

# Ouray County, County Road 14 and Engineer Pass Improvements



Project Manual including:

## CONTRACT DOCUMENTS & SPECIFICATIONS

Date: September 4, 2020

Prepared by  
SEH  
934 Main Ave. Unit C  
Durango, CO 81301



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## REQUEST FOR PROPOSAL INFORMATION

Proposals will be received by Ouray County, (herein called the “County”) until Tuesday, September 29, 2020 at 3:00 p.m. Proposals must be mailed or hand delivered to the Ouray County Administrator at P.O. Box C, 541 4<sup>th</sup> Street, Ouray, CO 81427. Late proposals will not be considered and will be returned unopened.

A mandatory pre-proposal walk-through will be conducted at the site on Tuesday, September 8, 2020 at 10:00 am. Although non-mandatory, attendance was strongly encouraged. Contractors should meet for the sitewalk at Ouray County Road and Bridge, 111 Mall Road, Ridgway, CO.

All questions relating to the proposal must be submitted via e-mail to SEH by 5:00 pm Wednesday, September 23, 2020. Emailed questions will be accepted at [bfrownfelter@sehinc.com](mailto:bfrownfelter@sehinc.com) and cc'd to [cwilliams@ouraycountyco.gov](mailto:cwilliams@ouraycountyco.gov) . An addendum with answers, if required, will be available by 5:00 pm on Thursday, September 24th. If an addendum is issued the contractor **must acknowledge receipt of any and all addenda on the proposal form in order to submit a qualifying proposal.**

Proposals will be opened by the Ouray County Administrator and the Ouray County Road and Bridge Superintendent by Wednesday, September 30, with results available to all contractors by 5:00 pm the following day. The proposal may be considered for award by the Board of County Commissioners on Tuesday October 6th at its regularly scheduled public meeting. The goal of the County is to have work begin this fall, although a decision to begin work early in the Spring of 2020 may be made based on contractor responses.

Each proposal must be submitted in a sealed envelope, addressed to Ouray County Administrator. Each sealed envelope containing a proposal must be plainly marked on the outside **“Ouray County, County Road 14 and Engineer Pass Improvements”** and the envelope should bear on the outside the name of the contractor and/or company, their address, and the bid opening date.

All proposals must be made on the required proposal form. All blank spaces for proposal prices must be filled in, in ink or typewritten, and the proposal form must be fully completed and executed when submitted. Only one copy of the proposal form is required. Any improperly completed proposal submittals will not be accepted.

Preference may be given to contractors with prior experience installing Gabion and/or Hilfiker retaining walls and specific references should be included to support such prior work and experience. Contractor may choose to bid any or all of the three alternates given in the Bid Schedule.

Security in the amount of not less than five percent (5%) of the total proposal must accompany each proposal. Bid security may be in the form of a bid bond or cashier's check. The County reserves the right to reject any and all proposals, to waive any informalities and minor

irregularities in proposals, and to accept the proposal deemed in the opinion of the County, to be the best overall value to the County. Any proposal may be withdrawn prior to the above scheduled date for the opening of proposals or authorized postponement thereof. Any proposal received after the time and date specified shall not be considered and will be returned unopened. No contractor may withdraw a proposal within 45 days after the actual date of the opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period; the time may be extended by mutual agreement between the County and the Contractor.

Contractors must satisfy themselves as to the accuracy of the estimated quantities in the Proposal Schedule by examination of the site and review of the drawings and specifications including Addenda. After proposals have been submitted, the Contractor shall not assert that there was a misunderstanding concerning the quantities of work or the nature of the work to be done.

The Proposal Documents and any Addenda issued contain the provisions required for the construction of the Project. Information otherwise obtained from an officer, agent or employee of the County, or any other person shall not affect the risks or obligations assumed by the Contractor or relieve the contractor from fulfilling any of the conditions of the contract.

Successful Contractor will be required to execute the Agreement within seven (7) calendar days from the date when Notice of Award is delivered to the Contractor. The Notice of Award shall be accompanied by the necessary Agreement and any additional forms. In case the Contractor fails to execute the Agreement, the County reserves the right to exercise its option to consider the Contractor in default, in which case, another Contractor may be awarded the project.

Upon receipt of acceptable proof of insurance, W-9, any other required documents, and an Agreement signed by the Contractor to whom the Agreement was awarded, the County shall sign the agreement and return successful contractor an executed duplicate of the Agreement.

The County shall issue the Notice to Proceed within seven (7) calendar days of the execution of the Agreement. Should there be reasons why the Notice to Proceed cannot be issued within such period; the time may be extended by mutual agreement between the County and Contractor. .

The County reserves the right to reject any or all proposal and to waive informalities when such action is deemed to be in the best interest of the County.

A conditional or incomplete proposal may be cause for rejection. All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Projects, shall apply to the Contract throughout.

Each Bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to his Bid.

## PROPOSAL FORM

Proposal of \_\_\_\_\_ (hereinafter called "Contractor"), organized and existing under the laws of the State of Colorado, doing business as \_\_\_\_\_\* (Corporation, Limited Liability Company, Partnership, Joint Venture, or Sole Proprietor) to Ouray County (hereinafter called "County").

Contractor acknowledges receipt of any and all addenda, nos. \_\_\_\_\_ through \_\_\_\_\_:

\_\_\_\_\_  
Contractor Representative                      Date

The Contractor hereby proposes to perform all work for the “**Ouray County, County Road 14 and Engineer Pass Improvements**” in strict accordance with the Proposal Documents, within the time set forth therein, and at the prices stated below.

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

Contractor hereby agrees to commence work under this contract on or before a date to be specified in the Notice to Proceed.

The foregoing price shall include all labor, materials, transportation, shoring, removal, dewatering, overhead, profit, insurance, etc. to cover the complete Work in place of the several kinds called for.

Contractor acknowledges that the County has the right to delete items in the proposal or change quantities at its sole discretion without affecting the Agreement or prices of any item so long as any change does not exceed a thirty percent (30%) decrease or increase of the line item quantities.

Contractor agrees to perform all work described in the Proposal Documents and as itemized in the Bid Schedule for the following price:

**Proposal Totals from Bid Schedule:**

**County Road 14 Improvements – Alt. #1 Gabion Walls** \_\_\_\_\_

**County Road 14 Improvements – Alt. #2 Hilfiker Walls** \_\_\_\_\_

**County Road 18 Improvements – Eng Pass - Hilfiker Walls** \_\_\_\_\_

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

**NOTARY:**

(SEAL) - If proposal is by a Corporation

**ATTEST:**

\_\_\_\_\_

Name: \_\_\_\_\_

(Please Type)

Title: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

(Please Type)

Telephone: \_\_\_\_\_

Title: \_\_\_\_\_

**BID SCHEDULE**  
**Ouray County**  
**County Road 14 and Engineer Pass Improvements**  
**Request for Proposals**  
 Tuesday, September 29, 2020

<b>County Road 14 Improvements - Alt #1 Gabion Walls</b>					
<b>Item</b>	<b>Item Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Total Cost</b>
101	Mobilization	LS	1		
102	Construction Surveying and staking	LS	1		
103	Erosion Control/Stormwater Management	LS	1		
104	Traffic Control	LS	1		
201a	Gabion Wall Placement - Location #1 (furthest northwest) 35ft long	SF	350		
201b	Gabion Wall Placement - Location #1 (middle) 30ft long X 10ft high	SF	300		
201c	Gabion Wall Placement - Location #1 (furthest southeast) 80ft long	SF	800		
501a	Other (describe)				
501b	Other (describe)				
<b>County Road 14 Alt #1 (Gabions) Total Cost</b>					
<b>County Road 14 Improvements - Alt #2 Hilfiker Walls</b>					
<b>Item</b>	<b>Item Description</b>	<b>Unit</b>	<b>Quantity</b>		
101	Mobilization	LS	1		
102	Construction Surveying and staking	LS	1		
103	Erosion Control/Stormwater Management	LS	1		
104	Traffic Control	LS	1		
202a	Hilfiker Wall Placement - Location #1 (furthest northwest) 35ft long	SF	350		
202b	Hilfiker Wall Placement - Location #1 (furthest northwest) 35ft long	SF	300		
202c	Hilfiker Wall Placement - Location #1 (furthest southeast) 80ft long	SF	800		
501a	Other (describe)				
501b	Other (describe)				
<b>County Road 14 Alt #2 (Hilfiker) Total Cost</b>					
<b>County Road 18 Improvements - Engineer Pass - Hilfiker Walls</b>					
<b>Item</b>	<b>Item Description</b>	<b>Unit</b>	<b>Quantity</b>		
101	Mobilization	LS	1		
102	Construction Surveying and staking	LS	1		
103	Erosion Control/Stormwater Management	LS	1		
104	Traffic Control	LS	1		
202d	Hilfiker Wall Placement (Mickey Breen Mine) 30ft long X 10 feet high	SF	300		
203	Hilfiker Wall pipe penetration	EACH	1		
204	Hilfiker Wall Rock Anchorage	EACH	20		
205	Additional for Contractor supplied wall material	Tons	2100		
301	Existing 18 inch culvert removal	LS	300		
302	Installation of 30 inch SLCPP	LF	50		
303	Rock excavation/blasting	CY	15		
501a	Other (describe)				
501b	Other (describe)				
<b>County Road 18 - Engineer Pass (Hilfiker) Total Cost</b>					

## STATEMENT OF BIDDERS QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder: \_\_\_\_\_
2. Permanent main office address: \_\_\_\_\_
3. When organized: \_\_\_\_\_
4. If a corporation, where incorporated: \_\_\_\_\_
5. How many years have you been engaged in the contracting business under your present firm or trade name? \_\_\_\_\_
6. Contracts on hand: (Schedule these, showing the amount of each contract and the appropriate anticipated dates of completion.)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
7. General character of Work performed by your company:  
\_\_\_\_\_  
\_\_\_\_\_
8. Have you ever failed to complete any Work awarded to you? \_\_\_\_\_  
If so, where and why? \_\_\_\_\_
9. Have you ever defaulted on a contract? \_\_\_\_\_  
If so where and why? \_\_\_\_\_
10. List the similar scale projects recently completed by your company, stating the approximate cost of each, and the month and year completed, location, and type of construction.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
11. List your major equipment available for this contract.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Experience in construction work similar in scope to this project (particularly Gabion and/or Hilfiker retaining walls).

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13. Background and experience of the principal members of your organization, including officers:

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14. Credit available: \$ \_\_\_\_\_

15. Bank reference: \_\_\_\_\_

16. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the OWNER? \_\_\_\_\_

17. Are you licensed as a General Contractor? \_\_\_\_\_  
If yes, in what city, county and state? \_\_\_\_\_

18. Do you anticipate subcontracting Work under this Contract? \_\_\_\_\_  
If yes, what percent of total contract? \_\_\_\_\_  
and to whom? \_\_\_\_\_  
\* See Section 00430 for Schedule Form of Subcontractors.

19. Are any lawsuits pending against you or your firm at this time? \_\_\_\_\_  
If yes, DETAIL

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20. What are the limits of your public liability? DETAIL

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What company? \_\_\_\_\_

21. What are your company's bonding limitations?

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22. The undersigned hereby authorizes and requests any person, firm or corporation to furnish any information requested by the OWNER in verification of the recital comprising this Statement of Bidder's Qualifications.

Dated at \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_.

\_\_\_\_\_  
Name of Bidder

By: \_\_\_\_\_

Title: \_\_\_\_\_

State of: \_\_\_\_\_

County of: \_\_\_\_\_

\_\_\_\_\_ being duly sworn

deposes and says that they are \_\_\_\_\_  
(Name of Organization)

of \_\_\_\_\_ and that the answers to the foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 2000.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Notary Public

My commission expires: \_\_\_\_\_



## NOTICE OF AWARD

\_\_\_\_\_, 2020

**Re: Ouray County, County Road 14 and Engineer Pass Improvements**

Dear Sir or Madam:

You are hereby notified that Ouray County has accepted your proposal for the above-referenced project in the amount of \$\_\_\_\_\_.

Within seven (7) calendar days, you are required to provide the following items to Ouray County, P.O. Box C, 541 4<sup>th</sup> Street, Ouray, CO 81427.

- a. Executed Acceptance of Notice of Award (Page 2 of this Notice of Award);
- b. Executed Agreement/Contract (4 originals – must be notarized);
- c. Certificate of Insurance **NAMING** Ouray County **AS AN ADDITIONAL INSURED** and which contains a Notice of Cancellation clause which is absolute and does **not** contain language such as “endeavor to” notify or “failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives.” If standard certificate is used with such language crossed out, representative shall **initial and date said deletions**.
- d. Proof of Workers’ Compensation coverage;
- e. Payment and Performance Bonds, as included as an ADD ON to the Proposal;
- f. Completed W-9.

If you fail to return the above-described items within seven (7) calendar days, from the date of this Notice of Award, Ouray County will be entitled to consider all your rights arising out of the acceptance of your proposal as abandoned. Ouray County will be entitled to such other rights as may be granted by law.

Sincerely,

Ouray County

# ACCEPTANCE OF NOTICE OF AWARD

## Ouray County, County Road 14 and Engineer Pass Improvements

Receipt of the Notice of Award is hereby acknowledged on this \_\_\_\_ day of \_\_\_\_\_, 2020.

By:

Print \_\_\_\_\_

Signature \_\_\_\_\_

Title:

Print \_\_\_\_\_

Company:

Print \_\_\_\_\_

Please execute and return this form with the contract, Certificates of Insurance, bonds, and completed W-9 in one envelope to:

Ouray County  
County Administrator  
PO Box C  
541 4<sup>th</sup> Street  
Ouray, CO 81427

**COUNTY ROAD 14 AND ENGINEER PASS IMPROVEMENTS**  
**AGREEMENT**

THIS AGREEMENT, made this day of \_\_\_\_\_, 20\_\_ by and between the **Ouray County** with an address of **541 4<sup>th</sup> Street, P.O. Box C, Ouray, CO 81427** and Contractor Name with an address of \_\_\_\_\_ hereinafter called "Contractor".

WITNESSETH:

That for and in consideration of the payments and agreements hereinafter mentioned:

1. The Contractor will commence and complete **Ouray County, County Road 14 and Engineer Pass Improvements** to include those items listed in the Contractor's Proposal Package dated \_\_\_\_\_, 2020. The Contractor will furnish all of the materials, supplies, tools, equipment, labor and other services necessary for the construction and completion of the Project described herein.
3. The Contractor will commence the work required by the Contract Documents within the required time period as provided in the Request for Proposal Information, and will complete the work within a time period as provided for on the Request for Proposal Form.
4. The Contractor agrees to perform all the Work described in the Contract Documents and comply with the terms therein for the sum of \_\_\_\_\_, as shown on the Proposal Form and within the Bid Schedule. The parties understand that the sum set forth in the Proposal Form/Bid Schedule is a maximum price, subject to change orders as set forth herein.
5. The term "Contract Documents" means and includes the following:
  - (A) Request for Proposal
  - (B) Request for Proposal Information
  - (C) Proposal Form
  - (D) Bid Schedule
  - (E) Statement of Qualifications
  - (F) Schedule of Major Subcontractors
  - (G) Notice of Award

- (F) Acceptance of Notice of Award
- (G) Agreement
- (H) Notice to Proceed
- (I) Lien Release Forms
- (J) Change Orders
- (K) General Conditions
- (L) Special Provisions
- (M) Standard Specifications
- (N) Construction Drawings
- (O) Addenda

All of the referenced documents are included in this Agreement and are as fully a part of the Agreement as if repeated herein. This Agreement represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral.

- 6. Ouray County certifies that funds have been appropriated and will pay to the Contractor in the manner and at such time as set forth in the General Conditions and Special Conditions such amounts as required by the Contract Documents.
- 7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors and assigns.
- 8. All notices, consents and communications required under the Contract Documents shall be in writing and shall be deemed effective when hand delivered or when sent by certified mail, return receipt requested and correctly addressed as follows:

**Ouray County P.O. Box C, Ouray, Colorado 81427**

Contractor:

To be filled out at time of execution  
\_\_\_\_\_  
\_\_\_\_\_

- 9. The prevailing party in any action to interpret the terms of this Agreement or to enforce any of the rights, obligations or conditions of this Agreement shall

collect all reasonable costs and expenses incurred, including, but not limited to, reasonable attorney fees.

10. The parties agree that an Independent Contractor relationship is created by this Agreement. Ouray County is interested only in the results to be achieved and the conduct and control of the work will lie solely with the Contractor. Contractor and its employees are not to be considered agents or employees of Ouray County for any purpose, and it is specifically understood and agreed that the Contractor and its employees are not entitled to any of the benefits that the County provides for its employees. Therefore, it is agreed that none of the benefits provided by Ouray County to its employees, including, but not limited to, any federal or state withholding taxes, FICA, insurance in any form, retirement plans, worker's compensation, or unemployment compensation, are available from Ouray County to the Contractor under the terms of this Agreement.

11. This Agreement shall be interpreted in accordance with the laws of the State of Colorado. Any legal action brought by either party relating to this Agreement shall be brought in Ouray County District Court.

IN WITNESS WHEREOF, the parties hereto have executed or caused to be executed by their duly authorized officials, four (4) copies of this agreement, each of which shall be deemed an original on the date first above written.

**Ouray County**

By: \_\_\_\_\_

**Don Batchelder, Chair**

**Board of County Commissioners**

(SEAL)

ATTEST:

\_\_\_\_\_

Name: \_\_\_\_\_

(Please type)

Title: \_\_\_\_\_

Contractor :

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Title: \_\_\_\_\_

(SEAL)  
ATTEST:

\_\_\_\_\_

Name: \_\_\_\_\_  
(Please type)

Title: \_\_\_\_\_

**NOTICE TO PROCEED**

Date:

Re: **Ouray County, County Road 14 and Engineer Pass Improvements**

Dear:

The date of Notice to Proceed for the above project is:

In accordance with the Agreement dated \_\_\_\_\_, 2020, you are hereby notified to commence work within seven (7) calendar days after the Notice to Proceed, hence on or before \_\_\_\_\_, 2020.

You are to complete the work within 45 days, plus a five calendar day allowance for inclement weather if necessary, of Notice to Proceed.

Cordially,

Ouray County

**ACCEPTANCE OF NOTICE TO PROCEED**

Receipt of the Notice to Proceed is hereby acknowledged on this \_\_\_\_\_ day of \_\_\_\_\_, 2020.

By \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Please complete and return this form within ten days to:

Ouray County Administrator  
Connie I. Hunt  
P.O. Box C  
541 4<sup>th</sup> Street  
Ouray, CO 81427

LIEN WAIVER RELEASE

TO: \_\_\_\_\_

FROM: \_\_\_\_\_

PROJECT: Ouray County County Road 14 and Engineer Pass Improvements

1. The CONTRACTOR acknowledges having received payment, except retainage from OURAY COUNTY for all work, labor, skill and material furnished, delivered and performed by the CONTRACTOR for OURAY COUNTY for anyone in the construction, design, improvement, alteration, addition or repair of the above described project.
2. In consideration of such payment and other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the CONTRACTOR voluntarily waives all rights, claims and liens, including but not limited to, mechanics liens, Miller Act claims (40 U.S.C.A. 270 a and b), stop notices, equitable liens and labor and material bond rights which the CONTRACTOR may now or may afterward have a claim or assert for all and any work, labor, skill or materials furnished, delivered or performed for the construction, design, improvement, alteration, addition or repair of the above described project, against OURAY COUNTY or its officers, agents, employees or assigns, against any fund of or in the possession or control of OURAY COUNTY, against the project or against all land and the buildings on and appurtenances to the land improved by the project.
3. The CONTRACTOR affirms that all work, labor and materials, furnished, delivered or performed to or for the construction, design, improvement, alteration, addition or repair of project were furnished, delivered or performed by the CONTRACTOR or its agents, employees, and servants, or by and through the CONTRACTOR by various subcontractors or material men or their agents, employees and servants and further affirms the same have been paid in full and have released in full any and all existing or possible future

mechanics liens or rights or claims against OURAY COUNTY or its officers, agents, employees or assigns arising out of the project.

- 4. The CONTRACTOR agrees to defend and hold harmless OURAY COUNTY, the lender, if any, and Surety on the project against and from any claim hereinafter made by the CONTRACTORS subcontractors, material men, employees, servants, agents or assigns out of the project for all loss, damage and costs, including reasonable attorneys fees, incurred as result of such claims.
- 5. The parties acknowledge that the description of the project set forth above constitutes an adequate description of the property and improvements to which this Lien Waiver Release pertains. It is further acknowledged that this Lien Waiver Release is for the benefit of and may be relied upon by OURAY COUNTY, the lender, if any, and Surety any labor and material bonds for the project.

Signed this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_\_

CONTRACTOR:

By: \_\_\_\_\_

Title: \_\_\_\_\_

ATTEST:

\_\_\_\_\_

STATE OF COLORADO

COUNTY OF OURAY

Subscribed and sworn before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by \_\_\_\_\_

Witness my hand and official seal.

My Commission Expires: \_\_\_\_\_

\_\_\_\_\_

Notary Public

# CHANGE ORDER

Project/Contract Name: **Ouray County, County Road 14 and Engineer Pass Improvements**

Direct Pay/Purchase Order #: \_\_\_\_\_ Acct. # \_\_\_\_\_

Department: Const. Management

Staff Contact: \_\_\_\_\_

Contractor Name: \_\_\_\_\_

Address: \_\_\_\_\_

Original Contract Date: \_\_\_\_\_

Change Order Number: \_\_\_\_\_

**THE CONTRACT SHALL BE MODIFIED AS FOLLOWS:**

JUSTIFICATION:

COST BREAKDOWN:

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The original Contract Sum was ..... \$  
Net change by previous Change Orders/Contract Modifications ..... \$  
Contract Sum prior to this Contract Modification ..... \$  
The Contract Sum will be  increased  decreased  unchanged by \$  
The new Contract Sum including this Contract Modification will be ..... \$  
The original completion date for the Contract was:  
The Contract Time will be  increased  decreased  remain the same  
The Date of Completion for the Contract therefore is \_\_\_\_\_.

By: \_\_\_\_\_ Date: \_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_

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**IS FUNDING APPROVED IN THE BUDGET?**  Yes  No (attach budget transfer form if necessary)

By: \_\_\_\_\_ Date: \_\_\_\_\_

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**IN WITNESS WHEREOF**, The Parties have executed this Change Order on \_\_\_\_\_.

**CONTRACTOR Signature:**

**OURAY COUNTY, Director of Procurement**

By: \_\_\_\_\_ By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Title: \_\_\_\_\_

# GENERAL CONDITIONS

## 001 ABBREVIATIONS AND DEFINITIONS

001.1 SCOPE: Many commonly used abbreviations appear in these specifications and the project drawings. These abbreviations normally require no explanation of definition beyond that contained in standard dictionaries and many technical handbooks.

Abbreviations of technical and construction terms used in these specifications and the project drawings are explained or defined in Section 001.2.

Technical and construction terms used in these specifications and the project drawings are defined in Section 001.3.

001.2 ABBREVIATIONS: Wherever the following abbreviations are used in these specifications, standard details or on the plans, they are to be construed the same as the respective expressions represented.

Abbreviations of technical or construction terms not defined herein shall be construed as defined in the most recent addition of CONSTRUCTION DICTIONARY, published by Greater Phoenix, Arizona Chapter #98 of the National Association of Women in Construction.

AASHTO	American Association of State Highway & Transportation Officials
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AGC	Associated General Contractors of America, Inc.
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
APA	American Plywood Association
APHA	American Public Health Association
APWA	American Public Works Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
AWSC	American Welding Society Code
AWWA	American Water Works Association
CDH	Colorado Department of Highways

## GENERAL CONDITIONS

IEEE	Institute of Electrical and Electronic Engineers
NBS	National Bureau of Standards
NCPI	National Clay Pipe Institute
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NIC	Not in Contract
SAE	Society of Automotive Engineers
USC&GS	United States Coast and Geodetic Survey
USGS	United States Geological Survey

001.3 DEFINITIONS: Technical and construction terms used in these specifications and the Project drawings shall have the meanings indicated, applicable to both the singular and plural thereof. The technical and construction terms that are not defined in this section shall have the meanings set forth in the most recent addition of GLOSSARY, WATER AND WASTEWATER CONTROL ENGINEERING, prepared by AIWA, AWWA and WPCE; or CONSTRUCTION DICTIONARY, published by Greater Phoenix, Arizona Chapter #98 of the National Association of Women in Construction.

### ADDENDA

Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Documents, Drawings and Specifications, by additions, deletions, clarifications or corrections.

### AGREEMENT OR CONTRACT

The formal or written agreement or contract executed by the authorized representatives of the County and the Contractor for the complete performance of the Project in accordance with the Contract Documents.

### AWARD

The formal action of the County in accepting a proposal.

### PROPOSAL

The offer or proposal submitted on the prescribed form setting forth the prices for the work to be performed.

## **GENERAL CONDITIONS**

### **CONTRACTOR**

Any qualified individual, firm partnership, corporation or combination thereof, acting directly or through a duly authorized agent submitting a proposal for the work.

### **BONDS**

Bid, Performance and Labor or Material Payment Bonds and other instruments of security furnished by the contractor and his surety in accordance with the contract documents.

### **CHANGE ORDER**

A written order to the contractor authorizing an addition, deletion or revision, in the work within the general scope of the contract documents, or authorizing an adjustment in the contract price or contract time.

### **CONTRACT DOCUMENTS**

All of the integral documents of the contract, including but not limited to, Advertisement for Request for Proposal, Request for Proposal Information for Contractors, Plans, Drawings, Construction Standards and Standard Details, Special Provisions, Proposal/Bid, Bid Bond, Agreement, Labor and Material Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Certificates of Insurance, Change Order and Addenda or documents incorporated by reference therein.

### **CONTRACT PRICE**

The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

### **CONTRACT TIME**

The number of calendar days stated in the Contract Documents for the completion of the work.

### **CONTRACTOR**

The individual firm, partnership, corporation or combination thereof with which the County has executed the agreement.

## **GENERAL CONDITIONS**

### **COUNTY (OWNER)**

The legal entity that has contracted for the performance of the work or for whom the work is being performed. For purposes of this project, Ouray County shall be the “County.”

### **DRAWINGS (PLANS)**

The part of the contract documents which show the characteristics and scope of the work to be performed and which have been prepared or approved by the engineer.

### **ENGINEER**

The person, firm or corporation named as such in the contract documents and licensed to perform such services in the State of Colorado. For purposes of this project, Russell Planning and Engineering, Inc. shall be the Engineer.

### **FIELD ORDER**

A written order effecting a change in the work not involving an adjustment in the contract price or an extension of the contract time, issued by the Engineer to the contractor during construction.

### **NOTICE OF AWARD**

The written notice of the acceptance of the bid from the County to the successful Contractor.

### **NOTICE TO PROCEED**

Written communication issued by the County to the contractor authorizing and directing him to proceed with the work and establishing the date of commencement of the work.

### **OWNER (COUNTY)**

A public or quasi-public body or authority, corporation, association, partnership or individual for whom the work is to be performed.

### **PROJECT**

The undertaking to be performed as provided in the Contract Documents.

### **RESIDENT PROJECT REPRESENTATIVE**

## **GENERAL CONDITIONS**

The authorized representative of the County who is assigned to the project site or any part thereof.

### **SHOP DRAWINGS**

All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the contractor, a subcontractor, manufacturer, supplier, or distributor, which illustrate how specific portions of the work shall be fabricated or installed.

### **SPECIAL PROVISIONS**

Provides a detailed description of each line item in the project schedule, and methods of measurement and payment for each line item.

### **SPECIFICATIONS (CONSTRUCTION STANDARDS)**

A part of the contract documents consisting of these General Conditions, special conditions and written descriptions of a technical nature relating to materials, equipment, construction systems, standards and workmanship.

### **SUBCONTRACTOR**

An individual firm or corporation having a direct contact with the contractor or with any other subcontractor for the performance of a part of the work at the site.

### **SUBSTANTIAL COMPLETION**

The date as certified by the engineer when the construction project or a specified part thereof is sufficiently completed, in accordance with the contract documents, so that the project or specified part can be utilized for the purposes for which it is intended.

### **SUPPLIER**

An individual, firm or corporation having a direct contract with the contractor or with any subcontractor for the manufacture or furnishing of any part of the supplies and/or materials to be used at or incorporated in part of the work at the site.

# GENERAL CONDITIONS

## WORK

All labor necessary to produce the construction required by the contract documents, and all materials and equipment incorporated in the project.

## WRITTEN NOTICE

Any written notice from one party of the agreement to any other party of the agreement relative to any part of the contract documents, which notice shall be deemed to have been properly served and delivered when posted by the sending party by Certified or Registered Mail to the receiving party at the receiving party's last given address or when delivered in person to the receiving party or to his or its authorized representative.

## 002 BIDDING REQUIREMENTS AND CONDITIONS

### 002.1 ELIGIBILITY AND PREFERENCE

The employment of contractors and subcontractors on this work shall be governed by these General Conditions and Specifications and any applicable provisions included in the Special Provisions.

### 002.2 CONTENTS OF PROPOSAL

The proposal document will state the location of the contemplated construction; give the description of the various quantities of work to be performed or materials to be furnished, and have a Project Schedule of pay items for which unit proposal prices are invited. The proposal documents shall also state the form and amount of the proposal guarantee, the time in which the work shall be completed and may include additional instructions not included in these specifications.

