100% Design - Demolition and Soil Remediation - Adams County Shooting Range, 14451 Riverdale Road, Brighton, Colorado, December 19, 2017

Quantum Water & Environment
1746 Cole Boulevard, Suite 340
Lakewood, Colorado 80401
(720) 524-4294

December 19, 2017

Ms. Jennifer Rutter
Adams County Board of County Commissioners
4430 S. Adams County Parkway, Suite 1700
Brighton, CO 80601

RE: 100% Design – Demolition and Soil Remediation
Adams County Shooting Range Property
14451 Riverdale Road, Brighton, CO
Quantum Water & Environment Project Number 132-15

Dear Ms. Rutter:

Attached is the 100% Design for the Demolition and Soil Remediation Project for the Adams County Shooting Range bid package which is currently being prepared by Adams County. This design includes specifications, drawings, plans and bid sheet and has received preliminary approval from the Colorado Department of Public Health and Environment (CDPHE). CDPHE will provide written approval of this design in a letter to Adams County. Any conditions of approval that require a design change will be incorporated as an amendment to the design. If you would like us to review the bid package prior to issuance, please feel free to contact me.

Thank you for the opportunity to provide you these services. Please contact me at 720-524-4294 or by email at john@quantumwaterco.com if you have any questions.

Sincerely,
QUANTUM WATER & ENVIRONMENT

John C. Dellaport, P.E., P.G.
Project Manager

Enclosure: 100% Design Package for Demolition and Soil Remediation

cc: Richard Mruz and Jill Parisi, CDPHE
Joshua Lee and Brad Coleman, Burns & McDonnell
Tim Gablehouse, Gablehouse Calkins & Granberg LLC
Sean Braden, Adams County

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Demolition and Soil Remediation
Project No. 90334

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Division 1 Specifications

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 011100

SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section summarizes the Work covered in detail in the complete Contract Documents.

B. Owner: Adams County is contracting for Work described in the Contract Documents.

1. Contract Identification: Adams County Shooting Range Demolition and Soil Remediation

C. Work Site Location: 14451 Riverdale Road, Brighton, Colorado.

D. Engineer: The Contract Documents were prepared by Quantum Water & Environment 1746 Cole Boulevard, Suite 340 Lakewood, Colorado 80401, Burns & McDonnell Engineering Company, Inc., 9785 Maroon Circle, Suite 400, Denver, Colorado 80112 and DS Environmental Consulting, Inc., 12477 West Cedar Drive, Lakewood, Colorado 80228.

1.2 PROJECT DESCRIPTION:

A. Description of Project:

1. Adams County is removing site structures and remediating soil impacted by former shooting range activies on its former Old Sheriff's Shooting Range Property located on Riverdale Road, approximately 3 miles southwest of Brighton, Colorado. This work is being performed under a Corrective Action Plan approved by the Colorado Department of Public Health and Environment (CDPHE). All Work under this Contract shall be completed according to the plans and Specifications.

2. Work Covered by Contract Documents:

a. The Work under this Contract includes demolishing and removing buildings and structures from the Property; excavation and remediation of approximately 2,900 bank cubic yards of shooting range soil and placement onto/adjacent to the landfill, and shall include furnishing all supervision, labor, tools, equipment, transportation, storage facilities, services, and supplies required to complete the Project in accordance with the Project Drawings and Specifications.

1.3 PROJECT CONDITIONS:

A. Temporary Utilities: The Owner will not provide temporary utilities. Contractor shall provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous or unsanitary conditions to develop or persist on the Site.A fire hydrant is located at the intersection of Riverdale Road and Yosemite Street, Thornton, Colorado and can be accessed via Riverdale Road approximately 2 miles south of the Site. Contractor shall contract with City of Thornton for purchase of water for construction purposes.

C. The property is equipped with a perimeter fence and two locking access gates that are located immediately west of Riverdale Road.

D. Contractor is responsible for installation and maintenance of overall site stormwater controls in accordance with Drawings and Specification Section 31 32 11 - Soil Surface Erosion Control. Contractor shall provide a stormwater management plan for soil excavation, treatment, and placement as part of the Soil Treatment Work Plan in accordance with Specification Section 02 61 13 – Excess Risk Soil.

1.4 CONTRACTOR'S USE OF PREMISES:

A. Coordinate with other separate Contractors and Owner to avoid interference of operations.

B. Conduct operations so as to ensure the least inconvenience to Owner (and the general public).

C. Restrict access to the property by unauthorized individuals by ensuring that access gates are locked when Contractor leaves the property after each work shift.

1.5 OWNER'S USE OF PREMISES:

A. This Site is vacant and not currently used by the Owner.

1.6 WORK SEQUENCE:

A. General Work sequence shall be performed as follows. Any proposed deviation from this sequence shall be submitted in writing for approval prior to commencement. Approval of any deviation in the sequence of construction must be in written form.

1. The Contractor shall notify the Utility Notification Center of Colorado (Colorado 811) at least 72 hours prior to the start of construction. Contractor shall be fully responsible for the cost of all damages, which occur as a result of the Contractor's failure to locate and protect any existing utilities.

2. Verify locations and depths of utilities prior to installation of erosion and sediment controls and excavation.

3. Install new erosion and sediment controls as shown on Drawings C007 and C008. No other work may occur until the specified perimeter sediment controls are in place. Maintain erosion and sediment controls throughout the entire duration of construction activities.

4. Abate asbestos-containing floor tile in Building C as shown on Drawing C002.

5. Remove regulated building materials and recycle/dispose off-site.

6. Demolish buildings, sheds and explosives magazines and dispose off-site.

7. Demolish steel shooting range backstop, wood landings, metal targets, and utility poles on North and South Shooting Ranges, decontaminate, and dispose off-site as shown on Drawings C002 and C003.

8. Pump contents of septic tank and dispose of wastes off-site. Excavate tank and consolidate in Soil Placement Area.

9. Remove miscellaneous waste tires and debris piles located at multiple locations on Site as shown on Drawings C002 and C003 and dispose off-site.

10. Remove or abandon in place stormwater culvert pipes on South Shooting Range as shown on the Drawings and in accordance with Project Specifications.

11. Construct Treatment Pad(s) and install storm water controls in accordance with Contractor's Soil Treatment Plan.

12. Recover surficial lead from Lead Surface Walk Area as shown on the Drawings and place in container for recycling by others.

13. Excavate Category I Excess Risk Soil areas and three bullet piles to depths and extents shown on Drawings C004 and C005 and in accordance with Project Specifications. Sieve soils from selected excavation areas as shown on the Drawings and recycle reclaimed lead off-site. Treat soils with ECOBOND®, or approved alternate.

14. Excavate Category II Excess Risk soil areas to depths and extents shown on Drawings C004 and C005 and in accordance with Project Specifications. Treat soils with ECOBOND®, or approved alternate,when directed by Owner's Representative.

15. Excavate Soil with Munitions Debris to depths and extents shown on Drawing C005 and in accordance with Project Specifications.

16. Place and compact treated and untreated Category I and II Excess Risk soils in the Soil Placement Area shown on the Drawings. Construct a temporary soil cover over the Soil Placement Area as shown on the Drawings using borrow material from locations specified on the Drawings.

17. Blend excavation edges to match surrounding topography. Grade final excavation surfaces to drain.

18. Inspect and maintain temporary erosion and sediment controls per a monthly maintenance contract for up to 6 months, as directed by Owner's Representative.

19. Clean up site as required by the Contract Documents.

1.7 MEASUREMENT AND PAYMENT:

A. The following bid items describe the measurement of and payment for the Work to be done under the respective items listed on the Bid Form. Each unit or lump sum price stated in Contractor's Bid shall constitute full compensation, as herein specified, for each item of the Work completed. The quantities provided are estimates and represent approximate maximum expected quantities. The actual amounts will likely vary from the listed amounts.

1. For lump sum items, the Contractor will be paid on the basis of the percentage of actual Work completed and accepted. One hundred percent of the Contract price for the Work completed and accepted may be paid, subject to the limitations of the Contract Documents.

2. For unit price items, the Contractor will be paid for the actual amount of Work accepted. The amount will be in accordance with unit prices submitted on the Bid Form.

3. Contractor shall note that Engineer will be implementing the requirements of the Construction Quality Assurance (CQA) Plan and shall accommodate all required CQA testing and monitoring in the Work and Project schedule at no additional cost to the Owner.

B. Bid Items

1. ITEM NO. 1: MOBILIZATION

a. Item No. 1a: Mobilization and Demobilization

(1) Method of Measurement: Lump Sum
(2) Payment: Payment shall include all incidentals and all costs associated with Contractor's field offices and temporary facilities, mobilization to and demobilization from the Site. Costs associated with Contractor's mobilization to and demobilization from the site shall include but are not limited to equipment, materials, personnel, supplies, health and safety, temporary barriers, temporary controls, temporary utilities, other Work including preparatory Work and operations. This item shall also include all costs associated with attending of all Engineer and Owner required meetings and submitting all required submittals and insurance. Payment for these items shall be made on a lump sum basis at the lump sum prices in the Unit Price Schedule.

Item No. 1a Mobilization and Demobilization shall not exceed 10% of the original Contract price.

b. Item No. 1b: Performance and Payment Bond

(1) Method of Measurement: Lump Sum
(2) Payment: Payment shall be made at the lump sum Contract price, which shall include all incidentals and all costs associated with

Contractor's performance and payment bond. This item also includes all other Work and expenses incidental thereto for which payment is not provided under other items.

c. Item No. 1c: Force Account

(1) Method of Measurement: Lump Sum
(2) Payment: The Engineer may direct the Contractor to perform Work under the Force Account. Payment to the Contractor for such Work will be considered as compensation in full. No Work shall be paid by Force Account unless previously approved by the Engineer. Force Account payment shall be based on hourly rates for labor and equipment provided as required by the Contract Documents. Supplies will be paid based upon invoices to the Contractor.

2. ITEM NO. 2: DEMOLITION

a. Item No. 2a: Asbestos Abatement

(1) Method of Measurement: Lump Sum
(2) Payment: Payment shall be made at the Contract lump sum price, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the abatement of asbestos containing material located in Building C as shown on Drawing C003. The Contractor is responsible for verifying estimated quantities prior to bidding. Quantities for this Work are approximately 400 square feet. This item includes all other Work and expenses incidental thereto for which payment is not provided under other items.

b. Item No. 2b: Debris Removal

(1) Method of Measurement: Lump Sum
(2) Payment: Payment shall be made at the Contract lump sum price, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the collection and removal of miscellaneous debris from the site. This item includes two steel magazine sheds and fence, waste tires, treated wood products, steel pipe, burn drum. and subsurface septic tank (approximately 2,000 gallons). This item includes all other Work and expenses incidental thereto for which payment is not provided under other items.

c. Item No. 2c: Building Demolition

(1) Method of Measurement: Lump Sum
(2) Payment: Payment shall be made at the Contract lump sum price, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the demolition of existing buildings located on the project site. This item includes 11 structures (4 buildings and 7 sheds), all Universal Waste found

in the structures (includes A/C units, mercury vapor light bulbs, fluorescent light ballasts, thermostats, and emergency exit signs, at a minimum), miscellaneous debris (wood, steel and other debris) next to these structures. This item includes all other Work and expenses incidental thereto for which payment is not provided under other items.

d. Item No. 2d: Range Demolition

(1) Method of Measurement: Lump Sum
(2) Payment: Payment shall be made at the Contract lump sum price, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the demolition of existing structures located on the project site. This item includes, Tall Wall on North Shooting Range, wood landings and metal targets on both shooting ranges, standing utility poles with associated cables and wires, and one small concrete slab west of Building A. This item includes all other Work and expenses incidental thereto for which payment is not provided under other items.

e. Item No. 2e: South Range Floor Demolition

(1) Method of Measurement: Lump Sum
(2) Payment: Payment shall be made at the Contract lump sum price, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the demolition of the asphalt and concrete South Range floor. This item includes sawcutting of existing asphalt at the location shown on the Drawings, removal of asphalt and concrete, breaking material into sizes suitable for placement, and placement in the soil placement areas. This item includes all other Work and expenses incidental thereto for which payment is not provided under other items.

3. ITEM NO. 3: EXCESS RISK SOIL REMEDIATION

a. Item No. 3a: Surficial Lead Recovery

(1) Method of Measurement: Lump Sum
(2) Payment: Payment shall be made at the Contract lump sum price, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the clearing of surficial lead from the Lead Surface Walk Area. Quantities for this Work are approximately 2.3 acres. This item includes all other Work and expenses incidental thereto for which payment is not provided under other items.

b. Item No. 3b: Lead Screening

(1) Method of Measurement: Bank Cubic Yard
(2) Payment: Payment shall be made at the Contract unit price per bank cubic yard, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation,

storage, quality control, and supplies required for the screening of lead from soils. This item includes excavation of Excess Risk Soil, hauling to the screening plant, screening, hauling reclaimed lead to an approved recycling facility, hauling soil to the treatment pad, and placing in piles. The Contractor is responsible for verifying estimated quantities prior to bidding. Quantities for this Work are approximately 240 cubic yards of soil. Measurement for payment of this item shall be the volume between the initial and final surveys for the excavation areas. This item includes all other Work and expenses incidental thereto for which payment is not provided under other items.

c. Item No. 3c: Category I Excess Risk Soil Excavation

(1) Method of Measurement: Bank Cubic Yard
(2) Payment: Payment shall be made at the Contract unit price per bank cubic yard, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, supplies and amendments required for the excavation of Excess Risk Soil from the North and South Shooting Range excavation areas as shown on the Drawings. This item includes the excavation of Excess Risk Soil, hauling to Treatment Pad, and placing in piles. The Contractor is responsible for verifying estimated quantities prior to bidding. CAD files of the design will be provided upon request. Quantities for this Work are approximately 2,000 cubic yards of soil. Measurement for payment of this item shall be the volume between the initial and final surveys for the excavation areas. This item includes all other Work and expenses incidental thereto for which payment is not provided under other items.

d. Item No. 3d: Category I Excess Risk Soil Treatment

(1) Method of Measurement: Bank Cubic Yard
(2) Payment: Payment shall be made at the Contract unit price per bank cubic yard, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the treatment of Excess Risk Soil. This item includes up to two treatments of the Category I soil with ECOBOND®, or approved alternate. The Contractor is responsible for verifying estimated quantities prior to bidding. CAD files of the design will be provided upon request. Quantities for this Work are approximately 2,000 cubic yards of soil. Measurement for payment of this item shall be the volume between the initial and final surveys of the excavation areas. This item also includes all other Work and expenses incidental thereto for which payment is not provided under other items.

e. Item No. 3e: Category I Excess Risk Soil Placement

(1) Method of Measurement: Bank Cubic Yard
(2) Payment: Payment shall be made at the Contract unit price per bank cubic yard, which shall be full compensation for furnishing

all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the hauling and compaction of treated soil to the lines and grades shown on the Drawings and all construction quality control material testing required by the Specifications. This item includes hauling the soil to the Soil Placement Area and compacting the soil. The Contractor is responsible for verifying estimated quantities prior to bidding. CAD files of the design will be provided upon request. Quantities for this Work are approximately 2,000 cubic yards of compacted fill. Measurement for payment of this item shall be the volume between the initial and final surveys of the excavation areas. This item also includes all other Work and expenses incidental thereto for which payment is not provided under other items.

f. Item No. 3f: Category II Excess Risk Soil Excavation

(1) Method of Measurement: Bank Cubic Yard
(2) Payment: Payment shall be made at the Contract unit price per bank cubic yard, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, supplies and amendments required for the excavation of Category II Excess Risk Soil from the North and South Shooting Range excavation areas as shown on the Drawings. This item includes the excavation of Excess Risk Soil, hauling to Treatment Pad, and placing in piles. The Contractor is responsible for verifying estimated quantities prior to bidding. CAD files of the design will be provided upon request. Quantities for this Work are approximately 200 cubic yards of soil. Measurement for payment of this item shall be the volume between the initial and final surveys of the excavation areas. This item includes all other Work and expenses incidental thereto for which payment is not provided under other items.

g. Item No. 3g: Category II Excess Risk Soil Treatment

(1) Method of Measurement: Bank Cubic Yard
(2) Payment: Payment shall be made at the Contract unit price per bank cubic yard, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the treatment of Category II Excess Risk Soil. This item includes up to two treatments of the Category II soil with ECOBOND®, or approved alternate. The Contractor is responsible for verifying estimated quantities prior to bidding. CAD files of the design will be provided upon request. Quantities for this Work are approximately 200 cubic yards of soil. Measurement for payment of this item shall be the volume between the initial and final surveys of the excavation areas. This item also includes all other Work and expenses incidental thereto for which payment is not provided under other items.

h. Item No. 3h: Category II Excess Risk Soil Placement

(1) Method of Measurement: Bank Cubic Yard
(2) Payment: Payment shall be made at the Contract unit price per bank cubic yard, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the hauling and compaction of treated soil to the lines and grades shown on the Drawings and all construction quality control material testing required by the Specifications. This item includes hauling the soil to the Soil Placement Area and compacting the soil. The Contractor is responsible for verifying estimated quantities prior to bidding. CAD files of the design will be provided upon request. Quantities for this Work are approximately 200 cubic yards of compacted fill. Measurement for payment of this item shall be the volume between the initial and final surveys of the excavation areas. This item also includes all other Work and expenses incidental thereto for which payment is not provided under other items.

i. Item No. 3i: Soil with Munitions Debris Excavation

(1) Method of Measurement: Bank Cubic Yard
(2) Payment: Payment shall be made at the Contract unit price per bank cubic yard, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, supplies and amendments required for the excavation of Soil with Munitions Debris from the South Shooting Range excavation areas as shown on the Drawings. This item includes the excavation of Soil with Munitions Debris. The Contractor is responsible for verifying estimated quantities prior to bidding. CAD files of the design will be provided upon request. Quantities for this Work are approximately 700 cubic yards of soil. Measurement for payment of this item shall be the volume between the initial and final surveys for the excavation areas. This item includes all other Work and expenses incidental thereto for which payment is not provided under other items.

j. Item No. 3j: Soil containing Munitions Debris Placement

(1) Method of Measurement: Bank Cubic Yard
(2) Payment: Payment shall be made at the Contract unit price per bank cubic yard, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the hauling and compaction of soil to the lines and grades shown on the Drawings and all construction quality control material testing required by the Specifications. This item includes hauling the soil to the Soil Placement Area and compacting the soil. The Contractor is responsible for verifying estimated quantities prior to bidding. CAD files of the design will be provided upon request. Quantities for this Work are approximately 700 cubic yards of compacted fill. Measurement for payment of this item shall be the volume between the initial and final surveys of the excavation areas. This item also includes all other Work and

expenses incidental thereto for which payment is not provided under other items.

k. Item No. 3k: Temporary Cover Placement

(1) Method of Measurement: Lump Sum

(2) Payment: Payment shall be made at the Contract lump sum price, which shall be full compensation for furnishing all supervision, labor, materials, tools, equipment, transportation, storage, quality control, and supplies required for the cut and placement of soil to place as temporary cover over the treated soil placed in the Soil Placement Area. This item includes the excavation of existing soil, hauling, and placement over the treated soil in the Soil Placement Area footprint. The Contractor is responsible for verifying estimated quantities prior to bidding. Quantities for this Work are approximately 400 cubic yards of fill. This item also includes all other Work and expenses incidental thereto for which payment is not provided under other items.

4. ITEM NO. 4: EROSION AND SEDIMENT CONTROL

a. Item No. 4a: Temporary Erosion and Sediment Control

(1) Method of Measurement: Lump Sum

(2) Payment: Payment shall be made at the Contract lump sum price, which shall be full compensation for all preparation, furnishing, installation, construction, inspection and maintaining of all silt fences, erosion control logs, and any other temporary measures to control erosion / dust control and minimize the siltation of intermediate streams and the pollution of private property. This item includes obtaining all required permits and filing notices in accordance with local, state and federal regulations for erosion and sediment control for construction activities. The Contractor shall provide all appropriate storm water pollution prevention plan documents for construction, inspect at least once per week with the on-site representative, and maintain all erosion control measures installed for this Project and maintain written records of inspections and maintenance activities. Dust control by and cleanup of any tracked sediment by construction vehicles onto adjacent roads is included in this item. This item also includes all other Work and expenses incidental thereto for which payment is not provided under other items.

b. Item No. 4b: Erosion and Sediment Control Inspection and Maintenance

(1) Method of Measurement: Lump Sum

(2) Payment: Payment shall be made at the Contract lump sum price, which shall be full compensation for inspection and maintaining of all silt fences, erosion control logs, and any other temporary measures to control erosion / dust control and minimize the siltation of intermediate streams and the pollution of private property. This item includes obtaining all required permits and filing notices in accordance with local, state and federal regulations for erosion and sediment control for construction

activities. The Contractor shall inspect at least once per month and within 24 hours of each 0.5-inch or greater rainfall event. Assume inspection and maintenance services will be needed for six months. This item also includes all other Work and expenses incidental thereto for which payment is not provided under other items.

5. ITEM NO. 5: SURVEYING

a. Method of Measurement: Lump Sum

b. Payment: Payment shall be made at the lump sum Contract price, which shall be full compensation for all supervision, labor, tools, equipment, transportation, storage, construction quality control, and supplies required to perform the surveying Work and prepare, certify, and submit survey data. This item includes the completion of an existing conditions survey, post excavation survey, Soil Placement Area survey prior to and after placement of material as described in the Specifications and the CQA Plan. The surveys shall define the horizontal and vertical placement for all new construction performed. This item also includes all other Work and expenses incidental thereto for which payment is not provided under other items.

1.8 LIST OF DRAWINGS:

A. Drawings:

1. Each sheet of the Drawings bears the following general title:

DWG Number – Title

2. Individual sheet numbers and titles are as follows:

a. n/a – Cover and Index

b. G001 – General Notes, Legend and Abbreviations

c. C001 – Existing Conditions Plan

d. C002 - Demolition Plan I

e. C003 – Demolition Plan II

f. C004 – Excess Risk Soil Excavation Plan – Category I Soil

g. C005 – Excess Risk Soil Excavation Plan – Category II Soil and Soil Containing Munitions Debris

h. C006 – Erosion and Sediment Control Plan

i. C007 – Erosion and Sediment Control Details

PART 2 - PRODUCTS

This Section is not used.

PART 3 - EXECUTION

This Section is not used.

— END OF SECTION —

SECTION 013100

PROJECT COORDINATION AND MEETINGS

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section includes the following administrative and procedural requirements for Project meetings. The Colorado Department of Public Health and Environment (CDPHE) may conduct site visits during this project.

1.2 PROJECT MEETINGS:

A. Preconstruction Conference:

1. Engineer will conduct a meeting within 30 days after the Contract Times commence to run, to review items stated in the following agenda and to establish a working understanding between the parties as to their relationships during performance of the Work.

2. Preconstruction conference shall be attended by:

a. Contractor and his superintendent.

b. Engineer.

c. Owner and Owner's Representative.

d. At Owner's option, representatives of principal Subcontractors and Suppliers.

e. CDPHE (optional)

3. Meeting Agenda:

a. Construction schedules.

b. Critical Work sequencing and long-lead items.

c. Designation of responsible personnel.

d. Project coordination.

e. Procedures and Processing of:

(1) Field decisions.

(2) Substitutions.

(3) Submittals.

(4) Change Orders.

(5) Applications for Payment.

f. Procedures for testing.

g. Procedures for maintaining record documents.

h. Use of Premises:

(1) Work, storage, laydown, and parking areas.

(2) Owner's requirements.

(3) Work restrictions and hours.

i. Construction facilities, controls, and construction aids.

j. Temporary utilities.

k. Safety and first-aid.

l. Security.

m. Deliveries of Equipment and Materials.

4. Location of Meeting: At or near the Project Site.

5. Reporting:

a. Within 5 working days after the meeting, Engineer will prepare and distribute minutes of the meeting to Owner and Contractor.

b. CDPHE will be included in the distribution of all meeting minutes.

c. Contractor shall provide copies to Subcontractors and major Suppliers.

B. Construction Progress Meetings:

1. Engineer will schedule and conduct a meeting at least once a month and at other times requested by Engineer. Representatives of the Owner, Engineer, and Contractor shall be present at each meeting. With Engineer's concurrence, Contractor may request attendance by representatives of Subcontractors, Suppliers, or other entities concerned with current program or involved with planning, coordination, or performance of future activities. All participants in the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work. CDPHE will be invited to attend meetings that include discussion and resolution of non-conformances.

2. Contractor and each Subcontractor represented shall be prepared to discuss the current construction progress report and any anticipated future changes to the schedule. Each Subcontractor shall comment on the schedules of Contractor and

other Subcontractors and advise if their current progress or anticipated activities are compatible with that Subcontractor's Work.

3. If one Subcontractor is delaying another, Contractor shall issue such directions as are necessary to resolve the situation and promote construction progress.

4. Meeting Agenda:

   a. Review of construction progress since previous meeting.

   b. Review scheduled work activities.

   c. Review test data.

   d. Review of outstanding non-compliance items.

   e. Field observations, interface requirements, conflicts.

   f. Problems which may impede construction schedule.

   g. Delivery schedules.

   h. Submittal schedules and status.

   i. Site use.

   j. Hours of Work.

   k. Hazards and risks.

   l. Housekeeping.

   m. Quality and Work standards.

   n. Change Orders.

   o. Documentation of information for payment requests.

   p. Corrective measures and procedures to regain construction schedule if necessary.

   q. Revisions to construction schedule.

   r. Review of proposed activities for succeeding Work period.

   s. Review proposed Contract modifications for effect on construction schedule and on completion date.

