SECTION 01009

GENERAL INFORMATION AND REQUIREMENTS

PART 1: GENERAL

1.1 SUMMARY

A. Description of Work: Furnishing labor, equipment, supplies, and materials to complete a partially completed high pressure artesian water well, including installing 8 5/8″ steel casing within existing 12 inch diameter steel casing, cementing between the two casings, constructing a water supply system which will connect to an existing functioning private community water system, constructing a concrete building foundation and floor, aggregate parking and trail and abandoning of an existing high pressure artesian water well.

B. General: All drilling operations shall comply with the State of Colorado 2 CCR 402-2.

C. Location: Work under this Contract is located in Fremont County, Colorado. The work locations are shown on the drawings.

D. Information Provided by the Government: In accordance with Federal Acquisition Regulation Clause 52.236-4, *Physical Data*, electronic copies of the data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor. The Government will provide attachments listed below in pdf format. In addition the Contractor may request to view a DVD of the downhole video of the existing well.

1. Replacement well casing cut sheet
2. Replacement well completion report
3. Gases present in both wells
4. Chemistry of the existing well
5. Chemistry of the replacement well
6. Previous well permit
7. Caliper log
8. Caliper report
9. First cement bond log
10. Final cement bond log
11. Downhole Video-Original Well
12. Downhole Video-Replacement Well

E. Storm Water Discharge Permit: Permit as required by the Colorado Department of Public Health and Environment-Water Quality Control Division. Contractor shall submit 3 copies of their approved permit along with three copies of the Contractors Erosion Control Plan to control. Plan shall include types of erosions prevention materials and their locations to be installed during the construction process.

1.2 REFERENCES

A. Referenced Specifications/Standards with Abbreviations and/or Acronyms: Wherever the following acronyms are used in these specifications or on the drawings, they are to be construed the same as the respective expressions represented. Copies of the referenced specifications/standards referred to herein may be procured by the Contractor, from the following:

AASHTO American Association of State Highway and Transportation Officials
444 North Capitol Street, N.W., Suite 249
Washington, DC 20001

AASHTO M 147-65	Materials for Aggregate and Soil Aggregate Subbase, Base and Surface Courses (R1993)
AASHTO T 99-93	Method of Test for the Moisture-Density Relations of Soils Using a 5.5 lb (2.5 kg) Rammer & a 12-inch (305 mm) Drop

ACI American Concrete Institute
P.O. Box 19150
Detroit, MI 48219

ACI 305R-91	Hot Weather Concreting
ACI 306R-88	Cold Weather Concreting
ACI 347R-94	Guide to Formwork for Concrete

ANSI American National Standards Institute
11 W 42nd St.
New York, NY 10036
ANSI B 16.1-89 Cast Iron Pipe Flanges and Flanged Fittings

API American Petroleum Institute
1220 L Street, N.W.
Washington, DC 20005

API RP 5A5-93	Recommended Practice for Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe

ASTM American Society for Testing and Materials
100 Barr Harbor Dr.
West Conshohocken PA 19428-2959

ASTM A 53 REV A-95	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A 392 REV B-91	Zinc-Coated Steel Chain Link Fence Fabric
ASTM A 536-84	Ductile Iron Castings
ASTM A 615REV B-95	Deformed and Plain Billet Steel Bars for Concrete Reinforcement
ASTM C 94-94	Ready-Mixed Concrete
ASTM C 143 REV	Methods for Slump of Hydraulic Cement Concrete

ASTM C 260-95	Air-Entraining Admixtures for Concrete
ASTM D 994-94	Preformed Expansion Joint Filler for Concrete (Bituminous Type)
ASTM F 477-95	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F 567-93	Installation of Chain Link Fence
ASTM F 626 REV A-94	Fence Fittings
ASTM F 1043-95	Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework

AWWA American Water Works Association
6666 West Quincy Avenue
Denver, CO 80235

AWWA C 115/A 21.15-94	Flanged Ductile Iron or Gray Iron Threaded Flanges
AWWA C 502-94	Dry Barrel Fire Hydrants
AWWA C 900-89	Polyvinyl Chloride (PVC) Pressure Pipe

MUTCD Manual on Uniform Traffic Control Devices for Streets and Highways
Superintendent of Documents
Government Printing Office
Washington, DC 20402

1.3 DEFINITIONS

A. Approvals: Approval of the submittals is an indication that the Contractor's submittals have been reviewed and that there are no objections, except as noted. Approval of deviations shall apply only to those deviations or omissions from the requirements of the drawings and specifications brought to the Contracting Officer's attention in writing. After approval of an item, submit a substitute for approval when the approved item cannot be purchased or delivered in time to avoid delay in completion of the project.

1.4 SUBMITTALS

A. General: Refer to the specifications for required submittals. A copy of all information required by the State of Colorado for the drilling of water wells, including but not limited to, drilling logs, well reports, shall be supplied to the Contracting Officer and/or the Contracting Officers Representative.

B. Bid Proposal Submittals: Refer to Specification Section 02527, 1.3 D for submittals required to be included with bid proposal.

C. Requirements: Allow at least 10 working days for review. Submittals shall be delivered to the Bureau of Land Management 2815 H Road Grand Junction, CO 81506.

D. Identification of Submittals: Completely identify each submittal by showing at least the following information:

1. Name and address of submitter, plus name and telephone number of the individual to contact for further information.
2. Name of project as it appears in these specifications.
3. Contract number, drawing number, and specification section number to which the submittal applies.
4. Whether this is an original submittal or resubmittal.
5. Each item shall clearly note the manufacturer's name and address, trade name, product, lot, style, color, catalog designation or model number, and locations of use.

1.5 CERTIFICATES OF CONFORMANCE

A. Requirements: The Contracting Officer may permit use, prior to sampling and testing, of materials when accompanied by Certificates of Conformance. Materials used on the basis of a Certificate of Conformance may be sampled and tested. Installation of materials on the basis of Certificates of Conformance shall not relieve the Contractor of responsibility for incorporating materials which conform to the requirements of the drawings and specifications. Material not conforming to those requirements will be subject to rejection, whether in place or not.

B. Format: The Certificate of Conformance provided by the supplier shall:
1. State that the named product conforms to the Contract requirements.
2. Either be accompanied with a certified copy of the test results, or certify that such test results are on file with the manufacturer and will be furnished to the Contracting Officer upon request.
3. Provide the name and address of the manufacturer, the testing agency, and the date of tests.
4. Set forth the means of identification which will permit field determination of the product delivered as being the product covered by the certification.

1.6 QUALITY ASSURANCE

A. Codes and Standards: The work shall comply with codes and standards applicable to each type of work and as listed in the individual sections of these specifications. This Contract incorporates materials, applications, and tests by reference, with the same force and effect as when they were given in full text.

B. Conflict: Where a conflict occurs between reference documents and project specifications, the project specifications shall govern.

C. Measurements: Where approved manufacturer's diagrams and shop drawings give specific measurements or rough-in dimensions for equipment, these dimensions shall take precedence over dimensions indicated on the drawings.

D. Equipment: Prior to ordering equipment, verify dimensions and functions of equipment proposed for use. Be certain the equipment is compatible with the structural and architectural features of the work,

avoids conflicts with equipment of other crafts, and that it will fit in the space provided.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Protect products incorporated into the work from damage while in transit to the site. Products must be delivered in original unopened containers with manufacturer's name, brand designation, and contents legibly indicated.

B. Storage: Provide temporary storage facilities for products. Storage shall comply with the manufacturer's instructions. The storage area shall permit access for inspection and handling.

C. Handling: Load and unload products protecting them from damage.

1.8 PROJECT/SITE CONDITIONS

A. Access to the Work: As per Federal Acquisitions Regulations Clause 52.236-10.

B. Environmental Considerations: As per Federal Acquisitions Regulations Clause 52.236-9 and 52.236-10.

C. Cleaning of Vehicles and Equipment: Prior to being allowed within the work area, all heavy equipment and vehicles to be used at the worksite shall be cleaned and free of dirt, sod, and any foreign materials that may contain noxious weeds seed. Notify the Contracting Officer’s Representative a minimum of 24 hour in advance of the location of equipment to allow for inspection of all equipment and vehicles. Equipment and/or vehicles will not be allowed within the work area until approved by the Contracting Officer’s Representative.

1.9 SEQUENCING AND SCHEDULING

A. Work Schedule: The schedule shall be submitted within 5 calendar days after signing the Notice to Proceed and as per Federal Acquisitions Regulations Clause 52.236-15. When requested, submit an updated schedule.

B. General Requirements: All work associated with the completion of the replacement well, construction of the water system including a functional connection to the existing Park Center water supply line, and abandonment of the existing well shall be completed and accepted prior to any other construction. Work not to be performed includes but is not limited to constructing the parking lot, trail, retaining walls, installing landscape boulders, re-habilitation of disturbed areas.

PART 2: PRODUCTS

(There are no applicable requirements.)

PART 3: EXECUTION

3.1 PROJECT MEETINGS

A. Pre-Work Conference:
1. Will be held prior to the start of work. The Contractor will be notified in advance of meeting time, date and place. The purpose will be to review required work, project drawings and specifications, construction schedules, payroll and payments, and administrative provisions of the Contract.
2. The Contractor, subcontractors and the persons responsible for coordination of the work shall be present at the meeting.
3. Be prepared to summarize and explain procedures planned for the project and may present submittals requested in the specifications.

B. Progress Meetings:
1. To be held at the project site, or as determined by the Contracting Officer.
2. May be called by either the Contracting Officer or the Contractor. Request shall state who should attend and include an agenda.

C. Final Inspection:
1. To be held at the project site, or as determined by the Contracting Officer.
2. Notify the Contracting Officer in writing at least 5 working days before the completion date so the Government can schedule final inspection.
3. The superintendent shall be present during this inspection.

3.2 PREPARATION

A. Contractor Staking: The Contractor shall be responsible for developing the stakeout plan and for the construction staking of the project. The Contractor shall be given electronic copies of the construction drawings. The electronic drawings are in version AutoCAD Civil 3D 2014 format. It is anticipated that a version of this AutoCAD Civil 3D 2014 will be required to develop the stakeout plan. Submit an electronic copy and paper printout to the Government upon completion of the stakeout plan. Printouts shall be of the same scale as the Government drawings.

B. Work Limits and Control Points: Will be established by the Contracting Officer.

3.3 SALVAGEABLE ITEMS

A. Requirements: Salvageable items consisting of miscellaneous pipe, fittings, valves, etc. shall be stockpiled within the work area at a location to be determined by the Contracting Officer.

3.4 DISPOSAL OF DEBRIS

A. Requirements: Items or debris not designated as salvage for the Government and material generated from clearing and grubbing shall become the property of the Contractor. Dispose of all materials in a legal manner.

