AGREEMENT FOR PROFESSIONAL ENGINEERING SERVICES
BY AND BETWEEN CITY OF PUEBLO AND
AECOM TECHNICAL SERVICES, INC.

THIS AGREEMENT ("Agreement") made and entered this _____ day of _____, 20_ by _and_ between the City of Pueblo, a Municipal Corporation (hereinafter "Owner" or "City") and AECOM Technical Services, Inc., a California Corporation authorized to do business in the State of Colorado, (hereinafter "Engineer"), a professional engineering firm for Engineer to render certain professional planning, design, engineering and related services for Owner in connection with Bid 21-071 Stormwater Department Engineer of Record - West 29th Drainage Improvements, hereinafter referred to as the "Project." In consideration of the mutual covenants hereinafter set forth, the parties agree as follows:

SECTION 1. GENERAL

1.1 Engineer shall satisfactorily perform professional engineering services for all phases of Project indicated below by mark placed in the appropriate box or boxes:

[X] - Study and Report Phase – Referred to as Tasks 1 through 2 in Schedule 1

[X] - Preliminary Design (Schematic) Phase – Referred to as Task 3 in Schedule 1

[X] - Final Design Phase – Referred to as Task 4 in Schedule 1

[ ] - Construction Documents & Bidding Phase

[ ] - Construction Phase

Upon completion of any phase, Engineer shall not proceed with work on the next phase, if any, until authorized in writing by Owner to proceed therewith.

Such services shall include all usual and customary professional engineering services and the furnishing (directly or through its professional consultants) of customary and usual civil, structural, mechanical, electrical engineering, environmental, and planning services. Engineer shall also provide any landscape engineering, surveying, and geotechnical services incidental to its work on the Project.

1.2 In performing the professional services, Engineer shall complete the work items described generally in Schedule 1 – "Scope of Services" and the items identified in Section 2 of this Agreement which are applicable to each phase for which Engineer is to render professional services.

1.3 Professional engineering services (whether furnished directly or through a professional subcontractor) shall be performed under the direction and supervision of a registered engineer in good standing and duly licensed to practice in the State of Colorado. Reproductions of final drawings for construction produced under this Agreement shall be the same as at least one record set which shall be furnished to Owner and which shall be signed by and bear the seal of such registered engineer.

1.4 Surveying work included within or reasonably contemplated by this Agreement shall be performed under the direction and supervision of a registered Professional Land Surveyor in good standing and duly licensed to practice in the State of Colorado. All plats and surveys produced under this Agreement shall be signed by and bear the seal of said Professional Land Surveyor.

1.5 Any architect services provided under this Agreement shall be performed under the direction and supervision of an architect licensed to practice architecture in the state of Colorado.

SECTION 2. ENGINEERING SERVICES

2.1 Study and Report Phase. If Engineer is to provide professional services with respect to the Project during the Study and Report Phase, Engineer shall perform the following unless otherwise stated in Schedule 1:

(a) Consult with Owner to determine his requirements for the Project and review available data.

(b) Advise Owner as to the necessity of his providing or obtaining from others data or services of the types described in paragraph 2.2(c) and assist Owner in obtaining any such services.

(c) Provide special analyses of Owner's needs, planning surveys, site evaluations and comparative studies of prospective sites and solutions.

(d) Identify and analyze requirements of governmental authorities and regulatory agencies involved in approval or permitting any aspect of Project.

(e) Provide general economic analysis of Owner's requirements applicable to various alternatives.

(f) Prepare a Report with appropriate exhibits indicating clearly the considerations involved and the alternative solutions available to Owner and setting forth Engineer's findings and recommendations with opinions of probable costs.

(g) Furnish one (1) hard copy and one (1) electronic copy of the Report and present and review it in person with Owner. Owner may request additional copies as needed for no additional charge.

2.2 Preliminary Design (Schematic) Phase. If Engineer is to provide professional services with respect to the Project during the Preliminary Design Phase, Engineer shall perform the following unless otherwise stated in Schedule 1:

(a) Consult with Owner and determine the general design concept and Project requirements based upon information furnished by Owner as well as any study or report on the Project.

(b) Prepare and submit to Owner preliminary design documents consisting of final design criteria, preliminary drawings, an outline of specifications, and written descriptions of all significant features of Project.

(c) Prepare and submit to Owner a requirements checklist of any subsurface investigation, additional data, permits, or other information and requirements which is anticipated will be necessary for the design or construction of Project.

(d) Provide written disclosure to Owner of significant design assumptions and design risks and advantages/disadvantages inherent in or presented by design alternatives and make recommendations to Owner based thereon.

(e) Prepare and submit to Owner a preliminary cost estimate for the Project including construction cost, contingencies, professional compensation, consultant fees, costs of land and rights of way, compensation for damages and finance costs, if any.

(f) Engineer shall furnish one (1) hard copy and one (1) electronic copy of each above referenced submittal document to Owner for Owner's use and shall review same in person with Owner. Owner may request additional copies as needed for no additional charge.

2.3 Final Design Phase. If Engineer is to provide professional services with respect to the Project during the Final Design Phase, Engineer shall perform the following unless otherwise stated in Schedule 1:

(a) After consultation with the Owner, receipt of Owner's selection of any design options and review of the Preliminary Design Documents, if any, prepare and submit to Owner final Drawings showing the scope, extent, and character of the work to be performed by contractors, and Specifications describing such work and the requirement therefor. Such plans and Specifications shall comply with all applicable building codes and requirements of regulatory agencies having any approval authority. Final design, including Drawings and Specifications, shall also comply with ADA Accessibility Guidelines (ADAAG) Manual developed by the U. S. Architectural and Transportation Barriers Board (1998) or ADA Standards for Accessible Design published at 28 C.F.R. Part 36, Appendix A, whichever is applicable. Engineer **shall**

include an attest statement on each record drawing sheet of final plan drawings that certifies compliance with either the ADAAG Manual or 28 CFR Part 36 Standards.

(b) Make reasonable revisions to the Drawings and Specifications requested by Owner, informing the Owner of any change in probable construction costs as a result of such revisions.

(c) Provide technical criteria, written descriptions, and design data for Owner's use, and disclose any significant risks and advantages/disadvantages inherent in or presented by design choices.

(d) Based upon Engineer's best professional judgment, prepare and submit to Owner a current detailed cost estimate for the Project including construction cost, contingencies, professional compensation, consultant fees, land and right of way costs, damages, and finance costs, if any.

(e) Engineer shall furnish one (1) hard copy and one (1) electronic copy of each above referenced submittal document to Owner for Owner's use and shall review same in person with Owner. Owner may request additional copies as needed for no additional charge.

2.4 Construction Documents & Bidding Phase. If Engineer is to provide professional services with respect to the Project during the Construction Documents & Bidding Phase, Engineer shall perform the following unless otherwise stated in Schedule 1:

(a) Prepare and submit to Owner draft forms of contract agreement, general and special conditions, bid forms invitations to bid, information for bidders, forms of warranty and including any special requirements imposed upon such contracts by any federal or other funding source and by any regulatory agency. In preparing such draft forms, Engineer shall consider and incorporate, to the extent both advisable and feasible, Owner's standard forms of agreement, warranty, payment and performance bonds, general conditions, and selected specifications.

(b) After review and comment by Owner, prepare and submit all deliverables identified in Schedule 1 to this Agreement, final forms of contract agreement, general and special conditions, Drawings, specifications, bid forms, invitations to bid, information for bidders, and forms of warranty, together with any Addenda which may be required or appropriate to correct errors, clarify Drawings or Specifications or advise of changes. One (1) hard copy and one (1) electronic copy of these final bid documents shall be furnished to Owner. Unless otherwise specified in Schedule 1, a copy of all contract documents and drawings shall also be submitted to Owner in Microsoft Word and AutoCAD (2006 or later version) format on electronic media.

(c) Make recommendations to Owner concerning the need for prequalification of equipment, vendors or bidders, and, if requested by Owner, incorporate prequalification requirements in final bid and construction contract documents.

(d) Attend a pre-bid conference with bidders to discuss Project requirements and receive requests for clarification, if any, to be answered by Engineer in writing to all plan holders.

(e) Consult with and make recommendations to Owner concerning acceptability of bidders, subcontractors, suppliers, materials, equipment, suitability of proposed "or equals", amount of bids, and any other matter involved in consideration and review of bids and bidders upon which Owner may reasonably request Engineer's advice.

2.5 Construction Phase. If Engineer is to provide professional services with respect to the Project during the Construction Phase, after award by the Owner of a general contractor for construction of the Project, Engineer shall perform the following unless otherwise stated in Schedule 1:

(a) Perform all duties and functions to be performed by Engineer under the terms of the construction contract.

(b) Visit the Project site, perform observations as to the progress and quality of the work and advise the Owner as to same. The frequency and level of observation shall be commensurate with the nature of the work and size of the Project, except that any specific provisions set forth in Schedule 1 - Scope of Services concerning the level of observation shall determine Engineer's obligation concerning level of observation.

(c) Make determinations as to whether the work is proceeding in accordance and compliance with the construction contract documents.

(d) Promptly advise the Owner in writing of any omissions, substitutions, defects, or deficiencies noted in the work of any contractor, subcontractor, supplier, or vendor on the Project.

(e) Reject any work on the Project that does not conform to the contract documents.

(f) On request of the Owner, the construction contractor or any subcontractor on the Project, issue written interpretations as to the Drawings and Specifications and requirements of the construction work.

(g) Review shop drawings, samples, product data, and other submittals of the Contractor for conformance with the design concept of Project and compliance with the Drawings, Specifications, and all other contract documents, and indicate to Contractor and Owner with respect thereto, any exceptions noted, or modification or resubmittals required.

(h) Review all applications of Contractor for payment and in connection with same, issue certificates for payment to the Owner for such amounts as are properly payable under the terms of the construction contract. Each such certificate shall constitute Engineer's representation to Owner that it has inspected the Project and that to the best of its knowledge, the work for which payment has been sought has been completed by Contractor in accordance with the Drawings, Specifications, and other contract documents.

(i) Subject to written concurrence by Owner, promptly render a written recommendation to Owner concerning all proposed substitutions of material and equipment.

(j) Draft, for Owner's consideration, and offer recommendations upon, all proposed change orders and contract modifications.

(k) On application for final payment by the Contractor, make a final inspection of the Project, assembling and delivering to the Owner any written guaranties, instructions manuals, as-built drawings, diagrams, and charts required by the contract documents, and issuing a certificate of final completion of the Project.

(l) The Engineer shall, if provided in the construction contract, be the interpreter of the construction documents and arbiter of claims and disputes thereunder. Upon written request of the Owner or Contractor, the Engineer shall promptly make written interpretations of the contract documents and render written decisions on all claims, disputes and other matters relating to the execution or progress of the work on the Project. The interpretations and decisions of the Engineer shall be final and binding on the Contractor and Owner, unless the Director of Public Works of the Owner shall, within seven calendar days after receipt of the Engineer's interpretation or decision, file its written objections thereto with the Engineer and Contractor.

2.6 Additional Responsibilities. This paragraph applies to all phases of Engineer's work.

(a) Engineer shall be responsible for the professional quality, technical accuracy, timely completion, and coordination of all of Engineer's work, including that performed by Engineer's consultants and subcontractors, and including designs, Drawings, Specifications, reports, and other services, irrespective of Owner's approval or acquiescence to same. Engineer shall, without additional compensation, correct or revise any errors, omissions, or other deficiencies in its work.

(b) Engineer shall be responsible, in accordance with applicable law, to Owner for all loss or damage to Owner caused by Engineer's negligent act or omission; except that Engineer hereby irrevocably waives and excuses Owner and its attorneys from compliance with any requirement to obtain a certificate of review as a condition precedent to commencement of an action, including any such requirements set forth in Section 13-20-602, C.R.S. or similar statute.

(c) Engineer's professional responsibility shall comply with the standard of care applicable to the type of engineering and architectural services provided, commensurate with the size, scope, and nature of the Project.

(d) Engineer shall be completely responsible for the safety of Engineer's employees in the execution of work under this Agreement, shall provide all necessary safety equipment for said employees, and shall hold harmless and indemnify and defend Owner from any and all claims, suits, loss, or injury to Engineer's employees.

(e) Engineer acknowledges that, due to the nature of engineering and related professional services and the impact of same on the Project, the Owner has a substantial interest in the personnel and consultants to whom Engineer assigns principal responsibility for services performed under this Agreement. Consequently, Engineer represents that Engineer has selected and intends to employ or assign the key personnel and consultants identified in Schedule 3 - "Identification of Personnel, Subcontractors, and Task Responsibility", attached hereto for the Project assignments and areas of responsibility stated therein. Within 10 days of execution of this Agreement, Owner shall have the right to object in writing to employment on the Project of any such key person, consultant, or assignment of principal responsibility, in which case Engineer will employ alternate personnel for such function or reassign such responsibility to another to whom Owner has no reasonable objection. Thereafter, Engineer shall not assign or reassign Project work to any person to whom Owner has reasonable objection.

Within five (5) days of execution of this Agreement, Engineer shall designate in writing a Project representative who shall have complete authority to bind Engineer, and to whom Owner should address communications.

(f) Promptly after execution of this Agreement, Owner and Engineer shall update the Project Timeline (attached as Schedule 4) and Owner shall issue authorization to commence work. The Project Timeline schedule shall provide for performance of the work in a timely manner so as to not delay Owner's timetable for achievement of interim tasks and final completion of Project work, provided however, the Engineer will not be responsible for delays beyond its control.

(g) Before undertaking any work which Engineer considers beyond or in addition to the scope of work and services which Engineer has contractually agreed to perform under the terms of this Agreement, Engineer shall advise Owner in writing (i) that Engineer considers the work beyond the scope of this Agreement, (ii) the reasons the Engineer believes the out of scope or additional work should be performed, and (iii) a reasonable estimate of the cost of such work. Engineer shall not proceed with such out of scope or additional work until authorized in writing by Owner. The compensation for such authorized work shall be negotiated, but in the event the parties fail to negotiate or are unable to agree as to compensation, then Engineer shall be compensated for its direct costs and professional time at the rates set forth in Schedule 2 - "Fee Schedule".

SECTION 3. OWNER'S RESPONSIBILITIES

3.1 Owner shall:

(a) Designate a representative to whom all communications from Engineer shall be directed and who shall have limited administrative authority on behalf of Owner to receive and transmit information and make decisions with respect to Project. Said representative shall not, however, have authority to bind Owner as to matters of legislative or fiscal policy.

(b) Advise Engineer of Owner's Project requirements including objective, project criteria, use and performance requirements, special considerations, physical limitations, financial constraints, and required construction contract provisions and standards.

(c) Provide Engineer with available information pertinent to the Project including any previous reports, studies or data possessed by Owner which relates to design or construction of the Project.

(d) Assist in arranging for Engineer to have access to enter private and public property as required for Engineer to perform its services.

(e) Examine all studies, reports, sketches, Drawings, Specifications, proposals, and other documents presented by Engineer, and render written decisions pertaining thereto within a reasonable time. The Owner's approval of Drawings, design, Specifications, reports and incidental engineering work or

materials furnished hereunder shall not in any way relieve the Engineer of responsibility for the professional adequacy of his work. The Owner's review, approval, or acceptance of, or payment for, any of the services shall not be construed to operate as a waiver of any rights under this Agreement or of any cause of action arising out of the performance of this Agreement.

(f) Upon advice of the necessity to do so from Engineer, obtain required approvals and permits for the Project. The Engineer shall provide all supportive documents and exhibits necessary for obtaining said approvals and permits.

(g) Notify Engineer whenever Owner becomes aware of any substantial development or occurrence which materially affects the scope or timing of Engineer's services.

(h) Owner shall perform its obligations and render decisions within a reasonable time under the presented circumstances. However, given the nature of Owner's internal organization and requirements, a period of 14 days shall be presumed reasonable for any decision not involving policy decision or significant financial impact. A period of 45 days shall be presumed reasonable for Owner to act with respect to any matter involving policy or significant financial impact.

SECTION 4. TIME FOR PERFORMANCE

Engineer's obligation to render services shall continue for such period of time as may reasonably be required for completion of the work contemplated in Schedule 1 – "Scope of Services" and Section 2 of this Agreement.

SECTION 5. PAYMENT

5.1 Owner will pay to Engineer as full compensation for all services required to be performed by Engineer under this Agreement, except for services for additional work or work beyond the scope of this Agreement, an amount not to exceed $158,846.98 in the aggregate as set forth in Schedule 2 - "Fee Schedule" and computed in accordance with this Section. In the event compensation for services is set forth in Exhibit B as to each phase of work indicated in Section 1.1 of this Agreement, the maximum amount of compensation for any phase shall not exceed the amount specified in Schedule 2 for such phase.

5.2 Engineer shall submit periodic, but not more frequently than monthly, applications for payment, aggregating to not more than the maximum amount, for actual professional services rendered and reimbursable expenses incurred. Such applications shall be submitted with appropriate documentation that such services have been performed and expenses incurred. Thereafter, Owner shall pay Engineer for the amount of the application within 40 days of the date of billing, provided that sufficient documentation has been furnished, and further provided that Owner will not be required to pay more than 90% of the maximum amount unless the Engineer's services on the Project phases for which this Agreement is applicable have been completed to Owner's reasonable satisfaction and all required Engineer submittals have been provided.

5.3 The rates of compensation for service and for reimbursable expenses to be used with periodic and final payment applications shall be those set forth in Schedule 2 - "Fee Schedule."

5.4 No separate or additional payment shall be made for profit, overhead, local telephone expenses, lodging, routine photocopying, computer time, secretarial or clerical time or similar expenses unless otherwise provided and listed in Schedule 2 - "Fee Schedule."

5.5 No compensation shall be paid to Engineer for services required and expenditures incurred in correcting Engineer's mistakes or negligence.

5.6 Compensation for authorized work beyond the scope of this Agreement shall be governed by Section 2.6(g).

SECTION 6. TERMINATION

6.1 Owner reserves the right to terminate this Agreement and Engineer's performance hereunder, at any time upon written notice, either for cause or for convenience. Upon such termination, Engineer and its subcontractors shall cease all work, stop incurring expenses, and shall promptly deliver to Owner all data, drawings, specifications, reports, plans, calculations, summaries and all other information, documents, work product and materials as Engineer may have accumulated in performing this Agreement, together with all finished work and work in progress.

6.2 Upon termination of this Agreement for events or reasons not the fault of Engineer, Engineer shall be paid at the rates specified in Schedule 2 for all services rendered and reasonable costs incurred to the date of termination; together with any reasonable costs incurred within 10 days of termination provided such latter costs could not be avoided or were incurred in mitigating loss or expenses to Engineer or Owner. In no event shall payment to Engineer upon termination exceed the maximum compensation provided for complete performance in Section 5.1.

6.3 In the event termination of this Agreement or Engineer's services is for breach of this Agreement by Engineer, or for other fault of Engineer including but not limited to any failure to timely proceed with work, or to pay its employees and Engineers, or to perform work according to the highest professional standards, or to perform work in a manner deemed satisfactory by Owner's Project Representative, then in that event, Engineer's entire right to compensation shall be limited to the lesser of: (a) the reasonable value of completed work to Owner, or (b) payment at the rates specified in Schedule 2 for services satisfactorily performed and reimbursable expenses reasonably incurred, prior to date of termination.

6.4 Engineer's professional responsibility for its completed work and services shall survive any termination.

SECTION 7. GENERAL PROVISIONS

7.1 (a) Ownership of Documents. All designs, Drawings, Specifications, technical data, and other documents or instruments procured or produced by the Engineer in the performance of this Agreement shall be the sole property of the Owner and the Owner is vested with all rights therein of whatever kind and however created, whether created by common law, statutory law, or by equity. The Engineer agrees that the Owner shall have access at all reasonable times to inspect and make copies of all notes, designs, drawings, specifications, and all other technical data pertaining to the work to be performed under this Agreement. In the event Owner uses the designs, Drawings or Specifications provided hereunder for another project independent from Project, without adaptation by Engineer, Owner shall hold harmless Engineer from all loss, claims, injury, and judgments arising from the use of such designs, Drawings or Specifications for such other project.

(b) Advertising. Unless specifically approved in advance in writing by Owner, Engineer shall not include representations of the Project in any advertising or promotional materials, except for accurate statements contained in resumes or curriculum vitae of Engineer’s employees. If Engineer wishes to include representations in advertising or promotional materials, it shall submit a draft of same and printer’s proof of the proposed advertising or promotional materials to the Owner for prior review and shall not publish or distribute same unless written approval of the materials is first obtained.

7.2 Insurance and Indemnity.

(a) Engineer agrees that it has procured and will maintain during the term of this Agreement, such insurance as will protect it from claims under workers' compensation acts, claims for damages because of bodily injury including personal injury, sickness or disease or death of any of its employees or of any person other than its employees, and from claims or damages because of injury to or destruction of property including loss of use resulting therefrom; and such insurance will provide for coverage in such amounts as set forth in subparagraph 8.2(b) below.

(b) The minimum insurance coverage which Engineer shall obtain and keep in force is as follows:

(i) Workers' Compensation Insurance complying with statutory requirements in

Colorado and in any other state or states where the work is performed. The Workers' Compensation Insurance policy shall contain an endorsement waiving subrogation against the Owner.

(ii) Commercial General Liability Insurance. The Engineer shall secure and maintain during the period of this agreement and for such additional time as work on the project is being performed, Commercial General Liability Insurance issued to and covering the liability of the Engineer with respect to all work performed by it and all its subcontractors under the agreement, to be written on a comprehensive policy form. This insurance shall be written in amounts not less than $1,000,000 for each occurrence and aggregate for personal injury including death and bodily injury and $1,000,000 for each occurrence and aggregate for property damage. This policy of insurance shall name the City of Pueblo, its agents, officers and employees as additional insureds. This policy shall have all necessary endorsements to provide coverage without exclusion for explosion and collapse hazards, underground property damage hazard, blanket contractual coverage, as well as Owner's and Contractor's Protective Liability (OCP) coverage. The policy shall also provide coverage for contractual liability assumed by Engineer under the provisions of the agreement, and "Completed Operations and Projects Liability" coverage.

(iii) Professional Liability Insurance with coverage of not less than $1,000,000 in a form and with a deductible acceptable to Owner.

