

Detail Study on Canal Lining”

Shivraj Patel, Pradumn Yadav,Pranay Yadav

Department of civil engineeringSSTC SSGI Bhilai

Professor,Dept. of civil engineering Vishal chandrakar SSTC SSGI Bhilai, India

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ABSTRACT

In a Agriculture state like Chattisgarh, water storage is major task which helps further in agriculture and many other water needs. Canals are one of the major source of water storage and transportation .Canal lining is one of the important task for this purpose. In this context, we will be discussing about the canal, types, needs, lining, advantages and backdrops of canal lining.

Key Words: canal, lining, channel, irrigation, safety

I. INTRODUCTION

The main purpose behind the lining of canal is to reduce the seepage losses. In some soils, the seepage loss in water in unlined canals is about 25 to 50% of total water supplied. Benefits from the project includes increased agriculture yield, increase in crop intensity, increase in crop area, crop diversification, more commercial fish production, increased employment outside agriculture from increased crop output in related industries such as input industry (backward linkages) and output processing industries (forward linkages), increased farm forestry and vegetation in irrigated areas. This should create beneficial impact on wildlife, flora & fauna, assurance of food security and poverty eradication, transfer of technology, health and nutrition.

1. INTRODUCTION OF IRRIGATION CANALS

Canal is a artificial channel, generally trapezoidal in section, constructed to carry water to fields from source (River/ Reservoir).

Classification of canals based on

1. Nature of source of supply
2. Financial output
3. Function of canal
4. Discharge & Relative importance of canal in network
5. Canal Alignment

Canal Lining is an impermeable layer provided for the bed and sides of canal to improve

the life and discharge capacity of canal. 60 to 80% of water lost through seepage in an unlined canal can be saved by construction canal lining. Canal Linings are provided in canals to resist the flow of water through its bed and sides. These can be constructed using different materials such as compacted earth, cement, concrete, plastics, boulders, bricks etc. The main advantage of canal lining is to protect the water from seepage loss.

Types of Canal Linings

Canal linings are classified into two major types based on the nature of surface and they are:

1. Earthen type lining
2. Hard surface lining

1. Earthen Type lining

Earthen Type lings are again classified into two types and they are as follows:

- Compacted Earth Lining
- Soil Cement Lining

Compacted Earth Lining Compacted earth linings are preferred for the canals when the earth is available near the site of construction or In-situ. If the earth is not available near the site then it becomes costlier to construct compacted earth lining. Compaction reduces soil pore sizes by displacing air and water. Reduction in void size increases the density, compressive strength and shear strength of the soil and reduces permeability. This is accompanied by a reduction in volume and settlement of the surface. Proper compaction is essential to increase the stability and frost resistance (where required) and to decrease erosion and seepage losses.

DETAIL STUDY

The State Government has sanctioned amount of Rs5.27 crore for the lining works and head and cross Regulator of Raipur Mahanadi Main Canal Project. Moreover, about 2000 hectares of acreage in four villages located at the tail-end of the irrigation project will also be irrigated.

The Irrigation Department officers has ordered for the completion of the lining works and construction of Regulator in the given time-frame. Moreover, about Rs2.54 lakh crore has been sanctioned for the concrete lining of five sub-canals of Mahanadi Main Canal at Arang Development block in Raipur district.

The project will irrigate an extra 127 hectares after the completion. The State Government has recently approved Rs1.84 crores for construction of distribution channel one and two from Mahanadi main canal in Dhamtari

district. The move would help irrigate 28,400 hectares of land in the district. The approval order was issued by State Water Resources Department.

Notably, the Chhattisgarh Government has set the target to develop additional irrigation capacity of nearly four lakh hectares area during the next four years, officials stated. From 12th to 19th phase of NABARD Scheme, total 29 projects have been completed to add up 19,748 hectares to irrigation capacity of the State. Betterment of farmers is simply not possible without the expansion of irrigation facilities. The State Government has always taken it as its priority to ensure proper utilisation of water resources for

expanding total area of irrigated land in State, they stated.

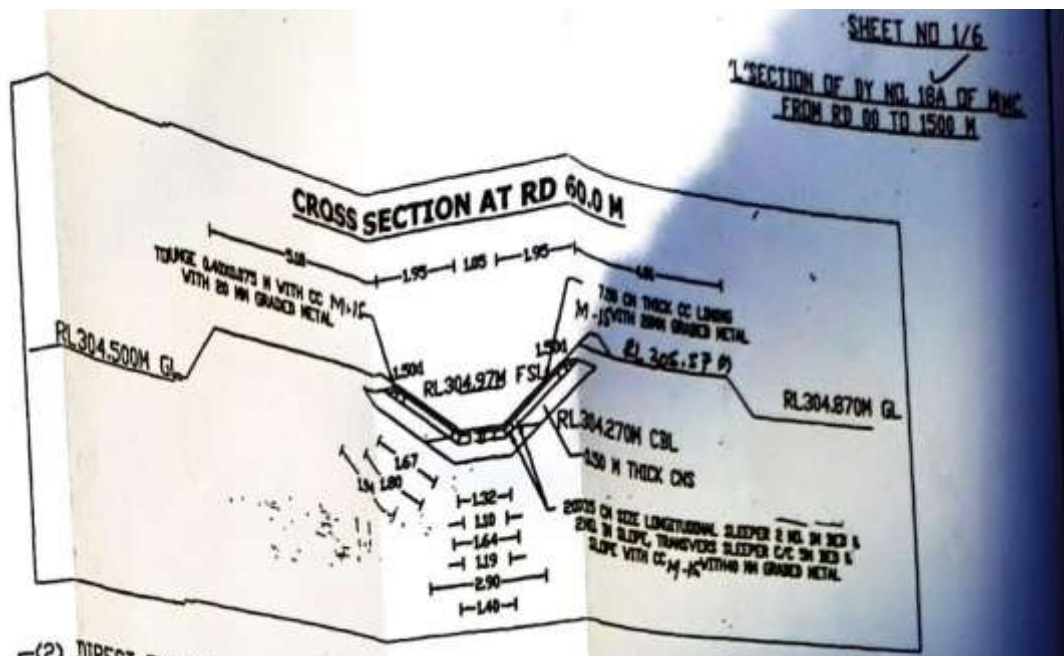
As a result of several measures, the irrigation capacity of State has increased from 20 per cent to 34.20 per cent. During Kharif season, the actual irrigated area in State expanded from 5.35 lakh hectare to 11.70 lakh hectare. Nearly 74.19 per cent of the total irrigation capacity of the State is being utilized for kharif crops, which is far better than many states of the country, officials claimed.