3.5 WARRANTY

A. Requirements: Materials and equipment furnished under this Contract shall be covered by the most favorable commercial warranties given to customers for such materials or equipment. The rights or remedies provided herein are in addition to and do not limit rights afforded to the Government by other clauses of this Contract. With respect to warranties, expressed or implied, from manufacturers or suppliers for materials or equipment furnished under the Contract the Contractor shall:
1. Obtain warranties that would be given in normal commercial practices.
2. Require warranties to be executed, in writing, for the benefit of the Government.
3. Submit warranties to the Contracting Officer prior to the final inspection.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section will not be measured for payment.

4.2 BASIS OF PAYMENT

A. Payment: No direct payment for the work described under this section will be made. Consideration for this item shall be included in the bid price for other items of the Contract.

END OF SECTION

SECTION 01458

TESTING LABORATORY SERVICES

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Requirements for the Contractor to engage a qualified, independent testing laboratory to conduct specific tests where the Contractor is required to do so in this contract.

1.2 SUBMITTALS

A. Test Reports: The Contractor shall provide 3 copies of test reports to the Contracting Officer. Reports shall include testing facility name, address, telephone number, and names of full-time responsible officers.

1.3 QUALITY ASSURANCE

A. Approval of Laboratory: The qualified, independent testing laboratory, which will be conducting the specific tests required in this contract, must have authority or be licensed to operate in the State in which the project is located. The testing laboratory shall be approved by the Contracting Officer prior to the Contractor beginning work.

B. Responsibilities of Laboratory:
   1. Test samples of mixes submitted by the Contractor.
   2. Provide qualified personnel at project site. Cooperate with the Contracting Officer and Contractor in performance of services.
   3. Perform specified sampling and testing of products and materials in accordance with specified standards.
   4. Ascertain compliance of materials and mixes with requirements of specifications.
   5. Promptly notify the Contracting Officer and Contractor of observed irregularities or non-conformance of work, products, or materials.
   6. Perform additional tests required by the Contracting Officer.
   7. Attend preconstruction meetings and progress meetings.

C. Limitations on Laboratory:
   1. Laboratory may not release, revoke, alter, or enlarge on requirements of specifications.
   2. Laboratory may not approve or accept partial portions of the work.
   3. Laboratory may not assume duties of the Contractor unless approved in writing by the Contracting Officer.

1.4 SEQUENCING AND SCHEDULING

A. Establishing Testing Schedule:

1. By advance discussion with the testing laboratory, determine the time required for the laboratory to perform its test and to issue its findings.
2. Provide required time within the construction schedule.

B. Revising Testing Schedule: When construction schedule changes are necessary during construction, coordinate such changes with the testing laboratory as required.

PART 2: PRODUCTS

2.1 Summary

A. Reports: Shall include:
1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specification sections.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

B. Interpretation: When requested by the Contracting Officer, provide interpretation of test results.

PART 3: EXECUTION

3.1 FIELD QUALITY CONTROL

A. Contractor Requirements: See individual specifications "Field Quality Control" paragraph for specific testing requirements. When applicable, the Contractor shall:
1. Deliver to agency or laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work.
3. Provide incidental labor and facilities:
   a. To obtain, handle, and label or identify samples at the site or at source of products and materials to be tested.
   b. To facilitate tests.
   c. To provide storage and curing of test samples.
4. Ensure samples are taken by qualified testing personnel.
5. Coordinate the laboratory test frequency and timing with the Contracting Officer.
6. Ensure tests are completed according to the testing schedule.
7. Furnish test reports within 5 working days after tests have been completed.

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section will not be measured for payment.

4.2 BASIS OF PAYMENT

A. Payment: No direct payment for the work described under this section will be made. Consideration for this item shall be included in the bid price for other items of the Contract.

END OF SECTION

SECTION 01505

MOBILIZATION

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Preparatory work and operations, including those necessary to the movement of personnel, equipment, supplies and incidentals to the project site; and for other work and operations which must be performed or costs incurred prior to beginning work on the various items on the project site.

PART 2: PRODUCTS

(There are no applicable requirements.)

PART 3: EXECUTION

(There are no applicable requirements.)

PART 4: MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT:

A. Units: Progress payments will be made as follows:

1. When 5% of the original Contract amount is earned from other bid items, 50% of the amount bid for mobilization or 5% of the original total Contract amount, whichever is lesser, will be paid. Upon completion of work for the project, when all equipment and materials have been removed from the work site and the site has been approved by the Contracting Officer, the remaining Contract amount for mobilization/demobilization may be invoiced.

2. The total sum of all payments shall not exceed the original Contract amount bid for mobilization, regardless of the fact that the Contractor may have shut down the work on the project or moved equipment away from the project and then back again.

4.2 BASIS OF PAYMENT

A. Payment: Payment will be made under:

Pay Item		Pay Unit
01505(1)	Mobilization.	Lump Sum

END OF SECTION

SECTION 01570

TRAFFIC REGULATION

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Requirements to provide safe and expeditious movement of traffic through constructions zones. Constructions zones include both the east and west sides of Fremont County Road 9 as shown on the drawings.

1.2 SUBMITTALS

A. General: Submittals shall be according to Section 01009 - General Information and Requirements.

B. Traffic Control Plan: Submit three copies for approval. Plan shall include at a minimum the following topics:

1. Specific signage, signals, channelizing and lighting devices, barricades, and flag persons that are detailed in the current MUTCD, and CDOT regulations and that will be used for the project.
2. Traffic Control requirements, if applicable, for working adjacent to county roads within Frement County, CO.
3. Provide for convenient access for authorized vehicles to the work site from the road or bypass road.
4. Provide for such guards as may be necessary to ensure against accidents and avoid damage or injury to passing traffic in areas where the nature of construction operations in progress and equipment and machinery in use pose a hazard.
5. Include a narrative and/or drawing showing the location of traffic control devices to be used.

PART 2: PRODUCTS

2.1 MATERIALS

A. Signs: Shall have reflectorized sheeting, and meet the standards of the current Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) for colors, sizes, and shapes.

B. Cones: Cones shall be a minimum of 18 inches high and shall be orange colored and highly visible both in daylight and darkness. For nighttime use, they shall be reflectorized or equipped with lighting devices for maximum visibility. Reflectorized material shall have a smooth, sealed outer surface, which will display the same approximate color day and night. Cones shall be capable of remaining upright during normal traffic flow and wind conditions.

C. Barriers: Water filled barriers or barrels shall be orange colored and highly visible in daylight and darkness. For nighttime use, they shall be reflectorized or equipped with lighting devices for maximum visibility. Reflectorized material shall have a smooth, sealed outer surface, which will display the same approximate color day and night.

D. Traffic Control Devises: Either flag persons or traffic control signals shall be in place if the Contractor utilizes the bypass road. The bypass road only accommodates one-way traffic and may not be expanded in width.

PART 3: EXECUTION

3.1 PUBLIC SAFETY

A. Preparation: Provide, erect, and maintain all necessary traffic control devices as on the approved Traffic Control Plan and as required by the State and local authorities having jurisdiction. Mobilization or construction shall not begin until all traffic control persons or devices as approved are in place.

3.02 VEHICLE TRAFFIC CONTROL

A. Application: Maintain flow of public traffic and conduct operations, to offer the least possible obstruction and inconvenience to public traffic.

1. Protect all roads closed to traffic with effective barricades having acceptable warning and detour signs. Illuminate all barricades and obstructions at night, and keep illuminated from sunset until sunrise.

2. Maintain the condition, operation, and effectiveness of all traffic control devices throughout their period of use. Remove all temporary traffic control devices when no longer needed.

3.3 ROADWAYS, TEMPORARY AND PERMANENT

A. Detours: Construct detours, if applicable, that will allow safe, continuous traffic flow on the existing bypass road alignment.

1. If necessary to route traffic, grade the existing detour as shown on the drawings to a smooth uniform surface. Re-grade and water the detour road surface as necessary to maintain a smooth, dust free condition while being used. Perform all necessary earthwork required to produce a stable, serviceable detour.
2. Construct and/or maintain ditches as needed to handle surface water on the detour road.
3. If requested by the Contracting Officer, place and grade aggregate surfacing material on the as needed. Quantity of aggregate surfacing, if needed, will be paid for by the ton of material placed and approved. Aggregate surfacing material placed without the request of the Contracting Officer shall not be paid for.
4. Promptly perform maintenance that is needed to ensure against accidents and to avoid damage or injury to passing traffic.

B. Maintenance of Traffic Control Devices: Signs and other devices shall be kept clean and readable.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section will be measured and paid for on a lump sum basis. When the Traffic Control Plan has been approved and accepted, 25% of the amount bid for Traffic Control or 3% of the original total Contract amount, whichever is lesser, may be invoiced. Additional expenses in labor and material may be invoiced as they occur, with the final billing being invoiced once all Traffic Control is complete and materials and personnel are removed from the work location.

4.2 BASIS OF PAYMENT

A. Payment: Prices and payment will be full compensation for all the work described in this section to implement the approved traffic control plan. Payment will be made under the following line item:

Pay Item	Pay Unit
01570(1) Traffic Control	Lump Sum

END OF SECTION

SECTION 02315

EXCAVATION AND FILL

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Excavation, borrow excavation, embankment construction, placement, and disposal of materials as shown on the drawings.

1.2 DEFINITIONS

A. Unclassified Excavation: Consists of the material excavation and placement regardless of its nature.

B. Rock Excavation: Removal of material is rock excavation when it consists of igneous, metamorphic, and sedimentary rock which cannot be excavated without the use of a hydraulic excavator having a 170 net flywheel horsepower and a minimum operating weight of 60000 lbs.
   1. Common Excavation: Removal of materials which can be excavated using a hydraulic excavator having a 170 net flywheel horsepower or less shall be considered common excavation.
   2. Muck Excavation: Shall consist of the removal and disposal of deposits of saturated or unsaturated mixtures of soils and organic matter not suitable for foundation material regardless of moisture content.
   3. Fill Material: Shall be mineral soil free from peat, frozen material, brush, trees, roots over 2 inches in diameter and rocks over 6 inches in greatest diameter obtained from site during excavation.

C. Topsoil: Soil that supports growth of vegetation and contains organic matter.

1.3 PROJECT/SITE CONDITIONS

A. Excess Material: Usable excess material excavated shall be used in the embankment construction before the use of borrow is allowed if material is approved by the Contracting Officer. Material not approved shall be disposed of onsite as directed by the Contracting Officer.

B. Borrow Material Area: Obtain borrow material and borrow topsoil as approved, from the north end of the existing well pad as shown on the drawings.

C. Drainage: Borrow area and waste or disposal areas shall be graded so that water will not collect and stand and to match existing adjacent slopes and/or grades.

