

## PURCHASE OF SERVICE AGREEMENT 2016.436B

THIS AGREEMENT ("Agreement") is made this 30<sup>th</sup> day of August 2016, by and between the Adams County Board of County Commissioners, located at 4430 South Adams County Parkway, Brighton, Colorado 80601, hereinafter referred to as the "County," and , RockSol Consulting Group, located at 6510 W 91<sup>st</sup> Ave, Suite 130, Westminster, Colorado 80031, hereinafter referred to as the "Contractor." The County and the Contractor may be collectively referred to herein as the "Parties".

The County and the Contractor, for the consideration herein set forth, agree as follows:

### **1. SERVICES OF THE CONTRACTOR:**

1.1. All work shall be in accordance with the attached IFB 2016.436 and the Contractor's response to the IFB 2016.436 attached hereto as Exhibit A, and incorporated herein by reference. Should there be any discrepancy between Exhibit A and this Agreement the terms and conditions of this Agreement shall prevail.

1.2. Emergency Services: In the event the Adams County Board of County Commissioners declares an emergency, the County may request additional services (of the type described in this Agreement or otherwise within the expertise of the Contractor) to be performed by the Contractor. If the County requests such additional services, the Contractor shall provide such services in a timely fashion given the nature of the emergency, pursuant to the terms of this Agreement. Unless otherwise agreed to in writing by the parties, the Contractor shall bill for such services at the rates provided for in this Agreement.

2. **RESPONSIBILITIES OF THE COUNTY:** The County shall provide information as necessary or requested by the Contractor to enable the Contractor's performance under this Agreement.

3. **TERM:** The work to be performed under this Agreement shall be completed prior to December 31, 2017.

3.1. Renewal Option: The County, at its sole option, may offer to renew this Agreement as necessary for up to two, one year renewals providing satisfactory service is given and all terms and conditions of this Agreement have been fulfilled. Such renewals must be mutually agreed upon in writing by the County and the Contractor.

4. **PAYMENT AND FEE SCHEDULE:** The County shall pay the Contractor for services furnished under this Agreement, and the Contractor shall accept as full payment for those services, the sum of fifty-one thousand three hundred eighty dollars and seventy-five cents (\$51,380.75).

4.1. Payment pursuant to this Agreement, whether in full or in part, is subject to and contingent upon the continuing availability of County funds for the purposes hereof. In the event that funds become unavailable, as determined by the County, the County may immediately terminate this Agreement or amend it accordingly.

5. **INDEPENDENT CONTRACTOR:** In providing services under this Agreement, the Contractor acts as an independent contractor and not as an employee of the County. The Contractor shall be solely and entirely responsible for his/her acts and the acts of his/her employees, agents, servants, and subcontractors during the term and performance of this Agreement. No employee, agent, servant, or subcontractor of the Contractor shall be deemed to be an employee, agent, or servant of the County because of the performance of any services or work under this Agreement. The Contractor, at its expense, shall procure and maintain workers' compensation insurance as required by law. **Pursuant to the Workers' Compensation Act § 8-40-202(2)(b)(IV), C.R.S., as amended, the Contractor understands that it and its employees and servants are not entitled to workers' compensation benefits from the County. The Contractor further understands that it is solely obligated for the payment of federal and state income tax on any moneys earned pursuant to this Agreement.**

6. **NONDISCRIMINATION:**

6.1. **The Contractor shall not discriminate against any employee or qualified applicant for employment because of age, race, color, religion, marital status, disability, sex, or national origin. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices provided by the local public agency setting forth the provisions of this nondiscrimination clause. Adams County is an equal opportunity employer.**

6.1.1. The Contractor will cause the foregoing provisions to be inserted in all subcontracts for any work covered by this Agreement so that such provisions will be binding upon each subcontractor, provided that the foregoing provisions shall not apply to contracts or subcontracts for standard commercial supplies or raw materials.

7. **INDEMNIFICATION:** The Contractor agrees to indemnify and hold harmless the County, its officers, agents, and employees for, from, and against any and all claims, suits, expenses, damages, or other liabilities, including reasonable attorney fees and court costs, arising out of damage or injury to persons, entities, or property, caused or sustained by any person(s) as a result of the Contractor's performance or failure to perform pursuant to the terms of this Agreement or as a result of any subcontractors' performance or failure to perform pursuant to the terms of this Agreement.

8. **INSURANCE:** The Contractor agrees to maintain insurance of the following types and amounts:

8.1. **Commercial General Liability Insurance:** to include products liability, completed operations, contractual, broad form property damage and personal injury.

8.1.1. Each Occurrence: \$1,000,000

8.1.2. General Aggregate: \$2,000,000

8.2. **Comprehensive Automobile Liability Insurance:** to include all motor vehicles owned, hired, leased, or borrowed.

8.2.1. Bodily Injury/Property Damage: \$1,000,000 (each accident)

8.2.2. Personal Injury Protection: Per Colorado Statutes

8.3. **Workers' Compensation Insurance:** Per Colorado Statutes

8.4. Professional Liability Insurance: to include coverage for damages or claims for damages arising out of the rendering, or failure to render, any professional services, as applicable.

8.4.1. Each Occurrence: \$1,000,000

8.4.2. This insurance requirement applies only to the Contractors who are performing services under this Agreement as professionals licensed under the laws of the State of Colorado, such as physicians, lawyers, engineers, nurses, mental health providers, and any other licensed professionals.

8.5. Adams County as "Additional Insured": The Contractor's commercial general liability, and comprehensive automobile liability, insurance policies and/or certificates of insurance shall be issued to include Adams County as an "additional insured" and shall include the following provisions:

8.5.1. Underwriters shall have no right of recovery or subrogation against the County, it being the intent of the parties that the insurance policies so affected shall protect both parties and be primary coverage for any and all losses resulting from the actions or negligence of the Contractor.

8.5.2. The insurance companies issuing the policy or policies shall have no recourse against the County for payment of any premiums due or for any assessments under any form of any policy.

8.5.3. Any and all deductibles contained in any insurance policy shall be assumed by and at the sole risk of the Contractor.

8.6. Licensed Insurers: All insurers of the Contractor must be licensed or approved to do business in the State of Colorado. Upon failure of the Contractor to furnish, deliver and/or maintain such insurance as provided herein, this Agreement, at the election of the County, may be immediately declared suspended, discontinued, or terminated. Failure of the Contractor in obtaining and/or maintaining any required insurance shall not relieve the Contractor from any liability under this Agreement, nor shall the insurance requirements be construed to conflict with the obligations of the Contractor concerning indemnification.

8.7. Endorsement: Each insurance policy herein required shall be endorsed to state that coverage shall not be suspended, voided, or canceled without thirty (30) days prior written notice by certified mail, return receipt requested, to the County.

8.8. Proof of Insurance: At any time during the term of this Agreement, the County may require the Contractor to provide proof of the insurance coverage or policies required under this Agreement.

