

**ROAD CONSTRUCTION IN WATER LOGGED HIGHWAY STRETCH
- NOTHING IS IMPOSSIBLE – (A Case Study)**

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- Sambalpur - Rourkela road S.H. 10 (162.932 KM) is the most important artery in Western Orissa.
- The feasibility studies carried out in late eighties but this road has been strengthened and widened to two lane road with loan assistance from A.D.B., during the period 1992 - 1993 to 1997 - 1998.
- Author joined in the project during June 1996 and noticed lots of work were left unattended due to want of decisions on certain problems. Two of such problems concerned to water logging are cited herewith.

Work held up

➤ It always becomes difficult to construct road in water logging areas. There was a typical portion of length (3km) in Sambalpur - Rourkela road near Ramabahal. Road construction could not be taken due to water logging area (Fig. I).

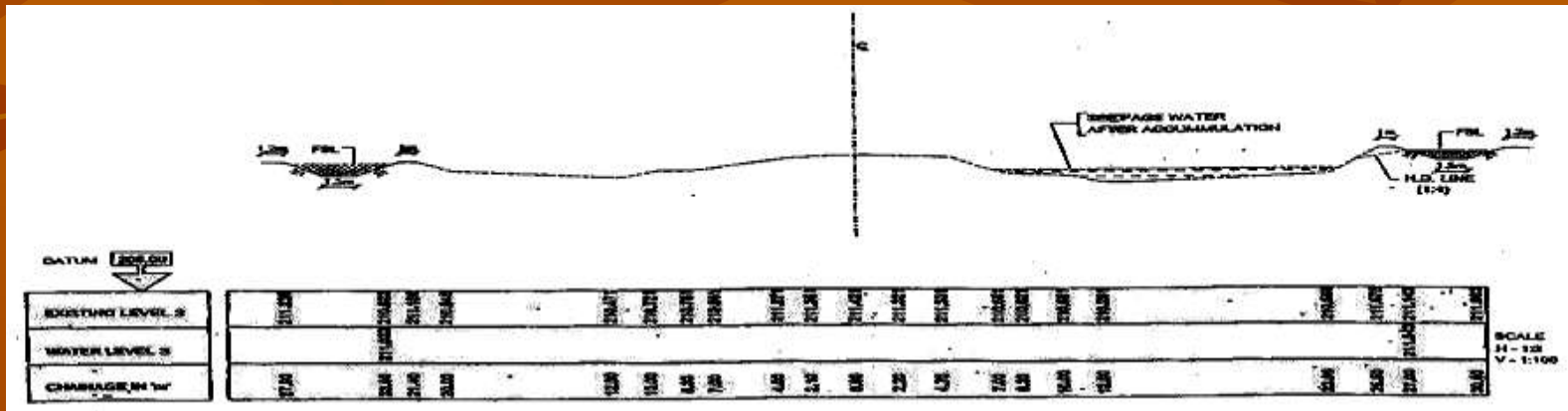


Fig. I : Cross Section at 147.660 Km.

➤ There were two nos. of high leveled canals on both side of existing road and due to seepage of water from the canals, the road construction could not be taken up in this particular reach. There were contractors, Engineers, specialized Engineers of consultant but however problems remain unsolved for more than 3 years. After Author joined in that project, noticed the same problem and that part of road was yet to be taken up for improvement.

➤ Consultant suggested to provide V shaped lined drain on both sides of road but that would not have given satisfactory result because the V shaped lined drain in such location would have been acted as anti - symphonic action and this was not suitable solution. The problem how to dry up the water logging area for construction of road work became a major issue. If the water level would be lowered 1M down of the neighbouring land than the problem would be solved.

- Since nothing is impossible in the world, suddenly solution came to mind that if a vertical filter media will be provided at outer edge of U shaped open drain then the out side water will draw down and will enter to drain through weep holes. In this respect Fig. II. Fig. III may be seen. The vertical drain of IM depth with Filter media 0.3m boulder, 0.15m metal 0.15 granite quarry dust as granular media at outer side of drain was created so that the water could be lowered to IM depth and through weep holes, the water entered to drain and finally this water lead to lowest of valley, since the drains are so design.

