

DRAWN BY BCH DATE 03/20/18
DESIGNED BY BCH DATE 03/20/18
CHECKED BY ALC DATE
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SCALES: PLAN & PROFILE
HORIZONTAL: 1" = NA
NA NA NA NA
VERTICAL: 1" = NA
NA NA NA NA

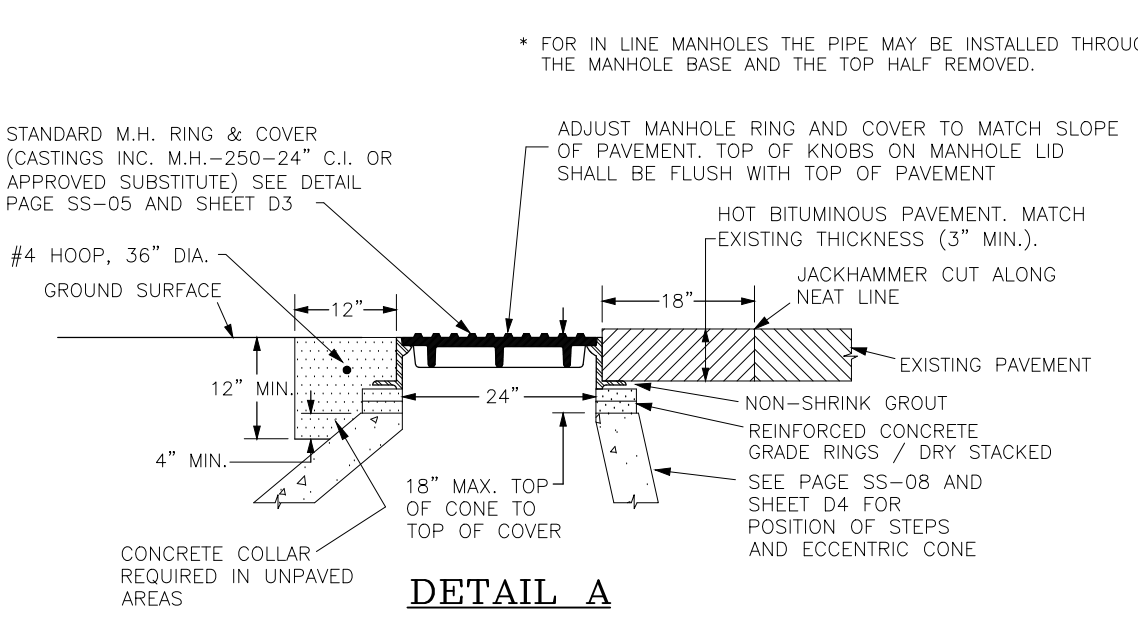
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

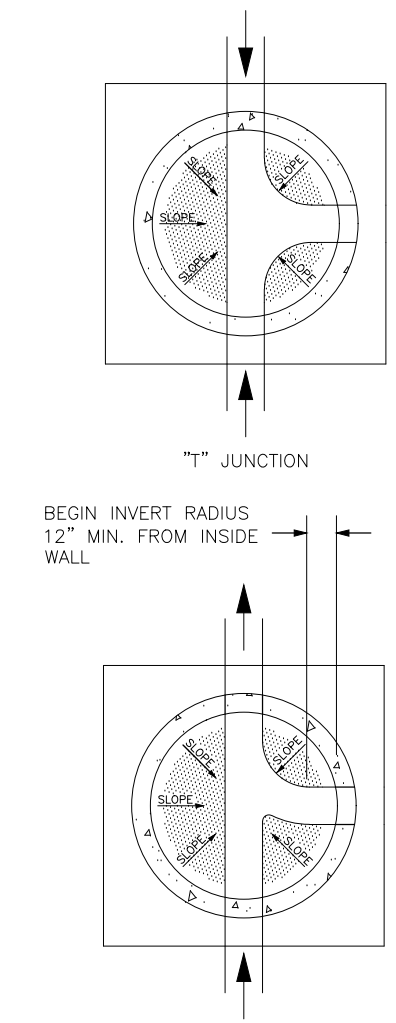
2018 SEWER LINE REPLACEMENTS - PHASE A
GENERAL SEWER NOTES AND
STANDARD MANHOLE

D1

* FOR IN LINE MANHOLES THE PIPE MAY BE INSTALLED THROUGH THE MANHOLE BASE AND THE TOP HALF REMOVED.