## 9. WARRANTY:

9.1. The Contractor warrants and guarantees to the County that all work, equipment, and materials furnished under the Agreement are free from defects in workmanship and materials for a period of one year after final acceptance by the County. The Contractor further warrants and guarantees that the plans and specifications incorporated herein are free of fault and defect sufficient for Contractor to warrant the finished product after completion date. Should the Contractor fail to proceed promptly in accordance with this guarantee, the County may have such work performed at the expense of the

- 11.10. Severability: If any provision of this Agreement is determined to be unenforceable or invalid for any reason, the remainder of this Agreement shall remain in effect, unless otherwise terminated in accordance with the terms contained herein.
- 11.11. Authorization: Each party represents and warrants that it has the power and ability to enter into this Agreement, to grant the rights granted herein, and to perform the duties and obligations herein described.
- 11.12. Confidentiality: All documentation related to this Agreement will become the property of Adams County. All documentation maintained or kept by Adams County shall be subject to the Colorado Open Records Act, C.R.S. 24-72-201 *et seq.* ("CORA"). The County does not guarantee the confidentiality of any records.

## **12. CHANGE ORDERS OR EXTENSIONS:**

- 12.1. Change Orders: The County may, from time to time, require changes in the scope of the services of the Contractor to be performed herein including, but not limited to, additional instructions, additional work, and the omission of work previously ordered. The Contractor shall be compensated for all authorized changes in services, pursuant to the applicable provision in the Invitation to Bid, or, if no provision exists, pursuant to the terms of the Change Order.
- 12.2. Extensions: The County may, upon mutual written agreement by the parties, extend the time of completion of services to be performed by the Contractor.

## **13. COMPLIANCE WITH C.R.S. § 8-17.5-101, ET. SEQ. AS AMENDED 5/13/08:** Pursuant to Colorado Revised Statute (C.R.S.), § 8-17.5-101, *et. seq.*, as amended May 13, 2008, the Contractor shall meet the following requirements prior to signing this Agreement (public contract for service) and for the duration thereof:

- 13.1. The Contractor shall certify participation in the E-Verify Program (the electronic employment verification program that is authorized in 8 U.S.C. § 1324a and jointly administered by the United States Department of Homeland Security and the Social Security Administration, or its successor program) or the Department Program (the employment verification program established by the Colorado Department of Labor and Employment pursuant to C.R.S. § 8-17.5-102(5)) on the attached certification.
- 13.2. The Contractor shall not knowingly employ or contract with an illegal alien to perform work under this public contract for services.
- 13.3. The Contractor shall not enter into a contract with a subcontractor that fails to certify to the Contractor that the subcontractor shall not knowingly employ or contract with an illegal alien to perform work under this public contract for services.
- 13.4. At the time of signing this public contract for services, the Contractor has confirmed the employment eligibility of all employees who are newly hired for employment to perform work under this public contract for services through participation in either the E-Verify Program or the Department Program.

IN WITNESS WHEREOF, the Parties have caused their names to be affixed hereto:

County Manager

Todd Leopold  
Todd Leopold

8/30/16  
Date

RockSol Consulting Group, Inc.

S. Saeb  
Signature

8, 18, 2016  
Date

Saeid Saeb  
Printed Name

President  
Title

Attest:

Stan Martin, Clerk and Recorder

Stan Martin  
Deputy Clerk

Approved as to Form:

P. Coetz  
Adams County Attorney's Office

NOTARIZATION OF CONTRACTOR'S SIGNATURE:

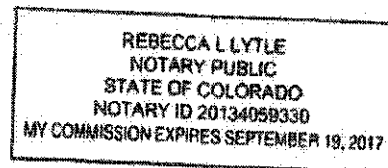
COUNTY OF Jefferson)

STATE OF Colorado)SS.

Signed and sworn to before me this 18<sup>th</sup> day of August, 2016,

by Saeid Saeb,

Rebecca Lytle  
Notary Public



My commission expires on: SEPTEMBER 19, 2017

**CONTRACTOR'S CERTIFICATION OF COMPLIANCE**

Pursuant to Colorado Revised Statute, § 8-17.5-101, *et seq.*, as amended 5/13/08, as a prerequisite to entering into a contract for services with Adams County, Colorado, the undersigned Contractor hereby certifies that at the time of this certification, Contractor does not knowingly employ or contract with an illegal alien who will perform work under the attached contract for services and that the Contractor will participate in the E-Verify Program or Department program, as those terms are defined in C.R.S. § 8-17.5-101, *et seq.* in order to confirm the employment eligibility of all employees who are newly hired for employment to perform work under the attached contract for services.

**CONTRACTOR:**

RockSol Consulting Group, Inc.  
Company Name

8, 18, 16  
Date

[Signature]  
Signature

Saeid Saeb  
Name (Print or Type)

President  
Title

Note: Registration for the E-Verify Program can be completed at: <https://www.vis-dhs.com/employerregistration>. It is recommended that employers review the sample "memorandum of understanding" available at the website prior to registering

