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GUJARAT WATER SUPPLY & SEWERAGE BOARD, GANDHINAGAR

(423)

Geo\DR\Drilling\GWSSB\42/99 Date 26.3.99

Circular

Preamble:

Recently in a daily news paper it was reported that tubewells drilled in Viramgam taluka of Ahmedabad district are failed due to salinity or sand rushing problems. In fact, salinity and sand rushing both are area specific, problems and some times even if the bores are drilled with full precautions, even then some failures are being reported.

GWSSB is providing water in all parts of the State irrespective of geological and hydrological of the area. Where ground water occures in different conditions.Earlier the bores were drilled by departmental rigs, only in case of scarcity or in excess work conditions, the drilling work was used to assigned to the private agencies. In present scenerio the drilling work has extra ordinarily increased, the Board does not have enough drilling rigs, therefore, the major part of the drilling of bores is being assigned to the private agencies.

Considering the heavy work load particularly, during drought conditions it is very difficult to keep all the sites vigillanet inspection at all the sites on and on the process of work in the field. If some changes could be proposed or incorporated in the system, the % failure of bores can be minimised and the performance of the work will definitely be increased. The possible modification in the system are proposed as under :

- In D.R. Bores where the drilling sites are proposed by Jr. Geologist.the sites should be confirmed by the Hydrologist, prior to drilling of bores.
- Best Electrical logging results could be obtained in minimum size of pilot bore hole i.e 10" diameter. This can be relaxed upto 12" dia only. In any case no logging should be performed in the bore holes more than 12" dia size. It is seen that in many cases the agencies start their drilling work with 14" dia cutter. There are all possibilities of getting false results if the dia of the pilot bore is more than 12" dia logger incharge should also mention the size of the pilot bore hole in the logging results.
- As per the Ground Water and wells by Johnson and Johnson "Electrical logging should always be done in bentonite mud filled uncased bore holes". Generally private agencies do not use bentonite powder for making drilling fluid and they use clay as mud. They should be forced to use bentonite for making mud because bentonite has its own importance in drilling and logging procedures.
- Earlier the department was used to supply the pipes, as per pipe assembly, to the agencies. The pipe assembly is always recommended by Hydrologist/ Geohydrologist keeping the fraction length of 3 meters. But the pipes which are being supplied by the deptt. presently, in some cases, are required cutting

to match with the assembly. This cutting creates uneven facing of the pipes which results space even after the welding between the pipes.This space allows saline water to percolate and contaminate the ground water in the bore. In fact this is the responsibility of the deptt. to provide propoerly faced pipes to the agency, or deptt. should pay extra charges to the agencies for pipe facing. This should be a tender condition like gravels cement sealing or compressor test etc.

- Pipe lowering in the bores during night should be avoided as far as possible.
- Slotted pipe should be cleaned properly from inside to ensure more entrance velocity.
- Many bores turn in to failure due to sand rushing. This failure is because of
  - Not proper back washing before gravel pack
  - Improper gravel size (which create bridging)
  - Lack of reaming (to accommodate gravels)
  - Accentricity of the bore hole.
- A proper attention should be paid on all these material/ activities.Because back washing and gravel packing are very important factors and both the activities needs proper attention,even after full attention, if any thing happens with the bore and sand rushing caused this may be avoided by "Feeder pipe". This feeder pipe may be lowered across the cement sealing 2" dia feeder pipe may easily be lowered in 5" annular space around the housing pipe.
- In general practice, the attention is not being paid towards the material which is packed the annular space from cement sealing to ground level. In fact this material should always be impervious to avoid contamination of surface leakage and inclusion of saline water from the upper (untapped) aquifers. In the said annular space proper clay packing with clay balls should be provided and this activity may be treated as separate item, in the tender conditions where even the cement sealing is proposed the clay balls in sufficient quantity should also be kept on site well in advance like gravels for inspection..
- In normally cases, pipe lowering to cement sealing the entire procedure is being completed within 24 hrs. If this procedure takes more than specified time, this may reveal some unwanted problems has occurred during process that may be filling ,bridging ,accentricity of bore or any other problem therefore,in case of laking more time the site engineer should inform to next higher officer for decession.
- Air compressor, cleans the bentonite (mud) layor from the walls of the bores. The agencies lower the air line at a particular depth and run the compressor. This procedure cleans a part of the mud wall. In fact the mud wall against all the tapped aquifers is required to be cleaned. This is possible only by zone wise application of air compressor with the help of air line and reduction pipes, so,the zone wise compressor developement should be a practice for getting. better results
- This compressor exercise is required to be done within a week period after completion of the bore hole. Otherwise it will be very difficult to remove bentonite layor against the aquifers for getting optimum results

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- For bore development pump should be utilised.The duration of the pumping may be decided on the permeability of aquifer. This can also help the exact design of the pumping machinery.
- Some proportionate sites may be checked by the SEs & EEs. This checking should be done only during lowering to cement sealing procedure. Because, checking during drillig of bores has no significant value.
  In sensitive areas the EE/Geohydrologist should remain present during pipe lowering to cement sealing procedures.
- As a new strategy decided by the authorities, for ~~surprise~~ checking of the drilling sites.The following officers should be informed 24 hrs before the pipe lowering by EEor GH in writing or on phone.

Shri H T Patel	(O)	20855	(R)	7474054
Shri S M Zhaveri	(O)	20855	(R)	6633731
Shri R N Shukla	(O)	22521	(R)	6635594

Note: Non-obeying of any above mentioned instructions, the concerned Engineer/Hydrologist will be held responsible for any failure.

S.M.Jhaveri
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(S.M.JHAVERI)
Chief Engineer (Mechanical)

0 Copy to Sup. Geohydrologist, GWSSB
1. Copy to all SEs & EEs (Mech)
2. Copy to all Geohydrologists/Hydrologists