PART 2 - PRODUCTS

This Section is not used.

PART 3 - EXECUTION

This Section is not used.

— END OF SECTION —

SECTION 013300

SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section includes definitions, descriptions, transmittal, and review of Submittals.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Project Coordination and Meetings: SECTION 013100

B. Contract Closeout: SECTION 017800

1.3 GENERAL INFORMATION:

A. Definitions:

1. Shop Drawings and product data are technical Submittals prepared by Contractor, Subcontractor, manufacturer, or Supplier and submitted by Contractor to Engineer as a basis for approval of the use of equipment and materials proposed for incorporation in the Work or needed to describe installation, operation, maintenance, or technical properties, as specified in each Division of the Specification section.

(1) Shop Drawings include custom-prepared data of all types including work plans, drawings, diagrams, material schedules, templates, instructions, and similar information not in standard printed form applicable to other projects.

(2) Product data includes standard printed information on materials, products, and systems not custom-prepared for this Project, other than the designation of selections from available choices.

2. Informational Submittals are those technical reports, administrative Submittals, certificates, and guarantees not defined as Shop Drawings or product data.

(1) Technical reports include laboratory reports, tests, technical procedures, technical records, and Contractor's design analysis.

(2) Administrative Submittals are those nontechnical Submittals required by the Contract Documents or deemed necessary for administrative records. These Submittals include maintenance agreements, Bonds, physical work records, statements of applicability, Project record data, schedules, and similar type Submittals.

3. Refer to Submittal List at end of this Specification Section for detailed lists of Submittals and specific requirements.

B. Quality Requirements:

1. Submittals such as Shop Drawings and product data shall be of suitable quality for legibility and reproduction purposes. Every line, character, and letter shall be clearly legible. Drawings such as reproducibles shall be useable for further reproduction to yield legible hard copy.

2. Documents submitted to Engineer that do not conform to specified requirements shall be subject to rejection by Engineer, and upon request by Engineer, Contractor shall resubmit conforming documents. If conforming Submittals cannot be obtained, such documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Contractor's (or his Subcontractor's) failure to initially satisfy the legibility quality requirements will not relieve Contractor (or his Subcontractors) from meeting the required schedule for Submittals.

C. Language and Dimensions: All words and dimensional units shall be in the English language.

D. Submittal Completeness:

1. Submittals shall be completed with respect to dimensions, design criteria, materials of construction, and other information specified to enable Engineer to review the information effectively.

2. Where standard Drawings are furnished which cover a number of variations of the general class of Equipment, each drawing shall be annotated to indicate exactly which parts of the drawing apply to the Equipment being furnished. Use hatch marks to indicate variations that do not apply to the Submittal. The use of "highlighting markers" will not be an acceptable means of annotating Submittals. Annotation shall also include proper identification of the Submittal permanently attached to the drawing.

3. Reproductions or copies of Drawings or portions thereof will not be accepted as complete fabrication drawings. Contractor may use a reproduction of Contract Drawings to identify details and drawing references. Whenever the Drawings are revised to show this additional Contractor information, Engineer's title block shall be replaced with Contractor's title block, and Engineer's professional seal shall be removed from the drawing. The Contractor shall revise these drawings for subsequent Engineer revisions to the Drawings.

1.4 TECHNICAL SUBMITTALS:

A. Items shall include, but not be limited to, the following:

1. Work plans and safety plan.

2. Manufacturer's specifications.

3. Shop fabrication drawings.

4. Material lists or schedules.

5. Performance tests on materials.

6. All drawings, catalogs or parts thereof, manufacturer's specifications and data, instructions, and other information specified or necessary for Engineer to determine that Materials conform with the design concept and comply with intent of the Contract Documents.

B. Schedule of Submittals:

1. Prepare for Engineer's concurrence, a schedule for submission of all Submittals specified or necessary for Engineer's approval of the materials proposed for incorporation in the Work or needed for proper installation, operation, or maintenance. Schedule submission of all Submittals to permit review, fabrication, and delivery in time so as to not cause a delay in the Work of Contractor or his Subcontractors or any other contractors as described in the Contract Documents.

2. In establishing schedule for Submittals, allow 7 days in Engineer's office for reviewing original Submittals and 4 days in Engineer's office for reviewing resubmittals.

3. The schedule shall indicate the anticipated dates of original submission for each item and Engineer's approval thereof, and shall be based upon at least one resubmission of each item.

4. Schedule all Submittals required prior to fabrication or manufacture for submission within 30 days of the Notice to Proceed. Schedule Submittals pertaining to storage, installation, and operation at the Site for Engineer's approval prior to delivery of the Equipment and Materials.

5. Resubmit Submittals the number of times necessary to obtain Engineer's "Submittal Approved." However, any need for resubmittals in excess of the number set forth in the accepted schedule, or any other delay in obtaining approval of Submittals, will not be grounds for extension of the Contract Times, provided Engineer completes his reviews within the times specified.

C. Transmittal of Submittals:

1. All Submittals (Shop Drawings and product data) for Materials furnished by Contractor, Subcontractors, manufacturers, and Suppliers shall be submitted to Engineer by Contractor.

2. After checking and verifying all field measurements, transmit all Submittals to Engineer for approval using the Submittal Transmittal supplied in the Project Manual.

3. Mark each Submittal by Project name, Contract title and number, and applicable Specification Section and Article number. Include in the submittal an itemized

list with identification number of submittal contents. Unidentifiable Submittals will be returned for proper identification.

4. Check and include Contractor's approval for Submittals of Subcontractors, Suppliers, and manufacturers prior to transmitting them to Engineer. Contractor's approval shall constitute a representation to Owner and Engineer that Contractor approves the Submittals and has determined and verified all quantities, dimensions, field construction and installation criteria, materials, catalog numbers, compliance with Laws and Regulations, and similar data. Contractor assumes full responsibility for doing so; and Contractor has coordinated each Submittal with the requirements of the Work and the Contract Documents.

5. At the time of each submission, call to the attention of Engineer in the letter of transmittal any deviations from requirements of the Contract Documents.

6. Make all modifications noted or indicated by Engineer and return the revised Submittals until approved. Direct specific attention in writing, or on revised Submittals, to changes other than the modifications called for by Engineer on previous Submittals. After paper copy Submittals have been approved, submit copies thereof for final distribution. Previously approved Submittals transmitted for final distribution will not be further reviewed and are not to be revised. If errors are discovered during manufacture or fabrication, correct the Submittal and resubmit for review.

7. Following completion of the Work and prior to final payment, furnish record documents and approved Shop Drawings necessary to indicate "as constructed" conditions, including field modifications, in the number of copies specified. All such copies shall be clearly marked "PROJECT RECORD."

8. Keep a copy or sample of each Submittal in good order at the Site.

D. Quantity Requirements:

1. Except as otherwise specified, transmit all Shop Drawings in either of the following quantities:

(1) Initial Submittal:

(a) Electronic - One copy to Engineer.

(2) Resubmittals:

(a) Electronic - One copy to Engineer.

(3) As-constructed documents:

(a) Paper – One copy to Engineer.

(b) Electronic - One copy to Engineer.

2. Transmit Submittals of product data as follows:

   (1) Initial Submittal:

      (a) Electronic - One copy to Engineer.

   (2) Resubmittals:

      (a) Electronic - One copy to Engineer.

3. Transmit Submittals for reference only:

   (1) Electronic – One to Engineer.

4. When all Submittals have been updated to "as-constructed" conditions, transmit to Engineer and to Owner in electronic format.

5. Owner may copy and use for internal operations and staff training purposes any and all document Submittals required by this Contract and approved for final distribution, whether or not such documents are copyrighted, at no additional cost to Owner. If permission to copy any such Submittal for the purposes stated is unreasonably withheld from Owner by Contractor or any Subcontractor, manufacturer, or Supplier, Contractor shall provide to Engineer the number of copies required by Contractor at each final distribution issue.

E. Engineer's Review:

1. Engineer will review and take appropriate action on Submittals in accordance with the accepted schedule of Submittals. Engineer's review and approval will be only to determine if the items of Equipment and Materials covered by the Submittals compatible with the design concept and conform to information given in the Contract Documents.

2. Engineer's review and approval will not extend to design data reflected in Submittals which is peculiarly within the special expertise of Contractor or Contractor's Subcontractors or Suppliers. Review and approval of a component item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval of Shop Drawings or product data will not relieve Contractor of responsibility for any deviation from requirements of the Contract Documents unless Contractor has in writing called Engineer's attention to such deviation at the time of submission, and Engineer has given written concurrence in and approval of the specific deviation. Approval by Engineer shall not relieve Contractor from responsibility for errors or omissions in Submittals.

F. Review Action:

1. Engineer's review action, appropriately completed, will appear on all submittal transmittals when returned by Engineer. Review status designations listed on Engineer's action stamp are defined as follows:

(a) NO EXCEPTION TAKEN: Signifies Material represented by the Submittal conforms with the design concept and complies with the intent of the Contract Documents and is approved for incorporation in the Work. Contractor is to proceed with fabrication or procurement of the items and with related Work. Copies of the Submittal are to be transmitted to Engineer for final distribution.

(b) MAKE CORRECTIONS AS NOTED: Signifies Material represented by the Submittal conforms with the design concept and complies with the intent of the Contract Documents and is approved for incorporation in the Work in accordance with Engineer's notations. Contractor is to proceed with fabrication or procurement of the items and with related Work in accordance with Engineer's notations and is to submit a revised Submittal responsive to notations marked on the returned Submittal or written in the letter of transmittal.

(c) AMEND AND RESUBMIT: Signifies Material represented by the Submittal appears to conform with the design concept and comply with the intent of the Contract Documents but information is either insufficient in detail or contains discrepancies which prevent Engineer from completing his review. Contractor is to resubmit revised information responsive to Engineer's annotations on the returned Submittal or written in the submittal transmittal. Fabrication or procurement of items represented by the Submittal and related Work is not to proceed until the Submittal is approved.

(d) REJECTED - RESUBMIT: Signifies Material represented by the Submittal does not conform with the design concept or comply with the intent of the Contract Documents and is disapproved for use in the Work. Contractor is to provide Submittals responsive to the Contract Documents.

1.5 INFORMATIONAL SUBMITTALS:

A. Informational Submittals are comprised of technical reports, administrative Submittals, and guarantees, which relate to the Work, but do not require Engineer approval prior to proceeding with the Work. Informational Submittals include:

1. Job progress schedules.

2. Equipment and Material delivery schedules.

3. Progress reports and photographs (excavation and soil staging pile tracking logs).

4. Warranties and guarantees.

B. Transmittal of Informational Submittals: All informational Submittals furnished by Subcontractors, manufacturers, and Suppliers shall be submitted to Engineer by Contractor unless otherwise specified.

1. Identify each informational Submittal by Project name and number, Contract title and number, and Specification Section and Article number marked thereon or in letter of transmittal. Unidentifiable Submittals will be returned for proper identification.

2. At the time of each submission, call to the attention of Engineer in the submittal transmittal any deviations from requirements of the Contract Documents.

C. Quantity Requirements:

1. Technical reports, test reports, and administrative Submittals except as otherwise specified:

(a) Electronic - One copy to Engineer.

2. Written Certificates and Guarantees:

(a) Paper - One copy to Engineer.

(b) Electronic - One copy to Engineer.

D. Engineer's Review:

1. Engineer will review informational Submittals for indications of Work or Material deficiencies.

2. Engineer will respond to Contractor on those informational Submittals, which indicate Work or Material deficiency.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

ADAMS COUNTY SHOOTING RANGE
DEMOLITION AND SOIL REMEDIATION
2017

SUBMITTAL LIST

Note: Contractor shall be aware that this submittal list may not be complete. Submittals not listed here but required elsewhere in the Project Manual are still required. This list shall be updated to include any missing submittals required elsewhere in the Project Manual. It is the Contractor's responsibility to ensure that all submittals required by the Project Manual are submitted.

Requirement Location	Description	Submittal Schedule
SECTION 013100 - PROJECT COORDINATION AND MEETINGS	Pre-construction conference summary	Within 5 working days after pre-construction conference
SECTION 013529 – SAFETY AND EMERGENCY RESPONSE	Site health and safety plan (SHSP)	Before work proceeds
	Copies of current training certifications	Before entry onto the Work Site
SECTION 017123 – CONSTRUCTION LAYOUT AND SURVEYING	Field notes	As required for pay estimates
	Initial survey drawings and electronic files	Before construction
	As-built drawings	After completion of the Work
SECTION 017800 - CONTRACT CLOSEOUT	Substantial completion documents	Before requesting inspection for certification of substantial completion
	Final acceptance documents	Before requesting final inspection for certification of final acceptance and final payment
	Record drawings	Upon completion of the Work
	Record specifications	Upon completion of the Work
	Record product data	Upon completion of markup
	Record samples	Prior to Substantial completion
	Miscellaneous records	Immediately prior to the date or dates of substantial completion
SECTION 024116 - DEMOLITION	Engineering Survey of Building Conditions	14 days prior to Work
	All Permits (demolition, state, local, etc.)	14 days prior to Work
	Proposed protective measures	14 days prior to Work
	Schedule of building demolition activities	14 days prior to Work
	Inventory of items removed or recycled	14 days prior to Work
	Subcontractor qualifications	14 days prior to Work
	Traffic control plan	14 days prior to Work
	Air monitoring and dust control plan	14 days prior to Work
	List of waste disposal facilities with qualifications to accept waste	14 days prior to Work
	Waste manifests and disposal documentation	Upon completion of the work
SECTION 026113 – EXCESS RISK SOIL	Soil treatment work plan	14 days prior to Work
	All permits (stormwater, grading, etc.)	14 days prior to Work
	Material samples	14 days prior to Work
	List of equipment to be used	14 days prior to Work
	Field screening logs	Each excavation area
	XRF certifications and calibration logs	14 days prior to Work
	As-built survey data	Each excavation area
SECTION 026113 – EXCESS RISK SOIL	Reclaimed lead recycling documentation	Upon completion of the Work
	Staging pile tracking logs	Daily and upon completion of Work
	Waste manifests	Upon completion of the Work
	Storm water construction permit	14 days prior to Work
SECTION 313211 – SOIL SURFACE EROSION CONTROL	Storm water management plan	At preconstruction conference
	Erosion control product data	14 days prior to Work
	Dust control agents	14 days prior to Work

— END OF SECTION —

SECTION 013529

SAFETY AND EMERGENCY RESPONSE

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section addresses special procedures and requirements that shall be followed for protection of health and safety of persons at the Project Site.

B. Before Work at the Site proceeds, all personnel involved in performing Work activities shall read, understand, and sign the Site-specific health and safety plan (SHSP) prepared by Contractor.

C. All field personnel that may come into contact with shooting range soils must have current OSHA HAZWOPER training per 29 CFR Part 1910.120, be covered under an OSHA-approved Respiratory Protection Program per 29 CFR Part 1910.134 and participate in the Contractor's medical surveillance program.

1.2 REFERENCES:

A. Section 13300 - Submittals

B. Applicable Regulations: Code of Federal Regulations (CFR):

1. Title 29, Part 1910 – Occupational Safety and Health Standards.

2. Title 29, Part 1926 – Safety and Health Regulations for Construction.

C. Quantum Water & Environment, Health and Safety Plan, Rev. 1, Appendix A to Sampling and Analysis Plan, Rev. 1, Adams County Shooting Range, May 14, 2016.

D. Quantum Water & Environment, Site Assessment and Closure Plan, Adams County Shooting Range, November 10, 2016.

1.3 SUBMITTALS:

A. Submit as specified in Section 013300 - Submittals.

B. Contractor's Site Health and Safety Plan

C. Training certificates for 40-hour Initial HAZWOPER training, current 8-hour refresher training, evidence of current respirator fit testing, and evidence of medical surveillance for all field personnel that may come into contact with Shooting Range soils.

1.4 SITE HEALTH AND SAFETY PLAN:

A. Contractor shall prepare and submit a Site Health and Safety Plan (SHSP) for review by Engineer and approval by Owner. Engineer and Owner shall be notified in writing and

consulted before any changes to SHSP are implemented. Contractor shall include as a minimum the items described in the following paragraphs.

1. Key Personnel: The SHSP shall name the health and safety representative (HSR) and an alternate, with necessary contact information. Contractor's HSR shall:

   (1) Oversee all operations at the Site.

   (2) Maintain proper medical surveillance.

   (3) Provide hazard communications to personnel at the Site.

   (4) Train personnel in safe operating procedures.

   (5) Advise Contractor on health and safety matters.

2. Site-Specific Information: The SHSP shall include the following information:

   (1) Nearest Hospital including name, address, phone number and direction from the Site (map included).

   (2) Nearest Fire Department including phone number.

   (3) Owner Contact including name and phone number.

   (4) Other emergency contacts.

3. Health Risk Analysis: Contractor shall develop a health risk analysis for hazards which may be encountered at an outdoor shooting range and a sanitary landfill. This analysis should sufficiently assess the risk of exposure to contaminants on site and propose controls (administrative, engineering, or Personal Protective Equipment [PPE]) to mitigate the risk.

4. Health and Safety Training Schedule and Procedures:

5. Training Certification: Contractor shall submit copies of current training certifications for all Project personnel to Owner prior to entry onto the Work Site.

6. PPE: Contractor shall include in SHSP all PPE anticipated for use on Site according to level of protection indicated by health risk analysis.

   (1) Level D shall be the minimum level of protection set for Site operations.

7. Dust monitoring procedures.

8. Site Security and Control: Include procedures for Site security and control in SHSP.

9. Contingency Plan: SHSP shall include a contingency plan for health and safety emergencies.

PART 2 - PRODUCTS

This section is not used.

PART 3 - EXECUTION

This section is not used.

— END OF SECTION —

SECTION 014000

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.

2. Specified tests, inspections, and related actions do not limit Contractor's other quality control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

4. Specific quality assurance requirements to be performed by Engineer for individual construction activities are specified in the Construction Quality Assurance (CQA) Plan.

1.2 RELATED SECTIONS:

A. For specific test and inspection requirements: DIVISIONS 2 through 31 sections.

1.3 REFERENCES:

This Section is not used.

1.4 DEFINITIONS:

A. Quality Assurance Services: Activities, actions, and procedures performed by a third party before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements. The collection and analysis of confirmatory soil samples and staging pile samples by the Engineer are considered quality assurance tests.

B. Quality Control Services: Tests, inspections, procedures, and related actions performed by Contractor or his representatives during and after execution of the Work to evaluate that actual Equipment and Materials incorporated into the Work and completed

construction comply with requirements. Services do not include Contract enforcement activities performed by Engineer.

C. Field Quality Control Testing: Tests and inspections that are performed on Site for installation of the Work and for completed Work, i.e., soil compaction, concrete strength, and weld radiographs. The operation of an X-ray fluorescent (XRF) analyzer by the Contractor is field quality control testing.

D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.5 SUBMITTALS:

This Section is not used.

1.6 QUALITY CONTROL:

A. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents are to be paid by Contractor at no additional cost to Owner.

B. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

C. Associated Services: Cooperate with entities performing required CQA tests, inspections, and similar services, and provide reasonable auxiliary services as requested. Provide the following:

1. Access to the Work.

2. Incidental labor and facilities necessary to facilitate tests and inspections.

D. Coordination: Coordinate sequence of activities to accommodate required quality assurance and quality control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS

This Section is not used.

PART 3 - EXECUTION

3.1 FIELD SCREENING LOG:

Prepare a record of XRF tests and visual inspections for each excavation area as described in Specification Section 026113 – EXCESS RISK SOIL.

— END OF SECTION —

SECTION 017123

CONSTRUCTION LAYOUT AND SURVEYING

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section describes Contractor's construction survey responsibilities.

1. Contractor shall complete all necessary construction staking and surveys that may be required for execution of the Work, measurement for payment, and outlined in the Contract Documents.

2. Contractor shall perform all as-built surveys as described in the Construction Quality Assurance (CQA) Plan.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Submittals: SECTION 013300.

B. Demolition: SECTION 024116.

C. Excess Risk Soil: SECTION 026113.

D. Soil Surface Erosion Control: SECTION 313211.

1.3 SUBMITTALS:

A. Submit as specified in SECTION 013300 - SUBMITTALS. Required Submittals include, but are not limited to:

1. All field notes required for determining progress pay estimates.

2. As-built survey data and plan drawings required to verify existing elevations, excavation depths, placement of treated soils, and constructed thicknesses of temporary cover. All as-built data shall be certified by a Professional Land Surveyor registered in the State of Colorado.

1.4 QUALITY ASSURANCE:

A. Surveyor Qualifications: Engage a land surveyor registered in the State of Colorado to perform required land surveying services.

B. Furnish competent men, equipment, tools, stakes, and other materials as required for properly staking out the Work.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. All Work shall be done to the lines, elevations, and grades indicated in the Drawings.

B. Benchmark monuments and other control points for horizontal and vertical control are indicated in the Drawings.

C. All established monuments, benchmarks, reference points, stakes, and other central points shall be carefully preserved by Owner and Contractor:

1. Contractor shall promptly replace project control points that have been lost or destroyed by Contractor at no additional cost to Owner.

2. Base replacements on original survey control points.

3. Contractor shall be responsible for any construction errors or loss of time resulting from loss or disturbance of control points by Contractor.

D. Contractor shall notify Owner in writing of benchmarks, reference lines, or other control points which may have been disturbed or which appear to be off line or grade.

3.2 PERFORMANCE:

A. Contractor shall complete the layout of the Work from the control points and shall be responsible for all measurements that may be required for execution of the Work to the location and limits prescribed in the Contract Documents, subject to such modification as may be required to meet changed conditions in the Work.

B. The existence and location of Underground Facilities, utilities, and other construction indicated as existing are not guaranteed by Engineer. Before beginning Site work, investigate and verify the existence and location of Underground Facilities and other construction.

C. Contractor shall be aware of all specified surveys and coordinate work with Owner to allow for surveying activities.

D. Initial Surveys:

1. Contractor shall perform initial surveys of the soil excavation areas, soil placement area, and asphalt and concrete removal areas indicating vertical elevations and horizontal locations of the initial grades. This survey will be used in addition to the as-built survey for measurement for payment of all earthwork quantities.

a. Survey initial soil excavation area points and soil placement area points as shown on the Drawings. Establish a uniform grid over the soil placement area not to exceed 100 feet between grid points.

b. Establish a uniform grid over dirty haul road areas, not to exceed 100 feet between grid points.

c. Establish limits of asphalt and concrete removal area on South Shooting Range as shown on the Drawings.

d. Vertical elevations shall be provided to the nearest 0.01 foot.

e. Contractor shall submit plan drawings, electronic files and other necessary documentation to Engineer indicating initial grades so that verification of quantities can be made.

f. The initial drawings shall be sealed by a Professional Land Surveyor registered in Colorado.

E. As-Built (Final) Survey:

1. Contractor shall perform an as-built survey indicating vertical elevations and horizontal location to verify conformance with the Drawings.

a. Contractor shall survey post-excavation soil excavation area points.

b. Survey completed soil placement area points on established grid points, prior to placement of temporary soil cover. Survey completed temporary soil cover on established grid points.

c. Survey final grades after removal of dirty haul road areas on established grid points.

d. Survey final limits of removed asphalt and concrete from South Shooting Range.

e. Vertical elevations shall be provided to the nearest 0.01 foot.

f. Contractor shall submit plan drawings, electronic files and other necessary documentation to Engineer indicating each grid point and the vertical elevations.

g. The as-built drawings shall be sealed by a Professional Land Surveyor registered in Colorado.

2. The Contractor will be responsible for correcting grades to conform with the Drawings at no cost to the Owner.

3.3 FIELD QUALITY ASSURANCE:

A. Owner reserves the right to field check by survey the Work completed by the Contractor.

— END OF SECTION —

SECTION 017800

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section includes administrative and procedural requirements for Contract closeout including, but not limited to, the following:

1. Inspection procedures.

2. Project record document submittal.

3. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections of the Specifications.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

1. Submittals: SECTION 013300.

1.3 SUBSTANTIAL COMPLETION:

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100% completion for the portion of the Work claimed as Substantially Complete.

a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Price.

b. If 100% completion cannot be shown, include a list of incomplete items, the value of incomplete Work, and reasons the Work is not complete.

2. Advise Owner of pending insurance changeover requirements.

3. Submit specific warranties, workmanship Bonds, maintenance agreements, final certifications, and similar documents.

4. Obtain and submit releases enabling Owner unrestricted use of the Work and access to services and utilities.

5. Submit record drawings, instruction books and operating manuals, final Project photographs, surveys, and similar final record information.

6. Complete final cleanup requirements.

B. Inspection Procedures: On receipt of a request for inspection, Engineer will either proceed with inspection or advise Contractor of unfilled requirements. Engineer will prepare the Certificate of Substantial Completion following inspection or advise Contractor of construction that must be completed or corrected before the certificate will be issued.

1. Engineer will repeat inspection when requested and assured by Contractor that the Work is Substantially Complete.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

3. The Colorado Department of Public Health and Environment will be invited to attend the final inspection.

1.4 FINAL ACCEPTANCE:

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Price.

3. Submit a certified copy of Engineer's final inspection list of items to be completed or corrected, endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by Engineer.

4. Submit consent of surety to final payment.

5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

6. Submit a final liquidated damages settlement statement.

B. Reinspection Procedure: Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to Engineer.

1. Upon completion of reinspection, Engineer will prepare a certificate of final acceptance. If the Work is incomplete, Engineer will advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, reinspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS:

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for Engineer's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Record information concurrently with construction progress.

2. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work. Mark each document "PROJECT RECORD" in neat, large, printed letters.

3. Mark new information that is important to Owner but was not shown on Drawings or Shop Drawings.

4. Note related Change Order numbers where applicable.

5. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

6. Upon completion of the Work, submit record drawings to Engineer for Owner's records.

7. Include the following:

a. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

b. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of construction.

c. Where Submittals are used for mark-up, record a cross-reference at corresponding location on Drawings.

d. Field changes of dimension and detail.

e. Changes made by Change Order or other Modifications.

f. Details not on original Contract Drawings.

C. Record Specifications: Maintain one complete copy of the Contract Documents including Addenda. Include with the Contract Documents one copy of other written construction documents, such as Change Orders and Modifications issued in printed form during construction.

D. Record Specifications: Maintain one complete copy of the Project Manual including Addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and Modifications issued in printed form during construction.

1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.

2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.

3. Note related record drawing information and product data.

4. Upon completion of the Work, submit record Specifications to Engineer for Owner's records.

5. Include the following:

a. Manufacturer, trade name, catalog number, and Supplier of each product installed, particularly optional and substitute items.

b. Changes made by Addendum, Change Order, or other Modifications.

c. Related Submittals.

E. Record Product Data: Maintain one copy of each product data Submittal. Note related Change Orders and markup of record drawings and Specifications.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the Site and from the manufacturer's installation instructions and recommendations.

2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.

3. Upon completion of markup, submit complete set of record product data to Engineer for Owner's records.

F. Record Samples Submitted: Immediately prior to Substantial Completion, Contractor shall meet with Engineer and Owner's personnel at the Project Site to determine which Samples are to be transmitted to Owner for record purposes. Comply with Owner's instructions regarding packaging, identification, and delivery to Owner.

G. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and Submittals in connection with actual performance of

the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records, and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to Engineer for Owner's records.

H. Warranties and Bonds: Specified in SECTION 013300.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 FINAL CLEANING:

A. General: Contractor shall keep the Site premises free from accumulations of waste materials, rubbish, and other debris resulting from the Work.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Final Completion.

a. Remove debris and surface dirt from limited-access spaces including manholes and similar spaces.

b. Clean the Site, including laydown areas, of rubbish, litter, and other foreign substances.

2. Remove temporary structures, tools, equipment, supplies, and surplus materials.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the Site and dispose of lawfully.

1. Extra materials of value remaining after completion of associated Work become Owner's property. Dispose of these materials as directed by Owner.

E. Repairs:

1. Repair roads, fences, and other items damaged or deteriorated because of construction operations.

2. Restore all ground areas affected by construction operations.

— END OF SECTION —

Division 2 Specifications

DIVISION 02 – EXISTING CONDITIONS

SECTION 024116

STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY:

A. Work in this section includes furnishing all labor, materials, equipment, and services required for demolishing and removing buildings and structures from the Property in accordance with the Project Drawings.

B. This Section includes:

1. Obtain permits, licenses and utility locates. Mobilize and secure jobsite.
2. Remove and dispose asbestos-containing floor tiles in Building C prior to demolition
3. Remove and dispose of Regulated Building Materials (RBMs) prior to demolition
4. Demolish and remove buildings, sheds, slabs, and foundations
5. Remove below-grade construction
6. Disconnect, cap/seal, and abandon subgrade utilities
7. Demolish South Shooting Range asphalt range floor, size and transport to soil placement area on North Shooting Range
8. Demolish and remove general Site improvements
9. Pump and remove sub-grade septic tank, dispose off-site, and backfill excavation
10. Expose and plug ends of corrugated metal pipe (CMP) at South Shooting Range
11. Remove waste tires, steel poles and wood products
12. Remove rip rap from stormwater detention pond and stockpile on-site
13. Remove and dispose of wood landings and Tall Wall
14. Remove and salvage or dispose of metal targets
15. Remove and salvage or dispose of ammo magazines
16. Remove twenty-one (21) 55-gallon drums of non-hazardous solid investigation derived waste (IDW) from Building A and transport to Soil Placement Area.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. (NOT USED)

1.3 REFERENCE:

A. The American Society of Safety Engineers

1. ASSE A10.6-2006: Safety Requirements for Demolition Operations (ANSI)

B. Code of Federal Regulations

1. 40 CFR 82-2012: Protection of Stratospheric Ozone

C. NFPA

1. NFPA 241-2013: Safeguarding Construction, Alteration, and Demolition Operations

D. Colorado Department of Transportation (CDOT)

1. Section 206 Excavation and Backfill For Structures

E. Quantum Water & Environment, Site Assessment and Closure Plan, Adams County Shooting Range, November 10, 2016.

1.4 SUBMITTALS:

A. Engineering Survey: Submit engineering survey of condition of buildings.

B. Submit copies of all permits, Site location, and arrangements for transport and disposal of demolished materials. Should individual permits and/or certifications, etc. not be required due to the nature of this scope, itemize and state, “not required.”

C. Submit copies of all demolition/building permits required by the State of Colorado as required in Section 013300 - SUBMITTALS. If no permits are required, submit a notarized letter stating as such.

D. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers and traffic control measures.

1. Adjacent Utilities: Detail special measures to protect adjacent utilities to remain.
2. Perimeter Fence: Detail specific measures to protect fences to remain.

E. Schedule of Building Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each building and activity.

F. Inventory: Submit a list of items that have been removed and salvaged.

G. Acceptance by Owner’s Representative or Owner of various construction and demolition activities or methods proposed by Contractor does not constitute an assumption of liability either by the Owner’s Representative or Owner for inadequacy or adverse consequences of said activities or methods.

H. Submit the qualifications of subcontractors, procedures, methods, and materials for review by the Owner’s Representative.

I. Submit a Traffic Control Plan, including ingress and egress routes to the property, prepared by a certified person.

J. Submit a Decontamination Plan that discusses the methods to be used to decontaminate structures to be removed that are located in or near Excess Risk Soil areas.

K. Submit an Air Monitoring and Dust Control Plan, as well as a Noise Management Plan in accordance with all applicable regulations.

L. Prepare a risk and exposure analysis section for demolition in the Site Health and Safety Plan.

M. Submit a list of proposed waste disposal facilities and their qualifications and licenses to accept waste generated from the Site.

1.5 QUALIFICATIONS:

1.6 OPERATING CONDITIONS:

A. Buildings to be demolished are vacant and there will be no intended use before start of Work.

B. Conduct building demolition so Site access and local traffic will not be disrupted.

1. Provide not less than 72 hours of notice of activities that will affect traffic on Riverdale Road.
2. Maintain access to existing driveways, roads, exits, and other facilities used by occupants of adjacent properties.

C. Conditions existing at time of pre-bid Site walk will be maintained by Owner to the extent practical.

D. No power or water are available on Site. Contractor to supply their own power and water. The nearest fire hydrant is located at the intersection of Yosemite Street and Riverdale Road, approximately 2 miles south of the Site.

E. Carefully examine the Site and available documents to obtain first-hand knowledge of existing conditions affecting this Work. No extra compensation will be allowed for the discovery of conditions that could have been determined by a careful examination of Site conditions and available documents.

F. Prior to commencing work, Contractor and Owner's Representative shall tour the Project Site together to examine and record damage to areas not to be demolished. This record shall serve as a basis for determination of subsequent damage due to Contractor's operations and shall be signed by all parties making the tour. Any damage to the specified areas not noted in the original survey, but subsequently discovered shall be reported to the Owner's Representative. Any damage caused or alleged to be caused to adjacent properties by demolition activities shall be the sole responsibility and liability of the Contractor.

G. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work. Do not disturb hazardous materials or items suspected of containing hazardous materials.

1. Known hazardous materials will be removed by Owner before start of the Work.
2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Owner's Representative. Hazardous materials will be removed by Owner under a separate contract.

H. Asbestos-Containing Materials: ACM is present in Building C which is to be demolished. A building survey report discussing the ACM is included in the Site Assessment and Closure Plan report. Examine the report to become aware of locations where ACM are present. All ACM is to be removed by the Contractor prior to demolition of Building C.

1. Asbestos-containing material (ACM) is subject to the USEPA NESHAP Regulations for Asbestos (40 CFR Part 61) and the Colorado Department of Health Regulation No. 8 (Regulation 8) "The Control of Hazardous Air Pollutants.
2. The Colorado Department of Health is presently responsible for administering the EPA NESHAP program for Colorado. ACM is subject to OSHA Standards for Asbestos (29 CFR Parts 1910.1001).

I. On-site storage or sale of removed items or materials is not permitted.

1.7 DELIVERY, STORAGE, AND HANDLING:

This section is not used.

1.8 WARRANTY:

This section is not used.

1.9 DEFINITIONS:

A. Remove: Detach items from existing construction and dispose of off-site unless indicated to be salvaged.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and protect materials for beneficial reuse as intended.

C. Remove and Dispose: Detach items from existing construction, profile waste stream, package and label for transportation, manifest, and dispose of materials off-site in accordance with all applicable regulations.

1.10 MATERIALS OWNERSHIP:

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.11 PROJECT MEETINGS:

A. Participate in a Preconstruction Conference in accordance with Section 013100 – PROJECT COORDINATION AND MEETINGS:

1. Inspect and discuss condition of construction to be demolished.

2. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review and finalize proposed schedule, subcontractors, vendors and procedures.
4. Review procedures for noise control and dust control.
5. Review traffic control plan and Site logistics.
6. Review procedures for protection of fences, haul roads and utilities to remain.
7. Review items to be salvaged and returned to Owner.

1.12 COORDINATION:

A. Arrange demolition schedule so as not to interfere with Owner's on-site operations, other contracors accessing the Site or operations of adjacent properties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS:

A. Regulatory Requirements: Comply with governing the Colorado Department of Public Health and Environment notification and permit regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Verify that all utilities have been deenergized, disconnected and capped before starting demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

E. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by planned excavation, demolition and salvage operations.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS:

A. Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.

1. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 PROTECTION:

A. Existing Facilities: Protect adjacent roadways and other facilities during demolition operations. Maintain exits and means of egress from the Site.

B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of demolition.

C. Existing Utilities to Remain: Maintain utility services to remain as shown on the Drawings and protect from damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
    a. Provide at least 72 hours' notice to occupants of affected buidings or properties if shutdown of service is required during changeover.

D. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.4 DEMOLITION, GENERAL:

A. General: Demolish buildings, structures, utilities and Site improvements as shown on the Drawings in a safe and complete manner. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
2. Maintain fire watch during and for at least 1 hour after flame-cutting operations.
3. Maintain adequate ventilation when using cutting torches.
4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, ditches paths and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, ditches, paths or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as noise, ice, flooding, and pollution.

C. Explosives: Use of explosives is not permitted.

3.5 DEMOLITION BY MECHANICAL MEANS:

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

C. Below-Grade Construction: Demolish foundation walls and other below-grade construction. Remove below-grade construction, including basements, foundation walls, and footings, completely.

D. Existing Utilities: Remove underground utilities or abandon by capping and/or plugging. Storm pipes near the South Shooting Range shall be removed or abandoned in place using Flow-Fill in accordance with CDOT Section 206.

3.6 SITE RESTORATION:

A. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials from on-site borrow area shown on the Drawings.

B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.7 REPAIRS:

A. Promptly repair damage to adjacent buildings, fences, haul roads, or utilits to remain that were caused by demolition operations.

3.8 DISPOSAL OF DEMOLISHED MATERIALS:

A. Remove demolition waste materials from the Site and dispose in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction, or recycle materials according to all applicable regulations.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Do not burn demolished materials.

3.9 CLEANING:

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

1. Clean roadways of debris caused by debris transport.

END OF SECTION

DIVISION 02 – EXISTING CONDITIONS

SECTION 026113

EXCESS RISK SOIL

PART 1 - GENERAL

1.1 SUMMARY:

A. Work includes furnishing all labor, materials, equipment, and services required for excavation, screening, stockpiling, on-site treatment, and on-site placement of Excess Risk Soil, Soil containing Munitions Debris, and removal of surficial metallic lead as shown on the Drawings.

B. All work shall be performed in accordance with the Contractor's Site Health and Safety Plan (SHSP), Contractor's Soil Treatment Work Plan and all applicable Occupational Safety and Health Administration (OSHA), local, state, and Federal regulations and requirements.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Section 01 33 00 – Submittals

B. Section 01 35 29 – Safety and Emergency Response

C. Section 01 40 00 – Quality Requirements

D. Section 01 71 23 - Construction Layout and Surveying

E. Section 01 78 00 – Contract Closeout

F. Section 02 41 16 – Demolition

G. Section 31 32 11 – Soil Surface Erosion Control

1.3 REFERENCES:

A. Applicable Standards:

1. Code of Federal Regulations (CFR), 40 CFR 261.24 – Toxicity Characteristic, Table 1 – Maximum Concentration of Contaminants for the Toxicity Characteristic.
2. Colorado Department of Public Health and Environment (CDPHE) Hazardous Materials and Waste Management Division, Groundwater Protection Values Soil Cleanup Table, March 2014.
3. CDPHE, Water Quality Control Division – Storm Water Construction Permit Program.
4. Colorado Hazardous Waste Regulations, 6 CCR 1007-3, Part 264.552 - Corrective Action Management Units (CAMUs).
5. Occupational Safety and Health Administration (OSHA): 29 CFR Part 1926 – Safety and Health Regulations for Construction.
6. Solid Waste (SW), SW-846 Test Method 1311: Toxicity Characteristic Leaching Procedure (TCLP).
7. SW-846 Test Method 1312: Synthetic Precipitation Leaching Procedure (SPLP).
8. U.S. Environmental Protection Agency Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1), May 2016.

B. Quantum Water & Environment, Phase I Environmental Site Assessment, Adams County Shooting Range, 14451 Riverdale Road, Brighton, Colorado, January 19, 2016.

C. Quantum Water & Environment, Sampling and Analysis Plan (Rev. 1), Adams County Shooting Range, 14451 Riverdale Road, Brighton, Colorado, May 14, 2016.

D. Quantum Water & Environment, Adams County Shooting Range, Site Assessment and Closure Plan Report, 14451 Riverdale Road, Brighton, Colorado, November 10, 2016.

E. Quantum Water & Environment, Materials Management Plan, Adams County Shooting Range, 14451 Riverdale Road, Brighton, Colorado, January 25, 2017.

F. Quantum Water & Environment, Decontamination Plan, Adams County Shooting Range Property, 14451 Riverdale Road, Brighton, Colorado, March 30, 2017.

G. Quantum Water & Environment, Treatability Testing Report, Adams County Shooting Range, 14451 Riverdale Road, Brighton, Colorado, March 30, 2017.

1.4 DEFINITIONS

A. Category I Excess Risk Soil (Category I soil) – Soil containing Toxicity Characteristic Leaching Procedure (TCLP)-lead concentrations above the EPA Toxicity Characteristic Rule (5.0 milligrams per liter [mg/l]), or containing total lead concentrations above the EPA Industrial Risk RSL (800 milligrams per kilogram, [mg/kg]). Category I soil includes the Bullet Piles shown on the Drawings.

B. Category II Excess Risk Soil (Category II soil) – Soil containing TCLP-lead concentrations below 5.0 mg/l and total lead between 400 mg/kg and 800 mg/kg.

C. Closure Parameters – Soil confirmation samples collected by the Engineer from the excavation areas that are laboratory analyzed for these parameters to determine if the CDPHE acceptabilty criteria area met, and include Total Metals (lead, antimony, arsenic, cadmium, copper, tin, and zinc [EPA Method 6010C]), leachable lead by TCLP (EPA Method 1311/6010C), and leachable lead by SPLP (EPA Method 1312/6010B). Acceptance criteria for Total Metals are the EPA Residential Regional Screening Levels for the South Shooting Range excavation areas and the EPA Industrial Screening Levels for the North Shooting Range excavation areas. Acceptance criteria for leachable lead by TCLP and SPLP are 5.0 milligrams per liter, and 1,100 micrograms per liter, respectively.

D. Excavation area – An area defined by perimeter coordinates (points) that contains Excess Risk Soil or Soil containing Munitions Debris identified for removal based on the Site Assessment study.

E. Excess Risk Soil – Soil that has been determined to have unacceptable levels of risk (based on laboratory analysis) either for leaving uncovered on-site or for placing as gradefill beneath the landfill cover without treatment. Excludes Soil containing Munitions Debris.

F. Munitions Debris – Soil containing debris from shooting range operations including metallic lead and shell casings.

G. Soil containing Munitions Debris - Soil excavation areas at the South Shooting Range that contain unacceptable quantities of munitions debris on the ground surface. The soil does not contain constituent concentrations above CDPHE action levels and is not considered Excess Risk Soil.

H. Soil Placement Area – An Engineer-designated location on the North Shooting Range where treated and untreated Excess Risk Soil, Soil containing Munitions Debris, and sized Treatment Pad pavement will be placed, compacted and covered with a temporary soil cover.

I. Soil Amendment – Amendment used by the Contractor to encapsulate lead and reduce its toxicity. On this site, treatability testing determined that a 2% mixture, by weight, of ECOBOND® is sufficiently effective at reducing lead leachability in shooting range soils to meet CDPHE acceptability criteria for placement on-site beneath a landfill soil cover. If an alternative amendment is proposed, treatability testing on site soils will be required to demonstrate the effectiveness of the amendment at reducing lead leachability to meet the CDPHE acceptability criteria. Alternatively, peer-reviewed literature and/or case studies may be submitted to demonstrate effectiveness of the amendment. Both the Engineer and CDPHE must approve the use of an alternate amendment.

J. Treatment Pad – The location where soils will be treated. Approved locations are shown on the Drawings.

1.5 SUBMITTALS:

A. Submit as specified in Specification Section 013300 – SUBMITTALS:

1. Permits (storm water construction permit [Colorado Discharge Permit System] grading permit, etc.)

2. Soil Treatment Work Plan to include the following, at a minimum:

(a) Discussion of how the treatment of characteristically hazardous soils on the Treatment Pads will comply with the CAMU requirements specified in Section 264.552 of the Colorado Hazardous Waste Regulations.

(b) Remediation approach to include Site Layout showing the following:

(1) Lay down and material staging areas

(2) Lead Surface Walk Area

(3) Haul roads (clean and dirty)

(4) Metallic lead screening area

(5) Soil excavation areas

a) Category I Soil

1) Areas requiring screening for metallic lead

2) Areas not requiring screening for metallic lead

b) Category II Soil

c) Soil containing Munitions Debris

(6) Treatment Pad(s)

(7) Soil Placement Area

(c) Remediation approach to include detailed descriptions and equipment used for the following:

(1) Haul road construction and removal (clean or dirty)

(2) Procedures to control dust to mitigate exposures and prevent migration of dust from work areas

(3) Surface sweep of Lead Surface Walk Area

(4) Treatment Pad construction and removal

(5) Demolishing structures in Excess Risk Soil – Describe the procedures and sequencing to be used to prevent the spread of contamination when demolishing structures in or near Excess Risk Soil.

(6) Surveying – Describe how the excavation areas will be pre-staked, delineated, and labeled prior to excavation. After excavation is complete, describe how the post-excavation surveys will be conducted and surveys provided to Engineer.

(7) Excavation and loading of Category I Soil that requires screening to reclaim metallic lead – Describe the areas and depths that soil will be excavated, how the soil will be transported, and how the soil will be screened on-site to remove metallic lead.

(8) Excavation and loading of Category I and II Soil, and Soil containing Munitions Debris – Describe the sequencing of removal of these three soil categories and methods used to prevent cross-contamination between adjacent soil areas of different risk levels. Describe how visual observations of the excavation and the XRF will be used to semi-quantitatively document the amount of residual soil contamination following excavation of Category I and II soils. Describe the types of information to be collected and the types of documentation that will be submitted to the Engineer.

(9) Hauling of soil – Describe the methods for transporting soil, if haul routes will be developed into roads, the equipment used, and the methods used to minimize releases of contaminants to the environment.

(10) Staging of soil on Treatment Pad – Describe storm water and erosion controls, methods to cover staging piles, and methods used to prevent or minimize releases of contaminants into the environment. Discuss how the staging piles will be tracked and labeled. Provide the anticipated duration that staging piles will remain on treatment pad.

(11) Treating of soil on Treatment Pad – Describe the volumes and percentages of amendment to be used and how that will be determined and estimated in the field. Describe the methods that will be used to incorporate amendment into the staging pile and the duration of time needed before sampling can be conducted. Describe the waste profiling process to be followed if treatment is not successful and the waste must be transported off-site for disposal.

(12) Placing of soil in Soil Placement Area – Describe the methods and equipment used to:

a) Perform pre- and post-waste placement surveys and final survey of temporary soil cover

b) Place, moisture condition, and compact soil in lifts

c) Borrow source and placement of the temporary soil cover

(13) Equipment decontamination – Describe the procedures that will be used to decontaminate equipment that has come into contact with potentially-contaminated soils that will minimize the releases of contaminants into the environment. Describe the procedures for characterizing and disposing of decontamination wastes.

(d) Staged Soil Sampling and Confirmation Sampling – Include a discussion of sampling conducted by Engineer to 1) verify soil treatment status, 2) confirm that contaminated soil has been adequately removed from the excavation areas, and 3) Treatment Pad pavement has been determined to be non-hazardous and acceptable for consolidation into the Soil Placement Area.

(e) Stormwater Management Plan for excavation, hauling, treatment, and placement of Excess Risk Soil.

(f) Project Schedule – Include anticipated start dates, end dates and durations for the following, at a minimum:

(1) Submittals

(2) Mobilization

(3) Excavation, treatment and placement of soil

(4) Placement of temporary soil cover

(5) Demolition and debris disposal

(6) Demobilization

(7) Post-construction storm water and erosion control inspections

(g) Reference this design, the Site Assessment and Closure Report and the Treatability Study. Attach all CDPHE correspondence documenting approvals of plans, reports, and modification of remediation boundaries.

3. Material samples and specifications (cut-sheets, Safety Data Sheets) including, but not limited to:

(a) Stockpile tarps and liners

(b) Storm water erosion and sediment control structures

(c) Contractor's Soil Amendment

4. List of all equipment to be used to excavate, haul, screen, treat, place, and compact soil.

5. Operator certificates and calibration reports for X-ray fluorescent (XRF) device

6. Survey reports in accordance with Specification Section 017123 – CONSTRUCTION LAYOUT AND SURVEYING
   (a) Initial survey of soil excavation areas prior to soil removal
   (b) Initial survey of placement area
   (c) Dirty haul roads – initial survey
7. Field-screening logs for each excavation area to include:
   (a) Date and time of inspection
   (b) Individual performing the quality control testing
   (c) Excavation area I.D.
   (d) Design and as-built excavation depth
   (e) XRF device readings (in mg/kg) and location of readings
   (f) Visual observations of munitions debris
   (g) Photograph(s) of excavation floor

B. Following completion of the work described in this section, the Contractor shall provide the Engineer with the following Closeout documents in accordance with Specification Section 017800 – CONTRACT CLOSEOUT:
1. Surveys:
   (a) Post-excavation survey of soil excavation areas
   (b) Completed Soil Placement Area before temporary soil cover
   (c) Completed Soil Placement Area after temporary soil cover
   (d) Dirty haul roads – final survey
2. Record drawings showing:
   (a) Final extents and depths of excavation areas
   (b) Final extent of Soil Placement Area
   (c) Final extents and depths of dirty haul roads
3. Volumes (bank cubic yards) of the following:
   (a) Category I Soil excavated, treated and placed on-site
   (b) Category II Soil excavated, treated and placed on-site
   (c) Category II Soil excavated and placed on-site (no treatment)
   (d) Soil containing Munitions Debris excavated and placed on-site
   (e) South Range Floor pavement excavated, sized and placed on-site
   (f) Category I or II Soil excavated, treated and transported off-site for disposal
4. Waste manifests for all materials disposed of off-site
5. Completed staging pile tracking log

1.6 QUALIFICATIONS:

This section is not used.

1.7 QUALITY ASSURANCE AND QUALITY CONTROL:

A. The Contractor will be responsible for quality control (QC) testing and the Engineer will be responsible for quality assurance (QA) oversight. QC testing using an XRF device and QA sampling activities are described in this Specification Section and the Construction Quality Assurance Plan.

1.8 OPERATING CONDITIONS:

A. Temporary Erosion and Sediment Controls: Furnish, install, construct, and maintain temporary measures to control erosion and minimize migration of contaminants from the Work area in accordance with Specification Section 313211 – SOIL SURFACE EROSION CONTROL.

B. Survey Work, to accurately determine locations, elevations, and quantities of Contract pay items. Contractor shall notify the Engineer prior to commencing survey Work.

1.9 DELIVERY, STORAGE, AND HANDLING:

A. All materials necessary for completion of the work described in this section shall conform to the materials described in this section or Engineer-approved alternate, or materials described in the Soil Treatment Work Plan.

B. All materials necessary for completion of the work described in this section shall be delivered, stored, and handled in accordance with the manufacturers recommendations.

1.10 WARRANTY:

This section is not used

PART 2 - PRODUCTS

2.1 SOIL AMENDMENT:

Soil amendment shall be ECOBOND® (or Engineer and CDPHE approved alternate).

2.2 TARPS:

Tarps used for covering soil staging piles shall consist of 10-mil plastic sheeting, at a minimum, or Engineer-approved alternate.

2.3 LINERS:

Liners used beneath staging piles, when required by this Specification Section, shall consist of 30-mil-thick minimum polyvinyl chloride (PVC) or high-density polyethylene (HDPE), or Engineer-approved alternate.