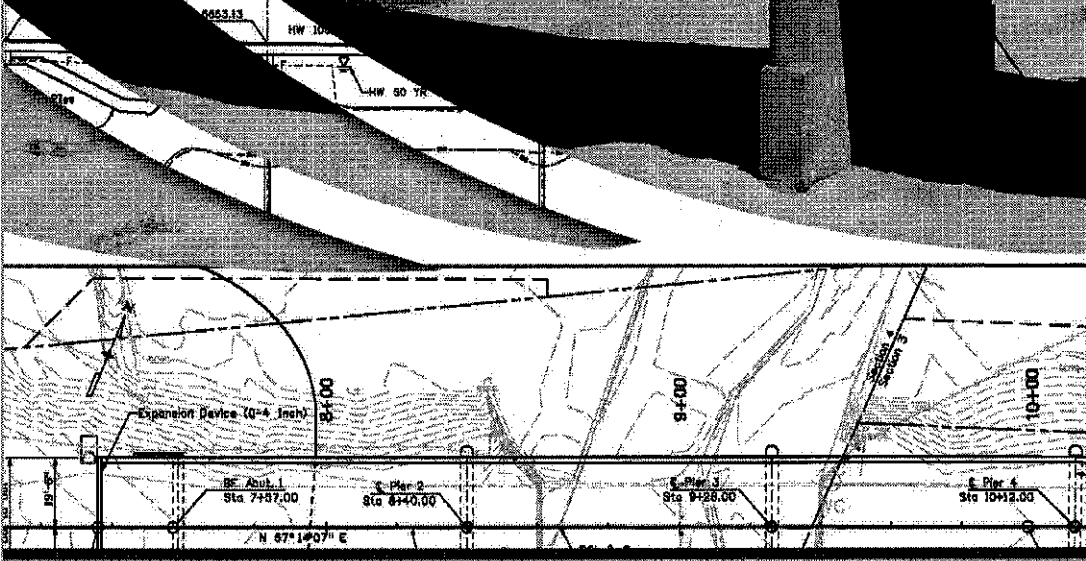
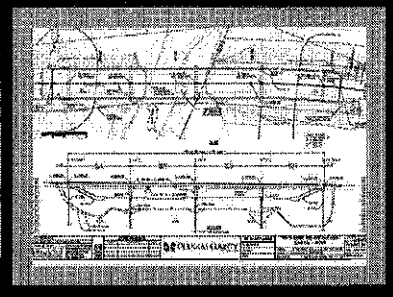
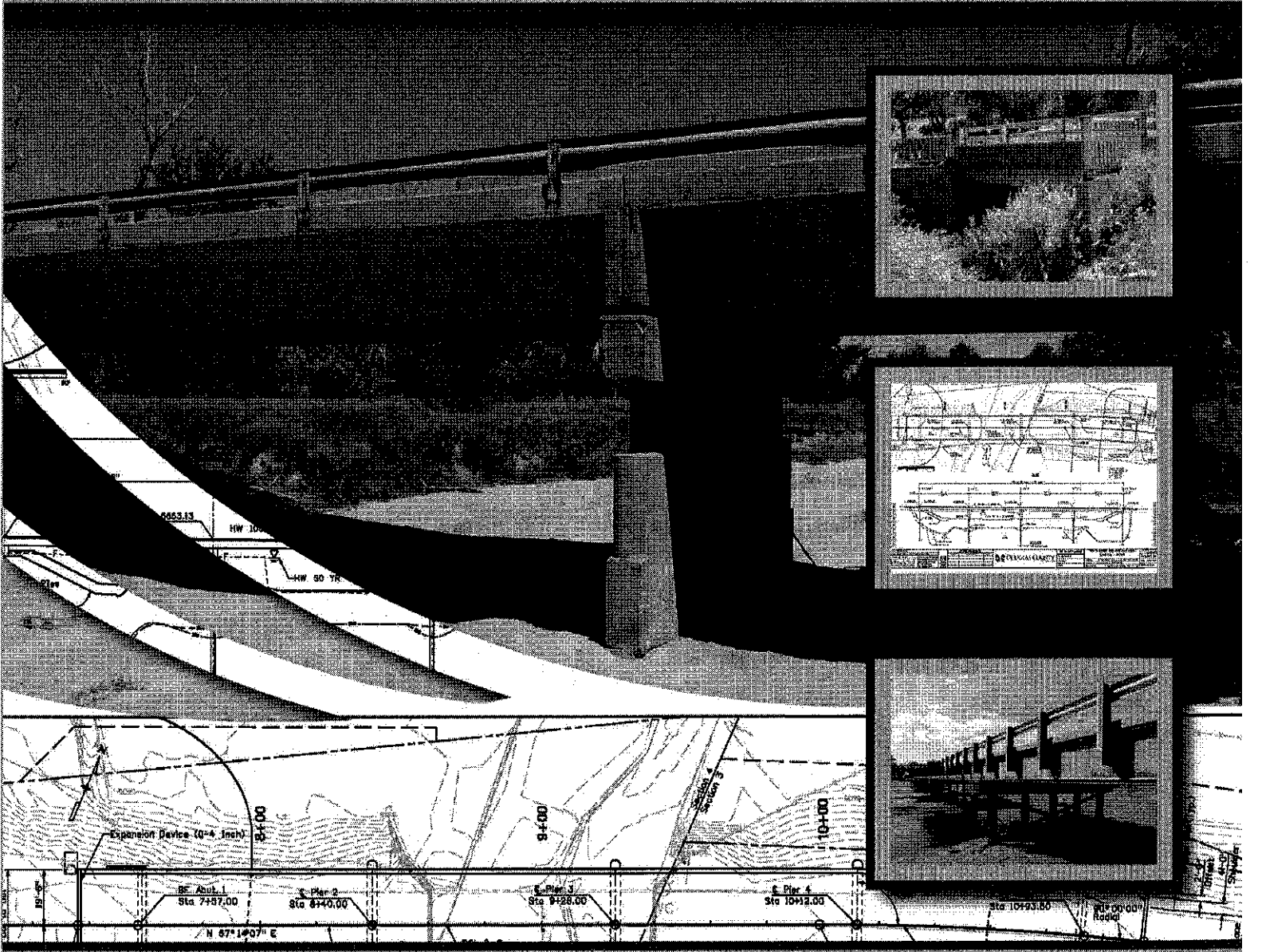
# 96th Avenue over East Bijou Creek

## Scour Critical & Structural Maintenance

### Adams County



ADAMS COUNTY  
COLORADO



RFQ # 2016.436  
June 24, 2016



Curve 2 Data:  
A = 231'10.24' Rt  
R = 1080.00'  
L = 438.37'  
T = 99.77'

ELAN

Ms. Bethany Bonasera  
Purchasing Division of the Finance Department  
Adams County Government Center  
4430 South Adams County Parkway, 4<sup>th</sup> Floor  
Brighton, Colorado 80601

June 24, 2016

SUBJECT: 96<sup>TH</sup> AVENUE OVER EAST BIJOU CREEK  
ADAMS COUNTY BRIDGE ADA096-49.8N164

Dear Ms. Bonasera and Selection Committee:

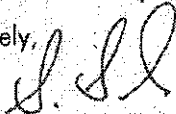
RockSol Consulting Group, Inc. (RockSol) is one of the engineering consultants selected by Adams County for the 2016-2018 Non-Project Specific Professional Services contract for the Structural Engineering service category. We are pleased to submit this proposal in response to RFP 2016.436 to provide engineering services for the 96<sup>th</sup> Avenue Bridge over East Bijou Creek.

Our guiding work principle focuses on providing exceptional, personalized attention to our clients. To best meet the needs of this bridge project, we are providing a comprehensive team ready to act as an extension of Adams County staff. We offer the County:

Integrated Design Services	Our design team offers an integrated approach to the primary disciplines vital to successfully completing this project: bridge design, bridge scour, roadway design, and geotechnical engineering. Our team also includes in-house environmental and survey services. We have teamed with Olson Engineering to provide non-destructive testing as outlined in our proposal.
Extensive Project Management Experience	Our project manager, Martin, brings a wealth of experience in managing bridge design projects. Martin has worked on bridge rehabilitations and reconstructions of all sizes and types, enabling him to select the project approach that best fits the needs of the actual project. With a keen understanding of the County's needs, Martin is dedicated to ensuring the project is completed on time and within budget.
Commitment to Client Satisfaction	We are committed to providing superior performance to Adams County. We excel at responding quickly to client requests, developing the right teams for multidiscipline projects, and executing the scope of services under each task order to meet the needs of our clients. We manage projects centered on our client's goals, and we treat each project with focused dedication.

Combined, these qualifications demonstrate RockSol's ability to produce excellent work for Adams County. We appreciate the opportunity to provide this proposal. We acknowledge receipt of Addendum 1. The information contained in this proposal, including all attachments, is true and complete to the best of our knowledge. Please contact Martin Merklinger at 303.962.9326, via e-mail at merklinger@rocksol.com, or via fax at 303.962.9350, if we can be of any assistance.

Sincerely,



Saeid Saeb, PhD, PE  
Project Principal



Martin Merklinger, PE  
Project Manager

RockSol Consulting Group, Inc.

