

প্রধান প্রকৌশলীর দপ্তর
ডিজাইন, বাপাউবো
৭২, গ্রীন রোড, ঢাকা - ১২১৫
ফোন : ৯১১১২০৬
ই-মেইলঃ
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Date: 18/10/2020

Design Guidelines for Excavation of River/Khal

1. Study DPP provision and guideline.
2. Study Feasibility Study or Technical Committee Report provision and guideline.
3. Identify the alignment of Khal/River on Google Map. Measure the Catchment Area. Check it with field Data.

4. Purpose

Drainage

Irrigation

Navigation

Irrigation are not discussed here.

5. Calculate Drainage Modulus from Rainfall data.

Drainage Modulus, $D_m = \text{Precipitation} - (\text{Infiltration} + \text{ET})$

$$D_m = \frac{I_p + R_t - T(E_t + S) - F_{lt}}{T}$$

Use, 1:10 year, 10 day Rainfall for calculation of Drainage Modulus.

Drainage Modulus can be taken directly from Map in CIDA Manual.

6. Calculate Discharge, Q

$Q = CIA$

BWDB Design Manual modified this formula in SI Unit in the following way.

$$Q = \frac{\text{Drainage Modulus} \times \text{Area}}{8640}$$

Q	m^3/sec
Drainage Modulus	mm/day
Area	ha

7. Design of Section :

Calculate b (Bed Width), d (Depth)

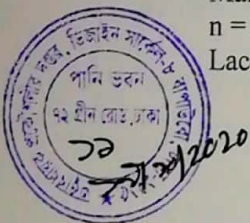
Use Manning's formula

$$Q = A \frac{R^{2/3} S^{1/2}}{n}$$

Manning's n depends bed roughness,

n = 0.025 may be used

Lacy's equation may also be used.



8. Navigation

Navigation may be needed in Monsoon or in Dry Period.

For Dry Period Bed Level = LWL - Draft of Vessel

For Monsoon Bed Level = LWL (June to October) - Draft of Vessel

Minimum Bed Width Width of Two Vessel + 3.00 m

9. Environmental Requirement

Minimum 1.00 m water shall be kept for Environmental Need.

It will provide soil moisture.

Prevent elimination of aquatic organism.

Keep the Environment wet.

Provide some water for Post-Monsoon & Pre-Monsoon irrigation.

10. Side Slope

Depend on Depth of channel and soil condition etc.

1 : 1.5 to 1:2 may be used.

11. Bed Level of Drainage Khal/River shall be fixed from D/S End, i.e "0" point.

Bed Level = WL- d (Depth)

Bed Level at outfall shall be matched with level of outfall khal/River.

If there is a regulator at Outfall,

i. Bed Level at outfall will be the Invert Level, if complete drainage is desired.

ii. But for Environmental need, at least 1.00 m water depth shall be kept. As such, Bed Level at outfall, will be the 1.00 m below Invert Level.

12. Bed Slope

Depend on Slope between U/S & D/S Water Level
Existing Bed slope

13. "0" (Zero point) of Drainage Khal must be at outfall.

14. Include the alignment of Khal in the Drawing.

15. During preparation of drawing, provide Long section preferably for whole length.

- a. In the Long Section provide Existing Bed Level, Design Bed Level, L/B Level, R/B Level.
- b. In the Long Section provide data at an interval of 100m.
- c. Draw the Cross-section at an interval of 100m depending on the Length of Khal. For similar section or similar depth, the interval may be increased. Interval may be reduced, when there is abrupt variation.
- d. In the Cross-section, write the L/B, R/B, Center Line, Side Slope and Cutting area.

- e. Outfall, offtake, regulator, bridge, culvert (with invert level, vent size, nos. of vent) etc. shall mark on the Long Section

16. Fitting of Design section with Existing Section

- Match with centre line of existing section.
- Minimum cutting.
- Does not create a steeper side slope.
- Minimum cutting on bank, in case of non-availability of land.
- Does not endanger valuable properties on the bank.

17. Disposal of Excavated Earth

Excavated Earth, which is harmful for human & environment shall be dumped to a safe place.

It may be spread over the adjacent land, if it is not harmful for agriculture.

Dyke may be constructed, on both bank or one bank. Opening in Dyke shall be kept, so that, there will no water logging on the adjacent area.

Dyke shall fine dress, turfing on slope and plantation on the top.

May be used for strengthening/re-sectioning/construction of adjacent Embankment.

Shall not dumped on flood plain.

18. Provide

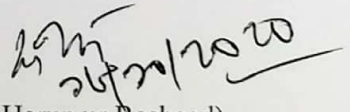
- a. Sign Board
- b. KM Post (if applicable)
- c. Stair (if needed)

19. Excavation shall be started, preferably from D/S.

20. Maintain a file for Hard Copy of design.

Store all Soft copy. Create a Folder for individual "BWDB Division". Store all soft copy by creating a Sub-Folder under the name of each Project.

21. For Design, BWDB Design Manual, Text Book, Other manual etc may also be followed.

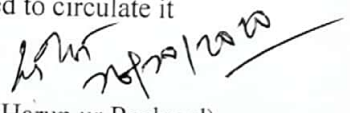

(Md. Harun ur Rasheed)
Chief Engineer, Design
BWDB, Dhaka

Memo no-335-CE,D/-

Date : 18/10/2020

Copy forwarded for favour of kind information and necessary action to: -

1. ADG, Planning, BWDB, Dhaka.
2. SE, Design circle (1/2/4/5/6/7/8/9), BWDB, Dhaka. He is requested to circulate it among all EE, SDE, AE of his circle.


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