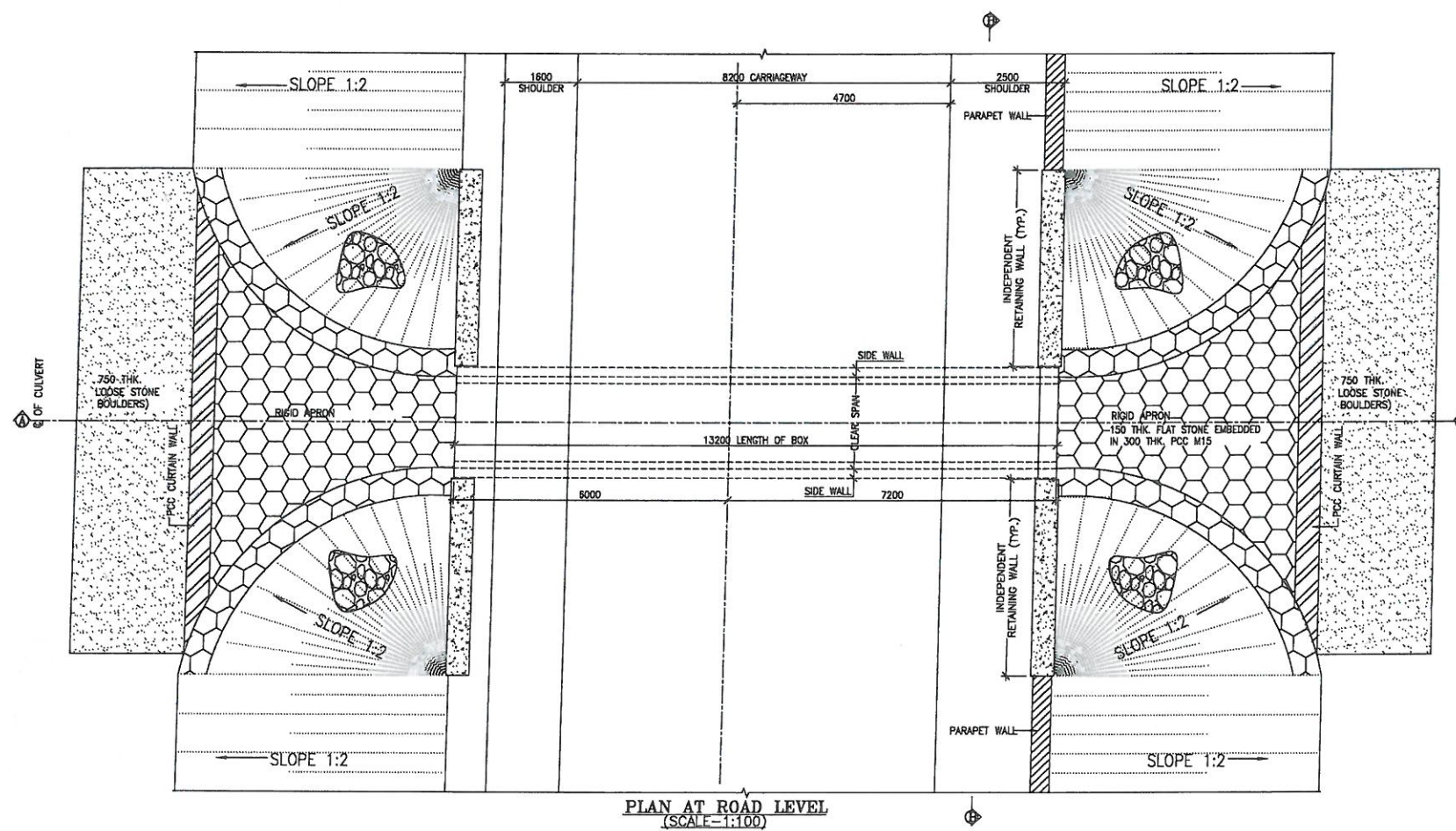
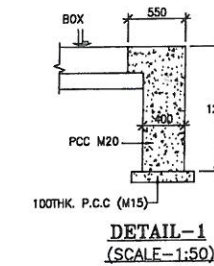
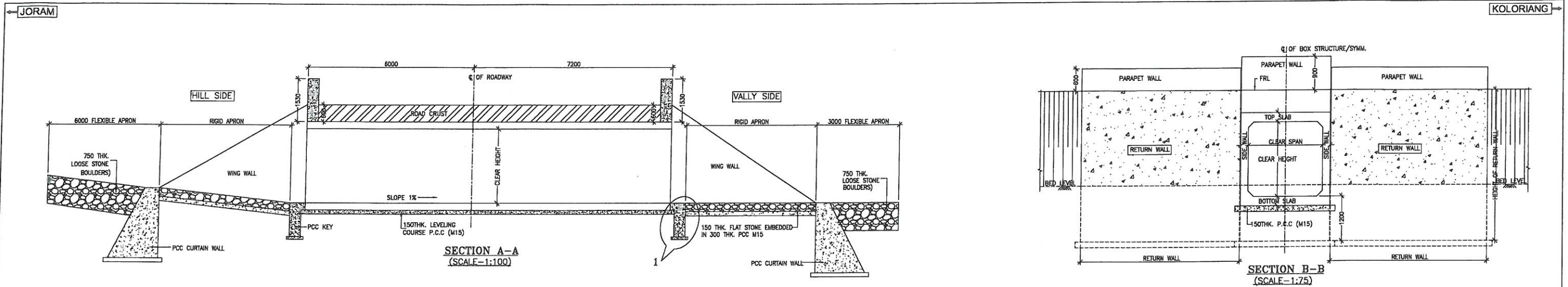




- NOTES :**
1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 2. GRADE OF CONCRETE :-
BOX STRUCTURE - M30
RETURN WALL - M30
APPROACH SLAB - M30
RAILING - M30
CURTAIN WALL - M15
LEVELING COURSE(P.C.C) - M15
CRASH BARRIER- M40 & KERB-M30
 3. GRADE OF STEEL F_y=500 AS PER I.S.-1786.
 4. LIFE LOSE ANALYSIS HAS BEEN DONE FOR 3 LANE IN CONNECTION WITH THE RECOMMENDATION OF IRC: 6-2010 & WORTH EFFECT HAS BEEN CONSIDERED FOR DESIGN.
 5. PROPERTIES OF BACKFILL SOIL $\gamma = 1.81/m^3$, $\phi = 30^\circ$.
 6. FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MoRTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 7. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 8. THE SOIL BELOW FOUNDATION LEVEL SHOULD BE WELL COMPACTED TO ACHIEVE MINIMUM BEARING CAPACITY OF 101/SQM.

CLIENT :

NHIDCL
BUILDING INFRASTRUCTURE - BUILDING THE NATION

National Highways & Infrastructure Development Corporation Ltd. (NHIDCL)

PROJECT :

CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING OF JORAM - KOLORIANG ROAD (NH-713) FROM KM. 20.00 TO KM. 70.00 & KM. 138.00 TO KM. 158.00 (TOTAL LENGTH 70 KM) IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE

DESIGN CONSULTANT:

Voyants Solutions Pvt Ltd.
403, 4th Floor, Park Centra,
Sector-30, Opp. 32nd Milestone, NH-8
Gurgaon-122002, Haryana
CIN- U74140HR2004PTC046918
Ph: 0124-4598200
Fax: 0124-4019051
E-mail: info@voyants.in, www.voyants.in

