

June 30, 2017

Mr. William Grange Grange Family Ranches, LLC 408 W Cody Lane Basalt, CO 81621

Mail to: grngbly@msn.com

Re: Grace & Shehi Ditch - Diversion Structure and Headgate Design

Mr. Grange,

We are pleased to present you with a summary of the work completed on the Grace & Shehi Ditch and recommendations for next steps to obtain funding, finalize permitting and begin construction. The 75% level drawings and cost estimate are also attached. As you are well aware, this project experienced unanticipated delays as a result of ditch incorporation challenges. SGM put forth considerable effort, outside the scope of this project, to work with you and the other ditch owners as the consolidated ditch company was being formed. We felt that this effort, if fruitful, would significantly help in building consensus and buy-in to any proposed design on the ditch diversion structure and headgate. However, after several years the ditch company consolidation efforts failed due to several owners backing out of the processes. This process resulted in impacts to the budget and schedule.

The current project deliverable represents a 75% level design based upon survey data and information of the Roaring Fork River. Additional data on the ditch needs to be collected to resolve current modeling conflicts depicting the delivery of diversions during low-flow conditions. SGM has finished our work in hopes that this project will be one step closer to becoming a reality. We understand your significant need for improvements to the diversion structure and headgate in order to re-establish flows to your fields.

Project Summary

The Grace & Shehi Ditch is a historical ditch along the Roaring Fork River and one of the few senior rights that is currently supporting agricultural production. Historical operations of the Ditch have been significantly modified due to changing land use, including the development of the Roaring Fork Golf Club.

In November 2015, SGM presented before the Ditch owners on the prepared Preliminary Design Report which evaluated the priorities of the ditch and assessed design alternatives for the diversion structure and headgate. There was no formal support for the project at this time due to the fact that the ditch was unconsolidated and no formal mechanism was in place to approve ditch improvements. However, at the



meeting there was a general approval by each owner that the recommended cross –vane structure be pursued for further design detail. Colorado Parks and Wildlife also provided input on design considerations for the recommended alternative.

Project Delivery

Since January 2017 SGM has refined the calculations, preliminary design and cost estimate for the preferred boulder drop diversion structure and automatic headgate. SGM completed an estimated 75% final design and estimated cost to complete for the project. A copy of the75% design drawings are included in Attachment A and represent the project needs based on the (limited) input from the ditch owners. SGM determined, based upon past projects, that development of the final design is not warranted without final permitting approvals, support of the other ditch owners and construction funds.

The 75% complete drawings include 10 sheets outlining the existing conditions mapping, drainage and erosion control plan, site plan & profile and details. Hydraulic modeling of the site under existing and proposed conditions indicated that the structure will allow for increased diversion at the Grace & Shehi Ditch during low flow conditions. The modeling results require further refinement to include survey information, specifically along the ditch as well as additional cross-sections upstream and downstream of the structure. The proposed diversion structure will likely cause a rise in the 100-year floodplain mapping and the additional survey will allow us to understand the full extents of those impacts required for federal and local permitting. Additional hydraulic model calibrations of the ditch diversion rating curve are also needed to better align observed ditch flows during low flows conditions to the current modeled built on surveyed and field measured data. These additional refinements in the model may lead to minor alteration of the design such that the weir may need to be higher, lower or even wider across the stream so as to better balance the floodplain impacts with the expected maximum diversions at the Grace & Shehi Ditch.

During our design assessment we found that existing low flows in the ditch may come from restrictions and inefficiencies in the ditch downstream of the headgate. Approximately 500 feet downstream from the headgate the Grace & Shehi Ditch enters into a concrete box where ditch flows can be spilled back to the river, measured and/or diverted into a lateral before continuing down the ditch. The measuring feature of this box is a raised concrete weir spanning the width of the box creating pooling up the ditch. The collected survey data and collected field measurements of the weir indicate that the elevation of the top of the weir may be causing significant pooling in the ditch requiring greater depths of the river at the ditch headgate to provide similar flows prior to the construction of the weir. Analysis of the ditch flows was not specifically addressed in our scope of work but we feel that additional efforts to understand the impacts of this measuring weir on ditch flows may lead to a less costly improvement (albeit a smaller impact on improved diversion flows) on the ditch flows than construction of the proposed diversion structure.

Permitting

No permit applications have been developed or submitted for this project. SGM contacted the regulatory agencies to confirm the required permits but did not feel that the expense for applying was justified now until funding for final design and construction is confirmed.



The permits and associated application fees include:

- Floodplain Conditional Letter of Map Revisions (CLOMR) ~ \$6,750
- Floodplain Letter of Map Revision (LOMR) ~ \$8,250
- Floodplain development permit (Pitkin County) ~ \$650
- Earthmoving Permit (Pitkin County) ~ \$650
 - o Revegetation Plan (Pitkin County)
 - o Construction Management Plan (Pitkin County)
- Town of Basalt Permits ~ \$3,450
- Coordination with Army Corp of Engineers (exemption for irrigation ditches, including diversion structures.)

Cost Estimate

The current cost estimate was developed through project implementation and construction with all anticipated costs outlined. The total project cost is estimated at \$398,600 including a 30% contingency. The cost estimate does not include any consulting fees related to assisting with securing funding for this project.

Recommended Next Steps

The 75% design and cost estimate were prepared in an effort to aid in future funding applications to support final design and construction of the new diversion structure and headgate. A recommended first step is further analysis into the ditch operations and understanding any flow restrictions that may be caused by the raised measuring weir currently located in the ditch.

Some funding sources to consider include previous funding partners for the preliminary design and other community grants. See Attachment A for a full list of grant opportunities related to irrigation ditch improvements. A few of the most applicable grants include:

- Water Supply Reserve Funds (WSRF)
 Colorado Basin Roundtable Funds and Statewide Funds are available with 50% matching funds.
- Pitkin County Healthy Rivers and Streams
 Healthy Rivers Board initially funded the design of the project and is interested in funding river
 improvement projects specifically those projects that will include the boating and recreational
 experiences near their new kayak park located in Basalt.
- Colorado River Water Conservation District (River District) Grant Program
 The River District offers small and large project grants for western Colorado water users and specifically for improvements of an existing water supply system and more efficient diversions.
- Natural Resource Conservation Service (NRCS)



The NRCS provides agricultural support services include engineering design and consultation. They also administer EQIP funding.

Sincerely,

SGM

Brendon Langenhuizen, P.E. Water Resources Team Leader

Attachments:

Appendix A – 75% Complete Design Drawings

Appendix B – Cost Estimate

Appendix C – Available Grant and Loans

CC:

Ken Ransford, P.C.

