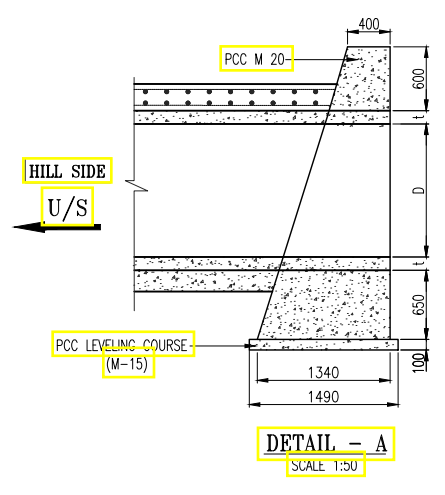
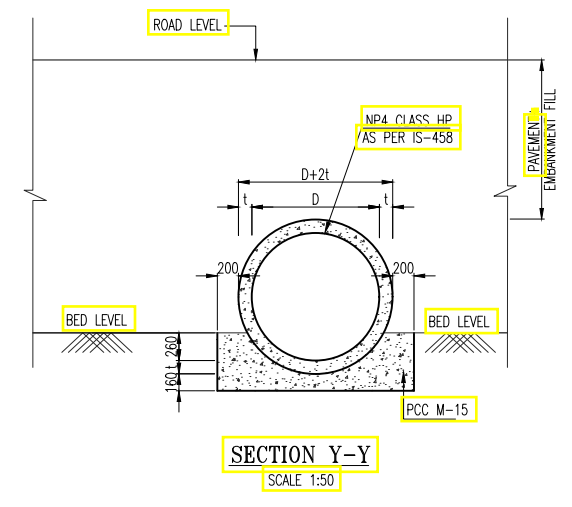


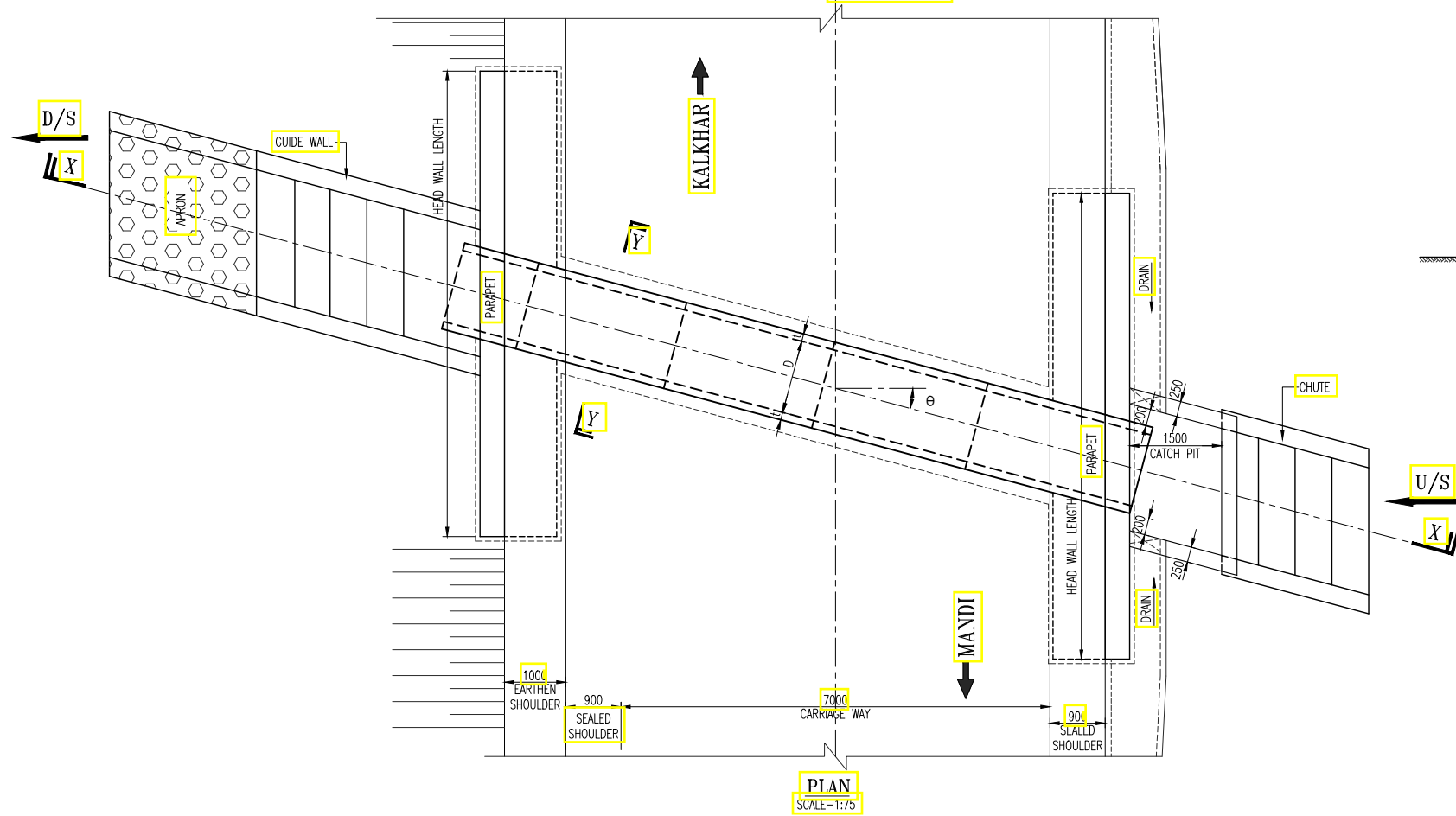
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SCALE: 1:7.5



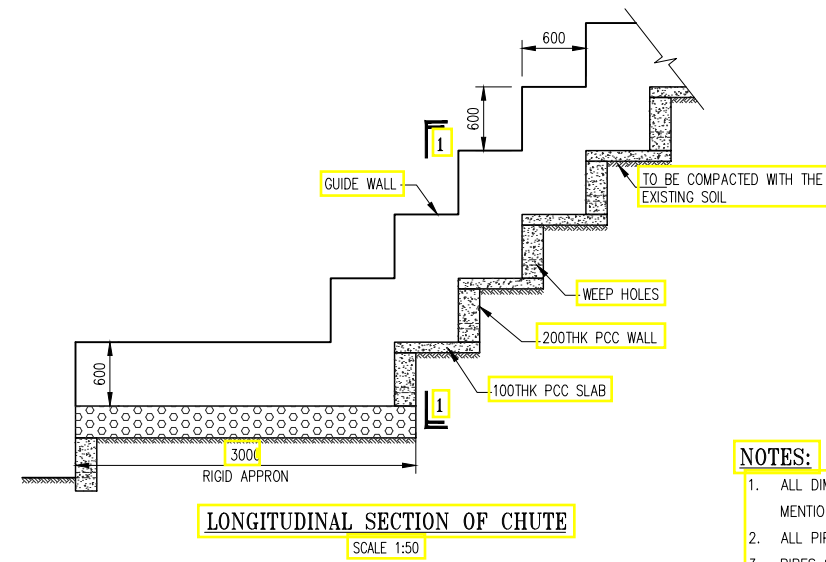
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SCALE: 1:50



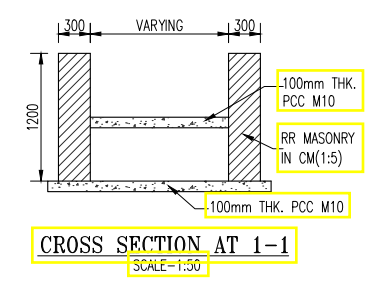
SECTION Y-Y
SCALE: 1:50



PIAN
SCALE: 1:7.5



LONGITUDINAL SECTION OF CHUTE
SCALE: 1:50



CROSS SECTION AT 1-1
SCALE: 1:50

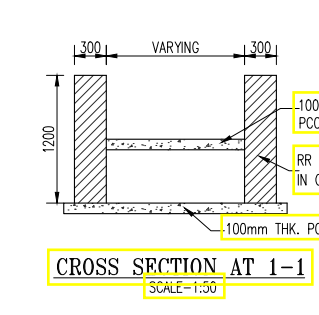
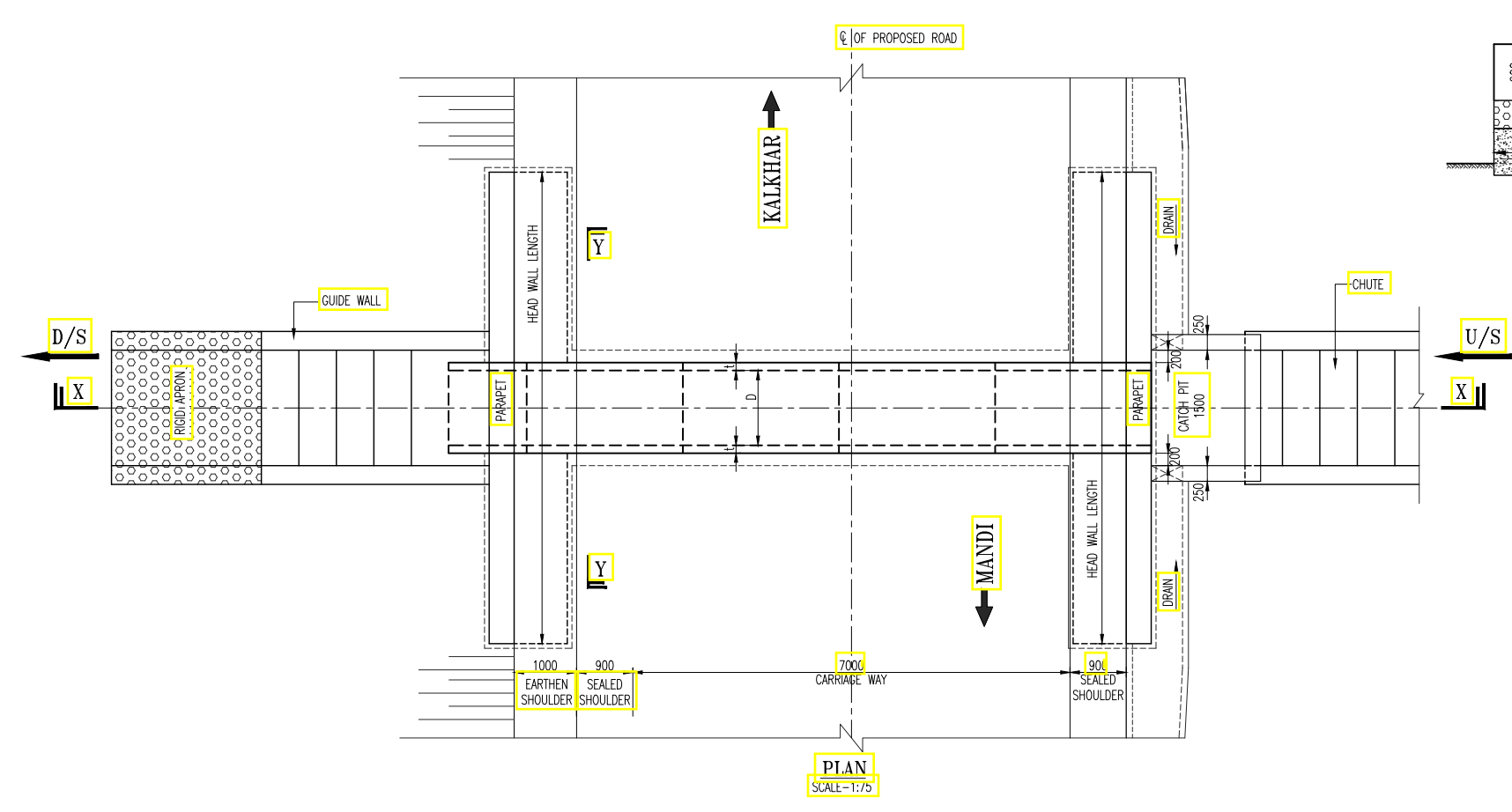
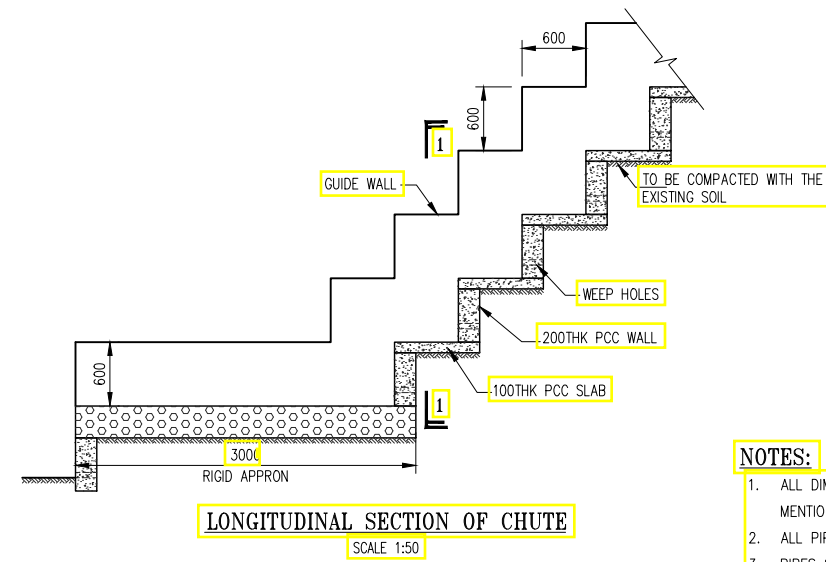
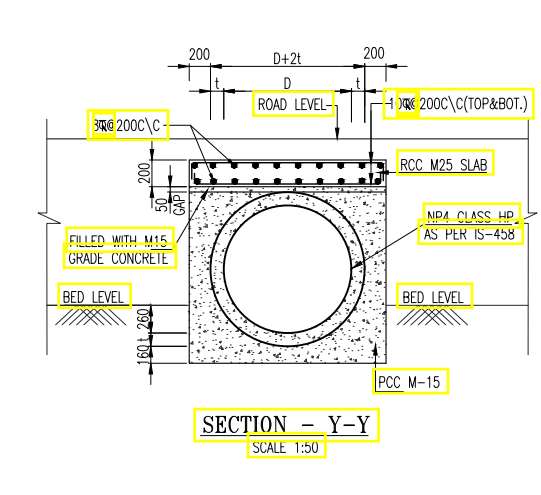
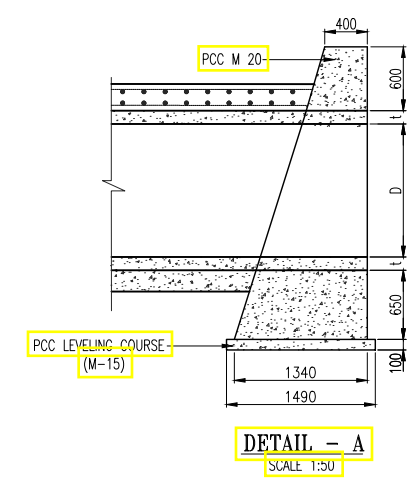
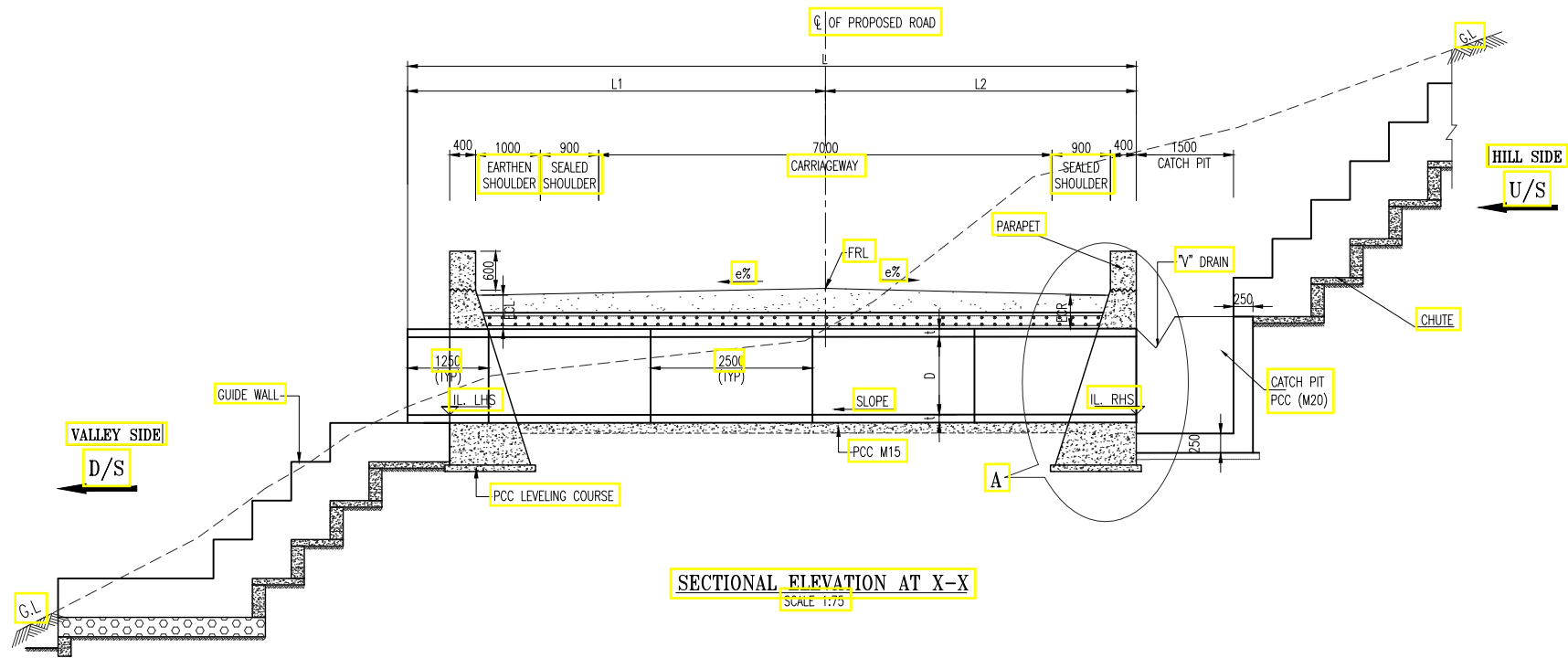
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION SHALL BE SCALED.
2. ALL PIPES FOR NEW CONSTRUCTION SHALL BE OF NP4 CLASS TYPE CONFORMING TO IS : 458.
3. PIPES SHALL BE JOINTED BY INTERNAL FLUSH JOINT AS PER IS 458 & AS PER THE DETAILS GIVEN IN SECTION 2906 OF MORTH SPECIFICATIONS OF ROAD AND BRIDGE WORKS. JOINTING SPACE SHALL BE FILLED WITH CEMENT MORTAR OF PROPORTION 1:2 OF CEMENT & SAND.
4. LENGTH OF EACH PIPE HAS BEEN CONSIDERED AS 2.5M. SMALLER PIPE OF 1.25M LENGTH HAS BEEN PROPOSED AT THE END TO MEET THE REQUIREMENT OF PART LENGTH OF PIPE.
5. FRL, CAMBER/SUPERELEVATION & WIDTH OF THE MEDIAN AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY PLAN, PROFILE AND CROSS SECTION DRAWINGS.
6. FOR PIPE BEDDING COMPACTED GRANULAR MATERIAL/PCC HAS BEEN PROVIDED AS PER THE SPECIFICATION OF IRC: SP: 13-2004.
7. ANY LOOSE/UNSUITABLE SOIL FOUND BELOW THE PIPE/HEAD WALL, THE SAME SHALL BE REPLACED WITH THE SAND OR COMPACTED GRANULAR MATERIAL AS DIRECTED BY ENGINEER-IN-CHARGE.
8. LONGITUDINAL SLOPE OF PROPOSED PIPE SHALL MATCH WITH THE EXISTING PIPE BUT SHALL NOT BE LESS THAN 1:1000.
9. FIRST CLASS BEDDING CAN BE USED FOR A MAXIMUM FILL HEIGHT OF 4M.
10. GRADE OF CONCRETE FOR PCC HEAD WALL IS M20.
11. CHAMBERS & CHUTE ARRANGEMENT SHOWN IN THE DRAWINGS IS TYPICAL ONLY, THE CONSTRUCTION CONTRACTOR SHALL SUBMIT WORKING DRAWINGS BASED ON THE OGL'S ALONG THE CROSS SECTION OF THE CULVERT. THE REQUIREMENT OF CHAMBERS ON U/S & CHUTES ON D/S CAN BE DISPENSED WITH IF THE TERRAIN IS FLAT.
12. THE SECTION OF HEADWALL SHOWN IN THE DRAWING IS TYPICAL ONLY. DEPENDING UPON THE INVERT LEVEL PROPOSED ON D/S & THE EXISTING OGL ON THE D/S THE HEIGHT OF HEADWALL SHALL BE SUITABLY INCREASED WHICH SECTION DETAILS OF HEAD WALL WILL BE AS PER DRAWING HP/MAN-KAL/STR/PC/TYP/201.

S.No	Existing Change	Design Change	Design FRL @ PCL	Camber e% (LHS)	Camber e% (RHS)	Flow direction	IL LHS (m)	IL RHS (m)	Size of Pipe			Cushion(m) (LHS) 'ECL'	Cushion(m) (RHS) 'ECR'	Lengths of Pipe (m)			Length of Head Wall	Type of TCS	Type of Proposal	Skew Angle	Direction
									No of Pipes	Dia of Pipe 'D'	Thk of Pipe 't'			Lengths of Pipe(m) L	L1	L2					
1	14+900	14+421	1112.843	-2.50 %	-2.50 %	R-L	1110.381	1110.700	1	1	0.115	1.08	0.82	11.25	6.75	4.47	6.50	TCS-3D	Reconstruction	22	Left
2	20+167	19+616	1340.091	-2.50 %	-2.50 %	R-L	1338.046	1338.343	1	1	0.115	0.68	0.43	11.25	5.96	4.21	6.50	TCS-3A	Reconstruction	16	Left

TENDER PURPOSE ONLY

<p>NOTES: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.</p>				<p>CLIENT: HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.</p>				<p>CONSULTANT: SATRA SERVICES AND SOLUTIONS PVT.LTD. #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India. Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in</p>				<p>PROJECT: HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)</p>				<p>JOB No. : 01041055</p>		<p>TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE ROW PIPE CULVERT (LEFT SKEW) WITH CUSHION FOR TCS-3(A,D)</p>		<p>REV. 0</p>
DESIGNED	GANESH	DRAWN	SATYA	CHECKED	PRANAI	APPROVED	PRANAI	ROAD NAME :				Package-VI:		DRAWING NO : HP/STR/PC/TYP/105		SIZE : A3				
Upgradation of Mandi - Rewalsar - Kalkhar Road in												SHEET 01 OF 01								



- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION SHALL BE SCALED.
 - ALL PIPES FOR NEW CONSTRUCTION SHALL BE OF NP4 CLASS TYPE CONFORMING TO IS : 458.
 - PIPES SHALL BE JOINTED BY INTERNAL FLUSH JOINT AS PER IS 458 & AS PER THE DETAILS GIVEN IN SECTION 2906 OF MORTH SPECIFICATIONS OF ROAD AND BRIDGE WORKS. JOINTING SPACE SHALL BE FILLED WITH CEMENT MORTAR OF PROPORTION 1:2 OF CEMENT & SAND.
 - LENGTH OF EACH PIPE HAS BEEN CONSIDERED AS 2.5M. SMALLER PIPE OF 1.25M LENGTH HAS BEEN PROPOSED AT THE END TO MEET THE REQUIREMENT OF PART LENGTH OF PIPE.
 - FRL, CAMBER/SUPERELEVATION & WIDTH OF THE MEDIAN AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY PLAN, PROFILE AND CROSS SECTION DRAWINGS.
 - FOR PIPE BEDDING COMPACTED GRANULAR MATERIAL/PCC HAS BEEN PROVIDED AS PER THE SPECIFICATION OF IRC: SP: 13-2004.
 - ANY LOOSE/UNSUITABLE SOIL FOUND BELOW THE PIPE/HEAD WALL, THE SAME SHALL BE REPLACED WITH THE SAND OR COMPACTED GRANULAR MATERIAL AS DIRECTED BY ENGINEER-IN-CHARGE.
 - LONGITUDINAL SLOPE OF PROPOSED PIPE SHALL MATCH WITH THE EXISTING PIPE BUT SHALL NOT BE LESS THAN 1:1000.
 - FIRST CLASS BEDDING CAN BE USED FOR A MAXIMUM FILL HEIGHT OF 4M.
 - GRADE OF CONCRETE FOR PCC HEAD WALL IS M20.
 - CHAMBERS & CHUTE ARRANGEMENT SHOWN IN THE DRAWINGS IS TYPICAL ONLY, THE CONSTRUCTION CONTRACTOR SHALL SUBMIT WORKING DRAWINGS BASED ON THE OGL'S ALONG THE CROSS SECTION OF THE CULVERT. THE REQUIREMENT OF CHAMBERS ON U/S & CHUTES ON D/S CAN BE DISPENSED WITH IF THE TERRAIN IS FLAT.
 - THE SECTION OF HEADWALL SHOWN IN THE DRAWING IS TYPICAL ONLY. DEPENDING UPON THE INVERT LEVEL PROPOSED ON D/S & THE EXISTING OGL ON THE D/S THE HEIGHT OF HEADWALL SHALL BE SUITABLY INCREASED WHICH SECTION DETAILS OF HEAD WALL WILL BE AS PER DRAWING HP/MAN-KAL/STR/PC/TYP/201.

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

CLIENT:
HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
SATRA
SATRA SERVICES AND SOLUTIONS PVT.LTD.
#1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:
HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)

SCALE: AS SHOWN

DATE: _____

JOB No. : 01041055

DESIGNED	GANESH
DRAWN	SATYA
CHECKED	PRANAI
APPROVED	PRANAI

ROAD NAME :

TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE ROW PIPE CULVERT WITH ENCASING FOR TCS-3(A,B,D,E)



DRAWING NO : HP/STR/PC/TYP/106

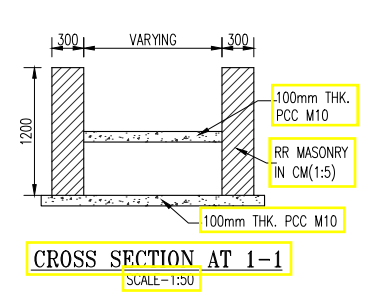
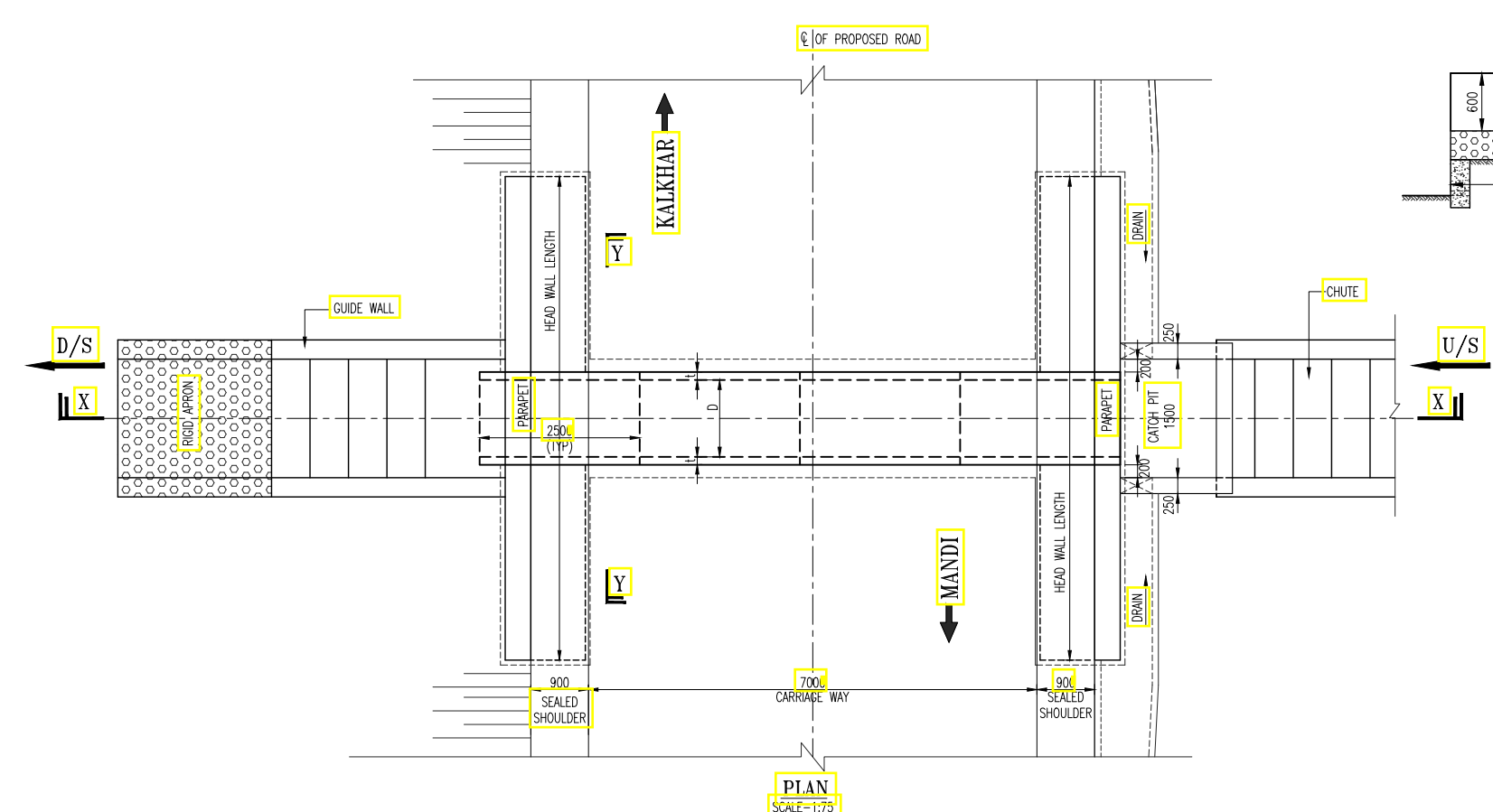
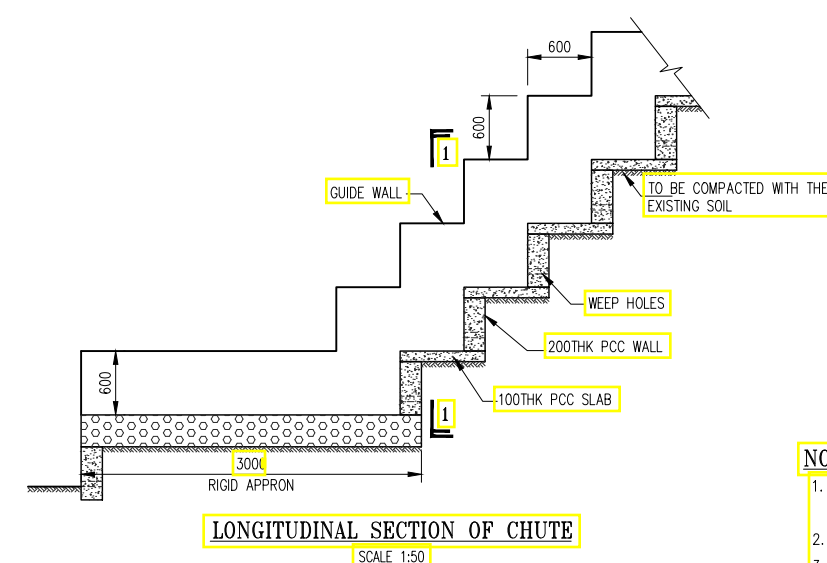
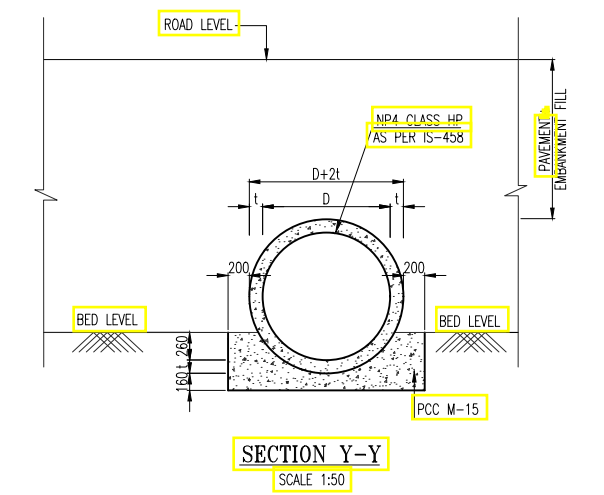
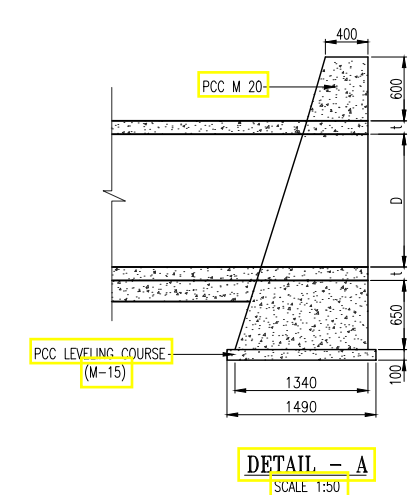
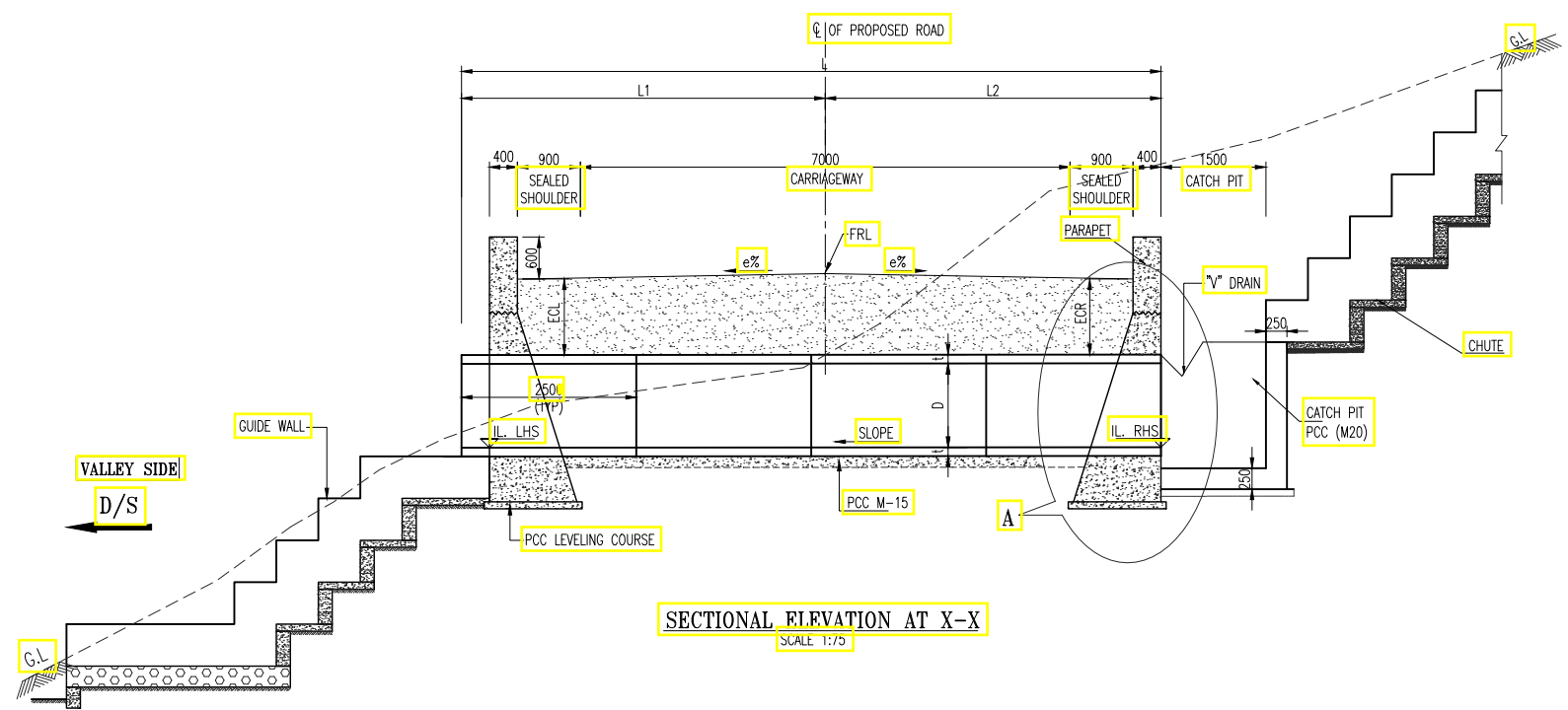
Package-VI:
Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

REV: 0
SIZE: A3
SHEET 01 OF 02

S.No	Existing Chainge	Design Chainge	Design FRL @ PCL	Camber e% (LHS)	Camber e% (RHS)	Flow direction	IL LHS (m)	IL RHS (m)	Size of Pipe			Cushion(m) (LHS) 'ECL'	Cushion(m) (RHS) 'ECR'	Lengths of Pipe (m)			Length of Head Wall	Type of TCS	Type of Proposal
									No of Pipes	Dia of Pipe 'D'	Thk of Pipe 't'			Lengths of Pipe(m) L	L1	L2			
1	13+030	12+578	1012.998	-7.00 %	7.00 %	R-L	1011.236	1011.553	1	1	0.115	0.08	0.51	11.25	6.65	4.05	6.50	TCS-3A	Reconstruction
2	13+550	13+081	1043.327	-2.50 %	-2.50 %	R-L	1041.471	1041.787	1	1	0.115	0.53	0.21	10.50	4.63	5.87	6.50	TCS-3B	Reconstruction
3	19+225	18+687	1317.750	-2.50 %	-2.50 %	R-L	1315.894	1316.212	1	1	0.115	0.50	0.22	10.50	5.53	4.97	6.50	TCS-3D	Reconstruction
4	20+978	20+415	1378.231	-7.00 %	7.00 %	R-L	1376.503	1376.830	1	1	0.115	0.03	0.47	11.25	6.95	4.05	6.50	TCS-3A	Reconstruction
5	21+819	21+251	1367.518	-7.00 %	7.00 %	R-L	1365.352	1365.669	1	1	0.115	0.45	0.92	11.25	7.15	4.05	6.50	TCS-3E	Reconstruction(Half Pipe Encased)
6	21+837	21+275	1367.247	-6.73 %	6.73 %	R-L	1365.027	1365.344	1	1	0.115	0.56	0.96	11.25	6.65	4.05	6.50	TCS-3D	Reconstruction(Half Pipe Encased)
7	22+100	21+532	1363.236	-7.00 %	7.00 %	R-L	1361.542	1361.859	1	1	0.115	0.01	0.45	11.25	6.65	4.05	6.50	TCS-3E	Reconstruction
8	25+967	25+398	1317.684	-2.50 %	-2.50 %	R-L	1315.843	1316.170	1	1	0.115	0.50	0.20	10.50	4.95	5.55	6.50	TCS-3D	Reconstruction
9	New	25+489	1318.657	-2.50 %	-2.50 %	R-L	1316.880	1317.177	1	1	0.115	0.44	0.16	10.50	5.05	5.45	6.50	TCS-3D	New Construction
10	26+214	25+649	1318.155	-2.50 %	0.87 %	R-L	1316.500	1316.813	1	1	0.115	0.30	0.16	10.50	5.50	5.00	6.50	TCS-3E	Reconstruction
11	28+150	27+563	1294.653	-5.00 %	5.00 %	R-L	1293.024	1293.351	1	1	0.115	0.09	0.29	11.25	6.45	4.05	6.50	TCS-3D	Reconstruction