PART 2: PRODUCTS

2.1 MATERIALS

A. General: See definitions.

B. Fill Material: Shall be obtained from the common excavation, or from approved designated borrow areas if required. Material from excavation shall be used unless it contains ice or frozen earth, debris, high moisture content, or is specified in other sections to be replaced. Materials removed in clearing and grubbing shall not be used for backfill or embankment.

C. Topsoil (Borrow): Existing topsoil is located at the north end of the existing well pad and graded to match the existing slopes of the pad as shown on the drawings. Actual quantity of materials is unknown but estimated at less than 100 cubic yards.

PART 3: EXECUTION

3.1 PREPARATION

A. Clearing and Grubbing: The work area to be excavated, and the surface area to be covered by fill material, shall be thoroughly cleared and stripped of vegetative matter, brush, trees, stumps, roots, loose rocks, and other objectionable materials. Dispose of debris offsite in a legal manner.

B. Borrow Area: The area north of the proposed well location, outside of the proposed chain-link fence as shown on the drawings may be used as a borrow area as directed by the Contracting Officer. Borrow material(s), if approved, shall be excavated in a uniform manner so when complete the excavation will match existing adjacent grades and slopes.

C. Prewatering: Excavation areas and borrow pits may be prewatered before excavating the material. The application of water shall be controlled so that the excavated material will be near the optimum moisture content as specified in paragraph 3.3A Testing, below. When necessary, prewatering shall be supplemented to assure that embankment material and backfill material moisture content comply with paragraph 3.3A Testing, below. Water may be obtained from the fire hydrant as shown on the drawings.

D. Preparation for Grading: Prior to beginning work in an area, necessary clearing and grubbing in that area shall have been completed and accepted by the Contracting Officer. No fill materials shall be placed upon an unapproved surface.

3.2 INSTALLATION

A. Excavation: Excavate where shown on the drawings and typical sections, unless staked otherwise. Excavate on a straight grade between the control points shown on the drawings unless staked otherwise. Existing structures which are disturbed or damaged by construction activity shall be reset, repaired, or replaced at the Contractor's expense.

B. Disposal of Materials: Excess and unsuitable material, including rock and boulders that cannot be used in embankments, shall be disposed of onsite at a location as directed by the Contracting Officer.

C. Use of Borrow Material: Do not use borrow material until after the materials obtained from required excavation have been placed in the fill, unless otherwise directed by the Contracting Officer.

D. Fill Material: Shall be spread over the full width of the cross section of the embankment to a maximum loose thickness of 8 inches, and shall be compacted as specified in paragraphs 3.3A before the next layer is spread. The in-place materials shall be free of lenses, pockets, streaks, or layers of materials differing substantially in texture or gradation from the surrounding materials.

E. Topsoil: Spread topsoil from borrow area at the locations and depths directed by the Contracting Officer. Finish grade topsoil to a uniform smooth surface.

F. Frozen Material: Shall not be placed, nor be placed upon a frozen surface.

3.3 FIELD QUALITY CONTROL

A. Compaction-Fill Material: Immediately following final spreading and smoothing, each layer shall be compacted full width. Compaction shall be accomplished by means of a vibratory roller compactor, minimum 48 inch drum width, and minimum 10,000 centrifugal force or with the use of a mechanical rammer compacter (Jumping Jack) if work limits prevent the larger compactor from achieving the desired compaction. A minimum of three passes shall be made over the entire width of the area, and until the material visible stops compacting. Add or remove water when necessary to obtain compaction.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section will not be measured for payment.

4.2 BASIS OF PAYMENT

A. Payment: No direct payment for the work described under this section will be made. Consideration for this item shall be included in the bid price for other items of the Contract.

END OF SECTION

SECTION 02321

TRENCHING

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Trenching, backfilling, and compacting for the installation of water lines.

1.2 DEFINITIONS

A. As described in Section 02315, Excavation and Fill.

1.3 PROJECT AND SITE CONDITIONS

A. Borrow Sources: Shall be as approved by the Contracting Officer prior to excavation.

B. Environmental Conditions:
   1. Excavate areas that have become saturated with oil, gasoline, or bituminous products to a depth of 12 inches beyond contaminated materials; backfill with approved material.
   2. Finish slopes according to the drawings. Hand rake as necessary to remove excess material in areas inaccessible to construction equipment. Final grade shall produce a well-drained surface.

C. Connection to Park Center Water System: Shall be as stated in Section 02516. Excavate trench to the depth required to meet the approximate elevations for connection with the functioning Park Center Water Line.

PART 2: PRODUCTS

2.1 MATERIALS

A. General: Material excavated shall be considered unclassified.

B. Fill Material: Shall be approved before use. Material from excavations shall be used, unless it contains ice or frozen earth, debris, high moisture content, or is specified in other sections to be replaced. Materials removed in clearing and grubbing shall not be used for backfill.

C. Bedding: Shall be CDOT Class 6 crushed aggregate as described in Section 02730, Aggregate Surfacing.

PART 3: EXECUTION

3.1 PREPARATION

A. Utilities: Before starting excavation, establish the location and extent of underground utilities in the work area. Protect active utility services uncovered by excavation. Notify the Contracting Officer immediately if utilities are damaged. Damage to utilities shall be repaired or replaced

at the Contractor's expense. Repair to damaged utilities shall be started immediately unless otherwise authorized by the Contracting Officer.

B. Protection of Excavation: Construct and maintain shoring, bracing, underpinning, and sheet piling if necessary to protect the excavation. Remove protection devices when safe to do so, or as authorized by the Contracting Officer.

3.2 INSTALLATION

A. Trench Excavation: Shall be as of sufficient depth and size to allow for the installation of the water line(s) and shall be constructed on a uniform grade. Depths of trench(s) shall be determined by the existing elevations of the applicable structures onsite, including the proposed foundation and footings for the well house, existing baffled outlet structures, and existing Park Center Water Supply line.
   1. When over-excavation occurs, repair the area by backfilling with approved bedding material and compacting to 95 percent maximum dry density according to AASHTO T 99, Method C.
   2. When frost action occurs, remove frozen soil and replace with approved soil compacted to 95% of maximum dry density as determined by AASHTO T 99, Method C.
   3. When soil becomes saturated above the optimum moisture content, compact after it has dried, or remove soil down to firm material and place backfill before construction proceeds.

B. Removal of Materials by Explosives: The use of explosives is prohibited.

C. Bedding: Shall be placed in 6-inch maximum loose lifts. Bedding shall extend a minimum of 6 inches below the pipe to a minimum of 6 inches above the pipe. Fine grade the trench bottom throughout and provide uniform and continuous support for each section of pipe. Compact to 95 percent maximum dry density as determined by AASHTO T 99, Method C.

D. Trench Backfill: After testing and approval of interconnected piping, the trench backfilling shall be completed. Puddling or flooding of trench for consolidation of backfill or use of wheel rolling by construction equipment will not be permitted.
   1. Provide uniform and continuous support for each section of pipe. Place backfill in 8-inch maximum loose lifts. Compact to 95 percent maximum dry density as determined by AASHTO T 99, Method C. Prevent lateral displacement of the pipe and prevent damage to the pipe during compaction.

3.3 FIELD QUALITY CONTROL

A. Testing of Soils Compaction: Arrange for a certified, independent testing laboratory, according to the requirements of Section 01458 - Testing Laboratory Services, to perform the required testing, recording, and distributing of the results.

B. Text Interval: Test soil compaction a minimum of every second lift at horizontal intervals no greater than 25 feet for the trench length. Soils

not meeting compaction as stated above shall be re-worked until compaction requirements are met.

C. Testing of Pipe Lines: Ensure there are not leaks within the pipelines prior to covering with bedding material. Repair all areas where leaks occur.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section will not be measured for payment.

4.2 BASIS OF PAYMENT

A. Payment: No direct payment for the work described under this section will be made. Consideration for this item shall be included in the bid price for other items of the Contract.

END OF SECTION

SECTION 02322

EXCAVATION AND FILL FOR STRUCTURES

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Excavating, backfilling, and compacting for structures.

1.2 DEFINITIONS

A. As described in Section 02315, Excavation and Fill.

1.3 QUALITY ASSURANCE

A. Failure Criteria: Not limited to the following:
   1. Settlement of backfill which would allow moisture to pond against the foundation or within a horizontal distance from the foundation equal to its design depth.

PART 2: PRODUCTS

2.1 MATERIALS

A. General: Material excavated shall be unclassified. Material from excavations shall be used unless it contains ice or frozen earth, debris, earth with high moisture content, or is specified in other sections to be replaced. Materials removed in clearing and grubbing shall not be used for backfill.

B. Bedding
   1. Concrete: CDOT Class 6 Aggregate as defined in Section 02730, Aggregate Surfacing and as shown on the drawings.

C. Backfill
   1. Footings and Foundations: Shall conform to the requirements for soil materials above, and shall not contain rock larger than 3 inches in diameter.

PART 3: EXECUTION

3.1 PREPARATION

A. Utilities: Before starting excavation, establish the location and extent of underground utilities in the work area. Protect utility services uncovered by excavation. Notify the Contracting Officer immediately if utilities are damaged. Damage to utilities shall be repaired at the Contractor's expense. Repair to damaged utilities shall be started immediately unless otherwise authorized by the Contracting Officer.

B. Protection of Excavation: Construct and maintain shoring, bracing, underpinning, and sheet piling necessary to protect the excavation and adjacent structures. Remove protective devices when safe to do so.

C. Dewatering: If water is encountered, keep the excavation dewatered so that installation of forming and concrete work can be carried on under dewatered conditions. Dispose of excess water by using natural drainageways near the site to the extent of their natural capacity, when no erosion or other damage will occur.

3.2 INSTALLATION

A. Excavation:
1. General: Perform excavation to the lines, grades, and elevations as shown on the drawings and to allow for safety, placing and removal of forms and inspection. Provide proper depth with allowance made for gravel fill and concrete slabs. When frost action occurs, remove frozen soil and replace with approved soil, compacted according to the requirements for bedding.
2. Footings and Foundations: Excavation for footings and foundation walls shall be level, clean, true-to-size, and free of loose material.
   a. When excavations for foundations are carried below the specified levels, refill the excavation to the required levels with bedding material specified for footings, and compact as specified.

B. Bedding
1. Concrete Slabs: Excavate and dispose of unstable or undesirable materials encountered, and those materials designated by the Contracting Officer. This material shall be replaced by bedding material placed in 6-inch maximum loose lifts. Compact to 95 percent maximum dry density as determined by AASHTO T 99, Method C.