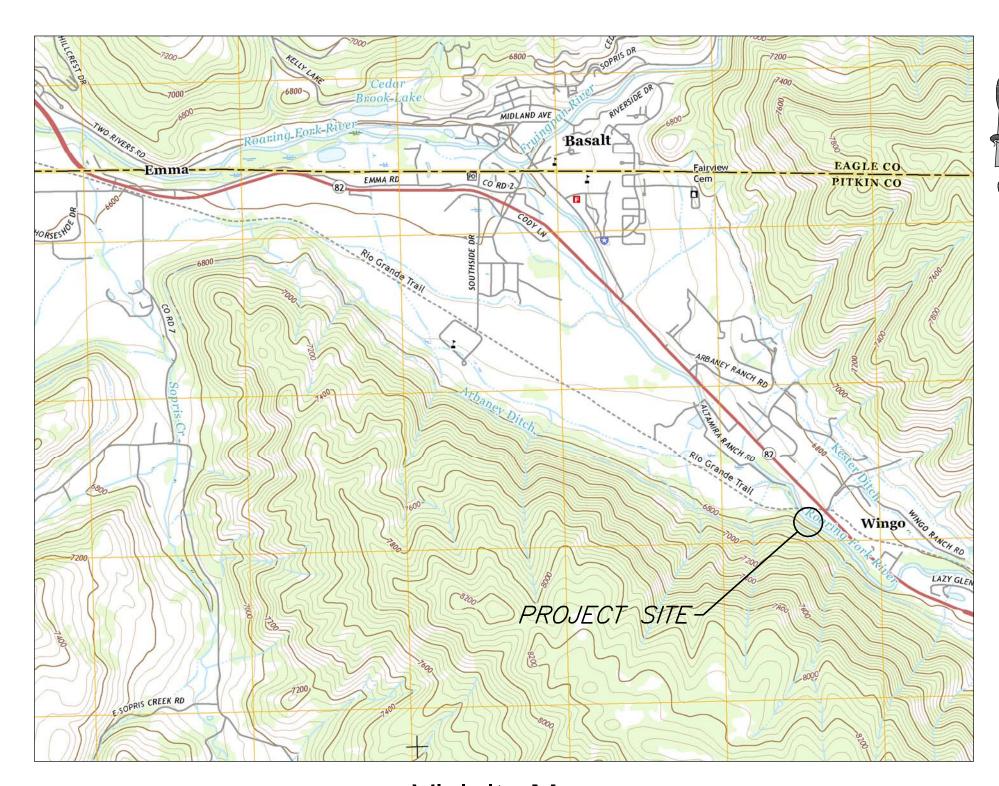
Ben Wade - CWCB

Dave Kotz, P.E.



APPENDIX A

Grace and Shehi Ditch Diversion Pitkin County and Town of Basalt, Colorado



Vicinity Map Scale: 1Inch = 2,000 Feet



118 West Sixth Street, Suite 200 Glenwood Springs, CO 81601 970.945.1004 www.sgm-inc.com

Project Engineer

David M. Kotz, P.E. #29961

Project Location

Latitude: 39.346307N Longitude: 107.013176W

75% Design Drawings

June 30, 2017

Sheet Index

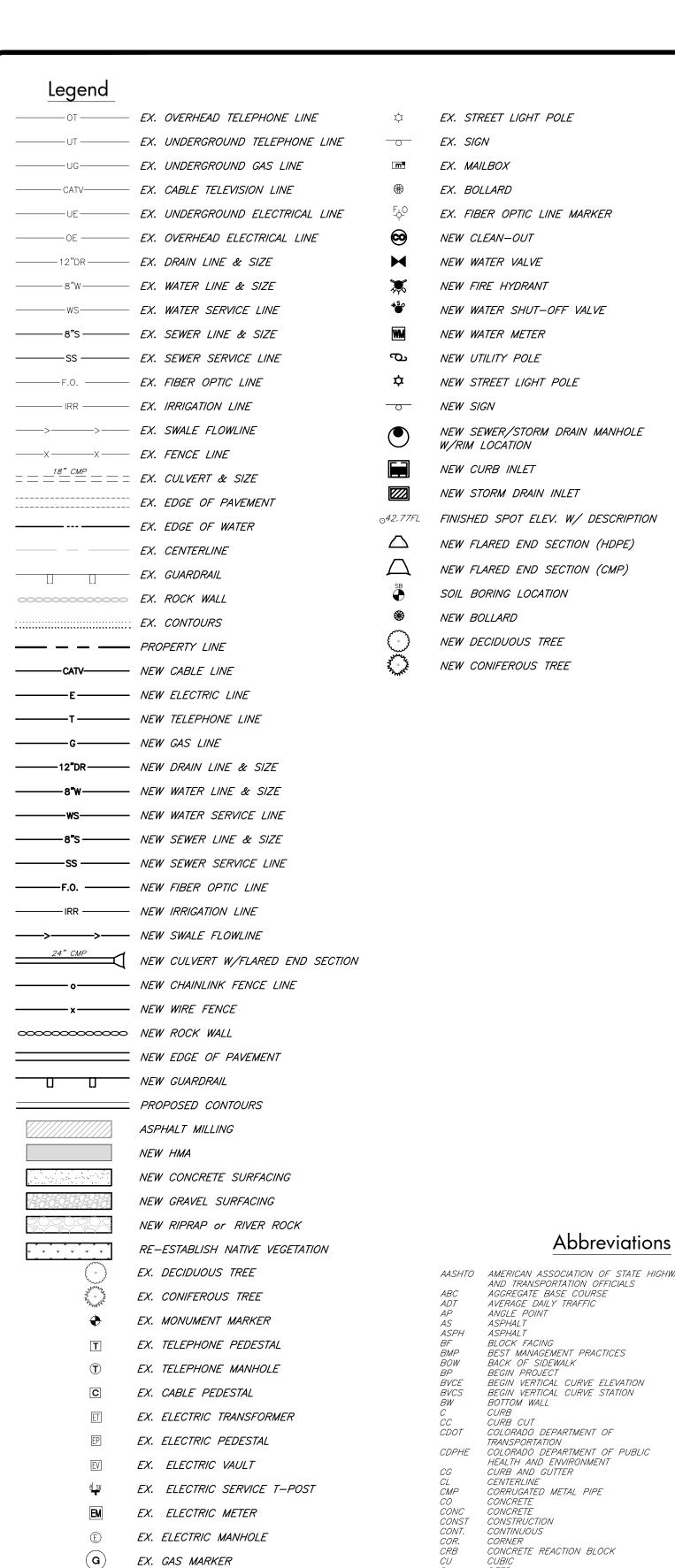
1-Cover	Cover Sheet
G.0.001	Legend, Abbreviations, & General Notes
C.1.001	Horizontal Control Plan
C.1.002	Drainage & Erosion Control Plan
C.1.003	Demolition Plan
C.1.004	Site Plan & Profile
C.6.001	Erosion Control Best Management Practices
C.6.002	Erosion Control Best Management Practices
C.6.003	Care of River Details

CNCC 1-800-922-1987

Project Preliminary Not For Construction

Cover Sheet

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



EX. GAS METER

EX. GAS VALVE

EX. GAS WELL

EX. CURB INLET

EX. CLEAN—OUT

EX. WATER VALVE

EX. FIRE HYDRANT

EX. WATER METER

EX. PVC PIPE

EX. UTILITY POLE

EX. WATER MANHOLE

EX. WATER SHUT-OFF VALVE

EX. IRRIGATION CONTROL VALVE

EX. STORM DRAIN MANHOLE

EX. STORM DRAIN INLET

EX. SEWER MANHOLE

LANDSCAPED AREA

AASHTO AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AGGREGATE BASE COURSE METHOD OF HANDLING TRAFFIC MEGALUG MASONRY LANDSCAPE WALL MILES PER HOUR NORTHING BEST MANAGEMENT PRACTICES N/A NAT. NOT APPLICABLE NATIVE GRASS AREA NORTH EAST BEGIN VERTICAL CURVE ELEVATION NATIONAL HIGHWAY SYSTEM BEGIN VERTICAL CURVE STATION N.T.S. NOT TO SCALE NORTH WEST ON CENTER COLORADO DEPARTMENT OF 0/5 POINT OF CURVATURE COLORADO DEPARTMENT OF PUBLIC PERM PERMANENT HEALTH AND ENVIRONMENT PROFILE GRADE LINE POINT OF INTERSECTION CORRUGATED METAL PIPE PROPERTY LINE PROPOSED POINT OF TANGENCY PVC PVI POLYVINYL CHLORIDE POINT OF VERTICAL INTERSECTION CONCRETE REACTION BLOCK PAVEMENT R-R*REMOVE & REPLACE* DRAIN DR/VEWAY REINFORCED CONCRETE PIPE EASTING REFERENCE REQUIRED EXISTING GRADE FI FVATION REVEGETATE ELEVATION ROW RP RIGHT-OF-WAY EDGE OF ASPHALT RADIUS POINT EDGE OF DRIVEWAY RETAINING WALL EDGE OF PAVEMENT STORM DRAIN EOG EDGE OF GRAVEL END PROJECT SQUARE FEET **EASEMENT** SHDR SMH SOD SHOULDER END VERTICAL CURVE ELEVATION SEWER MANHOLE END VERTICAL CURVE STATION STOPPING SIGHT DISTANCE EXIST. EXISTING STATION FINISH FLOOR SOUTH FAST SEWER LINE SIDEWALK FEDERAL HIGHWAY ADMINISTRATION FHWA FLOWLINE TOP BACK CURB TELEPHONE GRAV. GRAVEI TOP OF PIPE HANDICAP RAMP TRANSITION HOT MIX ASPHALT TRAFFIC FLANGE ON FIRE HYD. TR.FIG. TOP OF WALL HIGH PRESSURE GAS VERTICAL CURVE HIGHWAY VALLEY PAN WIDE HYDRANT *INVERT* WITHWATER LINE LINFAL FFFT W. W. M. WELDED WIRE MESH LOW POINT CROSS SLOPE

GENERAL NOTES

ADMINISTRATION (O.S.H.A.).