REV.	DATE	DESCRIPTION
R0	20/05/2016	

DRAWN BY : PD
DESIGNED BY : SG
APPROVED BY : KG
SCALE : AS SHOWN

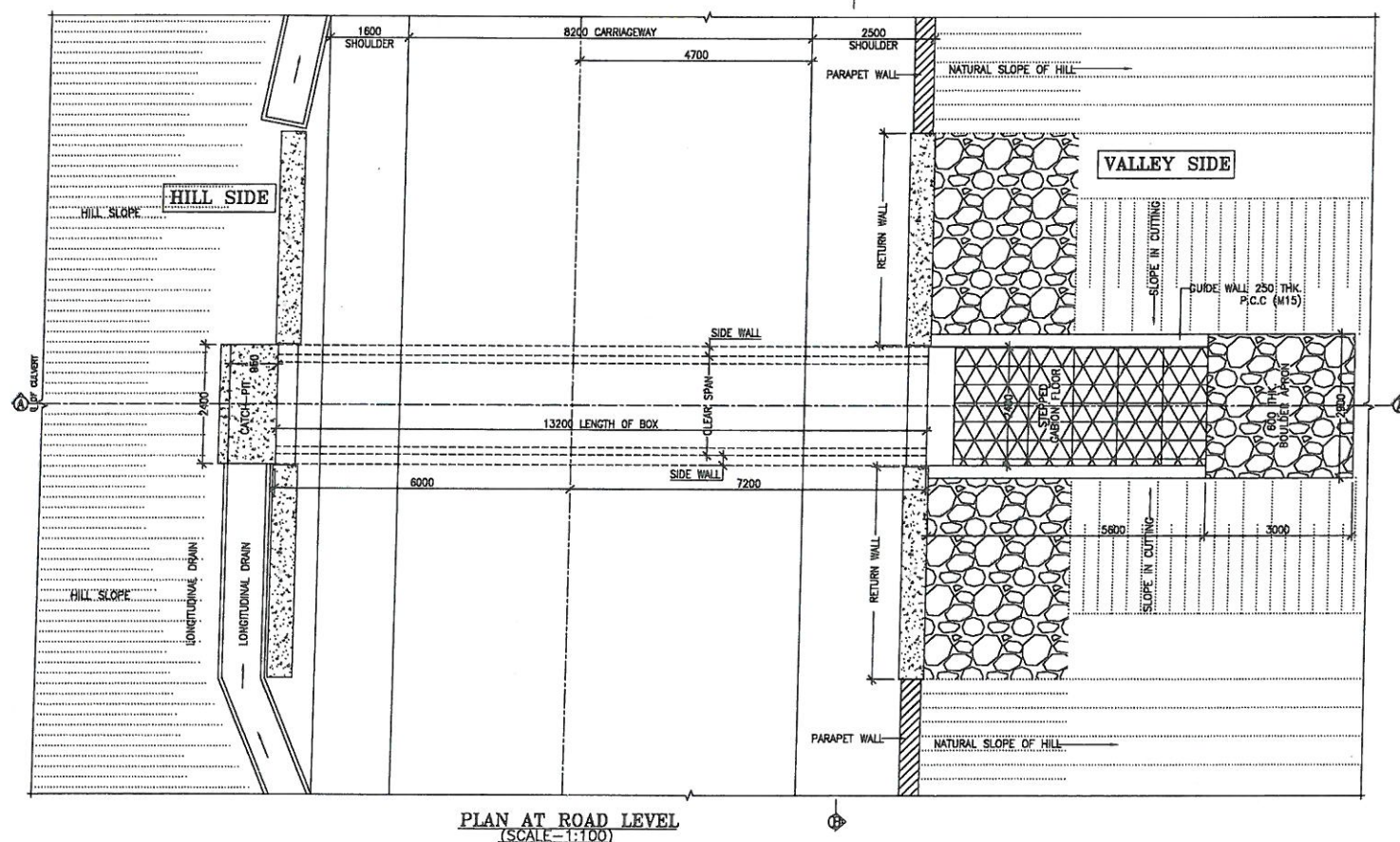
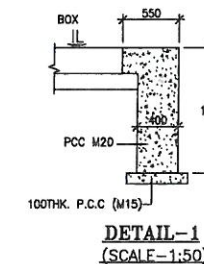
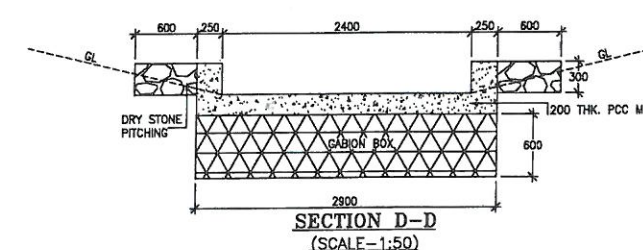
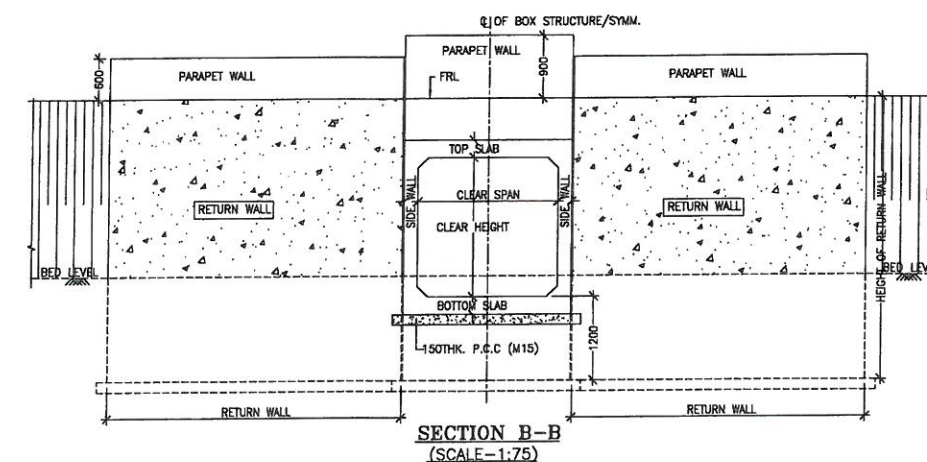
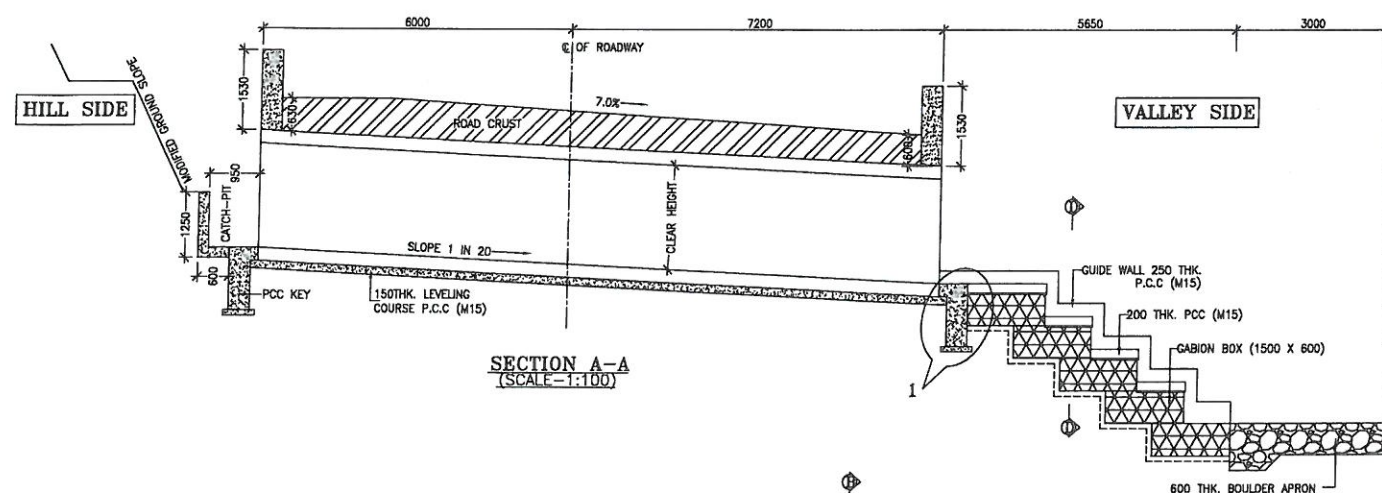
TITLE :
TYPICAL DRAWING OF BOX CULVERT TYPE-01

DRG. NO. :
VSPL/1438/JK/DPR/GAD/BOX-01 (SHEET 01 OF 05)

REVISION : R0
SEPT 2016

JORAM

KOLORIANG



- NOTES :**
1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 2. GRADE OF CONCRETE :-
BOX STRUCTURE - M30
RETURN WALL - M30
APPROACH SLAB - M30
RAILING - M30
CURTAIN WALL - M15
LEVELING COURSE(P.C.C) - M15
CRASH BARRIER- M40 & KERB-M30
 3. GRADE OF STEEL Fe-500 AS PER I.S.-1786.
 4. LIFE LODGE ANALYSIS HAS BEEN DONE FOR 3 LANE IN CONNECTION WITH THE RECOMMENDATION OF IRC-6-2010 & WORTH EFFECT HAS BEEN CONSIDERED FOR DESIGN.
 5. PROPERTIES OF BACKFILL SOIL $\gamma=1.81/m^3$, $\phi=30^\circ$.
 6. FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 7. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 8. THE SOIL BELOW FOUNDATION LEVEL SHOULD BE WELL COMPACTED TO ACHIEVE MINIMUM BEARING CAPACITY OF 10t/50m.

CLIENT :



National Highways & Infrastructure Development
Corporation Ltd. (NHIDCL)

PROJECT :

CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY
AND DETAILED PROJECT REPORT FOR TWO LANE OF JORAM -
KOLORIANG ROAD (NH-713) FROM KM. 20.00 TO KM. 70.00 & KM. 138.00 TO
KM. 158.00 (TOTAL LENGTH 70 KM)
IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE

DESIGN CONSULTANT:



Voyants Solutions Pvt Ltd.

403, 4th Floor, Park Centra,
Sector-30, Opp. 32nd Milestone, NH-8
Gurgaon-122002, Haryana
CIN- U74140HR2004PTC046918
Ph: 0124-4598200
Fax: 0124-4019051
E-mail: info@voyants.in, www.voyants.in

REV.	DATE	DESCRIPTION
R0	20/05/2016	

DRAWN BY :	PD
DESIGNED BY :	SG
ADPROVED BY :	KG
SCALE :	AS SHOWN

TITLE :	TYPICAL DRAWING OF BOX CULVERT TYPE-02
DRG. NO. :	VSPL/1438/JK/DPR/GAD/BOX-01 (SHEET 02 OF 05)
REVISION : R0	SEPT 2016

