

**TOWN OF CASTLE ROCK
SERVICES AGREEMENT
(McMurdo Gulch Reclamation Project Priority No. 3)**

DATE: _____

PARTIES: **TOWN OF CASTLE ROCK**, a Colorado municipal corporation, 100 N. Wilcox Street, Castle Rock, Colorado 80104 (the “Town”).

MULLER ENGINEERING COMPANY, INC., a Colorado corporation, 777 South Wadsworth Boulevard, Suite 4-100, Lakewood Colorado 80226 (“Consultant”).

RECITALS:

- A. The Town issued a Request for Proposals from qualified firms with expertise in design engineering and permitting services.
- B. Consultant timely submitted its proposal.
- C. The Town wishes to engage Consultant to provide the services more fully described in the following Agreement and Exhibits.

TERMS:

Section 1. Scope of Services. Consultant shall provide design engineering and permitting services in accordance with the scope of work attached as ***Exhibit 1*** (“Services”).

Section 2. Payment. Consultant shall invoice Town on a monthly basis for the Services rendered in accordance with the rate and fee scheduled identified in ***Exhibit 1***. The Town shall pay such invoices within 30 days receipt of such invoice. In no event shall the cumulative payment to Consultant exceed \$499,803.00, unless authorized in writing by Town.

Section 3. Completion. Consultant shall commence the Services on January 4, 2021 and complete the Services December 31, 2023. Consultant shall devote adequate resources to assure timely completion of the Services. Consultant shall perform the Services under this Agreement using a standard of care, skill and diligence ordinarily used by reputable professionals performing under circumstances similar to those required by this Agreement.

Town shall have the right to terminate this Agreement at any time with 30 days written notice to Consultant. The Town’s only obligation in the event of termination shall be payment of fees and expenses incurred up to and including the effective date of termination. Consultant shall turn over all work product produced up to the date of termination.

Section 4. Annual Appropriation. The continuance of this Agreement is contingent upon the appropriation of funds to fulfill the requirements of the Agreement by the Town. If the Town fails to appropriate sufficient monies to provide for the continuance of the

Agreement, the Agreement shall terminate on the final day preceding the date of the beginning of the first fiscal year for which funds are not appropriated. The Town's only obligation in the event of termination shall be payment of fees and expenses incurred up to and including the effective date of termination.

Section 5. Subcontractors. Consultant may utilize subcontractors to assist with specialized works as necessary to complete the Services. Consultant will submit any proposed subcontractor and the description of their services to the Town for approval.

Section 6. Assignment. This Agreement shall not be assigned by Consultant without the written consent of the Town.

Section 7. Notice. Any notice required or permitted by this Agreement shall be in writing and shall be deemed to have been sufficiently given for all purposes if sent by certified mail or registered mail, postage and fees prepaid, addressed to the party to whom such notice is to be given at the address set forth on the first page of this Agreement, or at such other address as has been previously furnished in writing to the other party or parties. Such notice shall be deemed given when deposited in the United States mail.

Section 8. Insurance. Consultant agrees to procure and maintain, at his own cost, the following policy or policies of insurance. Consultant shall not be relieved of any liability, claims, demands or other obligations assumed pursuant to this Agreement 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.

A. Consultant shall procure and maintain, and shall cause each subcontractor of the Consultant to procure and maintain a policy with the minimum insurance coverage listed below. Such coverage shall be procured and maintained with forms and insurers acceptable to the Town. All coverage shall be continuously maintained from the date of commencement of services hereunder. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage.

1. Workers Compensation insurance to cover obligations imposed by the Workers Compensation Act of Colorado and any other applicable laws for any employee engaged in the performance of Work under this contract, and Employer's 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.

2. Comprehensive 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 for contractual and employee acts), blanket contractual, independent contractors, products, and completed operations. The policy shall contain a severability of interests provision.

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

4. Professional Liability insurance with minimum limits of ONE MILLION DOLLARS (\$1,000,000) per claim and ONE MILLION DOLLARS (\$1,000,000) aggregate.

B. The policies required above, except Workers' Compensation insurance, Employers' Liability insurance and Professional Liability insurance shall be endorsed to include the Town, its officers and employees, as an additional insured. Every policy required above, except Workers' Compensation and Professional Liability insurance, if applicable, shall be primary insurance, and any insurance carried by the Town, its officers, or its employees, shall be excess and not contributory insurance to that provided by Consultant. The additional insured endorsement for the Comprehensive General Liability insurance required above shall not contain any exclusion for bodily injury or property damage arising from completed operations. The Consultant shall be solely responsible for any deductible losses under each of the policies required above.

C. Certificates of insurance shall be completed by Consultant's insurance agent and submitted at the time of execution of this Agreement as *Exhibit 2* as evidence that policies providing the required coverage, conditions and minimum limits are in full force and effect, and shall be subject to review and approval by the Town. Each certificate shall identify the Project and shall provide that coverage 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 Town. If the words "endeavor to" appear in the portion of the certificate addressing cancellation, those words shall be stricken from the certificate by the agent(s) completing the certificate. The Town reserves the right to request and receive a certified copy of any policy and any endorsement thereto.

D. Failure on the part of Consultant to procure or maintain policies providing the required coverage, conditions, and minimum limits shall constitute a material breach of contract upon which at the Town's discretion may procure or renew any such policy or any extended connection therewith, and all monies so paid by the Town shall be repaid by Consultant to the Town upon demand, or the Town may offset the cost of the premiums against any monies due to Consultant from the Town.

E. The parties understand and agree that the Town is relying on, and does not waive or intend to waive by any provision of this contract, the monetary limitations (presently \$387,000 per person, \$1,093,000 for two or more persons, per occurrence) or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, §24-10-101, *et seq.*, C.R.S., as from time to time amended, or otherwise available to Town, its officers, or its employees.

Section 9. Indemnification. Consultant expressly agrees to indemnify and hold harmless Town or any of its officers or employees from any and all claims, damages, liability, or court awards including attorney's fees that are or may be awarded as a result of any loss, injury or damage sustained or claimed to have been sustained by anyone, including, but not limited to, any person, firm, partnership, or corporation, to the extent caused by the negligent acts, errors or omissions of Consultant or any of their employees or agents in performing work pursuant to this Agreement. In the event that any such suit or action is brought against Town, Town will give notice within ten (10) days thereof to Consultant.

Section 10. Delays. Any delays in or failure of performance by any party of his or its obligations under this Agreement shall be excused if such delays or failure are a result of acts of God, fires, floods, strikes, labor disputes, accidents, regulations or orders of civil or military authorities, shortages of labor or materials, or other causes, similar or dissimilar, which are beyond the control of such party.

Section 11. Additional Documents. The parties agree to execute any additional documents or take any additional action that is necessary to carry out this Agreement.

Section 12. Entire Agreement. This Agreement represents the entire agreement between the parties and there are no oral or collateral agreements or understandings. This Agreement may be amended only by an instrument in writing signed by the parties. If any other provision of this Agreement is held invalid or unenforceable, no other provision shall be affected by such holding, and all of the remaining provisions of this Agreement shall continue in full force and effect.

Section 13. Time of the Essence. Time is of the essence. If any payment or any other condition, obligation, or duty is not timely made, tendered or performed by either party, then this Agreement, at the option of the party who is not in default, may be terminated by the non-defaulting party, in which case, the non-defaulting party may recover such damages as may be proper.

Section 14. Default and Remedies. In the event either party should default in performance of its obligations under this agreement, and such default shall remain uncured for more than 10 days after notice of default is given to the defaulting party, the non-defaulting party shall be entitled to pursue any and all legal remedies and recover its reasonable attorney's fees and costs in such legal action. In addition, no Party will be entitled to lost profits, economic damages, or actual, direct, incidental, consequential, punitive or exemplary damages in the event of a default.

Section 15. Waiver. A waiver by any party to this Agreement of the breach of any term or provision of this Agreement shall not operate or be construed as a waiver of any subsequent breach by either party.

Section 16. Governing Law. This Agreement shall be governed by the laws of the State of Colorado in the Douglas County District Court.

Section 17. Independent Contractor. Consultant and Town hereby represent that Consultant is an independent contractor for all purposes hereunder. As such, Consultant is not covered by any worker's compensation insurance or any other insurance maintained by Town except as would apply to members of the general public. Consultant shall not create any indebtedness on behalf of the Town.

Section 18. No Third Party Beneficiaries. It is expressly understood and agreed that enforcement of the terms and conditions of this Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to Town and Consultant, and nothing contained in this Agreement shall give or allow any such claim or right of action by any other third party on such Agreement. It is the express intention of the parties that any person other than Town or Consultant receiving services or benefits under this Agreement shall be deemed to be an incidental beneficiary only.

ATTEST:

TOWN OF CASTLE ROCK

Lisa Anderson, Town Clerk

Jason Gray, Mayor

Approved as to form:

Approved as to content:

Michael J. Hyman, Town Attorney

Mark Marlowe, Director Castle Rock Water

CONSULTANT:

MULLER ENGINEERING COMPANY, INC.

By: _____

Its: _____

EXHIBIT 1

SERVICES

Consultant shall provide engineering design and permitting services for the McMurdo Gulch Stream Reclamation Priority 3 Project, to include design and construction of stream channel improvements to mitigate impacts and preserve natural drainage way. More specifically, Consultant will perform the Services in accordance with the proposal and fee schedule attached as ***Exhibit 1-A***, for a total amount not to exceed \$499,803.00.



McMurdo Gulch Stream Reclamation

PRIORITY 3 PROJECT

12/2/2021



Response to Scope of Work

Response to Primary Objectives of Project/Project Description

The McMurdo Gulch scope of work requested by the Town is based on work previously performed by the Muller team. We completely support the list of objectives identified in the RFP as they are in line with our approach to stream restoration work. Our experience along McMurdo Gulch allows us to hit the ground running with this upcoming phase of work and our intimate knowledge of the McMurdo Gulch watershed will ensure that the Town's vision for the corridor can continue to be brought to life. Since completing the watershed management template in 2011, we are extremely encouraged by how the Town and CCBWQA uphold the principles and values identified in the template document including:

- Regular assessments of the stream followed by restorative efforts
- Retrofitting existing detention ponds to better control flows and water quality within the contributing basins
- Continual management of development to further control future flows and disturbance and leave room for the Gulch
- Coordination with developers to seek cash-in-lieu opportunities to protect the stream
- Implementing nature-based, environmentally friendly stream improvements

Our team will continue to support the Town's and CCBWQA's restoration and protection efforts along McMurdo Gulch, and we hope we can continue to work with the Town and CCBWQA to achieve the overarching goals in the watershed.