C. Backfilling
1. Footings and Foundations: Remove forms and clean the excavation of trash and debris prior to backfilling. Place and compact fill and backfill adjacent to structures in such a manner as to prevent wedging action or eccentric loading upon or against the structures. Rocks over 2 inches maximum diameter shall not be placed within 12-inches of foundations. Backfill shall not be placed against concrete footings until the 75% of the desired final design strength of the concrete has been achieved and verified by the independent test lab. Place backfill in horizontal layers not more than 8-inches thick loose. Flooding or puddling will not be allowed. The minimum distance to be maintained by heavy equipment for spreading and compacting backfill from a wall is a horizontal distance equal to the backfill height above the footing top. Compact each layer to 95 percent of maximum dry density as determined by AASHTO T 99, Method C.

3.3 FIELD QUALITY CONTROL

A. Testing
1. Arrange for a certified, independent testing laboratory, according to the requirements of Section 01458 - Testing Laboratory Services, to perform the required testing, recording, and distributing of the results. Soils and aggregates not meeting compaction as stated above shall be re-worked until compaction requirements are met.

2. Test Interval: Test soil compaction a minimum of every second lift and at a minimum of 5 locations each lift tested as directed by the Contracting Officer. Tests shall be performed for the subgrade and bedding material under the well house footings and slab.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section will not be measured for payment.

4.2 BASIS OF PAYMENT

A. Payment: No direct payment for the work described under this section will be made. Consideration for this item shall be included in the bid price for other items of the Contract.

END OF SECTION

SECTION 02513

FIRE HYDRANTS

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Furnishing and a Contractor-furnished fire hydrant.

1.2 SUBMITTALS

A. General: Submittals shall be according to Section 0109 – General Information and Requirements.

B. Manufacturer's Literature: Submit three copies of the manufacturer's descriptive data for the fire hydrants to be used on this project.

C. Maintenance Instructions: Submit three copies of the manufacturer's maintenance instructions for the fire hydrants to be used on this project.

D. Certificates of Conformance: Submit three copies of written certification from the supplier of the fire hydrants that they conform to the referenced standards.

PART 2: PRODUCTS

2.1 MATERIALS

A. General: Hydrant shall be dry-barrel type hydrant.

B. Dry-barrel Type: Hydrants shall conform to ANSI/AWWA C 502. Hydrant shall be 3-way with the main valve 5 ¼″ and two 2-1/2 inch hose connections. Inlet shall have a flanged connection. Size and shape of operating nuts and threads on hose and pumper connections shall be as specified in AWWA C 502. Hydrant shall have breakable features as defined in AWWA C 502. The traffic type hydrant shall have a stainless steel safety stem coupling. The hydrant shall be the “Modern Centurion Fire Hydrant” as manufactured by Mueller Company-Water Products Division or approved equal.

C. Connections: The hydrant shall be connected to the main with ductile iron pipe, 6-inch shoe size. The joints in the connecting pipe between the auxiliary valve and the main including the joint at the valve shall be as shown on the drawings.

D. Color: Color of the shop-applied above ground paint shall be red.

E. Wrenches and Spare Parts: Two operating wrenches and a spare break-off riser and bar shall be furnished for each the hydrant.

PART 3: EXECUTION

3.1 PREPARATION

A. Excavation and Backfill: Shall be according to Section 02321 – Trenching.

3.2 INSTALLATION

A. Hydrants: Install hydrant as instructed by the manufacturer. Hydrant shall be installed with pumper outlet facing away from the well slab. Set hydrant at the location as shown on the drawing and at an elevation where the bottom of the safety flange above the finished ground surface is approximately 2″-3″ and as recommended by the manufacturer. The lower barrel section of the hydrant shall be 40″ minimum length. Install bottom of hydrant upon a slab of concrete block not less than 6 inches thick and 15 inches square and as instructed by the manufacturer.

B. Drainage Aggregate: Place drainage aggregate around the base of each hydrant to insure drainage. A layer geotextile fabric shall be placed around the gravel as shown to keep the backfill material from sifting into the gravel.

C. Backfill: Place and compact the backfill around hydrants to the finish grade line according to Section 02321 - Trenching.

D. Thrust Blocks: Provide concrete thrust blocks at fire hydrants and other accessories with the bearing surface against undisturbed soil normal to the direction of the thrust. Thrust blocks shall be square, 6 inches minimum thickness and twice the pipe diameter.

3.3 FIELD QUALITY CONTROL

A. Testing of Soils Compaction: Arrange for a certified, independent testing laboratory, according to the requirements of Section 01458 - Testing Laboratory Services, to perform the required testing, recording, and distributing of the results.

B. Text Interval: Test soil compaction a minimum of every second lift at a minimum of 2 locations per lift tested as determined by the Contracting Officer. Soils not meeting compaction as stated above shall be re-worked until compaction requirements are met.

C. Testing of Hydrant: Ensure there are not leaks within the pipelines or hydrant prior to covering with bedding and or backfill material. Repair all areas where leaks occur.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section will be measured and paid for each fire hydrant, including appurtenances.

4.2 BASIS OF PAYMENT

A. Payment: Payment will be made under:

Pay Item	Pay Unit
02513(1) Fire Hydrant (Dry-Barrel)	Each

END OF SECTION

SECTION 02516

VALVES, PIPES, AND METERS

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Furnishing and Installing Contractor-furnished valves, meters, and fittings.

B. Connection to Park Center Water System: The Contractor shall cap the proposed water line within approximate 5 feet horizontally and at approximately the same elevations as the existing Park Center Water line in the approximate area as shown on the drawings. Actual connection to the Park Center Water line shall be done by the Park Center Water District. Contact “Wade” with Park Center Water District at 719-275-2055(W) or 719-240-6941(C) to determine the actual location and coordinate the connection of the water lines.

1.2 SUBMITTALS

A. General: Submittals shall be according to Section 01009 - General Information and Requirements.

B. Manufacturer's Literature: Submit three copies of the manufacturer's descriptive data for the valves, meters, and strainers to be used on this project.

C. Installation Instructions: Submit three copies of the manufacturer's installation instructions for the valves, meters, and strainers to be used on this project.

PART 2: PRODUCTS

2.1 VALVES

A. Strainer: Shall be 8” diameter, Class 125 Iron, “Y-Strainer”, flanged end with a minimum cold working pressure of 200 PSI with stainless steel screen.

B. Gate Valves: Sizes as shown on the drawings and shall have a ductile iron main body, resilient wedge, flange end, minimum 250 psi pressure rating, with hand wheel for operating.

C. Pressure Reducing Valve: Shall be 6” diameter with the main body ductile iron class 150 conforming to ASTM A536, with flanged ends. Trim and pilot system materials shall be stainless steel with an adjustment range of 30 psi-300 psi and a water temperature to 180 degrees Fahrenheit. Valve shall be the Cla-Val 90-01.

D. Flow Meter: Shall be 8” Sensus Omni T2 with flange ends and built in strainer.

E. Ductile Iron Pipe: Shall be 8″ diameter, flanged ends, with a minimum pressure rating of 250 psi according to ANSI/AWWA C115/A21.15 with flanges according to ANSI B16.1 Class 125. All materials associated with the ductile iron pipe flange connections, including but not limited to gaskets, bolts, washers, nuts, shall be as recommended by the pipe manufacturer.

F. Ductile Pipe Fittings: Shall be flanged fittings according to ANSI B16.1 Class 125. Fitting type and sizes area as shown on the drawings. All materials associated with the ductile iron pipe flange connections, including but not limited to gaskets, bolts, washers, nuts, shall be as recommended by the pipe manufacturer.

G. Pipe Support: Shall be an 8″ adjustable height “Saddle” type support specifically designed to fit ductile iron pipe. Saddle shall cradle approximately 50% of the pipe circumference. Pipe shall have a attached base plate. Supports shall be the “Standon Model S92 Adjustable Pipe Saddle Support” or approved equal.

H. Flap Gate: Shall be constructed of 3/16″ steel, powder coat black finish, duel-hinges. Model #FG12HD flap gate as manufactured by Agri-Drain Corporation or approved equal.

I. PVC Drain Pipe: Shall be 12″ PVC, blue or white in color, according to AWWA C900 and gaskets per ASTM F477. Pipe shall conform to AWWA C900-07, Pressure Class 165 psi (DR 25) minimum. Fittings shall be the same color of the pipe and shall meet or exceed the minimum pressure requirements of the pipe. Types and sizes of fittings are as shown on the drawings.

J. PVC Water Line Pipe: Shall be 8″ PVC, blue or white in color, according to AWWA C900 and gaskets per ASTM F477. Pipe shall conform to AWWA C900-07, Pressure Class 235 psi (DR 18) minimum. Fittings shall be the same color of the pipe and shall meet or exceed the minimum pressure requirements of the pipe. Types and sizes of fittings are as shown on the drawings.

K. Mechanical Pipe Restraints: Shall be specifically designed to be installed on AWWA C900 PVC pipe, and shall be manufactured of ductile iron conforming to ASTM A536. Series 2500 for pipe fittings and Series 1500 for PVC pipe as manufactured by EBAA Iron, Inc. or approved equal.

L. Thrust Blocks: Concrete mix as per Specifications 03306. Thrust blocks shall be a minimum of 6″ thick and shall have a surface area twice as wide as the pipe diameter and extend long enough to secure the entire pipe section being supported.

PART 3: EXECUTION

3.1 INSTALLATION

A. General: Elevations for pipelines shall be determined by the requirements as shown on the drawing “Plumbing Details” and by the existing elevations of the baffled outlet structure and existing Park Center Water line. Pipes shall be on a constant grade between these elevations.

B. Strainers, Valves, and Meters: Install all items as instructed by the manufacturer of the item. Install at the locations as shown on the drawings. Set outlet pressure on pressure reducing valve to 60 psi.

C. Ductile Iron Pipe and Fittings: Install as instructed by the pipe manufacturer.

D. Pipe Support: Install under the ductile pipe in the approximate locations as shown on the drawings. Install as instructed by the manufacturer.

E. Flap Gate: Install flap gate onto the end of the PVC drain pipe as it extends into the baffled outlet structure. Install as per manufacturer's instructions.

F. PVC Drain Pipe/ Mechanical Pipe Restraints: Install pipe as instructed by the pipe manufacturer and as shown on the drawings. Install pipe restraints at all joints and as instructed by the manufacturer.

G. Thrust Blocks: Provide concrete thrust blocks at changes in direction of the piping. Install directly against the pipe and perpendicular to the force being applied to the pipe.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. A. Units: The work described in this section will be measured and paid for on a Lump Sum Basis and will include all valves, meters, strainers, pipes, fittings, and all appurtenances required to make a complete and functional water supply system. The work associated to complete the drain into the existing baffled outlet structure be measured and paid for on a Lump Sum Basis and will include all pipes, fittings, and all appurtenances required to make a complete and functional drain system as approved and accepted.

4.2 BASIS OF PAYMENT

A. A. Payment: Payment will be made under:

Pay Item		Pay Unit
02516(1)	Water Supply System	Lump Sum
02516(2)	Drain System	Lump Sum

END OF SECTION

SECTION 02525

WATER SUPPLY WELLS

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Development of the completed replacement well and discharge requirements.