(iv) Comprehensive Automobile Liability Insurance. The Engineer shall procure and maintain during the period of the agreement and for such additional time as work on the project is being performed, Comprehensive Automobile Liability Insurance. This insurance shall be written with limits of liability for and injury to one person in any single occurrence of not less than $350,000 and for any injury to two or more persons in any single occurrence of not less than $1,000,000. This insurance shall include uninsured/underinsured motorist coverage and shall protect the Engineer from any and all claims arising from the use both on and off the site of the project of automobiles, trucks, tractors, backhoes and similar equipment whether owned, leased, hired or used by Engineer.

(c) Engineer agrees to hold harmless, defend and indemnify Owner from and against any liability to third parties, arising out of negligent acts, errors or omissions of Engineer, his employees, subcontractors, and consultants.

7.3 Notices. Any and all notices or other communications required or permitted by this Agreement or by law to be served on or given to either the Owner or the Engineer by the other party shall be in writing and shall be deemed duly served and given when personally delivered to the party to whom it is directed, or in lieu of such personal service when deposited in the United States mail, first-class postage prepaid, addressed to the City of Pueblo (Owner), Attn: Jeff Hawkins, Director of Stormwater, 211 E. "D" Street, Pueblo, CO 81003, or to AECOM Technical Services, Inc. (Engineer), Attn: Ryan Weaver, 2315 Briargate Pkwy, Suite 150, Colorado Springs, CO 80920. Either party may change his address for the purpose of this paragraph by giving written notice of such change to the other party in the manner provided in this paragraph.

7.4 Entire Agreement. This instrument contains the entire agreement between the Owner and the Engineer respecting the Project, and any other written or oral agreement or representation respecting the Project or the duties of either the Owner or the Engineer in relation thereto not expressly set forth in this instrument are null and void. Notwithstanding the foregoing, the terms of Bid 21-071 Stormwater Department Engineer of Record are hereby incorporated herein, and Engineer agrees to abide by and comply with the same. In the event of any conflict between any provision of this Agreement and a provision of any Schedule or attachment to this Agreement, the provision in this Agreement shall control and supersede the conflicting provision in the Schedule or attachment. Any inconsistent resolution provision in any attachment to this Agreement shall be void.

7.5 Successors and Assigns. This Agreement shall be binding on the parties hereto and on their partners, heirs, executors, administrators, successors, and assigns; provided, however, that neither this Agreement, nor any part thereof, nor any moneys due or to become due hereunder to the Engineer may be assigned by it without the written consent of the Owner. 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 the parties hereto, and nothing contained in this Agreement shall give or allow any such claim or right of action by any other or third person or

entity on such Agreement. It is the express intention of the parties hereto that any person or entity, other than the parties to this Agreement, receiving services or benefits under this Agreement shall be deemed to be an incidental beneficiary only.

7.6 Amendments. No amendment to this Agreement shall be made nor be enforceable unless made by written Amendment signed by an authorized representatives of both Engineer and Owner.

7.7 Choice of Law and Venue. This Agreement shall be governed and interpreted in accordance with the laws of the State of Colorado. Venue for any action arising under this Agreement or for the enforcement of this Agreement shall be in a state curt with jurisdiction located in Pueblo County, Colorado.

7.8 Equal Employment Opportunity. In connection with the performance of this Agreement, Engineer shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, national origin, disability, or age. Engineer shall endeavor to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, national origin, disability, or age.

7.9 Severability. If any provision of this Agreement, except for Section 2.6, is determined to be directly contrary to and prohibited by law or the requirements of any federal grant or other Project funding source, then such provision shall be deemed void and the remainder of the Agreement enforced. However, it is the intent of the parties that Section 2.6 of this Agreement not be severable, and that if any provision of said section be determined to be contrary to law or the terms of any federal grant, then this entire Agreement shall be void.

7.10 Appropriations. Subject to execution of this Agreement by the Director of Finance certifying that a balance of appropriation exists and funds are available, the amount of money appropriated for this Agreement is equal to or in excess of the maximum compensation payable hereunder; provided, however, that if work is phased and subject to annual appropriation, funds only in the amount of initial appropriation are available and Engineer shall confirm availability of funds before proceeding with work exceeding initial and subsequent annual appropriations.

7.11 Additional Requirements on Federally or State Funded Agreements. If any of the work to be performed by Engineer under this Agreement is funded in whole or in part with federal or state funds, then this Agreement shall be construed to include all applicable terms required by the federal or state assistance agreement and integrated federal or state regulations. By executing this Agreement, Engineer agrees to be bound by all such mandatory federal or state requirements, irrespective of Engineer's actual knowledge or lack of knowledge of such requirements prior to execution of this Agreement.

7.12 Access to Property Not Under Owner's Control. Engineer acknowledges that the Project may require access to property not under the control of Owner at the time of execution of this Agreement. Engineer and Engineer's employees and consultants shall, at Engineer's expense, obtain all additional necessary approvals and clearances required for access to such property. Owner shall assist Engineer in obtaining access to such property at reasonable times but make no warranty or representation whatsoever regarding access to such property. Engineer understands and agrees that entry to properties not under Owner's control may require Engineer to comply with the terms of separate access agreements to be negotiated hereafter with owners of such property.

SECTION 8. DISPUTES

8.1 Any dispute or disagreement between Engineer and Owner arising from or relating to this Agreement or Engineer's services or right to payment hereunder shall be determined and decided by the Owner's Director of Public Works whose written decision shall be final and binding unless judicial review is sought in a Colorado Court of competent jurisdiction located in Pueblo County, Colorado, pursuant to Rule 106, C.R.C.P.

8.2 Pending resolution of any dispute or disagreement, or judicial review, Engineer shall proceed diligently with performance of its work under this Agreement.

SECTION 9. SCHEDULES

The following Schedules are attached to and made a part of this Agreement:

Schedule 1 - "Scope of Services" consisting of 13 pages.
Schedule 2 - "Fee Schedule" consisting of 1 page.
Schedule 3 - "Identification of Personnel, Subcontractors, and Task Responsibility" consisting of 38 pages.
Schedule 4 – "Project Timeline" consisting of 1 page.

SECTION 10. ACCESSIBILITY.

The Americans with Disabilities Act (ADA) provides that it is a violation of the ADA to design and construct a facility for first occupancy later than January 26, 1993, that does not meet the accessibility and usability requirements of the ADA except where an entity can demonstrate that it is structurally impractical to meet such requirements. The Engineer therefore, will use its best reasonable professional efforts to implement applicable ADA requirements and other federal, state, and local laws, rules codes, ordinances and regulations as they apply to the Project.

SECTION 11. COMPLIANCE WITH IMMIGRATION REFORM AND CONTROL ACT OF 1986.

Engineer certifies that it has complied with the United States Immigration Reform and Control Act of 1986. Engineer represents and warrants that to the extent required by said Act, all persons employed by Engineer for performance of this contract have completed and signed Form I-9 verifying their identities and authorization for employment.

SECTION 12. PERA LIABILITY

The Engineer shall reimburse the City for the full amount of any employer contribution required to be paid by the City of Pueblo to the Public Employees' Retirement Association ("PERA") for salary or other compensation paid to a PERA retiree performing contracted services for the City under this Agreement. The Engineer shall fill out the Colorado PERA Questionnaire and submit the completed form to City as part of the signed Agreement.

SECTION 13. ELECTRONIC SIGNATURE

This Agreement and all other documents contemplated hereunder may be executed using electronic signatures with delivery via facsimile transmission, by scanning and transmission of electronic files in Portable Document Format (PDF) or other readily available file format, or by copy transmitted via email, or by other electronic means and in one or more counterparts, each of which shall be: (i) an original, and all of which taken together shall constitute one and the same agreement, (ii) a valid and binding agreement and fully admissible under state and federal law, and (iii) enforceable in accordance with its terms.

(Continue to next page for signature section.)

IN WITNESS WHEREOF the parties hereto have made and executed this Agreement as of the day and year first above written.

CITY OF PUEBLO, A MUNICIPAL CORPORATION

By_____
Naomi Hedden, Director of Purchasing

Attest_____
Marisa Stoller, City Clerk

[S E A L]

AECOM TECHNICAL SERVICES, INC.

By_____
Ryan Weaver, Vice President

BALANCE OF APPROPRIATION EXISTS FOR THIS AGREEMENT AND FUNDS ARE AVAILABLE.

_____
Laura Solano, Chief of Staff

APPROVED AS TO FORM:

_____
Dan Kogovsek, City Attorney

Attachments: Schedule 1 - Scope of Services
Schedule 2 - Fee Schedule
Schedule 3 - Identification of Personnel, Subcontractors, and Task Responsibility
Schedule 4 – Project Timeline

West 29th Drainage Improvements Scope of Work

7/11/2022

Project Summary

The W. 29th Drainage Improvements project is located in the northwest portion of the City of Pueblo. Specifically, along W. 29th Street from Adrian Avenue to Franklin Avenue. The goal of this project is to alleviate flooding problems in the residential neighborhood areas along W. 29th Street. This project was previously studied, and design plans were produced in 2012. AECOM will take the 2012 design and revise the cost estimate for 2022 prices, along with evaluate plastic storm pipe as an alternative pipe material to RCP. No other design changes are included within this contract.

Project Management and Data Collection Task Descriptions

This section describes the management tasks for the project. The project duration is anticipated to be six months. It is anticipated that twelve meetings with the City will occur over the duration of the project.

Task 1 – Project Management:

AECOM will perform the following:

1. Initial Project Meetings. The team will conduct an internal project kick-off meeting in accordance with our quality management requirements.
2. Project Management. AECOM will coordinate the work tasks being accomplished by the AECOM Project Team with the City of Pueblo.
3. Monthly Invoices
4. Bi-weekly Progress Meetings with City.
5. Bi-weekly team meetings with the AECOM team.

Task 2 – Subsurface Utilities:

Subsurface utilities will be completed by Sam,LLC. Refer to attachments for detailed scope.

Task 3 – 90% Design

AECOM will update the 2012 cost estimate to 2022 unit prices.

1. AECOM will provide a cost estimate using Corrugated Plastic Pipe (CPP) instead of RCP for construction material cost savings. If this is a viable solution AECOM will update the drainage plans and cost estimate.

Deliverables:
Updates to sheets will be clouded. It is anticipated that the pipe material type will be the only item updated. AECOM will provide a note on each plansheet documenting the design completed by AECOM and by others. AECOM will only stamp the plan and profile sheets for the revised pipe material. AECOM will not stamp plans for the design completed by others.

1. Coversheet Notes will be revised to include updated notes from the City.(2 Sheets)

2. 90% Plan and Profile (include removals, replacement, utilities, drainage) (12 Sheets)
3. 90% Erosion and Sediment Control Plans (initial, interim and final) (4 Sheets)
4. 90% Details (3)
5. 90% Traffic Striping Plans (3)
6. 90% Drainage Memo, with 2012 Drainage Report attached for reference
7. 90% Quantities and Cost Estimate
8. 90% Specifications

Task 4– 100% Design

AECOM will incorporate comments from the City and progress the 90% to 100%. It is assumed that review comments at 90% are minor and will not require significant re-design to advance to 100%. Updates to sheets will be clouded. It is anticipated that the pipe material type will be the only item updated. AECOM will provide a note on each plansheet documenting the design completed by AECOM and by others. AECOM will only stamp the plan and profile sheets for the revised pipe material. AECOM will not stamp plans for the design completed by others.

Deliverables:

1. Coversheet Notes (2 Sheets)
2. 100% Plan and Profile (include removals, replacement, utilities, drainage) (12 Sheets)
3. 100% Erosion and Sediment Control Plans (initial, interim and final) (4 Sheets)
4. 100% Details (3)
5. 100% Traffic Striping Plans (3)
6. 100% Drainage Report
7. 100% Quantities and Cost Estimate
8. 100% Specifications

Assumptions & Exclusions:

Assumptions:

The following are assumption are made in the development of this scope of work.

1. No Survey or ROW will be completed as part of this project. AECOM will reference the 2012 survey completed by others. Pueblo will survey points within the project, AECOM will compare to the previous survey.AECOMwill evaluate the use of plastic pipe as a pipe material alternative. AECOM will update the cost estimate to reflect 2022 construction unit prices.
2. No water quality design will be required.
3. Design criteria will remain the same as 2012.
4. AECOM will stamp the storm plan and profile sheets but will be limited to the analysis of pipe material. AECOM is not responsible for the H&H design, roadway, or traffic design.

Exclusions:

1. The following are not included in this scope and their inclusion is subject to a change in scope, schedule and/or fee: No roadway and ADA design is included in this scope. The roadway, curb and gutter, driveways, sidewalk (if impacted) will be replaced in kind. All roadway design will remain the same as the 2012 design.

2. No proposed pond design.
3. No Geotechnical design. The City of Pueblo will provide pavement design to AECOM.
4. No structural design is included. Standard details are assumed for all structures.
5. No channel design work will be completed at the storm outfall.
6. No ROW Plans are included in the scope of this work.
7. No Utility coordination will be required. The city will coordinate all Utility relocations.
8. Public meetings or any communication with the public
9. No ROW or adjacent property lines will be established between ownerships.
10. No permission to enter private property.
11. No additional ROW or Easements will be required for this project.
12. All other engineering services not identified in this scope of work are excluded, including but not limited to traffic operational analysis, value engineering studies, traffic studies, traffic counts or turn arrow warrant studies, timing studies, pedestrian/architectural lighting, landscaping.

Via Email:laura.kindt@aecom.com

April 22, 2022

Ms. Laura Kindt, PE
Project Manager
AECOM
7595 Technology Way
Denver, CO 80237

RE: W. 29th St. Drainage Improvements
Pueblo, CO
SAM, LLC Proposal No.: 1022070193

Ms. Kindt:

Surveying And Mapping, LLC (SAM) is pleased to provide this proposal for Subsurface Utility Engineering (SUE) services to AECOM for the W. 29th St. Drainage Improvements project in Pueblo, Colorado. This proposal has been prepared based on your e-mail dated April 20, 2022.

Should AECOM choose to engage SAM to provide the services described herein, please issue a task order as SAM intends to perform the work under the terms of our Master Service Agreement currently in place.

Once again, thank you very much for the opportunity to serve you on this important project. If you have any questions or require additional information, please contact me.

Sincerely,

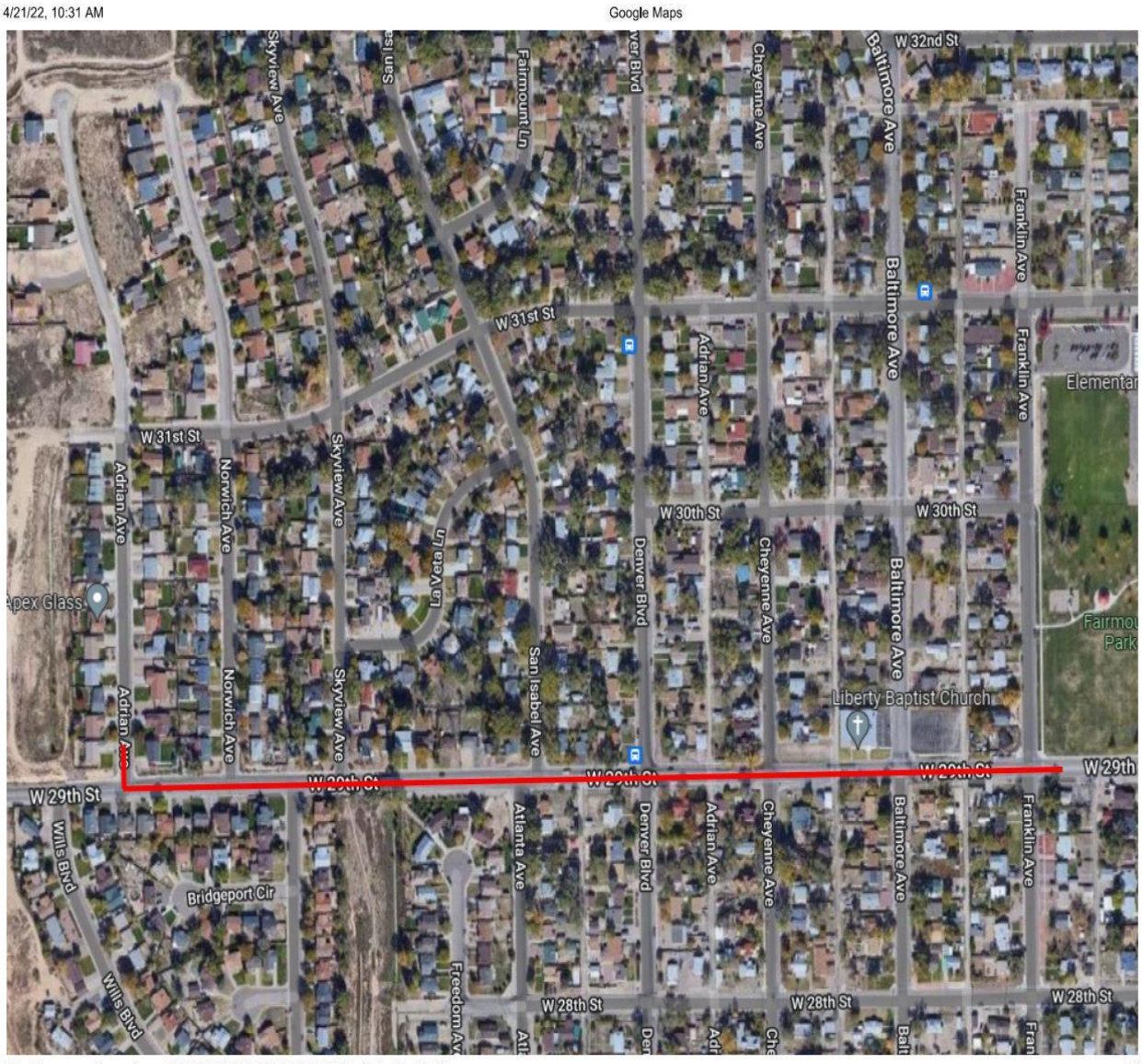
Timothy Sullivan, PE, PMP
Project Manager

Surveying And Mapping, LLC
555 Zang Street
Suite 210
Lakewood, CO 80228

PROJECT OVERVIEW

SAM will perform Quality Level-B SUE services following the route delineated in red from curb to curb, as indicated in Exhibit A. After the client has identified the test hole locations, SAM will return to the project site to perform Quality Level-A SUE services. All work will be performed in accordance with CI/ASCE 38-02, Colorado Revised Statutes 2018 Title 9, Article 1.5, and the attached Scope of Work.

EXHIBIT A



SUBSURFACE UTILITY ENGINEERING SERVICES

DEFINITIONS*

Subsurface Utility Engineering (SUE):
A branch of engineering practice that involves managing certain risks associated with utility mapping at appropriate quality levels, utility coordination, utility relocation design and coordination, utility condition assessment, communication of utility data to certain parties, utility relocation cost estimates, implementation of utility accommodation policies, and utility design.

Utility Quality Level:
A professional opinion of the quality and reliability of utility information. Such reliability is determined by the means and methods of the professional. Each of the four existing utility data quality levels is established by different methods of data collection and interpretation.

Utility Quality Level A (QL-A):
Precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of subsurface utilities, usually at a specific point. Minimally intrusive excavation equipment is typically used to minimize the potential for utility damage. A precise horizontal and vertical location as well as other utility attributes are shown on plan documents. Accuracy is typically set at 0.05' vertical, and to applicable horizontal survey and mapping accuracy as defined or expected by the project owner.

Utility Quality Level B (QL-B):
Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities. QL-B data should be reproducible by surface geophysics at any point of their depiction. This information is surveyed to applicable tolerances defined by the project and reduced onto plan documents.

Utility Quality Level C (QL-C):
Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to QL-D information.

Utility Quality Level D (QL-D):
Information derived from existing records or oral recollections.

** CI/ASCE 38-02 (Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data*

QL-B MAPPING SCOPE OF WORK

- The limits of our QL-B investigations will be as delineated in red in Exhibit "A" provided by the Client.
- SAM will collect utility records and identify utility owners along the proposed alignment.
- SAM will employ surface geophysical equipment to attempt to map utilities at locations selected by the Client.
- Provide all equipment, personnel, and supplies required for performing utility mapping services. SAM shall determine which equipment, personnel, and supplies are required.
- Conduct an appropriate investigation of the site conditions.
- Attempt to identify and map the underground utilities located within the proposed alignment.
- Gravity storm and sanitary systems will be mapped to the first structure located outside of our project limits, when possible.
- Conduct electronic sweeps within the project limits in order to identify utilities and other "unknown" linear conductors not represented in the information provided by utility owners.
- Mark utilities and "unknown" linear conductors using paint, flagging, staking, etc.
- Survey the horizontal position of marked utilities, "unknown" linear conductors and related structures.
- Collect vertical data (rim and invert elevations) from structures associated with gravity storm and sanitary systems, when accessible.
- Analyze and correlate mapping and invert data to utility records and related information. Resolve any conflicts through supplemental field investigations and/or the depiction of facilities at their record locations, when possible.

QL-B MAPPING DELIVERABLES

- Provide a digital AutoCAD Civil 3D file depicting the horizontal positions of underground utilities and related structures within our project limits.
- Utilities mapped will be clearly differentiated by line style and/or text labels from those depicted according to their record locations.
- The sizes and type (function) of mapped utilities will be clearly indicated by line style and/or text labels, when known.
- Utilities lines and associated structures will be color coded according to American Public Works Association standards.
- Rim and invert elevations for all accessible gravity storm and sanitary structures and associated piping will be provided in the form of text labels.
- SAM will provide a utility owner contact list including when available, company or agency names, addresses, phone numbers and e-mail addresses for individual contacts.
- SAM will provide signed and sealed (by a Colorado Licensed Professional Engineer) drawings in .pdf format. These drawings will include the utility information delivered in the CAD file, depicted against a Civil 3D aerial background.

QL-A SCOPE OF WORK

- Excavate up to **forty-two (42)** test holes to match what was done in 2012 per the client's request.
- Collect QL-A data at locations, which will be selected by the Client
- Provide all equipment, personnel and supplies required to perform its QL-A services. SAM shall determine which equipment, personnel and supplies are required to perform such services.

QL-A SCOPE OF WORK (Cont.)