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Type of Structures (Pipe, Slab, Box, Arch)	No. of span x Span length(m)	Width of Culvert (m)	Overall Condition	Recommendation	Improvement proposal	Proposed Type of Structures	Proposed Span Arrangement (m)	Proposed width(m)
1	20+595	20+400	Slab				New Construction	New 2- Lane	RCC Box	1x2.0	12.0
2	20+848	20+470	Pipe				New Construction	New 2- Lane	RCC Box	1x2.0	12.0
3	21+025	20+600	Pipe	1x0.6	6.3	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
4	22+050	21+480	Slab	1x1.8	6.3	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
5	22+100	21+530	Pipe	1x0.6	4.8	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
6	22+450	21+810	Slab	1x1.5	6.3	-	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
7	22+800	22+140	Pipe	1x0.6	5.8	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
8	22+950	22+250	Slab	1x1.0		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
9	23+020	22+320	Slab	1x1.0			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
10	24+565	23+650	Slab	1x1.0			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
11	25+350	23+870	Slab	1x1.0	5.5		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
12	25+590	23+930	Slab	1x1.5	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
13	25+800	24+060	Slab	1x1.0	5.3	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
14	26+980	25+100	Slab	1x1.0			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
15	27+430	25+447	Slab	1x1.0	5.3	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
16	28+080	25+870	Slab	1x1.0		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
17	28+300	26+030	Slab	1x1.0	5.5		New Construction	New 2- Lane	RCC Box	1x3.0x3.0	12.0
18	28+380	26+090	Pipe	1x0.6	5.5	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
19	28+480	26+170	Slab	1x1.0	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
20	28+910	26+580	-	-	-	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
21	28+950	26+600	Slab	1x1.0	5.0	-	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
22	28+990	26+630	Slab	1x1.0		Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
23	29+120	26+720			5.5		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
24	30+420	27+790	Slab	1x0.9	5.8	Poor	New Construction	New 2- Lane	RCC Box	1x2.5x2.0	12.0
25	33+910	30+900	Not visible	-	6.0	-	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
26	33+970	30+980	Pipe	1x0.5	5.5	-	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
27	34+620	31+540	Slab	1x1.0	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
28	36+890	33+560	Slab	1x1.0	5.9	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
29	37+370	33+990	Slab	1x1.0	5.9	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
30	37+490	34+080	Slab	1x1.0	5.9	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
31	38+360	34+860	Slab	1x1.0	5.9		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
32	39+450	35+780	Slab	1x1.0		Fair	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
33	39+640	35+880	Slab	1x1.0			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
34	40+500	36+510	Slab	1x1.0	6.3	Fair	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
35	40+700	36+680	Slab	1x1.0	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
36	40+840	36+760	Slab	1x1.0		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
37	40+950	36+880	Slab	1x8.0			New Construction	New 2- Lane	RCC Box	1x6.0	12.0
38	41+210	37+060	Slab	1x1.2			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
39	41+550	37+170	Slab	1x1.0	6.3		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
40	41+730	37+310	Slab	1x1.0	6.3	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
41	41+810	37+390	Slab	1x1.0	6.3	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
42	42+160	37+560	Slab	1x1.0	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
43	42+340	37+850	Slab	1x1.2	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
44	42+560	37+930	Slab	1x1.0		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
45	44+700	39+700	Slab	1x1.0	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
46	45+050	39+940	Slab	1x1.0	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
47	45+675	40+270	Pipe	1x0.6		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
48	46+210	40+680	Slab	1x1.0	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
49	47+300	41+710	Slab	1x1.0	5.7		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
50	47+350	41+780	Slab	1x1.5		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
51	49+600	43+670	Slab	1x1.0	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
52	50+290	44+160	-	-	-	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
53	51+450	45+130	Pipe			Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
54	51+500	45+170	Slab	-	5.0		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
55	51+860	45+330	Slab	1x1.0	-		New Construction	New 2- Lane	RCC Box	1x2.0	12.0
56	52+255	45+640	Pipe	1x0.6	5.0		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
57	52+475	45+810	Pipe	1x0.6		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
58	53+550	46+800	Pipe	1x0.6		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
59	53+920	46+930	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
60	54+620	47+410	Pipe	1x0.9		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
61	55+550	47+740	Not visible	-	5.0		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
62	55+610	48+080	Slab	1x1.0	5.0	-	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
63	56+570	48+890	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
64	56+895	49+190	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Type of Structures (Pipe, Slab, Box, Arch)	No. of span x Span length(m)	Width of Culvert (m)	Overall Condition	Recommendation	Improvement proposal	Proposed Type of Structures	Proposed Span Arrangement (m)	Proposed width(m)
65	57+030	49+280	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
66	57+160	49+400	-		5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
67	57+320	49+530	Slab	1x1.0	5.5	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
68	57+450	49+570	Slab	1x1.0	5.3	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
69	57+900	49+980	Slab	1x1.5			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
70	58+320	50+250	Slab	1x2.0			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
71	58+325	50+310	Slab	1x1.0	5.5		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
72	58+500	50+360	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
73	59+000	50+850	Slab	1x1.0	6.0	-	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
74	59+150	50+980	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
75	59+270	51+090	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
76	59+494	51+280	Slab	1x1.5		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
77	59+550	51+330	Pipe	1x0.9			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
78	60+160	51+910	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
79	60+600	52+280	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
80	61+080	52+680	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
81	61+190	52+790	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
82	61+330	52+910	Slab	1x6.0	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x6.0x4.0	12.0
83	61+510	52+980	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
84	61+700	53+140	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
85	61+810	53+270	Not Visible	-	-	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
86	61+950	53+370	Slab	1x1.0	6.0	-	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
87	62+280	53+700	Slab	1x1.5		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
88	62+410	53+810	Slab	1x1.0	5.0		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
89	62+510	53+920	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
90	63+125	54+410	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
91	63+260	54+440	Slab	1x1.5		Poor	New Construction	New 2- Lane	RCC Box	1x2.0	12.0
92	63+280	54+570	Slab	1x1.5			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
93	63+560	54+740	Slab	1x1.0	5.0		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
94	63+650	54+820	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
95	63+750	54+910	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
96	63+820	54+970	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
97	64+125	55+190	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
98	64+355	55+270	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
99	64+455	55+330	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
100	64+560	55+460	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
101	64+610	55+500	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
102	64+740	55+600	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
103	64+800	55+640	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
104	65+300	55+900	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
105	65+575	56+150	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
106	65+740	56+320	Slab	1x1.0	5.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
107	66+350	56+790	Slab	1x1.0	5.0		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
108	66+790	57+200	Slab	1x2.2			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
109	68+000	58+160	Slab	1x1.0	5.0		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
110	68+680	58+820	Slab	1x1.5			New Construction	New 2- Lane	RCC Box	1x2.0	12.0
111	69+110	59+250	Slab	1x1.0	5.0		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
112	138+900	138+810	Slab	1x1.5	6.3	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
113	139+090	138+960	Slab	1x1.6	6.1	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
114	139+125	138+980	Slab	1x1.5	6.3	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
115	139+310	139+170	Slab	1x1.6	6.5	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
116	139+490	139+320	Slab	1x1.5		Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
117	139+540	139+360	Slab	1x1.5	5.9		New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
118	139+910	139+720	Slab	1x1.5	6.3	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
119	141+300	141+040	Slab	1x2.8	8.2	Poor	New Construction	New 2- Lane	RCC Box	1x3.0x3.0	12.0
120	141+450	141+180	Slab	1x2.0	6.4	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
121	141+770	141+455	Slab	1x3.0	8.6	Poor	New Construction	New 2- Lane	RCC Box	1x3.0x3.0	12.0
122	142+045	141+680	Slab	1x1.8	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
123	142+590	142+200	Slab	1x2.5	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.5x2.0	12.0
124	142+640	142+270	Slab	1x2.0	6.0	Poor	New Construction	New 2- Lane	RCC Box	1x2.0x2.0	12.0