PART 3 - EXECUTION

3.1 GENERAL:

A. Notify the Engineer immediately if contaminated material is discovered that has not been previously identified or if other discrepancies between data provided and actual field conditions are discovered.

3.2 SURVEYS:

A. Perform surveys in accordance with Specification Section 017123 – CONSTRUCTION LAYOUT AND SURVEYING.

B. Stake all excavation points and label with Point I.D.s as indicated on the Drawings. Stake each excavation area with a labeled stake identifying the excavation area I.D. and design cut depth (inches).

C. Stake all confirmation sampling locations.

D. Survey the Soil Placement Area as described in this Specification Section

3.3 SITE PREPARATION:

A. Install erosion and sediment control measures as shown on the Drawings prior to the start of work.

B. Inspect and maintain storm water erosion and sediment control structures throughout the Contract period in accordance with the Specifications.

C. Minimize clearing to the maximum extent practical.

D. Detain, treat or dispose of all wash water (fluids from decontamination, vehicle cleaning, equipment cleaning, etc.) at no expense to the Owner.

E. Maintain sufficient oil and grease absorbing materials on-site to contain and clean up fuel or chemical spills and leaks.

F. Minimize dust generated by Contractor's activities to prevent exposures to airborne contaminants and to prevent visible dust from leaving the work area or Project site.

3.4 TREATMENT PAD CONSTRUCTION:

A. Prior to excavating Excess Risk Soil, the Contractor will construct one or more Treatment Pads for stockpiling and treating (if necessary). Treatment Pads may be constructed at the following locations and as shown on the Drawings:

1. North Shooting Range – Asphalt and concrete pavement on range floor. Following treatment, range floor can remain in place if determined not to be characteristically hazardous.

2. South Shooting Range – Asphalt and concrete pavement on range floor. Following treatment, range floor must be removed and consolidated in Soil Placement Area if determined not to be characteristically hazardous.

3. Additional Characterization Areas (ACAs) 1 and 2 on landfill area

4. Other landfill area, as approved by Engineer and CDPHE

B. Treatment Pads shall be sized sufficiently to allow working area for staging pile placement, treatment, and removal. Sufficient space will be provided between staging piles to allow Contractor and Engineer personnel to work efficiently and safely.

C. A liner shall be used beneath stockpiles on treatment pads constructed on the landfill area surface where underlying soils are considered to be uncontaminated, based on the Site Assessment study.

D. Liners are not required beneath stockpiles on asphalt/concrete Treatment Pads or where Treatment Pads are located on Additional Characterization Areas ACA-1 or ACA-2.

E. Storm water erosion and sediment control structures and potentially-contaminated storm water collection areas shall be installed in accordance with the Drawings and the Soil Treatment Work Plan.

Upon completion of a Treatment Pad, Contractor shall contact Engineer at least 24 hours prior to the intent to construct staging piles on the treatment pad. The CQA Engineer will inspect Treatment Pad for conformance with this Specification Section and the Soil Treatment Work Plan.

3.5 HAUL ROADS:

A. Haul roads shall be constructed as necessary for efficient and safe transport of material throughout the site.

B. Haul roads used for transport of impacted soil will be classified as either "clean" haul roads or "dirty" haul roads.

1. "Clean" Haul Roads – Roads used as ingress or egress to excavation, treatment areas, or placement areas by vehicles or equipment that have been properly decontaminated in accordance with the Soil Treatment Work Plan. Transport of material or equipment on clean haul roads shall be visually observed during hauling for any potentially impacted material that has fallen from haul vehicles or equipment. Potentially impacted material that is inadvertently deposited on haul roads will be immediately removed.

2. "Dirty" Haul Roads – Roads used as ingress or egress to excavation, treatment areas, or placement areas by vehicles or equipment that have not been decontaminated. Haul roads will be assumed to be impacted until analytical testing has confirmed that haul roads are not impacted. If haul roads are confirmed, through analytical testing, to be impacted, then impacted portions of haul roads will be excavated in 6-inch lifts, sampled and treated as if it were a excavation area. If this option is chosen, all costs associated with the excavation, sampling, treatment, and soil placement will be at the Contractor's expense.

3.6 SURFICIAL LEAD RECOVERY:

A. Survey and stake the perimeter of the Lead Surface Walk Area as shown on the Drawings.

B. Perform surficial lead recovery over the Lead Surface Walk Area using several personnel, trained to identify munitions debris, walking at arm's length to each other.

C. The objective of the recovery effort is to substantially reduce the amount of munitions debris on the ground surface so that any remaining munitions debris can be considered a de minimus amount.

D. Use rakes or other equipment in areas, such as steep slopes, that are difficult to access.

E. Place recovered surficial lead in an Engineer-designated storage container on-site for off-site disposal by others.

F. Upon completing surficial lead recovery, contact Engineer for inspection. The Engineer will inspect the Lead Surface Walk Area to ensure that any remaining munitions debris on the ground surface is a de minimus amount.

3.7 EXCAVATION:

A. Perform initial surveys of all excavation points for soil excavation areas.

B. Category I Excess Risk Soil: Locations of Category I Soil are shown on the Drawings. Contractor shall excavate Category I Soil before Category II soil and stage soil in piles on Treatment Pad or transport to the lead screening area per the Soil Treatment Work Plan, if screening is required. Category I Soil excavation areas that require screening prior to treatment are shown on the Drawings. Upon completing the excavation of Category I Soil, Category II Soil shall be excavated and staged on the Treatment Pad. Category II Soil excavation areas are shown on the Drawings.

C. All excavations shall be performed within the vertical and horizontal design limits and not more than 0.5 feet beyond the vertical and horizontal extents shown on the Drawings. Additional excavation beyond the design limits will not be compensated unless directed by the Engineer in writing. Excavation shall be performed in a manner that will limit the spread of contamination beyond the excavation area. The Engineer will provide CQA oversight during excavation.

D. Upon reaching the design excavation limits for Category I and II Soil excavation areas, perform as-built survey to confirm the design limits have been reached. Submit survey data to Engineer for review. Once design limits of excavation have been confirmed by Engineer, Contractor will inspect the excavation sidewalls and floor for munitions debris and field-screen soil surfaces for lead content with an XRF device. XRF acceptability criteria are <300 milligrams per kilogram (mg/kg) for the South Shooting Range and <700 mg/kg for the North Shooting Range. If the XRF acceptability criteria are met and no munitions debris are observed, the Engineer will notify the Contractor in writing that the excavation is complete and the Engineer will collect a soil confirmation sample as described in this Specification Section. If the Engineer determines that the XRF readings are not acceptable and/or munitions debris are present, the Contractor will conduct Additional Excavation as described in this Specification Section.

E. Soil containing Munitions Debris: Locations of Soil containing Munitions Debris are shown on the Drawings. The Contractor shall remove these soil areas and place the soil in the Soil Placement Area. No staging or treatment of this soil is required. Upon reaching the design excavation limits, perform as-built survey data to confirm the design limits have been reached. Submit survey data to Engineer for review. Once design limits of excavation have been confirmed by Engineer, Contractor and Engineer will inspect the excavation sidewalls and floor for munitions debris. If no munitions debris remains, the Engineer will notify the Contractor in writing that the excavation is complete. The Contractor is not required to field-screen the excavations with an XRF device. If the Engineer determines that munitions debris are present, the Contractor will conduct Additional Excavation as described in this Specification Section.

3.8 CONFIRMATION SOIL SAMPLING:

A. Once the Engineer determines that no additional soil removal is necessary from a Category I and II Soil excavation area, the Engineer will collect a confirmation soil sample from the excavation and submit the sample to a laboratory for analysis of Closure Parameters on a one week turn-around-time. Provide Engineer 24 hours to collect the confirmation soil sample. After the sample has been collected, the Contractor's surveyor will survey sample location and submit the survey data to Engineer within 48 hours of the survey. The Engineer will provide sample results to Contractor within 6 business days of sample collection. If the analytical results indicate that the acceptability criteria are met, no additional soil removal is necessary and the excavation is complete. If the analytical results indicate that the acceptability criteria are not met, the Engineer will direct the Contractor to excavate additional soil as described in this Specification Section.

3.9 ADDITIONAL EXCAVATION:

A. Upon receiving written direction from the Engineer, remove an additional six (6) inches of soil over the entire excavation floor, or as directed by Engineer. Repeat the survey, XRF field screening, and visual inspection process as described in this Specification Section. If the acceptability criteria are met, the Engineer will collect a follow-up confirmation soil sample as described in this Specification Section. This process will be repeated until sample results meet acceptability criteria.

3.10 METALLIC LEAD SCREENING:

A. Category I Soil excavation areas and Bullet Pile areas requiring screening to reclaim metallic lead are shown on the Drawings. Excavate areas to design lines and grades and transport soil to screen plant on-site. After removal of soil for screening, complete a final survey of excavation area for volume estimation.

B. Screen soil to remove metallic lead prior to staging soil on the Treatment Pad. Containerize metallic lead and stage container in a temporary location on-site as approved by the Engineer.

C. Transport reclaimed metallic lead to a permitted and licensed recycling facility off-site.

D. Submit trucking manifests and recycling documentation as part of Project Close-Out.

E. Decontaminate screening plant in accordance with Soil Treatment Work Plan prior to transport off-site.

3.11 SOIL STAGING PILES:

A. Construct Category I and Category II Soil staging piles (maximum 200 loose cubic yards) in an approximate conical shape on the Treatment Pad as described in Soil Treatment Work Plan.

B. Segregate Category I piles from Category II piles.

C. Cover piles with tarps or plastic sheeting to minimize dust generation, and reduce potential for generation of contaminated storm water. Maintain tarps on piles at all times except during pile construction, treatment, sampling, or removal. Anchor down tarps to withstand typical wind and weather events. Tarps that do not perform the intended function, shall be immediately repaired or replaced by Contractor.

3.12 SOIL TREATMENT:

A. Treat all Category I Soil with a minimum 2% ECOBOND® (or approved alternate) in accordance with Soil Treatment Work Plan. When treatment is complete, request Engineer to collect a soil sample. Provide the Engineer 24 hours to collect the soil sample. The Engineer will collect a 5-point composite soil sample for laboratory analysis of leachable lead by TCLP and SPLP on a one week turn-around-time. Soil sampling procedures are discussed in the Treatability Testing Report. If the results of laboratory analysis indicates that the acceptability criteria are met, the Contractor shall transport the staging pile to the Soil Placement Area. If the results of laboratory analysis indicate that acceptability criteria are not met, Contractor will repeat the treatment as described above. If after two unsuccessful attempts to treat soil to meet the acceptability criteria, the Contractor shall profile and transport the staged soil pile for disposal at a permitted off-site landfill facility at the Contractor's expense.

B. All Category II Soil will be staged in piles on the Treatment Pad and sampled by the Engineer to determine if pile should be treated with ECOBOND® (or approved

alternate). Treatment will be conducted as described in Section 3.12(A) - SOIL TREATMENT of this Specification.

C. The maximum time a staging pile can remain on the Treatment Pad without the Engineer's written approval is 30 days.

D. Prepare and maintain a staging pile tracking log to include the pile number, Category I or II Soil, excavation areas, pile construction date, pile location, sample I.D. and laboratory results (from Engineer), treatment status (treatment required, or no treatment required), volume of ECOBOND® (or approved alternate) added, pile removal date, and date moved to Soil Placement Area. Update log daily and provide to Engineer on a daily basis.

E. Place wood stakes on staging piles to identify if the soil is Category I or II Soil, the pile number, and the pile treatment status (no treatment required, treatment required, treated-results pending, treated-approved for placement, or re-treatment required). Maintain and update stakes as necessary to reflect current pile status.

3.13 SOIL PLACEMENT AREA:

A. Place fill materials in lifts having a loose thickness such that when compacted or graded, the lifts will have the following maximum thickness:

Treated Soil:	12 inches
Temporary Cover:	12 inches

B. Place fill in a manner to achieve the limits and grades shown on the Drawings.

C. Before compaction, moisten or aerate each lift as necessary to provide the moisture content required to meet the compaction requirements.

D. Do not place fill material on surfaces that are frozen or containing heavy frost, snow, standing water, or ice. Do not place fill material on soft surfaces.

3.14 COMPACTION:

A. Density Requirements: A method specification is used for compaction rather than density testing. Use a sheepsfoot compactor such as a Caterpillar 815 or CP563 and perform a minimum four full passes of coverage on each placed lift. The Engineer may approve alternate equipment for compaction of fill material. If soil appears poorly compacted, the Engineer may require additional passes with equipment until adequate compaction is achieved.

B. Moisture Requirements:

1. Provide moisture control to the extent that the soil remains in a workable state during placement.

2. Where fill material must be moisture-conditioned by increasing the moisture content before compaction, uniformly apply water to surface of subgrade, or layer of soil/recyclables material at such a rate as to avoid free water from appearing on surface during or subsequent to compaction operations.

3. Scarify and air dry, or remove and replace soil material that is too wet to permit compaction. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing or pulverizing, until moisture content is reduced to a satisfactory value, as determined by moisture-density relation tests.

3.15 GRADING:

Uniformly grade areas to the lines and grades shown on the Drawings, or as otherwise approved by the Engineer. Smooth finish surface, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades. Grade surface areas as necessary for adequate drainage and to prevent ponding.

3.16 TREATMENT PAD CLOSURE:

A. Following final treatment and removal of staging piles, Treatment Pad pavement and footprints will be evaluated for residual contamination by the Engineer and closed by Contractor in the following manner:

1. Upon completing soil staging activities, provide Engineer written notice of intent to close a treatment pad.

2. Treatment Pads on Asphalt/Concrete Pavement - Remove excess shooting range soil from treatment pad while minimizing generation of dust. Within 24 hours of receiving written notice of intent, the Engineer will collect three pavement core samples per treatment pad. The samples will be laboratory-analyzed for leachable lead by TCLP and leachable lead by SPLP on a one week turn-around-time.

   (a) North Shooting Range Floor Treatment Pad: If sample results indicate that pavement meets the acceptability criteria, the Engineer will notify Contractor that Treatment Pad can be closed in place.

   (b) South Shooting Range Floor Treatment Pad: If sample results indicate that pavement meets acceptability criteria, the Contractor shall demolish pavement, size pavement in accordance with Specification Section 024116 – DEMOLITION, and place and compact within the Soil Placement Area.

   (c) If sample results do not meet CDPHE acceptability criteria; Contractor shall profile pavement as waste and transport off-site to a permitted disposal facility at Contractor's expense. If the pavement is on the North Shooting Range range floor, the Engineer will collect a soil sample beneath each failed pavement core(s) location and two additional soil samples at locations specified by CDPHE. The Engineer will submit the samples to a laboratory for analysis of leachable lead by TCLP and leachable lead by SPLP on a one week turn-around-time. The results will be provided to Contractor. Soil that does not meet the acceptability criteria will be treated on-site in accordance with this Specification Section or transported for disposal off-site at a permitted landfill facility, either option at the Contractor's expense.

3. Treatment Pads on ACA-1 or ACA-2 Areas: Upon completing soil staging activities, and removal of Excess Risk Soil, the Engineer will collect a confirmation soil sample, as described in Section 3.8 of this Specification Section for analysis of Closure Parameters. If the closure criteria are met, the CAMU (treatment area) will be approved for closure. Regrade excavation areas in accordance with the grading requirements in this Specification Section.

4. Treatment Pads on other landfill area: Remove 30-mil liner, size, and transport to Soil Placement Area. Excavate a minimum of six (6) inches of soil underlying the Treatment Pad and create a staging pile. The Engineer will collect a

composite soil sample for analysis of Closure Parameters. If the results of laboratory analysis indicate that the acceptability criteria are met, the Contractor shall transport the staging pile to the Soil Placement Area. If analysis indicates that the soil does not meet the acceptability criteria, treat soil with 2% ECOBOND® (or alternate) and re-treat if necessary as described in this Specification Section. If this option is chosen, all costs associated with the excavation, sampling, treatment, and soil placement will be at the Contractor's expense.

3.17 ENGINEER'S'S RESPONSIBILITIES:

A. The Engineer will be responsible for the following:

1. Providing CQA oversight during construction
2. Establishing sample locations in excavation areas and on staging piles
3. Collection and analysis of soil and pavement samples for laboratory analysis
4. Reporting laboratory analysis results to Contractor
5. Preparation of the Certification Report

3.18 DECONTAMINATION

A. Decontamination shall be performed in accordance with the Soil Treatment Work Plan Plan.

— END OF SECTION —

Division 31 Specification

DIVISION 31 - EARTHWORK

SECTION 313211

SOIL SURFACE EROSION CONTROL

PART 1 - GENERAL

1.1 SUMMARY:

A. The work consists of furnishing and installing temporary soil surface erosion control materials to prevent the pollution of water and land, including fine grading, structural measures, and miscellaneous related work as indicated on the Drawings or specified herein. These temporary measures shall be installed at the locations where needed to control erosion and water pollution during the construction of the project, and as directed by Engineer, and as shown on the Drawings.

B. The Erosion Control Plan presented in the Drawings serves as a minimum for the requirements of erosion control during construction. The Contractor has the ultimate responsibility for providing adequate erosion control throughout the duration of the project. Therefore, if the provided plan is not working sufficiently to protect the project areas, the Contractor shall provide additional measures as required to obtain the required protection.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Excess Risk Soil: Section 02 61 13

1.3 REFERENCES:

This section is not used.

1.4 SUBMITTALS:

A. Submit as specified in SECTION 01 33 00 – SUBMITTALS.

1. Product data for materials proposed for use.

2. Dust control agents other than water must be approved by ENGINEER prior to use.

3. Stormwater quality management measures, Stormwater Management Plan (SWMP) and methods proposed by Contractor must be in conformance with all applicable permits and approved by Engineer prior to installation and prior to moving onto the construction site.

a. Submit the SWMP at the preconstruction conference.

b. Prepare schedules to implement stormwater management features, including but not limited to erosion and sediment control work, and submit for acceptance at preconstruction conference.

1.5 QUALIFICATIONS:

This section is not used.

1.6 QUALITY ASSURANCE AND QUALITY CONTROL:

This section is not used.

1.7 OPERATING CONDITIONS:

A. Temporary Erosion and Sediment Controls: Furnish, install, construct, and maintain temporary measures to control erosion and minimize the siltation of intermittent streams and the pollution of private properties. Temporary erosion and sediment control measures shall be constructed in substantial compliance with local, state, federal, and jurisdictional agency's regulations and Drawings. Temporary erosion and sediment control measures shall be maintained until the landfill closure construction begins.

1.8 DELIVERY, STORAGE, AND HANDLING:

A. Store materials in designated areas and as recommended by the manufacturer protected from the elements, direct exposure, and damage. Do not drop containers from trucks. Material shall be free of defects that would void required performance or warranty.

1.9 WARRANTY:

A. Erosion control material shall have a warranty for use and durable condition for project specific installations. Temporary erosion control materials shall carry a minimum eighteen-month warranty.

PART 2 - PRODUCTS

2.1 MATERIALS ENCOUNTERED:

A. All materials shall be submitted for approval prior to installation.

B. Materials may include erosion logs, sediment fence, aggregates, and other suitable materials, and shall meet the requirements shown on the Drawings.

C. Sediment Control Logs shall consist of straw, compost, excelsior or cocunt fiber, and shall be free of any noxious weed seeds or defects including rips, holes and obvious wear.

PART 3 - EXECUTION

3.1 GENERAL:

A. All temporary erosion and sediment control practices shall be maintained and repaired as needed to ensure continued performance of their intended function.

B. Owner and Engineer will monitor Contractor's erosion control and work methods. If the overall function and intent of erosion control is not being met, Owner will require Contractor to provide additional measures as required to obtain the desired results.

C. The erosion control features installed by Contractor shall be adequately maintained by Contractor until the project is accepted.

D. Properties adjacent to the site of a land disturbance shall be protected from sediment deposition.

3.2 WEATHER CONDITIONS:

A. Perform erosion control operations under favorable weather conditions; when excessive moisture, frozen ground or other unsatisfactory conditions prevail, the work shall be stopped as directed. When special conditions warrant a variance to earthwork operations, submit a revised construction schedule for approval. Do not apply erosion control materials in adverse weather conditions which could affect their performance.

3.3 WATER QUALITY CONTROL:

A. Contractor shall comply with the "Colorado Water Quality Control Act", the "Protection of Fishing Streams", the "Clean Water Act", regulations promulgated, certifications issued, and the construction requirements listed below.

1. In the event of conflicts between Federal and State water quality control laws, rules, or regulations, the more restrictive laws, rules, or regulations shall apply.

B. This Work shall consist of measures needed for the purpose of minimizing water pollution, erosion, and sedimentation during and after the construction activity.

C. This specification shall be followed to minimize the pollution of any watercourse, wetland, or water impoundment area.

D. Stormwater Management Plan (SWMP):

1. The erosion and sediment controls shown in the Drawings and listed in this section shall be used by Contractor as a guideline only. The Contractor shall be responsible for the development and implementation of the SWMP.

2. CONTRACTOR shall submit SWMP for review by the Owner in accordance with the submittal requirements defined in these Section 01 33 00 Submittals. Adjustments to the approved plan may be required by Owner based on actual construction operations. Changes to the plan shall only be made with the written approval of the Owner.

3. The SWMP may include measures for the control of erosion and sedimentation, and measures for stormwater quality management.

4. Contractor shall take the necessary steps to comply with the intent of erosion and sediment controls shown on the Drawings, and other applicable standards, permit conditions, and regulations of appropriate agencies.

3.4 CONSTRUCTION ENTRANCE:

A. Provide as indicated on drawings, a minimum of 8-inches thick, at points of vehicular ingress and egress on the construction site. Construction entrances shall be cleared and grubbed, and then excavated a minimum of 3-inches prior to placement of the filter fabric and aggregate. The aggregate shall be placed in a manner that will prevent damage and movement of the fabric. Place fabric in one piece, where possible. Overlap fabric joints a minimum of 12-inches.

B. Maintain entrance in a condition that minimizes tracking of sediment. Add stone or make other repaires as conditions demand to maintaio clean surface, mountable berm, and specified dimensions. Immediately remove stone and/or sediment spilled, dropped, or tracked onto Riverdale Road by vacuuming, scraping, and/or sweeping. Washing roadway to remove mud tracked onto pavement is not acceptable unless wash water is directed to an approved sediment control structure.

3.5 DUST CONTROL:

A. Contractor shall minimize dust from construction operations.

B. During the performance of the Work, Contractor shall furnish labor, equipment, and materials to control dust at all times, including evenings, holidays, and weekends.

C. Contractor shall be liable for any damage resulting from dust originating from Contractor's operations.

3.6 SEDIMENT (SILT) FENCE:

A. Install silt fence where indicated on Drawings.

B. The height of sediment fence shall be a minimum of 16-inches above the original ground surface and shall not exceed 34-inches above the ground surface.

C. The fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter cloth shall be securely spliced together only at support posts, with a maximum 6-inch overlap.

D. Dig a trench at least 6-inches deep and 4-inches wide along the fence alignment.

E. Drive posts at least 24-inches into the ground on the downslope side of the trench. Space posts a maximum of 6-feet apart.

F. Extra-strength sediment fence fabric shall be used. Posts for this type of fabric shall be placed a maximum of 6-feet apart. The sediment fabric shall be fastened securely to the upslope side of the posts using a minimum of one inch long, heavy-duty wire staples or tie-wires.

G. Place the bottom 1-foot of fabric in the minimum of 6-inch deep trench, lapping toward the upslope side. Backfill with compacted earth or gravel.

H. Compact anchor trench by hand with a “Jumping Jack” or by wheel rolling. Compaction shall be such that silt fence resists being pulled out of anchor trench by hand.

I. When connecting two fences, place the end post of the second fence inside the end post of the first fence. Rotate both posts together at least 180 degrees to create a tight seal with the fabric material. Cut the fabric near the bottom of the posts to accommodate the 6-inch flap. Then drive bothposts and bury the flap. Compact backfill.

J. Silt fence at the toe of a slope should be installed in a flat location at least several feet (2-5 ft.) from the toe of the slope to allow room for ponding and deposition.

K. At the end of a run of silt fence along a contour, the silt fence should be turned perpendicular to the contour to creat a “J-Hook”. The “J-Hook” extending perpendicular to the contour should be of sufficent length to keep runoff from flowing around the end of the silt fence (typically 10-20 feet).

L. To reduce maintenance, excavate a shallow sediment storage area in the upslope side of the fence. Provide good access in areas of heavy sedimentation for clean out and maintenance.

M. Sediment fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

N. Contractor Inspection:

1. Daily in areas of active construction or equipment operation.
2. Weekly in areas with no construction or equipment operation.
3. Within 24 hours of each 0.5-inch or greater rainfall event.
4. Complete inspection reports after each inspection and submit to Engineer within 2 working days.

O. Maintenance:

1. Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the fence. Avoid damaging or undermining the fence during cleanout. Sediment accumulation shall not exceed 1/2 the height of the fence. Place removed sediment in soil placement areas.

2. Any silt fence damaged so it cannot perform its intended function shall be replaced as indicated or as directed by Engineer.

3.7 SEDIMENT CONTROL LOGS

A. Install sediment control logs where indicated on Drawings and prior to any upgradient land-disturbing activities.

B. The height of the sediment control logs shall be a minimum of 1/3 diameter above the original ground surface.

C. Dig a trench at apprxoimately 1/3 of the diameter of the sediment control log along the alignment. If trenching to this depth is not feasible a lesser trenching depth may be acceptable with more robust staking.