- Obtain necessary permits from city, county or other municipal jurisdictions to allow SAM to work in existing Right-of-Ways, easements, etc.
- Comply with applicable utility damage prevention laws and coordinate with utility company representatives, as required.
- Conduct an appropriate investigation of the site conditions.
- Sweep proposed conflicts with appropriate surface geophysical equipment and perform surveying procedures as necessary to identify test hole locations in the field.
- Revise test hole locations as may be necessary to expose the target utilities.
- Excavate test holes to expose target utilities in such a manner as to maintain the safety of the excavations and the integrity of the target utilities. Vacuum excavation equipment is employed as the preferred and primary method of excavation. However, hand digging and other methods may be employed as necessary to supplement vacuum excavation.
- In paved areas, neatly cut and remove existing pavement. Paving cuts will typically not exceed 144 square inches or 12" in diameter.
- Expose target utilities to the extent required for QL-A data collection purposes. Notify the Client whenever existing conditions limit or prevent full exposure and/or complete data collection.
- Measure, evaluate and record as existing conditions allow a) the material type or composition of exposed utilities, b) the elevation of the top of piped utilities, conduits, casings, etc., c) the outside diameter of piped utilities, conduits, casings, etc., under 18" I.D. d) the elevation of the top and bottom of encasements, ducts and non-encased, multi-conduit configurations, e) the width of encasements, ducts and non-encased, multi-conduit configurations and f) the elevation of a recoverable mark or marker, set/installed at existing grade over the primary target utility.
- The sizes of all storm drain piping will be reported as an I.D. measurement.
- Elevations reported by SAM shall maintain vertical tolerances of +/- 0.1' based upon the values for the vertical control as provided by the Client.
- Survey the horizontal position of the recoverable mark or marker, set/installed at existing grade over the primary target utility at each test hole.
- Obtain "down hole" images of exposed utilities and "perspective" images or the test hole locations.
- Unless required by the utility owner, permits, etc. test holes will be backfilled with the spoils removed from the excavations. Test hole excavations will be backfilled and compacted in lifts. Compaction will be achieved as nearly as possible to pre-existing conditions or as required by permit.
- Provide restoration of pavement within the limits of the original paving cut. Where test holes have been excavated in areas other than pavement, the disturbed areas will be restored as nearly as reasonably possible to the pre-existing conditions.
- Analyze and correlate QL-A data to the results of previous QL-B investigations, utility records, etc. Resolve any resulting conflicts through supplemental field investigations and/or revisions of QL-B deliverables, as necessary.

QL-A DELIVERABLES

- SAM will provide a digital AutoCAD Civil 3D file depicting the horizontal positions of the recoverable marks or markers set/installed over the primary target utility at each test hole location.
- Where applicable, SAM will provide a revised QL-B deliverable depicting updated horizontal positions of target utilities.
- SAM will provide a QL-A data summary table. This table will include a) the material type or composition of exposed utilities, b) the elevation of the top of piped utilities, conduits, casings, etc., c) the outside diameter of piped utilities, conduits, casings, etc., under 18" I.D. d) the elevation of the top and bottom of encasements, ducts and non-encased, multi-conduit configurations, e) the width of encasements, ducts and non-encased, multi-conduit configurations and f) the elevation and coordinates of the recoverable mark or marker, set/installed at existing grade over the primary target utility.

QL-A DELIVERABLES (Cont.)

- SAM will provide signed and sealed drawings (by a Colorado Licensed Professional Engineer) in .pdf format. These drawings will include the individual test hole locations, the data summary table and any other utility information delivered in the CAD file, depicted against an aerial background.
- SAM will provide "down hole" images of utilities exposed in each test hole and "perspective" images of the test hole locations.

SUE PROJECT SCHEDULE

The following information approximates our work schedule for this project. Factors beyond our control may affect our ability to meet all of the projected milestones. We will keep the Client appraised of our progress.

- **Project Initiation** - SAM will begin prerequisite administrative activities within **3 working days** of receipt of a fully executed contractual document.
- **QL-B Field Data Collection –** We anticipate mobilizing to begin field data collection activities within **10 working days** of receipt of a fully executed contractual document.
- **Preliminary QL-B Deliverables** – SAM anticipates providing preliminary QL-B deliverables, within **10 working days** following the completion of our QL-B field investigation.
- **QL-A Permitting** – SAM anticipates applying for all necessary permits within **3 working days** following test hole location selection by the Client.
- **QL-A Field Data Collection -** SAM anticipates mobilizing to begin field data collection activities within **10 working days** of receipt of approved permits.
- **Final Project Deliverables** – SAM will provide final project deliverables within **10 working days** of completion of our QL-A field data collection activities.

COST ESTIMATE

QL-B Labor:			
Title / Responsibility	**# of Units**	**Unit Cost**	**Total**
Dept. Manager	2 Hours	$231.00 per Hour	$462.00
Sr. Project Manager	4 Hours	$ 214.00 per Hour	$856.00
Project Manager	16 Hours	$188.00 per Hour	$3,008.00
Task Manager	1 Hours	$139.00 per Hour	$139.00
Sr. SUE Office Technician	24 Hours	$132.00 per Hour	$3,168.00
Administrative Assistant	8 Hour	$90.00 per Hour	$720.00
Field Supervisor	16 Hours	$132.00 per Hour	$2,112.00
Field Supervisor (OT)	4 Hours	$198.00 per Hour	$792.00
SUE Field Technician	16 Hours	$86.00 per Hour	$1,744.00
SUE Field Technician (OT)	4 Hours	$129.00 per Hour	$654.00
Sub-Total - QL-B Labor:			**$13,655.00**

QL-B Direct Expenses:			
Vehicle Mileage	975 Miles	$0.56 per Mile	$570.38
GPS Receiver	20 Hours	$10.00 per Hour	$200.00
SUE Equipment Package	40 Hours	$6.55 per Hour	$262.00
Environmental Supplies	2 Days	$25.00 per Day	$50.00
Ground Penetrating Radar (GPR)	5 Hours	$20.00 per Hour	$100.00
Lodging	2 Nights	$105.60 per Night	$211.20
Per Diem	4 Days	$59.00 per Day	$236.00
Permitting Fees	1 Each	$500 Each	$500.00
Traffic Control	1 Days	$1,650.00 per Day	$1,650.00
Sub-Total - QL-B ODC's:			**$3,779.58**
Total Estimated QL-B Cost:			**$17,434.58**

COST ESTIMATE FOR QL-A 42 TEST HOLES

QL-A Labor / Test Holes			
Title / Responsibility	**# of Units**	**Unit Cost**	**Total**
Dept. Manager	1 Hours	$231.00 per Hour	$231.00
Sr. Project Manager	2 Hours	$214.00 per Hour	$428.00
Project Manager	12 Hour	$188.00 per Hour	$2,256.00
Task Manager	5 Hours	$139.00 per Hour	$695.00
Sr. SUE Office Technician	16 Hours	$132.00 per Hour	$2,112.00
Administrative Assistant	8 Hours	$90.00 per Hour	$720.00
SUE Field Supervisor	80 Hours	$132.00 per Hour	$10,560.00
SUE Field Supervisor (OT)	10 Hours	$198.00 per Hour	$3,960.00
SUE Field Technician	0 Hours	$86.00 per Hour	$0.00
Sub-Total - QL-A Labor:			**$20,962.00**

QL-A Direct Expenses:			
Support Vehicle Mileage (2)	500 Miles	$0.56 per Mile	$292.50
Vacuum Excavation Truck	10 Unit Rate	$ 2,200.00 per Day	$22,000.00
GPS Receiver	100 Hours	$10.00 per Hour	$1,000.00
SUE Equipment Package	100 Hours	$6.55 per Hour	$655.00
Environmental Supplies	2 Day	$25.00 per Day	$50.00
Lodging	9 Nights	$105.60 per Night	$950.40
Per Diem	10 Days	$59.00 per Day	$590.00
Permits	0 Permit	$100.00 Each	$0.00
Traffic Control	8 Day	$1,650.00 per Day	$13,200.00
Sub-Total - QL-A ODC's:			**$38,737.90**
Total Estimated QL-A Cost / 42 TEST HOLES:			**$59,699.90**
Total Estimated Project Cost			**$77,134.48**

Cost Estimate Notes:

1. This Cost Estimate is only applicable for a period of one (1) year from the date of submittal. After one (1) year SAM reserves the right to make rate adjustments.
2. SAM's labor and equipment rates are proprietary and are not to be shared with any individual, company, or entity outside of the Client organization.
3. In providing its QL-A & QL-B services, SAM will not exceed the Total Estimated Costs listed above, without written authorization from the Client.

QL-A & B ASSUMPTIONS

The following assumptions were made in preparing this proposal. If these assumptions do not prove to be correct, a modification to the Scope of Work and Cost Estimate for this project may be required.

- SAM will not perform any work outside of the Scope of Work defined in this proposal without written authorization by the Client.
- Unless expressly requested by the Client, SAM's utility mapping services will not include a) gravity services and laterals, b) utility tunnels, c) non-accessible empty conduits or empty utilities, d) traffic control/signalization related power and communications beyond master control boxes/cabinets, e) irrigation or sprinkler systems, f) railroad signalization, g) vault or manhole limits or dimensions, h) underground storage tanks and associated piping/wiring, i) grease traps and associated piping, j) septic tanks and distribution boxes, k) wastewater drain fields, l) area drainage tiles or french drains, m) privately owned wells and associated wiring and piping or n) abandoned/capped wells. If required, we will gladly include any of these facilities in our investigation(s). However, their inclusion may require a modification to our Cost Estimate.

QL-A & B ASSUMPTIONS (Cont.)

- OSHA compliant (29 CFR 1910.146) confined space entries are not required for this project.
- No project specific safety training, PPE or monitoring devices are required for this project.
- SAM assumes that all work areas are sufficiently cleared of vegetation (to a maximum height of 6") such that they are traversable on foot for the purpose of performing designating and sweeping activities.
- SAM assumes that all work areas are sufficiently cleared of snow such that all they are traversable on foot for the purpose of performing designating and sweeping activities.
- SAM is not responsible to facilitate the movement of parked vehicles or other physical obstructions.
- SAM is not responsible for discovering or uncovering utility relates structures which are covered by, soil, snow, brush, landscaping materials, paving, etc.
- SAM is not responsible for cleaning, clearing or otherwise removing silt and other debris from storm drainage piping or structures.
- SAM will not access utility related structures or map utilities which are located within fenced areas with locked gates, which contain unrestrained animals, etc.
- SAM owns a suite of surface geophysical equipment. We will determine which surface geophysical equipment and methods are appropriate for employment on this project.
- The ability to identify and accurately determine the horizontal positions of underground utilities through the employment of surface geophysical equipment and methods can be influenced by factors beyond SAM's control. Such factors include but are not limited to the conductivity of their materials and/or the surrounding soils, soil moisture content, proximity to other underground utilities, depth, etc.
- Not all utilities can be mapped at QL-B. Utilities which cannot be mapped at QL-B will be mapped at the next lowest quality level, as applicable.
- SAM is not responsible for the omission of any utility information that is not obtainable via the surface geophysical equipment and methods employed on this project.
- The accuracy of electronic depth readings (EDRs) received from surface geophysical equipment is dependent upon many factors such as soil type, soil moisture content, depth of utility, proximity to other utilities, utility material type, etc. It is generally considered to be unreliable and caution should be exercised in considering it for use in the design and/or the conflict analysis process. The only reliable method of obtaining accurate utility depths/elevations is through physical exposure and measurement.
- The use of any horizontal and/or vertical locations of utilities depicted in deliverables prepared by SAM does not relieve the contractor from the duty to comply with applicable utility damage prevention laws and regulations including but not limited to, giving notification to the local 811 call center before construction.
- Paint markings, flagging and other indicators of the presence of underground utilities placed by SAM are not to be used for construction purposes and does not relieve the contractor from the duty to comply with applicable utility damage prevention laws and regulations including but not limited to, giving notification to the local 811 call center before construction.
- Standard traffic control for our utility mapping services is considered to be the placement of traffic cones and freestanding warning signs. Traffic control requiring lane or sidewalk closures, traffic detouring, flag persons, off duty officers, etc. is considered to be special traffic control. If special traffic control is required, those services will be subcontracted to third party providers and billed to the Client at cost plus 10%.
- Gravity sanitary sewer and storm drainage systems will be mapped according to their record location as correlated to surface visible features, when available/accessible. Structures of record which cannot be located in the field will be depicted at their record location. Lines of record which cannot be physically verified in the field will be depicted at their record location.

QL-A & B ASSUMPTIONS (Cont.)

- No contaminated materials, water or soils will be encountered on this project. If contaminated materials, water or soils are identified or suspected, the Client will be notified immediately. All costs associated with environmental remediation, decontamination of equipment, etc. will be the sole responsibility of the Client.
- The Client will provide SAM with all records and other information in their possession which pertains to the underground utilities and associated structures located within the project limits.
- SAM will have uninterrupted access to all work areas on a minimum ten (10) hours per day basis.
- The Client is responsible to obtain Right of Entry agreements, coordinate with property owners and otherwise resolve all access issues which may affect SAM's ability to efficiently execute their Scope of Work. Any delays or interruptions caused by access issues may require a modification to our Cost Estimate.
- The Client will notify SAM prior to our initial mobilization, of any restrictions or special requirements associated with accessing the project site(s).
- All test hole locations will be selected by the Client.
- Test holes will be selected on target utilities which have been previously mapped at QL-B or QL-C.
- Test Holes will not be selected at locations where multiple utilities occupy the same horizontal space.
- The Client will provide SAM with horizontal and vertical control points which are proximate to the project limits. Our Cost Estimate does not anticipate the need to run traverses, run level loops, densify control or to verify the values provided for horizontal and vertical control points.
- The Client will provide the coordinate values for each test hole location or, identify their locations in a CAD file which is based upon the values reflected in the survey control diagram/table for the project.
- All test hole locations are directly accessible by vacuum excavation equipment.
- No test hole locations fall within areas of standing or running water.
- All target utilities are located above the existing ground water table.
- No target utilities are located in excess of 8.0' below exiting grade.
- All work will be performed during daytime hours with unrestricted access to all work areas on a ten (10) hours per day basis.

Schedule 2

DETAILED WORK-HOUR ESTIMATE **AECOM Technical Services, Inc** **7595 Technology Way** **Denver, CO 80237** **Project Name:W. 29th St** **DESIGN WORKHOUR SUMMARY** **Date: July 11, 2022** 2022 Rate Table	Project Management PM *Kindt* Project 5 $201.00	 PC/PA *Wood* Assistant/Support Staff 7 $123.00	Drainage Task Lead *Kindt* Project 5 $201.00	 Junior Engineer *ButlerB* Staff 3 $115.00	 Quality Check *Barr* Project 1 $152.00	Total Hours	Subs Sam, LLC	Total Labor Cost
TASK 1: PROJECT MANAGEMENT								
1.1 Project Setup	8	40				48		$ 6,528.00
1.2 Internal Kick-off Meeting with design team	2	2				4		$ 648.00
1.3 Monthly Invoices	12	24				36		$ 5,364.00
SUBTOTAL TASK 1: PROJECT MANAGEMENT	**22**	**66**	**0**	**0**	**0**	**88**		**$ 12,540.00**
TASK 2: SUBSURFACE UTILITIES								
3.1 SUE Investigation Level B	6					6	$ 17,434.58	$ 1,206.00
3.2 SUE Investigation Level A	12					12	$ 59,699.90	$ 2,412.00
SUBTOTAL TASK 4: SUBSURFACE UTILITIES	**18**	**0**	**0**	**0**	**0**	**18**	**$ 77,134.48**	**$ 3,618.00**
TASK 3: 90% DESIGN								
1.1 Evaluate replacing concrete pipe materials with CPP			2	24	12	38		$ 4,986.00
1.2 Roadway Plans			8	40	8	56		$ 7,424.00
1.3 Drainage Plans			8	80	8	96		$ 12,024.00
1.4 Erosion and Sediment Control Plans			2	16	2	20		$ 2,546.00
1.5 Drainage Memo			8	24	8	40		$ 5,584.00
1.6 Quantities and Cost Estimate			4	16	4	24		$ 3,252.00
1.7 Specifications			4	4	8	16		$ 2,480.00
SUBTOTAL TASK 6: 90% DESIGN	**0**	**0**	**36**	**204**	**50**	**290**		**$ 38,296.00**
TASK 4: 100% DESIGN								
6.1 Roadway Plans			8	20	8	36		$ 5,124.00
6.2 Drainage Plans			8	20	16	44		$ 6,340.00
6.3 Erosion and Sediment Control Plans			8	8	16	32		$ 4,960.00
6.4 Drainage Report			8	8	16	32		$ 4,960.00
6.5 Quantities and Cost Estimate			8	8	4	20		$ 3,136.00
6.6 Specifications			8	2	4	14		$ 2,446.00
SUBTOTAL TASK 7: 100% DESIGN	**0**	**0**	**48**	**66**	**64**	**178**		**$ 26,966.00**
GRAND TOTAL LABOR:	**40**	**66**	**84**	**270**	**114**	**574**	**77134.48**	**$ 81,420.00**
GRAND TOTAL:								**$ 158,846.98**

OTHER DIRECT COST RATES:

ITEM	ESTIMATED UNITS	UNIT RATES	
Vehicle Expense (personal m	500	$ 0.585	292.50
Postage, Express Mail, Courier		$ -	$ -
Major Reproduction (Mylars)			$ -
			$ -
			292.50

(1) Company owned or leased field vehicles (cars, pickups, vans, trucks, etc.) used on project assignments will be charged at the current mileage rate established by the Internal Revenue Service. The mileage charge for personal vehicles will be the current mileage rate established by the Internal Revenue Service.

(2) The cost of communications and transmittals (postage, express mail, courier, etc.) will be charged at cost.

(3) The cost of other direct costs (field supplies, report binding supplies, leased or rented field equipment, etc.) will be charged at cost.

Principal-in-Charge/ Authorized Signatory

Ryan Weaver, PE

Point of Contact

Laura Kindt, PE *(Primary)*
David Seyboldt, PE *(Alternate)*

Project Managers

Laura Kindt, PE
David Seyboldt, PE
Alan Turner, PE, CFM
Kimberley Pirri, PE, CFM

Personnel

Stormwater Infrastructure Design
Laura Kindt, PE
David Seyboldt, PE
Joe Roerkohl, PE, CFM
Leylin Marroquin, PE, CFM

Hydrology & Hydraulic Modeling
Leylin Marroquin, PE, CFM
Griffin Cullen, EIT, CFM
KC Robinson, PE, CFM

2D Hydraulic Modeling
Isaac Allen, PE, CFM
Alan Turner, PE, CFM

Stormwater Master Planning
Alan Turner, PE, CFM
Joel Jones, PE

Civil Design
Celeste Raine, PE

Structural Design
Craig Parent, PE, SE

Environmental/Ecological
Kallin Snow, PhD

Landscape Architecture & Urban Planning
Jeff McKelvey, PLA, ASLA, ENV SP

Geotechnical Engineering
Bill Barriere, PE[1]
Brysen Mustain, PG[1]

Survey/Right-of-Way
Stan Vermilyea, PLS
Eric Craig, PLS

Erosion Control, BMPs, & Low Impact Development
Laura Kindt, PE
Jessica Barr, EIT

Drainage & Floodplain Review
Kimberley Pirri, PE, CFM
David Seyboldt, PE

CLOMR/LOMR & Floodplain Permitting
Kimberley Pirri, PE, CFM

Levee Certification
Rigel Rucker, PE, CFM

Stream Restoration
Michael Scurlock, PhD, PE
Andy Steiniger, PE

Resident Engineering & Construction Administration
Kevin Kullman, PE

Trenchless Design
Sean Berzins, PE

Public Outreach
Ed Parks

Subconsultants: 1. Vivid Engineering Group

The AECOM Team provides the City of Pueblo with a diverse group experienced with cross-discipline collaboration. Our team embraces this coordination and opportunity to serve our client's many different needs.

Laura Kindt, PE

Project Manager/Stormwater Infrastructure Design/Erosion Control, BMPs, & Low Impact Development

Education
MS, Civil Engineering, Lawrence Technological University
BS, Civil Engineering, Lawrence Technological University

Years of experience
Total: 14
With AECOM: 6

Location
Denver, CO

Registrations/Certifications
Professional Engineer: CO, #46481

Laura has more than a decade of experience focused on low impact development (LID) design, hydrologic and hydraulic modeling, water quality, sediment and erosion control analysis and design, and research and testing.

Professional history

Laura is a project manager and drainage design engineer with 14 years of experience in water resources analysis and design. She has worked on a variety of water quality, roadway drainage, bridge and scour, facilities and municipal projects. Laura is experienced in hydrologic, hydraulic, floodplain and scour analyses, as well as and post-fire mitigation.

Selected project experience

Pikes Peak Rural Transportation Authority, Pikes Peak Avenue Reconstruction, Colorado Springs, CO. Drainage Design Engineer. Roadway reconstruction along Pikes Peak Avenue. Work consisted of design of new storm collection system along the project corridor, design of two permanent water quality features, and removal or abandonment of current system. Prepared SWMP and identified BMPs to be used on project site.

Pikes Peak Rural Transportation Authority, Vermijo and Sierra Madre Reconstruction, Colorado Springs, CO. Drainage Design Lead. Drainage design of redevelopment of 12 city blocks. Evaluated multiple water quality options for urban environment, including pond design, LID design and underground water quality treatment. Lead water quality design including, water quality planters and hydrodynamic separator.

Pikes Peak Rural Transportation Authority, Underground Detention, Colorado Springs, CO. Drainage Design Lead. Water quality design to provide regional water quality for downtown Colorado Springs. Evaluated multiple water quality designs to provide cost effective water quality treatment that met the city's MS4 permit. Lead final design and assisted during construction of water quality vault.

Town of Castle Rock, Craig and Gould North Infrastructure Improvements, Castle Rock, CO. Drainage Design Lead/Deputy Project Manager. Drainage design of over 3000 LF of new storm system. Evaluated water design alternatives and provided final design of hydrodynamic separator.

City and County of Denver, Upper Sanderson Gulch, Denver, CO. Project Manager/Drainage Design Lead. Drainage design of over 4200 LF of new storm system. Reviewed storm drainage and water quality design calculations, reports, and plans.

Colorado Department of Transportation, C-470 Managed Lanes, Denver, CO. Drainage Design Engineer. Drainage design of over 13 miles of roadway drainage, including roadside ditches, inlets, pipe and culverts. Designed 7 full spectrum ponds to provide water quality for the corridor. Worked with multiple stakeholders to meet multiple MS4 requirements. Reviewed storm drainage and water quality design calculations, reports, and plans.