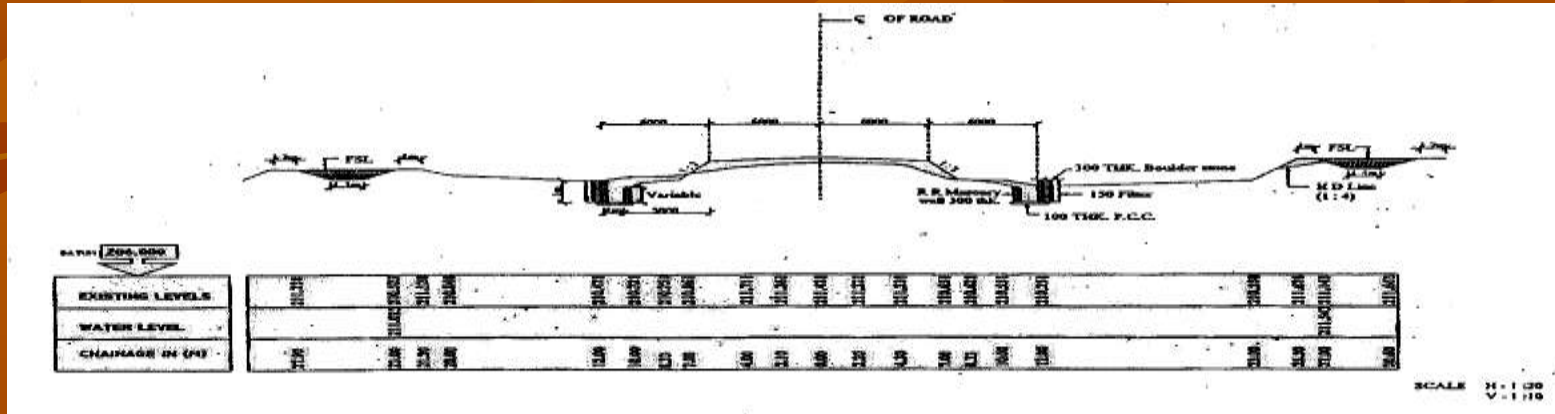


Fig. II : Typical Drainage Arrangement for Cross Section at 147.660

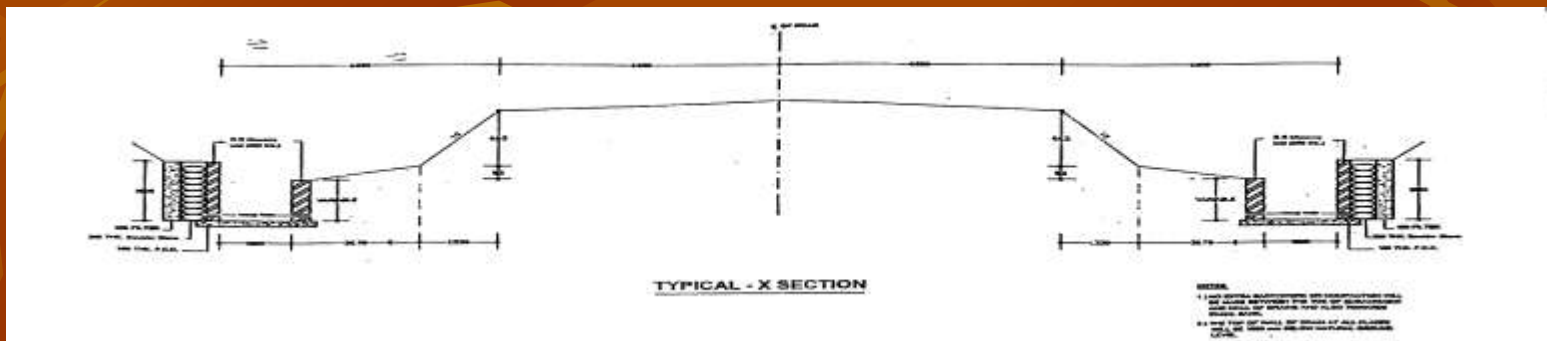


Fig. - III : Recommended Drain on Both Side of Road at Canal Zone
(Between CH 147.040 to 148.160).

- The proposal was sent to Delhi and it was approved and the road could be executed as per the proposal. Not only the road construction was easier due to dry condition but also this part turned to be beautiful landscape.

Work Progress Stopped

- During construction at a particular reach of Sambalpur - Rourkela road, left side half width was cut for a depth 1.2M. and was to be reconstructed but construction work could not be taken for a month since there was profused leaking of water from the bottom and side of road already cut. The tendency of entry of water was from right side to left side.
- The consultant and the contractor were harassed. Subsequently when the problem came to the notice, it was observed that the cut portion of road was in lower side and there was one reservoir at distance of about 400M, but at higher elevated areas and far from road side and it was not easily traceable. Due to this reservoir the water layer inside ground was moving downward and was crossing from right side to left side (Fig. IV) and there was water logging problem at left cut side.