6510 W 91st Ave, Ste 130 Westminster, CO 80031 Ph 303.962.9300 Fax 303.962.9350 Web www.rocksol.com





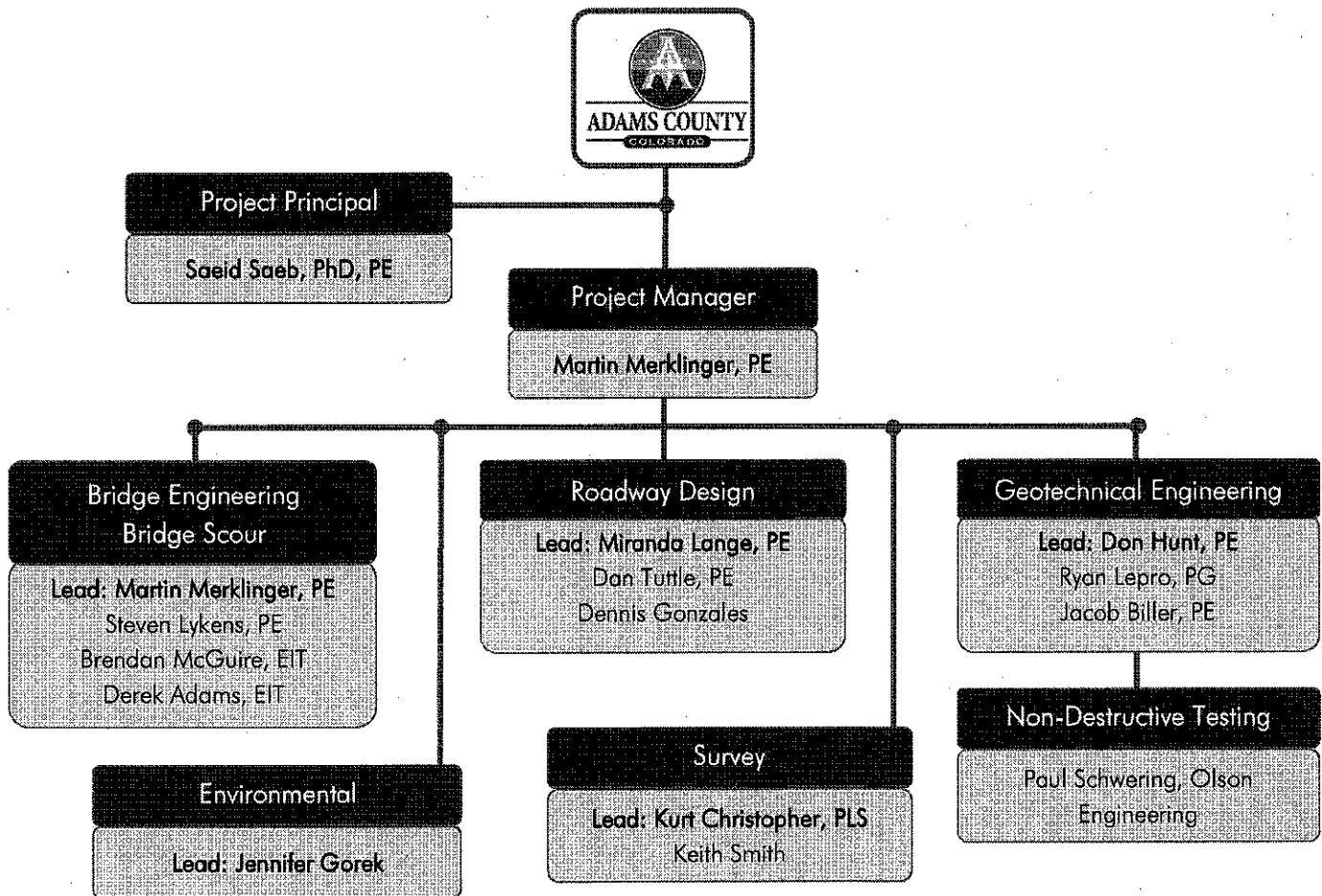
## FIRM QUALIFICATIONS

Founded in 1996, RockSol Consulting Group, Inc. provides engineering services to government agency clients. RockSol is a Colorado-based DBE firm providing engineering services for the analysis, design, and construction of bridges, roadways, tunnels, structures, retaining walls, pavements, foundations, underground excavations, rock slopes, and concrete and earthen structures. Our full capabilities include geotechnical investigations, pavement design, structural engineering, and roadway design. We also provide construction management, inspection, and materials testing services. For 20 years, RockSol has built its reputation on providing top quality services to all of our clients.

**High Quality Services** | RockSol approaches every project the same way: provide superior quality services efficiently, effectively, while achieving all applicable requirements and standards. We are committed to excellent client service, responding rapidly to project requests. Our services are backed by our Quality Commitment and supported by our Quality Management System, which emphasizes the needs of our clients and adheres to current industry and regulatory standards and has earned us our ISO 9001 certification. **Our past performance on projects such as the Pecos Grade Separation RCP Rehabilitation project exemplifies our dedication to quality transportation projects.**

**Integrated Design Services** | RockSol offers a well-rounded design team with experience in both design and construction practices. **Our in-house design team offers full integration of bridge design and bridge scour as well as roadway design, geotechnical engineering, and environmental services.** As a small firm, our disciplines work closely together, enabling us to effectively respond to changing project requirements.

RockSol can provide all the engineering services in the various engineering disciplines needed to accomplish **bridge rehabilitation to remove the scour critical designation and address the structural maintenance issues.** Our experienced staff have the necessary experience to complete the rehabilitation design for the bridge. The RockSol staff are organized as shown in the organization chart below.



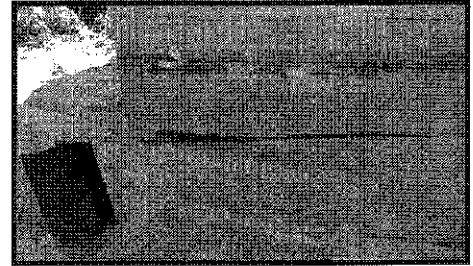
## UNDERSTANDING THE ISSUES

Our assessment of the issues from our site visit, and from the bridge inspection report, indicates the issues are in two categories: **scour critical designation** and **structural condition**.

### Scour Critical designation

Large flows from the May 2015 flood caused deepening of the channel in spans 5 and 6, around Pier 2, around Pier 6, and exposed the piles under the concrete debris wall at Pier 6. The East approach and West approach were overtopped, and the East approach was washed away.

The 96th Avenue bridge over East Bijou Creek is designated as a Scour Critical structure. **The designation is due to the unknown depth of the pile foundations, the recent scour magnitude, and the potential that future scour could cause loss of stability to the piers and abutments.**



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PILE DEPTH > POTENTIAL FUTURE SCOUR

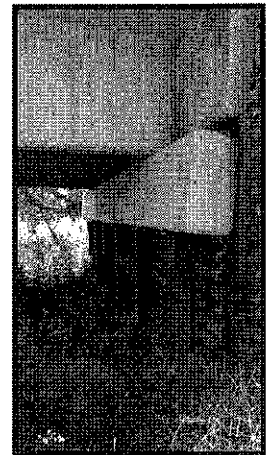
### Structural Condition

The 96th Avenue bridge has several structural condition issues:



- One steel pile on Pier 6 has a **broken weld**, and **reduced axial bending and resistance**. The steel pile with the broken weld is directly under a girder bearing where the vertical reactions onto the pier cap would result in a larger magnitude axial load on this pile compared to other piles supporting the pier cap.
- Abutment 1 cap has **rotated** out at the bottom (away from the retained fill), and toward the retained fill at the top, with **separation** between the abutment cap and the supporting piles. The displacement has increased with time, according to the magnitude of the separation that has been marked on the abutment cap.
- The southeast wingwall at Abutment 7 has significant outward deformation of the piles and backwall, deterioration of backwall resulting in sloughing of fill, and flange distortion where one of the wire deadman cables connects to the pile.
- Several pier caps have spalled concrete, rusted reinforcing steel exposed, flexure cracks, and cracks due to out-of-plane displacements.