- 1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE PITKIN COUNTY & TOWN OF BASALT LAND USE CODE, LATEST REVISION.
- 2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH APPLICABLE STANDARDS AND

REGULATIONS AS SET FORTH BY THE OCCUPATIONAL SAFETY AND HEALTH

- 3. NO FIELD CHANGES SHALL BE MADE TO THIS DESIGN WITHOUT PRIOR WRITTEN APPROVAL OF THE CIVIL ENGINEER.
- 4. SUBSTITUTIONS OF COMPONENTS OR MATERIALS WILL NOT BE PERMITTED WITHOUT THE WRITTEN APPROVAL OF THE CIVIL ENGINEER. CONTRACTOR SHALL PROVIDE CATALOG CUT WHEN REQUESTING SUBSTITUTIONS.
- 5. SUBMITTALS SHALL BE MADE TO THE CIVIL ENGINEER FOR ALL MATERIALS TO

BE USED IN THE CONSTRUCTION OF THE DESIGN DEPICTED IN THIS PLAN SET.

- 6. THE PHYSICAL FEATURES WITHIN THE LIMITS OF THE PROJECT HAVE BEEN SHOWN BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME OF DESIGN. THE CIVIL ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE FEATURES SHOWN. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL CRITICAL ELEVATIONS OF EXISTING PHYSICAL FEATURES PRIOR TO CONSTRUCTION.
- 7. THE CONTRACTOR SHALL LIMIT ALL WORK AND STORAGE TO THE AREAS SHOWN ON THIS PLAN. NO MATERIAL OR EQUIPMENT SHALL BE STORED WITHIN THE FLOODPLAIN.
- 8. ALL CONSTRUCTION IS TO INCLUDE COMPACTION AND FINISH GRADING IN THE UNIT PRICE RELATED WORK ITEM.
- 9. ALL WORK SHALL BE DONE TO THE LINES, GRADES, SECTIONS, AND ELEVATIONS SHOWN ON THE PLANS UNLESS OTHERWISE NOTED OR APPROVED IN WRITING BY THE CIVIL ENGINEER.
- 10. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE CIVIL ENGINEER.
- 11. THE CIVIL ENGINEER SHALL BE NOTIFIED WITHIN 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
- 12. A CONSTRUCTION FENCE SHALL BE INSTALLED AT THE PERIMETER OF THE PROJECT SITE TO PREVENT DEBRIS FROM LEAVING THE AREA.
- 13. THE CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITIES TO THOSE AREAS WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON THE PLANS. ANY DISTURBANCE BEYOND THESE LIMITS SHALL BE RESTORED TO ORIGINAL CONDITIONS AT THE CONTRACTORS EXPENSE.
- 14. THE CONTRACTOR SHALL NOT REMOVE AND SHALL PROTECT IN PLACE ALL TREES AND BUSHES INSIDE AND OUTSIDE THE LIMITS OF DISTURBANCE. APPROPRIATE SHORING SHALL BE PROVIDED FOR ALL TREES, STRUCTURES AND OTHER IMPROVEMENTS, AND SOIL ADJACENT TO DISTURBED AREAS.
- THIS PROJECT. THERE IS NO ACTIVITY ALLOWED WITHIN THIS FENCED AREA, NOR STORAGE OF MATERIAL, OR EQUIPMENT.

15. FENCE PROTECTION MUST BE INSTALLED AT THE DRIPLINES OF ALL TREES FOR

- 16. THE CONTRACTOR SHALL CLOSELY MONITOR ACCESS FOR HEAVY CONSTRUCTION EQUIPMENT THROUGH THE PROJECT AND USE TRAFFIC CONTROL AS NEEDED TO ACCOMMODATE CONSTRUCTION ACTIVITY ENTERING AND LEAVING THE PROJECT
- 17. WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. THE COST OF WATER SHALL BE INCIDENTAL TO OTHER BID ITEMS. SWEEPING AND CLEANING ADJACENT STREETS AND SIDEWALKS DURING CONSTRUCTION WILL BE PERFORMED AS NECESSARY AND AS DIRECTED BY THE CIVIL ENGINEER. SWEEPING AND DUST MITIGATION IS CONSIDERED TO BE INCIDENTAL TO THE
- 18. THE PHYSICAL FEATURES REQUIRING REMOVAL OR OBLITERATION WITHIN THE PROJECT SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND BE LEGALLY DISPOSED OF OFF-SITE.
- 19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING ANY MONUMENTS, RANGE POINTS, TIES, BENCHMARKS AND/OR SURVEY CONTROL POINTS WHICH MAY BE DISTURBED OR DESTROYED BY CONSTRUCTION, SUCH POINTS SHALL BE REFERENCED AND REPLACED WITH APPROPRIATE MONUMENT BY A REGISTERED PROFESSIONAL LAND SURVEYOR AUTHORIZED TO PRACTICE LAND SURVEYING IN THE STATE OF COLORADO.
- 20. THE CONTRACTOR SHALL MAINTAIN A COPY OF ALL APPLICABLE STANDARDS AND APPROVED CONSTRUCTION PLANS AND SPECIFICATIONS ON SITE FOR THE DURATION OF THE PROJECT.
- 21. ANY DISCREPANCIES WITHIN THESE PLANS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CIVIL ENGINEER AND WORK SHALL STOP UNTIL THE DISCREPANCY IS RESOLVED IN WRITING.
- 22. CONTRACTOR IS NOT AUTHORIZED TO PROCEED WITH CONSTRUCTION WITHOUT THE FOLLOWING PERMITS AND CONDITIONS OF APPROVALS IN THEIR POSSESSION:
- PITKIN COUNTY FLOOD PLAIN DEVELOPMENT PITKIN COUNTY EARTH MOVING PERMIT
- PITKIN COUNTY DEVELOPMENT PERMIT PITKIN COUNTY REVEGETATION PERMIT
- PITKIN COUNTY CONSTRUCTION MANAGEMENT PERMIT TOWN OF BASALT APPROVALS

BENCHMARK AND SURVEY CONTROL

- 1. BASE MAPPING PROVIDED BY SGM (GLENWOOD SPRINGS, CO).
- 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CONSTRUCTION STAKING OF BOTH HORIZONTAL AND VERTICAL LAYOUT ON THIS PROJECT. THE CONTRACTOR SHALL COORDINATE WITH THE CIVIL ENGINEER FOR INTERPRETATION AND INFORMATION IN STAKING OF THE PROJECT FOR
- 3. PRIOR TO PROJECT COMPLETION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF ANY PROPERTY MONUMENTATION DISTURBED OR REMOVED BY CONSTRUCTION OPERATIONS. THIS WORK SHALL BE PERFORMED BY A LAND SURVEYOR LICENSED IN THE STATE OF COLORADO. PROPERTY CORNERS WHICH FALL WITHIN NEW CONCRETE FLATWORK SHALL BE DURABLE

AND SET FLUSH. THIS SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.