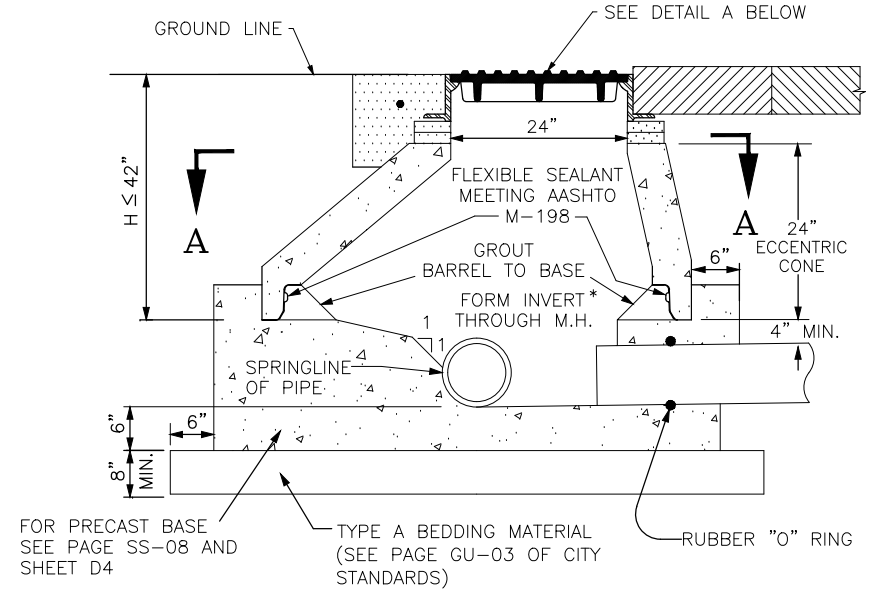
DETAIL A



INVERTS SHALL BE FORMED TO PROVIDE A 12" MIN. APPROACH IN LINE WITH EACH PIPE FOR MAINTENANCE EQUIPMENT.

SECTION A-A

ALL PRECAST MANHOLE SECTIONS SHALL CONFORM TO ASTM C-478 OR AASHTO M-199



NOTE: A FLAT LID SLAB MAY BE ALLOWED INSTEAD OF A CONE WHEN APPROVED BY THE CITY ENGINEER.

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

STANDARD SHALLOW MANHOLE - CAST IN PLACE BASE

CITY STANDARD SANITARY SEWER DETAIL - PAGE SS-03

DESCRIPTION	DATE
REVISION △	
REVISION △	
REVISION △	
REVISION △	

DRAWN BY BCH DATE 03/20/18
DESIGNED BY BCH DATE 03/20/18
CHECKED BY ALC DATE
APPROVED BY ALC DATE

SCALES: PLAN & PROFILE
HORIZONTAL: 1" = NA
NA NA NA NA
VERTICAL: 1" = NA
NA NA NA NA

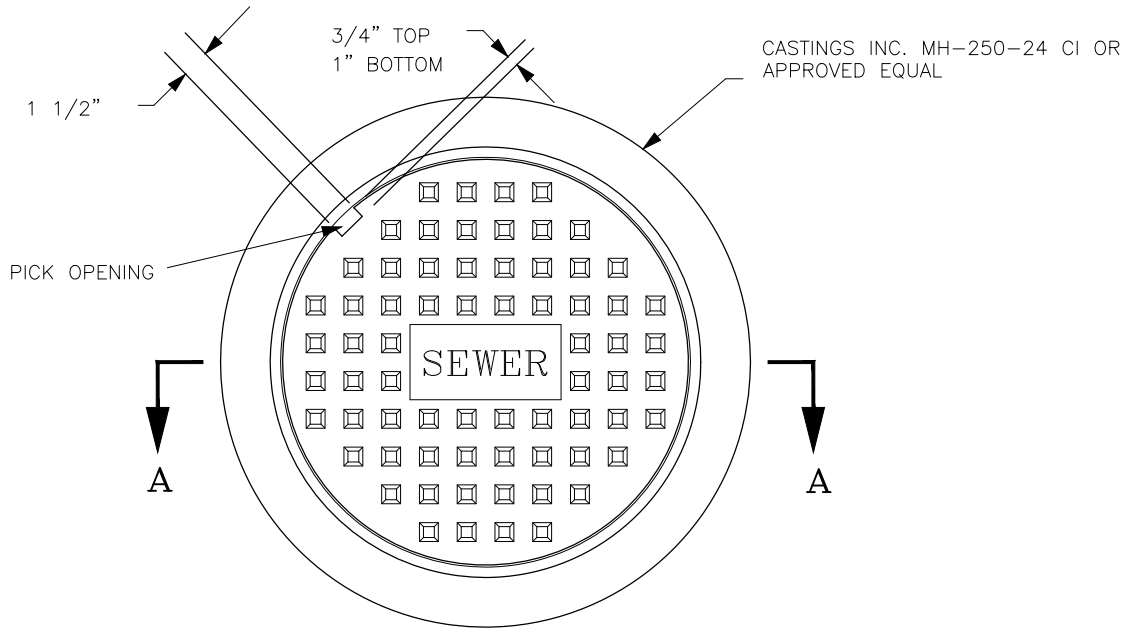
CITY OF Grand Junction COLORADO

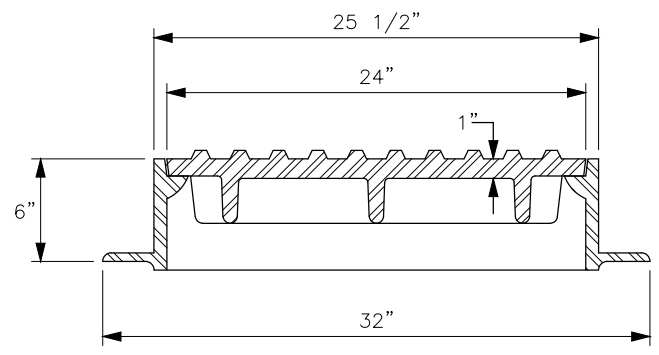
PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENTS - PHASE A
STANDARD SHALLOW MANHOLE AND DROP MANHOLE DETAIL

