

NATURAL RESOURCES CONSERVATION SERVICE

CONSTRUCTION SPECIFICATION

642 – WATER WELL

1. SCOPE

The work shall consist of furnishing and installing the well and its appurtenances. This work may include but is not limited to construction of the well hole, installation of the well components, and development of the well. These items shall be installed as shown on the drawings and as specified herein.

This specification is not intended for wells for human consumption or wells installed solely for monitoring or observation purposes.

Prior to commencing construction, public utilities shall be notified in accordance with N.Y.S. Industrial Code 753.

2. MATERIALS

The materials required for the water well shall be as shown on the drawings or as specified in Section 11. The materials specified shall meet the quality requirements as specified on the drawings or according to the latest revision of the ASTM specification.

Casing

Casings shall be of steel, iron, stainless steel, copper alloys, plastic, fiberglass, concrete, or other material of equivalent strength and durability consistent with the intended use of the water and the maximum anticipated differential head between the inside and outside of the casing.

Steel pipe used for well casings shall meet or exceed requirements specified in ASTM A 589.

Only steel pipe casings shall be used in driven wells.

To prevent galvanic corrosion, dissimilar metals shall not be joined.

Plastic pipe used in well casings shall conform to material, dimensional and quality requirements specified in ASTM F 480.

Filament-wound fiberglass casings (glass-fiber-reinforced-thermosetting-resin pipe, RTRP) may be used if material meets requirements specified in ASTM D 2996. Tests for long-term cyclic pressure strength, long-term static pressure strength, and short-term rupture strength as required in ASTM D 2996 are not needed because the pipe is to be used for well casing. Joints shall meet requirements specified in section 3.8, ASTM F 480.

Fiberglass pressure pipe, (also called reinforced plastic mortar pipe, RPMP, or fiberglass pipe with aggregate) shall meet or exceed requirements specified in ASTM D 3517.

Well casing wall thickness shall be sufficient to withstand all anticipated static and dynamic pressures imposed on the casing during installation, well development, and use.

Joints for well casings shall have adequate strength to carry the load due to the casing length and still be watertight, or shall be mechanically supported during installation to maintain joint integrity. Such mechanically supported casings shall terminate on firm material that can adequately support the casing weight.

#### Screen

Well screens shall be constructed of commercially manufactured screen sections, well points, or field-perforated sections.

Perforation by any method is allowable provided proper slot size and entrance velocity limits can be met. The length and open area of the screen shall be sized to limit entrance velocity of water into the well to less than or equal to 0.1 foot per second.

#### Seals

Telescoped screen assemblies shall be provided with one or more sand-tight seals between the top of the telescoped screen assembly and casing.

#### Filter Pack

Filter pack, if specified, shall be installed according to the manufacturer's recommendations.

#### Prepacked Well Screen

The prepacked well screen, where specified, shall be installed according to manufacturer's recommendations. The manufacturer shall supply a filter pack design calculation taking into account native soil material and anticipated pumping rate.

#### Pitless Adapter and Well Cap

Pitless adapter and well cap shall meet the requirements of Pitless Adapter Standard (PAS-97), as published by the Water Systems Council.

#### Riser Pipe

The riser pipe shall be 160 psi polyethylene high density polyethylene (HDPE) meeting the requirements of ASTM D2239 or a minimum of schedule 40 black iron pipe meeting the requirements of ASTM A-53. PVC pipe shall not be allowed.

### 3. SAFETY

The contractor shall abide by the requirements of all applicable state, or local regulations or construction codes.

The site shall be suitable for safe operation of the drilling equipment.

#### 4. INSTALLATION

##### Borehole

Drilled, jetted, bored, and driven wells shall be sufficiently round, straight, and of adequate diameter, to permit satisfactory installation of inlet, well casing, filter pack, and annular seal, and passage of tremie pipe (including couplings), if used.

##### Casing

Casing shall extend from above the ground surface down through unstable earth materials to an elevation of at least 2 feet into stable material or to the top of the screen.

All wells shall be cased to a sufficient height (minimum of 12 inches) above the ground surface to prevent entry of surface and near-surface water.

Casing for artesian aquifers shall be sealed into overlying, impermeable formations in such a manner as to retain confining pressure.

If a zone is penetrated that is determined or suspected to contain water of quality unsuitable for the intended use, the zone shall be sealed to prevent infiltration of the poor-quality water into the well and the developed portion of the aquifer.

Where specified, screen shall be attached to the bottom of the casing.

Seals, if specified, shall be installed per manufacturer's recommendation.

##### Filters

Filters, if specified, shall be installed in such a way as to prevent voids in the filter material, or collapse of surrounding material into the well.

##### Grouting and Sealing

The annulus surrounding the permanent well casing at the upper terminus of the well shall be filled with expansive hydraulic cement (ASTM C 845), shrinkage-compensating concrete, bentonite-based grout, clay, or other material with similar sealing properties. The length of the grout seal shall be no less than 10 feet and not less than the minimum specified in state or locally applicable construction codes.

A positive seal (grouted in place) or packer shall be provided between the casing and the less pervious material overlying the aquifer of artesian wells, and in all aquifers where co-mingling of waters is undesirable.

##### Access Port

An access port with a minimum diameter of 0.5 inch shall be installed to allow for unobstructed measurement of depth of the water surface, or for a pressure gage for measuring shut-in pressure of a flowing well. Access ports and pressure gages or other openings in the cover shall be sealed or capped to prevent entrance of surface water or foreign material into the well. Removable caps are acceptable as access ports.

#### 5. WELL DEVELOPMENT

Wells to be completed without a filter pack in unconsolidated granular aquifers shall be developed following guidance provided in ASTM D 5521, Standard Guide for Development of Ground-Water Monitoring Wells in Granular Aquifers.

The method shall be selected based on geologic character of the aquifer, type of drilling rig, and type of screen.

6. PUMP INSTALLATION

Pump, if specified, shall be installed according to the manufacturer's recommendation.

Riser pipe shall be a material as specified in Section 11.

Riser pipe shall be centered in the casing and securely held in place by centering spindles placed no more than 10 feet apart.

Pitless adapter shall be installed according to manufacturer's recommendations.

Wiring shall be as per pump manufacturer and shall comply with applicable state and local electrical codes.

A water tight vented cap shall be installed according to manufacturer's recommendations.

7. WELL DISINFECTION

Wells shall be disinfected immediately following their construction or repair to neutralize any contamination from equipment, material, or surface drainage introduced during construction. The disinfection process shall comply with all local or state requirements.

8. FINAL SITE GRADING

Surface water and drainage that might reach wellhead shall be diverted.

9. REPORTING

A complete New York State Department of Environmental Conservation "Well Completion Report" shall be submitted upon completion of the well.

## 10. MEASUREMENT AND PAYMENT

### Method 1

For items of work for which specific unit prices are established in the contract, the depth of the well will be measured. The overburden will be measured to the nearest linear foot, and rock, if present will be measured to the nearest linear foot. Such payment will constitute full compensation for all labor, materials, equipment, tools, and other appurtenances necessary and incidental to the completion of the work.

### Method 2

For items of work, for which specific lump sum prices are established in the contract, the quantity of each element of the well will not be measured for payment. Payment for the well will be made at the contract lump sum price. Such payment will constitute full compensation for all labor, materials, equipment, tools, and other appurtenances necessary and incidental to the completion of the work.

Compensation for any item of work described in the contract, but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 11.

## 11. ITEMS OF WORK AND ADDITIONAL CONDITIONS: