

Feasibility Study and Detailed Project Report for Two laning with hard shoulder of Ukhrul – ToloI - Tadubi section of NH-102A (115 km) in the State of Manipur on EPC mode



DETAILED PROJECT REPORT DRAWING VOLUME Pkg.-1: UKHRUL BYPASS Design chainage:- 0+000 Km to 6+571 Km

Prepared By



CE Testing Co. Pvt. Ltd.

124-A, N.S.C. Bose Road
Kolkata – 700 092, West Bengal

Submitted to

**National Highways & Infrastructure
Development Corporation Ltd**

4, Parliament Street, New Delhi-110001

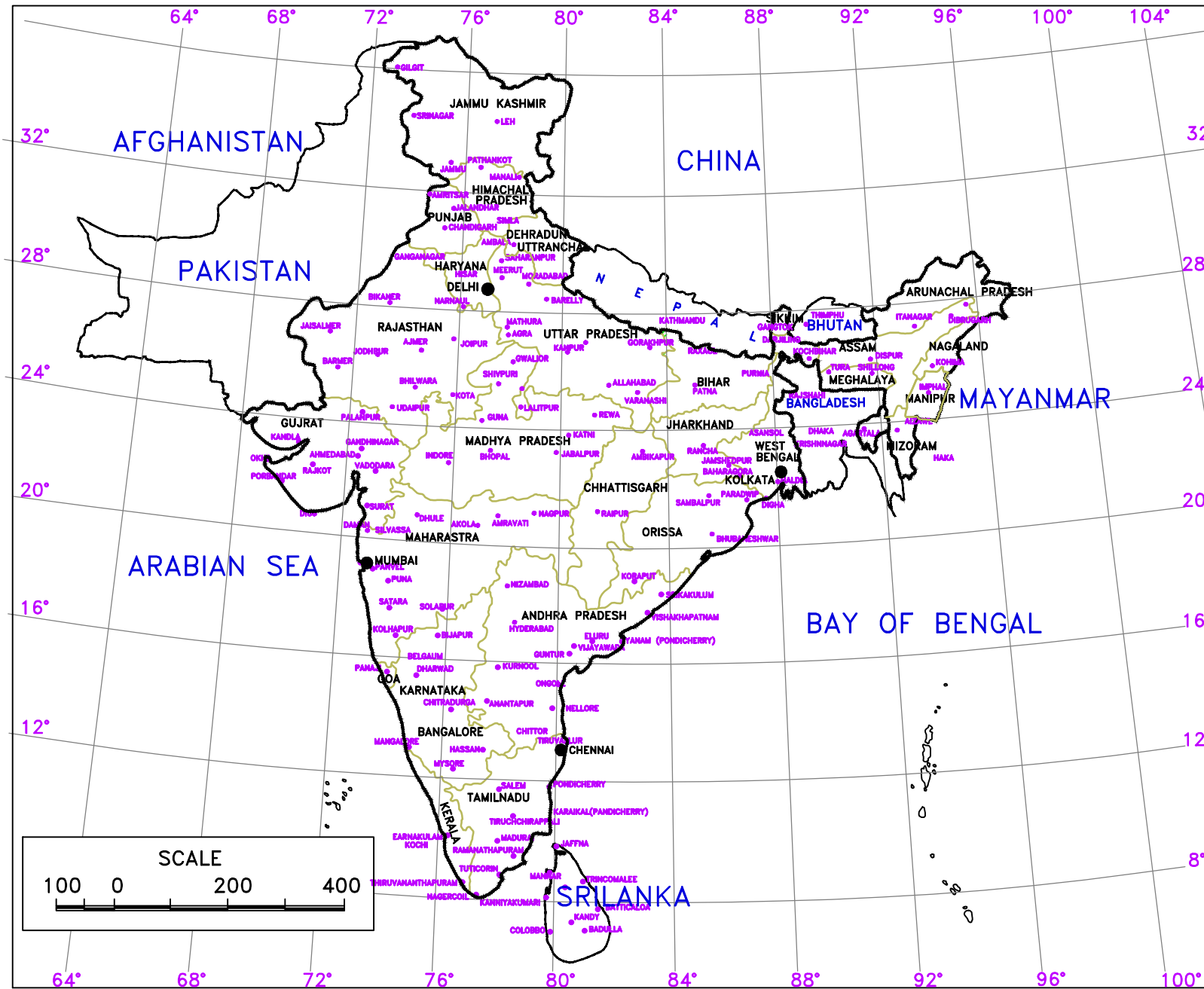
CONTENT

UKHRUL BYPASS

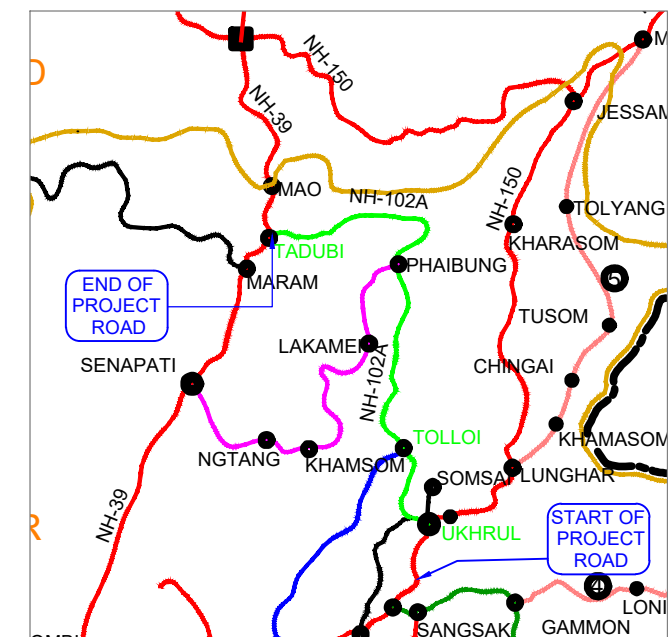
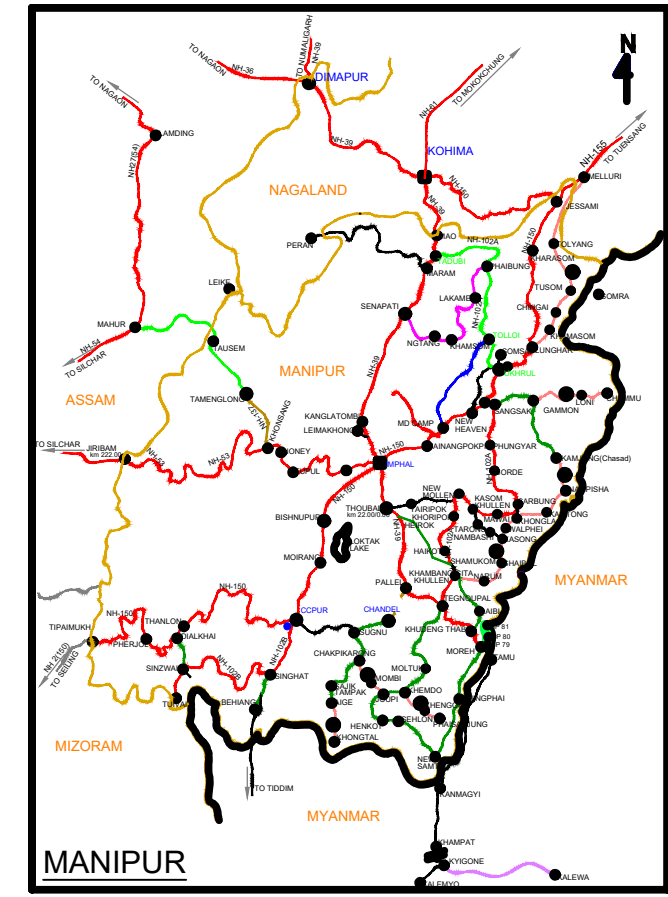
DESIGN CHAINAGE : KM. 0+000 - KM. 6+571

SL. NO	TITLE OF DRAWINGS	DRAWING NO.	NO. OF SHEETS
HIGHWAY WORKS			
01	LOCATION PLAN	DWG. NO:- CET/2016/3640/NH-102A/DPR/LP	01
02	KEY PLAN	DWG. NO:- CET/2016/3640/NH-102A/DPR/KP	01
03	TYPICAL CROSS SECTION	DWG. NO:- CET/2016/3640/NH-102A/DPR/TCS	11
04	LEGEND	DWG. NO:- CET/2016/3640/NH-102A/DPR/LEGEND	01
05	PLAN & PROFILE	DWG. NO:- CET/2016/3640/NH-102A/DPR/PP	14
06	HORIZONTAL ALIGNMENT REPORT	DWG. NO:- CET/2016/3640/NH-102A/DPR/HAR	03
07	VERTICAL CURVE REPORT	DWG. NO:- CET/2016/3640/NH-102A/DPR/VCR	01
08	CURVE REPORT	DWG. NO:- CET/2016/3640/NH-102A/DPR/CR	01
09	MISCELLANEOUS	DWG. NO:- CET/2016/3640/NH-102A/DPR/MISC	12

LOCATION PLAN



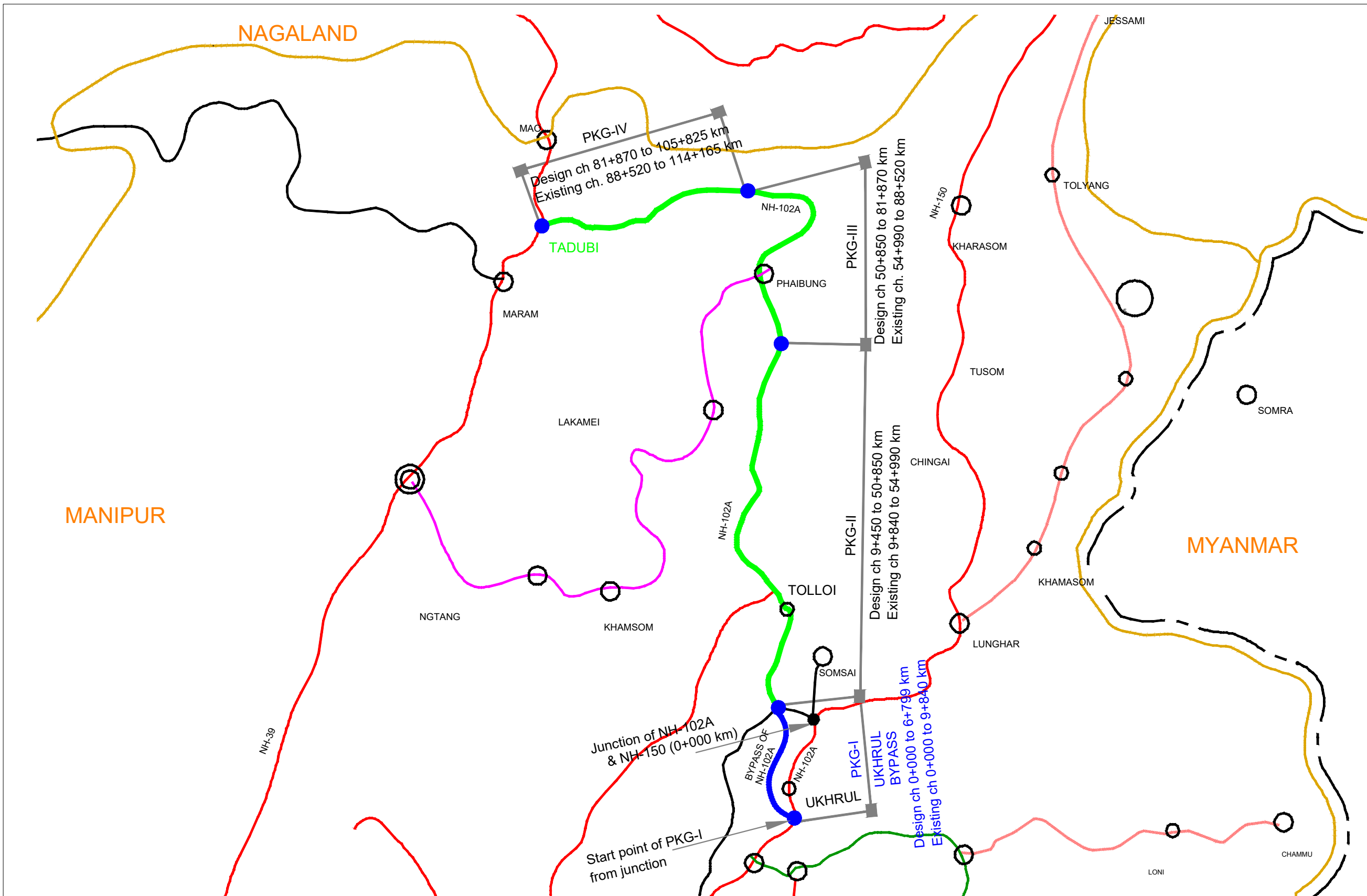
LOCATION MAP



					SCALE: NTS		CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	LOCATION PLAN	CONSULTANT : CETEST Engineering Consultants As ISO 9001, 14001 & 45001 Certified Company	C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/DPR/LP-01
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	DATE: SEPT, 2023		PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - ToloI - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.	UKHRUL BYPASS District:- UKHRUL Detailed Project Report			
REVISIONS											

