Purchasing Division

Invitation for Bid

IFB-4627-19-DH
2019 7th Street Reconstruction – Orchard Ave. to Patterson Ave.

Responses Due:

April 23, 2019 prior to 9:00AM

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 Jr., 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 to complete the project, which includes approximately 18,240 square yards of asphalt milling and subsurface material removal to facilitate the placement of a new pavement section, generally between the existing curb and gutters, consisting of 7 inches of HMA underlain by 15 inches of Class 6 aggregate base course, stabilized by Class 3 aggregate base course and/or geotextile as needed. This project will consist of approximately 2,036 tons of grading SX 75 (PG 76-28), and approximately 3,351 tons of grading SX 75 (PG 64-22), 9,999 tons of Class 6 aggregate base course, 212 square yards of driveway replacement, 260 square yards of sidewalk replacement, 431 square yards of concrete curb ramp replacement, and 80 linear feet of curb and gutter replacement on 7th Street between Orchard Avenue and Patterson Road within the City of Grand Junction. All dimensions and scope of work should be verified by Contractors prior to submission of bids.

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

The City would like to remind all Contractors, Sub-Contractors, Vendors, Suppliers, Manufacturers, Service Providers, etc. that (with the exception of Pre-Bid or Site Visit Meetings) all questions, inquiries, comments, or communication pertaining to any formal solicitation (whether process, specifications, scope, etc.) must be directed (in writing) to the Purchasing Agent assigned to the project, or Purchasing Division. Direct communication with the City assigned Project Managers/Engineers is not appropriate for public procurement, and may result in disqualification.

1.2. **Mandatory Pre-Bid Meeting:** **Prospective bidders are required to attend a mandatory pre-bid meeting on April 9, 2019 at 9:00am**. Meeting location shall be in the Auditorium at City Hall, located at 250 N. 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. **Prequalification Requirement:** Although the City no longer requires pre-qualification, Contractors are expected to have all of the proper equipment and training to perform the tasks include within this solicitation.

1.5. **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/BidOpenings.aspx 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**)

1.6. **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.

1.7. **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.

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

1.9. **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/BidOpenings.aspx.

1.10. 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.

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

1.12. 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.

1.13. 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.

1.14. 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/BidOpenings.aspx. 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.

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

1.16. 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.

1.17. 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.

1.18. 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.

1.19. 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.

1.20. Public Disclosure Record: If the bidder has knowledge of their employee(s) or sub-contractors having an immediate family relationship with a City 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.

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, shall constitute a contract equally binding between the City 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) and Contractor. City 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 are, and shall remain, City 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, Specifications 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: As soon as practicable after bids are received and prior to the award of the contract, the successful Contractor shall furnish 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. Offeors 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 he 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: 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 readvertise, 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: 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 **$500.00** 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 Offers: 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. 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. 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 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 work request is for improvements to selected roads within the City of Grand Junction. The improvements will include roadway reconstruction and widening, new concrete driveways, concrete removal and replacement, and storm sewer replacement.

3.2. PROJECT DESCRIPTION: The project includes approximately 18,240 square yards of asphalt milling and subsurface material removal to facilitate the placement of a new pavement section, generally between the existing curb and gutters, consisting of 7 inches of HMA underlain by 15 inches of Class 6 aggregate base course, stabilized by Class 3 aggregate base course and/or geotextile as needed. This project will consist of approximately 2,036 tons of grading SX 75 (PG 76-28), and approximately 3,351 tons of grading SX 75 (PG 64-22), 9,999 tons of Class 6 aggregate base course, 212 square yards of driveway replacement, 260 square yards of sidewalk replacement, 431 square yards of concrete curb ramp replacement, and 80 linear feet of curb and gutter replacement on 7th Street between Orchard Avenue and Patterson Road within the City of Grand Junction. All dimensions and scope of work should be verified by Contractors prior to submission of bids.

3.3. SPECIAL CONDITIONS & PROVISIONS:

3.3.1 Mandatory Pre-Bid Meeting: Prospective bidders are required to attend a

mandatory pre-bid meeting on April 9, 2019 at 9:00am. Meeting location shall be in the Auditorium at City Hall, located at 250 N. 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 Jr., Senior Buyer
City of Grand Junction
duaneh@gjcity.org

3.3.2 Project Manager: The Project Manager for the Project is Eric Mocko, Project Engineer, who can be reached at (970)256-4017. 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
Attn: Eric Mocko, Project Engineer
333 West Ave Building C
Grand Junction, CO 81501

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

3.3.4 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.

3.3.5 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.

3.3.6 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.

3.3.7 Time of Completion: The scheduled time of Completion for the Project is **70 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.

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

3.3.9 Licenses and Permits: Contractor is responsible for obtaining all necessary licenses and permits required for Construction, at Contractors expense. See Section 2.12. Contractor shall supply to Owner all copies of finalized permits.

3.3.10 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:

- None

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

- Door-hanger notices informing residents of the upcoming overlay work, planned dates of the work, and parking restrictions. These shall be hung on doors at least two, but not more than 7 days prior to the work at each location. In the event that door hangers are not distributed as per these special conditions and a vehicle needs to be removed from the project site the Contractor shall be responsible for the costs associated with the relocation of the vehicle.
- Damaged or outdated manhole ring and covers and Water Valve boxes and lids that need to be replaced. The City will furnish the above mentioned. The Contractor shall be responsible for picking up the materials from Castings Inc. The Contractor should verify the approved materials prior to placement.

3.3.12 Project Newsletters: The first newsletter for the project will be prepared and distributed by the City of Grand Junction. It will include general information about the Project including interruptions in utility services, street closures, parking restrictions, project schedule and the names and telephone numbers of the contacts for the City and Contractor. The first newsletter will be mailed approximately one week before the Contractor commences work.

The Contractor shall prepare the information for the weekly newsletter until the project is completed. The newsletters will be emailed and mailed to communicate the information to the business owners.

The contractor shall supply the following information in the weekly newsletters:

1. Description of work completed during the previous week.
2. Description of work scheduled for the upcoming two weeks.
3. Information about any road closures, detours, parking restrictions, and other activities that may cause delay or inconvenience to the businesses or the general public.
4. Scheduled or planned interruption changes in any utility services, trash pickup, mail delivery, or other services.
5. Project schedule changes or other information that may be useful or of interest.
6. The project schedule shall contain a one week look behind and a three week look ahead to be included in the newsletter.

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

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

3.3.15 Uranium Mill Tailings: It is anticipated that some radioactive mill tailings will be encountered on this project within the roadway. Mill tailings may also be encountered during driveway construction. Radioactive mill tailings generated from this project shall be deposited at the holding facility located at City Shops (333 West Avenue). All loads will be recorded in the log sheet located at the entrance to the clarifier.

3.3.16 Stockpiling Materials and Equipment: All stockpiling/storage shall be in accordance with General Contract Condition Section 51.

When approved by the Project Engineer, the Contractor may stockpile and store materials and equipment within public right-of-way. The Contractor shall be responsible for obtaining written permission to use private property for storage of materials and equipment. Copies of the above-mentioned agreements shall be submitted to the Project Engineer prior to use of the property.

3.3.17 Traffic Control: The following street and lane closures will be allowed for construction of this project:

All available public parking is reserved for the public. Contractor and subcontractor employee personal vehicle parking is prohibited in these locations. Parking of Contractor or subcontractor vehicles or construction equipment in existing public parking space is allowed only in the zones that are closed for construction. Parking of Contractor, subcontractor or employee construction or personal vehicles (or construction equipment) in private residential or business parking space is also strictly prohibited. Suitable transportation to the work site for personnel whose vehicles are parked off site shall be provided by the Contractor.

Access Maintenance Plan

Unless otherwise included in the plans or directed by the Engineer, the Contractor shall maintain continuous access to all roadways, side streets, walkways, alleyways, driveways, and other sidewalks and pathways at all times. Sidewalks shall remain open to pedestrians to the greatest extent practicable. If a sidewalk has to be closed, an alternate access shall be provided with appropriate signage. To the greatest extent possible, driveways shall be re-constructed when the access is closed for pavement placement.

At least 7 calendar days prior to beginning work on any driveway or private access, the Contractor shall notify each business or resident of the expected construction schedule.

The Contractor shall develop an Access Maintenance Plan (AMP) in coordination with all affected owners and tenants. A sample form of the AMP shall be developed for this purpose by the Contractor and submitted to the Engineer for review and approval. The AMP shall address any special needs any business or residence has for Americans with Disabilities Act (ADA) access or any other special needs. A place on the AMP form shall address special needs and ADA issues.

The AMP shall detail the effects to the accesses including closing dates, time and duration, and, if applicable, barricades, fencing and temporary means of access with all affected owners and tenants in a work area. The AMP shall include the address, the station location, the work periods affected, and show documentation of coordination, including the appropriate property owner signatures, and the date of the contact. Contact information regarding the companies that make frequent deliveries to the affected businesses shall be obtained and details of access changes shall be provided to these companies by the Public Information Manager along with other routine public information.

The signed AMP shall be submitted, as part of the corresponding method of handling traffic, to the Project Engineer for approval one week prior to the start of any work which will affect the signatory properties. If the Contractor is unable to obtain approval and signatures, documentation of “good faith efforts” to obtain said approval and signatures shall be submitted.

The Contractor will not be allowed to begin work until the plan is accepted. If Contractor does not have approved AMP forms completed for all accesses within a work area, the Engineer may delay progress of work for the affected accesses. Such delay shall not be the basis for a claim for additional contract time or compensation.

Other Special Traffic Control Requirements
Signs and stands shall not be permitted to be left on sidewalks overnight.

Equipment shall not be stored within 10 feet of the currently traveled roadway lanes on city streets.

Traffic Control Management shall include all Traffic Control Supervisors and helpers necessary to perform the work. There shall be a minimum of one helper for each Traffic Control Supervisor required for the project. At least one Traffic Control Supervisor and one Helper shall be on site at all times when construction activities are underway.

Although Traffic Control items such as Variable Message Sign Panels, Traffic Control Management or Traffic Control Inspection, and construction traffic control signs may be required and used prior to the beginning of contract time, no payment will be made for the use of any item prior to the beginning of contract time. All work performed prior to commencement of Contract time shall be considered subsidiary to mobilization.

Helpers for the Traffic Control Management item may give flagger breaks. However, the time shall be included in the item for Traffic Control Management, and shall not be paid as additional flagging hours.

The Contractor shall provide Traffic Control Supervisor(s) (TCS) with at least one year of experience, as accepted by the Engineer. A copy of the certification of the Traffic Control Supervisor(s) shall be provided to the Engineer at least two days prior to the project preconstruction conference.

A meeting will be scheduled each working day with the Contractor's superintendent, the Traffic Control Supervisor(s), and the Project Engineer for discussion, submittal and approval of the method(s) of handling traffic (MHT) for the next day's scheduled work. Work that has not been scheduled and requires a MHT that has not been approved shall not be allowed. Work which does not require a MHT may proceed if approved by the Engineer.

The required TCS Diary shall be submitted to the Engineer by 10:00 a.m. each following day and shall include a listing of all flagging hours.

All Construction Zone Traffic Control Devices shall be continuously maintained in accordance with Section 630 of the Standard Specifications. The TCS shall establish a set maintenance and cleaning schedule. A copy of the maintenance and cleaning schedule shall be provided to the Engineer.

All costs incidental to the foregoing requirements shall be included in the original contract prices for the project.

3.3.18 Clean-Up: The Contractor is responsible for cleaning up all loose materials that

have been deposited or swept into gutters, and onto sidewalks and driveways as a result of sidewalk operations. The costs for all clean-up work shall be considered incidental and will not be paid for separately.

3.3.19 Quality Control Testing:

Supplier shall perform Quality Control (QC) testing on the Asphalt. The Contractor shall provide QC throughout the Contract, with the use of their own QC Technicians or the use of a certified laboratory. In accordance with Section 401.06.3 of the City of Grand Junction Standard Specifications for Road and Bridge Construction, results of all QC tests shall be submitted to the Project Engineer and the City's Quality Assurance (QA) Technician within 4 hours of the time of sampling. Failure to do so may require that paving be suspended until all sampling results have been received, reviewed, and approved. The Contractor shall supply QC Lab personnel for night work (if necessary) for comparison of test data. If lab personnel is not supplied paving operations will be suspended until one is available. QC Field personnel shall remain on site during the duration of the paving operation or until in-place density are met.

The Contractor/Supplier shall perform QC testing on all concrete. The City will perform QA testing for concrete.

The Contractor, at their own discretion, may elect to forgo the soils QC field testing (in-place soils density) for placement of Aggregate Base Course or other subgrade tests. QA testing for these items will be performed by the City, and laboratory results for submittal purposes will be provided by the contractor. However, if a sufficient number of failed test results are observed by the City and/or it's QA testing representatives, written notification will be provided to the contractor, and back payment to the City for failed location re-tests will be required.

3.3.20 Stormwater Management Plan (Erosion Control): Existing curbside storm drain inlet basins are located throughout the project and each inlet basin shall receive stormwater protection in the form of a "silt sack" or "filter sock". The inlet basin stormwater protection devices shall remain in place until the Contractor has completed the asphalt paving operations and the street has been swept clean. The Contractor shall also be responsible for maintaining the inlet basin protection devices throughout construction and periodically inspecting the inlet basin protection devices during construction. In addition, after every rainfall and/or snowmelt event the Contractor shall inspect all inlet basin protection devices on the project. The Contractor shall be responsible for either cleaning or replacing the inlet basin protection device when the capacity of the protection device has reached 50% of its full capacity. The Contractor shall take into account the associated maintenance cost in the pay item.

Street sweeping shall be periodically completed along the streets adjacent to the project to contain tracking of soil. The street sweeping machine shall be capable of both sweeping and vacuuming up the roadway dirt. A machine that only sweeps will not be accepted and will not be paid for. The Contractor shall submit for approval a description of the street cleaning machine to be used prior to cleaning the street. Street sweeping will be considered incidental to this pay item.

The Contractor shall keep protective measures on site or excavated soil piles in the event of a rainstorm and/or snow melt event. The Contractor will only be required to

use these measures when it is likely that a rainstorm and/or snowstorm event is going to occur. The Contractor should contact the NOAA National Weather Service Forecast Office in Grand Junction to obtain extended weather forecast information to help in deciding whether gravel filter socks will need to be used. The NOAA Forecast Office of Grand Junction can be reached at 970-243-7007. These measures will be considered incidental and will not be paid for separately.

If groundwater within the roadway is encountered (not anticipated) 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.

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.

A storm water management plan will be provided to the contractor.

3.3.20 Schedule of Submittals: Contractor shall deliver these submittals at least two days prior to the pre-construction meeting:

- Traffic Control Plans
- Project Schedule
- Hourly rate tables for Labor and Equipment to be used on this project
- Asphalt Mix Designs for SX mix.
- Concrete Mix Designs
- Stormwater Management Plan
- Concrete Washout Facility

- Street Sweeping/Vacuum Machine
- Aggregate Base Course gradations
- Tack Coat
- Emulsified Asphalt
- Conduit
- Storm Pipe

3.3.21 Special Equipment:

Asphalt Material Transfer Vehicle: The contractor shall use a materials transfer vehicle in conjunction with belly dump to reduce irregularities in the paving for the top lift of asphalt, at a minimum.

3.3.22 Excess Material: In general, all excess materials shall be disposed in accordance with General Contract Condition Section 50. All asphalt millings shall be delivered to City Shops yard located at 333 West Avenue, and all excess materials generated from the roadway cut shall be delivered to the Riverside Yard located off Hale Avenue. These materials shall become the property of the City of Grand Junction.

3.3.23 Asphalt Paper Joints: The Contractor shall install asphalt paper joints at all locations where milling the roadway creates a vertical edge greater than 1" in height in the direction of travel. The paper joints shall be installed immediately following milling operations. The asphalt used in the paper joint shall be removed prior to paving. The cost of the paper joints shall be included in the unit price for the asphalt items and will not be measured or paid for separately.

3.3.24 Existing Utilities and Structures: Utilities were potholed during design of this project, as indicated on the plans. The locations of existing utilities and structures shown on the plans are approximate with the information gathered during design. It is the responsibility of the Contractor to pothole/locate and protect all structures and utilities in accordance with General Contract Condition Section 37.

3.3.25 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.

3.3.26 Tack Coat: Tack Coat will be required between the asphalt lifts. The tack coat shall meet the requirements of Section 407 of the *Standard Specifications for Road and Bridge Construction*, as modified herein. The cost of the tack coat will be considered incidental to the work and will not be paid for separately.

3.3.27 Milling at Drainage Inlets: When milling adjacent to inlets that have a concrete edge protruding into the street, it shall be the Contractor's responsibility to provide an approved marker or barricade to protect vehicle tires from damage until the asphalt is placed. **It shall be the Contractors responsibility to ensure millings, tack coat, HMA, and/or other deleterious materials do not enter the storm drain system**.

3.3.28 Painted Lane Lines: The Contractor shall be responsible for recording the location of all existing striping, and shall place longitudinal paving joints on or immediately adjacent to said striping.

3.3.29 Temporary Pavement Marking Tape: The Contractor shall be responsible for furnishing and placing temporary pavement marking tape in the event that existing stripes were removed during milling operation. The Contractor shall be responsible for furnishing and placing temporary pavement marking tape prior to the final roller pass. Pavement marking tape shall be placed on the seams of the new asphalt as determined by the record of existing striping. The cost of the marking tape and labor to install will be considered incidental to the work and will not be paid for separately.

3.3.30 Transverse Milling: Butt joints (Transverse Milling) shall be placed in all locations where new asphalt will be joined to existing pavement. The location and width of all butt joints will be designated by the Project Engineer or his representative.

3.3.31 Payment for Hot Mix Asphalt: The Contractor is reminded that Section 401.07.1 of the City of Grand Junction Standard Specifications for Road and Bridge Construction will be used to determine Pay Factors for calculating the basis of payment for Hot Bituminous Pavement with the following modifications:

The pay factor (PF) should be calculated for mat density (excluding joint density), air voids, and VMA daily. An average daily pay factor (DPF) should then be calculated/weighted in the following proportion:

- Mat Density (excluding joint density) – 50%
- Air Voids – 25%
- VMA – 25%

The incentive payment will then be based on a weighted average project pay factor (PPF). The PPF shall be calculated/weighted per the DPFs and accepted quantities placed for each day's production of each pay item. This PPF will then be applied to the total accepted quantities for each pay item, as applicable.

3.3.32 Manholes and Water Valves: It shall be the contractors' responsibility to accurately record and adjust all manholes, valve boxes and survey monuments final grade. In the event that a utility is paved over it shall be the contractors' responsibility to expose and adjust to final grade within 2 days. In all other cases utilities shall be raised to final grade within 7 days after completion of paving street segment, and shall be the contractors' responsibility to expose the affected utility during the event of an emergency.

3.3.33 Existing Concrete Sidewalks, Pans, Fillets, Curbs and Gutters: The existing sidewalks, pans, fillets, curb and gutter are in good serviceable condition. In most instances the installation of new sidewalk and pavement will be adjacent to existing concrete. The Contractor will need to protect all concrete adjacent to construction. If the concrete is damaged during construction the Contractor will be responsible for its replacement at no cost to the City. The Contractor, the City Project Inspector, and/or the City Project Engineer/Manager will walk and record any concrete that is deemed to be damaged before construction has started.

3.3.34 Materials: In the event that excavation of the manholes grade rings are disturbed or removed and replaced due to damage, the Contractor is instructed to follow these guidelines:

The annular area beneath the bottom of the uppermost grade ring shall either be filled with a self-consolidating material, i.e. ¾" screened rock or engineer approved equal or shall be completely filled with Quikrete's Rapid Road Repair or Engineer approved equal. No other means will be considered.

3.3.35 Work By Others / Coordination

Xcel Energy (and others) will be undergrounding overhead utilities from Bookcliff Ave. to Center Ave. before or during construction.

It is anticipated that this work will be completed concurrently at the start of the project, and the contractor will be required to coordinate with Xcel or work around them.

3.4. SCOPE OF WORK:

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:

SP-1 102.11 MANHOLES FOR SANITARY SEWERS AND STORM DRAINS

Add the following:

All shallow manholes shall be constructed in accordance with the City's shallow manhole standard (detail sheet SS-03 in City Std. Contract Documents). The cone-section shall be wet-set in a cast-in-place base.

Add the following:

All manholes located along 7th Street shall be constructed with a minimum of 6" of reinforced concrete grade rings and a maximum of 12" of reinforced concrete grade rings. In addition, all cast iron rings shall be 6" thick.

SP-2 SECTION 103 – REMOVALS, EXCAVATION, BACKFILLING AND RESTORATION

Add the following:

103.4 Bracing and Sheeting of Trenches

Add the following:

Trench wall support will be required when installing all new pipeline included in this project. The Contractor shall provide trench boxes, sheet piles and bracing, or other approved method of supporting trench walls that will limit the top width of any trench to a maximum of six (6) feet. Payment for trench bracing by the Contractors chosen method shall be included in the lineal foot pipe price for all pipe installed in this contract. Bracing required for manhole installation shall be included in the price of the manhole.

103.10 Cutoff Walls.

Add the following:

The cost of installing cutoff walls shall be incidental to the cost of pipe installation.

103.15 Granular Stabilization, Bedding and Haunch Backfill Materials

Replace Type A Pipe Bedding & Haunch Material specifications with the following:

Type A Pipe Bedding & Haunch (crushed rock)	
Sieve Size	% Passing by Weight
3/8"	100
#4	40-90
#200	0-5
P.I.	NP
L.L.	NV

103.16 Earth Backfill Material (Imported Trench Backfill).

Add the following:

Material excavated on site shall not be used in the trench backfill if determined to be unsuitable by the Engineer or his representative. The excavated material shall be hauled off site to a location secured by the Contractor and approved by the Project Engineer. Imported Trench Backfill shall be pitrun or other approved material meeting the requirements of Section 103.16. During placement of imported backfill over the initial backfill material (Type A) that extends to 6 inches above the top of the pipe, the Contractor shall not place any rocks over 4 inches in diameter within the first 12 inches above the initial backfill material to protect the pipe from damage.