D2

PROJECT NO. 902-F001633





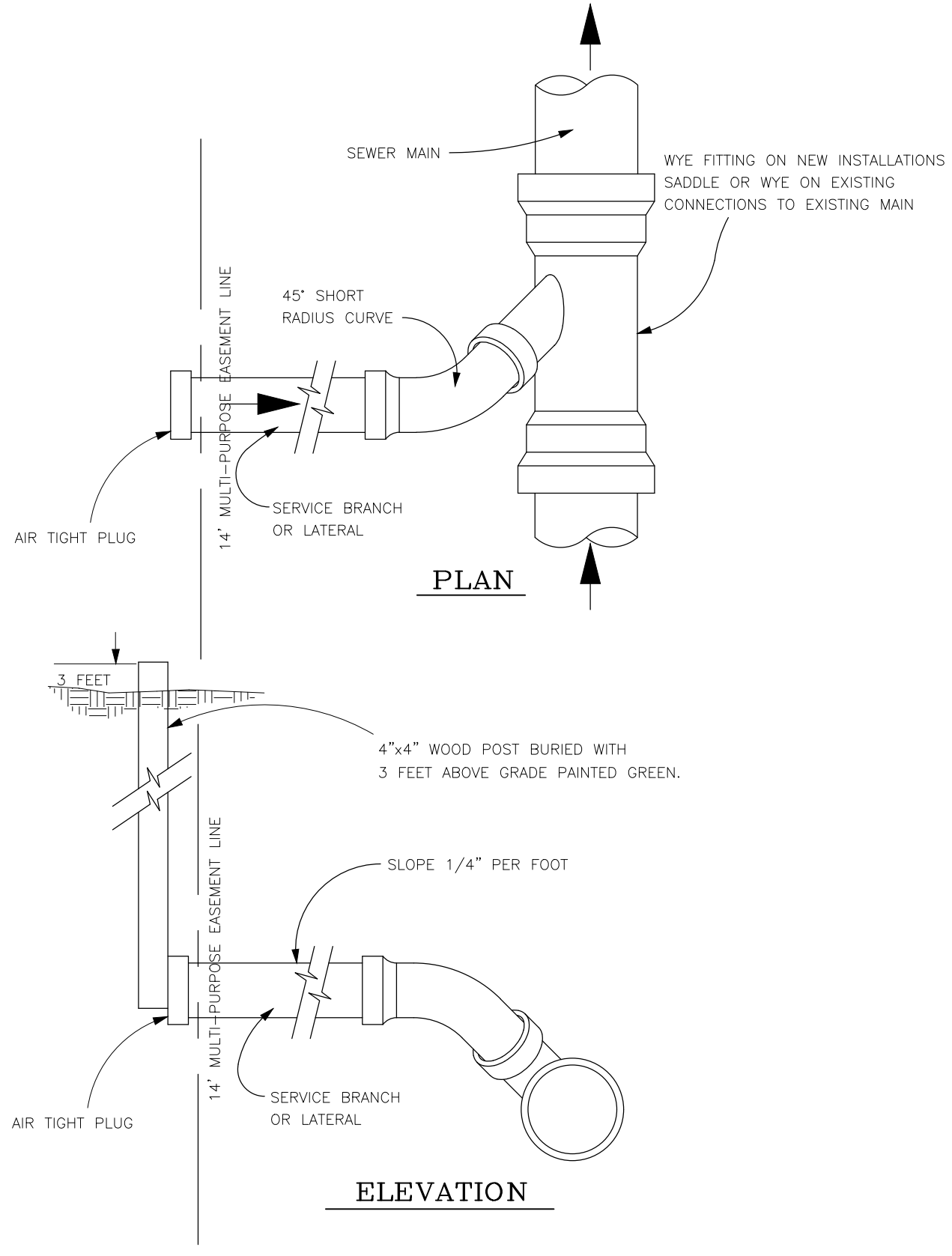
SECTION A-A

FOR MANHOLES LOCATED IN SIDEWALK OR OTHER PEDESTRIAN WAY USE CASTINGS INC. MH-150-24 AL OR APPROVED EQUAL (SEE DETAIL ON PAGE D-15 OF CITY STANDARDS).