DRAINAGE, GRADING, AND EARTHWORK NOTES

- 1. RETAINING WALLS ARE SHOWN FOR LAYOUT PURPOSES ONLY. DESIGN CHARACTERISTICS SHALL BE PER THE PLANS PROVIDED BY THE STRUCTURAL ENGINEER OF RECORD. ELEVATIONS AND LOCATIONS ARE TO THE FINISHED FACE/CREST OF THE WALL.
- 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LEGAL DISPOSAL OF ANY EXCESS SOIL, DEBRIS AND WASTE MATERIAL OFF OF THE PROJECT SITE.
- 3. ANY MATERIAL NOT SUITABLE FOR BACKFILL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF, BY AND AT THE EXPENSE OF THE CONTRACTOR.
- 4. ALL EMBANKMENT MATERIAL REQUIRING COMPACTION SHALL CONFORM TO CDOT/ASTM STANDARDS.
- 5. THE CONTRACTOR SHALL PROVIDE APPROPRIATE SHORING OR LAYBACK OF ALL EXCAVATION PER THE RECOMMENDATIONS OF A QUALIFIED GEOTECHNICAL ENGINEER.

UTILITY NOTES

- 1. ALL LOCATIONS FOR EXISTING UTILITIES SHOWN ON PLAN ARE APPROXIMATE AND ARE BASED ON INFORMATION PROVIDED BY THE RESPECTIVE UTILITY COMPANIES. TWO DAYS PRIOR TO ANY SITE EARTHWORK OR GRADING, CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) AT 811, AS WELL AS LOCAL UTILITIES THAT ARE NOT PART OF UNCC.
- 2. ANY CONTRACTOR-CAUSED DAMAGE TO UTILITY AND/OR SERVICE LINES SHOWN OR NOT SHOWN ON THE PLANS, SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL UTILITY COMPANIES PRIOR TO COMMENCING WORK IN THE PROJECT AREA. LIKEWISE, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE PROJECT WORK AND THAT OF THE INVOLVED UTILITIES IN THE PROJECT AREA.

EROSION CONTROL NOTES

- 1. CONTRACTOR SHALL COMPLETE AND OBTAIN A CONSTRUCTION MANAGEMENT PLAN AS REQUIRED BY PITKIN COUNTY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL FEDERAL, STATE, AND LOCAL PERMITS AS REQUIRED.
- 2. EROSION CONTROL MEASURES SHALL BE PROVIDED PER LOCAL AND STATE REQUIREMENTS. THE CONTRACTOR SHALL MAINTAIN AN ACTIVE DRAWING AND LOG DISPLAYING DATE OF BMP INSTALLATION, MAINTENANCE, AND REMOVAL.
- 3. EROSION CONTROL BMPS SHOWN ON THESE PLANS SHALL BE INSTALLED AS A MINIMUM, PRIOR TO THE START OF THE CONSTRUCTION PHASE. ADDITIONAL BMPS SHALL BE INSTALLED AS NEEDED THROUGHOUT THE CONSTRUCTION PHASE.
- 4. THE CONTRACTOR SHALL PROVIDE VEHICLE TRACKING CONTROL AT THE SITE ENTRANCE AND INSPECT THE SITE ENTRANCE DAILY. SOIL TRACKED OUT OF THE SITE SHALL BE REMOVED IMMEDIATELY.
- 5. CONTRACTOR TO PROVIDE SEDIMENT FENCE AT THE DOWNHILL EDGE OF AREAS OF DISTURBANCE. CONTRACTOR SHALL PROVIDE APPROPRIATE FROSION CONTROL MEASURES TO STOCKPILE AND FRESHLY GRADED AREAS. THIS MAY REQUIRE THE INSTALLATION OF SOIL EROSION BLANKETS, SOIL STABILIZER, OR OTHER BMP'S TO LIMIT EROSION FROM FRESHLY GRADED AREAS.
- 6. CONTRACTOR TO USE STRAW WATTLES, OR OTHER BMP, TO FILTER RUNOFF FROM EXCAVATION AREAS.
- 7. PROVIDE INLET PROTECTION FOR CULVERTS AND DRAIN INLETS UNTIL REVEGETATION IS COMPLETE.
- 8. FOR ANY DEEP EXCAVATION, CONTRACTOR TO PROVIDE TEMPORARY LOW POINT SUMP/PUMP WITH INLET SEDIMENT CONTROL. ALL DEWATERING SHALL MEET STATÉ AND LOCAL REGULATORY REQUIREMENTS
- 9. AREAS DISTURBED DURING THE CONSTRUCTION OF THIS PROJECT SHALL BE REVEGETATED PER THE LANDSCAPE PLANS, USING THE APPROVED SEED MIX IN ACCORDANCE WITH THE PITKIN COUNTY NATURAL RESOURCES "PITKIN COUNTY REVEGETATION GUIDE." CURRENT EDITION.
- 10. AFTER REVEGETATION AND PERMANENT EROSION CONTROL MEASURES ARE COMPLETE, TEMPORARY EROSION CONTROL DEVICES ARE TO BE REMOVED. SEE LANDSCAPE PLANS FOR SEEDING NOTES AND MIX.
- 11. THE CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL IMMEDIATELY REMOVE ALL SEDIMENT, MUD, AND CONSTRUCTION DEBRIS THAT MAY ACCUMULATE IN THE FLOW LINES AND PUBLIC RIGHTS-OF-WAY AS A RESULT OF THIS CONSTRUCTION PROJECT.
- 12. THE DISCHARGE OF WATER CONTAINING WASTE CONCRETE IS PROHIBITED. A CONCRETE WASHOUT SHALL BE PROVIDED.
- 13. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL WASTE PRODUCTS GENERATED BY SAID CUTTING OPERATIONS ON A DAILY BASIS. THE DISCHARGE OF ANY WATER CONTAMINATED BY WASTE PRODUCTS FROM CUTTING OPERATIONS TO THE CURB AND GUTTER IS PROHIBITED.

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Preliminary Not For Construction 02/28/20