SP-3 SECTION 202 – REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Section 202 of the Standard Specifications is hereby revised for this project as follows:

Section 202.07, shall include the following:

All concrete removal required for installation of new will be considered incidental and will not be measured or paid for separately.

Section 210.10, Adjust Structure, shall include the following:

(1) The following shall apply to adjusting manhole rings in traveled through lanes:

(a) Manholes shall be paved over during the paving operations. Sand or paper will be used to prevent the asphalt from adhering to the manhole cover. After paving, the manhole ring shall be adjusted to grade by the use of concrete grade rings. The cut area around the manhole shall then be patched with Grading-SX, Hot Mix Asphalt to the same thickness as the adjacent pavement. When adjusting the manhole ring to match the cross slope of the street, the Contractor shall fill the space between the concrete grade ring and the cast iron ring with Rapid Road Repair or Engineer approved equal. In the event that grade rings are removed and or replaced as part of the adjustment the contractor shall fill the annular area below the uppermost grade ring with a self-consolidating media such as 3/4" washed rock or completely fill the area with Rapid Road Repair or Engineer approved equal.

(b) Manhole adjustment tolerance: all manholes adjusted as part of this project shall meet the following criteria: level with the adjacent asphalt or (–)1/8". Manholes set outside of this tolerance will be rejected.

(2) Valve boxes can be adjusted by the use of cast iron valve box extensions or by digging the valve box out after paving and raising the existing box. After adjusting the height of the valve box, the area around the valve box shall be filled with Grading-SX, Hot Mix Asphalt to the same thickness as the adjacent pavement. Water valve tolerance will be the same as section 1 b with the exception of (–) ¼"

Subsection 202.12, shall include the following:

Locations of saw cuts shall be determined and directed by the Construction Inspector or the Engineer. Saw cuts shall be incidental to work.

Additionally, Section 202 of the Standard Specifications for Road and Bridge Construction is hereby revised for this Project as follows:

Add the following:

Removal and Disposal of Storm Sewer Manhole

Remove manhole ring and cover, grade rings, cone, risers, and base. Salvageable manhole ring and cover shall be returned to City Shops. Backfill excavation with backfill meeting Section 103.16, Earth Backfill Material and compact if manhole will not be replaced with a new manhole.

Method Measurement

Add the following paragraph:

Manholes to be removed and replaced in like locations shall not be measured or paid for separately. The removal shall be considered incidental to the project.

Removal and disposal of Storm Sewer Manholes that are not in the same location as the existing will be measured by each manhole removed and not replaced.

Basis of Payment

Pay Item	Pay Unit
Removal of Manhole (No reinstallation)	Each

SP-4 SECTION 203 – EXCAVATION AND EMBANKMENT

Section 203 of the Standard Specifications for Road and Bridge Construction is hereby revised for this Project as follows:

Add the following:

Potholing

Existing utilities should be potholed by the contractor to confirm at a minimum, depth, size and location, in order to effectively protect in place all existing utilities.

The contractor shall protect in place all existing utilities, not just where noted on the plans. If existing utilities are damaged, they shall be replaced by the contractor at no additional cost to the City.

Basis of Payment

Pay Item	Pay Unit
Excavation and Embankment (Potholing)	Lump Sum

SP-5 SECTION 209 – WATERING AND DUST PALLIATIVES

Section 209 of the Standard Specifications is hereby revised for this project as follows:

Subsections 209.08, Basis of Payment shall be modified to include the following:

The Contract Unit Price for the dust abatement items shall be full compensation for all equipment, labor, materials, and incidentals required for the complete dust abatement for the project including, but not limited to: 7th Street, alleys, and other potential detour alleys. This item also includes the bi weekly maintenance including grading (pot holes) of the potential detour alleys.

SP-6 SECTION 401 – PLANT MIX PAVEMENTS - GENERAL

REVISION OF SECTION 401
PLANT MIX PAVEMENTS

Section 401 if the Standard Specifications are hereby revised for this project as follows:

401.01 Description.

Add the following:

This work shall consist of providing a Hot Mix Asphalt (HMA) to be placed as shown on the plans, or as directed by the Owner. The Contractor shall be responsible for Process Control (PC) of the HMA; including the design, and control of the quality of the material incorporated into the project.

401.02 Composition of Mixtures.

Delete subparagraph (a) *Mix Design* and replace with the following:

A Job Mix Formula (JMF) design shall be submitted for each mixture required, at least 10 calendar days prior to placing any mix on the project, for acceptance by the Owner. JMF's previously approved by CDOT within the past six months may be utilized. The JMF design shall be determined using AASHTO T-312 or CP-L 5115 for the Method of Mixture Design. Grading ST, SX, and S shall be designed using 100mm molds. The job mix gradation shall be wholly within the Master Range Table in subsection 703.04 before the tolerances shown in Section 401 are applied.

Designs shall be developed and performed in a materials laboratory that meets the requirements set forth by AASHTO Materials Reference Laboratory (AMRL) for all testing procedures. The design shall be stamped and signed by a Professional Engineer licensed in the State of Colorado. In addition, the Contractor shall submit, as part of the mixture design, laboratory data documents to verify the following:

- Gradation, specific gravity, source and description of individual aggregate and properties, and the final blend.
- Aggregate physical properties.
- Source and Grade of the Performance Graded Binder.
- Proposed Design Job Mix: aggregate and additive blending, final gradation, optimum binder content.
- Mixing and compaction temperatures used.
- Mixture properties shall be determined with a minimum of four binder contents.

The JMF for each mixture shall establish a single percentage of aggregate passing each required sieve size, a single percentage of asphalt cement to be added to the aggregate, and a single temperature for the mixture at the discharge point of the plant.

The Owner reserves the right to verify the asphalt supplier's mix design for each JMF design utilizing materials produced and stockpiled. The asphalt supplier shall provide, at no cost, a sufficient quantity of each aggregate, mineral filler, Recycled Asphalt Pavement (RAP), and additive for the required laboratory tests, as well as all Certificates of Conformance/ Compliance at any time on any

material used. The Asphalt Supplier shall provide copies of quality control testing results during the production of HMA used within one business day from the sampling date.

Mixture design of HMA shall meet the requirements of Table 403-1 and Table 403-2 in the Revision to Section 403. For mixes requiring a design gyration of 100 (ESALs greater than 3 million) the Project Special Conditions should be used. This gyration is not recommended for the majority of roads within Mesa County.

Delete subparagraph *(b) Mixtures Furnished to the Project* and replace with the following:

Production verification shall occur prior to, or during, the start of the project. Volumetric properties of the mix shall be verified by LabCAT Level C Certified Technicians. If the mix was produced for another project within the last 90 days, data from that project can be submitted for verification. All mixtures furnished for the project shall conform within the ranges of tolerance listed in Table 401.02A. The mix verification test reports shall be submitted to the Owner prior to mix placement.

TABLE
401.02A
Production Mix
Tolerances

Property	Tolerance
Asphalt Cement Content	± 0.3%
VMA	± 1.2%
Air Voids	± 1.2%

Verification testing for binder content, gradation and physical properties shall be performed at the frequencies listed in Table 401.23-1.

There shall be no substitutions of materials allowed during production, unless approved in advance by the Owner. All substitutions will require checkpoint verification. If the checkpoint differs from the Job Mix Formula (JMF), a new mix design will be required. Upon request of the Owner, the binder grade may be changed by one available binder grade level without requiring a new mix design.

Should a change in the source of any material used in the production of HMA (aggregate, mineral filler, lime, or performance graded asphalt binder) occur, a one-point verification test (at optimum binder content) of the mix must be performed to verify that the applicable criteria shown on Table 403-1 (HMA) and Table 403-2 (VMA) of Revision to Section 403 are still met. If this testing shows noncompliance, the Contractor shall establish a new job mix design and obtain approval by the Owner before the new HMA is used.

Add the following new subparagraphs:

(c) *Reclaimed Asphalt Pavement (RAP).* RAP shall be allowed in HMA up to a maximum binder replacement of 23 percent, unless otherwise specified in the contract, and provided that all the specifications for the HMA are met. Fine Aggregate Angularity requirements shall apply only to the virgin fraction

of the fine aggregate. RAP shall be of uniform quality and gradation with a maximum size no greater than the nominal aggregate size of the mix. RAP shall not contain clay balls, vegetable matter, or other deleterious substances.

The Contractor shall have an approved mix design for the amount of RAP to be used. The AC content of the RAP utilized in the Contractor RAP mix design shall be the average AC content determined in accordance with 1B or 1C, below, or alternatively, a minimum of five samples of the Contractors RAP stockpile may be sampled and the average AC content of the RAP be determined using AASHTO T-164, Method A or B, or in accordance with 1C below. The Contractor shall determine the total binder replaced by the binder in the RAP pursuant to the following equation:

Total Binder Replaced = (A x B) x 100/E
Where:

A = RAP % Binder Content *
B = RAP % in Mix *
E = Total Effective Binder Content *
* in decimal format (i.e. 2% is 0.02)

The Total Binder Replaced by the binder in the RAP shall not exceed 23 percent of the effective binder content of either the mix design or the produced mix.
The Contractor shall have an approved Quality Control (QC) Plan that details how the RAP will be processed and controlled. The QC plan shall address the following:

1. RAP Processing Techniques. This requires a schematic diagram and narrative that explains the processing (crushing, screening, and rejecting) and stockpile operation for this specific project.

2. Control of RAP Asphalt Binder Content (AASHTO T-164, Method A or B). RAP Asphalt Binder Content may also be determined in accordance with CP-L 5120, provided an RAP AC content correction factor is determined through correlation testing with AASHTO T-164, Method A or B. The correction factor shall be determined by performing correlation testing on the first five samples of the RAP AC content, then at a frequency of one for every five AC content tests thereafter. The correction factor shall be determined by calculating the average difference in AC content between CP-L 5120 and AASHTO T-164, Method A or B, and applying the correction to the AC content determined in accordance with CP-L 5120 :
   Frequency: 1 per 1000 tons of processed RAP material (minimum five tests)

3. (Alternate) The Contractor may propose a RAP asphalt content correction factor to be used in conjunction with CP-L 5120. The proposed CP-L 5120 RAP asphalt content correction factor shall be used with all RAP asphalt contents tested for the mixture design and quality control sampling and testing. The methodology of the proposed CP-L 5120 RAP asphalt content correction factor shall be outlined in detail in the approved RAP QC Plan. At a minimum, the proposed CP-L 5120 correction factor shall identify the principal source locations of the RAP aggregate, gradation of the material tested, and specific ignition oven serial number used in all the RAP asphalt content testing. The RAP source locations, material gradation, and specific equipment used shall substantiate the CP-L 5120 asphalt content correction factor used for the testing. The substantiation must be from data gathered from historical information or specific asphalt content correction data obtained from tests performed on similar virgin aggregate sources, virgin material gradations, and the specific equipment used.

4. Control of RAP Gradation (CP31 or AASHTO T-30):
   Frequency: 1 per1000 tons of processed RAP material (minimum three tests, sampling from belt feed and not stockpile)

5. Process Control Charts shall be maintained for binder content and each screen listed in Table 401.2C, during addition of any RAP material to the stockpile. The Contractor shall maintain separate control charts for each RAP stockpile. The control charts shall be displayed and shall be made available, along with RAP AC extraction testing laboratory reports to the Engineer upon request

The processed RAP must be 100 percent passing the 31.5 mm (1¼ inch) sieve. The aggregate obtained from the processed RAP shall be 100 percent passing the 25.0 mm (1 inch) sieve. The aggregate and binder obtained from the processed RAP shall be uniform in all the measured parameters in accordance with the following:

Table 401.2C
RAP Binder & Aggregate Uniformity Tolerances

Element	StandardDeviation
Binder Content	0.5
% Passing ¾"	4.0
% Passing ½"	4.0
% Passing 3/8"	4.0
%Passing #4	4.0
% Passing #8	4.0
% Passing #30	3.0
% Passing #200	1.5

(d) *Warm Mix Asphalt (WMA) Technology.* The Contractor may choose to use a WMA Technology that is included on the CDOT approved products list (https://www.codot.gov/business/apl/asphalt-warm-mix.html).

WMA technologies (additive or foaming) used shall be identified on the mix design, indicating usage as a workability additive and/or anti-strip additive. WMA shall be submitted and approved by the Owner for use on a project.

The addition of WMA additives during production, including foaming, shall be controlled by a calibrated metering system interlocked with the plant's controls per the manufacturers' recommendation. Additives may be added at the asphalt terminal at the dosage rate recommended by the WMA technology provider. The foaming process mixes water and binder to create microscopic steam bubbles. Typical water injection rate is ≤ 2% of binder flow rate or per manufacturers' recommendation.

(e) *Anti-Strip Additives.* Anti-Strip shall be added into the HMA. Anti-Strip agents may be liquids (added to the binder), lime (added to the aggregates) or other products, and shall be submitted for approval by the Owner.

The minimum value for Tensile Strength Ratio (TSR) tested in accordance with Table 401.21-1 shall be 80% for the mix design and 70% during production.

There are various types of liquid Anti-Strips. Amine and Organo-silane type liquid Anti-Strip additives are physically mixed with the asphalt binder. Liquid Anti-Strip agents shall be added per the manufactures recommendations. Typical product dosages are provided in Table 401.2E-1.

TABLE 401.2E-1
Liquid Anti-Strip Dosage Rates

Type	Typical Dosage Rate
Amine	0.4% to 0.8%
Organo-silane	0.05% to 0.15%

WMA chemical products which display Anti-Stripping characteristics will be classified, and identified on the mix design, as a liquid Anti-Strip additive.

When a liquid Anti-Strip additive is used, the Contractor shall include the following information with the mix design submission:

- Information on the type of liquid Anti-Strip additive to be supplied, including product name, product manufacturer/supplier
- Additive rate
- TSR values for the treated mixes
- The proposed method for incorporating the additive into the plant produced mix

401.03 Aggregates.

Add the following:

The percentage of fractured faces shall be as shown in Table 403.1 of the Revision to Section 403.

Grading ST (3/8" nominal) mixes may be used for leveling, maintenance, bike paths, sidewalks and thin lift overlays. Grading SX (1/2" nominal) mixes shall be used on top and bottom lifts and for patching. Grading S (3/4" nominal) mixes may be used for bottom lifts.

401.05 Hydrated Lime.

Add the following:

When used in the HMA, hydrated lime shall be added at the rate of 1% by dry weight of the aggregate and shall be included in the amount of material passing the No. 200 sieve.

401.06 Asphalt Cement.

Revise the second paragraph to read as follows:

The asphalt cement shall meet the applicable requirements of subsection 702.01.

Add the following:

The Contractor shall provide to the Owner acceptable 'Certifications of Compliance' of each applicable asphalt binder grade from the supplier. Should testing or certificate show nonconformance with the specifications, the asphalt binder may be rejected. When production begins, the Contractor shall, upon request, provide to the Owner a one quart can of each specified asphalt binder for analysis. Additionally, the Contractor shall provide the refinery test results that pertain to the asphalt binders used during production.

Based on climatic conditions and reliability, binder grades approved for use in Mesa County are as follows in Table 401.06A-1:

TABLE
401.06A-1
Recommended Performance Graded Binders

Condition	Non-modified Binder	Modified Binder
Free flowing traffic loads and 300,000 to 1 million 18K ESAL	PG 64-22	
Free flowing traffic loads and 300,000 to 1 million 18K ESAL, plus above 6000 elevation	PG 58-28	
Slow moving or standing trucks, major street intersections and/or 10,000,000 18K ESAL		PG 76-28 (top lift only)

Binder grades other than those shown above shall not be used unless the proposed binder and the mix design are approved in writing by the OWNER. The asphalt cement shall meet the requirements of subsection 702.01

401.07 Weather Limitations and Placement Temperatures.

Revise as follows:

Surface temperatures shall be used to determine placement of APM. APM produced with documented WMA will be allowed a reduction in minimum surface temperatures for placement as provided in Table 401.07A-1. Ambient temperatures and other weather conditions shall be considered prior to placement.

TABLE 401.07A-1
Minimum Surface Temperatures for placement of APM

Compacted Layer Thickness (in.)	Minimum Surface Temperature (ºF)			
	Top Layer		Layers Below the Top Layer	
Product	APM	with WMA	APM	with WMA
<1½	60	50	50	40
1½ - <3	50	45	40	35
3 or more	45	40	35	35

If the Contractor modifies the placement and compaction processes when ambient temperatures are below minimum surface temperatures in Table 401.07A-1, they shall demonstrate to the Owner the required in-place density has been achieved. APM cooling software such as PaveCool, or MultiCool can be used to determine placement and compaction times available.

401.08 Asphalt Mixing Plant.

Delete the last paragraph of the subsection.

401.09 Hauling Equipment.

Add the following:

The Owner may reject any HMA which demonstrates it has been contaminated from a petroleum distillate release agent. The Owner may reject any uncovered HMA which demonstrates it has been impacted by contamination and/or weather.

401.10 Asphalt Pavers.

Delete the twelve paragraph and replace with the following:

Contractor shall submit for and receive approval of the screed control devices to be utilized on the paver prior to use for placing HMA on the project.

Add the following:

A Material Transfer Vehicle (MTV) or Material Transfer Device (MTD) may be required for placement of the HMA when specified in the contract documents. The MTV shall be a self-propelled unit with on board storage of material. An MTD is a non-self-propelled unit. Both MTV and MTD are capable of receiving material from trucks or from the ground, transferring the material from the unit to a paver hopper insert via a conveyor system.

401.11 Tack Coat.

Delete and replace with the following:

A tack coat shall be applied between pavement course and to all existing concrete and asphalt surfaces per Section 407. Tack coat is considered incidental to the cost of the HMA.

401.15 Mixing.

Add the following:

If a WMA technology (additive or foaming) is used, the discharge temperatures may be lowered during production at the discretion of the Contractor provided all specifications are achieved. Mix design is to indicate revised allowable discharge temperatures with WMA usage.

401.16 Spreading and Finishing.

Revise as follows:

Joints in the top layer of new pavement shall be located on lane lines unless otherwise shown on the plans. Longitudinal joints shall be minimized with wide paving pulls. Transverse joints shall be formed by cutting back on the previous run to expose the full depth of the course. Tack coat material shall be applied to contact surfaces of all joints before additional mixture is placed against the previously compacted material.

401.17 Compaction.
Revise as follows:

Equipment used for compaction of the HMA will be at the discretion of the Contractor. The number, weight, and type of rollers furnished shall be sufficient to obtain the required density and surface texture.

All joints shall be compacted to 92% of maximum theoretical specific gravity (Rice), taken six inches offset from the joint. The allowable variance shall be ±2%. Joint density will be determined using nuclear density equipment.

Delete paragraphs six through eight, and paragraphs eleven to the end of the subsection and replace with the following:

Cores may be used to verify compaction results. The Contractor shall core the pavement, as required by the Owner**;** in accordance with AASHTO T 230, Method B, or for field calibration of nuclear density equipment in accordance with the ASTM D 2950. At a minimum, cores for nuclear density equipment correlation shall be taken at the beginning of placement of each project or change of mixture materials or gradation, unless otherwise approved by the Engineer. If the correlation cores were produced for another project within the last 90 days, data from that project can be submitted for verification, if no change in materials or gradation has occurred. When cores are used, the Contractor shall provide all labor and equipment for the coring and repair of the holes.

Along forms, curbs, headers, walls, and all other places not accessible to the rollers, the mixture shall meet all project compaction specifications. Any mixture that is defective, shall be corrected to meet the project specifications at the expense of the Contractor.

401.20 Surface Smoothness.

Delete and replace with the following:

The finish transverse and longitudinal surface elevation of the pavement shall be measured using a 10-foot straightedge. Surface smoothness shall be verified following the finish roller pass. Surface variation shall not exceed 3/16 inch in 10 feet for full lane width paving. For patching, the variation shall not exceed 3/8 inch in 10 feet. The final pavement surface shall not vary from the specified cross section by more than one inch at any point. Transverse measurements for variations shall exclude breaks in the crown sections. If the surface tolerance exceeds 3/16” across transverse joints, measured in at least three locations, the Contractor shall make corrections to the joint before proceeding. All corrections shall be made at the Contractor’s expense.

The final surface pavement adjacent to curb and gutter shall be finished from 1/8-inch to 3/8- inches above the lip for catch curb and shall not extend above the lip for spill curb.

The Contractor shall adjust all manholes, valve boxes, and survey range boxes 1/8 to 1/4- inch below final grade and adjusted to match the slope of the roadway. Valve boxes and manholes are to be maintained fully accessible at all times for emergency and maintenance operations. The cost of adjusting valve boxes, manholes, and survey range boxes shall be included in the work, unless otherwise specified. The Contractor shall be responsible for any cost incurred by the Owner to provide access to the covered manholes or valve boxes. Final adjustment of all utility access points shall be completed within seven days of from the time the HMA was placed.

Add the following new subsections:

401.23 Testing and Inspection

The Contractor shall assume full responsibility for controlling all operations and processes to meet the Specifications. The Contractor shall perform all tests necessary for process control purposes on all elements at the frequency listed in Table 401.23-1. The Contractor shall maintain a log of all process control testing. Test results that have sampling or testing errors shall not be used. Process control testing shall be performed at the expense of the Contractor.

Laboratories shall be accredited by AASHTO Materials Reference Laboratory (AMRL) for the tests being performed. Technicians obtaining samples and conducting compaction tests must have a LabCAT Level A certification. Technicians conducting tests of asphalt content and gradation must have a LabCAT Level B certification. Technicians performing volumetric testing must have a LabCAT Level C certification. Equivalent NICET certification for all technicians is acceptable.

When requested by the Owner, the Contractor shall submit a quality control plan that addresses production, sampling, testing, and qualifications of testing personnel, timing, and methods for making adjustments to meet the specifications. The Contractor will provide a process or schedule for making corrections for material that was placed but does not meet specifications as well as obtain a follow up sample immediately after corrective actions are taken to assess the adequacy of the corrections. In the event the follow-up process control sample also fails to meet Specification requirements; the Contractor shall cease production of the asphalt mixture until the problem is adequately resolved to the satisfaction of the Owner.