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Type of Structures (Pipe, Slab, Box, Arch)	No. of span x Span length(m)	Width of Culvert(m)	Overall Condition	Recommendation	Improvement proposal	Proposed Type of Structures	Proposed Span Arrangement (m)	Proposed width(m)
1	20+294	20+220	Pipe	1x0.6			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
2	21+005	20+580					Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
3	21+125	20+690	Slab	1x1.4	5.4	Fair	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
4	21+296	20+800	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
5	22+300	21+710	Not visible	-	5.7	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
6	22+470	21+840	Pipe	1x0.6	5.8	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
7	22+700	22+050	Slab	1x1.0	5.7	Fair	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
8	23+150	22+400	Slab	1x1.0			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
9	23+200	22+460	Slab	1x1.0	5.7		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
10	24+180	23+350	Slab	1x1.0	5.9	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
11	24+345	23+490	Slab			Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
12	25+850	24+120	Slab	1x1.0	5.3	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
13	26+025	24+300	Slab	1x1.5	5.3	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
14	26+310	24+500	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
15	26+380	24+580	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
16	26+625	24+680	Pipe	1x0.6		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
17	26+900	25+050	Slab	1x1.0			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
18	27+200	25+230	Slab	1x0.9	5.5		Reconstruction	New 2- Lane	RCC Box	1x2.5x2.0	12.0
19	27+600	25+550	Slab	1x1.0	5.4	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
20	27+650	25+600	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
21	27+740	25+680	Slab	1x1.4	5.3	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
22	27+850	25+800	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
23	28+550	26+250	-	-	-	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
24	28+610	26+310	Slab	1x1.0	6.0		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
25	29+355	26+900	Slab	1x1.0	5.5	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
26	29+560	27+030	Slab	1x1.0		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
27	29+740	27+210	Slab	1x1.0			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
28	30+070	27+470	Slab	1x1.0	4.9		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
29	30+880	28+100	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
30	31+200	28+400	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
31	33+830	30+820	Slab	-	5.8	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
32	34+140	31+140	Slab	1x1.0	5.5	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
33	34+900	31+790	Slab	1x1.0		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
34	35+010	31+900	Pipe				Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
35	35+150	32+020	Slab	1x1.0	6.0		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
36	35+270	32+130	Slab	1x1.0		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
37	35+330	32+190	Slab	1x1.0			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
38	35+460	32+310	Slab	1x1.0	6.0		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
39	35+970	32+810	Slab	1x1.0	6.5	Fair	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	11.5
40	36+175	33+010	Slab	1x1.0	5.9	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Type of Structures (Pipe, Slab, Box, Arch)	No. of span x Span length(m)	Width of Culvert(m)	Overall Condition	Recommendation	Improvement proposal	Proposed Type of Structures	Proposed Span Arrangement (m)	Proposed width(m)
41	36+300	33+150	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
42	36+490	33+320	Slab	1x1.0	5.9	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
43	37+100	33+730	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
44	37+880	34+470	Slab	1x1.0		Fair	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
45	42+925	38+260	Slab	1x1.0	5.7		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
46	43+150	38+470	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
47	43+300	38+600	Slab	1x1.0	5.8	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
48	43+390	38+670	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
49	43+400	38+690	Slab	1x1.5		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
50	43+580	38+810	Slab	1x1.0	6.0		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
51	44+075	39+130	Slab	1x1.0	5.6	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
52	44+150	39+215	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
53	44+330	39+390	Slab	1x1.0	5.7	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
54	44+500	39+540	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
55	44+925	39+830	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
56	45+270	40+050	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
57	45+520	40+170	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
58	45+740	40+300	Slab	1x1.0	6.0		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
59	46+940	41+320	Slab	1x1.0		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
60	47+050	41+430	Pipe	1x0.6			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
61	47+900	42+160	Slab	1x1.0	5.5		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
62	48+050	42+260	Slab	1x1.0	5.9	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
63	48+330	42+500	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
64	48+500	42+670	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
65	48+700	42+820	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
66	48+900	42+980	Slab	1x1.5		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
67	49+150	43+240	Slab	1x1.5			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
68	49+200	43+300	Slab	1x5.8	5.6		Reconstruction	New 2- Lane	RCC Box	1x6.0x4.0	12.0
69	49+270	43+370	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
70	49+950	43+910	Slab	1x1.0	6.0		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
71	49+990	43+940	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
72	50+050	44+000	Pipe	1x0.9		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
73	50+160	44+080	Slab	1x1.0	5.0		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
74	50+360	44+230	Slab	1x1.0	5.0	-	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
75	50+500	44+370	Slab	1x1.0	5.5	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
76	50+830	44+640	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
77	52+710	45+980	Slab	1x1.0	5.0		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
78	53+475	46+690	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
79	53+870	46+890	Slab	1x1.0	5.2		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
80	54+020	47+030	Pipe	1x0.35		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Type of Structures (Pipe, Slab, Box, Arch)	No. of span x Span length(m)	Width of Culvert(m)	Overall Condition	Recommendation	Improvement proposal	Proposed Type of Structures	Proposed Span Arrangement (m)	Proposed width(m)
81	54+050	47+070	Slab	1x1.0	5.0		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
82	55+700	48+150	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
83	56+270	48+230	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
84	57+260	49+490	Slab	1x1.0	5.0	-	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
85	57+750	49+860	Pipe	1x0.9			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
86	58+625	50+500	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
87	58+750	50+600	Not visible	-	5.4	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
88	59+640	51+400	Slab	1x1.0	5.0		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
89	59+825	51+570	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
90	60+350	52+110	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
91	62+650	54+050	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
92	62+745	54+150	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
93	62+810	54+210	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
94	64+990	55+710	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
95	65+810	56+390	Slab	1x1.5		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
96	65+950	56+490	Slab	1x1.5			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
97	66+150	56+640	-	-			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
98	66+400	56+850	Slab	1x1.0	5.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
99	66+480	56+930	Slab	1x1.5		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
100	67+480	57+760	Slab	1x3.0			Reconstruction	New 2- Lane	RCC Box	1x3.0	12.0
101	67+660	57+920	Slab	1x2.0			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
102	68+440	58+600	Slab	1x1.5		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
103	68+870	59+000	Slab	1x1.5			Reconstruction	New 2- Lane	RCC Box	1x2.0	12.0
104	138+020	138+028	Slab	1x2.6	6.7	Poor	Reconstruction	New 2- Lane	RCC Box	1x3.0x3.0	12.0
105	138+760	138+700	Slab	1x1.5	7.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
106	138+800	138+730	Slab	1x1.0	6.2	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
107	141+000	140+750	Not visible	-	-		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
108	141+135	140+880	Slab	1x1.5	6.1	-	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
109	141+500	141+230	Slab	1x1.8	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
110	142+100	141+740	Slab	1x1.8	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
111	142+320	141+960	Slab	1x2.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
112	143+455	143+000	Slab	1x1.8	5.8		Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
113	145+090	144+470	Slab	1x1.5		Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
114	145+445	144+810	Slab	1x2.8			Reconstruction	New 2- Lane	RCC Box	1x3.0x3.0	12.0
115	146+165	145+350	Slab	1x1.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
116	151+410	149+720	Slab	1x3.0	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x3.0x3.0	12.0
117	151+490	149+840	Slab	1x1.5	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x2.0x2.0	12.0
118	151+580	149+925	Slab	1x2.8	6.0	Poor	Reconstruction	New 2- Lane	RCC Box	1x3.0x3.0	12.0

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Type of Structures (Pipe, Slab, Box, Arch)	No. of span x Span length(m)	Width of Culvert (m)	Overall Condition	Recommendation	Improvement proposal	Proposed Type of Structures	Proposed Span Arrangement (m)	Proposed width(m)
1	22+560	21+920	Slab	1x1.0	6.0	Poor	Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
2	35+700	32+350	Slab	1x1.0	6.0	Poor	Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
3	37+790	34+370	Slab	1x1.0	6.0	Poor	Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
4	38+420	34+920	Slab	1x1.0	5.9	Poor	Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
5	38+500	34+950	Slab	1x1.0	6.0	Fair	Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
6	38+640	35+080	Slab	1x1.0	5.9	Fair	Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
7	38+710	35+150	Slab	1x1.0	5.9	Fair	Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
8	38+940	35+370	Slab	1x1.0	5.9	Fair	Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
9	39+125	35+485	Slab	1x1.0	5.9	Fair	Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
10	40+260	36+260	Slab	1x1.0	5.9		Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
11	49+850	43+820	Slab	1x3.0		Poor	Widening	Widening to 2-Lane	RCC Box	1x3.0	12.0
12	57+600	49+690	Slab	1x1.0	5.0	Poor	Widening	Widening to 2-Lane	RCC Box	1x2.0	12.0
13	57+650	49+750	Slab	1x3.0		Fair	Widening	Widening to 2-Lane	RCC Box	1x3.0	12.0
14	140+970	140+720	Slab	1x3.0		Poor	Widening	Widening to 2-Lane	RCC Box	1x3.0x3.0	
15	155+850	153+285	Slab	1x2.1	6.0	Poor	Widening	Widening to 2-Lane	RCC Box	1x2.1	11.5
16	156+180	153+530	Slab	1x5.9	6.0	Fair	Widening	Widening to 2-Lane	RCC Box	1x5.9	11.5



CLIENT :



PROJECT :

CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING OF JORAM - KOLORIANG ROAD (NH-713) FROM KM. 20.00 TO KM. 70.00 & KM. 138.00 TO KM. 158.00 (TOTAL LENGTH 70 KM) IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE

DESIGN CONSULTANT:

Voyants Solutions Pvt Ltd.
403, 4th Floor, Park Centre,
Sector-30, Opp. 32nd Milestone, NH-8
Gurgaon-122002, Haryana
CIN- U74140HR2004PTC046918
Ph: 0124-4598200
Fax: 0124-4019051
E-mail: info@voyants.in, www.voyants.in

REV.	DATE	DESCRIPTION
R0	20/05/2016	

DRAWN BY : PD

DESIGNED BY : SG

APPROVED BY : KG

SCALE : AS SHOWN

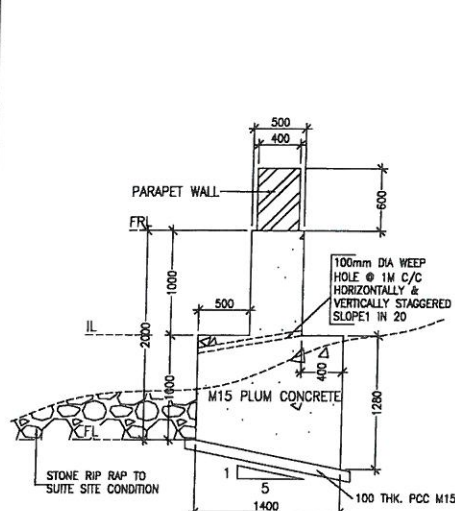
TITLE :

LOCATION DETAILS OF PROPOSED CULVERTS (WIDENING PROPOSAL)

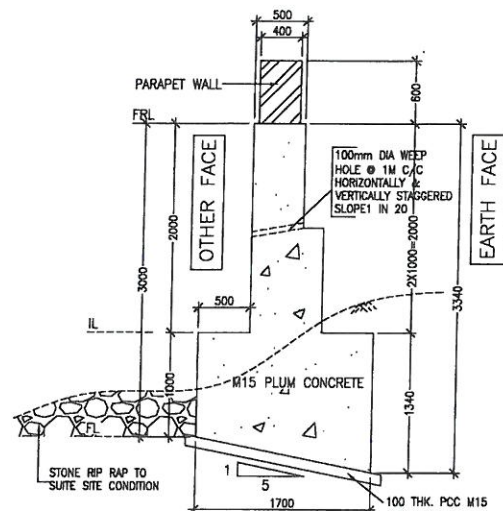
DRG. NO. : VSPL/1438/JK/DPR/BOX-01 (SHEET 05 OF 05)

REVISION : R0

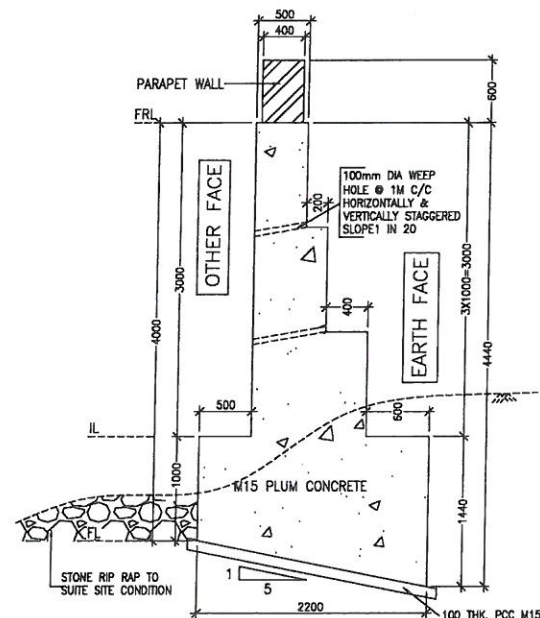
SEPT 2016



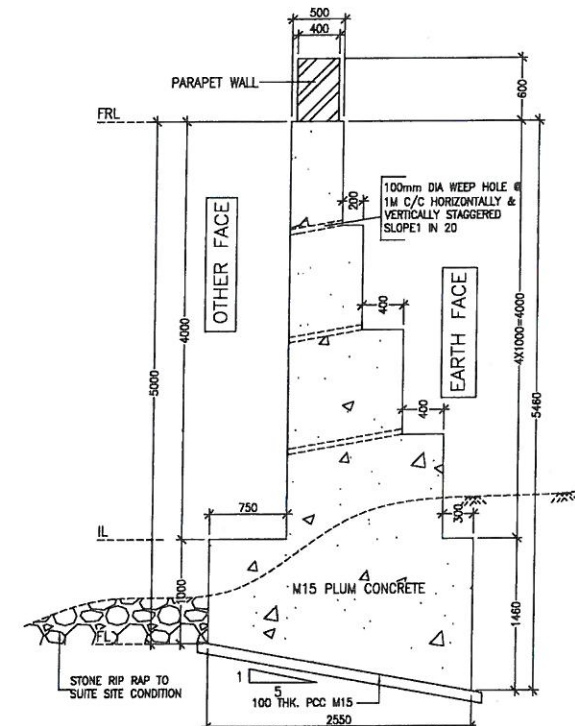
RETURN WALL (2M)
(SCALE-1:50)



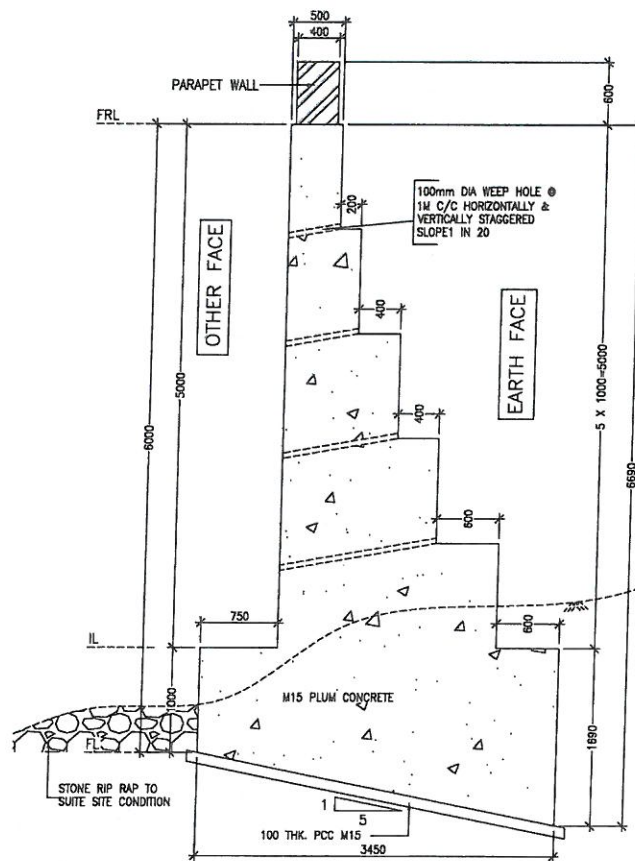
RETURN WALL (3M)
(SCALE-1:50)



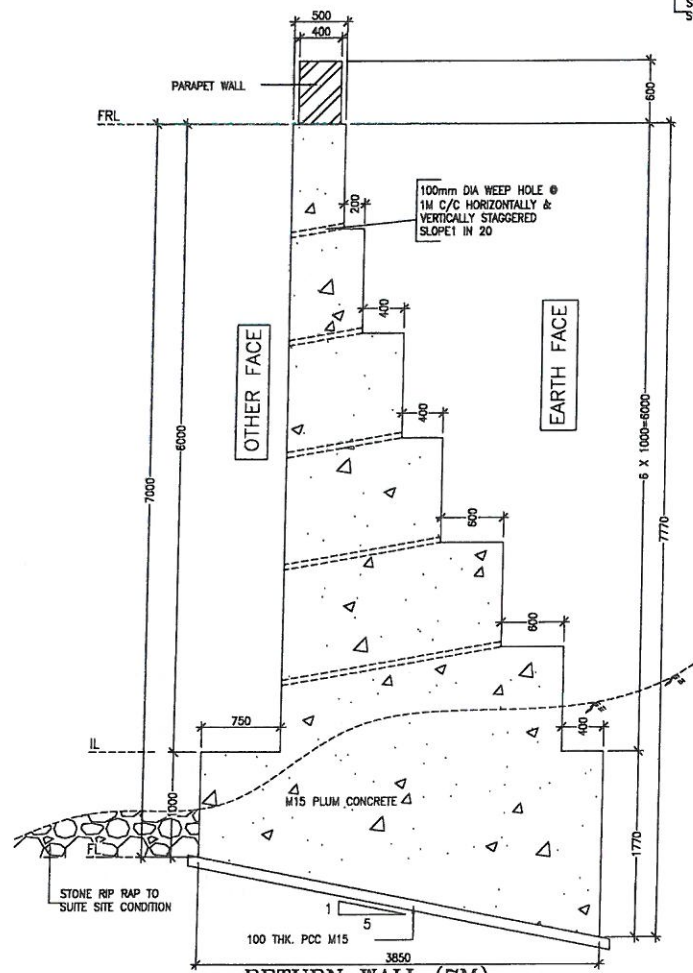
RETURN WALL (4M)
(SCALE-1:50)



RETURN WALL (5M)
(SCALE-1:50)



RETURN WALL (6M)
(SCALE-1:50)



RETURN WALL (7M)
(SCALE-1:50)

NOTES :

1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. 100 DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY & VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150mm ABOVE G.L.
4. BACK FILLING AND FILTER MEDIA BEHIND THE RETAINING WALL SHALL BE PROVIDED WITH SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC-78-2000 HAVING PROPERTIES $\phi=35^\circ$, $C=0$, $\gamma=21/m^3$
5. ALL FACE OF WALL SHALL BE PROVIDED WITH A MINIMUM STEEL OF 250mm² IN EACH DIRECTION. SPACING OF THESE BARS SHALL NOT EXCEED 300mm.
6. THESE DRAWING ARE APPLICABLE FOR M15 PCC OR M15 GRADE CONCRETE WITH PLUM. REFER SPECIFICATIONS FOR PLUM CONCRETE GIVEN IN THIS DRAWING.

PLUM CONCRETE SPECIFICATIONS:

THE SIZE OF STONE PLUMS MAY BE FROM 150-300MM. THE MAXIMUM DIMENSION OF THESE STONES OR PLUMS SHALL NOT EXCEED $\frac{1}{3}$ RD THE LEAST DIMENSION OF THE MEMBERS.

MATERIAL:

ALL PLUMS SHALL BE HARD, DURABLE, CLEAN AND FREE FROM SOFT MATERIALS OR LOOSEPIECES OR DELETERIOUS SUBSTANCE IN THEM & SHALL NOT HAVE SHARP.

CONSTRUCTION OPERATIONS:

DURING CONCRETING THE FIRST LAYER OF CONCRETE OF THE SPECIFIED MIX SHALL BE LAID TO A THICKNESS OF THE MAXIMUM SIZE OF THE PLUMS TO BE USED. THE PLUMS SHALL THEN BE LAID WHILE THE TOP PORTION OF THIS CONCRETE IS STILL GREEN BUT SUFFICIENTLY STIFF TO PREVENT COMPLETE SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PLUMS SHALL BE ABOUT HALF EMBEDDED IN THE CONCRETE & THE REMAINING PART EXPOSED ISO AS TO FORM A KEY WITH THE NEXT LAYER OF THE CONCRETE. NO PLUM SHALL BE USED FOR CONCRETE LAID UNDER WATER.

WHILE PLACING THE PLUMS, CARE SHALL BE TAKEN TO SEE THAT THE CLEAR DISTANCE BETWEEN ANY TWO PLUMS IS NOT LESS THAN EITHER THE WIDTH OR THICKNESS OF EITHER OF THE PLUMS. THE DISTANCE FROM THE PLUMS TO THE OUTER SURFACE FROM ANY STEEL REINFORCEMENT SHALL BE EQUAL TO GREATEST WIDTH OF PLUMS. IF PLUMS OF STRATIFIED STONE ARE USED THEY SHALL BE LAID ON THEIR NATURAL BED. STONES WITH CONCAVE FACES SHALL BE LAID WITH THE CONCAVE UPWARD THE THICKNESS OF THE NEXT AND SUCCESSIVE LAYERS OF CONCRETE SHALL BE AT LEAST TWICE THAT OF THE LARGEST PLUM.

QUALITY OF PLUM:

THE TOTAL VOLUME OF PLUMS SHALL NOT EXCEED 15% OF THE VOLUME OF THE FINISHED CONCRETE.

MIX OF CONCRETE:

PLUM CONCRETE 1:2:4 (1 CEMENT, 2 SAND, 4 GRADED STONE AGGREGATE 40 MM NORMAL SIZE) WITH 15% PLUMS.