Legend, Abbreviations & General Notes

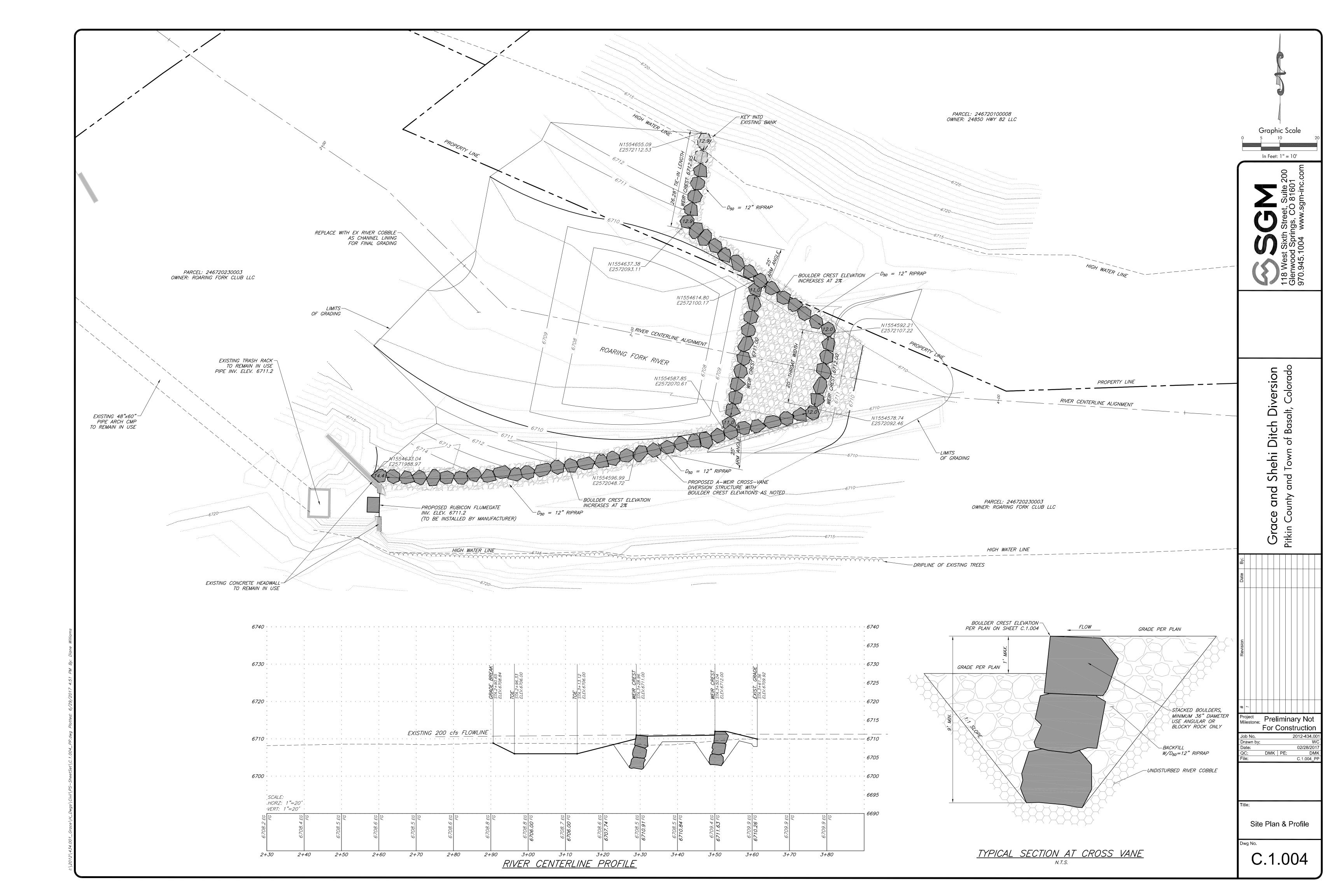
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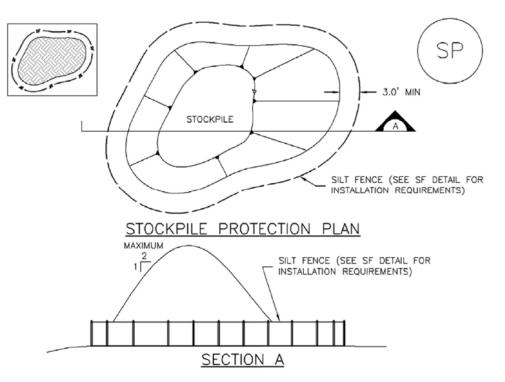








SC-1



SP-1. STOCKPILE PROTECTION STOCKPILE PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
-LOCATION OF STOCKPILES.
-TYPE OF STOCKPILE PROTECTION.

2. INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PERVIOUS OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SILMEDS AGAINST THE PERIMETER AND OTHER PACTORS.

3. STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDED AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30-60 DAYS).

4. FOR TEMPORARY STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADIENT CONTROLS, INCLUDING PERIMETER CONTROL, ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

Urban Drainage and Flood Control District

Urban Storm Drainage Criteria Manual Volume 3

MM-2

Stockpile Management (SM)

STOCKPILE PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON

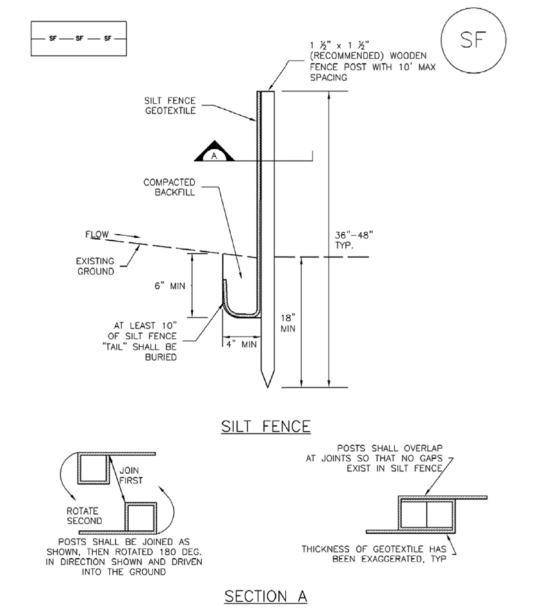
STOCKPILE PROTECTION MAINTENANCE NOTES

4. IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.

5. STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE

(DETAILS ADAPTED FROM PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.



SF-1. SILT FENCE

Silt Fence (SF)

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR

2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL

3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.

4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES. 5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.

6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' - 20').

7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

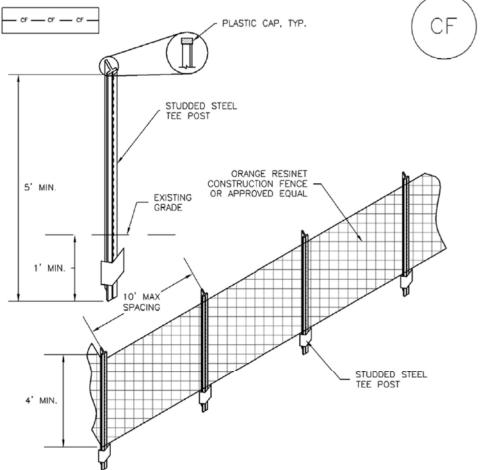
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".

5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.

6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.

7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION. (DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD) NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.



CF-1. PLASTIC MESH CONSTRUCTION FENCE

CONSTRUCTION FENCE INSTALLATION NOTES

SEE PLAN VIEW FOR:
 -LOCATION OF CONSTRUCTION FENCE.

2. CONSTRUCTION FENCE SHOWN SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING

3. CONSTRUCTION FENCE SHALL BE COMPOSED OF ORANGE, CONTRACTOR—GRADE MATERIAL THAT IS AT LEAST 4' HIGH. METAL POSTS SHOULD HAVE A PLASTIC CAP FOR SAFETY. 4. STUDDED STEEL TEE POSTS SHALL BE UTILIZED TO SUPPORT THE CONSTRUCTION FENCE. MAXIMUM SPACING FOR STEEL TEE POSTS SHALL BE 10'.

5. CONSTRUCTION FENCE SHALL BE SECURELY FASTENED TO THE TOP, MIDDLE, AND BOTTOM OF EACH POST.

CF-2 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

November 2010

Construction Fence (CF)

SM-3

CONSTRUCTION FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

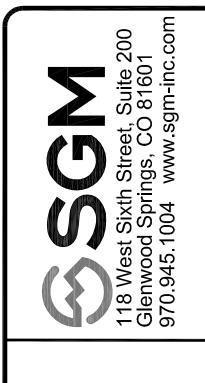
4. CONSTRUCTION FENCE SHALL BE REPAIRED OR REPLACED WHEN THERE ARE SIGNS OF DAMAGE SUCH AS RIPS OR SAGS. CONSTRUCTION FENCE IS TO REMAIN IN PLACE UNTIL THE

UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION. 5. WHEN CONSTRUCTION FENCES ARE REMOVED, ALL DISTURBED AREAS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE, AND/OR REMOVAL OF THE FENCE SHALL BE COVERED WITH

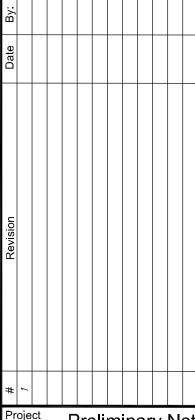
TOPSOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)



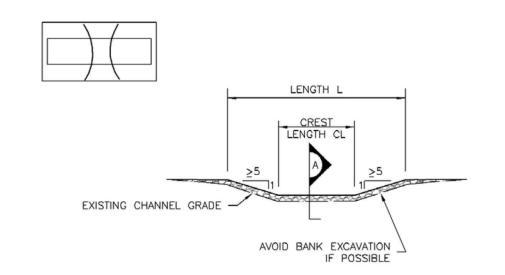
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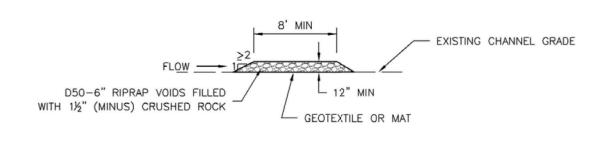
Project Preliminary Not For Construction

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Erosion Control Best Management Practices



FORD CROSSING SECTION



SECTION A

TSC-2. FORD CROSSING

TSC-4

SM-10

Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

TEMPORARY STREAM CROSSING INSTALLATION NOTES

SEE PLAN VIEW FOR:

 LOCATIONS OF TEMPORARY STREAM CROSSINGS.