Design chainage:- 0+000 Km to 6+571 Km

KEY PLAN



MKD	DATE	DESCRIPTION	CHKD	APPRD
REVISIONS				

SCALE:
NTS

DATE:
SEPT, 2023



CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
4, Parliament Street, New Delhi - 110001

PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

KEY PLAN

UKHRUL BYPASS District:- UKHRUL

Detailed Project Report

Design chainage:- 0+000 Km to 6+571 Km

CONSULTANT :

CETEST C.E. TESTING COMPANY PVT. LTD.
Engineering Consultants
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG NO :- CET/2016/3640/NH-102A/DPR/KP-01

TYPICAL CROSS SECTION

TCS NUMBER	TCS DESCRIPTION	LENGTH (KM)
TCS-1	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE TRIANGULAR OPEN DRAIN	0.841
TCS-1B	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH BOTH SIDE TRIANGULAR OPEN DRAIN	0.560
TCS-1C	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER	0.320
TCS-2	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH VALLEY SIDE GABION WALL & HILL SIDE TRIANGULAR OPEN DRAIN	1.135
TCS-3	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH VALLEY SIDE RR WALL & HILL SIDE TRIANGULAR OPEN DRAIN	0.530
TCS-4	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE BREAST WALL & TRIANGULAR OPEN DRAIN	0.735
TCS-5	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE BREAST WALL & VALLEY SIDE GABION WALL AND HILL SIDE TRIANGULAR OPEN DRAIN	0.110
TCS-6	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE BREAST WALL & VALLEY SIDE RR WALL AND HILL SIDE TRIANGULAR OPEN DRAIN	0.090
TCS-7	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE GABION WALL AND HILL SIDE TRIANGULAR OPEN DRAIN	1.460
TCS-8	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE GABION WALL & VALLEY SIDE BREAST WALL AND BOTH SIDE TRIANGULAR OPEN DRAIN	0.370
TCS-9	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE GABION WALL & VALLEY SIDE RR WALL AND HILL SIDE TRIANGULAR OPEN DRAIN	0.050
TCS-10	TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH BOTH SIDE GABION WALL & HILL SIDE TRIANGULAR OPEN DRAIN	0.370
Total =		6.571

TCS-1A

From	To	Length
680	690	10
990	1050	60
1340	1400	60
1870	1950	80
1970	2080	110
2980	3050	70
3180	3220	40
3260	3300	40
4060	4130	70
4850	4970	120
5460	5500	40
5940	5970	30
6460	6571	111
TOTAL		0.841

TCS-1B

From	To	Length
170	190	20
240	260	20
540	560	20
2270	2320	50
2330	2360	30
2420	2630	210
3580	3600	20
4350	4440	90
5590	5690	100
TOTAL		0.560

TCS-1C

From	To	Length
1470	1500	30
1660	1670	10
2360	2400	40
3650	3660	10
3750	3760	10
5790	5840	50
6270	6440	170
TOTAL		320

TCS-2

From	To	Length
190	200	10
390	475	85
560	680	120
690	750	60
1180	1270	90
1400	1470	70
1500	1660	160
2670	2720	50
2790	2830	40
2830	2860	30
2940	2980	40
3050	3180	130
3600	3650	50
5180	5280	100
5280	5320	40
5410	5460	50
5840	5850	10
TOTAL		1135

TCS-3

From	To	Length
50	90	40
1050	1130	80
1270	1290	20
1710	1730	20
2080	2100	20
2150	2180	30
2400	2420	20
3220	3260	40
3820	3870	50
5690	5790	100
6180	6270	90
6440	6460	20
TOTAL		530

TCS-4

From	To	Length
0	50	50
220	240	20
260	390	130
475	540	65
750	770	20
1320	1340	20
1670	1710	40
1730	1870	140
1950	1970	20
2630	2650	20
2730	2790	60
4530	4560	30
5500	5590	90
6090	6120	30
TOTAL		735

TCS-5

From	To	Length
200	220	20
1150	1180	30
2650	2670	20
2720	2730	10
2860	2890	30
TOTAL		110

TCS-6

From	To	Length
1130	1150	20
1290	1320	30
2110	2150	40
TOTAL		90

TCS-7

From	To	Length
90	170	80
770	990	220
2180	2270	90
2320	2330	10
2890	2920	30
3760	3820	60
3910	3960	50
4010	4060	50
4130	4350	220
4440	4530	90
4560	4730	170
4970	5000	30
5030	5060	30
5110	5150	40
5370	5410	40
5870	5940	70
5970	6090	120
6120	6180	60
TOTAL		1460

TCS-8



From	To	Length
3300	3580	280
3660	3750	90
TOTAL		370

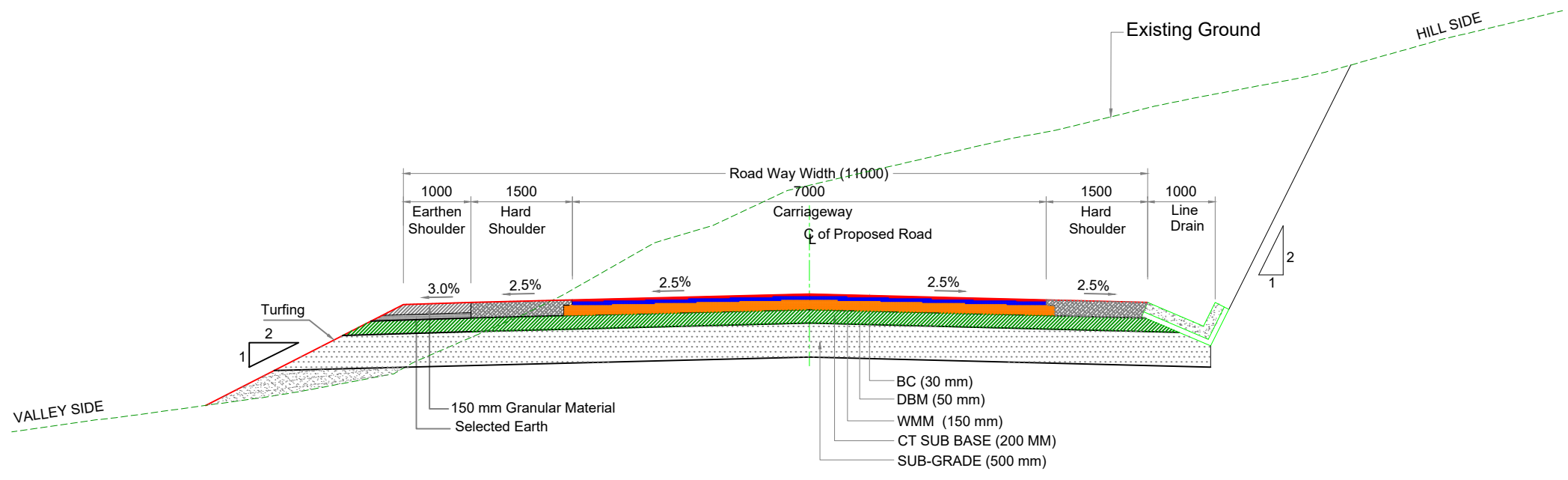
TCS-9

From	To	Length
2100	2110	10
3870	3910	40
TOTAL		50

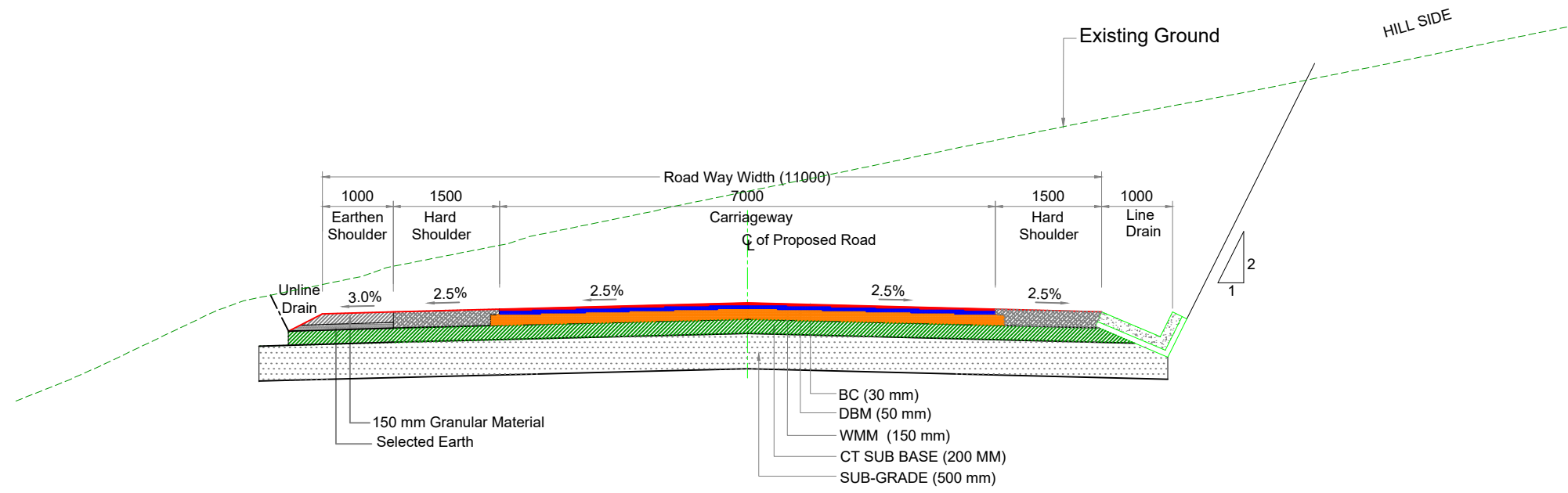
TCS-10

From	To	Length
2920	2940	20
3960	4010	50
4730	4850	120
5000	5030	30
5060	5110	50
5150	5180	30
5320	5370	50
5850	5870	20
TOTAL		370



Scale :- NTS						CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	TYPICAL CROSS SECTION UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+717 Km	CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/DPR/TCS-01
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.					
DATE: JULY, 2023					PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Lining with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.				
REVISIONS									