Colorado Department of Transportation, I-25 MP 127-135, Colorado Springs, CO. Drainage Design Lead. Drainage design of over 7 miles of roadway drainage. Lead design of inlets, pipes, roadway channels, culverts, erosion control, and water quality for the corridor to meet CDOT MS4. Reviewed storm drainage and water quality design calculations, reports, and plans.

Colorado Department of Transportation, I-25 MP 135-138, Colorado Springs, CO. Drainage Design Lead. Drainage design of over 7 miles of roadway drainage. Lead design of inlets, pipes, roadway channels, culverts, erosion control, and water quality for the corridor to meet CDOT MS4.

Colorado Department of Transportation, I-25 MP 144-146, Colorado Springs, CO. Drainage Design Lead. Drainage design of over 7 miles of roadway drainage. Lead design of inlets, pipes, roadway channels, culverts, erosion control and water quality for the corridor to meet CDOT MS4.

Colorado Department of Transportation, South Academy Bridge, Colorado Springs, CO. Drainage Design Lead. Drainage improvements for the South Academy Bridge Replacement. Evaluated and designed water quality to meet CDOT MS4.

Pikes Peak Rural Transportation Authority, Academy Boulevard Reconstruction, Colorado Springs, CO. Quality Lead. Roadway reconstruction along South Academy Boulevard. Work consisted of reviewing design of new storm collection system along the project corridor, design of permanent water quality features, and removal or abandonment of current system. Reviewed SWMP and identified BMPs to be used on project site.

Pikes Peak Rural Transportation Authority, Black Forest Road Widening, Colorado Springs, CO. Quality Lead. Roadway widening along 1.2 miles of Black Forest Road. Work consisted of reviewing design of new storm collection system along the project corridor, design of permanent water quality features, design of grade control structures and channel improvements, and removal or abandonment of current system. Prepared SWMP and identified BMPs to be used on project site.

Pikes Peak Rural Transportation Authority, Austin Bluffs Parkway Bridge and Roadway Improvements, Colorado Springs, CO. Quality Lead. Reviewed design of transportation drainage components for expanded roadway and proposed bridge. Reviewed drainage plan set, project cost estimate and drainage report.

David Seyboldt, PE

Project Manager/Stormwater Infrastructure Design/Drainage & Floodplain Review

Education
BS, Environmental Engineering, Syracuse University

Years of experience
Total: 15
With AECOM: 14

Registrations/Certifications
Professional Engineer, CO, TX

Location
Denver, CO

Mr. Seyboldt has more than 15 years of experience in transportation drainage, site design and development, water resources and stormwater analysis for residential, commercial, and government projects.

Professional history

Mr. Seyboldt has more than 15 years of experience as a Civil Engineer involved in transportation drainage, site design and development, water resources and stormwater analysis for residential, commercial, and government projects. Mr. Seyboldt performs hydrology and hydraulic design, develops grading plans, erosion control plans, drainage reports, utility plans and reports, roadway design and earthwork calculations, and is accountable for quality control and plan review.

Selected project experience

Oak Hill Parkway, Austin, Texas. Segment Drainage Lead for $700 Million Design Build project. Responsible for roadway drainage design, off site drainage design, and impacts analysis. Project utilized Geopak software for design of multiple mainlanes, frontage roads, ramps, local intersections and bridges. Involved extensive multi-discipline coordination and contractor collaboration on fast paced project.

Naval Air Station Corpus Christi, Texas. Civil Task Leader for Design Build project. Responsible for site design, site grading, utility layout and design, erosion control, and storm drainage design for new four-story training classroom building, parking lots, and aircraft wash rack located on the Base. Involved extensive multi-discipline coordination.

Stapleton District IV Outfall, Denver, Colorado. Drainage Task Leader. Responsible for hydrology and hydraulic design of large diameter box culvert, water quality pond, outlet structure and grouted boulder spillway to Sand Creek. Responsible for coordination and review of project plans through multiple agencies including USACE, UDFCD, MWRD and City of Denver. Also responsible for construction permitting and construction management.

Lamar Reliever Route, Lamar, Colorado. Drainage Task Leader responsible for site storm drainage design, water quality, detention, hydraulic modeling, and stormwater management design. This is a multi-disciplinary transportation project to construct a new 4-lane route for US 287, US 50, and US 385 to better accommodate truck commerce near the Town of Lamar.

Stapleton Aurora, Aurora, Colorado. Drainage Task Leader responsible for storm drainage design, detention pond design, hydraulic modeling, drainage report, and erosion control design for 100 acre mixed-use redevelopment on former airport site. Responsible for design and review of project plans throughout City submittal process. Also responsible for construction permitting and construction management.

Martin Luther King Blvd Extension, Denver, Colorado. Drainage Task Leader on arterial roadway project responsible for storm drainage design, detention pond design, drainage report, and erosion control design for roadway and associated mixed-use redevelopment. Responsible for design and review of project plans throughout CDOT and City submittal process.

Buckley Air Force Base, Aurora, Colorado. Civil Task Leader responsible for site design, site grading, utility layout and design, erosion control, and storm drainage design and analysis for new aircraft maintenance building on the Base.

I-76 Ramp Widening, Adams County, Colorado. Drainage Task Leader for highway ramp widening project for CDOT. Responsible for hydrologic and hydraulic analysis and preparation of drainage reports, drainage design for improvements on the ramp, stormwater management, coordination with other design disciplines within CDOT, and preparation of FIR and FOR plan sets.

I-29 Corridor Design, Sioux Falls, South Dakota. Drainage Task Leader responsible for highway widening project. Project included analysis of existing and proposed hydrology for hydraulic design of culverts and ditches, and coordination with roadway design and grading for approximately three miles of interstate and an interchange between I-29 and I-229.

Kennecott Mine, Magna, Utah. Civil Task Leader. Responsible for roadway layout, site layout and design, storm drainage analysis and design for access roads and sites for construction of a new electrical substation and pump station required to serve the copper mining operations. Project required extensive coordination with electrical engineers to ensure the site would meet their needs for equipment placement and large vehicle access.

F.E. Warren Air Force Base, Cheyenne, Wyoming. Civil Task Leader responsible for site design, road design, site grading, utility layout and design, and storm drainage design and analysis for multiple building rehabilitations on the base, and a new fire training facility for use by the base personnel.

BHP Billiton, Texas. Developed development permit packages that includes GIS mapping, base flood elevation determination, site grading, runoff determination and drainage design, and a site specific SWPPP for oil and gas well pad sites in Texas.

Horizon Uptown, Aurora, Colorado. Project Engineer responsible for storm drainage design and drainage reports, master utility design and utility reports. Responsible for quality review of project plans throughout City submittal process. Horizon Uptown is a 500 acre mixed-use development located in Aurora, CO focusing on low impact development design.

Colorado Studios, Denver, Colorado. Project Manager and Engineer responsible for upgrade and replacement of water lines, services and fire hydrants serving the Colorado Studios site which lies within the Stapleton Redevelopment. The work required coordination and consultation with Denver Water to devise a plan that would work within the constraints of the site and meet City standards.

FasTracks North Metro Corridor, Commerce City, Denver, Thornton & Northglenn, Colorado. Civil Task Leader for FasTracks North Metro Corridor project, an 18-mile long rail transit corridor between Denver and multiple cities in unincorporated Adams County. The project included 9 stations which required civil engineering site design. The civil engineering design services included site drainage analysis and design, roadways, sanitary sewer, potable water, storm sewers and detention/water quality ponds. The project was designed to a 30% level.

FasTracks Northwest Rail, Denver, Longmont & Boulder, Colorado. Civil Task Leader for three proposed stations, which required civil engineering site design. The civil engineering design services included site drainage analysis and design, roadways, sanitary sewer, potable water, storm sewers and detention/water quality ponds. Design also included site and parking lot layout and coordination with other disciplines. The project was designed to a 30% level.

Alan Turner, PE, CFM

Project Manager/2D Hydraulic Modeling/Stormwater Master Planning

Education
MS, Environmental Science and Engineering, Colorado School of Mines
BS, Civil Engineering, Colorado State University

Years of experience
Total: 22
With AECOM: 1

Location: Denver, CO

Registrations/Certifications
Professional Engineer: CO, ND, HI, TX, UT;
Certified Floodplain Manager

Mr. Turner Specializes in 1D and 2D hydraulic modeling, hydrologic and hydraulic engineering of structures, and basinwide master planning.

Professional history

Mr. Turner has extensive experience in hydrologic and hydraulic analysis providing services to state agencies, local municipalities, private industry, and federal clients such FEMA. Mr. Turner Specializes in 1D and 2D hydraulic modeling, hydrologic and hydraulic engineering of structures, and basinwide master planning.

Selected project experience

Project Manager and Senior Designer; South Boulder Creek Flood Mapping Study; City of Boulder, CO. Project Manager and Senior Designer. Mr. Turner was responsible for managing the project including multiple subcontractors and internal design staff. The project required the use of a detailed 2D MIKE FLOOD model of the South Boulder Creek Floodplain to create multiple model runs and multiple solution plans to mitigate the effects of flooding along South Boulder Creek. Solutions included the design of multiple hydraulic structures including 5 separate off-stream and on-stream detention structures. In addition to reviewing detention structures, other flow control structures were designed including weirs and flow diversions, storm drain and pipeline conveyance. This project included an in-depth HAZUS analysis using FEMA BCA software to decide the project benefits and costs for potential FEMA grant funding.

Project Manager Gregory Creek Master Drainageway Planning Study, City of Boulder, Boulder, CO. The plan included a comprehensive SWMM model that revised hydrology for the basin post 2013 floods. A comprehensive FEMA BCA analysis was completed to determine costs and benefits. The project also included a public open house to show project concepts and receive feedback on issues in the basin. As part of the main plan, CH2M developed an un-steady and steady state FLOW-2D model to define the extents of flooding for the split flow

Task Manager Harris Reservoir Expansion, Dow Chemical, Brazoria County, TX. Floodplain and environmental permitting Task lead for the design and permitting of a 55,000 ac-ft detention facility in Brazoria County. Mr. Turner is leading a multidiscipline team to complete a CLOMR, 404 and stream mitigation plan for a proposed 55,000 ac-ft detention facility in Brazoria County, TX. This includes approximately 50 miles of floodplain mapping on a complicated floodplain that involves two separate flooding sources, the Brazos River and Oyster Creek. Modeling has included the development of a Flood Modeler 2D model to understand the effects of the reservoir on the floodplain and to help understand required mitigation activities as well as development of HEC-RAS 1D models to complete the CLOMR application. Permitting tasks have included wetlands delineation, historical analysis, and development of a restoration mitigation plan to offset the impacts of the reservoir.

Project Manager and Senior Designer Little Shook's Run Outfall Systems Plan, City of Colorado Springs Colorado. Alan is currently completing an outfall system plan for the Little Shook's Run Basin east of Downtown Colorado Springs and Shook's Run Encompassing the Olympic Training Center and Memorial Hospital. Consultant has been asked to review existing storm drain capacities via an EPA-SWMM model and to help identify the cause and solution to a number of localized flooding areas along Little Shook's Run. As part of this work, Alan helps create a 2D model of the watershed to identify major overland flow paths which helped to identify and confirm localized flooding issues. The team is evaluating alternatives and the condition of the existing storm drains to provide a workable solution to improve drainage in the basin. The ultimate deliverable for the project will be 30% conceptual design and costs for the construction of storm drain improvements.

Kimberley Pirri, PE, CFM

Project Manager/ Drainage & Floodplain Review/ CLOMR/LOMR & Floodplain Permitting

Education
BS, Civil Engineering, University of Colorado

Years of experience
Total: 23
With AECOM: 12

Location
Denver, CO

Registrations/Certifications
Professional Engineer: CO, VA;
Certified Floodplain Manager

Kim has served as the Project Manager or Task Leader on several projects, including stormwater master plans, stormwater facility design, FEMA CLOMRs and LOMRs, flood mapping projects, floodplain management on-call service contracts, and floodplain analyses.

Professional history

Ms. Pirri is a Design Engineer and Project Manager with 20 years of experience in hydraulic and hydrologic design, floodplain and stormwater management, drainage analysis, and master planning. More recently, Kim has focused on Hazard Mitigation Planning and Community Rating System Program Support, as well as providing floodplain management subject matter expertise to both internal and external clients. Kim participates in local and national professional organizations to maintain a high level of currency with policies, procedures, and methods across the floodplain and stormwater management industry.

Selected project experience

Project Manager, City and County of Denver, 2018 Annual Certification (Community Rating System), Denver, Colorado. Led project to conduct the data gathering and analysis needed to support Denver's first Annual Certification under the 2017 CRS Coordinator's Manual and to prepare the needed documentation for submittal. Managed project resources, schedule, and budget.

Project Manager. City and County of Denver, Sanderson Gulch Flo-2D Study, Denver, Colorado. Led this Flo-2D planning study to use rain-on-grid methods and integrated SWMM storm sewer modeling with LiDAR-based terrain data to analyze existing surface flooding patterns and storm sewer capacities within a portion of the Sanderson Gulch watershed and to evaluate potential improvement projects. Rainfall inputs were developed using CUHP 2.0. Storm sewer inputs were developed from CCD inventory data. The results of this study showed that more than $20M in traditionally analyzed storm conveyance improvements were not needed.

Project Manager. City of Colorado Springs, Colorado. 2016 Hazard Mitigation Plan Update. Completed this plan update incorporating assessments of the potential for natural and human-caused hazards, while focusing on flood hazards and the City's vulnerability to those hazards. Technical lead for flood hazards assessment which was conducted using Hazus 2.0 with FIS flood discharges throughout the City and post-fire flood discharges in the three watersheds impacted by the Waldo Canyon wildfire disaster.

Project Manager/Technical Lead. City and County of Denver, Colorado. 2015 CRS Cycle Verification Services. Led project to evaluate Denver's stormwater and floodplain management programs against the updated scoring criteria in the 2013 CRS Coordinator's Manual and to prepare the needed documentation and GIS maps for submittal during the 5-year Cycle Verification visit. Participated with City in the Cycle Verification visit. Documented additional possible points that the City can easily achieve with small efforts.

Project Manager/Technical Lead. Southeast Metro Stormwater Authority, 2014 CRS Cycle Verification Services for City of Centennial and Arapahoe County, Colorado. Led this project to conduct the evaluation of both Centennial's and Arapahoe County's stormwater and floodplain management programs against the updated scoring criteria in the 2013 CRS Coordinator's Manual and to prepare the needed documentation and GIS maps for submittal during the 5-year Cycle Verification visits. Participated with both Centennial and Arapahoe County in separate Cycle Verification visits.

Task Lead/Senior Engineer. Colorado Water Conservation Board, Cooperating Technical Partner Contractor, Colorado.

- **Community Rating System Website Updates, Colorado**. Led task to update the content on the CWCB's Colorado-specific CRS website to incorporate changes in guidance based on the 2017 CRS Coordinator's Manual, as well as incorporating additional content associated with the revised class prerequisites in the 2017 Manual.
- **Colorado Hazard Mapping Program.** Providing quality review and technical guidance for the hydraulic analyses and floodplain mapping on this project to update the flood hazard analyses and mapping for more than 500 stream miles across the two watersheds most affected by the September 2013 floods. Also providing outreach and programmatic support.
- **Jamestown LOMR, Jamestown, Colorado.** Led team in fast-tracking preparation of an Existing Conditions Letter of Map Revision for the Town of Jamestown to reflect the changed flood hazard conditions along James Creek and Little James Creek following the 2013 floods. Provided oversight, technical guidance, modeling review, outreach coordination, and certification of this LOMR for approximately 1.5 stream miles of new detailed study, including an updated floodway. This new study provides a floodplain management baseline for ongoing flood recovery efforts.
- **Community Rating System Website, Colorado.** Task Lead. Led the team of technical staff to generate technical content for this new Colorado-specific Community Rating System (CRS) website. Coordinated with web-designers on the site design and functionality. Coordinated client and community review. This site is a "one-stop shop" for Colorado communities to obtain information about the CRS, whether they are new users or are current participants. Website provides tool to evaluate whether CRS is the right fit for a new community, tools for participating communities to consider new activities, and a substantial set of successfully scored samples.

Ryan Weaver, PE

Principal in Charge/Authorized Signatory

Education
BS/1999/Civil Engineering/
Purdue University

Years of experience
Total: 22
With AECOM: 21

Registrations/Certifications
2004/Professional Engineer/
CO #38560

Location
Denver, CO

Ryan's leadership experience includes smart growth of local engineering teams to among the largest in Colorado Springs. Ryan is a Certified Project Manager and has served in a variety of project oversight roles to ensuring internal compliance and deliver exceptional service to clients.

Professional history

Mr. Weaver, an AECOM Vice President, is the Location Lead for the Colorado Springs Office of approximately 50 employees. He also serves as the Southern Colorado Transportation Practice Lead, coordinating business development and project delivery efforts for clients throughout Southern Colorado. Ryan has nearly 22 years of design and management experience on transportation projects throughout Colorado. Ryan uses his excellent organizational skills to identify process improvements and manage multi-disciplinary project teams.

Selected project experience

I-25 Improvements, Colorado Springs, CO. Project Manager for improvements on I-25 from MP127-150 through Colorado Springs. A project determination phase involved design and construction estimates of three interim segments along the corridor. The initial improvements along I-25 include concrete resurfacing and safety improvements from MP127-135. This $100M project is using a CMGC delivery method and is being packaged with improvements along other local corridors that connect key military installations in the region.

Vermijo Avenue and Sierra Madre Street Reconstruction and Streetscape, Colorado Springs, CO. Project Principal for this high-profile project to transform two underutilized downtown corridors into a festival street and urban greenway. A vibrant urban destination will be created adjacent to the U.S. Olympic Museum through implementation of multi-modal facilities, urban design features, and smart technologies.

South Academy Boulevard Widening, El Paso County, CO. Project Principal for this project to widen the corridor to 3-lanes each direction from I-25 to Proby Parkway. The project includes evaluation of 7 bridge locations and bridge rehabilitation and scour protection at Fountain Creek. This project is using a CMGC delivery method and is being packaged with improvements along other local corridors that connect key military installations in the region.

Black Forest Road Widening, Colorado Springs, CO. Project Principal for this key project to increase capacity along within a high-growth part of Colorado Springs. AECOM provided corridor planning for a 3-mile segment from Woodmen Road to Old Ranch Road. Preliminary and final design followed to widen along this corridor. Construction will provide an urban 4-lane section for 1.5 miles, ADA and multimodal accommodations, and replace the Cottonwood Creek Bridge.

Academy Boulevard Reconstruction, Colorado Springs, CO. Project Principal for this major arterial in southeast Colorado Springs. AECOM provided preliminary and final design services for reconstruction of 3-miles of this urban corridor from Bijou Street to Airport Road and Fountain Boulevard to Proby Parkway. Construction is planned to start in late 2020.

Centennial Boulevard Extension, City of Colorado Springs, CO. Project Principal/Manager for design of a PPRTA-funded project to extend a 4-lane urban section of Centennial Boulevard from Fillmore St to the I-25 / Fontanero St interchange. This 1.5 mile segment provides a critical connection to improve mobility while enhancing access to new development areas and improving quality of life for west side residents. The corridor development phase evaluated different options and reduced impact to the surroundings through the vertical placement and typical section used. Close coordination with adjacent development will ensure cleanup of a former landfill, while balancing the net earthwork balance for the site.

US 160 Wildlife Crossings, Archuleta County, CO. Project Principal for a CDOT R5 project to provide a wildlife overpass structure, wildlife underpass structure, passing lanes and other improvements along US 160 near the intersection of SH 151. Coordination with CDOT, the Southern Ute Tribe, and the San Juan National Forest was necessary. Design was completed in 2019.

Pikes Peak Avenue, City of Colorado Springs, CO. Project Principal for design of a PPRTA-funded project to replace the pavement section and provide improvements to the drainage system and multi-modal accessibility of Pikes Peak Avenue between Shooks Run and Printers Parkway.

Lamar Reliever Route, Lamar, CO. Project Manager for design of nearly 10 miles of new CDOT R2 highway for this Ports-to-Plains corridor around the City of Lamar. The new route replaces the existing US 287 and US 50 highways that pass through the City, ultimately with a 4-lane free-flow high-speed reliever route for truck traffic continuing past Lamar. The project includes three ultimate interchange locations. AECOM is working with CDOT R2 to evaluate cost-effective interim solutions, for a phased implementation approach to the project. AECOM is also coordinating with the City of Lamar, Prowers County, and local business owners to develop interchange solutions that uphold their economic success and promote a prosperous downtown.

SH21 Powers Boulevard Corridor Support, Colorado Springs, CO. Project Principal for a contract to provide corridor-wide support to CDOT R2 for this ultimate 6-lane freeway facility around the eastern side of Colorado Springs. AECOM is organizing and indexing 20 years of data related to the corridor, including two EA documents, to assist CDOT in preserving and advancing the ultimate goals for Powers Boulevard. In addition, AECOM is obtaining survey and advancing conceptual design of the future North segment from SH83 to Voyager Parkway.

Monument Hill Road Safety Improvements, El Paso County, CO. Project Principal for an El Paso County project to evaluate and provide safety improvements along this 2.4 miles road. Located on the Palmer Divide, this corridor receives severe weather and has a poor accident history at several locations. AECOM evaluated corridor deficiencies, alternatives, and prioritized improvements. The initial improvements will provide a revised typical section, address drainage issues, and improve intersection operations. Final design of the initial improvements was completed in 2017, with construction in 2018.

US 50 / SH 9 Resurfacing, Fremont County, CO. Project Principal for a CDOT R2 project to provide roadway surface, safety, structural, and drainage improvements along 28-miles stretch of SH 9 and US 50 in Fremont County between Canon City and Parkdale. AECOM completed construction plans on a fast-track schedule in 2016 for construction in 2017.

Lime Road Phase 2 Realignment, Pueblo, CO. Project Principal for a City of Pueblo project to realign Lime Road for a new crossing of the existing railroad tracks. The project will improve safety while enhancing the development potential for this industrial corridor. AECOM completed final plans in early 2016.