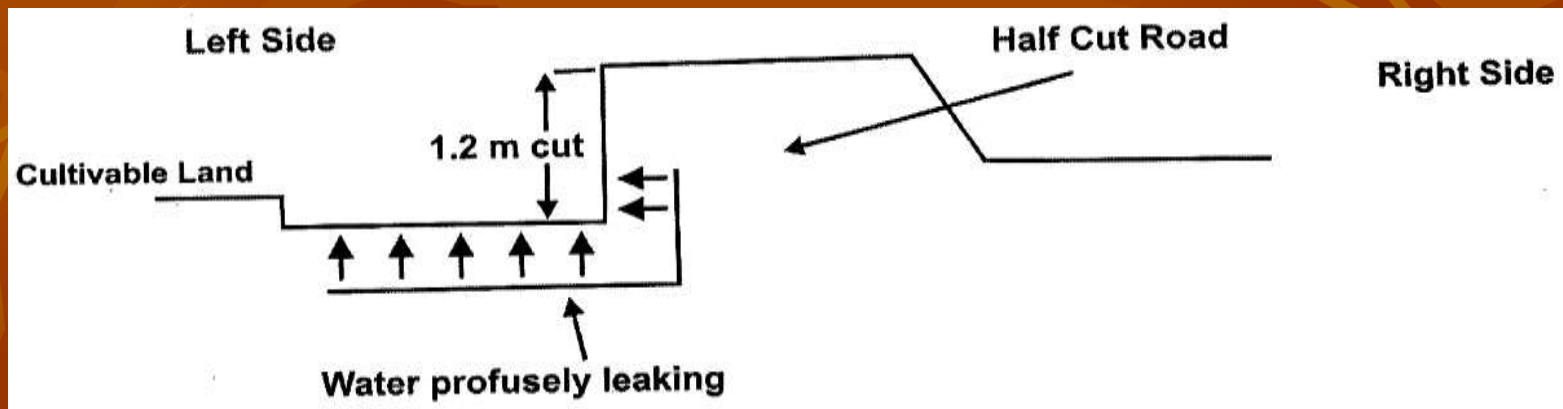


Fig. IV

- It was, therefore, advised to cut the right side V-type drain to a depth of 1.5M (Fig. V right side drain) which acted as cut-off of entry of water towards road and the underground water table finally flow down to nearest valley in the drain.

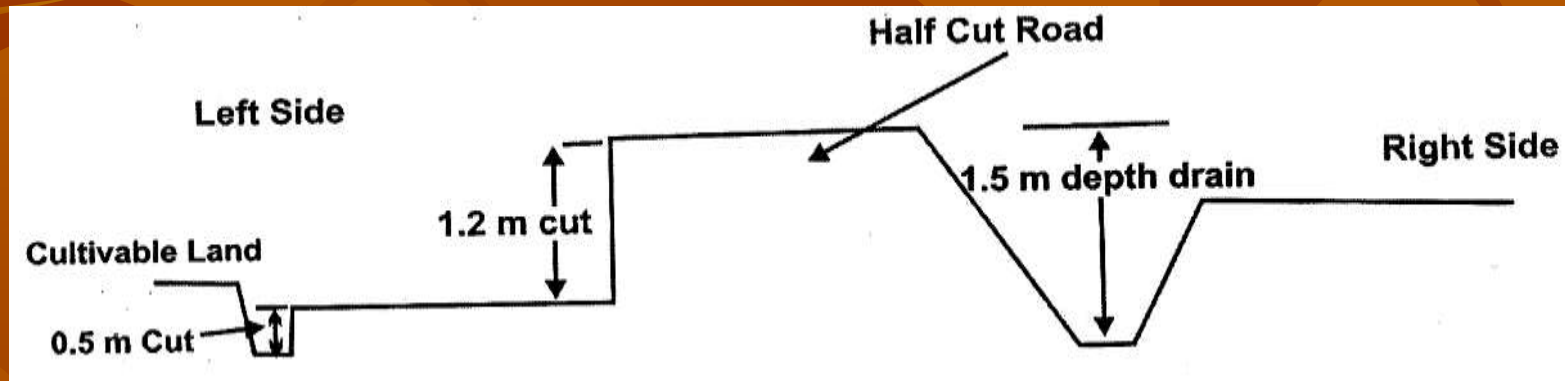


Fig. V

- Similarly at left side road cut level and neighbouring land were almost in same level, there were also entry of water from field side. A 0.5 M. cut drain was made to act as cut off of entry of water from field side. This drain was also lead to nearest valley. Therefore, the half cut part road became dry and road construction could be possible. (Fig. V left side drain).

Conclusion

- ❖ *Many critical problems with right solutions have been experimented and found success. The present paper highlights the Engineering Challenges in execution of some critical problems faced during the construction of project work. These are also enlightened path for young Engineers and reference as per situation.*
- ❖ *I appreciate that IRC has taken a strong step to encourage the expert's opinion from this year. To be frank, the code and the rules of IRC are only based on the subjects sent by the experts to IRC. But there is a lot of successfully completed practical solutions, solved by experienced engineers on site which are yet to be intimated to IRC. Hence the solutions to several technical problems faced during the construction of road and its maintenance can be accumulated from different engineers throughout the nation which will help other engineers to follow.*
- ❖ *I therefore suggest, these expert opinions on solving problems faced on site through state wise committee/members are to be collected by IRC*

THANK YOU