-STREAM CROSSING TYPE (FORD, CULVERT, OR FLUME).

3. SEE MAJOR DRAINAGE CHAPTER FOR RIPRAP GRADATIONS.

MUST BE DESIGNED BY A STRUCTURAL ENGINEER.

TEMPORARY STREAM CROSSING MAINTENANCE NOTES

EROSION, AND PERFORM NECESSARY MAINTENANCE.

REMOVED PRIOR TO THE END OF CONSTRUCTION.

IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

DOCUMENTED THOROUGHLY.

DISCOVERY OF THE FAILURE.

FUNCTIONALITY OF THE CROSSING.

-FOR FORD CROSSING: LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).

-FOR CULVERT CROSSING: LENGTH (L), CREST LENGTH (CL), CROSSING HEIGHT (H), DEPTH (D), CULVERT DIAMETER (CD), AND NUMBER, TYPE AND CLASS OR GAUGE OF

2. TEMPORARY STREAM CROSSING DIMENSIONS, D50, AND NUMBER OF CULVERTS INDICATED (FOR CULVERT CROSSING) SHALL BE CONSIDERED MINIMUM DIMENSIONS; ENGINEER MAY

4. WHERE FAILURE OF A STREAM CROSSING CAN RESULT IN SIGNIFICANT DAMAGE OR HARM IT

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS

POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN

EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE

4. REMOVE SEDIMENT ACCUMULATED UPSTREAM OF CROSSING AS NEEDED TO MAINTAIN THE

5. STREAM CROSSINGS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED AND SHALL BE

6. WHEN STREAM CROSSINGS ARE REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH

TOPSOIL, SEEDED AND MULCHED AND COVERED WITH GEOTEXTILE OR OTHERWISE STABILIZED

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND CITY OF AURORA, COLORADO (Vo. DSWC), NOT AVAILABLE IN

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON

ELECT TO INSTALL LARGER FACILITIES. ANY DAMAGE TO STREAM CROSSING OR EXISTING

STREAM CHANNEL DURING BASEFLOW OR FLOOD EVENTS SHALL BE PROMPTLY REPAIRED.

Temporary Stream Crossing (TSC)

June 2012

Vehicle Tracking Control (VTC)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR

COMPACTED SUBGRADE -

-LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S). -TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.

5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK. STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

20 FOOT
(WIDTH CAN BE
LESS IF CONST.
VEHICLES ARE
PHYSICALLY
CONFINED ON
BOTH SIDES) _ SIDEWALK OR OTHER C PAVED SURFACE UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, USE - CDOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" MINUS ROCK NON-WOVEN GEOTEXTILE FABRIC BETWEEN SOIL AND ROCK UNLESS OTHERWISE SPECIFIED BY LOCAL
JURISDICTION, USE CDOT SECT. #703, AASHTO
#3 COARSE AGGREGATE INSTALL ROCK FLUSH WITH OR BELOW TOP OF PAVEMENT OR 6" MINUS ROCK

VTC-1. AGGREGATE VEHICLE TRACKING CONTROL

November 2010

Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 VTC-3

NON-WOVEN GEOTEXTILE

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS 4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND

POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)

Erosion Control Best Management Practices

Preliminary Not

For Construction

02/28/20

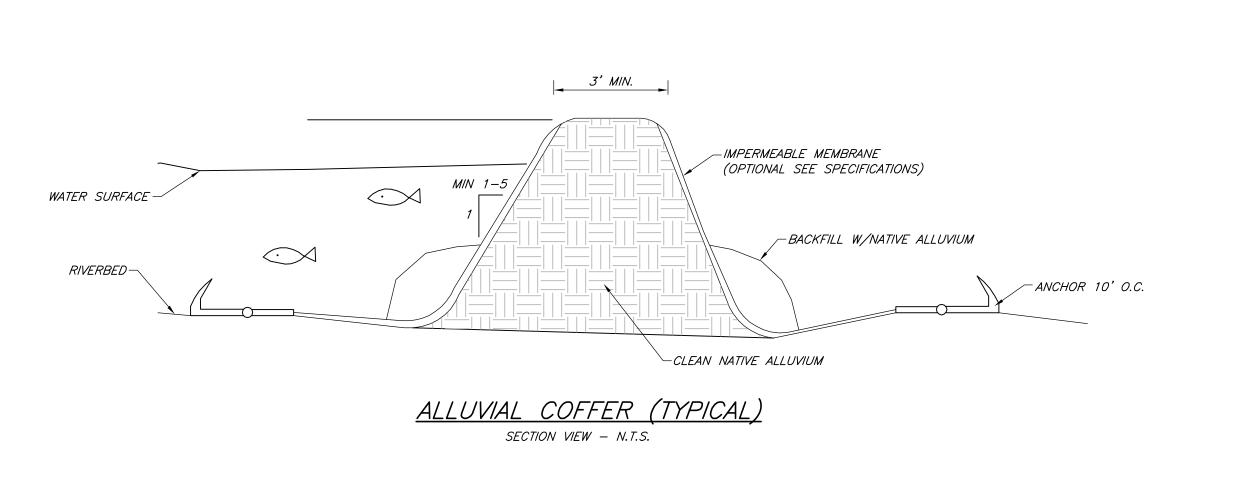
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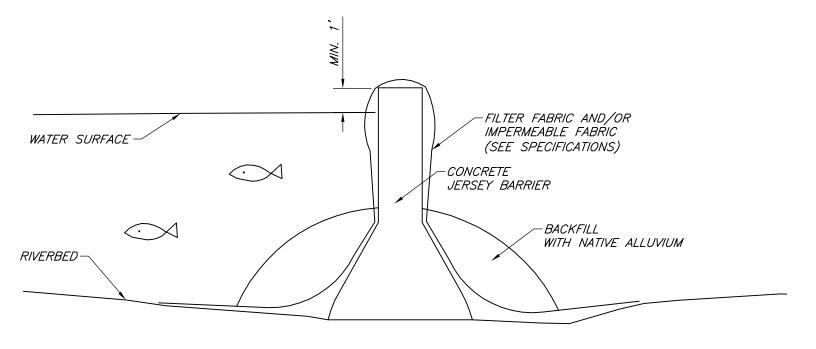
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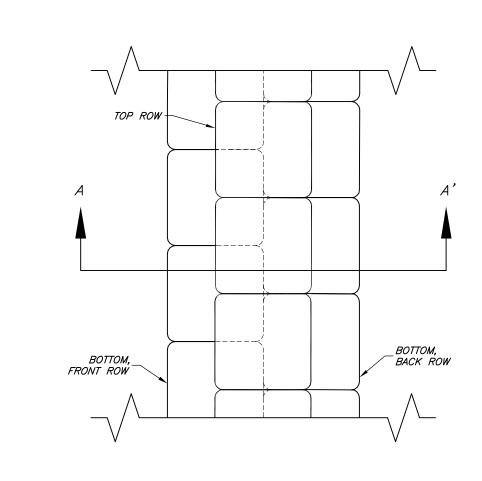


JERSEY BARRIER COFFER (TYPICAL)

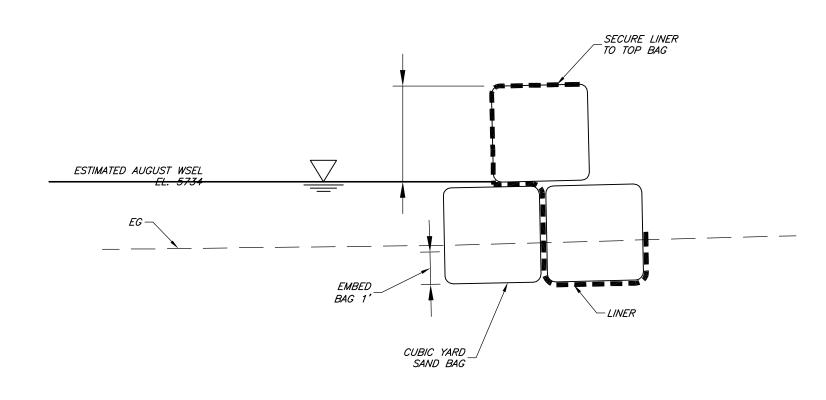
SECTION VIEW - N.T.S.