Below are sections that discuss how we will respond to the tasks outlined for this latest scope of work:

Key Tasks and Project Elements

Our team is very familiar with all of the steps required for this project. We know that all aspects of a project are crucial to the success of the whole. We place a particular focus on the following tasks which are critical for delivering this project successfully:

- As the first step, we emphasize a very thorough field reconnaissance of the areas identified for improvement at the conceptual level. A deep knowledge of the existing site is necessary to refine the conceptual level improvements and develop a context-sensitive solution. In addition to our team's observations and measurements, this will include new topographic survey of the improvement areas, a series of geotechnical borings to better understand the geology and groundwater level of the sites, environmental fieldwork, and SUE.
- We will perform a detailed hydraulic evaluation of both the existing and post-project stream to identify potential problem areas and implement our continually advancing set of natural channel design skills to counteract existing and potential degradation.
- We will provide proposed improvement concepts and associated costs to the Town early and often throughout the project to ensure that Town input is being incorporated and that the design is fully supported by the Town. This will occur at regular design meetings and as part of conceptual, 30%, and final design review submittals.
- We will begin the environmental fieldwork/permitting and the floodplain analysis process early in the project development, to avoid delays at final design.
- Once the extents of the stream improvements are defined, we will determine how the regional trail and maintenance routes fit in to the improvements. Topographic Land Surveyors will assist with generating legal descriptions and exhibits for maintenance easements, as necessary, so the Town can work through the right-of-way process with the affected property owners.
- All deliverables will provide thorough detail to ensure that the Town understands the design, the contractor can build the design without expensive change orders, and so it can be effectively referenced as part of future phases. We completed several design efforts for the Town and are very familiar with all of the products that are requested in the RFP.
- Finally, our experienced construction staff will work closely with our design staff to help inform construction erosion control and water control details and then work closely with the Town inspector and contractor to construct the improvements using environmentally sensitive techniques.

Key Technical Design Issues: Stream and Bank Restoration Design

Although we have developed a series of conceptual improvements as part of the latest stream assessment completed for the Town in 2016, we understand that the complexity of stream ecosystems and the dynamic nature of the channel in a developing basin demands that we examine every site in more detail. We will consider the existing site and find ways to best manage the multiple objectives of stream stability, aquatic and terrestrial habitat creation, riparian vegetation enhancement, water quality and wetland preservation. The following are a few additional insights for the four priority improvement areas:



Sta. 248+00 to Sta. 263+00

A portion of this reach was previously stabilized in 2012. Nearby development plans show several new stormwater outfalls into the gulch from water quality and detention ponds. This reach will be directly impacted by the increased flows due to the nearby development and stabilization including riffles or boulder cascades and bank protection are required to mitigate against the increased flows and protect the existing channel infrastructure.



Sta. 270+00 to Sta. 274+40

This reach of McMurdo Gulch is at the confluence with Tributaries 5 and 6 and is sensitive to the increased flows due to nearby development. Stabilization of this reach is critical to prevent channel head cuts from forming and traveling upstream on McMurdo Gulch, compromising recently installed channel infrastructure and Tributaries 5 and 6.



Sta. 278+00 to Sta. 295+00

The nearby development plans to install water quality and detention ponds with outfalls directly into McMurdo Gulch. The increased flows will impact the Gulch, including the existing and historic Civilian Conservation Corps (CCC) grade control structures. Channel stabilization, including riffles or boulder cascades and bank protection, will mitigate against the increased flows. The existing CCC structures are experiencing erosion around the sides of the structures due to flow frequently overtopping the structures and flowing down the banks. Overbank protection and reinforcement of the stilling basins around the CCC structures will preserve them and mitigate against end around erosion.



Tributary 5 and 6

Tributaries 5 and 6 are extremely steep drainages that run from Castle Oaks Drive to McMurdo Gulch mainstem. A small channel head cut is forming at the downstream end of the tributaries, near the mainstem. Additionally, the tributaries will be directly subjected to increased flows from stormwater discharges from the nearby development, including a water quality and detention pond slated to be installed by the development in the land between Tributaries 5 and 6. Channel improvements are required to mitigate against the increased flows.

Restoration Techniques

In the paragraphs below, we detail some of the restoration techniques that we will consider as we refine the layout of each area.

Raising a Degraded Stream Invert. A fundamental concept to consider for restoring the creek is raising the channel invert back up to a prior historic elevation and reconnect the channel to the adjacent floodplain benches. Muller successfully implemented this on previous sections of McMurdo Gulch.

Grade Control. To maintain the raised channel invert discussed above, grade control will be required. This is particularly challenging in the very steep tributaries 5 and 6. For this project, a combination of riffles, step-riffles, boulder cascades, and anchor drops (if necessary) could be considered.

Riffles/Step-Riffles/Boulder Cascades. A key element to consider for raising the invert and enhancing aquatic habitat is the implementation of low-height rock grade controls.

- **Riffle-pool complexes** are commonly found in gravel and cobble bed streams and are nature's way of dissipating energy. They can also become "bug factories," useful for improving fish habitat.
- **Step-riffles**, a type of riffle with occasional boulder steps, are a transitional structure for slopes too steep for a riffle but not steep enough for boulder cascades.
- Muller, with support from the Town, pioneered the development of **boulder cascades – "Castle-cades"** – as part of our first design and construction project along McMurdo Gulch. Since these first installations, we have implemented them on several other projects.

On each project, we learn more about advancing the design and construction of these elements and look forward to applying these lessons learned into the design of this phase of McMurdo Gulch.

Anchor Drops. Anchor drops provide a higher level of structural integrity to further protect the channel and surrounding infrastructure during large storm events. These structures use sheet pile or concrete cutoff walls that span the entire length of the riparian corridor. A rigid material such as sculpted concrete or grouted boulders span the active channel, allowing for slightly higher drop heights. These structures will be used as a last resort in locations where the hydraulic forces are too large for loose rock structures.

Stream Geomorphology. A geomorphic analysis of the project reach and proposed improvements will be completed. An assessment of geomorphic stream characteristics will be conducted in comparison to upstream and downstream reference reaches based on field reconnaissance and examination of current and historic aerial photography. This will also include the estimation of bankfull discharge, width, and depth, application of regime relationships between bankfull discharge and various stream parameters, determination of equilibrium slope, and evaluation of sediment balance (supply versus capacity), if necessary.

Bank Protection. Raising the channel invert will ease pressure along actively eroding banks. With the raised channel invert, larger storm flows can spread out into the floodplain, thereby reducing velocities and shear stresses along banks at the outside of bends. However, these outside bends and banks in the vicinity of critical infrastructure require stabilization. We will consider a palette of restoration concepts to lay out bank protection improvements along these areas. The palette will include biotechnical approaches that consist of a combination of woody and herbaceous vegetation, rock, and erosion control blanket (typically coir).

Aquatic and Fish Habitat Improvements. Although we do not anticipate that fish will be prevalent in this reach of McMurdo Gulch, the team will provide expertise on how to incorporate beneficial aquatic habitat elements into the restoration improvements. These elements will include the use of void-filled riprap as aquatic habitat structure, consideration of base flow depths, and placement of vegetation that will shade the creek, reducing water temperatures and increasing dissolved oxygen.



Boulder cascade and riffle
sequence on McMurdo
Gulch Priority 1.

Vegetation and Plantings. Muller and ERO have experience working together in and around streams and other sensitive environments. The existing project reaches are situated in a beautiful corridor with extremely valuable vegetation. The project will make use of the riparian benches that are adjacent to the active flow channel. We will seek to reduce disturbance of the site during construction. Where disturbance occurs, we will select appropriate vegetation that will improve stability and erosion resistance, improve native plant diversity, enhance aquatic and fish habitat, transition upland species to riparian cover in the proximity of wetter conditions, and provide long-term sustainability.

CCC Structure Preservation. The CCC Structures are extremely valuable features in the upper portion of the project reach. In existence for several decades, they represent the Gulch's unique history. A high level of care must be taken to design and construct protection measures for these structures to preserve their character and function. Perimeter rock will be placed in the surrounding overbanks to arrest ongoing erosion down the banks and the stilling basins will be supplemented with either rock or more structural measures to reinforce the foundation of the structure. Finally, the upstream face of the structure will be evaluated to determine if additional stabilization measures are required to provide additional strength and prevent seepage through the structure.

Additional Items for Consideration

Floodplain Management. We are familiar with the current regulatory floodplain data along McMurdo Gulch and have used it as part of our past design and development review work. We will use this information to create existing and proposed conditions models in the area of the proposed improvements. If practical, the goal will be to avoid any rise in the regulatory floodplain. However, if a rise occurs as a result of designing the most appropriate improvements, Muller has extensive experience in preparing CLOMR applications for FEMA.

Environmental Permitting. Muller and ERO will identify and communicate with the appropriate permitting agencies early in the project design. This will be particularly important when developing stabilization techniques for the CCC structures identified in this phase of work. ERO will delineate and survey wetlands regulated by the USACE. With the natural character of the corridor and the past involvement of the CCC in this area, the existence of threatened and endangered species as well as cultural resources may be possible. ERO will also provide investigation and consultation in both of these areas. Ultimately, ERO will assist in obtaining a 404 permit. It is assumed that this project may require an individual permit (including application of the Stream Quantification Tool); however, applicable nationwide permits will be explored with the USACE and the Town prior to taking a course of action.

Construction Access, Staging, and Phasing. The majority of the improvements will present significant challenges during construction related to access and staging. Between private land and steep terrain, we will need to work closely with the Town early on in the project to define sensible access routes and staging locations that will minimize disturbance and disruption and be compatible with the project improvements. As part of this process, we will also provide the Town with information on earthwork borrow and disposal, so material needs and the phasing of the project can be coordinated well before the start of construction.