The Plans, Construction Standards, Standard Details, Special Provisions, and all supplementary documents are essential parts of the contract documents and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy or conflict, Plans shall govern over both Standard Details and Construction Standards. Special Provisions will govern over standard specifications, standard details and plans.

## **GENERAL CONDITIONS**

Each and every provision of law and clause required by law to be inserted in the Contract Documents shall be deemed to be inserted herein, and the Contract Documents shall be read and enforced as though they were included herein.

### **002.3 INTERPRETATION OF QUANTITIES IN PROPOSAL**

The quantities appearing in the proposal are approximate only and are to be used for the comparison of proposals. Payment to the contractor will be made only for the actual quantities of work performed and accepted, or for materials furnished in accordance with the Contract Documents at the unit proposal price.

Any or all items in the signed agreement may be increased by any amount or decreased not more than 30% at the discretion of the County without invalidating the unit price in any way. Changes greater than 30% shall be considered to be an alteration to the work and shall be paid for in accordance with the provisions of Section 009.4.

### **002.4 EXAMINATION OF PLANS, SPECIAL PROVISIONS AND SITE OF WORK**

The County shall prepare plans and special provisions in accordance with acceptable engineering standards, giving such direction as will enable the contractor to carry them out.

The Contractor shall examine the site of the proposed work and all documents pertaining to the work. It is mutually agreed that the submission of a proposal shall constitute an acknowledgement that the Contractor has made such examination and is familiar with the character, quality and quantity of the work to be performed and material to be furnished.

Logs of test holes, ground water levels and accompanying soil reports furnished by the County are furnished for their general information only. Field conditions so set forth shall not constitute a representation or warranty expressed or implied that such conditions are actually existent. Contractors shall make their own investigations and form their own estimates of the site conditions.

No complaint or claim that there was any misunderstanding as to the quantities, conditions or nature of the work will be entertained after submission of the proposal, except as set forth in Section 004.2.

### **002.5 PREPARATION OF PROPOSAL**

## GENERAL CONDITIONS

The Contractor shall submit his proposal on the forms provided by the County. The Contractor shall specify a unit proposal price for each pay item where units and approximate quantities are given.

The Contractor shall specify a lump sum price for each pay item where a lump sum price is requested by the County.

The total proposal will be obtained by adding the amount proposed on the individual pay items. All information shall be in ink or typewritten. In case of a conflict between unit prices and total prices, unit prices shall govern.

The following shall also become a part of the Contractor's proposal:

(A) Acknowledge receipt of an agreement that the proposal is based on the list addenda received with and/or after the receipt of the proposal documents.

(B) Complete all portions of the proposal documents relating to escalation terms and limits if defined in the Special Provisions.

(C) Contractors' signature(s) will be in ink; attested or witnessed as required by the Bid Form.

### 002.6 SUBCONTRACTORS' LIST

A list of Subcontractors shall be attached to the proposal. The Contractor shall submit this list showing each specialty Subcontractor to whom he proposed to subcontract any portion of the work.

### 002.7 IRREGULAR PROPOSALS

Proposals shall be considered irregular and may be rejected for any one of the following reasons:

(A) If the proposal is on a form other than that furnished by the County; or if the form is altered or any part thereof is detached.

(B) If there are unauthorized additions, statements, conditional or alternate proposals, or irregularities of any kind.

## GENERAL CONDITIONS

(C) If the Contractor adds any provisions reserving the right to accept or reject an award, or to enter into a Contract pursuant to an award.

(D) If the proposal does not contain a unit price for each pay item listed except in the case of authorized alternate pay items.

(E) If the Contractor fails to submit the List of Subcontractors.

(F) If more than one proposal for the same work is submitted by an individual, partnership or corporation under the same or different names.

(G) If there is evidence of collusion among Contractors or assistance from any officer of the County or of any department thereof.

### 002.8 BID BONDS

No proposal will be considered unless accompanied by Bid Bond or certified check in the form and amount stated in the Request for Proposal. The bond or certified check shall be made payable to and shall be acceptable to the County as a guarantee that the Contractor shall execute the contract documents upon award of the Contract.

### 002.9 SUBMISSION OF PROPOSAL

Each proposal must be submitted in a sealed envelope, addressed to Ouray County Administrator. Each sealed envelope containing a proposal must be plainly marked on the outside **“Ouray County, CR 17 Road Improvement Project”** and the envelope should bear on the outside the name of the Contractor or Company, their address, and the bid opening date.

Proposals received after the time and date specified will be returned, unopened, to the Contractor or Company.

### 002.10 WITHDRAWAL OR REVISION OF PROPOSAL

Any Contractor may withdraw or revise a proposal after it has been deposited with the County, provided his request is received by the County, in writing, before the time specified for opening proposals as stipulated herein.

### 002.11 PUBLIC OPENING OF PROPOSALS

## GENERAL CONDITIONS

Proposals will be opened as described in the Request for Proposal Information.

### 003 AWARD AND EXECUTION OF CONTRACT

#### 003.1 CONSIDERATION OF PROPOSALS

All proposals received shall be as provided for in the Request for Proposal Information. After reading, the respective totals shall be checked and compared by the County. The accuracy of the total proposal shall be checked by verifying the extensions and additions. The Unit Proposal Price shall govern in all cases. The results of such comparison shall be considered public information. The right is reserved to award the Contract to the Contractor deemed, in the opinion of the County, to be in the best interest of the County, or to reject all proposals and re-advertise for any reason the County determines.

Should all proposals be rejected, any and all subsequent changes, additions, addenda, or new sets of plans and Special Provisions shall be provided to all purchasers of the first issue of the plans and Special Provisions at no additional charge, except that out of town Contractors will pay shipping charges.

Ouray County reserves the right to accept or reject any or all proposals or any portions of a proposal, to waive informalities and has the right to disregard all non-conforming, non-responsive or conditional proposals when such action is deemed to be in the best interest of Ouray County. Selection is not based solely upon low quotation price, but on overall service, quality, and “best overall value” to Ouray County in accordance with the Ouray County Purchasing Policy. Successful company shall also be required to comply with all, local, State and Federal requirements related to the contract.

#### 003.2 RETURN OF PROPOSAL BONDS

If Bid Bonds are required for the project the Bid Bonds or certified checks submitted by Contractors shall be retained by the County until the Contract has been executed by all parties. Retained Bid Bonds or certified checks shall be returned to Contractors upon execution of the Agreement.

#### 003.2.1 BONDS AND RETAINAGE

## GENERAL CONDITIONS

A Penal (Payment) Bond / Performance Bond for 100% of the contract shall be obtained prior to the start of work naming Ouray County as the beneficiary of the Bond if the contractor does not complete the work. One bond will be sufficient for this requirement. A 10% retainage will be required until one-half of the work is completed. Thereafter, no additional retainage shall be held if, in the County's opinion, satisfactory progress is being made by Contractor on the Project. The retainage must be held until final payment procedures are followed. The terms of the Performance Bond shall be such that it will remain in effect for at least one year after final acceptance of the project and will be effective as a warranty bond during such period. If the terms of the Performance Bond are not such that it may be effective as a warranty bond, County may require a separate warranty bond at the completion of the project.

### 003.3 AWARD OF CONTRACT

The County shall award the Contract or all proposals will be rejected within 45 days after bid opening. The County's award of Contract shall be considered an acknowledgement that funding appropriations exist.

No proposal shall be withdrawn for a period of 45 days after opening without consent of the County.

The successful Contractor shall execute and deliver the prescribed Agreement to the County within 7 days after receipt of notice of award, provided that acceptance of the proposal is delivered to the Contractor within the time limit prescribed and prior to withdrawal of the proposal. Required Bonds shall be delivered with the executed Contract.

### 003.4 REVOCAION OF AWARD

The County reserves the right to revoke the Award at any time prior to execution of the Contract without liability to the County.

### 003.5 CONTRACTOR'S INSURANCE

(A) Insurance Requirements. The Contractor agrees to procure and maintain, at its own cost, a policy or policies of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by the Contractor pursuant to Section 007.15 of this Contract. Such insurance shall be in addition to any other insurance requirements imposed by this Contract or by law. The Contractor shall not be relieved

## GENERAL CONDITIONS

of any liability, claims, demands, or other obligations assumed pursuant to Section 007.15 of this Contract by reason of its failure to procure or maintain insurance, or by reason of its failure to procure or maintain insurance in sufficient amounts, durations, or types. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage.

(B) Terms of Insurance. Insurance required shall be obtained from companies qualified to do business in the State of Colorado with a general policyholder's financial rating of not less than "A" as set forth in the most current edition of "Best's Insurance Reports" and may provide for deductible amounts as Contractor may deem to be reasonable, but in no event greater than \$5,000.00. Contractor shall be solely responsible for any deductible losses under any policy required by this Section. No such policies shall be cancelled, terminated, or materially changed except after thirty (30) days' prior written notice to County. The insurance agent completing the certificate shall strike any statement on the certificates that describes the thirty-day prior written notice as being less than obligatory. The County reserves the right to request and receive a certified copy of any policy and endorsement thereto. Contractor shall not do nor permit to be done anything that shall invalidate the insurance policies referred to in this section and Contractor shall immediately advise County in writing if a reduction in coverage or other modification of the insurance coverage occurs. No additional insured endorsement to the policy required by this Section shall contain any exclusion for bodily injury or property damage arising from completed operations.

The policies described in Section (C) below shall be for the mutual and joint benefit and protection of Contractor and County. Such policies shall contain a provision that County, although named as an additional insured, shall nevertheless be entitled to recovery under such policy for any loss occasioned to it, its officers, servants, agents, citizens, and employees by reason of negligence or other liability of the Contractor. Such policy shall be written as a primary policy not contributing to and not in excess of coverage that County may carry.

(C) Policies Required. Contractor shall procure and maintain, and shall cause any subcontractor of the Contractor to procure and maintain, the minimum insurance coverages listed below.

- (1) Worker's Compensation insurance to cover obligations imposed by applicable laws for any employee engaged in the performance of work under this Contract, and

## GENERAL CONDITIONS

Employers' Liability insurance with minimum limits of FIVE HUNDRED THOUSAND DOLLARS (\$500,000) each accident, FIVE HUNDRED THOUSAND DOLLARS (\$500,000) disease - policy limit, and FIVE HUNDRED THOUSAND DOLLARS (\$500,000) disease - each employee. Evidence of qualified self-insured status may be substituted for the Worker's Compensation requirements of this paragraph. If the Contractor elects to provide coverage through self-insurance, the County may require financial statements to assure that the Contractor has sufficient financial capability, as determined by the County in its sole discretion, to underwrite such self-insurance. If the County determines that the Contractor's financial capabilities are insufficient, contractual insurance coverage shall be required of the Contractor.

(2) General Liability insurance with minimum combined single limits of ONE MILLION DOLLARS (\$1,000,000) each occurrence and ONE MILLION DOLLARS (\$1,000,000) aggregate. The policy shall be applicable to all premises and operations. The policy shall include coverage for bodily injury, broad form property damage (including completed operations), personal injury (including coverage for contractual and employee acts), blanket contractual, independent contracts, products, and completed operations. The policy shall include coverage for explosion, collapse, and underground hazards. The policy shall contain a severability of interest's provision. The limits of such insurance shall not, however, be a limit to the liability of the Contractor hereunder.

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

(D) Certificates Required. The Certificate of Insurance shall be provided to the County and completed by the Contractor's insurance agent as evidence that policies providing the required coverages, conditions, and minimum limits are in full force and effect, and shall be reviewed and approved by the County prior to commencement of any work under the Agreement. The certificate shall identify this contract and shall provide that the coverages afforded under the policies shall not be cancelled, terminated, or materially changed until at least 30 days prior written notice has been given to the

## GENERAL CONDITIONS

County. The completed certificate of insurance shall be sent to the Ouray County Administrator, P. O. Box C, 541 4<sup>th</sup> St. Ouray, CO 81427.

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

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

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

(H) Subcontractor Insurance. Contractor will ensure that the substance of these insurance requirements is inserted into all subcontracts and County shall hold Contractor responsible in the event any subcontractor fails to have adequate insurance as required herein.

(I) Variations. County reserves the right to approve variations in the above requirements upon request of Contractor if, in County's opinion, such variations do not substantially affect County's interests.

003.6

### EXECUTION AND APPROVAL OF CONTRACT

The Contractor shall execute and deliver the Agreement to the County within seven (7) calendar days following receipt of the Notice of Award from the County.

The County shall approve and execute the Agreement within seven (7) calendar days following receipt of signed Agreement and Certificates of Insurance.

## GENERAL CONDITIONS

No Contract shall be considered in effect until the Agreement has been fully executed by all parties concerned.

### 004 SCOPE OF WORK

#### 004.1 WORK TO BE DONE

The Contractor shall perform all work as may be necessary to complete the Contract in a satisfactory and acceptable manner in full compliance with the plans, specifications and terms of the Contract.

The Contractor shall furnish any and all labor, materials, equipment, transportation, utilities, services and facilities required to perform all work for the construction of the project within the time specified.

#### 004.2 ALTERATION OF WORK

The County may order changes within the scope of the work without invalidating the Contract. Such changes may be made without notice to the Surety and the Surety shall not be released therefrom. An increase or decrease in the unit cost or completion time requiring an equitable adjustment and a Change Order shall be authorized by the Engineer.

Payment for work occasioned by these changes shall be made in accordance with provisions of Section 009. Completion time adjustment required by these changes shall be made in accordance with the provisions of Section 008.

##### 004.2.1 SUBSURFACE CONDITIONS

004.2.1.1 The Contractor shall promptly notify the County or the Engineer in writing of any subsurface or latent physical condition at the site that differs materially from that indicated in the Contract Documents. Notification shall precede disturbing such conditions.

004.2.1.2 The Contractor shall promptly notify the County in writing of any unusual physical conditions at the site which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents. Notification shall precede disturbing such Conditions.

## GENERAL CONDITIONS

004.2.1.3 The County shall promptly investigate the conditions. An equitable adjustment shall be made and the Contract Documents modified by a Change Order should the investigation reveal that the conditions do differ materially and cause an increase or decrease in the cost or time required for performance of the work.

004.2.1.4 Adjustment in compensation because of a change or changes resulting from one or more of the conditions described shall be made in accordance with the provisions of Section 009. Adjustment in Contract time because of such change or changes shall be made in accordance with the provisions of Section 008.

### 004.3 EXTRA WORK

The Contractor shall perform unforeseen work, for which there is no unit price included in the Contract, whenever it is deemed necessary or desirable in order to fully complete the work as contemplated. Such work shall be governed by all applicable provisions of the Contract documents and payment shall be made in accordance with the provisions of Section 009.5, so long as such extra work has been approved as provided herein.

The Contractor may claim that instructions received involve extra work under the Contract. If so, he shall give the County written notice thereof within 48 hours after receipt of such instructions. In any event, written notice shall precede execution of any extra work, except in emergencies endangering life or property. No claim for payment shall be valid unless such written notice is given and approved in writing by the County or their representative.

### 004.4 CHANGES AT CONTRACTOR'S REQUEST

The Contractor may request changes in the plans or specifications which do not materially affect the work or the interests of the County. Requests shall be in writing and submitted to the County for approval and such requests may be granted in writing by County to facilitate the work. The County reserves the right to receive an equitable adjustment in the contract price or contract time for authorizing change.

### 004.5 MAINTENANCE OF TRAFFIC

## GENERAL CONDITIONS

The Contractor shall insure the only portion of the project being used by the public be maintained in such condition that vehicular and pedestrian traffic shall be adequately accommodated. He shall also provide and maintain safe temporary approaches, crossing and intersection with Agencies and facilities that provide emergency services to the public.

The Contractor shall not interfere with traffic on streets adjacent to off-street projects. Traffic upon street projects shall be maintained in accordance with the Special Provisions. Detours to by-pass traffic shall be used only after approval by the County.

### 004.6 CLEAN UP AND DUST CONTROL

Throughout all phases of construction, and until final acceptance of the project, the Contractor shall keep the work area clean and free from rubbish, excess materials and debris.

Failure of the Contractor to comply with the Engineer's cleanup orders may result in an order to suspend work until the condition is corrected. No additional compensation or time will be allowed as a result of such suspension.

The Contractor shall take whatever steps, procedures or means required to prevent abnormal dust conditions due to his construction operations. The dust control measures shall be maintained at all times, to the satisfaction of the Engineer.

### 004.7 FINAL CLEANING UP

All private or public property and grounds occupied by the Contractor in connection with the work shall be cleaned of all rubbish, excess materials, temporary structures and equipment, and, all parts of the work area shall be left in a condition acceptable to the County. Disturbed areas shall be reseeded per the Special Provisions.

### 005 CONTROL OF WORK

The Contractor will be held strictly to the intent of the Contract Documents in regard to the quality of materials, workmanship and execution of the work.

### 005.1 AUTHORITY AND RESPONSIBILITY OF THE ENGINEER

## GENERAL CONDITIONS

The Engineer shall be the County's representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and work performed. He shall interpret the intent of the Contract Documents in a fair and unbiased manner. The Engineer shall make visits to the site and determine if the work is proceeding in accordance with the Contract Documents.

The Engineer shall not be responsible for the construction means, controls, techniques, sequences, procedures or construction safety nor shall he direct the Contractor's operations in any manner.

The Contractor shall be furnished additional instructions and detail drawings, by the Engineer, as necessary to carry out the work required by the Contract Documents.

The additional drawings and instructions thus supplied shall become a part of the Contract Documents. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions.

The Engineer may suspend the work, wholly or in part, for any of the following reasons:

- (A) For such period of time deemed necessary due to unsuitable weather conditions.
- (B) Contractor's failure to perform according to the provisions of the Contract.
- (C) Contractor's failure to provide safe working conditions.
- (D) For reasons deemed to be in the public interest.

### 005.2 DRAWINGS AND SPECIFICATIONS

Drawings will show details of all structures, utilities, lines, elevations, grades, typical cross sections and location and design of all work.

The intent of the specifications and drawings is that the Contractor shall furnish all labor, materials, tools, equipment and transportation necessary for the proper execution of the work in accordance with the Contract Documents and all incidental work necessary to complete the project in an acceptable manner, ready for use, occupancy or operation by the County.

## GENERAL CONDITIONS

In case of conflict between the drawings and Specifications, the drawings shall govern. Figure dimensions on drawings shall govern over scale dimensions and detailed drawings shall govern over general drawings.

Discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings or Specifications shall be immediately reported, in writing, to the Engineer. The Engineer shall promptly correct such inconsistencies or ambiguities in writing. Any work performed by the Contractor after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's risk, until or unless authorized by the Engineer.

### 005.3 SHOP DRAWINGS

The Contractor shall provide shop drawings as may be necessary for the prosecution of the work as required by the Contract Documents. The engineer shall promptly review all shop drawings. The engineer's approval of any shop drawing shall not release the Contractor from responsibility for deviations from the Contract Documents. The approval of any shop drawing which substantially deviates from the requirements of the Contract Documents shall be evidenced by a Change Order.

When submitted for the Engineer's review, Shop Drawings shall bear the Contractor's certification that he has reviewed, checked, and approved the Shop Drawings and that they are in conformance with the requirements of the Contract Documents.

Portions of the work requiring a shop drawing or sample submission shall not begin until the shop drawing or submission has been approved by the Engineer. A copy of each approved shop drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

The number of copies of shop drawings required by the County will be six (6) unless otherwise specified in the special provisions. The cost of furnishing all shop drawings shall be considered as included in the amount bid for one or more of the pay items.

### 005.4 CONFORMITY WITH DRAWINGS AND SPECIFICATIONS

All work performed and all materials furnished shall comply with the lines, elevations, grades, cross sections, dimensions and material requirements, including tolerances, shown on the plans or indicated in the specifications.

## **GENERAL CONDITIONS**

Materials or finished products incorporated in the work that do not conform to the plans and specifications may be accepted and remain in place. However, the engineer shall determine if reasonably acceptable work has been produced or that the finished product substantially complies with the Contract Documents. Acceptance shall be documented by a Change Order providing for an appropriate adjustment in the Contract price.

### **005.5 COOPERATION OF CONTRACTOR**

The Contractor shall be supplied with two (2) sets of Contract Documents. The Contractor shall keep one set available at the work site at all times.

The Contractor shall have on the work site at all times his agent, a competent superintendent capable of reading and understanding the plans and specifications. The superintendent shall have full authority to stop or delay work as directed by the Engineer for testing or inspection or for any reason as specified in Section 005.1.

Emergencies may arise during the progress of the work which may require special effort or require extra shifts of men to continue the work beyond normal working hours. The Contractor shall be prepared to do all such work promptly in case of such emergencies arising. If such emergencies arise out of or as a result of any improper or negligent act or omission of the County, the Contractor shall not be paid for all of his work costs actually incurred in excess of normal working hours and normal equipment use.

### **005.6 COOPERATION WITH UTILITIES**

There will be no utility relocations necessary to complete this project.

### **005.7 SEPARATE CONTRACTS**

The County reserves the right to let other contracts in connection with this project. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work with his. If the proper execution or results of any part of the Contractor's work depends upon the work of any other Contractor, the Contractor shall inspect and promptly report to the engineer any defects in such work that render it unsuitable for such proper execution and results.

The County may perform additional work related to the project itself. The Contractor will afford the County reasonable opportunity for the introduction and storage of

## GENERAL CONDITIONS

materials and equipment and the execution of work, and shall properly coordinate his work with theirs.

The County will not honor any claim for extra compensation due to delays, extra work or extensions of time caused by any other contractors working within the limits of the same project.

Performance of additional work by other Contractors or the County that was not noted in the Contract Documents prior to the execution of the Contract shall be subject to written notice to the Contractor prior to starting any such additional work.

The Contractor shall give all utility companies, all pipeline owners and other parties affected the maximum notice possible when their underground or overhead services interfere with his work. The Contractor shall resolve all problems with the utility owners concerned.

### 005.8 SURVEYS

The engineer shall establish all base lines for locating the principal component parts of the work, together with a suitable number of bench marks adjacent to the work. The contractor shall develop and make all detail surveys needed for construction, such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.

The Contractor shall carefully preserve bench marks, reference points and stakes and in case of willful or careless destruction, shall be charged with the replacement expense.

### 005.9 INSPECTION OF WORK

Inspection of the work by the Engineer or his authorized representative shall not be considered as direct control of the work. The direct control of the work shall be the sole responsibility of the Contractor's supervisor.

All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.

The Contractor shall provide the testing and inspection services required by the Contract Documents and other such tests necessary to assure the quality of the work.

## GENERAL CONDITIONS

Any law, ordinance, rule, regulation or order of a public authority having jurisdiction may require inspections or tests by someone other than the Contractor. If so, the Contractor will give the Engineer timely notice of readiness for such inspections or tests. The Contractor will furnish the Engineer copies of certificates of inspection, testing or approval resulting from such inspections or tests.

Inspections, tests or approvals by the Engineer shall not relieve the Contractor from his obligations to perform the work in accordance with the requirements of the Contract Documents.

The Engineer and his representatives will at all times have access to the work.

Authorized representatives or agents of a participating local, federal or state agency shall be permitted to inspect the work. The Contractor will provide access to the work for inspection or testing thereof.

The Engineer may order that portions of the work be uncovered, exposed or made available for observation, inspection or testing. The Contractor shall provide all necessary labor, materials, tools and equipment to comply with the Engineer's order. If such portion of the work is determined to be defective, the Contractor shall bear all costs involved, including the cost of reconstruction. If such portion of the work is determined to be in substantial compliance with the Contract Documents, the Contractor shall be compensated in accordance with Section 009.5(B). The Contract time shall be extended in accordance with Section 008.6.

### 005.10 DUTIES OF INSPECTOR

Inspectors employed by the County will be authorized to inspect all work done and materials furnished. Such inspection may extend to all or any part of the work and the preparation, fabrication or manufacture of the materials to be used.

The inspector will not be authorized to alter or waive the provisions of the Contract. The inspector will not be authorized to issue instructions contrary to the plans and specifications or to act as foreman for the Contractor.

The inspector will have authority to suspend acceptance of work or materials until any disagreement between the Contractor and the inspector can be referred to and decided upon by the Engineer.

## **GENERAL CONDITIONS**

### **005.11 REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK**

The Contractor shall remove from the premises all work rejected by the Engineer for failure to comply with the Contract Documents, whether incorporated in the construction or not. The Contractor shall promptly replace or re-execute the work in accordance with the Contract Documents and without expense to the County. The Contractor shall also bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

All removal and replacement work shall be done at the Contractor's expense within the Contract period.

No work shall be done without lines and grades having been given by the Engineer. Work done contrary to the instructions of the Engineer, work done beyond the lines shown on the plans, or any extra work done without authority, will be considered as unauthorized work to be removed and to deduct the costs for any monies due or to become due the Contractor.

### **005.12 MAINTENANCE OF PUBLIC ROADWAYS DURING CONSTRUCTION**

The Contractor shall maintain the work during construction and until the project is accepted. This maintenance shall require continuous and effective work prosecuted day by day, with adequate equipment and forces so that the roadway or structures are kept in satisfactory condition at all times.

The Contractor shall maintain the previous course or subgrade during all construction operations, except in areas as otherwise shown on the Construction Drawings. All cost of maintenance work during construction and before the project is accepted shall be included in the unit bid price on the various pay items.

### **005.13 FAILURE TO MAINTAIN PUBLIC ROADWAY OR STRUCTURE**

If the contractor fails to perform maintenance during construction, the Engineer will immediately notify the Contractor of such noncompliance. If the Contractor fails to comply within 24 hours after receipt of such notice the Engineer may immediately proceed to maintain the project at the expense of the Contractor. The entire cost of this maintenance will be deducted from monies due to the Contractor on this or other contracts with the County.

## GENERAL CONDITIONS

### 005.14 PARTIAL USE OR OCCUPANCY

Should an urgent or unforeseen need occur, the Contractor agrees to let the County use or occupy a unit or portion of the project, such as a structure, utility service or a section of road or pavement prior to final acceptance.

The County will prepare a written agreement with the Contractor and accomplish a partial acceptance inspection. The written agreement will include a revised construction schedule; responsibilities for maintenance of the portion of the project partially accepted and continued construction of the original project to final acceptance, payments, and insurance and bond requirements.

### 005.15 ACCEPTANCE

(A) PARTIAL ACCEPTANCE: During the prosecution of the project, the Contractor may substantially complete a unit or portion of the Project. The Contractor may request the Engineer to make final inspection of that portion of the work. If the Engineer finds, upon inspection, that the work has been satisfactorily completed in compliance with the Contract, he shall accept the work as being completed and the Contractor shall be relieved of further responsibility for that work. Such partial acceptance shall in no way void or alter terms of the Contract.

(B) FINAL ACCEPTANCE: Upon due notice from the Contractor of presumptive completion of the entire project, the Engineer shall make an inspection. If all construction provided for by the Contract is found completed, that inspection shall constitute the final inspection and the Engineer shall make the final acceptance. The Contractor shall be notified in writing of acceptance as of the date of the final inspection.

If the inspection discloses any work, in whole or in part, as being unsatisfactory, the Engineer shall give the Contractor the necessary instructions for correction of same, and the Contractor shall comply with and execute such instructions within the same contract period. Upon correction of the work, another inspection shall be made which shall constitute the final inspection provided the work has been completed. In such event, the Engineer shall make the final acceptance and notify the Contractor in writing of acceptance as of the date of the final inspection.

### 006 CONTROL OF MATERIALS

## GENERAL CONDITIONS

### 006.1 SOURCE OF MATERIALS AND QUALITY

All construction materials to be used on the work or incorporated into the work shall be subject to the inspection and approval or rejection of the Engineer.

The materials shall meet all quality requirements of these specifications. The Contractor shall notify the Engineer of his proposed source of materials prior to delivery. The Engineer may approve materials at the source of supply or point of manufacture prior to movement to the job site. Such approval does not waive the Engineer's right to inspect the materials at the job site or to reject materials that do not conform to specifications.

### 006.2 MATERIALS, SERVICES AND FACILITIES

The Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction and all other services and facilities necessary to execute, complete and deliver the work within the specified time.

Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as recommended by the manufacturer.

Materials, supplies and equipment shall be substantially equal to samples submitted by the Contractor and approved by the Engineer.

Materials, supplies or equipment to be incorporated into the work shall not be purchased by the Contractor or the Subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

### 006.3 SAMPLES AND TESTS OF MATERIALS

All materials to be incorporated into the work may be subject to sampling, testing and approval. Samples furnished shall be representative of the materials to be used. The Engineer may select samples, or may require that samples be delivered by the Contractor to a certified laboratory.

The procedures and methods used to sample and test materials will be determined by the Engineer. Unless otherwise specified samples and tests will be made in accordance

## GENERAL CONDITIONS

with the standard methods of Quality Standards which were in effect and published at the time of the Request for Proposal. Copies of tests accomplished by the County will be furnished the Contractor at his request.

The Engineer may permit the use of some manufactured materials prior to sampling and testing provided they are delivered with either a Certificate of Compliance or a Physical and Chemical Analysis conforming to Quality Standards requirements, stating that the materials comply with the requirements of the specifications. The certificates shall clearly identify each delivery of materials to the work area. The certificates shall be signed by a person having legal authority to bind the supplier or manufacturer. Copies of the certificate shall be delivered to the Engineer.

### 006.4 PLANT INSPECTION

The Engineer may authorize inspection of materials at the source, point of storage or point of manufacture. The following conditions shall apply in all cases:

(A) The Contractor shall submit a written request for the plant inspection. The request shall include a list of the materials to be inspected, detailed locations of inspection point and listing of responsible persons at location of inspection.