- At the girder bearings, the bearing sole plate connected to the girder bottom surface is showing distress, deformations, and displacement. The surrounding girder surface is cracked and showing distress.
- The longitudinal joint between the three tee girders is leaking water through the deck, an indication that the connection between adjacent girder flanges is not fully solid.
- The transverse joint at the end of each span leaks water down onto the bearings. The transverse joint at the end of each span does not contain an expansion joint or elastomeric compression seal.
- The deck contains spalls and cracks, indicated by distress in the asphalt wearing surface, including cracks, holes, dish-shaped areas, and a former patch with geogrid protruding.
- Curbs contain spalls, exposed rusted reinforcement, delaminations, and cracks.
- Bridge rail reveals collision damage and other distress. Portions of the South rail are supported by steel channel members that have yielded at the location of maximum bending moment. Post spacing is approximately 12.5 feet, which is twice the post spacing of current rail types. The railing does not comply with the height requirements or with the requirements that railing configuration be a crashed tested rail type.
- Approach guardrail does not connect to the bridge rail.



- The East road approach is steep, and results in reduced stopping sight distance. The steep grade is partially due to partial repair of the East road approach that washed out during the May 2015 flood.

## APPROACH TO PROVIDE COMPREHENSIVE AND ECONOMICAL ENGINEERED SOLUTIONS

Our experience with bridge design and bridge rehabilitation projects, such as the Martinez bridge rehabilitation for Douglas County and the Cooper Bridge Deck Replacement project for Morgan County, have given RockSol the opportunity to develop solutions to bridge rehabilitations.

RockSol engineers have determined solutions to the identified issues related to the scour critical designation, and to the structural condition issues.

### Scour Critical Designation Removal

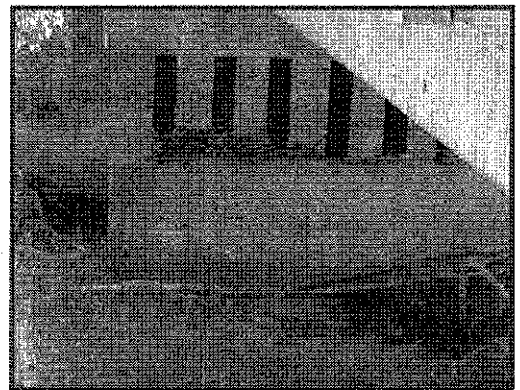
We understand Adams County's primary goal with this project is to remove the scour critical designation for this bridge. The scour critical designation is due to unknown pile foundation depth, the recent scour magnitude, and the potential that future scour could cause loss of stability to the piers and abutments. **Removal of the scour critical designation can only be achieved by verification that the pile depth exceeds the depth of potential future scour.**

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PILE DEPTH > POTENTIAL FUTURE SCOUR

RockSol proposes to address both sides of the equation. To address the left side of the equation, we intend to use non-destructive testing to determine the pile foundation depth at a representative pier location. The RockSol geotechnical staff will arrange for one vertical soil boring to be drilled near Pier 6, a pier that experienced scour during the May 2015 flood. Olson Engineering, who specializes in non-destructive testing, will conduct **parallel seismic testing to determine the pile depth** of the pile foundation members. The RockSol geotechnical staff and Olson Engineering conducted parallel seismic testing on the Martinez bridge rehabilitation project for Douglas County. This testing is an established method to determine the pile depth without excavation or destructive methods. Parallel seismic testing measures sonic waves traveling down through steel piles and then into the subsurface soil, where the response is measured by a receiver located at various depths in the boring hole near the pier. We can then determine the pile foundation depth by plotting the sonic wave response and interpreting changes in the wave length.

Our team will calculate potential future scour using HEC-18, the established scour calculation software. The main scour calculation parameters are the flow velocity, depth of water, shape of the pier, angle of the flow on the pier, and particle size. The 96th Avenue bridge piers have multiple piles below the pier cap, then a solid concrete debris wall, then multiple piles below the debris wall. HEC-18 documentation suggests that the pier configuration should use scour calculation procedures for complex piers. The total potential future scour will be the sum of the calculated pier scour plus contraction scour.



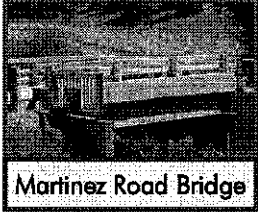
After we determine the pile depth and calculate the potential future scour, we will compare the pile depth to the potential future scour depth. We anticipate the pile depth to be deeper than the calculated potential future scour depth. **Our engineering approach is to determine the pile foundation depth and compare the depth to the calculated potential scour depth.**

PILE DEPTH > POTENTIAL FUTURE SCOUR

**If the pile foundation depth is deeper than the potential future scour depth, the scour critical designation can be removed.** If the scour depth needs to be minimized, our team can design scour mitigation, such as rip rap or articulated mats. We will collaborate with Adams County to determine if the cost of scour mitigation provides benefits that outweigh the cost.

## Evaluation of Bridge Replacement or Bridge Rehabilitation

We will conduct an evaluation of bridge replacement compared to bridge rehabilitation after we determine the scour critical designation. Our team will analyze a comparison of pile foundation depth to potential future scour depth to determine if the scour critical designation can be removed or not. This determination is an important part of evaluating a comparison between a bridge replacement and a bridge rehabilitation.



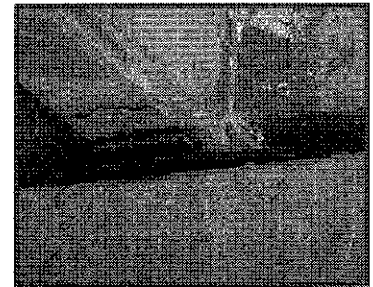
Martinez Road Bridge

Our evaluation of bridge replacement compared to bridge rehabilitation will also consider the various structural condition repair items and their estimated construction costs. We can estimate the structural condition repair items, described below, for the evaluation of bridge replacement versus bridge rehabilitation. Our team will prepare a memo containing the evaluation of the various components, their associated estimated construction costs, a qualitative evaluation of benefits and estimated remaining bridge life, and a quantitative comparison of construction costs.

### Structural Condition

Our experience with bridge design and bridge rehabilitation projects, such as the Martinez bridge rehabilitation for Douglas County and the Cooper Bridge Deck Replacement project for Morgan County, have given RockSol the opportunity to develop solutions to bridge rehabilitations. RockSol has developed solutions to the identified issues related to structural condition.