CLIENT :



National Highways & Infrastructure Development Corporation Ltd. (NHIDCL)

PROJECT :

CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING OF JORAM - KOLORIANG ROAD (NH-713) FROM KM. 20.00 TO KM. 70.00 & KM. 138.00 TO KM. 158.00 (TOTAL LENGTH 70 KM) IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE

DESIGN CONSULTANT:



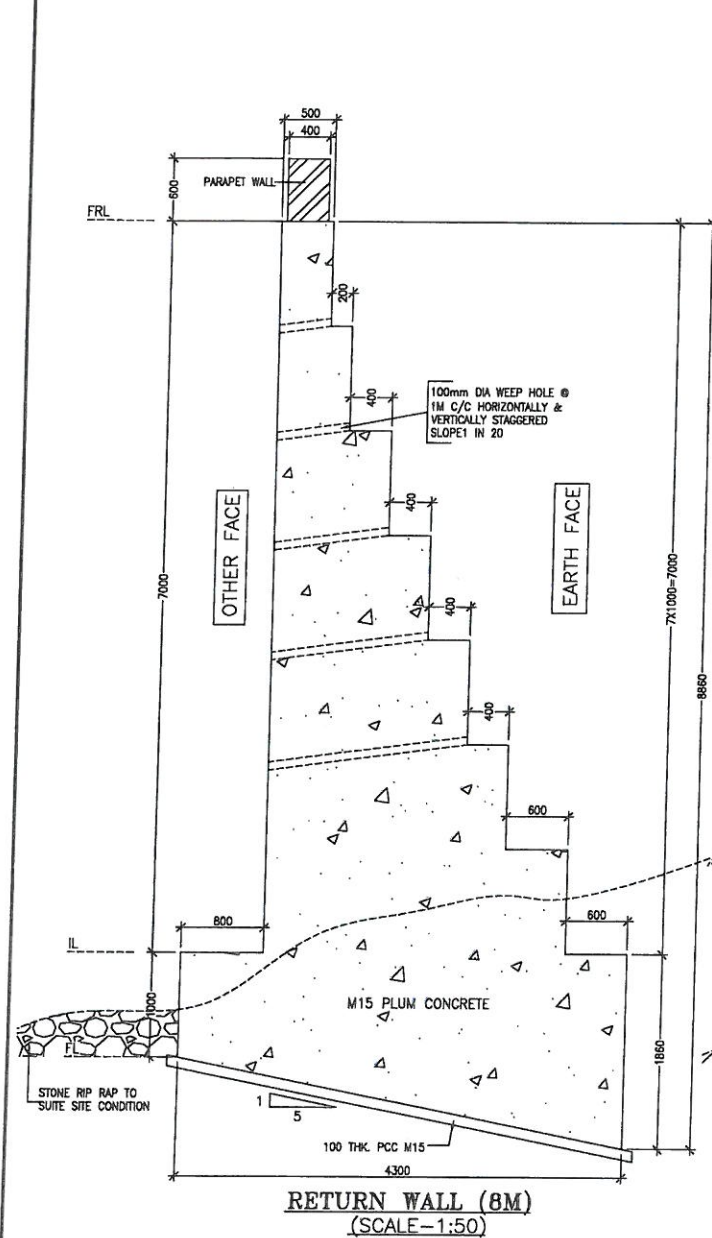
Voyants Solutions Pvt Ltd.

403, 4th Floor, Park Centra,
Sector-30, Opp. 32nd Milestone, NH-8
Gurgaon-122002, Haryana
CIN- U74140HR2004PTC046918
Ph: 0124-4598200
Fax: 0124-4019051
E-mail: info@voyants.in, www.voyants.in

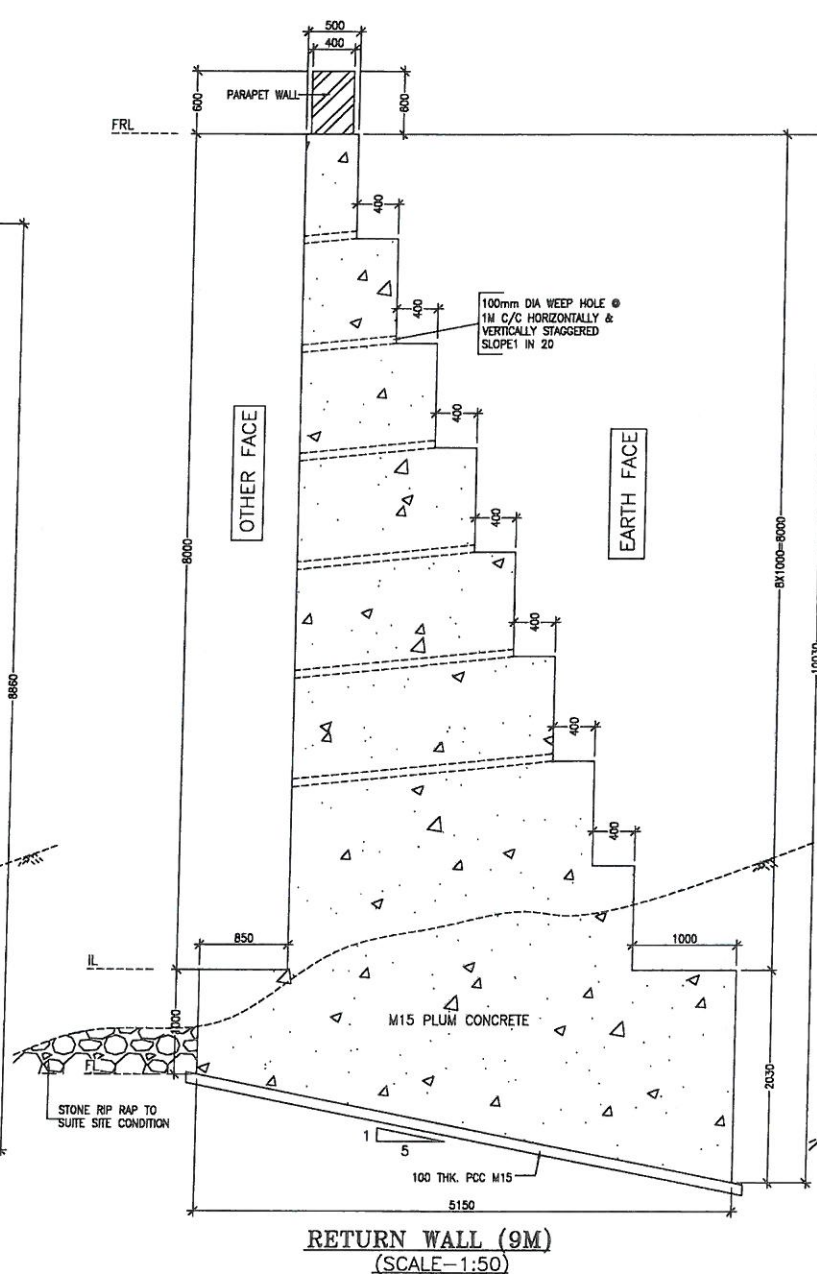
REV.	DATE	DESCRIPTION
R0	20/05/2016	

DRAWN BY :	PD
DESIGNED BY :	SG
ADPROVED BY :	KG
SCALE :	AS SHOWN

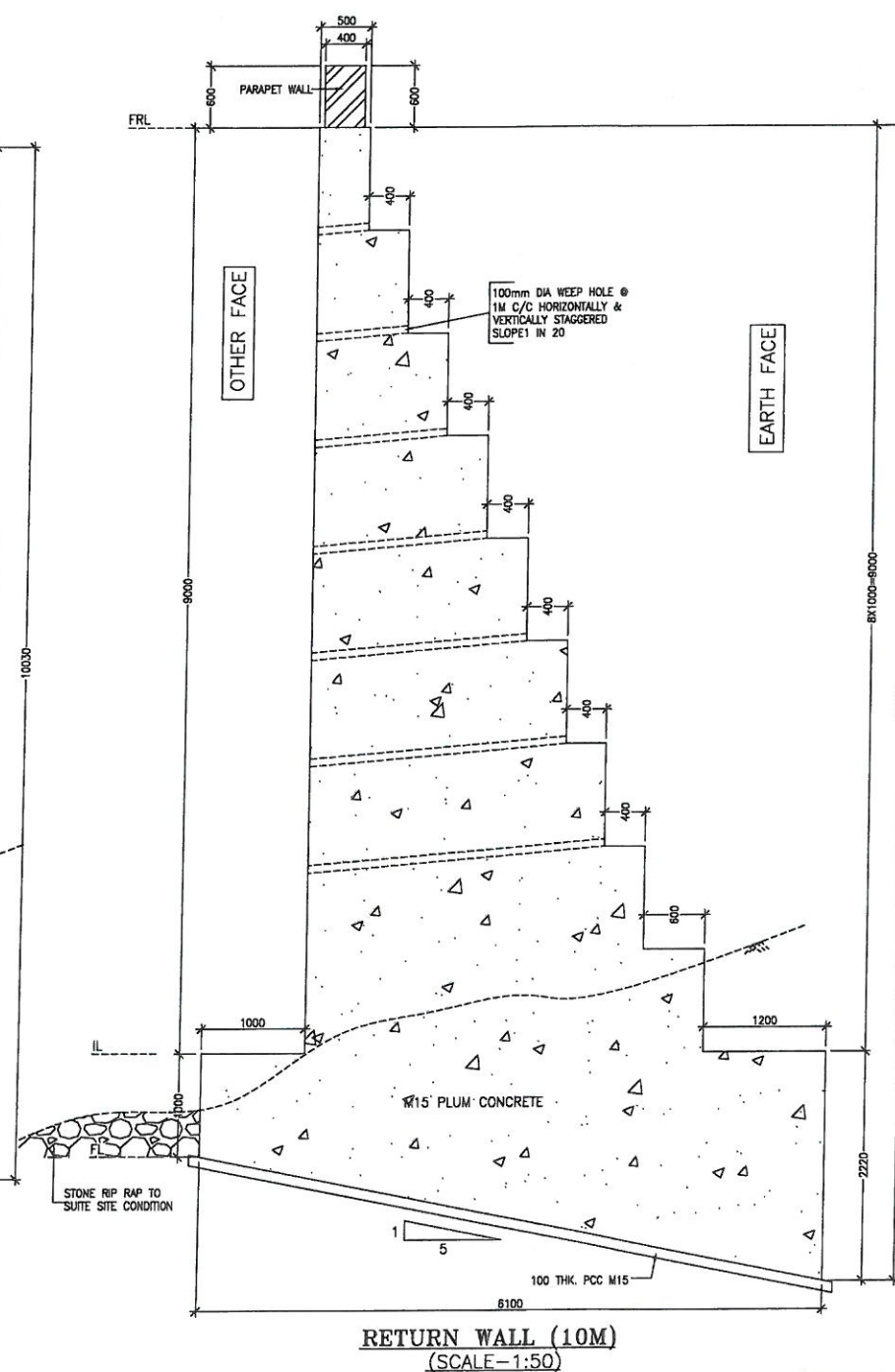
TITLE :	DETAILS OF RETURN WALL
DRG. NO. :	VSP/1438/JK/DPR/GAD/RETURN WALL-01
REVISION : R0	SEPT 2016