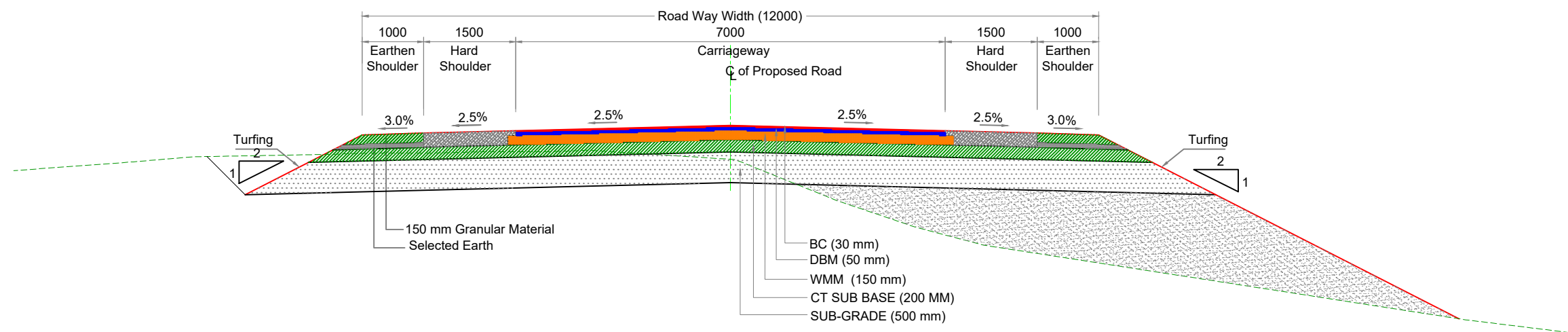


TCS-1A :- TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE TRIANGULAR OPEN DRAIN





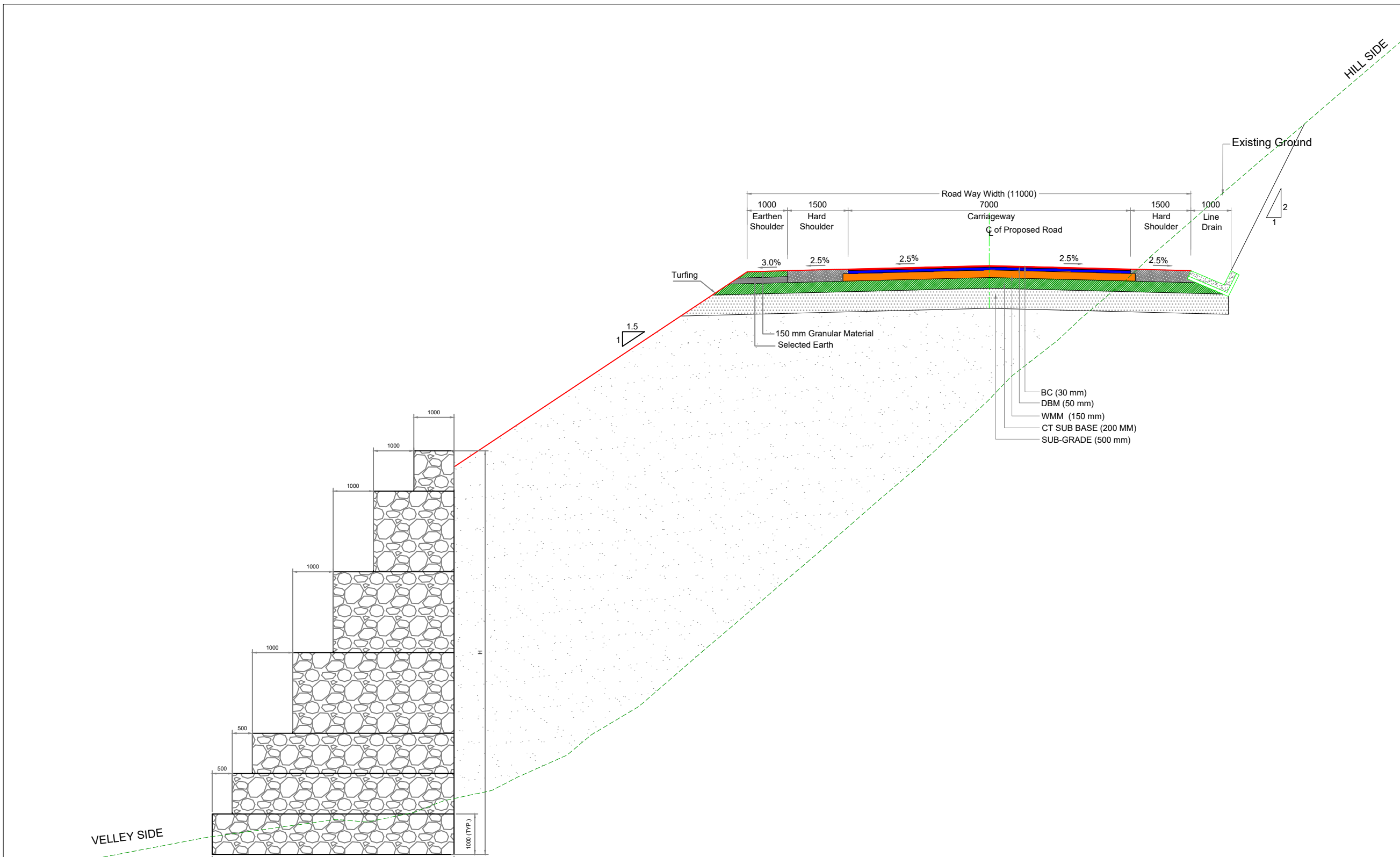
TCS-1B :- TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE TRIANGULAR OPEN DRAIN

Scale :- 1:50						CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	TYPICAL CROSS SECTION		CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/DPR/TCS-02
DATE: JULY, 2023							PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.			
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	REVISIONS					





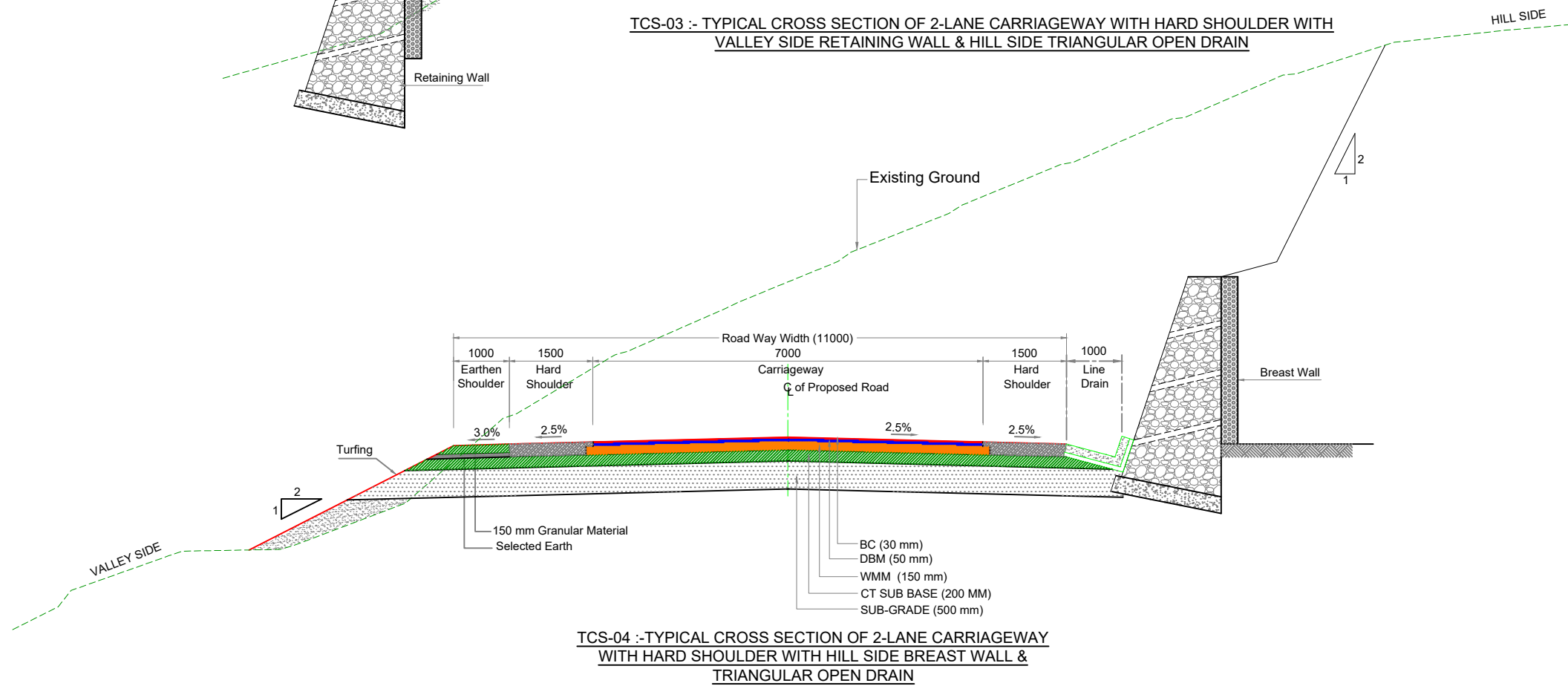
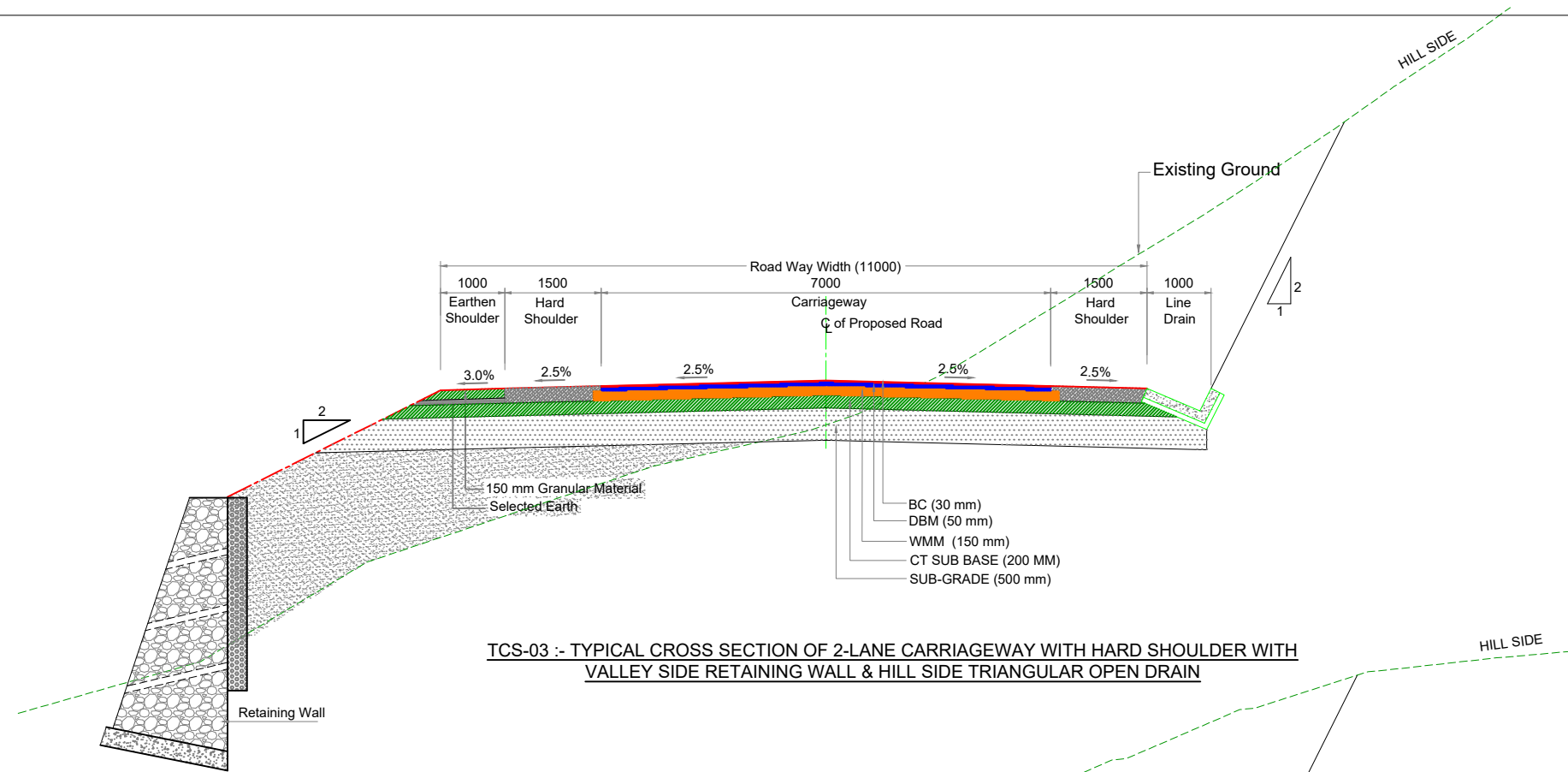
TCS-1C :- TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER



					Scale :- 1:50	 CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	TYPICAL CROSS SECTION		CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.		DWG NO :- CET/2016/3640/NH-102A/DPR/TCS-03
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	DATE: JULY, 2023		PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.	UKHRUL BYPASS District:- UKHRUL Detailed Project Report			
REVISIONS							Design chainage:- 0+000 Km to 6+717 Km				

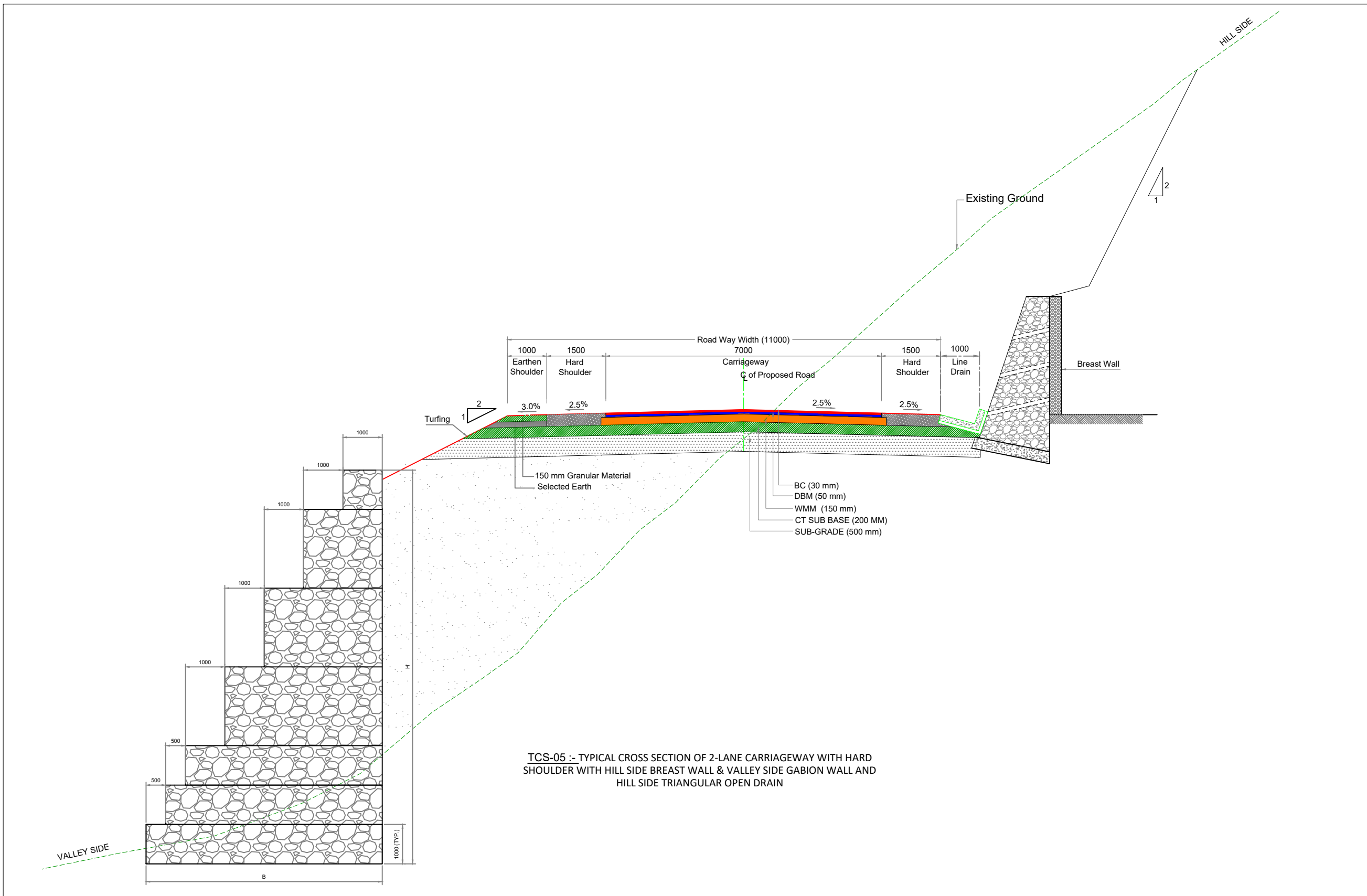


TCS-02 :- TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH VALLEY SIDE GABION WALL & HILL SIDE TRIANGULAR OPEN DRAIN



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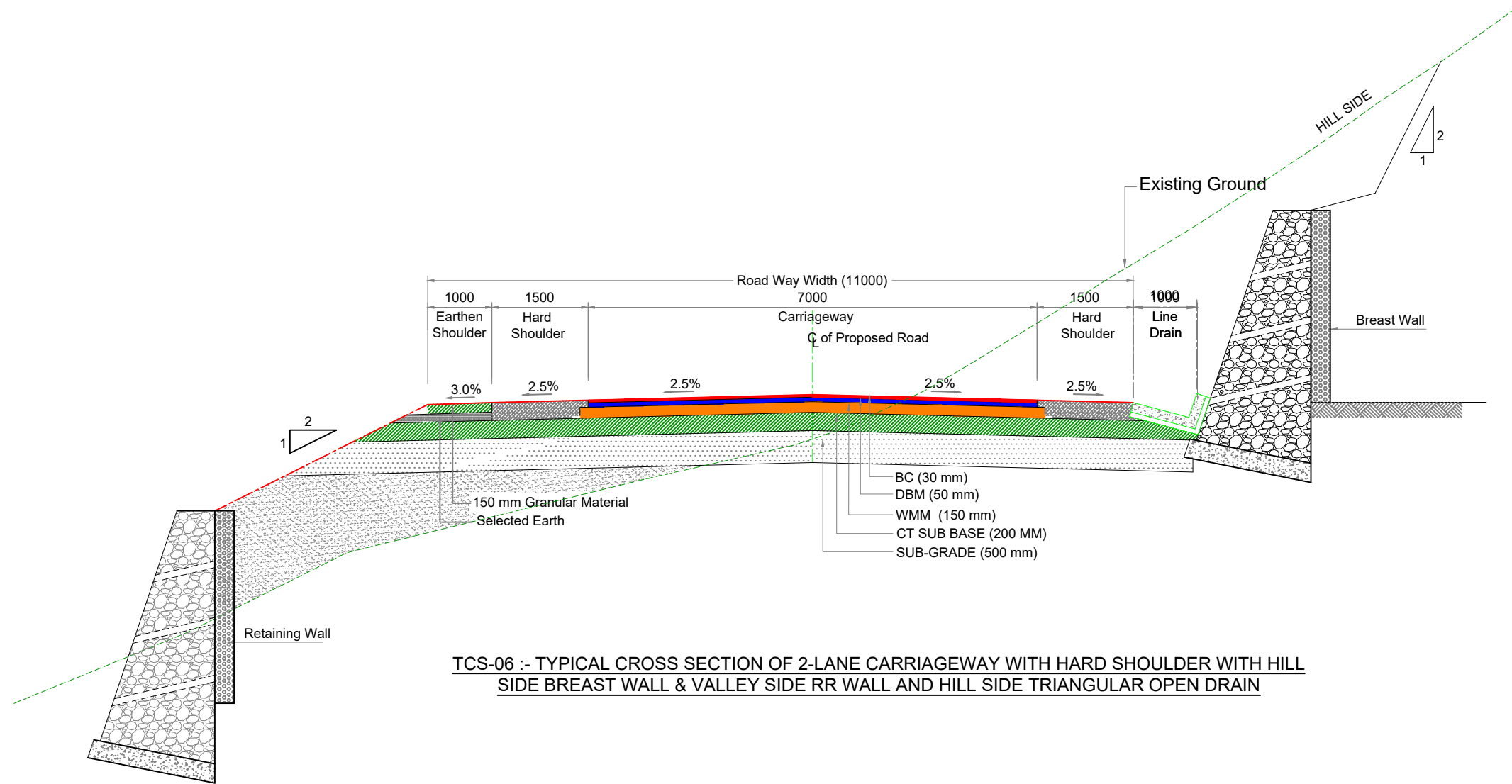


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PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.						UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+717 Km			
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	DATE: JULY, 2023				
REVISIONS									





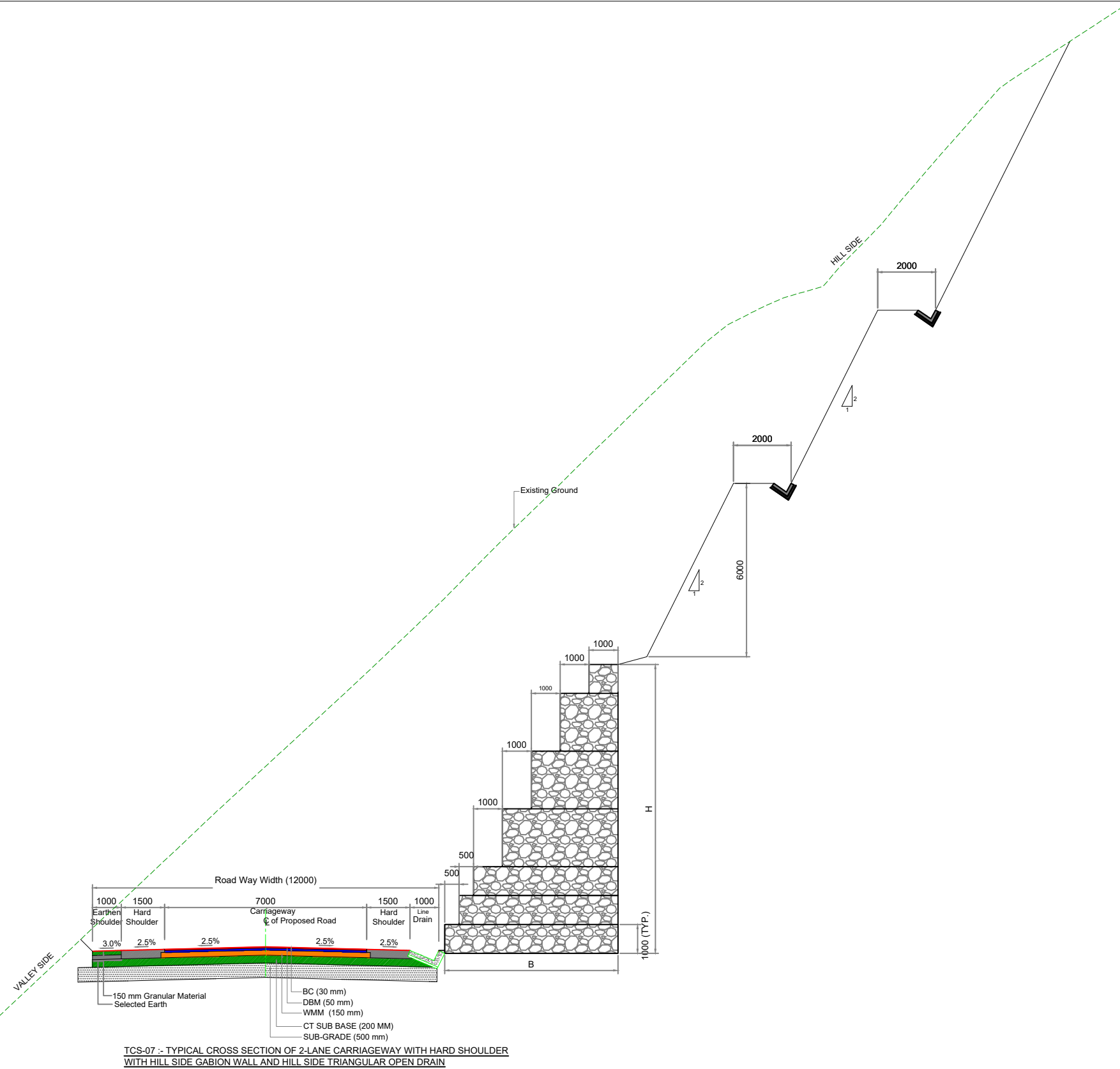
TCS-05 :- TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE BREAST WALL & VALLEY SIDE GABION WALL AND HILL SIDE TRIANGULAR OPEN DRAIN