- We will design a **repair for the broken weld** on the steel pile on Pier 6 which will provide the full axial resistance and flexural resistance of the pile section.
- Abutment 1 cap requires **realigning the cap** to remove the rotation, and re-establishing the welded connections between the abutment cap and the supporting piles.
- Southeast wingwall at Abutment 7 requires that the backwall be replaced and the outward deformation of the piles and backwall be mitigated. By removing the retained fill and re-connecting the deadman cables, the wingwall piles and new backwall will be stable and adequate to support the fill.
- Pier caps with spalled concrete, rusted reinforcing steel exposed, flexure cracks, and cracks due to out-of-plane displacements will be repaired by removing the rust from reinforcement, adding reinforcement where necessary, and placing epoxy grout and/or fiber wraps.
- At the girder bearings, the bearing sole plate connected to the girder bottom surface will have the weld removed from the lower bearing plates, and the surrounding girder surface will be repaired.
- The longitudinal joint between the three tee girders will be repaired by removing the asphalt wearing surface and repairing the connection between adjacent girder flanges.
- Transverse joints at the end of each span require repair to eliminate leaking water and the associated damage. We recommend elastomeric compression seals as they are more economical than strip seal expansion joints.
- Deck repairs will be made to repair spalls and delaminations. Using details similar to two previous projects, we will adapt deck repair details. Our Project Manager, Martin, will discuss the benefits and costs of waterproofing membrane under the asphalt wearing surface, with Adams County to determine if the benefits outweigh the costs.
- Curb spalls, exposed rusted reinforcement, delaminations, and cracks will be repaired, and details developed.
- Bridge rail collision damage, distress, post yielding, inadequate height, excessive post spacing, and lack of a crashed tested rail configuration require the rail be replaced. RockSol has determined that the road classification corresponds to AASHTO category for a Test Level 3 (TL-3) rail. RockSol evaluated potential rail types that fit on the 12" wide curbs, provide the required rail height and post spacing, and provide documented TL-3 crash test performance. We determined **two rail types that meet the listed criteria**; one type anchors on the top and front of the curb, and the other type mounts on the outside of the curb and deck edge. We will present the two alternatives to Adams County, discuss the benefits and cost of each alternative, and achieve a consensus on the rail type.



- Approach guardrail will be laid out to connect to the bridge rail.
- We will evaluate the steep East road approach to determine the modified grade to achieve the required stopping sight distance for the road classification and design speed. We will revise the East road approach grade to tie in to the bridge and provide the roadway design criteria.

### SCOUR MITIGATION DELIVERABLES, ASSOCIATED WORK HOURS, AND COSTS

Scour mitigation deliverables include determination of the existing pile foundation depth, calculation of the potential future scour depth, comparison of the pile depth to scour depth, and design of scour mitigation if scour depth needs to be minimized. The deliverables include:

- Non-destructive evaluation of pile depth, using parallel seismic testing; evaluation contained in a report.
- Calculation of potential future scour depth, including HEC-18 computer results.
- Comparison of pile depth to calculated potential future scour depth, and determination if the scour critical designation can be removed; comparison and conclusion contained in a memo.
- Determination of scour mitigation, including quantities, costs, and benefits; contained in a memo.
- Plans showing placement extents of scour mitigation.

Associated work hours and costs are shown below.

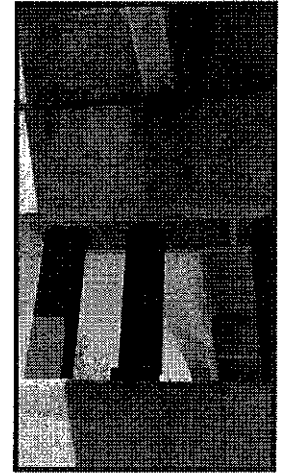
96TH AVENUE BRIDGE OVER EAST BIJOU CREEK  
 BRIDGE REHABILITATION TO ADDRESS SCOUR, CRITICAL DESIGNATION  
 Adams County, Colorado  
 Effort is based on Scope of Work in RFP and as Described in Proposal

Effort to Conduct Tasks needed to accomplish Scope of Work	Labor classification										Total (hours)
	Project Manager (hours)	Lead/Sr Bridge Engineer (hours)	Assistant Bridge Engineer (hours)	CAD Technician 1 (hours)	Roadway Engineer (hours)	CAD Technician 2 (hours)	Lead/Sr Geotech Engineer (hours)	Geologist (hours)	Technician (hours)	Admin (hours)	
<b>Scour Critical Mitigation</b>											
Non-destructive evaluation of pile depth, using parallel seismic testing, RockSol involvement only; includes RockSol involvement in drilling bore hole, casing the hole, grouting the outside of the casing, parallel seismic testing, and preparation of a report	2					2	2	16	6	2	30
Calculation of potential future scour depth, including HEC-18 computer results	2		24								26
Comparison of pile depth to calculated potential future scour depth, determination if the Scour Critical designation can be removed, and preparation of a memo containing the evaluation and conclusion.	2	2	2								6
Determination of scour mitigation, including quantities, costs and benefits; preparation of a memo.	1	2	4								7
Plans showing placement extents of scour mitigation.		1	2	6							9
Coordination with Adams County and stakeholders	7										7
Project management of the design team	6									2	8
<b>Total hours: prime consultant</b>	<b>20</b>	<b>5</b>	<b>32</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>16</b>	<b>6</b>	<b>4</b>	<b>93</b>
<b>Hourly Billing Rates</b>	\$ 159.00	\$ 159.00	\$ 82.33	\$ 82.00	\$ 112.00	\$ 82.00	\$ 146.00	\$ 112.00	\$ 76.80	\$ 69.00	
<b>Labor cost: prime consultant</b>	\$ 3,180.00	\$ 795.00	\$ 2,634.56	\$ 492.00	\$ -	\$ 164.00	\$ 292.00	\$ 1,792.00	\$ 460.80	\$ 276.00	\$ 10,086.36
Other Direct Costs: mileage 200 miles @ \$0.52/mile											\$ 104.00
Driller costs: 1 Bore hole to a depth of 60 feet with a track mounted drill rig											\$ 2,200.00
Sub-consultant Olson Engineering: non-destructive testing, and report											\$ 2,500.00
<b>Total Cost: Scour Mitigation</b>											<b>\$ 14,890.36</b>

## STRUCTURAL CONDITION REPAIRS, ASSOCIATED DELIVERABLES, ASSOCIATED WORK HOURS, AND COSTS

RockSol has determined solutions to the identified issues related to structural condition. The deliverables include:

- Details to repair the broken weld on the steel pile on Pier 6 to provide the full axial resistance and flexural resistance of the pile section; design calculations and details on one bridge plan sheet.
- Details to realign Abutment 1 cap to remove the rotation, and re-establish the welded connections between the abutment cap and the supporting piles; details on one bridge plan sheet.
- Details for Southeast wingwall at Abutment 7, including backwall replacement, re-connecting the deadman cables, repair of the deformation on the pile flange; details on one bridge plan sheet.
- Details of repair to pier caps with spalled concrete, rusted reinforcing steel exposed, flexure cracks, and cracks due to out-of-plane displacements. Details will include repair, removing rust from reinforcement, adding reinforcement where necessary, and placing epoxy grout and/or fiber wraps; details on one bridge plan sheet.
- At the girder bearings, repair details of the bearing sole plate connected to the girder bottom surface, including the weld removed from the lower bearing plates, and the surrounding girder surface will be repaired; details on one bridge plan sheet.
- Details to repair the longitudinal joint between the three tee girders at the connection between adjacent girder flanges; details on one bridge plan sheet.
- Layout extents and details of elastomeric compression seals to eliminate water leaking through the transverse joints at the end of each span; details on one bridge plan sheet.
- Details for deck repairs to fix spalls and delaminations; details on one bridge plan sheet.
- Memo with the benefits and costs of waterproofing membrane under the asphalt wearing surface, for discussion with Adams County to determine if the benefits outweigh the costs.
- Details for curb repairs of spalls, exposed rusted reinforcement, delaminations, and cracks; details on one bridge plan sheet.
- Memo containing figures of bridge rail types that fit on the 12" wide curbs, provide the required rail height and post spacing, and provide documented TL-3 crash test performance, including cost estimates, for discussion with Adams County of the benefits and cost of each alternative, and to achieve a consensus on the rail type.
- Layout extents and details of bridge rail replacement, including rail height, post spacing, and anchoring to the curb top and side, or anchoring to the side of curb and deck edge; details on one bridge plan sheet.
- General Layout of the bridge, showing the location of the repairs.
- Bridge quantities for each pay item, and associated notes for the bridge repairs; one bridge plan sheet.
- Layout of approach guardrail to the bridge rail; details on one roadway plan sheet.
- Roadway profile showing the East road approach modified grade to achieve the required stopping sight distance for the road classification and design speed; one roadway plan sheet.