(B) The Contractor shall also insure that the Engineer shall have access to any part of the plant engaged in the manufacturing, production or assembly of the material to be inspected. Access shall be subject to normal work schedules, safety procedures and security of the plant.

Materials delivered to job site that have been damaged or altered subsequent to the plant inspection may be rejected by the Engineer.

### 006.5 TRADE NAMES AND SUBSTITUTIONS

Plans and specifications may contain references to equipment, materials or patented processes by manufacturer, trade name, make or catalog number. Such references shall be regarded as establishing a standard of quality, finish, appearance, performance or as indicating a selection based upon compatibility with existing equipment or materials. Such reference shall not be construed as limiting the selection to a specified item or source, unless specifically designated.

The use of an alternate item or source may be permitted, subject to the following:

## GENERAL CONDITIONS

(A) No consideration will be given a request for an alternate prior to bid opening.

(B) The Contractor may submit a written request for approval of an alternate item or source after Notification of Award of Contract. The request shall include all information necessary for evaluation of quality and suitability for purpose intended. The Contractor shall submit samples when required.

(C) The Engineer shall evaluate the information, perform tests when necessary and make a final decision as to the acceptability of the proposed alternatives. The Engineer shall give the Contractor written notification of his decision within 10 days after receipt of request.

### 006.6 PATENTS

The Contractor shall pay all applicable royalties and license fees. He shall defend all lawsuits or claims for infringement of any patent rights and save the County harmless from loss on account thereof. The County shall be responsible for any loss when a particular manufacturer or manufacturers is specified in the Contract documents.

### 006.7 STORAGE OF MATERIALS

The Contractor shall provide storage facilities and exercise such measures as will insure the preservation of the quality and fitness of all materials and/or equipment approved for storage. Stored items shall be located so as to facilitate their prompt inspection. Portions of the right-of-way easements not required for public travel may be used for storage purposes when approved by the Engineer. Any additional storage area required must be provided by the Contractor. Private property shall not be used for storage purposes without written permission of the owner or lessee. The Engineer may request copies of such written permission. All storage sites shall be restored to their original condition by the Contractor at his expense.

### 006.8 HANDLING MATERIALS

Materials and/or equipment shall be handled in such a manner as to preserve their quality and fitness for the work. Manufacturers' written requirements shall be followed if different than accepted local practice.

### 006.9 UNACCEPTABLE MATERIALS

## **GENERAL CONDITIONS**

All materials and/or equipment not conforming to the requirements of the specifications, in place or not, may be rejected. Rejected materials and/or equipment shall be removed immediately from the site of the work otherwise permitted by the Engineer. No rejected materials and/or equipment, the defects of which have been subsequently corrected, shall be used until approved in writing by the Engineer.

Materials which may have been rejected for failure to comply with accepted national standards on any other project shall not be incorporated into this project without written approval of the County.

### 006.10 COUNTY FURNISHED MATERIALS

Materials and/or equipment furnished by the County will be delivered to the Contractor as indicated in the Special Provisions. The cost of handling and placing shall be included in the appropriate Contract pay sum. The Contractor shall be held responsible for any shortages, deficiencies and damages which may occur after his acceptance.

### 007 LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

#### 007.1 PROTECTION OF WORK, PROPERTY AND PERSONS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. He shall take precautions necessary to provide for the safety of the employees on the work. He shall protect materials and equipment that are to be incorporated into the work. He shall provide protection to prevent damage to other property at or adjacent to the site. Property to be protected shall include pavements, roadways, structures, utilities, trees, lawns, shrubs and walks designated to be incorporated into the completed project.

The Contractor shall comply with all legally applicable laws, orders, ordinance, rules or regulations enacted by the public body having jurisdiction over the work. He will erect and maintain all necessary safeguards for safety and protection as required by the progress of the work. He shall notify owners of adjacent utilities at such time as progress of the work may directly affect them. The Contractor shall remedy all damage, injury or loss to any property caused directly, in whole or in part, by the Contractor, his Subcontractors, or anyone directly employed by any of them.

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The Contractor shall act promptly in emergencies to prevent threatened damage, injury or loss to the work or persons or property at, or immediately adjacent to the site. The Contractor is expected to act promptly and without special instruction or authorization from the County or Engineer. The Contractor shall submit prompt written notice to the Engineer defining significant changes to the work or to the Contract Documents that resulted from the emergency. The Engineer shall promptly issue a change order covering the changes and deviations involved.

### 007.2 SUPERVISION BY CONTRACTOR

The Contractor will supervise and direct the work. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction.

The Contractor shall give the work the constant attention necessary to facilitate the progress thereof, and shall cooperate with the Engineer, his inspectors and other Contractors in every way possible.

All phases of the Project such as concrete work, pipe work, etc. shall be under the direct supervision of a foreman or the superintendent's designated representative on the site who shall have authority to accept instructions with respect to that particular phase of the project, and take action required to properly carry out the work.

The Engineer may require the Contractor to stop work on a specific part of the project until the required supervision is present.

The Contractor shall file with the Engineer the names, addresses and telephone numbers of representatives who can be contacted at any time in case of emergency. These representatives must be fully authorized and equipped to correct unsafe or excessively inconvenient conditions on short notice.

### 007.3 PERMITS

Permits and licenses of a temporary nature and necessary for the prosecution of the work shall be secured and paid for by the Contractor unless otherwise stated in Special Provisions. Easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the County.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the

## GENERAL CONDITIONS

Contractor observes that the contract documents are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in Section 009.4.

The Contractor shall notify the appropriate permit agencies of actions undertaken as required by the permit.

### 007.5 ARCHAEOLOGICAL REQUIREMENTS

When the Contractor's excavating operations encounter remains of prehistoric people's dwelling sites or artifacts of historical or archaeological significance, the operations shall be temporarily discontinued. The Engineer will contact archaeological authorities to determine the disposition thereof. When directed, the contractor shall excavate the site in such manner as to preserve the artifacts encountered and shall remove them for delivery to the custody of the proper state authorities. Such excavation will be considered and paid for as extra work.

### 007.6 RESERVED -- ARCHAEOLOGICAL REPORTS

### 007.7 SAFETY, HEALTH AND SANITATION PROVISIONS

The Contractor shall provide and maintain neat, sanitary accommodations for his employees' use as may be necessary to comply with the requirements and regulations of the Colorado State Department of Health. Full use of the Contractor's accommodations shall be provided to the employees of the County or the Engineer who might be assigned to the project.

The Contractor shall provide all safeguards, safety devices and protective equipment and take any other actions reasonably necessary to protect the life and health of employees on the job, the safety of the public and to protect property in connection with the performance of the work covered by the Contract.

Precautions shall be exercised by the Contractor at all times for the protection of persons (including employees) and property. The Contractor shall comply with the provisions of all applicable laws pertaining to such protection, including all Federal and State occupational safety and health acts, standards and regulations promulgated thereunder.

### 007.8 PUBLIC CONVENIENCE AND SAFETY

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The Contractor shall at all times conduct his work so as to assure the least possible obstruction to traffic and adjacent residents. The safety and the protection of persons and property of the general public and residents along the street, highway and areas adjacent to the work shall be provided for by the Contractor as set forth in the Special Provisions related to Traffic Control.

### 007.9 BARRICADES AND WARNING SIGNS

As provided in the Special Provisions related to Traffic Control, the Contractor shall provide, erect and maintain all necessary barricades, sufficient lights, danger signals and other traffic control devices and shall take all necessary precautions for the protection of the work and safety of the public. Roads partially or fully closed to traffic shall be protected by effective barricades. Obstructions shall be illuminated during hours of darkness. Suitable warning signs shall be provided to properly control and direct traffic.

The Contractor shall erect warning signs in advance of any place where operations may interfere with the use of the road by traffic. Warning signs shall be placed at all intermediate points where the new work crosses or coincides with an existing road.

All barricades, lights, control devices, signs and warning devices shall conform in all respects to the provisions of the Manual on Uniform Traffic Control Devices for Streets and Highways, which is hereby made a part of these Specifications.

### 007.10 USE OF EXPLOSIVES

The use of explosives will be permitted only when authorized in writing by the Engineer and after the Contractor has obtained the necessary permit from the County.

The County reserves the right to order the discontinuance of blasting operations at any time.

Explosives shall be transported, stored, handled and used in accordance with the provisions and requirements of all applicable laws, ordinance and regulations. Work shall be done in accordance with the recommendations of the AGC Manual of Accident Prevention in Construction and Institute Makers of Explosives.

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The approval by the Engineer for the use of explosives shall not relieve the Contractor from his responsibilities. When explosives are used the Contractor will:

- (A) Exercise the utmost care not to endanger life or damage property.
- (B) Be responsible for any and all damages resulting from their use.
- (C) Furnish and erect special signs to warn the public of his blasting operations. They shall be located and maintained so as to be clearly evident to the public during all critical periods of blasting operations.
- (D) Notify each public utility company having structures adjacent to the work of his intention to use explosives. Such notice shall be given sufficiently in advance to enable the companies to advise the Contractor of any precautions that should be taken to protect their structures from damage.
- (E) Make a survey of adjacent properties, before commencing blasting operations, locating on drawings and by photographs all existing cracks and damages to structures. A copy shall be filed with the Engineer, including a report of any property owners who refused to cooperate and permit entry and inspection.

### 007.11 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE

The Contractor shall be responsible for the preservation of all public and private property within the limits of the work. He shall protect and prevent disturbance or damage to all land monuments and property marks until the Engineer has witnessed or otherwise referenced their location, nor shall he move them until directed.

Access to private property shall be maintained to minimize inconvenience to the property owner or lessee. The Contractor shall notify the property occupant 24 hours in advance of any construction across driveways and sidewalks shall be minimized by restoring serviceability as quickly as possible.

### 007.12 CONTRACTOR'S RESPONSIBILITY FOR WORK

The Contractor shall protect and take all necessary precautions against injury or damage to all finished or partially finished work, including protection against action of the elements or from any other cause until the entire project is completed and accepted by

## GENERAL CONDITIONS

the Engineer. Partial payment for completed portions of the work shall not release the Contractor from such responsibility.

The Contractor shall be responsible for the project in case the work is suspended. The Contractor shall take appropriate precautions to prevent or minimize damage to the project. Erection of temporary structures, signs or other facilities may be required to provide the necessary protection.

### 007.13 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES

The Contractor shall cooperate with the owners of underground or overhead utilities in order that the work may progress in a reasonable manner and that duplication of work may be minimized. The Contractor shall not commence work at points adjacent to the property, equipment or service facilities of utilities until arrangements for protection, removal or movement thereof have been made. The Contractor shall not undertake work adjacent to fire hydrants until the local fire authority has approved provisions for continued use and service.

The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any action, omission, neglect or misconduct in his manner or method of executing the work, or at any time due to defective work or materials, and said responsibility will not be released until the project shall have been completed and accepted.

The Contractor shall immediately notify the proper authority if any utility service is interrupted as a result of the Contractor's operations. The Contractor shall assist and cooperate with the utility in the restoration of the service.

Utility service interruptions caused by the Contractor's negligence, carelessness or failure to utilize the utility's capabilities in locating services shall be the sole responsibility of the Contractor. If water service is interrupted, repair work shall be continuous until the service is restored.

In case of utility service interruptions caused by the failure or refusal of the utility to identify and/or locate existing utilities, the Contractor shall immediately provide the Engineer written notification of the utility's non-cooperation and proceed only as instructed by the Engineer.

### 007.14 INDEMNIFICATION

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The Contractor agrees to indemnify and hold harmless the County, its officers, employees, insurers, and self-insurance pool, from and against all liability, claims, and demands, on account of injury, loss, or damage, including without limitation claims arising from bodily injury, personal injury, sickness, disease, death, property loss or damage, or any other loss of any kind whatsoever, which arise out of or are in any manner connected with this contract, if such injury, loss, or damage is caused in whole or in part by, or is claimed to be caused in whole or in part by, the act, omission, error, professional error, mistake, negligence, or other fault of the Contractor, any subcontractor of the Contractor, or any officer, employee, representative, or agent of the Contractor, or which arise out of any worker's compensation claim of any employee of the Contractor or of any employee of any subcontractor of the Contractor. The Contractor agrees to investigate, handle, respond to, and to provide defense for and defend against, any such liability, claims, or demands at the sole expense of the Contractor. The Contractor also agrees to bear all other costs and expenses related thereto, including court costs and attorney fees, whether or not any such liability, claims, or demands alleged are groundless, false, or fraudulent.

### 007.15 NO WAIVER OF LEGAL RIGHTS

The County will expeditiously make a final inspection and notify the Contractor of acceptance, upon completion of the work. Such final acceptance shall not preclude or prevent the County from correcting any measurement, estimate or certificate made before or after completion of the work. Nor shall the Contracting Agency be precluded or prevented from recovering from the Contractor, his surety, or both, any overpayment made or for a failure by the Contractor to fulfill his obligations under the Contract. A County waiver on a single part of the work shall not be deemed to be a waiver on any other part of the work.

The Contractor shall be liable to the County for any fraud or latent defects or gross mistakes as may amount to fraud and the County's rights under any warranty or guaranty.

### 008 COMMENCEMENT, PROSECUTION AND PROGRESS

#### 008.1 NOTICE TO PROCEED

Neither the Contractor nor any Subcontractor shall commence work on the project prior to receipt of the written Notice to Proceed issued by the County. The Contractor shall

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commence work as soon as practicable after the starting date specified in the Notice to Proceed. All work under the Contract shall be completed within the number of calendar days stated in the proposal, plus extensions stipulated in Change Orders, beginning with the day following the starting date specified in the Notice to Proceed.

The Contractor shall notify the Engineer 24 hours in advance of the time and place where work will begin. Two working days advance notice is required for surveying and staking.

### 008.2 SUBLETTING OR ASSIGNMENT OF CONTRACT

The Contractor shall not sublet, sell, transfer, assign or otherwise dispose of all or any part of the Contract or Contracts, or of his right, title or interest therein, without prior written consent of the County.

The Contractor may utilize the services of specialty Subcontractors on those parts of the work, which under normal contracting practices, are performed by specialty Subcontractors.

The Contractor shall not award work to Subcontractor(s), in excess of fifty (50) percent of the Contract Price, without prior written approval of the County.

The Contractor shall be fully responsible to the County for the acts and omissions of his Subcontractors, and of persons directly employed by them, as he is for the acts and omission of persons directly employed by him.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind Subcontractors to the Contractor by the terms of the Contract Documents and to give the Contractor the same power as regards terminating any subcontract that the County may exercise over the Contractor under any provision of the Contract Documents. All subcontracts shall be in writing.

Nothing contained in this Contract shall create any contractual relation between any Subcontractor and County.

### 008.3 SCHEDULES, REPORTS AND RECORDS

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The Contractor shall submit information on the work to be performed to the County relating to quantities, progress schedules, payrolls, reports, estimates, records and other data as are required by the Contract Documents.

Prior to the commencement of construction, the Contractor shall submit construction progress schedules showing the order in which he proposes to carry on the work.

The progress schedules shall include starting and completion dates of the various parts of this project.

The Special Provisions shall detail requirements for submission of schedules and reports relating to Special Detail Drawings, Shop Drawings, manufacturing schedules, testing and/or inspection of materials purchased for the project and any other specific schedule, report or record.

### 008.4 LIMITATION OF OPERATIONS

The Contractor shall not perform any work after regular working hours, on weekends or legal holidays without written permission from the Engineer, except for emergencies. The Contractor and the Engineer shall arrange for continuous or periodic inspection of the work, surveys and tests when such work is necessary.

The Engineer may require the Contractor to increase his operations to insure that the construction schedule is attained, should the rate of construction fall behind schedule. The Contractor may be required to increase personnel, shifts and/or overtime operations as well as quantity of equipment until such time as the work is back on schedule. Increased operations required shall be at the Contractor's expense unless such increased operations arise out of or are as a result of any improper or negligent act or omission of the County in which latter event, the Contractor shall be paid for all of his or its costs actually incurred in excess of normal working hours and normal equipment usage.

### 008.5 CHARACTER OF WORKMANSHIP: METHODS AND EQUIPMENT

The Contractor shall at all times employ sufficient labor and equipment, for prosecuting the work to full completion in the manner and time required by the Contract Documents.

All workers shall be competent and have sufficient skill, knowledge and experience their class of work and operation of equipment, to perform all work properly and satisfactorily.

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The Engineer may provide the Contractor a written opinion that a specific person or persons are not performing in a proper and skillful manner. Further, the Engineer may request that such person or persons be removed from the work by the Contractor or Subcontractor. The request may also require that persons so removed shall not again be employed in any portion of the work without written approval of the Engineer. The Contractor shall hold the County harmless from damages or claims for compensation that may occur in the enforcement of this paragraph.

Should the Contractor fail to remove such person as required above, or fail to furnish suitable and sufficient personnel for the proper prosecution of the work, the Engineer may suspend the work by written notice until such orders are complied with.

All equipment which is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the project shall be such that it will not damage property adjacent to the work area.

The Contractor shall be responsible for the construction means, methods, controls, techniques, scheduling, sequences, procedures, construction safety and operations throughout the term of the Contract. Should work so produced not conform to the Specifications, the Contractor shall remove the defective work and replace it with work of the specified quality or take such corrective action as approved by the Engineer. No change in basis of payment or Contract Time shall be authorized for defective work replaced or corrective work required.

When the Contract specifies that construction be performed by the use of certain methods and equipment, should work so provided not conform to the Specifications, the Contractor may be required to remove the defective work and replace it with work of the specified quality or take such corrective action as approved by the Engineer.

### 008.6 DETERMINATION AND EXTENSION OF CONTRACT TIME

The number of calendar days allowed for the completion of the work included in the Contract will be as stated in the Invitation for Contractors. The Contract time shall consist of the number of calendar days specified, including all weekends and legal holidays. All calendar days elapsing between the effective dates of any written notice from the Engineer to suspend work and to resume work following suspension shall be

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excluded. Completion date of the project shall be determined as the date of final inspection on which all deficiencies have been corrected.

The Contractor may submit a written request for an extension to the completion time. The request must set forth specific reasons or conditions beyond the control of or through no fault of the Contractor. The Engineer shall evaluate the request and may extend the time for completion as the conditions justify. If granted, the extended time for completion shall be in full effect the same as though it were the original time for completion.

### 008.7 WARRANTY

Contractor warrants and guarantees to County that, without exception, all work performed hereunder shall be in accordance with the Contract Documents and will not be defective. The Contractor shall warrant all work, materials and equipment furnished or installed, and work performed for a period of one (1) year from the date of final acceptance. The Contractor warrants that the completed system is free from all defects due to faulty materials or workmanship. The Contractor shall promptly make such corrections as may be necessary by reason of such defects, including the repair of any damage resulting from such defects. The County will give notice of observed defects with reasonable promptness. The Performance Bond shall remain in full force and effect through the warranty period.

Should any defects develop within one year from the date of final acceptance due to faults in workmanship or materials, the Contractor shall, within 14 calendar days of receipt of written notice from the County, begin making the necessary repairs to the satisfaction of the County and the County's Engineer. Such work shall include the repair or replacement of other work or materials damaged or affected by making the above repairs or corrective work, all at no additional cost to the County. If Contractor fails or refuses to perform such remedial repair work, or in an emergency where delay would cause serious risk of loss or damage, County may have the remedial work completed and all direct and indirect costs of such repair work, including costs of professional services, shall be paid by Contractor or a claim made on the applicable Bond to recover such costs.

In case of work, materials or equipment for which written warranties are required by the special provisions, the Contractor shall provide or secure from the appropriate Subcontractor or supplier such warranties addressed to and in favor of the County and deliver same to the Engineer prior to final acceptance of the work. Delivery of such

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warranties shall not relieve the Contractor from any obligation assumed under any other provisions of the Contract.

### 008.8 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

The date of beginning and the time for completion of the work are essential conditions of the Contract Documents and the work embraced shall be commenced on the date specified in the Notice to Proceed.

The Contractor will proceed with the work at such a rate or progress to insure substantial completion within 45 days of notice to proceed plus a 5 calendar day allowance for inclement weather, and final completion within 7 more days. Substantial completion is to include all items necessary to open the road to public traffic and to obtain final approval from Ouray County for all improvements.

It is expressly understood and agreed, by and between the Contractor and the County, that the contract time for the completion of the work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work.

Should the Contractor fail to complete the work within the Contract time, or extension of time granted by the County, the Contractor shall pay the County the amount of liquidated damages specified in the Bid or \$500 per day if not specified in the Bid for each calendar day the Contractor may be in default of the time stipulated in the Contract Documents.

008.8.1 The Contractor shall not be charged with liquidated damages provided the delay in completion of the work is due to the following and the Contractor has promptly given written notice of such delay to the County or Engineer.

(A) To any preference, priority or allocation order duly assigned by the County.

(B) To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, or of the public enemy, acts of omission of the County, floods, epidemics, quarantine restrictions, strikes, material or fuel shortages due to governmental regulations or allocations, freight embargoes and abnormal or unusually severe weather.

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Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time fixed for its completion may have been extended, will in no way operate as a waiver on the part of the County of any of its rights under the Contract.

### 008.9 SUSPENSION OF WORK, TERMINATION AND DELAY

008.9.1 The County may suspend all or any portion of the work for not more than 90 days by written notice to the Contractor. The notice shall include the date on which work shall be resumed, and the contractor, shall resume work on that date. The Contractor shall be allowed an increase in the Contract Price or an extension in time of completion, or both, directly attributable to any suspension.

008.9.2 The County may terminate the services of the Contractor, and take possession of the project and all materials, equipment, tools, construction equipment and machinery thereon that may be owned by the Contractor. The termination shall be effective ten days after the County has delivered written notice to the Contractor. The termination may be initiated for any of the following reasons and shall not prejudice any other right or remedy available to the County:

- (A) The Contractor is adjudged bankrupt or insolvent.
- (B) The Contractor makes a general assignment for the benefit of his creditors.
- (C) A trustee or receiver is appointed for the Contractor or for any of his property.
- (D) The Contractor files a petition to take advantage of any debtor's act or to reorganize under any bankruptcy law.
- (E) The Contractor repeatedly fails to supply sufficient skilled workmen, materials or equipment to maintain the construction schedule.
- (F) The Contractor repeatedly fails to make prompt payments to Subcontractors, or for labor, materials or equipment.
- (G) The Contractor disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the work.
- (H) The Contractor disregards the authority of the Engineer.
- (I) The Contractor violates any provision of the Contract Documents.

## **GENERAL CONDITIONS**

After termination notice is served, the County may proceed to finish the work by whatever method it deems most expedient.

The Contractor shall not be entitled to receive any payment from time of termination until the work is finished. All direct and indirect costs incurred in completing the project shall be assessed against the Contract Price and any unpaid balance shall be immediately paid to the County by the Contractor.

008.9.3 The County may elect to suspend or abandon the project and terminate the Contract. The action shall be effective ten days after the County has delivered written notice to the Contractor. This action may be initiated for any reason, without cause, and shall not prejudice any other right or remedy available to the County. The Contractor shall be paid for all work executed. No claim for loss of profits will be considered.

008.9.4 The Contractor may terminate the Contract for any of the following reasons. The termination shall be effective ten days after the Contractor has delivered written notice to the County.

(A) The County has suspended the work for more than 90 days for reasons other than weather conditions or winter shutdown.

(B) The work is suspended for more than 90 days under the order of the court or other public authority.

(C) The Engineer fails to act on any request for payment within 30 days after its submittal.

(D) The County fails to pay the Contractor within 30 days the sum approved by the Engineer or awarded by arbitrators.

The Contractor shall be entitled to payment for all work executed. The Contract will be terminated by the Contractor ten days after receipt of the Contractor's written notification.

### 009 MEASUREMENTS AND PAYMENTS

#### 009.1 MEASUREMENT OF QUANTITIES

## GENERAL CONDITIONS

Measurement for pay items in the Contract shall be defined in the applicable standards or in the Special Provisions.

All work completed under the Contract will be measured by the Engineer according to United States standard measures. The methods of measurement and computation to be used in determination of quantities of materials furnished and of work performed under the Contract will be those methods generally recognized as conforming to good engineering practice.

Longitudinal and transverse measurement for area computations will be made horizontally, and no deductions will be made for individual fixtures having an area of one square yard or less. The neat dimensions shown on the plans or ordered in writing by the Engineer shall be used for area computation.

The term "lump sum," when used as a pay item, will mean complete payment for the work described.

Sundry items which are incidental to or required in the construction of the work but are not included as items in the bid schedule shall be considered an integral part of the Contract, and all labor, materials, etc. required for such items shall be furnished by the Contractor and included in the appropriate unit price bid.

### 009.2 SCOPE OF PAYMENT

Payment for individual pay items in the Contract shall be as indicated in the Special Provisions.

Payment for the various items in the Contract shall be made at a unit price in the proposal. Payment shall be compensation in full for furnishing all labor, materials, equipment, and appurtenances necessary to complete the work as shown on the plans and as required in the Specifications. Each item, fixture, piece of equipment, etc., shall be complete with all necessary connections and appurtenances, for the satisfactory use and operation of said item. No additional payment will be made for work related to any item unless specifically called for in the Contract.

Payment may be specified to be made on the basis of weight. The weighing shall be done on certified platform scales sealed by the State Inspector. The Contractor shall furnish the Engineer with duplicate Weighmaster's Certificates showing the actual net weights. The County will accept the certificates as evidence of the weight delivered.

## GENERAL CONDITIONS

The Engineer and Contractor may agree to use a weight/volume factor in computing payment for materials to be measured by the cubic yard. An acceptable method of computing volumes of excavation is to determine a weight/volume factor and convert weights to volumes by means of the factor. The weight/volume factor shall be determined by Colorado Test Procedures CP22 or CP80 as described in the Colorado State Highway Division's Materials Manual. The number of tests used to determine the material weight/volume factor shall be determined by the Engineer. The locations where the tests are taken shall be those locations specified in the "Method of Measurement" for the particular unit proposal item, i.e., Unclassified Excavation - in its original position: Fill Construction - in its final compacted position, or as agreed upon by the Engineer and the Contractor.

### 009.3 ASSIGNMENTS

Neither the Contractor nor the County shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

### 009.4 COMPENSATION FOR ALTERATION OF WORK

When the total quantity of the original Contract or the total quantity of any item increases or decreases more than 30 percent, either party may require an adjustment in payment as follows:

(A) A quantity decrease in an item that is in excess of 30% of the quantity bid may require an adjustment when a reasonable cost analysis supports an increase in the unit cost of the fixed costs chargeable to that item.

(B) A quantity increase in an item that is in excess of 30% of the quantity bid may be considered and will apply only to that quantity in excess of 130% of the Bid schedule quantity. Adjustment shall be made when a reasonable cost analysis supports a change in the pro rata share of the fixed costs chargeable to that item. The Engineer reserves the right to require increases in excess of 130% of the bid schedule quantity to be performed on the basis of extra work.

Adjusted unit prices shall include fixed costs as determined above an allowance of 15% of the fixed costs to cover applicable overhead and profit. No claim shall be made by the Contractor for any loss of anticipated profits because of such alterations. No claim

## GENERAL CONDITIONS

shall be made for any variations between the approximate quantities and the quantities of work as completed.

### 009.5 EXTRA, ALTERED, OR FORCE ACCOUNT WORK

The value of Extra, Altered or Force Account work performed in accordance with the requirements and provisions of Section 004 shall be determined by the Engineer in one or more of the following ways:

(A) By unit Bid prices or lump sum, either as set forth in the original proposal or as agreed upon by both the Contractor and the Engineer and stipulated in the Change Orders authorizing the work. Should both parties fail to agree on a basis of payment, the Engineer may order the work done on an actual cost basis.

(B) By actual cost for which reimbursement will be based in the following manner:

(1) Labor. For all labor and foremen in direct charge of the specific operations, the contractor shall receive the rate of pay (or scale) agreed upon in writing before beginning work for each and every hour that said labor and foremen are actually engaged in such work.

An amount equal to 67% of the above rates will also be paid the Contractor to cover overhead, additional bond, property damage and liability insurance, workmen's compensation insurance premiums, unemployment insurance contributions and social security taxes.

In addition to the wage plus 67% of the wage, the actual amount of fringe benefits will be paid to the Contractor for those work classifications which carry fringe benefits resulting from collective bargaining agreements or as required by U.S. Department of Labor Wage Schedules. (Fringe benefits are those payments made by the Contractor to a third party or trustee to cover such things as, but not limited to health and welfare, pensions, vacations, apprenticeship programs and industry advancement funds). Also, the Contractor shall receive the actual costs paid to or in behalf of workmen by reason of subsistence and travel allowances which are the result of a collective bargaining agreement or other employment contract generally applicable to the classes of labor employed by the work. The 67% factor shall not apply to fringe benefits, subsistence and travel allowances paid to the workmen, to a third party, or to a trustee.

## GENERAL CONDITIONS

(2) Materials. For materials accepted by the Engineer and used, the Contractor shall receive the actual cost of such materials delivered on the Work, including transportation charges by him (excluding machinery rentals as hereinafter set forth), to which cost 15% will be added.

(3) When extra work on a force account basis is performed on the project by a Subcontractor or specialty firm including utilities and railroads, in accordance with the provisions, an extra work order on a percentage based on the following table will be allowed as additional to the total compensation due as calculated under this Subsection. This additional percentage is to reimburse the prime Contractor for the administrative expenses incurred in connection with the work. Bid items and any other work in the original Contract are not to be considered. Percentages allowed will be applied to each individual billing for extra work not to exceed one billing per month.