Regional Trail Design. The Town would like to ensure that the proposed regional trail is compatible with all applicable drainageway improvements associated with this phase of work. The Town's Trail Master Plan shows the future regional trail meandering along most of the McMurdo Gulch channel alignment and eventually meeting the Cherry Creek Regional Trail at the confluence. With the McMurdo Gulch valley as a backdrop, this trail has the potential to be one of the most beautiful trail experiences along the Colorado Front Range. Muller has intimate knowledge of the McMurdo Gulch valley and shares a vision for this beautiful open space. Muller will assist the Town to ensure the stream reclamation project accommodates this future regional trail.

Subsurface Utility Engineering (SUE). Muller is very familiar with the requirements set forth in Senate Bill 18-167 and is committed to working with the Town to meet these requirements. Muller has teamed with Topographic to complete the SUE in accordance with the ASCE 38-08, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, and Colorado Subsurface Utility Law (SB18-167). Muller and Topographic will work closely to isolate excavation areas within the limits of construction. To minimize costs, SUE Quality Level B will be limited to only areas of excavation within the project limits and a lesser SUE quality level is anticipated outside of the excavation limits.

Action Plan & Schedule

Commitment

Our team is committed to providing the necessary staff and resources to complete project tasks for the Town and CCBWQA. Of utmost importance is our commitment to providing great service to the Town and CCBWQA – we will do what it takes to successfully accomplish the tasks that the Town and CCBWQA entrusts us with.

Muller's culture is to collaborate from principal to design engineer to ensure engineering excellence and that all aspects of the project are being explored and the best ideas are on the table. Also in our culture is our commitment to learning from each project that we do, so that we can do the next project better. With our continual advancement in natural channel design, we are excited to bring the latest technology and innovation to this project.

Willingness to Meet Contract Schedule, Budget, and Quality Requirements

As with all engineering projects, schedule, budget, and quality are all important elements of the services we provide. We are committed to providing services on time, within budget, and at a level of quality to meet the Town's and CCBWQA's expectations.

Schedule - On time is more than just a promise. For this contract, we will prepare a schedule to be maintained by the Muller Project Manager, Sara Johnson. Muller Principal, Joe Juergensen, will assure that staff are available to Sara, along with assisting with the administration of subconsultant agreements and schedules required for the work. Sara is responsible for assigning work tasks to project staff and subconsultant team members in a manner consistent with the schedule's critical path and desired milestones. Critical path items will include environmental clearances/investigations, CLOMR/LOMR reviews with FEMA, and ROW approval. To avoid project delays, Sara will keep communications open to review agencies and project participants, so information required for decision-making is provided in advance of key dates.

With a multi-discipline project, work completed by all disciplines must be assembled into a comprehensive, coherent package, free from errors and conflicting information. For the project team, Muller is the lead design firm and is responsible for managing project design documents. The design document management plan will match our current procedures and use an electronic filing system, team-wide project SharePoint and OneNote, and virtual server environment with backup files.

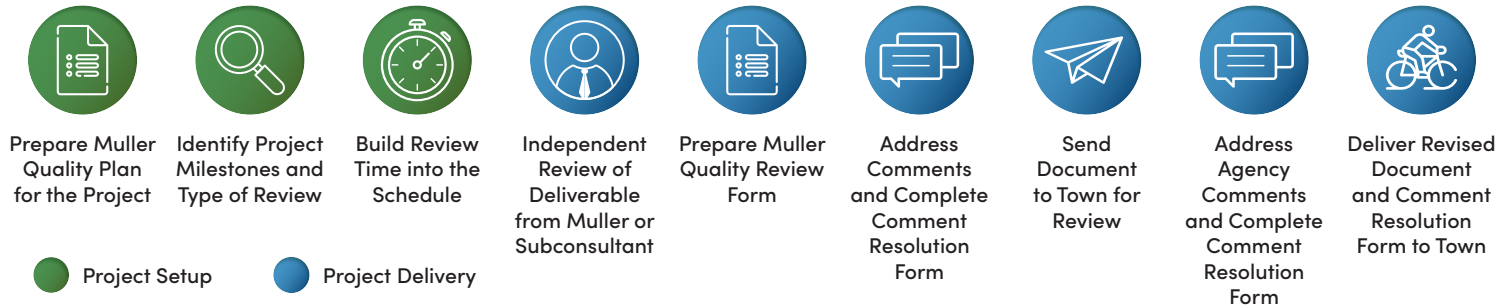
We will provide schedule updates with monthly progress reports. We find that we can provide services on a tight schedule because of the tenure of our staff, familiarity with project requirements, and the support of our subconsultants we work with so often. We will commit the resources necessary to meet contract schedule requirements of each individual project assignment and to meet overall schedule requirements for a construction start of October 2023.

Budget - Sara will be responsible for overall project cost control, consulting fees, and construction cost control. We will keep project scope and goals in mind as project construction documents are prepared. On a monthly basis, we compute the "earned value" of Muller work efforts to date for Muller staff and each subconsultant before reviewing actual charges incurred. Then we compare the earned value to the actual costs to gain an unbiased report of project status. This allows Sara to detect any design budget overrun trends early, when time remains to make corrective adjustments. It also allows us to monitor where overruns and under-runs are occurring on certain tasks and whether we can provide value-added services within the current contract budgets. In addition, when work scope changes due to the Town's decisions or unforeseen circumstances, Muller will advise the Town's Project Manager (PM) before proceeding with out-of-scope work to allow the Town PM to evaluate the need and potential costs before the work is done. This allows the Town's PM to determine the Town's options for spending additional funds, using Town staff for some tasks or reconsidering the need for the work. Coming back for additional compensation after extra work is completed usually results in a bad experience for all project participants.

In addition to controlling design costs, our team will also refresh construction cost estimates early and often through the process to ensure the proposed improvements fit within the Town's project budget. We roll out numerous projects to construction every year, so we have a great feel for the bidding climate and relevant unit costs for typical construction items. This being the case, we can ensure that our construction cost estimates are easy to follow and accurate.

Quality - Illustrated in Figure 2, Muller's Quality Management Program (QMP) is flexible and tailored to fit the scale of each project. Each project requires an individual Quality Plan, with defined review milestones and the type of review required. This is developed by the Design Manager using Muller's Quality Plan Setup Form, which outlines our company-wide quality management standards and project-specific contractual requirements. Roles and responsibilities of those involved are spelled out and required milestone reviews are identified. Muller staff at all levels use this form to ensure that quality processes are executed, and that work is free of errors and completed properly for client reviews. Quality Review Forms are used to document each required review and Comment Resolution Forms track and verify that all client/agency comments are incorporated into the final deliverable.

Figure 2: *Muller's design Quality Management Program ensures complete, coordinated milestone design deliverables.*



Our project manager follows the QMP to develop a project-specific quality assurance/quality control (QA/QC) plan that addresses your design standards and criteria. Internal QC deadlines, including review milestones, the type of review required, and those responsible for senior review, are clearly defined prior to major submittals and milestones. Using comment resolution forms, our project manager verifies all comments received during reviews have been incorporated into the final deliverable.

A true testament to our emphasis on quality is the fact that in more than 41 years of operation, Muller's professional liability insurance has never paid a claim to a third party.

Construction Drawing List

Below is the anticipated sheet list to be assembled to construct the proposed improvements:

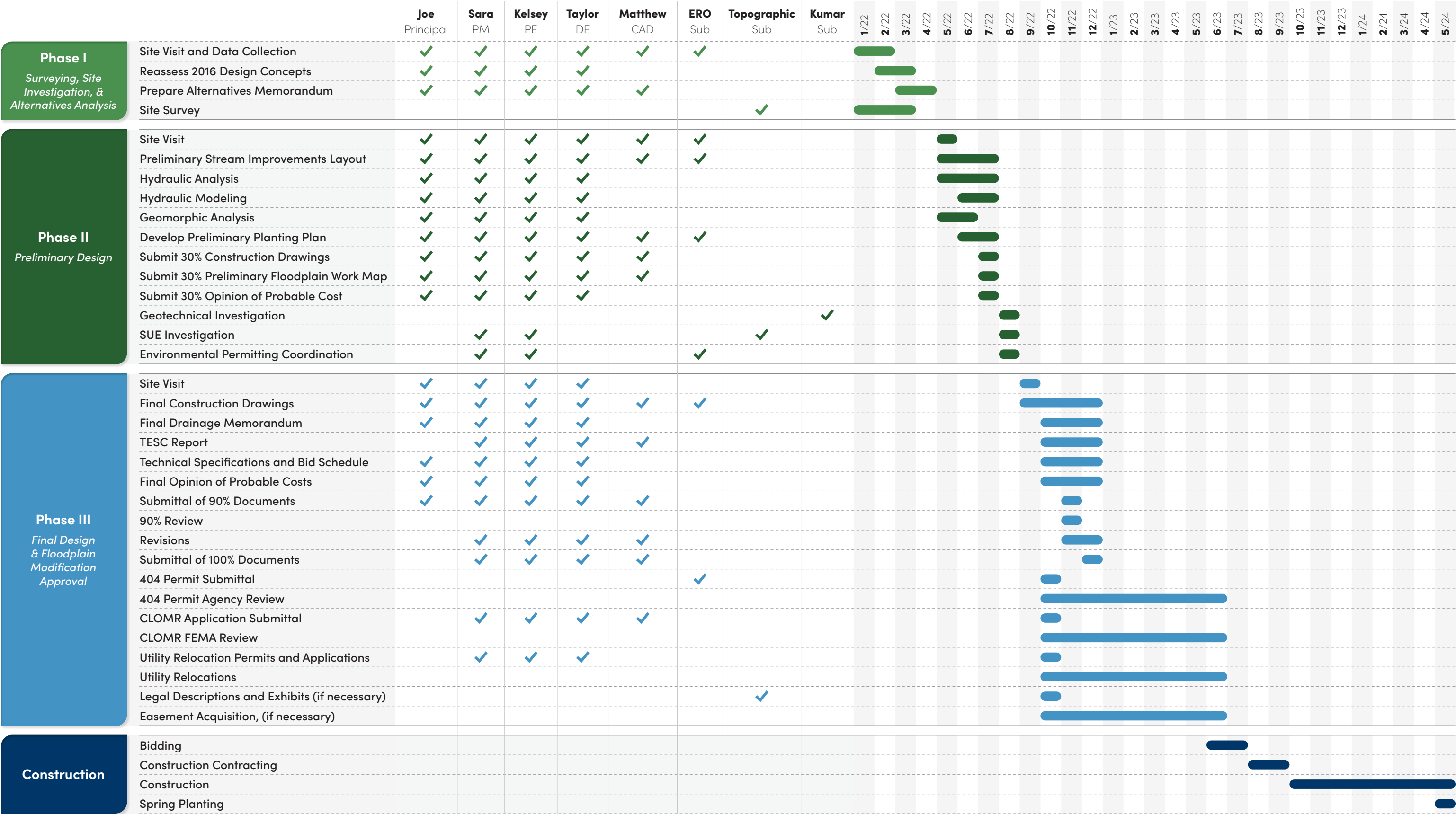
# of Sheets	Sheet #	Construction Drawings - Sheet Title
1	1	Title Sheet
1	2	General Notes and Legend
1	3	Site Plan
8	4-11	Grading Plans and Profiles (assume 8)
1	12	Riffle Structure Plan
2	13-14	Riffle Structure Sections and Details
1	15	Step-Riffle Structure Plan
2	16-17	Step-Riffle Structure Sections and Details
4	18-21	Typical Boulder Cascade Structure Plans