Associated work hours and costs are shown on the following page.

*"I found RockSol ... to be one of the more diligent and responsive consultants to provide Douglas County services. The design team was especially insightful and mindful of county criteria and associated costs. I would recommend their team for other agencies."*

Neil Sarno, Douglas County CIP Engineer III

96TH AVENUE BRIDGE OVER EAST BIJOU CREEK  
BRIDGE REHABILITATION TO ADDRESS STRUCTURAL CONDITION REPAIRS

Adams County, Colorado

Effort is based on Scope of Work in RFP and as Described in Proposal

Effort to Conduct Tasks needed to accomplish Scope of Work	Labor classification										Total (hours)
	Project Manager (hours)	Lead/Sr Bridge Engineer (hours)	Assistant Bridge Engineer (hours)	CAD Technician 1 (hours)	Lead/Sr Roadway Engineer (hours)	Roadway Engineer (hours)	CAD Technician 2 (hours)	Lead/Sr Geotech Engineer (hours)	Geologist (hours)	Admin (hours)	
<b>Structural Condition Repairs</b>											
Details to repair broken weld on the steel pile on Pier 6 to provide the full axial resistance and flexural resistance of the pile section; design calculations, details on one bridge plan sheet.		2	4	4							10
Details to re-align Abutment 1 cap to remove the rotation, and re-establish the welded connections between the abutment cap and the supporting piles; details on one bridge plan sheet.		3	2	4							9
Details for Southeast wingwall at Abutment 7, including backwall replacement, re-connecting the deadman cables, repair of the deformation on the pile flange; details on one bridge plan sheet.		2	4	4							10
Details to repair pier caps with spalled concrete, rusted reinforcing steel exposed, flexure cracks, and cracks due to out-of-plane displacements. Details will include repair, removing rust from reinforcement, adding reinforcement where necessary, and placing epoxy grout and/or fiber wraps; details on one bridge plan sheet.		2	4	6							12
At the girder bearings, repair details of the bearing sole plate connected to the girder bottom surface, including the weld removed from the lower bearing plates, and the surrounding girder surface will be repaired; details on one bridge plan sheet.		4	2	4							10
Details to repair the longitudinal joint between the three tee girders at the connection between adjacent girder flanges; details on one bridge plan sheet.		2	4	4							10
Layout extents and details of elastomeric compression seals to eliminate water leaking through the transverse joints at the end of each span; details on one bridge plan sheet.		2	4	6							12
Details for deck repairs to fix spalls and delaminations; details on one bridge plan sheet.		2	2	4							8
Memo with the benefits and costs of waterproofing membrane under the asphalt wearing surface, for discussion with Adams County to determine if the benefits outweigh the costs.	2	3	1								6
Details for curb repairs of spalls, exposed rusted reinforcement, delaminations, and cracks; details on one bridge plan sheet.		2	4	4							10
Memo containing figures of bridge rail types that fit on the 12" wide curbs, provide the required rail height and post spacing, and provide documented TL-3 crash test performance, including cost estimates, for discussion with Adams County of the benefits and cost of each alternative, and to achieve a consensus on the rail type.	2	2	4	2							10
Layout extents and details of bridge rail replacement, including rail height, post spacing, and anchoring to the curb top and side, or anchoring to the side of curb and deck edge; details on one bridge plan sheet.		4	2	6							12
General layout of the bridge, showing the location of the repairs.		4	2	6							12
Bridge quantities for each pay item, and associated notes for the bridge repairs; one bridge plan sheet.		2	2	2							6
Layout of approach guardrail to the bridge rail; details on one roadway plan sheet.	2				2	2	4				10
Roadway profile showing the East road approach modified grade to achieve the required stopping sight distance for the road classification and design speed; one roadway plan sheet.	2				2	2	6				12
Coordination with Adams County and stakeholders	4										4
Project management of the design team	8									2	10
<b>Total hours: prime consultant</b>	<b>20</b>	<b>36</b>	<b>41</b>	<b>56</b>	<b>4</b>	<b>4</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>173</b>
<b>Hourly Billing Rates</b>	\$ 159.00	\$ 159.00	\$ 82.33	\$ 82.00	\$ 146.00	\$ 112.00	\$ 82.00	\$ 146.00	\$ 112.00	\$ 69.00	
<b>Labor cost: prime consultant</b>	\$ 3,180.00	\$ 5,724.00	\$ 3,375.53	\$ 4,592.00	\$ 584.00	\$ 448.00	\$ 820.00	\$ -	\$ -	\$ 138.00	\$ 18,861.53
Other Direct Costs: mileage 100 miles @ \$0.52/mile											\$ 52.00
<b>Total Cost: Structural Condition Repair</b>											<b>\$ 18,913.53</b>



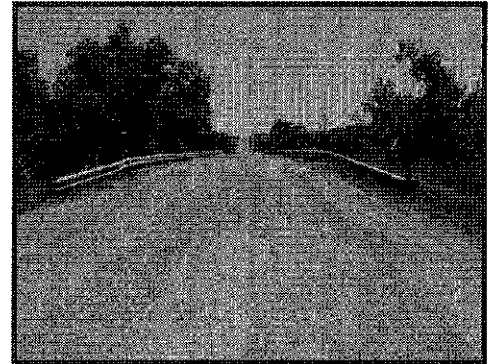
## OTHER ENGINEERING AND ENVIRONMENTAL WORK, ASSOCIATED DELIVERABLES, ASSOCIATED WORK HOURS, AND COSTS

In addition to the scour critical designation mitigation and structural condition repairs, other engineering and environmental work is required to develop complete biddable plans specifications, and estimates. We have determined the following engineering and environmental work is needed, along with associated deliverables include:

### Survey

Scour critical evaluation and structural condition repairs do not require survey information. Our team can design and detail the scour critical evaluation and structural condition repairs with layout and dimensions relative to the bridge piers and abutments.

The evaluation of the East approach road requires field survey of the existing east approach road surface, embankment, and side slopes. Our roadway design team will design the modified profile of the East approach road to tie into the existing road East of the bridge. The RockSol survey staff, which includes a Professional Land Surveyor and an experienced surveyor, will conduct the field survey and control. The associated costs are shown on the following page.