To \$1,000 .....	10%
Over \$1,000 to \$10,000 .....	\$100 plus 5% of excess over \$1,000
Over \$10,000.....	\$550 plus 3% of excess over \$10,000

Approval of this additional percentage will be made after certified invoices are furnished by the Contractor.

(4) Equipment. For use of equipment which has been authorized by the Engineer, the Contractor shall be paid in accordance with rental rates specified in the most current issue of the Colorado Department of Highways Construction Equipment Rental Rate Schedule or as agreed upon in writing before the work is commenced. Such rental rates shall exclude labor but shall include fuel and lubricants, to which will be added the cost of transporting such special equipment to the job site.

(5) Miscellaneous. Additional allowance will not be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.

(6) Compensation. The Contractor's representative and the Engineer shall compare records and agree upon the payment for work done as ordered on a force account basis.

## GENERAL CONDITIONS

(7) Statements. Payment will not be made for work performed until the Contractor has furnished the Engineer with an itemized statement of the cost of such Extra, Altered or Force Account Work.

Statements shall be accompanied and supported by certified invoices for all materials used. However, if materials used on the Extra, Altered or Force Account Work are not specifically purchased for such work but are taken from the Contractor's stock, then, in lieu of the invoices, the Contractor shall furnish a written statement certifying that such materials were taken from his stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

### 009.6 ELIMINATED ITEMS

Should any items contained in the proposal be found unnecessary for the proper completion of the work, the Engineer shall notify the Contractor in writing to eliminate the item. Such action will not invalidate the Contract. The Contractor, by Change Order, will be reimbursed for actual work done and all costs incurred, including mobilization of materials and equipment prior to the elimination of such items.

### 009.7 CHANGE ORDERS

The Contract Price may be changed only by a Change Order. The value of any work covered by a Change Order or of any claim for increase or decrease in the Contract Price shall be determined by one or more of the following methods in the order of precedence listed below:

- Unit prices previously approved.
- An agreed lump sum.
- The procedure set forth in Subsection 009.5.

A Change Order is a written instrument signed by the Contractor and the County stating their agreement of a change or adjustment in the scope of the project, contract price or date for completion. Prior to commencing work on any Change Order, the parties shall agree in writing on any adjustment of the contract price, if any. The Contractor shall not perform any changed work until it receives a signed, written change order from the County. Additional work performed by the Contractor without a written, signed change order shall not entitle the Contractor to any increase in the contract price or an extension

## GENERAL CONDITIONS

of the date of completion. If a change order is executed that increases the contract price, County shall also provide to Contractor, in writing, written assurance that a lawful appropriation of such additional sums is available to pay Contractor.

### 009.8 PAYMENTS TO THE CONTRACTOR

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

Prior to Substantial Completion, progress payments shall be made in the amount equal to the percentage given below, but in each case, less the aggregate of payments previously made and less such amounts as the Engineer shall determine, or the County may withhold, in accordance with section 9.9 below. The retainage shall equal ten percent (10%) of the Contract Price until the work has been fifty percent (50%) completed as determined by the Engineer. At this time, Engineer may decrease the retainage to five percent (5%) on the remaining fifty percent (50%) of the work. In this case, retainage will remain ten percent (10%) on the initial fifty percent (50%) of the work. The County will have the authority to retain ten percent (10%) of the Contract Price for the entire Contract period to ensure the subcontractors and suppliers have been paid in full. Ninety percent (90%) of the materials and equipment not incorporated in the work (but delivered and stored as described above) may be included in the Application for Payment.

The Contractor will indemnify and save the County, its agents and employees harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, suppliers and furnishers of machinery, parts, equipment, tools and all supplies incurred in the furtherance of the performance of the work. The Contractor shall, at the County's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged or waived. If the Contractor fails to

## GENERAL CONDITIONS

do so, the County may, after having notified the Contractor, either pay undisputed unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged, whereupon payment to the Contractor shall be resumed in accordance with the terms of the Contract Documents. In paying undisputed bills of the Contractor, any payment so made by the County shall be considered as payment made under the Contract Documents by the County to the Contractor and the County shall not be liable to the Contractor for any such payments made in good faith.

### 09.9 REVIEW OF PROGRESS PAYMENTS

Engineer will, within five (5) days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to County, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application. Thirty days after presentation of the Application for Payment to County with Engineer's recommendation, the amount recommended will (subject to the provisions of the last sentence of section 9.8) become due and when due will be paid by County to Contractor.

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

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

## GENERAL CONDITIONS

- The conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

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

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

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

- The Work is *defective*, or completed Work has been damaged requiring correction or replacement,
- the Contract Price has been reduced by Written Amendment or Change Order,
- County has been required to correct *defective* Work
- Engineer has actual knowledge of the occurrence of any violation by the Contractor of provisions of the Contract Documents or Laws and regulations of any government body that has jurisdiction.

County may refuse to make payment of the full amount recommended by Engineer because:

## GENERAL CONDITIONS

- Claims have been made against County on the account of Contractor's performance or furnishing of the Work,
- Liens have been filed in connection with the Work, except where contractor has delivered a specific Bond satisfactory to County to secure the satisfaction and discharge of such Liens,
- There are other items entitling County to a set-off against the amount recommended.

County must give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by County and Contractor, when Contractor corrects to County's satisfaction the reasons for such action.

### 09.10 FINAL INSPECTION, PAYMENT, AND RELEASE OF RETAINAGE

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

If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within five days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application to County for payment. At the same time Engineer will also give written notice to County and Contractor that the Work is acceptable subject to the provisions of paragraph 09.11. Otherwise, Engineer will return the Application to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary correction and resubmit the Application. Thirty Days after the presentation to County of the Application and accompanying documentation, in appropriate form and substance and with Engineer's recommendation and notice of acceptability, the amount recommended by Engineer will become due and will be paid by County to Contractor.

## GENERAL CONDITIONS

At the time of this final payment to the Contractor, all retainage shall be released by the County as a part of the final payment upon publication in the newspaper of record fourteen days after the publication date and subject to no claims or liens against the contractor by subcontractors, employees or vendors.

### 09.11 ACCEPTANCE OF FINAL PAYMENT AS RELEASE

The acceptance by the Contractor of final payment shall be and shall operate as a release to the County of all claims and all liability to the Contractor other than claims in stated amounts as may be specifically excepted by the Contractor for all things done or furnished in connection with this work and for every act and neglect of the County and others relating to or arising out of this work. Any payment, however, final or otherwise, shall not release the Contractor or his sureties from any obligations under the Contract Documents or the Performance Bond and Labor and Material Payment Bonds, as hereinabove more fully described.

**SPECIAL PROVISIONS**  
**Ouray County,**  
**County Road 14 and Engineer Pass Improvements**

**Project Description**

- A. **Scope:** The scope of work for this Project is limited to road improvement work on Ouray County Roads County Roads 14 and Engineer Pass (County Road 18).

The project consists of three parts:

**Part 1 is County Road 14 Bid Alternate #1** consists of installing Gabion walls in 3 locations with components as follows:

1. Excavation of material necessary to install Gabion walls in 3 locations as shown on the scheduled site walk.
2. Installation of gabions which are minimum 3 foot in width and 1, 1.5 or 3 foot in height.
3. Provision of all materials necessary to backfill the gabion walls and areas behind them. Backfill behind the walls may consist of native material compacted in place. Backfill within the gabions shall meet the requirements of the special provisions

**Part 2 is County Road 14 Bid Alternate #2** consists of installing Hilfiker walls in 3 locations with components as follows:

1. Excavation of material necessary to install Hilfiker walls in 3 locations as shown on the scheduled site walk.
2. Installation of Hilfiker shall be per the Hilfiker Standard Drawings included in this bid package. Provision of all materials necessary to backfill the Hilfiker walls and areas behind them. Backfill behind the walls may consist of native material compacted in place. Backfill within the Hilfikers shall meet the requirements in the Special Provisions and Section 300 of the specifications.

**Part 3 is County Road 18 (Engineer Pass)** consists of installing one hilfiker wall with components as follows:

1. Excavation of material necessary to install Gabion walls in 3 locations as shown on the scheduled site walk.
2. Installation of hilfiker wall per the plans included.
3. Provision of all materials necessary to backfill the hilfiker wall and areas behind it. Backfill behind the embedment area of the walls may consist of native material compacted in place. Backfill within the Hilfikers shall meet the requirements in the Special Provisions and Section 300 of the specifications.
3. Removal of an existing 18 inch culvert, and replacement with a 30 inch culvert.

**Note: The County will only award either Part 1 OR Part 2 but may include Part 3 with the same contractor. They reserve the right to only award one of the three schedules but may award either Part 1 OR Part 2, AND Part 3.**

**Contractors may bid any one or all of the Parts above.**

## SPECIAL PROVISIONS

### General Items

- A. SEH will be the Project Manager and main point of contact for this project, and will serve as Ouray County designee, Ouray County Road and Bridge Department designee, or County Representative in the contract documents. Designated members of the Ouray County Road and Bridge Department may also serve as inspectors on the project.
- B. Contractor shall provide the following submittals to the County for the project:
  - Hilfiker Materials List prior to order placement.
  - SLCPP Culverts Product Data
  - Grout Product Data for Wall Anchors
  - Weed Free Mulch
  - Rock Anchorage Bolts
  - Traffic Control Plan
- C. Cost for these, and any other required submittals shall be incidental to the proposal items they are associated with.

### Schedule

Contractor shall provide a rough schedule for the work with this proposal. Work on CR-14 shall be completed by November 15, 2020 unless the Contractor chooses to begin the work in spring in which case it will be completed by June 1, 2021.

For work on CR-18 Engineer Pass, it is desirable to complete the work in October. However, the County recognizes that high country weather conditions may make this difficult, so work may be completed in either October or May/June.

### Line Item Descriptions

#### 101. Mobilization –

**Description:** Includes all labor, materials, and equipment costs to mobilize for the project including such items as moving equipment, trucks, and personnel both to the site and off of the site upon completion of the work. All expenses for which there are no specific pay items such as permits, bonds, project coordination, materials and quality control testing coordination, storage of materials, removal and disposal of construction debris and temporary supplies, including power, telephone, and temporary offices necessary for the execution of the work, shall be included in this proposal item. All work and testing for the work shall conform to the Project's Standard Specifications. The staging area and surrounding disturbed areas are to be returned to their original condition. Selection and payment of a firm for materials and quality control testing shall be the responsibility of Ouray County.

**Pay Item:** Measurement and payment shall be on a lump sum basis based upon the percentage complete of items 200 through 500.

## SPECIAL PROVISIONS

### 102. Construction Staking/Surveying

**Description:** Includes all labor, materials, and equipment costs associated with layout for the walls guaranteeing that all walls are level.

**Pay Item:** Payment shall be based on the percentage completion of the entire job as determined by the total amount paid to date for all line items excluding items 200 through 501 divided by the total contract amount including change orders.

### 103. Erosion Control/Storm Water Management (pre-construction, during construction, and post-construction)

**Specifications:** Per CDOT Standards

**Description:** Includes all labor, materials, and equipment costs associated with standard methods of protection from erosion and stormwater management, particularly to properties below the CR-14 fill slope. Although the project should disturb less than an acre and a State of Colorado Department of Health and Environment (CDPHE) Stormwater Discharge Permit may not be required, the contractor will be expected to protect adjacent areas to the project site from erosion and deposition due to impacts of the project. Work shall include the cost of dust control, and watering.

The Contractor shall be responsible for monitoring net area impacted by the project and procuring any permits that become necessary.

The Contractor shall make every attempt to minimize the area of disturbance for the project. Revegetation work shall include the cost of loading, hauling, placing, compacting, soil preparation, including dicing, raking, spreading, and fine grading; furnishing and installation of seed and mulch materials; temporary protection by fencing or other means; watering and all other required maintenance until Final Acceptance of the work.

Straw in such advanced stages of decomposition as to smother or retard the normal growth of grass will not be accepted. Old dry straw, which breaks in the crimping process in lieu of bending will not be accepted.

Seed mix shall be provided by the County for application. Contractor shall supply straw for mulch.

Contractor shall, at all times, have materials for BMP's (erosion logs, silt fencing, etc.) on site and ready to use. Contractor is responsible for maintaining and repairing erosion control BMP's at his expense during construction.

Contractor shall be responsible for dust and mud control of his construction activity. During dry weather conditions, Contractor shall wet down his Work area and roads leading to Work area as needed to keep airborne dust generated by his activities to an absolute minimum. Vehicles leaving site shall take proper measures to clean excess mud from vehicle before entering improved street areas. Contractor shall clean mud and debris tracking off asphalt roads immediately.

## **SPECIAL PROVISIONS**

**Pay Item:** Payment shall be based on the percentage completion of the entire job as determined by the total amount paid to date for all line items excluding items 200 through 501 divided by the total contract amount including change orders.

### **104. Traffic Control**

**Specifications:** Per CDOT and MUTCD

**Description:** Includes all labor, materials, and equipment costs associated with all necessary traffic control for construction of the proposed improvements. Traffic control shall meet all Colorado Department of Transportation and the Manual of Uniform Traffic Control Devices requirements.

In addition to proper signage and barricades at the point of closure, partial barricades with closure information shall be placed at the closest 3 way road intersection to either end of the closure. Posted closure information at these points and at the barricades themselves shall include dates and approximate times of delay. Closures on CR-14 shall be limited to 20 minutes, and a minimum one-way 8-ft travel lane width shall be maintained. Work on Engineer Pass most likely will occur when through travel on the road is closed (late fall or early spring). When this is not feasible, contractor shall coordinate with the Ouray County Road and Bridge Department and shall advertise road closures as called for by the County. Contractor shall provide a detailed, written traffic control plan to the County for approval prior to start of work.

Ouray County shall be responsible for individual notifications of those who live along the closure route.

**Pay Item:** Payment shall be based on the percentage completion of the entire job as determined by the total amount paid to date for all line items excluding items 200 through 501 divided by the total contract amount including change orders.

### **201. Gabion Wall Placement**

**Specifications:** Per CDOT, Manufacturer's Specifications and Recommendations

**Description:** Includes all labor, materials, and equipment costs associated with the placement and fabrication of the Gabion Retaining Walls. For CR-14, contractor shall provide backfill meeting Gabion requirements and CDOT Specs (4-inch to 8-inch stone size). Gabion wall construction shall include hauling and placement of backfill stones.

Gabions are to be a minimum of 3-foot in width and either 1, 1.5, or 3 feet in height.

**Pay Item:** Measurement and payment shall be on a square foot basis (wall face area)

### **202. Hilfiker Wall Placement (Mickey Breen Mine)**

**Specifications:** Per CDOT, Manufacturer's Specifications and Recommendations

**Description:** Includes all labor, materials, and equipment costs associated with the placement and fabrication of the 10-foot high Hilfiker Retaining Walls as detailed in the Hilfiker Standard Drawing sheets. For CR-14 Hilfikers, contractor shall provide backfill

## SPECIAL PROVISIONS

meeting Hilfiker requirements (see below). For CR-14, backfill of the Hilfikers is included in the bid price.

For Engineer Pass, CR-18 Hilfikers, contractor shall provide backfill meeting Hilfiker requirements from materials at the site if possible. A separate pay item is provided if it is deemed necessary to haul in acceptable material to the site.

Generally backfill shall meet the following granular backfill materials specification, although the County realizes the need for flexibility at the Mickey Breen site:

Sieve Designation	Percent by Weight Passing Standard Sieves (AASHTO T27)
6 inches (152.4 mm)	100
3 inches (76.2 mm)	100-75
No. 200 (75 µm)	0-15*

**Pay Item:** Measurement and payment shall be on a square foot basis (wall face area)

### **203. Hilfiker Wall (Pipe Penetration)**

**Specifications:** Per CDOT

**Description:** Includes all labor, materials, and equipment costs associated with the modification of the Hilfiker Retaining Wall in order to accommodate a mat penetration, culvert, or to avoid an obstruction specified in the associated Engineering Plans.

**Pay Item:** Measurement and payment shall be on an each basis

### **204. Hilfiker Wall (Rock Anchorage)**

**Specifications:** Per CDOT

**Description:** Includes all labor, materials, and equipment costs associated with the fabrication, construction and installation of the Hilfiker Rock Anchor System in areas where recommended wall embedment is not possible. A Ouray County supplied Geotechnical Engineer will conduct a pull-out test of rock anchors to determine the competency of the rock in the vicinity of the cliff at the proposed structure site, in conjunction with Franklin Drilling or other approved testing company. Testing company will install three (3) test anchors in the rock at the proposed structure site. The rock anchor installation will be observed by Geotechnical Engineer and the anchor tensile tests will be observed after the anchor installation is complete.

**Pay Item:** Measurement and payment shall be on an each basis as measured in the field. Rock Anchorage Testing costs shall be paid by the County.

### **301. Existing 18 inch culvert removal**

**Specifications:** Per CDOT

**Description:** Includes all labor, materials, and equipment costs associated with the removal and legal disposal of existing drainage pipe. Where portions of structures are to be removed,

## **SPECIAL PROVISIONS**

the portions designated to remain shall be prepared to fit the new construction, and shall be protected from damage. All damage to structures designated to remain in place shall be repaired at the Contractor's expense. Materials removed shall become the property of the Contractor.

**Pay Item:** Measurement and payment shall be on an each basis.

### **302. Installation of 30 inch SLCPP**

**Specifications:** Per CDOT and Ouray County Road Standards

**Description:** Includes all labor, materials, and equipment costs associated with the installation of smooth-lined corrugated plastic pipe (SLCPP) per the construction drawings including excavation, rock excavation (blasting), the legal disposal of the excavated material, dewatering, coupling band, placement of the pipeline to grade, backfilling and compacting embankment to top of subgrade. Pipe material shall be ADS HP Storm Pipe or approved equal. All shipping, treatment, and installation of pipe shall be in accordance with manufacturer's specifications and recommendations. Price includes the cost of importing and placing bedding material supplied by the County. Compaction and testing shall comply with Section 200 of this Project Manual, Standard Specifications for Construction of Streets and Roads.

New pipe shall be laid at the maximum slope possible matching the upstream invert grade and matching grade of the bottom of the new hilfiker wall at the downhill end.

**Pay Item:** Measurement and payment shall be on a linear foot basis.

### **303. Rock Excavation/Blasting**

**Specifications:** Per CDOT

**Description:** Includes all labor, materials, and equipment costs associated with the removal of igneous, metamorphic and sedimentary rock which cannot be excavated with the use of a backhoe bucket alone and shall include all boulders or other detached stones having a volume of ½ cubic yard or more, as determined by physical or visual measurement. Payment for rock excavation shall be the beyond the payment for excavation included in the drainage pipe installation cost. All rock removal shall be documented and confirmed daily.

Excavated rock material shall be deposited on site in a location sdjacent to the excavation.

**Pay Item:** Measurement and payment shall be in cubic yard measured at the time of removal.

### **501. Other**

This line item should cover any costs which are not covered by the line items above. If the Bidder chooses to add costs to these line items, they should describe what the cost covers.

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STANDARD SPECIFICATIONS FOR CONSTRUCTION

WATER LINES, SANITARY SEWERS, AND STORM DRAINAGE FACILITIES

- 100.0 GENERAL: This project will utilize the following Standard Specifications for Construction along with selected Standard Specifications from the Colorado Department of Transportation. Any references to the City Engineer, Traffic Engineer, Engineer, etc. shall mean the County's representative or Engineer.
- 100.1 DESCRIPTION: These specifications include material specifications and construction requirements for underground water, sewer and drainage systems installed in Ouray County right-of-way including the county's jurisdiction or ownership.
- 100.2 SPECIFICATION MODIFICATIONS: Portions of these specifications may be modified or deleted by appropriate items in the Special Conditions or notes on the contract drawings. All modifications and deletions shall be approved by the Engineer.
- 100.3 REVISIONS OF STANDARDS: When reference is made to a Standard Specification (ASTM, AWWA, AASHTO, etc.), the specifications referred to shall be understood to mean the latest revision of said specification as amended at the time of the Request for Proposal.
- 100.4 PUBLIC SAFETY AND TRAFFIC ACCESS: The Contractor's operations shall cause no unnecessary inconvenience. The safety and access rights of the public shall be considered at all times.

Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time. If backfill has been completed to such an extent that safe access may be provided, and the street opened to local traffic, the Contractor shall immediately clear the street and driveways and provide and maintain access.

The Contractor shall cooperate with the various parties involved in the delivery of mail and the collection and removal of trash and garbage to maintain existing schedules for these services.

- 100.5 BARRICADES AND WARNING SIGNS: All signs, barricades, flagmen, lights and other devices necessary for the protection of work and safety of the public shall be the Contractor's responsibility. A traffic control plan shall be submitted and approved by the Traffic Engineer prior to beginning construction where any construction activity will involve the use of public right-of-way.
- 100.6 LOCATION AND PROTECTION OF UTILITIES: The locations of existing utilities shown on the construction drawings are approximate only. The Contractor shall be responsible for the exact locations and protection of all utilities encountered.

In the event of a break in an existing water main, gas main, sewer or underground cable, the Contractor shall immediately notify the responsible official of the organization operating the utility interrupted and shall lend all possible assistance in restoring services.

- 100.7 INTERRUPTION OF WATER SERVICE: The Contractor shall not discontinue water service to any residence, business or other occupied dwelling without notifying the organization operating the water line at least 24 hours in advance. The residents of all dwellings to which water service is temporarily discontinued shall be notified by the Contractor not less than thirty (30) minutes before the water is shut

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off. Water service shall not be discontinued for more than two (2) consecutive hours without special written permission from the Engineer.

- 100.8 REMOVAL OF PLANTINGS: Where trees, hedges, shrubs or other ornamental planting within the construction limits are not designated to be protected or saved, the Contractor shall notify the owner of the property fronting the plantings in question not less than ten (10) days prior to removing the plantings. This notification shall include allowing the property owner the option to transplant the plantings fronting his property onto his property instead of having the Contractor remove them.
- 100.9 MUD AND EARTH TRACKING ON PUBLIC STREETS: The Contractor shall conduct their operations so as not to have the equipment tracking mud and earth onto the adjacent public streets. Upon notification by the County Engineer, Director of Public Works, or their representative, the Contractor may be required to clean from the public streets mud and/or earth tracked by his equipment or that of material suppliers to the project.
- 101.0 MATERIALS:
- 101.1 GENERAL: This section covers pipe and other materials to be used in the construction of the various types of underground utilities.
- All materials used shall be new and in conformance with the applicable standards.
- 101.2 CONTRACTOR REQUIREMENTS: All materials to be furnished by the Contractor shall conform to the requirements of these specifications. The type, size and strength class of pipe, fittings and other materials shall be as shown on the plans or otherwise specified in the Contract Documents.
- 101.3 HANDLING: All materials shall be handled with equipment and methods adequate to prevent shock or damage. Under no circumstances shall materials be dropped. Pipe handled on skid ways shall not be skidded or rolled against pipe already on the ground. If any part of the coating or lining is damaged, the Contractor shall repair or replace the material at his expense as directed by the Engineer. All pipe and appurtenances shall be handled in accordance with the appropriate AWWA and ASTM Standards.
- 101.4 STORAGE: The Contractor will be held responsible for the safe storage and protection of all pipe and other materials delivered to the work site. The interiors of all pipe and pipe fittings shall be kept free from dirt and foreign matter at all times. Gaskets for pipe joints shall be stored in a cool location out of direct sunlight.
- Any material that has been damaged before actual incorporation in the work shall be repaired or replaced at the Contractor's expense. Any material which does not meet these material specifications shall be removed from the construction site.
- 101.5 PIPE AND FITTINGS FOR SANITARY SEWER CONSTRUCTION: Pipe used in construction of gravity sanitary sewer mains and service lines shall be of vitrified clay, polyvinyl chloride (PVC), or ductile iron or cast iron.
- The minimum pipe size for gravity sewers shall be eight (8) inch diameter for mains and laterals, and four (4) inch diameter for service lines. Sanitary sewers under pressure shall be of ductile iron or PVC pipe.
- 101.5a VITRIFIED CLAY PIPE: All vitrified clay pipe and fittings shall conform to ASTM Designation C-700 (extra strength).

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Compression joints for clay pipe shall conform to ASTM C-425.

- 101.5b POLYVINYL CHLORIDE PIPE: Polyvinyl Chloride (PVC) sewer pipe and fittings shall conform to ASTM D 3034, Type PSM. The minimum wall thickness for PVC pipe shall conform to Standard Dimension Ratio (SDR) 35.

JOINTS: PVC sewer pipe shall have integral bell and spigot joints. PVC sewer pipe shall be connected with flexible elastomeric seals per ASTM D 3212. Gaskets shall be neoprene or other synthetic rubber material conforming to ASTM D 1689.

FITTINGS: Wyes for 4" or 6" service connections to sewer mains shall be saddle-type fittings made of PVC plastic.

- 101.5c DUCTILE IRON PIPE: Ductile iron pipe for sanitary sewers under pressure shall conform to AWWA C-151. Pipe thickness shall be AWWA Class 52 unless a higher class is required by the County Engineer. Ductile iron pipe shall be cement lined per AWWA C-104.

JOINTS: Unless otherwise specified in the Construction Plans or Special Conditions, ductile iron pipe joints shall be mechanical or push on joints conforming to AWWA C-111. Gaskets shall be neoprene or other synthetic rubber material.

FITTINGS: Fittings for ductile iron pipe shall be in accordance with AWWA C-110 and shall have a pressure rating of not less than that specified for the pipe. Fittings shall be ductile iron or cast iron and shall be cement lined per AWWA C-104.

- 101.5d PVC PRESSURE PIPE: PVC pipe used for sanitary sewers under pressure shall meet the requirements of AWWA C-900 and shall be Class 150 unless the pressure class is shown on the plans or otherwise specified.

JOINTS: Joints shall be bell and spigot type sealed with an elastomeric gasket conforming to ASTM D-1869 and E-477. The bell section shall be at least as strong as the pipe wall.

FITTINGS: Fittings for PVC pipe shall be of cast iron or ductile iron in accordance with Section 101.5c of these specifications.

- 101.6 PIPE AND FITTINGS FOR STORM SEWERS, CULVERTS, AND SIPHONS: Pipe shall be galvanized corrugated steel, corrugated aluminum non-reinforced concrete or reinforced concrete.

- 101.6a CORRUGATED STEEL PIPE: (CSP) Corrugated steel pipe and coupling bands shall conform to the applicable requirements of AASHTO M 36. The pipe shall be made from zinc-coated (galvanized) iron or steel sheets per AASHTO M 218. Unless otherwise specified or approved by the County Engineer, all round C.S.P. shall be fabricated with helical corrugations and a continuous lock or welded seam. If not specified, the wall thickness of C.S.P. shall be per Colorado Division of Highways Standard M-603-MB.

JOINTS: Corrugated steel pipe shall be jointed with gasketed coupling band corrugated to match the ends of the pipe and form a watertight seal. Dimple bands are not permitted. Coupling bands shall be of the same material and have the same coating as the pipe. Gasket material shall be of neoprene or other approved synthetic rubber.

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COATING: The inside and outside of all corrugated steel pipe shall be coated with bituminous, polymeric or aluminum material if so specified on the plans.

Bituminous coated CSP shall conform to the requirements of AASHTO M 190, Type A (fully bituminous coated).

Corrugated steel pipe and coupling bands with polymeric coating shall be fabricated from precoated sheets and shall conform to the requirements of AASHTO M 245 and M 246, Type B.

Corrugated steel pipe and coupling band coated with aluminum shall be fabricated from sheet that has been hot-dipped in commercially pure aluminum or approved aluminum alloy. The minimum coating weight on both sides of the sheet shall be 1.0 oz./sq.ft.

- 101.6b CORRUGATED ALUMINUM PIPE (CAP): Corrugated aluminum pipe and coupling bands shall conform to AASHTO M 196. Unless otherwise specified or approved by the County Engineer, all round corrugated aluminum pipe shall be fabricated with helical corrugations and a continuous lock seam. Unless otherwise specified, the thickness gauge of CAP shall be per Colorado Division of Highways Standard M-603-MB.

JOINTS: Corrugated aluminum pipe shall be joined with gasketed coupling bands of the same alloy as the pipe. Bands shall be corrugated to match the ends of the pipe and form a watertight seal. Dimple bands are not permitted. Gasket material shall be of neoprene or other approved synthetic rubber.

- 101.6c CONCRETE PIPE: Nonreinforced concrete pipe (NCP) shall conform to the requirements of AASHTO M 86. Reinforced concrete pipe (RCP) shall meet the requirements of AASHTO M 170. The wall thickness and strength class of reinforced and nonreinforced concrete pipe shall be determined in accordance with Colorado Division of Highways Standard M-603 RC unless otherwise specified.

JOINTS: Gasketed bell and spigot joints for watertight concrete pipe shall conform to the requirements of AASHTO M 198.

Concrete pipe with tongue and groove joints may be used for storm drainage only. Tongue and groove joints will not be allowed under paved surfaces.

- 101.7 PIPE AND FITTINGS FOR WATER MAINS AND SERVICE CONNECTIONS: Pipe for water mains shall be ductile iron. Service pipe shall be of copper or ductile iron.

- 101.7a DUCTILE IRON PIPE: Ductile iron pipe for water mains shall conform to AWWA C-151, thickness-classes. Pipe thickness shall be AWWA Class 52 unless otherwise specified in the construction plans. Ductile iron pipe shall be cement lined per AWWA C-104.

JOINTS: Unless otherwise specified in the Construction Plans or Special Conditions, ductile iron pipe joints shall be mechanical or push on joints conforming to AWWA C-111. Gaskets shall be of neoprene or other synthetic rubber material.