Isaac Allen, EI, CFM

2D Hydraulic Modeling

Education
M.S., Civil Engineering, University at Buffalo
B.S., Environmental Engineering, Syracuse University,

Years of experience
Total: 6
With AECOM: 6

Location: Denver, CO

Registrations/Certifications
Professional Engineer, Colorado
ASFPM Certified Floodplain Manager, Colorado

Mr. Allen has been primary modeler for a variety of hydraulic modeling studies of varying complexity in both one and two-dimensional environments. He has lead a number of efforts to implement new and innovative solutions and takes pride in developing quality, defendable work that reflects well on all team.

Professional history

Mr. Allen has experience in a variety of surface water modeling projects focused on floodplain mapping, flood hazard mitigation, bridge design and evaluation, and watershed planning. His primary skills include design and analysis using hydrologic and hydraulic modeling techniques, as well as development of geographic information systems. He is proficient in data analysis, presentation, and the development of innovative approaches and community outreach.

Selected project experience

Colorado Hazard Mapping Program, Colorado Water Conservation Board. This project developed updated flood risk information for nearly 700 miles of streams impacted by the 2013 floods in the Big Thompson and St Vrain Watersheds and along the South Platte River. Performed 2-D hydraulic analyses for select streams using the U.S. Bureau of Reclaimations's Sediment and River Hydraulics (SRH-2D) model as well as the combined 1-D/2-D capabilities of the USACE HEC-RAS. Results from these analyses are currently being used for regulatory updates to the FEMAs DFIRMs. Assisted in the development of a process to analyze floodways for 1-D/2-D combined and 2-D hydraulic models. Implemented the process to analyze 1-D/2-D combined floodways for portions of St. Vrain and Boulder Creeks in Weld County and Boulder County, CO. Developed GIS tools to support the 1-D/2-D floodway analyses. Performed hydraulic analyses for hunderds of miles of streams using the HEC-RAS 1-D software package. Coordinated with various private and public entities to assemble hydrologic analyses for over 450 miles of streams into FEMA compliant Techncial Support Data Notebooks (TSDN). Created hydrologic models for approximately 50 miles of stream using the USACE Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS) software package. Presented project information to numerous government agencies, communities, watershed coalitions, and consultants at a project progress meetings and technical conferences.

Central Federal Lands Highway Division (CFL), Moraine Avenue and Riverside Drive CO FLAP, Estes Park, CO. Leveraged SRH-2D hydraulic model developed for the CHAMP project to evaluate proposed conditions alternatives. Calculated scour impacts for proposed conditions using SRH-2D outputs.

CDOT, SH60 and SH257 Bridge Study, Milliken, CO. Developed a HEC-RAS model for existing and proposed conditions to be used in a Conditional Letter of Map Revision (CLOMR) submittal. Used SRH-2D hydraulic model to develop flow estimates for multiple split flow reachs. Used flow estimates to supplement HEC-RAS lateral weir capabilities. Developed proposed conditions surface to be used in HEC-RAS analysis using ArcGIS.

FEMA, 2-D Floodway Innovations, Various. Deptuy project manager for a FEMA innovations projects looking at alternative floodway analyses for 2D and coupled 1D/2D models. Lead team of modelers to compile results of various alternatives to facilitate discussion with FEMA on future updates for 2D modeling guidance and standars. Primary author of a 2D Floodway Whitepaper used as background for a FEMA IPT technical group which was responsible for short-term updates to guidance and standards to facilitate 2D model use. Attended meeting at U.S. Army Corps of Engineers Hydrologic Engineering Center to discuss implementation of new floodway analysis tools in HEC-RAS software.

Jessica Barr, EIT

Erosion Control, BMPs, & Low Impact Development

Education
BS, Civil Engineering/ Technology,
Metropolitan State University, Denver

Years of experience
Total: 9
With AECOM: 9

Registrations/Certifications
Engineer in Training (EI)

Location
Denver, CO

Jessica has experience in performing water resource engineering analysis and design, particularly focused on stormwater and transportation drainage

Professional history

Jessica has 9 years of experience performing water resource engineering analysis and design, particularly focused on stormwater and transportation drainage. Her design experience includes, floodplain mapping, bridge hydraulic design, scour analysis, H&H analysis, pond analysis and post-fire mitigation.

Selected project experience

CDOT R4, State Highway 72 Permanent Repairs, Jefferson County, CO. Design Engineer responsible for hydrologic and hydraulic analysis along a 12.5 mile section of the SH72 corridor. The 2013 September floods resulted in disastrous flooding along Coal Creek, which runs parallel to SH72. Sections of roadway and embankment were washed away and numerous infrastructures were severely damaged.

CCD, Upper Sanderson Gulch, Denver, CO. Drainage Lead for the design of storm sewer systems to alleviate flooding along residential neighborhood streets. Project consists of hydrology, hydraulics, and 2D flow analysis.

CDOT, SH119 Park and Ride, Firestone, CO. Drainage Design Lead responsible for the design of transportation drainage components for the expansion of the Regional Transportation District's Park-an Ride parking lot and additional of bus station pullouts. The project consists of closed storm drain systems, culverts and open roadside channels.

CDOT, I-25 Rehab. Stormwater Design Engineer responsible for the design of cross culverts and roadside ditches for the widening of I-25 along 5 miles of highway. The project consists of closed storm drain systems, open roadside channels, and water quality.

CCD, Tennessee & Oneida Storm Sewer Improvements, Denver, CO. Assistant Project Manager and Drainage Lead for the design of storm sewer systems to alleviate flooding along Oneida Street. Project consists of hydrology, hydraulics, pond analysis and crossing of a 72" waterline with a large storm sewer system.

CDOT, C-470 Tolled Express Lanes Segment 1 D/B, Douglas County, CO. Stormwater Design Engineer responsible for the design of transportation drainage components for the widening and addition of tolled express lanes along 13 miles of highway. The project consists of closed storm drain systems, open roadside channels, bridge replacements and water quality.

El Paso County, Post–Fire Mitigation for Waldo Canyon, El Paso County, CO. Design Engineer responsible for the analysis and design of post-fire mitigation improvements. This project consisted of mitigating the impacts from the June 2012 Waldo Canyon Wildfire, which burned approximately 18,000 acres and altered the hydrologic and hydraulic characteristics of the burn area. Improvements included 2,500 feet of channel restoration, drop structures, bendway wiers and, low water crossing.

CDOT, 11th Street Bridge Replacement, City of Pueblo, CO. Design Engineer responsible for designing transportation drainage components for roadway realignment and bridge replacement and extended detention basin for water quality purposes. Prepared drainage plan set, project cost estimate, and drainage report.

Pikes Peak Rural Transportation Authority, Austin Bluffs Parkway Bridge and Roadway Improvements, Colorado Springs, CO. Design Engineer responsible for performing hydrologic analysis and quality control detail checks on drainage facility hydraulics and design.

William Barreire, PE (Vivid Engineering Group)

Geotechnical Engineering

Education
BS Civil Engineering, Colorado State University
MS Geotechnical Engineering, University of Colorado

Years of experience
Total: 28

Location
Colorado Springs, CO

Registrations/Certifications
Professional Engineer: CO, TX, MT, WY, NM, AZ

Mr. Barreire has 28 years of practical experience providing geotechnical engineering, materials testing/inspection, services in the water, transportation, energy, federal, and commercial market sectors

Professional history

Mr. Barreire experience includes a significant amount of drainage related projects for various agencies and municipalities. His expertise includes providing geotechnical engineering services including geologic and hazard mapping, subsurface investigations, recommendations, and design services for slope stability/embankment retention, retaining walls, detention pond design and construction, scour protection, drop structure foundations, and channel armoring ranging from concrete lining, soil cement, and riprap to reinforced earth, erosion mats, and native seeding/vegetative cover.

Selected project experience

Fountain Creek Improvement Projects, El Paso and Pueblo Counties, Colorado. Mr. Barreire was the geotechnical engineer for numerous geotechnical projects within and adjacent to Fountain Creek within El Paso and Pueblo Counties, providing subsurface drilling, test pit explorations, and engineering analysis for the placement, design, and construction of erosion control measures including localized re-grading/filling of the channel, construction of minor fill slopes, placement of grouted rip-rap, and other improvements to decrease hydraulic velocity and maintain channel integrity to protect utility infrastructure. Follow on services will include construction inspection and testing services as well for several of these projects when construction occurs.

Sand Creek Channel and Bank Stabilization/Restoration Projects, Colorado Springs, Colorado. Mr. Barreire served as the geotechnical engineer for various projects within and adjacent to Sand Creek, providing subsurface drilling and engineering analysis for the placement, design, and construction of erosion control measures including localized re-grading/filling of the channel, construction of minor fill slopes, placement of grouted rip-rap, and other improvements to decrease hydraulic velocity and maintain channel integrity to protect utility infrastructure.

Cottonwood Creek PDM Grant Reach, Academy Boulevard to Monument Creek, Colorado Springs, Colorado. The overall project included improving the section of Cottonwood Creek between North Academy Boulevard and its confluence with Monument Creek located just west of Interstate 25. Mr. Barreire led the geotechnical and construction materials testing/inspection services included performing geologic mapping, a subsurface (drilling) investigation and preparation of a geotechnical report presenting the existing conditions, geologic setting, and existing hazard and stability issues. Engineering recommendations were provided for construction/stabilization of slopes, channel bed, hydraulic structures, and armoring of the channel. In addition, an evaluation addressed scour/erosion of bridge abutments and center foundations.

Monument Creek Slope Stability/Bank Erosion Investigation, Monument Creek Drainage Channel located adjacent 3755 Mark Dabling Boulevard, Colorado Springs, Colorado. As part of a geotechnical and geologic hazard study for construction of an addition to an existing manufacturing facility at the above address, Mr. Barreire performed a subsurface investigation, slope stability analysis and bank erosion study. The purpose of the study was to evaluate the potential impact to the proposed expansion from continued erosion/instability of a portion of the bank of Monument Creek that included a sharp bend, located adjacent the subject property. Based on historical flow data and subsurface information, a scour/erosion analysis as well as a global slope stability analysis was performed to help evaluate risk.

Sean Berzins, PE

Trenchless Design

Education
BS, Civil Engineering, Colorado State University, 1992

Years of experience
Total: 26
With AECOM: 13

Registrations/Certifications
Professional Engineer: CO (#33366)

Location
Denver, CO

Sean was selected for this role based on his excellent engineering and leadership skills related to managing a design staff, scheduling, budget control, and client communications.

Professional history

Sean is an experienced project manager and civil engineer with 25+ years of experience in large diameter pipeline planning, design and construction projects. He has managed multidisciplinary teams as a project manager and design lead, overseeing design staff, scheduling, budget control, and client communications. He also specializes as a design engineer of water systems, wastewater systems, hydrology and hydraulics of storm water structures, grading and drainage and transportation engineering. Sean manages project revenue, budgets and workload. He is experienced with staffing requirements to meet current and projected workload. He is also accomplished in providing construction management services and coordination with contractors, utility owners, and municipal agencies throughout the construction period to project closeout.

Selected project experience

Project Manager, Lupton Lakes Inlet/Outlet Works Design, Denver Water, Fort Lupton, CO. Project Manager responsible for managing a multidisciplinary project team in the design of a river inlet and outlet structure, flow metering structure, and conveyance pipeline from the inlet/outlet to the existing storage basins. The initial design phase involved development of the basis of design, including a master plan approach to define future hydraulic facility requirements not included in the final design phase. Final design included 30%, 60%, 90% and final design of a river intake structure and outfall structure, slurry wall penetration and grouting specifications, 54-inch steel and HDPE pipelines, and 54-inch meter and vault. The pipeline design included an 800-foot long TBM tunneling installation. The underground bore was for a 72-inch casing installation under the Colorado Department of Transportation Right-of-Way. The bore penetrated an existing slurry-wall. The design included exterior and internal grouting.

Design Lead, Manitou 30-Inch Waterline Replacement Design-Build, Colorado Springs Utilities, Colorado Springs, CO. The Manitou 30-Inch Waterline Replacement Project was a design build (DB) project to replace an existing cast iron raw waterline for Colorado Springs Utilities (Owner). As a DB project, he worked closely with Colorado Springs Utilities and Wildcat Construction (Contractor) to provide services to relocate nearly 8,500 LF of 30- inch DIP. Delivery of the project included initial design of the pipeline and continuing design efforts during the construction phase. Initial design included survey, utility locates, utility potholing, and geotechnical investigations. Design features included connections to existing pipelines, boring for creek crossings, blowoff valves, air release valves and concrete reverse anchors for thrust protection. The design also included a 400-foot long bored casing through existing bedrock. The jack and bore design was a 25-foot deep installation through bedrock including dewatering and a robust shoring system.

Design Lead, PFAS Collection System and Treatment, Confidential Client, Widefield, CO. Design Lead responsible for leading pipeline design for approximately 21,600 feet of 8- to 16- inch-diameter and approximately 27,500 feet of 24-to 36-inch diameter pipelines as part of this municipal water system project to address PFC/PFAS contamination in the groundwater source of supply. The improvements consist of collection system pipelines to collect water from 34 existing ground water wells and convey the water to two new water treatment plants. The project also included 11 bored crossings of BNSF and Union Pacific railroads and 3 bored crossings of CDOT Right-of-Way. The underground bores were under BNSF Right-of-Way and included permitting with the rail company for installation approval.

Eric Craig, PLS

Survey/Right of Way

Education
HS Diploma, Doherty HS Colorado Springs, CO

Years of experience
Total: 27
With AECOM:23

Location
Colorado Springs, CO

Registrations/Certifications
Professional Land Surveyor, CO

Mr. Craig has 27 years of experience in almost all aspects pertaining to construction, topographic and boundary surveying, including FEMA compliant flood study surveys.

Professional history

Mr. Craig has more than 19 years of experience and is experienced in almost all aspects pertaining to construction, topographic and boundary surveying, including FEMA compliant flood study surveys. His survey responsibilities have included field and office computations, contractor coordination, and on-site surveying. His construction management responsibilities have included as-built surveys, field engineering, cad design, utility coordination, compiling monthly pay estimates, project documentation, and construction inspection of utilities, structures and roadways.

Selected project experience

City of Colorado Springs, Barnes Road Widening, El Paso County, Colorado Springs, CO. Consultant Project Engineer responsible for the field and office management and documentation of the contractor's activities on the project, including the oversite of other consultant personnel. The project consisted of the widening of 1500' of Barnes Rd., an established road with heavy traffic that had to be maintained. Improvements included additional stormwater infrastructures, increased site-lines, curb, and sidewalk.

CDOT, R2, Critical Wall Repair Project, El Paso County, Colorado Springs & Manitou Springs, CO. Senior Field Inspector responsible for the field management, inspection and documentation of the contractor activities on a CDOT critical wall repair project. A portion of the project consisted of disassembling a historical stone wall, constructing a soil nail wall and drainage system behind the historic wall, and reassembling the stone wall to its original appearance. The other portion of the project consisted of shot-blasting, repairing and resealing of the concrete sound wall along SB I-25, between Fillmore St. and Bijou Ave.

Preliminary Design and Right-of-way Survey, Powers Blvd. and Airport Rd., Colorado Springs, CO: In charge of surveying and processing all drainage, utility, right-of-way and general planimetrics for Powers Blvd., from Platte Ave. to Fountain, and Airport Rd., from East Fork Sand Creek to Stewart. The proposed design is to realign Airport and Stewart, and the future design of the interchange for Powers and Airport.

Preliminary Design and Right-of-way Survey, Woodmen Road (Phase 2), Colorado Springs, CO. In charge of surveying and processing all drainage, utility, right-of-way and general planimetrics for Woodmen Rd., from Stinson Rd. to Yellowwood Dr. The proposed design is to widen Woodmen to a 3-lane road and construct a CFI intersection at Union Blvd

Preliminary Design and Right-of-way Survey, El Paso County, CO. In charge of surveying and processing all drainage, utility, right-of-way and general planametrics for transportation corridor studies in El Paso County. Projects included 10 miles Hodgen Road corridor, 2 miles of Proby Parkway (Drennen Rd.) corridor and 10 miles of Meridian Road (North) corridor.

CDOT, H24E Manitou Ave. CBC Emergency Repair Project, El Paso County, Manitou Springs, CO. Assistant Project Engineer/Inspector responsible for the field management and documentation of the contractor activities on a CDOT concrete box culvert removal and replacement project. The project consisted of replacing a collapsed portion of an existing concrete box culvert and the reconstruction of Manitou Ave., which it was under.

City of Colorado Springs, Evans Ave Bridge Replacement, Colorado Springs, CO. Project Engineer responsible for the field and office management and documentation. The project consisted of the removal and replacement of the historic bridge structure, relocation of a HDPE waterline under the channel and re-stabilizing the existing channel.

Griffin Cullen, EIT, CFM

Hydrology and Hydraulic Modeling

Education
B.S., Environmental Engineering, Colorado State University, 2016
B.A., Liberal Arts, Saint Mary's College of California, 2016

Years of experience
Total: 5
With AECOM: 5

Location
Denver, CO

Registrations/Certifications
Fundamentals of Engineering Certificate, Colorado, December 2016
ASFPM Certified Floodplain Manager, Colorado, September 2018

Ms. Cullen primary experience includes design and analysis using hydrologic and hydraulic modeling techniques, as well as river modeling and restoration.

Professional history

Ms. Cullen is a Water Resources Engineer in the AECOM Surface Water Group in Denver with experience in floodplain mapping, flood hazard mitigation studies, and drainage design. Her primary responsibilities include design and analysis using hydrologic and hydraulic modeling techniques, as well as river modeling and restoration. She is proficient in data analysis, technical writing, and creative thinking. Ms. Cullen's studies focused on hydraulic modeling and stream restoration, which included design projects on the Saint Vrain River in Lyons, Colorado.

Selected project experience

Colorado Water Conservation Board (CWCB), Colorado Hazard Mapping Program, Northern Colorado. The Colorado Hazard Mapping Program was initiated in 2015 in order to provide updated flood and erosion risk to communities affected by the September 2013 floods within the Saint Vrain and Big Thompson Hydrologic Unit Code (HUC) 8 Watersheds. Responsibilities on this project include:

- Coordinating with various private and public entities to assemble hydrologic analyses of streams into FEMA compliant Technical Support Data Notebooks (TSDN).
- Performing hydraulic analyses for approximately 80 miles of streams using the USACE HEC-RAS (River Analysis System) software package.
- Delineating floodplains and generating floodways on 10 different streams within the two watersheds.
- Assisting in Flood Insurance Rate Map (FIRM) development and compiling data to comply with FIRM Database technical standards.
- Organizing deliverables for presentation to government agencies, communities, watershed coalitions, and consultants.

Town of Breckenridge, Illinois Gulch Storm Sewer/Sidewalk Rehabilitation Project Phase 1, 2, & 3. The Town of Breckenridge contracted AECOM to perform an alternative analysis on a heavily degraded triple barrel CMP and sagging sidewalks and responsibilities include:

- Performed alternative analysis for repairs using HEC-RAS modeling and communicated with the Town to determine the selected alternative.
- Prepared an engineering's opinion of probable construction costs for the selected alternative as well as draft bid documents.
- Provided construction oversight and coordinated with the contractors on submittals and RFIs.
- Assisted in FEMA Letter of Map Revision (LOMR) submittal by performing the hydraulic analysis, preparing LOMR documentation, mapping, and forms.

Gilpin County Risk MAP, Colorado Water Conservation Board. As part of the Gilpin County Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) Countywide update, all streams were restudied. Responsibilities included:

- Acquiring and processing terrain data for the entire county from multiple sources.
- Analyzing the hydrology using USGS regression analysis, rainfall-runoff modeling, and gage analysis.
- Developing 2D HEC-RAS Rain-on-Grid model for the Base Level Engineering (BLE) streams and 1D HEC-RAS and Storm CAD models for the Enhanced Study reaches.
- Assembling a combined Terrain, Survey, Hydrology, Hydraulics and Floodplain Mapping FEMA compliant Technical Support Data Notebook (TSDN).

Black Forrest Road Widening Corridor Plan, City of Colorado Springs. AECOM was contracted to design the roadway expansion of Black Forest Road

from Woodmen Road to Old Ranch Road. My responsibilities for this project are:

- Analyzing existing hydrologic and hydraulic conditions in accordance with the City of Colorado Springs Drainage Criteria Manual.
- Designing drainage improvements to capture new roadway runoff as well as designing two full spectrum detention ponds that will provide water quality.
- Hydraulically evaluating the existing bridge at Cottonwood Creek to determine existing and proposed freeboard and scour.

6400 South Tributary Stabilization Project, Town of Castle Rock Water Stormwater Division. This project will provide stabilization to the 6400 South Tributary that has experienced erosion issues near infrastructure and recreational facilities that could compromise public safety. Responsibilities included:

- Coordinating with the topographic survey team to acquire channel cross sections, utility locations, structures, and wetland delineation.
- Reviewing existing hydrologic studies of the area and formulating a suggested approach.
- Obtaining the FEMA regulatory model and using this as the basis for a hydraulic analysis of up to three design alternatives. This model will be compliant with CLOMR and LOMR requirements.
- Communicating permitting strategies to the Town in order to successful stabilize the stream while still sustaining the environmental integrity of the site.

Hover Development Company, LLC, 1901 South Hover Street Development Project CLOMR. This project worked to reassess the existing complex hydraulics through three parallel bridges and three parallel roadway/railroad embankments that define the flood hazards along Left Hand Creek near the project site before assessing the impacts from the proposed site development. Responsibilities included:

- Performed 2D HEC-RAS hydraulic analysis to determine split flow paths, split flow amounts, and overtopping flow amounts between the bridges and embankments.
- Calibrated the regulatory 1D model to include a new encroachment study along each split flow using results from the 2D hydraulic analysis.
- Prepared the Conditional Letter of Map Revision (CLOMR) documentation, mapping, and forms in accordance with current FEMA standards.

Joel Jones, PE

Stormwater Master Planning

Education
MS, Civil Engineering, University of Colorado, Denver, 2007
BS, Civil Engineering, University of Colorado, Denver, 1993

Years of experience
Total: 20
With AECOM: 12

Location
Denver, CO

Registrations/Certifications
Professional Engineer, Colorado, #33916
Professional Engineer, Wyoming, #13561
Professional Engineer, Arkansas, #15190
Professional Engineer, New Mexico, #21804

Mr. Jones has more than 20 years of experience in civil engineering with technical knowledge in both water resources and geotechnical engineering.