### Right-of-Way

Right-of-way effort will consist of research of the county road right-of-way width, and adjacent property ownership. Field locating right-of-way monuments is not necessary to accomplish the bridge rehabilitation described.

### Utilities

Utilities will be cleared before the bore hole is drilled for the non-destructive testing. Other utilities work is not needed to accomplish the bridge rehabilitation described.

### Environmental

RockSol understands that environmental impacts require analysis and minimization, regardless of whether a project is federally or locally funded. In preparing the scour critical mitigation and structural maintenance design for the bridge, we will provide the County with full environmental clearances for applicable federal, state, and local laws. During her time at CDOT, our Environmental Manager provided environmental clearances for several bridge scour projects in Northern Colorado that resulted from the September 2013 flood. This experience will allow for a streamlined clearance process.

The bridge scour improvements will require 404 permitting administered by the US Army Corps of Engineers (USACE). The project action will likely be covered under a Nationwide 3(a) permit. We will produce a Preconstruction Notification that includes Endangered Species Act and Section 106 of the National Historic Preservation Act considerations provide it to the County for submission to the USACE. We have included two rounds of review with Adams County and USACE in our proposal. We do not anticipate any cultural resources or threatened and endangered species will be affected by the project.

Based on the age of the bridge, it is possible that the paint contains lead. The maintenance aspect of the project will require the removal of the paint. We will include project specifications addressing the proper removal and disposal of the material.



Our environmental team will create a site specific stormwater management plan that addresses temporary erosion control practices, site restoration, and the process for removal of bridge components such as sand blasting and wingwall replacement in order to ensure that the creek's water quality is maintained. We anticipate any disturbance will equal less than one acre; therefore, we assume no Stormwater Construction Permit.

Our environmental team will also create Migratory Bird Treaty Act specifications to ensure compliance with this act. We are not anticipating any impacts.

### Plans, Specifications, and Estimates

In addition to the scour critical designation mitigation and structural condition repairs, other engineering and environmental work is required to develop complete biddable plans specifications, and estimates. The overall project deliverables include:

- Preliminary design submittal; preliminary plans, list of specifications, preliminary quantities and preliminary cost estimate.
- Summary of preliminary review meeting; review comments compiled, and responses prepared.
- Draft final design submittal; draft final plans, draft final specifications, draft final quantities and draft final cost estimate.
- Summary of draft final review meeting; review comments compiled, and responses prepared.
- Final design submittal; final plans, final specifications, final quantities and cost estimate.
- Prepare responses to questions during the bid phase.
- Prepare and transmit plans and specifications containing the professional engineer stamp, signature and date of the professional engineer directing the engineering work shown on each plan sheet and specifications title page.
- Provide design support services during construction, estimated to be 24 hours for a structural engineer.

Associated work hours and costs are shown on the following page.

### PROPOSED SCHEDULE FOR DELIVERABLES

The proposed schedule is shown on page 11.

96TH AVENUE BRIDGE OVER EAST BIJOU CREEK  
OTHER ENGINEERING AND ENVIRONMENTAL WORK

Adams County, Colorado

Effort is based on Scope of Work in RFP and as Described in Proposal

Effort to Conduct Tasks needed to accomplish Scope of Work	Labor classification										
	Project Manager (hours)	Lead/Sr Bridge Engineer (hours)	Assistant Bridge Engineer (hours)	CAD Technician 1 (hours)	Roadway Engineer (hours)	CAD Technician 2 (hours)	Geologist (hours)	Surveyor (hours)	Environmental Scientist (hours)	Admin (hours)	Total (hours)
<b>Other Engineering and Environmental Work</b>											
Survey: field survey of existing East approach road surface, embankment, and side slopes, to accommodate design of the East approach vertical profiles and tie-in location. The field survey and control will be conducted by the RockSol survey staff, including a Professional Land Surveyor and an experienced surveyor.	1							16			17
Right-of-way effort will consist of research of the county road right-of-way width, and adjacent property ownership. Field locating right-of-way monuments is not necessary to accomplish the bridge rehabilitation described.	1							6			7
Utilities will be cleared before the bore hole is drilled for the non-destructive testing. Other utilities work is not needed to accomplish the bridge rehabilitation described.							2				2
Environmental work: prepare 404 Permit PCN, hazardous materials specification, MBTA specification. Includes one site visit. Assumes two rounds of review by Adams County.									16		16
Preliminary design submittal; preliminary plans, list of specifications, preliminary quantities and preliminary cost estimate.	2	2	2	4	1	2			1		14
Summary of preliminary review meeting; review comments compiled, and responses prepared.	2	2									4
Draft final design submittal; draft final plans, draft final specifications, draft final quantities and draft final cost estimate.	2	4	4	8	2				4		24
Summary of draft final review meeting; review comments compiled, and responses prepared.	2	2									4
Final design submittal; final plans, final specifications, final quantities and cost estimate.	2	2	4	6							14
Prepare responses to questions during the bid phase.	1	2									3
Prepare and transmit plans and specifications containing the professional engineer stamp, signature and date of the professional engineer directing the engineering work shown on each plan sheet and specifications title page.		2			1						3
Provide design support services during construction, estimated to be 24 hours for a structural engineer.		12	12								24
Coordination with Adams County and stakeholders	6										6
Project management of the design team	6								3		9
<b>Total hours: prime consultant</b>	<b>25</b>	<b>28</b>	<b>22</b>	<b>18</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>22</b>	<b>21</b>	<b>3</b>	<b>147</b>
<b>Hourly Billing Rates</b>	\$ 159.00	\$ 159.00	\$ 82.33	\$ 82.00	\$ 112.00	\$ 82.00	\$ 112.00	\$ 109.80	\$ 112.00	\$ 69.00	
<b>Labor cost: prime consultant</b>	\$ 3,975.00	\$ 4,452.00	\$ 1,811.26	\$ 1,476.00	\$ 448.00	\$ 164.00	\$ 224.00	\$ 2,415.60	\$ 2,352.00	\$ 207.00	\$ 17,524.86
Other Direct Costs: mileage 100 miles @ \$0.52/mile											\$ 52.00
<b>Total Cost: Other Engineering and Environmental Work</b>											<b>\$ 17,576.86</b>

SCHEDULE - 96TH AVENUE BRIDGE OVER EAST BIJOU CREEK

Activity	Activity Duration (month)	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Scour Critical Mitigation	1.5	█	█							
Determine Pile Depth	0.5	█								
Calculate Potential Scour Depth	1	█	█							
Determine if Scour Critical	0.5		█							
Structural Condition Repairs	2	█	█							
Str. Condition Repair Items	2	█	█							
Design & Plans Preparation plus Reviews	4	█	█	█	█					
Surveying, Right-of-Way Research	0.5	█								
Environmental	2	█	█							
Preliminary Design Submittal	2	█	█	◆						
County Review Prelim Submittal	0.5		█							
Preliminary Review Meeting				◆						
Draft Final Design Submittal	0.5		█		◆					
County Review Draft Final Submittal	0.5			█						
Draft Final Review Meeting					◆					
Final Plans & Specs & Estimate Submittal	0.5				█					
Advertisement for Bids						◆				
Pre-Bid Meeting							◆			
Answer Questions								◆		
Bid Preparation	0.75					█				
Bid Opening								█		
Construction	4								█	
Design Support During Construction	2									█