3.1 LOCATION

The location of project is village Berberaa and Barbhatha in Arang Block in Raipur district . it is connected to Main Mahanadi canal in Distributary no 18A. The total length of this canal is 8190 km.

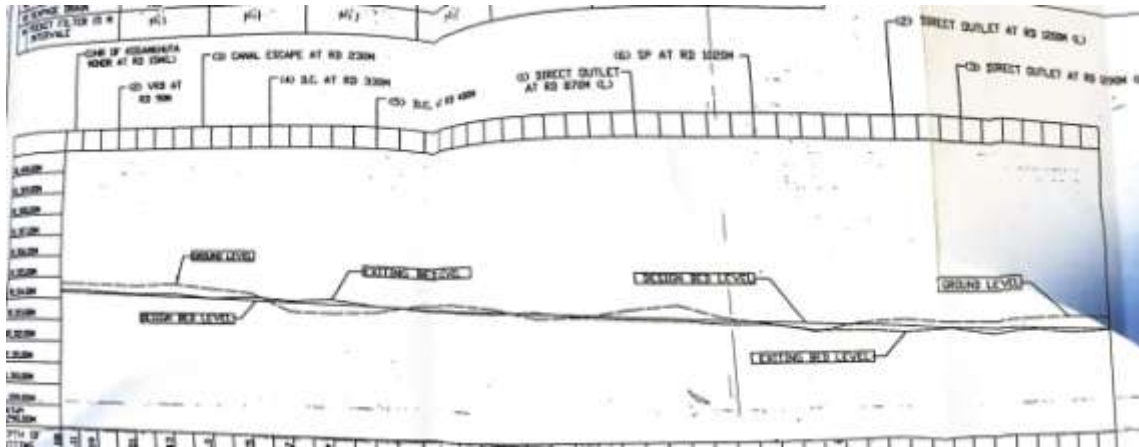
3.2 LAYOUT

A construction layout is the capacity to specifically earmark below- and above-ground structure locations. The aspect of surveying where a team transfers a layout from construction drawings into the ground is called setting out. It demonstrates edge slabs, boundaries, walls, and other location



S.N.	DESCRIPTION	RD DM	RD1650 M	RD 4650 M	RD 4650 M	RD 5640 M	RD 7050 M	RD 7710 M
		TD 1650M	TD3630 M	TD 5640 M	TD 5640 M	TD 7050 M	TD 7710 M	TD 8190 M
1	DISCHARGE IN CUMEC	1.363	1.196	0.971	0.796	0.450	0.260	0.115
2	BED WIDTH M	1.05	0.80	0.80	0.75	0.60	0.45	0.30
3	F S D	0.70	0.70	0.65	0.60	0.45	0.35	0.30
4	FREE BOARD	0.6/0.30M	060/0.30M	0.60/0.20M	0.60/0.20M	0.60/0.20M	0.60/0.20M	0.60/0.20M
5	SIDE SLOPE	INNER50.1	INNER50.1	INNER50.1	INNER50.1	INNER50.1	INNER50.1	INNER50.1
		OUTER2.1	OUTER2.1	OUTER2.1	OUTER2.1	OUTER2.1	OUTER2.1	OUTER2.1
6	BED GRADE	1/1000	1/1000	1/1000	1/1000	1/500	1/500	1/300
7	VALUE OF 'N'	0.018	0.018	0.018	0.018	0.018	0.018	0.018
8	VELOCITY IN M/Sec	0.98	0.95	0.91	0.87	1.01	0.85	0.98
9	CNS THICKNESS	CNS/50	CNS/50	CNS/50	CNS/50	CNS/40	CNS/30	CNS/0.30
10	THICKNESS OF LINING	0.075	0.075	0.075	0.075	0.075	0.075	0.075
11	SIZE OF SLEEPER	20 x 15	20 x 15	20 x 15	20 x 15	20 x 15	20 x 15	20 x 15
12	SEPAGE DRAIN	NIL	NIL	NIL	NIL	NIL	NIL	NIL
13	POCKET FILTER 15 M INTERVALE	NIL	NIL	NIL	NIL	NIL	NIL	NIL

CANAL DATA



II. CONCLUSION

1. Canals are the major system of any irrigation project, which delivers the irrigation water to fields. Most of these canals are earthen so considerable water losses take place due to seepage. These losses can be overcome by lining the bed and sides of the canal cross-section with an impervious material. Lining of canal reduces operation and maintenance cost, erosion and also improves the flow velocity. Different materials are available for lining the canal like concrete lining.

2. In this report, I have tried to explain the advantages and disadvantages of the various canal lining systems. The factors affecting the decision for selection of the canal lining material are also discussed in this report. The main objective is to find out the most economical method of canal lining based on the cost criteria in relation to the wastages.

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