TENDER PURPOSE ONLY

NOTES: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.					CLIENT:  HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.					CONSULTANT:  SATRA SERVICES AND SOLUTIONS PVT.LTD. #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India. Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in					PROJECT: HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)					JOB No. : 01041055 DESIGNED: GANESH DRAWN: SATYA CHECKED: PRANAI APPROVED: PRANAI			TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE ROW PIPE CULVERT WITH ENCASING FOR TCS-3(A,B,D,E) DRAWING NO : HP/STR/PC/TYP/106			REV. 0 SIZE : A3
ROAD NAME :		Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854										SHEET 02 OF 02														
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED	SCALE: AS SHOWN					DATE														



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 2. ALL PIPES FOR NEW CONSTRUCTION SHALL BE OF NP4 CLASS TYPE CONFORMING TO I.S : 458.
 3. PIPES SHALL BE JOINED BY INTERNAL FLUSH JOINT AS PER IS 458 & AS PER THE DETAILS GIVEN IN SECTION 2906 OF MORTH SPECIFICATIONS OF ROAD AND BRIDGE WORKS. JOINTING SPACE SHALL BE FILLED WITH CEMENT MORTAR OF PROPORTION 1:2 OF CEMENT & SAND.
 4. LENGTH OF EACH PIPE HAS BEEN CONSIDERED AS 2.5M. SMALLER PIPE OF 1.25M LENGTH HAS BEEN PROPOSED AT THE END TO MEET THE REQUIREMENT OF PART LENGTH OF PIPE.
 5. FRL, CAMBER/SUPERELEVATION & WIDTH OF THE MEDIAN AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY PLAN, PROFILE AND CROSS SECTION DRAWINGS.
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TENDER PURPOSE ONLY

NOTES:
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REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

CLIENT:

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:

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Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:

HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)

SCALE: AS SHOWN

DATE: _____

JOB No. : 01041055

DESIGNED	GANESH
DRAWN	SATYA
CHECKED	PRANAI
APPROVED	PRANAI

ROAD NAME : _____

TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE ROW PIPE CULVERT WITH CUSHION FOR TCS-3(C,F)



DRAWING NO : HP/STR/PC/TYP/107

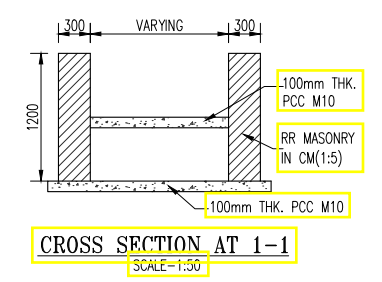
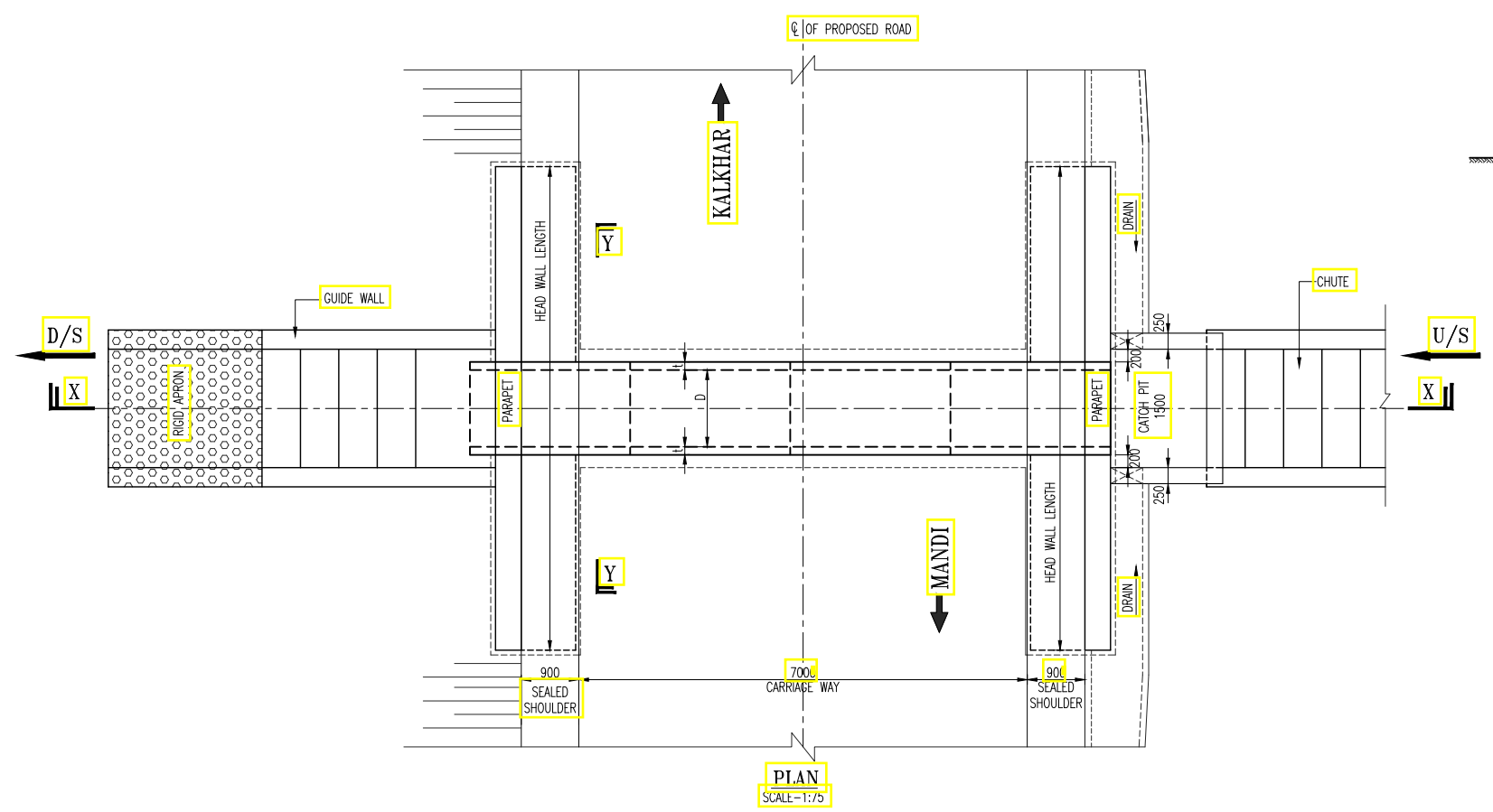
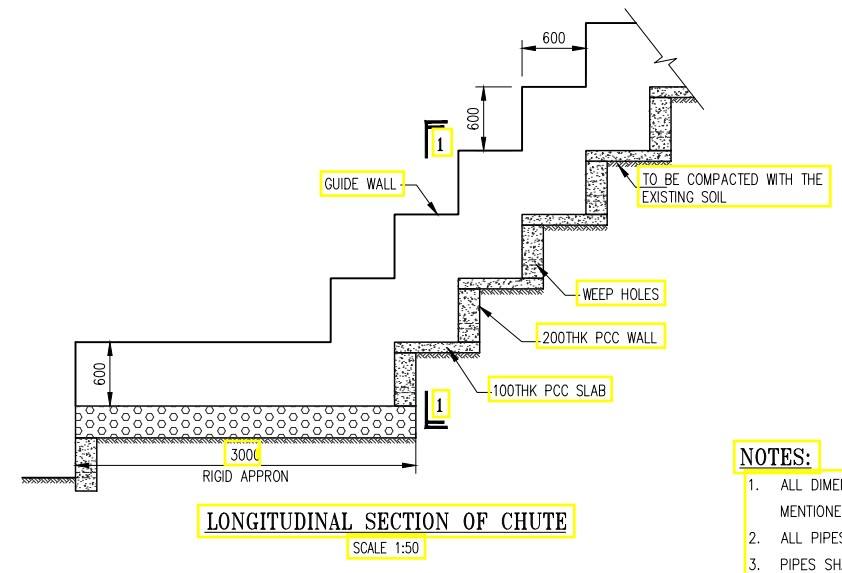
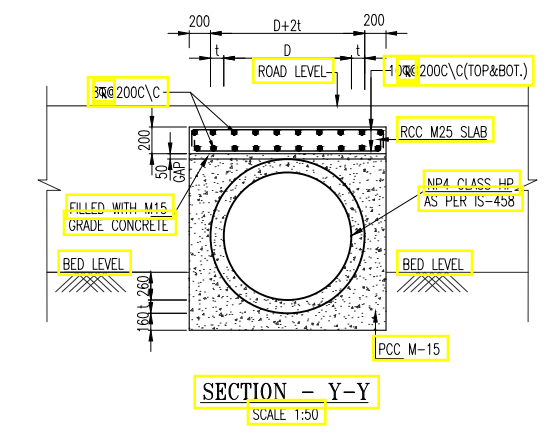
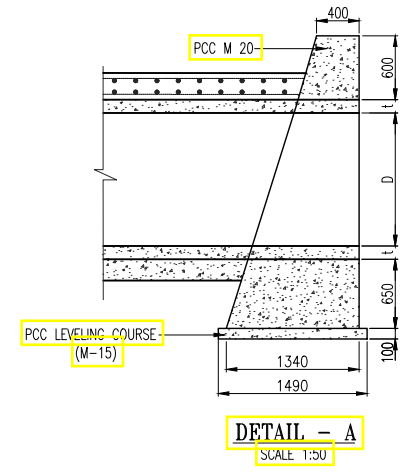
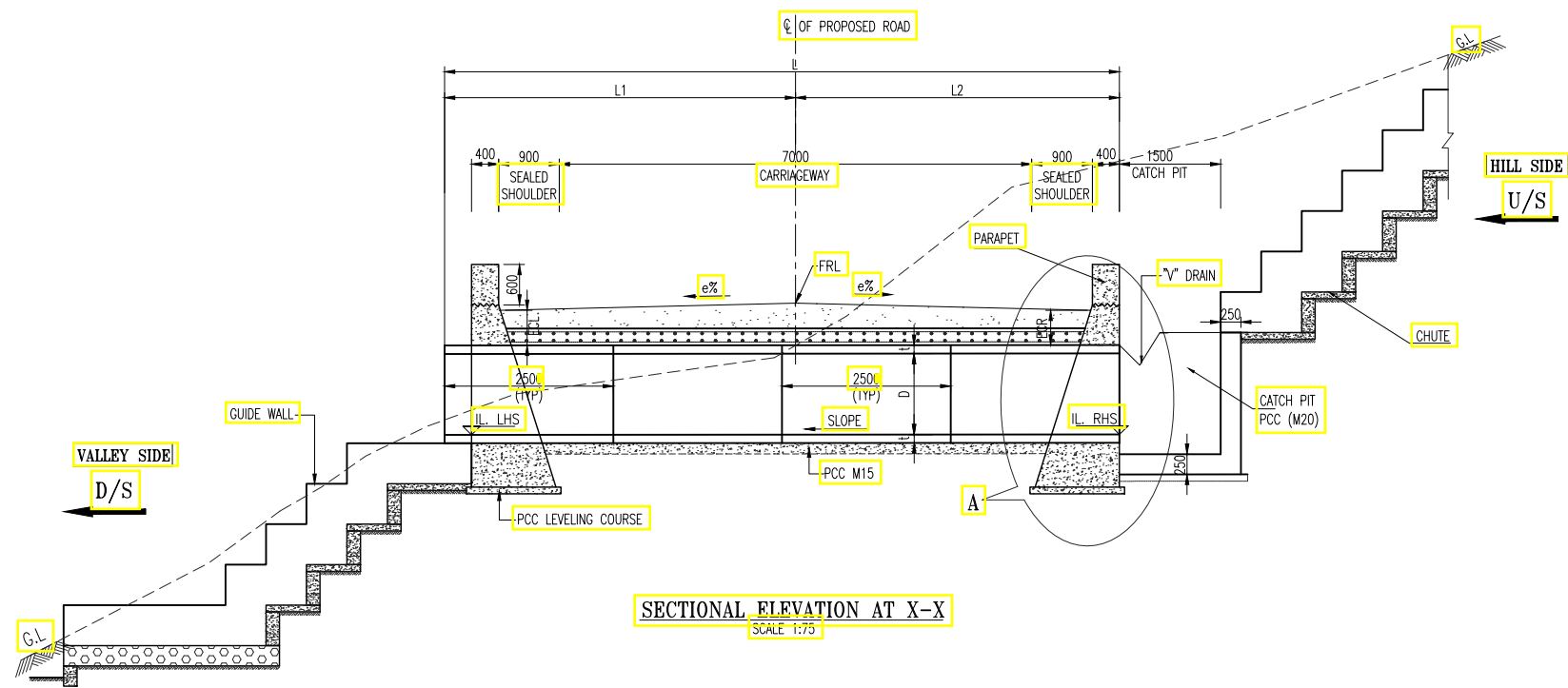
Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

REV. 0
SIZE : A3
SHEET 01 OF 02

S.No	Existing Change	Design Change	Design FRL @ PCL	Camber e% (LHS)	Camber e% (RHS)	Flow direction	IL LHS (m)	IL RHS (m)	Size of Pipe			Cushion(m) (LHS) 'ECL'	Cushion(m) (RHS) 'ECR'	Lengths of Pipe (m)			Length of Head Wall	Type of TCS	Type of Proposal
									No of Pipes	Dia of Pipe 'D'	Thk of Pipe 't'			Lengths of Pipe(m) L	L1	L2			
1	14+300	13+833	1087.682	-5.66 %	5.66 %	R-L	1084.573	1084.900	1	1	0.115	1.50	1.80	11.25	6.95	4.05	6.50	TCS-3F	Reconstruction
2	15+424	14+925	1137.978	-7.00 %	7.00 %	R-L	1135.373	1135.700	1	1	0.115	0.90	1.35	11.25	6.95	4.05	6.50	TCS-3F	Reconstruction
3	20+361	19+800	1348.726	-2.50 %	-2.50 %	R-L	1346.019	1346.346	1	1	0.115	1.37	1.06	10.50	4.95	5.55	6.50	TCS-3F	Reconstruction
4	New	20+479	1378.328	3.03 %	-3.03 %	R-L	1375.789	1376.103	1	1	0.115	1.49	0.87	11.25	5.55	4.56	6.50	TCS-3C	New Construction
5	24+070	23+501	1357.748	-7.00 %	7.00 %	R-L	1352.036	1352.333	1	1	0.115	4.07	4.48	11.25	6.05	4.05	6.50	TCS-3F	Reconstruction
6	25+150	24+572	1325.368	0.25 %	-2.50 %	R-L	1323.483	1323.800	1	1	0.115	0.68	0.24	10.50	5.05	5.45	6.50	TCS-3C	Reconstruction (Half Pipe Encased)
7	New	24+812	1322.158	-2.50 %	-2.50 %	R-L	1319.607	1319.935	1	1	0.115	1.21	0.90	10.50	4.90	5.60	6.50	TCS-3C	New Construction
8	27+109	26+534	1309.268	-2.50 %	-1.08 %	R-L	1306.773	1307.090	1	1	0.115	1.14	0.92	10.50	5.65	4.85	6.50	TCS-3F	Reconstruction
9	New	26+804	1302.359	-1.58 %	-2.50 %	R-L	1299.797	1300.100	1	1	0.115	1.27	0.94	10.50	5.05	5.45	6.50	TCS-3C	New Construction
10	New	27+009	1300.407	-2.50 %	-2.50 %	R-L	1297.873	1298.200	1	1	0.115	1.20	0.89	10.50	4.95	5.55	6.50	TCS-3C	New Construction

TENDER PURPOSE ONLY

NOTES: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.					CLIENT:  HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.					CONSULTANT:  SATRA SERVICES AND SOLUTIONS PVT.LTD. #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India. Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in					PROJECT: HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)					JOB No. : 01041055 DESIGNED: GANESH DRAWN: SATYA CHECKED: PRANAI APPROVED: PRANAI			TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE ROW PIPE CULVERT WITH CUSHION (FOR TCS-3(C,F)) DRAWING NO : HP/STR/PC/TYP/107			REV. 0 SIZE : A3
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED	ROAD NAME : Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854					Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854			SHEET 02 OF 02											



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 - PIPES SHALL BE JOINTED BY INTERNAL FLUSH JOINT AS PER IS 458 & AS PER THE DETAILS GIVEN IN SECTION 2906 OF MORTH SPECIFICATIONS OF ROAD AND BRIDGE WORKS. JOINTING SPACE SHALL BE FILLED WITH CEMENT MORTAR OF PROPORTION 1:2 OF CEMENT & SAND.
 - LENGTH OF EACH PIPE HAS BEEN CONSIDERED AS 2.5M. SMALLER PIPE OF 1.25M LENGTH HAS BEEN PROPOSED AT THE END TO MEET THE REQUIREMENT OF PART LENGTH OF PIPE.
 - FRL, CAMBER/SUPERELEVATION & WIDTH OF THE MEDIAN AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY PLAN, PROFILE AND CROSS SECTION DRAWINGS.
 - FOR PIPE BEDDING COMPACTED GRANULAR MATERIAL/PCC HAS BEEN PROVIDED AS PER THE SPECIFICATION OF IRC: SP: 13-2004.
 - ANY LOOSE/UNSUITABLE SOIL FOUND BELOW THE PIPE/HEAD WALL, THE SAME SHALL BE REPLACED WITH THE SAND OR COMPACTED GRANULAR MATERIAL AS DIRECTED BY ENGINEER-IN-CHARGE.
 - LONGITUDINAL SLOPE OF PROPOSED PIPE SHALL MATCH WITH THE EXISTING PIPE BUT SHALL NOT BE LESS THAN 1:1000.
 - FIRST CLASS BEDDING CAN BE USED FOR A MAXIMUM FILL HEIGHT OF 4M.
 - GRADE OF CONCRETE FOR PCC HEAD WALL IS M20.
 - CHAMBERS & CHUTE ARRANGEMENT SHOWN IN THE DRAWINGS IS TYPICAL ONLY, THE CONSTRUCTION CONTRACTOR SHALL SUBMIT WORKING DRAWINGS BASED ON THE OGL'S ALONG THE CROSS SECTION OF THE CULVERT. THE REQUIREMENT OF CHAMBERS ON U/S & CHUTES ON D/S CAN BE DISPENSED WITH IF THE TERRAIN IS FLAT.
 - THE SECTION OF HEADWALL SHOWN IN THE DRAWING IS TYPICAL ONLY. DEPENDING UPON THE INVERT LEVEL PROPOSED ON D/S & THE EXISTING OGL ON THE D/S THE HEIGHT OF HEADWALL SHALL BE SUITABLY INCREASED WHICH SECTION DETAILS OF HEAD WALL WILL BE AS PER DRAWING HP/MAN-KAL/STR/PC/TYP/201.

TENDER PURPOSE ONLY

NOTES:
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REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

CLIENT:

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:

SATRA SERVICES AND SOLUTIONS PVT.LTD.
#1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:

HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)

SCALE: AS SHOWN

DATE: _____

JOB No. : 01041055

DESIGNED	GANESH
DRAWN	SATYA
CHECKED	PRANAI
APPROVED	PRANAI

ROAD NAME :

TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE ROW PIPE CULVERT WITH ENCASING (FOR TCS-3(C,F))

DRAWING NO : HP/STR/PC/TYP/108

Package-VI:
Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854


REV. 0
SIZE : A3
SHEET 01 OF 02

S.No	Existing Change	Design Change	Design FRL @ PCL	Camber e% (LHS)	Camber e% (RHS)	Flow direction	IL LHS (m)	IL RHS (m)	Size of Pipe			Cushion(m) (LHS) 'ECL'	Cushion(m) (RHS) 'ECR'	Lengths of Pipe (m)			Length of Head Wall	Type of TCS	Type of Proposal
									No of Pipes	Dia of Pipe 'D'	Thk of Pipe 't'			Lengths of Pipe(m) L	L1	L2			
1	11+753	11+330	938.526	-2.50 %	-2.50 %	R-L	936.657	936.954	1	1	0.115	0.51	0.26	10.50	5.55	4.95	6.50	TCS-3C	Reconstruction
2	17+550	17+004	1228.810	-4.71 %	4.41 %	R-L	1227.083	1227.400	1	1	0.115	0.20	0.37	11.25	6.65	4.05	6.50	TCS-3C	Reconstruction
3	18+960	18+423	1301.368	-3.82 %	2.40 %	R-L	1299.701	1300.039	1	1	0.115	0.23	0.22	11.25	5.76	4.58	6.50	TCS-3C	Reconstruction
4	21+750	21+181	1368.060	-2.50 %	-2.50 %	R-L	1366.261	1366.578	1	1	0.115	0.44	0.17	10.50	5.65	4.85	6.50	TCS-3C	Reconstruction
5	25+805	25+240	1316.865	-2.50 %	-2.50 %	R-L	1315.073	1315.400	1	1	0.115	0.45	0.15	10.50	4.95	5.55	6.50	TCS-3F	Reconstruction
6	26+400	25+826	1319.276	-2.50 %	-2.50 %	R-L	1317.453	1317.779	1	1	0.115	0.51	0.16	10.50	4.05	6.45	6.50	TCS-3F	Reconstruction
7	New	26+239	1314.487	-2.50 %	-2.50 %	R-L	1312.683	1313.000	1	1	0.115	0.45	0.17	10.50	5.65	4.85	6.50	TCS-3F	New Construction
8	28+295	27+708	1293.371	-3.18 %	1.05 %	R-L	1291.723	1292.037	1	1	0.115	0.24	0.16	11.25	5.98	4.13	6.50	TCS-3C	Reconstruction

TENDER PURPOSE ONLY

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PROJECT:
HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)

SCALE: AS SHOWN

DATE

JOB No. : 01041055

DESIGNED	GANESH
DRAWN	SATYA
CHECKED	PRANAI
APPROVED	PRANAI

TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE ROW PIPE CULVERT WITH ENCASING (FOR TCS-3(C,F))

DRAWING NO : HP/STR/PC/TYP/108

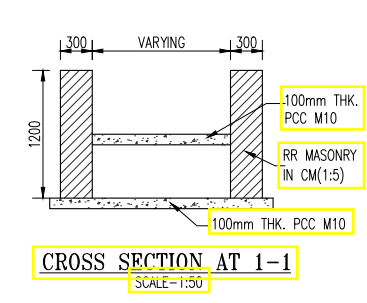
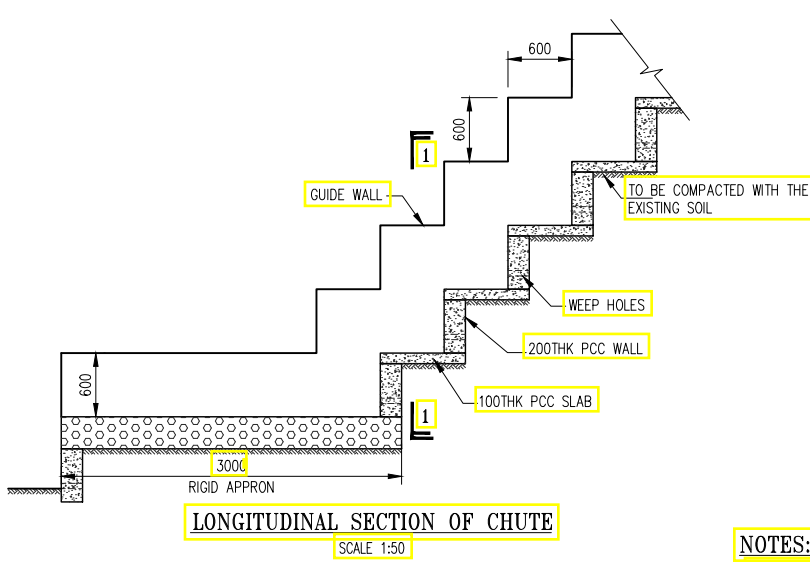
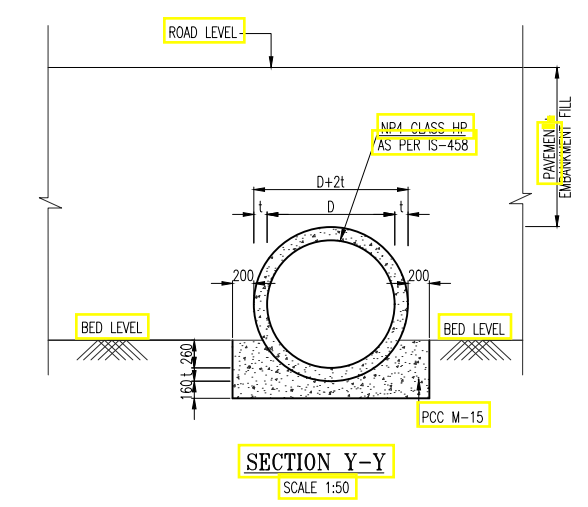
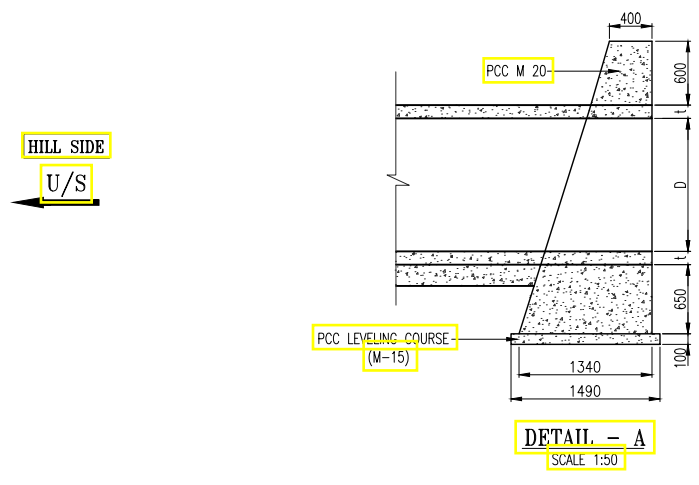
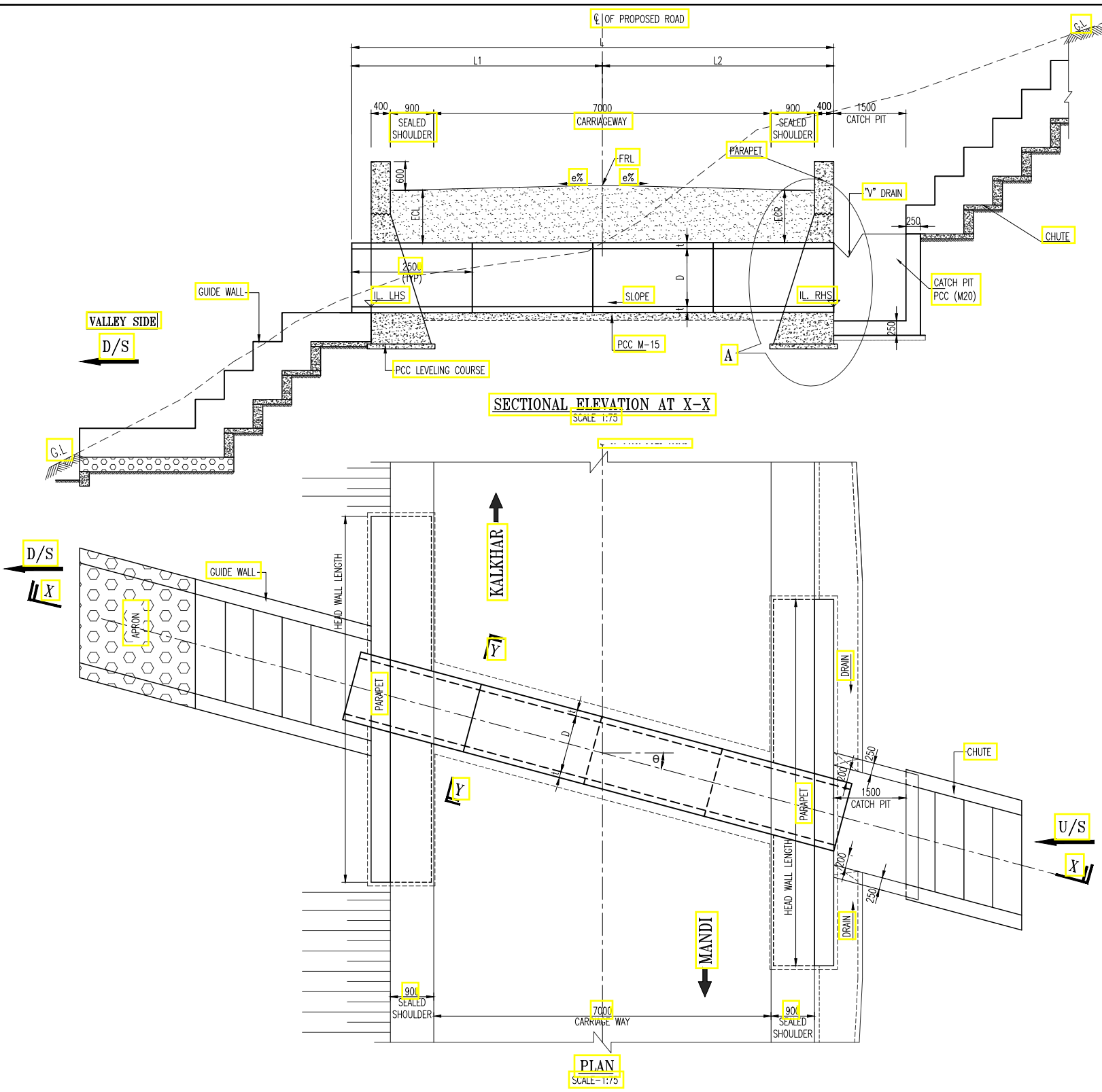
ROAD NAME :

Package-VI:
Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

REV. 0

SIZE : A3

SHEET 02 OF 02

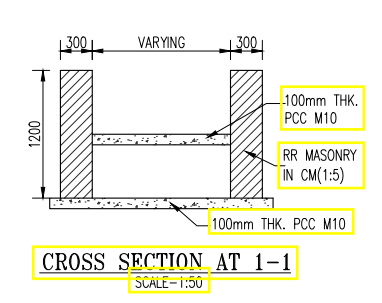
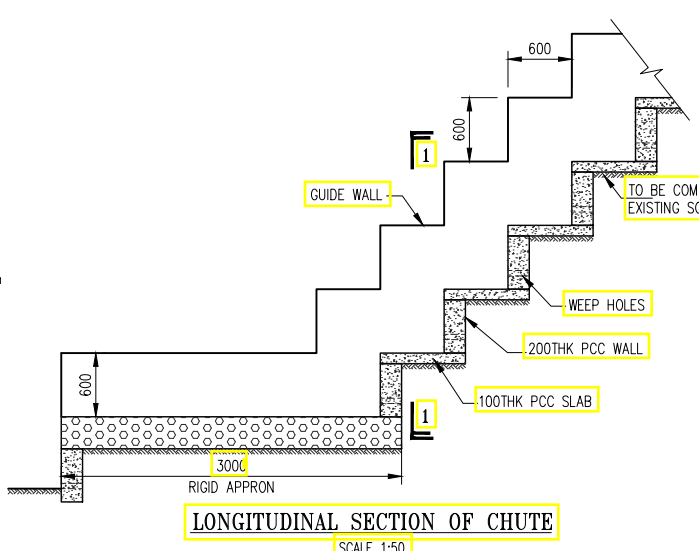
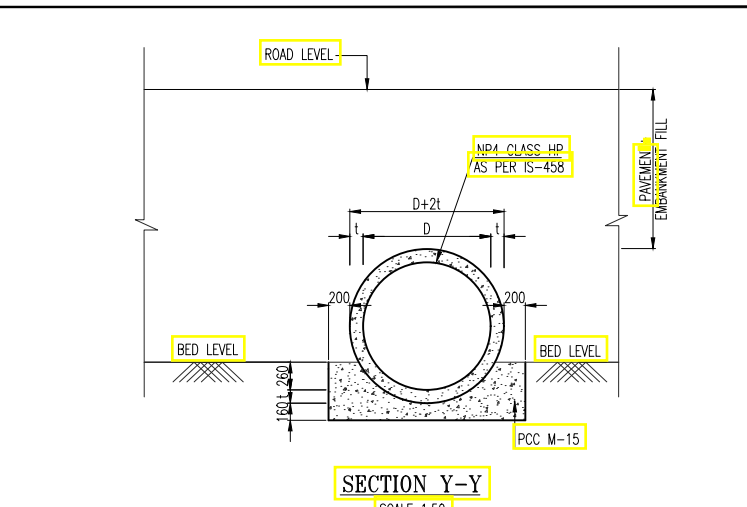
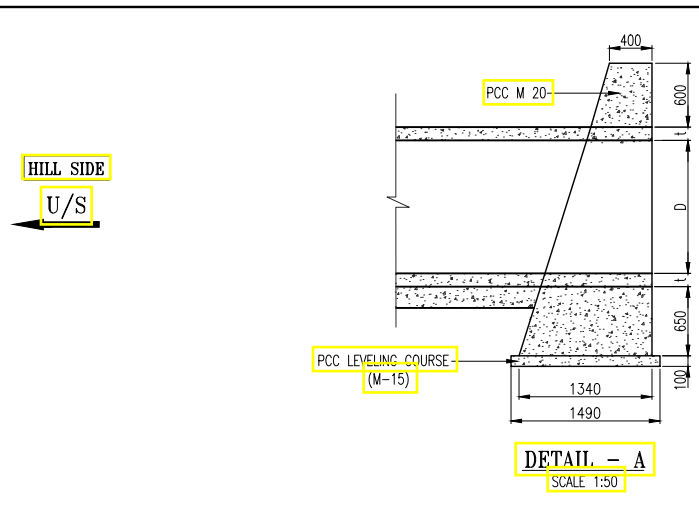
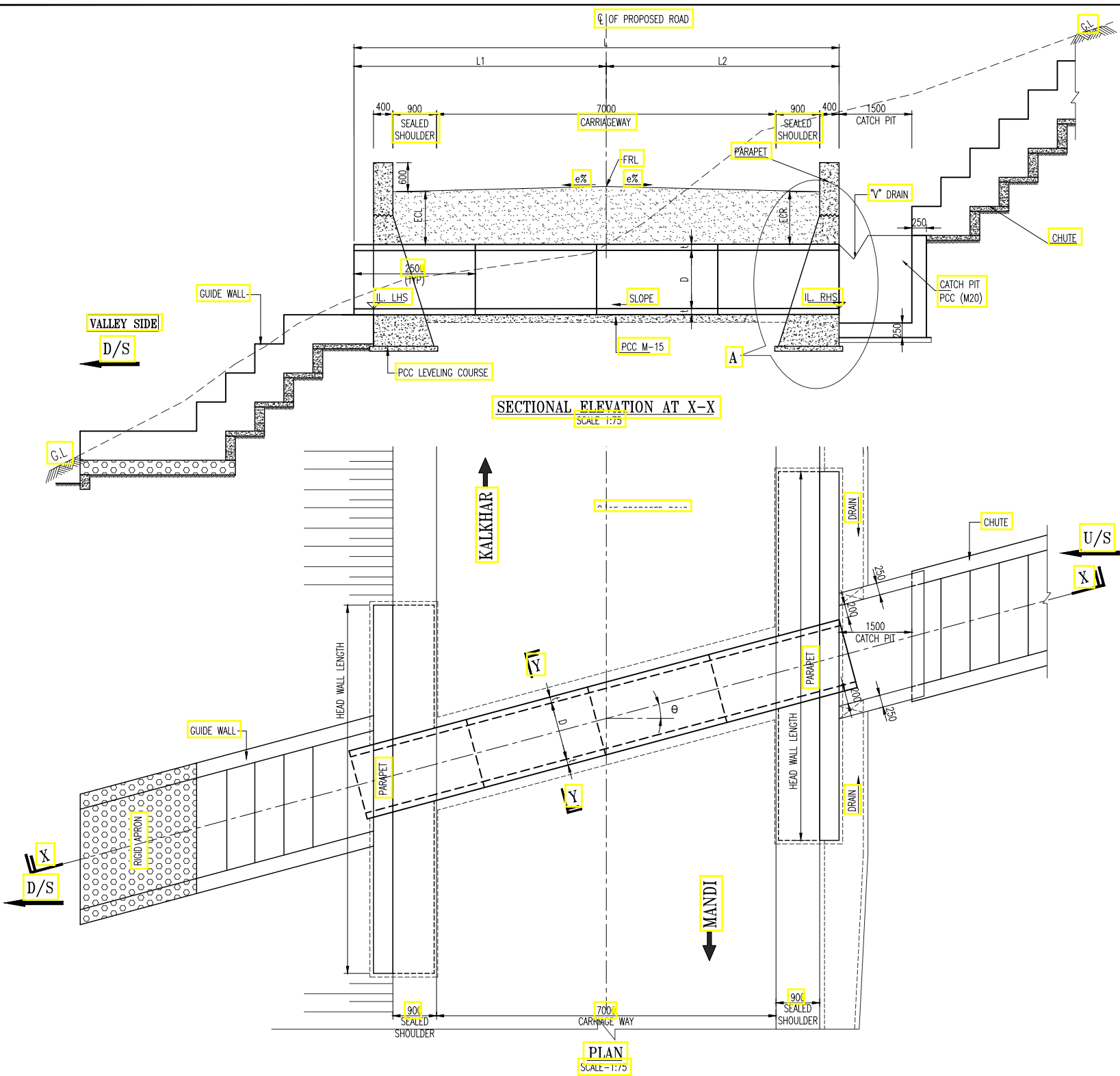


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S.No	Existing Change	Design Change	Design FRL @ PCL	Camber e% (LHS)	Camber e% (RHS)	Flow direction	IL LHS (m)	IL RHS (m)	Size of Pipe			Cushion(m) (LHS) 'ECL'	Cushion(m) (RHS) 'ECR'	Lengths of Pipe (m)			Length of Head Wall	Type of TCS	Type of Proposal	Skew Angle	Direction
									No of Pipes	Dia of Pipe 'D'	Thk of Pipe 't'			Lengths of Pipe(m) L	L1	L2					
1	15+227	14+740	1128.861	-7.00 %	7.00 %	R-L	1125.273	1125.600	1	1	0.115	1.85	2.33	12.50	7.51	4.10	6.50	TCS-3C	Reconstruction	9	Left
2	16+245	15+714	1173.985	-2.50 %	-2.50 %	R-L	1171.576	1171.900	1	1	0.115	1.04	0.76	11.25	6.29	4.39	6.50	TCS-3C	Reconstruction	14	Left
3	18+755	18+223	1289.826	-4.34 %	1.98 %	R-L	1287.390	1287.700	1	1	0.115	0.95	0.99	11.25	6.29	4.14	6.50	TCS-3C	Reconstruction	12	Left
4	20+550	19+985	1360.973	-2.50 %	-2.50 %	R-L	1358.662	1358.984	1	1	0.115	0.94	0.66	11.25	6.09	4.40	6.50	TCS-3F	Reconstruction	10	Left

TENDER PURPOSE ONLY

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<p>ROAD NAME : Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854</p>				<p>PACKAGE-VI:</p>				<p>SCALE: AS SHOWN</p>				<p>DATE:</p>				<p>SHEET 01 OF 01</p>									