FITTINGS: Fittings for ductile iron pipe shall be in accordance with AWWA C-110 and shall have a pressure rating of not less than that specified for the pipe. Fittings shall be ductile iron or cast iron and shall be cement lined per AWWA C-104.

- 101.7b COPPER SERVICE PIPE: Copper tube for water service lines shall be type K, soft temper for underground service conforming to ASTM B-88 and B-251. The pipe shall be marked with the

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manufacturer's name or trademark and a mark indicating the type of pipe. The outside diameter of the pipe and minimum weight per foot shall not be less than that listed in ASTM B-251, Table 11.

101.7c CURB STOPS, CURB STOP BOXES, CORPORATION STOPS: Curb stops shall be Ford Ball Valves (Ford B-22-333). Curb Stop Boxes shall be Mueller H-10350 or approved equal. Corporation Stops shall be Ford F-600.

101.8 MANHOLES FOR SANITARY AND STORM SEWERS: Manholes shall be constructed in accordance with CDOT M&S Standard Plan M-604-20.

101.8a CEMENT: All cement used in mortar, concrete bases, and precast manhole riser sections, cones and flat tops, for sanitary sewer manholes, shall be Type V or modified Type II Portland cement having less than five (5) percent tricalcium aluminate. Type II Portland cement may be used in the various concrete elements of storm sewer manholes.

101.8b PRECAST CONCRETE MANHOLE SECTIONS: Manhole risers, cones, flat tops, manhole bases and grade rings shall be precast reinforced concrete sections conforming to ASTM C-478 or AASHTO M 199. Manholes which are 5 feet or less in depth as measured from the invert to the top of rim shall have a flat reinforced concrete top. Manholes greater than 5 feet deep as measured from the invert to the top of rim shall use eccentric conical top section.

Manhole riser and conical sections shall be made with tongue and groove ends for continuous and uniform joints between sections. Such joints shall be sealed with preformed bitumatic material and other approved flexible joint sealant.

101.8c MANHOLE STEPS: Manhole steps shall be of plastic coated steel or other approved materials. The rungs shall be 10 inches wide with non-slip surface free from splinters, burrs or sharp edges which may be a hazard. The legs shall be long enough to provide a 3-1/2 inch minimum embedment length and 6 inch projection from the wall.

The steps shall be fabricated with tapered legs which lock into specially formed holes in cured concrete walls or with lugs for embedment in wet concrete.

101.8d RINGS AND COVERS: Manhole rings and covers shall be cast iron. The standard manhole shall be Castings Inc., MH-250-24" C.I., Neenah R-1657, Deeter 1258, or approved substitute. The bearing surfaces between the ring and cover shall be machine finished or ground to assure non-rocking fit in any position (See Drawing No. S-4).

101.9 STORM DRAIN INLET BOXES, GRATES AND FRAMES: Storm drain inlets shall be constructed in accordance with the CDOT M&S Standard Plan no M-604-10.

All inlet grates, frames and curb opening sections shall be of cast iron and all grates shall be bicycle safe.

101.10 MANHOLE ADJUSTING RINGS: To raise grades of manhole rims by 1" to 3", cast iron manhole adjusting rings may be used. The bearing surfaces between the ring and cover shall be machine finished to assure non-rocking fit. Set screw fasteners shall be included in each adjusting ring. Adjusting rings shall be Neenah R-1979 Series or approved equal. Adjusting rings shall be dimensioned to fit existing rings snugly.

101.11 APPURTENANCES FOR WATER DISTRIBUTION:

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101.11a FIRE HYDRANTS: Fire hydrants shall be the dry bowl type and shall conform to the requirements of AWWA C-502. Hydrants shall be Watrous W-B67 or Mueller Centurian A423 (National Standard Thread). No substitutes will be accepted. (See Drawing No. W-1).

The standard hydrant shall have a six-inch inlet construction, a 5 1/4 inch main valve opening, two (2) 2 1/2 inch hose nozzles (National Standard - 7 1/2 threads per inch) and one (1) 5 inch pumper nozzle with 6.055" O.D. male thread (Seagraves Thread). The hydrant barrel shall be marked with a circumferential rib to denote the interceded ground line. The center of the hose nozzles and pumper nozzle shall be at least 14 inches above the ground line mark.

Hydrants shall be of the "traffic" or "breakaway" design, having easily replaceable breaking devices for the grade line flange and operating stem that prevents damage to the barrel sections upon impact. The hydrant base must be 4'6" below the breakaway base. The breakaway base shall be set at the ground level.

The operating nut and nozzle cap wrench nuts shall be 1 1/2 inches pentagon, measuring from point to opposite flat side at the base and tapering uniformly to 1 7/16 inches at the top. The height of the nut shall not be less than one inch.

The nozzle caps shall be removable and the operating nut opened by turning to the left (counter-clockwise). Nozzle caps shall be securely chained to the upper barrel section.

PAINTING: Fire hydrants shall be painted with Dupont Centari #700-A; White; Alkyd Enamel or an approved substitute.

101.11b GATE VALVES: The minimum requirements for all gate valves shall conform to the standards of AWWA C-500 or AWWA C-509.

All gate valves shall be double disc or resilient wedge, cast or ductile iron body, fully bronze mounted with non-rising stem and parallel seats. The stem and all wearing surfaces shall be bronze or other approved non-corrosive material. Contact surfaces shall be machine finished and all wearing surfaces shall be easily renewable. Nonferrous bushings shall be of substantial thickness tightly fitted and pressed into machined seats. A clockwise turn of the stem shall close the valve. Acceptable brands of double disc gate valves are APS Smith Metropolitan, Mueller, Dresser or Stockham. Acceptable brands of resilient seat gate valves are Watrous, Mueller, and Dresser.

END CONNECTIONS: End connections of gate valves shall consist of mechanical or push-on (rubber gasket) joints conforming to AWWA C-111 or flanged ends in accordance with ANSI B-16.1.

WRENCH NUTS: Wrench nuts shall be made of cast iron and shall be 1 5/16 inches square at the top, 2 inches square at the base, and 1 3/4 inches high.

101.11c BUTTERFLY VALVES: Butterfly valves shall conform to AWWA C-504 specifications. Valves shall be manufactured by BIF, Allis Chalmers, or Henry Pratt Co. All valves shall be 200 psi working pressure with direct buried operators. Provision shall be made for locking the disc in the fully open or fully closed position. Counter clockwise turn of the operating nut shall open the valve.

101.11d VALVE BOXES: A cast iron valve box and lid shall be provided for each underground valve. Valve boxes shall be 5 1/2-inches diameter, adjustable screw-together type, sized for the type of valve and depth of bury. The lid shall have the word "WATER" permanently cast in the top.

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- 101.11e AIR AND VACUUM VALVES: Air and vacuum valves shall be of the type and size specified. They shall be designed for 200 psi working pressure and shall be Crispen Type RN or equal. A separate isolation valve of the same size and pressure rating as the air valve shall be installed between the water main and the air and vacuum valve. The air and vacuum valve shall be housed in a vault made of reinforced concrete pipe or manhole riser section. The vault shall be covered with a precast concrete lid and cast iron manhole ring. The vault shall be insulated in a manner acceptable to the Engineer.
- 101.11f BONDING STRAPS: A bonding strap shall be installed across each joint in the water line to provide metal to metal continuity for tracing purposes. The Contractor shall be responsible for installation. Bonding strap shall be a minimum #9 copper wire properly attached at each end by means of magnesium weld or other approved method.
- 101.11g METER VALVES: Meter valves shall be made of brass and shall be the same size as the service line. The inlet end of the valve shall be threaded in accordance with AWWA C-800 for use with type K flared copper service tubing.
- All meter valves shall be provided with an approved locking device and meter coupling attached.
- 101.11h FLANGED ADAPTERS: The flanged adapters shall be Smith-Blair 912 or Baker Series 601 cast flanged coupling adapters with anchor studs or equal approved by the Engineer.
- 101.11i FLEXIBLE COUPLERS: Flexible couplings shall have cast iron or steel sleeves the same as pipe type furnished; ductile iron flanges, bronze bolts and nuts; and wedge-type rubber gaskets. The couplings shall be designed for a 200 psi working pressure except as noted and each shall be sized to properly fit the ends of the two pieces of pipe being joined. The couplings shall be Smith-Blair Type 433, Baker Series 236 Cast Transition Couplings, or equal approved by the Engineer.
- 101.12 CONCRETE AND MORTAR: All concrete used in construction of manholes, inlet boxes, vaults, concrete encasement, thrust blocks, etc., shall be Colorado Division of Highways "Class B". Unless otherwise specified, all concrete shall be made with Type II Portland Cement.

Cement mortar used in construction of manholes, inlets, vaults, etc., shall be mixed at a ratio of one part Portland cement to three parts sand. The amount of water used in the mortar shall be the minimum amount required for workability of the mix. Mortar shall be made with Type II Portland Cement unless otherwise specified. Mortar used for the patching of existing manholes shall be non-shrink type approved by the Engineer.

### 102.0 TRENCH EXCAVATION

- 102.1 GENERAL: Following are the specifications that shall govern excavations and trenching for pipelines or other underground conduits and appurtenances within the street rights-of-way for Ouray County.

- 102.2 RESPONSIBILITY: The Contractor shall notify all utility companies and interested parties prior to commencement of work in order to insure that there will not be interruptions of services during construction. The Contractor shall notify all utility users in advance of any interruption to service. No interruption in service shall exceed 8 hours in duration. The Contractor shall be liable for all damages. An excavation permit must be secured from Ouray County.

Should any utility be damaged in the construction operations, the Contractor shall immediately notify the owner of such utility and unless authorized by the owner of the utility, the Contractor shall not attempt to make repairs.

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In the event that during construction it is determined that any underground utility conduit or any aboveground utility will be encountered, the Contractor shall notify the affected utility company 48 hours in advance so that any anticipated problems can be addressed and utilities located.

- 102.3 SURFACE REMOVALS AND TOPSOIL PRESERVATION: The Contractor shall remove surface materials and obstructions only to the widths necessary for excavation of the trench. All fences, landscaping and structures not designated for removal shall be protected or, if moved, restored to their original condition after construction is complete.

No more than one-half of the width of a street shall have an open trench at any time.

Removal of concrete curbs, gutters, sidewalks and driveways shall be along existing joints or neatly sawed lines.

Where excavation is required under paved areas, the pavement shall be cut in such a manner as to affect a smooth, straight cut edge and as a vertical face six (6) inches minimum beyond the trench wall. Trench width shall be no wider than 12" wider than the conduit to be installed. All vegetation, concrete, asphalt and other refuse removed from the construction limits shall be separated from suitable topsoil and backfill material, and hauled to a disposal site secured by the Contractor.

Where the trench is in an unpaved area, clean topsoil suitable for final grading shall be stripped, stockpiled separately in approved locations, and restored to the surface after the trench is backfilled evenly. Where excavation is in a lawn covered area, the sod shall be cut and removed and replaced after trench filling so as to promote regrowth. Where sod is disturbed, the Contractor shall resod with like grass at his own expense.

- 102.4 STOCKPILING EXCAVATED MATERIAL: Excavated material shall be piled in locations that will not endanger the work, create traffic hazards or obstructed sidewalks and driveways. Fire hydrants, valve boxes, manholes and other utility access points shall be left unobstructed until the work is complete. Gutters and other water courses shall not be obstructed unless other provisions are made for runoff and street drainage.

All surplus material and excavated material unsuitable for backfilling shall be removed from the site and disposed of in areas secured by the Contractor.

- 102.5 TRENCHING WIDTHS: Trenches shall be excavated to the width necessary to permit the pipe to be laid and jointed properly and backfill materials placed and compacted as required. Where conduit is to be installed outside of existing pavement and pipes have an inside diameter of 33 inches or less, the trench shall be excavated at pipe level a minimum of 16 inches wider than the outside diameter of the pipe so that a clear space of not less than 8 inches is provided on each side of the pipe.

For pipes having an inside diameter of 36 inches or greater, the trench shall be excavated at pipe level a minimum of 24 inches wider than the outside diameter of the pipe so that a clear space of not less than 12 inches is provided on each side of the pipe. Wherever it is necessary to exceed these limits, approval of the Engineer shall be obtained and provision shall be made for the additional load imposed on the pipe. When sheeting is used, the widths indicated above shall be measured to the inside dimension between the sheeting.

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102.6 TRENCHES WITH SLOPING SIDES: The banks of trenches shall be kept as nearly vertical as possible, however, where working conditions and easement or right-of-way permit (as determined by the Engineer), trenches may be excavated with sloping sides with the following limitations:

(1) In traveled streets, alleys or narrow easements, only vertical trenches with proper bracing will be allowed.

(2) Where trenches with sloping sides are permitted, the slopes shall not extend below a point 12 inches above the top of pipe. The trench shall be excavated with vertical sides below this point with widths not exceeding those specified on the Standard Detail Sheets (See Drawing No. 0-1).

102.7 TRENCH LENGTH: No more than 200 feet of unbackfilled trench may be left open overnight. During the months of November through April no uncovered trench shall be left overnight. Trenches should be backfilled as soon as possible to eliminate hazards and traffic congestion, but in no case shall the open trench length exceed 400 feet without the consent of the Engineer.

Trenches across existing streets are to be made so that traffic is not closed. Short duration closure may be allowed by the Engineer. In such instances, the Contractor shall notify the County emergency services.

102.8 TUNNELING: No tunneling under sidewalks, curb and gutter or other structures will be permitted, except when line can be pulled or jacked, in which case such line shall be left in place.

102.9 BRACING AND SHEETING OF TRENCHES: All trenches shall be properly braced, sheeted or otherwise supported to provide safe working conditions and protection of the work and adjacent property.

Bracing and sheeting shall conform to the recommendations in the Occupational Safety and Health Standards for Construction (OSHA). A sand box or trench shield may be used in lieu of sheeting and bracing as permitted by OSHA. Unless otherwise approved, all trench support materials shall be removed in a manner that will prevent caving of the sides and movement or other damage to the pipe.

102.10 EXCAVATION BELOW GRADE: Where the excavation is carried beyond or below the lines and grades shown on the plans or staked, the Contractor shall, at his own expense, refill all such excavated space with suitable granular material.

102.10a OVEREXCAVATING FOR ROCK: When bedrock or boulders are encountered in the trench bottom, or loose, stony soil where there is the possibility of pipe being subjected to "point" contacts, the trench shall be over-excavated a minimum of six (6) inches. The over-excavated material shall be replaced with Engineer-approved material and compacted.

If blasting is required for rock excavation, all work with explosives shall conform to Federal and State Laws, and OSHA rules and regulations. Any damage caused by blasting shall be repaired by the Contractor at his expense.

102.10b UNSTABLE TRENCH BOTTOM: Where the trench bottom is found to consist of soft, spongy or unstable soil, frozen material, organic matter or any other material that the Engineer determines to be unsuitable for supporting the pipe, an additional depth equal to the outside diameter of the pipe shall be removed and replaced with suitable granular materials, properly compacted to provide adequate support.

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102.11 REMOVAL OF WATER: Trenches shall be kept free of water during pipe laying operations by draining, pumping or other approved methods. The water level shall be maintained below the trench bottom throughout the placement of bedding, pipe laying, and joining and backfilling operations. The dewatering shall be carried out so that it does not destroy or weaken the strength of the soil under or alongside the trench. Water shall be disposed of in a suitable manner without damage to adjacent property or without being a menace to public health and convenience. Under no circumstances shall trench water be discharged into sanitary sewers. The method of disposal of trench water shall be approved by the Engineer.

102.12 PREPARING THE TRENCH BOTTOM: If soil conditions are stable, and the trench bottom is of a material that can be cut true and straight, pipe can be installed using the uniform trench bottom for support. The trench bottom must be straight, free of bumps or hollows, and at the correct grade. As the pipe is laid, any irregularities in the trench bottom must be leveled off or filled in with tamped soil. The trench bottom may also be prepared by digging at least 4" deeper than pipe grade and then bringing the trench bottom up to grade with selected refill material tamped to provide the proper cushion for the pipe. A coupling or bell hole shall be dug at each pipe joint so that the pipe is uniformly supported along its length. The hole shall have sufficient length, width and depth to permit assembly of the joint and provide a minimum clearance of two (2) inches between the coupling and the trench bottom (See Drawing No. 0-1).

102.13 BEDDING CLASSES: Herein are contained the various classes of Bedding and Cradles (See Drawing No. 0-2).

102.13a Class A Bedding: Class A bedding shall be defined as that method of bedding in which the lower half of the pipe is set in reinforced concrete (2000 psi min.). The minimum thickness of concrete under the lowest part of the conduit shall be 1/4 of the outside pipe diameter but not less than 4 inches.

The trench shall be maintained free of water during placing of the concrete cushion before the concrete has taken its initial set. The concrete shall extend upward around the pipe to the spring line of the pipe barrel. The width of the concrete cradle shall be at least equal to the outside pipe diameter plus 8 inches.

102.13b Class B Bedding: Class B bedding shall be defined as that method of bedding in which the pipe is set on compacted granular material. The trench shall be excavated to a depth below the established grade equal to 1/4 of the outside pipe diameter, but not less than 4 inches. In rock excavation, the minimum depth shall be 6 inches. Compacted granular material shall be placed under the pipe and around the sides of the pipe up to the spring line of the pipe barrel. The placing shall be done in a manner which will assure no separation or change in uniform gradation. The granular material shall be consolidated and compacted by hand operated mechanical vibrators to at least 90% of maximum dry density as determined by AASHTO T 180. Granular material shall be placed to one (1) foot above the top of the pipe.

102.13c Class C Bedding (Hand Shaped Bottom): Class C bedding shall be defined as that method of bedding in which the pipe is placed on a native, stable soil foundation shaped to fit and uniformly support the lower quadrant of the pipe barrel for a width of at least 50% of the outside pipe diameter. Bell holes shall be excavated and kept free of foreign material.

The barrel of the pipe shall be bedded throughout its entire length. Native soil shall be hand compacted to spring line and then placed to one foot above the top of the pipe and compacted to at least 90% maximum dry density. The remainder of the backfill shall be placed in compliance with the section on trench and excavation backfill.

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102.14 GRANULAR, BEDDING AND HAUNCHING MATERIALS.

Granular materials required for bedding of pipe and structures, and haunching around pipe shall meet the following gradation requirements:

<u>Sieve Size</u>	<u>Total Passing by Sizes (% by Weight)</u>
3/4"	100 to 90
1/2"	-----
3/8"	20 to 55
No. 4	0 to 10
No. 8	0 to 5

The aggregate used shall contain not more than a total of 8% by weight of deleterious substances such as clay, shale or organic matter. The plasticity index shall not be over 6.

102.15 STABILIZING MATERIAL: In the event unstable trench conditions are found at pipe line grade, or in the case of over-excavation for rock, (dry) uniformly graded (class 1, 4, or 5) rock shall be used for trench stabilization. Nothing in this bedding material classification is intended to preclude the use of sand bedding provided the sand has a plasticity index of 6 or less, and having no more than 15% passing 100 sieve.

102.16a BACKFILL MATERIAL: In general, backfill shall be that material excavated from pipeline trenches on the site that is free from frozen materials, large amount of organic material, concrete, asphalt, dry clods, muck, debris and rock over three (3) inches in diameter. When, in the opinion of the Engineer, the excavated material is not satisfactory for use as backfill, suitable backfill material shall be furnished by the Contractor and condemned material removed from the site.

Backfill material consisting of earth and rock shall contain a sufficient amount of earth to completely fill all voids between the rocks.

102.16b SPECIAL BACKFILL MATERIAL: Where required on the plans or in the Special Provisions, backfill shall consist of a flowable fill consisting of a plant mixed aggregate cement combination meeting the following specification: 94 pounds Portland cement, 200 pounds fly ash, 2,990 pounds fine aggregate, and 49 to 57 gallons of water per cubic yard.

102.17 COMPACTING BACKFILL MATERIAL: Backfill material in trenches shall be compacted to at least ninety (90%) percent of maximum density except for the top three (3) feet of the trench under existing or proposed roads which shall be compacted to at least ninety-five (95%) percent of maximum density. Maximum density shall be defined by AASHTO T 180. All approved backfill material shall be adjusted to within three (3) percent of the optimum moisture content prior to its placement in the trench. When sand is placed as backfill it must have a minimum moisture content of 5%.

102.18 INITIAL BEDDING AND TAMPING: Backfilling should follow pipe assembly as closely as possible. During initial bedding and backfilling, the Contractor shall take all necessary precautions to prevent movement or distortion of the pipe or structure being backfilled. The first step in providing firm, continuous support for the pipeline is to tamp soil solidly under the pipe and couplings. The next step is providing effective support of the pipe in the haunching area. This is accomplished by placing bedding material equally along both sides of the pipe and thoroughly compacting it by hand under the haunches and around the pipe. Tamping should be done in 4" layers. Side support is accomplished by tamping

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the soil firmly under the haunches of the pipe to the spring line and compacting it out to the undisturbed trench walls.

Backfilling of the trench with bedding material shall continue to a point that is at least one foot above the top of the pipe. The balance of the backfill may be machine placed in lifts not to exceed 24". Compaction between lifts is required by mechanical or other approved means. Trenches outside of proposed roads shall be backfilled to provide for mounding between 6" and 12" over existing natural ground.

102.19 FLOODING OR JETTING OF TRENCHES: Flooding or jetting of trenches shall not be permitted unless approved by the Engineer.

102.20 TESTING: All backfill shall be frequently tested to insure that the required density is being attained. The minimum requirements for compaction testing shall be as follows:

For every 400 lineal feet of trench and each branch or section of trench less than 400 feet in length, at least one compaction test shall be performed at the surface and at mid-trench for excavations greater than 6 feet. Compaction tests shall be taken at random locations along the trench and wherever poor compaction is suspected by the Engineer. If any portion of the backfill placed fails to meet the minimum density specified, the area shall be defined by additional tests if necessary and the material in the designated area shall be removed and replaced to the required density at the Contractor's expense.

Compaction testing shall be performed by an approved materials testing laboratory at the Owner's expense unless the tested material does not meet specifications. Contractor will pay for all subsequent tests until the material passes. It shall be Contractor's responsibility to make necessary excavations and preparations in order to accommodate compaction tests at all locations designated.

A summary report of all compaction test results shall be submitted to the County Engineer. These test results are required as a basis of acceptance of facilities by the County.

102.21 RESTORATION OF GROUNDS: The cleanup and restoration of grounds shall be a continuous process from the beginning of construction to final completion of the work. The Contractor shall keep the work site free from the accumulation of debris and waste material caused by his operation.

Immediately after the pipeline is backfilled, the area shall be cleaned and restored to the original grade and condition. See Section 102.3 for grass removal and replacement requirements. All fences shall be replaced to the same elevation and alignment and restored to a condition equal to or better than that at the beginning of construction.

102.22 RESTORATION OF PAVED AND CONCRETE SURFACES: Immediately after any section of a completed pipeline has been tested and accepted by the Engineer, the Contractor shall replace all paved surfaces removed or damaged by his operation. All asphalt pavement and areas of curb removed shall be replaced with hot mixed bituminous pavement. Paved surfaces shall be restored to their original line and grade and finished to match adjacent undisturbed surfaces. The excavation contractor shall be responsible for the maintenance of the patch for a period of one (1) year or until it is removed and replaced by Ouray County or their contractor. The equipment used for excavation must be equipped with pads for the stabilizers so as not to damage the street. Also, the front-end loader bucket should have a plank or buffer between the bucket and the street.

103.0 INSTALLATION OF PIPE AND APPURTENANCES: All pipes, valves, hydrants, manholes and other pipeline appurtenances shall be installed and tested in accordance with the construction plans and

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specifications, applicable AWWA, ASTM or AASHTO Standards and Manufacturer's instructions. When installation instructions or procedures differ, the Engineer will determine which will take precedence over the others.

103.1 INSTALLATION OF SANITARY SEWERS, STORM SEWERS AND CULVERTS: All sanitary sewer facilities shall be in compliance with design criteria of the Colorado State Department of Health. All plastic sewer pipe installed shall be installed in accordance with ASTM-D 2321-89.

103.1a PIPE LAYING: After the trench has been dewatered and the bedding prepared, the pipe shall be laid to the line and grade shown on the plans or staked. Variance from established line and grade shall not be greater than three (3) inches horizontally and one-half (1/2) inch vertically, provided that such variation does not result in a level or reverse sloping invert.

The Contractor shall constantly check line and grade of the pipe with a laser beam or batter boards. Whenever the pipe is found to be outside the specified limits, the misaligned sections shall be removed and re-laid to the correct line and grade at the Contractor's expense.

Pipe shall be laid upgrade from the point of connection to the existing sewer or from a designated starting point. Pipe with bell and spigot joints shall be laid with the bell end forward or upgrade.

The inside of the pipe and jointing surfaces shall be kept clean and free from mud, soil, gravel, ground water and other foreign material. When pipe laying is not in progress, the forward end of the pipe shall be kept tightly closed with a temporary plug.

103.1b INSTALLATION OF SEWER SERVICE LINES: Service pipe shall be laid at a minimum grade of one-eighth (1/8) inch per linear foot. The alignment of service lines shall be established by the Engineer.

The maximum deflection permissible at any one fitting or any combination of adjacent fittings shall not exceed 45 degrees, unless otherwise approved.

The service line shall be joined to the sewer main with a wye fitting or approved saddle permanently connected above the spring line of the sewer pipe. The method of tapping the main shall be approved by the Engineer. The service line or wye shall not extend beyond the inside wall of the sewer main.

Where service lines are stubbed out to the right-of-way line and ended for future connection, the end of the pipe shall be plugged and marked with a 2" x 4" x 4' board buried vertically above the end of the pipe and extending to the ground surface or with a 4" wide plastic tape with the words, "WARNING SEWER LINE" marked on the tape extending from the sewer line to the surface (See Drawing No. S-6). The ends of the service lines shall be capped with water-tight plugs braced to withstand test pressures.

103.1c CONSTRUCTION OF MANHOLES: The foundation for each manhole base shall be prepared by replacing unsuitable material with subgrade stabilization material as directed by the Engineer, and placing granular bedding material in accordance with the standard detail sheets.

The manhole base shall be cast-in-place on the line and grade staked or shown on the plans. The invert shall be formed and smoothly finished to match the shape and elevation of all pipes connected to the manhole. The internal diameter of the manhole shall be not less than 48".

Pre-cast manhole bases may be used when laid on a firm unyielding subgrade as determined by the Engineer. Prior to placement of manhole base, the ground surface shall be compacted to a smooth and

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level supporting surface. Any unevenness or over-excavation shall be brought to final grade using gravel backfill material.

The first pre-cast manhole section shall be placed on the concrete base structure before the base has taken initial set; or the section shall be grouted into a suitable groove formed in the top of the manhole base. The first section shall be adjusted to the proper grade and alignment so that it is uniformly supported by the base concrete and not bearing on any of the pipes.

The remaining pre-cast sections shall be placed and aligned to provide vertical sides and alignment of the ladder rungs. Approved bituminous sealer shall be placed between pre-cast sections so that the completed manhole is rigid and watertight. Horizontal joints and any holes shall be plastered with non-shrink grout to a smooth finish inside and out.

The manhole ring and cover shall be adjusted to grade with pre-cast grade rings. The total height of grade rings shall not be more than twelve (12) inches. Grade rings shall be grouted together and the cast iron ring set in a bed of mortar at the finished grade elevation.

Where the manhole is in an unpaved street, alley or other area where grade has not been established, 12 inches of grade rings shall be placed between the top of cone and bottom of casting (to allow future adjustment of the ring to grade).

Where the manhole is in a cultivated area, the top of the casting shall be eighteen (18) inches below the existing ground surface.

Where the manhole is in an uncultivated but open area, the top of the casting shall be 6" above the existing ground surface.

All newly constructed manholes shall be cleaned of any accumulation of silt, debris, or foreign matter of any kind, and shall be free from such accumulations at the time of final inspection (See Drawing No. S-4).

103.1d CONSTRUCTION OF STORM INLETS AND VAULTS: Pre-cast or formed concrete boxes for storm inlets and vaults shall be placed on prepared granular bedding, uniformly supported, in correct alignment and at proper grade.

When the box is furnished in more than one section, the sections shall be joined and sealed with an approved bituminous material so that the completed box is rigid and watertight.

Pipe connections to concrete structures shall be made by approved methods and shall result in a smoothly finished, watertight connection. Pipe ends shall not extend more than one inch beyond the inside face of the structure.

All inlet boxes, vaults and irrigation structures shall be cleaned of any accumulation of silt, debris or other foreign matter and shall be free from such accumulations at the time of final inspection.

103.2 INSTALLATION OF WATER LINES, FORCE MAINS, SIPHONS AND OTHER PRESSURE PIPELINES:

103.2a PIPE LAYING: Pipe shall be laid on the alignment shown on the plans or staked. Unless otherwise specified or approved, all pressure pipelines shall be laid to a minimum depth of forty-eight (48) inches measured from the proposed final ground surface or of the proposed road surface.

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The inside of the pipe and jointing surfaces shall be kept clean and free from mud, dirt, gravel, ground water and other foreign material. When pipe laying is not in progress, the open ends of the pipeline shall be kept closed with water-tight plugs. All pipe lengths shall be squarely cut.

Long radius horizontal or vertical curves may be laid with standard pipe by deflections at the joints of rigid pipe. Maximum deflections at pipe joints shall be per the Manufacturer's recommendations or applicable AWWA Standard.