D. The uphill side of the sediment control log shall be backfilled with soil or filter material that is free of rocks and debris. The soil shall be tightly compacted into the shape of a right triangle using a shovel or weighted lawn roller or blown in place.

E. Follow manufacturers' guidance for staking. If manufacturers' instruction do not specify spacing, stakes shall be placed on 4-foot centers and embedded a minimum of 6 inches into the ground. Allow a minimum 3-inches of the stake to protrude from the top of the log. Stakes that are broken prior to installation shall be replaced.

F. Contractor Inspection:

1. Daily in areas of active construction or equipment operation.

2. Weekly in areas with no construction or equipment operation.

3. Within 24 hours of each 0.5-inch or greater rainfall event.

4. Complete inspection reports after each inspection and submit to Engineer within 2 working days.

G. Maintenance:

1. Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the fence. Avoid damaging or undermining the sediment control logs during cleanout. Sediment accumulation shall not exceed 1/2 the height of the sediment control logs. Place removed sediment in stockpile areas.

2. Any sediment control log damaged so it cannot perform its intended function shall be replaced as indicated or as directed by Engineer.

3. Remove sediment control logs after area has been surfaced, seeded and permanent erosion devices are in place and has been accepted by Engineer.

3.8 FINISHED GRADE:

A. Verify that finished grades are as indicated on the Drawings; complete finish grading and compaction in accordance with Section 02 61 13 EXCESS RISK AND SOIL. Due to the

grade changes during the development of the project, the Contractor shall be responsible for adjusting the erosion control measures in order to prevent erosion.

3.9 CLEAN-UP:

A. Dispose of excess material, debris, and waste materials off-site at an approved landfill or recycling center. Clear adjacent paved areas. Immediately upon completion of the Work in an area, protect the area against traffic or other use by erecting barricades as required, or as directed.

3.10 EROSION CONTROL INSPECTION AND MAINTENANCE:

A. Contractor shall inspect and maintain temporary erosion controls after completion of the Work until notified by the Owner.

B. Contractor shall perform inspections a minimum of once per month and within 24 hours of each 0.5-inch or greater rainfall event.

C. It is estimated that inspection and maintenance services will be needed for up to six months following completion of the Work.

— END OF SECTION —

Drawings

Adams County, Colorado

Adams County Shooting Range
Demolition And Soil Remediation

Adams County, Colorado

November 2017

PROJECT NO. 90334

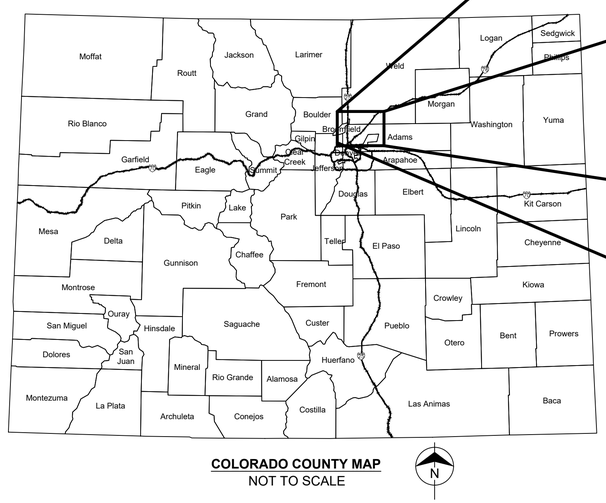
List of Drawings

GENERAL DRAWINGS

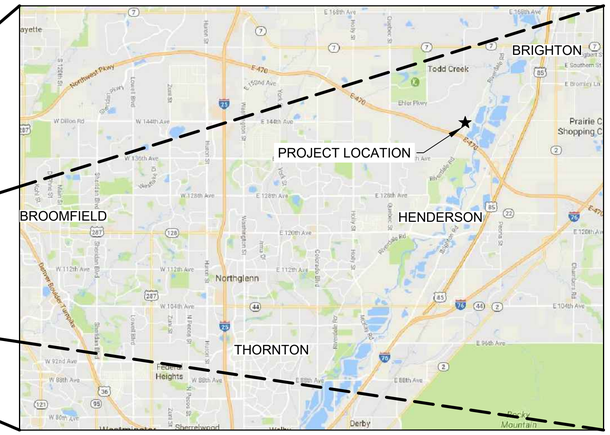
DWG. NO.	TITLE
	COVER - INDEX
G001	GENERAL NOTES, LEGEND AND ABBREVIATIONS

CIVIL DRAWINGS

DWG. NO.	TITLE
C001	EXISTING CONDITIONS
C002	DEMOLITION PLAN I
C003	DEMOLITION PLAN II
C004	EXCESS RISK SOIL EXCAVATION PLAN - CATEGORY I SOIL
C005	EXCESS RISK SOIL EXCAVATION PLAN - CATEGORY II SOIL AND SOIL CONTAINING MUNITION DEBRIS
C006	EROSION AND SEDIMENT CONTROL PLAN
C007	EROSION SEDIMENT CONTROL DETAILS



COLORADO COUNTY MAP
NOT TO SCALE



PROJECT LOCATION
SECTION 14 T 1 S, R 67 W

VICINITY MAP
NOT TO SCALE

no.	date	by	ckd	description
0	11/14	TS	JL	ISSUED FOR BID

QUANTUM
WATER & ENVIRONMENT
1746 Cole Blvd
Lakewood, CO 80401
720.524.4294
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BURNS McDONNELL

Cover - Index

GENERAL NOTES:

1. THE PROJECT SITE IS LOCATED SOUTHWEST OF BRIGHTON IN THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 14, TOWNSHIP 1 SOUTH, AND RANGE 67 WEST ON THE PARCEL OWNED BY ADAMS COUNTY, COLORADO (OWNER). CONTRACTOR SHALL CONTRACT WITH OWNER DIRECTLY TO PERFORM WORK.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES, FOR REPAIRING ANY DAMAGE TO THEM, AND FOR ANY CLAIMS RESULTING FROM HIS/HER ACTIONS AND ACTIVITIES. THE CONTRACTOR SHALL IDENTIFY, LOCATE, AND PROTECT ALL UNDERGROUND UTILITIES THAT MAY BE POTENTIALLY AFFECTED BY CONSTRUCTION UNDER THIS CONTRACT. CONTRACTOR SHALL CONTACT COLORADO 811 AT 1-800-922-1987 TO LOCATE UTILITIES A MINIMUM 72 HOURS PRIOR TO CONSTRUCTION ACTIVITIES.
3. THE CONTRACT DRAWINGS REPRESENT THE FINISHED WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS AND METHODS OF CONSTRUCTION. CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT, MATERIALS, AND TOOLS NECESSARY TO COMPLETELY PERFORM THE WORK IN SAFE, EXPEDITIOUS, AND WORKMAN LIKE MANNER. COORDINATE SCHEDULE OF THE WORK WITH THE OWNER. CONTRACTOR SHALL INSTALL EQUIPMENT AND MATERIALS PER MANUFACTURERS RECOMMENDATIONS UNLESS NOTED OTHERWISE. THE CONTRACTOR ACCEPTS FULL RESPONSIBILITY FOR PROPER HANDLING AND INSTALLATION OF EQUIPMENT AND MATERIALS.
4. CONTRACTOR SHALL UNDERTAKE ALL NECESSARY MEASURES TO ENSURE SAFETY OF ALL PERSONS AND STRUCTURES AT THE SITE AND ADJACENT TO THE SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CLAIMS RESULTING FROM HIS/HER ACTIONS AND ACTIVITIES. VISITS TO THE SITE BY OWNER OR THE ENGINEER SHALL NOT RELIEVE THE CONTRACTOR OF SUCH RESPONSIBILITY.
5. THE CONTRACTOR SHALL ACCEPT FULL RESPONSIBILITY FOR EQUIPMENT AND MATERIALS THROUGH PROJECT COMPLETION. CONTRACTOR SHALL STORE EQUIPMENT AND MATERIALS IN A SECURE LOCATION (ON OR OFF-SITE).
6. CONTRACTOR SHALL MINIMIZE DISTURBANCES TO ADJACENT PROPERTIES.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL CONSTRUCTION PERMITS REQUIRED TO PERFORM THE WORK AND TO PROVIDE CERTIFICATES OF INSURANCE AND OTHER DOCUMENTATION REQUIRED BY THE JURISDICTIONAL AGENCY BEFORE PERFORMING THE WORK.
8. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH OSHA REQUIREMENTS.
9. ALL WORK SHALL BE COMPLETED TO THE LINES, SLOPES AND GRADES INDICATED IN THESE CONTRACT DRAWINGS.
10. THESE NOTES AND OTHER DRAWING NOTES CONTAINED HEREWITH ARE PROVIDED TO MEET SPECIFIC REQUIREMENTS AND TO SUPPLEMENT THE CONTRACT DOCUMENTS.
11. ALL DIMENSIONS, ELEVATIONS, AND CONDITIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR AND ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION BEFORE PROCEEDING WITH THE AFFECTED PART OF WORK.
12. ALL WORK SHOWN IS IN APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF/HERSELF WITH THE EXISTING CONDITIONS BEFORE SUBMITTING HIS/HER BID. SCALING FROM THE DRAWINGS IS PROHIBITED.
13. IF CERTAIN FEATURES ARE NOT FULLY SHOWN OR CALLED FOR ON THE CONTRACT DRAWINGS OR SPECIFICATIONS, THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AS FOR SIMILAR CONDITIONS THAT ARE SHOWN OR CALLED FOR, SUBJECT TO THE APPROVAL OF THE ENGINEER.
14. ALL MONITORING WELLS, FENCES, AND UTILITIES NOT BEING ABANDONED SHALL BE PROTECTED AT ALL TIMES BY CONTRACTOR. ANY DAMAGE TO THESE STRUCTURES SHALL BE REPAIRED AT CONTRACTOR'S SOLE EXPENSE. ALL SUCH DAMAGE SHALL BE PROMPTLY REPORTED TO OWNER AND ENGINEER.

ABBREVIATIONS

AC-SED	ADDITIONAL CHARACTERIZATION STORMWATER BASIN
ACA	ADDITIONAL CHARACTERIZATION AREA
BLLT	BULLET
CONC	CONCRETE
CONT'D	CONTINUED
CU.	CUBIC
DIA	DIAMETER
E	EAST / EASTING
ELEV	ELEVATION
EX.	EXISTING
FL	FLOW LINE
FT	FOOT, FEET
INV.	INVERT ELEVATION
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
MSL	MEAN SEA LEVEL
N	NORTH / NORTHING
NE	NORTHEAST
NRIB	NORTH RANGE IMPACT BERM

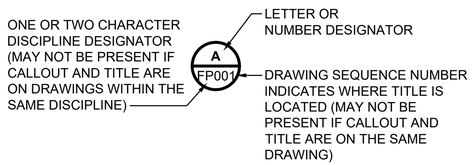
ABBREVIATIONS (CONT'D)

NW	NORTHWEST
O.A.	OUTER DIAMETER
REV	REVISION
S	SOUTH
SDR	STANDARD DIMENSION RATIO
SE	SOUTHEAST
SEC	SECOND
SRBB	SOUTH RANGE BACK BERM
SRIB	SOUTH RANGE IMPACT BERM
SRLB	SOUTH RANGE LATERAL BERM
SRRF	SOUTH RANGE RANGE FLOOR
SRSF	SOUTH RANGE LATERAL BERM
STD.	STANDARD
SW	SOUTHWEST
SY	SQUARE YARD
T	TOWNSHIP
TYP.	TYPICAL
W	WEST
YD	YARDS

LEGEND

- PROPERTY BOUNDARY
- RIVERDALE ROAD RIGHT OF WAY
- EXISTING LIMIT OF WASTE
- EXISTING DITCH FLOWLINE
- EXISTING EDGE OF ASPHALT
- EXISTING EDGE OF CONCRETE
- EXISTING EDGE OF GRAVEL
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR (4350)
- EXISTING FENCE
- EXISTING GAS LINE (GAS)
- EXISTING STORMWATER PIPE
- EXISTING TELEPHONE LINE
- EXISTING OVERHEAD ELECTRICAL LINE (OHU)
- EXISTING UNDERGROUND ELECTRICAL
- EXISTING WATER LINE
- EXISTING AREAS OF DEBRIS
- EXISTING BUILDINGS
- DEMOLITION AND REMOVAL AREA
- CONTROL POINT
- EXISTING MONITORING NETWORK WELLS
- EXISTING PIEZOMETER
- EXISTING LANDFILL GAS PROBE
- EXISTING FIRE HYDRANT
- EXISTING UTILITY POLE
- EXISTING FIBER OPTIC BOX
- EXISTING GUY ANCHOR
- EXISITNG SIGN
- EXISTING WATER SPIGOT
- EXISTING POST
- EXISTING WATER WELL
- RIPRAP
- DESIGN 2' CONTOUR
- DESIGN 10' CONTOUR (4350)
- SILT FENCE (SF)
- SEDIMENT CONTROL LOG

SECTION, DETAIL, AND ELEVATION IDENTIFICATION SYSTEM

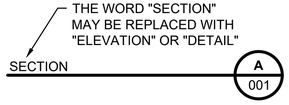


SECTION, DETAIL, AND ELEVATION SYMBOL IDENTIFIERS

SECTION CALLOUT EXAMPLE

DETAIL CALLOUT EXAMPLE

ELEVATION CALLOUT EXAMPLE



SECTION, DETAIL, OR ELEVATION TITLE EXAMPLE

no.	date	by	ckd	description
0	11/14	TS	JL	ISSUED FOR BID

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date	detailed
NOVEMBER 2017	M GONZALES
designed	checked
J LEE	J DELLAPORT

ADAMS COUNTY
COLORADO
ADAMS COUNTY, COLORADO

ADAMS COUNTY SHOOTING RANGE
DEMOLITION AND SOIL REMEDIATION

GENERAL NOTES, LEGEND AND ABBREVIATIONS

project	contract
90334	QUANTUM EC-4

drawing **G001** – rev. **0**

sheet 2 of 9 sheets

file 90334G001NOTE.DWG

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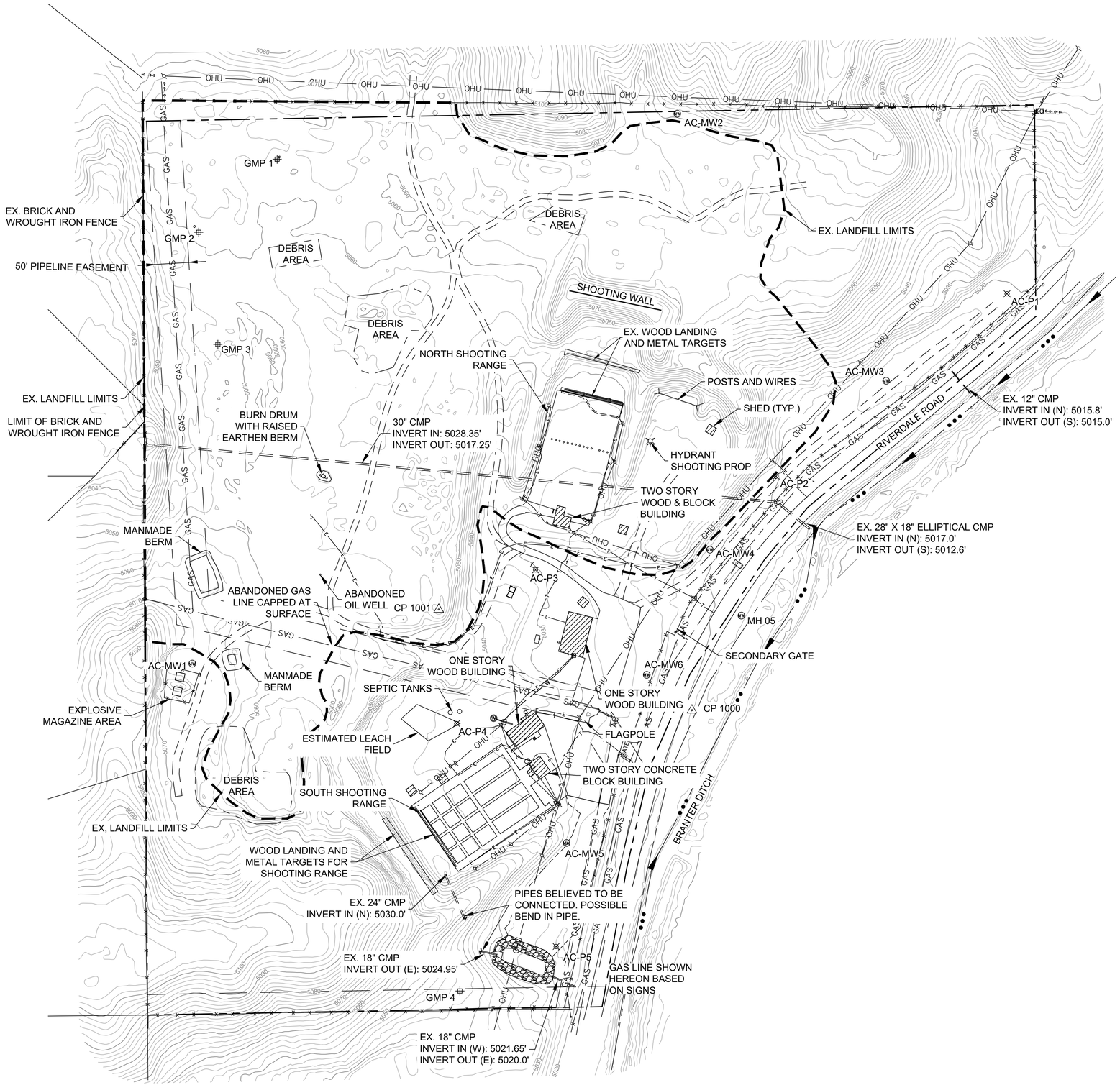

CONTROL POINT LOCATIONS

CONTROL POINT	NORTHING	EASTING	ELEVATION
CP 1000	1,228,513.4	3,178,683.4	5018.1
CP 1001	1,228,661.2	3,178,311.7	5058.3

no.	date	by	ckd	description
0	11/14	MG	JL	ISSUED FOR BID

NOTES:

1. CONTOURS BASED ON LIDAR DATA PRODUCED BY PHOTO SCIENCE, INC. PUBLISHED AUGUST 31, 2013. ELEVATIONS SHOW ARE NAVD 88. CONTOURS ARE SHOWN AT AN INTERVAL OF 2 FEET.
2. FIELD SURVEY COMPLETED BY BOULDER LAND CONSULTANTS APRIL 2016 AND OCTOBER 2016.
3. SURVEY CONTROL INFORMATION PROVIDED BY BOULDER LAND CONSULTANTS. THE SURVEY PROVIDED IS BASED ON THE MODIFIED STATE PLANE COORDINATE SYSTEM, COLORADO NORTH ZONE, NAD 83 (2011).
4. DATA PROVIDED FOR INFORMATION ONLY, CONTRACTOR SHALL FIELD VERIFY ALL FEATURES SHOWN ON THIS DRAWING.
5. CONDITIONS SHOWN ARE ACCURATE AS OF OCTOBER 2017.

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NORTH

0 80' 160'
SCALE IN FEET
MAJOR CONTOUR INTERVAL = 10 FEET
MINOR CONTOUR INTERVAL = 2 FEET

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NOVEMBER 2017	M GONZALES
designed	checked
J LEE	J DELLAPORT

ADAMS COUNTY
COLORADO
ADAMS COUNTY, COLORADO

ADAMS COUNTY SHOOTING RANGE
DEMOLITION AND SOIL REMEDIATION

EXISTING CONDITIONS

project	contract
90334	QUANTUM EC-4

drawing **C001** – rev. **0**

sheet 3 of 9 sheets

file 90334C001EXST.DWG

Scale For Microfilming: Millimeters / Inches

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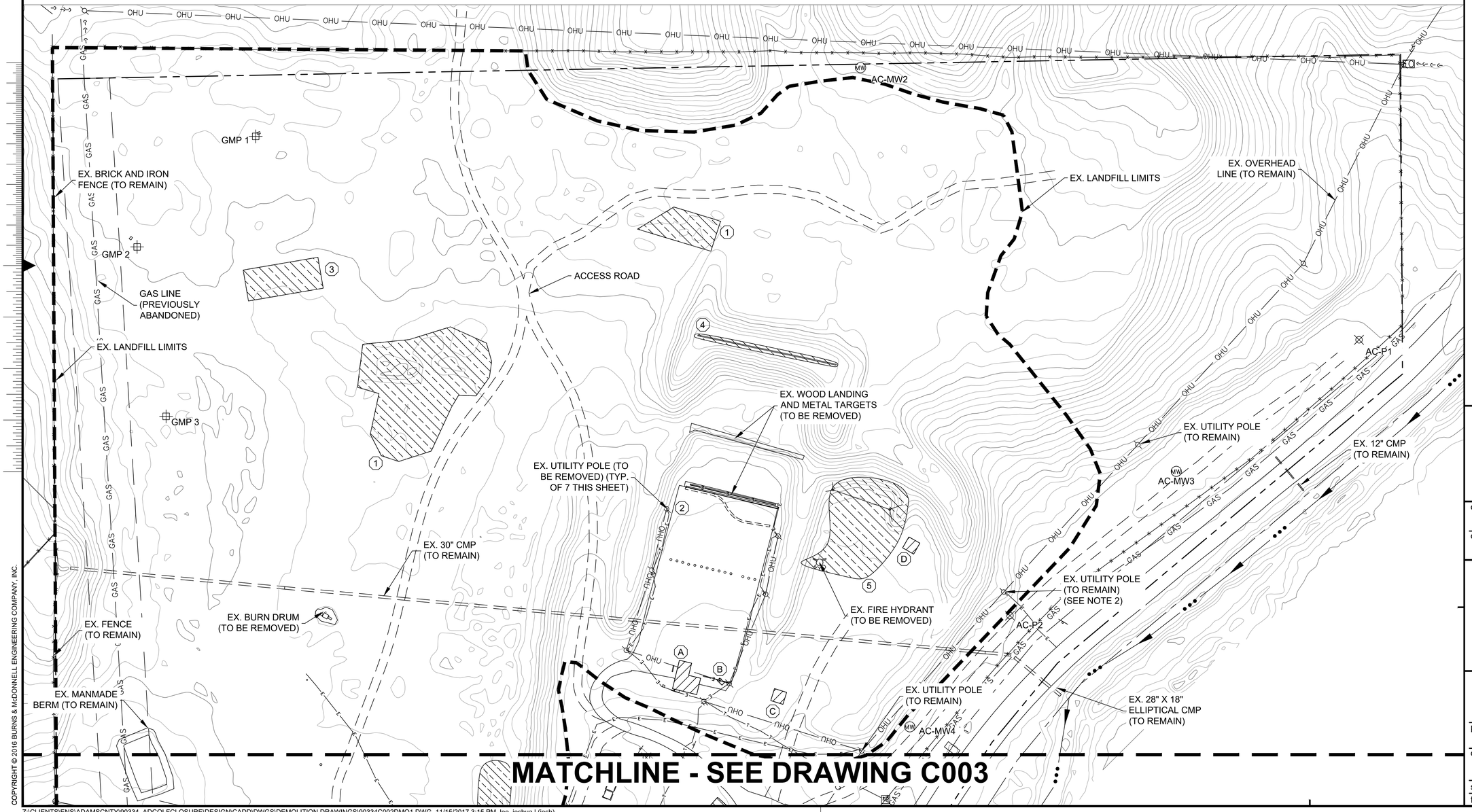
DEBRIS AREA CLEANUP (THIS SHEET)		
ITEM ID	DESCRIPTION	DISPOSAL AREA (SEE NOTE 2)
1	PILE OF TREATED WOOD PRODUCTS	REMOVE FROM SITE
2	STANDING UTILITY POLES (7) AND UTILITY WIRES AROUND NORTH RANGE	REMOVE FROM SITE
3	STEEL PIPES OF VARIOUS SIZES	REMOVE FROM SITE
4	TALL WOODEN SHOOTING RANGE WALL	REMOVE FROM SITE
5	MISCELLANEOUS SITE DEBRIS INCLUDING PROP FIRE HYDRANT, POST AND WIRE, MAILBOX AND TIRES	REMOVE FROM SITE
6	BURN DRUM	REMOVE FROM SITE

BUILDING DEMOLITION (THIS SHEET)		
BUILDING ID	DESCRIPTION	DISPOSAL AREA (SEE NOTE 1)
A	TWO STORY WOOD AND BLOCK BUILDING	REMOVE FROM SITE
B	SHED	REMOVE FROM SITE
C	SHED	REMOVE FROM SITE
D	SHED	REMOVE FROM SITE



MATCHLINE - SEE DRAWING C003

no.	date	by	ckd	description
0	11/14	TS	JL	ISSUED FOR BID

ISSUED FOR BID
NOT FOR CONSTRUCTION

NOTE:

1. DISPOSAL OF MATERIALS REMOVED FROM SITE SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LAWS, CODES, AND REGULATIONS.
2. ALL MONITORING WELLS, FENCES, AND UTILITIES NOT BEING ABANDONED SHALL BE PROTECTED AT ALL TIMES BY CONTRACTOR. ANY DAMAGE TO THESE STRUCTURES SHALL BE REPAIRED AT CONTRACTOR'S SOLE EXPENSE. ALL SUCH DAMAGE SHALL BE PROMPTLY REPORTED TO OWNER AND ENGINEER.

