

2. REGULATORS

| S. NO. | ITEM / COMPONENT | REFERENCE |
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| I | GENERAL: | |
| a | The proposals be scrutinized & verified in respect of levels & relevant information by the concerned Unit Officers before communicating to CDO for vetting. | |
| b | Location & ayacut details have to be ascertained & confirmed by the concerned Unit Officers. | |
| II | SITE SURVEY: | |
| 1 | The Site survey be furnished as per the check slip | Check slip enclosed. |
| a | Report accompanying the site survey along with approved HPs of the canal on U/S & D/S of Regulator with typical canal section, list of structures on either side of structure for 3 Kms. | |
| b | L.S. of the canal for a distance of 1.0 Km. | |
| c | If the Regulator is clubbed with Road Bridge, mention the Road level and type of bridge i.e., Single Lane or Double Lane bridge. | |
| d | Approved HPs of off taking distributary in case of O.T. sluice combined with Regulator & mention the ayacut for the O.T., sill level proposed and the heighest field level. | |
| e | Borehole data / Trial pit particulars up to hard strata or for minimum depth of 2.0m for shallow foundations & up to 1/3 rd embedment depth below maximum scour depth for deep foundations with minimum 3 nos T.Ps covering Abutment, Pier and Stilling Basin. | Table I&II of APERL for test results of foundation soils enclosed. IRC: 78 -2000; |
| III | HYDRAULIC DESIGN : | |
| a | Note on design features indicating the vents proposed and design considerations etc., for all the components of the structure. | |
| b 1. | H.Ps of canal on both U/S & D/S. | |
| 2 | (i) Fixation of crest level, vent way calculations and crest width, Glacis profile with U/S & D/S slopes with radius of curves. (ii) Minimum thickness of Pier shall be 1000 mm to 1500 mm. | |
| | (a) For Head Regulator | IS:6531-1994 |
| | (b) For Cross regulator | IS:7114-1993 |
| | (c) For Escape regulator | IS:6936-1992 |
| | (d) For Bed regulator | Text book of Irrigation Manual by W.M.Ellis |

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| 3 | Energy dissipation calculations for determining the cistern level and length of Stilling Basin. These calculations are to be done for various discharge conditions namely for 100%, 75%, 50%, 25%, 15%, 10% and 5% for one gate open, two gates open etc., conditions. | IS: 4997-1968 |
| 4 | Scour depth calculations $R = 1.34 (q^2/f)^{1/3}$ with relevant factor of safety | IS:7784 (Part-I)-1993 |
| 5 | If Road Bridge is combined refer IRC code also. | IRC:78-2000 |
| 6 | Exit gradient calculations $G_E = (H/d) \times [1/(\pi \sqrt{\lambda})]$; Where $\lambda = [1 + \sqrt{(1 + \alpha^2)}]/2$; $\alpha = b/d$; | CBIP-12 & IS:7114 - 1973 |
| 7 | Design of floor thickness as per Khosla's theory | CBIP-12 & IS:7114 – 1973 |
| 8 | Protection works on U/S and D/S side. In case of regulator combined with offtake / surplus escape refer offtake / surplus escape design guidelines issued separately. | IS:7784 (Part-I)-1993 |
| IV | SUPERSTRUCTURE: 1. D.L.Bridge (OR) 2. S.L.Bridge (OR) 3. Hoist bridge slab The top of hoist bridge level shall be tentatively finalized considering crest level + 2 x Ht of gate + free board (0.6 to 0.9m) + thickness of hoist slab subject to confirmation of mechanical drawings. 4. Design of bearing as given in MOST drawings 5. Breast wall wherever necessary. | MOST drawings, IRC:5-1998, IRC:6-2000, IRC:21-2000 IRC:83(Part-II)-1987. IS:456-2000: |
| V | SUB STRUCTURE: 1. Pier, abutment, wings & Returns (with bridge) 2. Pier, abutment, wings & Returns (without bridge) and hoist portion 3. Wings and returns be designed adopting TVA procedure/Coloumb's theory/ Rankine's theory adopting top width of 500 mm | IRC:5-1998 IRC:6-2000 IRC:21-2000 and IRC:78-2000 IS: 456-2000, IS: 3370(Part-I&II)-1965 TVA Hand book |

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| | 4 Adequate gate grooves in pier & abutment and provision of sill beam and embedded metal parts shall be made keeping in view Hydro Mechanical Guidelines issued by CDO. | Hydro Mechanical guidelines by CDO. |
| | 5 Foundations for pier, abutment, wings & Returns etc | |
| | (i) For shallow and open foundation | IS:1904-1986 |
| | (ii) For raft foundation | IS: 2950-1981,Part-I |
| | (iii) For pile foundation | IS: 2911-1979(part-I Sec 1, 2, 3, 4) IS:2911-1980 (part-II) IS:2911-1980 (Part-III) IS:2911-1985 (Part IV) |
| | Unless otherwise mentioned, the minimum grade of concrete shall be M 10 for PCC, M 20 for RCC. | |
| | 6.Miscellaneous Items: | |
| | a) weep holes in retaining walls | IS:7784(part I)-1993 |
| | b) Bearings | IS:7784(part I)-1993 |
| | c) Expansion, contraction & construction joints | IS:3370(part I)-1965 |
| VI | DRAWINGS | |
| | a) General Layout on net level plan duly showing contours. | |
| | b) General plan and sectional elevations, plan indicating half plan at top & half plan at foundation level, L.S. along the canal & C/S across the canal along with T.P. particulars. | Scale 1:50 or 1:100 or 1:200 |
| | c) Sections of Pier, abutment, wings and Returns . | Scale 1:25 or 1:50 |
| | d) R.C.C.details of deck slab, hoist slab and other miscellaneous items. | Scale 1:25 or 1:20 or 1:10 |
| | e)The drawing shall contain assumptions made, TPs, specifications, HPs of canal, bar bending schedule (wherever applicable) , stress table etc., | |
| | f)To be mentioned specially Hoist Bridge level, gate grooves. A special note shall be inscribed duly mentioning that the gate grooves are indicative and separate Hydro Mechanical Drawing shall be referred for details of Embedded Metal parts and Secondary Concreting. | |