Government of Rajasthan

Water Resources Department

Check list of various Hydraulic/Structural components related to Canal Design

INDEX

Check list for Village Road Bridge (VRB)

S.No.	Information Check List	Response (Attached Y/N)	Remarks
1.	Design Discharge of Canal		
2.	Canal Bed level at Bridge site		
3.	Full Supply Depth		
4.	Side slope of Canal (H:V)		
5.	Free Board		
6.	Bed Slope of Canal		
7.	L-section of canal at Bridge site		
8.	S.B.C of Strata @ interval of 1.0 m up to 4.0 m Depth		
9.	Type of Strata		
10.	Velocity		
11.	Angle of Crossing in Degree		
12.	Silt Factor		
13.	Avg. Obstruction Width of Pier		
14.	Linear Waterway		
15.	Depth of Flow at U/S and D/S of Bridge		
16.	Distance (U/S&D/S of the crossing) at which Cross-Section should be Taken		

17.	Highest Flood Level		
18.	Stream Boundaries		
19.	Safety Measures Against Scouring		

Bridge Data

S.No.	Information Check List	Response (Attached Y/N)	Remarks
1.	Type of Bridge		
2.	Carriageway		
3.	IRC Loading		
4.	Span of Bridge		
5.	Maximum Flood Level		
6.	Afflux		
7.	Scouring Depth		
8.	Maximum Scouring Depth		
9.	Thickness of Approach Slab		
10.	Length of Approach Slab		
11.	Length of Span		
12.	Depth of Foundation		
13.	Vertical Clearance as per Discharge		

14.	No. of Spans		
15.	Carriageway Width		
16.	Width of Footpath		
17.	Width of Parapet wall		
18.	Height of Parapet wall		
19.	Side Slope of Abutment above Bed Level Water Side: Land Side:		
20.	Road Top Level		
21.	Concrete Grade for Deck Slab		
22.	Pier/ Abutment Cap		
23.	Top Width of Pier/ Abutment		
24.	Grade of Concrete for Foundation		
25.	Height of Approach Road		
26.	Road Top Level		
27.	Permissible Comp. Stress of Masonry		
28.	Permissible Comp. Stress of Concrete		
29.	Permissible Comp. Stress of Steel		
30.	Density of Concrete Reinforcement		
31.	Minimum Depth of Foundation Below HFL		

Check list for District Road Bridge (DRB)

S.No.	Information Check List	Response (Attached Y/N)	Remarks
1.	Design Discharge of Stream/ Drain		
2.	Stream Bed level at Bridge site		
3.	Full Supply Depth		
4.	Free Board		
5.	L-section of Stream/ Drain at Bridge site		
6.	S.B.C of Strata @ interval of 1.0 m up to 4.0 m Depth		
7.	Type of Strata		
8.	Velocity		
9.	S.B.C of Sub-Soil @ interval of 1.0 m up to 4.0 m Depth		
10.	Angle of Crossing in Degree		
11.	Silt Factor		
12.	Natural Surface Level		
13.	Avg. Obstruction Width of Pier		
14.	Stream Width		
15.	Linear Waterway		
16.	Depth of Flow at u/s and d/s of Bridge		

17.	Distance (u/s & d/s of the crossing) at which Cross-Section should be Taken		
18.	Highest Flood Level		
19.	Stream Boundaries		
20.	Safety Measures Against Scouring		

Bridge Data

S.No.	Information Check List	Response (Attached Y/N)	Remarks
1.	Type of Bridge		
2.	Carriageway		
3.	IRC Loading		
4.	Span of Bridge		
5.	Maximum Flood Level		
6.	Afflux		
7.	Scouring Depth		
8.	Maximum Scouring Depth		
9.	Thickness of Approach Slab		
10.	Length of Approach Slab		
11.	Length of Span		

12.	Depth of Foundation		
13.	Vertical Clearance as per Discharge		
14.	No. of Spans		
15.	Carriageway Width		
16.	Width of Footpath		
17.	Width of Parapet wall		
18.	Height of Parapet wall		
19.	Seismic Zone		
20.	Side Slope of Abutment above Bed Level Water Side: Land Side:		
21.	Road Top Level		
22.	Concrete Grade for Deck Slab		
23.	Expansion Joint		
24.	Pier/ Abutment Cap		
25.	Top Width of Pier/ Abutment		
26.	Return Wall/ Wing Wall		
27.	Weep holes & Water Pouts		
28.	Grade of Concrete for Foundation		

29.	Height of Approach Road		
30.	Relief Culverts		
31.	Floor Protection Work		
32.	Road Top Level		
33.	Permissible Comp. Stress of Masonry		
34.	Permissible Comp. Stress of Concrete		
35.	Permissible Comp. Stress of Steel		
36.	Density of Concrete Reinforcement		
37.	Minimum Depth of Foundation Below HFL		
38.	Minimum Span and Clearance		
39.	Depth of Foundation		