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

STANDARD MANHOLE RING AND COVER

CITY STANDARD SANITARY SEWER DETAIL - PAGE SS-05



TYPICAL SERVICE "Y" CONNECTION

CITY STANDARD SANITARY SEWER DETAIL - PAGE SS-06

DESCRIPTION	DATE
REVISION △	
REVISION △	
REVISION △	
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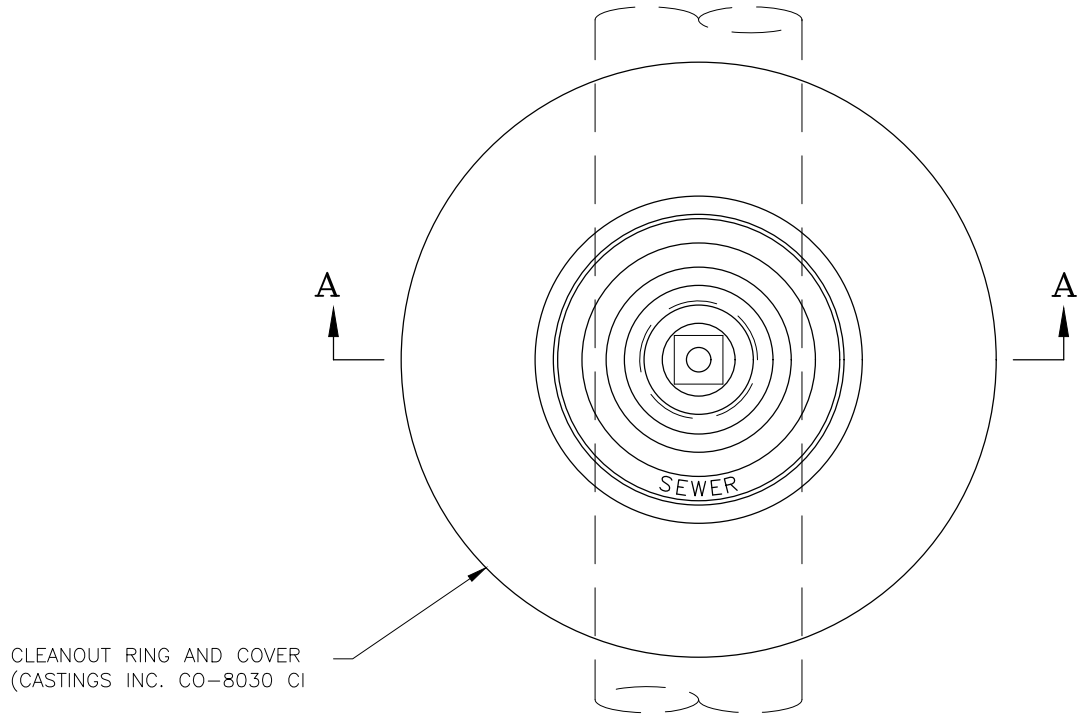
CITY OF Grand Junction COLORADO

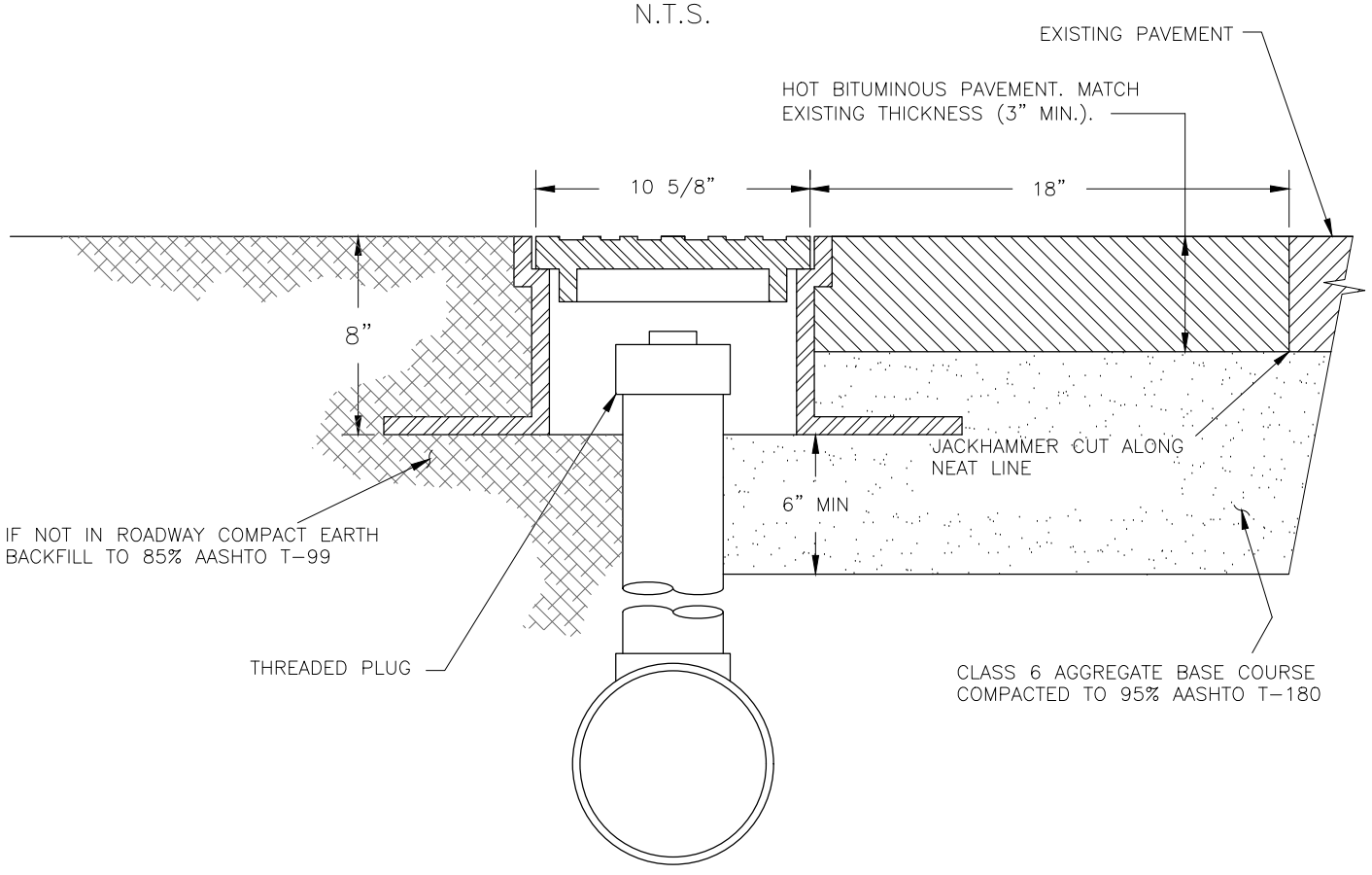
PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENTS - PHASE A
STANDARD MANHOLE RING AND COVER, AND
TYPICAL SERVICE "Y" CONNECTION

D3



PLAN
N.T.S.