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REVISIONS																				

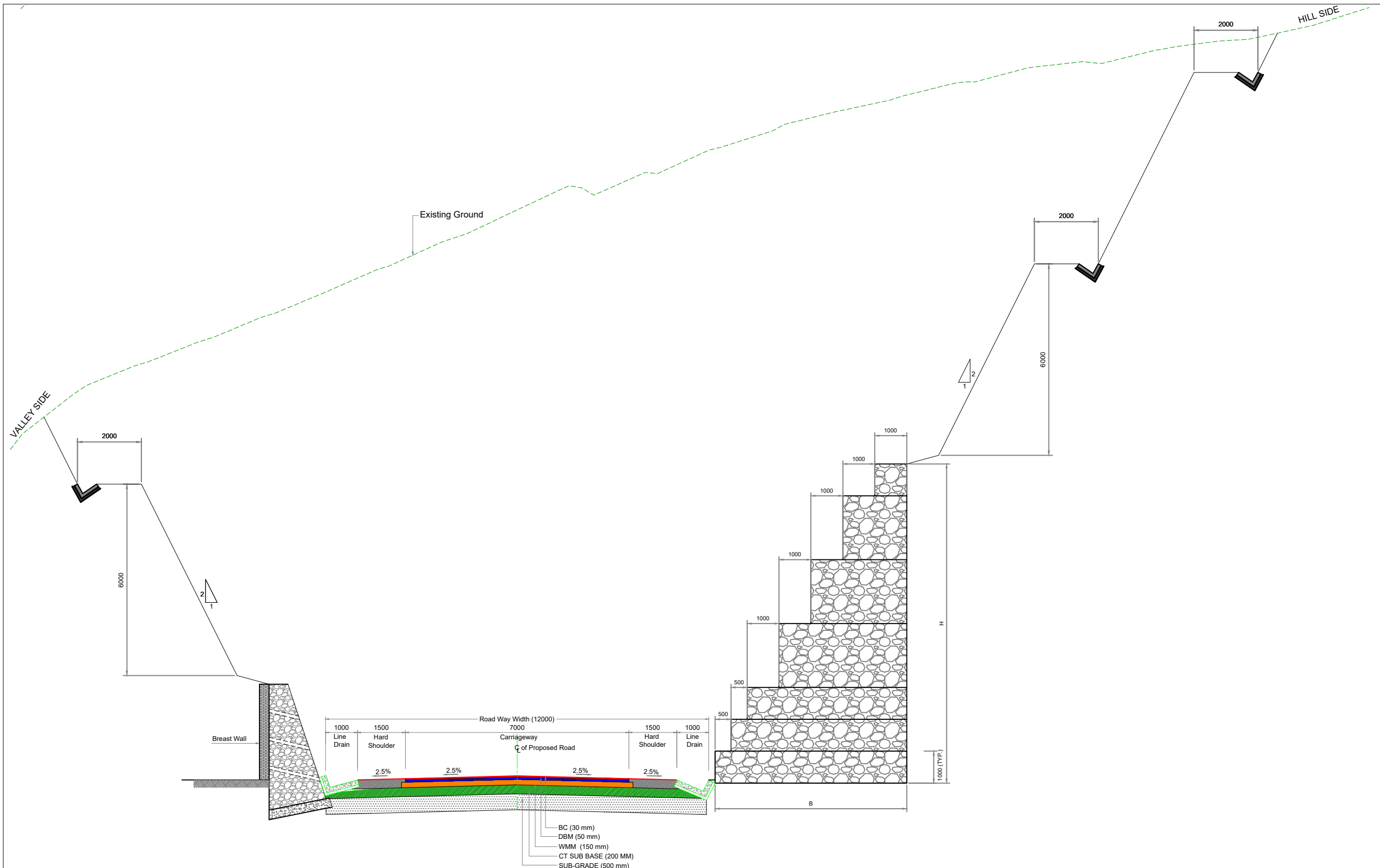


TCS-06 :- TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE BREAST WALL & VALLEY SIDE RR WALL AND HILL SIDE TRIANGULAR OPEN DRAIN



Scale :- 1:50						CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	TYPICAL CROSS SECTION UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+717 Km		CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/DPR/TCS-07
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.						
REVISIONS										

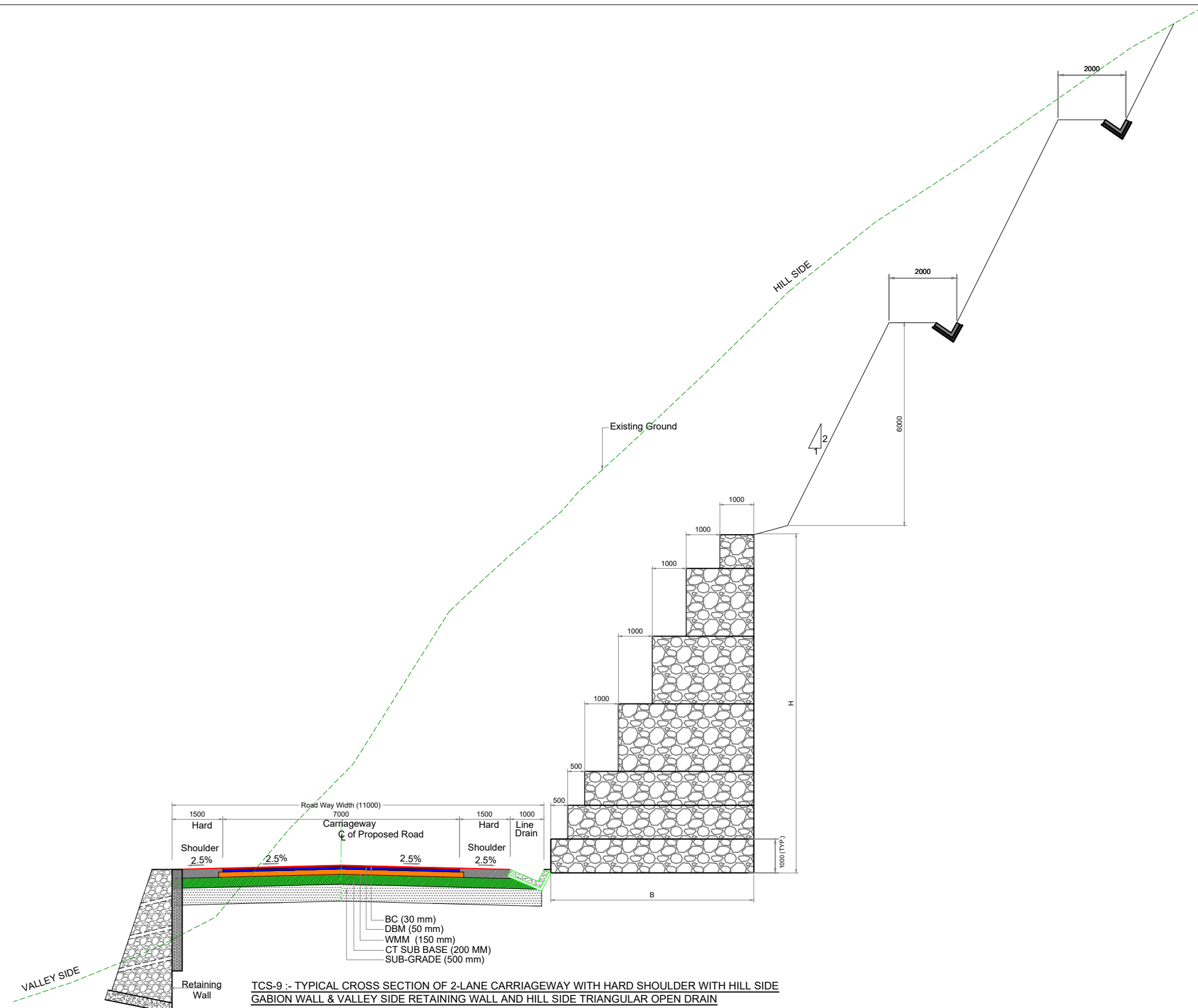


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DATE: JULY, 2023		PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.				UKHRUL BYPASS District:- UKHRUL		DWG NO :- CET/2016/3640/NH-102A/DPR/TCS-08	
REVISIONS						Detailed Project Report Design chainage:- 0+000 Km to 6+717 Km			





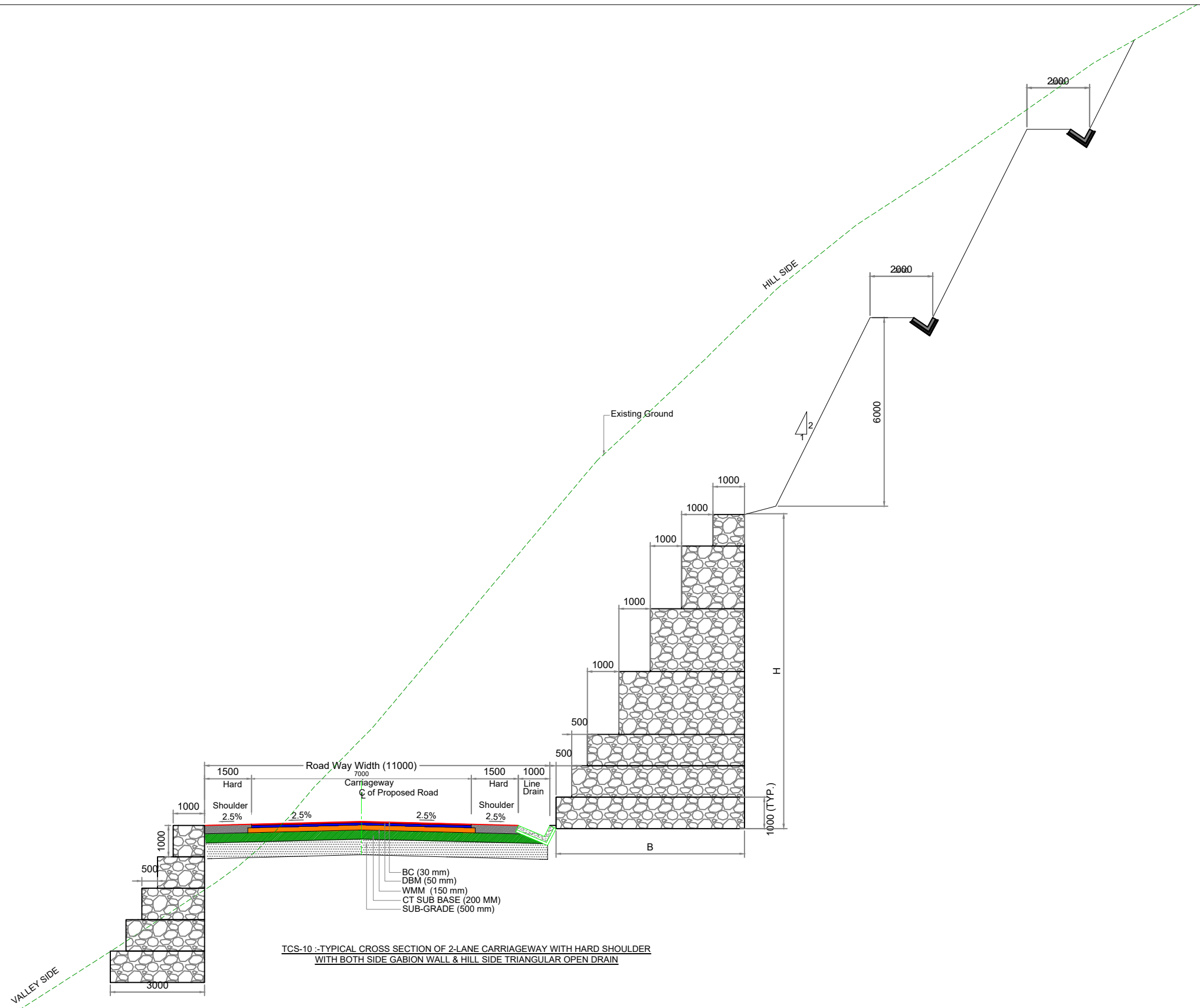
TCS-8 :- TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE GABION WALL & VALLEY SIDE BREAST WALL AND BOTH SIDE TRIANGULAR OPEN DRAIN