Professional history

Mr. Jones has considerable experience in the analysis and design of stormwater control projects involving: dams; bridges; culverts; channels and channel stabilization structures; mine tailing storage facilities; mine heap leach pads; mine process water ponds; mining stormwater permitting; SPCC, NPDES and NEPA permitting; hydrologic and hydraulic analysis; and work in FEMA regulated waterways

Selected project experience

City of Casper, Stormwater Master Plan, Casper Wyoming. Design Engineer and Hydrologist for the Stormwater Master Plan for tributary watersheds to the North Platte River within the city. The plan summarizes the existing hydrologic, hydraulic and water quality conditions and that can be used as guidance for future water resources development in the area. Hydrologic and hydraulic analysis on the planning level for 12 sq. mi. catchment using InfoSWMM hydrologic and hydraulic models. Deliverables include a final plan and separate Water Quality report on the Cities' NPDES MS4 permit. Responsible for hydrologic and hydraulic designs, preparation of alternatives and final CIP, client contact, and staffing.

City of Delta, Stormwater Master Plan, Delta, Colorado. Project Manager for a master drainage plan that summarizes the existing hydrologic, hydraulic and water quality conditions and that can be used as guidance for future water resources development in the area. Hydrologic and hydraulic analysis on the planning level for 64 sq. mi. catchment using HEC-HMS, HEC-RAS and XPSWMM hydrologic and hydraulic models. Deliverables include a final report with a CIP plan and a separate water quality memorandum outlining the needs of the city for their upcoming NPDES MS4 permit. Responsible for hydrologic and hydraulic designs, preparation of alternatives and final CIP, client contact, and staffing

City of Gillette, Stormwater Strategic Plan, Gillette, Wyoming. Task Lead for the Stormwater Master Plan Task for two watersheds within the city. The plan summarizes the existing hydrologic, hydraulic and water quality conditions and that can be used as guidance for future water resources development in the area. Hydrologic and hydraulic analysis on the planning level for a 64 sq. mi. basin using InfoSWMM hydrologic and hydraulic models. Deliverables include a final plan and a separate water quality memorandum outlining the needs of the city for their upcoming NPDES MS4 permit. Responsible for hydrologic and hydraulic designs, preparation of alternatives and final CIP. Task lead also for the Stormwater Criteria Manual revision/rewrite. Update to the 1978 Criteria manual with complete new sections on policy, rainfall and runoff, streets and storm structures, water quality and BMP selection.

City of Boulder, WRRF Levee Repair in Colorado, USA. Professional Sealing Engineer for preparation of plans for levee repair. This fast track project provided the City of Boulder with designs to repair a 6-inch diameter waterline and levee that was damaged when the waterline broke under the levee. The plans were delivered in time for construction in the early spring before potential floods. The levee surrounds and protects the City's Water Resource Recovery Facility and a 24-inch diameter sanitary sewer pipeline lies above the water line and in the levee. Design included the levee repair earthwork drawings and specifications, water line replacement drawings, and sanitary sewer line replacement drawings. A second project will provide support for the levee repair portion of the construction.

Kevin Kullman, PE

Resident Engineering & Construction Administration

Education
BS Civil Engineering, Colorado State University, 2009

Years of experience
Total: 14
With AECOM: 5

Location
Colorado Springs, CO

Registrations/Certifications
Professional Engineer, Colorado, #48870

Kevin has assisted design teams with development of construction schedules to assist with design functions including development of time counts, constructability reviews, construction cost estimates, and plan and specification reviews.

Professional history

Mr. Kullman has 14 years of experience in the engineering industry with a diverse and progressive focus in construction administration, project management, and program management on various projects across Colorado for numerous municipalities and public agencies. His varied and extensive background as a construction manager includes delivering many successful municipal and CDOT projects in urban, rural, and freeway corridors including roadway reconstructions, ADA ramp construction, multi-agency coordination, utility relocations and coordination, stormwater and drainage installations, and substantial public involvement efforts.

Selected project experience

City of Colorado Springs, Barnes Road Improvements, Colorado Springs, CO. Project Manager. Kevin's was responsible for oversight of the AECOM project team, coordination with the City Project Manager, assistance with complex construction issues, and occasional field inspection and project engineering duties as a backup to the full-time project engineer. The project included a vertical curve correction, asphalt reconstruction of Barnes Road from the Homestead Trail crossing to Powers Boulevard to accommodate turn lanes, new sidewalks and ADA ramps, a center median, curb and gutter, coordination of multiple utility relocations, and a new storm sewer system. Also included was a new signalized intersection at Barnes Road and Rio Vista Drive/Chaparral Road, and the reconstruction and widening of Chaparral Road between Barnes Rd and Jeffery Road.

City of Colorado Springs, Vermijo and Sierra Madre Streetscape, Colorado Springs, CO. Construction Management Supervisor. Vermijo Avenue, from the base of the U.S. Olympic and Paralympic Museum at Sierra Madre Street and extending east will be transformed into a wide, pedestrian and business-friendly street that will become downtown Colorado Springs's second "Signature Street" after Tejon Street. Kevin managed AECOMs' construction management project team, coordinating with the City's and AECOM's project managers as well as Norwood's construction manager to verify proper staffing, construction phase budget management, and team performance.

Colorado Department of Transportation, FY 19 Pikes Peak Area Traffic Signal Replacement, Colorado Springs, CO. The project included replacing traffic signals at four intersections in Colorado Springs and one intersection in Fountain, including replacing pedestrian ramps and sidewalk to ADA compliance at all five locations. Coordination was required between the AECOM project team, CDOT, Colorado Springs, and CSU to effectively manage the project. Responsibilities included proactive communication with the CDOT Resident Engineer to verify staffing needs and performance, budget tracking, and coordination with the AECOM staff.

Subsurface Utility Engineering Program Manager, Statewide. Program/Department Manager. Managed and provided technical guidance to a staff of 20 engineers and technicians, providing Subsurface Utility Engineering plans to numerous cities and counties as well as the Colorado Department of Transportation. Kevin coordinated with the municipalities, designers, and other stakeholders to provide complete and accurate plans to assist in minimizing cost and potential delays on transportation projects across the state.

C470 Managed Lanes, CDOT, Douglas County, CO. Assistant Project Administrator. The C470 Managed Lanes project is adding Express Lanes along 12.5 miles of C470 from I-25 to Wadsworth

Boulevard, including widening and replacement of bridges, new concrete roadway, and installation of ITS elements and tolling equipment. Kevin coordinated work with field and office staff, assisted with project design review, reviewed working drawings, provided guidance to construction assessors, and provided field assessments during construction. 2018

I-25 Belleview to County Line Resurfacing, CDOT, Arapahoe County, CO. Consultant Project Manager. The project included bridge deck repairs, new overhead sign installation, and a mill and overlay from E-470 to Belleview Avenue. Kevin coordinated with the client and the Consultant Project Engineer to ensure sufficient and proper staffing, reviewed and contributed to change orders, provided guidance and expertise on technical issues and construction elements, and participated in discussions with the contractor on solutions to project-level disagreements.

University Boulevard from Arapahoe to Hampden Resurfacing, CDOT, Arapahoe County, CO. Consultant Project Manager. The resurfacing project included a deck replacement at Big Dry Creek, signal replacements, and a mill and overlay from Arapahoe Road to Hampden Avenue. Kevin managed the consultant staff and contract for the project and worked with the client to keep adequate staffing and provided input on unique or difficult field issues.

Region 1 Curb Ramps Phase 1, CDOT, Region Wide. Assistant Project Engineer/Consultant Project Manager. Kevin served as the subject matter expert and Assistant Project Engineer, providing oversight to the field staff, negotiating change orders, and preparing progress estimates on this project which replaced over 50 curb ramps across the Denver metro area.

Colorado Department of Transportation, US 287 Resurfacing – 120th South, Westminster, CO. Project Engineer/Consultant Project Manager. This project was centered around resurfacing a three-mile stretch of Federal Boulevard from 92nd Avenue to 120th Avenue with approximately 25,000 Tons of hot mix asphalt, deck rehabilitation of the structure over Niver Canal, and over 100 curb ramps. Kevin was the Engineer in Responsible Charge for the project, managing the construction of the project, coordinating with adjacent municipalities, coordinating public involvement, and also managed and reviewed the design of approximately 60 curb ramps by both CDOT and consultant staff during construction.

RTD, 15L Transit Improvements Project Cost Estimating, Denver, CO. Project Manager. Provided a complete plan set review and full quantity take-offs and cost estimation for RTD's $9M 15L Transit Improvements project, which consisted of improved sidewalks and ADA curb ramps, new bus pads, replacement of bus structures, asphalt paving, and new communications infrastructure. Kevin coordinated with both the design team, the RTD project management staff, and internal project staff to accurately produce the construction cost estimate.

Colorado Department of Transportation, Federal Boulevard over BNSF Bridge Replacement, Westminster, CO. Project Engineer and Consultant Project Manager. The project included new full-depth HMA paving, new curb ramps, and replacement of the structural deficient and functionally obsolete bridge over the BNSF railway in this urban corridor. Kevin reviewed all constructor submittals, managed and directed construction inspectors, oversaw girder erections and bridge demolitions and reviewed safety critical plans, and coordinated with the local stakeholders including the City of Westminster and Adams County.

I-225 RAMP Bridge Decks, CDOT, Aurora, CO. Project Engineer. Kevin served as the Engineer in Responsible Charge for this project which included deck rehabilitation, expansion joint replacement, and a polyester concrete overlay on seven structures along the I-225 corridor. He was responsible for all construction administration and management of construction staff and reviewed and prepared monthly progress estimates, change orders, and RFI's.

PAR 1109 South Entrance Bridge Construction, Metro Wastewater Reclamation District, Commerce City, CO. Assistant Project Engineer. The project included a new asphalt intersection, a two-span bridge over the South Platte River, new drainage and stormwater features, and over one half mile of concrete pavement. Kevin's role was to oversee and coordinate all construction, review construction submittals including girder erection plans, negotiate and write change orders, and run monthly progress estimates.

Leylin Marroquin, PE, CFM

Stormwater Infrastructure Design/Hydrology and Hydraulic Modeling

Education
BS, Civil Engineering,
Bucknell University, 2014

Years of experience
Total: 7
With AECOM: 7

Registrations/Certifications
PE, CO,55805
CFM, US-19-11304

Location
Denver, CO

Ms. Marroquin has experience in erosion control design, drainage design, stream restoration, water quality, flood hazard analysis and mapping and construction inspection.

Professional history

Ms. Marroquin has experience in erosion control design, drainage design, stream restoration, water quality, flood hazard analysis and mapping and construction inspection.

Selected project experience

CDOT R4, State Highway 72 Permanent Repairs, Jefferson County, CO. Design Engineer responsible for hydrologic and hydraulic analysis along a 12.5 mile section of the SH72 corridor. The 2013 September floods resulted in disastrous flooding along Coal Creek, which runs parallel to SH72. Sections of roadway and embankment were washed away and numerous infrastructures were severely damaged.

CCD, Upper Sanderson Gulch, Denver, CO. Drainage Lead for the design of storm sewer systems to alleviate flooding along residential neighborhood streets. Project consists of hydrology, hydraulics, and 2D flow analysis.

CDOT, SH119 Park and Ride, Firestone, CO. Drainage Design Lead responsible for the design of transportation drainage components for the expansion of the Regional Transportation District's Park-an Ride parking lot and additional of bus station pullouts. The project consists of closed storm drain systems, culverts and open roadside channels.

CDOT, I-25 Rehab. Stormwater Design Engineer responsible for the design of cross culverts and roadside ditches for the widening of I-25 along 5 miles of highway. The project consists of closed storm drain systems, open roadside channels, and water quality.

CCD, Tennessee & Oneida Storm Sewer Improvements, Denver, CO. Assistant Project Manager and Drainage Lead for the design of storm sewer systems to alleviate flooding along Oneida Street. Project consists of hydrology, hydraulics, pond analysis and crossing of a 72" waterline with a large storm sewer system.

CDOT, C-470 Tolled Express Lanes Segment 1 D/B, Douglas County, CO. Stormwater Design Engineer responsible for the design of transportation drainage components for the widening and addition of tolled express lanes along 13 miles of highway. The project consists of closed storm drain systems, open roadside channels, bridge replacements and water quality.

CDOT, 11th Street Bridge Replacement, City of Pueblo, CO. Design Engineer responsible for designing transportation drainage components for roadway realignment and bridge replacement and extended detention basin for water quality purposes. Prepared drainage plan set, project cost estimate, and drainage report.

Pikes Peak Rural Transportation Authority, Austin Bluffs Parkway Bridge and Roadway Improvements, Colorado Springs, CO. Design Engineer responsible for performing hydrologic analysis and quality control detail checks on drainage facility hydraulics and design.

Colorado Springs Utilities, Woodmen Road Corridor Improvements Project Phase II, Pikes Peak Rural Transportation Authority, Colorado Springs, CO. Design Engineer responsible for designing storm drainage systems and water quality pond for approximately 1.5 miles of roadway related to the widening of Woodmen Road, a major east/west corridor within Colorado Springs. The project included widening Woodmen from two lanes to three continuous lanes in each direction from I-25 to east of Woodmen Commons and the replacement of the existing Woodmen Road/Academy Boulevard intersection with a grade-separated interchange. Prepared drainage plan set, project cost estimate, and drainage report.

Jeff McKelvey, PLA, ASLA, ENV SP

Landscape Architecture & Urban Planning

Education
BS, University of Georgia
MSRECM, University of Denver

Location
Denver, CO

Years of experience
Total: 17
With AECOM: < 1

Registrations/Certifications
Landscape Architect, Colorado, LA.0000780
CLARB Certified
Envision Sustainability Professional (ENV SP)

Jeff brings nearly 20 years of experience in landscape architecture, planning and urban design across a broad range and scale of project types, both domestic and international.

Professional history

Jeff has experience in all relevant areas of site planning and design, including master planning, site analysis, conceptual design, detailed site design, construction documentation, and implementation. His primary areas of expertise include integrated project delivery, construction feasibility and implementation, with a strong track record of working effectively through all phases of a project lifecycle to deliver projects that exemplify excellence in design, sound technical execution, and commitment to sustainability. Recognized as a senior contributor and technical lead with expertise in constructability and integrated project delivery, Jeff has played an integral role in delivering high-profile streetscape and public realm projects.

Selected project experience

16th Street Mall Improvement Project, Denver, CO, Technical Lead for Landscape Architecture. The iconic 16th Street Mall, originally constructed 1982, is one of the longest pedestrian malls in the world at 1.2 miles and nearly 18 blocks in length. The Mall is a regional destination for commercial and cultural activities in Downtown Denver and serves as a last mile connection between the transit hubs at Union Station and Civic Center Park. The project will utilize state and local funds as well as U.S. Department of Transportation (USDOT) grant funds to reconstruct and renovate the 16th Street Mall to increase opportunities for public use of the Mall as an iconic civic space while also addressing the deteriorating infrastructure, improving safety, and maintaining transit operations. Responsible for oversight of the public realm design process of the 16th Street Mall Improvement Project. Managed the production of technical documentation related to the public realm during the procurement phase, specifically regarding construction feasibility and quality control. Advised the design team on integrating cost considerations and construction sequencing into the design process. Coordinated design efforts with project stakeholders including the Downtown Denver Partnership, City and County of Denver, Federal Transit Administration (FTA), Regional Transportation District (RTD), and the Denver Urban Renewal Authority (DURA).

Denver Water Operations Complex Redevelopment – Denver, CO. The Denver Water Operations Complex project represents the redevelopment and modernization of a 34.6-acre water utility operations complex that has been in operation since 1881. The redevelopment features a new 190,000 SF Administration building along with seven other completely new facilities including new Fleet Services, Meter Shop, Trades, Warehouse and Wellness buildings, a 490-space parking garage, and a renovated conference and training center adapted from the 132-year-old Three Stone pumping station. Eight buildings within the complex have been awarded Platinum, Gold, and Silver levels of LEED certification. Serving as the lead landscape architect, my responsibilities included providing full landscape architectural services from schematic design through construction documentation and implementation.

Horizon Uptown – Aurora, CO. Horizon Uptown is a proposed 500-acre mixed-use, sustainable community development located on the southwest corner of Interstate 70 and E-470 in the eastern suburbs of the Denver metro area. Developed by Lendlease Communities, the estimated $1.7 billion project would feature 3,800 residential units, 2.9 million square feet of office space, 1.25 million square feet of retail, lodging and restaurant space, 60 acres of parks, a variety of recreational amenities, and a K-8 school built out over a period of 25 years. Serving as the lead landscape architect, my responsibilities included providing full landscape architectural services including schematic design, design development, and construction documents including site plans,

planting plans, construction details and specifications for the Phase 1 streetscapes, pocket and neighborhood parks, as well as the first phase of the Central Park.

Colorado Department of Transportation (CDOT) Region 1 Headquarters – Denver, CO. The Colorado Department of Transportation (CDOT) Region 1 Headquarters is a five-story, 175,000 square foot office building in the Sun Valley neighborhood just southwest of Downtown Denver. The $45 million facility includes a 400-space parking garage and features a high-quality public plaza space that engages nearby transit and is the face of the new facility. The 2.98-acre transit-oriented development (TOD) site immediately adjacent to the RTD Decatur-Federal station offers direct access to light rail and several major bus lines. The site is also adjacent to the Lakewood Gulch and Platte River recreational trail systems. Provided technical design and construction documentation services in my role as project landscape architect.

Greeley Downtown Streetscape Improvements – Greeley, CO. $2.6 million infrastructure project led by the Greeley Downtown Development Authority to revitalize the downtown commercial district. Funded through a public-private partnership between the city of Greeley and downtown property owners, the project focused on modifying the Eighth and Ninth Street pedestrian plazas to re-open them to one-way traffic and increase visibility and access to the businesses, construction of a walkway across Lincoln Park designed to draw Union Colony Civic Center and Recreation Center patrons to downtown shops and restaurants, new streetscape and lighting improvements along Eighth Avenue, and the creation of 200 additional parking spaces within the downtown commercial district. Provided full landscape architectural services from concept through construction documentation and implementation in my role as project landscape architect.

Buffalo Mountain Ranch – Silverthorne, CO. Proposed upscale, private golf-course community planned for the east side of Highway 9 in Silverthorne on 523 acres extending from the Blue River to the National Forest boundary, featuring more than 350 home sites surrounding an 18-hole golf course. Provided master planning services in my role as project landscape architect.

Brysen Mustain, PG (Vivid Engineering Group)

Geotechnical Engineering

Education
BS, Geology, Adams State College

Years of experience
Total: 17

Registrations/Certifications
Professional Geologist: CO, WY

Location
Colorado Springs, CO

Mr. Mustain has over 17 years of experience with geotechnical, environmental, and geological engineering projects

Professional history

Mr. Mustain experience includes numerous field and subsurface investigations, project engineering, and project management involving geotechnical investigations and geologic hazard evaluations for commercial, industrial, and infrastructure projects. In addition, his experience includes a significant amount of creek channel/drainage improvement related projects for various agencies and municipalities along the Colorado Front Range, including the City of Colorado Springs, Colorado Springs Utilities, El Paso County, and Fountain Creek Watershed. Mr. Mustain has also overseen exploratory drilling services for a variety of investigations and gained considerable experience with a number of drilling techniques, as well as installation of piezometers to monitor groundwater levels and inclinometers to monitor slope movements.

Selected project experience

Cottonwood Creek Slope Stabilization – Colorado Springs, Colorado. Mr. Mustain served as the Engineering Geologist for an extensive geologic/geotechnical investigation of a major urban drainage with numerous unstable soil and rock slopes protecting a major Colorado Springs Utilities' sanitary sewer infrastructure. Project-specific geologic mapping, subsurface drilling services, global slope stability analyses using the program SLOPEW®, and geotechnical recommendations were prepared for design of slope improvements. The design remediation included a permanent rock bolt/soil nail system tied into a temporary micropile system, grouted rip-rap toe protection, and channel re-grading to stabilize an existing slope being undercut by erosive hydraulic forces.

Monument Creek Slope Stability/Bank Erosion Investigation – Monument Creek Drainage Channel located adjacent Goose Gossage Park, Colorado Springs, Colorado. Mr. Mustain served as Project Geologist, providing geotechnical engineering services for one phase of design and construction in a major drainage extending through a major urban and recreation area. The services provided included subsurface drilling, geologic mapping, slope stability analyses, and engineering analysis for the placement, design, and construction of erosion control measures including rip-rap slopes, drop structures, and cut-off walls.

Channel Stabilization Projects – Monument Creek at Woodmen & Commerce, Douglas Creek at Mark Dabling Blvd., Cheyenne Creek at Motor Way, and Monument Branch located west of Voyager Parkway - Colorado Springs, Colorado. Mr. Mustain served as the Engineering Geologist for geotechnical investigations performed to support design and construction of new grade control (drop) structures within portions of the above-mentioned creek channels in Colorado Springs. The services provided included subsurface drilling and engineering analysis for the placement, design, and construction of localized re-grading/filling of the channels, construction of fill slopes, placement of grouted rip-rap, and other improvements to decrease hydraulic velocity and maintain channel integrity.

Camp Creek Channel Stabilization at Garden of the Gods Park – Colorado Springs, Colorado. Mr. Mustain served as the Engineering Geologist/Project Manager for a geotechnical investigation performed to support design and construction of channel stability improvements along Camp Creek in the vicinity of Garden of the Gods Park. Mr. Mustain provided subsurface drilling and information along the channel alignment to support design of localized re-grading/filling of the channel, construction of minor fill slopes, placement of grouted rip-rap, and other improvements to decrease hydraulic velocity and maintain channel integrity.

Craig Parent, PE, SE

Structural Design

Education
BS, Civil Engineering/ Technology,
Metropolitan State University, Denver

Years of experience
Total: 25
With AECOM: 25

Registrations/Certifications
Engineer in Training (EI)

Location
Denver, CO

Mr. Parent is experienced in many facets of bridge and structural engineering including finite element analysis, seismic analysis, reinforced and prestressed concrete, structural steel, complex drainage structures and project management.

Professional history

Mr. Parent is experienced in many facets of bridge and structural engineering including finite element analysis, seismic analysis, reinforced and prestressed concrete, structural steel, complex drainage structures and project management. These interests have been extensively applied in his work with AECOM in bridge design and rehabilitation; design-build and other fast track projects; and earthquake risk analysis.

