

DB4/ 125/CIR/2023/INV-IDRB

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CIRCULAR

Sub:-

Instructions regarding the submission of investigation estimates through PRICE for according Financial and Administrative Sanction-reg

For ensuring the structural stability of water retaining structures such as RCB, VCB, weirs, check dams, and others, soil investigation including boring and topographic survey plays a vital role. However, it has been observed that the required data is often not incorporated in the investigation estimates, make it challenging to design these irrigation structures properly and optimally. Hence the following guidelines are recommended to field officers while submitting investigation estimates through PRICE software to obtain financial and administrative sanction from this office.

Instructions regarding the documents to be submitted along with the estimates and data and rates to be followed for the topographic survey, were issued from this office vide circular dated 30/09/2020 and 03/06/2023 respectively shall also be strictly followed.

SUB SOIL INVESTIGATION

1) Spacing and location of boreholes should be

- a. Regulator, RCB, VCB, bridges, or combinations of any structure with Bridge : Boreholes should be spaced at 14 m intervals along the centre line of the proposed structure unless specific pier points or site conditions demands otherwise.
- b. Check dams and weirs: Boreholes should be spaced at 20 m intervals along the centre line unless specific conditions demands otherwise.
- c. Narrow streams/rivers: At least one borehole must be taken at the centre of the stream/river along the alignment of the proposed structure.
- a. Abutments: Boreholes must be taken at each abutment point (Total 2 nos).

- e. Apron Design: Boreholes should be taken 5 m upstream and 10 m downstream from the proposed alignment of the structure within the river portion (Total -2 NOS). If the width of the river is more than 50m, for the D/S apron, equally distributed two bore holes may be taken along the width of the river at 10 m from the proposed alignment of the structure (In that condition Total -3 nos)
- f. Retaining Walls (if any required): Boreholes should be taken at 30 m and 60 m from abutment points on both upstream and downstream sides of the river on both banks (total - 8nos).

2) Boring through hard rock

- a. Regulator, RCB, VCB, bridges, or combinations of any structure with Bridge - Boring depth into hard rock should be extended up to 3 m, provided the samples obtained from the core consists of sound rock pieces with good value of RQD .
- b. Check dams and weirs: Boring depth into hard rock should be limited to 2 m if the hard rock layer is found within a depth of 12 m. If no hard rock is found within 12 m, boring should proceed up layer with an N value > 50.
- c. Wing walls: Boring depth into hard rock should be limited to 1 m.
- a. Apron Design: Boring into hard rock is not required.

3) SPT (Standard Penetration Test)

SPT (*Standard Penetration Tests*) should be conducted at 1.5 m intervals up to a depth of 15 m. If the soil layer extends beyond 15 m, the intervals may be increased to 3 m. Additionally, tests should be conducted whenever there is a change in the soil strata to ensure accurate data collection. As per the data in the specifications, SPT tests at 5 m intervals are included; additional SPT tests can be calculated based on the depth drilled.

4) Soil Sampling

The interval at which the samples are collected depends on the type of strata variation. **Generally, Disturbed or SPT samples are collected at 1.5 m intervals and undisturbed samples (UDS) are to be collected at least one sample from each bore hole.** In case of variations of profiles within a strata, the samples (Both UDS & DS) shall be collected at a frequency of at least every 1.5 m to 2 m depth interval in a borehole.

5) Soil Testing:

Soil tests must be carried out at KERI or through any other reputed Government institute laboratories. All laboratory tests shall be conducted using calibrated equipment and apparatus, and the procedures shall comply with the relevant Indian Standards. Depending on the type of substrata and technical requirements, appropriate laboratory tests shall be conducted on the collected soil, rock, and samples.

6) Core Boxes:

The number of core boxes should correspond to the total length of hard rock drilled. Generally, a core box can hold up to 7.5 m of drilled rock.

TOPOGRAPHIC SURVEY

(1) Length to be surveyed:-

(a) Upstream side- According to the topography depending on the FRL and the slope of the river bed.

Minimum 2 km

(If the length of back water effect at FRL of the structure is more than 2 km, that much length should be surveyed)

(b) Downstream side

Minimum-1.5 km

(2) Intervals of Longitudinal and Cross section to be taken:-

(a) Upstream side- Depending on the FRL and the slope of the river bed

Upto 60m @ 15m interval

60 m to 500 m @ 50 m interval

500 m to 1000 m @ 100 m interval

Above 1000 m @ 500 m (Additional C/S to be taken if observing steep undulation during reconnaissance survey)

(b) Downstream side-

Up to 60 m @ 15 m interval

60 m to 500 m @ 100 m interval

500 m to 1000 m 250 m interval

Above 1000 m @ 500 m (Additional C/S to be taken if observing steep undulation during reconnaissance survey)

Signed by Priyesh R

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Chief Engineer

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All Chief Engineers/ Superintending Engineers/ Executive engineers IDR B Website