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MKD.	DATE	DESCRIPTION	CHKD.	APPRD.															
REVISIONS																			





TCS-9 :- TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH HILL SIDE GABION WALL & VALLEY SIDE RETAINING WALL AND HILL SIDE TRIANGULAR OPEN DRAIN

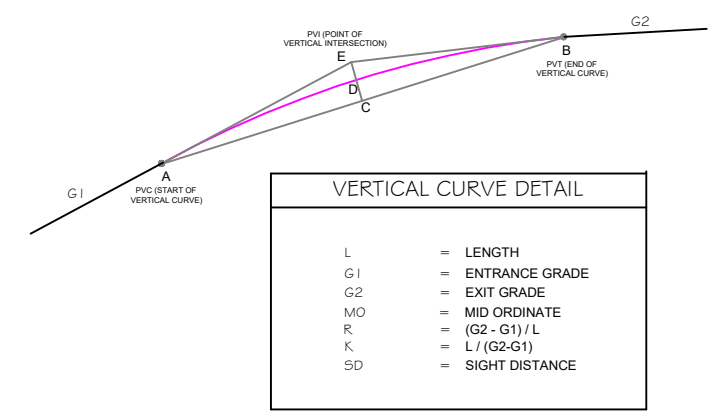
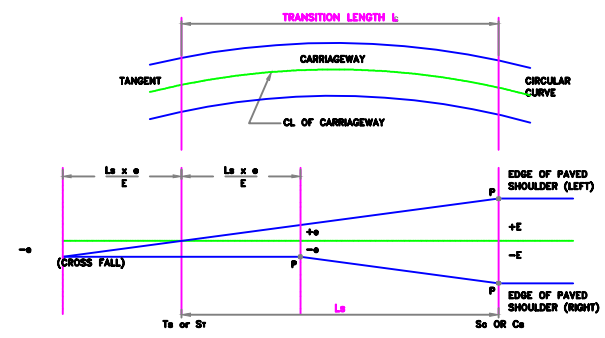
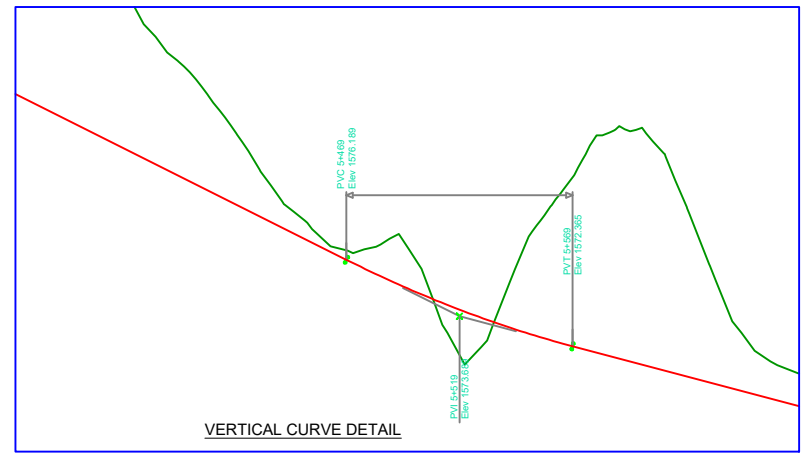
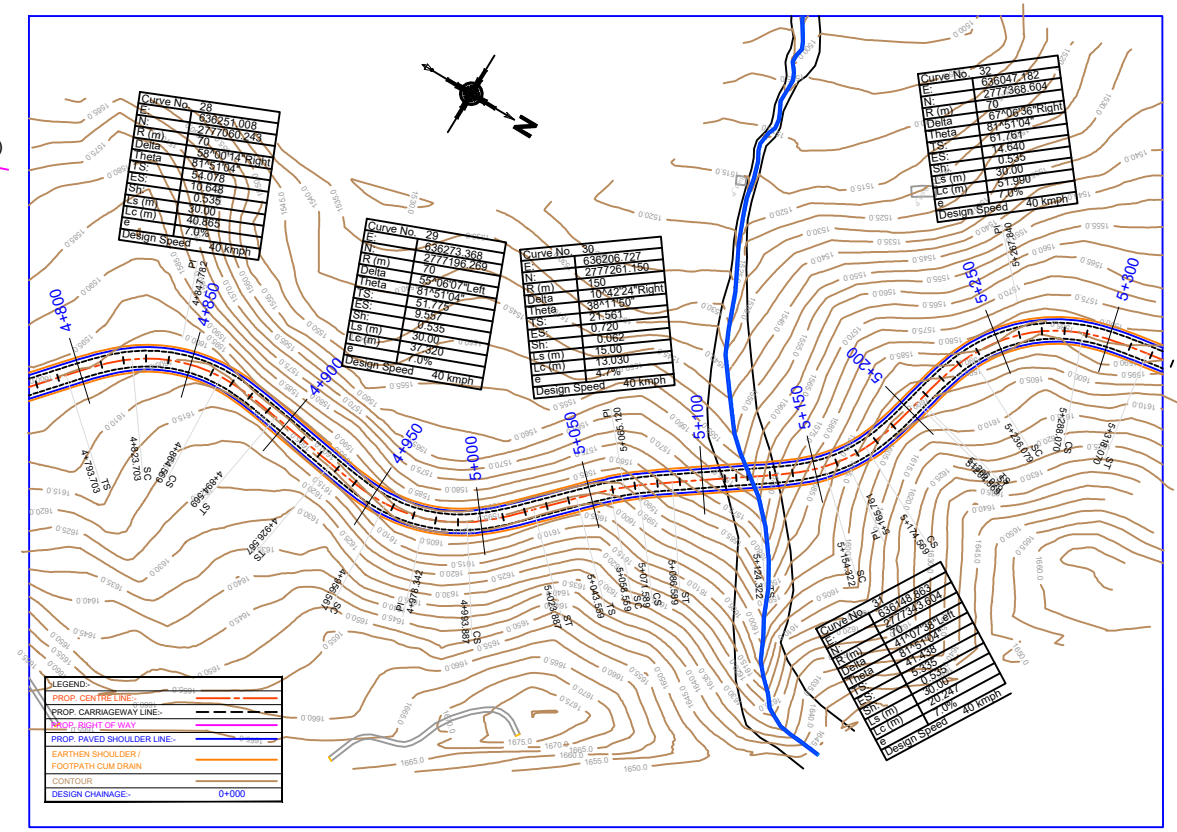
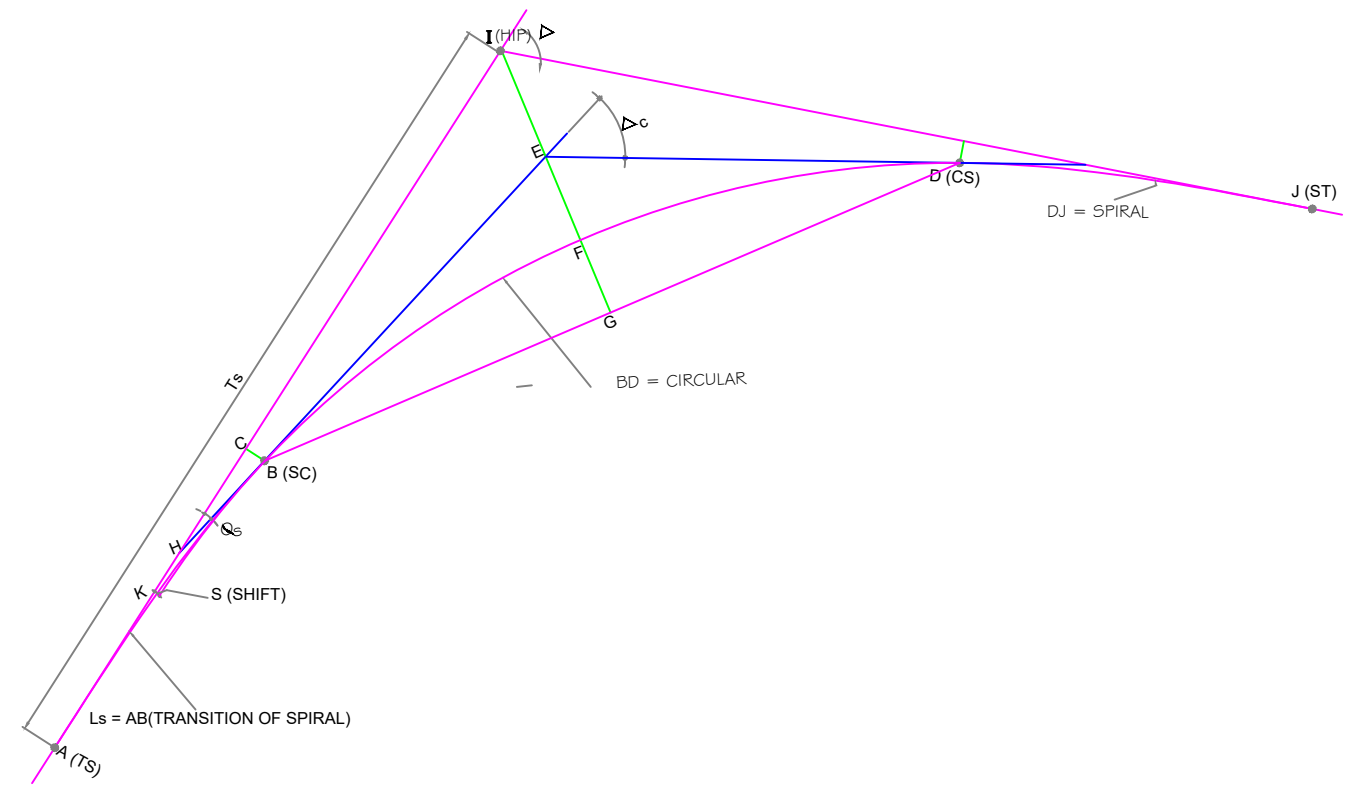
Scale :- 1:50						CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	TYPICAL CROSS SECTION		CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/DPR/TCS-10
DATE: JULY, 2023							PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.			
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	REVISIONS					



TCS-10 :- TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH HARD SHOULDER WITH BOTH SIDE GABION WALL & HILL SIDE TRIANGULAR OPEN DRAIN

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MKD.	DATE	DESCRIPTION	CHKD.	APPRD.																
REVISIONS																				

LEGEND



SPIRAL CURVE DETAIL		CIRCULAR CURVE DETAIL	
R_b	= BEGINNING CURVATURE (AT A & J)	R	= RADIUS
R_e	= END RADIUS (AT B & D)	L_c	= LENGTH OF CIRCLE
L_s	= LENGTH OF SPIRAL (AB & DJ)	T	= TANGENT LENGTH (EB)
θ	= SPIRAL ANGLE $= \frac{2\pi HC}{L_s \times R_b}$	Δ	= ANGLE OF CIRCULAR ARC (c) Δ
A	= CONSTANT $= \sqrt{L_s \times R_b}$	DC	= DEGREE OF CURVATURE
S	= SHIFT	C	= CHORD LENGTH
K_s	= AK (ABSCISSA)	O	= MIDDLE ORDINATE (FG)
X_s	= AC	E	= EXTERNAL ORDINATE (EF)
Y_s	= BC		
L_t	= LONG TANGENT (AH)		
S_t	= SHORT TANGENT (HB)		
T_s	= TANGENT DISTANCE (IA)		
	TOTAL DEVIATION ANGLE $= \Delta = \Delta_c + 2\theta$		
E_s	= (IP) = APEX DISTANCE $= (R+S) \sec \frac{\Delta}{2}$		

