DRILLING AND INSTALLATION

OF A WATER SUPPLY WELL - HUNTER FLATS

Prepared for:

Town of Duncan

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BID SCHEDULE
DRILLING, INSTALLATION, AND TESTING OF A WATER SUPPLY WELL

ITEM NO	ITEM DESCRIPTION	UNIT	QUANTITY*	UNIT COST	TOTAL
1	**Mobilization/Demobilization**	Lump Sum	1		
2	**Surface Casing Installation (12¾" OD)**	Lump Sum	1		
3	**Borehole Construction (9 7/8" diameter)**	Linear Foot	300		
4	**Casing and Screen Installation**				
	A. 8 ⅝-Inch OD Low Carbon Steel Well Casing	Linear Foot	200		
	B. 8 ⅝-Inch OD LCS Mill Slotted Perforations	Linear Foot	100		
5	**Completion and Development**				
	A. Air Lift/Bail Development	Hourly	8		
			TOTAL		

CONTRACTOR: _____

Total bid amount in numbers: _____

Total bid amount in words: _____

_____

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Acknowledgment of addendum to No. _____ and all proceeding addenda.

Notes:

a. Quantities are not guaranteed. Final payment will be based on actual quantities. If the required quantities of the items listed above are increased or decreased by Change Order, the unit prices set forth above shall apply to such increased or decreased quantities.

b. The contractor's Total Bid is based upon lump sum and unit prices. If there is an error in the Total Bid or other computed totals by the bidder it shall be changed and the unit price amounts shall govern. The written word amounts take precedence over the figure amounts.

TECHNICAL SPECIFICATIONS: DRILLING, INSTALLATION, AND TESTING OF A WATER SUPPLY WELL

SECTION 1.0 WELL INSTALLATION GENERAL SPECIFICATIONS

1.1 LOCATION OF WORK

A. The work to be accomplished under the following specifications consists of the drilling, installation and testing of an exempt construction water supply well.

B. The new exempt construction water supply well will be located

C. 1.2 PROJECT REQUIREMENTS

A. The work includes the furnishing of all materials, labor, equipment, transportation, and services for drilling, installation and equipping the water supply with a completion date of

B. Any rotary drilling method is acceptable including air rotary or direct mud rotary or reverse circulation rotary.

C. Drill cutting samples shall be collected from the borehole as specified. Well testing shall consist of constant-rate pumping/drawdown test after the installation of the well is complete.

D. All operations shall be performed under the direct and personal supervision of a CONTRACTOR employee who currently holds an Arizona Well Driller's License issued by the Arizona Department of Water Resources (ADWR).

E. Payment for the construction of the well will be based on actual quantities furnished, installed, or constructed in accordance with the prices bid for various lump sum or unit price items.

F. Should the well be lost due to any negligent action on the part of the CONTRACTOR, the well shall be abandoned at no cost to the OWNER in accordance with ADWR Article 8, Rule R12-15-816, and a replacement well shall be constructed in the immediate area. The replacement well location will be selected by the CONSULTANT, and the replacement well shall be completed in accordance with all the terms and conditions stated herein.

1.4 SUMMARY OF WORK

The CONTRACTOR will install the well pursuant to this design. The general description of work includes:

1. Mobilization of drilling equipment at the Site.
2. Surface casing installation by drilling a minimum 16-inch diameter borehole to a depth of 20 feet

3. Drill by rotary methods, a 9 7/8-inch diameter nominal borehole from the surface to depth 300 feet. Basin-fill sediments are anticipated to be encountered throughout the borehole depth.
4. Periodically measure depth to water in the borehole once groundwater is encountered
5. Install 8⅝-inch outside diameter low-carbon steel (LCS) well casing and mill-slotted screen
6. Develop well by airlift pumping and bailing
7. Demobilization of equipment.
8. Cleanup of the Well Site.

1.5 PROTECTION OF SITE

A. The CONTRACTOR shall take all necessary precautions to preserve the Well Site, as nearly as practical, in its present condition. The CONTRACTOR shall be responsible for replacing any damaged items. At all times during the progress of this project, the CONTRACTOR is responsible to keep the Well Site free of litter and debris.