TABLE
401.23-1
Minimum Materials Sampling and Testing for Process Control and Owners Acceptance

Test	Standard	Minimum Frequency
Sampling	AASHTO T168, ASTM D 979 and ASTM D3665, CP 41	1/1000 tons or fraction thereof (not less than one test per day)
In-Place Density	AASHTO T 166, T 238, T 230, CP 81 (nuclear), CP 44 (coring)	One test for each 250 lineal feet per lane and one test per 1,000 lineal feet of joint per lift

Thickness (Core) (when called for in Project specs.)	ASTM D3549	One test for each 1000 lineal feet per lane
Air Voids & VMA	CP-L 5115 A.I. SP-2	1/1000 tons or fraction thereof (not less than one test per day)
Gradation	AASHTO T 27/T 11, CP 31	1/1000 tons or fraction thereof (not less than one test per day)
Hveem/Marshall Stability As Applicable	CP-L 5016	One per project per mix used
Binder Content	CP-L 5120, AASHTO T 164 or other methods agreed upon between Owner and Contractor	1/1000 tons or fraction thereof (not less than one test per day)
Maximum Theoretical Specific Gravity (Rice)	AASHTO T 209 (Rice), CP-L 51	1/1000 tons or fraction thereof (not less than one test per day)
Lottman Stripping, TSR & Dry Density	CP-L 5109	One per project per mix used.

Field control testing of dense graded asphalt mixes for the above tests shall meet the requirements of Table 403-1 and Table 403-2 in the Revision to Section 403.

401.24 Acceptance

If any materials furnished, or work performed, fails to meet the specification requirements, such deficiencies shall be documented and reported to the Owner. Copies of all process control tests shall be delivered to the Owner within one business day. Test results that cannot be completed within one day shall be provided to the Owner no later than three days after the sample was obtained.

Owners Acceptance (OA) test results, if any, and/or Process Control (PC) test results will be evaluated to determine acceptability. If the Contractor does not meet the project specifications, but acceptable work has been produced, the Owner shall determine the extent of the work to be accepted. If the Owner determines the work is not acceptable, the Contractor shall correct the work, as approved by the Owner, at the expense of the Contractor.

SP-7 SECTION 403 – HOT MIX ASPHALT

REVISION OF SECTION 403
HOT MIX ASPHALT

Section 403 of the Standard Specifications is hereby revised for this project as follows:

403.02 Materials

Delete and replace with the following:

The materials shall conform to the requirements of subsections 401.2 of the Revised Section 401 above.

The design mix for hot mix asphalt (HMA) shall conform to the following Table 403-1 and Table 403-2:

Table 403-1
Mixture Properties for Hot Mix Asphalt

Property	Test Method	Value
Air Voids, percent at: N (design)	AASHTO T-132, CPL 5115	3.0 – 4.0
Lab Compaction (Revolutions): N (design)	CPL 5115	75
Hveem Stability, (Grading ST, SX & S only)	CPL 5106	28 min.
Aggregate Retained on the 4.75 mm (No. 4) Sieve for S, SX and SG, and on the 2.36mm (No. 8) Sieve for ST and SF with at least 2 Mechanically Induced fractured faces	CP 45	60% min.
Accelerated Moisture Susceptibility Tensile Strength Ratio (Lottman)(for S & SX mixes)	AASHTO T-283 Method B, CPL 5109 Method B	80 min.
Minimum Dry Split Tensile Strength, kPa (psi)	CPL 5109 Method B	205 (30) min.
Voids in the Mineral Aggregate (VMA) % minimum	CP 48, AI-SP2	See Table 403-2
Voids Filled with Asphalt (VFA)	AI MS-2	65-80%
Dust to Asphalt Ratio: Fine Gradation Coarse Gradation	CP 50	 0.6 – 1.2 0.8 – 1.6

Note: AI MS-2 = Asphalt Institute Manual Series 2

Note: Mixes with gradations having less than 40% passing the 4.75 mm (No. 4) sieve shall be approached with caution because of constructability problems.

Note: Gradations for mixes with a nominal maximum aggregate size of one-inch or larger are considered a coarse gradation if they pass below the maximum density line at the #4 screen.
Gradations for mixes with a nominal maximum aggregate size of 3/4" to 3/8" are considered a coarse gradation if they pass below the maximum density line at the #8 screen.
Gradations for mixes with a nominal maximum aggregate size of #4 or smaller are considered a coarse gradation if they pass below the maximum density line at the #16 screen.

Table 403-2
Minimum Voids in Mineral Aggregate (VMA)

Nominal Maximum Size*, mm (inches)	***Design Air Voids **		
	3.5%	4.0%	4.5%

37.5 (1½)	11.6	11.7	11.8
25.0 (1)	12.6	12.7	12.8
19.0 (¾)	13.6	13.7	13.8
12.5 (½)	14.6	14.7	14.8
9.5 (⅜)	15.6	15.7	15.8
4.75 (No. 4)	16.6	16.7	16.8

* The Nominal Maximum Size is defined as one sieve larger than the first sieve to retain more than 10%.
** Interpolate specified VMA values for design air voids between those listed.
*** Extrapolate specified VMA values for production air voids beyond those listed.

403.03 Construction Requirements

Delete the first paragraph and replace with the following:

The construction requirements shall be as prescribed in subsections 401.3 through 401.14 of the Revised Section 401 above.

403.04 Method of Measurement

Delete and replace with the following:

Hot Mix Asphalt will be measured by the ton or the square yard. Batch weights will not be permitted as a method of measurement when measured by the ton. The tonnage shall be the weight used in the accepted pavement.

403.05 Basis of Payment

Delete and replace with the following:

The accepted quantities of hot mix asphalt will be paid for in accordance with subsection 401.22, at the contract unit price per ton or square yard for the asphalt mixture.

Payment will be made under:

Pay Item	**Pay Unit**
Hot Mix Asphalt (Grading __)(PG___)	Ton
Hot Mix Asphalt (Grading __)(PG ___)	Square Yard
Hot Mix Asphalt (Patching)	Square Yard

Aggregate, asphalt cement, asphalt recycling agent, additives, hydrated lime, tack coat, and all other work necessary to complete each hot mix asphalt items will not be paid for separately but shall be included in the unit price bid.

Excavation, preparation, and tack coat of areas to be patched will not be measured and paid for separately, but shall be included in the work.

SP-8 SECTION 407 – PRIME COAT, TACK COAT, AND REJUVINATING AGENT

REVISIONS OF SECTION 407
PRIME COAT, TACK COAT, AND REJUVENATING AGENT

Section 407 of the Standard Specifications is hereby revised for this project as follows:

407.01 Description

Add the following:

Prior to placement of APM, a tack coat shall be applied to all existing concrete and asphalt surfaces.

407.02 Asphalt Material.

Add the following:

The tack coat shall meet the specification for emulsified asphalt, consisting of CSS-1h or SS-1h, and conform to AASHTO M208 or M140.

407.07 Application of Asphalt Material.

Add the following:

The tack coat shall be applied at the rates specified in Table 407-1. The surface receiving the tack coat shall be dry and clean, and dust, debris, and foreign matter shall be removed. Tack coat shall be applied uniformly. The Contractor shall allow the tack coat to cure (dehydrate) prior to the placement of APM. If the tack becomes contaminated during construction, it shall be cleaned, and if necessary, additional tack coat shall be reapplied and allowed to cure before paving resumes.

TABLE 407-1
Tack Coat Application Rates

Pavement Condition	Application Rate (gal/yd^2)		
	Residual	Undiluted	Diluted (1:1)
New asphalt	0.03 - 0.04	0.05 – 0.07	0.10 – 0.13
Oxidized asphalt	0.04 – 0.06	0.07 – 0.10	0.13 – 0.20
Milled Surface (asphalt)	0.06 – 0.08	0.10 – 0.13	0.20 – 0.30
Milled Surface (PCC)	0.06 – 0.08	0.10 – 0.13	0.20 – 0.30
Portland Cement Concrete	0.04 – 0.06	0.07 – 0.10	0.13 – 0.20

407.09 Method of Measurement and Basis of Payment.

Delete and replace the following:

Tack Coat will not be measured and paid separately but shall be considered included in the work for Section 401 – Asphalt Pavement Materials.

SP-9 SECTION 601 – STRUCTURAL CONCRETE

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

Subsection 601.02, Classification:

CONCRETE SHALL MEET THE FOLLOWING REQUIREMENTS:

- 4,500 PSI Compressive at 28 Days
- 6% air ±1.5%
- Slump 4", Loads exceeding 4 ½" shall be rejected
- Maximum Water Cement Ratio no greater than 0.45.

Subsection 601.06, Batching:

This CDOT Specification has been added to this Project:

The Contractor shall furnish a batch ticket (delivery ticket) with each load for all concrete. Concrete delivered without a batch ticket containing complete information as specified shall be rejected. The Contractor shall collect and complete the batch ticket at the placement site and deliver all batch tickets to the Engineer or his representative at the end of each day. The Engineer or his representative shall have access to the batch tickets at any time during the placement. The following information shall be provided on each ticket:

1. Suppliers name and date
2. Truck number
3. Project name and location
4. Concrete class and designation number
5. Cubic yards batched
6. Type brand and amount of each admixture
7. Type, brand, and amount of cement and fly ash
8. Weights of fine and course aggregates
9. Moisture of fine and course aggregates
10. Gallons of batch water

The contractor shall add the following information to the batch ticket at time of placement:

1. Gallons of water added by the truck operator.
2. Number of revolutions of the drum for mixing
3. Discharge time

SP-10 SECTION 608 – CURBS, GUTTERS, SIDEWALKS, AND TRAILS

Section 608 of the Standard Specifications is hereby revised for this project as follows:

Subsections 608.06, Basis of Payment shall include the following:

The Contract Unit Price for the various concrete items shall be full compensation for all equipment, labor, materials, and incidentals required for the complete installation. Incidental items include subgrade compaction, cutting and removal of asphalt in areas where concrete will be installed; removal of existing concrete, removal of existing base course, disposal of excavated and removed materials; furnishing, placement and compaction of a minimum of 6 inches of Class 6 Aggregate Base Course; forming, furnishing and placement, finishing, curing and protection of the concrete; reinforcing steel and joint filler.

SP-11 SECTION 630 - CONSTRUCTION ZONE TRAFFIC CONTROL

Section 630 of the Standard Specifications are hereby revised for this project as follows:

Subsection 630.09, Traffic Control Plan, shall include the following:

The following guidelines and limitations shall apply to the traffic control:

1. Two-way traffic shall be maintained at all times (unless otherwise approved).
2. Concrete activities shall be coordinated so that concrete trucks and other vehicles do not block the traffic lanes.
3. All incidental costs shall be included in the original contract price for the project. Flagging shall be considered incidental and included in Traffic Control (Complete in Place).
4. Sidewalks that are obstructed or under construction shall be barricaded, as required for pedestrian safety.

Subsection 630.14, Method of Measurement, shall include the following:

Distribution of door-hanger notices to all businesses and / or residents located adjacent to the overlay work will not be paid for separately but shall be included in the pay item for Traffic Control (Complete in Place). The City will provide the door hangers for distribution.

3.5. IFB TENTATIVE TIME SCHEDULE:

Invitation For Bids available	April 3, 2019
Mandatory Pre-Bid Meeting	April 9, 2019
Inquiry deadline, no questions after this date	April 15, 2019
Addendum Posted	April 17, 2019
Submittal deadline for proposals	April 23, 2019
City Council Approval	May 15, 2019
Notice of Award & Contract execution	May 16, 2019
Bonding & Insurance Cert due	May 22, 2019
Preconstruction meeting	May 23, 2019
Work begins no later than	June 3, 2019
Final Completion	August 11, 2019
Holidays:	
Independence Day	July 4, 2019

4. Contractor's Bid Form

Bid Date: _____

Project: IFB-4627-19-DH "2019 7th Street Reconstruction – Orchard Ave. to Patterson Ave."

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: _____

Bid Schedule: 2019 7th Street Reconstruction Phase II - Orchard Ave. to Patterson Road

Contractor:_____

Item No.	CDOT, City Ref.	Description	Quantity	Units	Unit Price	Total Price
1	108.2	12" Storm Drain Pipe (SDR 35 or approved equal)	20.	LF	$ _____	$ _____
2	108.2	18" Storm Drain Pipe (SDR 35 or approved equal)	435.	LF	$ _____	$ _____
3	108.5	Storm Sewer Basic Manhole (48" I.D.)	2.	EA	$ _____	$ _____
4	108.6	Single Storm Drain Inlet (Vertical Curb)	1.	EA	$ _____	$ _____
5	202	Asphalt Removal (Planing)(Thickness Varies - Maximum 12")	18,240.	SY	$ _____	$ _____
6	202	Removal of Manhole	1.	EA	$ _____	$ _____
7	202	Removal of Inlet	3.	EA	$ _____	$ _____
8	202	Removal of Storm Sewer Pipe	425.	LF	$ _____	$ _____
9	202	Removal of Traffic Pole Bases	3.	EA	$ _____	$ _____
10	203	Excavation and Embankment (Potholing) (See SP-6)	Lump	Sum	- - -	$ _____
11	203	Excavation and Embankment (Unclassified Excavation)	7,847.	CY	$ _____	$ _____
12	203	Disposal of Radioactive Material (Dispose at City Shops, 333 West Ave.)	200.	CY	$ _____	$ _____
13	208	Erosion Control (Complete-In-Place)	Lump	Sum	- - -	$ _____
14	209	Dust Abatement	70.	Days	$ _____	$ _____
15	210	Adjust Valve Box (water)	20.	EA	$ _____	$ _____
16	210	Adjust Valve Box (Reference and Reset Survey Monuments)	3.	EA	$ _____	$ _____
17	210	Adjust Manhole Ring and Cover (Sanitary and Storm Sewer)	15.	EA	$ _____	$ _____
18	210	Adjust Manhole Ring and Cover (Others)	2.	EA	$ _____	$ _____
19	304	Aggregate Base Course (Class 6) - 15" Pavement Section	9,999.	Tons	$ _____	$ _____
20	304	Aggregate Base Course (Class 3) - 18" Subgrade Stabilization	4,000.	Tons	$ _____	$ _____
21	306	Reconditioning (12")	12,030.	SY	$ _____	$ _____
22	401	Hot Mix Asphalt (5" thick) (Grading SX, Binder Grade 64-22)	3,351.	Tons	$ _____	$ _____
23	401	Hot Mix Asphalt (2" thick) (Grading SX, Binder Grade 76-28)	2,036.	Tons	$ _____	$ _____
24	420	Geosynthetics - Mirafi RS580i or equivalent	11,730.	SY	$ _____	$ _____
25	608/304	Concrete Curb and Gutter (2' Wide) To Include 6" of Class 6 Aggregate Base Course	80.	LF	$ _____	$ _____

Bid Schedule: 2019 7th Street Reconstruction Phase II - Orchard Ave. to Patterson Road

Contractor:_____

Item No.	CDOT, City Ref.	Description	Quantity	Units	Unit Price	Total Price
26	608/304	Concrete Sidewalk (4" Thick) to Include 6" of Class 6 Aggregate Base Course	260.	SY	$ _____	$ _____
27	608/304	Concrete Curb Ramp to include 6" of Class 6 Aggregate Base Course	431.	SY	$ _____	$ _____
28	608	Detectable Warning (Wet Set)(Cast Iron)(2'x4')	144.	SF	$ _____	$ _____
29	608/304	Concrete Driveway Section (6"Thick)	212.	SY	$ _____	$ _____
30	620	Sanitary Facility	Lump	Sum	- - -	$ _____
31	625	Construction Surveying	Lump	Sum	- - -	$ _____
32	626	Mobilization	Lump	Sum	- - -	$ _____
33	627-30405	Preformed Thermoplastic Pavement Marking (Word/Symbol)	408.	SF	$ _____	$ _____
34	627-30410	Preformed Thermoplastic Pavement Marking (X-Walk/Stopline)	1,940.	SF	$ _____	$ _____
35	630	Traffic Control (Complete In Place)	Lump	Sum	- - -	$ _____
36	630	Flagging	1,920.	HR		
37	630	Traffic Control Plan	Lump	Sum		
INC		Incentive HMA 64-22	- - -	- - -	- - -	$ 12,000.00
INC		Incentive HMA 76-28	- - -	- - -	- - -	$ 10,000.00
MCR		Minor Contract Revisions	- - -	- - -	- - -	$ 100,000.00

Bid Amount: **$** _____

Bid Amount:

_____ **dollars**

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.

APPENDIX A
Project Submittal Form

PROJECT SUBMITTAL FORM

PROJECT: **2019 7th Street Reconstruction – North Ave. to Orchard Ave.**

CONTRACTOR:

PROJECT ENGINEER: Eric Mocko

Description	Date Received	Resubmittal Requested	Resubmittal Received	Date Accepted
STREET CONSTRUCTION				
Asphalt mix designs				
Base course gradation, Proctor curves				
Concrete Mix Designs				
Storm Sewer				
EROSION CONTROL / STORMWATER MANAGEMENT				
Inlet Protection				
Concrete Washout				
PERMITS, PLANS, OTHER				
Traffic Control Plan				
Access Management Plan				

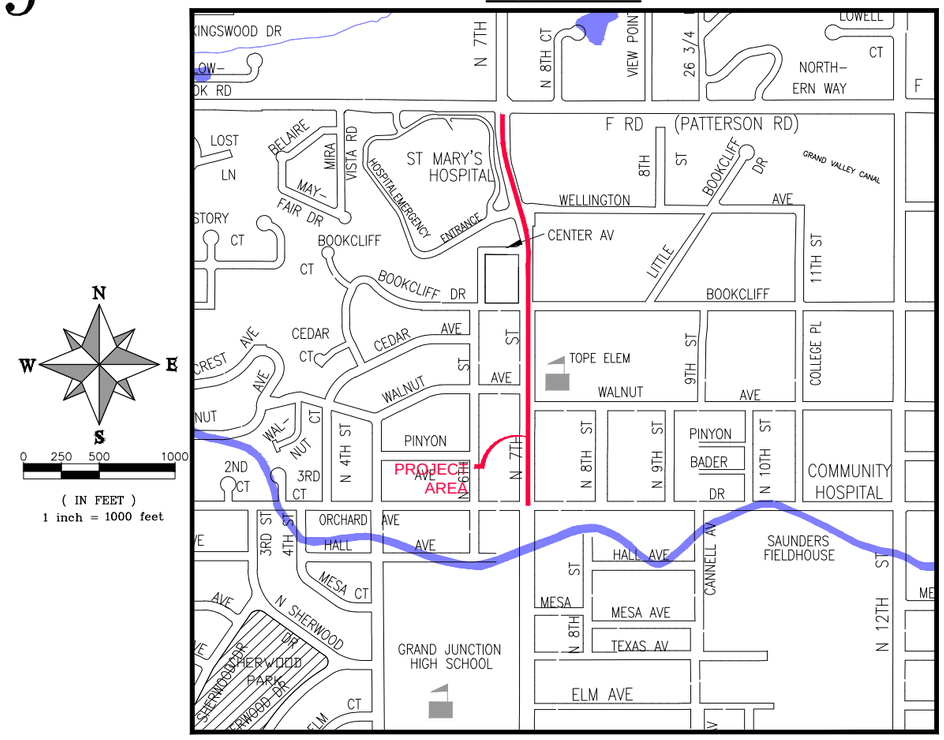
APPENDIX B

Plan Sheets and Individual Thermoplastic Quantities

PROJECT NO. _____

7TH STREET RECONSTRUCTION
PHASE II
ORCHARD AVENUE TO PATTERSON ROAD
MARCH, 2019

VICINITY MAP



UTILITIES AND AGENCIES								
AGENCY	NAME	POSITION	ROLE	MAILING ADDRESS	STREET ADDRESS	CITY, STATE	VOICE-WK	FAX
CITY OF GRAND JUNCTION	ERIC MOCKO	PROJECT ENGINEER	PROJECT ENGINEER	333 WEST AVE BLDG C	333 WEST AVE BLDG C	GRAND JCT., CO 81501	(970) 256-4017	(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
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
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 △	
REVISION △	
REVISION △	
REVISION △	

CITY OF Grand Junction COLORADO

Public Works
Engineering Division

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

DRAWING STATUS:
- ● PROGRESS
- ○ FINAL CONSTRUCTION DRAWINGS
- ○ ASBUILT

DESIGNED BY: 2019

REVIEWED BY:
TRENT C. PRALL, PUBLIC WORKS DIRECTOR 2019

AUTHORIZED FOR CONSTRUCTION
TRENT C. PRALL, PUBLIC WORKS DIRECTOR 2019

ACCEPTED AS CONSTRUCTED
ERIC MOCKO 2019

7TH STREET RECONSTRUCTION PHASE II ORCHARD AVENUE TO PATTERSON ROAD, MARCH, 2019

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PROJECT NO. _____

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

BSWMP SILT FENCE — 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 — 9' 9'

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

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 — 4580

CONTOUR LINES (SHOWN BETWEEN TOP & TOE)

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

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) — VG

VALVE (IRRIGATION) — VIR

VALVE (WATER) — VW

VEGETATION (HEDGE OR BUSH)

VEGETATION (TREE STUMP)

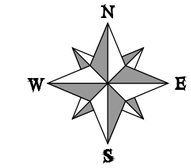
VEGETATION (TREE) (CALIPER SIZE NOTED) — 8"

WATER HYDRANT — WH

WEIR

YARD LIGHT

NORTH ARROW:



BAR SCALE:

0 5 10 20

(IN FEET)
1 inch = 20 feet

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

DRAWN BY _____ DATE _____
DESIGNED BY _____ DATE _____
CHECKED BY _____ DATE _____
APPROVED BY JCS DATE 4-02

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

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

CITY OF GRAND JUNCTION
STANDARD ABBREVIATIONS, LEGEND, AND SYMBOLS

2

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PROJECT NO. _____

Bid Schedule: 2019 7th Street Reconstruction Phase II - Orchard Ave. to Patterson Road