1.2 SUBMITTALS

A. General: Submittals shall be according to Section 01009 - General Information and Requirements.

B. Anticipated Flow of Well: The well is anticipated to flow between 7000 GMP and 8000 GPM with an estimated surface pressure of approximately 165 psi.

PART 2: PRODUCTS

2.1 MATERIALS

A. General: As shown on the drawings and as stated within other specification sections.

B. Well Disinfection: As per State of Colorado 2 CCR 402-2.

PART 3: EXECUTION

3.1 PREPARATION

A. Temporary Well Head: Construct the “Temporary Well Head” as shown on the drawing “Plumbing Details”. Drain into existing baffled outlet structure through the drain pipe as shown on the drawings and specified herein.

3.2 WELL DEVELOPMENT

A. General: The contractor is permitted to discharge a maximum of 7,000 GPM until the water from the well is visible clear, or for a maximum of 80 continuous hours. If the well requires additional development time to reach clarity, notify the Contracting Officer a minimum of 24 hours in advance of reaching the 80 total hours to allow the Government to get the be required to approvals for continued flow.

B. Well Temperature: The water temperature of the well is approximately 86 degrees Fahrenheit.

C. Discharge Limits: The discharge from the well into Fourmile Creek will be done gradually to the requirements stated below to minimize impact on aquatic life downstream from the well. Once the well development is completed and accepted by the Government, a gradual decrease in flow will

also be performed by the contractor to minimize impact on aquatic life downstream from the well.

1. Measurement of Discharge: The volume of discharge, as measured by the Sensus Flow Meter, will be monitored and recorded at each increase or decrease in flow and at a minimum of 12 hour increments when flow is stabilized. Submit 3 copies of the discharge report as specified in Section 01009.

2. Water Temperature Requirements: Increase or decrease in the discharge of the well will be done on a gradual basis. Water temperature in Fourmile Creek shall increase or decrease in temperature a maximum of 1 degree Fahrenheit per one minute for a maximum of 10 degrees to prevent thermal shock to aquatic species downstream. Once stream temperatures have increased or decreased 10 degrees, discharge from the well shall remain constant for a minimum of 30 minutes to allow the stream to stabilize. Locations for comparing temperature variations in Fourmile Creek shall be a minimum of 50 feet upstream and 50 feet downstream of the baffled outlet structure.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section will not be measured for payment.

4.2 BASIS OF PAYMENT

A. Payment: No direct payment for the work described under this section will be made. Consideration for this item shall be included in the bid price for other scheduled items of the Contract

END OF SECTION

SECTION 02527

WELL DRILLING AND CASING

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Completion of a partially complete artesian water well. Work consists of drilling through existing cement plugs within existing 12″ diameter steel casing, installing 8 5/8″ production casing within the 12″ casing, and cement grouting between the casings. After completion of the well drilling and casing, construction of a water piping system for connection with an existing functional water supply line.

B. General: All materials used in the drilling of water wells, including but not limited to, bentonite, drilling foam, drilling fluid, grout mixtures, formation packers, stabilizers, shall be according to the State of Colorado "Water Well Construction Rules 2 CCR 402-2". All drilling fluids shall be contained in storage containers specifically designed for the storing of well drilling. Construction of earth "mud" pits shall not be allowed.

C. Hydraulic Connection: The existing well and the partially complete replacement well have a hydraulic connection. Consideration regarding this connection shall be taken with all aspects of drilling and abandonment operations to prevent damage or impact flows of the wells during drilling and abandonment operations. If either well shows signs of damage or impeded flow while work is being performed on the other well, stop operations immediately.

1.2 WELL HISTORY

A. Well History: Replacement Well Initial Construction: A replacement well was drilled and cased between May to November 2010, however the replacement well was never successfully completed. In August 2010 while drilling at depth 2786 feet the contractor lost control of the well and the well flowed uncontrolled for 7 days. Once the well was killed the Contractor reamed the borehole and installed 20 inch surface casing to a depth of 596 feet. Following the installation of the surface casing the Contractor redrilled the well to depth 2786 feet. The contractor installed 12 ¾ OD, mild steel, Schedule 40 production casing from ground surface to 2696 feet. A welded wire screen was hung at the bottom of the production casing by a casing hanger, but dislodged and was later removed from the well. The cement grout seal between the 12 inch production casing and the 20 inch surface casing and borehole was placed at the following intervals: 0-595 feet, 1100-1400 feet, and 2100-2700. However, the attached cement bond logs show limited bond in much of the cement placed in the 0-595 and 1100-1400 foot intervals. Upon completion of the contract the well was leaking water in the annular space between the 12 inch surface casing and the 20 inch production casing. See attached Well Construction Report submitted to the State by the contractor.

B. Replacement Well Follow-Up Work: Between September 2012 and February 2014 a contract was awarded to perform data collection on the well and attempt to cement the surface casing into position. A multi-finger caliper was run down the 12 inch production casing and indicated a hole at a depth of 22.6 feet. The Contractor then perforated the casing at 2100 feet and attempted to squeeze 1000 sacks cement out the perforations and up the backside of the production casing. The packer was not inflated during this operation, which resulted in the cement circulating up the production casing. The Contractor slid a thin liner in the casing to cover the hole at 22.6 feet. The Government makes no assumptions on the durability or the integrity of this patch. Following the milling and removal of the cement and tools in the 12 inch casing, the Contractor cemented the liner because the hole continued to leak. The contractor perforated the casing at 1400 feet, however circulation could not be established. These perforations did take on some water from the formation. The Contractor perforated the casing at 750 feet and pumped 1200 sack cement. Very little cement circulated up the backside of the casing, and the majority of the cement followed the formation and bubbled up to the surface in areas of the pad. Later, the Contractor perforated the casing at four different depths, but never established circulation to attempt to pump a cement shoe. Those perforations were shot at the following depths: 680, 660, 620, and 595 feet. See the attached cement bond logs and drawings for a current well diagram.

C. Current Status of Replacement Well: The well is an artesian well with shut in pressure approximately 162 psi at the surface. Wide open the approximate flow is approximately between 7,000 and 8,000 gpm. Any device or tool installed into the well is subject to the upward thrust caused by the water flowing up the well. All components in the well are subject to the downhole pressures, as well. The 12 inch production screen is unsecured and the well is unstable when open and water flows.

1.3 SUBMITTALS

A. General: Submittals shall be according to Section 01009 - General Information and Requirements.

B. Certificates of Conformance: Submit three copies of written certification from the pipe manufacturer of the Contractor-furnished pipe to be used on this project. Pipe shall conform to the ASTM or API requirements of this specification section. Only American made pipe shall be allowed.

C. Records: Submit three copies of the well logs and samples described in this section to the Contracting Officer upon completion of the well.

D. Bid Proposal Submittals: Prior to award, submitted with bid proposal. Submit 3 copies of the following.

1. Driller Qualifications: Driller shall have experience working on deep water, high pressure artesian flow wells. Submit past work experience for similar types of water wells along with the completion results of the wells. In addition, submit the driller’s state certifications for drilling water wells in the State of Colorado.

2. Drilling Fluids Engineer Qualifications: Drilling Fluids “Mud” Engineer shall have experience working on deep water, high pressure artesian flow wells. Submit past work experience for similar types of water wells along with the completion results of the wells.

3. Equipment: Submit the type and size of the drill rig(s) to be used including make and model number, drilling tools and all accessory equipment to be used for the completion of the replacement well and abandonment of the existing well.

3. Drilling Plan: Submit the drilling plan stating how the completion of the replacement well will be accomplished, including but not limited to a sequence of drilling operations, drilling methods, how the pressures associated with the well will be addressed, including weight and type of drilling mud to be used, how the 8” production casing will be secured to the 20” surface casing, cement mix design placement method of cement.

4. Abandonment Plan: Submit a plan stating the processes for the abandonment of the existing well, including but not limited to a sequence for abandonment operations, abandonment method, casing perforation method and intervals, how the pressures associated with the existing well will be addressed, cement mix design and placement method and stages of cementation to completely shut off the flow of the well.

5. Submit a plan on how to deal with the hydraulic connections between wells during drilling and abandonment operations, and how to deal with repairs to well(s) if damage to the wells in encountered during operations.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Storage: Carefully store materials off the ground to provide proper protection against oxidation caused by ground contact. Replace defective or damaged materials at the Contractor's expense.

1.5 SEQUENCING AND SCHEDULING

A. Drilling Program: Within 10 calendar days after the date of receipt of notice to proceed, submit to the Contracting Officer for approval a complete and practicable drilling program. The program shall provide for orderly performance of the work and be in such form and detail as to show the following:
1. Sequence of drilling operations.
2. The days of the week and month that work is to be performed.
3. The number and length of each shift per day. The length of a shift may be extended in the field as required to avoid interrupting a drilling and testing operation.
4. Number and type of rigs to be operated simultaneously.
5. Plan for mud storage and disposal of waste.

PART 2: PRODUCTS

2.1 MATERIALS

A. General: Materials specified shall be new and free from defects. No used or old material will be accepted. However, when necessary or desirable to use temporary casing, the temporary casing may be used casing, subject to the approval of the Contracting Officer.

B. Steel Casing: Steel casing shall be American made steel pipe, according to the American Petroleum Institute (API) 5L, Grade J55, 8 5/8″ O.D, minimum 32 lb/ft. Each section of steel casing shall be marked to show the diameter, standard number, weight, wall thickness; and United States manufacturer.

C. Steel Casing Joints: Shall be watertight, threaded and coupled with Short Thread Coupling (STC) with a minimum strength of 3,900 psi.

D. Drilling Fluids: Drilling fluids and additives shall be as stated in the approved drill plan and comply with the State of Colorado 2 CCR 402-2.

E. Drilling Accessories: Including but not limited to packers and cement baskets shall be sized to fit the pertinent dimensions and as stated in the approved drill plan.

F. Cement: Shall be as stated in the approved drill plan and comply with the State of Colorado 2 CCR 402-2.

PART 3: EXECUTION

3.1 PREPARATION

A. Clearing: Worksite clearing shall be large enough to allow for efficient and safe operations for the required work as approve by the Contracting Officer. Clearing of vegetation outside of the required work are shall not be allowed.

B. Site Preparation: Construction of well pads as necessary for safe drilling operations. Pads shall be large constructed just large enough to accommodate safe and efficient drilling operations as approved by the Contracting Officer. Resultant cut or fill slopes shall not be steeper than 4:1, unless staked otherwise.