NORTH

0 50' 100'
SCALE IN FEET

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date	detailed
NOVEMBER 2017	M GONZALES
designed	checked
J LEE	J DELLAPORT

ADAMS COUNTY
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ADAMS COUNTY SHOOTING RANGE
DEMOLITION AND SOIL REMEDIATION

DEMOLITION PLAN I

project	contract
90334	QUANTUM EC-4

drawing **C002** – rev. **0**

sheet 4 of 9 sheets

file 90334C002DMO1.DWG

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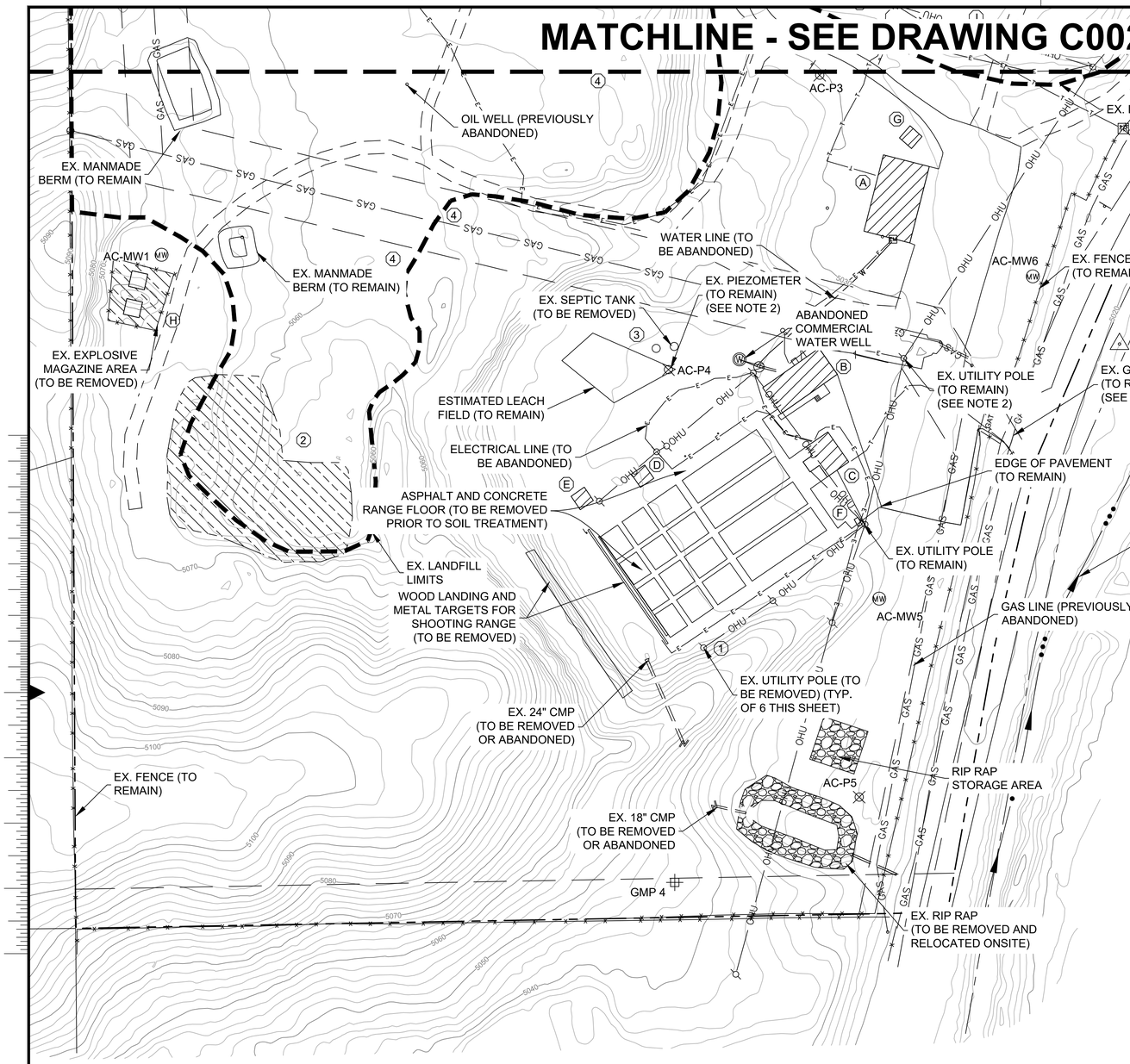
Scale For Microfilming
Millimeters
Inches

MATCHLINE - SEE DRAWING C002



BUILDING DEMOLITION (THIS SHEET)		
BUILDING ID	DESCRIPTION	DISPOSAL AREA (SEE NOTE 1)
A	ONE STORY WOOD BUILDING	REMOVE FROM SITE
B	ONE STORY WOOD BUILDING	REMOVE FROM SITE
C	TWO STORY CONCRETE BLOCK BUILDING	REMOVE FROM SITE
D	SHED	REMOVE FROM SITE
E	SHED	REMOVE FROM SITE
F	SHED	REMOVE FROM SITE
G	SHED	REMOVE FROM SITE
H	MAGAZINE SHEDS (2) AND FENCE	SALVAGE OR DISPOSE AND REMOVE FROM SITE

DEBRIS AREA CLEANUP (THIS SHEET)		
ITEM ID	DESCRIPTION	DISPOSAL AREA (SEE NOTE 1)
1	STANDING UTILITY POLES (6) AND UTILITY WIRES AROUND SOUTH RANGE	REMOVE FROM SITE
2	LARGE STOCKPILE OF TIRES	REMOVE FROM SITE
3	SEPTIC TANK	REMOVE FROM SITE
4	PILE OF TREATED WOOD PRODUCTS	REMOVE FROM SITE

no.	date	by	ckd	description
0	11/14	TS	JL	ISSUED FOR BID

ISSUED FOR BID
NOT FOR CONSTRUCTION

NOTE:

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NORTH

0 50' 100'
SCALE IN FEET

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NOVEMBER 2017	M GONZALES
designed	checked
J LEE	J DELLAPORT

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ADAMS COUNTY, COLORADO

ADAMS COUNTY SHOOTING RANGE
DEMOLITION AND SOIL REMEDIATION

DEMOLITION PLAN II

project	contract
90334	QUANTUM EC-4

drawing **C003** – rev. **0**

sheet 5 of 9 sheets

file 90334C003DMO2.DWG

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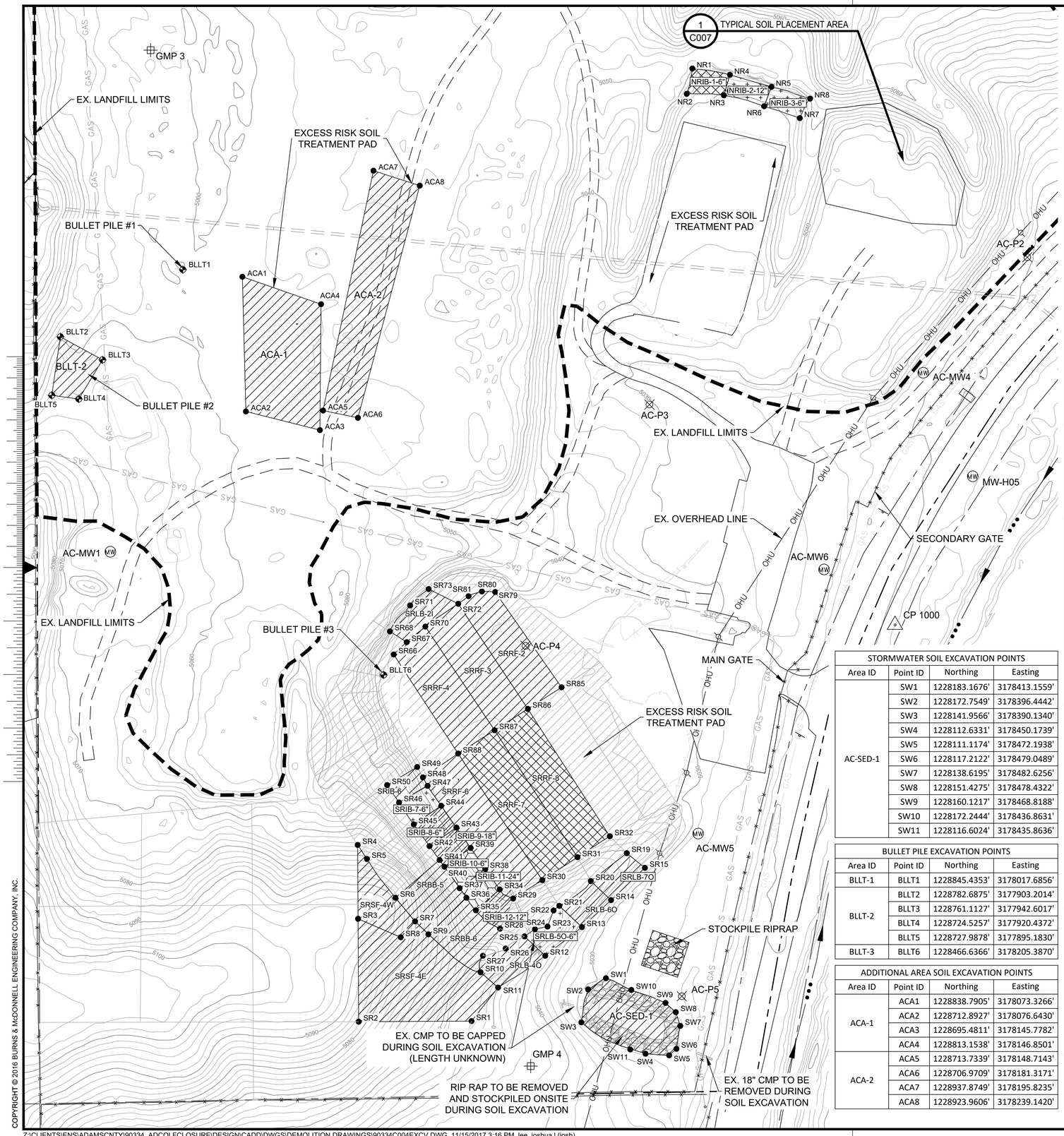

SOUTH RANGE CATEGORY I SOIL EXCAVATION POINTS			
Area ID	Point ID	Northing	Easting
SRSF-4E	SR1	1228143.1210'	3178287.5072'
	SR2	1228142.5253'	3178182.0205'
	SR3	1228238.7437'	3178181.4770'
	SR8	1228221.4526'	3178221.3957'
	SR7	1228236.3050'	3178234.7612'
	SR9	1228224.1983'	3178247.1196'
	SR10	1228188.7912'	3178295.9531'
	SR11	1228174.4985'	3178312.3159'
SRSF-4W	SR3	1228238.7437'	3178181.4770'
	SR4	1228307.7754'	3178181.0872'
	SR5	1228294.6785'	3178189.7408'
	SR6	1228258.3889'	3178216.3289'
	SR7	1228236.3050'	3178234.7612'
	SR8	1228221.4526'	3178221.3957'
SRBB-5	SR6	1228258.3889'	3178216.3289'
	SR7	1228236.3050'	3178234.7612'
	SR9	1228224.1983'	3178247.1196'
	SR36	1228258.3971'	3178282.7004'
	SR37	1228267.3347'	3178276.3808'
	SR40	1228287.3745'	3178262.2103'
	SR41	1228293.6882'	3178257.6064'
SRBB-6	SR9	1228224.1983'	3178247.1196'
	SR10	1228188.7912'	3178295.9531'
	SR27	1228204.2108'	3178298.1611'
	SR25	1228222.2754'	3178337.0428'
	SR35	1228246.6613'	3178291.4599'
	SR36	1228258.3971'	3178282.7004'
SRLB-2I	SR67	1228497.2736'	3178226.9791'
	SR68	1228507.3047'	3178211.1897'
	SR70	1228511.8030'	3178244.3518'
	SR71	1228531.6214'	3178230.0796'
	SR72	1228533.1621'	3178275.0750'
	SR73	1228546.8994'	3178247.4232'
SRLB-4O	SR10	1228188.7912'	3178295.9531'
	SR11	1228174.4985'	3178312.3159'
	SR12	1228204.1975'	3178356.4171'
	SR25	1228222.2754'	3178337.0428'
	SR26	1228210.9675'	3178319.4146'
	SR27	1228204.2108'	3178298.1611'
SRLB-5O	SR12	1228204.1975'	3178356.4171'
	SR13	1228230.9418'	3178390.7372'
	SR21	1228250.8228'	3178369.5335'
	SR22	1228246.5376'	3178364.1675'
	SR23	1228231.4709'	3178358.5507'
	SR24	1228229.0391'	3178346.7393'
	SR25	1228222.2754'	3178337.0428'
SRLB-6O	SR13	1228230.9418'	3178390.7372'
	SR14	1228256.1288'	3178417.9128'
	SR20	1228273.9837'	3178398.9616'
	SR21	1228250.8228'	3178369.5335'
SRLB-7O	SR14	1228256.1288'	3178417.9128'
	SR15	1228286.3393'	3178449.5539'
	SR19	1228300.0570'	3178432.6074'
	SR20	1228273.9837'	3178398.9616'
SRRF-2	SR72	1228533.1621'	3178275.0750'
	SR79	1228544.1656'	3178309.6288'
	SR81	1228540.2396'	3178284.7746'
	SR80	1228544.6362'	3178297.1880'
	SR85	1228455.0785'	3178371.6636'
	SR86	1228434.9368'	3178340.1383'

SOUTH RANGE CATEGORY I SOIL EXCAVATION POINTS			
Area ID	Point ID	Northing	Easting
SRRF-3	SR70	1228511.8030'	3178244.3518'
	SR72	1228533.1621'	3178275.0750'
	SR86	1228434.9368'	3178340.1383'
	SR87	1228414.9235'	3178309.0311'
SRRF-4	SR87	1228414.9235'	3178309.0311'
	SR88	1228393.1438'	3178274.9685'
	SR66	1228485.7656'	3178214.7802'
	SR67	1228497.2736'	3178226.9791'
	SR70	1228511.8030'	3178244.3518'
SRRF-6	SR23	1228231.4709'	3178358.5507'
	SR30	1228274.8523'	3178353.6566'
	SR34	1228266.1503'	3178313.8250'
	SR38	1228285.3728'	3178300.3826'
	SR39	1228304.9558'	3178286.6887'
	SR43	1228324.0191'	3178273.3581'
	SR44	1228344.3400'	3178259.1481'
	SR47	1228362.9687'	3178246.4061'
	SR48	1228370.8509'	3178242.0854'
	SR88	1228393.1438'	3178274.9685'
SRRF-7	SR30	1228274.8523'	3178353.6566'
	SR31	1228296.3280'	3178386.5554'
	SR87	1228414.9235'	3178309.0311'
	SR88	1228393.1438'	3178274.9685'
SRRF-8	SR31	1228296.3280'	3178386.5554'
	SR32	1228315.8464'	3178416.7346'
	SR86	1228434.9368'	3178340.1383'
	SR87	1228414.9235'	3178309.0311'
SRIB-12	SR28	1228229.4528'	3178314.1104'
	SR29	1228257.6428'	3178326.3893'
	SR34	1228266.1503'	3178313.8250'
	SR35	1228246.6613'	3178291.4599'
SRIB-11	SR34	1228266.1503'	3178313.8250'
	SR35	1228246.6613'	3178291.4599'
	SR36	1228258.3971'	3178282.7004'
	SR37	1228267.3347'	3178276.3808'
	SR38	1228285.3728'	3178300.3826'
SRIB-10	SR37	1228267.3347'	3178276.3808'
	SR38	1228285.3728'	3178300.3826'
	SR39	1228304.9558'	3178286.6887'
	SR40	1228287.3745'	3178262.2103'
SRIB-9	SR39	1228304.9558'	3178286.6887'
	SR40	1228287.3745'	3178262.2103'
	SR41	1228293.6882'	3178257.6064'
	SR42	1228306.6548'	3178248.1959'
	SR43	1228324.0191'	3178273.3581'
SRIB-8	SR42	1228306.6548'	3178248.1959'
	SR43	1228324.0191'	3178273.3581'
	SR44	1228344.3400'	3178259.1481'
	SR45	1228326.9518'	3178233.5242'
SRIB-7	SR44	1228344.3400'	3178259.1481'
	SR45	1228326.9518'	3178233.5242'
	SR46	1228347.4528'	3178219.7539'
	SR47	1228362.9687'	3178246.4061'
SRIB-6	SR46	1228347.4528'	3178219.7539'
	SR48	1228370.8509'	3178242.0854'
	SR49	1228380.6210'	3178236.7296'
	SR50	1228363.7041'	3178208.6146'

STORMWATER SOIL EXCAVATION POINTS			
Area ID	Point ID	Northing	Easting
AC-SED-1	SW1	1228183.1676'	3178413.1559'
	SW2	1228172.7549'	3178396.4442'
	SW3	1228141.9566'	3178390.1340'
	SW4	1228112.6331'	3178450.1739'
	SW5	1228111.1174'	3178472.1938'
	SW6	1228117.2122'	3178479.0489'
	SW7	1228138.6195'	3178482.6256'
	SW8	1228151.4275'	3178478.4322'
	SW9	1228160.1217'	3178468.8188'
	SW10	1228172.2444'	3178436.8631'
	SW11	1228116.6024'	3178435.8636'

BULLET PILE EXCAVATION POINTS			
Area ID	Point ID	Northing	Easting
BLLT-1	BLLT1	1228845.4353'	3178017.6856'
BLLT-2	BLLT2	1228782.6875'	3177903.2014'
	BLLT3	1228761.1127'	3177942.6017'
	BLLT4	1228724.5257'	3177920.4372'
BLLT-3	BLLT5	1228727.9878'	3177895.1830'
	BLLT6	1228466.6366'	3178205.3870'

ADDITIONAL AREA SOIL EXCAVATION POINTS			
Area ID	Point ID	Northing	Easting
ACA-1	ACA1	1228838.7905'	3178073.3266'
	ACA2	1228712.8927'	3178076.6430'
	ACA3	1228695.4811'	3178145.7782'
	ACA4	1228813.1538'	3178146.8501'
ACA-2	ACA5	1228713.7339'	3178148.7143'
	ACA6	1228706.9709'	3178181.3171'
	ACA7	1228937.8749'	3178195.8235'
	ACA8	1228923.9606'	3178239.1420'

NORTH RANGE SOIL EXCAVATION POINTS			
Area ID	Point ID	Northing	Easting
NRIB-1	NR1	1229033.3894'	3178493.8764'
	NR2	1229009.7467'	3178488.6306'
	NR3	1229008.3448'	3178523.4110'
	NR4	1229027.5018'	3178529.0035'
NRIB-2	NR3	1229008.3448'	3178523.4110'
	NR4	1229027.5018'	3178529.0035'
	NR5	1229016.2219'	3178567.8783'
	NR6	1228998.1393'	3178560.9912'
NRIB-3	NF5	1229016.2219'	3178567.8783'
	NF6	1228998.1393'	3178560.9912'
	NR7	1228987.0707'	3178594.3341'
	NR8	1229005.2551'	3178603.9625'

no.	date	by	ckd	description
0	11/14	TS	JL	ISSUED FOR BID

NOTES:

1. SOIL WITHIN EXCAVATION LIMITS SHOWN SHALL BE EXCAVATED TO THE MINIMUM DEPTH DENOTED BY THE HATCHING, TREATED, AND TESTED IN ACCORDANCE WITH THE SPECIFICATIONS AND MMP.
2. LEAD SCREENING AREAS SHALL BE SCREENED FOR METALLIC LEAD IN ACCORDANCE WITH THE SPECIFICATIONS. DEPTHS OF EXCAVATION FOR LEAD SCREENING AREAS INDICATED IN THE LABEL. TOTAL DEPTH OF EXCAVATION INDICATED BY HATCH SHALL BE COMPLETED AFTER LEAD SCREENING EXCAVATION.

EXCAVATION DEPTH LEGEND:

- 6" EXCAVATION DEPTH
- 12" EXCAVATION DEPTH
- 18" EXCAVATION DEPTH
- 24" EXCAVATION DEPTH
- 30" EXCAVATION DEPTH
- SRSF-1-6" — LEAD SCREENING AREA WITH EXCAVATION DEPTH (SEE NOTE 2)
- SR38 — EXCAVATION GRID POINT

NORTH

0 50' 100'

SCALE IN FEET
MAJOR CONTOUR INTERVAL = 10 FEET
MINOR CONTOUR INTERVAL = 2 FEET

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NOVEMBER 2017	M GONZALES
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J LEE	J DELLAPORT

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ADAMS COUNTY SHOOTING RANGE
DEMOLITION AND SOIL REMEDIATION

EXCESS RISK SOIL EXCAVATION PLAN - CATEGORY I SOIL

project	contract
90334	QUANTUM EC-4

drawing C004 — rev. 0

sheet 6 of 9 sheets

file 90334C004EXCV.DWG

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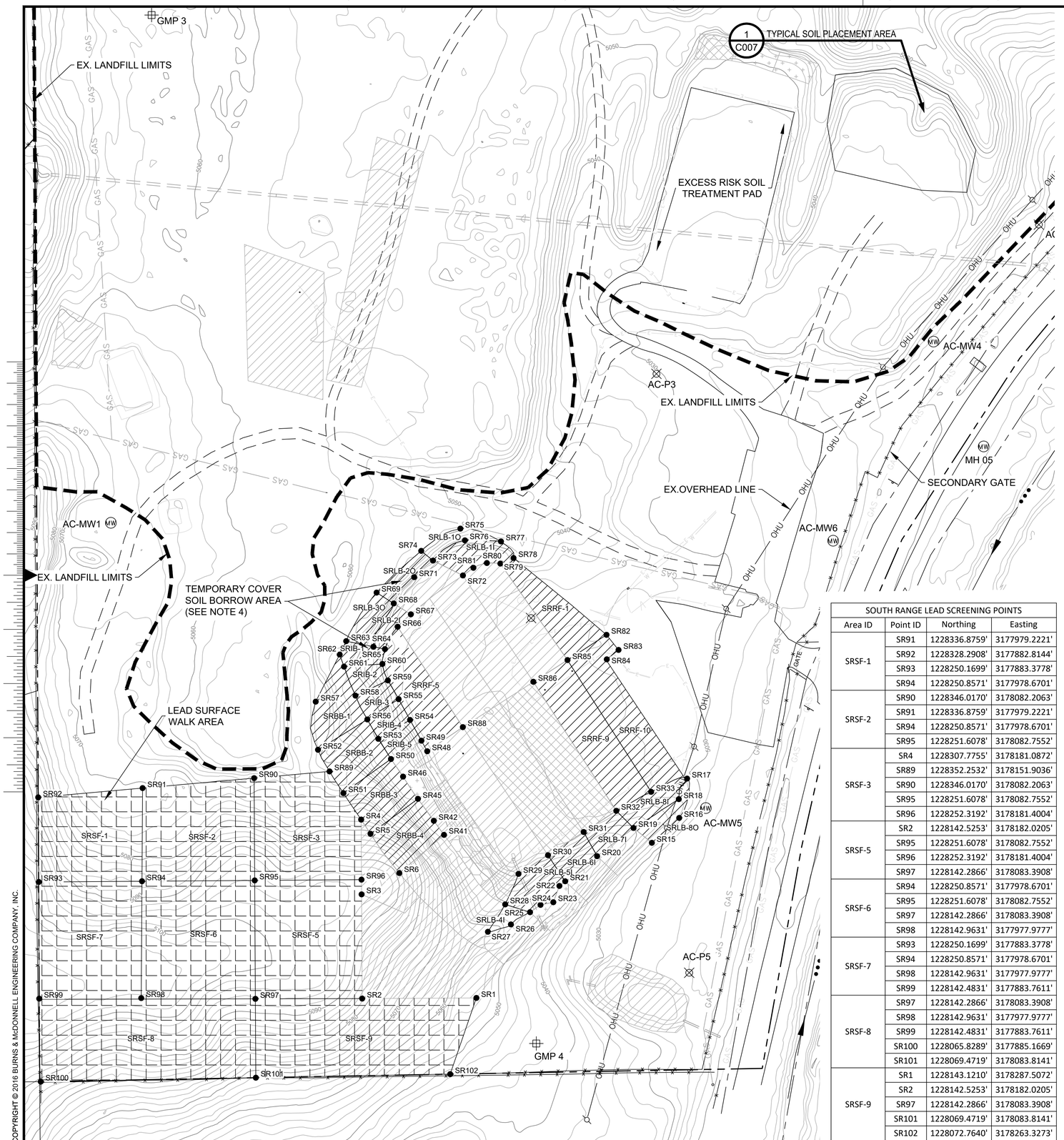
Scale For Microfilming
Millimeters
Inches