Selected project experience

CDOT, 2013 Colorado Flood Disaster Repair Project, Colorado. Local Agency representative for Boulder County for damage assessments and repair reimbursement. Boulder County has over 20 sites that were damaged in the federally declared flood disaster that caused an estimated $7000M in damages throughout Colorado. Provided site assessments for an estimated $50M in damages including severe damage to a 10 mile stretch of Lefthand Canyon Drive and two bridge replacements. Assessments included site visits and developing repair scope and cost estimates for FHWA reimbursement. Providing design oversight which includes Lefthand Canyon and the East County Line Road and Sunset Street Bridges over St. Vrain Creek.

Colorado Department of Transportation SH55 over S. Platte River Streambank Stabilization Project. Project Manager for the design of a 745 foot steel sheet pile wall with a timber facing on the south streambank as well as a 258 foot guidebank on the north streambank which includes a steel sheet pile wall. The purpose of the south sheet pile wall is to prevent lateral stream migration and ultimately scour damage to the south abutment of the SH55 Bridge over the S. Platte River. The north guidebank will provide additional protection for the north abutment while funneling the stream under the primary bridge spans. These structures will provide resiliency to future flood events similar to the 2013 and 2015 Colorado floods.

West 11th Street Bridge Replacement, Pueblo, Colorado. Engineer of Record for a 3-span precast prestressed concrete bridge over Wild Horse Creek. Provided an independent design check of the superstructure and foundations which was complicated by an estimated 100-yr. scour depth of over 20 ft. at the abutments. Providing post-design services for this project under construction in 2017. This was a CDOT Region 2 Local Agency Project.

CDOT Region 3, US40 Sage Creek Bridge Replacement, Colorado. Project manager for the replacement of a timber bridge built in 1933 with a 20’ x 10’ reinforced concrete box culvert. The project included approximately 1500’ of roadway reconstruction that corrects existing geometric deficiencies. The project also includes phased construction, hydraulic design; stormwater management plans; project control survey and right-of-way survey. This project is part of a blended team with CDOT who performed geotechnical engineering, utility coordination and environmental services.

Colorado River Water Conservation District, Ritschard Dam Tower Bridge, Kremmling, Colorado. Lead structural engineer for the inspection, structural analysis, and evaluation of the Ritschard Dam Tower Bridge. The tower bridge is an existing steel structure that provides access to the intake tower of Wolford Mountain Reservoir from the crest of Ritschard Dam. The bridge consists of four, simply supported spans with a reinforced concrete deck and reinforced concrete substructures. The evaluation summarized the movement of the bridge and provides recommendations for maintaining stability in the near term as well as potential future rehabilitation measures.

Edward Parks

Public Outreach

Education
MA, Urban & Environmental Planning (Hons), Griffith University, 2010
BA, History, Ohio University, 2004

Years of experience
Total: 13
With AECOM: 3

Location: Denver, CO

Ed is senior planner with 13 years of experience in transportation planning. He has led or played a key role in several large-scale public involvement programs.

Professional history

Ed has 13 years' experience in transportation planning and has played a key role in large scale capital improvement programs and projects. Ed is currently the program manager for the Colorado Department of Transportation Division of Transit and Rail's Senate Bill 267 Transit Program. In this role he is leading the development of a Mobility Hub Handbook, Mobility Hub Area Plans, stakeholder engagement strategies and policy development for the division. Prior to joining AECOM, Ed was stationed within the Illinois Tollway's Planning Department to work on the Tollway's $14B Move Illinois Capital Program.

Selected project experience

Colorado Department of Transportation, Division of Transit and Rail Program Management. Program Manager leading the development of CDOT's Mobility Hub Handbook, sub-sequent Mobility Hub Area Plans and stakeholder development to identify hub locations. In addition to the work on these key deliverables Ed is leading the strategy and development of the Divisions first capital program under Colorado Senate Bill 267 funding. This includes the identification potential transit projects and coordination with key stakeholders around the state of Colorado.

Boulder County, US 287 Bus Rapid Transit Feasibility Study, Boulder, Colorado. Public involvement lead to study the feasibility of implementing Bus Rapid Transit services along the US 287 corridor. Study recommendations will outline transit and multimodal improvements along the corridor. In addition, station improvements will be identified for further evaluation in the next phase of the project.

Colorado Smart Cities Alliance, Mobility Evolution Initiative, Englewood, Colorado. Project Manager leading the study of 7 Regional Transportation District light rail stations along the Southeast corridor to determine the best station to implement smart mobility tools to enable the launch an automated shuttle service. The shuttle service will help alleviate first and last mile issues at the stations and improve transit ridership. A key portion of the study is an examination of first and last mile strategies at each station.

US 34, 35th and 47th Interchange Improvement Project, Colorado Department of Transportation Region 4 and City of Greely. Ed is the Public Involvement Task Lead for the project. This includes the planning and management of open house meetings and communication materials.

Peyton Transportation and Drainage Master Plan, Peyton and El Paso County, Colorado. Ed is the Public Involvement Task Lead for the project. This includes the planning and management of open house meetings and communication materials.

Vine and Lemay BNSF Intersection Improvements, City of Fort Collins. Ed was the Public Involvement Task Lead for the project. This included the planning and management of open house meetings and communication materials.

Statewide Transportation Systems Management and Operations Planning, Colorado Department of Transportation, Denver, Colorado. As Project Manager, Ed led a team in the development of a planning and project prioritization methodology for the CDOT Division of Transportation Systems Management and Operations. The prioritization tool will enable the division to better determine project return on investment and track corridor performance.

Investing 4 the Future Program Management, Wheat Ridge, Colorado. Ed conducted a review of the socioeconomic and the environmental justice sections within the Wadsworth Boulevard Widening Project Environmental Assessment for the City of Wheat Ridge.

Celeste Raine, PE

Civil Design

Education
BS, Construction Engineering,
Iowa State University

Years of experience
Total: 21
With AECOM: 11

Location: Denver, CO

Registrations/Certifications
Professional Engineer, Colorado
Project Manager Certification

Celeste's background in the construction industry has shaped her design that focuses on constructability, cost, and schedule.

Professional history

Celeste performs the duties of a Roadway Team Lead and Transportation Project Manager for the Roadway Group located in Colorado Springs, CO. She has 21 years of experience in civil and construction engineering at various locations in the United States. Her background in the construction industry has shaped her design that focuses on constructability, cost, and schedule. These skills along with her meticulous attention to detail have provided a well-rounded approach to her transportation design.

Selected project experience

City of Colorado Springs, Pikes Peak Avenue Reconstruction, Colorado Springs, Colorado. Project Manager. Celeste led the design for the pavement reconstruction of 1.25 miles of Pikes Peak Avenue from Shooks Run to Printers Parkway. Design will remove and replace deteriorating pavement, curb and gutter, sidewalk, and driveways along the corridor. Design has included practical and cost-effective solutions to improve the driver experience by reducing cross slope, and eliminating jarring grade changes in intersections. Celeste coordinated with project stakholders, (Nor'wood and CSDB), and multiple business and residential owners throughout the corridor.

City of Pueblo, Lime Road Realignment, Pueblo, Colorado. Project Manager. The goal of this project was to realign Lime Road over the BNSF and UP railroad tracks, and improve access to the adjacent businesses. Design included roadway geometry adjustments to improve sight distance and safety for vehicles and trains. The design team adjusted vertical geometry to minimize impact to the landscaping, signage and gates for these adjacent businesses. The design refinements allowed for reduced construction and easement costs. Celeste accelerated the schedule to accommodate railroad construction and meet the client's construction timeframe.

City of Pueblo, Union Avenue Bridge Pre-Scoping Report, Pueblo, Colorado. Project Manager. Celeste served as the Project Manager for a prescoping report of the Union Avenue Bridge. The bridge was built in 1925 and is a 568' long, 3-span structure that spans the Arkansas River and Pueblo Railyard. This bridge serves as an important link between South Pueblo and Downtown. The City has determined that rehabilitation measures will no longer provide significant long term benefits and replacement is required. The report serves as a roadmap to the City for a funding strategy, which documents design constraints and construction implementation plan.

CDOT Region 4, SH 144 Realignment, Fort Morgan, Colorado. Project Manager. A portion of the highway was completely destroyed during the September 2013 Flood event in Colorado. This project realignes nearly 2 miles of SH 144 away from the 100-year floodplain of the South Platte River. Celeste led the project team and coordinted directly with FHWA, CDOT, and a subconsultant team.

City of Pueblo, W 11th Street Bridge, Pueblo, Colorado. Project Manager. 11th Street Bridge is currently under construction and expected to be complete by late summer of 2017. Celeste Raine served as the Project Manager starting in February of 2012. Over the course of this multi-year project she led the team, adjusting to changing expectations with a positive outlook. She coordinated with stakeholders and agencies including: Pueblo Conservancy District, U.S. Army Corps of Engineers (USACE), City of Pueblo Wastewater Department, Private Utility Companies, adjacent property owners, and CDOT. On many occasions stakeholder interests misaligned with project goals causing conflict and distrust. Celeste

led the project team through these challenges by listening to concerns, offering solutions, and never giving up hope for a resolution.

City of Colorado Springs, Fillmore Street, Colorado Springs, Colorado. Assistant Project Manager. Celeste is completing design and plans for improvements to Fillmore and Chestnut Street in Colorado Springs. The design changes a once very confusing 6-point intersection to two typical 4-point intersection. Chestnut Street will be relocated to the west to form a new signalized intersection and create separation from the nearby I-25 on/off ramps. The steep topography along the existing Fillmore Street created a challenge for the project. The design had to balance the existing commercial and residential driveways, while improving the safety of the existing site grades. During Construction, she managed RFI's and Notice of Design Change Documents. One significant change included the adjustment of design elements to match an adjacent CDOT project.

El Paso County, Meridian Road, El Paso County, Colorado. Deputy Project Manager. Worked on the final design plans for over a mile of overlay and replacement of Meridian Road in El Paso County. Working with the County goals, alternatives were developed and construction estimates provided. The final design included a structural overlay of a portion of the roadway which was found to meet geometric design standards, saving the client over a million dollars. A complete removal and replacement of a portion of the road was needed meet vertical sufficiency for a design of 65 mph

CDOT R2, Powers Boulevard Widening at Airport/Stewart, Colorado Springs, Colorado. Deputy Project Manager for design of CDOT R2 project involving widening of Powers Boulevard (SH 21) to six lanes from Fountain Blvd to Platte Ave. The design included reconfiguration of Airport Rd and Stewart Ave to remove a traffic signal, simplify an intersection, and improve traffic flow into and out of Peterson Air Force Base. Utility coordination and relocation planning with existing and future utilities within the corridor. Working with CDOT to develop utility agreements with impacted utilities

City of Woodland Park, On-Call Contract, Woodland Park, Colorado. Project Manager for On-Call Engineering and GIS Services contract. Worked directly with City staff to develop and manage a wide range of tasks. Tasks include GIS support and development, floodplain analysis, development review, seismic evaluations, roadway rehabilitation, ROW plat review, storm sewer design, traffic analysis, and traffic study.

CDOT R3, Grand Lake Pre-Scoping Report, Colorado. Project Manager. Developed a pre-scoping report for bridge structure D-13-A, which lies on US 34 over the North Fork of the Colorado River in Grand Lake. The bridge recently received a structurally deficient rating of 42.8, and is eligible for Bridge Enterprise Funds. The pre-scoping report provided a concept level analysis of the structure to assist in securing funding. Celeste coordinated the efforts of the structural, roadway, traffic and phasing, hydraulic, utility, ROW and environmental disciplines for report. The pre-scoping report included: 1) evaluation of whether the structure should be rehabilitated or reconstructed, 2) provided a technical summary of the unique critical issues for design and construction and 3) provided a schedule, estimate, and project delivery recommendation for the structure.

CDOT R2, Lamar Reliever Route, Lamar, Colorado. Deputy Project Manager. Coordinator for design of nearly 10 miles of new CDOT R2 highway for this Ports-to-Plains corridor around the City of Lamar. The new route replaces the existing US 287 and US 50 highways that pass through the City, ultimately with a 4-lane free-flow high-speed reliever route for truck traffic continuing past Lamar. The project includes three ultimate interchange locations. Working with CDOT R2 to evaluate cost-effective interim solutions, for a phased implementation approach to the project. Celeste is coordinating with the City of Lamar, Prowers County, BNSF, Public Utility Commission, several local economic development councils, Colorado State Patrol (Port of Entry), and local business owners to develop interchange solutions that uphold their economic success and promote a prosperous downtown.

City of Colorado Springs, Vermijo and Sierra Madre Streetscape, Colorado Springs, CO. Project Manager. This project has redeveloped a once-blighted City core to an enhanced streetscape which will position the area as a public space for celebrations, festivals, and year-round activities. "Smart" strategies were implemented in the project's parking, wayfinding, security, sustainability, lighting and acoustic features. Developed several design charrettes to determine guiding principles for the project.

KC Robinson, PE

Hydrology & Hydraulic Modeling

Education
BS, Civil & Environmental Engineering, Brigham Young University

Years of experience
Total: 16
With AECOM: 1

Location
Denver, CO

Registrations/Certifications
Professional Engineer: CO, MD, ND

Mr. Robinson has provided hydrology and hydraulic analysis, riverine modeling in support of stream restoration, stormwater facility design, and floodplain management services

Professional history

Mr. Robinson has 16 years of experience in water resources engineering and project management. He has provided hydrology and hydraulic analysis, riverine modeling in support of stream restoration, stormwater facility design, and floodplain management services. His modeling and software experience includes the use of 1D and 2D HEC-RAS, HEC-HMS, HEC-1, HEC-2, HEC-SSP, HEC-DSS, EPA SWMM, XPSWMM, and SRH-2D. He is proficient in using GIS software for data processing and automated floodplain analysis and mapping.

Selected project experience

Project Manager and Lead Technical Engineer for Multiple Projects in North Dakota. Mr. Robinson served as project manager, engineer and team lead for multiple floodplain studies as part of FEMA's Map Modernization and Risk MAP efforts for the ND State Water Commission in Williams, Emmons, Morton, Pembina, and Traill Counties. Mr. Robinson modeled complex hydrologic and hydraulic scenarios such as the confluence of the Yellowstone and Missouri Rivers, multiple river reaches with levees, and climate-informed flood frequency gage analysis.

Clarkson Outfall Channel, Greeley, Colorado. The City of Greeley solicited a flood protection project to reconstruct 0.5 mile of the Clarkson Drainageway from the Greeley No. 3 ditch and replace two existing box culverts. Mr. Robinson performed multiple 1D steady, 1D unsteady, and 2D unsteady hydraulic analyses to accurately capture the complex flooding that occurs in this relatively flat area. The proposed design for just the channel portion was very constrained and required multiple modeled scenarios.

Kee Branch Tributary 1 Stream Stabilization, Arlington, Texas. Channel incision has resulted in failing banks and degradation in the creek bed. As part of the stabilization design efforts, Mr. Robinson performed multiple 1D steady and unsteady HEC-RAS modeling to compare various design aspects and incorporate multiple criteria.

Williamson Creek Tributary 2 Rehabilitation Project, Austin, Texas. Preliminary design and final construction plans were completed in order to rehabilitate approximately 3,000 feet of channel using the stable equilibrium slope concept. Mr. Robinson helped incorporate final as-built data into a 1D HEC-RAS model and prepare the final LOMR for approval from FEMA.

Sellars Gulch No-Rise, City of Castle Rock, Colorado. Provided hydraulic modeling expertise to incorporate site design developments into the regulatory floodplain HEC-RAS model and successfully showed all impacts resulted in no rise to the existing water surface elevation. Mr. Robinson worked with the floodplain administrator to ensure all aspects for the floodplain development permit were completed**.**

Northeast Canon Detention Basin Analysis and Design Services, City of Canon City, CO. This project involved hydrologic/hydraulic analysis, FEMA floodplain analysis/mapping, and detention basin design for two new detention basins to alleviate flooding and to remove floodplain areas within the city boundaries. The project involved reviewing existing studies that have already been done, performing alternative analysis, developing the detailed detention basin design, geotechnical work, permitting, breach analysis, and other related work. Mr. Robinson provided the 1D hydraulic modeling of multiple scenarios to compare the proposed improvements to the existing flood hazard.

Risk MAP Production and Technical Services Contract (PTS) FEMA, Regions II, V, VII, IX, and X. Responsibilities include providing a whole range of technical hydraulic and hydrologic solutions of riverine, coastal, and lacustrine flood hazards. Mr.

Robinson has also provided Quality Assurance and Quality Control reviews for both work done internally by peers and other contractors working on behalf of FEMA. Mr. Robinson also served as a Subject Matter Expert (SME) for various FEMA Regions regarding any technical questions for the HEC-RAS and cHECk-RAS software packages.

Eastman Park Hydraulic Support, City of Windsor, Colorado. Mr. Robinson was the primary engineer responsible for constructing and analyzing multiple hydraulic HEC-RAS models for possible proposed park improvements near the Cache la Poudre River. The modeling included various site grading options, channel bank armoring, split flow modeling, and floodway encroachment analysis.

Main Street and South Pratt Parkway Bridges, City of Longmont, Colorado. Mr. Robinson provided multiple HEC-RAS hydraulic analyses for both bridge reconstruction projects. The modeling included various hydrologic scenarios, coordinating with multiple firms to incorporate multiple intermediate and ultimate design scenarios, scour analysis, freeboard analysis, and split flow analysis for the St. Vrain River.

Mapunapuna Industrial Subdivision Litigation Flooding Analysis, Honolulu, HI; REIT Management and Research, LLC. This project involves a detailed analysis of a multi-faceted flooding concern in Honolulu, Hawaii. The site is impacted by tidal flooding nearly 100 times per year, and is also at risk of riverine and tsunami flooding. Tasks completed to date include: review of thousands of pages of historical documents, field reconnaissance, development and implementation of a “plug test” to isolate flooding sources, development of conceptual designs for a stormwater pump station, duckbill tidal gate system, and riverine improvements program. Mr. Robinson, in support of this project, modeled the Moanalua Stream using HEC-2 and HEC-RAS in Honolulu, Hawaii. The modeling included the incorporation of multiple channel improvement options for the existing stream. He also modeled various complex scenarios of the current and proposed storm drainage system using XP-SWMM. He also prepared multiple maps for various permit applications (USACE 404, NPDES, etc.) for this project. The site posed several challenges due to its tidal nature and differential subsidence throughout the site. The goals of the study were to evaluate previous proposals to alleviate flooding in the area and to propose new recommendations to fully mitigate the flooding observed during all tidal stages.

Ralph Price Reservoir Emergency Spillway Bridge, City of Longmont, Colorado. Mr. Robinson provided flood hazard and hydrologic/hydraulic modeling for a construction of an access road bridge as part of the post-2013 floods, which had completely wiped out the previous road crossing. This new bridge was constructed to pass the “75%-PMP” flood, which would be much more severe than the typically modeled “100-year” storm event.

Hydrologic Investigation of the Arkansas River, Fremont County Economic Development Corporation, Cañon City, Colorado. Mr. Robinson conducted a thorough review of past and present hydrologic studies for the Arkansas River through portions of Fremont County, including Cañon City. As part of a grant to help the economic development group, he identified deficiencies and outdated methodologies in the effective hydrologic study for the Arkansas River which, if revised, could have a beneficial economic impact on businesses on or near the river. He also ran preliminary HEC-RAS hydraulic models to quantify the positive effects due to reduction in flooding extents.

Colorado Post Flood Automated Floodplain Mapping, Colorado Water Conservation Board. This project identified revised flood risks following the historic 2013 flooding in northern Colorado for local floodplain management using rapid, automated hydrologic and hydraulic (H&H) analysis in an accurate and cost-efficient manner. Mr. Robinson helped identify affected streams and damaged structures to incorporate into the automated H&H proprietary program.

Weld County Road 49 Letters of Map Revision (LOMR), Weld County, Colorado. Mr. Robinson was responsible for performing revised hydraulic and floodway analyses for new bridges on the Cache La Poudre and South Platte rivers in Weld County. The work involved preparation of two separate CLOMRs and the following LOMR applications to the Federal Emergency Management Agency (FEMA) and addressing all concerns in the approval process.

Joe Roerkohl, PE, CFM

Erosion Control, BMPs, & Low Impact Development

Education
BS, Civil Engineering, University of Wisconsin-Milwaukee

Years of experience
Total: 14
With AECOM: 13

Registrations/Certifications
Professional Engineer: CO, NM;
Certified Floodplain Manager

Location
Denver, CO

Joe has experience in hydrologic, hydraulic, floodplain, and scour analyses, as well as revetment design and post-fire mitigation.

Professional history

Joe has 14 years of experience in water resources analysis and design. He has worked on a variety of flood hazard, transportation, bridge and scour, facilities, and municipal projects. He is experienced in hydrologic, hydraulic, floodplain, and scour analyses, as well as revetment design and post-fire mitigation. He also has previous experience within the survey field and as a construction inspector.

Selected project experience

CDOT R4, State Highway 72 Permanent Repairs, Jefferson County, CO. Design Engineer responsible for hydrologic and hydraulic analysis along a 12.5 mile section of the SH72 corridor. The 2013 September floods resulted in disastrous flooding along Coal Creek, which runs parallel to SH72. Sections of roadway and embankment were washed away and numerous infrastructures were severely damaged.

CCD, Upper Sanderson Gulch, Denver, CO. Drainage Lead for the design of storm sewer systems to alleviate flooding along residential neighborhood streets. Project consists of hydrology, hydraulics, and 2D flow analysis.

CDOT, SH119 Park and Ride, Firestone, CO. Drainage Design Lead responsible for the design of transportation drainage components for the expansion of the Regional Transportation District's Park-an Ride parking lot and additional of bus station pullouts. The project consists of closed storm drain systems, culverts and open roadside channels.

CDOT, I-25 Rehab. Stormwater Design Engineer responsible for the design of cross culverts and roadside ditches for the widening of I-25 along 5 miles of highway. The project consists of closed storm drain systems, open roadside channels, and water quality.

CCD, Tennessee & Oneida Storm Sewer Improvements, Denver, CO. Assistant Project Manager and Drainage Lead for the design of storm sewer systems to alleviate flooding along Oneida Street. Project consists of hydrology, hydraulics, pond analysis and crossing of a 72" waterline with a large storm sewer system.