3.2 INSTALLATION

A. Drilling Location(s): As shown on the drawings.

B. Steel Casing: Approximately 2,700 LF of 8 5/8″ O.D. steel casing installed within existing 12″ steel casing as shown on the drawing. Install centralizers as required to keep the 8 5/8″ casing centered in the existing casing. Cement grout shall be placed between the 8 5/8″ steel casing and the existing 12″ steel casing for the entire depth of the casing’s.

C. Casing at the Wellhead: Extend the 8 5/8″ casing above the wellhead to match finished grade elevations and dimensions as shown on the “Plumbing Details” drawing.

D. Cementing: Upon completion of the replacement well, the space between the existing 12″ diameter casing and the 8 inch production casing shall be filled with cement as per the approved drill plan and according to the State of Colorado 2 CCR 402-2. The cement shall be placed for the entire length of the production casing.

3.3 FIELD QUALITY CONTROL

A. General: Install production casing without causing damage to existing 12″ diameter steel casing.

B. Drilling Fluid (Mud): Drilling mud shall be constantly monitored and of sufficient weight to contain the hydraulic pressure of the well. Mud shall remain liquid at all times. A qualified “Mud Engineer” or “Bariod” shall be onsite a minimum of once every 48 hours to monitor drilling operations during the completion of the replacement well.

3.4 PROTECTION

A. Drilling Waste: All drilling waste shall be stored in containers and as stated in the approved drill plan. Drilling waste(s) shall not be allowed in contact with the live stream adjacent to the site.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section shall be measured and paid for by the linear foot of steel casing, installed and accepted, and by the linear foot of cement grout placed between the production casing and the existing steel casing. Moving equipment between the replacement well and existing well shall not be measured for payment. Standby time will not be measured for payment.

4.2 BASIS OF PAYMENT

A. Payment: Prices and payment will be full compensation for the work described in this section. Payment will be made under:

Pay Item	Pay Unit
02672(1) Complete and Case Well	Lump Sum
02672(2) Cement Production Casing	Lump Sum

END OF SECTION

SECTION 02671

WATER WELL ABANDONEMENT

PART 1: GENERAL

1.01 SUMMARY

A. General: Furnishing labor, equipment, supplies, and materials abandon a high pressure artesian water well. Work also includes the removal and salvage of existing wellhead materials, and removal and disposal of waste materials. All work shall comply with the State of Colorado 2 CCR 402-2.

1.02 WELL HISTORY

A. Existing Park Center Water Well: The Park Center Well is estimated to have been completed between the years of 1923 through 1927. The well was drilled with cable tool methods with a telescoping style well completion, using 6 different diameter casings.

The well was completed to 3,216 feet below ground surface. The well was originally completed with the placement of a 4.25 inch casing to a total depth of 2819 feet. Most of the 4.25 inch casing was recovered from the well with the exception of the shoe and 1 or 2 joints and was subsequently plugged with cement from 2960 feet to 3216 feet. None of the other casings were cemented in place. The wooden conductor casing which was set to 25 feet has decayed.

Summary of assumed casing lengths:

Surface to 100 feet – 15.50 inch steel
Surface to 350 feet – 12.25 inch steel casing
Surface to 650 feet – 10.00 inch steel casing
Surface to 2201 feet – 8.25 inch steel casing
Surface to 2747 feet – 6.25 inch casing
2747 to 2758 feet – 4.25 inch casing

The producing aquifer is the Fountain Formation and is considered a Type 1 confined aquifer. It is assumed that the water production is from the 2675 feet to 2698 feet interval and the 2778 feet to 2797 feet interval. The upper zone flows upward in the annulus between the 6.25 inch casing and the 8.25 inch casing. The lower zone flows up through the 6.25 casing.

The well is an artesian well with shut-in measured pressure of 160 to 165 pounds per square inch (psi) at the surface, and a flow rate of 781 gallons per minute. In recent years, approximately 150 gallons per minute (gpm) of water has been flowing around the casings and through the annuluses to the surface.

B. Well Surface Conditions: The wellhead stands approximately 5 feet above the ground surface. A 25 inch casing string extends a couple of inches above the ground. Grout fills the space between it and the 12.75 inch casing. The 12.75 inch casing string extends above the ground surface

approximately 2 feet. An 8 to 6 inch reducer extends above, and is connected to the 8.25 inch casing string by a casing collar. The reducer is flanged at the top to a 6 inch gate valve. A Tee is flanged above the gate valve, with 6 inch gate valves flanged to each side. The well is blind flanged at the top. Production from the well flows into the piping on the west side of the well, to the Park Center Water District pipeline. The pipe to the East is presently used as a water source for construction, including this project.

1.03 WELL VIDEO

A. Well Video: On 7/17/08 a down hole video of the existing well was completed. A copy of the DVD can be made available for viewing upon request. A summary of the well video is as follows:

1. There is significant scaling throughout the casing.
2. The casing appears to be 6.25 inch diameter to the depth of 2747.4 feet.
3. At 2388 feet there is damage to the casing.
4. At 2396 feet there is damage to the casing.
5. At 2397 feet there is damage to the casing.
6. At 2747.4 feet casing reduces to the 4-inch casing.
7. At 2756.8 feet the casing is pinched off; the camera could not travel any further down the casing.

The bottom of the well, as measured by the camera, is 2757.5 feet, which is 202.5 ft shallower than reported on the well log and is the approximate bottom of the Fountain formation. Also the well log indicated that the lower portion of the well was not cased. However, the video indicates casing to 2757.5 feet. See drawings to view the well construction as understood from the well video.

1.04 SUBMITTALS

A. General: Submittals shall be according to Section 01009 - General Information and Requirements.

B. Certificates of Conformance: Submit 3 copies of written certification from the supplier of the Contractor-furnished equipment and material to be used on this project that it conforms to the requirements of this specification section.

C. Bid Proposal Submittals: Prior to award, submitted with bid proposal. Submit 3 copies of the following.

1. See Section 02527 1.2, D.

D. Submittal Requirements:

1. Well Abandonment Report: State of Colorado GWS-09 Well Abandonment Report shall be completed by the licensed well driller that performed the work and filed with the State in accordance with 2 CCR 402-2.

1.05 QUALITY ASSURANCE

A. Qualifications: Work shall be performed by or under the direct supervision of a licensed Water Well Driller in the State of Colorado.

B. Stream Protection: Operations are next to a live stream and no water, cement, or other constituents will be allowed to come in contact with the stream.

1.06 SEQUENCING AND SCHEDULING

A. Sequence: The abandonment of the existing well shall not be performed until the replacement well has been completed and connected to the Park Center Water District distribution system.

PART 2: MATERIALS AND PRODUCTS

2.01 MATERIALS

A. General: Materials and equipment are as stated above and according to Section 02527-Well Drilling and Casing.

PART 3: EXECUTION

3.01 SITE PREPARATION

A. General: The Contractor shall prepare the site by clearing a work area, and preparing a stable pad for the rig and additional equipment prior to plugging the well. Site grading shall be performed in accordance with Section 02220 – Excavating, Backfilling, and Compacting.

B. Salvage Items: Prior to abandonment, the Contractor will disassemble and remove without damage, all surface well equipment, including valves and piping. Items designated by the Contracting Officer as salvage shall remain in a designated area on the project site for BLM to remove from the project site. All other items not designated as salvage will be considered waste to be removed and disposed of by the Contractor.

3.02 ABANDONMENT PROCEDURE

A. General: The wells shall be abandoned according to the Colorado Water Well Construction Rules (2 CCR 402-2, January 1, 2005). The Contractor’s abandonment operation plan shall be approved by the Contracting Officer prior to Contractor mobilizing to the site and beginning work. The Contractor shall perform work as scheduled and detailed in the approved Contractor’s abandonment operation plan and schedule. Any deviation from the abandonment plan or schedule shall be approved by the Contracting Officer in advance.

3.03 SITE RESTORATION

A. Waste Removal: All other items designated by the Contracting Officer as waste, shall be disposed of by the Contractor in a legal manner. Dispose of all materials and project waste at an approved sanitary landfill.

B. Vault: An existing buried concrete vault is located adjacent to the existing well as shown on the drawings. Items in the vault, including pipe, fittings, and valves, are to removed and stored at a location as determined by the Contracting Officer. Once items are removed, the Contractor shall backfill the vault with earthen fill material. A pipeline remaining in the ground shall be blind flanged and sealed downstream from the existing flow meter.

C. Grading: Following completion of abandonment, site grading shall be in accordance with Section 02220 Excavating, Backfilling, and Compacting. Grade to match existing ground slopes and for proposed new construction, whichever is applicable.

PART 4: MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

A. Units: The work described herein to plug and abandon the existing Park Center well in accordance with these specifications and the Colorado State Water Well Construction Rules, will be paid for by the Lump Sum unit. Final payment will not be made until work in this section is complete, accepted, and abandonment documents have been submitted to the State of Colorado, and copies have been received by the Contracting Officer.

4.02 BASIS OF PAYMENT

A. Payment: Prices and payment will be full compensation for the work described herein. Payment will be made under:

PAY ITEM	PAY UNIT
02671(1) Well Abandonment	Lump Sum

END OF SECTION

SECTION 02730

AGGREGATE SURFACING

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: This work shall consist of furnishing, placing and compacting a crushed aggregate surfacing material on a prepared parking area.

PART 2: MATERIALS

2.1 GENERAL REQUIREMENTS

A. Crushed Aggregate: Aggregate shall consist of hard, durable articles or fragments of stone or gravel crushed to the size and of the quality requirements for crushed aggregate materials normally used locally in the construction and maintenance of highways by Federal or State agencies and shall be according to AASHTO M 147. The aggregates comply with Colorado Department of Transportation (CDOT) Class 6.

PART 3: EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. Preparation: Shall be completed as per Section 02315.

B. Placing: The material shall be placed on the prepared surface in layers of the thickness shown on the plan.
   1. Placing shall be from vehicles equipped to distribute the material in a uniform layer or windrow. The layer or windrow shall be such size that when spread and compacted, the layer shall have the required thickness.
   2. When hauling is done over previously placed material, hauling equipment shall be routed as uniformly as possible over the entire width of previously constructed layers.

C. Compacting: Immediately following final spreading and smoothing, each layer shall be compacted full width. Compaction shall be accomplished by means of a smooth drum vibratory roller compactor, minimum 48 inch drum width, and minimum 10,000 centrifugal force. A minimum of three passes shall be made over the entire width of the area, and until the material visible stops compacting. Apply water as necessary to obtain maximum compaction.

D. Thickness Requirements: The thickness of the completed course shall not vary more than 1/2-inch from the thickness shown on the plans.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHODS OF MEASUREMENT

A. Method: The quantity to be paid for will be the number of tons of material placed, compacted and accepted in the completed course. Weighing of material shall be at Contractor's expense. A weight receipt for each load of material shall be furnished by the Contractor. Aggregate placed in parking areas and trails shall be measured for payment. Aggregate used as base course material under concrete flatwork shall not be measured for payment and costs associated with this shall be included in other bid items within the contract.