# of Sheets	Sheet #	Construction Drawings - Sheet Title
4	22-25	Typical Boulder Cascade Sections and Details
3	26-28	CCC Structure Preservation Details
1	29	Bank Protection Sections and Details
1	30	Miscellaneous Details
8	31-38	Landscape Plans (Assume 8)
4	39-42	Landscape Notes and Details
1	43	TESC Title Sheet
1	44	TESC Site Plan
1	45	TESC Control Notes
5	46-50	TESC Plans (Assume 5)
5	51-55	TESC Details

Work Breakdown Structure & Schedule

The Town has identified three phases of work for this project as well as milestones to complete this work. **Figure 3** on the following page depicts a breakdown of the tasks to be completed for each phase and the associated schedule to complete each task. Person hours associated with each task are included in our fee submittal under separate cover. Muller is prepared to hit the ground running to meet this schedule.

Figure 3: Project Schedule with Milestone Submittals





McMurdo Gulch Stream Reclamation

PRIORITY 3 PROJECT
Fee Schedule

12/2/2021



TASK LIST AND FEE

CLIENT:	Town of Castle Rock	PROJECT NO.:	PROPOSAL NO.:	921.69
		PREPARED BY: SRJ/JAY	DATE:	12/2/2021
PROJECT:	McMurdo Gulch Stream Reclamation Priority 3 Project	CHECKED BY: JPJ	FEE: \$499,803	

Task No.	Sheet No.	Task Description	TIME (HOURS)						EXPENSES (\$\$)				TOTALS				
			Joe PRIN.	John TECH.	Sara P.M.	Kelsey P.E.	Taylor D.E.	Matthew CAD	O/C	T/L	REPRO	OTHER	(a)	(b)	(c)	(d)	
			\$217	\$197	\$187	\$145	\$132	\$125	<<<2022 Billing Rate								
PHASE I: SURVEYING, SITE INVESTIGATION, & ALTERNATIVES ANALYSIS																	\$55,136
		Basic Services															
		Project Management															
		Progress meetings (assume 1 kickoff meeting and 1 progress meeting)	6		8	12			\$30				26	\$4,538	\$30	\$4,568	
		Prepare Monthly Progress Reports.			6	2							8	\$1,412	\$0	\$1,412	
															Subtotal =	\$5,980	
		Alternatives Analysis															
		Review of existing information/reports.			1	1	1						3	\$464	\$0	\$464	
		Obtain project data and mapping from Town.			1	1		2					4	\$582	\$0	\$582	
		Process survey data			1	4	6	6					17	\$2,309	\$0	\$2,309	
		Site Visits (assume 1 day)	4	8	8	10	10		\$30				40	\$6,710	\$30	\$6,740	
		Reassess 2016 design concepts.	4	4	8	8	12						36	\$5,896	\$0	\$5,896	
		Update concept cost estimates	2		4	8	8						22	\$3,398	\$0	\$3,398	
															Subtotal =	\$19,389	
		Deliverables															
		Alternatives Memorandum w/ Conceptual Level Cost Estimate	2		6	12	6				\$100		26	\$4,088	\$100	\$4,188	
		Preparing Conceptual Level Plans and Profiles	2		4	12	24	18			\$100		60	\$8,340	\$100	\$8,440	
															Subtotal =	\$12,628	
		Special Services															
		Site Survey (Topographic Land Surveyors)			2	8			\$15,605				10	\$1,534	\$15,605	\$17,139	
															Subtotal =	\$17,139	
PHASE II: PRELIMINARY DESIGN																	\$148,725
		Project Management															
		Progress Meetings (assume 2)	4		8	12			\$30				24	\$4,104	\$30	\$4,134	
		Prepare Monthly Progress Reports			6	2							8	\$1,412	\$0	\$1,412	
															Subtotal =	\$5,546	
		Stream Stabilization Design															
		Site Visits (assume 1 day)		8	8	8	8		\$30				32	\$5,288	\$30	\$5,318	
		Layout and initial grading of proposed channel stabilization measures	12	24	36	40	60	30					202	\$31,534	\$0	\$31,534	
		Hydraulic modeling for rock sizing and initial floodplain results (5 Reaches)	8		36	40	60						144	\$22,188	\$0	\$22,188	
		Rock sizing and shear stress calculations	2		4	4	8						18	\$2,818	\$0	\$2,818	
		Geomorphic analysis of project reach	2	4	6	8	12						32	\$5,088	\$0	\$5,088	
		Preliminary Planting Plan		4	4	6	8	12					34	\$4,962	\$0	\$4,962	
															Subtotal =	\$71,908	
		Deliverables															
		30% Construction Drawings	4	4	10	20	40	40			\$100		118	\$16,706	\$100	\$16,806	
		30% Preliminary Floodplain Work Map (Hours for this effort are included in CLOMR Task)											0	\$0	\$0	\$0	
		30% Engineer's Opinion of Probable Cost	1		2	6	8						17	\$2,517	\$0	\$2,517	
															Subtotal =	\$19,323	
		Special Services															
		Survey and Subsurface Utility Engineering (SUE)			2	4			\$7,975				6	\$954	\$7,975	\$8,929	
		404 Permitting Coordination and Meeting with USACE (ERO)	1		6	4			\$19,885				11	\$1,919	\$19,885	\$21,804	
		Preliminary Planting/Revegetation Plan (ERO)	1		16	18			\$7,442				35	\$5,819	\$7,442	\$13,261	
		Geotechnical Investigation (Kumar)			2	4			\$7,000				6	\$954	\$7,000	\$7,954	
															Subtotal =	\$51,948	
PHASE III: FINAL DESIGN & FLOODPLAIN MODIFICATION APPROVAL																	\$295,942
		Basic Services															
		PROJECT MANAGEMENT															
		Prepare Monthly Progress Reports			8	4							12	\$2,076	\$0	\$2,076	
		Progress Meetings (2)	6		8	12			\$60				26	\$4,538	\$60	\$4,598	
		Site Visits (1 Day)	8	8	8	10	10		\$30				44	\$7,578	\$30	\$7,608	
		CONSTRUCTION DRAWINGS															
	1	Title Sheet			1	1	1	1					4	\$589	\$0	\$589	
	1	General Notes and Legend			1	2	1	1					5	\$734	\$0	\$734	
	1	Site Plan			1	1	2	2					6	\$846	\$0	\$846	
	8	Grading Plans and Profiles (assume 8)	2	4	12	24	24	24					90	\$13,114	\$0	\$13,114	
	1	Riffle Structure Plan	1		4	6	8	12					31	\$4,391	\$0	\$4,391	
	2	Riffle Structure Sections and Details	1		2	4	8	12					27	\$3,727	\$0	\$3,727	
	1	Step-Riffle Structure Plan	1	2	6	12	16	12					49	\$7,085	\$0	\$7,085	
	2	Step-Riffle Structure Sections and Details	1	2	4	8	16	12					43	\$6,131	\$0	\$6,131	
	4	Typical Boulder Cascade Structure Plans	2	2	8	12	16	16					56	\$8,176	\$0	\$8,176	
	4	Typical Boulder Cascade Sections and Details		2	4	8	16	16					46	\$6,414	\$0	\$6,414	
	3	CCC Structure Protection Details	3	3	12	24	24	24					90	\$13,134	\$0	\$13,134	
	1	Bank Protection Sections and Details	1		2	4	8	6					21	\$2,977	\$0	\$2,977	
	1	Misc. Details			4	4	8	6					22	\$3,134	\$0	\$3,134	
	8	Landscape Plans (Assume 8)	1	2	4	4	12	18					41	\$5,773	\$0	\$5,773	

TASK LIST AND FEE

CLIENT:	Town of Castle Rock	PROJECT NO.:	PROPOSAL NO.:	921.69
		PREPARED BY: SRJJ/JAY	DATE:	12/2/2021
PROJECT:	McMurdo Gulch Stream Reclamation Priority 3 Project	CHECKED BY: JPJ	FEE: \$499,803	