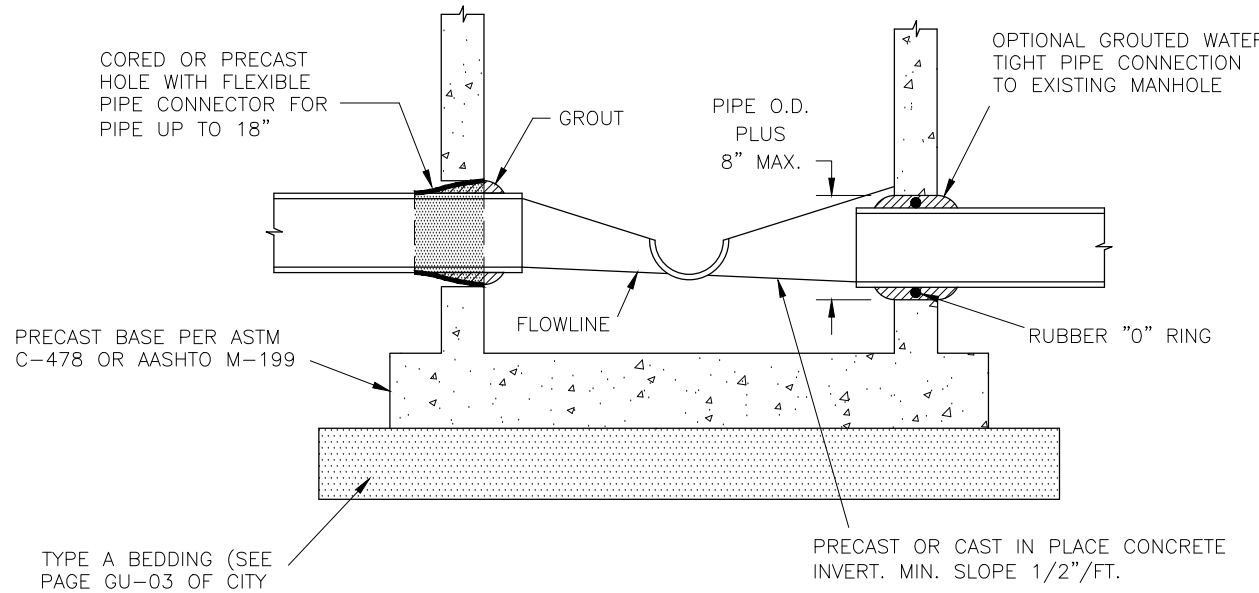


SECTION A-A
N.T.S.

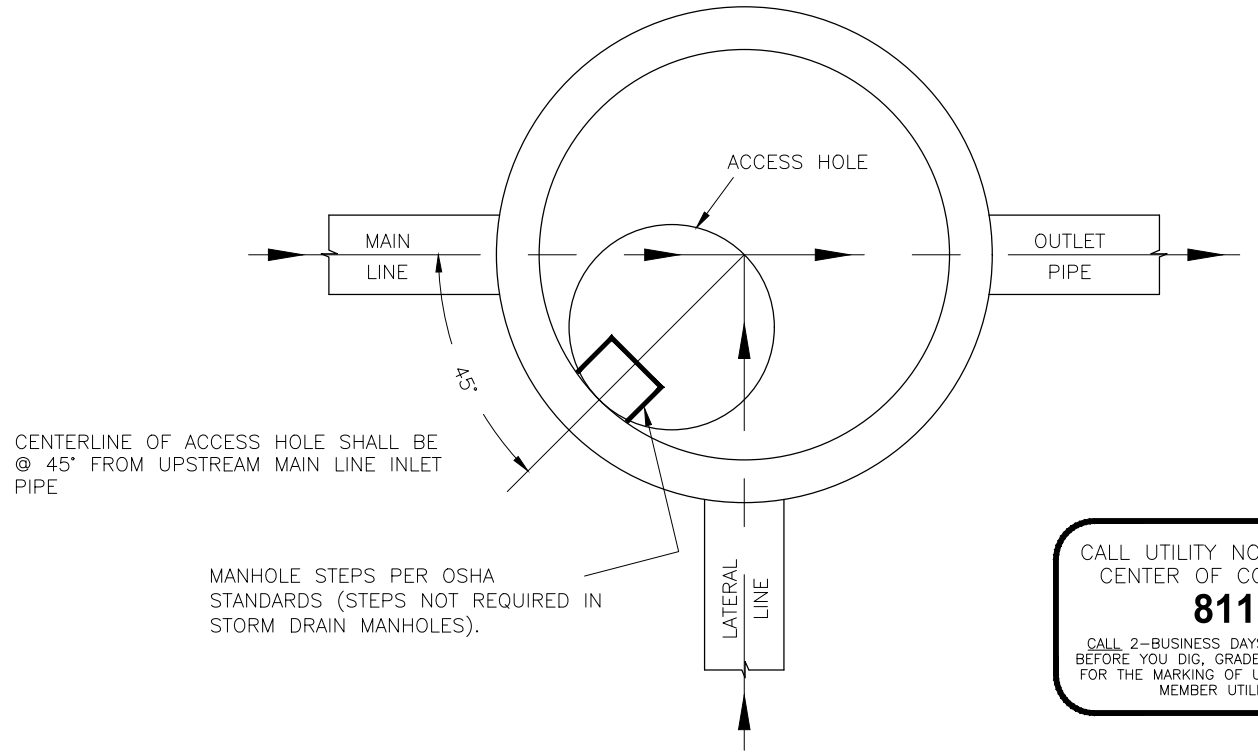
SEWER SERVICE CLEANOUT WITHIN RIGHT OF WAY DETAIL

CITY STANDARD SANITARY SEWER DETAIL - PAGE SS-07

GROUT FOR PIPE CONNECTIONS SHALL BE ALL-CRETE (5 OR 20 MINUTE SET) MANUFACTURED BY FOSROC INC. OR AN APPROVED SUBSTITUTE.