4.2 BASIS OF PAYMENT

A. General: Prices and payment will be full compensation for the work described in this section. Payment will be made under:

PAYMENT WILL BE MADE UNDER:

Pay Item		Pay Unit
02730(1)	Aggregate Surfacing	TON

END OF SECTION

SECTION 02821

CHAIN LINK FENCES AND GATES

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Furnishing and installing stained galvanized chain link fence and gate. All galvanized fence materials shall be required to have a factory stain applied prior to installation.

1.2 SUBMITTALS

A. General: Submittals shall be according to Section 01009 - General Information and Requirements.

B. Shop Drawings: Submit three copies of shop drawings for fences and each gate to be used on this project showing details of post installation, extension arms, gate swing, hardware and accessories.

C. Fence Stain: A copy of the manufacturer's product Material Safety Data Sheet, along with the supplier’s independent lab results stating that the stain material is environmentally safe.

1.3 QUALITY ASSURANCE

A. Single-Source Supplier: Obtain chain link fence and gate materials, including accessories, fittings, and fastenings, from a single supplier.

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for fences and gates shown on the drawings.

PART 2: PRODUCTS

2.1 FENCE FABRIC

A. Chain Link Fence Fabric: 9 Gauge galvanized fabric, 2.0 ounce zinc coating (Class 2), 2 inch mesh, knuckled selvage commercial grade fabric according to ASTM A 392.

2.2 FENCE FRAMEWORK

A. Corner/Gate Posts: Round, galvanized 2 7/8” o.d., minimum 5.7 lbs/ft, minimum yield strength 80,000 psi, according to ASTM F 1043, Group IA. Minimum 0.9 oz/ft^2) minimum zinc coating.

B. Line Posts: Round, galvanized 2 3/8” o.d., minimum 3.6 lbs/ft, minimum yield strength 80,000 psi, according to ASTM F 1043, Group IA. Minimum 0.9 oz/ft^2) minimum zinc coating.

C. Rails: Round, galvanized 1 7/8" o.d., minimum 2.7 lbs/ft, minimum yield strength 80,000 psi, according to ASTM F 1043, Group IA. Minimum 0.9 oz/ft^2) minimum zinc coating.

D. Swing Gates: Comply with ASTM F 900 and as recommended by the fence manufacturer. Gate swing and opening as shown on the drawing. Hardware required for a complete, functional gate as recommended by the manufacturer.

E. Miscellaneous Chain Link Fence Materials: Including but not limited to post caps, bracing and supports, hardware, tie wire, clips, tension wire, stretcher bar and bands, gate hinges and latches, and various items required to make a complete and functional fence shall be of the material type and size as recommended by the fencing manufacturer for a complete fence. All items shall be hot dipped galvanized. Gate chain link fence fabric shall be identical to the fence.

2.3 BARBED MATERIAL

A. Barbed Wire Supporting Arms: Manufacturer's standard barbed wire supporting arms conforming to ASTM F 626, metal and finish to match fence framework, with provision for anchorage to posts and attaching three rows of barbed wire to each arm. Supporting arms may be either attached to posts or integral with post top weather cap and must be capable of withstanding 250 pounds downward pull at outermost end. All items as recommended by the fence manufacturer.

B. Galvanized Steel Barbed Wire: Two-strand, 12-1/2 gauge steel wire with 14-gauge, two-point or four-point barbs spaced approximately 5 inches apart. Clips and hardware as recommended by the manufacturer.

C. Gate Latches: Shall be fork or plunger bar type to permit opening from either side of the closed gate. Provide padlock eye as integral part of latch. Locking devices shall be constructed so that the center drop rod or plunger cannot be raised when locked.

2.4 FENCE STAIN

A. Galvanized Surface Stain: Shall be a non-pigmented based galvanized surface stain, with a minimum life expectancy of 50 years, consisting of a clear soluble solution of natural pigments and soft buffered organic acids. Pigment based colorants shall not be added to achieve the desired color. Stain shall be as manufactured by Natina Products, LLC P.O. Box 4563 Palm Desert, CA 92261, 877-762-8462, www.natinaproducts.com, or approved equal.

2.5 CONCRETE

A. Concrete: Shall be per Section 03306.

PART 3: EXECUTION

3.1 PREPARATION

A. Scheduling: Do not begin installation and erection before final grading is completed and approved by the Contracting Officer.

B. Excavation: Excavate post holes to the diameter and depth as specified and as recommended by the manufacturer of the fencing materials.

3.2 INSTALLATION

A. General: Construct and install fence to comply with ASTM F 567, and according to the manufacturer's written instructions. All material and workmanship shall conform to the Chain Link Fence Manufacturer’s Institute Specification (CLFMI).

B. Construct fence as shown on the drawings an according to the fence manufacturers installation instructions. All posts shall be plumb and secure after installation. Alignment shall be straight between corners, rails shall be straight and tight and chain link shall be uniformly stretched tight and straight. Tension wire shall be taut. Gate shall be installed as shown on the drawings and according to manufacturer’s instructions.

C. Setting Posts: Excavate holes for post footings. Posts shall have a maximum 10 foot distance between posts. All excavations shall be 3’-6” minimum depth and 12” minimum hole diameter. All posts shall be embedded in concrete. Allow concrete to cure a minimum of 72 hours before putting any stress on the posts.

D. Fabric: Chain link fabric shall be extended to provide approximately 4 inches clearance to the surfaces of grade depressions, drainage swales, or ditches. The extended fabric shall be the same piece of fencing material or a piece of the same fabric securely attached or welded to the adjacent fabric of the fencing. A stretcher bar shall be provided through the vertical height of the fence at the lowest point in the depression to stiffen the extended fabric. The stretcher bars shall be threaded through and securely attached to the fabric by wire ties.

E. Barbed Wire: Extend end members of gate frames above top member of gate to match the height of adjacent fence and prepare to receive the same number of strands as adjacent arms of fence posts. Pull taut to remove sag, firmly install it in the slots of the extension arms and secure it. Provide necessary clips for securing wire to extensions.

F. Gates: Install gates plumb and level in a closed position, according to manufacturer's written instructions for full opening without interference. Install ground-set items in concrete for anchorage. Attach hardware by means that will prevent unauthorized removal.

G. Corner Posts: Install corner posts at all locations where fence changes alignment greater than 20 degrees.

H. Galvanized Surface Stain: Stain shall be applied by submersing materials into the stain and at the stain manufacturer's facility in Palm Desert, CA. Costs associated with shipping fencing material to and from the manufacturer's locations shall be at the contractor's expense. All items of the chain link fence shall be stained. Materials requiring touch up post staining shall be done onsite as recommended by the stain manufacturer.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section will be measured and paid for by the linear foot as measured along the ground surface next to the completed fence, including gate openings.

4.2 BASIS OF PAYMENT

A. Payment: Prices and payment will be full compensation for the work described in this section. Payment will be made under:

Pay Item	Pay Unit
02821(2) Chain Link Fence	Linear Foot

END OF SECTION

SECTION 02923

SEEDING

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Fine grading, preparing and applying Contractor furnished seed to areas as shown on the drawings.

1.2 SUBMITTALS

A. General: Submittals shall be according to Section 01009 - General Information and Requirements.

B. Product Data: Submit 3 copies of manufacturer's product data for seed type(s),including physical characteristics, and erosion control blanket to be used on this project.

C. Installation Instructions: Submit 3 copies of installation instructions for erosion blanket to be used on this project.

D. Certificates of Conformance: Submit 3 copies of Certification of seed from seed vendor for each seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1.3 DELIVERY AND STORAGE

A. Seed: Deliver seed in original sealed, labeled, undamaged containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

PART 2: PRODUCTS

2.1 SEED

A. Seed Mix: Shall be as follows:

30% Bouteloua Curtipendula-Side Oats Grama
30% Pascopyrum Smithii-Western Wheatgrass
20% Bouteloua Gracilis-Blue Grama
18% Oryzopsis Hymenoides-Indian Ricegrass
2% Sporobolus Cryptandrus-Sand Dropseed

2.2 EROSION-CONTROL MATERIAL

A. Blankets: Interlocking, curled, Aspen fiber, inside of a photodegradable rapid break-down polypropylene netting, minimum 0.75 lb/sq. yd., 1.75 lb/sq. ft. shear stress rating. “Curlex I” blanket with “QuickMow” netting as manufactured by American Excelsior Company or approved equal.

B. Anchoring Staples: Minimum 4 inch, biodegradable staples composed of Polyhydroxyalkanoate (PHA) plastic made from plant sugars and oils, “E-Staple” as manufactured by American Excelsior Company or approved equal.

PART 3: EXECUTION

3.1 SEEDING

A. Requirements: Apply seed with a spreader or a seeding machine specifically designed for broadcast application of seed. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by spreading equal quantities in 2 directions at right angles to each other.

1. Seed Application Rate: 19 lbs/acre.

B. Raking: Rake seed lightly into top 1/8 inch of topsoil roll lightly.

C. Erosion Blankets: Install blankets with anchor staples as per manufacturer's instructions.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described in this section will be measured and paid for on a lump sum basis. The estimated quantity of seeding and blanketing is shown on the drawings.

4.2 BASIS OF PAYMENT

A. Payment: Prices and payment will be full compensation for the work described in this section. Payment will be made under:

Pay Item	Pay Unit
02923(1) Seeding	Lump Sum

END OF SECTION

SECTION 03306

MINOR CONCRETE

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Furnishing and placing cast-in-place concrete, including formwork and reinforcement.

1.2 SUBMITTALS

A. General: Submittals shall be according to Section 01009 - General Information and Requirements.

1.3 QUALITY ASSURANCE

A. General: Forming, installing steel reinforcement, placing, and finishing concrete shall be performed with experienced concrete worker whose full time position(s) are involved with the preparation and placement of concrete.

B. Testing: Perform testing on the concrete to be placed in the well house foundation footings, stem walls, and slab according to Section 01458. Testing of concrete shall not be required for the concrete used in the footings of the chain link fence.

C. Causes for Rejection: Concrete may be rejected for, but not limited to, the following reasons:
1. Freezing within the first 3 days of placement
2. Excessive or inadequate slump
3. Segregation of aggregate or over-vibration resulting in excessive water in the surface of the concrete
4. Honeycomb over 25% of the surface
5. Voids larger than 2 inches across
6. Exposed reinforcing steel
7. Misalignment of concrete
8. Substandard aggregate in the mix
9. Failure to apply cure/sealer within 24 hour after completion of pour.

PART 2: PRODUCTS

2.1 MATERIALS

A. General: Concrete shall be ready mix as per 2.1 B with the option of using sack concrete as per 2.1 C for construction of the chain link fence footings.

