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DPHE-UNICEF RURAL WATER SUPPLY

AND

SANITATION PROGRAMME

INSTALLATION INSTRUCTIONS

FOR

TARA DEEPSET HANDPUMP TUBEWELL

(EXTRACTABLE MODE)

232.2-87IN-5961

STAGE 1
BORING OF TUBEWELL

1. Bore hole for 3" borehole casing to depth as follows:
For Setting 1 : bore 50 ft. (allows 5 ft. extra)
For Setting 2 : bore 65 ft. (allows 5 ft. extra)
2. Bore hole for 1-1/2" lower well casing until required aquifer is found.
3. Select depth to top of filter.
4. Bore 30 ft. below top of filter position to allow 10 ft. for filter, 15 ft. for sand trap and 5 ft. spare.
5. Save at least 5 buckets of coarse sand from boring for use later as shrouding.

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AND SANITATION (IRC)
P.O. Box 93190, 2509 AD The Hague
Tel. (070) 814911 ext. 141/142

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STAGE 2

PREPARATION OF PIPE

While boring is going on, pipes can be prepared:

1. Fix reducing socket to spigot end of 3" borehole casing using solvent cement *+.
2. Also fix cylinder to the pipe of 2" rising main with solvent cement.
3. Fit rubber seat to bottom of cylinder.

* For all solvent cement joints, take care that sand or soil does not adhere to excess cement at joint. Always wipe off excess cement.

+ If not already marked, mark socket depth on spigot end of all pipes before joining, to ensure full depth of joint is achieved.

STAGE 3

MEASURING LENGTHS OF
BOREHOLE CASING,
RISING MAIN
AND
PUMP ROD

1. Lay 3" borehole casing pipe on ground in straight line, with each spigot alongside and overlapping the socket by the required socket depth. Ensure socket ends face towards pump head.
2. Lie pump head assembly at the end of 3" borehole casing.
3. Lie cylinder and 2" rising main on ground alongside 3" pipe. Ensure socket ends face towards piston. Align rubber seat (at bottom of cylinder) with reducing portion of the reducing socket.
4. If necessary cut 3" borehole casing on the 2" rising main so that the rising main is 7" longer than the borehole casing. If 3" borehole casing has to be cut, cut at the spigot (lower) end of the top pipe, as the end against bottom flange must always be a socket.
5. Length of Pump Rod
The length of pump rod from top connector to bottom connector should be 3'-6" less than overall length of rising main including cylinder. If no tape available, proceed as follows:
 - a. Temporarily assemble pump rod, piston assembly and handle and lie on ground alongside rising main. Ensure socket ends face towards pump head.
 - b. Align T-bar of handle, with top of guide bush.
 - c. If not already marked, measure 18" (1 "haath" - from elbow to finger tips) from bottom of cylinder pipe to bottom of grapple.
 - d. Cut one pipe to adjust length of pump rod as necessary.

STAGE 4

CONNECTION OF PUMP ROD
AND
PISTON ASSEMBLY

1. Chamfer outside of each socket of 1-1/4" pump rod.
2. Check that the piston assembly is fixed correctly onto bottom connector.
3. Insert one rubber bung into spigot end. Push another bung inside the socket so that it will not interfere when making joint. Open end of bung should face outwards.
4. Fit rubbing ring 2" from the spigot end of each 1-1/4" pump rod to allow for depth of joint.
5. Assemble pump rod by jointing with solvent cement and leave on ground undisturbed for minimum eight hours to ensure maximum strength of joints.

STAGE 5

SETTING OF WELL PIPE

1. To select length of 1-1/2" lower well casing, subtract the following lengths from overall depth to top of filter:

For Setting 1 subtract 44 ft. from depth from ground level to top of filter.

For Setting 2 subtract 58 ft. from depth from ground level to top of filter.

(For example, if depth to top of filter is 150 ft. then:

For Setting 1 1-1/2" lower well casing will be $150-44 = 106$ ft.

For Setting 2 1-1/2" lower well casing will be $150-58 = 92$ ft.)

2. Using solvent cement fit end cap to sand trap (if not already fitted) and then connect sand trap, filter, lower well casing and borehole casing while lowering into the borehole.

For Setting 1 Use 3 standard lengths of 3" pipe.

For Setting 2 Use 4 standard lengths of 3" pipe minus 6" cut off the spigot end of the top pipe before joining.

Pour in water continuously to keep filter clean. Allow at least one minute for each joint to set. Never raise pipes upward after joining.