- 103.2b CONCRETE BLOCKING: Concrete support or thrust blocks shall be poured at all pipe bends, tees, caps, valves, hydrants and other locations shown on the plans.

Thrust blocks shall be poured on firm, stable foundation material and all bearing surfaces shall be against undisturbed earth.

Concrete for support and thrust blocks shall be made with Type II Portland Cement and shall reach a minimum compressive strength of 3000 psi in 28 days.

Reinforcing steel and bolts used to anchor valves, fittings, etc., to thrust blocks shall meet tensile requirement of ASTM Grade 40. All anchorage steel not embedded in concrete shall be coated with coal tar or other approved coating material.

- 103.2c INSTALLATION OF VALVES AND VALVE BOXES: Each valve shall be installed in a vertical position and anchored to a concrete support block as shown on the Standard Water Line Drawing No. W-6. An adjustable screw type valve box shall be set into position during backfilling operations. The lower section of the valve box shall be cushioned with backfill material so that it does not rest directly upon the body of the valves or upon the water main. The upper section of the unit shall be placed in proper alignment and adjusted so that its top will be at final grade. The completed valve box shall be vertically centered over the valve operating nut and each valve shall be tested for proper access and operation.

- 103.2d INSTALLATION OF FIRE HYDRANTS: Hydrants shall be installed at the locations shown on the plans. They shall be plumb and set so that the bottom of the pumper nozzle is no less than twelve (12) inches above finished grade.

A minimum of 1/4 cubic yard of washed gravel shall be placed around the base of the hydrant to insure proper drainage of the hydrant after use. Blocking of the hydrant shall consist of pouring a solid concrete base of not less than 1/4 cubic yard extending from the hydrant base to the undisturbed soil on the bottom and sides of the trench. Weep holes which drain the hydrant shall not be covered with concrete.

- 103.2e INSTALLATION OF WATER SERVICE PIPE: Underground water service pipe shall be laid not less than ten (10) feet horizontally from the building sewer service line. Where this separation is not possible, the water service line shall be at least eighteen (18) inches above the top of the building sewer service line.

Each water service line shall be machine tapped and connected to the water main through a brass corporation stop. The main shall be tapped at an angle of forty-five degrees (45°) from the vertical, and the stop must be turned so that the T-handle will be on top.

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103.2f CONNECTION TO EXISTING MAINS: New water main lines shall not be connected to existing mains in service until the new lines have been tested, disinfected at least 25 ppm residual of Cl<sub>2</sub>, and accepted by the County as an exception is approved by the Engineer.

Where the connection of the new work to old requires interruption of service, the Engineer and the Contractor shall mutually agree upon a date and time for connections which will allow ample time to assemble labor and materials.

104.0 TESTING PIPELINES: All pressure and leakage testing shall be performed by the Contractor under direct control of the Engineer.

104.1 TESTING SANITARY SEWERS: Testing sanitary sewers for acceptability shall include the following tests:

- a. Exfiltration of water or exfiltration of air under pressure..... by Contractor
- b. Deflection of thermoplastic pipe.....by Engineer
- c. Lamping .....by Engineer

104.1a EXFILTRATION TESTS: An exfiltration or leakage test shall be performed on all newly constructed sanitary sewer mains. The Contractor will determine whether the test will be made with water or air pressure and shall furnish all labor, tools and equipment necessary to conduct the test.

The exfiltration test will not be considered valid without the presence of the Engineer or his representative throughout the test.

EXFILTRATION OF WATER TEST: The test section shall be sealed off from the remaining pipeline with water-tight plugs inserted in the pipes at the end manholes. The Contractor shall fill the pipe to the test level with potable water at least 24 hours prior to conducting the test. The test level shall be at least eighteen (18) inches above the top of the pipe opening in the upper manhole or eighteen (18) inches above the ground water table, whichever is higher.

Throughout the test period of at least one (1) hour, the water level shall be maintained at the test level and all water added shall be accurately measured. If the exfiltration rate exceeds 0.15 gallon per inch of inside pipe diameter per hour per 100 feet of pipe length, the leaks shall be located and repaired at the Contractor's expense, and the pipeline retested until the leakage is within the allowable limits.

AIR LEAKAGE TEST: If the Contractor chooses to test for exfiltration with air pressure, the testing shall be in accordance with ASTM Standard C-828. The ends of the test section shall be sealed at the manholes with pneumatic plugs. One of the plugs provided shall have two taps. One tap will be used for introducing air into the pipeline through suitable valves and fittings so that the input air may be regulated. The second tap shall be fitted with valves and fittings to accept a pressure gauge to monitor the internal pressure of the sewer pipe.

The pressure gauge shall meet the following minimum specifications:

- Size .....4 1/2 inches diameter
- Pressure range.....0-15 psi
- Figure intervals .....1 psi increments
- Minor Subdivisions .....0.05 psi
- Pressure tube .....Bourdon tube or diaphragm

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PROCEDURE: Connect the pressure gauge and air control equipment to the proper fittings and slowly apply air pressure. Pressurize the pipe line to 4.0 psig and throttle the air supply to maintain between 4.0 and 3.5 psig for at least two (2) minutes in order to allow equilibrium between air temperature and pipe walls. During this time check all plugs for leakage. If plugs are found to leak, bleed off air, tighten plugs and re-pressurize the pipeline. After the temperature has stabilized, allow the pressure to decrease to 3.5 psig. At 3.5 psig begin timing to determine the time required for pressure to drop to 2.5 psig. The time, in seconds, for the air pressure to decrease from 3.5 psig to 2.5 psig should be greater than the minimum test time shown in the following table:

MINIMUM TEST TIME FOR VARIOUS PIPE SIZES

Nominal Pipe Size, in.	T(time) min/100 ft.	Nominal Pipe Size, in.	T(time) min/100 ft.
4	0.3	21	3.0
6	0.7	24	3.6
8	1.2	27	4.2
10	1.5	30	4.8
12	1.8	33	5.4
15	2.1	36	6.0
18	2.4	39	6.6
		42	7.3

If the air test fails to meet the above requirements, the leaks shall be located and repaired at the Contractor's expense, and the pipeline retested until the leakage is within the allowable limits.

In areas where the ground water level is above the pipe, the hydrostatic pressure of the ground water above bottom of the pipeline shall be determined and added to all test pressures.

104.1b

DEFLECTING TESTING FOR PLASTIC PIPE: All PVC and ABS composite sewer lines will be tested for excess deflection by the Engineer. The maximum allowable deflection of flexible pipe shall not exceed seven and one-half percent (7 1/2%) of the Base Inside Diameter as established in ASTM D3034-81. The following values from ASTM D3034-81 shall apply:

<u>Nominal Pipe Size, in.</u>	<u>Base Inside Diam., in.</u>	<u>7 1/2% Deflection Mandrell Diam. in.</u>
6	5.742	5.31
8	7.665	7.09
10	9.563	8.84
12	11.361	10.51
15	13.898	12.86

The deflection test will be performed by pulling a "go-no-go" mandrel up-grade through the pipe from manhole to manhole. Where deflection is found to be in excess of allowable testing limits, the Contractor shall excavate to the point of excess deflection and remove the deflection by recompacting around the pipe or other approved method. After backfilling, the line shall then be retested for deflection. If the line has failed to return to its original size (inside diameter) the deflected pipe shall be replaced by the Contractor at his expense.

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104.1c LAMPING TEST: Lamping will be performed on all sanitary sewer pipes by the Engineer. In order to pass the lamping test, three-fourths (3/4) of the pipe circle shall be observed both vertically and horizontally between manholes.

104.2 TESTING STORM SEWERS AND CULVERTS: Testing of all gravity flow pipeline, other than sanitary sewers, shall consist of a physical inspection by the Engineer. All pipelines and sewer lines will be lamped to check for proper alignment and uniformity of grade.

All plastic pipes will be subject to deflection testing by the Engineer. The maximum allowable deflection of any flexible pipe shall be seven and one-half percent (7 1/2%) of the base inside diameter of the pipe as defined above.

104.3 TESTING PRESSURE PIPELINES: Water main, force mains, siphons, and all other pipelines that will operate under pressure shall be tested for pressure and leakage in accordance with these specifications and AWWA Standard C-603, Section 4.

The Contractor shall furnish all labor, equipment, tools, water and other incidental items required to conduct the tests. Test results will not be considered valid without the presence of the Engineer or his representative throughout the test.

No pressure testing shall be performed until all thrust blocks have been placed and cured for at least two (2) days, and the pipeline backfilled adequately to prevent any movement or lifting of the pipe. Pavement or other permanent surfaces shall not be placed until all pressure and leakage tests are satisfactorily completed.

104.3a TEST PRESSURE: Unless otherwise specified, the test pressure for all pipes shall be double the operating pressure at the lowest elevation of the test section or the class designation of the pipe plus fifty (50) psi, whichever is less, except that the minimum test pressure for water distribution lines shall be one hundred fifty (150) psi.

104.3b FILLING: The pipeline shall be filled with potable water at least twenty-four (24) hours before being subjected to the hydrostatic pressure test. Each section of pipeline shall be filled slowly and all air expelled by means of taps at points of highest elevation. Tapping to remove air shall be the responsibility of the Contractor and location of taps shall be approved by the Engineer.

104.3c PROCEDURE: The pressure and leakage tests may be performed simultaneously or separately. The total time for the combined pressure and leakage tests shall be a minimum of two (2) hours for each section of pipeline. If separate tests are made, the pressure test shall be made first. The duration of the pressure test shall be a minimum of one (1) hour and the duration of the leakage test shall be a minimum of four (4) hours. The pressure of the leakage test may be reduced to one hundred and fifty percent (150%) of the maximum working pressure that will occur on that portion of the line.

The specified test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. No pipe installation will be accepted if the leakage for the section of line being tested is more than the rate calculated using the following formula, except that leakage for Asbestos-Cement pipe shall conform to provisions of AWWA C-603.

$$L = \frac{ND\sqrt{P}}{7400}$$

Where: L = allowable leakage in gallons per hour  
N = number of joints in length of pipeline tested  
D = nominal diameter of pipe in inches  
P = average test pressure in psi gauge

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Leakage is defined as the quantity of water to be supplied to the section of pipeline being tested, which is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

- 105.0 DISINFECTION OF WATER LINES: After completion of pressure and leakage testing and prior to being placed into service, all new water mains and repaired portions of or extensions of existing mains shall be chlorinated by the Contractor in accordance with AWWA Standard C-601.
- 105.1 PREVENTING REVERSE FLOW: Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water.
- 105.2 CHLORINATING VALVES AND HYDRANTS: In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipeline is filled with the chlorinating agent and under normal operating pressure.
- 105.3 FINAL FLUSHING AND TESTING: Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its length shows upon test a chlorine residual of less than 2 mg/l.
- 105.4 BACTERIOLOGICAL TESTING: Following flushing samples shall be collected by the Contractor for testing for bacteriological quality. Each 1,000 feet of water main shall be sampled and tested and results of the test supplied to the County before acceptance of any portions of the line.
- 106.0 FINAL INSPECTION AND ACCEPTANCE: The acceptance of all pipelines by the County will be based on the following:
1. Submittal of satisfactory results of required tests (such as pressure test, leakage tests, compaction, bacteriological tests, etc.) certified by the Engineer or an approved independent laboratory.
  2. Passing a final inspection of the work by the County Engineer or his representative.
  3. Submittal of "As-Built" construction drawing on 24" x 36" reproducible Mylar or other suitable material.
- 107.0 MEASUREMENT AND PAYMENT: The complete and accepted pipeline will be paid for in accordance with the contract project items listed in the project schedule, approved change order, and with these specifications.
- The unit prices proposed for the various contract pay items shall be full compensation for furnishing all materials, labor, equipment, tools and other incidental items required for completion of the work in accordance with the construction plans and specifications.
- The quantities shown on the project schedule are approximate only. Payment will be based on measurement of actual quantities installed and approved.
- 107.1 CONDUIT: Unless otherwise specified, conduit of the various sizes, types and classes shown on the project schedule will be paid for at the contract unit price per linear foot of pipe installed and approved. Measurement will be made along the centerline of the conduit from end to end. The footage of conduit to be paid for will include the lengths of fittings, valves and valve vaults in line with the pipe but will not include the lengths of manholes, drain inlet boxes, culvert end sections, or other structures in line with the pipe.

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107.2 VALVES AND HYDRANTS: Valves and fire hydrants will be paid for at the contract unit price "each" for the different sizes, types and classes listed in the project schedule. The number of valves and hydrants to be paid for will be the number of units furnished, installed and approved.

107.3 WATER SERVICE LINES: Water service lines will be paid for at the contract unit price per linear foot for each size of line installed and approved. This price shall include the cost of furnishing and installing a corporation stop and curb stop and curb stop box on each service line.

107.4 MANHOLES AND INLETS: Manholes and storm drain inlets will be paid for at the contract unit price "each" for the various sizes, types and depths listed in the project schedule. The number of manholes and inlets to be paid for will be the number of complete units (including ring and cover or grate and frame) constructed and approved.

107.5 GRANULAR STABILIZATION MATERIAL: When the use of the granular stabilization material is ordered or authorized by the Engineer, it will be paid for at the contract unit price per ton of material placed and approved. The tonnage of material to be paid for will be determined from weight tickets collected by the Engineer at the time of delivery on the job site or delivered daily to the Engineer by the Contractor. Weight tickets not delivered daily will not be used in calculating payment.

For each load of granular stabilization material delivered, a weight ticket shall be given to the Engineer's field representative by the driver of the truck or, in the absence of an Engineer's representative, to the Contractor's foreman. Each ticket shall have the following information recorded on it:

Date \_\_\_\_\_  
Truck No. \_\_\_\_\_  
Total Weight \_\_\_\_\_  
Tare Weight \_\_\_\_\_  
Weight of material delivered \_\_\_\_\_  
Truck driver's signature \_\_\_\_\_

107.6 ROCK EXCAVATION: No payment will be made for "rock excavation" unless the method and costs of such work are established and approved by the Engineer in writing before any rock excavation is done.

107.7 PAVEMENT REPLACEMENT: The area of pavement replacement to be paid for will be the same area designated for removal. Where pavement is removed beyond the limits designated on the plans or otherwise approved, the Contractor shall replace the pavement at his own expense. The contract unit price per square yard for "Pavement Replacement" shall be full compensation for replacement of the pavement structure, including all hot bituminous pavement and aggregate base course required to restore the paved surface to its original condition.

107.8 INCIDENTAL CONSTRUCTION: Unless otherwise specified or provided for, the following list of materials and items of work will not be paid for separately but will be considered incidental to the contract pay items and all costs of these incidental items shall be included in the contract prices for the various pay items.

1. The furnishing and maintenance of barricades, warning signs and other traffic control devices.
2. All surface removals including removal of asphalt pavement, concrete, fences, plantings and structures.

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3. The location and protection of existing utilities.
4. All excavation (for trenches, compaction tests, etc.) except rock excavation. (See section 107.6 for payment for rock excavation.)
5. The support bracing and sheeting of trenches.
6. The dewatering of trenches.
7. The furnishing and placement of all granular bedding and haunching material, and all backfill material with moisture and density control.
8. The clean-up and restoration of grounds.
9. The removal and disposal of all waste materials including excess excavated material, trash and debris resulting from the work.
10. The furnishing and installation of tracing wire.
11. The furnishing and installation of concrete support and thrust blocking required on pressure pipelines.
12. All pressure and leakage testing.
13. The flushing and disinfection of waterlines. Water from County mains for the required flushing and disinfection shall not be charged to the Contractor. Water for compaction, cleanup, and non-required flushing shall be a Contractor expense, and, if County water is used, shall be paid for at the rate of \$0.84/1000 gallons.
14. The connection of new pipeline to existing facilities.
15. The separation, removal and disposal of muck, large rock, organic matter or other materials from project excavations which in the opinion of the Engineer are unsuitable for use in the backfill. No separate or additional payment will be made for hauling unsuitable materials to the Contractor's disposal site.

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STANDARD SPECIFICATIONS FOR CONSTRUCTION

STREETS AND ROADS

200.0 GENERAL: This project will utilize the following Standard Specifications for the Construction along with selected Standard Specifications and Standard Plans from the Colorado Department of Transportation. Any references to the City Engineer or Traffic Engineer shall mean the County's Engineer or Ouray County Public Works employees. The intent of this section is to specify materials and methods to be used for the construction or overlaying of streets, roads, parking lots, walks, drainage ways and other miscellaneous work requiring the use of asphalts and aggregates. The work covered shall include general requirements that are applicable to embankment and subgrade preparation, roadway excavation and grading, aggregate base course, bituminous tack coat and asphalt concrete overlay. All workmanship and materials shall be in accordance with the requirements of these specifications, and in conformity with the lines, grades, depths, quantity requirements and the typical cross section shown on the plans or as directed by the Engineer.

201.0 PERMITS AND INSPECTION: Permits shall be obtained before work begins (see General Conditions). The Contractor shall call for inspection from Ouray County, giving 24 hours minimum notice, before the placement of any county owned utilities or materials. In the event that any of the work or material fails to meet any of the requirements of the specifications, written notice of rejection shall be given to the Contractor and work shall be halted until such time as corrective action is taken.

A complete set of the approved drawings and a valid permit shall be on the job site and available to the Engineer at all times.

The Contractor shall be licensed and bonded for work in Colorado.

Inspection is only an aid to the Contractor and in no way reflects a responsibility on the part of Ouray County for quality or quantity control, and in no way implies acceptance of the work or any part thereof by Ouray County.

202.0 TESTING: A number of quality control tests shall be performed by an approved Material Testing Laboratory to determine compliance with the requirements of this section. An approved laboratory shall be construed to mean any institution or firm properly equipped to perform such tests and who has in their employment a registered professional engineer experienced in testing. Any tests will be performed at the County's expense. All materials, whether or not in place, failing to meet the requirements herein set forth, after testing, shall be removed, replaced (if necessary) and retested at the Contractor's expense.

Several basic tests and their minimum frequencies are listed below; these and any additional tests are more fully described in the text for each specification.

REQUIRED QUALITY CONTROL TESTS:

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<u>Item</u>	<u>Type of Test</u>	<u>Minimum Test Frequency</u>
Subgrade & Embankment	Moisture-Density Curve	1 per soil type
Compaction	In-Place Density	1/6000 sq.ft./lift
Aggregate Base Course or Subbase Course	Gradation, Plasticity Index, Liquid Limit	1/1000 ton or fraction thereof on each class
	Moisture-Density Curve	1/source on each class
Hot Bituminous Pavement	In-Place Density	1/200 ton
	Asphalt Content	1/500 tons or 2 per project, whichever is greater
	Gradation	Aggregate-Minimum of 2/source

203.0 ROADWAY EXCAVATION AND GRADING: This work shall consist of excavation, disposal, shaping or compaction of all material encountered within the limits of the roadway in close conformity with the lines, grades and typical cross sections shown on the plans or as directed by the Engineer.

203.1 CLEARING: Excavation and grading for street improvements and paving projects shall include removal of trash, rubbish and low lying vegetation in the construction area. All vegetation and objects designated to remain shall be protected from injury or defacement.

203.2 GRUBBING: All vegetation such as trees, stumps, hedges, shrubs, brush, heavy sod, heavy growth of grass, decayed vegetable matter, rubbish and other unsuitable material within the area of excavation or upon which embankment is to be placed shall be stripped or otherwise removed to a depth of six (6) inches. All such materials shall be wasted or spread outside the construction area or disposed of as directed by the Engineer. In no case shall such objectionable material be allowed in or under embankment.

Except in areas to be excavated, stump holes and other holes from which obstructions are removed, shall be backfilled with suitable material and compacted in accordance with these specifications.

203.3 STRIPPING: Stripping shall consist of removing unsuitable overburden material before removal of other material for use in the roadway. All areas to be graded and all embankments or fill areas under paved slabs shall be stripped.

203.4 EXCAVATION: After all clearing, grubbing and stripping has been done, excavation of every description and of whatever materials encountered within the grading limits of the project shall be

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performed. All suitable excavated materials shall be transported to and placed in embankments or fills within the limits of the work.

The excavation and embankments for the roadway and ditches shall be finished to reasonably smooth and uniform surfaces. Variation from the subgrade plane shall not be more than 1" unless approved by the Engineer. Excavation operations shall be conducted so that material outside of the limits of slopes will not be disturbed, but all cuts shall be made to subgrade a minimum of 1 foot outside the proposed edge of pavement or curb. Prior to beginning grading operations in any area, all necessary clearing and grubbing in that area shall have been performed. The Contractor shall not excavate beyond the dimensions and elevations established and material shall not be removed prior to the staking.

If excavation to the finished graded section encounters a subgrade or slopes of spongy material, vegetable matter or trash pockets, or standing water, the Engineer may require the Contractor to remove the unsuitable materials and backfill to the finished graded section with suitable material. Subgrade stabilization material (Type 1, Aggregate Classification Table) may be used to backfill the excavations of unsuitable material. The Engineer may designate as unsuitable those soils or materials that are in his judgment detrimental to the finished roadway. All unsuitable material shall be disposed of outside the construction area.

- 203.5 SHOULDERING AND MISCELLANEOUS WORK: The Contractor shall deposit sufficient suitable earth between curb and sidewalks, or property lines, so that when smoothed and consolidated in final deposition, it will provide a uniform smooth slope from top of curb to the adjacent sidewalk or property line. All broken concrete, trash and debris shall be removed before any fill is placed back of curb. In case excavation is necessary to accomplish the above purpose, the Contractor shall make such necessary excavation, and he shall leave the parking area so filled or excavated free from all trash and debris.

The Contractor shall set all manholes, water boxes or other service boxes, to the proper finished grade of the pavement or of the fill back of the curb. This work will be considered as part of the grading.

- 204.0 EMBANKMENTS: Embankment construction shall consist of constructing roadway embankments, including preparation of the areas upon which they are to be placed; the construction of dikes; the placing and compacting of approved material within project areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits and other depressions within the project area. Only approved materials shall be used in the construction of embankments and backfills.

Free running water shall be drained from the material before the material is placed. Rocks, broken concrete or other solid materials more than 6" in greatest dimension shall not be placed in embankment areas higher than 1 foot from the finished subgrade. Materials up to 150 pounds in weight may be placed at the lower area of fills when they will lie 3 feet below the finished subgrade. All fill material shall be free from roots, organic material, trash and frozen material.

When an embankment is to be placed and compacted on hillsides, or when new embankment is to be compacted against existing embankments, or when embankment is built 1/2 width at a time, the slopes that are steeper than 4:1 when measured longitudinally or at right angles to the roadway shall be continuously benched over those areas where it is required as the work is brought up in layers. Benching shall be well keyed and where practical a minimum of 8 feet wide. Each horizontal cut shall begin at the intersection of the original ground and the vertical sides of the previous cuts. Material thus cut out shall be re-compacted along with the new embankment material at the Contractor's expense.

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Embankment material shall be placed in horizontal layers not to exceed 8 inches in loose depth and compacted prior to placing each following layer.

The Contractor shall add moisture to or dry by aeration each layer as may be necessary to meet the requirements for compaction. Materials shall not be placed in embankments or fills when the moisture content exceeds 5% above or is 3% below optimum moisture content for that material. Under roadways and extending one (1) foot beyond proposed curb line measured perpendicular from the centerline embankments shall be compacted for the entire depth of the fill to a density of not less than 93% maximum dry density as measured by AASHTO T 180.

205.0 SUBGRADE PREPARATION: After all necessary grading has been done to bring the surface to the subgrade; the subgrade shall be scarified and compacted to a depth of 8 inches. The entire road bed width, 8 inches deep, shall be compacted to a density of not less than 93% of maximum dry density as measured by AASHTO T 180. If necessary, subgrade stabilization material may be used to achieve the specified compaction. Failure to attain the specified density shall be cause for rescarifying and recompacting.

Base or subbase shall not be placed upon the subgrade or any previously placed layer of the pavement section until compaction tests are taken and approved by the Engineer. Testing shall include but not be limited to trenches for water, sanitary, storm, telephone, and gas, electric and around manholes, valve boxes, or inlets. After the specified compaction density is approved by the Engineer, the subgrade shall be struck off and rolled with a smooth roller to the exact cross section as shown on the plans.

206.0 BASE COURSE AGGREGATE: Aggregates shall be crushed stone, crushed slag, crushed gravel or natural gravel which conforms to the requirements of AASHTO M 147. Aggregate shall meet the grading requirements in the Classification Table below. The type used shall be specified on the plans or special provisions. The liquid limit (LL) shall be as shown in the table and the plasticity index (PI) shall not exceed 6 when the aggregate is tested in accordance with AASHTO T 89 and T 90, respectively.

In advance of the beginning of placing any aggregates, the Contractor shall submit suitable samples of the proposed material to an approved Materials Testing Laboratory for tests to determine the compliance with the requirements of this specification. The results of all tests shall be submitted to the Engineer for approval prior to the placement of any aggregate material. Tests shall be at the Contractor's expense.

### CLASSIFICATION TABLE FOR AGGREGATE BASE COURSE

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Sieve Designation	Percentage by Weight Passing Square Mesh Sieves						
	LL not greater than 35			LL not greater than 30			
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
4 inch	...	100	...	...	...	...	...
3 inch	...	95-100	...	...	...	...	...
2½ inch	100	...	...	...	...	...	...
2 inch	95-100	...	...	100	...	...	...
1½ inch	...	...	...	90-100	100	...	...
1 inch	...	...	...	...	95-100	...	100
¾ inch	...	...	...	50-90	...	100	...
No. 4	30-65	...	...	30-50	30-70	30-65	...
No. 8	...	...	...	...	...	25-55	20-85
No. 200	3-15	3-15	20 max.	3-12	3-15	3-12	5-15

Note: Class 3 material shall consist of bank or pit run material

207.0 **BASE COURSE PLACEMENT AND COMPACTION:** The subbase course material shall be placed on the previously prepared subgrade. Subgrade shall be graded and rolled to a smooth and uniform surface free of cracks and soft spots with approximate optimum moisture obtained immediately prior to placement of subbase. The base course material shall be placed on the previously prepared subbase at the locations and in the proper quantities to conform to the typical cross sections as shown on the plans and as directed by the Engineer. Placing and spreading shall be done by means of spreader machine, moving vehicle, motor grader or other approved equipment methods. The material shall be placed without segregation. Any segregated areas shall be removed and replaced with uniformly graded material at the Contractor's expense.

Each layer of subbase material shall be placed in layers not to exceed eight (8) inches in loose depth. Each layer shall be wetted or aerated, if necessary, and compacted to not less than 95% of maximum density as determined by AASHTO T 180, Method D (Modified Proctor). If water is needed, it shall be uniformly applied as necessary during compaction to obtain optimum moisture content and to aid in consolidation. The surface of each layer shall be maintained during the compaction operations in such a manner that a uniform texture is produced and the aggregates are firmly keyed. No subbase material shall be placed upon a soft, spongy or frozen subgrade or other subgrade, the stability of which is, in the opinion of the Engineer, unsuitable for the placement thereof.

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The above specifications are required for the placement and compaction of the base course material with the exception that each layer of base course material shall have a thickness not to exceed 6 inches when compacted.

The finished base course surface shall be smooth and free of ruts and irregularities and true to grade and crown as shown on the plans or as directed by the Engineer. The final surface shall be finished with a surface smoothness tolerance of one-fourth inch (1/4") measured as vertical ordinate from the face to a ten-foot straightedge laid parallel or 3/8" perpendicular to the station line. The base course shall be maintained in this condition by watering, drying, rolling or blading, as necessary until the surfacing is placed.

In-place field density determinations shall be made in accordance with AASHTO T 191 or T 205. The use of a nuclear density gauge will be allowed when correlated with one of the above test methods.

208.0 PLANT MIX HOT BITUMINOUS PAVEMENT: The bituminous pavement shall be composed of a mixture of aggregate, filler if required, and bituminous material, hot mixed at a central plant and placed on the prepared base in conformity with the cross section and grades shown on the approved plans.

208.1 TESTING: The Contractor, at his expense, shall submit suitable samples of all materials proposed for use on the project to a materials testing laboratory approved by the Engineer. The Testing Laboratory shall, at the Contractor's expense, test all materials for compliance with these specifications and establish a job mix formula for each mixture proposed for use on the project.

The job mix formula for each mixture shall establish a single percentage of aggregate passing each required sieve size, a single percentage of bituminous material to be added to the aggregate, and a single temperature at which the mixture is to be mixed. The job mix formula shall be within the master range specified in the following subsection. The job mix formula may be derived by either the Marshall (ASTM 1559) (AASHTO T 245) or the Hveem methods (AASHTO T 246) (ASTM 1560) but shall employ all current, applicable AASHTO, ASTM or Asphalt Institute procedures. An immersion compression test (AASHTO T 165) will be performed on a sample made at the optimum asphalt cement content to determine the effect of water on the cohesion of the compacted bituminous mixture.

The aggregate source is undesignated but test results proving that the aggregate meets these specifications must be submitted to the Engineer with the job mix formula. The aggregate must be tested for size and grading, cleanliness and soundness, toughness, surface texture and particle shape, absorption and stripping potential using current, applicable AASHTO, ASTM and/or Asphalt Institute procedures.

Test results must be submitted to the Engineer before paving is to begin and his approval must be obtained in writing before any paving is begun.

Job mix formula testing will not have to be conducted for each new paving project if a mix formula conforming to these specifications has previously been established using the same aggregate source that the Contractor is proposing for this project. The test results and mix formula from the earlier lab tests shall then be submitted to the Engineer for approval before paving begins.