Contractor: _____

Item No.	CDOT, City Ref.	Description	Quantity	Units	Unit Price	Total Price
1	108.2	12" Storm Drain Pipe (SDR 35 or approved equal)	20.	LF	$ _____	$ _____
2	108.2	18" Storm Drain Pipe (SDR 35 or approved equal)	435.	LF	$ _____	$ _____
3	108.5	Storm Sewer Basic Manhole (48" I.D.)	2.	EA	$ _____	$ _____
4	108.6	Single Storm Drain Inlet (Vertical Curb)	1.	EA	$ _____	$ _____
5	202	Asphalt Removal (Planing)(Thickness Varies - Maximum 12")	18,240.	SY	$ _____	$ _____
6	202	Removal of Manhole	1.	EA	$ _____	$ _____
7	202	Removal of Inlet	3.	EA	$ _____	$ _____
8	202	Removal of Storm Sewer Pipe	425.	LF	$ _____	$ _____
9	202	Removal of Traffic Pole Bases	3.	EA	$ _____	$ _____
10	203	Excavation and Embankment (Potholing) (See SP-6)	Lump	Sum	- - -	$ _____
11	203	Excavation and Embankment (Unclassified Excavation)	7,847.	CY	$ _____	$ _____
12	203	Disposal of Radioactive Material (Dispose at City Shops, 333 West Ave.)	200.	CY	$ _____	$ _____
13	208	Erosion Control (Complete-In-Place)	Lump	Sum	- - -	$ _____
14	209	Dust Abatement	70.	Days	$ _____	$ _____
15	210	Adjust Valve Box (water)	20.	EA	$ _____	$ _____
16	210	Adjust Valve Box (Reference and Reset Survey Monuments)	3.	EA	$ _____	$ _____
17	210	Adjust Manhole Ring and Cover (Sanitary and Storm Sewer)	15.	EA	$ _____	$ _____
18	210	Adjust Manhole Ring and Cover (Others)	2.	EA	$ _____	$ _____
19	304	Aggregate Base Course (Class 6) - 15" Pavement Section	9,999.	Tons	$ _____	$ _____
20	304	Aggregate Base Course (Class 3) - 18" Subgrade Stabilization	4,000.	Tons	$ _____	$ _____
21	306	Reconditioning (12")	12,030.	SY	$ _____	$ _____
22	401	Hot Mix Asphalt (5" thick) (Grading SX, Binder Grade 64-22)	3,351.	Tons	$ _____	$ _____
23	401	Hot Mix Asphalt (2" thick) (Grading SX, Binder Grade 76-28)	2,036.	Tons	$ _____	$ _____
24	420	Geosynthetics - Mirafi RS580i or equivalent	11,730.	SY	$ _____	$ _____
25	608/304	Concrete Curb and Gutter (2' Wide) To Include 6" of Class 6 Aggregate Base Course	80.	LF	$ _____	$ _____
26	608/304	Concrete Sidewalk (4" Thick) to Include 6" of Class 6 Aggregate Base Course	260.	SY	$ _____	$ _____
27	608/304	Concrete Curb Ramp to include 6" of Class 6 Aggregate Base Course	431.	SY	$ _____	$ _____
28	608	Detectable Warning (Wet Set)(Cast Iron)(2'x4')	144.	SF	$ _____	$ _____
29	608/304	Concrete Driveway Section (6"Thick)	212.	SY	$ _____	$ _____
30	620	Sanitary Facility	Lump	Sum	- - -	$ _____
31	625	Construction Surveying	Lump	Sum	- - -	$ _____
32	626	Mobilization	Lump	Sum	- - -	$ _____
33	627-30405	Preformed Thermoplastic Pavement Marking (Word/Symbol)	408.	SF	$ _____	$ _____
34	627-30410	Preformed Thermoplastic Pavement Marking (X-Walk/Stopline)	1,940.	SF	$ _____	$ _____
35	630	Traffic Control (Complete In Place)	Lump	Sum	- - -	$ _____
36	630	Flagging	1,920.	HR		
37	630	Traffic Control Plan	Lump	Sum		
INC		Incentive HMA 64-22	- - -	- - -	- - -	$ 10,000.00
INC		Incentive HMA 76-28	- - -	- - -	- - -	$ 10,000.00
MCR		Minor Contract Revisions	- - -	- - -	- - -	$ 100,000.00

Bid Amount: $ _____

Bid Amount:

_____ **dollars**

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DESCRIPTION	DATE			SCALES: PLAN & PROFILE
REVISION △		DRAWN BY	DATE	HORIZONTAL: 1" = 50'
REVISION △		DESIGNED BY	DATE	0 12.5 25 50
REVISION △		CHECKED BY	DATE	VERTICAL: 1" =
REVISION △		APPROVED BY	DATE	

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

7TH STREET RECONSTRUCTION
PHASE II – ORCHARD AVE TO PATTERSON RD
SUMMARY OF APPROXIMATE QUANTITIES

NOTE
PROTECT ALL UTILITIES IN PLACE

PROJECT NO.

7TH STREET

WELLINGTON AVENUE

BOOKCLIFF AVENUE

CENTER AVENUE

MATCH LINE STA 1+50

MATCH LINE STA 15+00

TRAFFIC POLE

PED WALK SIGNAL

POWER POLE

POWER POLE WITH STREET LIGHT

STOP SIGN TO BE RELOCATED

DEMO EXISTING CURB, GUTTER AND SIDEWALK

PROPOSED CURB, GUTTER AND SIDEWALK

DEMO EXISTING TRAFFIC POLE BASE

MATCH PROPOSED TO EXISTING CONCRETE

N: 43433.17, E: 92310.37
N: 43438.63, E: 92310.34
N: 43600.52, E: 92291.24
N: 43594.63, E: 92288.75
N: 43455.67, E: 92289.92
N: 43594.64, E: 92285.39
N: 43455.69, E: 92282.92
N: 43446.58, E: 92229.89
N: 43393.18, E: 92310.03
N: 43387.77, E: 92309.98
N: 43370.77, E: 92289.51
N: 43370.73, E: 92282.50
N: 43360.37, E: 92230.44
N: 43360.42, E: 92223.44
N: 43385.48, E: 92203.61
N: 43392.48, E: 92203.63
N: 43432.12, E: 92208.36
N: 43425.12, E: 92208.35
N: 43756.02, E: 92212.93
N: 43763.02, E: 92212.94

CP /PK-W CENTER/ N 43797.1280 E 92208.88 EL 4639.97

CP /PK-W 2335/ N 43628.1750 E 92227.33 EL 4638.82

CP /PK BOOKCLF/ N 43379.5920 E 92293.34 EL 4636.31

HATCH LEGEND
PROPOSED CONCRETE
PROPOSED CONCRETE

DESCRIPTION	DATE
REVISION	
REVISION	
REVISION	
REVISION	

DRAWN BY _____ DATE _____
DESIGNED BY _____ DATE _____
CHECKED BY _____ DATE _____
APPROVED BY _____ DATE _____

SCALES: PLAN & PROFILE
HORIZONTAL: 1" = 50'
0 12.5 25 50
VERTICAL: 1" =

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

7TH STREET RECONSTRUCTION
PHASE II – ORCHARD AVE TO PATTERSON RD
STA 0+00 – STA 15+00

4

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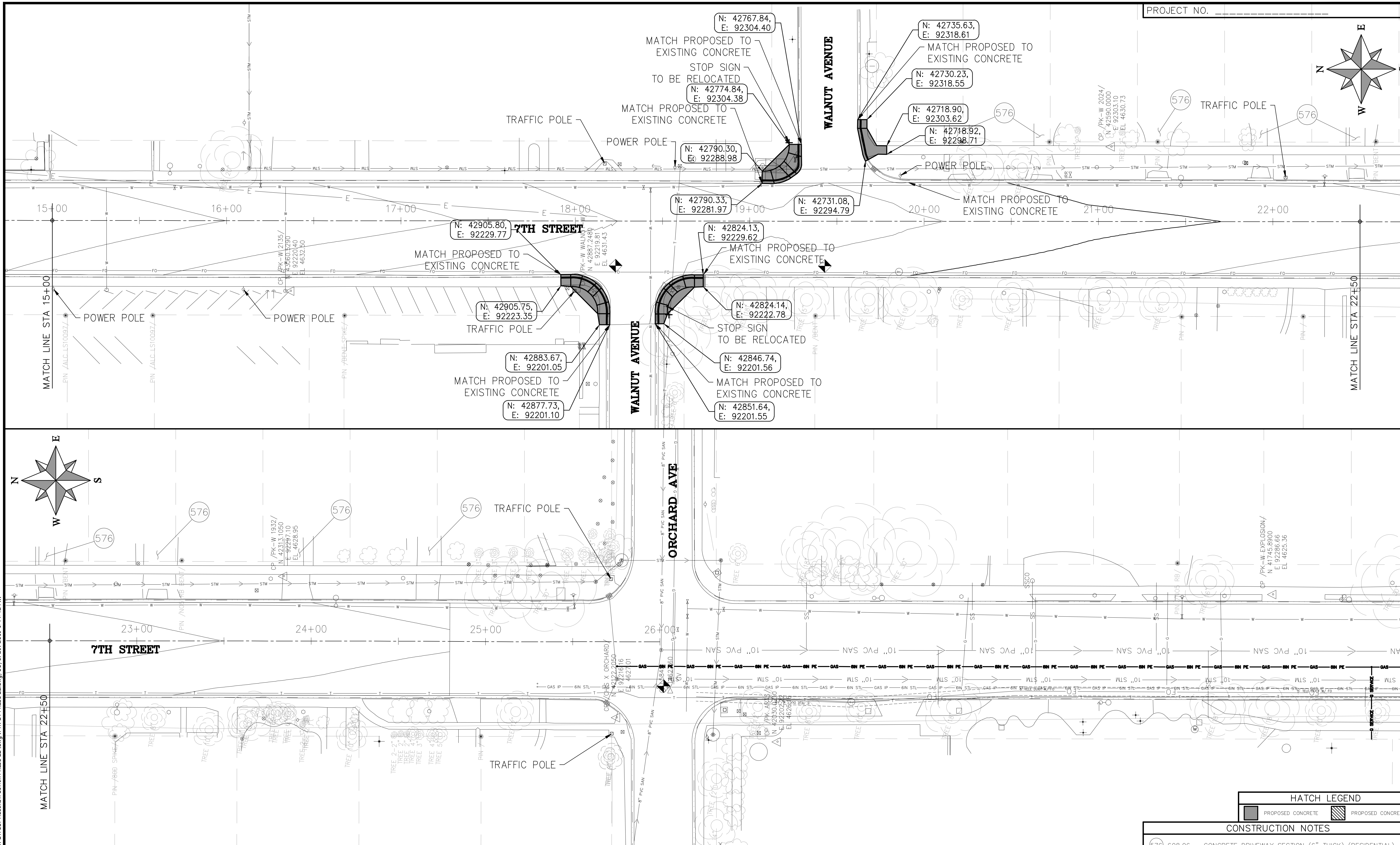

HATCH LEGEND

PROPOSED CONCRETE	PROPOSED CONCRETE

CONSTRUCTION NOTES

(576) 608.06 – CONCRETE DRIVEWAY SECTION (6" THICK) (RESIDENTIAL)

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

DRAWN BY ________ DATE ________
DESIGNED BY ________ DATE ________
CHECKED BY ________ DATE ________
APPROVED BY ________ DATE ________

SCALES: PLAN & PROFILE
HORIZONTAL: 1" = 50'
0 12.5 25 50
VERTICAL: 1" =

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

7TH STREET RECONSTRUCTION
PHASE II – ORCHARD AVE TO PATTERSON RD
STA 0+00 – STA 26+00

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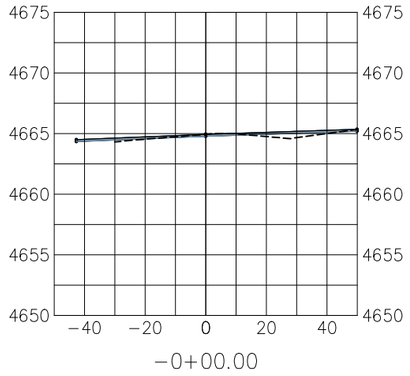

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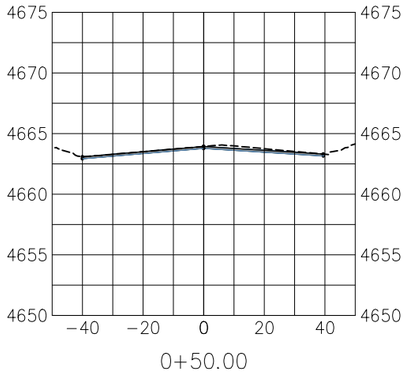

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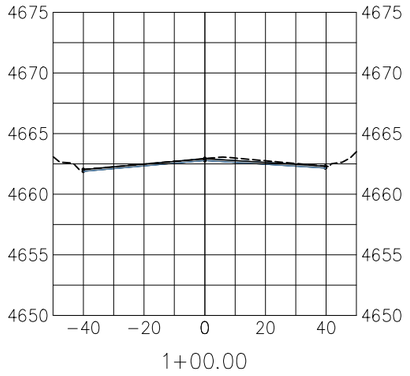

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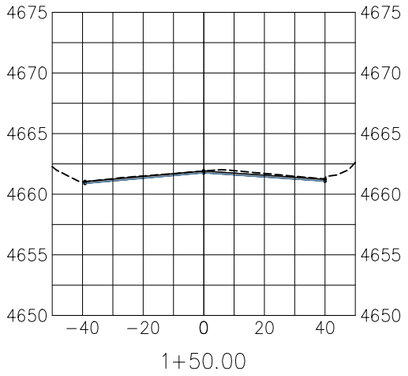

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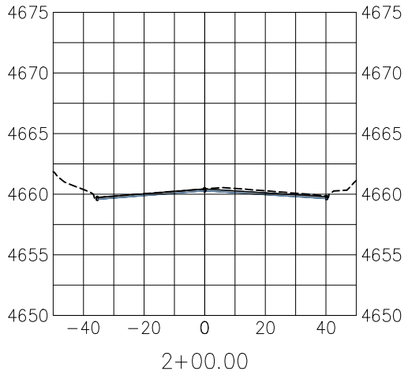

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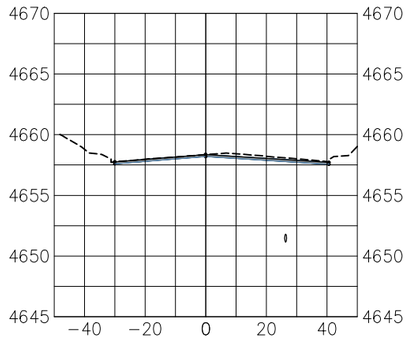

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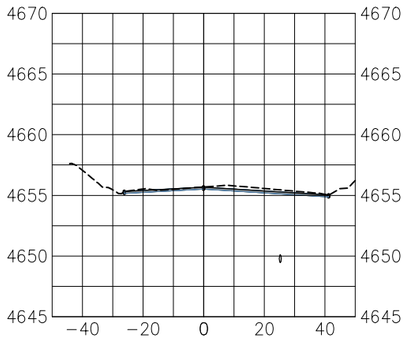

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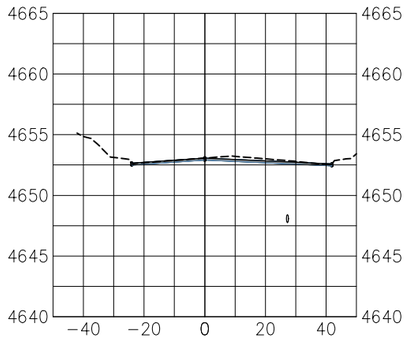

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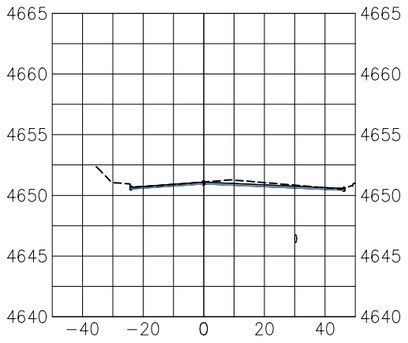

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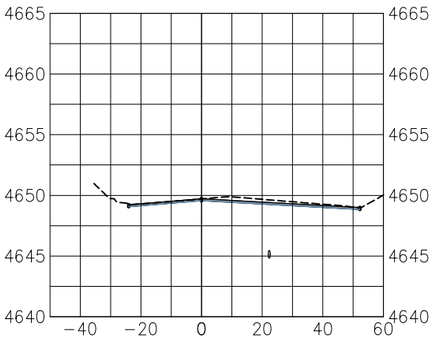

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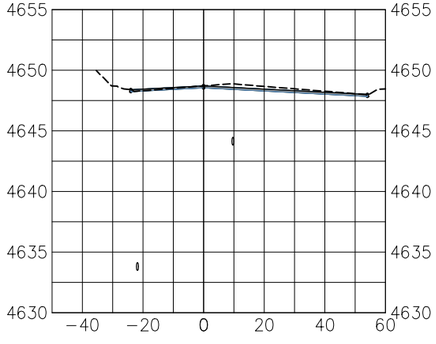

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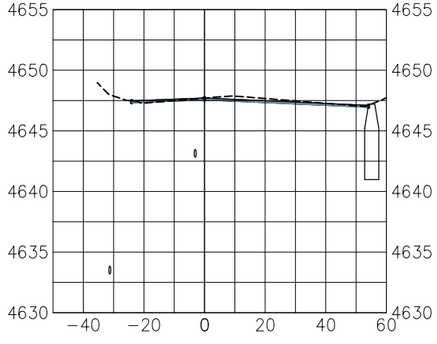

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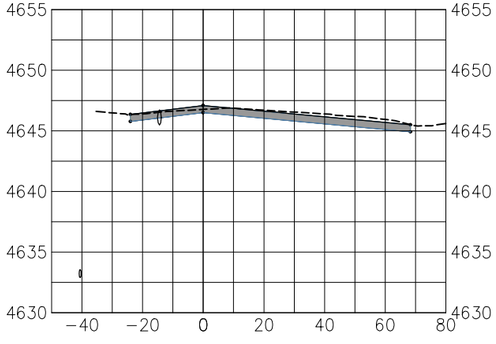

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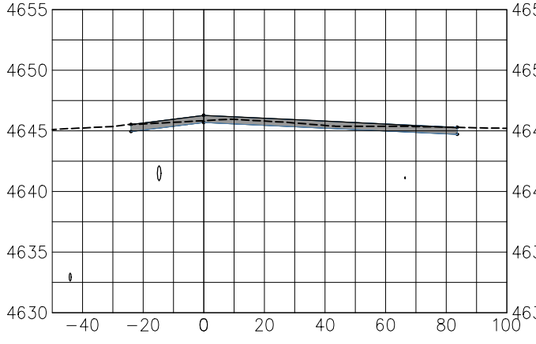

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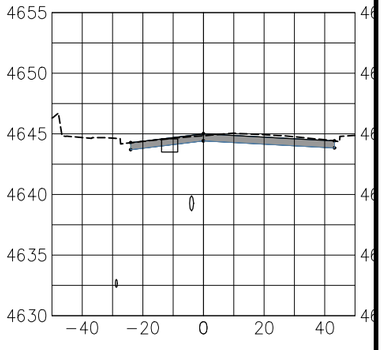

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DESCRIPTION	DATE
REVISION △	–
REVISION △	–
REVISION △	–
REVISION △	–

DRAWN BY _____ DATE _____
DESIGNED BY _____ DATE _____
CHECKED BY _____ DATE _____
APPROVED BY _____ DATE _____

SCALES: PLAN & PROFILE
HORIZONTAL: 1" = 50'
0 12.5 25 50
VERTICAL: 1" = 12.5'
0 3.13 6.25 12.5

CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

7TH STREET RECONSTRUCTION
SECTION VIEWS
STA 0+50 – STA 7+50

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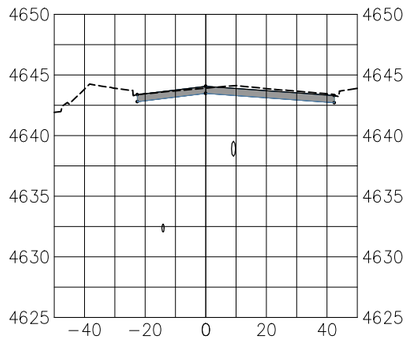
PROJECT NO. _____



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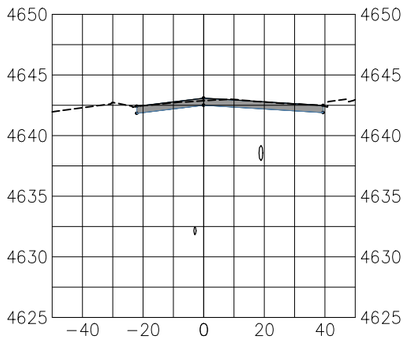

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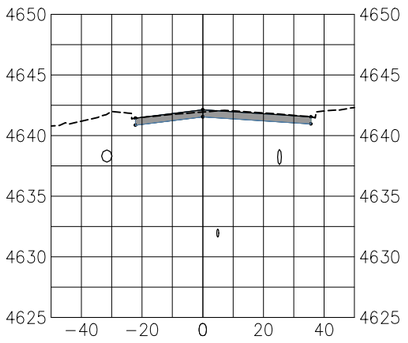

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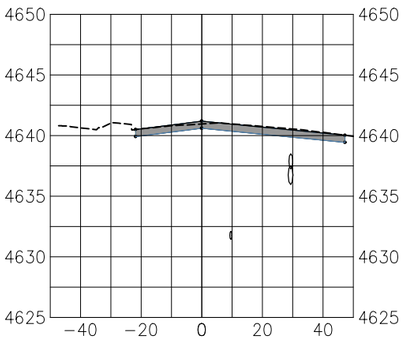

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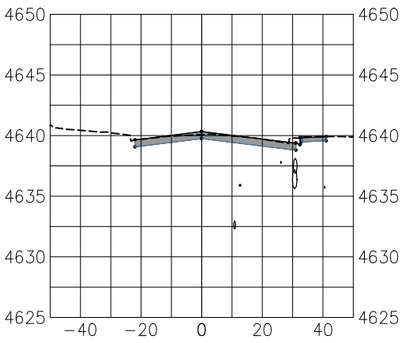