Task No.	Sheet No.	Task Description	TIME (HOURS)						EXPENSES (\$\$)				TOTALS			
			Joe PRIN.	John TECH.	Sara P.M.	Kelsey P.E.	Taylor D.E.	Matthew CAD	O/C	T/L	REPRO	OTHER				
			\$217	\$197	\$187	\$145	\$132	\$125	<<<2022 Billing Rate				(a)	(b)	(c)	(d)
	4	Landscape Notes and Details		2	4	4	12	18					40	\$5,556	\$0	\$5,556
	1	TESC Title Sheet			1	1	1	1					4	\$589	\$0	\$589
	1	TESC Site Plan			1	1	2	2					6	\$846	\$0	\$846
	1	TESC Control Notes			1	2	1	1					5	\$734	\$0	\$734
	5	TESC Plans (assume 5 sheets)	1		4	8	24	24					61	\$8,293	\$0	\$8,293
	5	TESC Details			1	1	1	2					5	\$714	\$0	\$714
	55	Total Sheets Assumed														
		REPORTS														
		Drainage Calculation Memorandum	1		8	24	12	2					47	\$7,027	\$0	\$7,027
		TESC Report			1	2	4						7	\$1,005	\$0	\$1,005
		Technical Criteria Variance Letter			2	2							4	\$664	\$0	\$664
		SPECIFICATIONS														
		Technical Specifications	1		6	12							19	\$3,079	\$0	\$3,079
		Bid Schedule and Measurement and Payment	1		12	16							29	\$4,781	\$0	\$4,781
		ENGINEER'S COST OPINION AND BID SCHEDULE	2		6	12	12						32	\$4,880	\$0	\$4,880
		SUBMITTALS														
		Internal Senior Review	8	8									16	\$3,312	\$0	\$3,312
		Submittal of 90% Documents			1	2	2	4			\$150		9	\$1,241	\$150	\$1,391
		90% Review and Revisions	2		8	8	16	16					50	\$7,202	\$0	\$7,202
		Submittal of 100% Documents			1	2	2	4			\$150		9	\$1,241	\$150	\$1,391
															Subtotal =	\$141,971
		Special Services														
		404 Permit Preparation (ERO)			12	8			\$16,654				20	\$3,404	\$16,654	\$20,058
		Colorado Stream Quantification Tool (ERO)		4	16	8			\$38,778				28	\$4,940	\$38,778	\$43,718
		Planting/Revegetation Consultation (ERO)			24	16			\$9,983				40	\$6,808	\$9,983	\$16,791
		Cultural Resource Survey and Report (ERO)			8	4			\$13,833				12	\$2,076	\$13,833	\$15,909
		Utility Relocation Permits and Applications (coordination only, no applications anticipated)			4	6		2					12	\$1,868	\$0	\$1,868
		Legal Descriptions and Exhibits (TLS)	1		2	6	8	12	\$900				29	\$4,017	\$900	\$4,917
		CLOMR Application Submittal: (Tributaries 5 and 6 and 4,500 LF of McMurdo Gulch)	20		32	48	68	32			\$100		200	\$30,260	\$100	\$30,360
		CLOMR FEMA Review Fee (online submittal)									\$6,500		0	\$0	\$6,500	\$6,500
		Address FEMA CLOMR Review Comments (two rounds anticipated up to the hours shown)	8		18	24	24	16			\$100		90	\$13,750	\$100	\$13,850
															Subtotal =	\$153,971
CONSTRUCTION ADMINISTRATION																
		None included.														\$0
		Total Hours	127	95	457	611	630	406	-	-	-	-	2326	-	-	-
		Fee, Billing Rate	\$27,559	\$18,715	\$85,459	\$88,595	\$83,160	\$50,750	-	-	-	-	-	\$354,238	-	-
		Total Expenses	-	-	-	-	-	-	\$138,055	\$210	\$800	\$6,500	-	-	\$145,565	-
		Total, Billing Rate(b+c)	-	-	-	-	-	-	-	-	-	-	-	-	-	\$499,803

Assumptions for Scope and Fee:

- Scope and fee assumes two legal descriptions.
- Irrigation design services are not included.
- No changes to regulatory flow rates are anticipated and no hydrologic modeling is included in the scope and fee.
- The estimated level of effort to address CLOMR review comments is indicated in the fee above; this estimate will be re-assessed with the Town after comments are received.
- All submittals will be in PDF format.
- Environmental permitting assumes: wetland delineation, T&E compliance, cultural resources investigation, SQT evaluation, and Individual 404 Permit application.
- Public meetings and Town Council meetings are not included in this scope and fee.

ERO Resources Corporation Scope of Work for Environmental Services for McMurdo Gulch Priority 3 Stream Reclamation Project Castle Rock, Colorado

November 29, 2021

Background

Muller Engineering, Inc. (Muller) has requested ERO Resources Corporation (ERO) prepare a scope of work and fee estimate to perform ecological and revegetation design services for a stream reclamation project along McMurdo Gulch and two tributaries to McMurdo Gulch in Castle Rock, Colorado (project area) associated with a Request for Proposal (RFP) issued by the Town of Castle Rock (Town). The proposed channel stabilization activities include installing riffle structures, rock lining in the channel bottom, grade control structures, bioengineered bank protection treatments, and site revegetation.

The proposed project will require a Clean Water Act (CWA) Section 404 permit from the U.S. Army Corps of Engineers (Corps). As part of obtaining Section 404 CWA permit authorization from the Corps, the project must also comply with the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA). Based on current knowledge of the proposed activities, ERO anticipates that the proposed project would require a Section 404 CWA Individual Permit (IP).

The RFP and this scope of work has been divided into three phases (Phase 1, Phase 2, and Phase 3) and are based on the project limits depicted on Attachment 1 of the RFP that will likely require a federal action (i.e., Section 404 IP, Section 7 of the ESA, and Section 106 of the NHPA).

Phase 1. Surveying, Site Investigation, and Alternatives Analysis

Task 1. Kickoff Meeting and Site Visit with the Project Team

ERO will attend the project kickoff meeting and conduct a site visit with the Muller and Town to become familiar with site conditions in the project area and to discuss alternatives and design concepts.

Task Assumptions

- ERO will attend the project kickoff meeting.
- ERO will conduct a site visit with Muller and the Town.

Task 2. Identify and Map Wetlands, Open Water, and Channels

ERO will delineate wetlands, open waters, and channels following the routine on-site wetland determinations in areas of less than 5 acres as described in the revised online version of the 1987 Corps

Wetlands Delineation Manual and appropriate regional supplement. Open water and channels will be determined based on the presence of an ordinary high water mark (OHWM), as defined in 33 Code of Federal Regulations Part 328. ERO will map the boundaries of wetlands, OHWM, open water, and streambeds to submeter accuracy using a Global Positioning System (GPS) unit or, when appropriate, ERO will hand draw boundaries onto an aerial photograph. ERO will incorporate the wetland boundaries into base mapping provided by Muller and will send the Muller a revised base mapping file that includes a layer with the boundaries of wetlands, open water, and channels. A summary of the wetland and waters mapping would be included in the alternative analysis memorandum under Phase 1, Task 4.

Task Assumptions

- Performing the delineation is weather dependent. The ground must be free of snow and, in most instances, the soils must be unfrozen to collect the needed soil data.
- Muller will provide topographical survey mapping data and/or aerial photography.
- Muller will arrange and provide written permission to access the project area.
- Changes to the boundaries of the project area will require additional effort and ERO will coordinate with Muller to determine if changes in the scope or budget are necessary.

Task Products

- Electronic file with wetlands, open water, and channel boundaries delivered to Muller via email.

Task 3. Endangered Species Act and Migratory Bird Treaty Act Compliance

Under this task, ERO will conduct a habitat assessment for federally listed threatened and endangered species within the project area in conjunction with Task 2. Based on ERO's current knowledge of the area, potential habitat for federally threatened or endangered species is not likely present in the project area. Data gathered during this task will be used to prepare a habitat assessment letter for submittal to the U.S. Fish and Wildlife Service (Service) under Phase 3, Task 7; and a description of the habitat assessment, as well as a copy of the response letter from the Service, will be included in the IP application to the Corps under Phase 3, Task 10.

ERO will also note other regulated natural resources that may affect the project, such as raptor or other migratory bird nests protected by the Migratory Bird Treaty Act. ERO will include notes on other regulated resources, if present, under Phase 1, Task 4. Additionally, this scope of work assumes the proposed project would not contribute to depletions to the South Platte River, which could affect federally listed Platte River species, and consultation with the Service will not be required for the project.

Task Assumptions

- No threatened or endangered species habitat occurs in the project area.
- Presence/absence surveys for listed species will not be required by the Service. If a survey is required, ERO can provide a separate scope of work and cost estimate.
- Consultation with the Service on depletions will not be required for the project.

Task 4. Alternatives Analysis

During the alternatives analysis process, ERO will work with Muller to identify environmental compliance and permitting requirements as it relates to the design alternatives. ERO will prepare a brief memorandum that includes a summary of existing conditions, including ecological resources identified in the project area during Tasks 2 and 3, and a discussion of environment compliance and permitting approaches associated with each of the alternatives.

Task Products

- Technical memorandum delivered to Muller via email.

Phase 2. Preliminary Design

Task 5. Environmental Permitting Coordination

Based on the selected design alternative, ERO will work with Muller and Town to identify areas with valuable and sensitive habitat to be avoided or minimized during design and to discuss potential impacts and mitigation approaches needed to meet Corps permit requirements. ERO will attend up to six virtual progress meetings with Muller and the Town to discuss project design and permitting requirements during the preliminary design phase.

Ahead of scheduling a pre-application meeting with the Corps, ERO will conduct a site visit with Muller to review locations for the proposed structures and discuss the Colorado Stream Quantification Tool (SQT) sub-reach locations and parameters in the project area. Following this site visit, ERO will arrange an onsite meeting with the Corps, Muller, and Town to review project goals, preliminary design concepts, the SQT parameters checklist, and impacts on waters of the U.S. This meeting will take place prior to conducting the SQT field assessment and preparing the IP application so that the Corps can review and provide comments on the proposed SQT sub-reach locations and parameters and to determine the appropriate permitting approach.

ERO will arrange a second onsite meeting with the Corps and invite other local agencies, such as the Service, Environmental Protection Agency (EPA), and Colorado Department of Public Health and Environment (CDPHE) to review the project design and identify agency concerns so that they can be incorporated into the project design as practicable. An ERO cultural resources specialist will attend the second onsite meeting with the agencies to help identify potential project consultation strategies needed for compliance with Section 106 of the NHPA (1996, as amended).

Task Assumptions

- ERO will attend up to six virtual progress meetings with Muller and the Town during preliminary design.
- One site meeting with Muller to discuss project design and SQT sub-reaches and parameters ahead of a site meeting with the Corps.

- ERO will coordinate and attend two onsite meetings with the project team and agencies to discuss project design, SQT, permitting requirement, and compliance with the ESA and the NHPA.

Task Products

- Meeting notes from the onsite meetings with the agencies delivered to Muller via email.

Task 6. Preliminary Revegetation Plan

Under this task, ERO will work with Muller to develop a preliminary revegetation plan to minimize impacts to high-quality vegetation and wildlife habitat and would aim to provide the most ecological lift and creation of wetland and riparian habitats within the project area for the 30% design submittal. The preliminary revegetation plan will include recommendations on plant material and native seed mixes. ERO assumes that Muller will be responsible for incorporating planting concepts into the AutoCAD drawings. This task includes two virtual meetings and one in-person meeting with Muller to develop the preliminary revegetation plan and one in-person meeting with Muller and Town for the 30% design submittal review.

