

## ***Section VI. Specifications***

This set of specifications shall govern the methods of construction and the kinds of materials to be used for the **SUPPLY OF LABOR AND MATERIALS FOR THE DRILLING OF CAROLINA VII, CAROLINA III, AND CARARAYAN VI TEST/PRODUCTION WELLS** shown in the plans and detailed drawings.

### **1. SCOPE OF WORK**

The plans, detail drawings and these specifications shall be considered as complementing each other. So that what is mentioned or shown in one, although not mentioned or shown in the other, shall be considered as appearing on both. In case of conflict between the two, the same should be referred to the Designing Engineer for resolution.

All parts of the construction shall be furnished with first class workmanship to the fullest talent and meaning of the plans and these specifications, and to the entire satisfaction of the Engineer-in-charge and the Owner. Drilling shall be performed with the rotary drilling method.

#### **1.1 Site Preparation and Reinstatement**

- 1.1.1. The Contractor shall prepare the site, provide all necessary tanks and pits and make all necessary arrangements for erecting and dismantling the drilling unit and shall reinstate the site on completion of such phase of work to the satisfaction of the Engineer.

### **2. WELL DRILLING**

#### **2.1 Equipment**

- 2.1.1. The Contractor shall provide and operate mobile Rotary Drilling Rig together with all auxiliary equipment and appurtenances, all of which shall be in good running condition and have undergone preventive maintenance within the last Six (6) months prior to the posting of invitation to bid.
- 2.2.2. The Contractor shall provide all lubricants, fuels and spares necessary to keep the drilling rig(s) in continuous operation.

#### **2.2 Drilling Method**

- 2.2.1. All drilling shall be performed with the rotary drilling method.
- 2.2.2. The Contractor shall drill the hole to such depth and with such a diameter which shall enable an easy installation of casing and screen and placement of gravel envelope with a uniform thickness as specified in the Contract Drawings.

#### **2.3 Strata Sampling**

- 2.4.1. Strata samples shall be taken at one (1) meter intervals or more frequent if the formation penetrated changes. Samples shall be placed in plastic or other appropriate bags on which or in which the sampling depth is written in such a manner that it is permanently readable.

2.4.2. The sampling procedure must provide that all the fractions of the penetrated strata are present in the sample.

### **3. GEOPHYSICAL LOGGING**

#### **3.1 Scope**

The Contractor shall perform geophysical logging (self-potential and electrical resistivity). An Electric log shall be provided upon completion of the pilot hole. The lithology shall be evaluated every five-meter (5m) depth of borehole and shall be plot in complete detail. The E-log shall consist of two (2) spontaneous potential curves and resistivity curves which shall be plot in Millivolts and Ohm-Meter units. The recorded logs shall be submitted to the Engineer immediately upon completion of logging.

### **4. WELL CASING**

#### **4.1 Scope**

The Contractor shall provide and install the well casing specified in the Contract Drawings and any temporary casing required during the work.

#### **4.2 Casing Material**

4.2.1. The type of well casings shall be as specified:

300 mm Ø x 6 meters Spiral welded steel casing (8 mm Thick)

### **5. WELL SCREENS**

#### **5.1 Scope**

The Contractor shall provide and install the well screens specified in the Contract Drawings.

#### **5.2 Type of Screens**

5.2.1. The type of screens shall be as specified:

300mm Ø Continuous Slot Wedge Wirewound Stainless Steel Screen, 1.5mm

(Slot 60). 3m per length.

### **6. GRADED GRAVEL PACK**

#### **6.1 Scope**

The Contractor shall provide and install gravel pack specified in the Contract Drawings.

#### **6.2 Materials**

The gravel pack material shall consist of well rounded, water-worn siliceous grains size ranging from 4 – 7 mm.

## **7. WELL DEVELOPMENT**

### **7.1 Scope**

- 7.1.1. The Contractor shall furnish compressors, surge plungers, jetting tools, electric generators, chemicals and any other equipment required for satisfactory well development and shall undertake the development as directed by the Engineer.
- 7.1.2. Development shall comprise deflocculation, high velocity jetting in continuous slot screens, surging with plunger in slotted screens and development by airlifting.

## **8. WELL TESTING**

### **8.1 Scope**

The Contractor shall provide a Pumping Unit together with all auxiliary equipment and conduct the Step-drawdown pumping tests and Continuous constant discharge pumping test on the completed well.

### **8.2 Duration of Tests**

- 8.2.1. The step-drawdown pumping tests shall be performed on 5 steps with a duration of 1 hour each.
- 8.2.2. The continuous constant discharge pumping tests shall be performed for a period of 72 hours. Water sample shall be collected during 72 hours pumping test for water quality testing.

## **9. CEMENT GROUTING**

### **9.1 Scope**

The Contractor shall provide the cement and mixing equipment required for the mixing of the grouting indicated in the Preliminary Well Design and shall place the cement grout from ground surface to 15 meters below ground level.