B. During mobilization, new plastic tarps shall be placed beneath the drilling rig and other equipment to protect the Site against oil or hydraulic fluid spills or leaks, and will remain beneath the rig and other equipment until demobilization. All open sub-surface pits must be fenced. After completion of drilling, earthen mud pits shall be drained and allowed to dry to the maximum extent possible before backfilling with clean earth and thoroughly compacting.

C. The CONTRACTOR shall work with the OWNER to identify control methods for water from drilling, development, and test pump operations.

1.6 UTILITIES

A. Water for the drilling program will be available by the OWNER from a source within 2 miles from the well site at no cost to CONTRACTOR. Water will need to be trucked by CONTRACTOR to the well site.

B. The CONTRACTOR shall furnish all required fuel, power, light, heat, telephone, and sanitary facilities for its operations.

C. The CONTRACTOR is responsible, at its own cost, for locating any underground utilities or pipelines at the well site prior to excavating and/or drilling. The CONTRACTOR is responsible for all costs associated with repair or replacement of any underground utilities or pipelines that were not located and are damaged during the course of drilling and well construction activities. The CONTRACTOR shall comply with the State requirements regarding excavation and underground utilities per Arizona Revised Statutes (A.R.S.), Chapter 2, Article 6.3, Sections 40.360.21 through 40.360.31, and other pertinent Sections of the Arizona Blue Stake Law.

END OF SECTION

TECHNICAL SPECIFICATIONS: DRILLING, INSTALLATION, AND TESTING OF A WATER SUPPLY WELL

SECTION 2.0 MATERIALS

2.1 EQUIPMENT

A. The CONTRACTOR shall furnish and maintain in safe and efficient working condition all equipment necessary to perform the specified work, including a drilling rig or rigs capable of performing the specified operations to the specified depths, and pumping, testing, and auxiliary equipment as specified or required to complete the described tasks.

B. Compressed air introduced into the well during drilling or well development, must be treated by passage through a high-volume carbon or coalescing filter to remove organic contaminants (e.g., compressor lubrication oil).

C. Prior to the start of drilling, the CONTRACTOR shall decontaminate the drill rig and downhole tools by steam cleaning.

D. The CONTRACTOR shall perform any grading required for proper access and positioning of equipment.

2.2 SURFACE CASING

A. The surface casing shall be manufactured in accordance with ASTM Specification A53 Grade B steel or ASTM Specification A139 Grade B steel. The surface casing shall have a 12¾-inch outside diameter (OD) and a minimum 0.1875-inch wall thickness. The minimum length of the surface casing shall be 21 feet to allow for a 1-foot stickup above land surface.

B. The casing shall be factory assembled with one longitudinal seam parallel to the casing axis (for ASTM Specification A53 Grade B steel) or one spiral seam along the casing axis (for ASTM Specification A139 Grade B steel) and, in either case, not more than one circumferential seam per 10 linear feet.

2.3 CEMENT GROUT SEAL

A. The cement grout seal shall be sand cement for the surface casing. The cement grout slurry shall consist of 5.2 to 6.0 gallons of water per 94-pound sack of Portland cement.

B. The Portland cement shall conform to ASTM Standard C150, Type II.

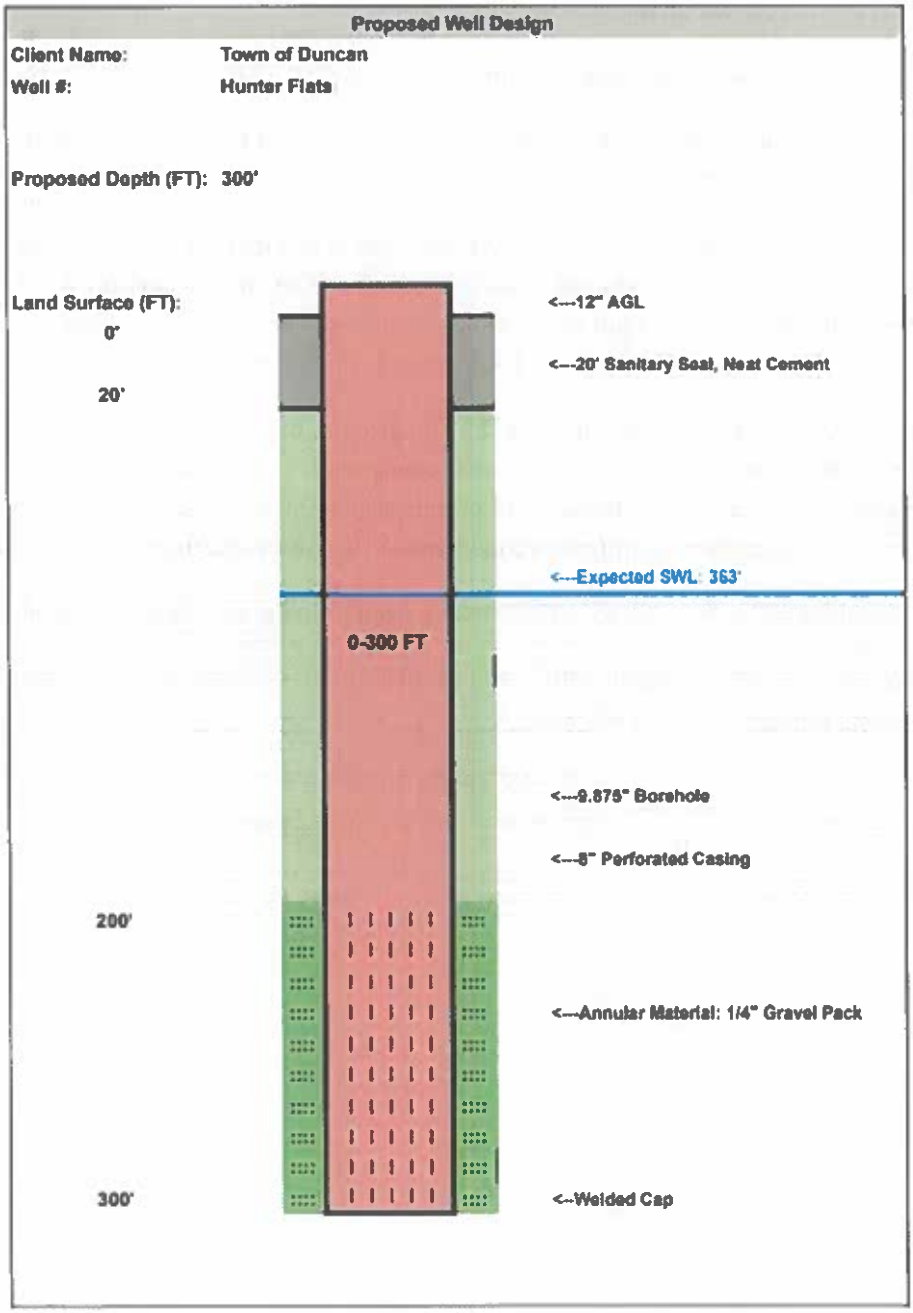
C. The cement grout weight shall be measured prior to installation, as an indicator of the cement-water mix ratio.

D. The cement grout slurry shall not exceed 17 pounds per gallon (lb/gal) or 127 pounds per cubic foot (lb/cf).

E. Sand or aggregate as an additive shall not exceed 50 percent by volume of the cement. Water shall be added for the sand additive, as required.

F. Accelerator additives, such as calcium chloride, shall not exceed 2 percent by weight of the cement.

Figure 2 – Construction Water Supply Well Design



2.4 WELL CASING AND SCREEN

A. The well casing and screen shall be manufactured in accordance with ASTM Specification A53 Grade B steel or ASTM Specification A139 Grade B steel. The well casing and screen shall consist of low-carbon steel as shown on the well design (Figure 2).

