

## **Explanatory Notes**

### **1) SOR Item no. 1 (Removing of Submersible Pumps)**

Removing of Submersible Pumps from existing bore in Delhi state area including GZB area. Quantity shall be as per SOR.

Refer **Annexure A** for Installation and Execution Guidelines.

### **2) SOR Item no. 2 (Lowering, fixing, testing and commissioning of Submersible Pumps)**

Lowering, fixing, testing and commissioning of Submersible Pumps in the existing bore in Delhi state area including GZB area. Quantity shall be as per SOR.

Refer **Annexure A** for Installation and Execution Guidelines.

### **3) SOR Item no. 3 (Removing of Submersible Pumps)**

Removing of Submersible Pumps from existing bore outside Delhi state area over Delhi Division. Quantity shall be as per SOR.

Refer **Annexure A** for Installation and Execution Guidelines.

### **4) SOR Item no. 4 (Lowering, fixing, testing and commissioning of Submersible Pumps)**

Lowering, fixing, testing and commissioning of Submersible Pumps in the existing bore up to the depth of 200ft outside Delhi State area over Delhi Division. Size, Quantity shall be as per SOR.

Refer **Annexure A** for Installation and Execution Guidelines.

### **5) SOR Item no. 5 (Removing, Lowering, Fixing, Testing & Commissioning of openwell submersible pump sets)**

Removing, Lowering, Fixing, Testing & Commissioning of openwell submersible pump sets 20HP & above underground tanks over Delhi Division. Quantity, rating shall be as per SOR.

Refer **Annexure A** for Installation and Execution Guidelines.

### **6) SOR Item no. 6 (Removing, Lowering, Fixing, Testing & Commissioning of openwell submersible pump sets)**

Removing, Lowering, Fixing, Testing & Commissioning of openwell submersible pump sets of capacity upto and including 15 HP in underground tanks over Delhi Division. Quantity, rating shall be as per SOR.

Refer **Annexure A** for Installation and Execution Guidelines.

### **7) SOR Item no. 7 (05 HP Monoblock Submersible pump set)**

Supply & testing of monoblock submersible pump set openwell, water cooled vertical type three phase 415V, 50Hz AC supply, 05 HP, 2-3 stage, 450-380 LPM, 36-45 Mtr. head, copper rotor, SS impeller with suitable submersible pump cable complete of make KSB, Crompton, Kirloskar or equivalent. Size, Quantity and rating shall be as per SOR.

Refer **Annexure B** for technical specifications.

### **8) SOR Item no. 8 (05 HP water cooled Submersible bore pump set)**

Supply & testing of ISI marked water cooled submersible bore pump set, water cooled vertical type three phase 415V, 50Hz AC supply, 05 HP, 20-26 stage, 110-160 LPM, 90-100 Mtr. head, copper rotor, SS impeller with ISI marked suitable submersible pump cable complete of make KSB, Crompton, Kirloskar or equivalent. Size, Quantity and rating shall be as per SOR.

Refer **Annexure B** for technical specifications.

### **9) SOR Item no. 9 (03 HP water cooled Submersible bore pump set)**

Supply & testing of ISI marked water cooled submersible bore pump set, water cooled vertical type three phase 415V, 50Hz AC supply, 03 HP, 18 stage, 110-65 LPM, 106-108 Mtr. head, copper rotor, SS impeller with ISI marked suitable submersible pump cable complete of make KSB, Crompton, Kirloskar or equivalent. Size, Quantity and rating shall be as per SOR.

Refer **Annexure B** for technical specifications.

**10) SOR Item no. 10 (06 HP water cooled Submersible borewell pump set)**

Supply & testing of ISI marked energy efficient, BEE 5 star rated and above water cooled submersible borewell pump set three phase 415V, 50Hz AC supply, 06 HP, 6-10 stage, 140-175 LPM, 90-100 Mtr. head, copper rotor, SS impeller with ISI marked suitable submersible pump cable complete of make KSB, Crompton, Kirloskar or equivalent. Size, Quantity and rating shall be as per SOR.

Refer **Annexure B** for technical specifications.