Check list for Aqueduct

S.No.	Information Check List	Response (Attached Y/N)	Remarks
1.	Index Map on full size GT Sheets showing location of Cross Drainage Structure		
2.	Catchment Area Map on GT Sheets		
3.	Duly approved L-Section of Canal and Nallah/River		
4.	Cross Section of the Drainage Channel		
5.	L-section of Stream/ Drain at Bridge site		
6.	S.B.C of Strata @ interval of 1.0 m up to 4.0 m Depth		
7.	Short duration intensity and frequency of Rainfall		
8.	Seismic Disturbance		
9.	Salient Design feature of Structures existing u/s &d/s		
10.	Maximum intensity of the Rainfall with year		
11.	Maximum observed Discharge at site		
12.	Design Flood for Drainage Channel		
13.	Soil Properties		
14.	Highest Flood Level achieved in past		

For the checking/ vetting the design and drawing of the Cross Drainage Structure, the following specified data must also be made available-

S.No.	Particulars	Canal		River/Drain		
		U/S	D/S	U/S	D/S	
1.	Discharge	…….Cumecs	…..Cumecs	…….Cumecs	…..Cumecs	
2.	Bed Level	….m	….m	….m	….m	
3.	F.S.D	….m	….m	….m	….m	
4.	F.S.L	…..m	…m	…..m	…m	
5.	Free Board	….m	….m	….m	….m	
6.	T.B.L	….m	…..m	….m	…..m	
7.	Side Slope(H:V)	……..	……	……	……..	
8.	Bed Width	….m	…..m	….m	…..m	
9.	Velocity	….m/sec	…..m/sec	….m/sec	…..m/sec	
10.	H.F.L			…..m	……m	
11.	General Ground Level			……m	…..m	
12.	Subsoil Water Level			……m	…..m	
13.	Nature of Bed Material and value of Manning's Rugosity Coeff 'n'					
14.	Lacey's Silt Factor					

Check list for Head & Cross Regulators

S.No.	Information Check List	Response (Attached Y/N)	Remarks
1.	Index Map on full size GT Sheets showing location of Cross Drainage Structure		
2.	Catchment Area Map on GT Sheets		
3.	Duly approved L-Section of Canal and Nallah/River		
4.	Strata Details		
5.	L-section of Stream/ Drain at Bridge site		
6.	S.B.C of Strata		
7.	Short duration intensity and frequency of Rainfall		
8.	Seismic Disturbance Details		
9.	Salient Design feature of Structures existing u/s &d/s		
10.	Maximum intensity of the Rainfall with year		
11.	Maximum observed Discharge at site		
12.	Design Flood for Drainage Channel		
13.	Soil Properties		
14.	Linear Waterway as per IS: 7114-1973		
15.	Downstream Cistern Dimension as per IS: 4997-1968		
16.	Safety Check for Exit Gradient		

For the checking/ vetting the design and drawing of the Cross Drainage Structure, the following specified data must also be made available-

S.No.	Particulars	Parent Canal		Distributary	
		U/S	D/S	U/S	D/S
1.	Discharge	…….Cumecs	…..Cumecs	…….Cumecs	…..Cumecs
2.	Bed Level	….m	….m	….m	….m
3.	F.S.D	….m	….m	….m	….m
4.	F.S.L	…..m	…m	…..m	…m
5.	Free Board	….m	….m	….m	….m
6.	T.B.L	….m	…..m	….m	…..m
7.	Side Slope (H:V)	……..	…….	…….	……..
8.	Bed Width	….m	…..m	….m	…..m
9.	Velocity	….m/sec	…..m/sec	….m/sec	…..m/sec
10.	H.F.L	….m	…..m	….m	…..m
11.	General Ground Level	….m	…..m	….m	…..m
12.	Subsoil Water Level	….m	…..m	….m	…..m
13.	Nature of Bed Material and value of Manning's Rugosity Coeff 'n'				
14.	Lacey's Silt Factor				

Check List for Canal Design

Name of project :-

Total GCA:-

Total CCA:-

S.No.	Information Check List	Response (Attached Yes/No)	Remarks
1.	Duly approved L-section of Canal.		
2.	Duly approved Cross-section of Canal @ Interval of 100.00 m U/S and D/S of canal.		
3.	Design Data of Canal: a. Design Discharge b. Full Supply Depth c. Slope of Canal d. Canal Bed Level e. Free-board		
4.	Type of soil through which the canal is laid		
5.	Canal is Lined/Unlined		
6.	Design and Drawing to be submitted duly signed by concerned zonal officers		

Check List for Micro irrigation Design(PIN)