COFFERDAM QUANTITY NOTES:

1. COFFERDAM IS TO BE CONSTRUCTED AS DETAIL DEPICTS.
THE FOLLOWING QUANTITIES SHALL BE USED:
CUBIC YARD SAND BAG: 184
GEOMEMBRANE (24 MIL PVC): 300 SY
CLASS 6 A.B.C: 330 TON (184 CY)



<u>PLAN VIEW</u>



ELEVATION VIEW SECTION A-A'

NOTES:

1) CUBIC YARD SAND BAGS ARE TO BE FLAT BOTTOM, UNCOATED, AND WOVEN POLYPROPYLENE.

2) SAND BAG FILL IS TO BE CLASS 6 A.B.C. AFTER DECONSTRUCTION OF COFFERDAM, CLASS 6 FILL MATERIAL IS TO BE REUSED IN THE STRUCTURAL SECTION OF THE TRAIL.

3) LINER IS TO BE 24 MIL PVC OR APPROVED ALTERNATIVE.

4) LINER IS TO RUN FROM GROUND LEVEL ON THE BACK SIDE OF THE INNER ROW, UNDER THE INNER BAG, BETWEEN THE OUTER AND INNER BAGS, AND WRAP OVER THE TOP BAG. LINER IS THEN TO BE SECURED TO THE TOP BAG.

5) SAND BAGS ROWS AND LAYERS ARE TO BE OFFSET BY ONE—HALF BAG LENGTH TO AVOID CONTINUOUS JOINTS. IF NECESSARY, SUPPLEMENTARY SAND BAGS ARE TO BE PLACED IN JOINTS TO ENHANCE SEAL.

6) ANY FILL USED AS PART OF OR INSIDE COFFERDAM IS TO BE IN ACCORDANCE WITH THE REQUIREMENTS IN THE PCN PERMIT.

TYP COFFER DAM SECTION

SCALE: 1" = 4'

118 West Sixth Street, Suite 200 Glenwood Springs, CO 81601 970.945.1004 www.sgm-inc.cor

Grace and Shehi Ditch Diversion
Pitkin County and Town of Basalt, Colorado

Project Milestone: Preliminary Not For Construction

 Job No.
 2012-434.001

 Drawn by:
 WC

 Date:
 02/28/2017

 QC:
 DK | PE: DK

 File:
 C.6.003_CofferDetail.dwg

Care of River Details

No.

C.6.003



APPENDIX B

All costs are estimated and based on current market conditions. The design fee estimate does not constitute a proposal on behalf of SGM. FEMA hourly review fees are not included in this estimate.

Development of a Colorado Parks and Wildlife Adaptive Management Plan & Monitoring Program is not included in this estimate.

#	Item	Unit Cost	Unit	Units Req'd	Units Req'd	
1	Design Costs					
1.1	Surveying	\$ 7,000.00	Lump Sum	1	\$	7,000.00
1.2	Hydraulic Modeling & FEMA Submittal Prep.	\$ 35,000.00	Lump Sum	1	\$	35,000.00
1.3	Structural Engineering	\$ 3,000.00	Lump Sum	1	\$	3,000.00
1.4	Geotechnical Investigation	\$ 5,000.00	Lump Sum	1	\$	5,000.00
1.5	Revegetation Plan	\$ 2,500.00	Lump Sum	1	\$	2,500.00
1.6	Construction Management Plan	\$ 2,500.00	Lump Sum	1	\$	2,500.00
1.7	Final Design Drawings	\$ 5,000.00	Lump Sum	1	\$	5,000.00
	Subtotal of Design & Monitoring Costs		·		\$	60,000.00
2	Permitting Costs					
2.1	FEMA CLOMR Submittal Fee	\$ 6,750.00	Lump Sum	1	\$	6,750.00
2.2	FEMA LOMR Submittal Fee	\$ 8,250.00	Lump Sum	1	\$	8,250.00
2.3	Pitkin County Floodplain Development Permit	\$ 650.00	Lump Sum	1	\$	650.00
2.4	Pitkin County Earthmoving Permit	\$ 650.00	Lump Sum	1	\$	650.00
2.5	Local, State, & Federal Coordination	\$ 15,000.00	Lump Sum	1	\$	15,000.00
2.6	Town of Basalt Permit Fees	\$ 3,450.00	Lump Sum	1	\$	3,450.00
2.7	FEMA Effective Model	\$ 300.00	Lump Sum	1	\$	300.00
	Subtotal of Permitting Costs				\$	35,050.00
3	Construction Costs					
3.1	Mobilization	\$ 17,500.00	Lump Sum	1	\$	17,500.00
3.2	Temporary Care of River	\$ 30,000.00	Lump Sum	1	\$	30,000.00
3.3	Tracking Pad	\$ 5,000.00	Each	1	\$	5,000.00
3.4	Construction Fence	\$ 2.40	Linear Foot	414	\$	993.60
3.5	Silt Fence	\$ 7.20	Linear Foot	223	\$	1,605.60
3.6	Diversion	\$ 30,000.00	Each	1	\$	30,000.00
3.7	Excavation	\$ 18.00	Cubic Yard	520	\$	9,360.00
3.8	12" Riprap Furnished and Placed	\$ 75.00	Cubic Yard	680	\$	51,000.00
3.10	3-4' Boulders Furnished and Placed	\$ 120.00	Ton	150	\$	18,000.00
3.12	Rubicon Flumegate & Installation	\$ 41,185.00	Each	1	\$	41,185.00
3.13	Seeding/Revegetation	\$ 0.30	Square Foot	23,076	\$	6,922.80
	Subtotal of Construction Costs				\$	211,567.00
Total:					\$	306,617.00
	30% Contigency				\$	91,985.10
Projec	ct Total				\$	398,602.10



APPENDIX C

Agency	Grant Name	Max \$ asked	Matching required?	Whom can apply	Types of projects	Deadline	Grants Awarded Date
Colorado Department of Agriculture and CO State Conservation Board	Colorado State Conservation Board (CSCB) Matching Grants Website: https://www.colorado.gov /pacific/agconservation/m atching-grants-program	The level of grant application funding per district that may be available for 2017 is the range of \$1,000 to \$7,000. Requests for \$4,999 or less will not require a contract.	The grant application must provide for and identify matching funds to satisfy a 100%, dollar-for-dollar match of the CSCB funds requested with a fifty-percent (50%) minimum hard cash match. The 50% minimum required hard cash match may include landowner labor time (based on verifiable rates for local professional service-providers) for conservation education. Use of landowner equipment is not considered a cash or in-kind match.	Colorado Conservation Districts in implementing and encouraging sound natural resource planning, management and development particularly in minerals, energy, geology, and water resources. Projects must impact/benefit private lands within the State of Colorado	The funds are intended primarily to implement enduring on-the-ground conservation practices and educational activities for sustaining and protecting Colorado's natural resources through public/private partnership. Only educational activities will be considered for 2017	July 8, 2016	January 1, 2017
Colorado River District	Annual Grant Program	\$0-\$10,000 = \$5,000 mx award \$10k-\$60k = \$15K mx award >\$60k = 25% of total project cost or \$150,000, whichever is less	None indicated	Projects must be located within the physical boundaries of the District	Projects must meet one or more program goals: Development of a new water supply Improvement of an existing water supply system Measures to improve instream water quality Water use efficiency improvements Sedimentation reduction Implementation of watershed and riparian management actions	December 1- January31	April
Colorado Water Conservation Board	Water Supply Reserve Fund	if greater than \$100,000 the WSRA Standard Contract Info is needed	25% or greater for Statewide funds and 25% or greater for roundtable founds of total project cost (cash, in-kind contributions or donations from the applicant or third-party partners)	Water Supply Reserve Account (WSRA), a proposed water activity must be approved by the local Basin Roundtable AND the Colorado Water Conservation Board (CWCB).	Competitive grant s for environmental compliance and feasibility studies Technical assistance regarding permitting, feasibility studies and environmental compliance Studies or analysis of structural, non-structural, consumptive, and non-consumptive water needs, projects or activities Structural or nonstructural projects or activities Grants to promote education and outreach (current with roundtable education goals).	support 60 cal	Itable letter of endar days monthly Board ich it will be oard meetings uary, March,