**11) SOR Item no. 11 (10HP Monoblock Submersible pump set)**

Supply & testing of monoblock submersible pump set openwell, water cooled vertical type three phase 415V, 50Hz AC supply, 10HP, 2-3 stage, 760-810 LPM, 35-40 Mtr. head, copper rotor, SS impeller with suitable submersible pump cable complete of make KSB, Crompton, Kirloskar or equivalent. Size, Quantity and rating shall be as per SOR.

Refer **Annexure B** for technical specifications.

**12) SOR Item no. 12-15 (3 core copper conductor submersible cable)**

Supply & testing of ISI marked PVC coated flat 3 core copper conductor submersible cable of mentioned size as per IS 694 or latest version. Size, Quantity and rating shall be as per SOR.

**13) SOR Item no. 16 (Steel wire rope)**

Supply, fixing, testing and commissioning of Steel wire rope 8 mm dia. Braided wire with PVC coating complete with shackles for fixing of pump set during and after lowering of pump set to avoid slippage complete as required confirming to IS 2266 latest version. Size, Quantity shall be as per SOR.

**Annexure-A :**

**Installation and Execution Guidelines:**

- # All work shall be executed under the supervision of a qualified electrical supervisor.
- # The following shall be mandatory during execution:
  - Use of motorized lifting tools or tripod arrangement
  - Use of insulated tools
  - Use of complete PPE kit
- # Bore health check shall be carried out prior to installation, including: Bore depth, Alignment, Water level etc.
- # Alignment Requirements:
  - Alignment tolerance:  $\leq 0.2$  mm deviation
  - Vertical deviation:  $\leq 1-2$  mm per meter length
- # Pump Installation Requirements:
  - Proper clamping using stainless steel (SS) clamps
  - Anti-fall safety arrangement using SS wire rope conforming to ISI 2266
- # A trial run shall be conducted for a minimum of 2 hours of continuous operation.
- # Performance Criteria: Maximum permissible deviation:  $\pm 5\%$
- # Upon completion, the contractor shall submit:
  - Test report
  - Installation report duly signed by the Railway Engineer.
- # The pump must be properly earthed.

**Annexure-B :****Pump Technical Specifications (as per the details provided by SSE/OE&P/SSB):**

<b>S. No.</b>	<b>Description</b>	<b>SOR Item No. 07</b>	<b>SOR Item No. 08</b>	<b>SOR Item No. 09</b>	<b>SOR Item No. 10</b>	<b>SOR Item No. 11</b>
1	<b>Type</b>	Open Well	Borewell	Borewell	Borewell	Openwell
2	<b>HP</b>	5	5	3	6	10
3	<b>Stage</b>	2-3	20-26	18	6-10	2-3
4	<b>Discharge</b>	450-380	110-160	110-65	140-175	760-810
5	<b>Head</b>	36-45	90-100	106-108	90-100	35-40
6	<b>Rotor</b>	Copper	Copper	Copper	Copper	Copper
7	<b>Impeller</b>	SS-304	SS/Derlin/Noryl	SS/Derlin/Noryl	SS-304	SS-410
8	<b>Delivery Size</b>	65mm	50mm	40mm	50mm	80mm
9	<b>Shaft Pump</b>	SS-410	SS-410	SS-410	SS-410	SS-410
10	<b>Efficiency</b>	>65%	65%	65%	65%	65%
11	<b>ISI</b>	Not applicable	ISI	ISI	ISI	Not applicable
12	<b>IS Conforming</b>	14220-2018 or latest	8034-2018 or latest	8034-2018 or latest	8034-2018 or latest	14220-2018 or latest
13	<b>Cable ISI</b>	Yes	Yes	Yes	Yes	Yes
14	<b>Star Rating</b>	Not applicable	3/5	3/5	3/5	Not applicable
15	<b>Performance</b>	No abnormal vibration or noise	No abnormal vibration or noise	No abnormal vibration or noise	No abnormal vibration or noise	No abnormal vibration or noise
16	<b>Certificate</b>	Routine test, type test etc.	Routine test, type test etc.	Routine test, type test etc.	Routine test, type test etc.	Routine test, type test etc.