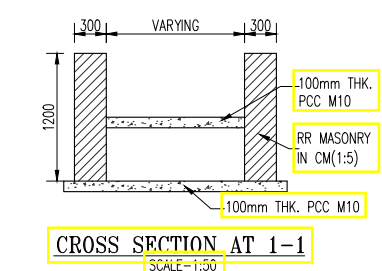
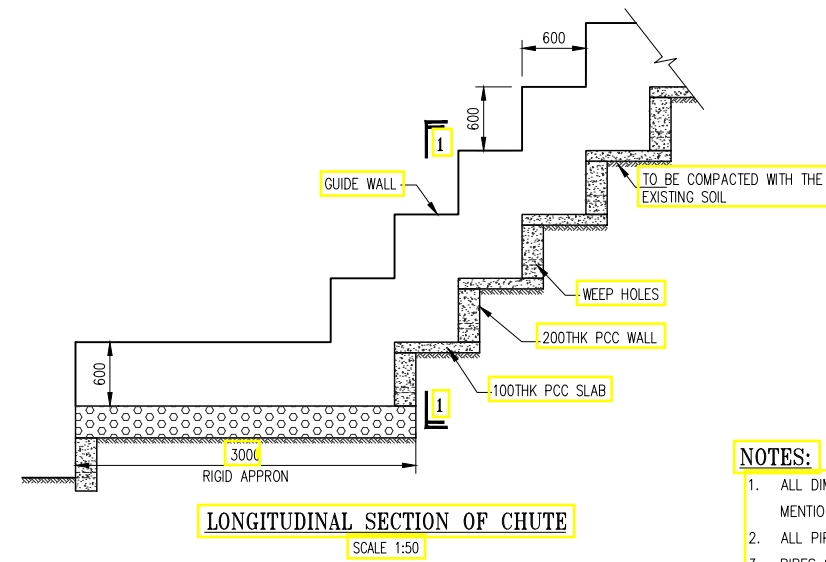
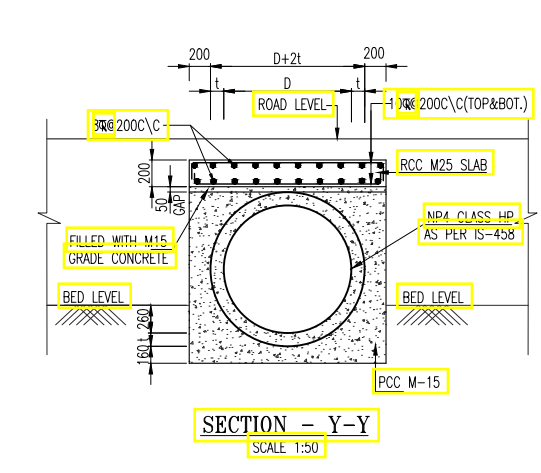
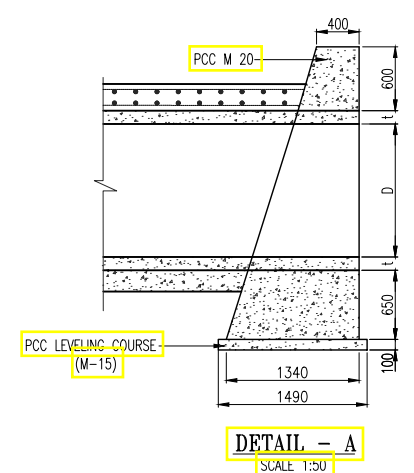
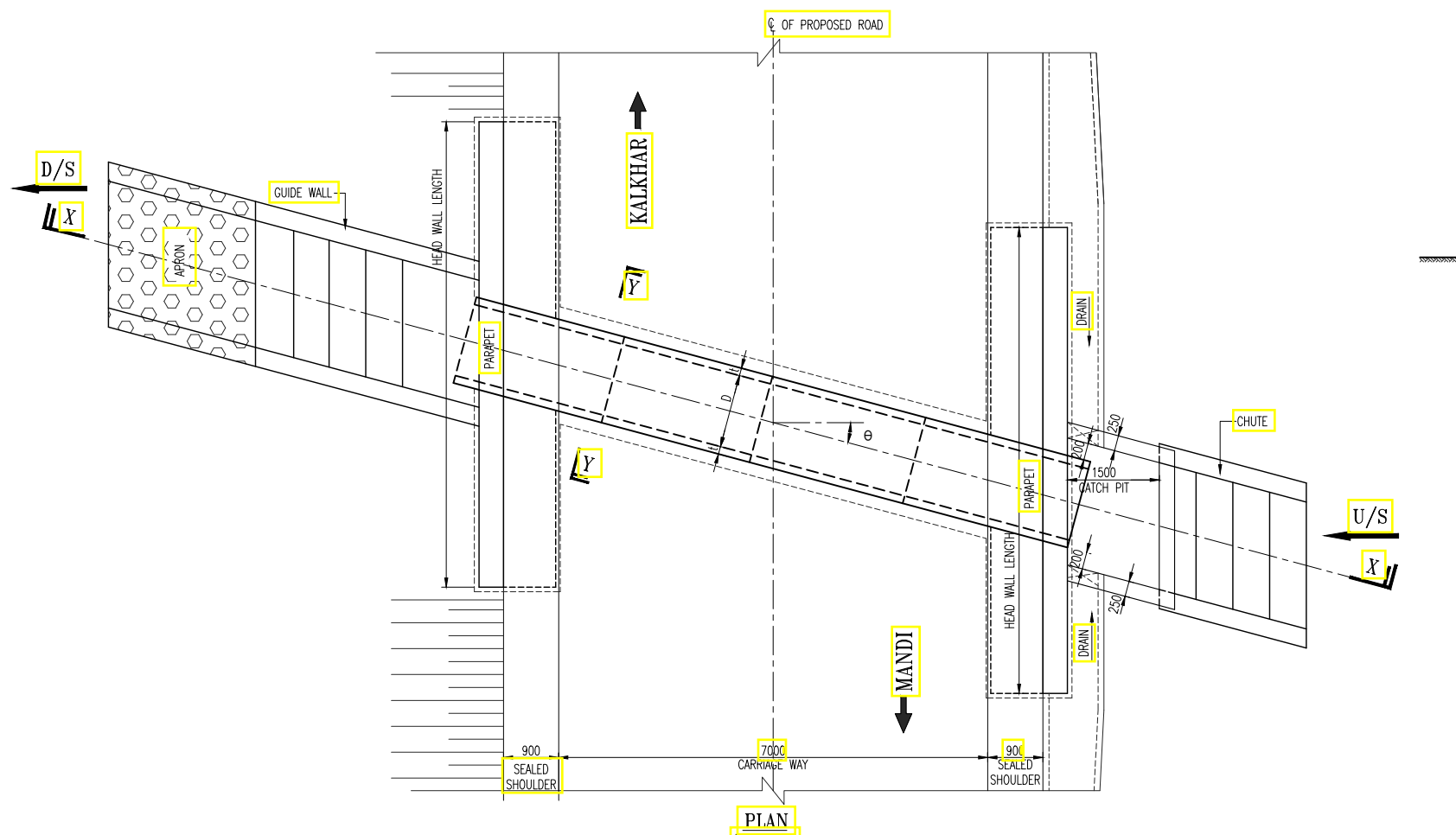
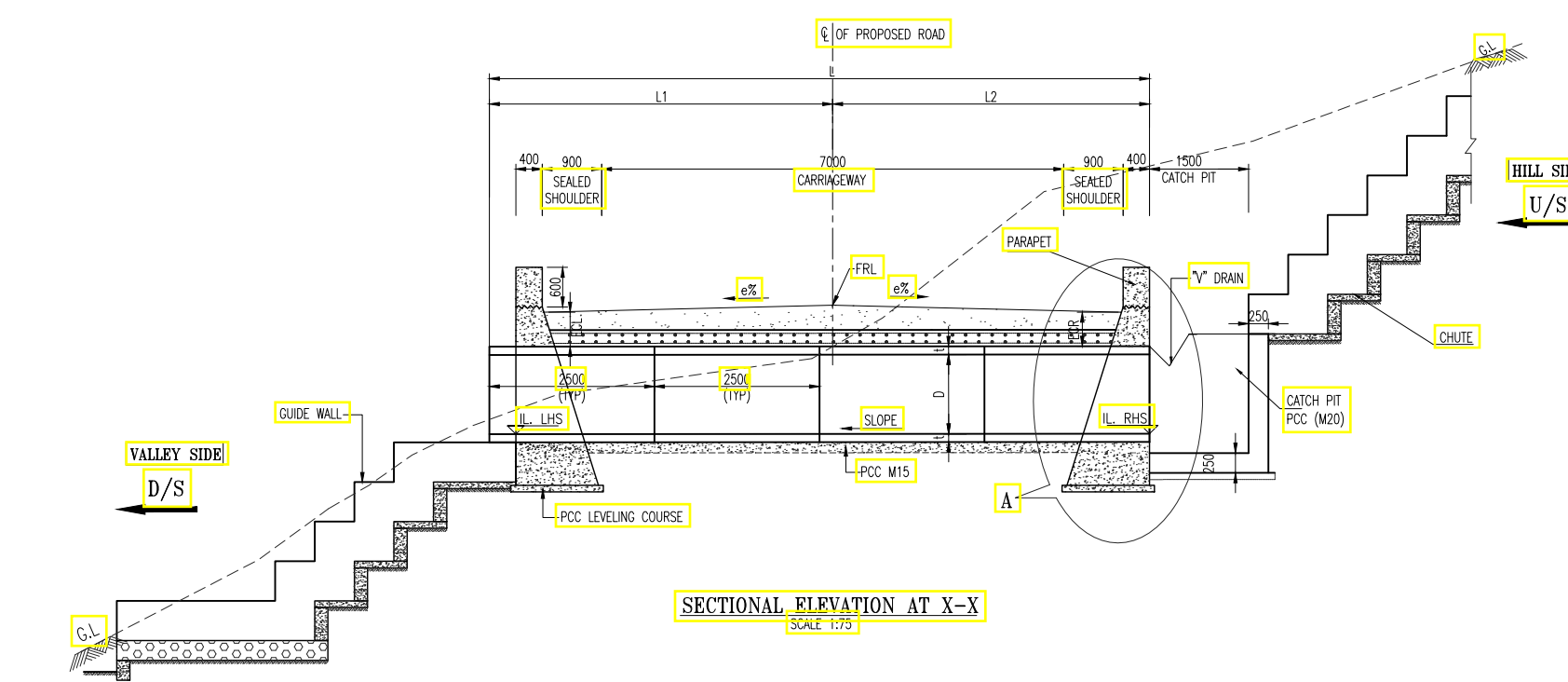


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S.No	Existing Change	Design Change	Design FRL @ PCL	Camber e% (LHS)	Camber e% (RHS)	Flow direction	IL LHS (m)	IL RHS (m)	Size of Pipe			Cushion(m) (LHS) 'ECL'	Cushion(m) (RHS) 'ECR'	Lengths of Pipe (m)			Length of Head Wall	Type of TCS	Type of Proposal	Skew Angle	Direction
									No of Pipes	Dia of Pipe 'D'	Thk of Pipe 't'			Lengths of Pipe(m) L	L1	L2					
1	12+625	12+292	996.035	-5.00 %	5.00 %	R-L	992.673	993.000	1	1	0.115	1.77	2.02	12.50	7.50	4.09	6.50	TCS-3F	Reconstruction	8	Right

TENDER PURPOSE ONLY

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<p>DESIGNED: GANESH</p>				<p>DRAWN: SATYA</p>				<p>CHECKED: PRANAI</p>				<p>APPROVED: PRANAI</p>		<p>DRAWING NO : HP/STR/PC/TYP/110</p>		<p>SIZE : A3</p>				
<p>ROAD NAME : Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854</p>				<p>Package-VI:</p>				<p>SCALE: AS SHOWN</p>				<p>DATE:</p>		<p>SHEET 01 OF 01</p>						



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 4. LENGTH OF EACH PIPE HAS BEEN CONSIDERED AS 2.5M. SMALLER PIPE OF 1.25M LENGTH HAS BEEN PROPOSED AT THE END TO MEET THE REQUIREMENT OF PART LENGTH OF PIPE.
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S.No	Existing Change	Design Change	Design FRL @ PCL	Camber e% (LHS)	Camber e% (RHS)	Flow direction	IL LHS (m)	IL RHS (m)	Size of Pipe			Cushion(m) (LHS) 'ECL'	Cushion(m) (RHS) 'ECR'	Lengths of Pipe (m)			Length of Head Wall	Type of TCS	Type of Proposal	Skew Angle	Direction
									No of Pipes	Dia of Pipe 'D'	Thk of Pipe 't'			Lengths of Pipe(m) L	L1	L2					
1	27+968	27+382	1292.678	-2.50 %	-2.50 %	R-L	1290.874	1291.201	1	1	0.115	0.42	0.16	11.25	6.65	4.21	6.50	TCS-3D	Reconstruction	16	Left

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

CLIENT:	CONSULTANT:	PROJECT:	JOB No. : 01041055
HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.	SATRA SERVICES AND SOLUTIONS PVT.LTD. #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India. Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in	HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)	TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE ROW PIPE CULVERT (LEFT SKEW) WITH ENCASING FOR TCS-(3F)
DESIGNED	CHECKED	APPROVED	DESIGNED: GANESH DRAWN: SATYA CHECKED: PRANAI APPROVED: PRANAI
DATE	DATE	DATE	DRAWING NO : HP/STR/PC/TYP/111
DESCRIPTION	DESIGNED	DRAWN	CHECKED
APPROVED	APPROVED	APPROVED	APPROVED

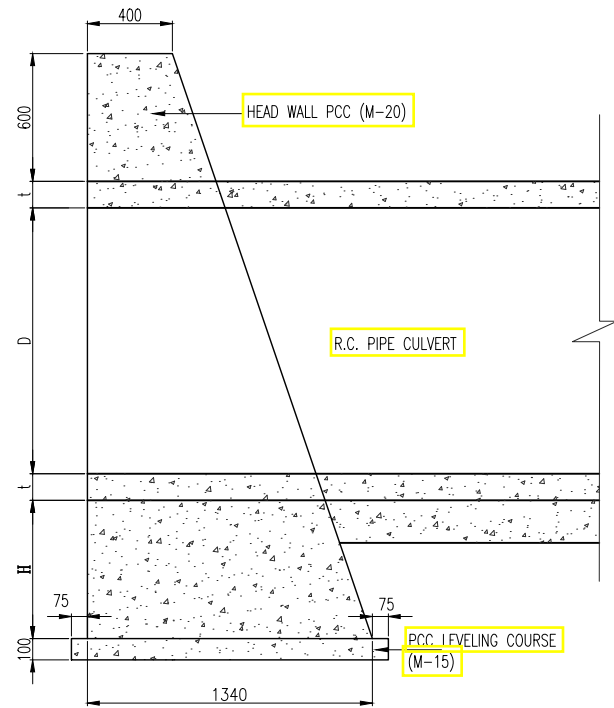
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PACKAGE-VI: Upgrade of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

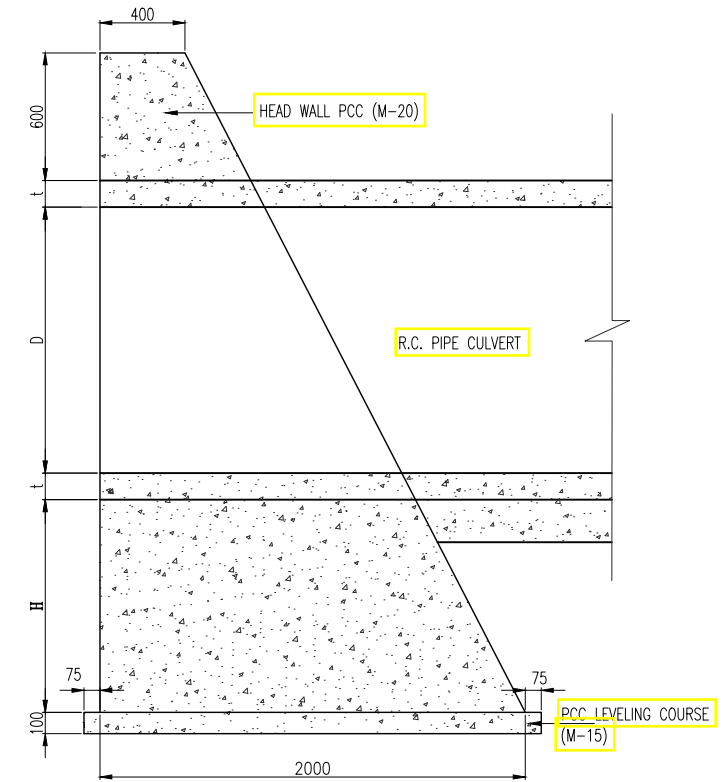
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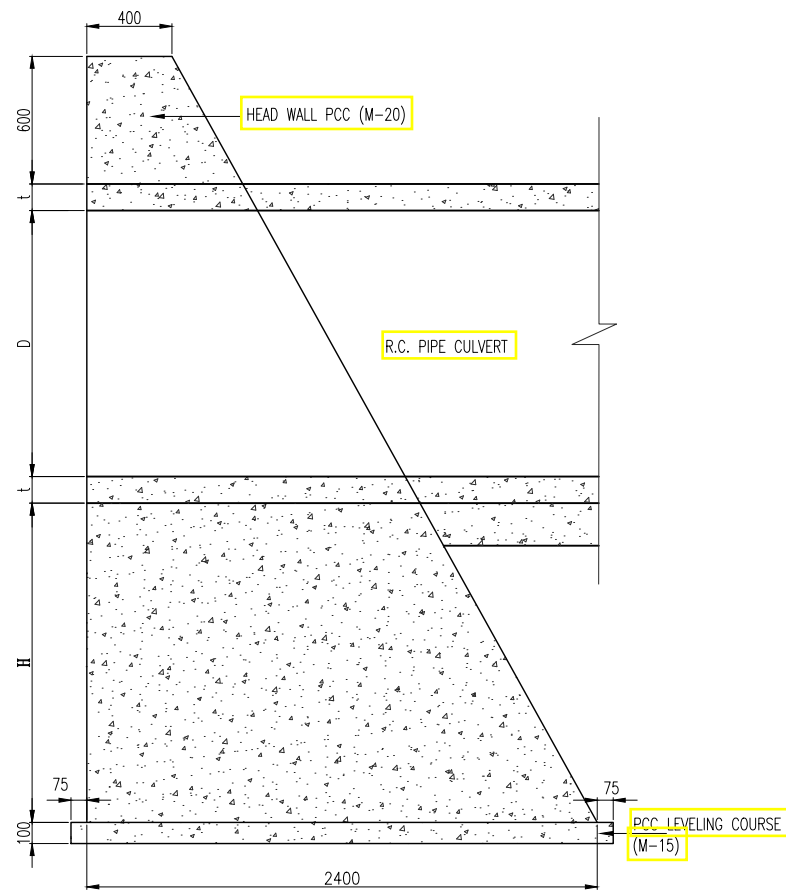
SHEET 01 OF 01



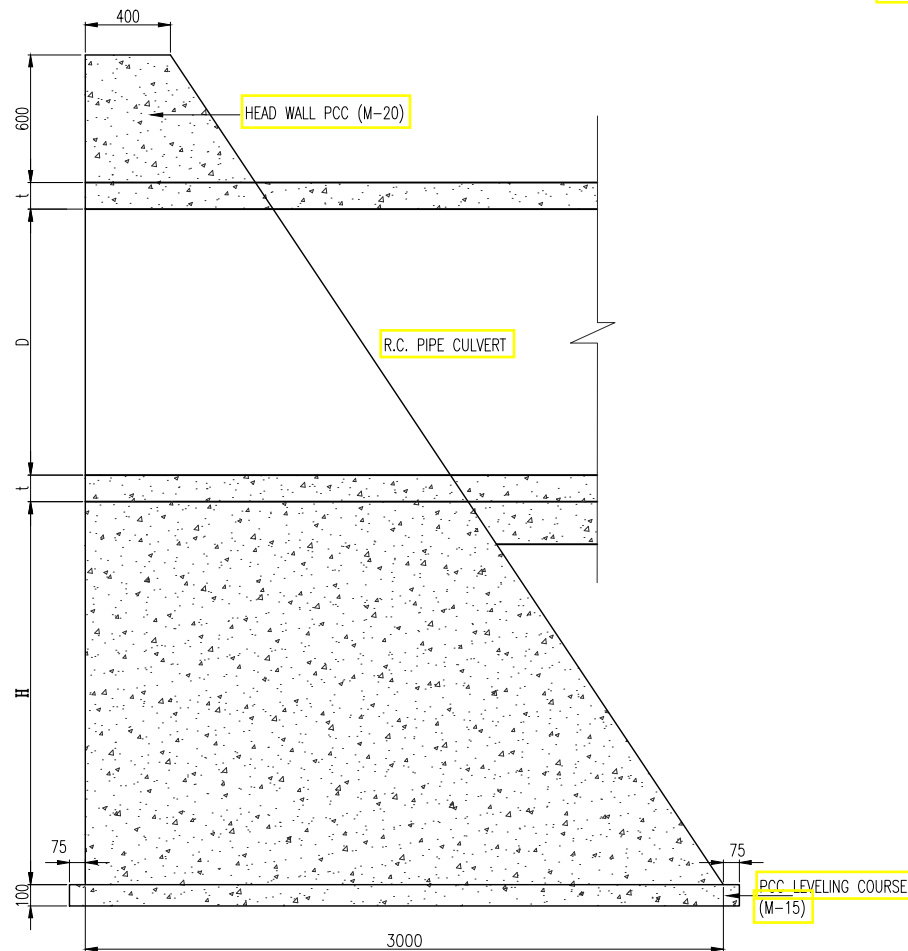
**HEAD WALL SECTION
(H= 650)**



**HEAD WALL SECTION
(650> H<=1300)**



**HEAD WALL SECTION
(1300> H<=1950)**



**HEAD WALL SECTION
(1950> H<=2600)**

REFERENCE DRAWINGS:

- 1. TYPICAL GENERAL ARRANGEMENT DRAWING OF PIPE CULVERT - HP/MAN-KAL/STR/PC/TYP/101-107.


NOTES:

- 1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION SHALL BE SCALED.
- 2. GRADE OF CONCRETE FOR PCC HEAD WALL IS M20.

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

CLIENT:

 HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:

 SATRA SERVICES AND SOLUTIONS PVT.LTD.
 #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
 Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:
 HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)

SCALE: AS SHOWN

DATE: _____

JOB No. : 01041055

DESIGNED	GANESH
DRAWN	SATYA
CHECKED	PRANAI
APPROVED	PRANAI

ROAD NAME :

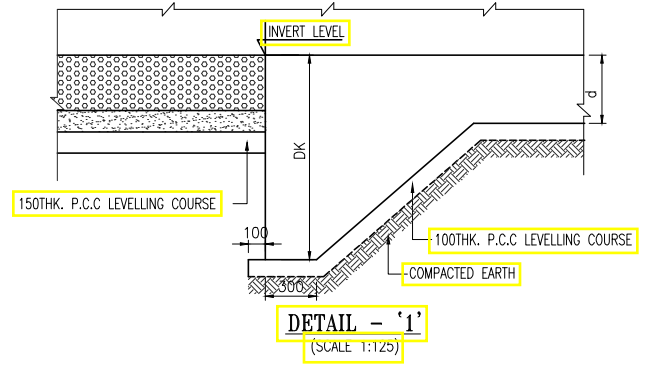
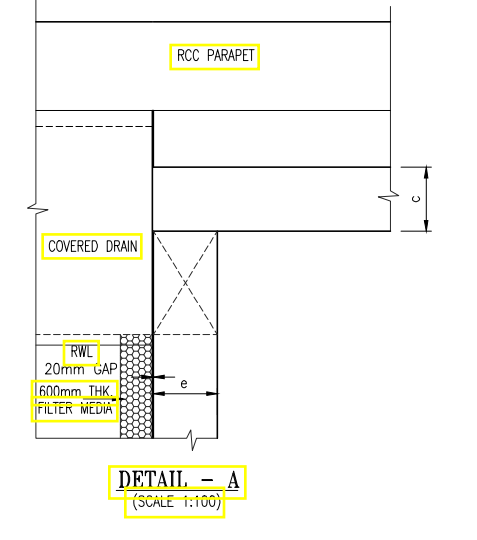
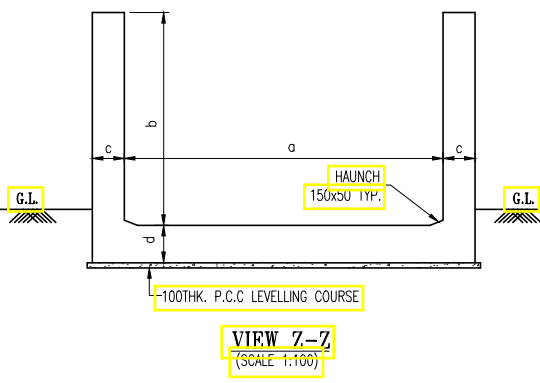
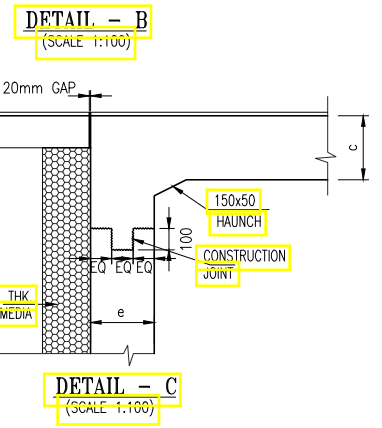
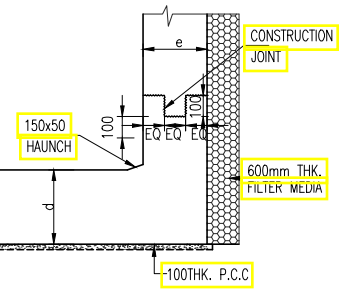
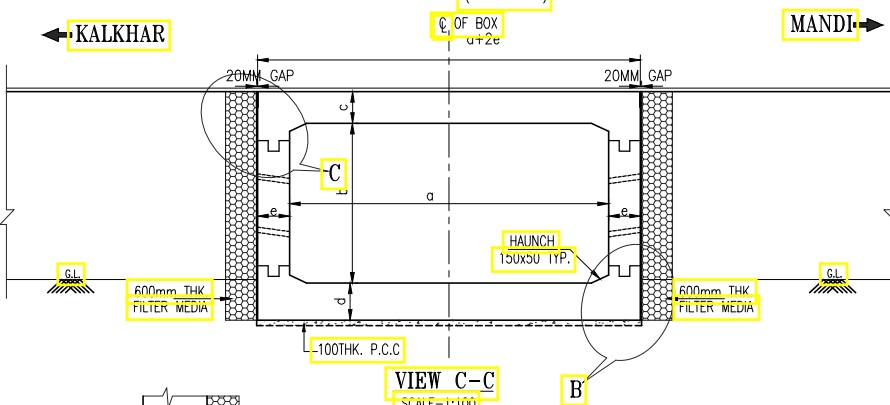
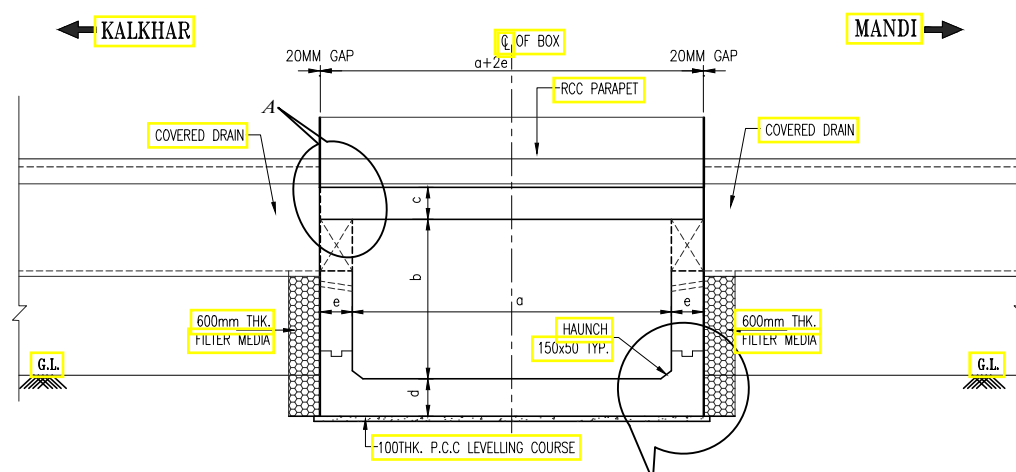
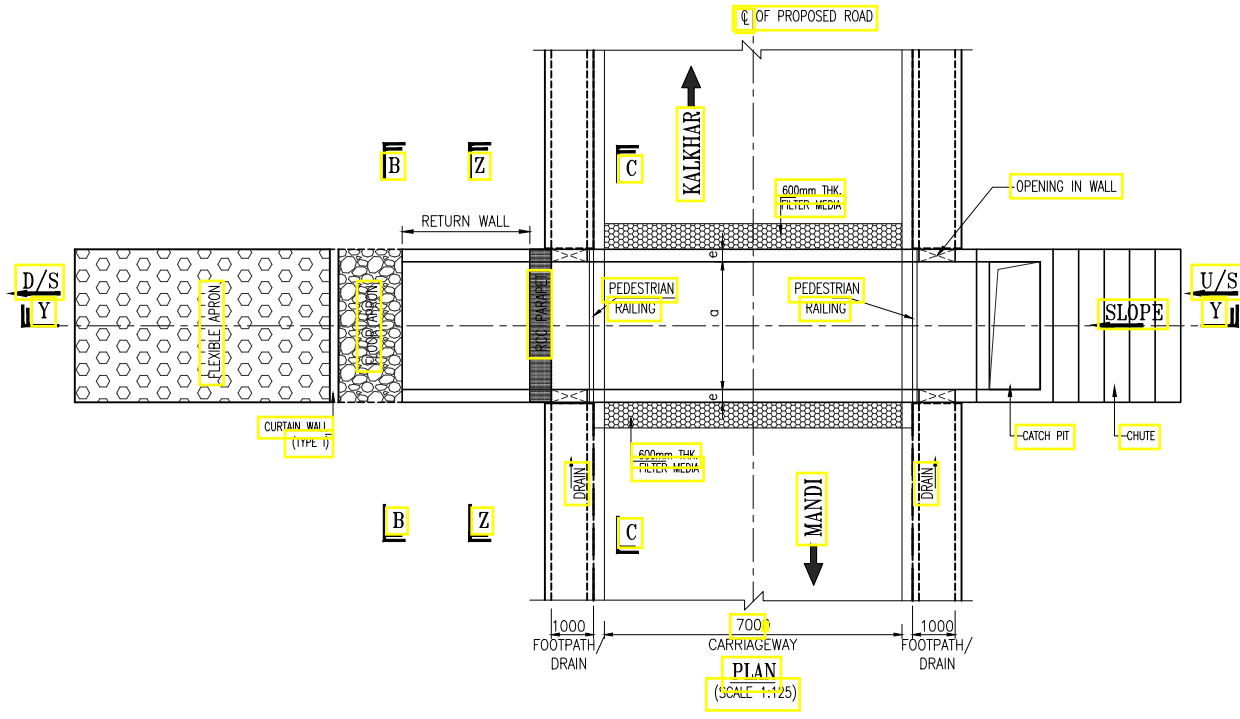
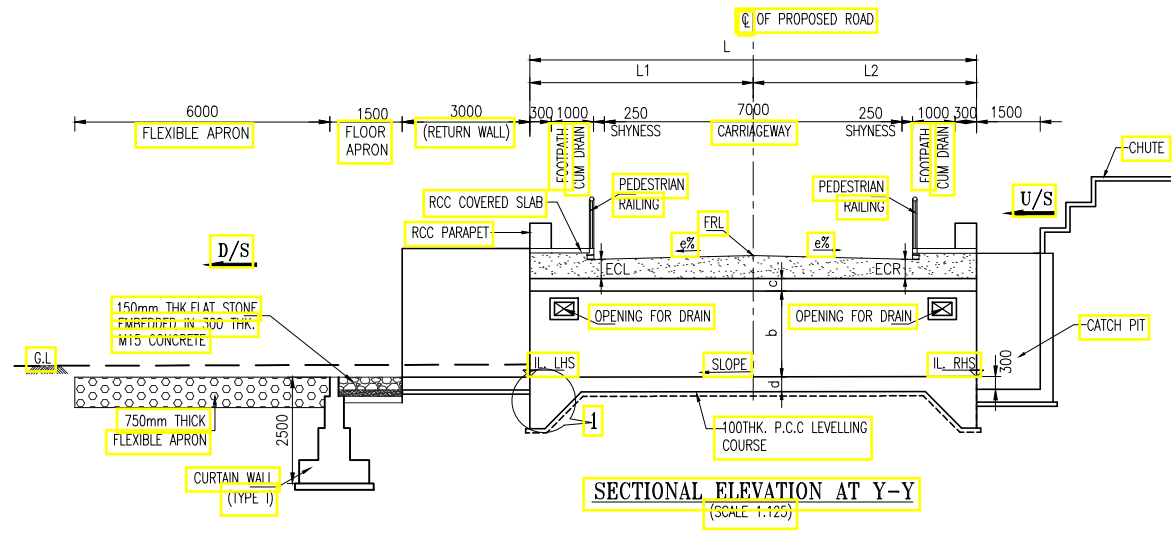
TITLE :
 DIMENSION DETAILS OF HEAD WALL FOR PIPE CULVERTS ON DOWN STREAM SIDE

DRAWING NO : HP/STR/PC/TYP/201

Package-VI:
 Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

REV: 0
 SIZE: A3
 SHEET 01 OF 01

BOX CULVERTS



- LEGEND:**
- FRL : FINISHED ROAD LEVEL
 - GL : GROUND LEVEL
 - IL : INVERT LEVEL
 - U/S : UP STREAM SIDE
 - D/S : DOWN STREAM SIDE
 - THK : THICKNESS
 - RWL : RETAINING WALL
 - RTL : RETURN WALL
 - ECL : EARTH CUSHION LEFT
 - ECR : EARTH CUSHION RIGHT

- REFERENCE DRAWINGS:**
1. REINFORCEMENT DETAILS OF BOX CULVERT - HP/MAN-KAL/STR/BC/TYP/201
 2. MISCELLANEOUS DETAILS - HP/MAN-KAL/STR/MISC/601-606
 3. RETAINING WALL DETAILS - HP/MAN-KAL/STR/MISC/608

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES UNLESS MENTIONED OTHERWISE.
 2. GRADE OF CONCRETE SHALL BE AS FOLLOWS.
RC BOX - M30 RETAINING WALL - M30
CURTAIN WALL, TOE WALL & LEVELLING COURSE P.C.C. - M15
 3. CLEAR COVER FOR ANY REINFORCEMENT SHALL BE
TOP SLAB - 40mm BOTTOM SLAB - 75mm
SIDE WALL EARTH FACE - 75mm
SIDE WALL OTHER FACE - 40mm
 4. GRANULAR BACK FILL MATERIAL CONFORMING TO IRC:78-2014 SHALL BE USED.
 5. DIMENSIONS & LEVELS MAY VARY AS PER SITE CONDITIONS.
 6. GRADE OF STEEL - Fe-500D SHALL CONFORM TO IS1786.
 7. ONLY WRITTEN DIMENSIONS ARE SHALL BE FOLLOWED, NO DIMENSION SHALL BE SCALED.
 8. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY & STRUCTURAL DRAWINGS.
 9. THE DIMENSIONS AND DETAILS ARE SUBJECT TO MODIFICATION/ CORRECTION/ OMISSION DURING EXECUTION.
 10. CHAMBERS & CHUTE ARRANGEMENT SHOWN IN THE DRAWINGS IS TYPICAL ONLY, THE CONSTRUCTION CONTRACTOR SHALL SUBMIT WORKING DRAWINGS BASED ON THE OGL'S ALONG THE CROSS SECTION OF THE CULVERT. THE REQUIREMENT OF CHAMBERS ON U/S & CHUTES ON D/S CAN BE DISPENSED WITH IF THE TERRAIN IS FLAT.
 11. 'DK' IS DEPTH OF KEY AT BASE SLAB.
FOR BASE SLAB THICKNESS VALUE OF "DK"
UPTO 900MM. 1200MM.
GREATER THAN 900MM D+300MM.
D = BASE SLAB THICKNESS