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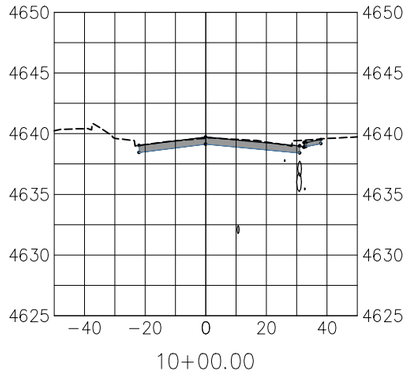

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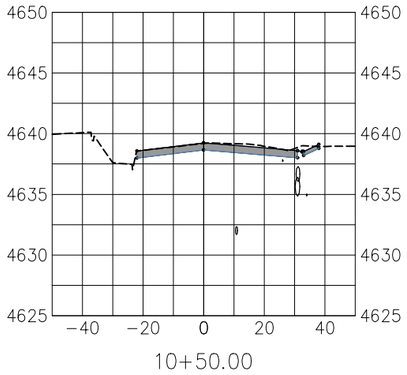

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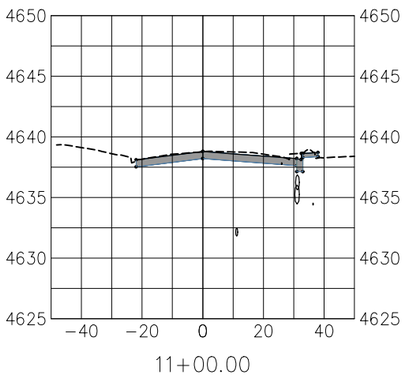

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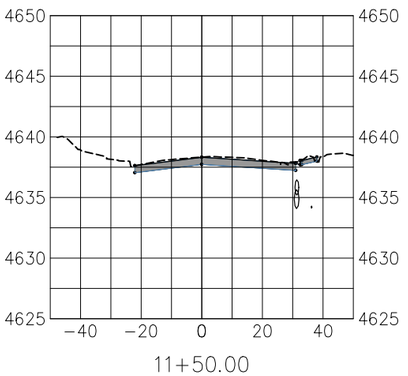

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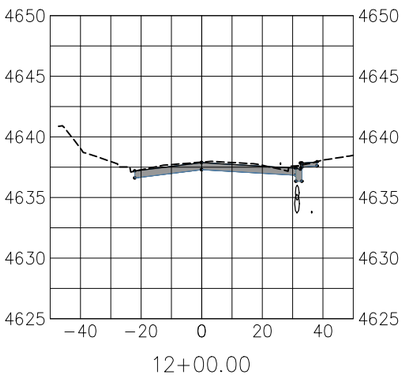

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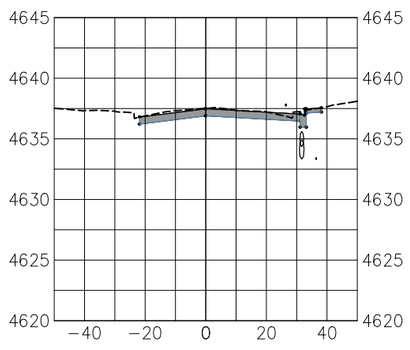

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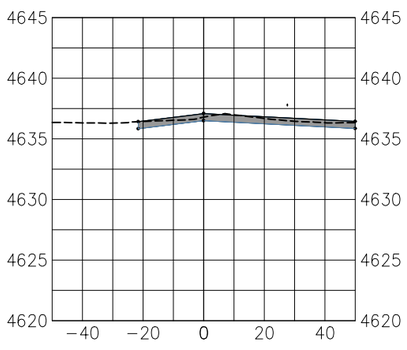

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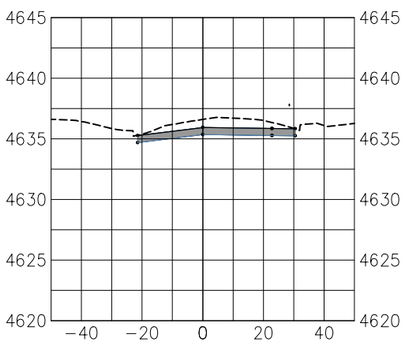

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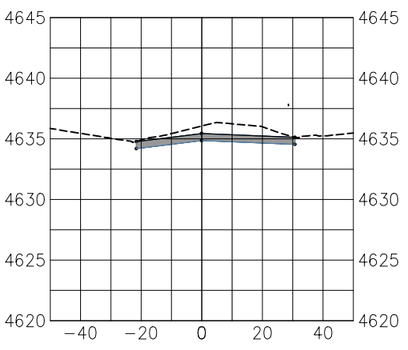

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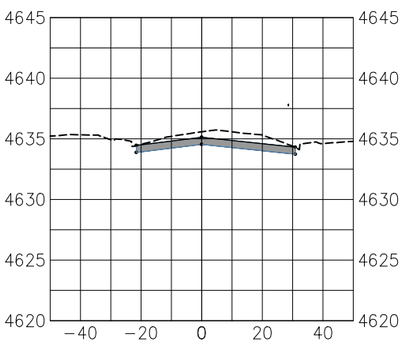

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VERTICAL: 1" = 12.5'
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CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

7TH STREET RECONSTRUCTION
SECTION VIEWS
STA 8+00 – STA 15+00

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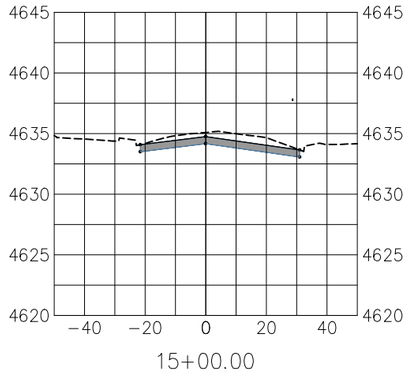

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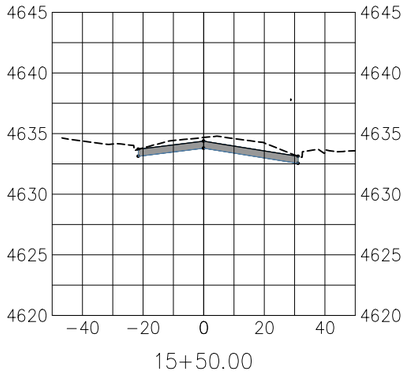

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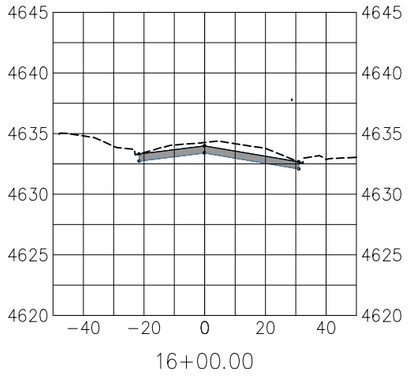

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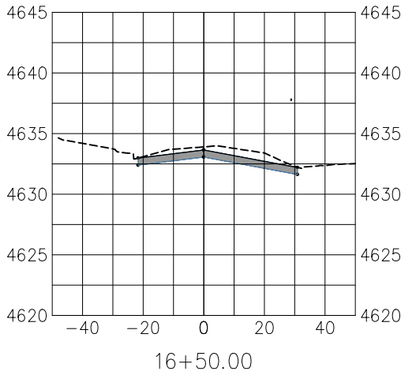

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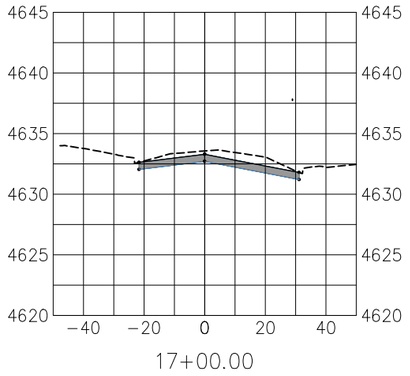

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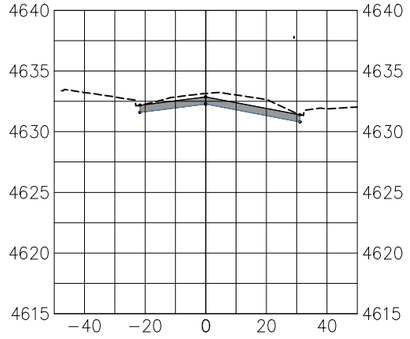

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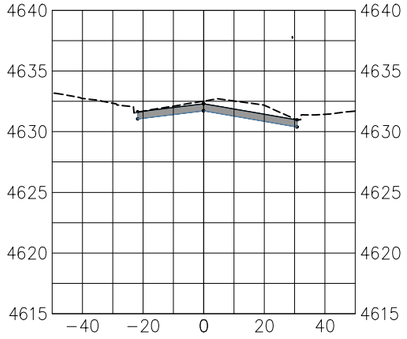

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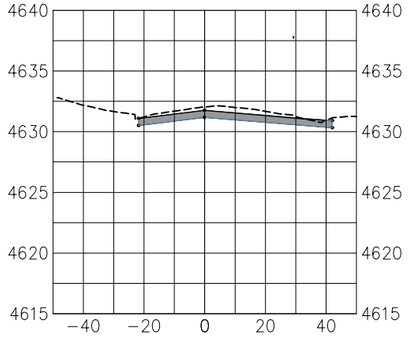

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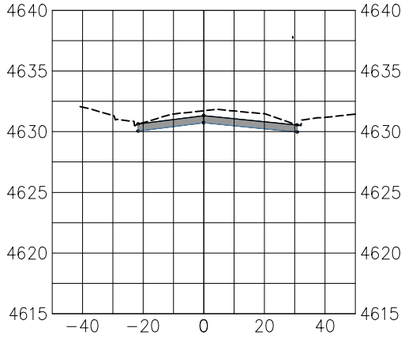

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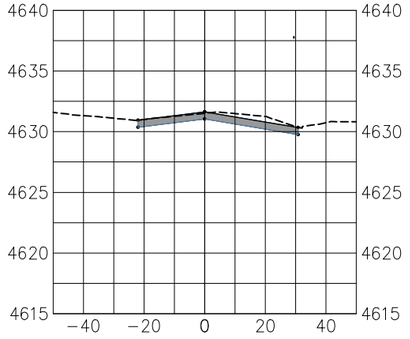

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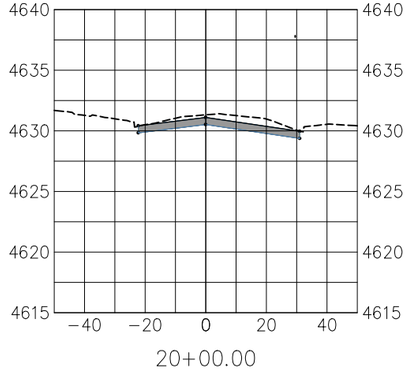

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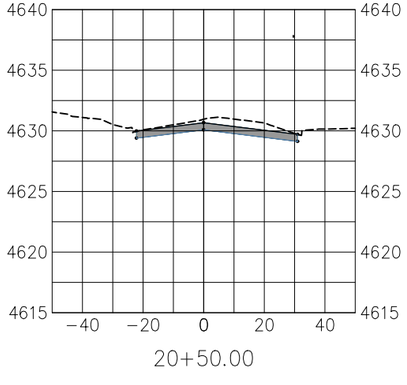

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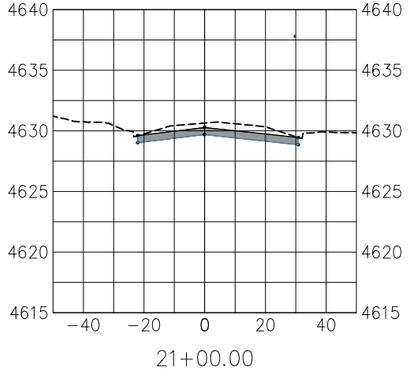

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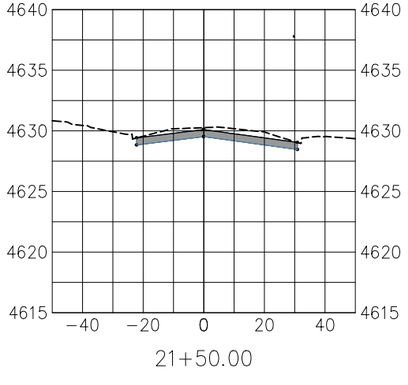

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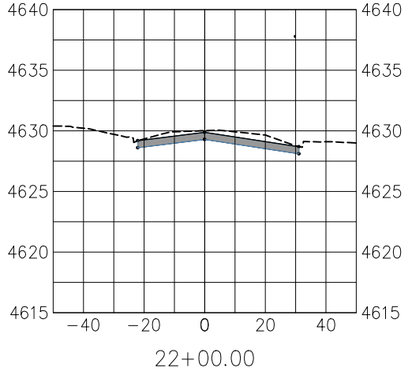

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VERTICAL: 1" = 12.5'
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CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

7TH STREET RECONSTRUCTION
SECTION VIEWS
STA 15+50 – STA 22+50

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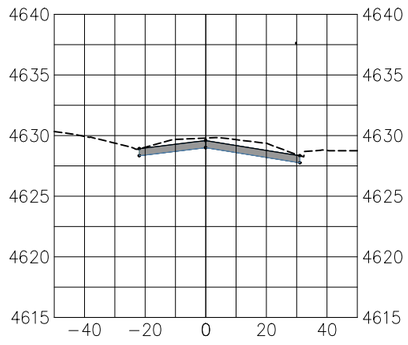

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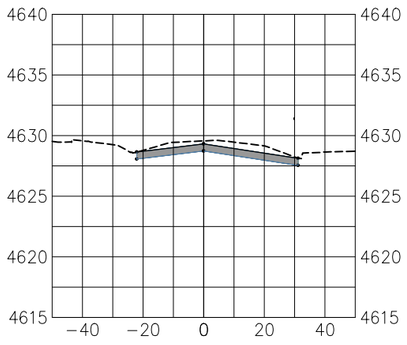

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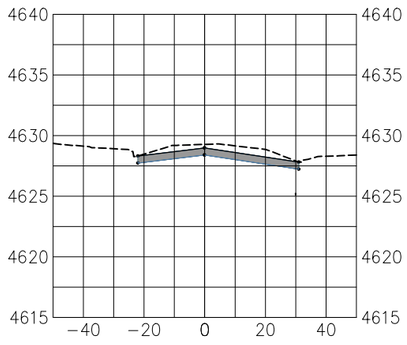

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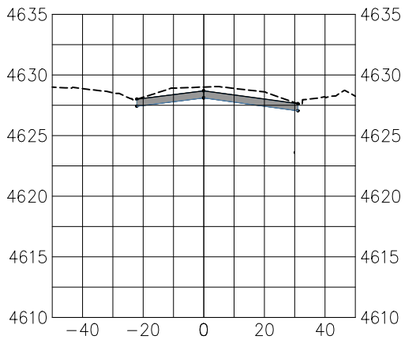

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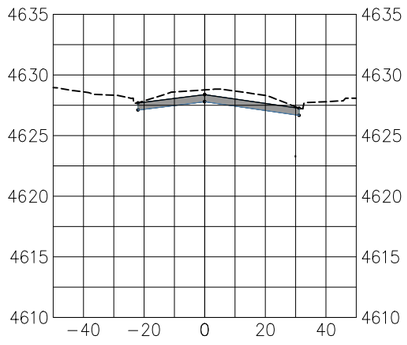

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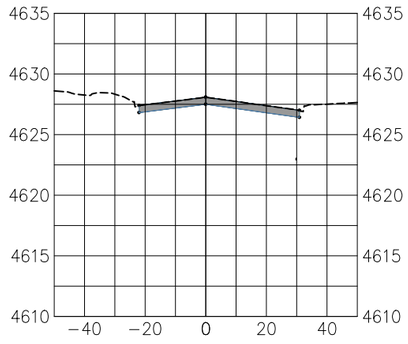

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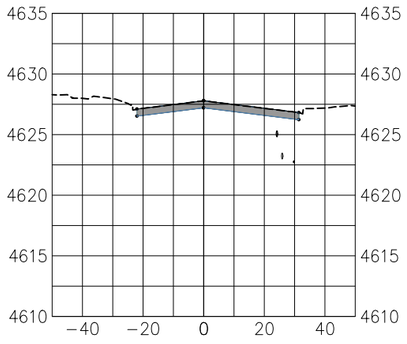

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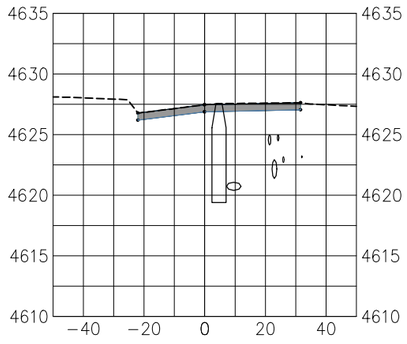

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CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

7TH STREET RECONSTRUCTION
SECTION VIEWS
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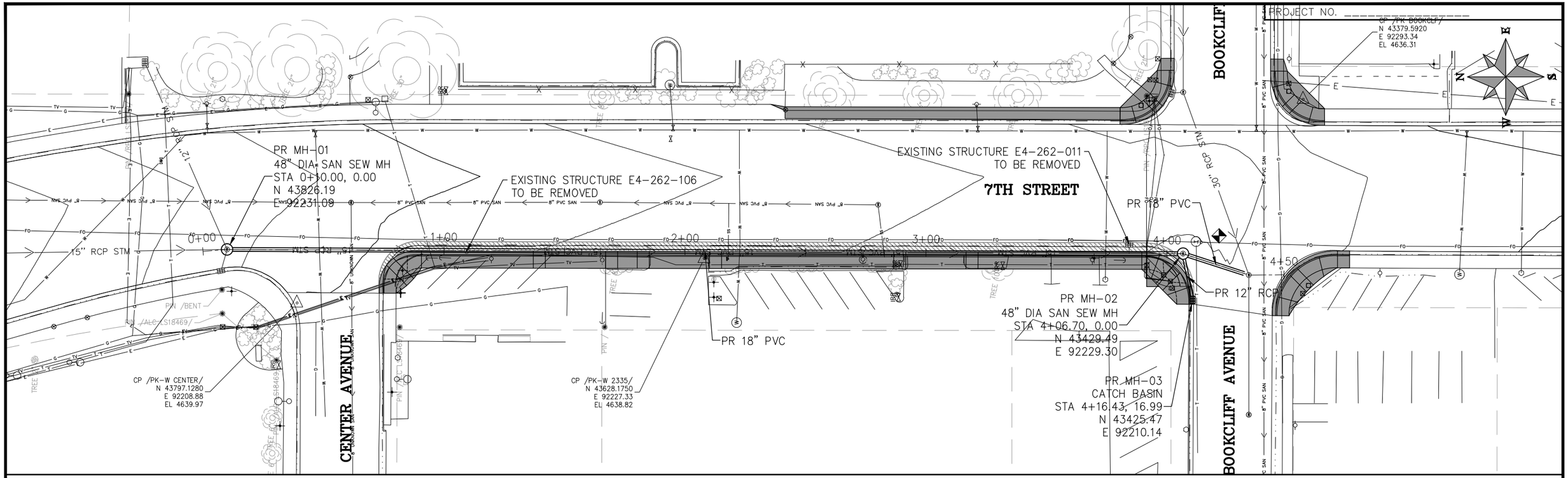

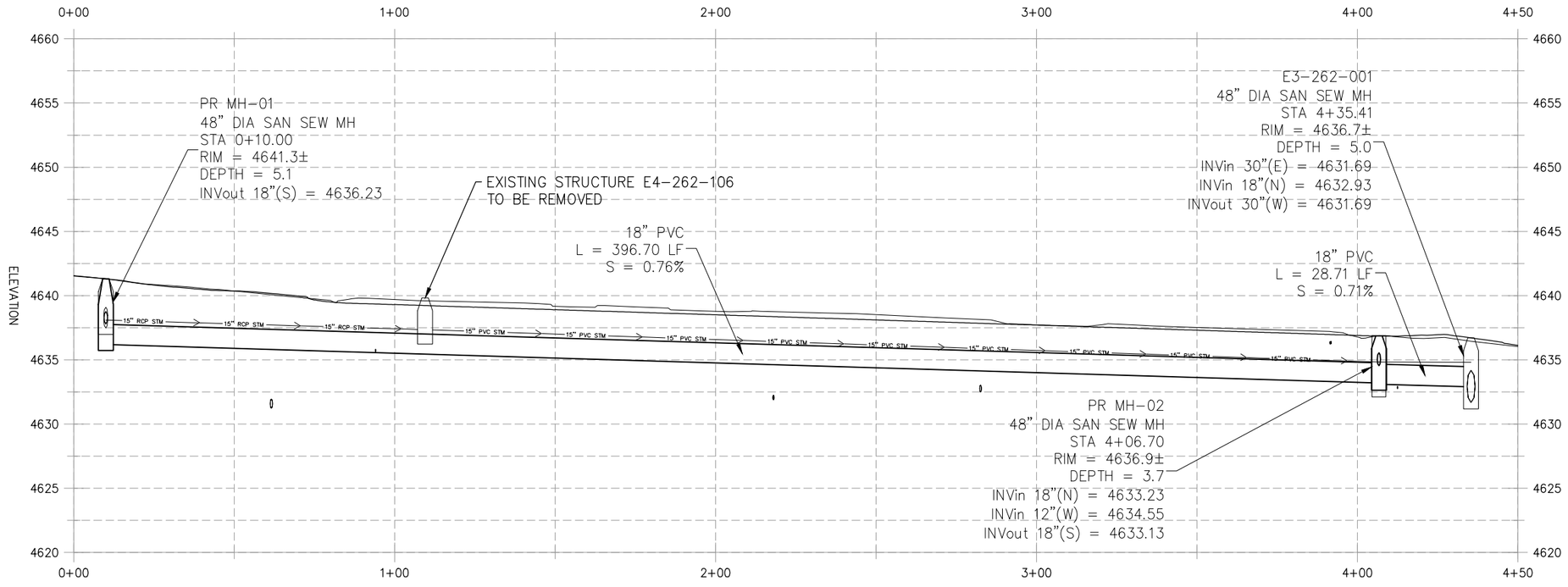

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CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