SOUTH RANGE CATEGORY II SOIL EXCAVATION POINTS			
Area ID	Point ID	Northing	Easting
SRBB-4	SR5	1228294.6785'	3178189.7408'
	SR6	1228258.3905'	3178216.3276'
	SR41	1228293.6883'	3178257.6065'
	SR42	1228306.6549'	3178248.1960'
	SR45	1228326.9518'	3178233.5242'
SRBB-3	SR4	1228307.7755'	3178181.0872'
	SR5	1228294.6785'	3178189.7408'
	SR45	1228326.9518'	3178233.5242'
	SR46	1228347.4528'	3178219.7539'
	SR50	1228363.7041'	3178208.6146'
	SR51	1228332.1754'	3178164.7384'
SRBB-2	SR50	1228363.7041'	3178208.6146'
	SR51	1228332.1754'	3178164.7384'
	SR52	1228372.2295'	3178141.2225'
	SR53	1228382.3538'	3178196.9018'
	SR56	1228400.2201'	3178186.7780'
SRBB-1	SR52	1228372.2295'	3178141.2225'
	SR56	1228400.2201'	3178186.7780'
	SR57	1228416.6397'	3178139.1159'
	SR58	1228422.1966'	3178175.8394'
	SR61	1228448.9962'	3178165.2586'
	SR62	1228460.1558'	3178161.2153'
SRIB-5	SR49	1228380.6210'	3178236.7296'
	SR50	1228363.7041'	3178208.6146'
	SR53	1228382.3538'	3178196.9018'
	SR54	1228399.7643'	3178226.2357'
SRIB-4	SR53	1228382.3538'	3178196.9018'
	SR54	1228399.7643'	3178226.2357'
	SR55	1228418.9785'	3178215.7035'
	SR56	1228400.2201'	3178186.7780'
SRIB-3	SR55	1228418.9785'	3178215.7035'
	SR56	1228400.2201'	3178186.7780'
	SR58	1228422.1966'	3178175.8394'
	SR59	1228436.2206'	3178205.7441'
SRIB-2	SR58	1228422.1966'	3178175.8394'
	SR59	1228436.2206'	3178205.7441'
	SR60	1228451.4505'	3178200.6946'
	SR61	1228448.9962'	3178165.2586'
SRIB-1	SR60	1228451.4505'	3178200.6946'
	SR61	1228448.9962'	3178165.2586'
	SR62	1228460.1558'	3178161.2153'
	SR63	1228472.5185'	3178167.2656'
	SR64	1228467.3292'	3178192.4282'
	SR65	1228465.1492'	3178202.9994'
SRLB-3I	SR64	1228467.3292'	3178192.4282'
	SR65	1228465.1492'	3178202.9994'
	SR66	1228485.7656'	3178214.7802'
	SR67	1228497.2736'	3178226.9790'
	SR68	3178211.1897'	1228507.3047'
SRLB-3O	SR63	1228472.5185'	3178167.2656'
	SR64	1228467.3292'	3178192.4282'
	SR68	3178211.1897'	1228507.3047'
	SR69	3178195.3539'	3178195.3539'
SRLB-2O	SR68	3178211.1897'	1228507.3047'
	SR69	3178195.3539'	3178195.3539'
	SR71	1228531.6214'	3178230.0796'
	SR73	1228546.8994'	3178247.4232'
	SR74	1228555.8504'	3178236.5723'
SRLB-1I	SR72	1228533.1621'	3178275.0750'
	SR73	1228546.8994'	3178247.4232'
	SR76	1228565.5656'	3178276.8839'
	SR77	1228564.5740'	3178310.2439'
	SR78	1228549.2534'	3178321.8160'
	SR79	1228544.1656'	3178309.6288'
	SR80	1228544.6362'	3178297.1880'
	SR81	1228540.2396'	3178284.7746'

SOUTH RANGE CATEGORY II SOIL EXCAVATION POINTS			
Area ID	Point ID	Northing	Easting
SRLB-1O	SR73	1228546.8994'	3178247.4232'
	SR74	1228555.8504'	3178236.5723'
	SR75	1228576.4043'	3178272.6731'
	SR76	1228565.5656'	3178276.8839'
	SR77	1228564.5740'	3178310.2439'
SRLB-1I	SR72	1228533.1621'	3178275.0750'
	SR73	1228546.8994'	3178247.4232'
	SR76	1228565.5656'	3178276.8839'
	SR77	1228564.5740'	3178310.2439'
	SR78	1228549.2534'	3178321.8160'
	SR79	1228544.1656'	3178309.6288'
	SR80	1228544.6362'	3178297.1880'
	SR81	1228540.2396'	3178284.7746'
SRRF-1	SR78	1228549.2534'	3178321.8160'
	SR79	1228544.1656'	3178309.6288'
	SR82	1228478.3547'	3178407.6775'
	SR85	1228455.0753'	3178371.6657'
SRRF-5	SR48	1228370.8509'	3178242.0854'
	SR49	1228380.6210'	3178236.7296'
	SR54	1228399.7643'	3178226.2357'
	SR55	1228418.9785'	3178215.7035'
	SR59	1228436.2206'	3178205.7441'
	SR60	1228451.4505'	3178200.6946'
	SR65	1228465.1492'	3178202.9994'
	SR66	1228485.7656'	3178214.7802'
	SR88	1228393.1438'	3178274.9685'
SRRF-10	SR82	1228478.3547'	3178407.6775'
	SR83	1228464.4174'	3178418.7916'
	SR84	1228455.7292'	3178407.9438'
	SR85	1228455.0753'	3178371.6657'
	SR17	1228345.6282'	3178482.1213'
	SR33	1228333.4130'	3178448.9066'
SRRF-9	SR32	1228315.8464'	3178416.7346'
	SR33	1228333.4130'	3178448.9066'
	SR85	1228455.0753'	3178371.6657'
	SR86	1228435.0237'	3178340.0825'
SRLB-8I	SR17	1228345.6282'	3178482.1213'
	SR18	1228326.6603'	3178474.4486'
	SR19	1228300.0570'	3178432.6074'
	SR32	1228315.8464'	3178416.7346'
	SR33	1228333.4130'	3178448.9066'
SRLB-8O	SR15	1228286.3393'	3178449.5539'
	SR16	1228309.3152'	3178474.8137'
	SR17	1228345.6282'	3178482.1213'
	SR18	1228326.6603'	3178474.4486'
	SR19	1228300.0570'	3178432.6074'
SRLB-7I	SR19	1228300.0570'	3178432.6074'
	SR20	1228273.9837'	3178398.9616'
	SR32	1228315.8464'	3178416.7346'
	SR31	1228296.3280'	3178386.5554'
SRLB-6I	SR20	1228273.9837'	3178398.9616'
	SR21	1228250.8228'	3178369.5335'
	SR30	1228274.8523'	3178353.6566'
	SR31	1228296.3280'	3178386.5554'
SRLB-5I	SR21	1228250.8228'	3178369.5335'
	SR22	1228246.5376'	3178364.1675'
	SR23	1228231.4709'	3178358.5507'
	SR24	1228229.0391'	3178346.7393'
	SR25	1228222.2754'	3178337.0428'
	SR28	1228229.4528'	3178314.1104'
	SR29	1228257.6428'	3178326.3893'
	SR30	1228274.8523'	3178353.6566'
SRLB-4I	SR25	1228222.2754'	3178337.0428'
	SR26	1228210.9675'	3178319.4146'
	SR27	1228204.2108'	3178298.1611'
	SR28	1228229.4528'	3178314.1104'

SOUTH RANGE LEAD SCREENING POINTS			
Area ID	Point ID	Northing	Easting
SRSF-1	SR91	1228336.8759'	3177979.2221'
	SR92	1228328.2908'	3177882.8144'
	SR93	1228250.1699'	3177883.3778'
	SR94	1228250.8571'	3177978.6701'
SRSF-2	SR90	1228346.0170'	3178082.2063'
	SR91	1228336.8759'	3177979.2221'
	SR94	1228250.8571'	3177978.6701'
	SR95	1228251.6078'	3178082.7552'
SRSF-3	SR4	1228307.7755'	3178181.0872'
	SR89	1228352.2532'	3178151.9036'
	SR90	1228346.0170'	3178082.2063'
	SR95	1228251.6078'	3178082.7552'
	SR96	1228252.3192'	3178181.4004'
SRSF-5	SR2	1228142.5253'	3178182.0205'
	SR95	1228251.6078'	3178082.7552'
	SR96	1228252.3192'	3178181.4004'
	SR97	1228142.2866'	3178083.3908'
SRSF-6	SR94	1228250.8571'	3177978.6701'
	SR95	1228251.6078'	3178082.7552'
	SR97	1228142.2866'	3178083.3908'
	SR98	1228142.9631'	3177977.9777'
SRSF-7	SR93	1228250.1699'	3177883.3778'
	SR94	1228250.8571'	3177978.6701'
	SR98	1228142.9631'	3177977.9777'
	SR99	1228142.4831'	3177883.7611'
SRSF-8	SR97	1228142.2866'	3178083.3908'
	SR98	1228142.9631'	3177977.9777'
	SR99	1228142.4831'	3177883.7611'
	SR100	1228065.8289'	3177885.1669'
	SR101	1228069.4719'	3178083.8141'
SRSF-9	SR1	1228143.1210'	3178287.5072'
	SR2	1228142.5253'	3178182.0205'
	SR97	1228142.2866'	3178083.3908'
	SR101	1228069.4719'	3178083.8141'
	SR102	1228072.7640'	3178263.3273'

no.	date	by	ckd	description
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NOTES:

1. SOIL WITHIN EXCAVATION LIMITS SHOWN SHALL BE EXCAVATED TO THE MINIMUM DEPTHS DENOTED BY THE HATCHING, TREATED, AND TESTED IN ACCORDANCE WITH THE SPECIFICATIONS AND MMP.
2. CONTRACTOR SHALL PERFORM A DETAILED SURFACE WALK OF THE AREA DENOTED BY THE LEAD SURFACE WALK AREA HATCHING IN ACCORDANCE WITH THE SPECIFICATIONS.
3. SOILS IN AREAS SRBB-2 AND SRRF-9 SHALL BE CONSIDERED CATEGORY II SOILS. ALL OTHER AREAS SHOWN ON THIS DRAWING SHALL BE CONSIDERED SOILS CONTAINING MUNITIONS DEBRIS.
4. CONTRACTOR SHALL BORROW TEMPORARY COVER SOIL FROM THIS AREA AFTER FINAL SURVEY.

EXCAVATION DEPTH LEGEND:

6" EXCAVATION DEPTH

LEAD SURFACE WALK AREA (SEE NOTE 2)

SR38 EXCAVATION GRID POINT

NORTH

0 50' 100'
SCALE IN FEET
MAJOR CONTOUR INTERVAL = 10 FEET
MINOR CONTOUR INTERVAL = 2 FEET

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designed	checked
J LEE	J DELLAPORT

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ADAMS COUNTY, COLORADO

ADAMS COUNTY SHOOTING RANGE
DEMOLITION AND SOIL REMEDIATION

EXCESS RISK SOIL EXCAVATION PLAN - CATEGORY II SOIL AND SOIL CONTAINING MUNITION DEBRIS

project	contract
90334	QUANTUM EC-4

drawing C005 — rev. 0

sheet 7 of 9 sheets

file 90334C005EXC2.DWG

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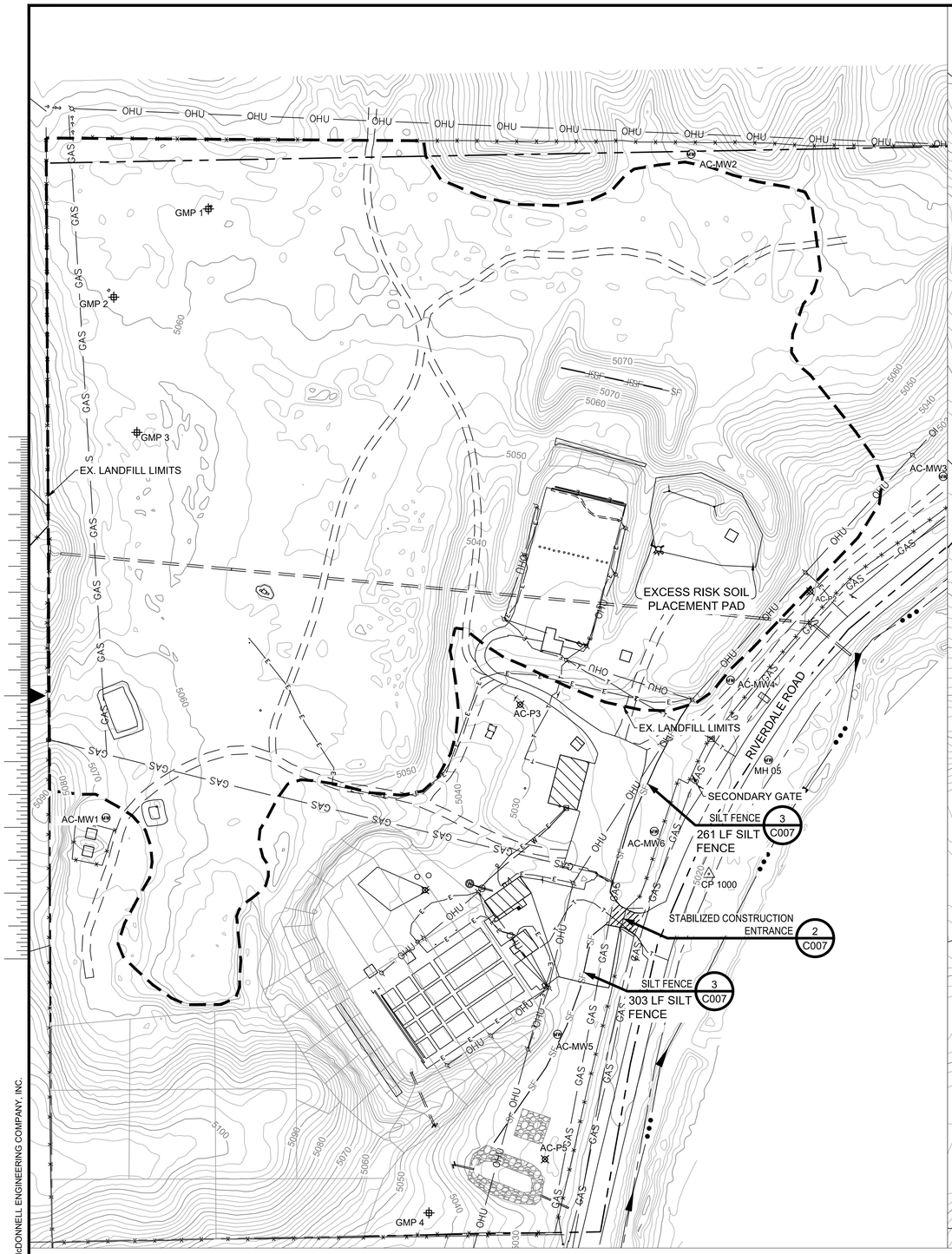
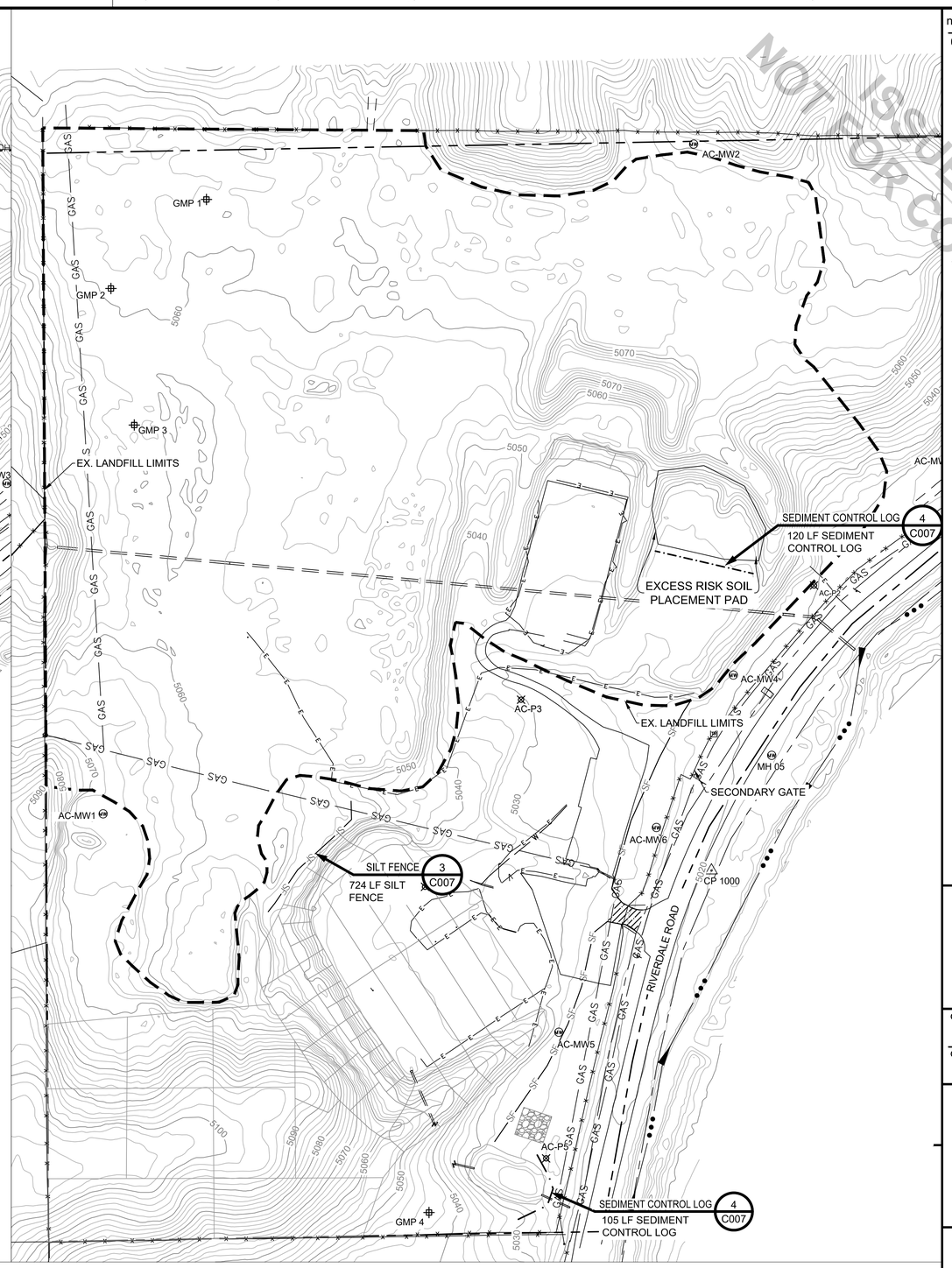
Millimeters
Scale For Microfilming
Inches

no.	date	by	ckd	description
0	11/14	TS	JL	ISSUED FOR BID



EROSION CONTROL EXISTING CONDITIONS
SCALE: 1" = 80'

NORTH



EROSION CONTROL POST-REMEDIATION CONDITIONS
SCALE: 1" = 80'

NORTH

0 80' 160'
SCALE IN FEET

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DEMOLITION AND SOIL REMEDIATION

EROSION AND SEDIMENT CONTROL PLAN

project	contract
90334	QUANTUM EC-4

drawing **C006** rev. **0**

sheet 8 of 9 sheets

file 90334C006ESCP.DWG

Scale For Microfilming
Millimeters
Inches

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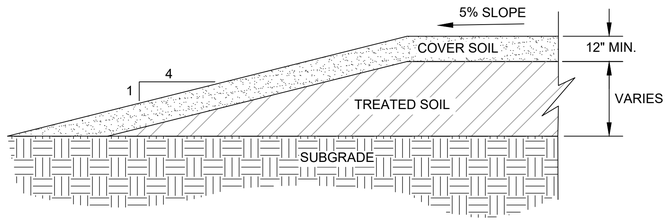

TYPICAL SOIL PLACEMENT AREA — 1 / C005
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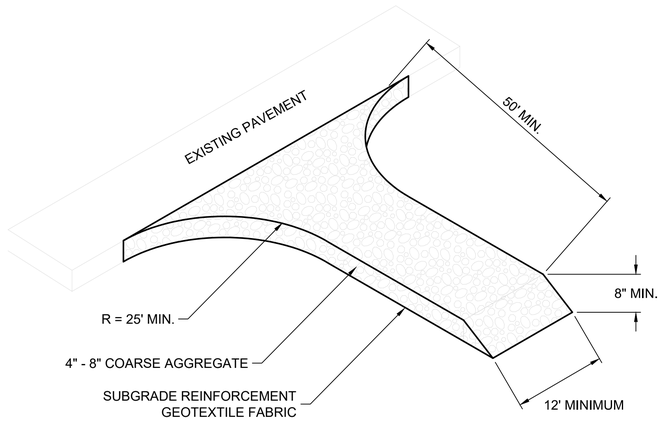
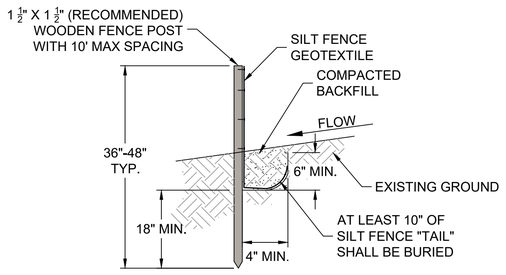
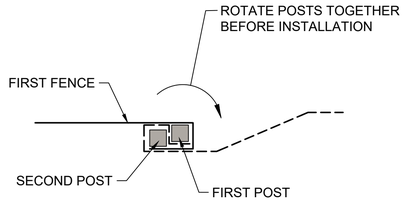


STABILIZED CONSTRUCTION ENTRANCE — 2 / C006
NOT TO SCALE

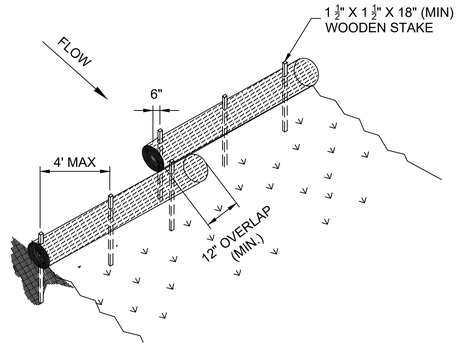


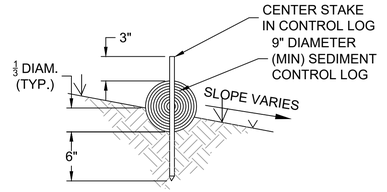
PROFILE



PLAN

SILT FENCE — 3 / C006
NOT TO SCALE





SEDIMENT CONTROL LOG — 4 / C006
NOT TO SCALE

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J LEE	J DELLAPORT

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ADAMS COUNTY SHOOTING RANGE
DEMOLITION AND SOIL REMEDIATION

EROSION SEDIMENT CONTROL DETAILS

project	contract
90334	QUANTUM EC-4

drawing **C007** – rev. **0**

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file 90334C007ESCD.DWG

Scale For Microfilming
Millimeters
Inches

Construction Quality Assurance Plan

Construction Quality Assurance Plan

Adams County, Colorado

Adams County Shooting Range Demolition and
Excess Risk Soil Remediation
Project No. 90334

Revision 0
November 2017

Construction Quality Assurance Plan

prepared for

Adams County, Colorado
Adams County Shooting Range Demolition and
Excess Risk Soil Remediation
Adams County, Colorado

Project No. 90334

Revision 0
November 2017

prepared by

Quantum Water & Environment, Inc.
Lakewood, Colorado
&
Burns & McDonnell Engineering Company, Inc.
Centennial, Colorado

INDEX AND CERTIFICATION

Adams County, Colorado
Construction Quality Assurance Plan
Project No. 90334

Report Index

Certification

I hereby certify, as a Professional Engineer in the State of Colorado, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by the Adams County, Colorado or others without specific verification or adaptation by the Engineer.

John C. Dellaport, P.E., P.G.
Colorado PE License No. 39739

Date:

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LIST OF ABBREVIATIONS AND DEFINITIONS

Abbreviation	Term/Phrase/Name
ATSM	American Society for Testing and Materials
Burns & McDonnell	Burns & McDonnell Engineering, Inc.
CDPHE	Colorado Department of Public Health and Environment
CQA	Construction quality assurance
CQC	Construction quality control
EPA	Environmental Protection Agency
MMP	Materials Management Plan
lb.	Pound
MMP	Materials Management Plan
SW-846	Solid Waste 846
SPLP	Synthetic precipitation leaching procedure
SWMP	Storm Water Management Plan
TCLP	Toxicity characteristic leaching procedure
Quantum	Quantum Water & Environment

1.0 INTRODUCTION

This Construction Quality Assurance (CQA) Plan has been prepared for structures demolition and soil remediation of the shooting range for the Adams County Shooting Range project. The site is located on Riverdale Road in unincorporated Adams County, approximately one mile north of Interstate E-470. The project consists of demolishing and removing buildings and structures from the property; and excavation and remediation of shooting range soil and placement onto/adjacent to the landfill.

Quantum Water & Environment (Quantum) has prepared this construction quality assurance (CQA) plan and has a contract with Adams County for the overall site characterization and closure design. Quantum subcontracted Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to provide landfill engineering design services for the project.

The purpose of this CQA Plan is to set forth the quality-related requirements to be implemented during completion of the project to verify and document that the project activities are constructed in accordance with the Contract Documents. The objectives of this CQA Plan are to set forth:

- Key definitions pertinent to the overall execution of the project
- CQA personnel minimum qualifications, responsibilities, and authorities
- Inspection, monitoring, and testing activities necessary to ensure that the project components are constructed to meet or exceed the requirements set forth in the Contract Documents.
- CQA documentation requirements

The scope of this plan includes the CQA activities associated with the following field activities:

- Demolition of buildings and structures and removal from the site.
- Excavation and remediation of Excess Risk Soil and placement as a compacted fill within the landfill.
- Installation of temporary stormwater controls for both run-on and runoff from the excavation areas, Treatment Pads, and Soil Placement Area.
- Surveying of completed components.

- Documentation of the remediation and construction activities.

Table 1-1 provides a list of construction components, the required testing, and the required frequencies of testing.

2.0 GENERAL

2.1 Definitions

This section provides definitions for terms used in this CQA Plan:

CQA - refers to means and actions employed by the Engineer to verify conformity of project work preparation, production, and installation with this CQA Plan, the Specifications, the Drawings. CQA is provided by a party independent from the product Manufacturer and Contractor.