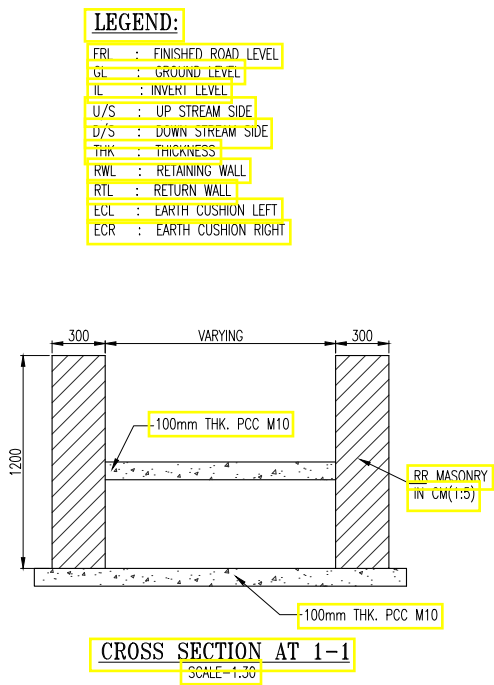
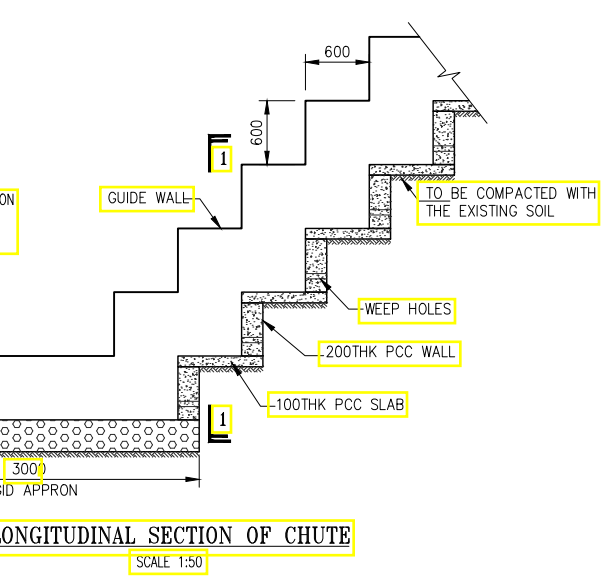
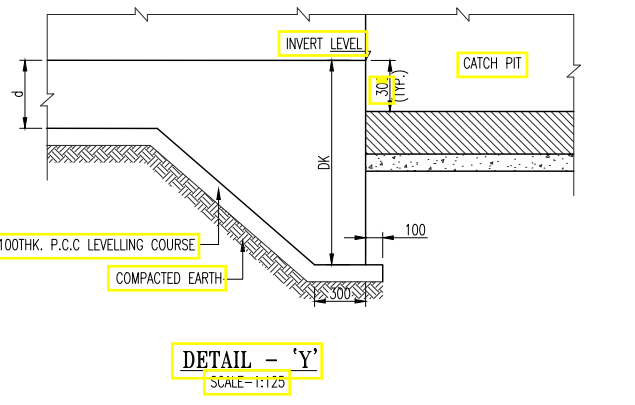
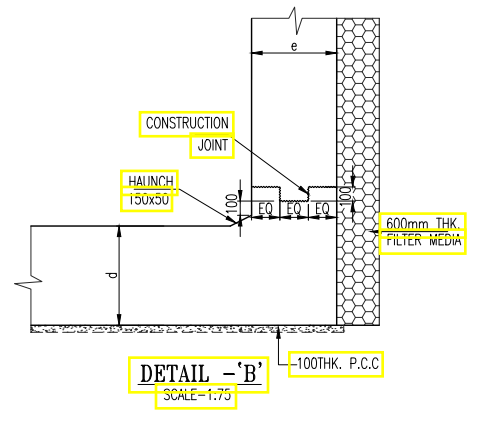
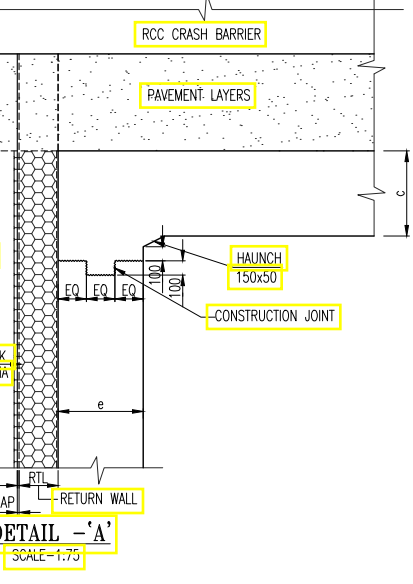
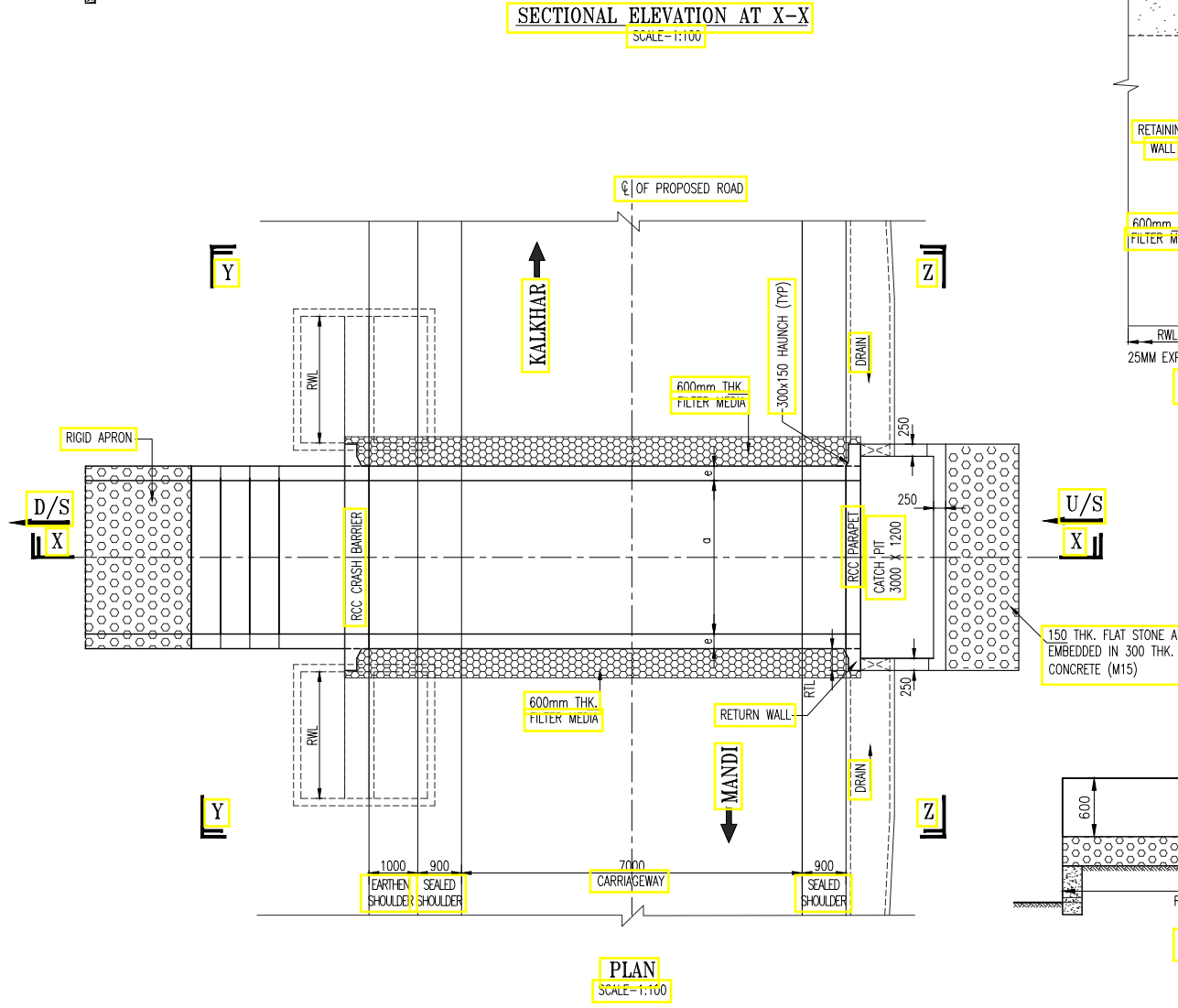
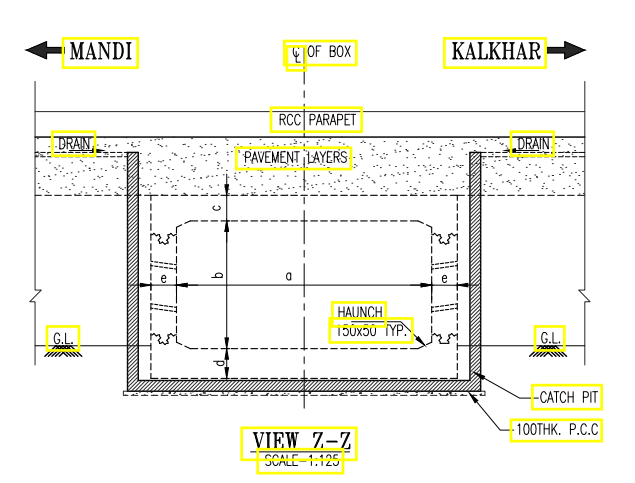
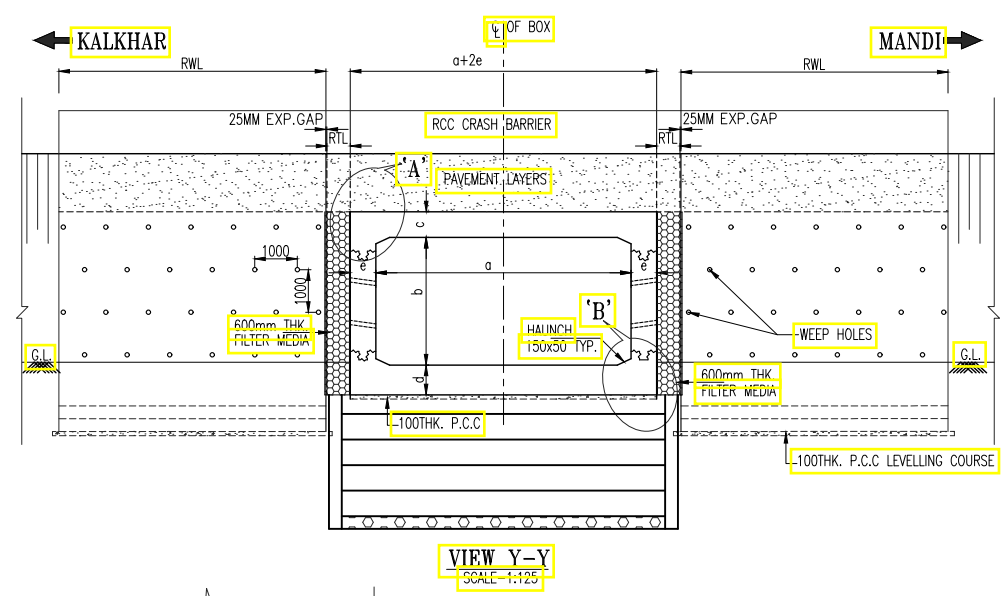
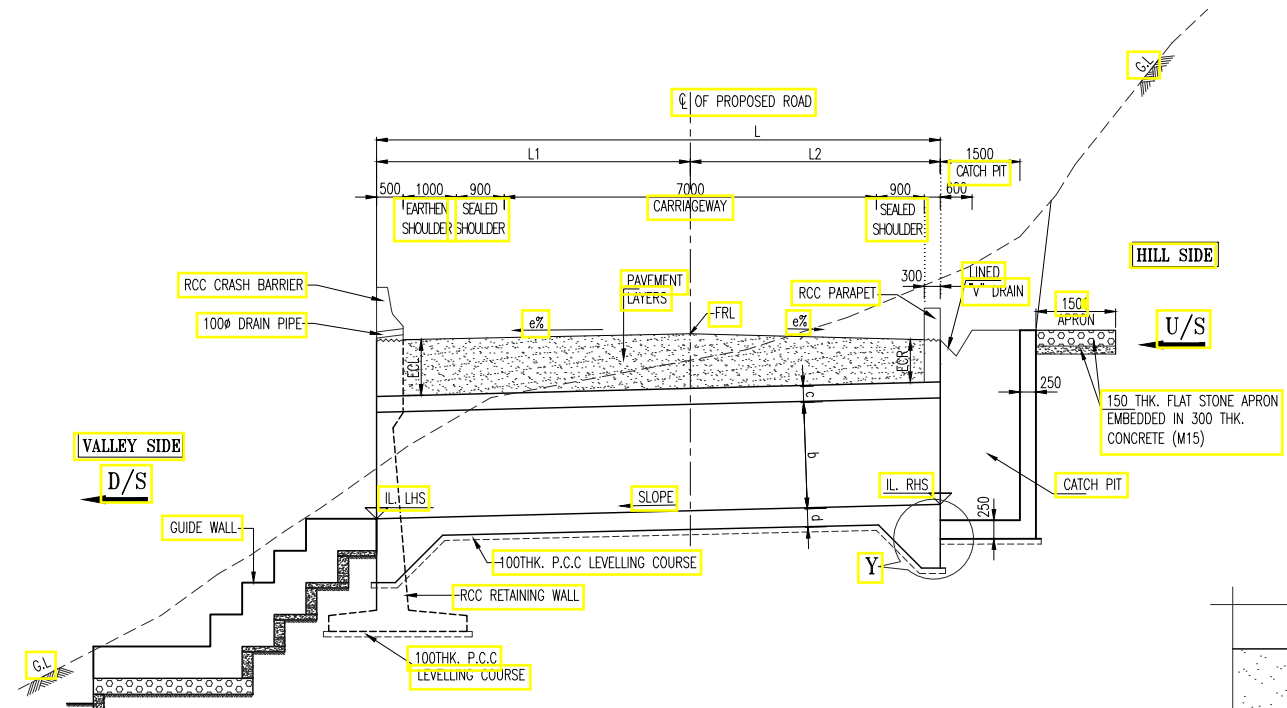
U-SHAPE RETAINING WALL

S.No	Existing Change	Design Change	Design FRL @ PCL	Flow direction	Height Of U Shape Return Wall		Dimensions of U Shape Return Wall		
					D/S (b)	Length Of U Shape Return Wall	Clear Span (a)	Wall (c)	Base Slab (d)
1	16+737	16+204	1194.161	R-L	2.39	3.00	2.0	0.25	0.30
2	22+733	22+170	1342.461	R-L	2.32	3.00	2.0	0.45	0.50
3	22+950	22+397	1333.771	R-L	5.08	3.00	2.0	0.25	0.30
4	23+440	22+872	1338.511	R-L	2.07	3.00	2.0	0.25	0.30

S.No	Existing Change	Design Change	Design FRL @ PCL	Camber e% (LHS)	Camber e% (RHS)	Flow direction	IL LHS (m)	IL RHS (m)	Proposed Structure Details				Lengths of Box (m)			Dimensions of Box (m)		Return Wall Length (LHS) (RTL)	Return Wall Length (RHS) (RTL)	SBC T/m ²	Skew Angle (°)	TCS Type	Improvement Proposal		
									Type of Structure	No of Spans	Clear Span (m) (a)	Clear Height (m) (b)	Cushion (m) (LHS) (ECL)	Cushion (m) (RHS) (ECR)	Lengths of Box (m) L	L1	L2							Wall Ex (e)	Base Slab (d)
1	16+737	16+204	1194.161	-3.2	0.5	R-L	1191.769	1192.100	Box	1	2	1.5	0.32	0.23	11.25	7.10	4.15	0.25	0.30	-	0.55	0°	TCS-2	Reconstruction	
2	22+733	22+170	1342.461	-2.5	-2.5	R-L	1340.139	1340.150	Box	1	2	1.5	0.33	0.34	10.50	5.50	5.00	0.25	0.30	-	-	15	0°	TCS-2	Reconstruction
3	22+950	22+397	1333.771	-2.5	-2.5	R-L	1328.686	1328.697	Box	1	2	2.5	2.00	2.00	10.50	5.50	5.00	0.35	0.40	-	-	15	0°	TCS-2	Reconstruction
4	23+440	22+872	1338.511	-2.5	-2.5	R-L	1336.439	1336.450	Box	1	2	1.5	0.08	0.09	10.50	5.53	4.97	0.25	0.30	-	-	15	13 (Right)	TCS-2	Reconstruction

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

CLIENT: HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.	CONSULTANT: SATRA SERVICES AND SOLUTIONS PVT.LTD. #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India. Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in	PROJECT: HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)	JOB No. : 01041055 DESIGNED: GANESH DRAWN: SATYA CHECKED: PRANAI APPROVED: PRANAI	TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE CELL BOX CULVERT FOR TCS-2 DRAWING NO : HP/STR/BC/TYP/101 Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854	REV. 0 SIZE : A3 SHEET 01 OF 01
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- LEGEND:**
- FRL : FINISHED ROAD LEVEL
 - GL : GROUND LEVEL
 - IL : INVERT LEVEL
 - U/S : UP STREAM SIDE
 - D/S : DOWN STREAM SIDE
 - THK : THICKNESS
 - RWL : RETAINING WALL
 - RTL : RETURN WALL
 - ECL : EARTH CUSHION LEFT
 - ECR : EARTH CUSHION RIGHT

- REFERENCE DRAWINGS:**
1. REINFORCEMENT DETAILS OF BOX CULVERT - HP/MAN-KAL/STR/BC/TYP/201
 2. MISCELLANEOUS DETAILS - HP/MAN-KAL/STR/MISC/601-606
 3. RETAINING WALL DETAILS - HP/MAN-KAL/STR/MISC/608

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES UNLESS MENTIONED OTHERWISE.
 2. GRADE OF CONCRETE SHALL BE AS FOLLOWS.
RC BOX - M30 RETAINING WALL - M30
CURTAIN WALL, TOE WALL & LEVELLING COURSE P.C.C - M15
 3. CLEAR COVER FOR ANY REINFORCEMENT SHALL BE
TOP SLAB - 40mm BOTTOM SLAB - 75mm
SIDE WALL EARTH FACE - 75mm
SIDE WALL OTHER FACE - 40mm
 4. GRANULAR BACK FILL MATERIAL CONFORMING TO IRC:78-2014 SHALL BE USED.
 5. DIMENSIONS & LEVELS MAY VARY AS PER SITE CONDITIONS.
 6. GRADE OF STEEL - Fe-500D SHALL CONFORM TO IS1786.
 7. ONLY WRITTEN DIMENSIONS ARE SHALL BE FOLLOWED, NO DIMENSION SHALL BE SCALED.
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 10. CHAMBERS & CHUTE ARRANGEMENT SHOWN IN THE DRAWINGS IS TYPICAL ONLY. THE CONSTRUCTION CONTRACTOR SHALL SUBMIT WORKING DRAWINGS BASED ON THE OGL'S ALONG THE CROSS SECTION OF THE CULVERT. THE REQUIREMENT OF CHAMBERS ON U/S & CHUTES ON D/S CAN BE DISPENSED WITH IF THE TERRAIN IS FLAT.
 11. 'DK' IS DEPTH OF KEY AT BASE SLAB.
FOR BASE SLAB THICKNESS UPTO 900MM. VALUE OF 'DK' 1200MM.
GREATER THAN 900MM D+300MM.
D = BASE SLAB THICKNESS

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

CLIENT:

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:

SATRA SERVICES AND SOLUTIONS PVT.LTD.
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Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:
HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)

SCALE: AS SHOWN

DATE: _____

JOB No. : 01041055

DESIGNED	GANESH
DRAWN	SATYA
CHECKED	PRANA
APPROVED	PRANA

ROAD NAME : _____

TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE CELL BOX CULVERT FOR TCS-3(A,B,E)



DRAWING NO : HP/STR/BC/TYP/102

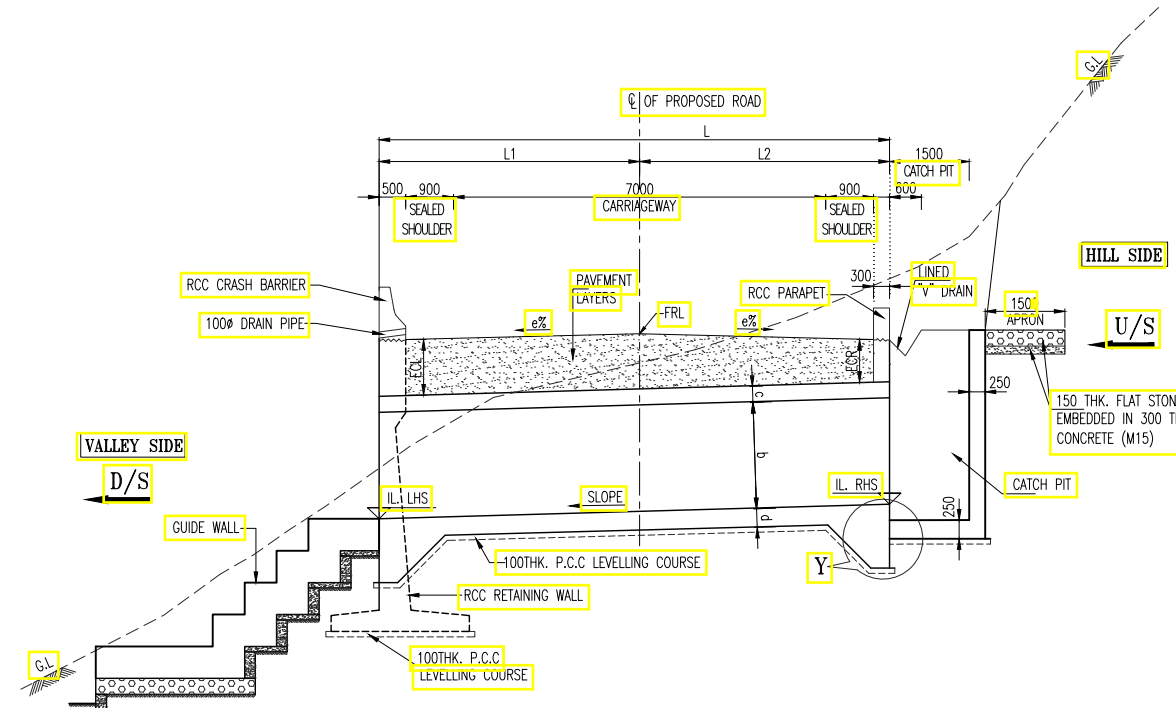
Package-VI:
Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

REV. 0
SIZE : A3
SHEET 01 OF 02

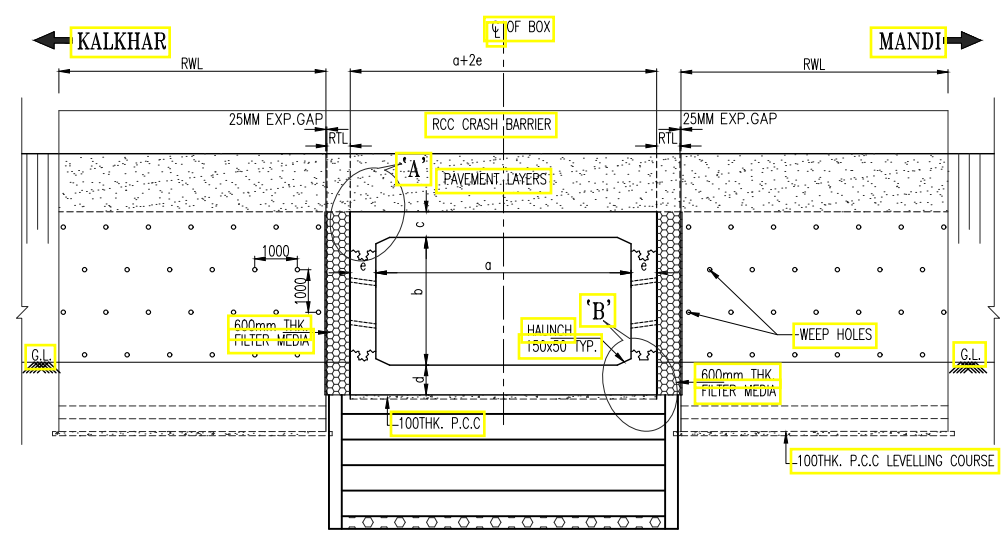
S.No	Existing Chainge	Design Chainge	Design FRL @ PCL	Camber e% (LHS)	Camber e% (RHS)	Flow direction	IL LHS (m)	IL RHS (m)	Proposed Structure Details				Cushion (m) (LHS) (ECL)	Cushion (m) (RHS) (ECR)	Lengths of Box (m)			Dimensions of Box (m)			Return Wall Length (LHS) (RTL)	Retaining Wall Length (LHS) (RWL)	Return Wall Length (RHS) (RTL)	Retaining Wall Length (RHS) (RWL)	Skew Angle (°)	TCS Type	Improvement Proposal
									Type of Structure	No of Spans	Clear Span (m) (a)	Clear Height (m) (b)			Lengths of Box (m) L	L1	L2	Top Slab (c)	Wall Ex (e)	Base Slab (d)							
1	12+587	12+153	987.087	-7.0	7.0	R-L	984.560	984.900	Box	1	2	1.50	0.12	0.65	12.50	8.03	4.48	0.25	0.25	0.30	-	2.60	0.55	-	22 (Right)	TCS-3A	Reconstruction
2	New	11+821	968.920	-2.5	-2.5	R-L	965.690	966.000	Box	1	2	2.00	0.73	0.45	10.50	5.85	4.65	0.25	0.25	0.30	-	4.30	0.55	-	0°	TCS-3B	New Construction
3	16+400	15+870	1180.445	-2.5	-2.5	R-L	1178.057	1178.400	Box	1	2	1.50	0.39	0.08	10.50	5.75	4.75	0.25	0.25	0.30	-	3.00	0.55	-	0°	TCS-3B	Reconstruction
4	17+273	16+743	1215.832	-7.0	7.0	R-L	1213.060	1213.400	Box	1	2	1.50	0.42	0.87	11.25	7.10	4.15	0.25	0.25	0.30	-	3.10	0.55	-	0°	TCS-3B	Reconstruction
5	19+371	18+840	1324.531	-7.0	7.0	R-L	1321.139	1321.469	Box	1	2	2.00	0.46	1.01	12.50	8.26	4.24	0.25	0.25	0.30	-	3.90	0.55	-	12 (Left)	TCS-3B	Reconstruction
6	25+447	24+876	1321.670	-2.5	-2.5	R-L	1317.765	1318.101	Box	1	2	2.50	0.86	0.55	10.50	5.66	4.84	0.30	0.30	0.35	-	5.20	0.55	-	0°	TCS-3B	Reconstruction
7	25+710	25+144	1318.687	-7.0	7.0	R-L	1316.370	1316.700	Box	1	2	1.50	0.00	0.43	11.25	7.10	4.15	0.25	0.25	0.30	-	2.40	0.55	-	0°	TCS-3B	Reconstruction
8	18+054	17+524	1250.912	-7.0	7.0	R-L	1248.276	1248.606	Box	1	2	1.50	0.21	0.75	12.50	8.27	4.23	0.25	0.25	0.30	-	2.70	0.55	-	11 (Right)	TCS-3E	Reconstruction
9	26+005	25+439	1318.976	-2.5	-2.5	R-L	1316.478	1316.818	Box	1	2	1.50	0.50	0.19	10.50	5.85	4.65	0.25	0.25	0.30	-	3.20	0.55	-	0°	TCS-3E	Reconstruction
10	27+810	27+234	1296.5532	-5.0	5.0	R-L	1293.703	1294.050	Box	1	2	2.00	0.08	0.36	12.50	8.35	4.15	0.25	0.25	0.30	-	3.30	0.55	-	0°	TCS-3E	Reconstruction

TENDER PURPOSE ONLY

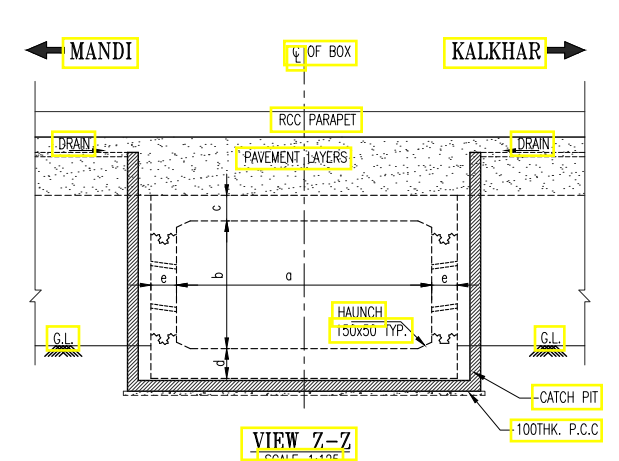
NOTES: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.					CLIENT:  HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.					CONSULTANT:  SATRA SERVICES AND SOLUTIONS PVT.LTD. #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India. Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in					PROJECT: HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)					JOB No. : 01041055 DESIGNED: GANESH DRAWN: SATYA CHECKED: PRANAI APPROVED: PRANAI			TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE CELL BOX CULVERT FOR TCS-3(A,B,E) DRAWING NO : HP/STR/BC/TYP/102 Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854					REV. 0	SIZE : A3	SHEET 02 OF 02
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED						SCALE:	AS SHOWN	DATE																



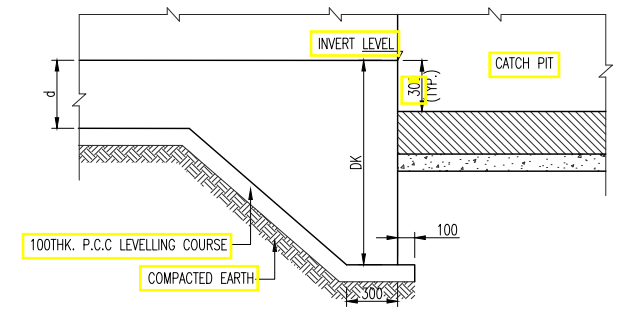
SECTIONAL ELEVATION AT X-X
SCALE=1:100



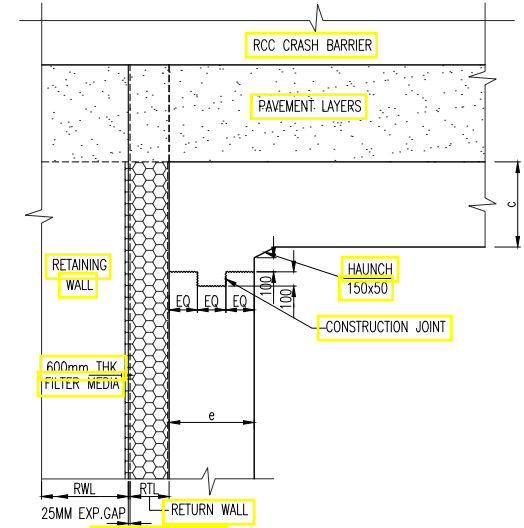
VIEW Y-Y
SCALE=1:125



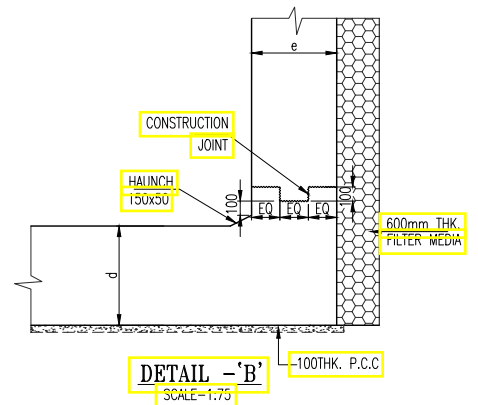
VIEW Z-Z
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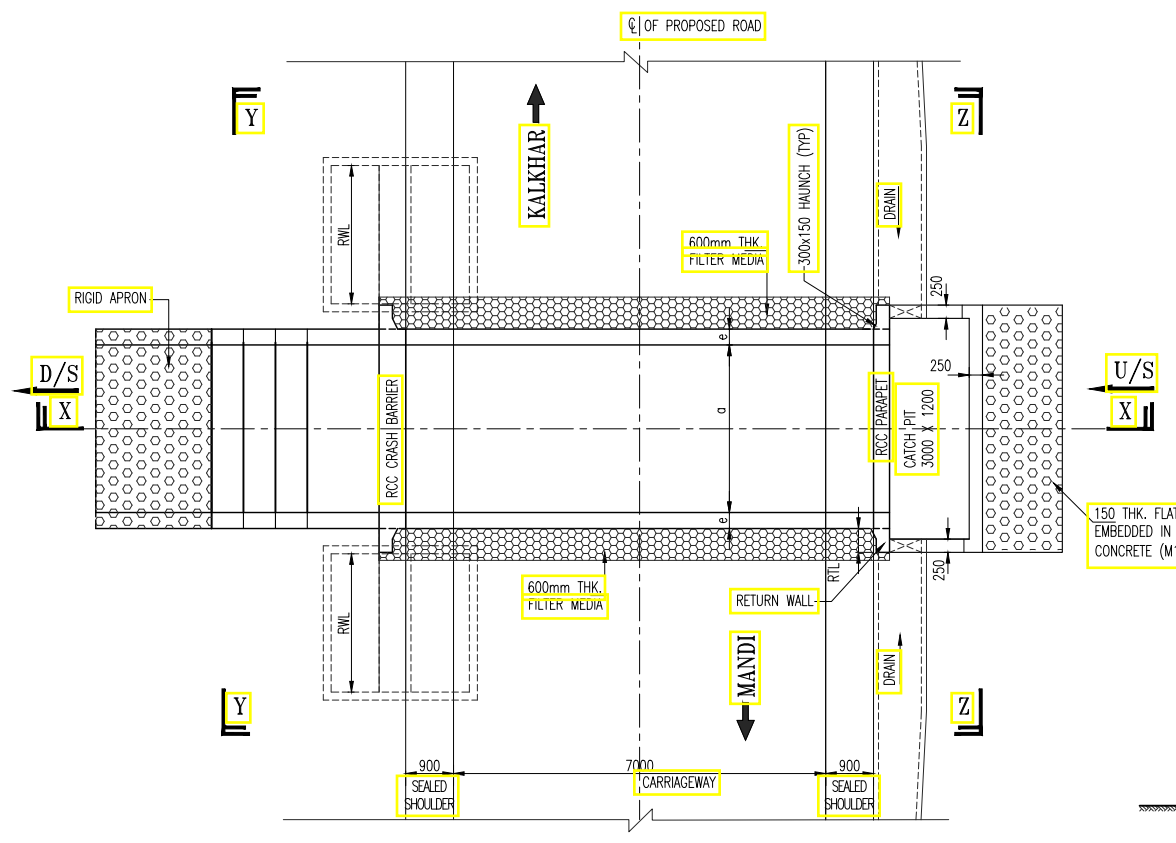
DETAIL - 'Y'
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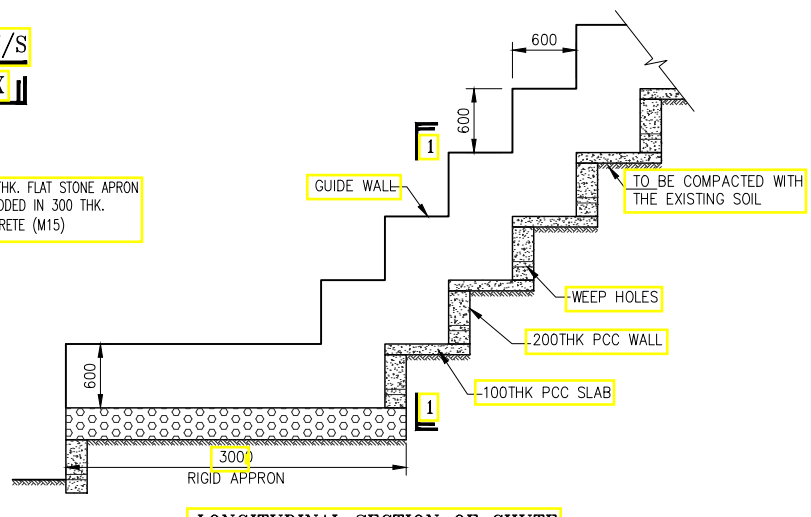
DETAIL - 'A'
SCALE=1:75



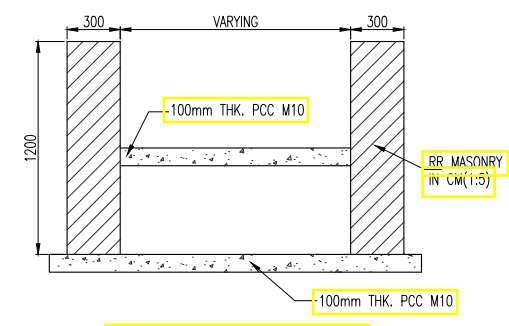
DETAIL - 'B'
SCALE=1:75



PLAN
SCALE=1:100



LONGITUDINAL SECTION OF CHUTE
SCALE 1:50



CROSS SECTION AT 1-1
SCALE=1:30

- LEGEND:**
- FRL : FINISHED ROAD LEVEL
 - GL : GROUND LEVEL
 - IL : INVERT LEVEL
 - U/S : UP STREAM SIDE
 - D/S : DOWN STREAM SIDE
 - THK : THICKNESS
 - RWL : RETAINING WALL
 - RTL : RETURN WALL
 - ECL : EARTH CUSHION LEFT
 - ECR : EARTH CUSHION RIGHT

- REFERENCE DRAWINGS:**
1. REINFORCEMENT DETAILS OF BOX CULVERT - HP/MAN-KAL/STR/BC/TYP/201
 2. MISCELLANEOUS DETAILS - HP/MAN-KAL/STR/MISC/601-606
 3. RETAINING WALL DETAILS - HP/MAN-KAL/STR/MISC/608

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES UNLESS MENTIONED OTHERWISE.
 2. GRADE OF CONCRETE SHALL BE AS FOLLOWS.
RC BOX - M30 RETAINING WALL - M30
CURTAIN WALL, TOE WALL & LEVELLING COURSE P.C.C - M15
 3. CLEAR COVER FOR ANY REINFORCEMENT SHALL BE
TOP SLAB - 40mm BOTTOM SLAB - 75mm
SIDE WALL EARTH FACE - 75mm
SIDE WALL OTHER FACE - 40mm
 4. GRANULAR BACK FILL MATERIAL CONFORMING TO IRC:78-2014 SHALL BE USED.
 5. DIMENSIONS & LEVELS MAY VARY AS PER SITE CONDITIONS.
 6. GRADE OF STEEL- Fe-500D SHALL CONFORM TO IS1786.
 7. ONLY WRITTEN DIMENSIONS ARE SHALL BE FOLLOWED, NO DIMENSION SHALL BE SCALED.
 8. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY & STRUCTURAL DRAWINGS.
 9. THE DIMENSIONS AND DETAILS ARE SUBJECTED TO MODIFICATION/ CORRECTION/ OMISSION DURING EXECUTION.
 10. CHAMBERS & CHUTE ARRANGEMENT SHOWN IN THE DRAWINGS IS TYPICAL ONLY. THE CONSTRUCTION CONTRACTOR SHALL SUBMIT WORKING DRAWINGS BASED ON THE OGL'S ALONG THE CROSS SECTION OF THE CULVERT. THE REQUIREMENT OF CHAMBERS ON U/S & CHUTES ON D/S CAN BE DISPENSED WITH IF THE TERRAIN IS FLAT.
 11. 'DK' IS DEPTH OF KEY AT BASE SLAB.
FOR BASE SLAB THICKNESS UPTO 900MM. VALUE OF 'DK' 1200MM.
GREATER THAN 900MM D+300MM.
D = BASE SLAB THICKNESS

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

CLIENT:

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:

SATRA SERVICES AND SOLUTIONS PVT.LTD.
#1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:

HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)

SCALE: AS SHOWN

DATE: _____

JOB No. : 01041055

DESIGNED	GANESH
DRAWN	SATYA
CHECKED	PRANA
APPROVED	PRANA

ROAD NAME :

TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE CELL BOX CULVERT FOR TCS-3(C,F)

REV. 0
SIZE : A3



DRAWING NO : HP/STR/BC/TYP/103

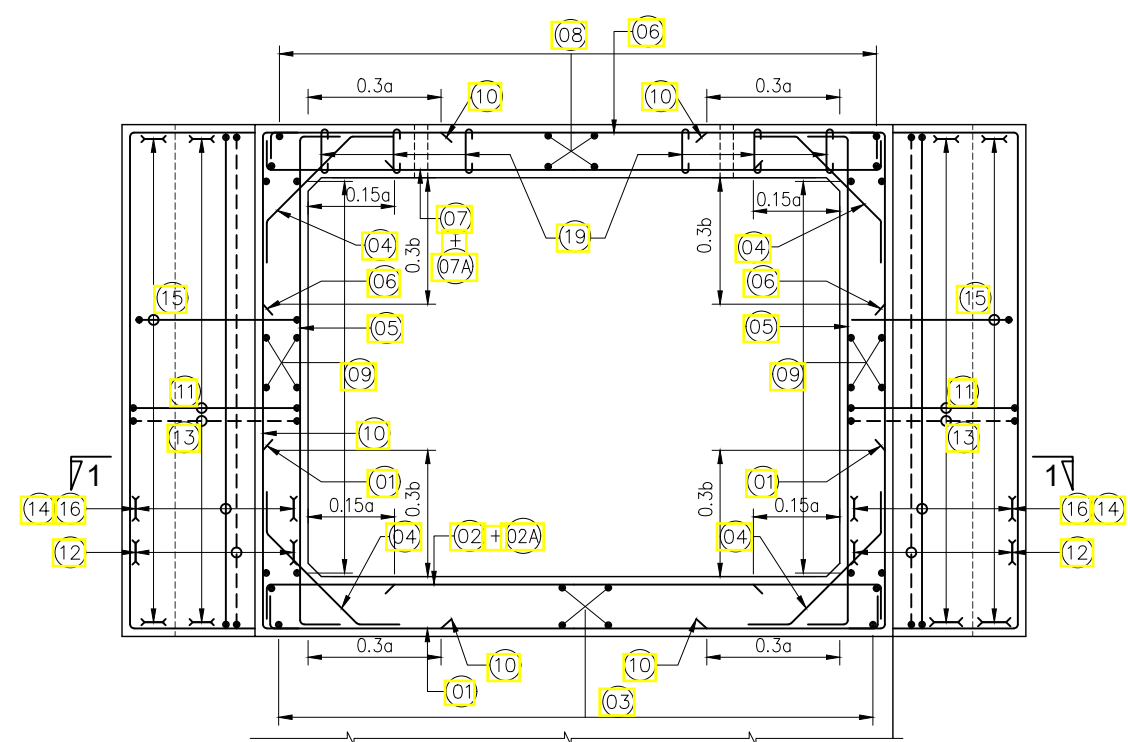
Package-VI:
Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 01 OF 02