7TH STREET RECONSTRUCTION
STORM PLAN AND PROFILE
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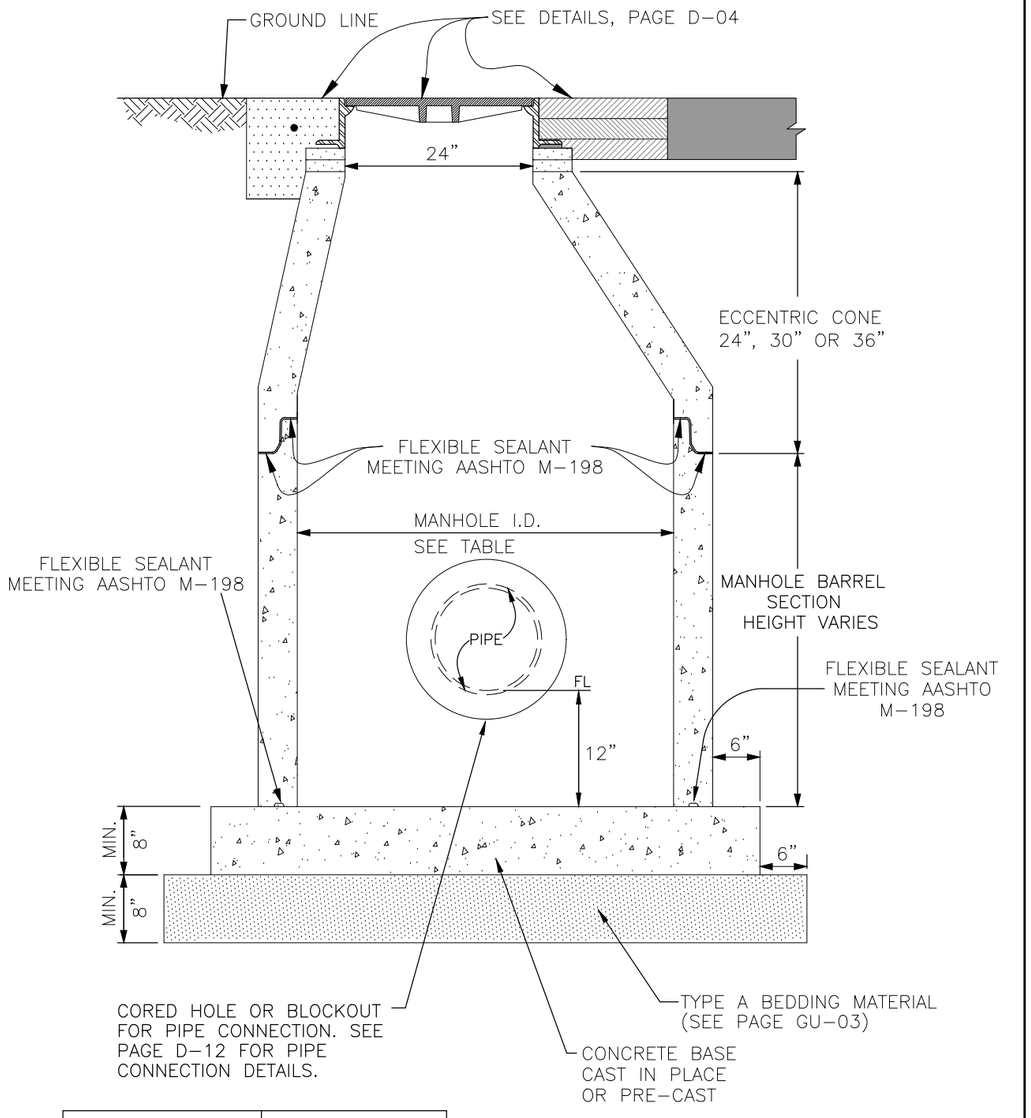


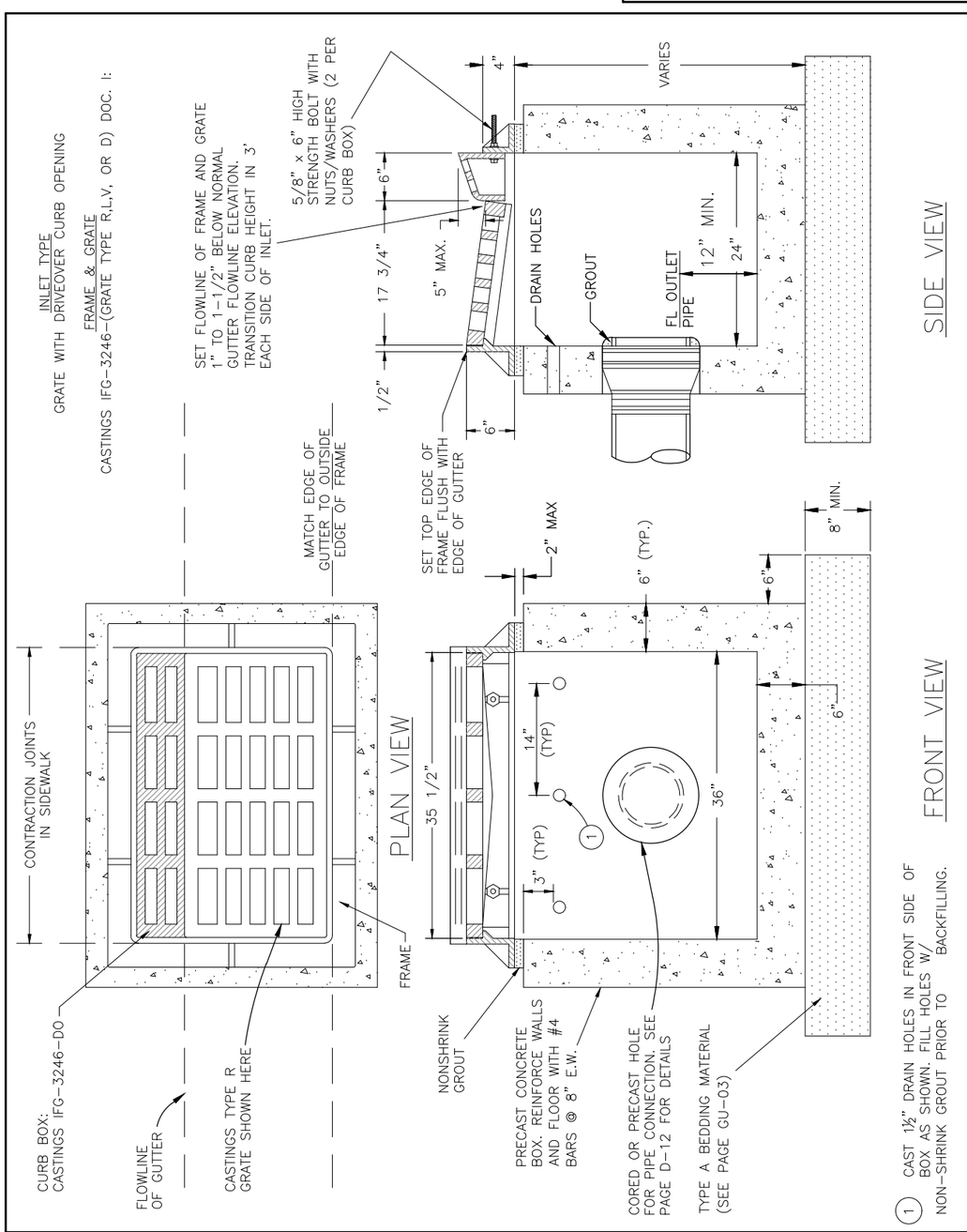
PIPE DIAMETER	MANHOLE I.D.
18" OR LESS	48"
21" – 30"	60"
36"	72"
42" – 48"	90"

ALL PRECAST MANHOLE SECTIONS SHALL CONFORM TO ASTM C-478 OR AASHTO M-199.

NO STEPS REQUIRED IN STORM SEWER MANHOLES.

STANDARD STORM SEWER MANHOLE

DEPARTMENT OF PUBLIC WORKS AND PLANNING ENGINEERING DIVISION CITY OF GRAND JUNCTION, COLORADO	STANDARD STORM DRAIN DETAIL	APPROVED: DN REVISED: FEB. 2007 DRAWN: TLT	PAGE D-03



STORM DRAIN INLET WITH DRIVE OVER CURB OPENING

DEPARTMENT OF PUBLIC WORKS AND PLANNING ENGINEERING DIVISION CITY OF GRAND JUNCTION, COLORADO	STANDARD STORM DRAIN DETAIL	APPROVED: DN DATE: APRIL 2007 DRAWN: CM	PAGE D-06

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SCALES: PLAN & PROFILE

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CITY OF Grand Junction COLORADO

PUBLIC WORKS
ENGINEERING DIVISION

7TH STREET RECONSTRUCTION
STORM SEWER DETAILS

2019 7th Street Reconstruction - Phase II		
Tabulation of Pavement Marking		
Location	**(627-30405) Preformed Thermoplastic Pavement Marking (Word/Symbol)**	**(627-30410) Preformed Thermoplastic Pavement Marking (X-Walk/Stopline)**
7th Street - Orchard Ave to Patterson Road		
350 LF - 12 inch STOP BAR (125 mil)		350
750 LF - 24 inch CROSSWALK (125 mil)		1500
19 EA - LEFT ARROW (12ft Elongated)(90 mil)	295	
6 EA - RIGHT ARROW (12ft Elongated)(90 mil)	93	
Total	**388**	**1850**
Total (SF)	388	1850
Contingency	20	90
Project Total (SF)	**408**	**1940**

APPENDIX C
Geotechnical Report

Huddleston-Berry
Engineering & Testing, LLC

GEOTECHNICAL AND GEOLOGIC HAZARDS INVESTIGATION
7th STREET RECONSTRUCTION
GRAND JUNCTION, COLORADO
PROJECT#00208-0078

CITY OF GRAND JUNCTION
333 WEST AVENUE, BUILDING E
GRAND JUNCTION, COLORADO 81501

MARCH 8, 2018

Huddleston-Berry Engineering and Testing, LLC
640 White Avenue,
Grand Junction, Colorado 81501

TABLE OF CONTENTS

1.0 INTRODUCTION

As part of continued infrastructure improvements, the City of Grand Junction proposes to reconstruct 7th Street between North Avenue and Patterson Road. As part of the design development process, Huddleston-Berry Engineering and Testing, LLC (HBET) was retained by the City of Grand Junction to conduct a geologic hazards and geotechnical investigation at the site.

1.1 Scope

As discussed above, a geologic hazards and geotechnical investigation was conducted for the 7th Street Reconstruction project in Grand Junction, Colorado. The scope of the investigation included the following components:

- Conducting a subsurface investigation to evaluate the subsurface conditions at the site.
- Collecting soil samples and conducting laboratory testing to determine the engineering properties of the soils at the site.
- Providing recommendations for excavations, subgrade preparation, and pavements.
- Evaluating potential geologic hazards at the site.

The investigation and report were completed by a Colorado registered professional engineer in accordance with generally accepted geotechnical and geological engineering practices. This report has been prepared for the exclusive use of the City of Grand Junction.

1.2 Site Location and Description

The site includes 7th Street, between North Avenue and Patterson Road, in Grand Junction, Colorado. The project location is shown on Figure 1 – Site Location Map.

At the time of the investigation, 7th Street consisted of two lanes in each direction with a center turn lane. The area includes both commercial and residential properties. The general slope of the roadway was gently down to the south.

1.3 Proposed Construction

The proposed construction is anticipated to include new pavements along 7th Street from North Avenue to Patterson Road.

2.0 GEOLOGIC SETTING

2.1 Soils

Soils data was obtained from the USDA Natural Resource Conservation Service Web Soil Survey. The data indicates that several soil types are present in the project area. Soil survey data is included in Appendix A.

Road construction in the site soils is described as being very limited due to low strength, slope, and/or shrink/swell. Excavation in the site soils is described as being somewhat limited to very limited due to dust, unstable excavation walls, and/or slope. The site soils are indicated to have a low potential for frost action, moderate risk of corrosion of uncoated steel, and low to moderate risk of corrosion of concrete.

2.2 Geology

According to the *Geologic Map of the Grand Junction Quadrangle, Mesa County, Colorado* (2002), the project area is underlain by the pediment deposit of Walker Field and undivided alluvium and colluvium.

2.3 Groundwater

Groundwater was not encountered in the subsurface at the time of the investigation.

3.0 FIELD INVESTIGATION

3.1 Subsurface Investigation

The subsurface investigation was conducted on January 29th and February 14th, 2018, and consisted of eleven geotechnical borings. The borings were drilled to depths of between 11.5 and 12.0 feet below the existing ground surface. Boring locations are shown on Figures 2 through 5. Typed boring logs are included in Appendix B. Samples of the native soils were collected during Standard Penetration Testing (SPT) and using bulk sampling methods at the locations shown on the logs.

As shown on the logs, the subsurface conditions were fairly consistent. The borings generally encountered 7.0 to 9.0-inches of asphalt pavement above granular base course to depths of between 13.0 and 30.0-inches. The base course was underlain by brown, moist soft to very stiff lean clay, lean clay with sand, and/or silty clay with sand soils. However, in B-11, the base course was underlain by tan, moist, medium dense silty sand with gravel fill materials.

In most of the borings, the clay and/or sand fill materials extended to the bottoms of the borings. However, in B-2, the clay extended to a depth of 7.5 feet and was underlain by brown, moist, medium dense sandy gravel to the bottom of the boring. In addition, in B-8, the clay extended to a depth of 11.0 feet and was underlain by brown, moist, loose silty sand to the bottom of the boring. As discussed previously, groundwater was not encountered in the borings at the time of the investigation.

4.0 LABORATORY TESTING

Selected native soil samples collected from the borings were tested in the Huddleston-Berry Engineering and Testing LLC geotechnical laboratory for natural moisture and density determination, grain size analysis, Atterberg limits determination, maximum dry density and optimum moisture content (Proctor) determination, swell/consolidation, California Bearing Ratio (CBR), and water soluble sulfates content determination. The laboratory testing results are included in Appendix C.

The laboratory testing results indicate that the native sand and clay soils are slightly plastic. In addition, the native clay soils were shown to generally tend to consolidate under loading at their existing density. However, the CBR results indicate that the clay soils may expand as much as 1.2% when compacted and introduced to excess moisture. Water soluble sulfates were detected in the site soils in concentrations as high as 0.3%.

5.0 GEOLOGIC INTERPRETATION

5.1 Geologic Hazards

The most critical geologic hazard identified on the site is the presence of moisture sensitive soils.

5.2 Geologic Constraints

In general, the primary geologic constraint to construction at the site is the presence of moisture sensitive soils. However, soft soil conditions were encountered in some of the borings and these may impact portions of the construction.

5.3 Water Resources

No water supply wells were observed in the project area. As discussed previously, shallow groundwater was not encountered in the subsurface. In general, with proper design and construction, the proposed construction is not anticipated to adversely impact surface water or groundwater.

5.4 Mineral Resources

No significant mineral resources were identified on the property. Potential mineral resources in western Colorado generally include gravel, uranium ore, and commercial rock products such as flagstone. No significant gravel, uranium bearing bedrock, or other mineable bedrock units were encountered on the subject site at the time of the investigation, nor was any literary or cartographic information discovered that indicate the existence or potential existence of commercial quality mineral deposits.

6.0 CONCLUSIONS

Based upon the available data sources, field investigation, and nature of the proposed construction, HBET does not believe that there are any geologic conditions which should preclude reconstruction of 7th Street. However, pavements and/or earthwork may have to consider the impacts of soft soil conditions in some areas of the site.

7.0 RECOMMENDATIONS

7.1 Corrosion of Concrete

As indicated previously, water soluble sulfates were encountered in the site soils in concentrations as high as 0.3%. These concentrations represent a severe degree of potential sulfate attack on concrete. Therefore, Type V cement is recommended in accordance with the International Building Code. However, Type V cement can be difficult to obtain in Western Colorado. Where Type V cement is unavailable, Type I-II sulfate resistant cement is recommended.

7.2 Corrosion of Steel

As discussed previously, the USDA Soil Survey data indicate that the native soils are moderately corrosive to uncoated steel. As a result, corrosion should be considered in design of any buried steel elements proposed to be used as part of the construction.

7.3 Non-Structural Flatwork

As mentioned above, moisture sensitive soils were encountered at the site. In order to limit the potential for excessive differential movements of concrete flatwork, it is recommended that slabs-on-grade be constructed above a minimum of 12-inches of structural fill. However, this thickness can be reduced to 6-inches in areas where existing base course is present in the subgrade.

As discussed previously, the native clay soils were indicated to be slightly expansive when compacted and introduced to excess moisture. However, the magnitude of expansion measured in the laboratory was small. Therefore, with careful moisture control and proper compaction, the native clay soils may be reused as structural fill. Imported structural fill should consist of a granular, non-expansive, non-free draining material such as crusher fines or CDOT Class 6 base course. Unless it can be demonstrated that they are not free-draining, pit-run materials should not be used as structural fill.

7.4 Lateral Earth Pressures

Retaining walls should be designed to resist lateral earth pressures. For backfill consisting of the native soils or imported granular, non-free draining, non-expansive material, we recommend that the walls be designed for an active equivalent fluid unit weight of 50 pcf in areas where no surcharge loads are present. Lateral earth pressures should be increased as necessary to reflect any surcharge loading behind the walls.

7.5 Excavations

Excavations in the soils at the site may stand for short periods of time but should not be considered to be stable. In general, the site soils classify as Type C soil with regard to OSHA's Construction Standards for Excavations. For Type C soils, the maximum allowable slope in temporary cuts is 1.5H:1V. However, the soil classification is based solely on the boring data and the actual conditions may differ. It is recommended that HBET be provided the opportunity to examine excavations in order to accurately classify the soil conditions with regard to temporary support.

7.6 Subgrade Preparation

In general, it is recommended that concrete flatwork, utility lines, etc. be placed above well compacted subgrade soils. However, as indicated previously, soft soils were encountered in many of the borings and compaction of the subgrade may be difficult depending upon the subgrade elevation. It may be necessary to utilize geotextile and/or geogrid in conjunction with up to 30-inches of granular fill to stabilize the subgrade. HBET should be contacted to provide specific recommendations for subgrade stabilization based upon the actual subgrade conditions during construction.

7.7 Pavements

As discussed previously, the proposed work will include reconstruction of 7th Street in the project area. Also as discussed previously, the native pavement subgrade materials range from clay to sand. However, the clay will be critical for the pavement design. The design CBR of the native clay soils was determined to be less than 2.0. Therefore, the minimum recommended Resilient Modulus of 3,000 psi will be used for the pavement design.

Based upon the subgrade conditions and anticipated traffic loading, pavement section alternatives were developed in accordance with the *Guideline for the Design and Use of Asphalt Pavements for Colorado Roadways* by the Colorado Asphalt Pavement Association and CDOT *Pavement Design Manual*. ESAL calculations are included in Appendix D and indicate a design value of approximately 2,150,000 ESAL's. Based upon the subgrade conditions and anticipated traffic loading, the following pavement section alternatives are recommended:

7th Street from North to Patterson

ALTERNATIVE	PAVEMENT SECTION (Inches)			
	Hot-Mix Asphalt Pavement	CDOT Class 6 Base Course	CDOT Class 3 Subbase Course	TOTAL
A	7.0	15.0		22.0
B	8.0	12.0		20.0
C	7.0	6.0	13.0	26.0

The recommended pavement sections above can be reduced by using geogrid reinforcement consisting of Tensar TX5, or equivalent, below the base course. Where a geogrid is used, the following pavement sections are recommended:

7th Street from North to Patterson

ALTERNATIVE	PAVEMENT SECTION (Inches)			
	Hot-Mix Asphalt Pavement	CDOT Class 6 Base Course	CDOT Class 3 Subbase Course	TOTAL
A	7.0	9.0		15.0
B	8.0	6.0		14.0
C	7.0	6.0	6.0	19.0

Prior to new pavement placement, areas to be paved should be stripped of all topsoil, uncontrolled fill, or other unsuitable materials. It is recommended that the subgrade soils be scarified to a depth of 12-inches; moisture conditioned, and recompacted to a minimum of 95% of the standard Proctor maximum dry density, within ±2% of optimum moisture content as determined by AASHTO T-99. However, as discussed previously, soft soil conditions were encountered in some areas of the site and this may make compaction of the subgrade difficult. It may be necessary to utilize geotextile and/or geogrid in conjunction with up to 30-inches of granular fill to stabilize the subgrade. However, HBET should be contacted to provide specific recommendations for stabilization based upon the actual subgrade conditions during construction.

Aggregate base course and subbase course should be placed in maximum 9-inch loose lifts, moisture conditioned, and compacted to a minimum of 95% and 93% of the maximum dry density, respectively, at -2% to +3% of optimum moisture content as determined by AASHTO T-180. In addition to density testing, base course should be proofrolled to verify subgrade stability.

It is recommended that Hot-Mix Asphaltic (HMA) pavement conform to CDOT grading SX or S specifications and consist of an approved 75 or 100 gyration Superpave method mix design. HMA pavement should be compacted to between 92% and 96% of the maximum theoretical density. An end point stress of 50 psi should be used. In addition, pavements should conform to local specifications.

The long-term performance of the pavements is dependent on positive drainage away from the pavements. Ditches, culverts, and inlet structures in the vicinity of paved areas must be maintained to prevent ponding of water on the pavement

8.0 GENERAL

The recommendations included above are based upon the results of the subsurface investigation and on our local experience. These conclusions and recommendations are valid only for the proposed construction.

As discussed previously, the subsurface conditions at the site were fairly consistent. However, the precise nature and extent of any subsurface variability may not become evident until construction. Therefore, it is recommended that a representative of HBET observe the subgrade prior to pavement construction to verify that the subsurface conditions are consistent with those described herein. In addition, it is recommended that a representative of HBET test compaction of pavement section materials.

As discussed previously, moisture sensitive soils were encountered at the site. The recommendations contained herein are designed to reduce the potential for excessive differential movements; however, HBET cannot predict long-term changes in subsurface moisture conditions and/or the precise magnitude or extent of volume change. ***Where significant increases in subsurface moisture occur due to poor grading, improper stormwater management, utility line failure, or other cause, during or after construction, significant movements are possible***.