B. The well casing shall have an 8⅝ inch outside diameter and a 0.1875-inch wall thickness.

C. The well screen shall be set at depths from 240 to 500 feet and blank well casing shall be set from 240 feet to 4-foot above land grade.

D. The well casing and screen shall be factory assembled in not less than 20-foot long sections, shall contain one longitudinal seam (for A53 Grade B steel) or one spiral seam (for A139 Grade B steel) along the casing axis, and shall not contain more than one circumferential seam per 10 linear feet. Casing landing at surface shall allow for a 1-foot stickup above land surface.

E. The ends of the casing and screen lengths shall be ground, or sufficiently scarfed, to remove sharp edges or burrs. Section ends of the well casing and slotted casing shall also be beveled perpendicular to the casing axis to facilitate proper alignment of joined sections, and shall not vary more than 0.010 inch at any point from a true plane at right angles to the axis of the casing.

F. The slot openings in the mill-slotted casing shall be sized to the production of the well

G. The bottom sump shall be capped with a bottom plate or shoe consisting of the same composition and same wall thickness as the well casing.

END OF SECTION

TECHNICAL SPECIFICATIONS: DRILLING AND INSTALLATION OF A WATER SUPPLY WELL

SECTION 3.0 EXECUTION

3.1 GENERAL REQUIREMENTS

During the drilling of the borehole and the installation of the well, care will be required to minimize chemical or biological disturbance of the formation adjacent to the borehole. The use of organic drilling fluid materials (such as starch, guar, or cottonseed hulls) will not be accepted for drilling. The use of organic polymer additives will be allowed. The CONTRACTOR shall be responsible for maintaining the quality of the drilling fluid to assure:

1. Protection of water-bearing formations exposed to the borehole.
2. Representative samples of the formation materials.
3. Maximum development capability and optimum potential yield of the completed well.
4. Inhibition of the formation and prevention of formation-caused drilling problems (e.g., heaving sands, swelling clays, or lost circulation).
5. Protection of the integrity of the boring during the drilling and well installation operations.

3.2 REPORTS, LOGS, AND RECORDS

A. During the drilling and well completion operations, a detailed driller's report shall be maintained. The report shall give a complete description of all formations encountered, number of feet drilled, number of hours on the job, downtime due to breakdown, length and type of casing set, and other such pertinent data.

B. The CONTRACTOR shall prepare a detailed driller's log in compliance with the requirements of ADWR. A copy of the driller's log may be furnished to the and filed with the ADWR as required by the rules and regulations of ADWR.

3.3 WELL BORING

A. The borehole for the well shall be drilled to a depth of 300 feet using a 9 7/8-inch diameter rotary drill bit.

B. Samples of the drill cuttings shall be collected at 10-foot intervals from the land surface to the total depth of the borehole. Drill cutting samples shall be carefully collected from the sampling point, and the sample catching device shall be cleaned of all cuttings after each sample is taken.

C. Each sample shall be laid out in a sample storage area on a waterproof tarp or ground cloth for each sampled interval in descending order.

3.4 INSTALLATION OF WELL CASING AND SCREEN

A. The well casing and screen shall be set centered in the hole so as not to interfere in any way with the complete well installation, or maximum efficient operation of 6-inch diameter submersible pump for use in the 8¾-inch diameter casing.

B. The well screen shall be set at depths from 200 to 100 feet and blank well casing shall be set from 200 feet to 1-foot above land grade (Figure 2).

3.5 JOINTS IN THE WELL CASING

A. Joints in the well casing and screen shall be field welded in accordance with applicable provisions of the American Waterworks Association (AWWA) Standard C206 for welded joints. A welding sequence will be followed that will avoid excessive distortion.

B. All well casing and screen joints or overlaps shall be made watertight. All welding shall be performed by an experienced welder.

3.6 WELL DEVELOPMENT

A. Well development shall be accomplished by airlift pumping or bailing. Air lift pumping shall be performed with compressor capacity as follow:

b. 2 3/8-inch nominal OD drill pipe/airline (minimum)

c. 150-psi air compressor (minimum)

END OF SECTION