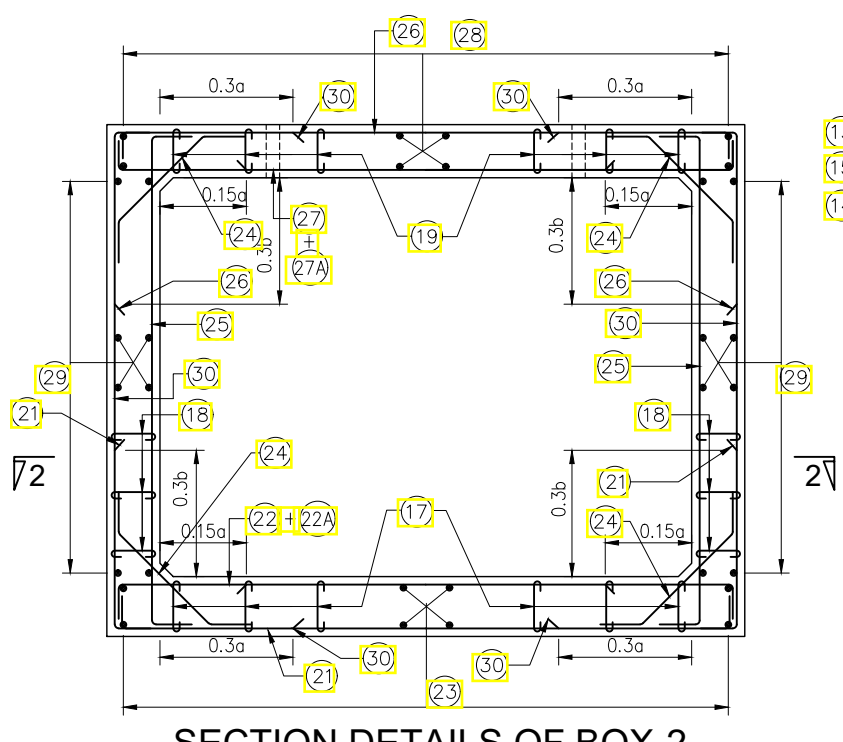
S.No	Existing Chainge	Design Chainge	Design FRL @ PCL	Camber e% (LHS)	Camber e% (RHS)	Flow direction	IL LHS (m)	IL RHS (m)	Proposed Structure Details				Cushion (m) (LHS) (ECL)	Cushion (m) (RHS) (ECR)	Lengths of Box (m)			Dimensions of Box (m)			Return Wall Length (LHS) (RTL)	Retaining Wall Length (LHS) (RWL)	Return Wall Length (RHS) (RTL)	Retaining Wall Length (RHS) (RWL)	Skew Angle (°)	TCS Type	Improvement Proposal
									Type of Structure	No of Spans	Clear Span (m) (a)	Clear Height (m) (b)			Lengths of Box (m) L	L1	L2	Top Slab (c)	Wall Ex (e)	Base Slab (d)							
1	16+495	15+959	1185.093	-7.0	7.0	R-L	1181.870	1182.200	Box	1	2	2	0.38	0.83	11.25	7.10	4.15	0.25	0.25	0.30	-	3.70	0.55	-	0°	TCS-3C	Reconstruction
2	17+150	16+615	1210.171	-7.0	7.0	R-L	1207.060	1207.400	Box	1	2	1.5	0.71	1.16	11.25	7.10	4.15	0.30	0.30	0.35	-	3.50	0.55	-	0°	TCS-3C	Reconstruction
3	25+320	24+748	1324.091	-2.5	-2.5	R-L	1321.013	1321.353	Box	1	2	2	0.58	0.27	10.50	5.85	4.65	0.25	0.25	0.30	-	4.00	0.55	-	0°	TCS-3C	Reconstruction
4	New	12+931	1034.705	-4.9	3.1	R-L	1032.169	1032.500	Box	1	2	1.5	0.34	0.48	11.25	7.10	4.15	0.25	0.25	0.30	-	2.90	0.55	-	0°	TCS-3F	New Construction
5	14+163	13+703	1081.494	-4.8	4.8	R-L	1078.160	1078.500	Box	1	2	2	0.64	0.84	11.25	7.10	4.15	0.25	0.25	0.30	-	4.10	0.55	-	0°	TCS-3F	Reconstruction
6	17+090	16+550	1208.136	-2.5	-2.5	R-L	1205.790	1206.100	Box	1	2	1.5	0.35	0.07	10.50	5.85	4.65	0.25	0.25	0.30	-	2.90	0.55	-	0°	TCS-3F	Reconstruction
7	17+701	17+173	1236.431	0.9	-3.9	R-L	1233.772	1234.107	Box	1	2	1.5	0.86	0.28	10.50	5.50	5.00	0.25	0.25	0.30	-	3.70	0.55	-	0°	TCS-3F	Reconstruction
8	24+890	24+321	1332.724	-4.6	4.6	R-L	1329.839	1330.179	Box	1	2	1.5	0.71	0.88	11.25	7.10	4.15	0.25	0.25	0.30	-	3.50	0.55	-	0°	TCS-3F	Reconstruction
9	24+910	24+336	1332.563	-7.0	7.0	R-L	1327.670	1328.010	Box	1	2	3.5	0.50	0.94	11.25	7.10	4.15	0.30	0.35	0.35	-	6.10	0.55	-	0°	TCS-3F	Reconstruction

TENDER PURPOSE ONLY

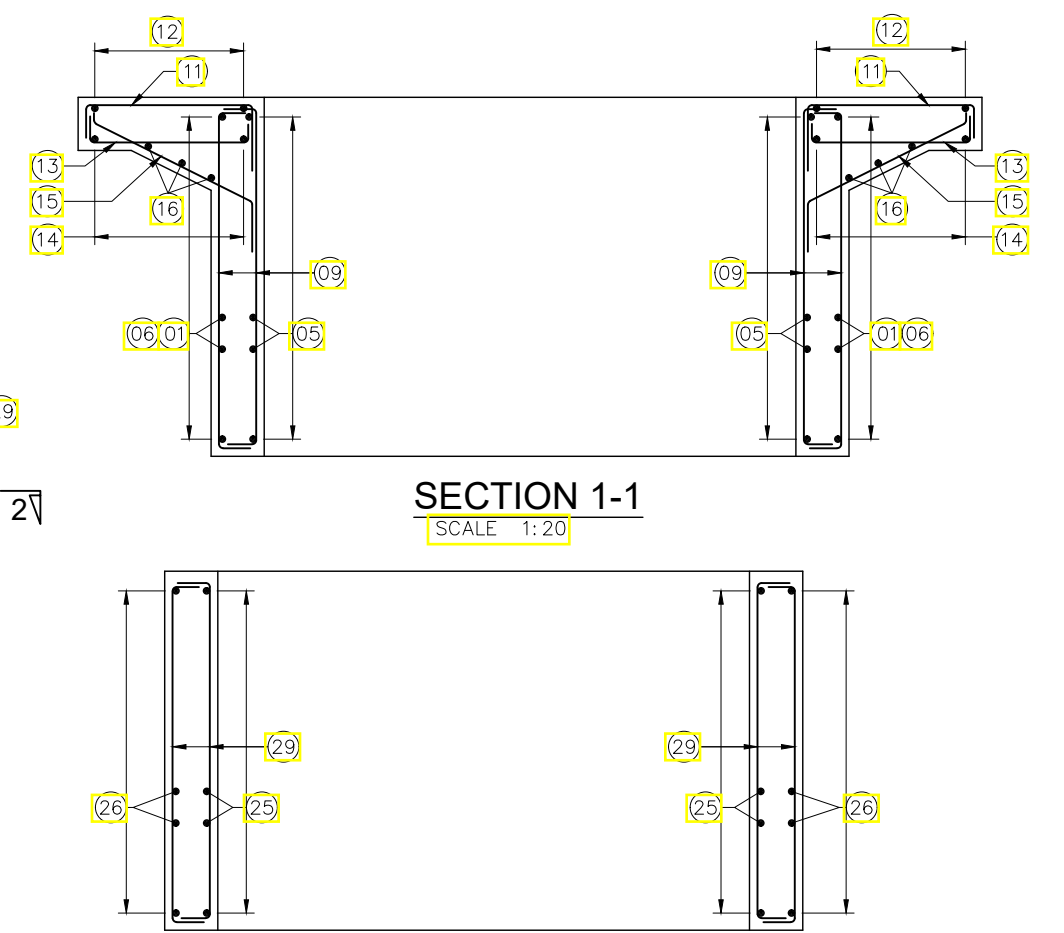
NOTES: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.					CLIENT:  HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.					CONSULTANT:  SATRA SERVICES AND SOLUTIONS PVT.LTD. #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India. Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in					PROJECT: HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)					JOB No. : 01041055 DESIGNED: GANESH DRAWN: SATYA CHECKED: PRANAI APPROVED: PRANAI			TITLE : TYPICAL GENERAL ARRANGEMENT DRAWING FOR NEW/RECONSTRUCTION OF SINGLE CELL BOX CULVERT FOR TCS-3(C,F) DRAWING NO : HP/STR/BC/TYP/103 Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854					REV. 0	SIZE : A3	SHEET 02 OF 02
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED						SCALE:	AS SHOWN	DATE																



SECTION DETAILS OF BOX-1
SCALE 1:20

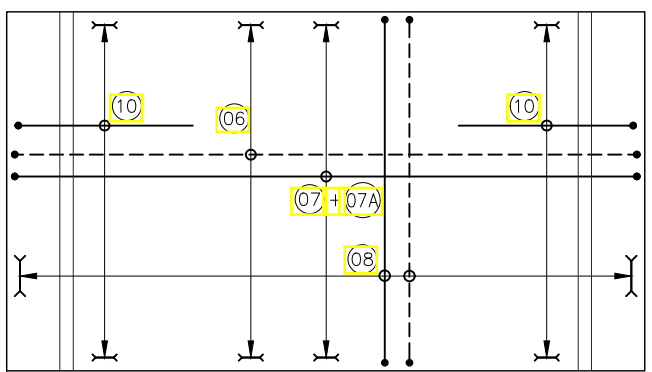


SECTION DETAILS OF BOX-2
SCALE 1:20

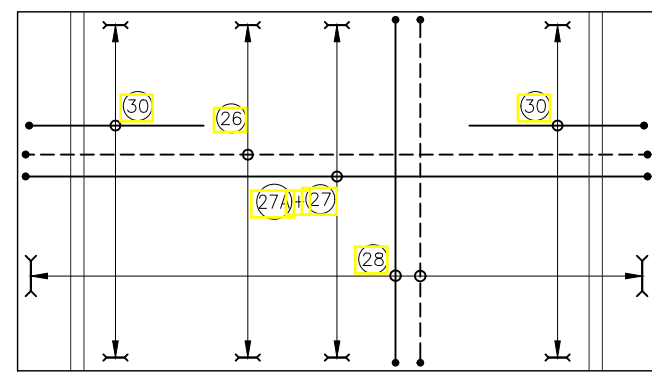


SECTION 1-1
SCALE 1:20

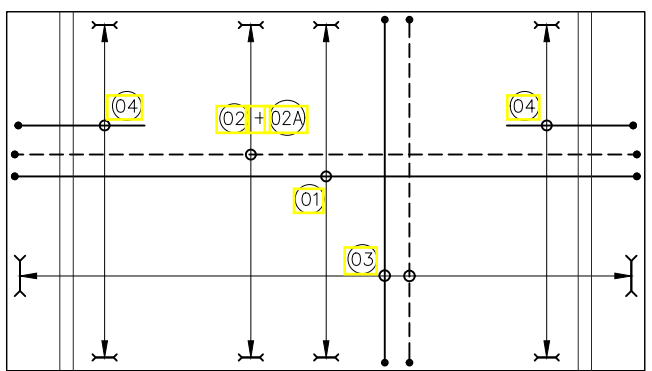
SECTION 2-2
SCALE 1:20



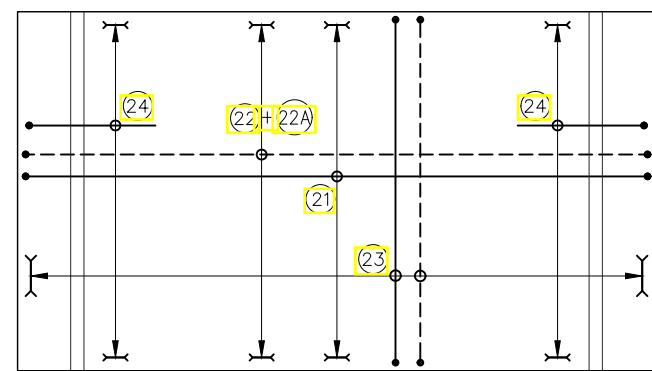
BOX TOP SLAB REINF. PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE 1:25



BOX TOP SLAB REINF. PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE 1:25



BOX BOTTOM SLAB REINF. PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)

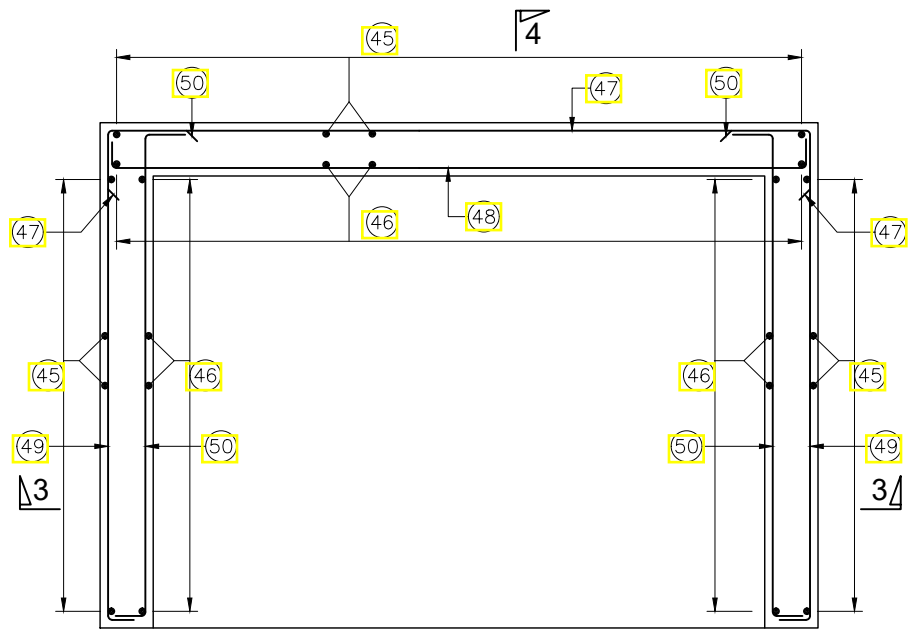


BOX BOTTOM SLAB REINF. PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)

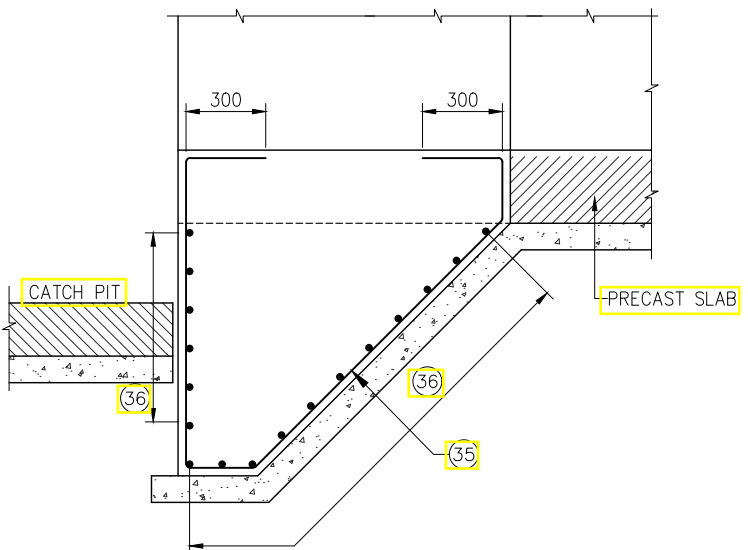
- NOTES**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS UNLESS OTHERWISE MENTIONED.
 - ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. DRAWINGS SHALL NOT BE SCALED.
 - THE GRADE OF CONCRETE FOR
RC BOX & RETAINING WALL : M30
CRASH BARRIER : M40
 - CLEAR COVER TO REINFORCEMENT FOR
SIDE WALL EARTH FACE : 75mm
SIDE WALL OTHER FACE : 40mm.
TOP SLAB : 40mm
BOX BOTTOM SLAB : 75mm
FLY WING WALL : 75mm
 - LAPS SHALL BE STAGGERED MINIMUM LAP LENGTH AND ANCHORAGE LENGTH SHALL BE AS PER IRC:112-2011
 - REINFORCEMENT BAR SHALL BE HYSD BARS (DENOTED BY Φ) OF GRADE Fe-500D AND CONFORMING TO IS -1786 :2000.
 - LAP LENGTH & DEVELOPMENT LENGTH SHALL BE
FOR HYSD BARS Fe 500 & Fe 500D $\Phi \leq 32$ mm
- | CONCRETE GRADE Mpa | M20 | M25 | M30 | M35 | M40 | M45 | M50 |
|------------------------------|-----------|-------------|-----------|-----------|-----------|-----------|-------------|
| DEVELOPMENT LENGTH | 54 Φ | 47 Φ | 40 Φ | 36 Φ | 34 Φ | 32 Φ | 29 Φ |
| LAP LENGTH > 50% LAPPED BARS | 81 Φ | 70.5 Φ | 60 Φ | 54 Φ | 51 Φ | 48 Φ | 43.5 Φ |

TENDER PURPOSE ONLY

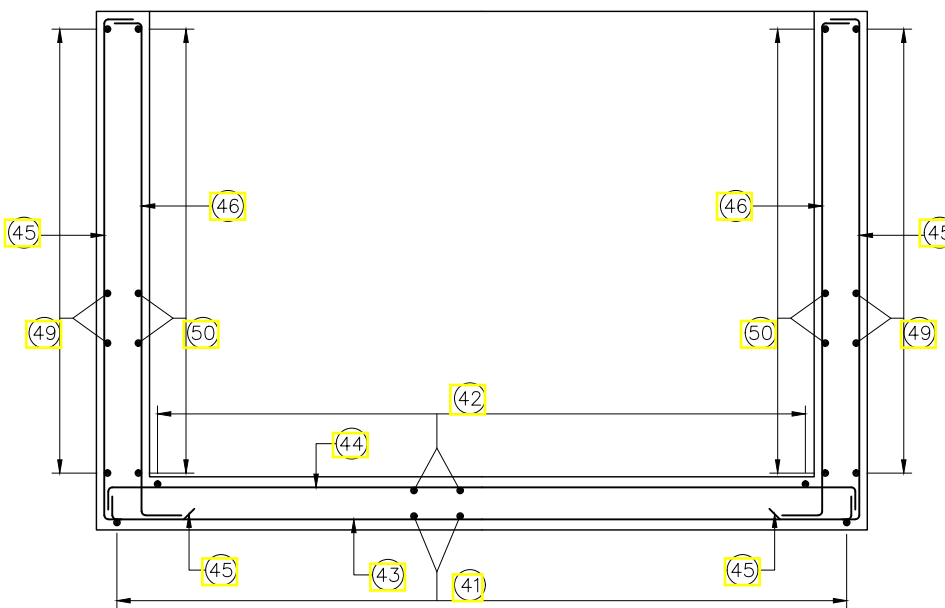
<p>NOTES: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.</p>					<p>CLIENT: HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.</p>					<p>CONSULTANT: SATRA SERVICES AND SOLUTIONS PVT.LTD. #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India. Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in</p>					<p>PROJECT: HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)</p>					<p>JOB No. : 01041055</p> <table border="1"> <tr> <td>DESIGNED</td> <td>GANESH</td> </tr> <tr> <td>DRAWN</td> <td>SATYA</td> </tr> <tr> <td>CHECKED</td> <td>PRANAI</td> </tr> <tr> <td>APPROVED</td> <td>PRANAI</td> </tr> </table>					DESIGNED	GANESH	DRAWN	SATYA	CHECKED	PRANAI	APPROVED	PRANAI	<p>TITLE : TYPICAL REINFORCEMENT DETAILS FOR SINGLE CELL BOX CULVERTS</p>					<p>REV. 0 SIZE : A3</p>				
DESIGNED	GANESH																																									
DRAWN	SATYA																																									
CHECKED	PRANAI																																									
APPROVED	PRANAI																																									
<p>ROAD NAME : Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854</p>										<p>DRAWING NO : HP/STR/BC/TYP/201 Package-VI: SHEET 01 OF 05</p>																																
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED	SCALE:	AS SHOWN	DATE																																	



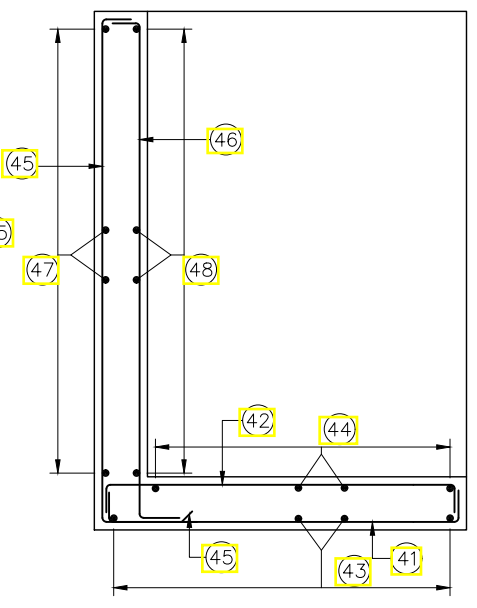
SECTION DETAILS OF CATCH PIT
SCALE 1:20



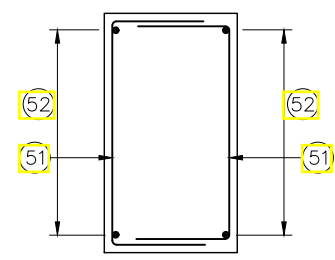
DETAILS OF SHEAR KEY
SCALE 1:20



SECTION 3-3
SCALE 1:20



SECTION 4-4
SCALE 1:20



PCC PARAPET
SCALE 1:20

** FOR REINFORCEMENT DETAILS REFER BAR BENDING SCHEDULE OF CATCH PIT

1x2x1.5-UPTO 0.5m FILL (BOX-1)		
BAR NO	BAR SHAPE	REINFORCEMENT
01	150	ϕ12 @ 200c/c
02	125	ϕ12 @ 200c/c
02A		ϕ12 @ 200c/c
03	125	ϕ10 @ 200c/c
04	200	ϕ10 @ 200c/c
05	125	ϕ12 @ 200c/c
06	150	ϕ12 @ 200c/c
07	125	ϕ12 @ 200c/c
07A		ϕ12 @ 200c/c
08	125	ϕ10 @ 200c/c
09	125	ϕ10 @ 200c/c
10	500	ϕ12 @ 200c/c
11	125	ϕ10 @ 200c/c
12	125	ϕ10 @ 200c/c
13	125	ϕ10 @ 200c/c
14	125	ϕ10 @ 200c/c
15	125	ϕ10 @ 200c/c
16	125	ϕ10 @ 200c/c
17		ϕ10-2L @ 150c/c
18		NOT USED
19		NOT USED


1x2x1.5-UPTO 0.5m FILL (BOX-2)		
BAR NO	BAR SHAPE	REINFORCEMENT
21	150	ϕ12 @ 200c/c
22	125	ϕ12 @ 200c/c
22A		ϕ12 @ 200c/c
23	125	ϕ10 @ 200c/c
24	200	ϕ10 @ 200c/c
25	125	ϕ12 @ 200c/c
26	600	ϕ12 @ 200c/c
27	125	ϕ12 @ 200c/c
27A		ϕ12 @ 200c/c
28	125	ϕ10 @ 200c/c
29	125	ϕ10 @ 200c/c
30	500	ϕ12 @ 200c/c

SHEAR KEY		
BAR NO	BAR SHAPE	REINFORCEMENT
35	300	ϕ10 @ 250c/c
36	125	ϕ8 @ 200c/c

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

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PROJECT:
 HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)

SCALE: AS SHOWN

DATE: _____

JOB No. : 01041055

DESIGNED	GANESH
DRAWN	SATYA
CHECKED	PRANA
APPROVED	PRANA

ROAD NAME : _____

TITLE : TYPICAL REINFORCEMENT DETAILS FOR SINGLE CELL BOX CULVERTS

DRAWING NO : HP/STR/BC/TYP/201

Package-VI:
 Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

REV. 0
 SIZE : A3
 SHEET 02 OF 05

BAR BENDING SCHEDULE

1x2x1.5-0.5m TO 1.2m FILL (BOX-1)		
BAR NO	BAR SHAPE	REINFORCEMENT
01	150	Φ 12 @ 200 c/c
02	125	Φ 12 @ 200 c/c
02A		Φ 12 @ 200 c/c
03	125	Φ 10 @ 150 c/c
04	200	Φ 10 @ 200 c/c
05	125	Φ 12 @ 200 c/c
06	150	Φ 12 @ 200 c/c
07	125	Φ 12 @ 200 c/c
07A		Φ 12 @ 200 c/c
08	125	Φ 10 @ 150 c/c
09	125	Φ 10 @ 150 c/c
10	500	Φ 12 @ 200 c/c
11	125	Φ 10 @ 150 c/c
12	125	Φ 10 @ 150 c/c
13	125	Φ 10 @ 250 c/c
14	125	Φ 8 @ 150 c/c
15	125	Φ 10 @ 250 c/c
16	125	Φ 8 @ 200 c/c
17		Φ 8 - 2L @ 100c/c
18		NOT USED
19		Φ 10 LINKS @ 250c/c

BAR BENDING SCHEDULE

1x2x1.5-0.5M TO 1.2M FILL (BOX-2)		
BAR NO	BAR SHAPE	REINFORCEMENT
21	150	Φ 12 @ 200 c/c
22	125	Φ 12 @ 200 c/c
22A		Φ 12 @ 200 c/c
23	125	Φ 10 @ 150 c/c
24	200	Φ 10 @ 200 c/c
25	125	Φ 12 @ 200 c/c
26	600	Φ 12 @ 200 c/c
27	125	Φ 12 @ 200 c/c
27A		Φ 12 @ 200 c/c
28	125	Φ 10 @ 150 c/c
29	125	Φ 10 @ 150 c/c
30	500	Φ 12 @ 200 c/c
SHEAR KEY		
35	300	Φ 10 @ 250 c/c
36	125	Φ 8 @ 200 c/c

BAR BENDING SCHEDULE

1x2x2-UPTO 0.5m FILL (BOX-1)		
BAR NO	BAR SHAPE	REINFORCEMENT
01	150	Φ 12 @ 200 c/c
02	125	Φ 12 @ 200 c/c
02A		Φ 12 @ 200 c/c
03	125	Φ 10 @ 200 c/c
04	200	Φ 10 @ 200 c/c
05	125	Φ 12 @ 200 c/c
06	150	Φ 12 @ 200 c/c
07	125	Φ 12 @ 200 c/c
07A		Φ 12 @ 200 c/c
08	125	Φ 10 @ 200 c/c
09	125	Φ 10 @ 200 c/c
10	500	Φ 12 @ 200 c/c
11	125	Φ 10 @ 200 c/c
12	125	Φ 10 @ 200 c/c
13	125	Φ 10 @ 200 c/c
14	125	Φ 10 @ 200 c/c
15	125	Φ 10 @ 200 c/c
16	125	Φ 10 @ 200 c/c
17		Φ 10 - 2L @ 200c/c IN L-L
18		NOT USED
19		NOT USED


BAR BENDING SCHEDULE

1x2x2-UPTO 0.5m FILL (BOX-2)		
BAR NO	BAR SHAPE	REINFORCEMENT
21	150	Φ 12 @ 200 c/c
22	125	Φ 12 @ 200 c/c
22A		Φ 12 @ 200 c/c
23	125	Φ 10 @ 200 c/c
24	200	Φ 10 @ 200 c/c
25	125	Φ 12 @ 200 c/c
26	600	Φ 12 @ 200 c/c
27	125	Φ 12 @ 200 c/c
27A		Φ 12 @ 200 c/c
28	125	Φ 10 @ 200 c/c
29	125	Φ 10 @ 200 c/c
30	500	Φ 12 @ 200 c/c
SHEAR KEY		
35	300	Φ 10 @ 250 c/c
36	125	Φ 8 @ 200 c/c

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

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PROJECT:
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SCALE: AS SHOWN

DATE: _____

JOB No. : 01041055

DESIGNED	GANESH
DRAWN	SATYA
CHECKED	PRANA
APPROVED	PRANA

ROAD NAME :

TITLE : TYPICAL REINFORCEMENT DETAILS FOR SINGLE CELL BOX CULVERTS

DRAWING NO : HP/STR/BC/TYP/201

Package-VI:
 Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

REV. 0
 SIZE : A3
 SHEET 03 OF 05

BAR BENDING SCHEDULE

1x2x2-1.1m FILL (BOX-1)		
BAR NO	BAR SHAPE	REINFORCEMENT
01		ϕ12 @ 200 c/c
02		ϕ12 @ 200 c/c
02A		ϕ12 @ 200 c/c
03		ϕ10 @ 200 c/c
04		ϕ10 @ 200 c/c
05		ϕ12 @ 200 c/c
06		ϕ12 @ 200 c/c
07		ϕ12 @ 200 c/c
07A		ϕ12 @ 200 c/c
08		ϕ10 @ 200 c/c
09		ϕ10 @ 200 c/c
10		ϕ12 @ 200 c/c
11		ϕ10 @ 150 c/c
12		ϕ10 @ 150 c/c
13		ϕ10 @ 250 c/c
14		ϕ8 @ 150 c/c
15		ϕ10 @ 250 c/c
16		ϕ8 @ 200 c/c
17		ϕ8-1L @ 200c/c IN L-L & 200c/c IN T-T
18		NOT USED
19		ϕ8-1L @ 200c/c IN L-L & 200c/c IN T-T

BAR BENDING SCHEDULE

1x2x2-1.1m FILL (BOX-2)		
BAR NO	BAR SHAPE	REINFORCEMENT
21		ϕ12 @ 200 c/c
22		ϕ12 @ 200 c/c
22A		ϕ12 @ 200 c/c
23		ϕ10 @ 200 c/c
24		ϕ10 @ 200 c/c
25		ϕ12 @ 200 c/c
26		ϕ12 @ 200 c/c
27		ϕ12 @ 200 c/c
27A		ϕ12 @ 200 c/c
28		ϕ10 @ 200 c/c
29		ϕ10 @ 200 c/c
30		ϕ12 @ 200 c/c
SHEAR KEY		
35		ϕ10 @ 250 c/c
36		ϕ8 @ 200 c/c

BAR BENDING SCHEDULE

1x2x2.5-1.0m FILL (BOX-1)		
BAR NO	BAR SHAPE	REINFORCEMENT
01		ϕ16 @ 200 c/c
02		ϕ16 @ 200 c/c
02A		ϕ12 @ 200 c/c
03		ϕ10 @ 150 c/c
04		ϕ10 @ 200 c/c
05		ϕ16 @ 200 c/c
06		ϕ12 @ 200 c/c
07		ϕ12 @ 200 c/c
07A		ϕ12 @ 200 c/c
08		ϕ10 @ 150 c/c
09		ϕ10 @ 150 c/c
10		ϕ16 @ 200 c/c
11		ϕ10 @ 150 c/c
12		ϕ10 @ 150 c/c
13		ϕ10 @ 250 c/c
14		ϕ8 @ 150 c/c
15		ϕ10 @ 250 c/c
16		ϕ8 @ 200 c/c
17		ϕ8-1L @ 200c/c IN L-L & 200c/c IN T-T
18		NOT USED
19		ϕ8-1L @ 200c/c IN L-L & 200c/c IN T-T

BAR BENDING SCHEDULE

1x2x2.5-1.0m FILL (BOX-2)		
BAR NO	BAR SHAPE	REINFORCEMENT
21		ϕ16 @ 200 c/c
22		ϕ16 @ 200 c/c
22A		ϕ12 @ 200 c/c
23		ϕ10 @ 150 c/c
24		ϕ10 @ 200 c/c
25		ϕ16 @ 200 c/c
26		ϕ12 @ 200 c/c
27		ϕ12 @ 200 c/c
27A		ϕ12 @ 200 c/c
28		ϕ10 @ 150 c/c
29		ϕ10 @ 150 c/c
30		ϕ16 @ 200 c/c
SHEAR KEY		
35		ϕ10 @ 250 c/c
36		ϕ8 @ 200 c/c

TENDER PURPOSE ONLY

<p>NOTES: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.</p>					<p>CLIENT: HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.</p>		<p>CONSULTANT: SATRA SERVICES AND SOLUTIONS PVT.LTD. #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India. Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in</p>		<p>PROJECT: HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)</p>		<p>JOB No. : 01041055</p> <table border="1"> <tr><td>DESIGNED</td><td>GANESH</td></tr> <tr><td>DRAWN</td><td>SATYA</td></tr> <tr><td>CHECKED</td><td>PRANA</td></tr> <tr><td>APPROVED</td><td>PRANA</td></tr> </table>		DESIGNED	GANESH	DRAWN	SATYA	CHECKED	PRANA	APPROVED	PRANA	<p>TITLE : TYPICAL REINFORCEMENT DETAILS FOR SINGLE CELL BOX CULVERTS</p>		<p>REV. 0</p>	
DESIGNED	GANESH																							
DRAWN	SATYA																							
CHECKED	PRANA																							
APPROVED	PRANA																							
<table border="1"> <tr><th>REV</th><th>DATE</th><th>DESCRIPTION</th><th>DESIGNED</th><th>DRAWN</th><th>CHECKED</th><th>APPROVED</th></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>					REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED								<p>PACKAGE-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854</p>		<p>DRAWING NO : HP/STR/BC/TYP/201</p>		<p>SHEET 04 OF 05</p>	
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED																		

BAR BENDING SCHEDULE

BAR BENDING SCHEDULE

BAR BENDING SCHEDULE

BAR BENDING SCHEDULE

BAR BENDING SCHEDULE OF CATCH PIT

1x2x2.5-2.0m TO 2.6m FILL (BOX-1)		
BAR NO	BAR SHAPE	REINFORCEMENT
01	150	ϕ12@200c/c
02	125	ϕ12@150c/c
02A		NOT USED
03	125	ϕ10@200c/c
04	200	ϕ10@200c/c
05	125	ϕ12@200c/c
06	150	ϕ12@200c/c
07	125	ϕ12@180c/c
07A		NOT USED
08	125	ϕ10@200c/c
09	125	ϕ10@200c/c
10	500	ϕ12@200c/c
11	125 300	ϕ10@150c/c
12	125	ϕ10@150c/c
13	125	ϕ10@250c/c
14	125	ϕ8@150c/c
15	125 300	ϕ10@250c/c
16	125	ϕ8@200c/c
17		ϕ8-1L@200c/c IN L-L & 200c/c IN T-T
18		NOT USED
19		ϕ8-1L@200c/c IN L-L & 200c/c IN T-T

1x2x2.5-2.0m TO 2.6m FILL (BOX-2)		
BAR NO	BAR SHAPE	REINFORCEMENT
21	150	ϕ12@200c/c
22	125	ϕ12@150c/c
22A		NOT USED
23	125	ϕ10@200c/c
24	200	ϕ10@200c/c
25	125	ϕ12@200c/c
26	600	ϕ12@200c/c
27	125	ϕ12@180c/c
27A		NOT USED
28	125	ϕ10@200c/c
29	125	ϕ10@200c/c
30	500	ϕ12@200c/c
SHEAR KEY		
35	300 300	ϕ10@250c/c
36	125	ϕ8@200c/c

1x2x3.5-1.0m FILL (BOX-1)		
BAR NO	BAR SHAPE	REINFORCEMENT
01	150	ϕ12@200c/c
02	125	ϕ12@200c/c
02A		NOT USED
03	125	ϕ10@200c/c
04	200	ϕ10@200c/c
05	125	ϕ12@100c/c
06	150	ϕ12@200c/c
07	125	ϕ12@200c/c
07A		NOT USED
08	125	ϕ10@200c/c
09	125	ϕ10@200c/c
10	500	ϕ12@200c/c
11	125 300	ϕ10@150c/c
12	125	ϕ10@150c/c
13	125	ϕ10@250c/c
14	125	ϕ8@150c/c
15	125 300	ϕ10@250c/c
16	125	ϕ8@200c/c
17		ϕ8-1L@200c/c IN L-L & 200c/c IN T-T
18		NOT USED
19		ϕ8-1L@200c/c IN L-L & 200c/c IN T-T


1x2x3.5-1.0m FILL (BOX-2)		
BAR NO	BAR SHAPE	REINFORCEMENT
21	150	ϕ12@200c/c
22	125	ϕ12@200c/c
22A		NOT USED
23	125	ϕ10@200c/c
24	200	ϕ10@200c/c
25	125	ϕ12@100c/c
26	600	ϕ12@200c/c
27	125	ϕ12@200c/c
27A		NOT USED
28	125	ϕ10@200c/c
29	125	ϕ10@200c/c
30	500	ϕ12@200c/c
SHEAR KEY		
35	300 300	ϕ10@250c/c
36	125	ϕ8@200c/c

BAR NO	BAR SHAPE	REINFORCEMENT
41	125	ϕ10@150c/c
42	125	ϕ10@150c/c
43	125	ϕ8@200c/c
44	125	ϕ8@200c/c
45	125	ϕ12@150c/c
46	125	ϕ10@150c/c
47	300	ϕ8@200c/c
48	300	ϕ8@200c/c
49	125	ϕ8@200c/c
50	125	ϕ8@200c/c
51	300	ϕ10@250c/c
52	300	ϕ8@200c/c

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

CLIENT:

 HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:

 SATRA SERVICES AND SOLUTIONS PVT.LTD.
 #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
 Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:
 HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)

SCALE: AS SHOWN

DATE: _____

JOB No. : 01041055

DESIGNED	GANESH
DRAWN	SATYA
CHECKED	PRANA
APPROVED	PRANA

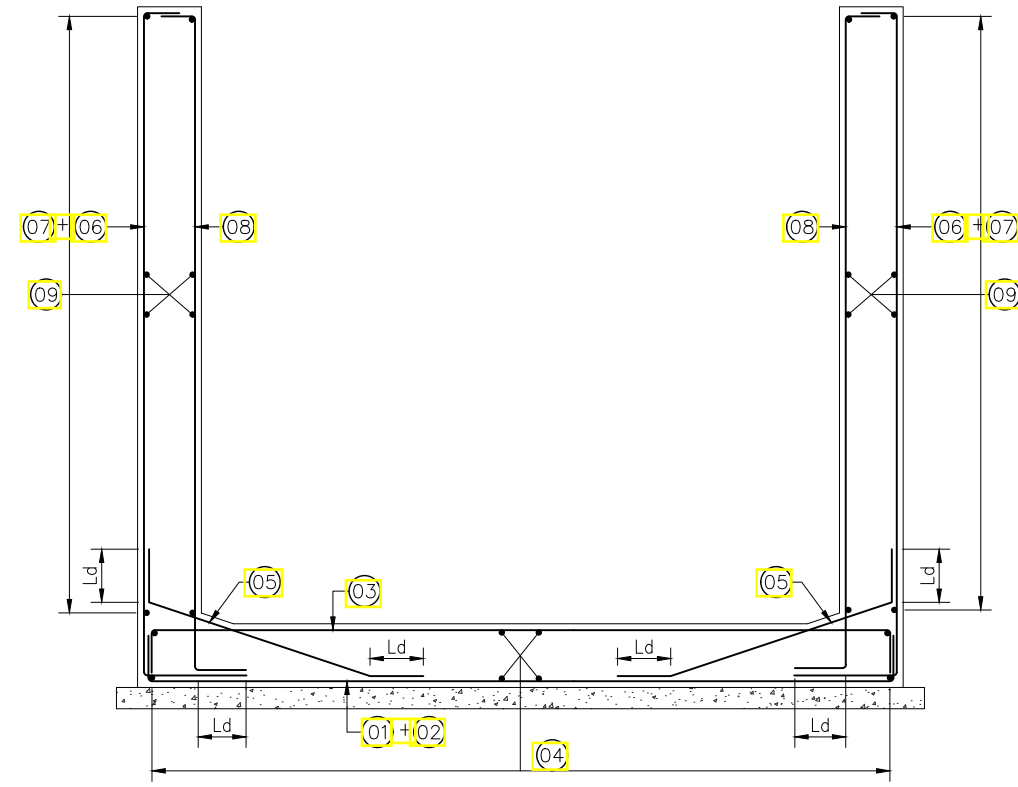
ROAD NAME :

TITLE :
 TYPICAL REINFORCEMENT DETAILS FOR SINGLE CELL BOX CULVERTS

DRAWING NO : HP/STR/BC/TYP/201

Package-VI:
 Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

REV. 0
 SIZE : A3
 SHEET 05 OF 05



**RCC U-SHAPE RETAINING WALL
REINFORCEMENT DETAIL**
SCALE 1:25

BAR BENDING SCHEDULE

BAR NO	BAR SHAPE	REINFORCEMENT
U SHAPE WING WALL		
(01)		ϕ12 @ 200 c/c
(02)		ϕ10 @ 200 c/c
(03)		ϕ10 @ 200 c/c
(04)		ϕ10 @ 200 c/c
(05)		ϕ10 @ 200 c/c
(06)		ϕ10 @ 200 c/c
(07)		ϕ10 @ 200 c/c
(08)		ϕ10 @ 200 c/c
(09)		ϕ10 @ 200 c/c

NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS UNLESS OTHERWISE MENTIONED.
- ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. DRAWINGS SHALL NOT BE SCALED.
- THE GRADE OF CONCRETE FOR
RCC U SHAPE WING WALL & RETAINING WALL : M25
- CLEAR COVER TO REINFORCEMENT FOR
SIDE WALL EARTH FACE : 75mm
SIDE WALL OTHER FACE : 40mm.
BOTTOM SLAB : 75mm
RCC U SHAPE RETAINING WALL : 75mm
- LAPS SHALL BE STAGGERED MINIMUM LAP LENGTH AND ANCHORAGE LENGTH SHALL BE AS PER IRC:112-2011
- REINFORCEMENT BAR SHALL BE HYSD BARS (DENOTED BY ϕ) OF GRADE Fe-500D AND CONFORMING TO IS -1786 :2000.
- LAP LENGTH & DEVELOPMENT LENGTH SHALL BE

FOR HYSD BARS Fe 500 & Fe 500D $\phi \leq 32mm$

CONCRETE GRADE Mpa	M20	M25	M30	M35	M40	M45	M50
DEVELOPMENT LENGTH	54 ϕ	47 ϕ	40 ϕ	36 ϕ	34 ϕ	32 ϕ	29 ϕ
LAP LENGTH > 50% LAPPED BARS	81 ϕ	70.5 ϕ	60 ϕ	54 ϕ	51 ϕ	48 ϕ	43.5 ϕ

TENDER PURPOSE ONLY

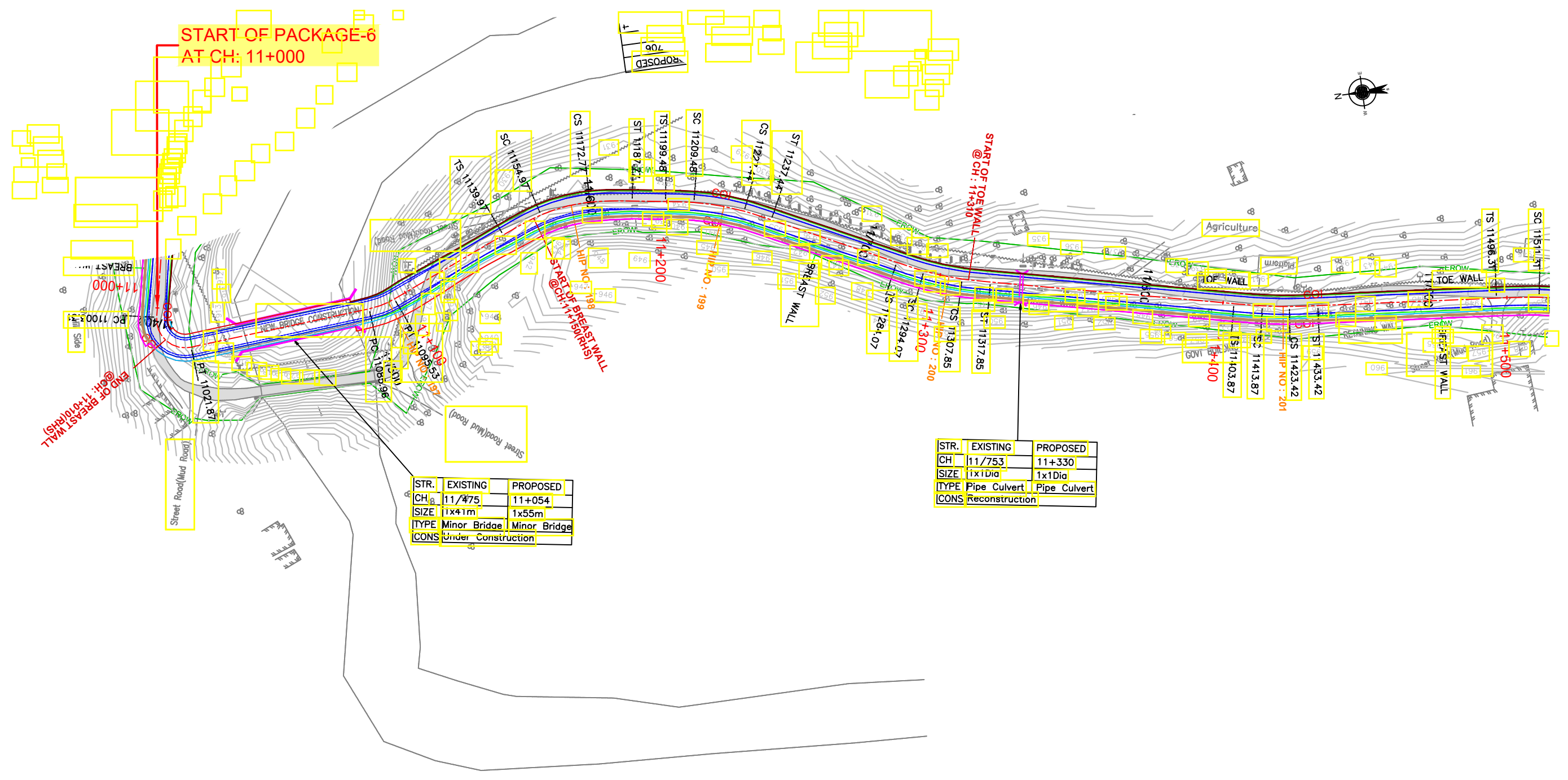
<p>NOTES: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.</p>					<p>CLIENT: HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.</p>					<p>CONSULTANT: SATRA SERVICES AND SOLUTIONS PVT.LTD. #1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India. Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in</p>					<p>PROJECT: HIMACHAL PRADESH STATE ROADS TRANSFORMATION PROJECT (HPSRTP)</p>					<p>JOB No. : 01041055</p> <table border="1"> <tr> <td>DESIGNED</td> <td>GANESH</td> </tr> <tr> <td>DRAWN</td> <td>SATYA</td> </tr> <tr> <td>CHECKED</td> <td>PRANAI</td> </tr> <tr> <td>APPROVED</td> <td>PRANAI</td> </tr> </table>					DESIGNED	GANESH	DRAWN	SATYA	CHECKED	PRANAI	APPROVED	PRANAI	<p>TITLE : REINFORCEMENT DETAILS OF U-SHAPE RETAINING WALL FOR TYPICAL SINGLE CELL BOX CULVERT (TCS-2)</p>					<p>REV. 0 SIZE : A3</p>				
DESIGNED	GANESH																																									
DRAWN	SATYA																																									
CHECKED	PRANAI																																									
APPROVED	PRANAI																																									
<table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>DESIGNED</th> <th>DRAWN</th> <th>CHECKED</th> <th>APPROVED</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>					REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED								<p>DRAWING NO : HP/STR/BC/TYP/202</p>					<p>ROAD NAME : Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854</p>					<p>Package-VI: SHEET 01 OF 01</p>													
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED																																				
<p>SCALE: AS SHOWN</p>					<p>DATE</p>					<p>SCALE: AS SHOWN</p>					<p>DATE</p>																											

DRAINAGE DRAWINGS

PLAN & PROFILES
(KM 11+000 TO 27+854)

← MANDI

KALKHAR →



STR.	EXISTING	PROPOSED
CH	11/475	11+054
SIZE	1x41m	1x55m
ITYPE	Minor Bridge	Minor Bridge
CONS	Under Construction	

STR.	EXISTING	PROPOSED
CH	11/753	11+330
SIZE	1x1Dia	1x1Dia
ITYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED



SATRA
SATRA SERVICES AND SOLUTIONS PVT LTD.
#1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

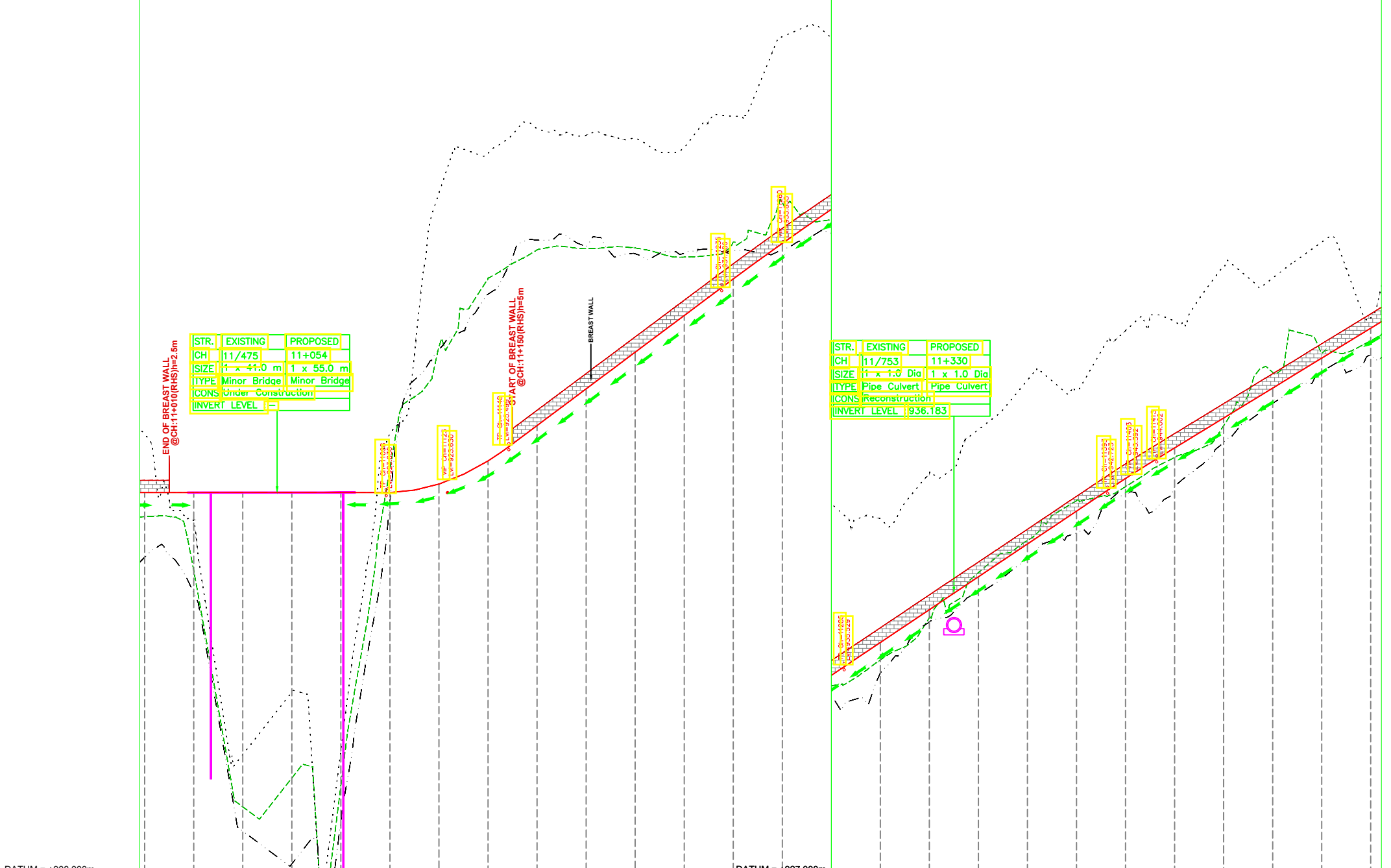
TITLE : DRAINAGE PLAN & PROFILE
FROM CH: 11+000 TO CH: 11+500
DRAWING NO : HP/MAN-KAL/DRAINAGE P&P
ROAD NAME : Package-VI:
Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SCALE: NOT TO SCALE

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MANDI ←

→ KALKHAR



	11+000	11+020	11+040	11+060	11+080	11+100	11+120	11+140	11+160	11+180	11+200	11+220	11+240	11+260	11+280	11+300	11+320	11+340	11+360	11+380	11+400	11+420	11+440	11+460	11+480	11+500		
PROPOSED ROAD LEVELS(m)	923.630	923.630	923.630	923.630	923.630	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	923.632	
EXISTING ROAD LEVELS(m)	922.646	920.457	910.819	911.689	911.689	924.597	929.581	932.349	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520	933.520
GL AT 5m LHS (m)	920.994	919.551	909.828	908.493	910.254	923.243	929.464	931.718	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921	933.921
GL AT 8m RHS (m)	926.008	922.510	912.948	915.492	913.124	924.107	935.842	937.442	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450	938.450
VERTICAL SCHEMATIC	[Vertical curve data: D=0.000%, L=106.190, D=64.092, D=44.447, D=7.476%, L=86.764, D=46.631, D=6.695%, L=107.457, D=86.022, D=62.867]																											
HORIZONTAL SCHEMATIC	[Horizontal curve data: R=-10.000, L=18.559, R=60.000, L=17.799, R=90.000, L=17.955, D=62.867]																											
SUPERELEVATION	[Superelevation data: e=2.50%, e=2.50%, e=7.00%, e=7.00%, e=7.00%, e=7.00%, e=2.50%, e=2.50%, e=7.00%, e=7.00%, e=2.50%, e=2.50%, e=7.00%, e=7.00%, e=2.50%, e=2.50%]																											
CROSS SECTION DETAILS	[Cross section details: TCS-3, TCS-4, TCS-3, TCS-3]																											

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

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Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 11+000 TO CH: 11+500

DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

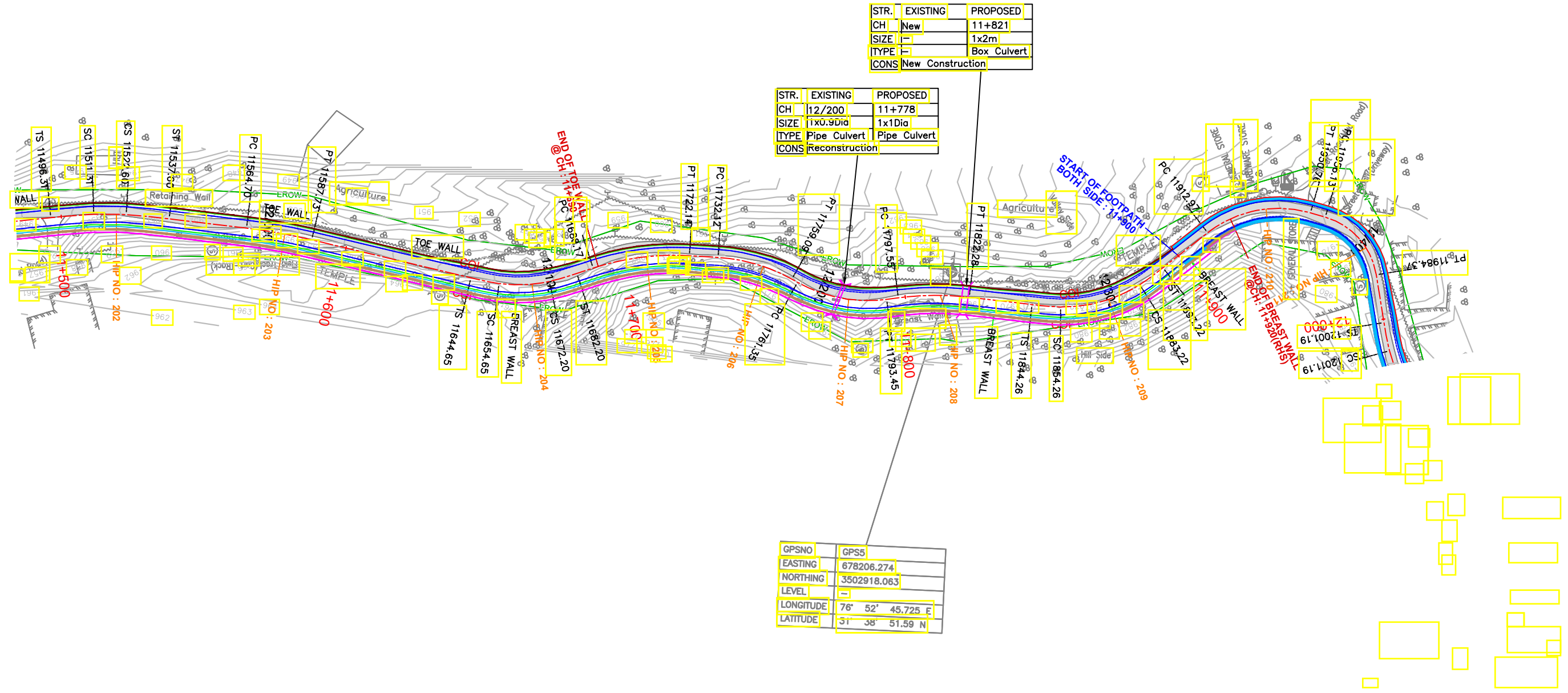
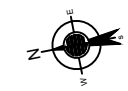
ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 18 OF 148

TENDER PURPOSE ONLY

← MANDI

KALKHAR →



STR.	EXISTING	PROPOSED
CH	New	11+821
SIZE		1x2m
ITYPE		Box Culvert
CONS		New Construction

STR.	EXISTING	PROPOSED
CH	12/200	11+778
SIZE	1x0.9Dia	1x1Dia
ITYPE	Pipe Culvert	Pipe Culvert
CONS		Reconstruction

GPSNO	GPS5
EASTING	678206.274
NORTHING	3502918.063
LEVEL	=
LONGITUDE	76° 52' 45.725 E
LATITUDE	31° 38' 51.59 N

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

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PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 11+500 TO CH: 12+000

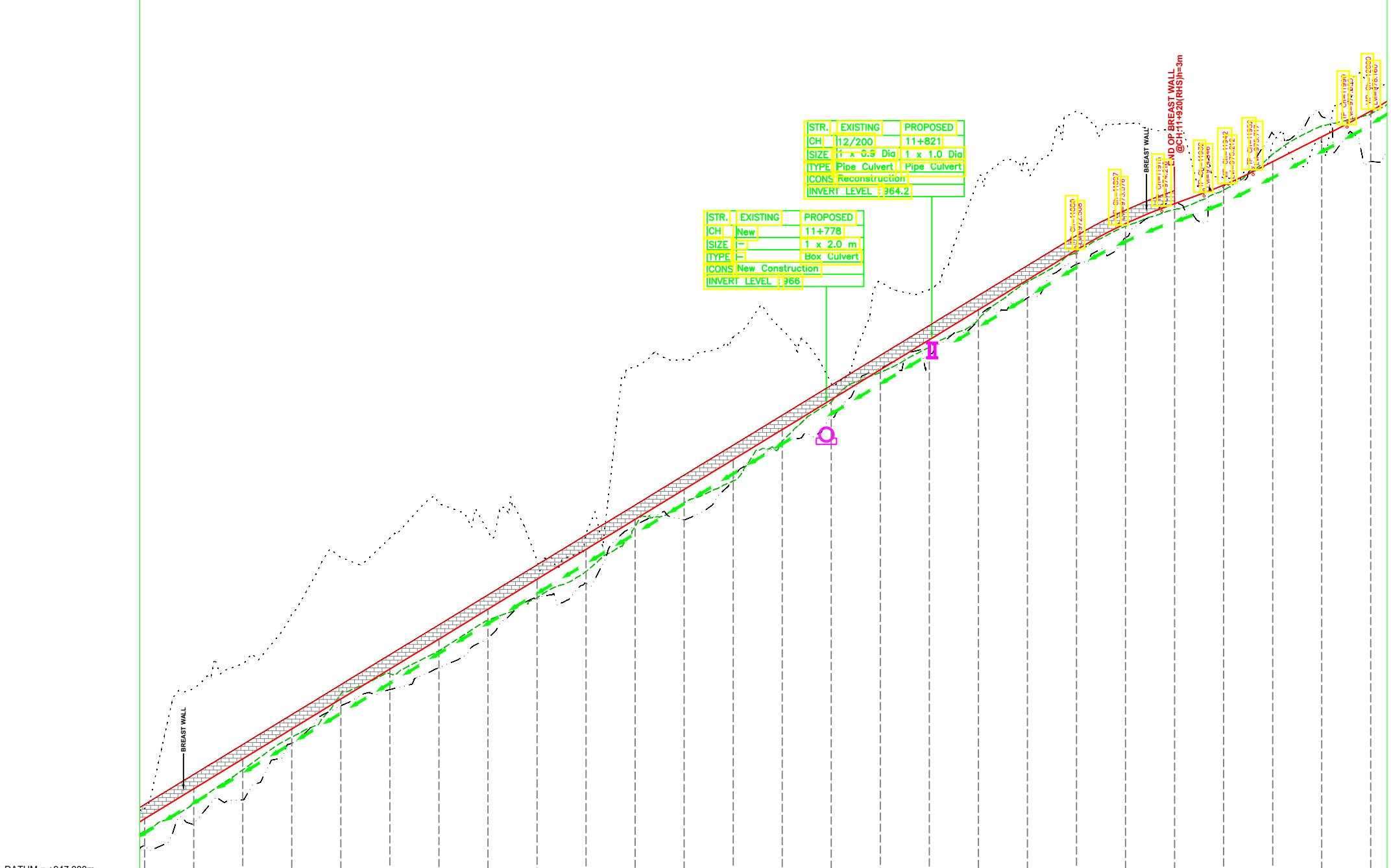
DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 2A OF 48

MANDI ←

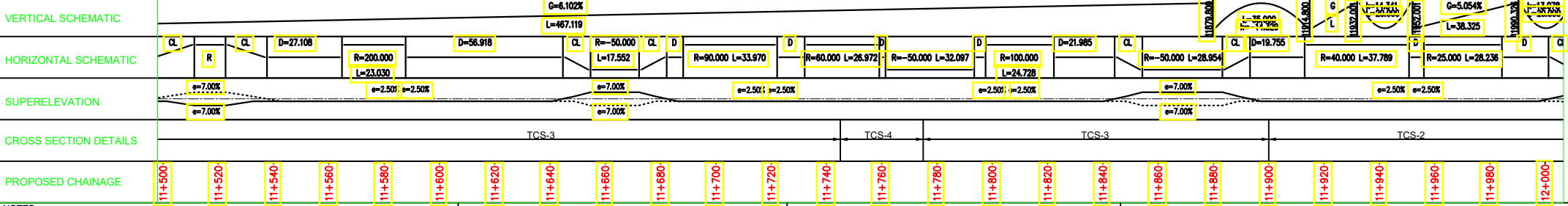
→ KALKHAR



STR.	EXISTING	PROPOSED
CH	12/200	11+821
SIZE	1 x 0.9 Dia	1 x 1.0 Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	
INVERT LEVEL	964.2	

STR.	EXISTING	PROPOSED
CH	New	11+778
SIZE		1 x 2.0 m
TYPE		Box Culvert
CONS	New Construction	
INVERT LEVEL	966	

PROPOSED ROAD LEVELS(m)	EXISTING ROAD LEVELS(m)	GL AT 5m LHS (m)	GL AT 8m RHS (m)
949.743	948.819	948.244	949.331
954.639	949.155	949.945	950.551
955.659	950.101	951.329	951.772
957.678	952.411	952.661	952.992
959.986	953.934	954.408	954.213
960.772	954.598	955.242	955.433
962.202	955.484	956.175	956.654
961.052	956.697	957.426	957.874
959.877	958.340	958.534	959.095
960.979	958.928	959.417	960.315
967.733	961.295	961.227	961.536
968.064	961.520	962.219	962.756
968.962	963.173	963.103	963.977
969.263	964.616	964.727	965.197
967.084	965.668	966.323	966.418
971.225	967.702	967.550	967.638
970.903	968.299	968.558	968.859
975.402	969.854	969.692	970.079
975.984	970.563	971.225	971.300
978.167	971.945	972.428	972.500
977.672	973.020	973.493	973.598
977.456	974.497	974.170	974.407
975.476	975.107	974.965	975.161
976.877	977.263	976.426	976.122
976.915	977.956	977.570	977.133
979.193	978.064	978.120	978.179



PROPOSED CHAINAGE
11+500
11+520
11+540
11+560
11+580
11+600
11+620
11+640
11+660
11+680
11+700
11+720
11+740
11+760
11+780
11+800
11+820
11+840
11+860
11+880
11+900
11+920
11+940
11+960
11+980
12+000

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

SATRA SERVICES AND SOLUTIONS PVT LTD.
#1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

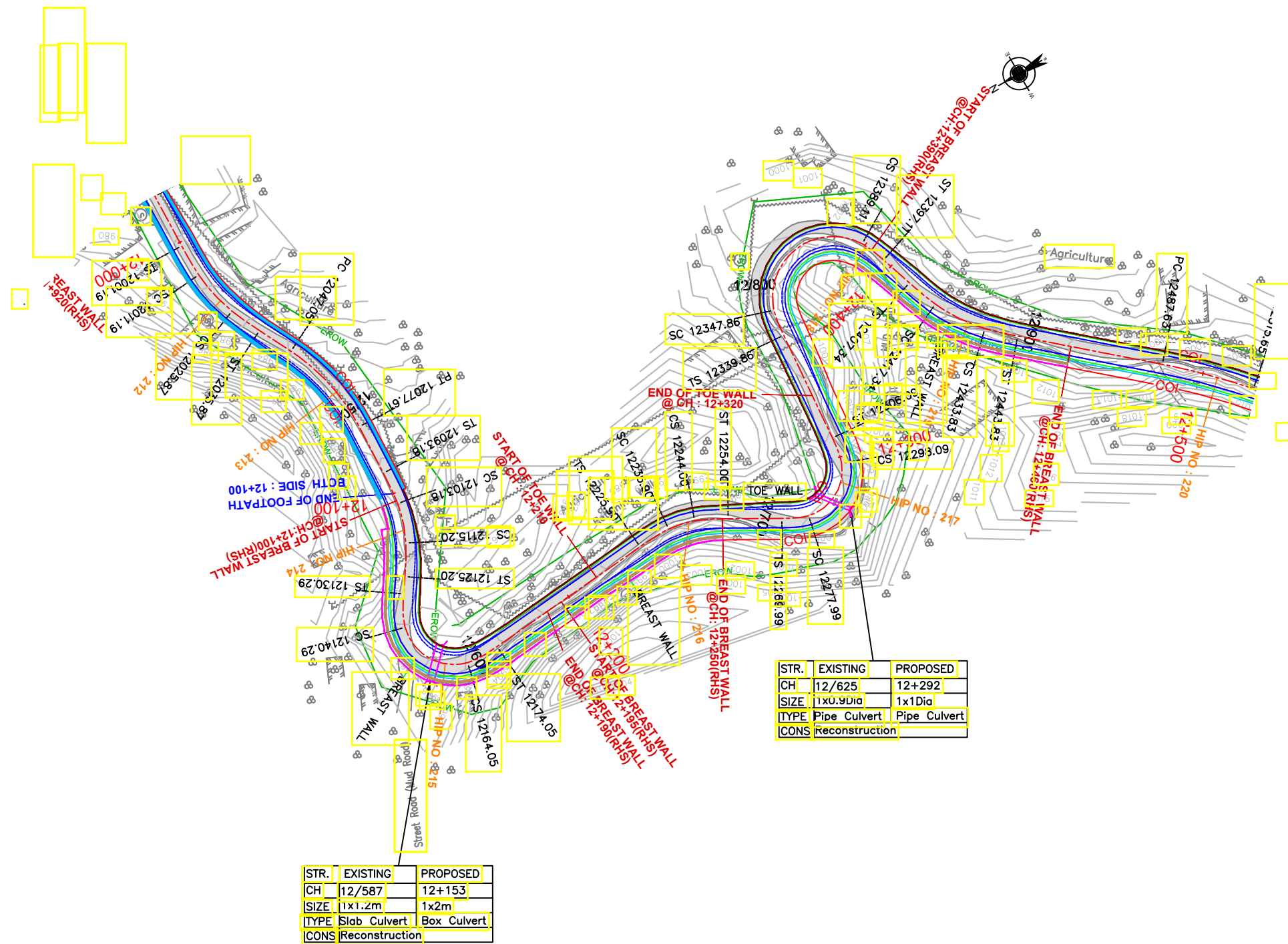
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DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 28 OF 48

TENDER PURPOSE ONLY



STR.	EXISTING	PROPOSED
CH	12/625	12+292
SIZE	1x0.9Dia	1x1Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	

STR.	EXISTING	PROPOSED
CH	12/587	12+153
SIZE	1x1.2m	1x2m
TYPE	Slab Culvert	Box Culvert
CONS	Reconstruction	

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED



HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.



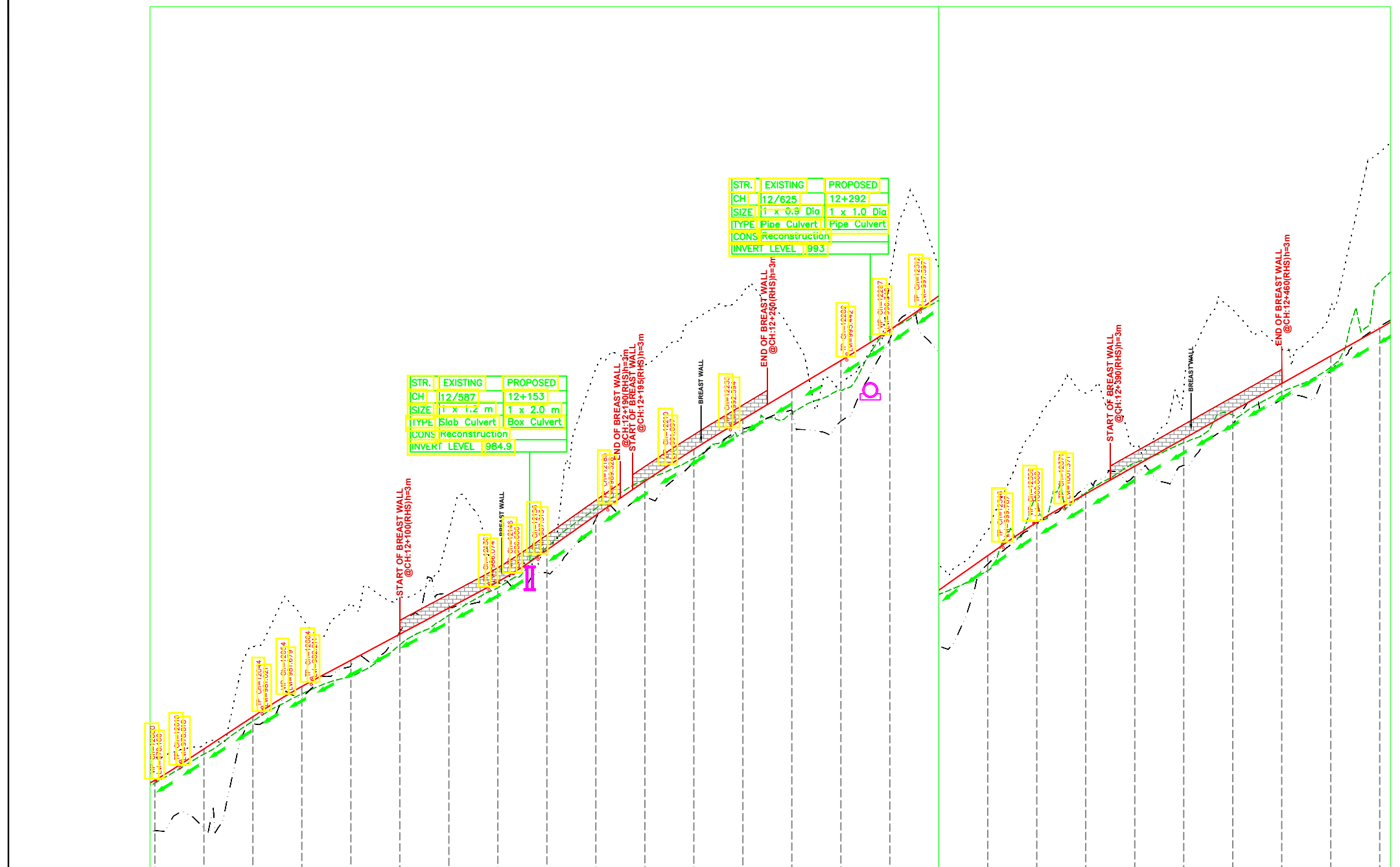
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PROJECT:	DESIGNED	GANESH
Himachal Pradesh State Roads Transformation Project (HPSRTP)	DRAWN	SWAROOPA RANI
SCALE:	CHECKED	PRANVI
NOT TO SCALE	APPROVED	PRANVI

TITLE :	DRAINAGE PLAN & PROFILE FROM CH: 12+000 TO CH: 12+500
DRAWING NO :	HP/MAN-KAL/DRAINAGE P&P
ROAD NAME :	Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854
SHEET	3A OF 348

← MANDI

KALKHAR →



	12+000	12+020	12+040	12+060	12+080	12+100	12+120	12+140	12+160	12+180	12+200	12+220	12+240	12+260	12+280	12+300	12+320	12+340	12+360	12+380	12+400	12+420	12+440	12+460	12+480	12+500		
DATUM = +974.000m																												
PROPOSED ROAD LEVELS (m)	979.193	978.064	976.179	976.120	976.237	979.245	979.455	980.591	980.772	981.707	982.006	983.643	980.489	981.553	981.707	982.006	983.643	980.489	981.553	981.707	982.006	983.643	980.489	981.553	981.707	982.006	983.643	
EXISTING ROAD LEVELS (m)																												
GL AT 5m LHS (m)	979.193	976.120	976.120	976.120	976.237	979.245	979.455	980.591	980.772	981.707	982.006	983.643	980.489	981.553	981.707	982.006	983.643	980.489	981.553	981.707	982.006	983.643	980.489	981.553	981.707	982.006	983.643	
GL AT 8m RHS (m)	979.193	976.120	976.120	976.120	976.237	979.245	979.455	980.591	980.772	981.707	982.006	983.643	980.489	981.553	981.707	982.006	983.643	980.489	981.553	981.707	982.006	983.643	980.489	981.553	981.707	982.006	983.643	
VERTICAL SCHEMATIC	[Vertical curve data including grades, lengths, and elevations]																											
HORIZONTAL SCHEMATIC	[Horizontal curve data including radii, lengths, and elevations]																											
SUPERELEVATION	[Superelevation percentages and transition lengths]																											
CROSS SECTION DETAILS	[Cross-section details for TCS-2 and TCS-3]																											
PROPOSED CHAINAGE	12+000	12+020	12+040	12+060	12+080	12+100	12+120	12+140	12+160	12+180	12+200	12+220	12+240	12+260	12+280	12+300	12+320	12+340	12+360	12+380	12+400	12+420	12+440	12+460	12+480	12+500		

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

SATRA SERVICES AND SOLUTIONS PVT LTD.
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Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 12+000 TO CH: 12+500

DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

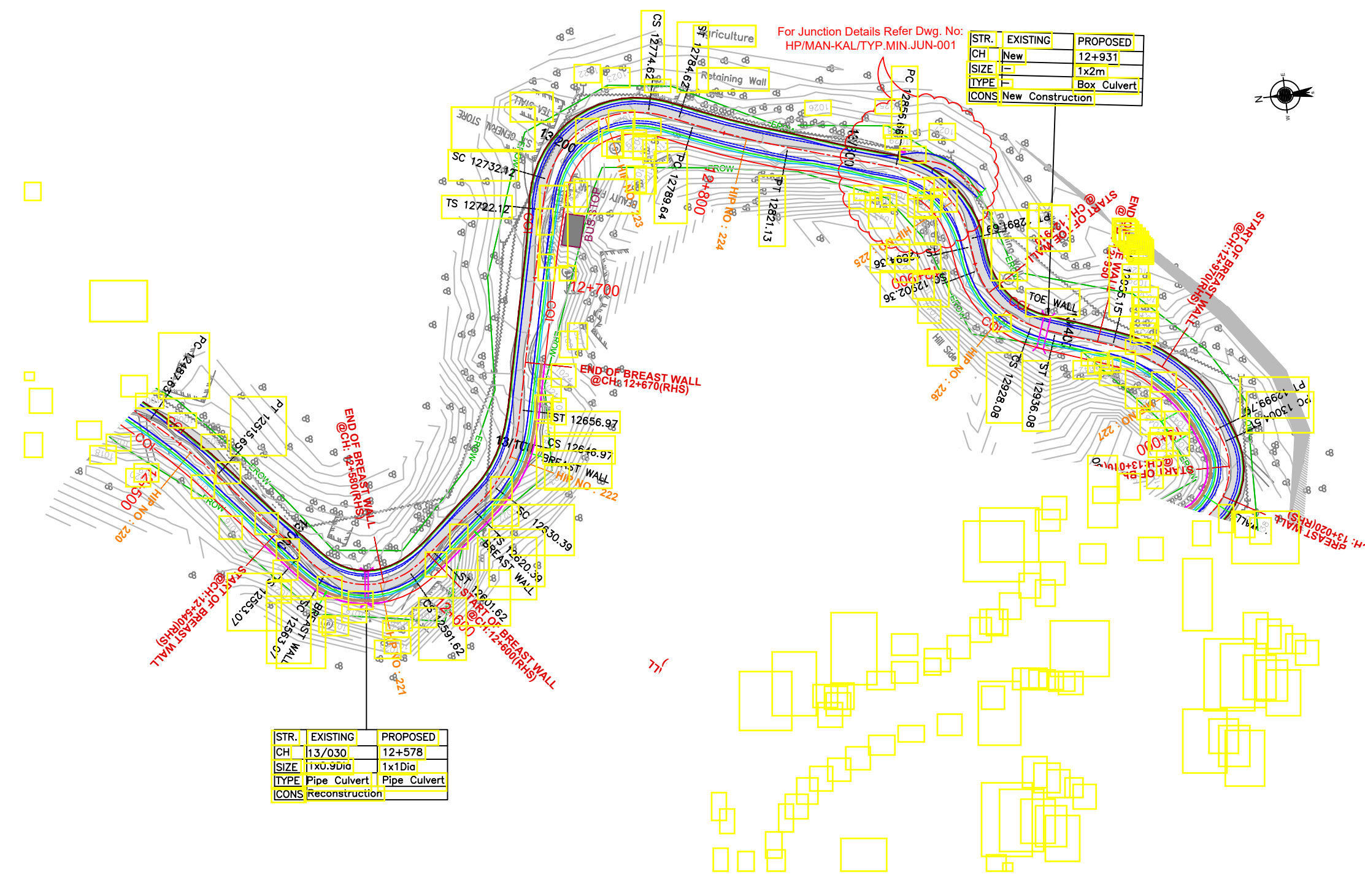
ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 38 OF 48

TENDER PURPOSE ONLY

← MANDI

KALKHAR →



STR.	EXISTING	PROPOSED
CH	New	12+931
SIZE		1x2m
TYPE		Box Culvert
CONS		New Construction

STR.	EXISTING	PROPOSED
CH	13/030	12+578
SIZE	1x0.9Dia	1x1Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS		Reconstruction

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED



SATRA
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E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