Huddleston-Berry Engineering and Testing, LLC is pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

Respectfully Submitted:
Huddleston-Berry Engineering and Testing, LLC

Michael A. Berry, P.E.
Vice President of Engineering

FIGURES

City of Grand Junction

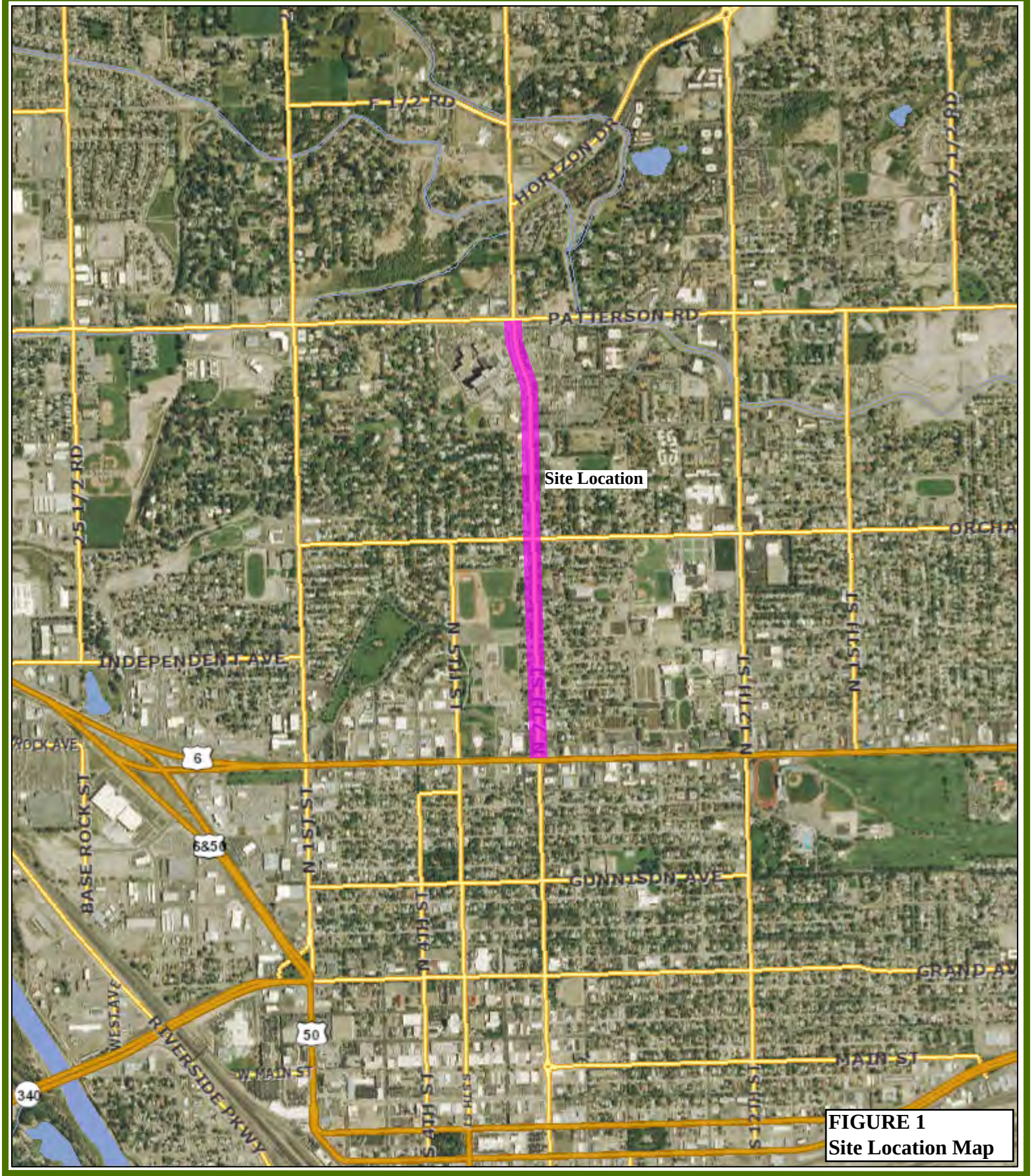

FIGURE 1
Site Location Map

N

0 0.425 0.85 Miles

Printed: 3/8/2018

1 inch = 1,505 feet

CITY OF Grand Junction COLORADO GEOGRAPHIC INFORMATION SYSTEM

City of Grand Junction

FIGURE 2
Site Plan

N

0 0.05 0.1 Miles

Printed: 3/8/2018

1 inch = 188 feet

CITY OF Grand Junction COLORADO GEOGRAPHIC INFORMATION SYSTEM

City of Grand Junction

FIGURE 3
Site Plan

N

0 0.05 0.1 Miles

Printed: 3/8/2018

1 inch = 188 feet

CITY OF Grand Junction COLORADO GEOGRAPHIC INFORMATION SYSTEM

City of Grand Junction

FIGURE 4
Site Plan

N

0 0.05 0.1 Miles

Printed: 3/8/2018

1 inch = 188 feet

CITY OF Grand Junction COLORADO GEOGRAPHIC INFORMATION SYSTEM

City of Grand Junction

FIGURE 5
Site Plan

N

0 0.05 0.1 Miles

Printed: 3/8/2018

1 inch = 188 feet

CITY OF Grand Junction COLORADO GEOGRAPHIC INFORMATION SYSTEM

APPENDIX A
Soil Survey Data

Map Scale: 1:9,260 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 8, Oct 12, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Mar 2, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Av	Avalon sandy loam, gravelly substratum, 2 to 5 percent slopes — DRAFT	0.5	2.5%
AvC	Avalon loam, gravelly substratum, 5 to 25 percent slopes — DRAFT	1.1	5.4%
Bc	Sagers silty clay loam, 0 to 2 percent slopes — DRAFT	2.6	13.5%
BcU	Sagers-Urban land complex, 0 to 2 percent slopes — DRAFT	15.3	78.6%
Totals for Area of Interest		**19.5**	**100.0%**

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Mesa County Area, Colorado

Av—Avalon sandy loam, gravelly substratum, 2 to 5 percent slopes — DRAFT

Map Unit Setting

National map unit symbol: k0bn

Elevation: 4,600 to 4,800 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Avalon, gravelly substratum, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Avalon, Gravelly Substratum

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone and shale

Typical profile

A - 0 to 3 inches: sandy loam
Bk1 - 3 to 17 inches: loam
Bk2 - 17 to 42 inches: clay loam
Bk3 - 42 to 60 inches: gravelly loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Mack

Percent of map unit: 10 percent
Landform: Terraces

Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

AvC—Avalon loam, gravelly substratum, 5 to 25 percent slopes — DRAFT

Map Unit Setting

National map unit symbol: k0bp
Elevation: 4,500 to 4,900 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Avalon, gravelly substratum, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Avalon, Gravelly Substratum

Setting

Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Alluvium and/or slope alluvium derived from sandstone and shale

Typical profile

A - 0 to 3 inches: sandy loam
Bk1 - 3 to 17 inches: loam
Bk2 - 17 to 42 inches: clay loam
Bk3 - 42 to 60 inches: gravelly loam

Properties and qualities

Slope: 5 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Pariette

Percent of map unit: 20 percent
Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Bc—Sagers silty clay loam, 0 to 2 percent slopes — DRAFT

Map Unit Setting

National map unit symbol: k0bq
Elevation: 4,500 to 5,900 feet
Mean annual precipitation: 5 to 8 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Sagers and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sagers

Setting

Landform: Terraces, alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Alluvium derived from calcareous shale and sandstone

Typical profile

Ap - 0 to 12 inches: silty clay loam
C - 12 to 25 inches: silty clay loam
Cy - 25 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Massadona

Percent of map unit: 10 percent
Landform: Alluvial fans
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

BcU—Sagers-Urban land complex, 0 to 2 percent slopes — DRAFT

Map Unit Setting

National map unit symbol: k1rq
Elevation: 4,500 to 4,900 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Sagers and similar soils: 55 percent
Urban land: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sagers

Setting

Landform: Alluvial fans, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear

Parent material: Alluvium derived from calcareous shale and sandstone

Typical profile

Ap - 0 to 12 inches: silty clay loam
C - 12 to 25 inches: silty clay loam
Cy - 25 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Alluvial fans, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Alluvium derived from calcareous shale and sandstone

Typical profile

H1 - 0 to 60 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: Unranked

Minor Components

Killpack

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear

Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 8, Oct 12, 2017

Roads and Streets, Shallow Excavations, and Lawns and Landscaping

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Roads and Streets, Shallow Excavations, and Lawns and Landscaping

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Roads and Streets, Shallow Excavations, and Lawns and Landscaping–Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Av—Avalon sandy loam, gravelly substratum, 2 to 5 percent slopes — DRAFT							
Avalon, gravelly substratum	90	Somewhat limited		Very limited		Somewhat limited	
		Dusty	0.27	Low strength	1.00	Dusty	0.27
						Unstable excavation walls	0.01

Roads and Streets, Shallow Excavations, and Lawns and Landscaping–Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AvC—Avalon loam, gravelly substratum, 5 to 25 percent slopes — DRAFT							
Avalon, gravelly substratum	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low exchange capacity	0.50			Dusty	0.27
		Dusty	0.27			Unstable excavation walls	0.01
Bc—Sagers silty clay loam, 0 to 2 percent slopes — DRAFT							
Sagers	90	Somewhat limited		Very limited		Somewhat limited	
		Dusty	0.50	Low strength	1.00	Dusty	0.50
				Shrink-swell	0.50	Unstable excavation walls	0.01
BcU—Sagers-Urban land complex, 0 to 2 percent slopes — DRAFT							
Sagers	55	Somewhat limited		Very limited		Somewhat limited	
		Dusty	0.50	Low strength	1.00	Dusty	0.50
				Shrink-swell	0.50	Unstable excavation walls	0.01
Urban land	40	Not rated		Not rated		Not rated	

Data Source Information

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 8, Oct 12, 2017

Soil Features

This table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Report—Soil Features

Soil Features–Mesa County Area, Colorado									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
		In	*In*		*In*	*In*			
Av—Avalon sandy loam, gravelly substratum, 2 to 5 percent slopes — DRAFT									
Avalon, gravelly substratum		—	—		0	—	Low	Moderate	Low
AvC—Avalon loam, gravelly substratum, 5 to 25 percent slopes — DRAFT									
Avalon, gravelly substratum		—	—		0	—	Low	Moderate	Low
Bc—Sagers silty clay loam, 0 to 2 percent slopes — DRAFT									
Sagers		—	—		0	—	Low	Moderate	Moderate
BcU—Sagers-Urban land complex, 0 to 2 percent slopes — DRAFT									
Sagers		—	—		0	0	Low	Moderate	Moderate
Urban land		—	—		—	—			

Data Source Information

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 8, Oct 12, 2017

APPENDIX B
Typed Boring Logs

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

BORING NUMBER B-1

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 1/29/18 **COMPLETED** 1/29/18
GROUND ELEVATION ---- **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
		Lean CLAY to Lean CLAY with Sand (cl), brown, moist, medium stiff										
2.5			SS 1	83	2-3-2 (5)							
5.0			SS 2	100	2-3-4 (7)							
7.5		Sandy GRAVEL (gw), brown, moist, medium dense										
10.0			SS 3	83	7-6-7 (13)							
		Bottom of hole at 11.5 feet.										

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BORING NUMBER B-2

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 2/14/18 **COMPLETED** 2/14/18
GROUND ELEVATION _____ **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
		Lean CLAY to Lean CLAY with Sand (cl), brown, moist, soft to medium stiff										
2.5			MC 1	67	4-3-4 (7)		104	18				
5.0												
			SS 1	50	2-2-2 (4)							
7.5												
10.0			SS 2	67	1-2-1 (3)							
		Bottom of hole at 11.5 feet.										

GEOTECH BH COLUMNS 00208-0078 7TH STREET RECONSTRUCTION.GPJ GINT US LAB.GDT 3/7/18

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970-255-6818

BORING NUMBER B-3

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 1/29/18 **COMPLETED** 1/29/18
GROUND ELEVATION _____ **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
		Lean CLAY to Silty CLAY with Sand (CL-ML), brown, moist to wet, soft to medium stiff										
2.5		SS1: Lab Classified	SS 1	83	3-2-2 (4)			17	26	20	6	81
5.0												
			SS 2	89	2-3-2 (5)							
7.5												
10.0			SS 3	100	2-1-2 (3)							
		Bottom of hole at 11.5 feet.										

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BORING NUMBER B-4

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 2/14/18 **COMPLETED** 2/14/18
GROUND ELEVATION _____ **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
		Lean CLAY to Lean CLAY with Sand (cl), brown, moist, medium stiff										
2.5			SS 1	17	4-3-4 (7)							
5.0												
7.5			SS 2	78	3-3-3 (6)							
10.0			SS 3	50	3-3-3 (6)							
		Bottom of hole at 11.5 feet.										

GEOTECH BH COLUMNS 00208-0078 7TH STREET RECONSTRUCTION.GPJ GINT US LAB.GDT 3/7/18

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970-255-6818

BORING NUMBER B-5

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 1/29/18 **COMPLETED** 1/29/18
GROUND ELEVATION _____ **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
		Lean CLAY to Lean CLAY with Sand (cl), brown, moist, medium stiff to stiff										
2.5			SS 1	28	2-3-5 (8)							
5.0												
7.5			SS 2	89	2-3-3 (6)							
10.0			SS 3	94	3-5-6 (11)							
		Bottom of hole at 11.5 feet.										

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BORING NUMBER B-6

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 2/14/18 **COMPLETED** 2/14/18
GROUND ELEVATION _____ **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
		Lean CLAY to Lean CLAY with Sand (cl), brown, moist, medium stiff to stiff										
2.5			SS 1	28	4-4-4 (8)							
5.0												
			SS 2	22	3-5-7 (12)							
7.5												
10.0			SS 3	25	3-2-3-4 (5)							
		Bottom of hole at 12.0 feet.										

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BORING NUMBER B-7

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 1/29/18 **COMPLETED** 1/29/18
GROUND ELEVATION _____ **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
2.5		Lean CLAY to Lean CLAY with Sand (CL), brown, moist, medium stiff to stiff SS1: Lab Classified	SS 1	44	5-6-7 (13)			14	29	17	12	83
5.0			SS 2	78	3-3-4 (7)							
7.5												
10.0			SS 3	94	3-4-5 (9)							
		Bottom of hole at 11.5 feet.										

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BORING NUMBER B-8

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 2/14/18 **COMPLETED** 2/14/18
GROUND ELEVATION _____ **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
2.5		Lean CLAY to Lean CLAY with Sand (cl), brown, moist, medium stiff	SS 1	28	3-3-4 (7)							
5.0												
			SS 2	44	3-4-3 (7)							
7.5												
10.0			SS 3	50	4-3-3 (6)							
		Silty SAND (sm), brown, moist, loose										
		Bottom of hole at 11.5 feet.										

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BORING NUMBER B-9

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 1/29/18 **COMPLETED** 1/29/18
GROUND ELEVATION _____ **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
2.5		Lean CLAY to Lean CLAY with Sand (cl), brown, moist, medium stiff	SS 1	94	4-5-5 (10)							
5.0			SS 2	94	3-4-5 (9)							
7.5												
10.0			SS 3	89	5-4-4 (8)							
		Bottom of hole at 11.5 feet.										

Huddleston-Berry Engineering & Testing, LLC
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BORING NUMBER B-10

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 2/14/18 **COMPLETED** 2/14/18
GROUND ELEVATION _____ **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
2.5		Lean CLAY to Lean CLAY with Sand (cl), brown, moist, medium stiff to very stiff					113	13				
			MC 1	94	12-12-12 (24)							
5.0												
			SS 1	22	4-4-3 (7)							
7.5												
10.0			SS 2	33	5-7-8 (15)							
		Bottom of hole at 11.5 feet.										

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BORING NUMBER B-11

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO
DATE STARTED 1/29/18 **COMPLETED** 1/29/18
GROUND ELEVATION _____ **HOLE SIZE** 4-inch
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		ASPHALT Pavement										
		Granular Base Course										
2.5		Silty SAND with Gravel (FILL), tan, moist, medium dense SS1: Lab Classified	SS 1	83	7-4-5 (9)			12	29	23	6	35
5.0												
7.5			SS 2	78	4-9-15 (24)							
10.0			SS 3	83	7-11-7 (18)							
		Bottom of hole at 11.5 feet.										

APPENDIX C
Laboratory Testing Results

Huddleston-Berry Engineering & Testing, LLC
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Grand Junction, CO 81501
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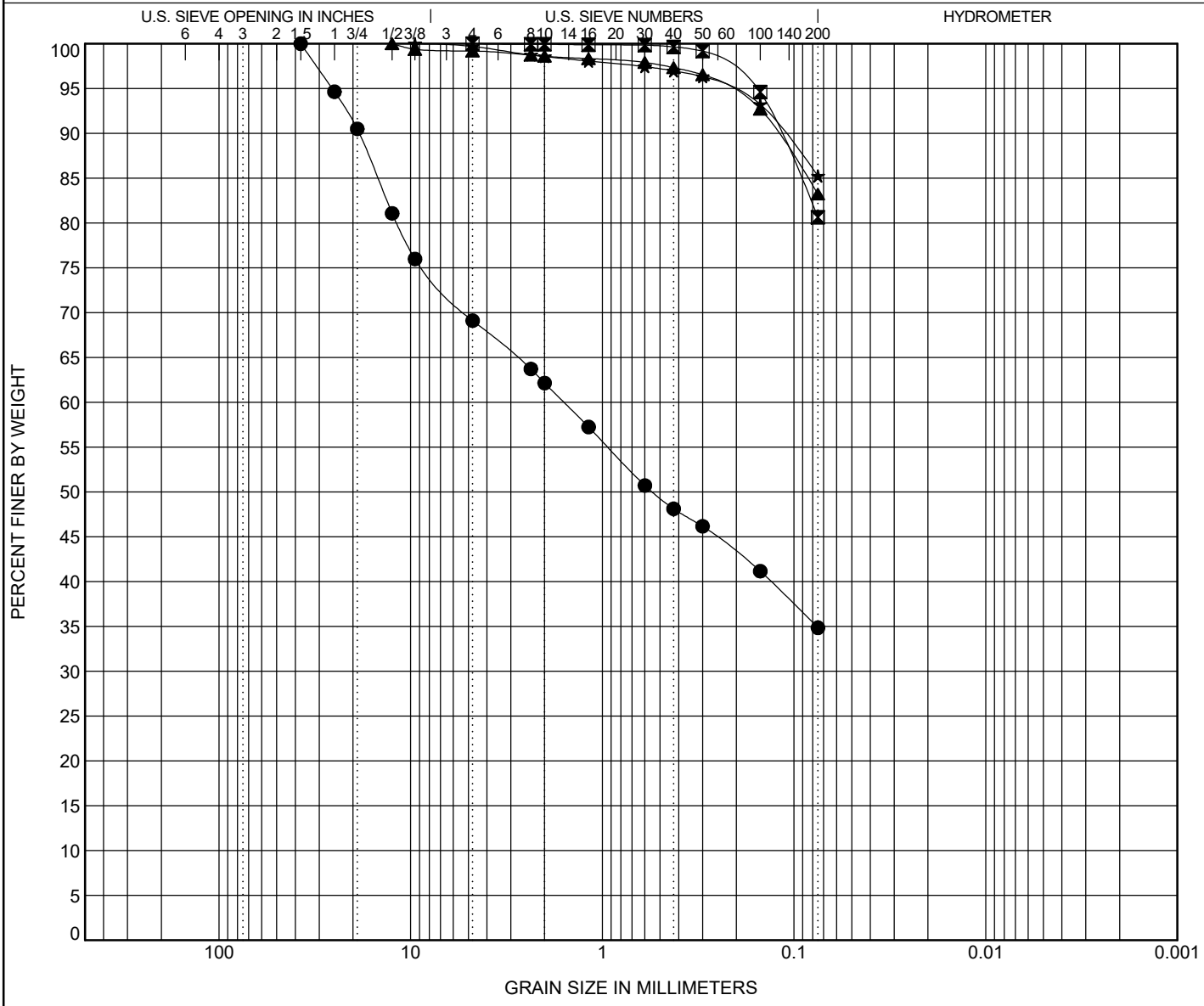
GRAIN SIZE DISTRIBUTION

CLIENT City of Grand Junction **PROJECT NAME** 7th Street Reconstruction

PROJECT NUMBER 00208-0078 **PROJECT LOCATION** Grand Junction, CO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	B-11, SS1	1/18	SILTY SAND with GRAVEL(SM)	29	23	6		
⊠	B-3, SS1	1/18	SILTY CLAY with SAND(CL-ML)	26	20	6		
▲	B-7, SS1	1/18	LEAN CLAY with SAND(CL)	29	17	12		
★	Composite	1/18	LEAN CLAY(CL)	29	16	13		

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-11, SS1	1/18	37.5	1.588			30.9	34.3	34.8	
⊠	B-3, SS1	1/18	4.75				0.0	19.4	80.6	
▲	B-7, SS1	1/18	12.5				0.8	15.9	83.2	
★	Composite	1/18	9.5				0.3	14.5	85.2	