However, a written statement is required with the job mix submittal from the lab performing the earlier tests verifying that: (1) the Contractor's proposed aggregate is the same as that of the previously established mix formula and (2) the performance of the two mixes, produced under similar conditions, will essentially be the same, with proper allowances for testing deviation.

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Should a change in sources of materials be made, a new job-mix formula shall be established before the new material is used. When unsatisfactory results make it necessary, the Engineer may require the Contractor to establish a new job-mix formula.

### 208.2 MATERIALS:

208.2a Asphalt - Asphalt cement shall adhere to the requirements of viscosity grade AC-10 as specified by AASHTO M 226, Table 1 unless otherwise permitted by the Engineer in writing.

208.2b Prime Coat Asphalt - Cutback asphalt for prime coat shall be MC-70 complying with the requirements of AASHTO M 82. Emulsified asphalt may be substituted where special construction methods, as outlined in 209.1, are followed. Emulsified asphalt shall conform to those requirements specified under 208.25 Tack Coat.

208.2c Tack Coat - Emulsified asphalt for tack coat shall be SS-1, SS-1h, CSS-1 or CSS-1h diluted one part water to one part emulsified asphalt. Before dilution the emulsified asphalt shall comply with the requirements of AASHTO M 140 or M 208.

208.2d Aggregate - Mineral aggregate shall consist of hard, durable particles or fragments of crushed stone or gravel which shall be free from disintegrated stone, vegetable matter, clay lumps or other deleterious substances. Aggregate shall conform to the following grading limits (Grading C):

<u>Sieve Size</u>	<u>Percent by Weight Passing Square Mesh Sieves</u>
3/4"	100
1/2"	70-95
3/8"	60-88
#4	44-72
#8	30-58
#30	12-34
#200	3-9

The aggregate shall also conform to the following requirements:

- Percentage of wear, Los Angeles Test (AASHTO T 96), not more than 35.
- At least 90 percent of the gravel retained on the No. 4 sieve shall have at least two fractured faces.
- When tested for stripping potential (AASHTO T 182), aggregate shall have a retained bituminous film of above 95 percent.
- Plasticity index shall not exceed 6 when the aggregate is tested in accordance with AASHTO-T 90.

208.2e MINERAL FILLER: If mineral filler is required to meet gradation or strength requirements, finely powdered limestone, Portland cement, hydrated lime or other approved materials may be used for the filler.

208.3 JOB MIX: The job mix for the asphalt-aggregate mixture shall meet the following criteria by testing method:

The exact percentage of asphalt cement in the job mix shall be determined by the testing laboratory for the aggregate to be used on the project. The percentile will vary between 4 and 7 percent. The amount of filler or anti-stripping agent, if necessary, will be determined by the testing laboratory. The stability

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will be at least 1500 pounds. Per cent airvoids will be between 3 and 7. The flow value will be between 8 and 16.

All mixtures furnished for the project shall conform to the job-mix formula within the following ranges of tolerances:

Passing No. 8 and Larger Sieves*	+/- 8 percent
Passing Sieves Smaller than No. 8 to larger than No. 200	+/- 6 percent
Passing No. 200 Sieve	+/- 3 percent
Bitumen	+/- 0.5 percent
Temperature of Mixture when emptied from Pugmill Mixers	+/- 20°F

\*Exclusive of the maximum size designated in the job-mix formulas.

Any variation from the job-mix formula in the grading of the aggregate or in the asphalt content greater than the tolerances shown above shall be investigated and the conditions causing the variation corrected.

### 209.0 CONSTRUCTION REQUIREMENTS:

209.1 PREPARING AREA TO BE PAVED: The area to be paved shall be substantially true to line and grade. It shall have a dry, firm and properly prepared surface before paving operations begin. Prime coat shall be applied uniformly at a rate of 0.25 gallons per square yard to the surface of aggregate base course prior to placement of hot bituminous pavement. The prime coat shall be sprayed at a temperature of between 120°F and 130°F. Where emulsified asphalt is applied as a prime coat, it shall be applied to finished base course prior to compaction. It shall be applied at a rate of 0.3 gallons per square yard. The surface shall be rolled and compacted after placement of emulsified asphalt. Emulsions may be used when air temperature is above 60°F and where application of asphalt paving will be completed within 24 hours of placing of prime coat.

If new asphalt is to be placed over existing asphalt, holes and depressions in existing surfaces shall be repaired by removing all loose and defective material to sound pavement or base and applying prime coat and replacing with an asphalt-aggregate patching material. The patching mixture shall be compacted to produce a tight surface conforming to the adjacent pavement area. If there is excess asphalt in existing patches or joints, it shall be removed and made level with the surrounding pavement grade.

A tack coat shall be applied uniformly at the rate of 0.10 gallons per square yard between layers of hot bituminous pavement (either between new layers or existing and new layers). Likewise, surfaces of curbs, gutters, vertical faces of existing pavements, and all structures to be in actual contact with the asphalt-aggregate mixture shall be given a thin, even coating of asphaltic material. Care shall be taken to prevent splattering, with asphalt, surfaces that will not be in contact with the asphalt-aggregate mixture. Immediately prior to application of the asphalt tack coat, all loose and foreign material shall be removed by sweeping or by blowing, or both.

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209.2 **BITUMINOUS MIXING PLANT:** The aggregate shall be dried and heated to provide a paving mixture temperature in conformance with placing conditions, but not to exceed 163°C (325°F).

The heated and dried aggregates shall not contain enough moisture to cause the mixture to slump, the asphalt to foam, or the aggregate to segregate during hauling and placing, or to interfere with the proper adhesion of the asphalt aggregate mixture.

Mixing time shall be the shortest time that will produce a satisfactory mixture. It will be established by the contractor based on the procedure for determining the percentage of coated particles described in AASHTO Method T 195 (ASTM Method D 2489). The mixing times will be set to achieve 95 percent of coated particles for all mixtures.

The aggregates shall be combined in the mixer in the amount of each fraction of aggregates required to meet the job-mix formula. The bituminous material shall be measured or gauged and introduced into the mixer in the amount specified by the job-mix formula.

The job-mix temperature at the mixer discharge (for pugmill or dryer drum) shall be between 245°F and 300°F. Mixtures shall be delivered for use on the road at not less than 235°F nor greater than 290°F. The mixture shall be hauled in such a manner so that it is protected from the weather and so that the minimum temperature stated above is maintained until the mixture is unloaded into the paver.

209.3 **MIXTURE PLACEMENT:** The asphalt mixture shall be placed by bituminous pavers which shall be self-contained, power-propelled units, provided with an activated screed or strike-off assembly, heated if necessary, and capable of spreading and finishing courses of bituminous plant mix material in widths applicable to the specified typical section and thicknesses shown on the plans.

The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed.

The paving machine shall be equipped with an automatic control system which will control the elevation of the screed and which is automatically actuated by a system of sensor-operated devices which sense and follow reference lines or surfaces on one or both sides of the machine as required.

The screed shall be maintained at the proper elevation at each end by controlling the elevation of one end and automatically controlling the transverse slope or by controlling the elevation of each end independently, as directed.

The screed or strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture.

When laying mixtures, the paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture.

Rollers shall be of the steel wheel, vibratory, pneumatic tire type or combination and shall be in good condition, capable of reversing without backlash.

The base course mixture shall be placed in one or more lifts with an asphalt paver to provide a nominal compacted thickness. The minimum lift thickness shall be at least two times the maximum particle size. The maximum lift thickness shall be that which can be demonstrated to be laid in a single lift and compacted to required uniform density and smoothness.

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Placing the mixture shall be a continuous operation. If any irregularities occur, they shall be corrected before final compaction of the mixture.

The minimum ambient temperature at the time of placement shall be 50°F unless specifically approved by the County Engineer or Public Works Representative. No asphalt shall be laid on a wet or damp base. The Engineer shall determine if the base is suitable for placement.

The longitudinal joint in one layer shall offset that in the layer immediately below by approximately 6 inches; however, the joints in the top layer shall be located as follows:

For 2-lane roadway, at the centerline of the pavement and at the outside edge of the travel lanes.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading or finishing equipment impracticable, the mixture shall be spread, raked and luted by hand tools. For such areas, the mixture shall be dumped, spread and hand screeded to give the required compacted thickness.

209.4 COMPACTION: The mix shall be compacted immediately after placing. Initial rolling shall follow the paver as closely as possible. If needed, intermediate rolling with a pneumatic-tired roller shall be done immediately behind the initial rolling. Final rolling shall eliminate marks from previous rolling. In areas too small for the roller, a vibrating plate compactor or a hand tamper shall be used to achieve thorough compaction.

The surface shall be rolled when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking or shoving. Unless otherwise directed, rolling shall begin at the sides and proceed longitudinally parallel to the road center line, each trip overlapping one-half the roller width, gradually progressing to the crown of the road.

Any displacement occurring as a result of the reversing of the direction of the roller, or from other causes, shall be corrected at once by the use of rakes and addition of fresh mixture when required. Care shall be exercised in rolling not to displace the line and grade of the edges of the bituminous mixture.

To prevent adhesion of the mixture to the rollers, the wheels shall be kept properly moistened with water. Use of excess water will not be permitted.

Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective shall be removed and replaced with fresh hot mixture, which shall be compacted to conform with the surrounding area. Any area showing an excess or deficiency of bituminous material shall be removed and replaced.

209.5 JOINTS: Placing of the bituminous paving shall be as continuous as possible. Rollers shall not pass over the unprotected end of a freshly laid mixture unless authorized by the Engineer. Transverse joints shall be formed by cutting back on the previous run to expose the full depth of the course. A coat of bituminous material shall be used on contact surfaces of all joints just before additional mixture is placed against the previously rolled material.

209.6 SURFACE TOLERANCES: The variation between any two contacts with the surface shall not exceed 3/16 inch in 10 feet. All humps or depressions exceeding the specified tolerance shall be corrected by removing defective work and replacing it with new material or by overlaying (patching) as directed by the Engineer. The final pavement surface shall not vary from the theoretical cross section by more than one (1) inch at any one point.

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The final surface pavement adjacent to concrete gutter shall be finished from 1/8 inch to 3/8 inch above the lip of the gutter into which it drains.

Any surface pavement that is above the lip more than 3/8 inch shall be removed and replaced to the specified height. Any surface pavement that is below the lip of the gutter shall be corrected as specified above.

209.7 MANHOLES AND VALVE BOXES: All manholes and valve boxes shall be brought to finished grade by the Contractor before the surface course is placed. The Engineer shall inspect all manholes and valve boxes. The Contractor shall remove any foreign matter introduced into them by his work. It shall also be the Contractor's responsibility to insure proper compaction around all manholes and valve boxes after they have been raised. As an alternate, valve boxes and manholes may be raised after completion of the final lift and backfilled. Asphalt shall be neatly cut with a saw to provide a square cutout. Dimension of the cutout shall be 30" square on water valve boxes and 48" square on manholes. Boxes and manholes shall be centered on the cutouts. Concrete for the cutouts shall be as shown on the detail sheet.

210.0 ACCEPTANCE REQUIREMENTS: In addition to all other required tests described in previous sections, acceptance of paving will be based upon density tests conducted by an Engineer approved testing laboratory. The temperature of the asphalt material will be measured and recorded by the Contractor as the mixture is being placed. A sufficient number of samples shall be chosen at random at the job site to perform an asphalt content (extraction) test, (AASHTO T 164), aggregate grading of the extracted aggregate (AASHTO T 30) and laboratory compaction of at least 3 briquettes in accordance with ASTM D 1559 (AASHTO T 245).

The briquettes will be tested by the Marshall Method (AASHTO T 245) to determine the amount of voids, stability and flow of the compacted mixture. A specific gravity and unit weight of the briquettes will be determined (AASHTO T 166) to compare with the in-place density.

After the asphalt pavement has been rolled and has cooled, two four-inch diameter cores will be sampled from that mat. These cores will be measured for thickness and density (AASHTO T 230). This density will be compared to the density of the Marshall briquettes to determine the percent compaction of the cores.

As an alternative to core sampling, the compacted layers of asphalt can be tested for density using a nuclear device in accordance with ASTM D 2950.

Each day's paving and each layer of compacted asphalt will be tested as specified above. For acceptance by the County, the average of the field density determinations must be equal to or greater than 94 percent, with no individual determination being lower than 93 percent, of the average density of the laboratory-prepared specimens.

211.0 INSPECTION AND ACCEPTANCE OF WORK: The County Engineer, or his duly authorized representative, shall at all times have access to the work during its construction. All work done and all materials furnished shall be subject to his inspection and approval. Work and materials not meeting the requirements shall be made good and unsuitable work or materials may be rejected. All work which has been rejected shall be remedied, or removed and replaced in an acceptable manner.

When the County Engineer has made a final inspection and determines that the work has been completed in all respects, and after as-built drawings are submitted, he will formally accept in writing the improvements.

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CONTRACTORS' GUARANTEE: The Contractor shall guarantee all portions of street construction for a period of one year after acceptance by the Engineer against defective workmanship and materials and shall keep same in good order and repair. The determination of the necessity, during such guarantee period, for the Contractor to repair said street, or any portion thereof, shall rest entirely with the County Engineer, whose decision upon the matter shall be final and obligatory upon the Contractor.

# Section 300

## TECHNICAL SPECIFICATIONS

### FOR HILFIKER M. S. E. SYSTEM

### Welded Wire Wall

### (Commercially Galvanized Wire)

Note: "Owner" references Ouray County

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#### 1.0 DESCRIPTION

This work shall consist of a **Welded Wire Retaining Wall (WWW)**, Mechanically Stabilized Earth Retaining Wall [MSE] constructed in accordance with these specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on the plans or established by the Owner's Engineer.

#### 2.0 MATERIALS

The Contractor shall make his own arrangements to purchase all **WWW** M.S.E. materials, including wire mesh reinforcement mats, backing materials, and all necessary incidentals from Hilfiker Retaining Walls, 1902 Hilfiker Lane, Eureka, CA 95503-5711, ph. 707/443-5093; [www.hilfiker.com](http://www.hilfiker.com); [info@hilfiker.com](mailto:info@hilfiker.com).

##### 2.1 Wire Reinforcement and Cap Mesh

Welded wire fabric for facing shall be formed by a 90-degree bend of the soil wire reinforcement mesh and a prong to interlock with the soil reinforcing mesh above. The reinforcing mesh shall be shop fabricated of cold drawn steel wire and shall be welded into the finished mesh fabric conforming to the minimum requirements of ASTM A-1064, with a yield strength minimum of 450 MPa [65 ksi]. Welded Wire Mesh for the **WWW** shall be as per project specifications, and will be commercial galvanized.

##### 2.2 Backing Materials

###### 2.2.1 Backing Mats

Where required, as shown on the plans, steel backing mat shall be W5 vertical x W2.5 horizontal minimum (.2582" [6.6 mm] x .178" [4.5 mm] nom. dia.) welded wire fabric meeting ASTM A-1064.

###### 2.2.2 Hardware Cloth

Where required, as shown on the plans, 20-Gauge metallic hardware cloth screen, or 23-Gauge PVC coated (Brown or Green) hardware cloth screen with openings not exceeding ¼ inch (6.4 mm) and a roll width of 26-inches. The hardware cloth screen shall be in accordance with ASTM A-740 and shall be placed between the backfill and steel backing mat. A minimum vertical lap of 2" and horizontal lap of 1" must be maintained to retain the wall backfill.

###### 2.2.3 Filter Fabric

Where required, as shown on the plans, geotextile filter fabric shall be utilized to retain the soil.

#### 3.0 SELECT GRANULAR BACKFILL MATERIALS

As shown on the plans, select granular backfill materials for the **WWW** wall structure shall be reasonably free from organic and otherwise deleterious materials and shall conform to the following gradation limits as determined by ASTM D-422:

Sieve Designation	Percent by Weight Passing Standard Sieves (AASHTO T 27 & T 11)
6 inches (152.4 mm)	100
3 inches (76.2 mm)	100 - 75
No. 200 (75 µm)	0 - 15

The backfill shall conform to all of the following additional requirements:

- A. The Plasticity Index (P.I.), as determined by ASTM D-4318 (AASHTO T 90), shall not exceed 6.
- B. The fraction finer than 15 microns (0.015 mm), as determined by ASTM D-422 (AASHTO T-88) shall not exceed 15 percent.
- C. The material shall exhibit an angle of internal friction of not less than 34 degrees, as determined by the standard direct shear test ASTM D-3080-72 (AASHTO T-236), utilizing a sample of the material compacted to 90% percent of ASTM D-1557-92. No testing is required for backfill where 80 percent of the material is greater than ¾ inch (19 mm). Before construction begins, the borrow selected shall be subject to show conformance with this frictional requirement.

In addition, backfill materials shall also meet the following corrosion requirements:

Resistivity	≥ 3000 OHM-cm (min)	AASHTO T 288
pH	5.0 to 10.0, inclusive	AASHTO T 289
Chlorides	≤ 100 mg/kg (ppm)	AASHTO T 291
Sulfates	≤ 200 mg/kg (ppm)	AASHTO T 290
Organic Content	<1%	AASHTO T267-86

If the resistivity is greater than or equal to 5,000 ohm-cm, the chlorides and sulfates requirements may be waived.

### 3.1 Acceptance of Material

The Contractor shall furnish to the Owner's Engineer a Certificate of Compliance certifying that the select granular backfill material complies with this section of the specifications. A copy of all test results performed by the Contractor, which are necessary to assure compliance with the specifications, shall also be furnished to the Owner's Engineer and the MSE supplier.

The frequency of sampling of Select Granular Backfill necessary to assure the above-mentioned requirements shall be directed by the Owner's Engineer.

Backfill not conforming to this specification shall not be used without written consent of the Engineer.

### 3.2 Free Draining, Permeable Backfill

If the M. S. E. will be subject to water inundation, the following permeable, free-draining backfill material shall be used:

Sieve Designation	Percent by Weight Passing Standard Sieves (AASHTO T 11 and T 27)
6" (76 mm)	100
¾" (19 mm)	50 - 90
No. 4 (4.75 mm)	20 - 50
No. 200 (75 µm)	0 - 2

## 4.0 CONSTRUCTION REQUIREMENTS

### 4.1 Wall Excavation

Wall excavation shall be in accordance with the requirements of the Project specifications and in reasonably close conformity with the limits and construction stages shown on the plans. All excavation cuts and slopes shall be in accordance with governing safety regulations.

### 4.2 Foundation Preparation

The foundation for the structure shall be graded level for a width equal to or exceeding the length of the reinforcement mat or as shown on the plans. Prior to wall construction, the foundation, if not in rock, shall be compacted, as directed by the Owner's Engineer.

Any unsuitable foundation material below the reinforced soil volume, as determined by the Owner's Engineer, shall be excavated for the full length of mat reinforcements, and to a depth as directed by the Owner's Engineer. Excavated unsuitable material shall be replaced as directed by the Owner's Engineer.

The maximum calculated applied bearing pressure at the foundation level is as shown on the elevation view for each wall. It is the responsibility of the Owner's Engineer to determine that this calculated applied bearing pressure is allowable for that location.

### 4.3 M.S.E. Wall Erection

Standard wire mesh reinforcement mats, and applicable facing materials, shall be placed in 24" successive horizontal lifts in the sequence shown on the plans as backfill placement proceeds. Each standard lift must have the ability to compress a minimum of 2" without creating any outward bulge of the facing elements. Vertical tolerance (plumbness) and horizontal alignment tolerance shall not exceed two (2) inches (51mm) when measured at the junction of the wire facing and soil reinforcement along a 10-foot (3 m) straight edge.

The overall vertical tolerance of the wall (top and bottom) after construction shall not exceed one (1) inch (25 mm) per ten (10) feet (3 m) of wall height, unless the wall design requires a battered facing. For battered facing structures, the overall tolerance from the theoretical battered locations shall not exceed one-half (1/2) inch (13 mm) per ten (10) feet (3 m) of battered wall height.

### 4.4 Backfill Placement

Backfill placement shall closely follow erection of each course of reinforcement mats. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the facing. Any wall materials, which become damaged or disturbed during backfill placement, shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Owner's Engineer. The Contractor, at their expense, shall correct any misalignment or distortion of the wall facing due to placement of backfill outside the limits of this specification.

Backfill shall be compacted to 95 percent of AASHTO T 99 method C or D, with oversize correction, at optimum moisture content ( $\pm 2\%$ ).

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill material shall have a placement moisture content equal to or within two percentage points of optimum moisture content ( $W_{opt} \pm 2\%$ ). Backfill material with placement moisture content in excess or less than  $W_{opt} \pm 2\%$  shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift. The Contractor shall decrease the percentage of deviation from optimum moisture, if necessary, to obtain the specified

density. The optimum moisture content shall be determined in accordance with AASHTO T 99 Standard Proctor Method A, with coarse particle correction according to AASHTO T 224.

Backfill shall be placed in complete horizontal lifts. The maximum lift thickness after compaction shall not exceed twelve (12) inches (305 mm). The Contractor shall decrease this lift thickness, if necessary, to obtain the desired density.

Compaction within three (3) feet (1 m) of the backface of the wall facing shall be achieved by at least three (3) passes of a lightweight mechanical tamper, roller or vibratory system. Soil density tests are not generally required within this area.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to rapidly direct run-off of rainwater away from the wall face. In addition, the Contractor shall not allow surface run-off from adjacent areas to enter the wall construction.

## 5.0 METHOD OF MEASUREMENT

### 5.1 Wire Mesh Facing

The unit of measurement for furnishing and fabricating all materials for the walls, including wire mesh reinforcement mats, applicable backing materials and other incidentals will be the square foot or square meter of wall surface area. The quantity shall be measured on the basis of supplied [may differ than installed] wall face area shown on the plans.

Measurement and payment for excavation and backfill quantities performed during **WWW** construction will be in accordance with the applicable sections of the contract specifications.

### 5.2 Wall Erection

The unit of measurement for wall erection will be the square foot of wall surface area complete and in place. The quantity to be paid for will be the actual quantity erected in place at the site. Payment shall include compensation for all labor and materials required to prepare the wall foundation, place the reinforcement mats, and position the backing mats and screens as shown on the plans.

• End of Section •

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This information is proprietary to Hilfiker Retaining Walls, 1902 Hilfiker Lane, Eureka, CA 95503-5711, Telephone: 707-443-5093, Email: [info@hilkiker.com](mailto:info@hilkiker.com).

### HILFIKER RETAINING WALLS ARE COVERED BY ONE OR MORE OF THE FOLLOWING PATENTS:

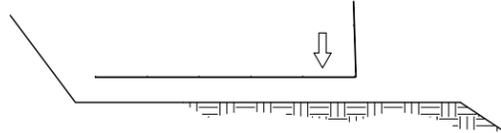
3,631,682	4,068,482	4,329,089	
3,922,864	4,117,686	4,324,508	OTHER
243,697	4,051,570	4,343,572	PATENTS
243,613	4,266,890	4,391,557	PENDING
4,154,554	4,260,296	4,505,621	

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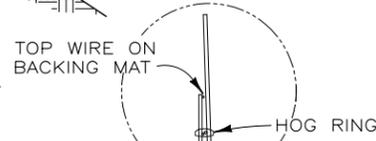
Revision Date: June 12, 2012

w:\product info\3. specifications\product specs\www\www-com.galvanized spec updated 6-12-12.doc

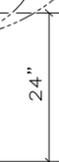
**STEP 1**  
PLACE THE FIRST COURSE OF SOIL REINFORCEMENT MATS ON PREPARED FOUNDATION



**STEP 2**  
PLACE THE BACKING MAT AGAINST THE INSIDE FACE OF THE SOIL REINFORCEMENT MAT. CLIP THE SECOND-TO-TOP TRANSVERSE WIRE ON THE BACKING MAT TO THE TOP TRANSVERSE WIRE ON THE SOIL REINFORCEMENT MAT.

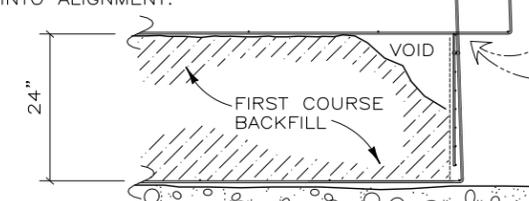


INSTALL FILTER FABRIC OR CONTINUOUS HARDWARE CLOTH, HOG-RING TO THE TOP WIRE ON THE BACKING MAT.

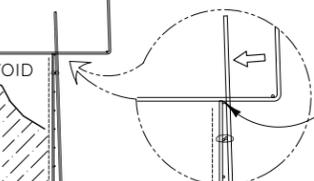


**STEP 3**  
PLACE AND COMPACT THE BACKFILL IN LAYERS AND DENSITIES AS SPECIFIED IN THE PROJECT PLANS. LEAVE A VOID AT THE FACE AS SHOWN.

PLACE THE SECOND COURSE OF SOIL REINFORCEMENT MATS WITH THE BASE LONGITUDINAL WIRES RESTING ON THE TOP TRANSVERSE WIRE OF THE BACKING MAT BELOW. SLIDE THE SOIL REINFORCEMENT MAT INTO ALIGNMENT.



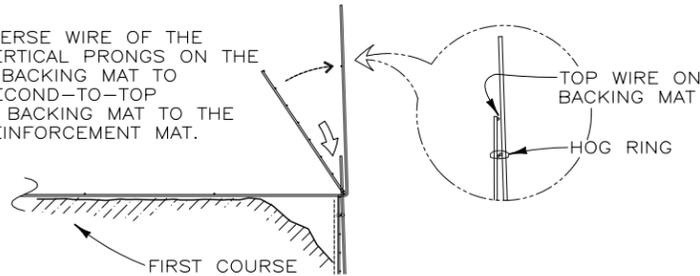
SECOND COURSE SOIL REINFORCEMENT MAT



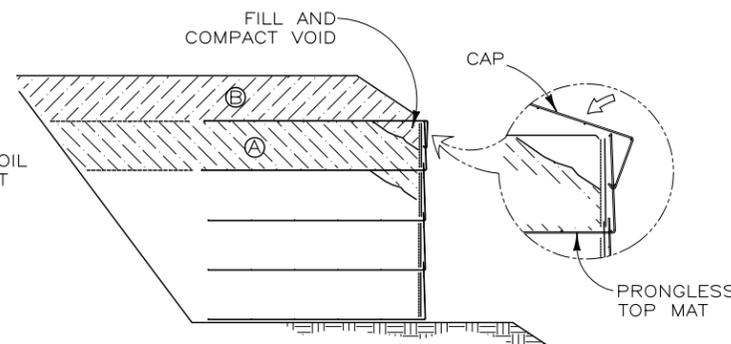
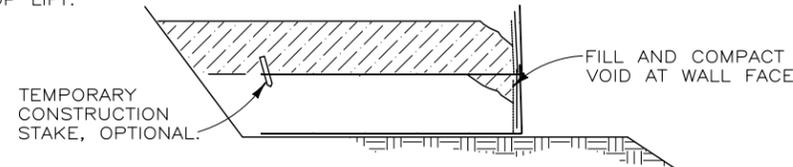
TOP WIRE ON BACKING MAT

**CONSTRUCTION SEQUENCE**  
NOT TO SCALE

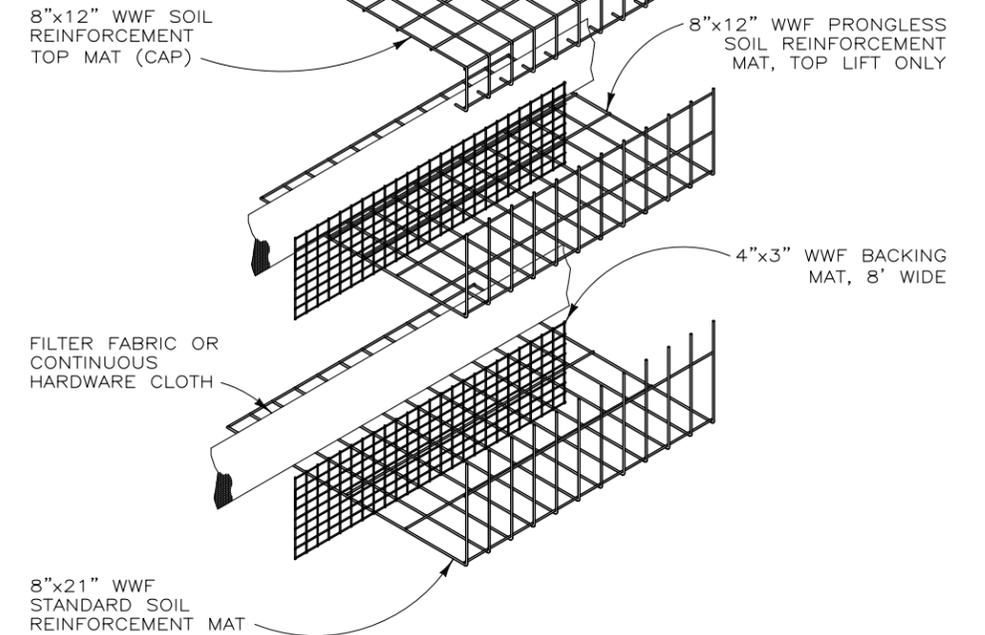
**STEP 4**  
HOOK THE BOTTOM TRANSVERSE WIRE OF THE BACKING MAT OVER THE VERTICAL PRONGS ON THE LOWER MAT. ROTATE THE BACKING MAT TO VERTICAL AND CLIP THE SECOND-TO-TOP TRANSVERSE WIRE ON THE BACKING MAT TO THE TOP WIRE ON THE SOIL REINFORCEMENT MAT.