Agency	Grant Name	Max \$ asked	Matching required?	Whom can apply	Types of projects	Deadline	Grants Awarded Date
Colorado Water Conservation Board	Water Project Loan Program	Recommended minimum loan request is \$100,000	No	Any private or public entity that can contract with the state and that can establish and document the need for the project. The project sponsor must show that the project is technically, economically, institutionally and financially feasible.	Eligible projects for financing include new construction or rehabilitation of existing raw water storage and delivery facilities, such as: Reservoirs Ditches and canals Pipelines River diversion structures Groundwater wells Water rights purchases Flood control projects Hydropower		
Colorado Water Conservation Board	Implementation of the Colorado Water Plan (HB 17-1248 Section 15)		50%		 Agricultural Projects Long-term strategies for conservation and drought planning Watershed health, environment & Recreation 	TBD	TBD
Colorado Parks and Wildlife	Habitat Partnership Program	Up to \$5,000 Greater than \$5,000 requires more state approval	Yes		The HPP program is again offering large-scale habitat improvement grant opportunities which, when completed, will provide: • benefits to livestock, • private land owners, • land managers, • big game animals • and other wildlife species.	5pm, Wednesday, February 1, 2017	
Great Outdoors Colorado	Habitat Restoration Grants	The program offers \$500,000 in available funding.	Yes	Non-profit land-conservation organizations, municipalities, counties, political subdivisions of the state (with a land conservation focus), and the Colorado Division of Parks and Wildlife are eligible for restoration grants. Projects must take place on conserved property i.e. private property protected with a conservation easement (or other, permanent development restriction) or public open space.	GOCO funding for habitat restoration aims to improve and restore Colorado's rivers, streams, wetlands, and critical habitat. The program offers \$500,000 in available funding. Previous habitat restoration grants targeted river habitat, but the current program includes all types of ecosystem restoration and enhancement, from forests and grasslands to rivers and wetlands.	September 23, 2016	December 8, 2016

Agency	Grant Name	Max \$ asked N	latching required?	Whom can apply	Types of projects	Deadline	Grants Awarded Date	
Great Outdoors Colorado	Protect initiative Grants		kely	Eligible grantees are municipalities, counties, land trusts, Colorado Parks and Wildlife, and a limited number of political subdivisions of the state with an open space purpose.		December 19, 2016: Request for concept papers posted here February 1, 2017: Concept papers due May 12, 2017: Final applications due June 15, 2017: Grants awarded		
NRCS	Conservation Stewardship Program (CSP)	Applications must include all agricultural or private forest land in your operation that you will have control of for the 5 year term of the CSP contract. Once your application has been filed the local NRCS conservation planner will have a one-on-one consultation with you to evaluate your current management system and the natural resources on your land using the Conservation Activity Evaluation Tool. Eligible lands will be identified and the number of resource concerns that are currently meeting and not meeting stewardship thresholds will be determined. Each applicant must be meeting stewardship threshold for at least two resource concerns on each land use at the time of application. The applicant must also agree to address one additional resource concern for each land use by the end of the contract to be eligible.				February 3, 2017		
NRCS	Environmental Quality Incentives Program (EQIP) CO Funding pool categories include: Conservation Activity Plan (CAP) Grazing Land Operations Water Quality and Quantity Wildlife Habitat			Agricultural producers and owners of non-industrial private forest land and Tribes are eligible to apply for EQIP. Eligible land includes: cropland, rangeland, pastureland, non-industrial private forest land and other farm or ranch lands. Applicants must: Control or own eligible land Comply with adjusted gross income limitation (AGI) provisions Be in compliance with the high erodible land and wetland conservation requirements Develop an NRCS EQIP plan of operations	irrigation systems, water control structures and irrigation water management Grazing management: fencing, stockwater systems, range and pasture planting Nutrient management: manure storage structures, planned nutrient applications, soil testing Soil Health: conservation crop rotation, cover crops and conservation tillage Wildlife habitat enhancement:	February 17, 2017		
Reclamation	Drought Resiliency	\$750,000 (Level 1 up to \$300,00	50% or more of total project cost (cash or in- kind contributions from applicant or third-party partners)	states, tribes, irrigation districts, water districts, and other organizations with water or power delivery authority	How will proposed project improve drought resiliency?	February 14, 2017	May 2017 or so	

Agency	Grant Name	Max \$ asked	Matching required?	Whom can apply	Types of projects	Deadline	Grants Awarded Date
Reclamation	Drought Contingency	\$200,000 (completed in 2 years)	50% of total project cost (cash, in-kind contributions or donations from the applicant or third-party partners)	An eligible applicant is a state, tribe, irrigation district, water district, or other organization with water or power delivery authority.	Proposals that address more urgent needs and more severe drought risks will receive higher priority consideration on this criterion than proposals to address less significant needs and risks.	February 14, 2017	
Reclamation	WaterSMART Grants- Small-Scale Water Efficiency Projects for FY 2017	Total project costs cannot exceed \$150,000; Up to \$75,000 Federal funding per project. Projects should be completed within 2 years.	50 percent or more of total project costs. Total project costs shall not exceed \$150,000.	states, tribes, irrigation districts, water districts, and other organizations with water or power delivery authority Special note on partnering organizations	Small-scale improvements previously considered under Water Conservation Field Services Program. Small-scale water management projects that have been identified through previous planning efforts. Projects will be similar to those funded under the Water and Efficiency Grant program, but total project cost must be less than \$150,000.	Rolling deadline up until April 27, 2017; Selection dates expected March 2017 and June 2017	
Reclamation	WaterSMART Grants- Water and Energy Efficiency Grants	Funding Group I: Up to \$300,000 for projects that can be completed in 2 years (majority of projects will be in this group) Funding Group II: Up to \$1 million for projects that can be	50% or more of project costs	states, tribes, irrigation districts, water districts, and other organizations with water or power delivery authority	Projects that result in quantifiable and sustained water savings, increase renewable energy use and improved energy efficiency, and support broader water sustainability benefits; Note: this program will no longer fund water marketing activities Focus on projects that result in quantifiable and sustained water savings, including canal lining and piping projects, irrigation flow measurement, canal automation, installation of residential and commercial water meters, and other similar projects. This grant category also supports projects that increase renewable energy use and improve energy efficiency, as well as projects that address endangered species issues and otherwise support broader water sustainability benefits	January 18, 2017	
Reclamation	Water Marketing Grants	Funding Group I: Up to \$200,00 for projects that can be completed in 2 years Funding Group II: Up to \$400,000 for projects that can be completed in 3 years	50% or more of project costs		Planning activities to develop a water marketing strategy that establishes or expands water markets or water marketing transactions; Infrastructure and construction is not eligible	Posted draft evaluation or 30-day publi comment pe Nov. 22; Exp post FY 2017 February 202	riteria for c riod on ect to FOA in