RETURN WALL (8M)
(SCALE-1:50)



RETURN WALL (9M)
(SCALE-1:50)



RETURN WALL (10M)
(SCALE-1:50)

- NOTES :**
1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 3. 100 DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY & VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150mm ABOVE G.L.
 4. BACK FILLING AND FILTER MEDIA BEHIND THE RETAINING WALL SHALL BE PROVIDED WITH SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC:78-2000 HAVING PROPERTIES $\mu=35^\circ$, $C=0$, $\gamma=21/m^3$
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- PLUM CONCRETE SPECIFICATIONS:**
- THE SIZE OF STONE PLUMS MAY BE FROM 150-300MM. THE MAXIMUM DIMENSION OF THESE STONES OR PLUMS SHALL NOT EXCEED 1/3RD THE LEAST DIMENSION OF THE MEMBERS.
- MATERIAL:**
- ALL PLUMS SHALL BE HARD, DURABLE, CLEAN AND FREE FROM SOFT MATERIALS OR LOOSEPIECES OR DELETERIOUS SUBSTANCE IN THEM & SHALL NOT HAVE SHARP.
- CONSTRUCTION OPERATIONS:**
- DURING CONCRETING THE FIRST LAYER OF CONCRETE OF THE SPECIFIED MIX SHALL BE LAID TO A THICKNESS OF THE MAXIMUM SIZE OF THE PLUMS TO BE USED. THE PLUMS SHALL THEN BE LAID WHILE THE TOP PORTION OF THIS CONCRETE IS STILL GREEN BUT SUFFICIENTLY STIFF TO PREVENT COMPLETE SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PLUMS SHALL BE ABOUT HALF EMBEDDED IN THE CONCRETE & THE REMAINING PART EXPOSED 150 AS TO FORM A KEY WITH THE NEXT LAYER OF THE CONCRETE. NO PLUM SHALL BE USED FOR CONCRETE LAID UNDER WATER.
- WHILE PLACING THE PLUMS, CARE SHALL BE TAKEN TO SEE THAT THE CLEAR DISTANCE BETWEEN ANY TWO PLUMS IS NOT LESS THAN EITHER THE WIDTH OR THICKNESS OF EITHER OF THE PLUMS. THE DISTANCE FROM THE PLUMS TO THE OUTER SURFACE FROM ANY STEEL REINFORCEMENT SHALL BE EQUAL TO GREATEST WIDTH OF PLUMS. IF PLUMS OF STRATIFIED STONE ARE USED THEY SHALL BE LAID ON THEIR NATURAL BED. STONES WITH CONCAVE FACES SHALL BE LAID WITH THE CONCAVE UPWARD THE THICKNESS OF THE NEXT AND SUCCESSIVE LAYERS OF CONCRETE SHALL BE AT LEAST TWICE THAT OF THE LARGEST PLUM.
- QUALITY OF PLUM:**
- THE TOTAL VOLUME OF PLUMS SHALL NOT EXCEED 15% OF THE VOLUME OF THE FINISHED CONCRETE.
- MIX OF CONCRETE:**
- PLUM CONCRETE 1:2:4 (1 CEMENT, 2 SAND, 4 GRADED STONE AGGREGATE 40 MM NORMAL SIZE) WITH 15% PLUMS.



CLIENT :



PROJECT :

CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING OF JORAM - KOLORIANG ROAD (NH-713) FROM KM. 20.00 TO KM. 70.00 & KM. 138.00 TO KM. 158.00 (TOTAL LENGTH 70 KM) IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE

DESIGN CONSULTANT:



Voyants Solutions Pvt Ltd.
403, 4th Floor, Park Centra,
Sector-30, Opp. 32nd Milestone, NH-8
Gurgaon-122002, Haryana
CIN- U74140HR2004PTC046918
Ph: 0124-4598200
Fax: 0124-4019051
E-mail: info@voyants.in, www.voyants.in