LEGEND :
 T_s or S_t - Point of change from transition to tangent (spiral to tangent)
 S_c or C_s - Point of change from transition to circular curve (spiral to circular)
 L_s - Length of transition curve
 e - Normal cross fall rate (2.5%) for flexible pavement.
 e - Normal cross fall rate (2.0%) for rigid pavement.
 E - Rate of super elevation

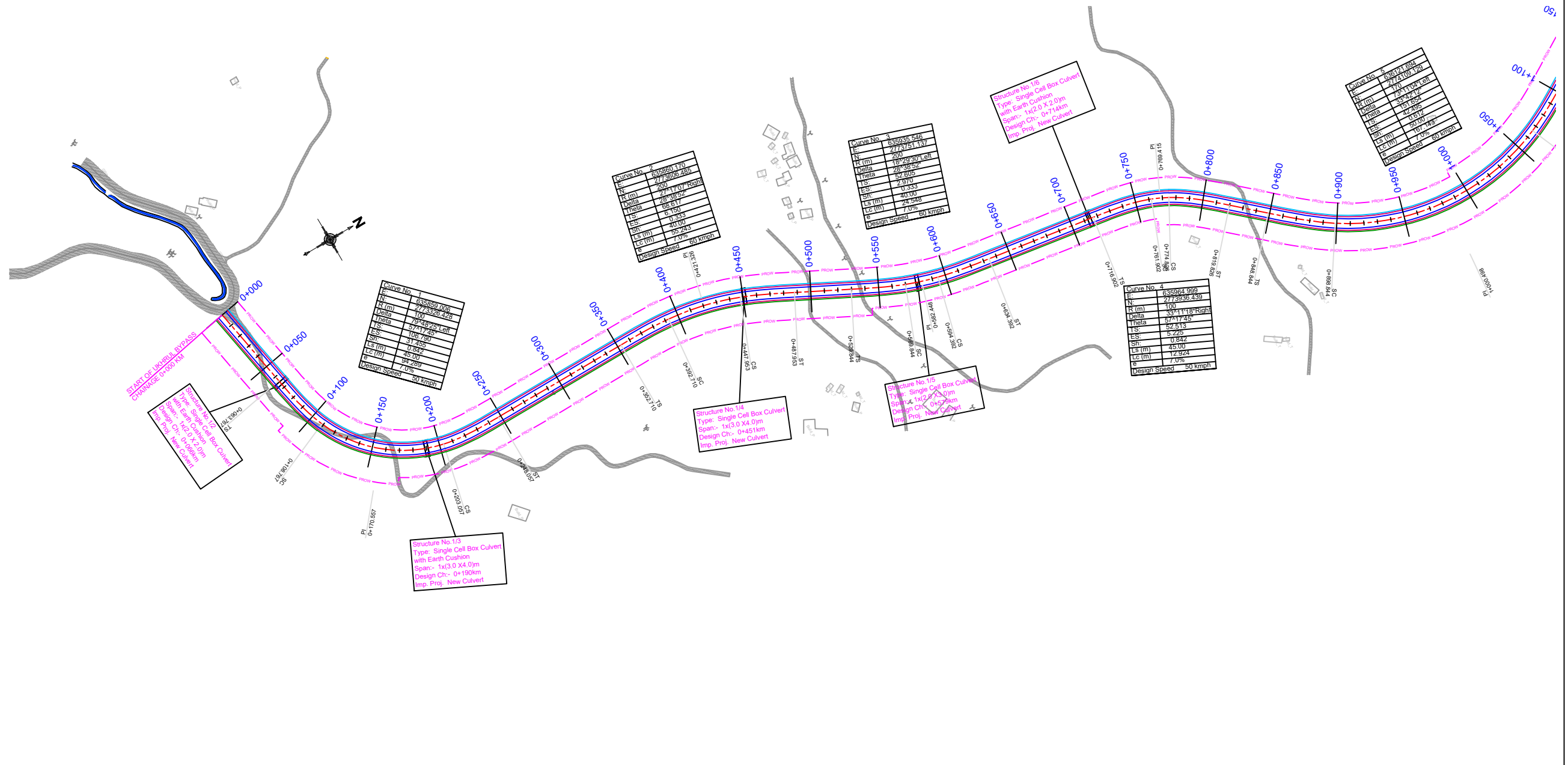
NOTE : SHORT VERTICAL CURVES (AT LEAST 15M LONG) TO BE INSERTED AT POINT "P" IF NECESSARY. LEFT AND RIGHT ARRANGEMENT WILL BE REVERSED IN SIGN FOR CURVE IN REVERSE DIRECTION.



GENERAL NOTES
 01. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SPECIFIED.

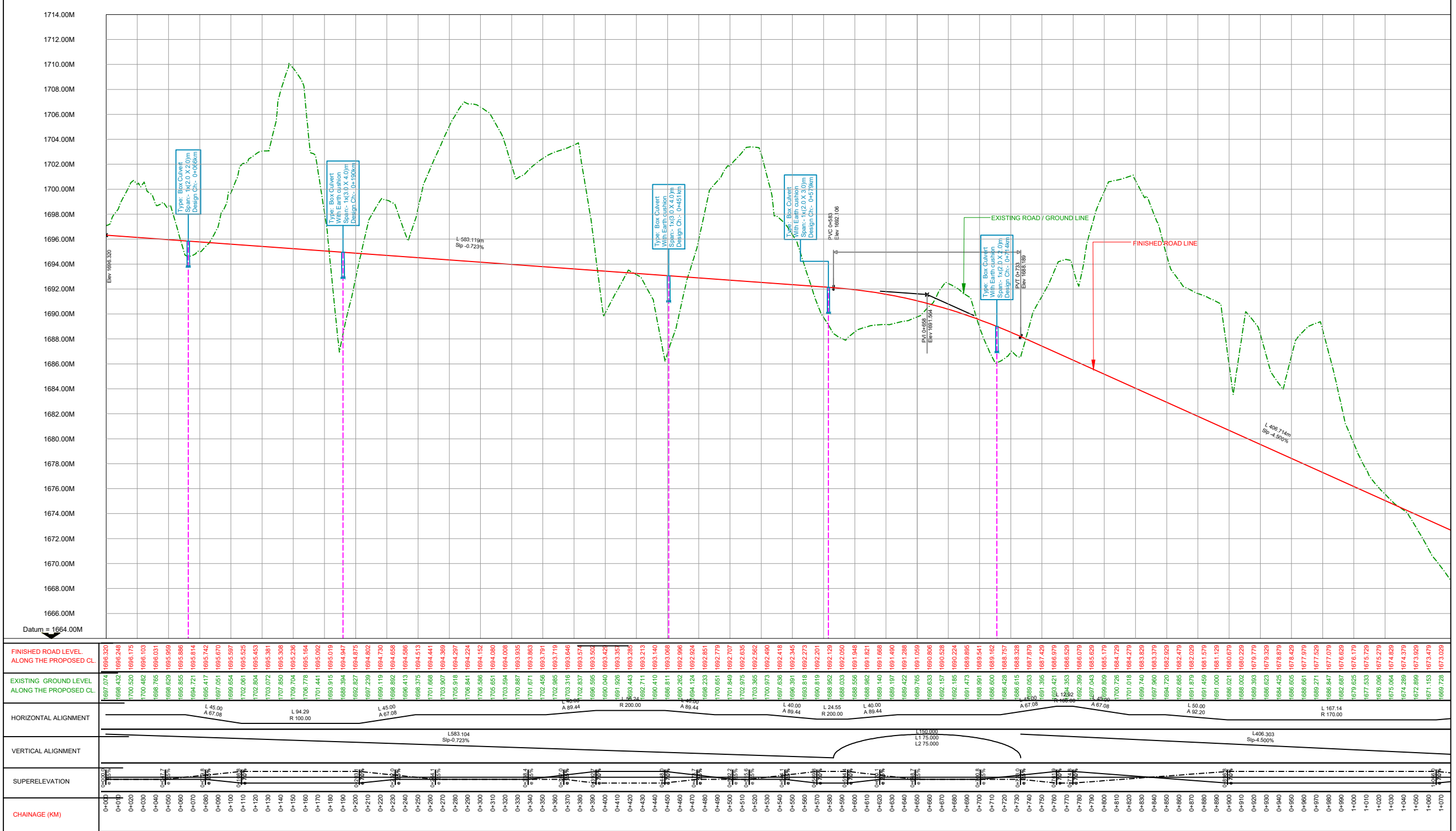
Scale :- NTS						CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.	DETAILS OF RETAINING WALL & BREAST WALL UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km	CONSULTANT : C.E. TESTING COMPANY PVT. LTD. Engineering Consultants 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/DPR/LEG-01	
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.							
REVISIONS											

PLAN & PROFILE

LEGEND:-	
PROP. CENTRE LINE:-	---
PROP. CARRIAGEWAY LINE:-	---
PROP. RIGHT OF WAY	---
PROP. HARD SHOULDER LINE:-	---
EARTHEN SHOULDER/	---
DRAIN LINE	---
CONTOUR	---
DESIGN CHAINAGE:-	0+000