Task Assumptions

- ERO will attend two virtual and one in-person meetings with Muller to develop the preliminary revegetation plan.
- ERO will attend one in-person meeting for the 30% design submittal review.

Task Products

- Plant material lists and seed mixes delivered to Muller via email.

Phase 3. Final Design and Floodplain Modification Approval

Task 7. Habitat Assessment Letter

As part of the project, a Conditional Letter of Map Revision (CLOMR) will be submitted to the Federal Emergency Management Agency (FEMA) for its review and approval of modifications to the regulatory floodplain within the project area. As part of the CLOMR submittal process, the applicant (Town) must provide documentation to FEMA that the modifications are in compliance with the ESA. Based on data collected in Phase 1, Task 3, ERO will prepare a habitat assessment letter for submittal to the Service. The habitat assessment letter will be submitted as a draft to Muller and the Town for review and comment before ERO submits it to the Service. ERO will provide Muller with the habitat assessment letter and response letter from the Service for inclusion in the CLOMR submittal package prepared by Muller.

Task Products

- Draft and final habitat assessment letter delivered via email.
- Copy of the response letter from the Service delivered via email.

Task 8. Stream and Wetland Functional Assessment

The Corps is currently implementing a stream functional assessment method that will be required for all IP applications and some Nationwide Permit applications and ERO assumes the Corps will require this analysis for the project. ERO will conduct the full analysis of stream functions using the Colorado Stream Quantification Tool (SQT) Version 1.0, with input from Muller on proposed design conditions, for up to seven sub-reaches in the project area. ERO assumes that up to four virtual meetings with Muller will be required to discuss the channel alignment and cross section, bank stabilization treatments, and proposed conditions to complete the SQT analysis. ERO will summarize the results of the SQT analysis in the IP application under Phase 3, Task 10.

ERO will also conduct a functional assessment of any wetlands found within the project area using the Functional Assessment of Colorado Wetlands Method (FACWet). FACWet data sheets will be completed using the standard practices outlined in the FACWet manual. FACWet results will be incorporated into the IP application under Phase 3, Task 10.

Task Assumptions

- This scope of work includes the full SQT analysis (hydrology, hydraulics, geomorphology, and riparian vegetation) with input from Muller for the proposed conditions.
- This scope of work includes seven sub-reaches in the SQT analysis. If the Corps requires additional sub-reaches for the SQT analysis, ERO will provide a new cost estimate for these additional services.
- ERO will attend up to four virtual meetings with Muller to complete the SQT analysis.

Task Products

- Draft and final SQT worksheets and forms.
- FACWet datasheets and analysis.
- Summary of SQT and FACWet analysis included in the IP application (Task 10).

Task 9. Cultural Resource Services

Section 106 of the NHPA (1996, as amended) requires that the lead federal agency (Corps) consult with the Colorado State Historic Preservation Officer (SHPO) regarding the project's potential to affect historic properties. The project area is located in an area known for its Civilian Conservation Corps (CCC) structures and Native American resources and, therefore, the Corps will likely define the area of potential effect (APE) to include the limits of construction.

Class III Survey and Exploratory Testing

ERO believes that the Corps will require pedestrian survey and evaluative testing of appropriate landforms for this project. Four known cultural resource surveys intersect the project area and ERO will use data and results from those projects to reduce cost for the current project. Two surveys were conducted by ERO in 2018 and 2020 and the other two by PaleoWest 2018 and 2020. Unsurveyed

portions of the project area remain and PaleoWest's 2018 survey was limited to a Class II (reconnaissance survey) which does not qualify as a Class III survey.

ERO will identify the unsurveyed and insufficiently surveyed areas and will survey those areas at a Class III level that conforms to the Secretary of the Interior's Guidelines for Identification and by supervisory personnel that meet the Secretary of the Interior's Professional Qualification Standards. This task will involve two archaeologists walking systematic transects to identify unknown cultural resources within the APE.

ERO identified four CCC-related resources that will intersect the APE based on proposed drop structure locations: two erosion control systems (5DA3750 and 5DA3292), a dump (5DA3747), and a road (5DA3660). Previously documented Native American resources are located near the proposed drop structures on Tributaries 5 and 6. 5DA3750 will require rehabilitation under the proposed project due to historical drop structures threatened by erosion. ERO will work with Muller to identify stabilization techniques that are least likely to avoid adversely affecting the resource. If stabilization results in an adverse effect, the Corps and State Historic Preservation Officer (SHPO) will require Level II documentation of the affected structure. ERO has already collected field data for this effort for previous projects. ERO assumes one more undocumented resource will be present in the APE.

ERO's previous work around the project area has demonstrated buried Native American sites are present in alluvial terraces. ERO identifies such resources through exploratory shovel testing which requires two archaeologists hand-excavating 3-foot-deep circular holes and screening excavated sediments to identified buried artifacts. The SHPO will likely require evaluative testing and ERO recommends conducting the work after approval from the Corps to identify any potential constraints.

Identified cultural resources will be documented on relevant Office of Archaeology and Historic Preservation (OAHP) site forms, mapped, photographed, and located using a sub-meter GeoXH global positioning system unit. Each identified resource will be assessed for its eligibility to be listed in the National Register of Historic Places (NRHP) per 36 CFR 60.4 of the National Historic Preservation Act (NHPA, 1966, as amended).

Reporting

ERO will prepare a cultural resource survey report that conforms to the OAHP (state), Secretary of the Interior's Standards for Documentation, and Corps requirements. This report will include figures depicting the project area and tables listing documented cultural resources, their NRHP eligibility, and management recommendations. A separate appendix will include completed OAHP site forms and cultural resource site location maps (information exempted from the Freedom of Information Act and prohibited from disclosure to the general public). All documents and figures are reviewed for technical and editorial accuracy.

Task Assumptions

- Ground conditions must be 80 percent free of snow and any pedestrian survey areas and access roads must be dry in order to initiate survey. These stipulations are required by the SHPO and federal agencies.
- ERO's cost assumes that four CCC resources will be documented and one buried prehistoric cultural resource will be documented. If more than five resources are encountered during the inventory, ERO will contact Muller after the survey is completed and negotiate a new cost estimate.
- ERO assumes that 12 shovel tests will be necessary to evaluate landforms. If a buried site that is potentially eligible is identified, ERO will contact Muller immediately to prescribe additional steps and negotiate a new cost estimate.
- ERO assumes that evaluative testing and treatment of historic properties, if needed, would be conducted under a separate scope of work.
- ERO assumes that proposed rehabilitation strategies will not adversely affect 5DA3750. If adverse effects are determined by the agency, ERO will use existing documentation to reduce costs associated with a new scope of work and cost estimate.

Task Products

- Draft project team and Agency reports delivered to Muller for review via email.
- Final report documents include two hard copies and a compact disc with accompanying GIS files mailed the Corps and one PDF version emailed to Muller.

Task 10. Prepare Individual Permit Application

ERO will prepare an IP application for submittal to the Corps. The application will include a discussion of the purpose and need for the project, a summary of the wetland delineation, threatened and endangered species information, cultural resources results, an alternatives analysis, information on grading, structures, and best management practices provided by Muller, and a compensatory wetland and stream mitigation plan.

ERO will coordinate with Muller on what information ERO requires for the application. Typical information includes plan and profile views, cross sections, basic sediment and erosion control plan, figures showing and quantifying impacts to jurisdictional areas, quantities of fill material below the ordinary high water mark, details, and background information on other approval requirements (e.g., those of the Federal Emergency Management Agency), and a discussion of the purpose of, and need for, the project. ERO will also coordinate with Muller to develop compensatory wetland and stream mitigation plan concepts that will be incorporated into the final revegetation plan under Phase 3, Task 11. This task includes one round of project impact calculations and one revision to finalize the IP, including reviewing all documents and figures for technical and editorial accuracy.

This task also includes working with Muller and Town throughout the final design phase to discuss project design, SQT analysis, impacts on waters of the U.S., and appropriate mitigation approaches to

meet Corps requirements. ERO will attend up to eight virtual progress meetings with Muller and the Town during the final design phase.

Task Assumptions

- Muller will provide ERO with electronic and PDF project plan sets.
- This task includes with one round of wetland and stream impact calculations based on the project plan set and AutoCAD drawings provided by Muller. Should design plan changes occur after project impact calculations have been completed, revisions would be considered an additional service and ERO will provide a new cost estimate to complete these services.
- One revision to the IP submittal document.
- Muller will develop a suitable range of alternatives to the proposed action for evaluation in the IP process, including why the alternatives considered are not practicable.
- This task assumes that ERO will cover the cost of the section 401 Water Quality Certification fee.
- ERO will attend up to eight virtual progress meetings.

Task Products

- Draft IP submittal documents delivered to Muller and the Town via email.
- Final IP submittal documents including electronic copy submitted to the Corps and hard copies mailed to the Colorado Department of Public Health and Environment (CDPHE) – Water Quality Control Division and Environmental Protection Agency, and a PDF document emailed to Muller and the Town.

Task 11. Final Revegetation Plan

ERO will work with Muller to minimize impacts to wetlands and riparian habitat as much as possible to meet the Corps' required wetland and stream mitigation within the project area and to incorporate these concepts into the final revegetation design plans and construction cost estimate. ERO will provide Muller with the plant material quantities, seed mixes, and revegetation notes in Microsoft Word and/or Excel format and the seeding and planting areas will be represented graphically (redlined) on the plan sheets. ERO assumes that Muller will be responsible for the AutoCAD drawings and will prepare construction documents and specifications. ERO will review Muller's construction drawings and specifications for compliance with Section 404 requirements. This task includes two virtual meetings and one in-person meeting with Muller to develop the final revegetation plan and one in-person meeting with Muller and Town for the 90% design submittal review.

Task Assumptions

- Muller will incorporate final revegetation plan concepts into AutoCAD and prepare construction documents.
- ERO will attend two virtual meetings and one in-person meeting with Muller to develop the final revegetation plan.
- ERO will attend one in-person meeting with Muller and the Town for the 90% design submittal review.

Task Products

- Redlined plan sheets with revegetation concepts delivered to Muller via email.

- Seed mixes, plant lists, and specifications delivered to Muller via email.