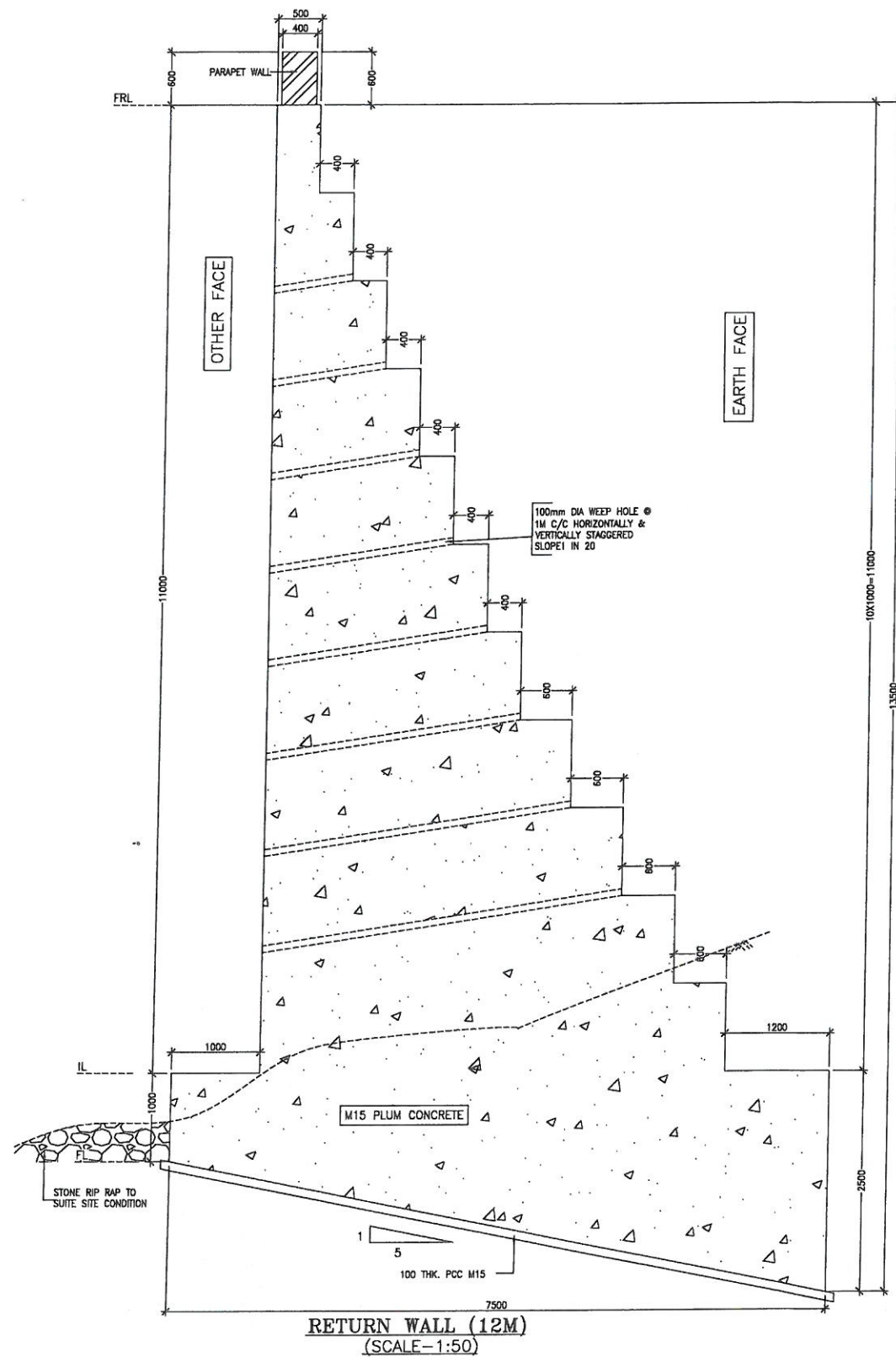
REV.	DATE	DESCRIPTION
R0	20/05/2016	

DRAWN BY :	PD
DESIGNED BY :	SG
ADPROVED BY :	KG
SCALE :	AS SHOWN

TITLE :
DETAILS OF RETURN WALL

DRG. NO. :
VSP/L1438/JK/DPR/GAD/RETURN WALL-02

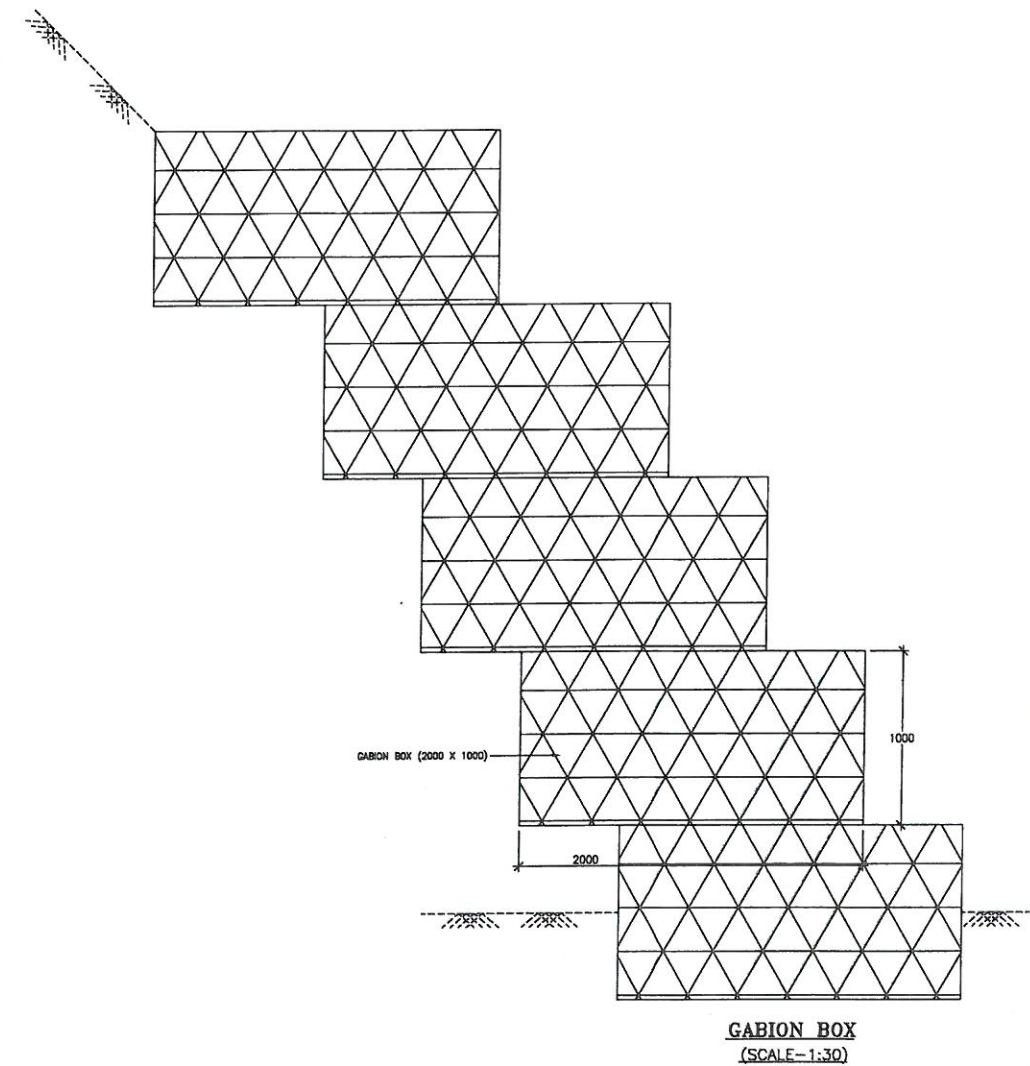
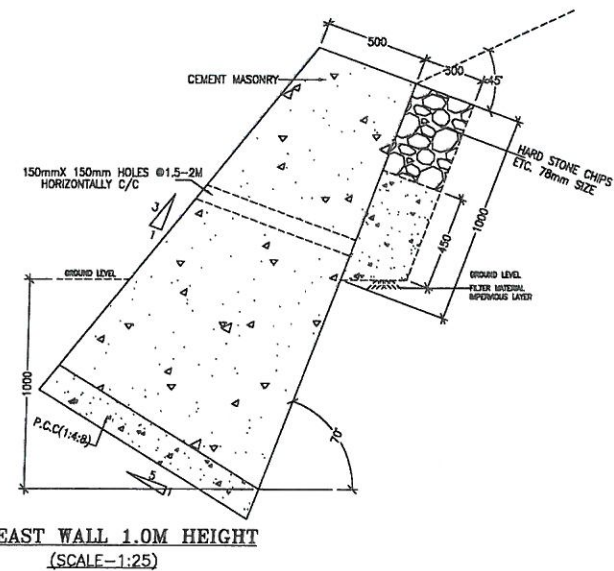
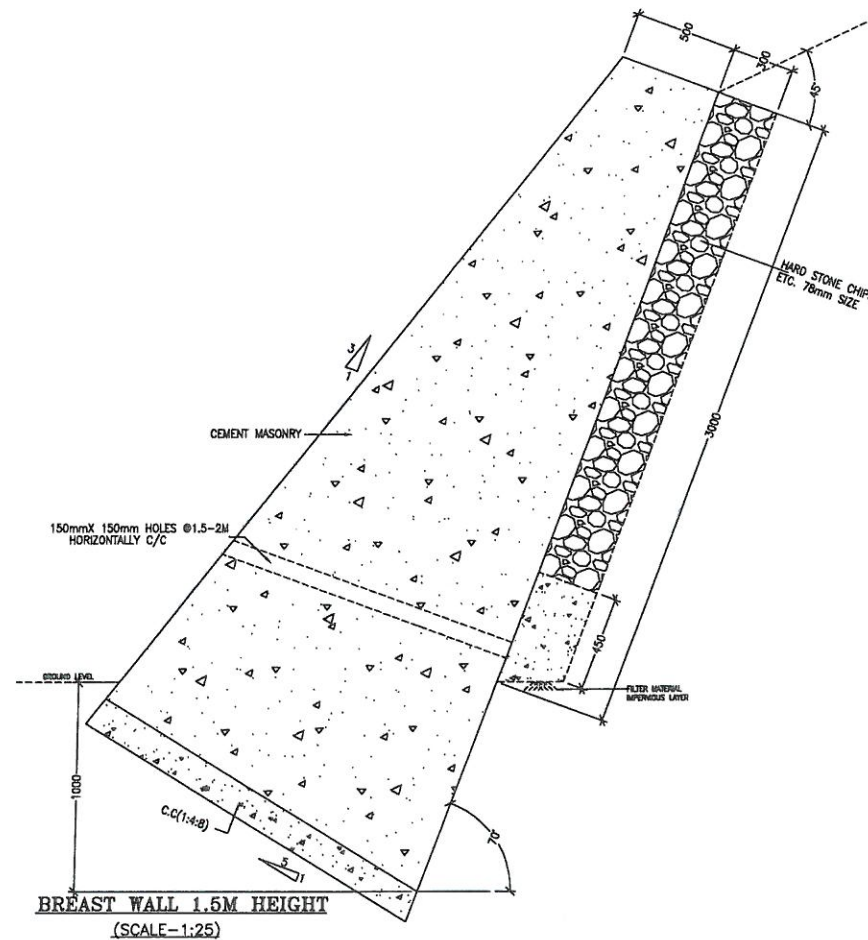
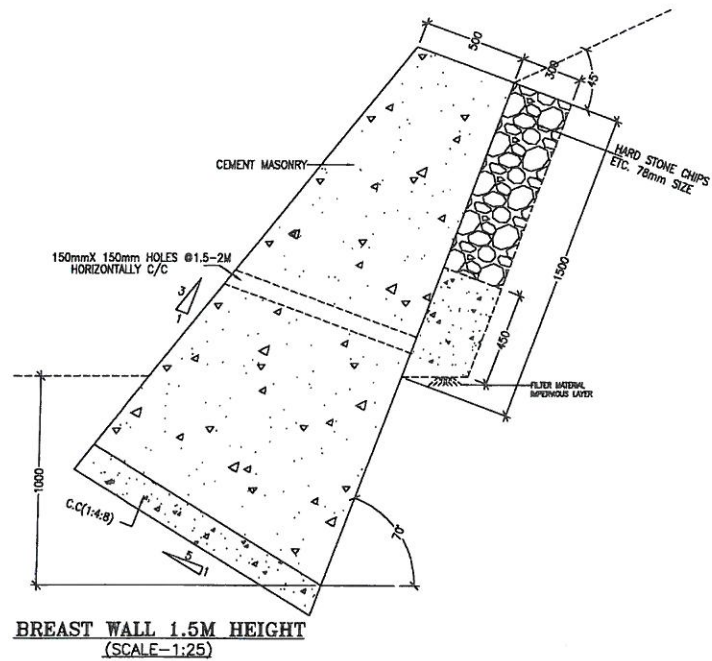
REVISION : R0
SEPT 2016



- MIX OF CONCRETE:**
PLUM CONCRETE 1:2:4 (1 CEMENT, 2 SAND, 4 GRADED STONE
AGGREGATE 40 MM NORMAL SIZE) WITH 15% PLUMS.



REVISION : R0	SEPT 2016
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NOTES :
1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.

CLIENT :



PROJECT :

CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING OF JORAM - KOLORIANG ROAD (NH-713) FROM KM. 20.00 TO KM. 70.00 & KM. 138.00 TO KM. 158.00 (TOTAL LENGTH 70 KM) IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE

DESIGN CONSULTANT:

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Sector-30, Opp. 32nd Milestone, NH-8
Gurgaon-122002, Haryana
CIN- U74140HR2004PTC046918
Ph: 0124-4598200
Fax: 0124-4019051
E-mail: info@voyants.in, www.voyants.in

REV.	DATE	DESCRIPTION
R0	20/05/2016	

DRAWN BY :	PD
DESIGNED BY :	SG
APPROVED BY :	KG
SCALE :	AS SHOWN

TITLE :	TYPICAL DRAWING OF BREAST WALL GABION BOX
DRG. NO. :	VSPL/1438/JK/PPR/BREAST WALL (SHEET 01 OF 01)
REVISION : R0	SEP 2016