PRECAST MANHOLE BASE/TIE TO EXISTING MANHOLE WITHOUT BOOT



MANHOLE ACCESS LOCATION

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

PRECAST MANHOLE BASE, PIPE CONNECTIONS & ACCESS HOLE LOCATION

CITY STANDARD SANITARY SEWER DETAIL - PAGE SS-08

DESCRIPTION	DATE
REVISION △	
REVISION △	
REVISION △	
REVISION △	

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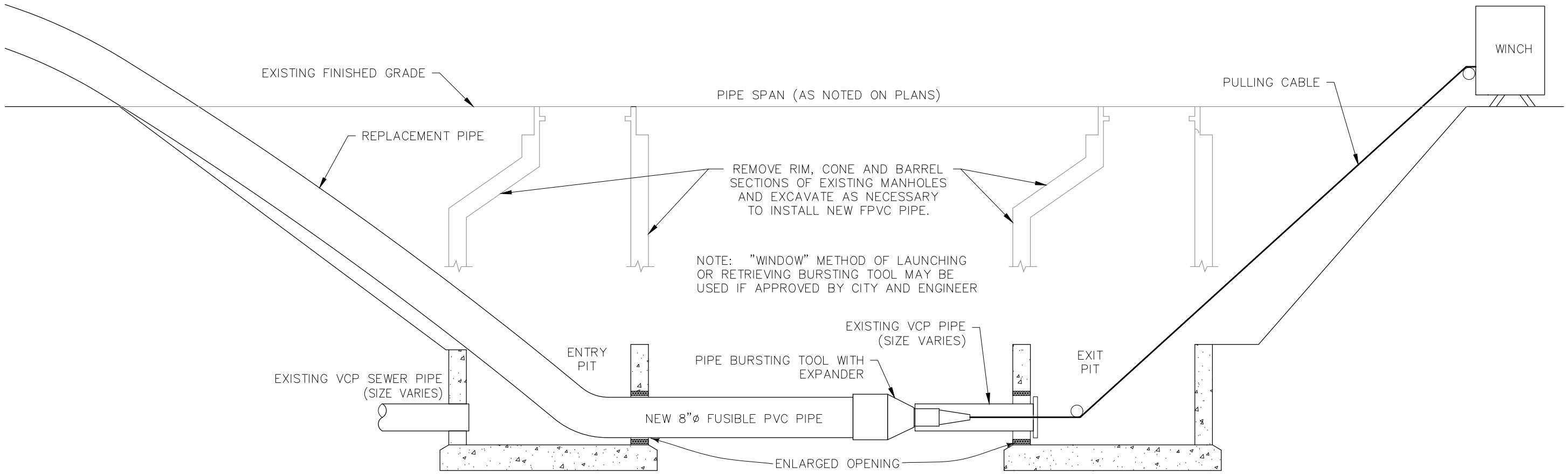
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENTS - PHASE A
SEWER SERVICE CLEANOUT AND
PRECAST MANHOLE BASE

D4

PROJECT NO. 902-F001633



NOTE:

CONTRACTOR SHALL MAINTAIN MINIMUM ALLOWABLE BENDING RADIUS FOR 8" FPVC PER MANUFACTURER RECOMMENDATIONS AT ALL TIMES DURING PIPE BURSTING OPERATIONS.