Closure Parameters - Soil confirmation samples collected from the excavation areas will be laboratory analyzed for these parameters to determine if the CDPHE acceptabilty criteria area met, and include Total Metals (lead, antimony, arsenic, cadmium, copper, tin, and zinc [EPA Method 6010C]), leachable lead by TCLP (EPA Method 1311/6010C), and leachable lead by SPLP (EPA Method 1312/6010B). Acceptance criteria for Total Metals are the EPA Residential Regional Screening Levels for the South Shooting Range excavation areas and the EPA Industrial Screening Levels for the North Shooting Range excavation areas. Acceptance criteria for leachable lead by TCLP and SPLP are 5.0 milligrams per liter, and 1,100 micrograms per liter, respectively.

"Construction Quality Control" (CQC) - refers to those actions taken by Contractors, Manufacturers, or Suppliers, including their designated representatives, to ensure that the materials and the workmanship meet the requirements of the Specifications and the Drawings. In the case of soils, and within this CQA Plan, Construction Quality Control may be made a part of the CQA requirements and is provided by the Engineer**.**

Construction Quality Assurance Plan or CQA Plan - A written plan that addresses the qualifications and responsibilities of the Engineer, field guidelines for quality assurance, required laboratory and field test, frequency of testing, and required documentation. The CQA Plan is a component of the Contract Documents.

Contractor - The firm or firms responsible for all construction related activities. This definition applies to any party performing work defined as construction even if it is not his or her primary function.

Contract Documents - Includes all project related contract documents, including but not limited to the Drawings, Specifications, Materials Management Plan (MMP), and this CQA Plan.

Drawings – The engineering design drawings issued for construction and sealed by a Colorado-registered Professional Engineer.

Record Drawings - Drawings recording the as-built dimensions, details and coordinates of the construction components after construction is completed.

Earthwork - An activity involving the use of soil or rock materials as defined in the Specifications.

Quality Assurance - Verification that quality control functions have been performed in substantial compliance with the project construction drawings and Specifications.

Quality Control - Functions performed by the Contractor or supplier to verify that work performed conforms to project construction drawings and Specifications.

Specifications – The documents that set forth the project requirements in narrative form. The Specifications are a component of the Contract Documents.

2.2 Parties to Construction Quality Assurance

Owner and Owner's Representative - Adams County, Colorado is the Owner of the property. Adams County will designate a person or persons as the Owner's Representative. The Engineer and Contractor will both report to the Owner.

Contractor - The Contractor has overall responsibility for the completion of construction and will direct the daily activities of its subcontractors. References to Contractor in this document will also mean all subcontractors under Contractor.

CQA Laboratory - The CQA Laboratory conducts tests in a laboratory (which may be onsite or offsite) on samples of soil to be used in the construction of the corrective measures. More than one laboratory may be used as the CQA Laboratory. Each CQA Laboratory must have experience with the type of testing required by the Specifications, meet all applicable regulatory requirements, and be familiar with hazardous waste test methods (SW-846), American Society of Testing and Materials (ASTM) and other required test standards. The CQA Laboratory will be capable of providing test results in accordance with this CQA Plan and the Specifications.

Engineer - The Engineer is the individual having direct responsible charge of the design and CQA of the project. During construction, the Engineer must approve any significant deviation from the design requirements given in the Contract Documents. The Engineer must be registered as a Professional Engineer in the State of Colorado. References to the "Engineer" in this CQA Plan refer to the Professional Engineer certifying the construction or his/her designee.

Testing Firm - The Testing Firm is an independent agency hired by the Engineer to provide specialty testing and inspection services.

Surveyor - The Surveyor, under contract to the Contractor, will perform record surveys of the work as required by this CQA Plan and the Specifications. The Surveyor will be a licensed professional land surveying organization experienced in providing record surveys on projects of similar nature and will be pre-approved by the Engineer. The Surveyor will provide a person who directly manages the record survey activities who is a Licensed Professional Land Surveyor in the State of Colorado. The Surveyor must provide signed and sealed copies of all survey data and reports as required by the Specifications, Drawings, and this CQA Plan for use by the Engineer in certifying that the project was constructed in general accordance with the Contract Documents.

2.3 Qualifications

Engineer - The person who is in responsible charge of the project CQA will be a Professional Engineer registered in the State of Colorado with a demonstrated successful completion of projects of similar complexity, means, and methods. The Engineer will have a history which demonstrates familiarity with the hazardous waste treatment, including detailed design methods and construction procedures and competency in certifying remediation work similar to this project.

CQA Personnel - Personnel representing the Engineer will be properly trained and qualified to test and inspect the excess risk soil excavations, treated soil staging piles, and the Soil Placement Area. The Engineer will predominantly be represented by an experienced field representative, who has direct responsibility for management of all daily CQA activities. The CQA field personnel will be experienced in hazardous waste management, construction, soil sampling and analysis, CQA of soil, and preparation of CQA documentation including CQA forms, reports, and plans.

The CQA field personnel will perform their duties under the direct supervision of the Engineer. At least one CQA field representative will be onsite at all times during structures demolition, debris removal, soil excavation, soil treatment, and soil placement activities.

2.4 Duties of Engineer

The overall responsibility of the Engineer is to perform those activities specified in this CQA Plan (e.g., inspection, sampling, testing, and documentation, including final certification). At a minimum, the Engineer will be represented by a Colorado Registered Professional Engineer and the necessary supporting CQA field representatives. Specific responsibilities of the Engineer will include:

- Reviewing the Drawings and Specifications for clarity and completeness so that the CQA Plan can be implemented
- Educating CQA field personnel on CQA requirements and procedures
- Scheduling and coordinating CQA inspection activities
- Directing and supporting the CQA field personnel in performing observations and tests
- Providing daily reports of the CQA activities
- Reporting the results of observations and tests as the work progresses and interacting with the Contractor to provide assistance in modifying the materials and work to comply with the specified design
- Providing the Certification Report and the associated Professional Engineer's certification required by this CQA Plan

For the supporting CQA inspection personnel, specific responsibilities may include:

- Performing independent on-site inspection of the work in progress to verify conformance with the Drawings and Specifications
- Verifying that the equipment used in testing meets the test requirements and that the tests are conducted according to the standardized procedures defined by the CQA plan
- Reporting to the Engineer results of all inspections including work that is not of acceptable quality or that fails to meet the specified requirements

3.0 MEETINGS

To facilitate construction and to clearly define remediation and construction goals and activities, close coordination between the Owner/Owner's Representative, Engineer, and Contractor is essential. To meet this objective, periodic meetings will be held.

3.1 Pre-Construction Conference

A pre-construction conference will be held at the site prior to the start of construction and may be held prior to the start of major construction components (e.g., soil excavation and treatment). The Engineer, Owner's Representative, Engineer, Contractor, and others designated by the Owner may attend this meeting. The purpose of this conference is to discuss the following:

- Review the Drawings, Specifications, CQA plan, work area security, construction procedures, and related issues
- Define the responsibilities of all parties
- Define lines of communications and authority
- Review the project schedule
- Review documentation procedures (i.e., test results and record drawings).
- Establish testing protocols and procedures for correcting and documenting construction deficiencies
- Conduct a site inspection to discuss health & safety planning, work areas, work plans, stockpiling, Treatment Pads, laydown areas, access roads, haul roads, and related items
- Develop any required addenda to the project documents

3.2 Progress Meetings

Periodic progress meetings will be held once a month and at other times requested by the Engineer. At a minimum, the Owner's Representative, Contractor, and Engineer will attend these meetings. The purpose of these meetings is to accomplish the following activities:

- Review scheduled work activities
- Discuss problems and their resolution
- Review test data
- Identify outstanding submittals

3.3 Deficiency Meetings

As required, special meetings will be held to discuss problems or deficiencies. At a minimum, the Engineer, Contractor, and Owner's Representative will attend these meetings. The meetings will be documented by the Engineer.

4.0 DEMOLITION QUALITY ASSURANCE

Demolition activities will be performed as described in the Drawings and Specifications. Environmentally impacted and/or regulated materials will be managed in accordance with the Specifications and MMP and all applicable laws and regulations.

4.1 Demolition and Removal

During Demolition and removal, the Engineer will verify that:

- The required permits have been obtained and utility locates have been performed
- The utilities have been disconnected and capped.
- Refrigerant has been removed from mechanical equipment
- Contractor has signed form verifying disconnection of utilities and removal of refrigerants
- Asbestos-containing floor tile in Building C has been abated before demolition of building
- Materials are handled in accordance with the Specification and MMP
- Abandoned pipes and related utility structures are abandoned in accordance with the Specifications.
- The Contractor has removed and disposed of all items identified for removal and disposal on the Drawings.
- Contractor signs form verifying all materials removed from site have been disposed of in accordance with all applicable laws and regulations

4.2 CQA Evaluation

The Engineer will identify any remaining items to be demolished and/or removed and will report any observed deficiencies to the Owner's Representative and the Contractor. Deficiencies will also be logged into the Nonconformance/Corrective Action Tracking Log.

4.3 Surveying

The Surveyor will perform a record survey of the ends of any pipes, utilities, or other structures that remain in place after demolition is complete. The results of the survey conducted by the Surveyor will be compiled in a report signed and sealed by the Surveyor. The Engineer must review and approve the record survey results for a given area before fill placement over that area.

5.0 SOIL REMEDIATION QUALITY ASSURANCE

This section describes the CQA activities for remediation of Excess Risk Soil, as defined in the Contract Documents. It also addresses the CQA of ancillary structures used to facilitate the remediation.

5.1 Haul Roads

The Engineer will monitor construction and removal of "dirty" haul roads, if used. During these activities, the Engineer will verify and document that:

- For each contaminated section of haul road, the Contractor removes the minimum thickness of soil required by the Specifications.
- The material removed is disposed of in accordance with the Contract Documents.
- The Surveyor performs record surveys of the initial and post-excavation surfaces of the "dirty" haul roads.

5.1.1 CQA Evaluation

The Engineer will collect a soil sample every 100 feet of haul road and test it as required by the Specifications. The Engineer will use soil sampling and analysis to verify that all contaminated materials have been removed from "dirty" haul roads. Any identified deficiencies will be reported to the Owner's Representative and Contractor and added to the Nonconformance/Corrective Action Tracking Log.

5.2 Surficial Lead Recovery

The Engineer will monitor the surficial lead recovery from the Lead Surface Walk Area. During these activities, the Engineer will verify and document that:

- The Surveyor stakes out the limits of the Lead Surface Walk Area.
- The Contractor performs a surface walk by having several trained personnel walk at arm's length to each other.
- Recovered items are placed in a storage container on-site.

The Engineer will observe the Lead Surface Walk Area for excessive amounts (i.e., more than a de-minimus amount) of munitions debris on ground surface. Any identified deficiencies will be reported to

the Owner's Representative and Contractor and added to the Nonconformance/Corrective Action Tracking Log.

5.3 Treatment Pads

Treatment Pad requirements are provided in the Specifications and Contractor's Soil Treatment Work Plan. During construction, operation and closure of Treatment Pads, the Engineer will verify and document that:

- Treatment Pads are constructed in approved areas shown on the Drawings.
- Erosion and sediment controls are in place and in accordance with Soil Treatment Work Plan.
- Contractor obtains approval from Engineer prior to staging Excess Risk Soil on Treatment Pad.
- Contractor provides written notice of intent to close a Treatment Pad.
- Treatment pads are decontaminated after use and decontamination solids are disposed in accordance with the Specifications.

The Engineer will observe each Treatment Pad prior to use and inspect each Pad for adequate decontamination prior to approving closure and collecting pavement core samples. The Engineer will collect asphalt/concrete cores and analyze per the Specifications for Treatment Pads constructed on the North or South Shooting Range floor. Any identified deficiencies will be reported to the Owner's Representative and Contractor and added to the Nonconformance/Corrective Action Tracking Log.

5.4 Excess Risk Soil Excavation and Treatment

The Engineer will monitor the excavation and treatment of Excess Risk Soils and Soil containing Munitions Debris. During these activities, the Engineer will verify and document that:

<u>Excavation</u>

- The Surveyor conducts an initial survey of the area to be excavated.
- Contractor takes measures to prevent cross-contamination between adjacent soil areas of different types
- The Contractor excavates and stages Category I soil before excavating Category II soil.

- Staging piles are covered with sheeting or tarps.
- The coverage of tarps on staging piles is maintained.
- The Contractor screens soils with XRF device and notes any residual munitions debris.
- Once the excavation area and depth has been approved by Engineer, the Surveyor performs a post-excavation survey of the completed excavation and calculates the volume of soil excavated.

Screening

- The Contractor excavates the Category I Excess Risk Soil areas to the depths shown on the Drawings.
- Screened soils are hauled to a Treatment Pad.
- Reclaimed lead is hauled off-site and recycled and recycling certificate is provided to Engineer.
- The screening plant is decontaminated before leaving site.

Treatment

- The Contractor creates staging piles no greater than 200 cubic yards with adequate spacing between piles and properly labels stakes.
- The Contractor mixes the recommended amount of ECOBOND® (or approved alternate) into the staging pile

The Engineer will collect confirmatory soil samples for analysis and report the results to Contractor. The Engineer will notify the Contractor when the staging pile can be hauled to Soil Placement Area or if an additional treatment is needed. Any identified deficiencies will be reported to the Owner's Representative and Contractor and added to the Nonconformance/Corrective Action Tracking Log.

5.5 Placement and Compaction

The Engineer will observe the placement and compaction of treated and untreated Excess Risk Soil in the Soil Placement Area. During these activities, the Engineer will verify and document that:

- An initial survey of the Soil Placement Area is performed in accordance with the Specifications.

- Soil is placed in lifts, moisture conditioned as necessary, and compacted in accordance with the Specifications.

- After all soil has been placed, an as-built survey of the placed soil is performed prior to placing temporary cover.

The Engineer will observe that the excavation and treatment of Excess Risk Soils are completed in conformance with the Specifications and will notify the Contractor of any deficiencies. Any identified deficiencies will be reported to the Owner's Representative and Contractor and added to the Nonconformance/Corrective Action Tracking Log.

5.6 Temporary Cover Construction

The Engineer will observe the placement of a temporary soil cover over the shooting range soils in the Soil Placement Area. The Engineer will verify and document that:

- The post soil placement survey of the treated soil has been completed prior to placing temporary cover.

- The cover material is obtained from an approved location depicted on the Drawings.

- The Surveyor performs an as-built survey of the completed temporary cover.

- The cover material is placed to the minimum thickness identified on the Drawings.

Any identified deficiencies will be reported to the Owner's Representative and Contractor and added to the Nonconformance/Corrective Action Tracking Log.

6.0 STORMWATER CONTROLS QUALITY ASSURANCE

The Engineer will observe the installation and maintenance of erosion controls as well as any eroded areas. The Engineer will verify and document that:

- The Contractor installs erosion controls as shown on the Drawings and in accordance with the Contractor's Storm Water Management Plan (SWMP).
- The erosion controls are in place and approved by the Engineer before Excess Risk Soil is excavated.
- Appropriate erosion controls are added and/or changed at areas exhibiting erosion and that the Contractor updates the SWMP accordingly.
- The erosion controls are in place and approved by the Engineer before staging piles are constructed on the Treatment Pads.
- The Contractor inspects and maintains erosion controls in accordance with the SWMP, Specifications and Drawings.
- After the work is completed, the erosion controls are inspected and maintained in accordance with the Contract.

Any identified deficiencies will be reported to the Owner's Representative and Contractor and added to the Nonconformance/Corrective Action Tracking Log.

Table 1-1: Construction Quality Assurance Requirements Summary

ITEM	CQA PLAN SECTION	SPECIFICATION SECTION	PARAMETER	SPECIFICATION	TEST METHOD	PRECONSTRUCTION FREQUENCY	CONSTRUCTION FREQUENCY
Demolition	4.0	024116 3.0	Construction Oversight	Asbestos-containing materials and regulated building materials removed before buildings are demolished. Utilities are capped 5-ft. beyond building footprints. All buildings and sheds are removed per Drawings. All miscellaneous debris is removed and disposed per Drawings. All existing structures to remain are protected. Waste manifests for each item disposed off-site are submitted. Stormwater CMP is plugged as per Drawings. Drums of Investigation-Derived Waste in Building A are hauled to Soil Placement Area.	Observation	N/A	Continuous
"Dirty" Haul Roads	5.1	026113 3.5	Closure Analyses	Minimum cut depth is 6". Soil sample analytical results meet CDPHE acceptability criteria	Observation and Various Tests	N/A	Every 100 feet of haul road
Surficial Lead Recovery	5.2	026113 3.6	Construction Oversight	Perimeter of Lead Surface Walk Area is surveyed. After munitions debris is collected there is a de-minimus amount remaining	Observation	N/A	Once
Treatment Pads	5.3	026113 3.4 and 3.16	Leachable lead by TCLP and SPLP	Pads are located as per Drawings. Erosion controls are in-place before staging soil. Pads are decontaminated before pavement sample cores are collected. Pad	Observations and Various Tests	N/A	3 samples

				pavement is demolished, sized and placed in Soil Placement Area			
Excess Risk Soil Excavation	5.4	026113 3.7	Closure Analyses	Design depth is reached and confirmed by survey. Excavation is field-screened with XRF and inspected for munitions debris. Soil sample results meet CDPHE acceptability criteria. When excavation area is complete, edges are knocked down to match surrounding grade. Area is graded to drain.	Observation and Various Tests	N/A	1 sample per excavation area and design depth
Excess Risk Soil Screening	5.4	026113 3.10	Oversight	Contractor excavates the Category I Excess Risk Soil areas and depths identified for screening on the Drawings and hauls the soil to the screening plant. Screened soils are hauled back to the Treatment Pad. Reclaimed lead is recycled off-site and certificate provided to Engineer. Screening plant is decontaminated before leaving Site.	Observation	N/A	Continuous
Excess Risk Soil Treatment	5.4	026113 3.12	Leachable lead by TCLP and SPLP	Staging piles are no greater than 200 cy in size. All Category I soil is treated. All Category II is sampled and treated if necessary. Contractor treats by mixing at least 2% ECOBOND®, or approved alternate, into staging pile. Staging piles are kept covered at all times, except as noted in Specification. Contractor does not allow potentially contaminated runoff to leave	Observation and Various Tests	N/A	1 sample per staging pile requiring treatment

				Treatment Pad. CQA Engineer collects 5-point composite sample for analysis.			
Soil Placement	5.5	026113 3.13 and 3.14	Oversight	Initial survey is conducted on Soil Placement Area before placing soil. Lifts are placed in maximum 12-inch lifts. Each lift is compacted with four full passes with a sheepsfoot compactor, or approved equal. Moisture conditioning is performed to keep soil in a workable state. Soil is placed to attain the design subgrade elevations shown on the Drawings. An as-built survey is performed.	Observation	N/A	Continuous
Soil Surface Erosion Control	6.0	313211 3.0	Oversight	Silt fence posts placed 6 feet apart driven 24 inches into ground.	Observation	N/A	Continuous

7.0 DOCUMENTATION

An effective CQA program depends largely on recognition of construction activities that should be monitored and on assigning responsibilities for monitoring each activity. This is most effectively accomplished and verified by the documentation of CQA and CQC activities. The Engineer will document that the CQC requirements have been addressed and satisfied. The Engineer will also audit the CQC field activities, review the CQC documentation, and document that CQA requirements have been addressed and satisfied. The Engineer will prepare signed descriptive remarks, data sheets, and logs to verify and document that monitoring activities have been carried out. The QA and QC documentation will include, at a minimum, those discussed in this CQA Plan and/or the Specifications.

7.1 Project Administration Records

Most project administration records are completed daily by the Engineer and submitted weekly to the Owner Representative. The minimum requirements for these records are described below.

7.1.1 Daily Field Report

A Daily Field Report will be prepared by the Engineer for each work day. At a minimum, the Daily Field Report will include the following information:

- The date, project name, location, and other identification;
- A narrative of all events and work activities occurring that day, including equipment used, meetings held, and pertinent observations that occurred during a given day;
- The weather conditions;
- The name of parties to any discussions;
- The relevant subject matter or issues;
- The activities planned and performed;
- A discussion of any problems encountered and their resolution; and
- The signature of the Engineer representative completing the report.

7.1.2 Nonconformance/Corrective Action Tracking Log

The Engineer will record the status of necessary corrective actions in a Nonconformance/Corrective Action Tracking Log. All work performed that does not conform with the Specifications, Drawings, and requirements of the CQA Plan will be tracked on this log. The log will indicate the date nonconformance was identified, describe the nonconforming work, reference the applicable Drawing or Specification section, identify the required corrective action and status, and indicate the date resolved.

7.1.3 Field Change Requests

The Contractor will document requests for changes and modifications to the requirements of the Drawings, Specifications, or this CQA Plan on a Field Change Request (FCR) form. The FCR will contain information related to the request including: the originator, description of the proposed change, reason for the change, estimated cost and schedule impacts, documents affected (e.g., Specification section or Drawing number) and whether the change request was approved. Each FCR will be assigned a number by the Engineer. All FCRs must be approved by the Engineer (technical and regulatory review) and Owner Representative (project management review). Major FCR approvals will only be made with the written agreement of the Engineer, Owner Representative, and CDPHE. Major changes will be documented by preparation of an addendum to the Specifications, CQA Plan, and/or Drawings as applicable and attached to the FCR.

7.1.4 Individual Test Data

The results of all tests performed and/or received on a given day shall be attached to the Engineer's Daily Field Report for that day and submitted to the Engineer.

7.1.5 Summary of Laboratory Test Data

The Engineer will prepare a summary of laboratory test results for soil and asphalt/concrete testing performed on Excess Risk soils.

7.2 Record Surveys

Record Drawings prepared and certified by the Surveyor will be reviewed by the Engineer for conformance to the Drawings and Specifications. At a minimum, these Records Drawings will include as-built survey data for the following system components:

- Perimeter survey of Lead Surface Walk Area
- Initial and as-built surveys of Excess Risk Soil excavations

- Initial and as-built surveys of excavations for Excess Risk Soil that will be screened
- Initial and as-built surveys of Soil Placement Area
- As-built survey of Temporary Soil Cover
- Initial and as-built surveys of "dirty" haul roads

7.3 Photographic Documentation

The Engineer will create digital photographic documentation to serve as a pictorial record of the project activities, progress, CQA activities, problems encountered, and repair or mitigation activities. The date, time, photographer's initials, location, and subject photographed are to be documented in a photographic log. A photographic summary of the project will be included in the certification report.

7.4 Certification Report

At the completion of the work, the Engineer will prepare a certification report for submittal to CDPHE. At a minimum, this report will include summaries of (1) the construction activities and key personnel involved; (2) any changes to the requirements of the Drawings, Specifications, and this CQA Plan; (3) test results, and (4) as-built Record Survey Drawings. The certification report will also include a summary statement signed and sealed by the Engineer stating that:

> *The CQA was generally conducted as provided in the CQA Plan except for any changes as described in the certification report.*
>
> *Based on visual observations and data generated in accordance with the CQA Plan, the project was constructed in general accordance with the Drawings, the CQA Plan, and the Specifications, except as properly authorized and documented in this report.*

8.0 REFERENCES

Quantum Water & Environment. November 30, 2016. Materials Management Plan, Adams County Landfill, 14451 Riverdale Road, Brighton, Colorado.

Quantum Water & Environment. November 10, 2016. Site Assessment and Closure Plan Report, Adams County Shooting Range, 14451 Riverdale Road, Brighton, Colorado.

Adams County Shooting Range, Demolition and Soil Remediation Specifications and Drawings, 90 % Design, October 23, 2017.

QUANTUM
WATER & ENVIRONMENT

BURNS McDONNELL

CREATE AMAZING.

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Bid Form

ADAMS COUNTY SHOOTING RANGE
DEMOLITION AND SOIL REMEDIATION
UNIT PRICE SCHEDULE

ITEM #	EST. QTY	UNIT	DESCRIPTION	UNIT PRICE	ITEM TOTAL
1	**MOBILIZATION**				
1a	1	LS	Mobilization & Demobilization		
1b	1	LS	Performance & Payment Bond		
1c	20,000	$$	Force Account	$1.00	$20,000
2	**DEMOLITION**				
2a	1	LS	Asbestos Abatement		
2b	1	LS	Debris Removal		
2c	1	LS	Building Demolition		
2d	1	LS	Range Demolition		
2e	1	LS	South Range Floor Demolition		
3	**EXCESS RISK SOIL REMEDIATION**				
3a	1	LS	Surficial Lead Recovery		
3b	1	LS	Lead Screening		
3c	2000	BCY	Category I Excess Risk Soil Excavation		
3d	2000	BCY	Category I Excess Risk Soil Treatment		
3e	2000	BCY	Category I Excess Risk Soil Placement		
3f	200	BCY	Category II Excess Risk Soil Excavation		
3g	200	BCY	Category II Excess Risk Soil Treatment		
3h	200	BCY	Category II Excess Risk Soil Placement		
3i	700	BCY	Soil with Munitions Debris Excavation		
3j	700	BCY	Soil with Munitions Debris Placement		
3k	1	LS	Temporary Cover Placement		
4	**EROSION AND SEDIMENT CONTROL**				
4a	1	LS	Temporary Erosion and Sediment Control		
4b	1	LS	Erosion and Sediment Control Inspection and Maintenance. Assume six months of inspection and maintenance.		
5	**SURVEYING**				
5a	1	LS	Surveying		

TOTAL = $_____

TOTAL =

_____

(USE WORDS)

Quantities are not guaranteed. Final payment will be based on actual quantities.