Name of Project:-

Total GCA in Ha.:-

Total CCA in Ha. :-

S.No.	Information Check List	Response (Attached Yes/No)	Remarks
1.	Water Allowance (Cusecs/1000 acres)		
2.	Type of irrigation i.e. Drip/Sprinkler		
3.	Intensity of irrigation / Efficiency		
4.	Area of chak in Ha.		
5.	Area of subchak in Ha.		
6.	Topographical map of area		
7.	Micro survey of command area with contour interval of 0.50M		
8.	Residual head at each outlet		
9.	Water requirement for crop per day		
10.	Day of Rotation for crop		
12.	Cropping pattern		
13.	Depth of water required for crop		
14.	Specification of Sprinkler i.e pressure, throw distance, discharge etc.		
15.	Type of pipe used in distribution network and rising main		
16.	Grade and class of pipe		
17.	Details of individual khasra of whole command with type of land as per revenue record		
18.	Design and Drawing to be submitted duly signed by concerned zonal officers		
19.	Reference of IS code		

Check list for Vetting the Drawings of Canal Head/Cross Regulator Gates & Rope Drum Hoist

Name of Work:

S.No.	Information Check List	Response (Attached Y/N)	Remarks
A	**Design of Canal Head/Cross Regulator/Escape Gate**		
1	No. of Bays		
2	Type of gate		
3	Clear width of Opening		
4	C/C of Roller tracks		
5	Level of Top of Pier		
6	Crest level		
7	Width of Pier		
8	F.S.L		
9	F.S.D		
10	Designed head		
11	Height of Pier above Crest		
12	Groove Size		
13	Skin Plate & Sealing arrangement (up stream side/ down stream side)		

14	Height of gate		
15	Operation (head condition)		
16	Type of wheel assembly		
17	Minimum thickness of skin plate		
18	Minimum thickness of seal seats		
19	Types of seals		
20	Grade of Concrete to be used:- First stage Second stage		
21	Design & Drawing to be submitted according to IS code 4622, IS 5620 & IS 9349 duly recommended by concerning zonal officers.		
B	**Design of Rope Drum Hoist**		
1	No of Hoist		
2	Capacity of hoist		
3	Total lift		
4	Operating speed		
5	No of drums		
6	No of falls		
7	Wire rope specifications		
8	Design & Drawing to be submitted according to IS code 6938 & IS 2266 duly recommended by concerning zonal officers		

Check list for Vetting the Drawings of Radial Gate & Hydraulic Hoist for Dam

Name of Work:-

S.No.	Information Check List	Response (Attached Y/N)	Remarks
A	**Design of Radial Gate**		
1	No. of Gates		
2	Vent Width		
3	Vent height (above Sill to FRL)		
4	Radius to inside of skin plate		
5	Sill level		
6	Spill way crest level		
7	Trunnion level		
8	Sill beam central line from center line of crest		
9	FRL		
10	MWL		
11	Design head		
12	Level of Top of gate		
13	Level of Top of Shield		
14	Level of top of pier		

15	Distance of bottom of the gate when fully lifted position		
16	Type of hoisting arrangement		
17	Type of Arms		
18	Grade of Concrete to be used:- First stage Second stage		
19	Design & Drawing to be submitted according to IS code 4623, IS 2062 & IS 800 duly recommended by concerning zonal officers.		
B	**Design of Hydraulic Hoist**		
1	No of Hoist		
2	Capacity of hoist		
3	Stroke Length		
4	Hoist speed		
5	Lowering speed		
6	Working pressure		
7	Test pressure		
8	Type of mounting		
8	Design & Drawing to be submitted according to IS code 10210 & IS 2825 duly recommended by concerning zonal officers		

Check list for Vetting the Drawings of Gantry Crane for Operation of Spillway Stoplog Gate

Name of Work:-

S.No.	Information Check List	Response(Attached Y/N)	Remarks
	Design of Gantry crane		
1	Type of crane		
2	Class and duty		
3	Span of the crane(C/C of G.T rails)		
4	C/C of crab rails i.e. C/C of Rail girder		
5	Level of Top of Pier		
6	Column C/C at bottom		
7	Total lift		
8	Operating speeds Hoist Crab travel Gantry travel		
9	Cross travel rail size		
10	Gantry travel rail size		
11	Operated by		
12	Length of the gantry track		
13	Lifting beam type		
14	Type of Control system		
15	Design & Drawing to be submitted according to IS code 3177, IS 807 & IS 6938 duly recommended by concerning zonal officers.		

Check list for Vetting the Drawings of Screw Hoist for operation of Sluice Gate

Name of Work:-

S.No.	Information Check List	Response (Attached Y/N)	Remarks
	Design of Screw Hoist		
1	Capacity of Hoist		
2	Normal speed		
3	Lift of gate		
4	Factor of safety		
5	Design & Drawing to be submitted according to IS code IS 11228 duly recommended by concerning zonal officers.		