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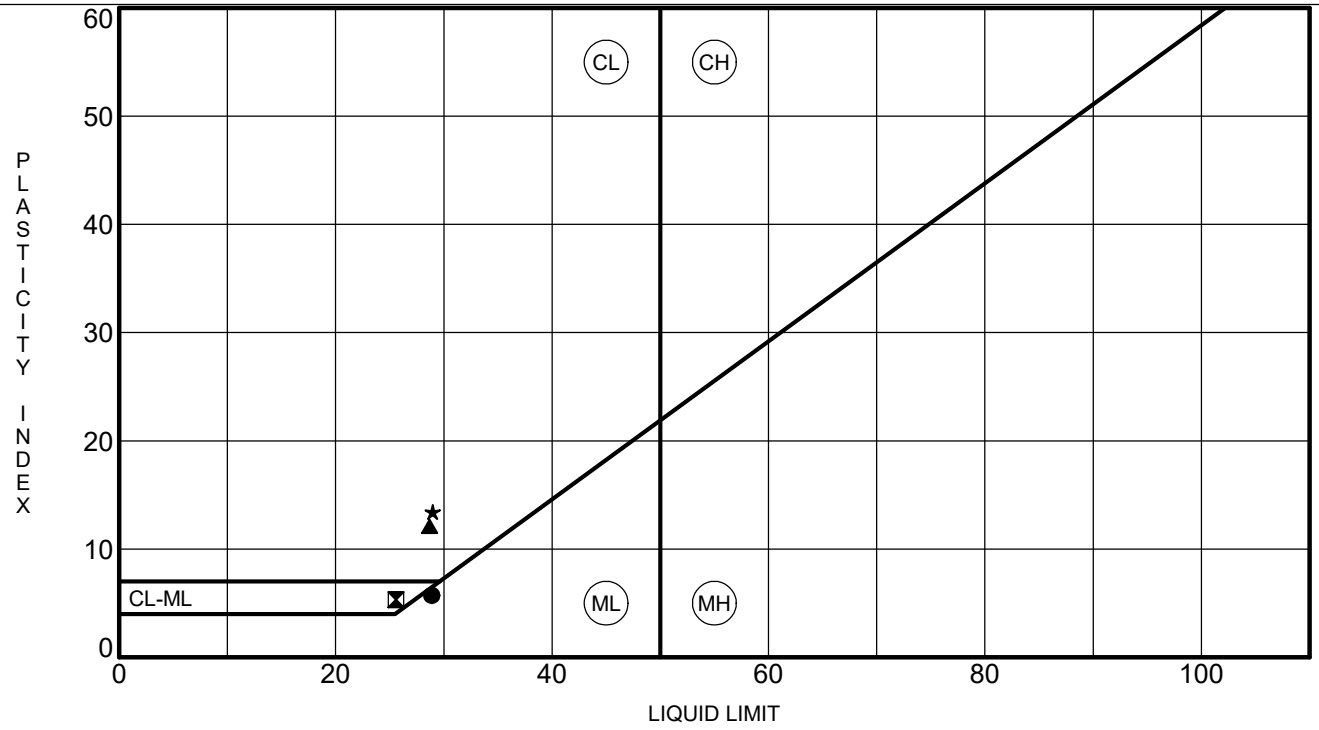
ATTERBERG LIMITS' RESULTS

CLIENT City of Grand Junction **PROJECT NAME** 7th Street Reconstruction

PROJECT NUMBER 00208-0078 **PROJECT LOCATION** Grand Junction, CO



	Specimen Identification		LL	PL	PI	#200	Classification
●	**B-11, SS1**	**1/29/2018**	**29**	**23**	**6**	**35**	**SILTY SAND with GRAVEL(SM)**
⊠	**B-3, SS1**	**1/29/2018**	**26**	**20**	**6**	**81**	**SILTY CLAY with SAND(CL-ML)**
▲	**B-7, SS1**	**1/29/2018**	**29**	**17**	**12**	**83**	**LEAN CLAY with SAND(CL)**
★	**Composite**	**1/29/2018**	**29**	**16**	**13**	**85**	**LEAN CLAY(CL)**

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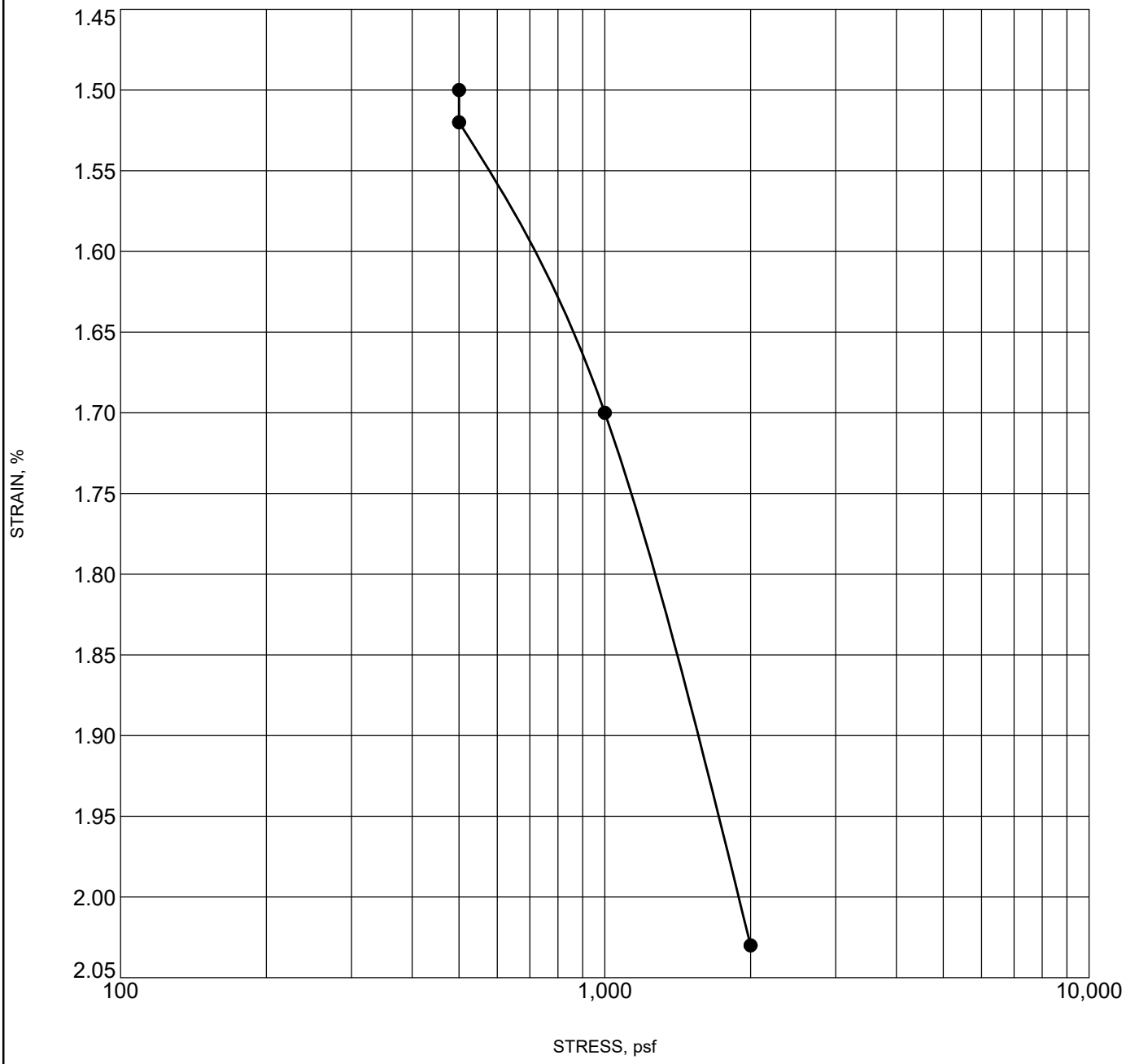
CONSOLIDATION TEST

CLIENT City of Grand Junction **PROJECT NAME** 7th Street Reconstruction

PROJECT NUMBER 00208-0078 **PROJECT LOCATION** Grand Junction, CO



Specimen Identification		Classification	γ_d	MC%
● **B-2**	**2.0**		**111**	**13**

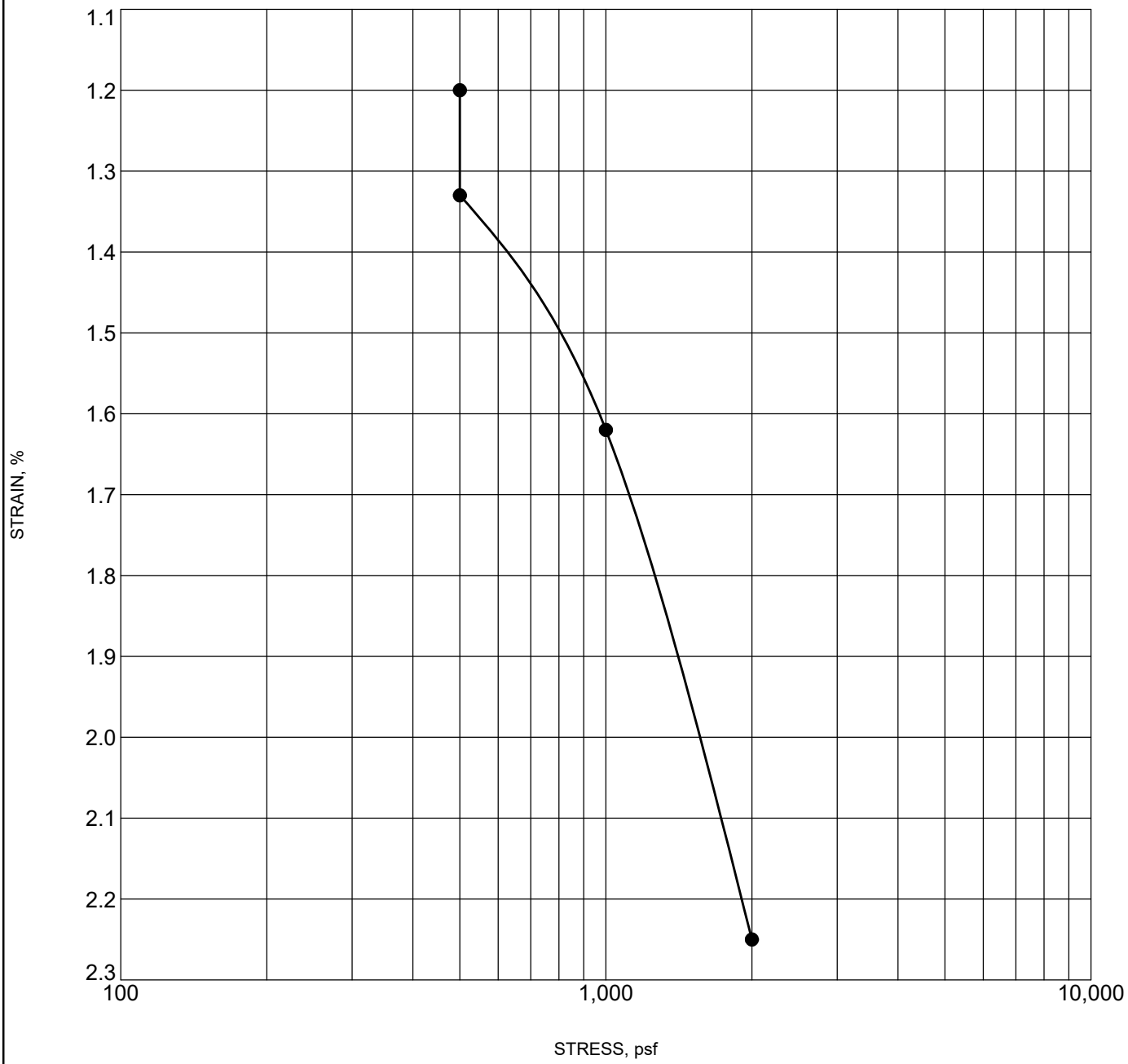
CONSOL STRAIN 00208-0078 7TH STREET RECONSTRUCTION.GPJ GINT US LAB.GDT 3/8/18

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

CONSOLIDATION TEST

CLIENT City of Grand Junction **PROJECT NAME** 7th Street Reconstruction

PROJECT NUMBER 00208-0078 **PROJECT LOCATION** Grand Junction, CO



Specimen Identification		Classification	γ_d	MC%
● **B-10**	**2.0**		**102**	**18**

CONSOL STRAIN 00208-0078 7TH STREET RECONSTRUCTION.GPJ GINT US LAB.GDT 3/8/18

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Grand Junction, CO 81501
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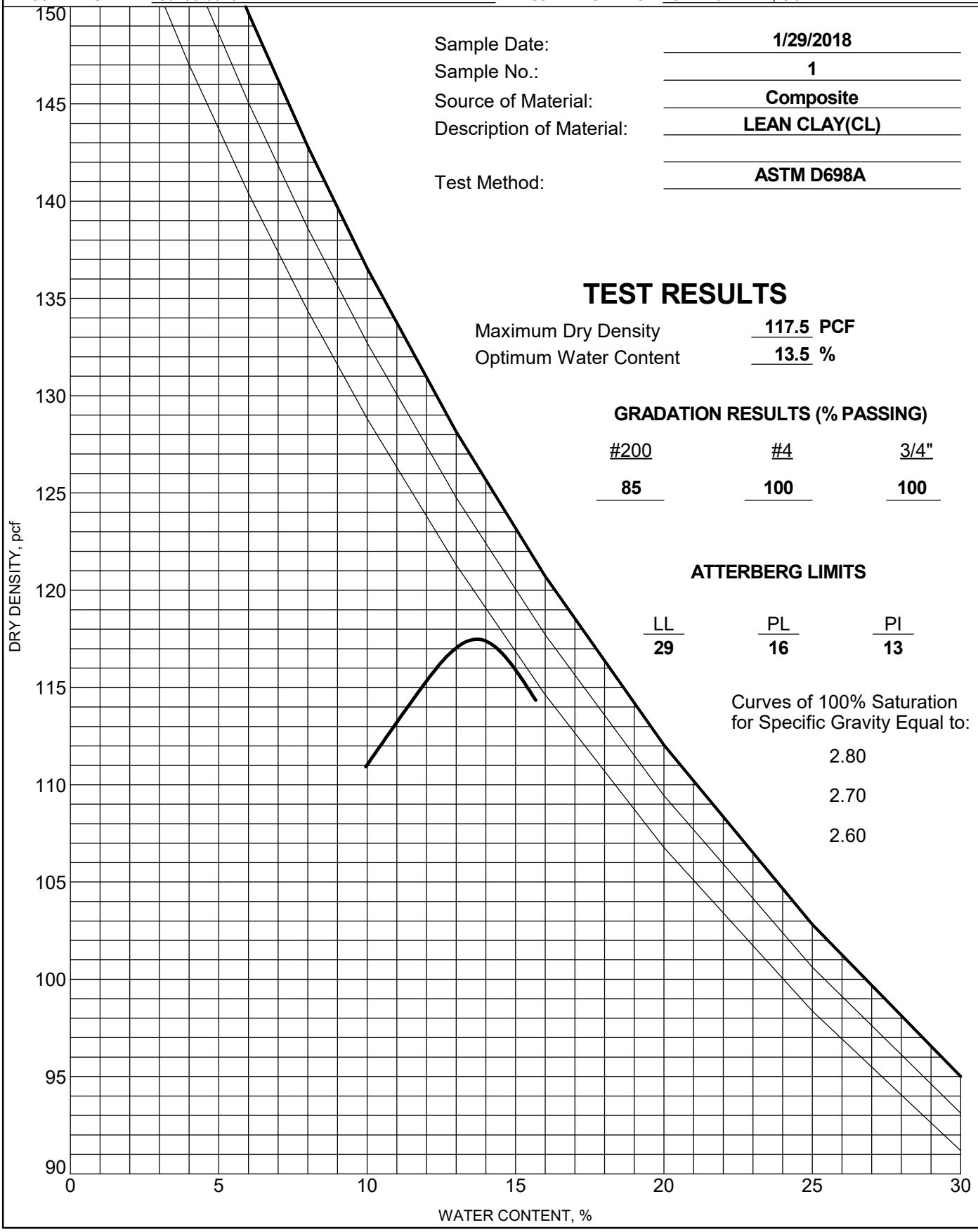
MOISTURE-DENSITY RELATIONSHIP

CLIENT City of Grand Junction
PROJECT NAME 7th Street Reconstruction
PROJECT NUMBER 00208-0078
PROJECT LOCATION Grand Junction, CO



Sample Date: **1/29/2018**
Sample No.: **1**
Source of Material: **Composite**
Description of Material: **LEAN CLAY(CL)**
Test Method: **ASTM D698A**

TEST RESULTS

Maximum Dry Density **117.5** PCF
Optimum Water Content **13.5** %

GRADATION RESULTS (% PASSING)

#200	#4	3/4"
85	100	100

ATTERBERG LIMITS

LL	PL	PI
29	16	13

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 00208-0078 7TH STREET RECONSTRUCTION.GPJ GINT US LAB.GDT 3/7/18

Huddleston-Berry Engineering & Testing, LLC

CALIFORNIA BEARING RATIO
ASTM D1883

Project No.:	00208-0078	**Authorized By:**	Client	**Date:**	01/29/18
Project Name:	7th Street Reconstruction	**Sampled By:**	CM	**Date:**	01/29/18
Client Name:	City of Grand Junction	**Submitted By:**	CM	**Date:**	01/29/18
Sample Number:	18-0144 **Location:** Composite	**Reviewed By:**	MAB	**Date:**	03/08/18

Compaction Method ASTM D698, Method A

Maximum Dry Density (pcf): 117.5

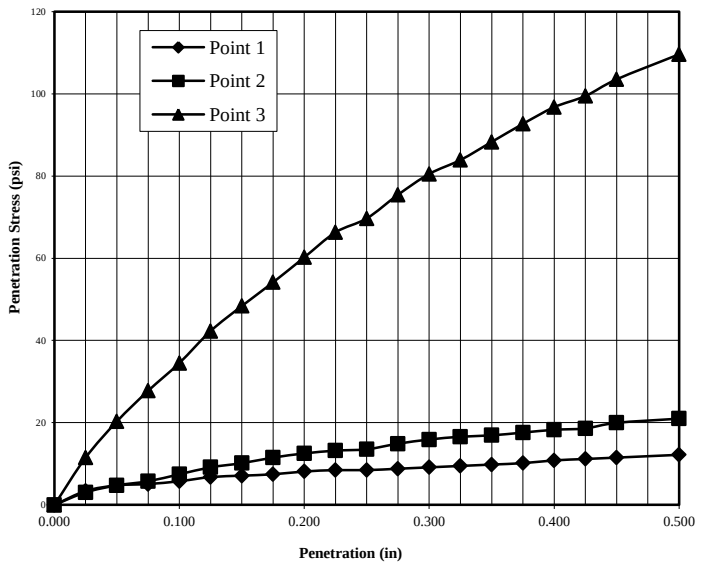
Opt. Moisture Content (%): 13.5

Sample Condition: Soaked

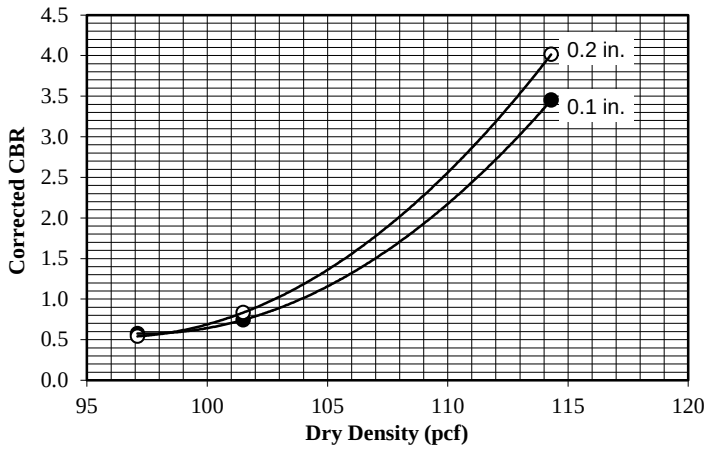
Remarks:

Sample Data		Point 1	Point 2	Point 3
Blows per Compacted Lift:		15	25	56
Surcharge Weight (lbs):		10.0	10.0	10.0
Dry Density Before Soak (pcf):		97.1	101.5	114.3
Dry Density After Soak (pcf):		96.6	100.3	113.3
Moisture Content (%)	Bottom Pre-Test	13.7	13.9	13.9
	Top Pre-Test	13.7	14.0	13.6
	Top 1" After Test	23.3	25.5	19.8
	Average After Soak:	25.2	22.4	17.0
Percent Swell After Soak:		0.5	1.2	0.9

Load Pentration Curve(s)



Dry Density vs CBR



Penetration Data								
Point 1			Point 2			Point 3		
Dist. (in)	Load (lbs)	Stress (psi)	Dist. (in)	Load (lbs)	Stress (psi)	Dist. (in)	Load (lbs)	Stress (psi)
0.000	0	0	0.000	0	0	0.000	0	0
0.025	10	3	0.025	9	3	0.025	34	12
0.050	14	5	0.050	14	5	0.050	60	20
0.075	15	5	0.075	17	6	0.075	82	28
0.100	17	6	0.100	22	7	0.100	102	35
0.125	20	7	0.125	27	9	0.125	125	42
0.150	21	7	0.150	30	10	0.150	143	48
0.175	22	7	0.175	34	12	0.175	160	54
0.200	24	8	0.200	37	13	0.200	178	60
0.225	25	8	0.225	39	13	0.225	196	66
0.250	25	8	0.250	40	14	0.250	206	70
0.275	26	9	0.275	44	15	0.275	223	75
0.300	27	9	0.300	47	16	0.300	238	81
0.325	28	9	0.325	49	17	0.325	248	84
0.350	29	10	0.350	50	17	0.350	261	88
0.375	30	10	0.375	52	18	0.375	274	93
0.400	32	11	0.400	54	18	0.400	286	97
0.425	33	11	0.425	55	19	0.425	294	99
0.450	34	12	0.450	59	20	0.450	306	104
0.500	36	12	0.500	62	21	0.500	324	110

Corrected CBR @ 0.1"		
0.6	0.7	3.5
Corrected CBR @ 0.2"		
0.5	0.8	4.0

Penetration Distance Correction (in)		
0.000	0.000	0.000

Figure: _____

APPENDIX D
ESAL Calculations

Given: (from City of GJ)

2018 ADT ≈ 20,000

1% Growth

Assumptions:

8% of vehicles are trucks

90% of trucks are single-unit

10% of trucks are combination

20 year design life

Calculate ADT in 2038

$ADT_{2038} = (20{,}000)(1.01)^{20} =$

Calculate ADT at midpoint

$ADT = (20{,}000 + 24{,}404)/2 = 22{,}202$

Calculate breakdown of vehicles and multiply by equivalency factors

Automobiles $= (22{,}202)(0.92)(0.003) \approx 62$

Single Unit $= (22{,}202)(0.08)(0.9)(0.249) \approx 398$

Combination $= (22{,}202)(0.08)(0.1)(1.067) \approx 193$

653

Calculate flexible pavement ESAL's

$ESAL's = (653)(365\ days/yr)(20\ yr)(0.45) = 2{,}145{,}105$ ←

↑ 2 lanes each direction