TYPICAL PIPE BURSTING SETUP

N.T.S.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

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REVISION △	–
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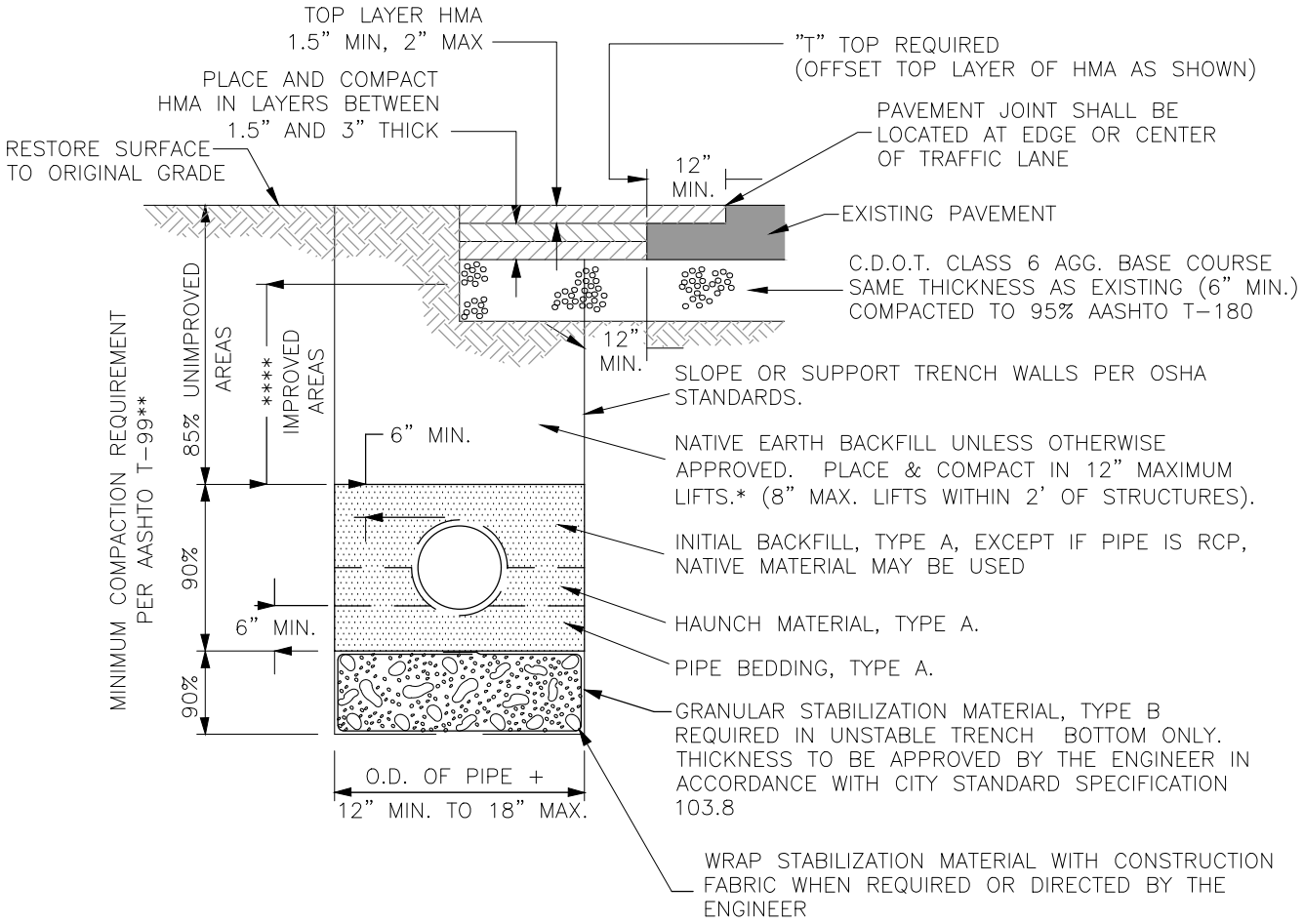
CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENTS – PHASE A
PIPE BURSTING DETAILS

D5



	MAXIMUM PERCENT BY WEIGHT PASSING SQUARE MESH SIEVES		
SIEVE SIZE	PIPE BEDDING, HAUNCH & INITIAL BACKFILL MATERIAL (CRUSHED ROCK, TYPE A)	GRANULAR STABILIZATION MATERIAL (SCREENED OR CRUSHED ROCK, TYPE B)	IMPORTED BACKFILL MATERIAL (USE ONLY WHERE SPECIFIED OR DIRECTED BY THE ENGINEER
12 INCH	---	---	100
2 INCH	---	100	---
1 INCH	100	---	---
NO 4	---	15 MAX	---
NO 200	20 MAX ***	---	3% – 20% ***

* 24" COMPACTED BACKFILL REQUIRED OVER ALL PLASTIC PIPE PRIOR TO VEHICLE OR HEAVY EQUIPMENT LOADING.

** COMPACT PER AASHTO T-180 WHEN SPECIFIED, DIRECTED OR APPROVED BY THE ENGINEER.

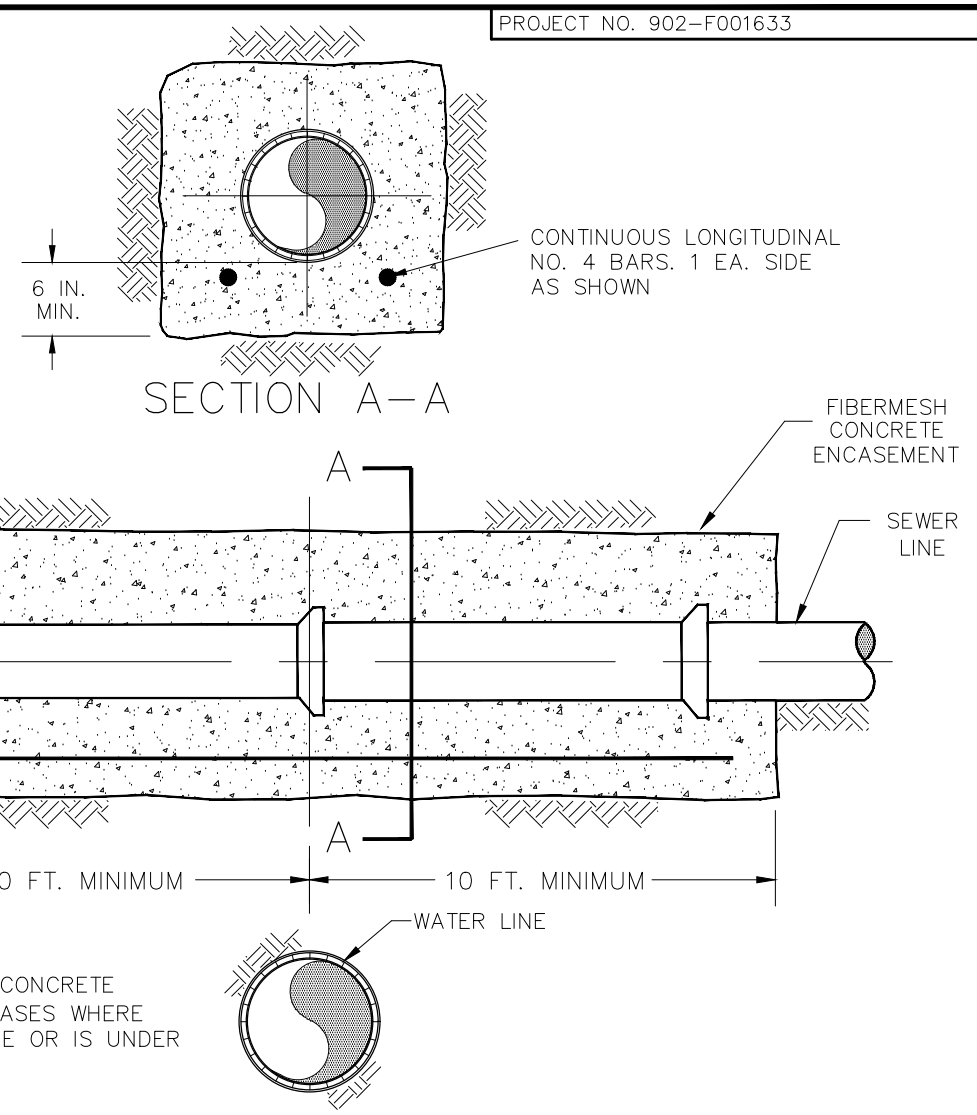
*** PLASTIC INDEX (PI) SHALL NOT BE MORE THAN 7.