CDOT, C-470 Tolled Express Lanes Segment 1 D/B, Douglas County, CO. Stormwater Design Engineer responsible for the design of transportation drainage components for the widening and addition of tolled express lanes along 13 miles of highway. The project consists of closed storm drain systems, open roadside channels, bridge replacements and water quality.

El Paso County, Post–Fire Mitigation for Waldo Canyon, El Paso County, CO. Design Engineer responsible for the analysis and design of post-fire mitigation improvements. This project consisted of mitigating the impacts from the June 2012 Waldo Canyon Wildfire, which burned approximately 18,000 acres and altered the hydrologic and hydraulic characteristics of the burn area. Improvements included 2,500 feet of channel restoration, drop structures, bendway wiers and, low water crossing.

CDOT, 11th Street Bridge Replacement, City of Pueblo, CO. Design Engineer responsible for designing transportation drainage components for roadway realignment and bridge replacement and extended detention basin for water quality purposes. Prepared drainage plan set, project cost estimate, and drainage report.

Pikes Peak Rural Transportation Authority, Austin Bluffs Parkway Bridge and Roadway Improvements, Colorado Springs, CO. Design Engineer responsible for performing hydrologic analysis and quality control detail checks on drainage facility hydraulics and design.

Rigel Rucker, PE, CFM

Levee Certification

Education
BS, Civil Engineering, New Mexico State University

Years of experience
Total: 19
With AECOM:14

Registrations/Certifications
Professional Engineer: CO, NM, TX
Certified Floodplain Manager

Location
Denver, CO

Rigel has effectively managed projects of varying complexity with values of several thousand to multi-million dollars. He understands the importance of providing quality service and products to meet expectations while seeking innovation to drive down cost.

Professional history

Rigel specializes in program/project management, and technical approach for flood risk studies. He has experience as program manager for CTP and FEMA programs, RSC lead for FEMA Region VI, and technical lead who has worked on every phase of flood risk studies from Discovery to Effective FIRM release for 19 years. Through this time, he has supported FEMA Headquarters, Regions, and CTPs to write guidance and standards, apply knowledge as a subject matter expert for levees, and provide outreach and trainings for CTPs and communities. He is also well versed in drainage design and has supported H&H projects across the country.

Selected project experience

City of Boulder Engineering On-Call: WWTF Levee Certification, Energy Futures Site Levee Expansion & Access Road Flood Mitigation Assessment. Worked with City of Boulder and AECOM team to produce levee certification for Boulder WWTF to meet 44 CFR 65.10, which was obtained from FEMA. Also worked with City to determine permitting requirements for a potential power substation next to WWTF levee.

Colorado Water Conservation Board (CWCB) Projects, Various, CO. Assisted the Colorado Water Conservation Board Program Manager in scoping and obtaining work under expert task order contract. Also led technical work, conducted technical reviews, and coordinated subcontracts, external quality reviews, and stakeholder coordination. Specific projects included:

- **Colorado Hazard Mapping Program –** Managed team to complete over 700 miles of stream study in multiple counties. Tasks included survey, topographic data development, hydrology, hydraulics, and floodplain mapping. Coordinated with over 30 communities and counties, state, and federal stakeholders, local consultants, and client to discuss methodologies and results. Worked with outreach team to lead stakeholder update meetings, newsletters, and website development.
- **Big Thompson Discovery –** Coordinated with project team, client, partners, and communities to conduct a discovery project.
- **Animas River Discovery –** Coordinated with both Colorado and New Mexico clients to conduct a joint discovery project that spanned FEMA regions and states. Worked with team to produce subsequent flood studies.
- **El Paso County Post Prelim –** Worked with project team to support meetings, an open house, and resolution to comments from community. Also helped review FIRM submittal after transition from another consultant.
- **Cache la Poudre Revision –** Led a team to update an analysis of the Cache la Poudre River from Ft. Collins to Greeley based on community comments.

Estes Valley Watershed Coalition, Upper Big Thompson Master Plan for Resilience. Led a team to identify a plan to restore the Big Thompson through and above Estes Park and select tributaries. Worked with stream restoration specialists and ecologists to develop a plan that would restore the river with natural solutions. Coordinated with Watershed Coalition to complete plan and coordinate with public stakeholders in the area.

FEMA, Natural Valley Levee Analysis for Rio Grande Levees in the El Paso-Las Cruces and Rio Grande-Fort Quitman Watersheds, Doña Ana County, NM and El Paso County, TX. Project included heavy communication with multiple federal, state, and local stakeholders. Communication was

needed to determine appropriate path for 44 CFR 65.10 certification based on work that had been conducted by USIBWC. Meetings were held with all stakeholders to work toward a solution. Concurrently, levees were analyzed using 2D modeling to determine the absolute limits of flooding that could occur if levees were not providing protection. Most support on this project was related to outreach and communication of results.

RAMPP Regional Support Center (RSC) Coordinator for FEMA Region 6. Led a multidisciplinary team of professionals from two Joint Venture Partners in the Risk Assessment, Mapping, and Planning Partners (RAMPP) for local client support. Interacted with Risk Analysis and other branch chiefs, leads, engineers, and specialists on a daily basis. Specific duties included: Assisted Cooperating Technical Partners (CTPs) with training and project needs; Coordinated responses to various congressional, FEMA Map Information eXchange (FMIX), and regional requests; Coordinated critical information for high profile activities to multiple stakeholders. Coordinated collection of information for disaster “Rapid Responses” with an average of four hour deadlines which included collection of levee, FIRM status, hazard mitigation plan status, active CTPs, and other information for the disaster impacted area. Coordinated teams responsible for levee review and tracking, post preliminary tracking, congressional responses, GIS coordination, and engineering technical responses for FEMA Region 6. Developed national and regional guidance and processes that could be used by FEMA, CTPs, RAMPP, and other mapping partners. Utilized messaging to promote client’s goals which included mitigation action, community collaboration, and data integrity.

Michael Scurlock, PE

Stream Restoration

Education
PhD. Colorado State University (2014). Civil and Environmental Engineering

Years of experience
Total: 14
With AECOM: 2

Location
Glenwood Springs, CO

Registrations/Certifications
PE Colorado #517359; Texas #136923; PE Wyoming #15648; PE New Mexico #26121

Michael has 14 years of experience in research, analysis, and applied engineering design of river systems and instream structures.

Professional history

Michael specializes in fluvial geomorphology, river dynamics, sediment transport, bank stability, scour dynamics, and infrastructure hydraulics. He has 14 years of experience in research, analysis, and applied engineering design of river systems and instream structures. He has co-authored federal guidelines for bank and vertical channel stabilization and has published tools for rapid engineering assessments of channel stability structural solutions tailored to site specific constraints. Michael uses state-of-art hydraulic and geomorphic analysis tools, including CFD, to comprehensively assess eco-hydraulic stream impacts and optimize stream restoration projects for site-specific constraints. His experience allows for the assessment and evaluation of system-scale alternatives for stream stability, floodplain activation, and riparian habitat improvements.

Selected project experience

Santa Fe River Greenway Improvements. The ephemeral Santa Fe River in Santa Fe, NM has been targeted for restoration and recreational enhancement for the benefit of the local community. Michael is leading the technical team from in-river survey through construction implementation for the in-river portion of a restoration and riparian corridor activation project. The project has a significant fluvial geomorphology component, balancing resilient stream restoration design within a system with significant flood damage potential. Floodplain activation with native vegetation recruitment and interaction with the local trails and public is a key project objective.

Brazos Riverbank Stabilization. The Brazos River at the SH-99 Bridge in Sugarland, TX has been the site of aggressive and damaging bank erosion on a large scale which has compromised bridge integrity and affected local flood levees. Dr. Scurlock is leading the design of bank stabilization structures specifically targeted to the fluvial geomorphic instabilities associated with the channel. The project has received a large FEMA grant for implementation.

Instream Flow Assessment of Fish Habitat. The wild and scenic Rio Grande River at the northern extent of New Mexico provides habitat for species such as rainbow and brown trout and the Rio Grande Chub. Working with the Bureau of Land Management, Dr. Scurlock has led the hydrographic survey efforts of a remote river reach to develop a calibrated two-dimensional numerical model for the full in-channel hydrograph, couple model output with habitat suitability criteria, and develop methodologies for the prediction of habitat uplift as a function of flow augmentation using Instream Flow Incremental Methods.

Gila River Instream Diversion Designs. The Fort West Diversion in the Cliff-Gila Valley is a historic acequia with active agricultural water use. Working for The Nature Conservancy, Dr. Scurlock led the evaluation of the existing river system and developed a proposed design for this geomorphologically and ecologically sensitive river. The design functions to deliver irrigation water, reduce annual maintenance, and maintain fish and riparian connectivity and is primarily composed of endemic large boulder materials and soft-engineering approaches. Comprehensive geomorphological and sedimentation analyses were performed using hydraulic modeling to forecast short- and long-term structural function. Floodplain activation, avulsion potential, and impacts to overbank vegetation and habitat were analyzed of a key component of alternative analysis.

Monument Creek Flushing Flow Modeling and Monitoring. As part of the environmental analysis of a proposed high-elevation reservoir expansion project on the western slope of Colorado, Dr. Scurlock led the river survey and base model development of Monument Creek for evaluation of impacts to sediment transport, fluvial

geomorphology, and riparian habitat health. Specifically, the frequency and duration of flushing flows to maintain spawning gravel beds was of critical importance.

Continental-Hoosier Expansion Fluvial Geomorphic Evaluation. Dr. Scurlock has led the fluvial geomorphic evaluation of the Blue River and South Platte River as a function of proposed reservoir enlargements along the Continental Divide at Hoosier Pass, CO. Seasonal alterations to flow diversions have potential alterations to quantity and duration with implications for sediment transport, geomorphic response, and habitat quality. 1D and 2D hydraulic and sediment transport modeling capture in-river effects and long-term geomorphic trends.

Grand River Restoration Environmental Impact Statement Analysis. The Grand River at Grand Rapids, MI has been the focus of a long-standing project to revitalize the rapids in the downtown urban corridor of the City. Working with the original design firm and now AECOM, Michael has performed a wide range of sediment transport analyses, recreational design, fish passage and fish barrier design and analyses, and aquatic habitat assessments. Long-term sediment deposition, transport, and mitigation for aquatic species and the fluvial geomorphology of the Grand River was performed using HEC-RAS and SRH-2D. 3D CFD modeling was used to determine recreational and fish barrier function.

Ohio River – USCG Station Owensboro Debris and Sediment Evaluations. Evaluation of the USCG boat station in Owensboro, KY was conducted using a developed HEC-RAS sediment transport model to establish baseline loading and proposed conditions impacts. One-dimensional conditions were used as boundary conditions for a three-dimensional CFD model to optimize debris deflector designs for the station.

Helper City River Revitalization. The Price River in the urbanized corridor of Helper, UT is a channelized and denuded system. Working with the municipality, environmental agency stakeholders, and the local community, Michael designed and constructed the removal and rehabilitation of four decommissioned diversion structures which impeded both fish passage and river use. The Price River at the project site is debris flow affected, which was considered during the design of grade-control structures for recreational and fish-passage improvements.

Design and CFD modeling of the Bend Whitewater Park Surf Wave. Dr. Scurlock performed renovative design for whitewater recreational features at the Bend Whitewater Park in Bend, OR using computation fluid dynamics modeling to improve upon poorly performing recreational features. Results of the design refinement included the creation of the “Green Wave” feature in the park, which is widely regarded as one of the premier river surf waves worldwide and draws recreational users year-round.

CFD modeling and analysis of Pitkin County Whitewater Park. Recreational features were installed in the Roaring Fork River near Basalt, CO as part of a Recreational Instream Channel Diversion water rights procurement. After community disappointment with the original recreational experience and widespread public safety concerns, Dr. Scurlock performed design refinement and optimization of the structures using CFD modeling to predict flow distributions, fish passage, and enhance recreational potential. He led the efforts for fish passage evaluations of the original structures and developed tools to optimize the structural refinements. Taken through construction in 2020, the newly designed features function at a higher level than the original installment and are now widely used by river kayakers, stand-up-paddle boards, and other recreational watercraft.

Design and CFD modeling of Ogden Utah Whitewater Park. As part of a holistic urban corridor enhancement project, Dr. Scurlock aided in CFD modeling and design efforts for a whitewater recreational amenity in the Weber River at Ogden, UT. Proposed features considered play kayaking, river surfing, fish passage, safe boat passage, and public engagement. Performed CFD modeling directly aided in the realization of hydraulics in the channels and optimized design.

Kallin Snow, PhD

Environmental/Ecological

Education
PhD, Ecology and Evolutionary Biology, University of Colorado
BSc, Biological Sciences, Stanford University

Years of experience
Total: 16
With AECOM: 6

Location
Fort Collins, CO

Kallin has experience managing complex environmental permitting projects requiring coordination with multiple resource agencies. She has managed projects requiring permits from and in coordination with the US Fish and Wildlife Service, US Army Corps of Engineers, US Environmental Protection Agency, State Parks, and local regulatory agencies.

Professional history

Dr. Snow is a project manager and senior environmental scientist with more than 16 years of experience. She specializes in managing complex environmental permitting projects requiring coordination with multiple resource agencies in the transportation and water industry in support of NEPA. She has served as the environmental lead on many projects in Colorado including local City and County agencies. Kallin has experience preparing and reviewing technical documents including Biological Resources Reports, Wetland Findings Reports, Biological Assessments, and NEPA permitting documents.

Selected project experience

Doherty Channel Restoration, City of Colorado Springs, El Paso County, CO. Environmental Lead for the reconstruction Doherty Channel in the City of Colorado Springs. Performed environmental assessment for Threatened and Endangered Species, Cultural Resources, and Hazardous Materials. Coordinated with the City of Colorado Springs and the design team to prepare environmental permits pertaining to the USACE Section 404 of the CWA.

America the Beautiful Park Pond Retrofit, City of Colorado Springs, El Paso County, CO. Environmental Lead for the retrofit of the pond in the America the Beautiful Park in the City of Colorado Springs. Performed environmental assessment for Wetlands and Waters of the U.S. Coordinated with the City of Colorado Springs and the design team to prepare environmental permits pertaining to the USACE Section 404 of the CWA.

Northern Integrated Supply Project, Larimer County, CO. Environmental lead for a water supply project for Northern Colorado Water Conservancy District. Performed special status species surveys for project sites that are potential mitigation sites for Preble's Meadow Jumping Mouse and wetlands. Special status plant species included focused surveys for the Ute's ladies-tresses orchid and the Colorado butterfly plant.

State Highway 72 Permanent Repair Project, CDOT Region 1, Boulder and Jefferson Counties, CO. Environmental Lead for approximately 10 miles of roadway repair work. Responsible for coordinating with CDOT, subcontractors, and the engineering design team to facilitate attainment of environmental permits and clearances associated with NEPA.

C-470 Tolled Express Lanes Design-Build, Jefferson, CDOT Region 1, Douglas and Arapahoe Counties, CO. Environmental Design Lead and Senior Biologist for the construction of 13 miles of tolled express lanes design-build project along C-470. Performed biological survey for prairie dogs and prepared the Prairie Dog Management Plan. Led the implementation of passive relocation of more than 10 prairie dog colonies. Prepared applications to obtain nationwide permits from the USACE.

State Highway 14 Permanent Repair Project, CDOT Region 4, Larimer County, CO. Environmental Lead for approximately 35 miles of roadway and culvert repair work. Coordinated with CDOT, subcontractors, and the engineering design team to facilitate the timely attainment of necessary environmental permits and clearances associated with NEPA. This project involved USACE Section 404 permitting and the preparation of a joint BA/BE for the USFS to consult with the USFWS for likely effects to the federally protected Preble's Meadow jumping mouse.

Andy Steininger, PE

Stream Restoration

Education
BS, Physics, Fort Lewis College, 2005
MS Civil and Environmental Engineering, Colorado State University, 2014

Years of experience
Total: 6
With AECOM: 1

Location
Glenwood Springs, CO

Registrations/Certifications
PE, Colorado
CESCL Certified Erosion and Sediment Control Lead

Andy has experience in design, management and construction of stream, river and wetland projects

Professional history

Andy has experience in design, management and construction of stream, river and wetland projects. His primary focus has been the design and construction of river restoration and recreation projects involving channel and bank stabilization, floodplain reconnection, habitat improvement, diversion improvement, flood conveyance, riparian corridor enhancement, recreation access and whitewater features.

Selected project experience

Fishers Bend Side Channel Reconnection Project, Clackamas River, Damascus, OR. Designer and construction manager of a side channel reconnection project on the Clackamas River resulting in over 1000 feet of off channel habitat and improved flood conveyance. Many historic side channels on the Clackamas River have been disconnected due to modified flow regime and main channel downcutting. Andy completed design grading, flow monitoring, construction plans drafting, permitting and construction management to bring the project to completion.

Clackamas Confluence Habitat Restoration Project, UT. Construction manager for project implementation. The Clackamas Confluence Habitat Restoration Project established a lowered and accessible floodplain and Large Wood habitat structures to increase habitat areas in the reach. Andy managed construction and all client correspondence to complete the project.

SW Boones Ferry Bridge and Restoration Project, OR. Designer for stream restoration efforts. The culvert conveying Tryon Creek under SW Boones Ferry road was undersized resulting in impounded water during heavy rain events. Also, the outlet of the culvert was perched above the creek bed creating a barrier to fish passage. The bridge and restoration project involves removal of the culvert and road fill and installation of a channel spanning bridge. In addition to the bridge installation rock weirs were designed to stabilize the channel grade under the bridge. Bank stabilization measures and vegetation establishment were also designed to stabilize the disturbed corridor. Andy designed rock weirs and bank revetment through the reach, created drawings and initiated permitting efforts.

Big Bend Habitat Restoration Project, West Jordan, UT. Design engineer of several phases of a multi-phase pond and river enhancement project. Andy was involved in the design of the bank stabilization, split channel and pond. He performed hydrographic survey, design grading, one dimensional hydraulic modeling, construction plans drafting, specification development, and permitting.

Crystal River Restoration and Weaver Ditch Enhancement Project, CO. Lead designer and surveyor for diversion improvement and riparian corridor enhancement project. Andy performed site survey, design grading, two-dimensional hydraulic modeling, cost estimation and plans development.

Helper City River Improvements Phases 4 - 6, UT. Surveyor, designer and construction oversight lead. Design constraints included maintaining water surface elevations at an existing diversion headgate. Andy performed hydrographic survey of 3 reaches of the river, designed and graded boulder ramp drop structures and bank stabilization structures, performed two-dimensional hydraulic modeling, performed construction oversight, and created construction drawings cost opinions and specifications.

Stanley Vermilyea, PLS

Survey/Right-of-Way

Education
1976-1978/Mathematics & Industrial Arts Major/University of Northern Colorado

Years of experience
Total: 42
With AECOM: 22

Location
Denver, CO

Registrations/Certifications
Professional Land Surveyor/(2003) SD #7939/(2003) OK #1569/ (2002) UT #5242629/(1988) CO #25381
1987/Certified Surveyor-In-Training/CO/#577

Mr. Vermilyea's thorough understanding of the R/W process from initial project scoping to final monumentation gives him the unique ability to analyze specific situations and develop an alternative analysis.

Professional history

Mr. Vermilyea has 42 years of experience working within the Uniform Acquisition and Relocation acts. He has been actively involved with all phases of Transportation Project Development, including project scoping, preliminary surveys, public hearings/meetings, design reviews, Right-of-Way plans development, appraisal showings, value findings, and the acquisition of parcels and easements.

Selected project experience

CCD, Denver Department of Public Works, Upper Sanderson Gulch, Denver, Colorado. Survey Manager for Survey Control, Topographic and Planimetric mapping, Right of Way research and location survey. This project consisted of establishing Project Control tied to the Denver Low Distortion Projection (LDP) for horizontal datum, and NAVD 88 benchmarks for vertical datum. Survey terrain and improvements, underground utilities affecting the project corridor, as well as measuring inverts for sanitary and storm sewer lines. Research the county record for subdivision and survey plats affecting properties within the project corridor. Survey the position of aliquot corners, range points, and property boundary monuments controlling the position of property boundaries and ROW within the project corridor. Analyze record information and reconcile it with the found boundary evidence. Create 2D drawing of the ROW and property boundaries, and 3D drawings of the topographic features and improvement in the project corridor.

City of Colorado Springs, Doherty Channel, Colorado Springs, Colorado. Survey Project Manager for a project to complete a topographic survey of the existing channel. This project consisted of establishing Project Control tied to the CSU FIMS control, Colorado HARN and NAVD 88 benchmarks. Locate and survey underground utilities affecting the project corridor, as well as measuring inverts for sanitary and storm sewer lines. Research the county record for subdivision and survey plats affecting properties within the project corridor.

City of Colorado Springs, Vermijo and Sierra Madre Streetscape, Colorado Springs, Colorado. Survey Project Manager for a project to complete topographic survey and right of way delineation of a portion W. Vermijo Ave and Sierra Madre St., This project consisted establishing Project Control using the NGVD29 datum. Surveyed existing improvements and condition, obtained underground utility locates and surveyed manholes and inlets to determine pipe size/type and direction. Created a boundary model of the right of way using found land survey monuments in the area. Created legal descriptions and exhibits for temporary easements needed for construction of the improvements.

CCD, Denver Department of Public Works, Valverde Stormwater Improvements, Denver, Colorado. Survey Manager for Potholing, and Right of Way research and location survey. The survey was completed using horizontal and vertical control established by CCD. AutoCAD drawings were created showing the planimetric mapping and a spreadsheet detailing the size, type, material, and location of the potholed utilities. Research the county record for subdivision and survey plats affecting properties within the project corridor. Survey the position of aliquot corners, range points, and property boundary monuments controlling the position of property boundaries and ROW within the project corridor. Analyze record information and reconcile it with the found boundary evidence. Create an electronic model of the ROW limits within the project corridor.

Project Timeline:

It is assumed the design for 29th Avenue described in this scope will be developed and completed in six months from the date of NTP.

Table 1. Anticipated Timeline

Task (Duration)	July	August	September	October	November	December
NTP						
Task 1: Project Management (6 Months)	■	■	■	■	■	■
Task 2:	■	■				
Task 3:	■	■	■			
Task 6:				■	■	■

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END SCOPE OF WORK

Submitted By:

AECOM Technical Services, Inc.

Ryan Weaver, PE
Vice President