B. Ready Mix Concrete: Ready-mixed concrete shall be according to ASTM C 94 and be designed for a 28-day compressive strength of 4000 psi, and a maximum slump of 4 inches as determined by ASTM C 143.

C. Sack Concrete Mix: Shall be designed for a 28-day compressive strength of 4000 psi, and a slump of 4 inches as determined by ASTM C 143. Sack concrete shall not be used in the footing, stem walls, or slab of the well house concrete. Sack concrete shall only be used in the chain link fence footings if desired by the contractor.

D. Color: Concrete in the stem walls and slab floor of well house shall be colored concrete. The concrete in the well house footings and chain link fence footings are not required to be colored. Color shall be as manufactured by Davis Colors, 3700 Olympic Blvd. Los Angeles, CA 90023, 800-356-4848, www.daviscolors.com, or approved equal. Submit color chart for selection of color to be used.

E. Concrete Cure/Sealer: A water based, non-yellowing, low-odor acrylic polymer specifically designed to cure, harden and dustproof colored and uncolored concrete.

F. Reinforcing Steel: Shall have a yield point of 60 ksi, and shall be according to grade 60 of ASTM A 615. The size of the bars shall be as indicated on the drawings.

G. Fiber: 100% virgin polypropylene, fibrillated fibers specifically manufactured for use as concrete secondary reinforcement, installed at 1.5 pounds per cubic yard of concrete.

H. Water: Potable water shall be used for mixing concrete.

I. Air-Entraining Admixture: ASTM C260. The amount of air shall be 4 to 6 percent when maximum aggregate size is 3/4-inch, and 4.5 to 7.5 percent when maximum aggregate size is 3/8-inch. A variations of plus or minus 1 percent is allowable.

J. Expansion Joint Material: Preformed filler strips shall be according to ASTM D 994 and shall be the full width and depth of the joint. Unless otherwise indicated, the material shall be 1/2-inch thick.

K. Expansion/Control Joint Sealant: Shall be a two-part polysulfide modified polyurethane sealant, non-staining, able to withstand constant water immersion, and capable of 25% joint movement. Sonolastic Polysulfide Sealant as manufactured by Sonneborn, Division of BASF, 800-433-9517 or www.buildingsystems.basf.com, or approved equal. Color of sealant shall closely match color of concrete. Submit color samples for approval. Primers and Backer-Rod required with the installation of the sealant shall be as recommended by the manufacturer.

L. Trench Drain: Shall be the Z874-12 wide throat trench drain, 3 sections of drain, #1220P with 1% slope, #1221P with 1% slope, #1222P with neutral slope. Drain shall have a 12” no-hub bottom outlet, ductile iron slotted grate and shall include all items required for a complete functional drain system. Drain as manufactured by Zurn Industries, LLC 814-455-0921 or www.zurn.com.

PART 3: EXECUTION

3.1 PREPARATION

A. Subbase Preparation: Subbase and earth walls to be in contact with concrete shall be undisturbed or compacted according to Section 02322 - Excavation and Fill for Structures.

B. Form Construction: ACI 347R. Construct forms to the sizes, shapes, lines, and dimensions shown on the drawings. The Contractor shall provide construction aids and imbedded items such as shown on the drawings. Fabricate forms for easy removal without hammering or prying against the concrete surfaces. Form oil may be applied to facilitate removal of forms. Forms and subbase shall be wet before placement of concrete.

C. Form Inspection: Notify the Contracting Officer 48 hours in advance of concrete placement to allow for inspection of forming and placement of items to be imbedded in the concrete. Excess water shall be removed from the forms before concrete placement.

D. Reinforcing Steel: Shall be held securely in position by steel wire, mortar blocks, or plastic or metal chairs during the placement of concrete. Workers are not to walk on rebar during placement of the concrete. Reinforcement shall be inspected by the Contracting Officer before concrete is placed.

E. Expansion Joints: Install expansion joints at the location as shown on the drawings. Install so expansion joint material is even with bottom of concrete and approximately ½″ from top of concrete to allow room for joint sealant.

3.2 CONCRETE PLACEMENT

A. Placement and Consolidation: Concrete shall be placed in lifts with a maximum depth of 18 inches. Each lift shall be adequately vibrated, rodded, or spaded into place to fill voids. Where more than one lift is placed, a vibrator shall be used to consolidate the concrete by penetrating through the upper lift and at least 6 inches into the lower lift. Vibrators shall not be used next to the form or to move concrete. Concrete shall be deposited as nearly as practical to its final position to avoid flow causing segregation of the aggregate. Concrete shall not be dropped more than 5 feet vertically without the use of a tremie or similar device.

B. Bonding to Existing Concrete: Pours shall be scheduled and quantified so that each pour encompasses a complete section within expansion joints. If any pour is short, the entire section, from the last expansion joint shall be removed and re-poured.

C. Concrete Placement under Adverse Conditions: During hot weather, refer to ACI 305R. During cold weather, refer to ACI 306R. Materials required for protection shall be on the jobsite before concrete work

is started. Do not place concrete on a frozen subgrade or against surfaces having deposits of frost, snow, or ice.

3.3 CONCRETE FINISHING

A. Well House Slab Finish: Concrete slabs shall be given a course broom finish. Brooms shall have a minimum width of 18 inches and shall be applied perpendicular to the centerline. Edges shall be formed with a metal tool to leave a smooth border on the concrete.

B. Form Removal: Formwork not supporting concrete may be removed after curing at not less than 50 degrees F for 24 hours after placing the concrete, and when curing and protection procedures are followed as specified. The concrete should be sufficiently hard so as not to be damaged by form removal.

C. Control Joints-Well House Slab Floor: Shall be saw cut with a wheel mounted saw to a depth of ¼ of the slab thickness or hand tooled at the time of the pour. Saw-cutting control joints shall be completed within 24 hours after finishing concrete, but not until the concrete has cured enough to prevent aggregates from being dislodged by the saw. Construct control joints at the locations on the concrete as shown on the drawings.

D. Expansion/Control Joint Sealant: Install joint sealant at all control and expansion joints in the concrete. Clean, prime, and install backer rod within joints as instructed by the manufacturer. Note: Concrete cure time prior to installing sealant as per manufacturer’s instructions.

3.4 CONCRETE CURING

A. Concrete Curing: Apply cure/sealer as instructed by the manufacturer.

3.5 TRENCH DRAIN

A. General: Install drain as shown on the drawings and according to manufacturer’s instructions. Bottom outlet for drain shall be located in Trench Section #1222P with neutral slope, location of outlet to be determined as described on the “Plumbing Details” drawing.

3.6 PROTECTION

A. Requirements: During the curing period, protect concrete from load stresses, shock loads, or vibration. Do not allow vehicles or equipment on concrete for a minimum of 7 days after completion of the pour.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The concrete work described in this section will be measured and paid for on a lump sum basis for the concrete placed for the well house including the footers, stem walls and slab, based on the dimensions and the details shown on the drawings. Concrete used in construction of the chain link fence shall not be included in the total volume of concrete. The Zurn Trench Drain will be measured and paid for on a Lump Sum basis for the completed and accepted installation of the Zurn Drain based on the dimensions and the details shown on the drawings and according to the manufacturer's recommendations.

4.2 BASIS OF PAYMENT

Prices and payment will be full compensation for the work described in this section. Payment will be made under:

Pay Item	Pay Unit
03306(1) Concrete-Well House	LS
03306(2) Zurn Trench Drain	LS

END OF SECTION

SECTION 10990

MISCELLANEOUS SPECIALITIES

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Furnishing and installing steel parking stops, furnishing and installing contractor furnished landscape boulders, relocating existing landscape boulders, and constructing retaining wall with contractor furnished boulders.

PART 2: PRODUCTS

2.1 MATERIALS

A. Steel Parking Stops: Steel according to ASTM A 53, and as shown on the drawings.

B. Landscape Boulders/Retaining Wall Boulders: Shall be hard, durable and angular in shape. Sizes of boulders vary and are as shown on the drawings. Boulders shall be red granite, or approved equal.

C. Existing Landscape Boulders: Boulders vary in dimensions from approximately 2’ minimum dimension to approximately 4’ minimum dimension. Boulders are currently located on the existing well pad parallel to County Road 9.

D. Geotextile Material: Shall be a non-woven needle punched geotextile made of 100% polypropylene. Fabric shall have a minimum tensile strength of 175 lbs, minimum puncture strength of 450 lbs, and a minimum weight of 7 oz/sy.

E. Washed Aggregate: Shall be ¾” washed aggregate or approved equal.

PART 3: EXECUTION

3.1 INSTALLATION

A. Steel Parking Stops: Construct as shown the drawings. Install at the locations as shown on the drawings. Parking stops shall be set in a straight line. Distances between items shall be symmetrical. Elevations of stops shall be installed on a uniform grade throughout the parking area.

B. Landscape Boulders: Shall be set as shown on the drawings. Boulders shall be installed in the proximity, number of boulders, and orientation as shown on the drawings. Orientate boulders to best fit with adjacent boulders and to blend into adjacent surroundings. Excavated materials shall be smoothed and shaped, by hand if necessary, around each boulder to blend into adjacent surroundings. Install in a manner which will produce a firmly set boulder.

C. Retaining Wall Boulders: Construct retaining walls as shown on the drawings. Compact subgrade material prior to the placement of the boulders. Select adequate size boulders at each placement to best fit the required dimensions for constructing an even and symmetrical wall according to the boulders approximate sizes and elevations as shown on the drawings. Fill all voids within the wall from the inside of the wall to prevent easy removal of the boulders after completion of the wall. Orientate boulders to best fit with adjacent boulders and to blend into adjacent surroundings. Install geotextile fabric and washed aggregate as shown on the drawings.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Units: The work described will be measured and paid for by each Steel Parking Stop, each Contractor Furnished Landscape Boulders 3’-4’ Typical Size, each Contractor Furnished Landscape Boulders 18”-24” Typical Size, Linear Foot of Retaining Wall 4’-5’ Typical Boulder Size, Linear Foot of Retaining Wall 3’-4’ Typical Boulder Size, all items approved and accepted. Costs associated with the geotextile fabric, washed aggregate, relocating the existing landscape boulders, and smaller size boulders used to fill in voids within the retaining wall will not be measured for payment. Costs associated with these items shall be included in the bid price of other items in the contract.

4.2 BASIS OF PAYMENT:

A. Payment: Prices and payment will be full compensation for the work described in this section. Consideration for items of work not listed shall be included in the bid price of other items. Payment will be made under:

Pay Item	Pay Unit
10990(1) Steel Parking Stops	Each
10990(2) Landscape Boulder 3’-4’	Each
10990(3) Landscape Boulder 18”-24”	Each
10990(4) Retaining Wall 4’-5’	LF
10990(5) Retaining Wall 3’-4’	LF

END OF SECTION