3. Set top of 3" borehole casing 1'-0" above ground level (for both settings).
4. Use surging pump inside 3" borehole casing until water flows easily down well and back up outside casing. Then continue to pour clean water until clean water comes up around borehole casing. Do not surge too violently in case joints or filter burst.
5. Pour at least five full buckets (large size) of coarse sand (extracted from borehole) back down well to form shrouding around filter.

STAGE 6
INSTALLATION OF CYLINDER
AND
RISING MAIN

1. Chamfer inside of each spigot end of 2" rising main (khoa can be used if sandpaper not available).
2. Check rubber seat is in position at bottom of cylinder pipe.
3. Fit one rising main centralizer 3" from the spigot end of each 2" pipe (to allow for socket)*.
4. Insert cylinder pipe into borehole casing and successively join each 2" pipe with solvent cement (socket ends towards cylinder).

For Setting 1 use 3 standard lengths 2" pipe

For Setting 2 use 4 standard lengths 2" pipe.

Allow at least one minute for each joint to set. Never raise pipe upward after joining.

5. If you have measured correctly under Section 3, the top of the 2" rising main should be approximately 7" above 3" borehole casing.
6. Check foot-valve properly assembled and then drop into rising main.

* If rubber components are difficult to fit, use soap as lubricant.

STAGE 7

SETTING OF PUMP HEAD ASSEMBLY
AND
DEVELOPMENT OF WELL

1. Remove bottom flange from pump head assembly.
2. Place bottom flange over rising main to rest on top of borehole casing.
3. Place grommet in position, fix pump head onto bottom flange and tighten all nuts.
4. Make pump head rigid by tying to bamboo supports.
5. Remove guidebush from pump head.
6. Insert piston and pump rod into the well.
7. Fix guidebush onto handle and thread handle to top connector of pump rod.
8. Fix guidebush into pump head with handle retainer.
9. Make temporary drain to prevent water logging in platform area.
10. Pump tubewell vigorously for eight hours. After pumping, fill a glass to check water is clear and free from sand. If not, continue pumping.
11. Remove pump head and handle assemblies. Fit blank flange onto bottom flange sub-assembly.

STAGE VIII

CONSTRUCTION OF PLATFORM

1. Ensure sufficient quantity and good quality of cement, brick, khoa, sand and clean water are available.
2. Ensure dry foundation for the platform.
3. Set VS ring in position as shown in drawing with a gap of at least 1 inch between inner surface of ring and two front lugs of bottom flange.
4. Fix the centre of ring and draw a diameter perpendicular to the direction of spout.
5. Extend the diameter upto 2'-9" from centre of ring in both the directions to form one side of square platform. Draw other three sides to form 5'-6" x 5'-6" square as shown in drawing.
6. Select the position of drain along either right or left side as convenient (shown right side in drawing).
7. From the centre of the ring mark out the 12" apron by drawing an arc of radius 12" longer than the ring outer radius.
8. Create a slope by excavating platform area evenly so that drainage corner is 2" lower than ground level.
9. Ensure the platform area is well compacted.
10. Complete Class I brick flat soling over compacted area with frog facing upward.
11. Spray sand over the soling to fill gaps. Also water sparingly for more compaction.
12. Block off 6" radius around borehole casing to the full depth of the ring using bricks or steel plate.
13. Fill VS ring with earth and rubble and compact well leaving 3-1/2" gap from top.
14. Compact 2" layer of sand on top of ring leaving 1-1/2" clear for concrete slab.

Installation Instruction
for TARA, Page 9

15. Make a temporary shuttering wall of 4" height using wood or bricks around perimeter of platform apron.
16. Clean and wash bricks, khoa, and sand properly before mixing.
17. Remove the bricks or plate from around the borehole casing to the full depth of the ring for casting pump block.
18. Mix cement, sand and khoa in a proportion 1:2:4 by volume in a mixing tray or on the platform soling. Never mix on the ground.
19. Add sufficient water and mix well.
20. Immediately after wet mixing place and compact concrete (a) 4" thick all over the brick soling, (b) 1-1/2" thick over the top of ring, (c) in the hole for the pump block and (d) 4" sloping to 3" thick over apron. Be sure to maintain 2" slope towards drain while placing concrete. Take special care to compact concrete around pump block. Do not disturb pump after compaction.
21. Before concrete has set (within two hours) construct flat brick wall around square platform and drain as shown in drawing.
22. After 2 to 3 hours plaster whole platform for neat cement finishing.
23. Engrave tubewell number and date of platform construction in plaster while still fresh.
24. Cure the platform for 10 days. Avoid any disturbance to the platform during curing.
25. After 10 days curing remove blank flange fix pump head and fit handle.
26. Conduct pump test and fill in the completion report.