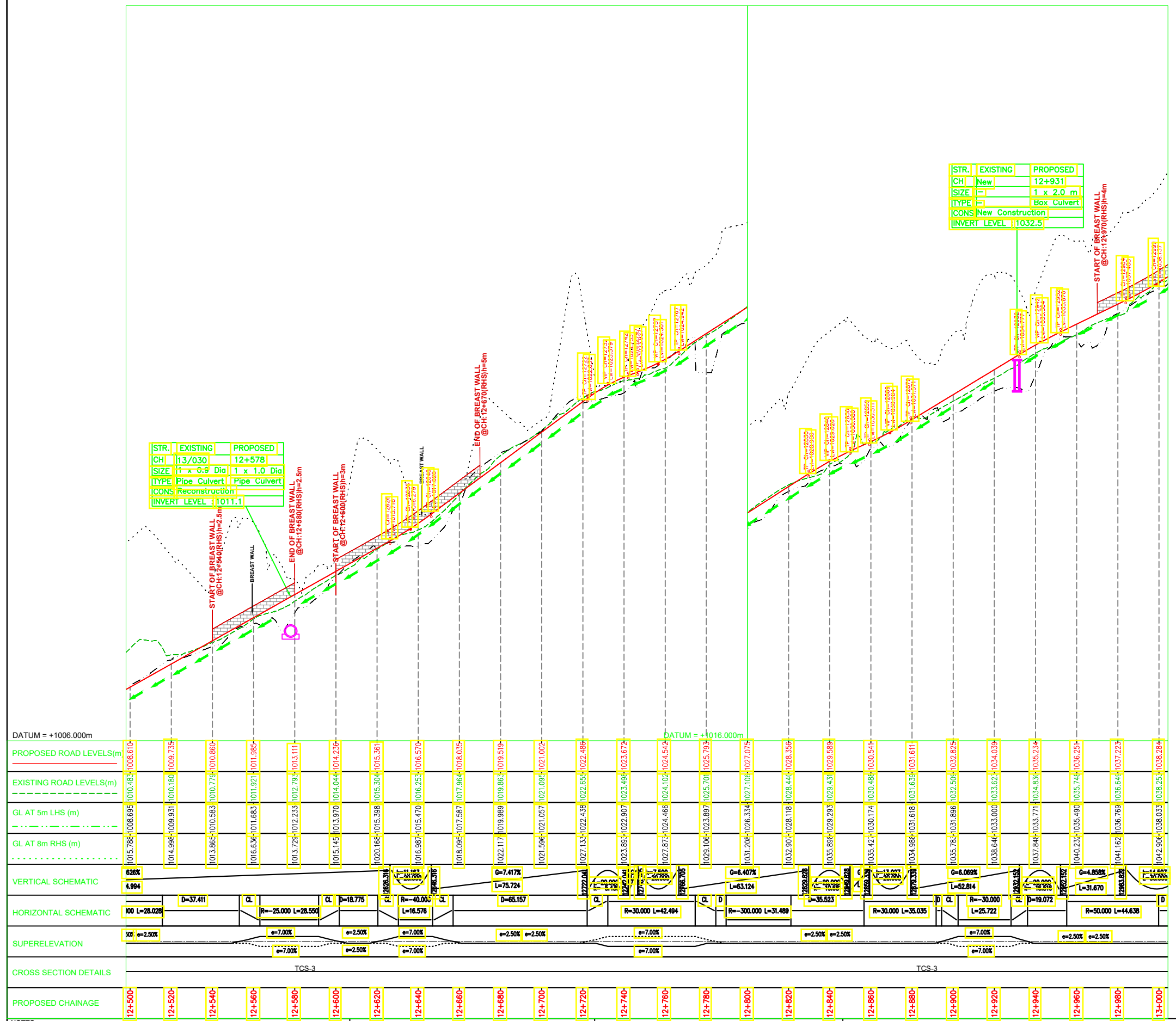
DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 12+500 TO CH: 13+000
DRAWING NO : HP/MAN-KAL/DRAINAGE P&P
ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 4A OF 48

MANDI

KALKHAR



TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

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PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 12+500 TO CH: 13+000

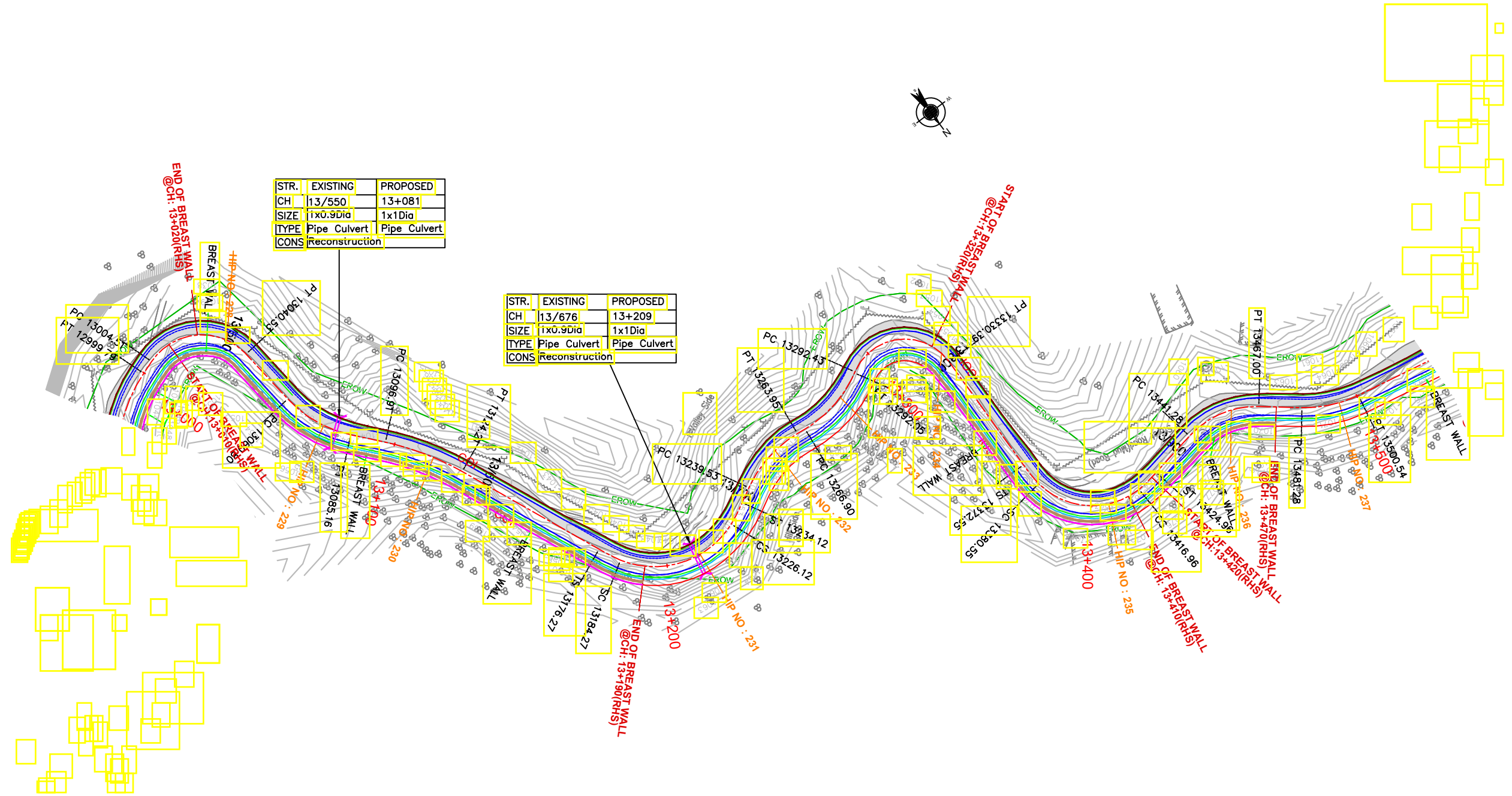
DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 48 OF 148

← MANDI

KALKHAR →



STR.	EXISTING	PROPOSED
CH	13/550	13+081
SIZE	1x0.9Dia	1x1Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS		Reconstruction

STR.	EXISTING	PROPOSED
CH	13/676	13+209
SIZE	1x0.9Dia	1x1Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS		Reconstruction

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

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PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 13+000 TO CH: 13+500

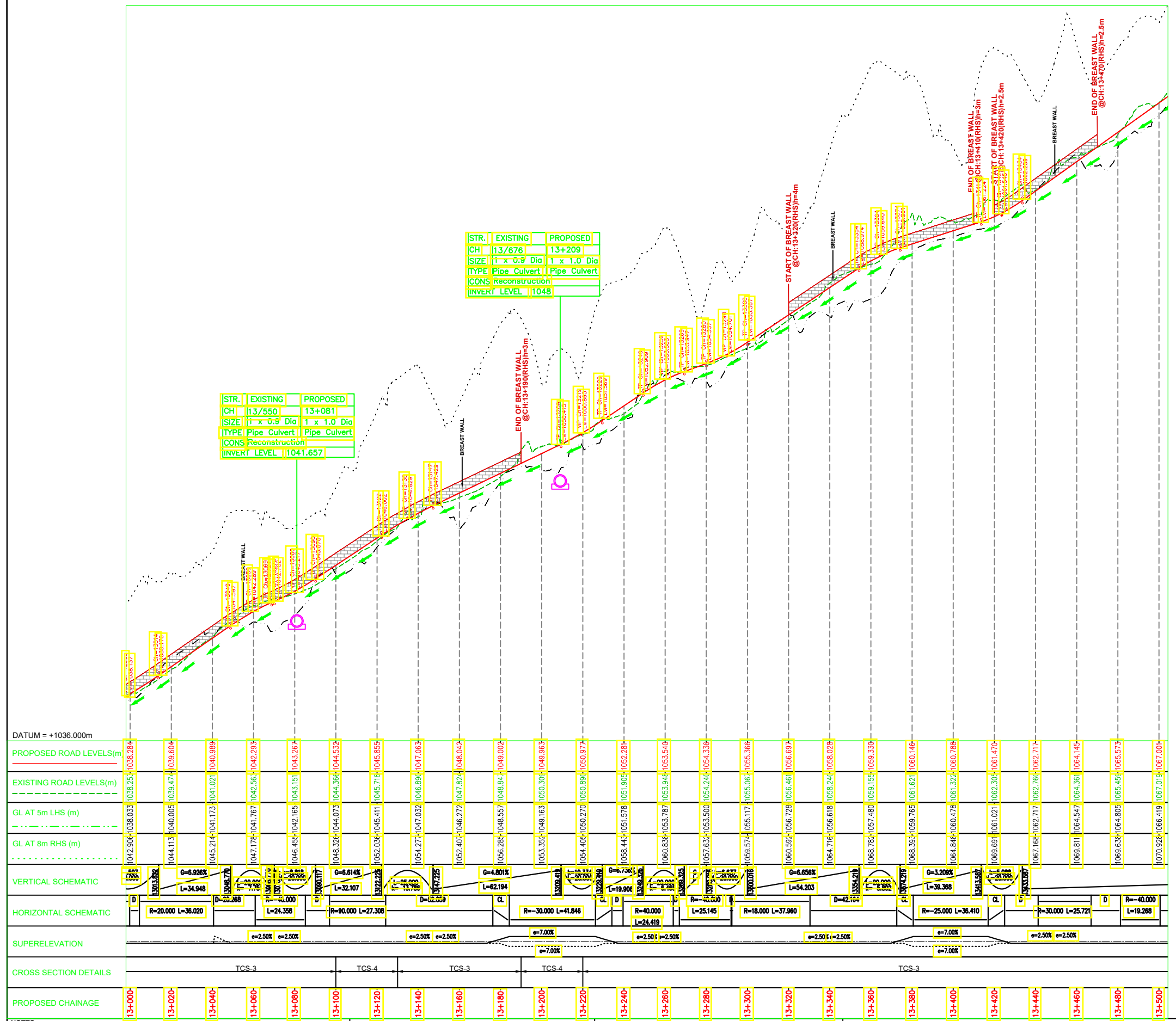
DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 5A OF 148

← MANDI

KALKHAR →



STR.	EXISTING	PROPOSED
CH	13/550	13+081
SIZE	1 x 0.9 Dia	1 x 1.0 Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	
INVERT LEVEL	1041.657	

DATUM = +1036.000m

PROPOSED ROAD LEVELS(m)	EXISTING ROAD LEVELS(m)	GL AT 5m LHS (m)	GL AT 8m RHS (m)	VERTICAL SCHEMATIC	HORIZONTAL SCHEMATIC	SUPERELEVATION	CROSS SECTION DETAILS	PROPOSED CHAINAGE
1042.904	1038.033	1038.254	1039.284	G=6.926%	R=20,000 L=36,020	e=2.50%	TCS-3	13+000
1044.113	1040.005	1039.477	1039.604	G=6.614%	R=40,000 L=24,358	e=2.50%	TCS-4	13+020
1045.214	1041.173	1041.021	1040.989	G=4.801%	R=30,000 L=27,308	e=2.50%	TCS-3	13+040
1047.175	1042.561	1042.561	1042.293	G=6.856%	R=18,000 L=37,960	e=2.50%	TCS-4	13+060
1048.451	1042.165	1043.151	1043.204	G=3.209%	R=25,000 L=36,410	e=7.00%	TCS-3	13+080
1048.321	1044.073	1044.364	1044.532		R=40,000 L=24,419	e=2.50%	TCS-4	13+100
1052.031	1045.411	1045.715	1045.855		R=30,000 L=41,846	e=7.00%	TCS-3	13+120
1054.271	1047.032	1046.894	1047.063		R=40,000 L=24,419	e=2.50%	TCS-4	13+140
1052.401	1046.272	1047.824	1048.042		R=18,000 L=37,960	e=2.50%	TCS-3	13+160
1056.281	1048.557	1048.841	1049.002		R=25,000 L=36,410	e=7.00%	TCS-4	13+180
1053.351	1049.163	1050.301	1049.983		R=30,000 L=41,846	e=2.50%	TCS-3	13+200
1054.401	1050.270	1050.894	1050.974		R=40,000 L=24,419	e=2.50%	TCS-4	13+220
1058.441	1051.578	1051.905	1052.281		R=18,000 L=37,960	e=2.50%	TCS-3	13+240
1060.831	1053.787	1053.944	1053.549		R=25,000 L=36,410	e=7.00%	TCS-4	13+260
1057.631	1053.500	1054.241	1054.339		R=30,000 L=41,846	e=2.50%	TCS-3	13+280
1059.571	1055.117	1055.061	1055.366		R=40,000 L=24,419	e=2.50%	TCS-4	13+300
1060.591	1056.728	1056.461	1056.694		R=18,000 L=37,960	e=2.50%	TCS-3	13+320
1064.711	1058.618	1058.241	1058.028		R=25,000 L=36,410	e=7.00%	TCS-4	13+340
1068.781	1057.480	1059.151	1059.339		R=30,000 L=41,846	e=2.50%	TCS-3	13+360
1068.391	1059.765	1061.621	1060.146		R=40,000 L=24,419	e=2.50%	TCS-4	13+380
1064.841	1060.478	1061.321	1060.789		R=18,000 L=37,960	e=2.50%	TCS-3	13+400
1069.691	1061.021	1062.301	1061.470		R=25,000 L=36,410	e=7.00%	TCS-4	13+420
1067.161	1062.717	1062.761	1062.717		R=30,000 L=41,846	e=2.50%	TCS-3	13+440
1069.811	1064.547	1064.361	1064.145		R=40,000 L=24,419	e=2.50%	TCS-4	13+460
1069.631	1064.805	1065.451	1065.573		R=18,000 L=37,960	e=2.50%	TCS-3	13+480
1070.921	1066.419	1067.018	1067.001		R=25,000 L=36,410	e=7.00%	TCS-4	13+500

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

SATRA SERVICES AND SOLUTIONS PVT LTD.
#1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 13+000 TO CH: 13+500

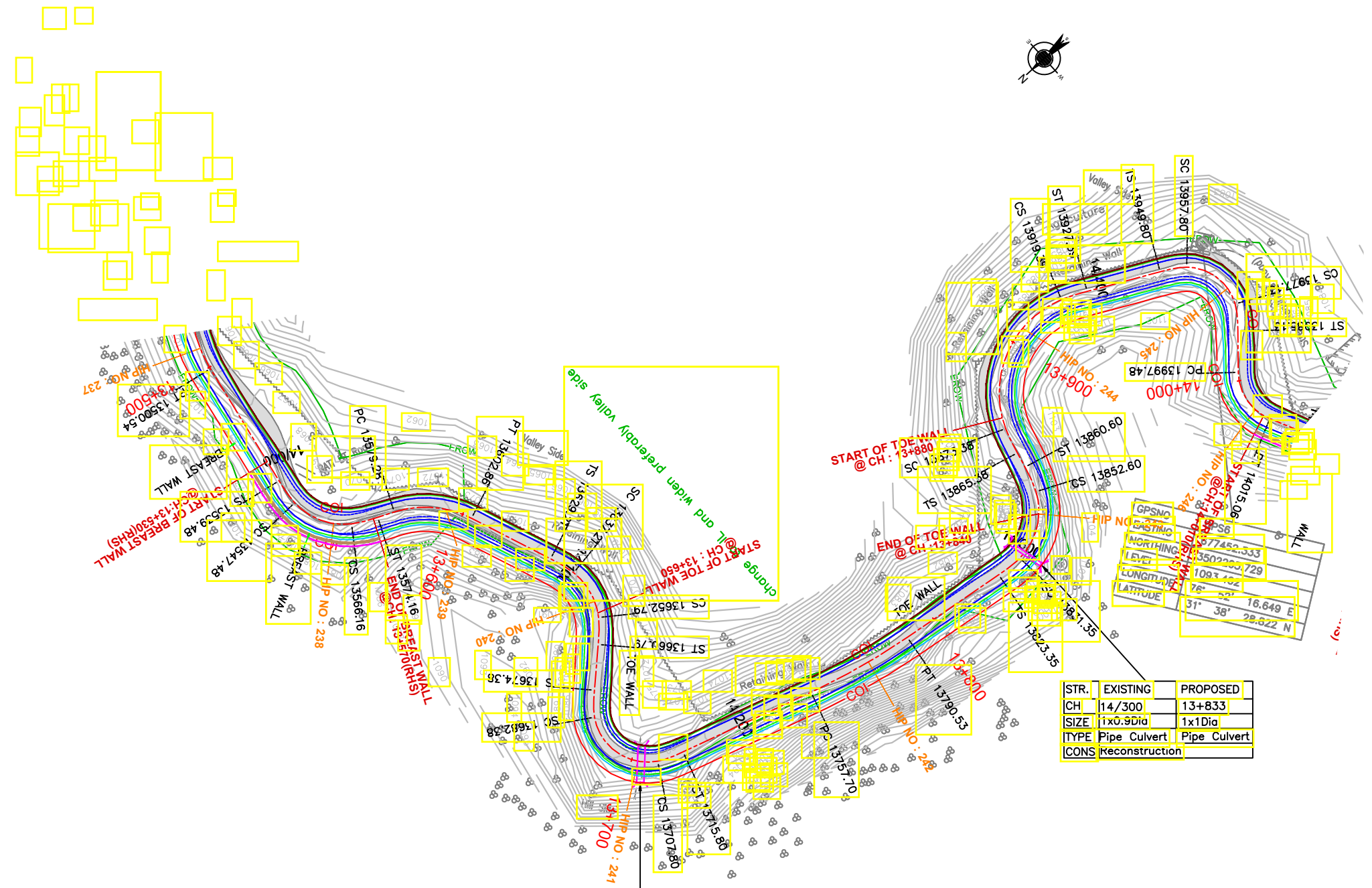
DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 58 OF 148

MANDI ←

→ KALKHAR



STR.	EXISTING	PROPOSED
CH	14/300	13+833
SIZE	1x0.9Dia	1x1Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	

STR.	EXISTING	PROPOSED
CH	14/163	13+703
SIZE	1x1.2m	1x2m
TYPE	Slab Culvert	Box Culvert
CONS	Reconstruction	

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

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PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 13+500 TO CH: 14+000

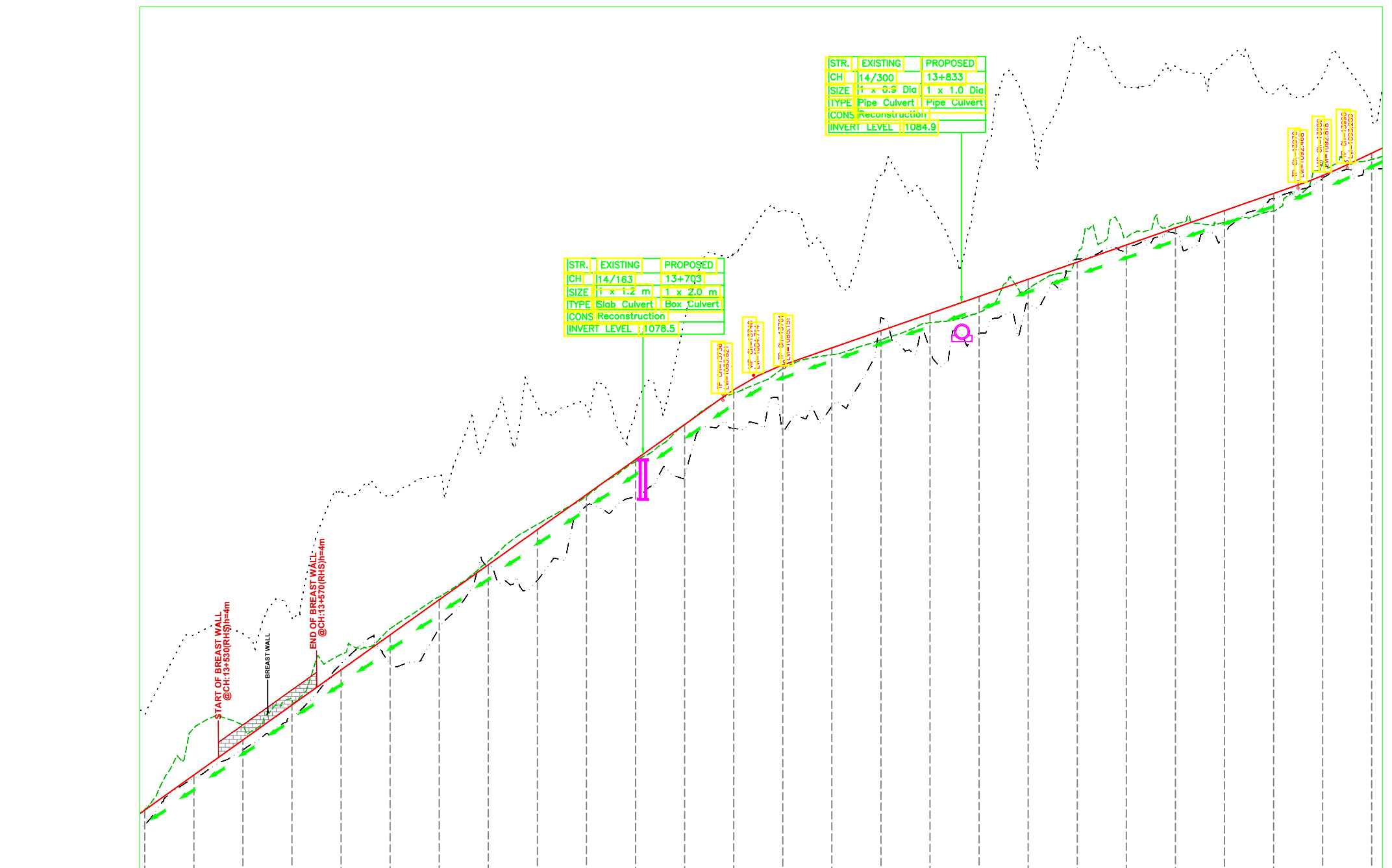
DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 6A OF 14B

← MANDI

KALKHAR →



PROPOSED ROAD LEVELS(m)	EXISTING ROAD LEVELS(m)	GL AT 5m LHS (m)	GL AT 8m RHS (m)
1070.924	1066.419	1067.014	1067.000
1074.145	1068.292	1070.333	1068.429
1074.186	1069.466	1070.454	1069.857
1074.916	1070.803	1071.493	1071.285
1079.977	1072.965	1073.333	1072.713
1079.754	1072.929	1074.394	1074.141
1080.634	1074.403	1075.685	1075.569
1083.465	1076.358	1078.644	1078.425
1083.427	1078.407	1079.784	1079.853
1083.264	1079.758	1081.197	1081.280
1086.987	1080.625	1082.704	1082.709
1089.644	1082.550	1083.984	1084.122
1091.427	1082.376	1084.993	1085.130
1089.176	1083.453	1085.553	1085.879
1092.871	1087.072	1086.155	1086.528
1091.651	1085.733	1086.854	1087.227
1093.071	1086.438	1087.274	1087.926
1095.361	1087.615	1088.234	1088.625
1088.407	1089.448	1089.554	1089.324
1096.416	1089.722	1090.324	1090.024
1097.284	1090.496	1090.884	1090.722
1097.481	1090.460	1090.944	1091.421
1096.176	1091.925	1091.404	1092.120
1096.851	1092.742	1093.334	1092.856
1095.431	1093.103	1093.504	1093.762

STR.	EXISTING	PROPOSED
CH	14/300	13+833
SIZE	1 x 3.0 Dia	1 x 1.0 Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	
INVERT LEVEL	1084.9	

STR.	EXISTING	PROPOSED
CH	14/163	13+703
SIZE	1 x 1.2 m	1 x 2.0 m
TYPE	Slab Culvert	Box Culvert
CONS	Reconstruction	
INVERT LEVEL	1078.5	

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

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PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 13+500 TO CH: 14+000

DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

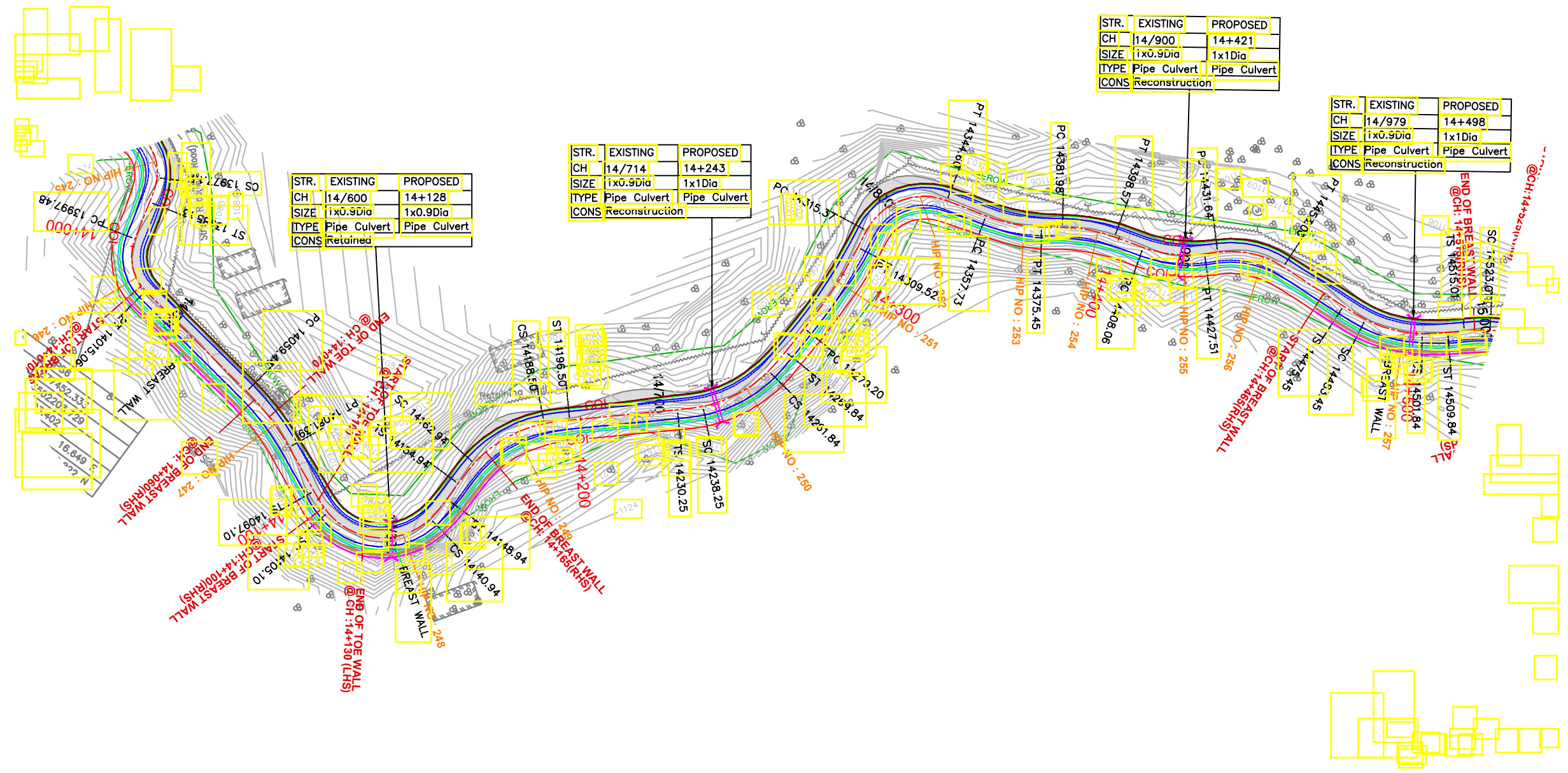
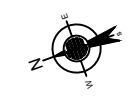
ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 68 OF 148

TENDER PURPOSE ONLY

← MANDI

KALKHAR →



TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED



SATRA
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#1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

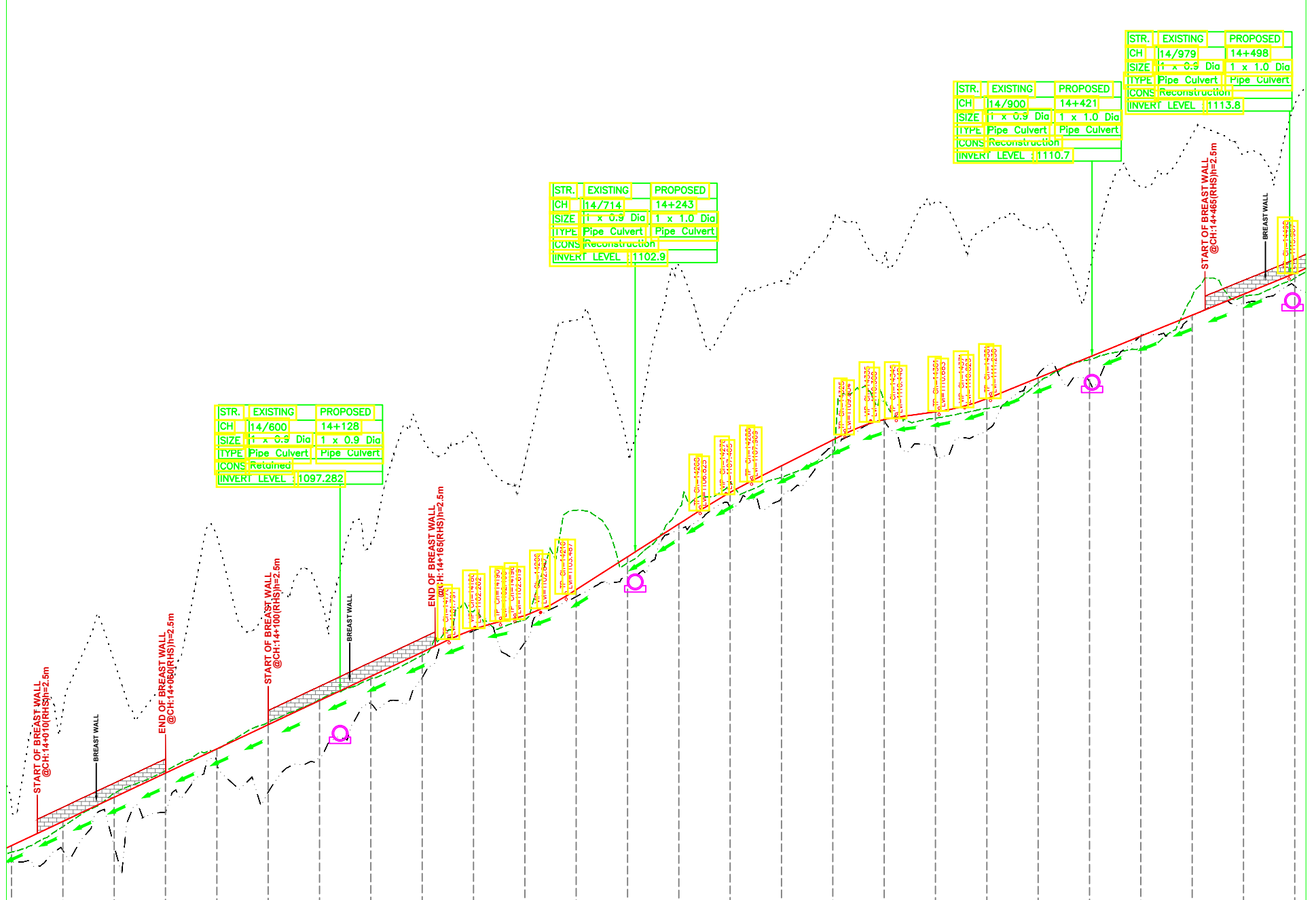
DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 14+000 TO CH: 14+500

DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 7A OF 14B



STR.	EXISTING	PROPOSED
CH	14/979	14+498
SIZE	1 x 0.9 Dia	1 x 1.0 Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	
INVERT LEVEL		1113.8

STR.	EXISTING	PROPOSED
CH	14/714	14+243
SIZE	1 x 0.9 Dia	1 x 1.0 Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	
INVERT LEVEL		1110.7

STR.	EXISTING	PROPOSED
CH	14/600	14+128
SIZE	1 x 0.9 Dia	1 x 0.9 Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Retained	
INVERT LEVEL		1097.282

DATUM = +1091.000m

PROPOSED ROAD LEVELS(m)	EXISTING ROAD LEVELS(m)	GL AT 5m LHS (m)	GL AT 8m RHS (m)
1095.43	1093.50	1093.10	1093.76
1099.00	1093.57	1094.49	1094.70
1100.94	1093.73	1095.79	1095.64
1100.16	1095.64	1096.67	1096.58
1105.83	1096.95	1097.57	1097.50
1103.12	1095.85	1098.56	1098.47
1103.57	1097.22	1099.45	1099.41
1105.53	1099.29	1100.26	1100.36
1109.65	1100.30	1101.17	1101.26
1109.81	1102.13	1102.06	1102.15
1108.71	1101.67	1102.56	1102.72
1114.24	1103.46	1106.83	1103.73
1109.34	1104.24	1104.77	1105.01
1116.37	1106.05	1106.93	1106.29
1114.48	1106.91	1107.93	1107.57
1115.76	1107.37	1108.10	1108.59
1118.02	1109.31	1109.09	1109.56
1116.66	1110.31	1111.06	1110.36
1118.84	1109.12	1110.41	1110.66
1117.83	1109.94	1110.79	1111.75
1117.65	1111.23	1111.78	1111.97
1116.15	1111.85	1112.69	1112.80
1119.40	1113.19	1113.62	1113.61
1121.45	1114.37	1115.13	1114.43
1120.72	1114.89	1115.19	1115.24
1122.66	1115.56	1115.67	1116.06

VERTICAL SCHEMATIC	HORIZONTAL SCHEMATIC	SUPERELEVATION	CROSS SECTION DETAILS
<p>Grades: 4.710%, 0.396%, 5.043%, 4.071%</p> <p>Vertical Curves: L=180.519, L=52.201, L=36.374, L=116.355</p>	<p>Horizontal Curves: R=15.000, D=44.381, R=80.000, L=21.952, R=22.000, L=35.844, R=40.000, L=25.565, D=33.745, R=150.000, L=30.322, R=20.000, L=29.228, R=50.000, L=17.719, R=50.000, L=18.449, R=30.000, L=21.411, D=22.396, R=45.000, L=18.390</p>	<p>Superelevations: e=2.50%, e=7.00%, e=2.50%, e=7.00%, e=2.50%, e=7.00%, e=2.50%, e=7.00%, e=2.50%, e=7.00%, e=2.50%, e=7.00%</p>	<p>Cross Section: TCS-3</p>

TENDER PURPOSE ONLY

NOTES: 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

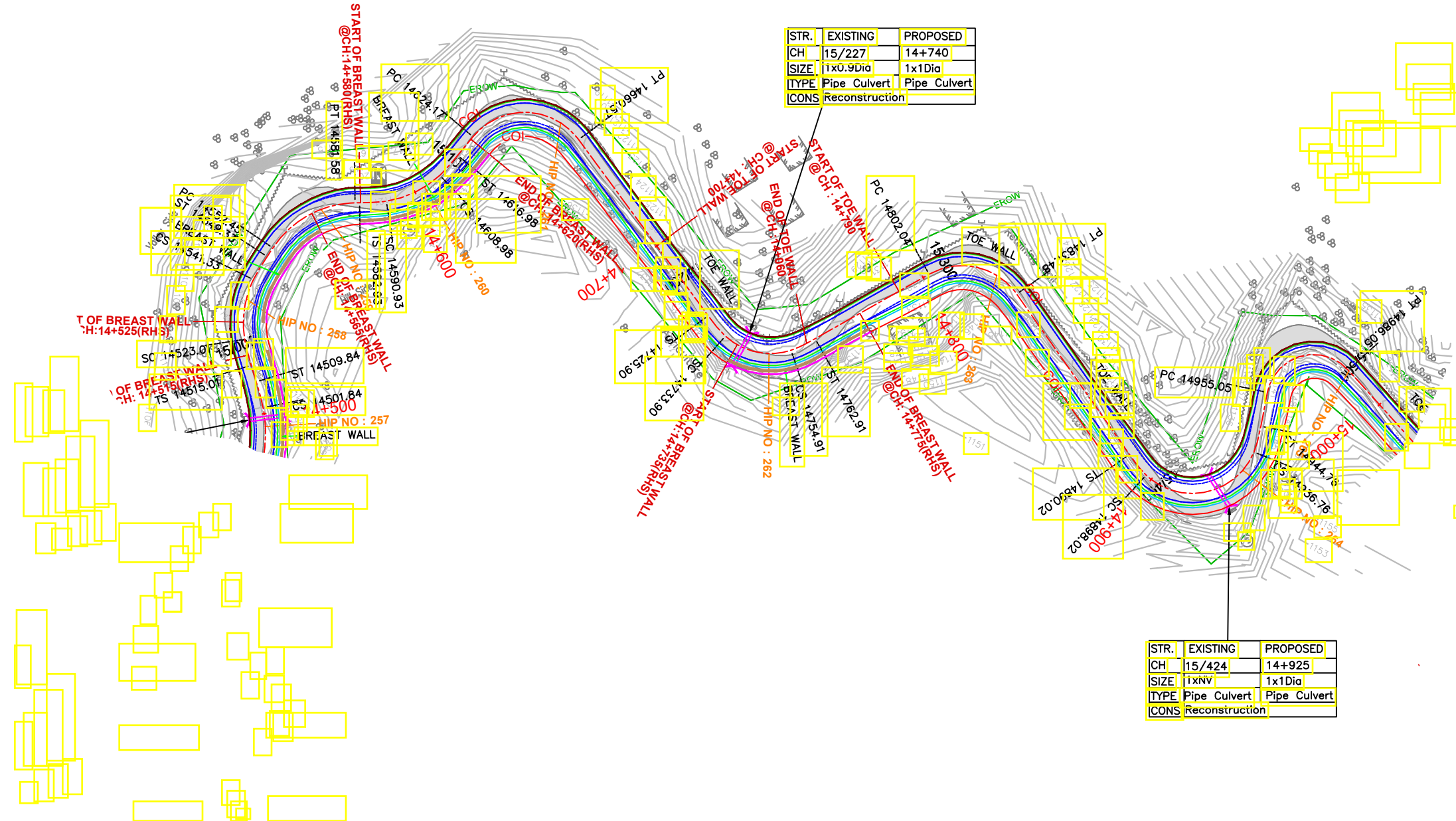
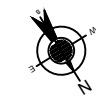


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PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)
 SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 14+000 TO CH: 14+500
 DRAWING NO : HP/MAN-KAL/DRAINAGE P&P
 ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854



TENDER PURPOSE ONLY

NOTES:
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REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

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PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 14+500 TO CH: 15+000

DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

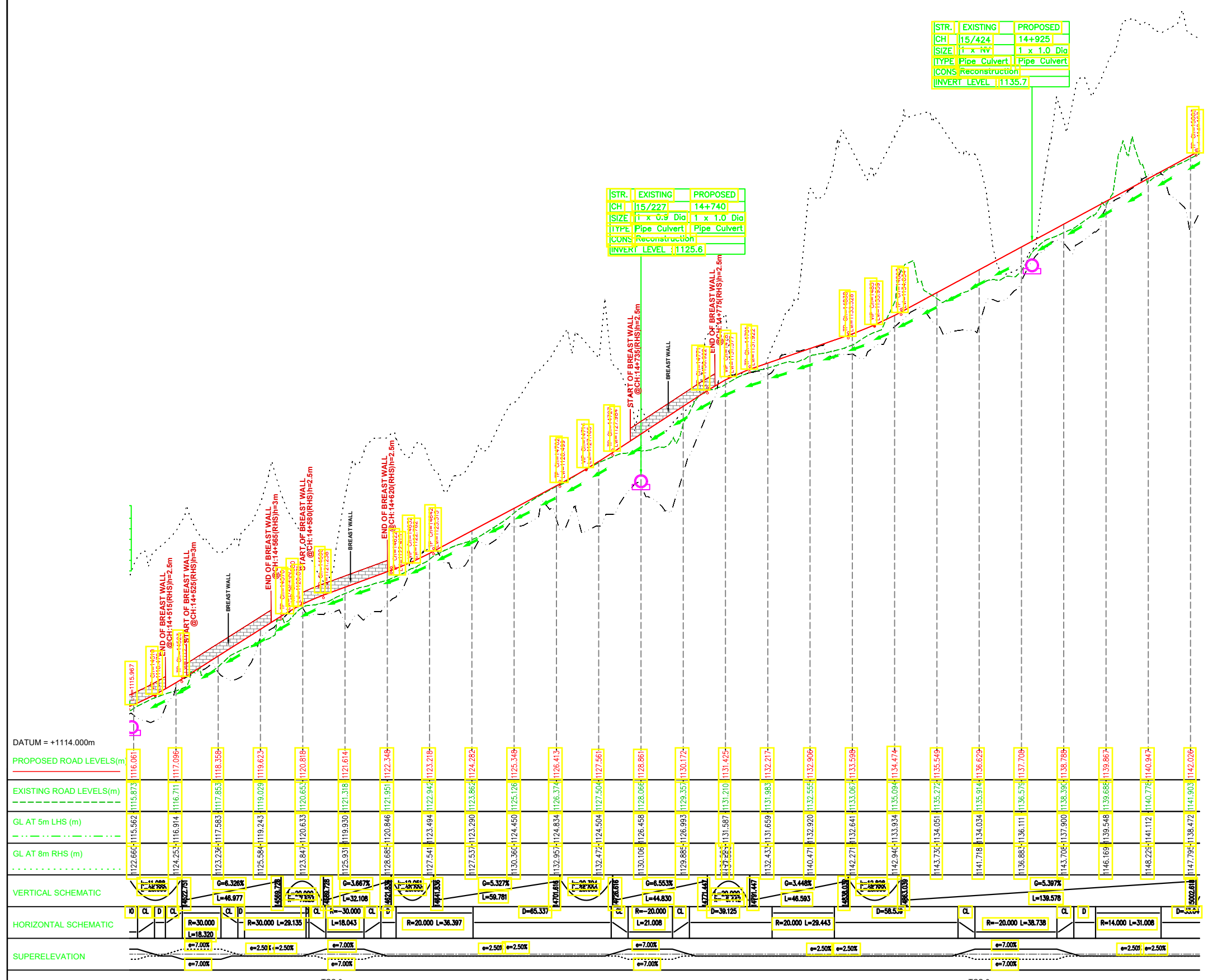
SHEET 8A OF 148

MANDI ←

→ KALKHAR

STR.	EXISTING	PROPOSED
CH	15/227	14+925
SIZE	1 x NV	1 x 1.0 Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	
INVERT LEVEL		1135.7

STR.	EXISTING	PROPOSED
CH	15/227	14+740
SIZE	1 x 0.9 Dia	1 x 1.0 Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	
INVERT LEVEL		1125.6



CH	PROPOSED ROAD LEVELS (m)	EXISTING ROAD LEVELS (m)	GL AT 5m LHS (m)	GL AT 8m RHS (m)	VERTICAL SCHEMATIC	HORIZONTAL SCHEMATIC	SUPERELEVATION
14+500	1122.66	1115.87	1115.56	1116.06	G=-6.326%	R=30.000 L=18.320	e=7.00%
14+520	1124.25	1116.91	1116.54	1117.08	G=-6.326%	R=30.000 L=28.135	e=2.50% e=2.50%
14+540	1125.84	1117.75	1117.38	1118.05	G=-6.326%	R=30.000 L=18.043	e=7.00%
14+560	1127.43	1118.59	1118.22	1119.02	G=-6.326%	R=20.000 L=36.397	e=7.00%
14+580	1129.02	1119.43	1119.06	1120.18	G=-5.327%	D=5.337	e=2.50% e=2.50%
14+600	1130.61	1120.27	1119.90	1121.14	G=-5.327%	R=20.000 L=21.008	e=7.00%
14+620	1132.20	1121.11	1120.74	1122.11	G=-3.448%	D=39.125	e=2.50% e=2.50%
14+640	1133.79	1121.95	1121.58	1123.08	G=-3.448%	R=20.000 L=28.443	e=7.00%
14+660	1135.38	1122.79	1122.42	1124.15	G=-3.448%	D=58.552	e=7.00%
14+680	1136.97	1123.63	1123.26	1125.22	G=-5.397%	R=20.000 L=38.738	e=7.00%
14+700	1138.56	1124.47	1124.10	1126.29	G=-5.397%	R=14.000 L=31.008	e=2.50% e=2.50%
14+720	1140.15	1125.31	1124.94	1127.36	G=-5.397%	D=35.552	e=7.00%
14+740	1141.74	1126.15	1125.78	1128.43	G=-5.397%		e=7.00%
14+760	1143.33	1126.99	1126.62	1129.50			
14+780	1144.92	1127.83	1127.46	1130.57			
14+800	1146.51	1128.67	1128.30	1131.64			
14+820	1148.10	1129.51	1129.14	1132.71			
14+840	1149.69	1130.35	1130.00	1133.78			
14+860	1151.28	1131.19	1130.84	1134.85			
14+880	1152.87	1132.03	1131.68	1135.92			
14+900	1154.46	1132.87	1132.52	1136.99			
14+920	1156.05	1133.71	1133.36	1138.06			
14+940	1157.64	1134.55	1134.20	1139.13			
14+960	1159.23	1135.39	1135.04	1140.20			
14+980	1160.82	1136.23	1135.88	1141.27			
15+000	1162.41	1137.07	1136.72	1142.34			

PROPOSED CHAINAGE	14+500	14+520	14+540	14+560	14+580	14+600	14+620	14+640	14+660	14+680	14+700	14+720	14+740	14+760	14+780	14+800	14+820	14+840	14+860	14+880	14+900	14+920	14+940	14+960	14+980	15+000
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NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

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#1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

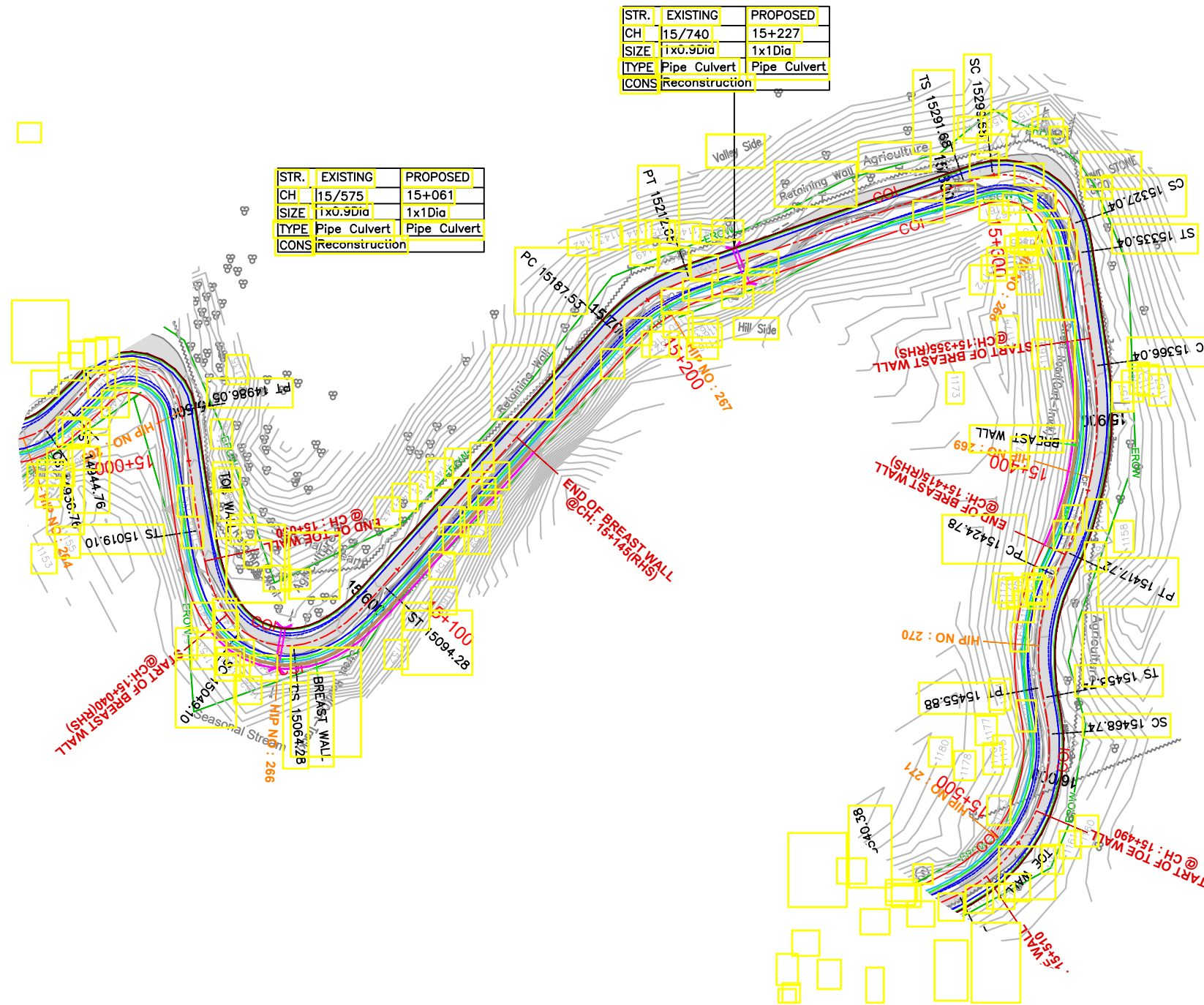
TITLE : DRAINAGE PLAN & PROFILE FROM CH: 14+500 TO CH: 15+000

DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 88 OF 148

TENDER PURPOSE ONLY



TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED



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PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

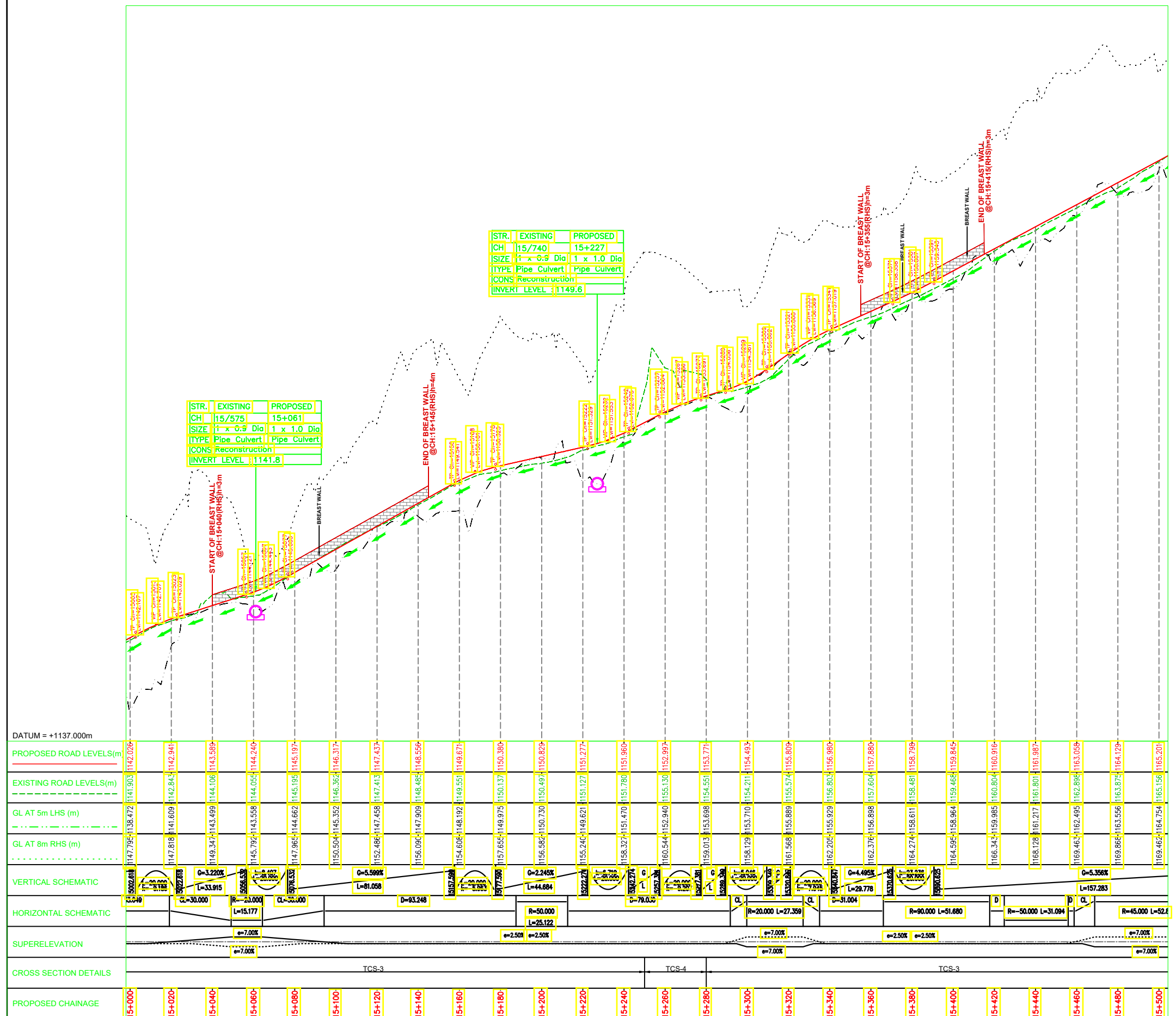
DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 15+000 TO CH: 15+500

DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 9A OF 148



DATUM = +1137.000m																										
PROPOSED ROAD LEVELS(m)	1142.026	1141.903	1142.026	1142.941	1143.589	1144.240	1144.917	1145.617	1146.317	1147.017																
EXISTING ROAD LEVELS(m)	1147.795	1148.472	1141.903	1142.843	1143.589	1144.106	1144.662	1145.195	1145.730	1146.267																
GL AT 5m LHS (m)	1147.795	1148.472	1141.903	1142.843	1143.589	1144.106	1144.662	1145.195	1145.730	1146.267																
GL AT 8m RHS (m)	1147.795	1148.472	1141.903	1142.843	1143.589	1144.106	1144.662	1145.195	1145.730	1146.267																
VERTICAL SCHEMATIC	[Vertical curve data: G=3.220%, L=33.915; G=5.590%, L=81.056; G=2.245%, L=44.684; G=4.480%, L=29.778; G=5.356%, L=157.283]																									
HORIZONTAL SCHEMATIC	[Horizontal curve data: R=20.000, L=15.177; R=50.000, L=25.122; R=20.000, L=27.359; R=80.000, L=51.680; R=50.000, L=31.094; R=45.000, L=52.4]																									
SUPERELEVATION	[Superelevation data: e=7.00%, e=2.50%, e=2.50%, e=7.00%, e=2.50%, e=2.50%, e=7.00%, e=7.00%, e=7.00%]																									
CROSS SECTION DETAILS	[Cross-section details for TCS-3 and TCS-4]																									
PROPOSED CHAINAGE	15+000	15+020	15+040	15+060	15+080	15+100	15+120	15+140	15+160	15+180	15+200	15+220	15+240	15+260	15+280	15+300	15+320	15+340	15+360	15+380	15+400	15+420	15+440	15+460	15+480	15+500

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

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HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

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PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 15+000 TO CH: 15+500

DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

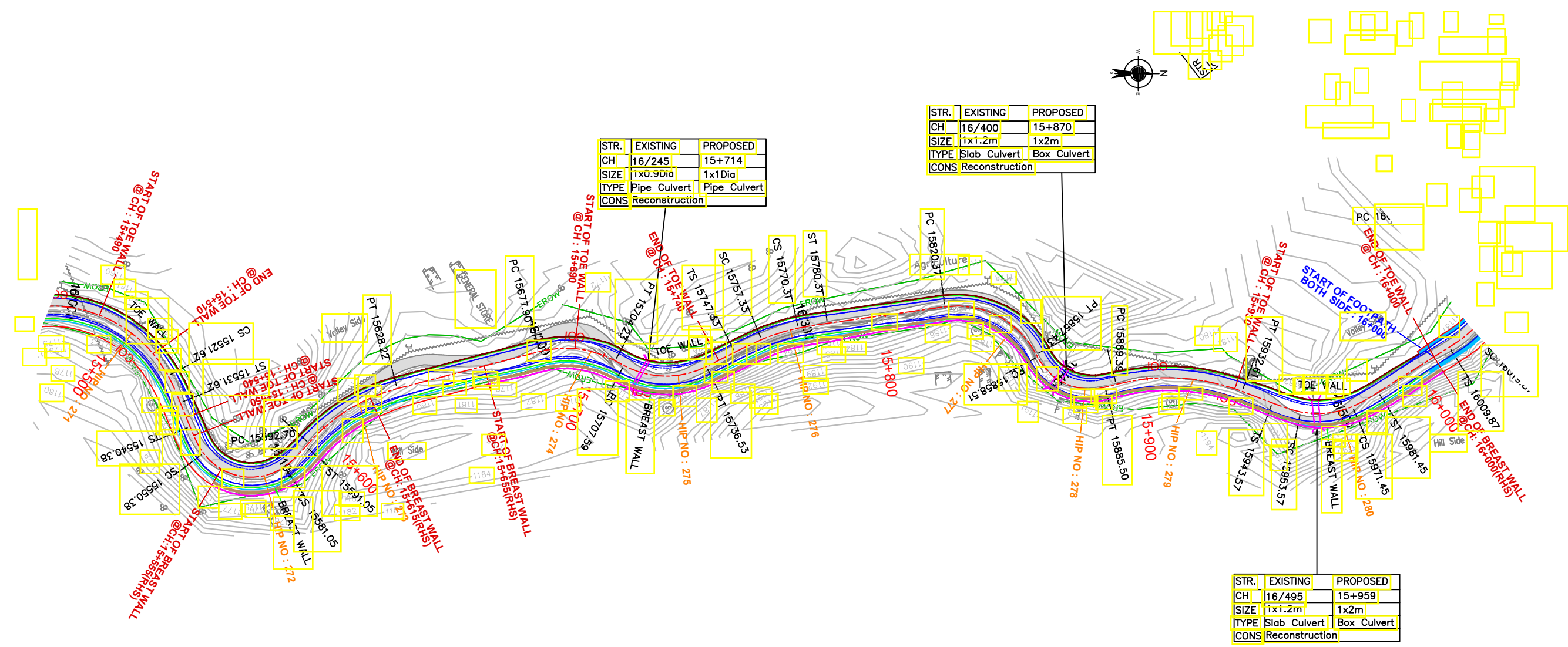
ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 98 OF 148

TENDER PURPOSE ONLY

← MANDI


KALKHAR →



TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED



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PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 15+500 TO CH: 16+000

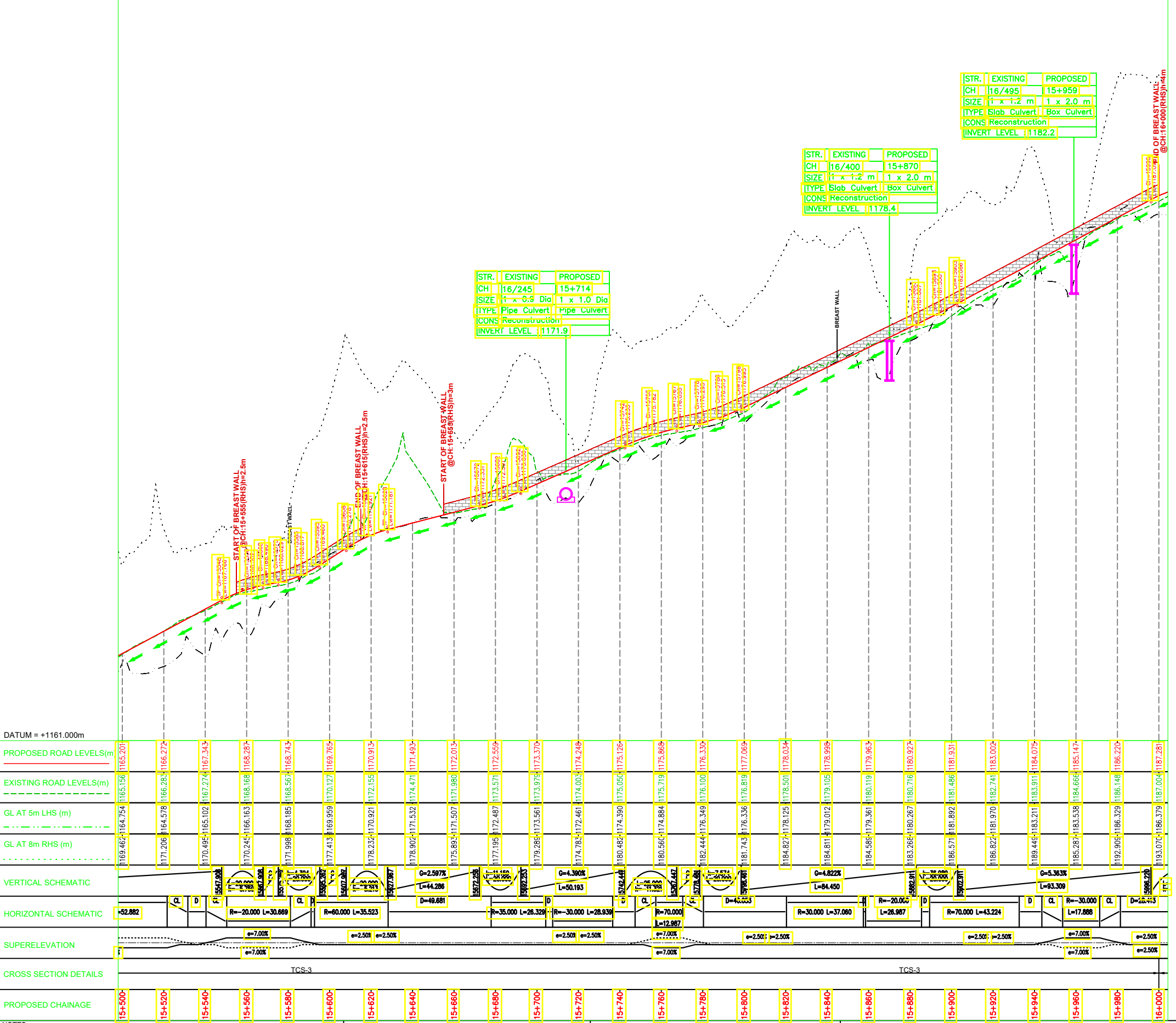
DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 10A OF 14B

MANDI ←

→ KALKHAR



STR.	EXISTING	PROPOSED
CH	16/495	15+959
SIZE	1 x 1.2 m	1 x 2.0 m
TYPE	Slab Culvert	Box Culvert
CONS	Reconstruction	
INVERT LEVEL	1182.2	

STR.	EXISTING	PROPOSED
CH	16/400	15+870
SIZE	1 x 1.2 m	1 x 2.0 m
TYPE	Slab Culvert	Box Culvert
CONS	Reconstruction	
INVERT LEVEL	1178.4	

STR.	EXISTING	PROPOSED
CH	16/245	15+714
SIZE	1 x 0.9 Dia	1 x 1.0 Dia
TYPE	Pipe Culvert	Pipe Culvert
CONS	Reconstruction	
INVERT LEVEL	1171.9	

TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

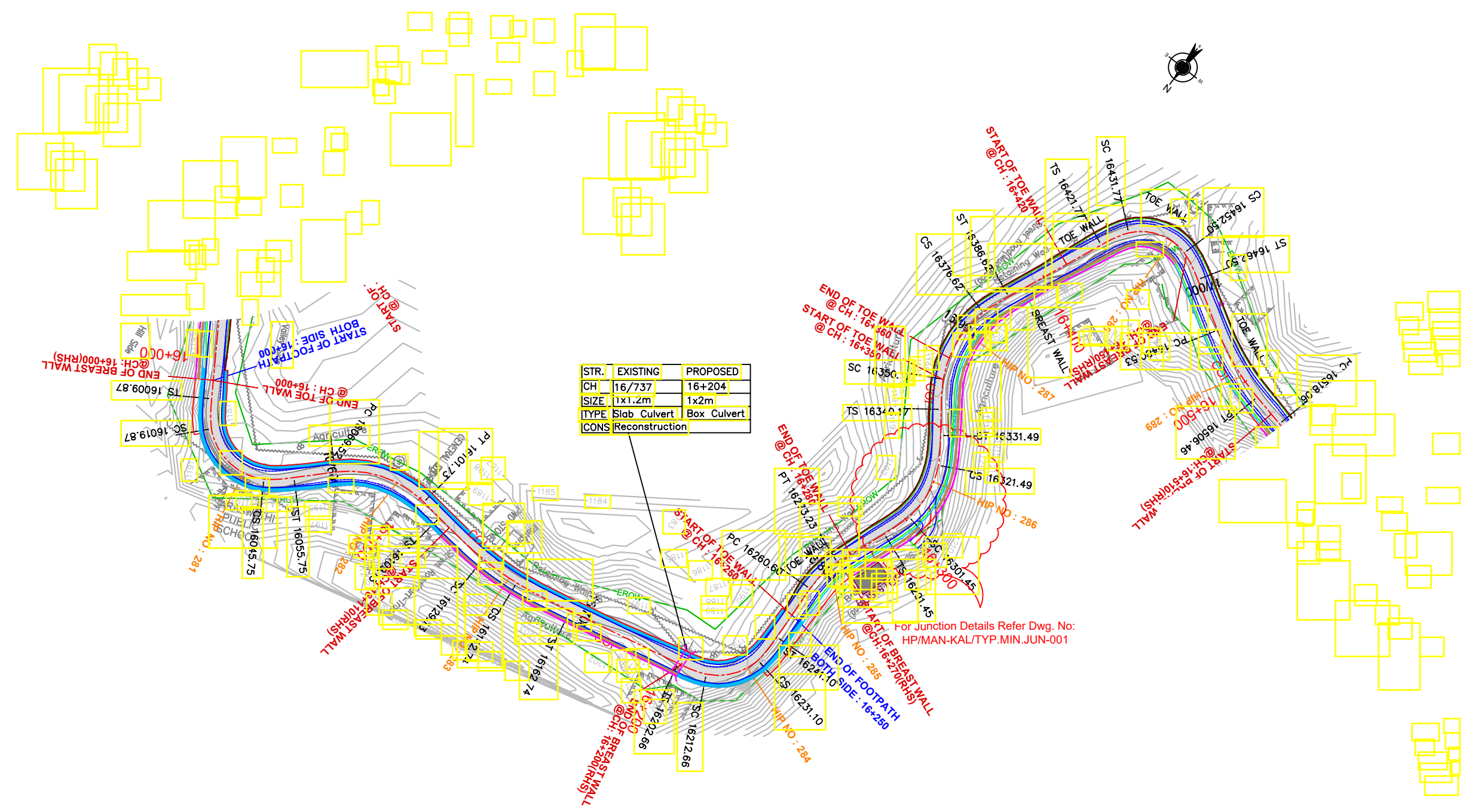
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PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH	TITLE : DRAINAGE PLAN & PROFILE FROM CH: 15+500 TO CH: 16+000
DRAWN	SWAROOPA RANI	
CHECKED	PRANVI	DRAWING NO : HP/MAN-KAL/DRAINAGE P&P
APPROVED	PRANVI	ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854



For Junction Details Refer Dwg. No: HP/MAN-KAL/TYP.MIN.JUN-001

TENDER PURPOSE ONLY

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SCALE: NOT TO SCALE

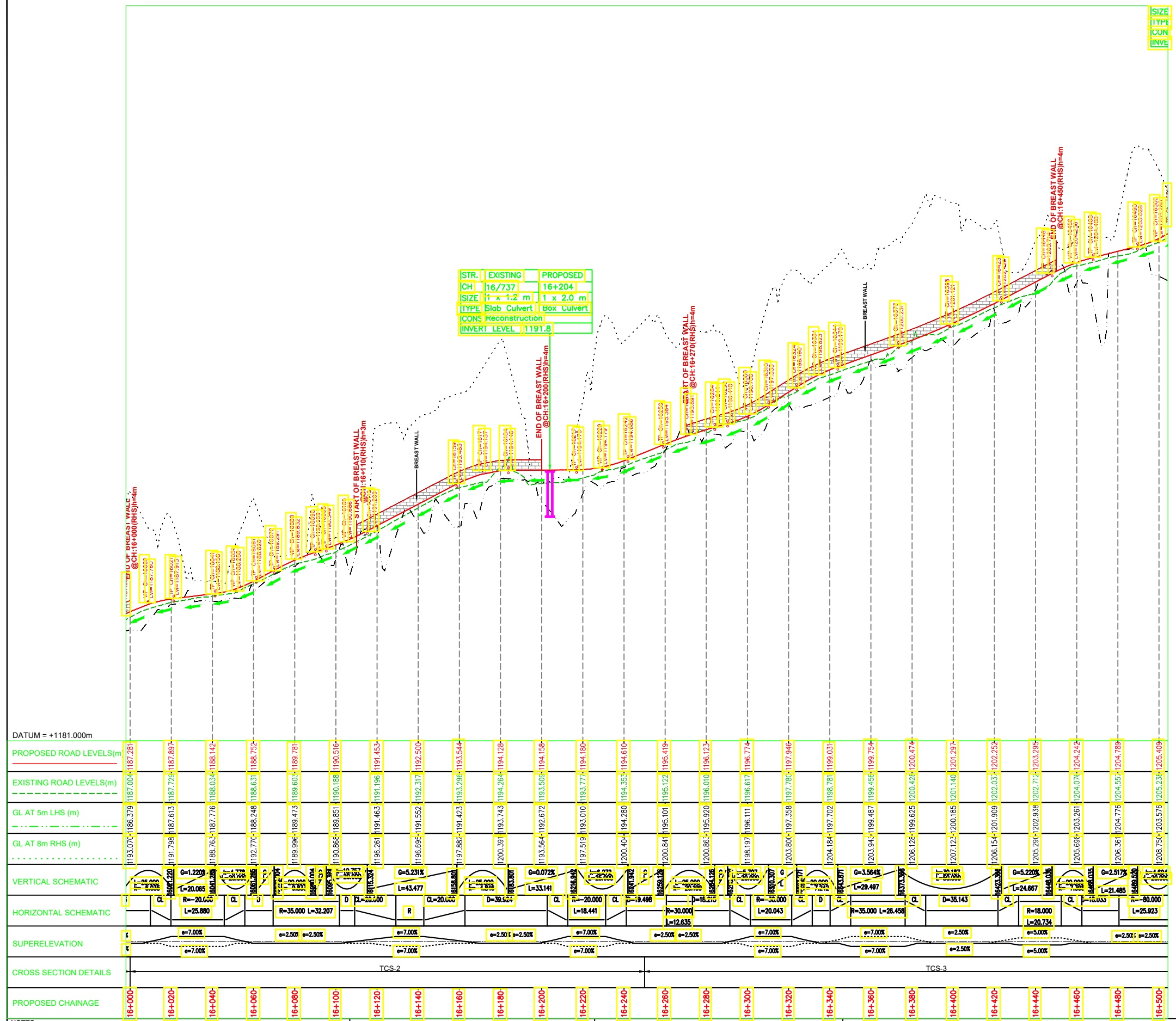
DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 16+000 TO CH: 16+500

DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 11A OF 14B



TENDER PURPOSE ONLY

NOTES:
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REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

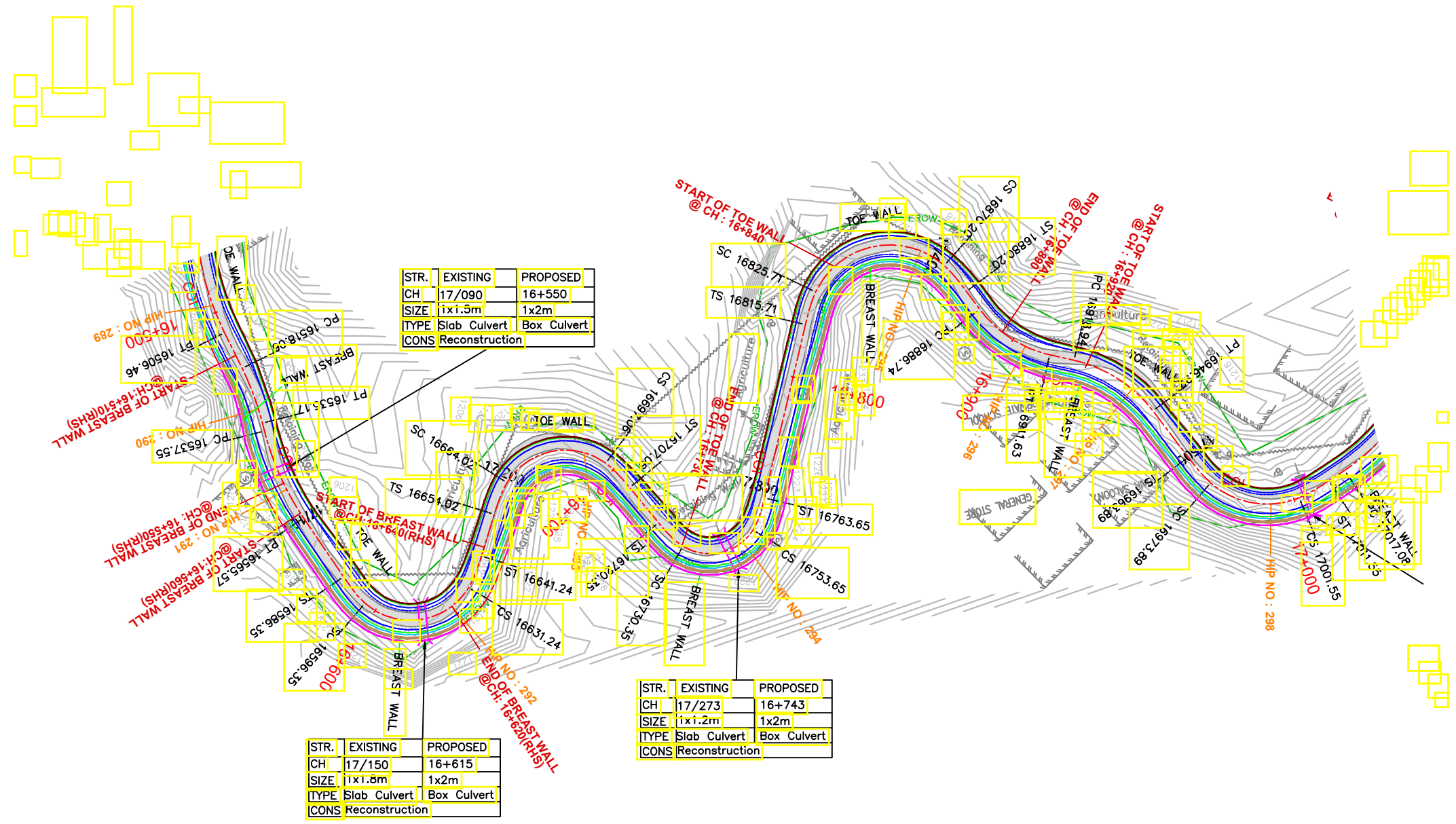
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PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH	TITLE : DRAINAGE PLAN & PROFILE FROM CH: 16+000 TO CH: 16+500
DRAWN	SWAROOPA RANI	
CHECKED	PRANVI	DRAWING NO : HP/MAN-KAL/DRAINAGE P&P
APPROVED	PRANVI	ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 11B OF 14B



TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

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PROJECT: Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 16+500 TO CH: 17+000

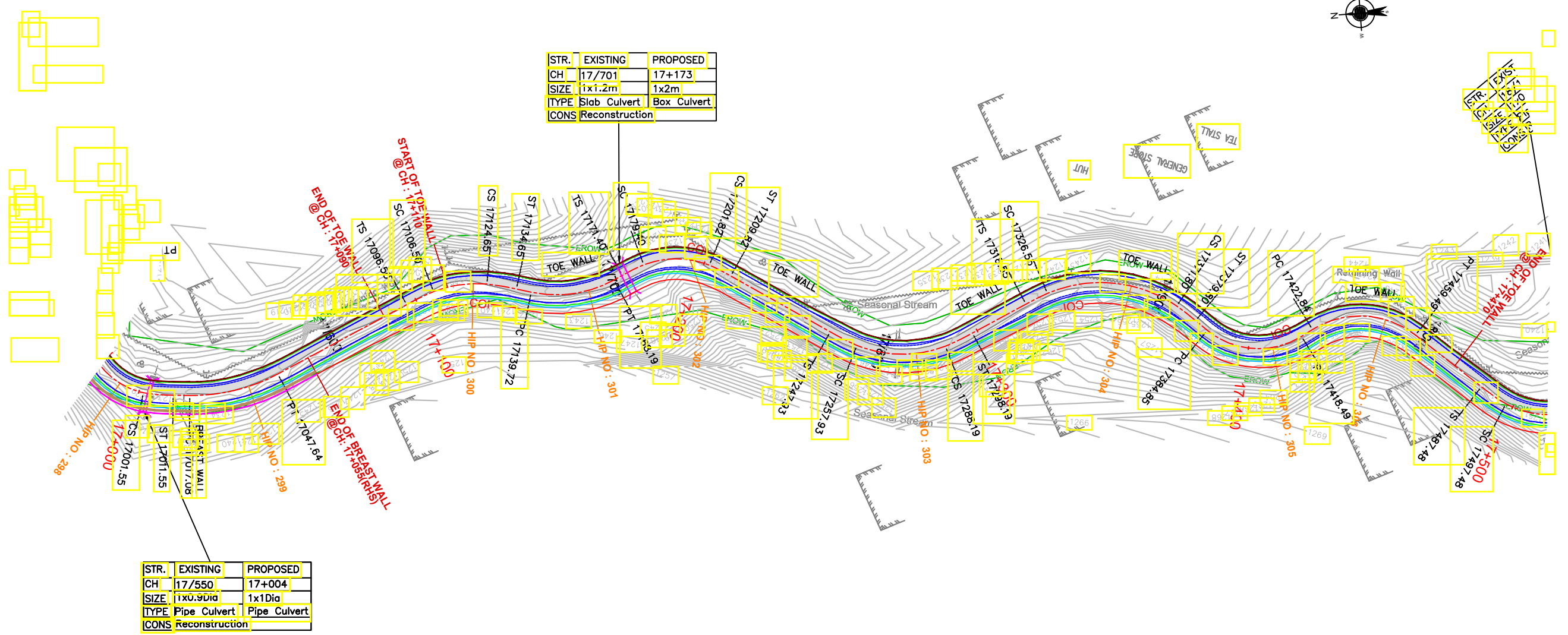
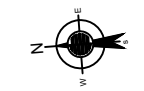
DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

SHEET 12A OF 14B

← MANDI

KALKHAR →



TENDER PURPOSE ONLY

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED

HIMACHAL PRADESH ROAD AND OTHER INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

SATRA SERVICES AND SOLUTIONS PVT LTD.
#1-8-359 to 363, 4th Floor, Centre Point Building, SP Road, Begumpet, Secunderabad, Telangana - 500003, India.
Tel: +91 40 2784 0040, Fax: +91 40 2784 0050, E-mail: info@satragroup.in, Web: www.satragroup.in

PROJECT:
Himachal Pradesh State Roads Transformation Project (HPSRTP)

SCALE: NOT TO SCALE

DESIGNED	GANESH
DRAWN	SWAROOPA RANI
CHECKED	PRANVI
APPROVED	PRANVI

TITLE : DRAINAGE PLAN & PROFILE FROM CH: 17+000 TO CH: 17+500

DRAWING NO : HP/MAN-KAL/DRAINAGE P&P

ROAD NAME : Package-VI: Upgradation of Mandi - Rewalsar - Kalkhar Road in Mandi District From Km 11+000 To Km 27+854

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