Task 12. Comment Resolution and IP Review

With collaboration from Muller, ERO will compile and respond to comments provided by regulatory agencies and the public during the Corps IP review process. This task also includes a review of the draft IP document provided by the Corps. ERO will review the accuracy of the permit's project description, figures, and proposed special conditions to determine if any unexpected or unreasonable conditions are proposed by the Corps. ERO will also identify any Section 404 special conditions or 401 water quality certification compliance requirement that should be updated or included in the construction drawings and specifications. ERO will provide Muller with a memorandum summarizing any concerns with the proposed permit conditions and updates on the final construction drawings and specifications.

Task Assumptions

- During the permit process, the Corps or other entity will not require major changes to the project that will require redesign of the project.

Task Products

- One response to comments delivered to Muller and Corps via email.
- Permit review memorandum delivered to Muller via email.

Estimated Costs

Tasks 1 through 12 will be completed on a times a time-and-materials basis for a cost not to exceed \$106,576.00 (see below for breakout), including expenses billed at cost plus 8%.

Phase 1. Surveying, Site Investigation, & Alternatives Analysis

Task 1. Kickoff Meeting and Site Visit with Project Team	\$2,962
Task 2. Identify and Map Wetlands, Open Water, and Channels	\$7,294
Task 3. ESA and Migratory Bird Treaty Act Compliance	\$1,016
Task 4. Alternatives Analysis	\$2,255
Phase 1 Total	\$13,527

Phase 2. Preliminary Design

Task 5. Environmental Permitting Coordination	\$9,320
Task 6. Preliminary Revegetation Plans	\$4,480
Phase 2 Total	\$13,800

Phase 3. Final Design and Floodplain Modification Approval

Task 7. Habitat Assessment Letter	\$1,537
Task 8. Stream and Wetland Functional Assessments	\$38,778
Task 9. Cultural Resource Services	\$13,833
Task 10. Prepare IP Application	\$12,923
Task 11. Final Revegetation Plan	\$9,984
Task 12. Coordination with Involved Agencies and Comment Resolution	\$2,194
Phase 3 Total	\$79,249

Project Total	\$106,576
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ERO Cost Proposal - McMurdo Gulch Priority 3 Stream Reclamation Project

		Phase 1. Surveying, Site Investigation, & Alternatives Analysis				Phase 3. Preliminary Design		Phase 3. Final Design & Flood Plain Modification Approval							
Labor Category	2022 Unit Rate	Task 1. Kickoff Meeting and Site Visit with Project Team	Task 2. Identify and Map Wetlands, Open Water, and Channels	Task 3. ESA and MBTA Compliance	Task 4. Alternatives Analysis	Task 5. Environmental Permitting Coordination	Task 6. Preliminary Revegetation Plan	Task 7. Habitat Assessment Letter	Task 8. Stream and Wetland Functional Assessment	Task 9. Cultural Resource Services	Task 10. Prepare IP Application	Task 11. Final Revegetation Plan	Task 12. Comment Resolution and IP Review	Labor Hours Total	Totals
Project Principal	\$179.00										1			1	\$179
Senior Project Biologist	\$164.00	10	10	1	4	30	24	2	16		30	52	8	187	\$30,668
Biologist II	\$114.00	10	20	4	8	28	4		260		32	12	6	384	\$43,776
Staff Biologist	\$99.00		20	4				8	16					48	\$4,752
GIS/Graphics Specialist	\$114.00		8		2			2	24	4	20			60	\$6,840
Senior Cultural Resource Specialist	\$120.00					6				19				25	\$3,000
Project Cultural Resource Specialist	\$104.00									50				50	\$5,200
Staff Cultural Resource Specialist II	\$71.00									60				60	\$4,260
Cultural Resources Technician	\$60.00									10				10	\$600
Word Processing/Editor	\$99.00				2			1		4	4		2	13	\$1,287
Administrative Staff	\$84.00				2	1		1		1	2			7	\$588
Total Labor Hours		20	58	9	18	65	28	14	316	148	89	64	16	845	
Total Labor		\$2,780	\$6,812	\$1,016	\$2,162	\$8,916	\$4,392	\$1,531	\$36,584	\$13,276	\$11,591	\$9,896	\$2,194		\$101,150
Expenses	Unit Rate	Task 1. Kickoff Meeting and Site Visit with Project Team	Task 2. Identify and Map Wetlands, Open Water, and Channels	Task 3. ESA and MBTA Compliance	Task 4. Alternatives Analysis	Task 5. Environmental Permitting Coordination	Task 6. Preliminary Revegetation Plan	Task 7. Habitat Assessment Letter	Task 8. Stream and Wetland Functional Assessment	Task 9. Cultural Resource Services	Task 10. Prepare IP Application	Task 11. Final Revegetation Plan	Task 12. Comment Resolution and IP Review	Totals Quantities	Totals
Field Equipment Charges	\$10.00	2	4			9			16	3				34	\$340
Mileage	\$0.58	280	280		150	490	100		1300	175		100		2,875	\$1,668
Photocopy (color/8.5x11)	\$0.30		100		20	100	100	20	100		600	95		1,135	\$341
Photocopy (b&w/8.5x11)	\$0.15										200			200	\$30
File search fee	\$50.00									1				1	\$50
Postage	\$5.00													0	\$0
GPS Rental (per day)	\$125.00		2						10	3				15	\$1,875
401 Water Quality Certification	\$1,122.00									1				1	\$1,122
Total Expenses		\$182	\$482	\$0	\$93	\$404	\$88	\$6	\$2,194	\$557	\$1,332	\$87	\$0		\$5,425
Total estimated costs		\$2,962	\$7,294	\$1,016	\$2,255	\$9,320	\$4,480	\$1,537	\$38,778	\$13,833	\$12,923	\$9,983	\$2,194		\$106,575

An Employee Owned Company

Office Locations: Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs, and Summit County, Colorado

November 22, 2021

Attn: John Yager, PE, CFM
Muller Engineering Co.
777 S Wadsworth Boulevard 4-100
Lakewood, Colorado 80226

Subject: Proposal for Geotechnical Engineering Study, McMurdo Gulch Stream
Reclamation Project, Priority III, Castle Rock, Colorado.

Proposal No. C21-394

Dear Mr. Yager:

Kumar & Associates, Inc., is pleased to submit this proposal for the subject project. We understand the project will include channel improvements at the third priority areas identified by the Town of Castle Rock. The reach of McMurdo Gulch considered in this study will include the upstream portion from approximately Sta. 240+00 to 350+00, and will also include Tributaries 5 and 6. We have assumed that access to the project area will be possible using a 2wd truck mounted drill rig.

Scope of Work: Based on the information provided, we propose the following:

1. As requested, drill a total of 8 exploratory borings within the project area at the locations identified by the client. The borings are anticipated to extend about 25 to 30 feet deep. If practical auger drilling refusal is encountered, the boring depths may be less. The final depth of the borings will be determined in the field as drilling progresses and as the subsurface profile becomes evident. The borings will be made to provide information on the subsurface profile, to obtain samples for laboratory testing, and to estimate the ground-water level and depth to bedrock, if encountered within the drilled depth. The groundwater level will be checked after drilling, and the borings will then be backfilled.

We will coordinate with the Utility Notification Center of Colorado to locate buried utilities prior to drilling. Utilities cleared through this service will not include privately owned on-site utility lines. The property owner should identify any privately owned underground utilities that may be present within the property, and notify us of the locations prior to drilling. We will not be responsible for damage to utility lines that are not properly identified.

2. Conduct a laboratory testing program on selected samples obtained from the borings to determine:
 - Moisture content,
 - Density of undisturbed fine-grained samples,
 - Gradation characteristics,
 - Atterberg limits,
 - Swell-consolidation of fine-grained samples (if appropriate), and
 - Water soluble sulfate concentrations.

3. Analyze the data obtained from the field and laboratory portions of the study to provide engineering recommendations for:
 - Foundation type or types, depths and allowable bearing pressures
 - Foundation construction criteria
 - Mitigation of sulfate attack, if any, on concrete
 - Seismic Site Class designation in accordance with Chapter 16 of the IBC
 - Excavation and dewatering considerations
4. Prepare a report summarizing the site exploration data and laboratory test results, and providing our conclusions and recommendations. The field work and report preparation will be supervised by a registered professional engineer.

Fee: We propose to perform the above-described scope of work for a lump sum fee of **\$7,000**.

Schedule: We propose to initiate the study immediately upon being given notice to proceed. We anticipate the field work will be completed within 6 weeks of notice to proceed, and a final report will be available within 2 to 3 weeks after completion of the field program. Specific times may vary somewhat if weather conditions or other conditions beyond our control prevent access. In any event, we will notify you of our progress and any available information.

Please call if you have any questions about the scope of work. If this proposal meets your approval, please sign one copy and return it to this office. Thank you for considering us for the study of this project.

Sincerely,

KUMAR & ASSOCIATES, INC.

By 
Arben Kalaveshi, P.E.

AFK:bj
Rev. by: DPC
Attachment

ENGINEERING, ENVIRONMENTAL AND FIELD TECHNICAL SERVICES

Principal Engineer	\$180.00 - \$220.00/hr.
Senior Project Engineer/Geologist/Manager	\$125.00 - \$160.00/hr.
Project Engineer/Geologist/Scientist	\$100.00 - \$130.00/hr.
Staff Engineer/Geologist/Scientist	\$80.00 - \$105.00/hr.
Project Supervisor	\$90.00 - \$140.00/hr.
Construction Inspector I	\$65.00 - \$75.00/hr.
Construction Inspector II	\$75.00 - \$90.00/hr.
Environmental Specialist/Scientist	\$90.00 - \$135.00/hr.
Environmental Field Technician/Geologist	\$85.00 - \$95.00/hr.
Safety Professional	\$110.00 - \$125.00/hr.
Project Administrator	\$110.00 - \$130.00/hr.
Staff Administrator	\$70.00 - \$80.00/hr.
Exploration Field Engineer/Technician/Geologist	\$70.00 - \$90.00/hr.
Construction Materials Testing Technicians:	
▪ Field Observation	\$65.00 - \$75.00/hr.
▪ Concrete	\$50.00 - \$60.00/hr.
▪ Soils, Reinforcing Steel, Asphalt	\$53.00 - \$62.00/hr.
▪ Piers, Masonry	\$60.00 - \$70.00/hr.
▪ Fireproofing	\$75.00 - \$85.00/hr.
▪ Post-Tensioning	\$60.00 - \$70.00/hr.
▪ Floor Flatness	\$80.00 - \$90.00/hr.
▪ Structural Steel	\$80.00 - \$90.00/hr.
▪ UL Fire Stop Inspection	Call for Pricing
Laboratory Technician/Sample Preparation	\$45.00 - \$55.00/hr.
Word Processing	\$50.00 - \$60.00/hr.
Drafting	\$80.00 - \$100.00/hr.
Litigation/Expert Witness/Deposition	\$175.00 - \$350.00/hr.