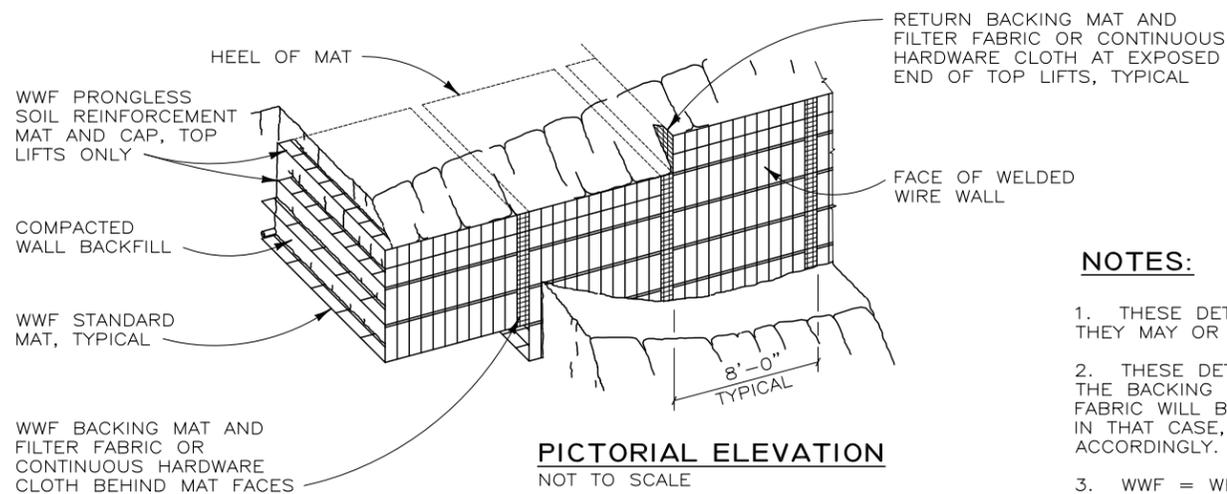
**STEP 5**  
INSTALL THE FILTER FABRIC OR CONTINUOUS HARDWARE CLOTH. PLACE AND COMPACT THE BACKFILL TO THE BASE ELEVATION OF THE NEXT MAT. REPEAT STEPS 3 THROUGH 5 TO THE TOP LIFT.



**STEP 6: TOP LIFT**  
PLACE THE TOP LIFT (PRONGLESS MAT), BACKING MAT AND FILTER FABRIC OR CONTINUOUS HARDWARE CLOTH. PLACE AND COMPACT BACKFILL IN AREA "A". HOOK THE CAP OVER THE MIDDLE TRANSVERSE WIRE ON THE PRONGLESS MAT, AND ROTATE INTO PLACE. BACKFILL "B" TO 1'-6" MIN. COVER OVER THE CAP.



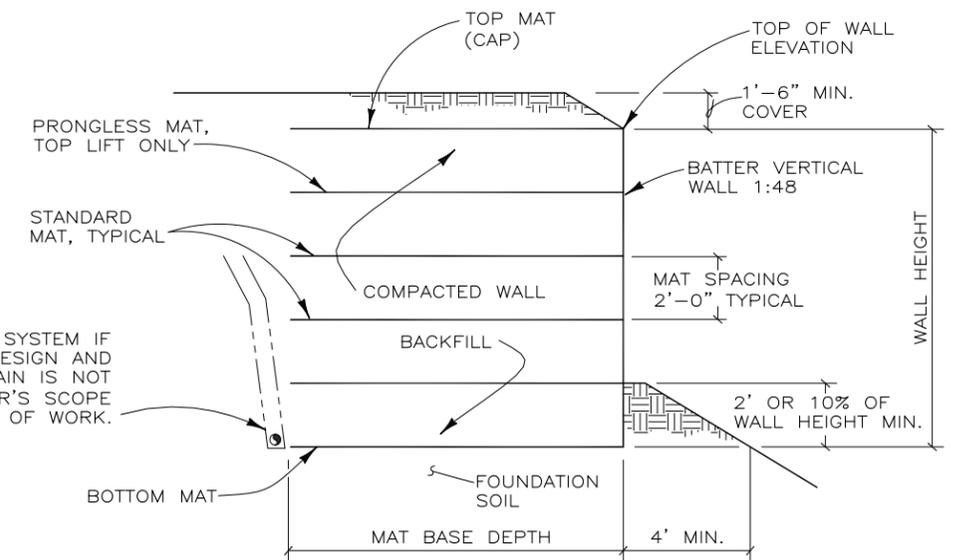
**WALL COMPONENTS**  
NOT TO SCALE



**PICTORIAL ELEVATION**  
NOT TO SCALE

**NOTES:**

1. THESE DETAILS ARE INTENDED FOR INFORMATION ONLY. THEY MAY OR MAY NOT APPLY TO SPECIFIC PROJECTS.
2. THESE DETAILS SHOW HARDWARE CLOTH USED BEHIND THE BACKING MATS. IN SOME APPLICATIONS, FILTER FABRIC WILL BE REQUIRED INSTEAD OF HARDWARE CLOTH. IN THAT CASE, THESE DETAILS SHOULD BE REVISED ACCORDINGLY.
3. WWF = WELDED WIRE FABRIC

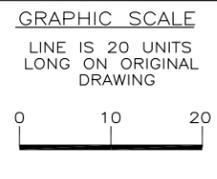


**TYPICAL SECTION**  
NOT TO SCALE

WELDED WIRE WALL STANDARD DETAILS

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REV. NO.	DATE	BY	DESCRIPTION
1	6 JAN 03	DR	MINOR REVISIONS
2	25 SEP 06	AMJ	MINOR REVISIONS
3	12 SEP 07	AMJ	MINOR REVISIONS, UPDATED BORDER
4	17 SEP 07	JTE	CHANGED LOGO, FIXED LEADERS



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ENGINEER  
CADD BY  
HRW

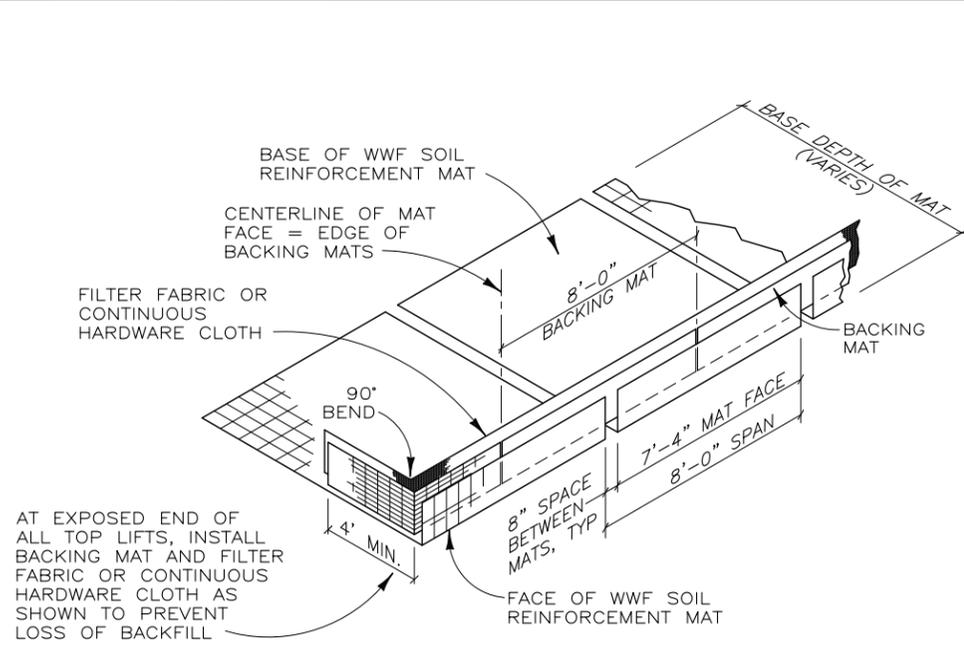
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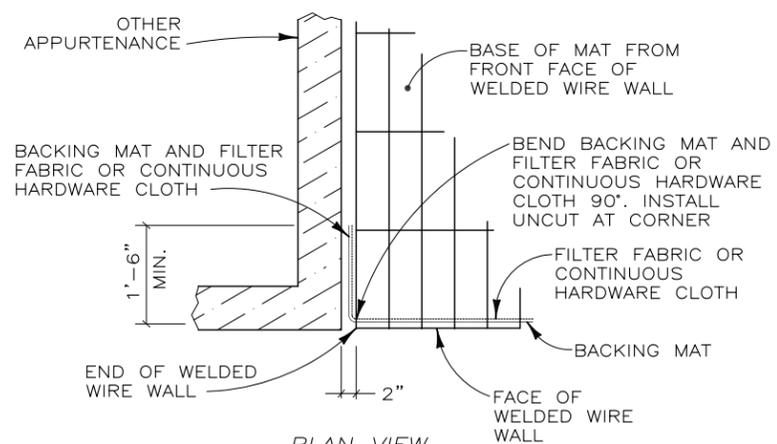
DWG DATE  
NOV 98  
REVISION DATE  
17 SEP 07  
SCALE  
NOTED

**STANDARD DRAWING**  
**WELDED WIRE RETAINING WALL**  
24" LIFTS  
STANDARD DETAILS

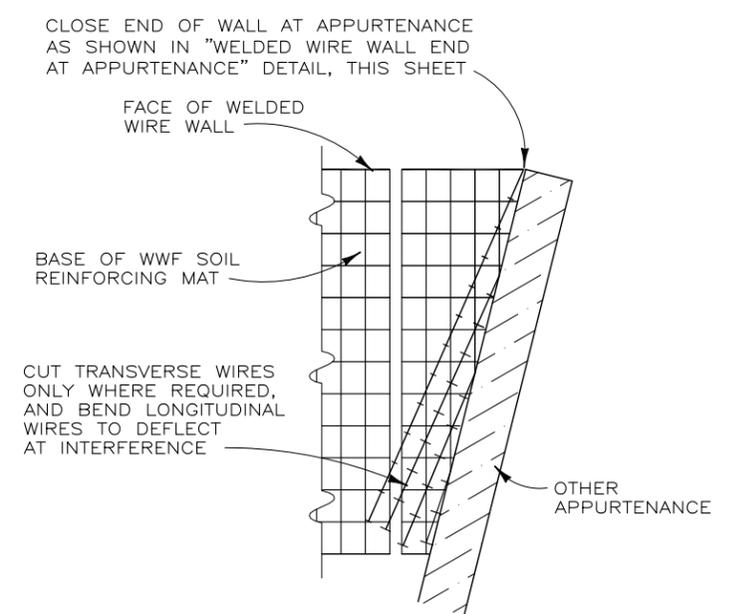
PROJECT NO.  
SHEET  
**1**  
OF 3



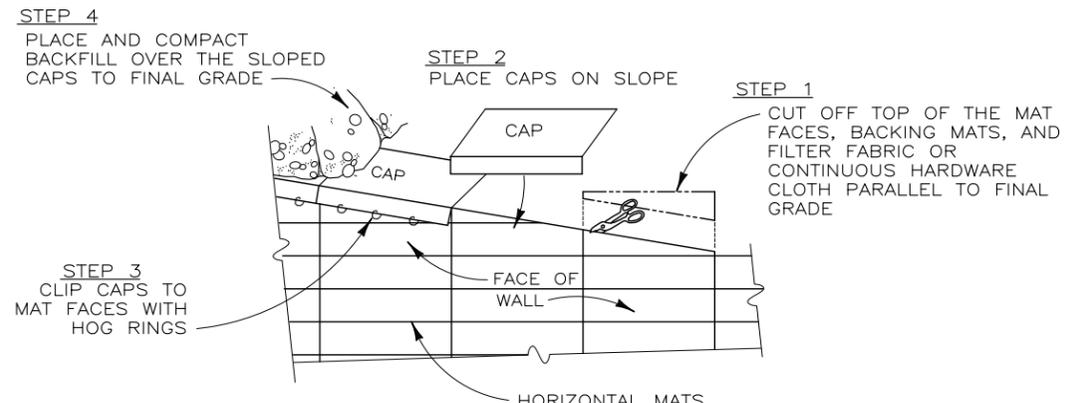
**ISOMETRIC VIEW**  
**WELDED WIRE WALL COMPONENTS WITH RETURN MAT**  
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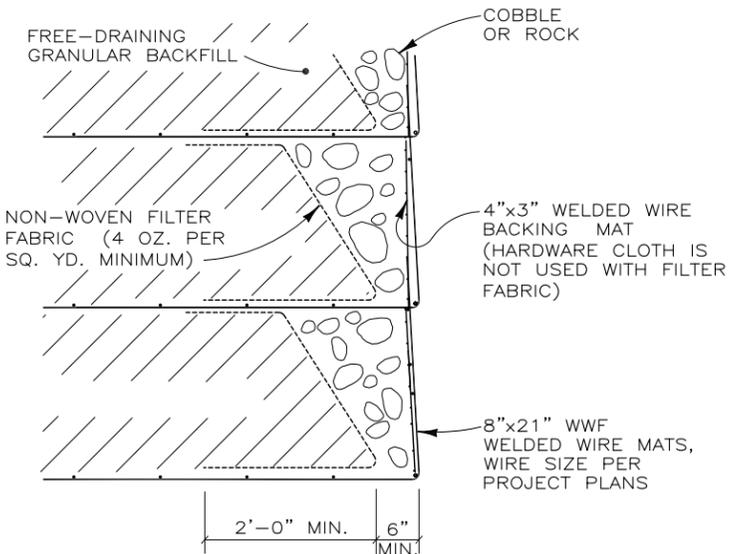
**PLAN VIEW**  
**WELDED WIRE WALL END AT OTHER APPURTENANCE**  
 NOT TO SCALE



**PLAN VIEW**  
**DEFLECTED LONGITUDINAL WIRES**  
 NOT TO SCALE



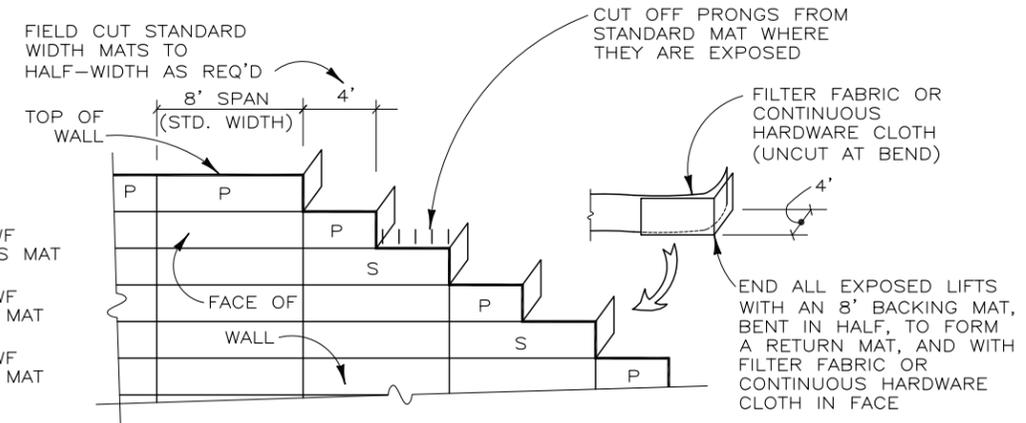
**PICTORIAL ELEVATION**  
**SLOPED CAP MAT DETAIL**  
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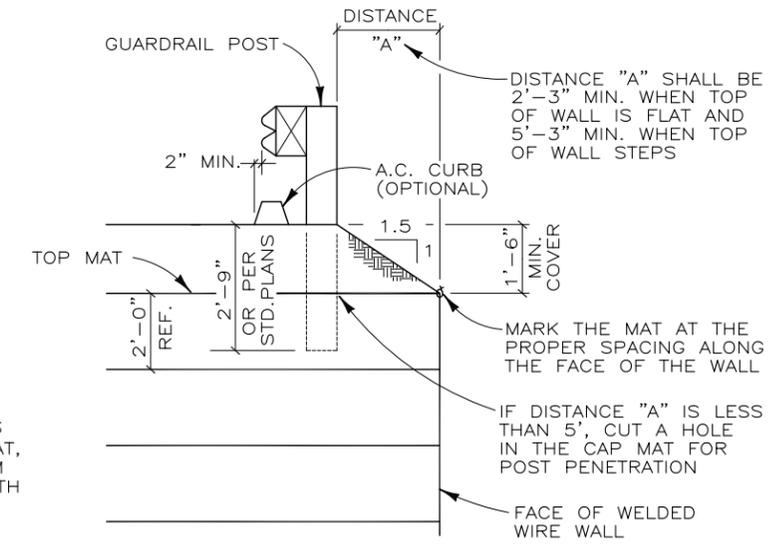
**SECTION**  
**ROCK FACING DETAIL**  
 NOT TO SCALE

**LEGEND**  
 (THIS DETAIL ONLY)

P	8"x12" WWF PRONGLESS MAT
S	8"x21" WWF STANDARD MAT
	8"x21" WWF STANDARD MAT



**RETURN MATS AND TOP OF WALL DETAIL**  
 NOT TO SCALE

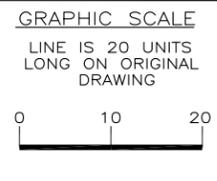


**SECTION**  
**GUARDRAIL DETAIL**  
 NOT TO SCALE  
 (FENCE DETAIL SIMILAR)

WELDED WIRE WALL STANDARD DETAILS

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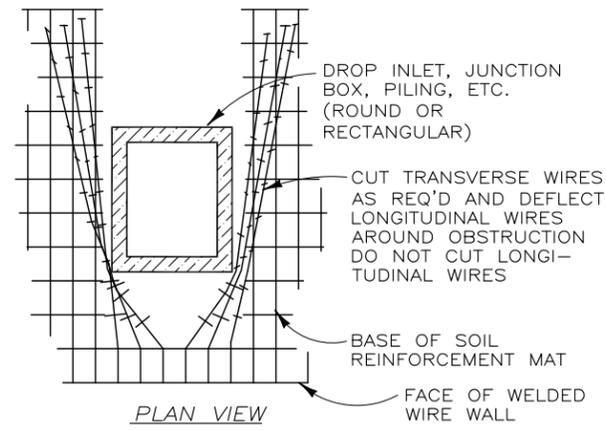
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 PH 707.443.5093 FAX 707.443.2891  
 WEB SITE www.hilfiker.com E-MAIL info@hilfiker.com

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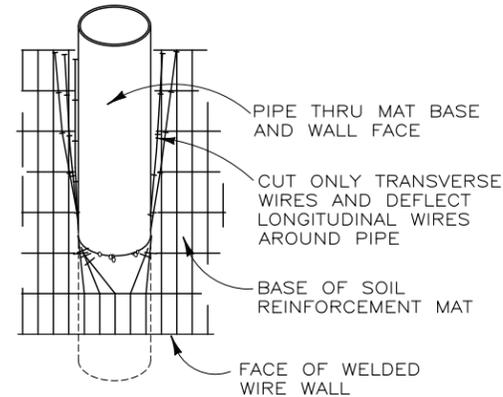
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 NOV 98  
 REVISION DATE  
 17 SEP 07  
 SCALE  
 NOTED

<b>STANDARD DRAWING</b>
<b>WELDED WIRE RETAINING WALL</b>
24" LIFTS
STANDARD DETAILS

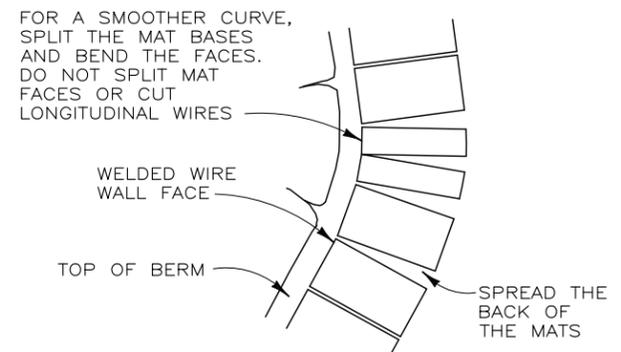
PROJECT NO.  
 SHEET  
**2**  
 OF 3



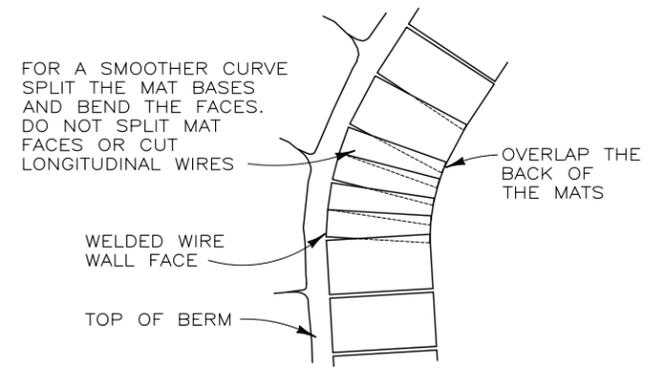
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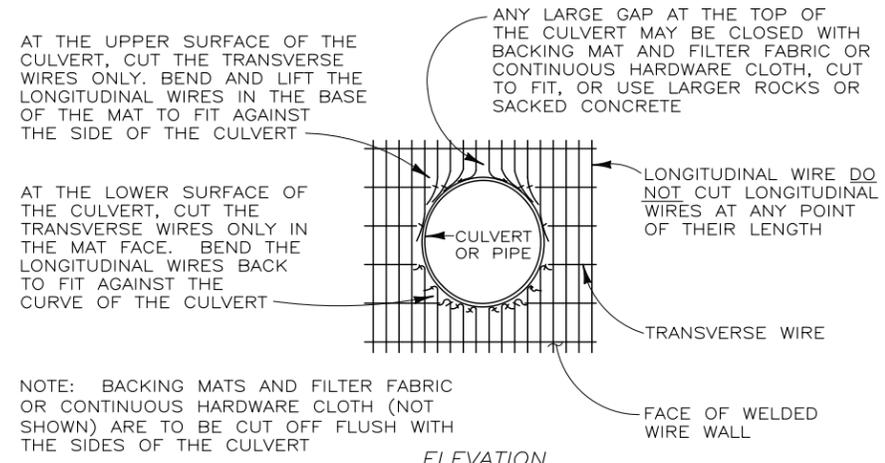
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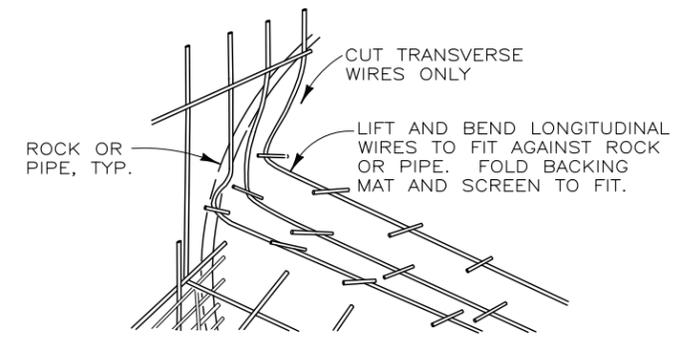
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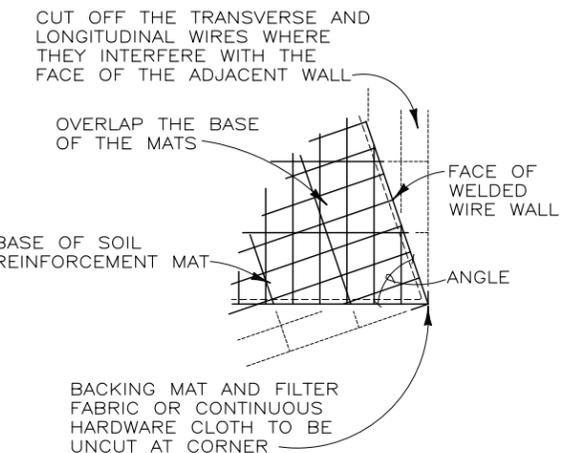
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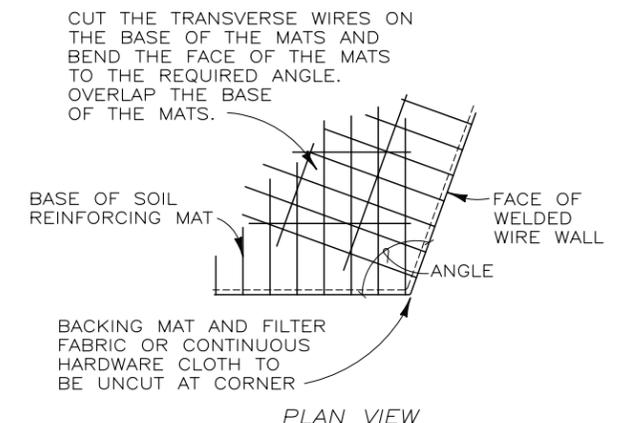
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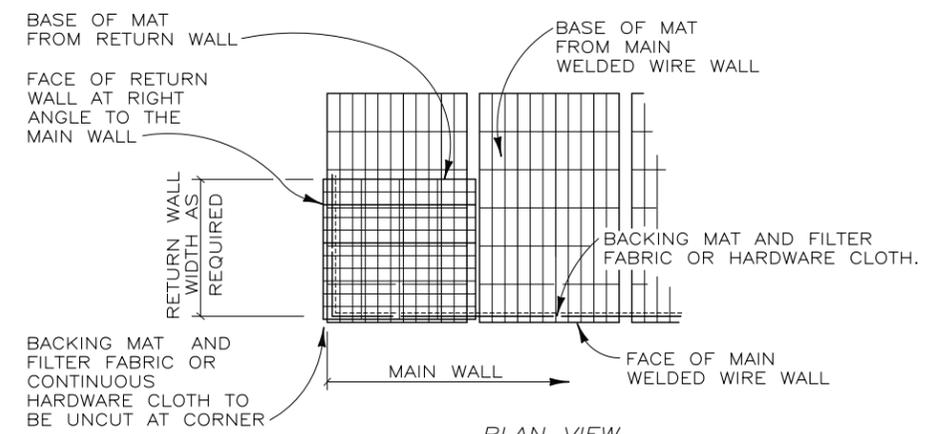
**FITTING MATS TO OBSTRUCTION**  
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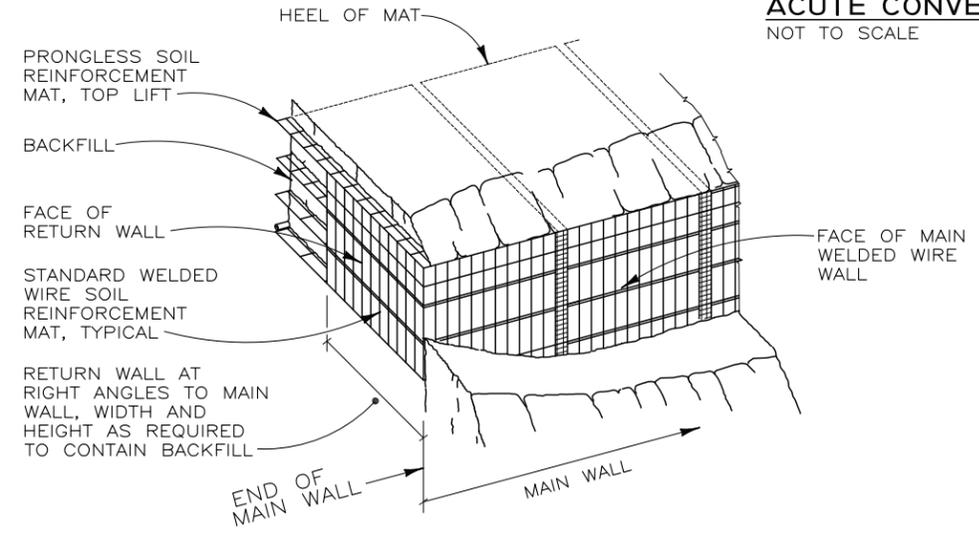
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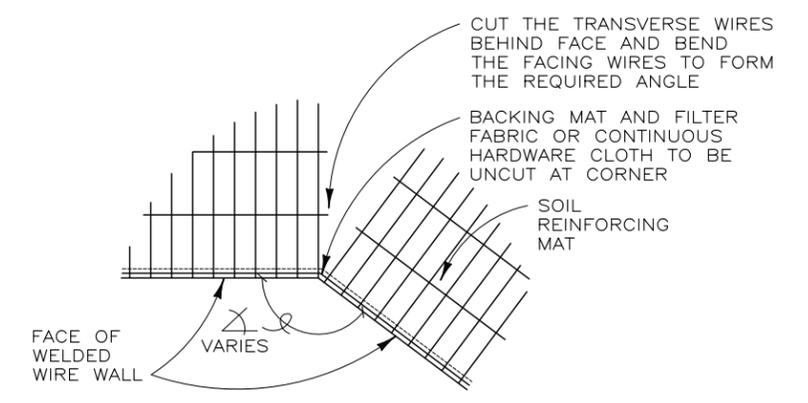
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**RETURN WALL DETAIL**  
NOT TO SCALE



**RETURN WALL DETAIL**  
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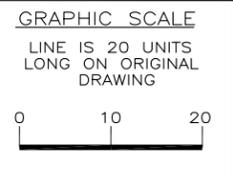


**CONCAVE ANGLE DETAIL**  
NOT TO SCALE

WELDED WIRE WALL STANDARD DETAILS

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**STANDARD DRAWING**  
**WELDED WIRE RETAINING WALL**  
24" LIFTS  
STANDARD DETAILS

PROJECT NO.  
SHEET  
**3**  
OF 3