**** TRENCH BACKFILL UNDER ASPHALT OR CONCRETE PAVEMENT SHALL BE COMPACTED PER SECTION 103.14 AND TABLE 101 IN THE SSFUU (STANDARD SPECIFICATIONS FOR UNDERGROUND UTILITIES).

ALL BACKFILL MATERIAL SHALL BE UNIFORMLY ADJUSTED TO WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT PRIOR TO PLACEMENT AND COMPACTION.

TYPICAL TRENCH DETAIL

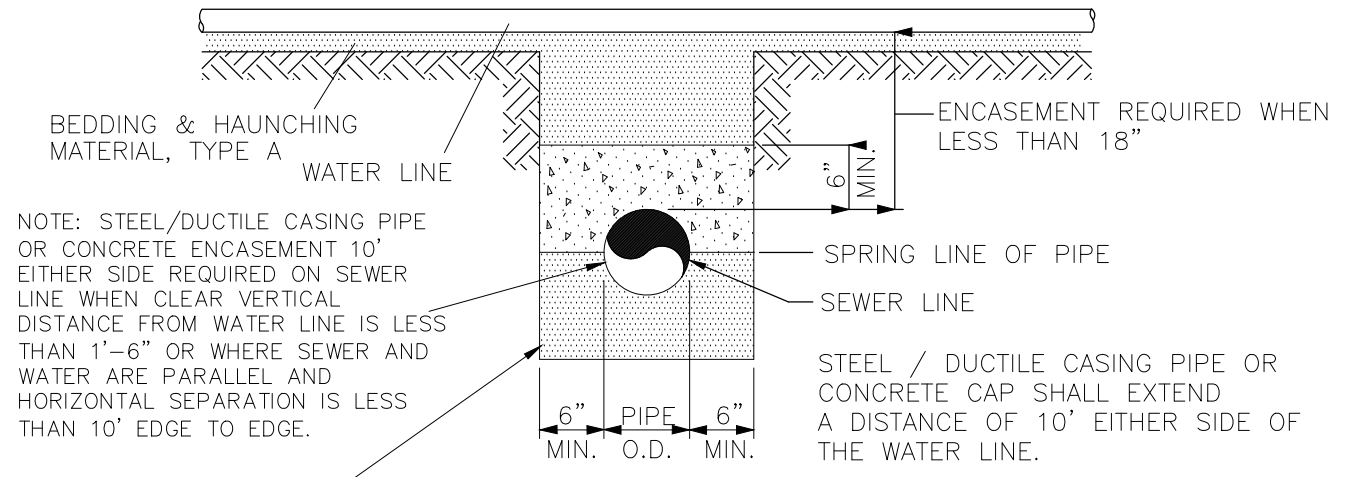
DEPARTMENT OF PUBLIC WORKS AND PLANNING ENGINEERING DIVISION CITY OF GRAND JUNCTION, COLORADO	GENERAL UTILITY DETAIL	APPROVED: DN REVISED: FEB. 2007 DRAWN: TLT	PAGE GU-03



SECTION A–A

STEEL/DUCTILE CASING PIPE OR CONCRETE ENCASEMENT REQUIRED IN ALL CASES WHERE SEWER LINE IS ABOVE WATER LINE OR IS UNDER WATERWAY CROSSING.

WATER LINE BELOW SEWER LINE



WATER LINE ABOVE SEWER LINE

TYPICAL WATER AND SEWER LINE CROSSINGS

DEPARTMENT OF PUBLIC WORKS AND PLANNING ENGINEERING DIVISION CITY OF GRAND JUNCTION, COLORADO	GENERAL UTILITY DETAIL	APPROVED: DN DATE: FEB. 2005 DRAWN: TCP/DPW	PAGE GU-04

DESCRIPTION	DATE
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CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

2018 SEWER LINE REPLACEMENTS – PHASE A
GENERAL UTILITY DETAILS

D6