OTHER DIRECT CHARGES

Out of Town Expenses, Travel, Rental Etc.	Cost + 15%
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SUBSURFACE EXPLORATION, SAMPLING, MONITORING WELL INSTALLATION

Exploration Subcontractor Subconsultant's (4-Inch Solid Auger, Hollow Stem Auger, Rotary and Diamond Core Drilling, Exploratory Pit Excavation, ATV Drill Rig, Geophysical Exploration, Specialty Sampling, etc.)	Cost + 15%
Materials/Equipment Rental/Outsourced Laboratory Testing/Subconsultants	Cost + 15%
Falling Weight Deflectometer (Includes Operator)	\$250.00/hr.
Concrete/Asphalt Coring	\$100.00/hr.
Photoionization Detector	\$100.00/Day
LEL/CO/H ₂ S/O ₂ Meter	\$100.00/Day
Conductivity, Temperature, pH Tester	\$25.00/Day
Personal Protective Equipment	Rates Quoted on Project Basis

LABORATORY TESTING

Soils	
Moisture Content (ASTM D2216)	\$10.00 ea.
Moisture Content & Density (ASTM D2216)	\$15.00 ea.
Gradation (ASTM D6913)	\$85.00 ea.
Hydrometer (ASTM D7928)	\$90.00 ea.
Double Hydrometer (ASTM D4221)	\$225.00 ea.
Percent Less than #200 Sieve (ASTM D1140)	\$30.00 ea.
Atterberg Limits (ASTM D4318) Method A	\$75.00 ea.
Atterberg Limits (ASTM D4318) Method B	\$50.00 ea.
Standard Proctor (ASTM D698)	\$100.00 ea.
Modified Proctor (ASTM D1557)	\$120.00 ea.
Soil/Cement Proctor (ASTM D558)	\$135.00 ea.
Proctor Checkpoint (ASTM D698 or ASTM D1557)	\$50.00 ea.
Relative Density (ASTM D4253 and ASTM D4254)	\$175.00 ea.
Specific Gravity (ASTM D854)	\$90.00 ea.
Standard Swell-Consolidation (ASTM D4546)	\$75.00 ea.
Air-Dried Swell-Consolidation (ASTM D4546)	\$90.00 ea.
Remolded Swell-Consolidation (ASTM D4546)	\$120.00 ea.
Time/Consolidation (ASTM D2435)	\$325.00 ea.
Unconfined Compressive Strength (ASTM D2166)	\$70.00 ea.
Slake Durability (ASTM D4644)	\$100.00 ea.
Pinhole Dispersion (ASTM D4647)	\$150.00 ea.
Water Soluble Sulfates (AASHTO T290, CP-L 2103)	\$50.00 ea.
pH (ASTM E70)	\$50.00 ea.
Chloride (AASHTO T291, CP-L 2104)	\$50.00 ea.
Re-Dox (ASTM D1498)	\$50.00 ea.
Sulfides (Hach Procedure)	\$50.00 ea.
Electrical Resistivity (ASTM G57)	\$150.00 ea.
Organics (AASHTO T267)	\$75.00 ea.
R-Value (ASTM D2844)	\$350.00 ea.
California Bearing Ratio (ASTM D1883) 1-Pt.	\$150.00 ea.
California Bearing Ratio (ASTM D1883) 3-Pt.	\$400.00 ea.
Soil/Lime, Soil/Cement Mix Analysis	Call for Pricing
Freeze/Thaw (ASTM D560)	\$400.00 ea.
Wet/Dry (ASTM D559)	\$400.00 ea.
Compressive Strength of Soil-Cement (ASTM D1633)	\$70.00 ea.
Direct Shear/per point (ASTM D3080)	
Unconsolidated-Undrained (Quick Test)	\$150.00 ea.
Residual Strength, Additional Per Carriage Reversal	\$50.00 ea.
Drained Tests Quoted on Project-Specific Basis	

McMurdo Gulch P3 Topographic Design Survey

Muller Engineering

John A. Yager

777 S. Wadsworth Blvd
Suite 4-100
Lakewood CO 80226
(303) 988-4939 x222

Tuesday, November 30, 2021

Section 6, T8S, R66W
Castle Rock, Douglas County, CO
LL 39.389580°,-104.815860°

Scope of work:

- ° Project setup and client coordination.
- ° Research public records for surveys of record, utilities, maps by others, and survey control.
- ° Compile data and prepare for field surveys.
- ° Establish two horizontal and vertical survey control points, for future design and construction layout. - Survey datum NAD83 and NAVD88, unless otherwise specified by client.
- ° Field survey existing conditions in 4 areas, approximately 4000' total. (See Exhibit A)
- ° Prepare field sketches and pictures.
- ° Process field survey data.
- ° Prepare topographic design survey showing all physical features including utility markings by others, locate and measure inverts on 4 sanitary manholes, trees larger than 6" and caliper, groupings of smaller trees and shrubs, 1' contours, and spot elevations.
- ° Prepare SUE plan set.
- ° Prepare 2 easement exhibits based on record information.
- ° Provide copies of field notes, site pictures, research data and field sketches.
- ° Provide final electronic files in AutoCAD 2020 format along with a sealed Topographic Survey and SUE.

McMurdo Gulch P3	hrs.	rate	cost
° Project research and preparation for field surveys	8	110	880.00
° Field surveys - establish & recover horizontal and vertical site control	8	190	1,520.00
° Field surveys - topographic design survey	50	190	9,500.00
° Field sketches and photos	5	95	475.00
° Process field data - prepare base drawing files	10	95	950.00
° Prepare topographic design survey	24	95	2,280.00
° Prepare SUE plan set	16	110	1,760.00
° PE - SUE Review	8	185	1,480.00
° Mileage / Materials			510.00
° PLS Review	4	145	580.00
° Prepare 2 easement exhibits	2	450	900
° Underground Utility Locates (by others)	Est		810.00
° 4 pothole locations (by others)	Est		2,835.00
Total			24,480.00

Survey Area

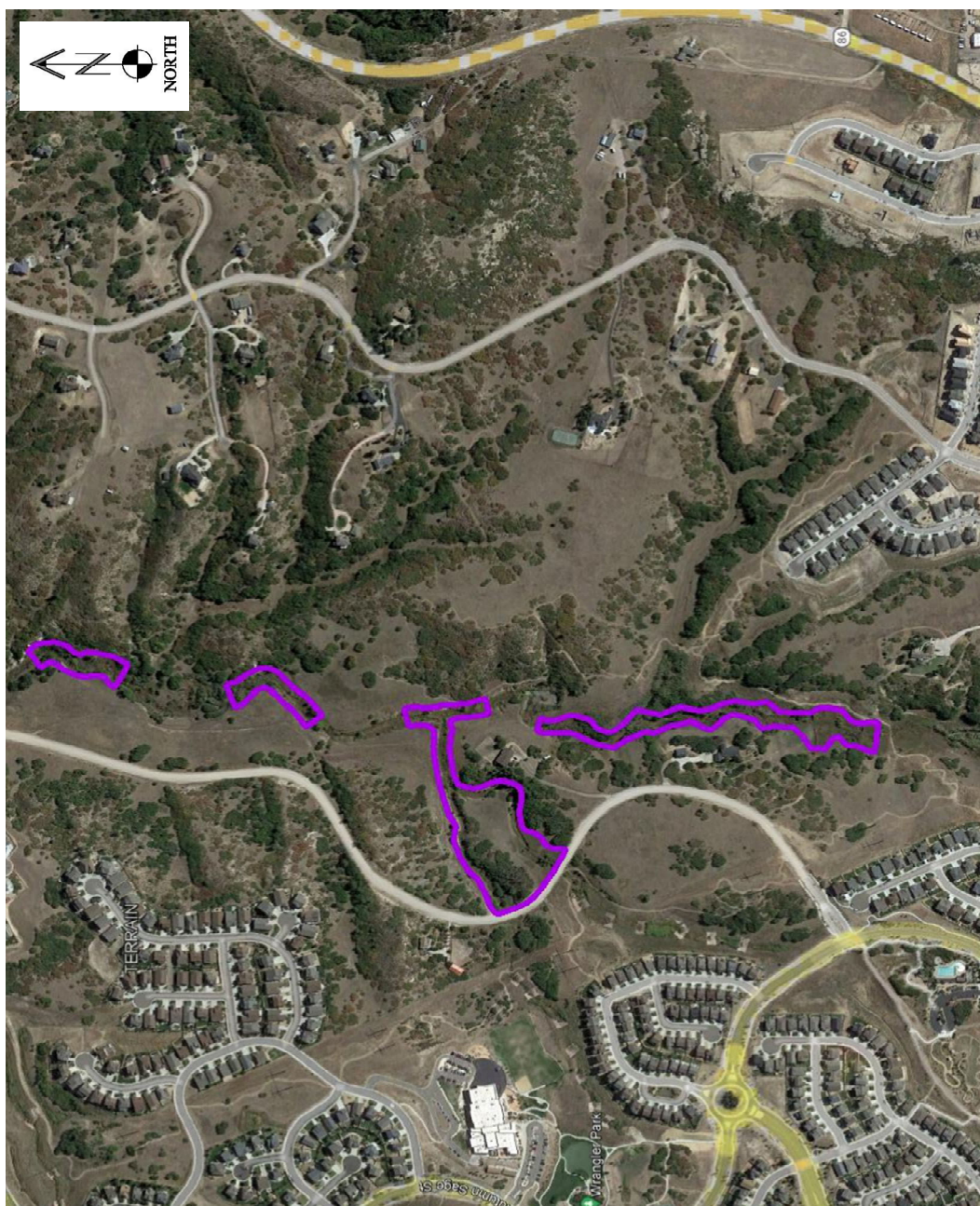


EXHIBIT 2

CONSULTANT'S CERTIFICATION OF INSURANCE (COI)