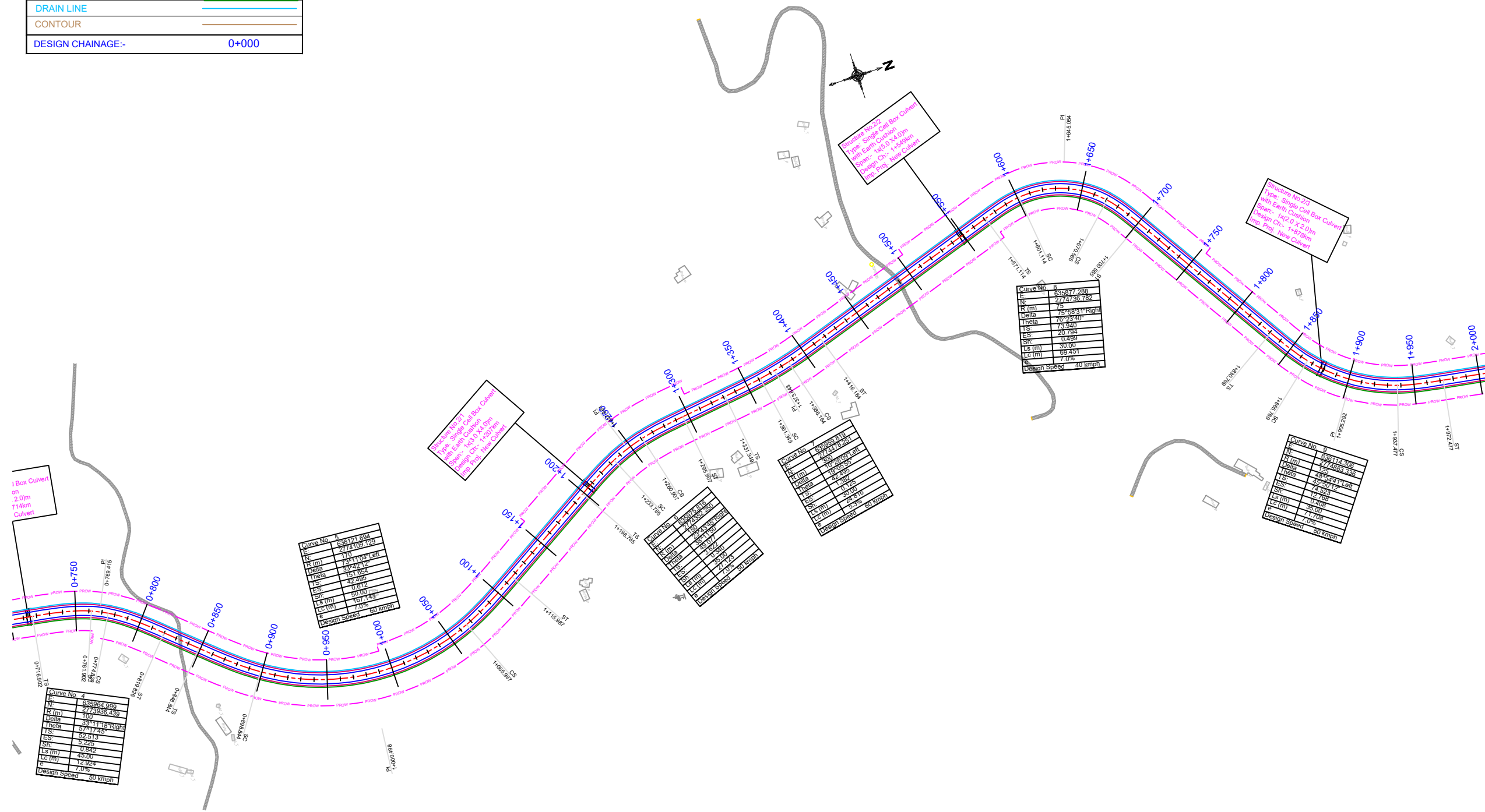


<table border="1"> <thead> <tr> <th>MKD.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>CHKD.</th> <th>APPRD.</th> </tr> </thead> <tbody> <tr> <td colspan="5">REVISIONS</td> </tr> </tbody> </table>					MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	REVISIONS					Scale :- HOR-1:2000  PROJECT:	CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	PLAN Km 0+000 to 1+000 Km UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km	CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/DPR/PP-01
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FINISHED ROAD LEVEL ALONG THE PROPOSED CL.	1697.074 1696.432 1696.246 1700.520 1696.175 1700.492 1696.103 1696.031 1696.705 1696.629 1696.959 1696.886 1696.814 1696.742 1695.417 1695.742 1697.051 1696.670 1696.654 1696.597 1702.061 1695.525 1702.804 1695.453 1703.072 1695.381 1707.850 1695.308 1709.704 1695.236 1706.778 1695.164 1701.441 1695.092 1693.915 1695.019 1694.947 1694.875 1692.827 1694.875 1694.802 1694.730 1690.119 1694.658 1694.586 1694.513 1694.441 1701.668 1694.369 1703.907 1694.297 1705.918 1694.224 1706.586 1694.152 1705.651 1694.080 1703.584 1694.008 1700.887 1693.935 1701.671 1693.863 1702.456 1693.791 1702.985 1693.719 1703.316 1693.646 1702.837 1693.574 1696.595 1693.502 1690.040 1693.428 1691.626 1693.351 1693.443 1693.285 1692.711 1693.213 1693.140 1693.068 1692.996 1690.262 1692.996 1692.924 1692.854 1692.785 1701.649 1692.707 1702.975 1692.635 1703.365 1692.562 1700.973 1692.480 1697.636 1692.418 1696.301 1692.345 1692.273 1693.818 1692.201 1690.819 1692.129 1692.050 1692.050 1691.948 1696.556 1691.868 1691.821 1691.779 1691.737 1691.695 1691.653 1691.611 1691.569 1691.527 1691.485 1691.443 1691.401 1691.359 1691.317 1691.275 1691.233 1691.191 1691.149 1691.107 1691.065 1691.023 1690.981 1690.939 1690.897 1690.855 1690.813 1690.771 1690.729 1690.687 1690.645 1690.603 1690.561 1690.519 1690.477 1690.435 1690.393 1690.351 1690.309 1690.267 1690.225 1690.183 1690.141 1690.099 1690.057 1690.015 1689.973 1689.931 1689.889 1689.847 1689.805 1689.763 1689.721 1689.679 1689.637 1689.595 1689.553 1689.511 1689.469 1689.427 1689.385 1689.343 1689.301 1689.259 1689.217 1689.175 1689.133 1689.091 1689.049 1689.007 1688.965 1688.923 1688.881 1688.839 1688.797 1688.755 1688.713 1688.671 1688.629 1688.587 1688.545 1688.503 1688.461 1688.419 1688.377 1688.335 1688.293 1688.251 1688.209 1688.167 1688.125 1688.083 1688.041 1687.999 1687.957 1687.915 1687.873 1687.831 1687.789 1687.747 1687.705 1687.663 1687.621 1687.579 1687.537 1687.495 1687.453 1687.411 1687.369 1687.327 1687.285 1687.243 1687.201 1687.159 1687.117 1687.075 1687.033 1686.991 1686.949 1686.907 1686.865 1686.823 1686.781 1686.739 1686.697 1686.655 1686.613 1686.571 1686.529 1686.487 1686.445 1686.403 1686.361 1686.319 1686.277 1686.235 1686.193 1686.151 1686.109 1686.067 1686.025 1685.983 1685.941 1685.899 1685.857 1685.815 1685.773 1685.731 1685.689 1685.647 1685.605 1685.563 1685.521 1685.479 1685.437 1685.395 1685.353 1685.311 1685.269 1685.227 1685.185 1685.143 1685.101 1685.059 1685.017 1684.975 1684.933 1684.891 1684.849 1684.807 1684.765 1684.723 1684.681 1684.639 1684.597 1684.555 1684.513 1684.471 1684.429 1684.387 1684.345 1684.303 1684.261 1684.219 1684.177 1684.135 1684.093 1684.051 1684.009 1683.967 1683.925 1683.883 1683.841 1683.799 1683.757 1683.715 1683.673 1683.631 1683.589 1683.547 1683.505 1683.463 1683.421 1683.379 1683.337 1683.295 1683.253 1683.211 1683.169 1683.127 1683.085 1683.043 1683.001 1682.959 1682.917 1682.875 1682.833 1682.791 1682.749 1682.707 1682.665 1682.623 1682.581 1682.539 1682.497 1682.455 1682.413 1682.371 1682.329 1682.287 1682.245 1682.203 1682.161 1682.119 1682.077 1682.035 1681.993 1681.951 1681.909 1681.867 1681.825 1681.783 1681.741 1681.699 1681.657 1681.615 1681.573 1681.531 1681.489 1681.447 1681.405 1681.363 1681.321 1681.279 1681.237 1681.195 1681.153 1681.111 1681.069 1681.027 1680.985 1680.943 1680.901 1680.859 1680.817 1680.775 1680.733 1680.691 1680.649 1680.607 1680.565 1680.523 1680.481 1680.439 1680.397 1680.355 1680.313 1680.271 1680.229 1680.187 1680.145 1680.103 1680.061 1680.019 1679.977 1679.935 1679.893 1679.851 1679.809 1679.767 1679.725 1679.683 1679.641 1679.599 1679.557 1679.515 1679.473 1679.431 1679.389 1679.347 1679.305 1679.263 1679.221 1679.179 1679.137 1679.095 1679.053 1679.011 1678.969 1678.927 1678.885 1678.843 1678.801 1678.759 1678.717 1678.675 1678.633 1678.591 1678.549 1678.507 1678.465 1678.423 1678.381 1678.339 1678.297 1678.255 1678.213 1678.171 1678.129 1678.087 1678.045 1678.003 1677.961 1677.919 1677.877 1677.835 1677.793 1677.751 1677.709 1677.667 1677.625 1677.583 1677.541 1677.499 1677.457 1677.415 1677.373 1677.331 1677.289 1677.247 1677.205 1677.163 1677.121 1677.079 1677.037 1676.995 1676.953 1676.911 1676.869 1676.827 1676.785 1676.743 1676.701 1676.659 1676.617 1676.575 1676.533 1676.491 1676.449 1676.407 1676.365 1676.323 1676.281 1676.239 1676.197 1676.155 1676.113 1676.071 1676.029 1675.987 1675.945 1675.903 1675.861 1675.819 1675.777 1675.735 1675.693 1675.651 1675.609 1675.567 1675.525 1675.483 1675.441 1675.399 1675.357 1675.315 1675.273 1675.231 1675.189 1675.147 1675.105 1675.063 1675.021 1674.979 1674.937 1674.895 1674.853 1674.811 1674.769 1674.727 1674.685 1674.643 1674.601 1674.559 1674.517 1674.475 1674.433 1674.391 1674.349 1674.307 1674.265 1674.223 1674.181 1674.139 1674.097 1674.055 1674.013 1673.971 1673.929 1673.887 1673.845 1673.803 1673.761 1673.719 1673.677 1673.635 1673.593 1673.551 1673.509 1673.467 1673.425 1673.383 1673.341 1673.299 1673.257 1673.215 1673.173 1673.131 1673.089 1673.047 1673.005 1672.963 1672.921 1672.879 1672.837 1672.795 1672.753 1672.711 1672.669 1672.627 1672.585 1672.543 1672.501 1672.459 1672.417 1672.375 1672.333 1672.291 1672.249 1672.207 1672.165 1672.123 1672.081 1672.039 1671.997 1671.955 1671.913 1671.871 1671.829 1671.787 1671.745 1671.703 1671.661 1671.619 1671.577 1671.535 1671.493 1671.451 1671.409 1671.367 1671.325 1671.283 1671.241 1671.199 1671.157 1671.115 1671.073 1671.031 1670.989 1670.947 1670.905 1670.863 1670.821 1670.779 1670.737 1670.695 1670.653 1670.611 1670.569 1670.527 1670.485 1670.443 1670.401 1670.359 1670.317 1670.275 1670.233 1670.191 1670.149 1670.107 1670.065 1670.023 1669.981 1669.939 1669.897 1669.855 1669.813 1669.771 1669.729 1669.687 1669.645 1669.603 1669.561 1669.519 1669.477 1669.435 1669.393 1669.351 1669.309 1669.267 1669.225 1669.183 1669.141 1669.099 1669.057 1669.015 1668.973 1668.931 1668.889 1668.847 1668.805 1668.763 1668.721 1668.679 1668.637 1668.595 1668.553 1668.511 1668.469 1668.427 1668.385 1668.343 1668.301 1668.259 1668.217 1668.175 1668.133 1668.091 1668.049 1668.007 1667.965 1667.923 1667.881 1667.839 1667.797 1667.755 1667.713 1667.671 1667.629 1667.587 1667.545 1667.503 1667.461 1667.419 1667.377 1667.335 1667.293 1667.251 1667.209 1667.167 1667.125 1667.083 1667.041 1666.999 1666.957 1666.915 1666.873 1666.831 1666.789 1666.747 1666.705 1666.663 1666.621 1666.579 1666.537 1666.495 1666.453 1666.411 1666.369 1666.327 1666.285 1666.243 1666.201 1666.159 1666.117 1666.075 1666.033 1665.991 1665.949 1665.907 1665.865 1665.823 1665.781 1665.739 1665.697 1665.655 1665.613 1665.571 1665.529 1665.487 1665.445 1665.403 1665.361 1665.319 1665.277 1665.235 1665.193 1665.151 1665.109 1665.067 1665.025 1664.983 1664.941 1664.899 1664.857 1664.815 1664.773 1664.731 1664.689 1664.647 1664.605 1664.563 1664.521 1664.479 1664.437 1664.395 1664.353 1664.311 1664.269 1664.227 1664.185 1664.143 1664.101 1664.059 1664.017 1663.975 1663.933 1663.891 1663.849 1663.807 1663.765 1663.723 1663.681 1663.639 1663.597 1663.555 1663.513 1663.471 1663.429 1663.387 1663.345 1663.303 1663.261 1663.219 1663.177 1663.135 1663.093 1663.051 1663.009 1662.967 1662.925 1662.883 1662.841 1662.799 1662.757 1662.715 1662.673 1662.631 1662.589 1662.547 1662.505 1662.463 1662.421 1662.379 1662.337 1662.295 1662.253 1662.211 1662.169 1662.127 1662.085 1662.043 1662.001 1661.959 1661.917 1661.875 1661.833 1661.791 1661.749 1661.707 1661.665 1661.623 1661.581 1661.539 1661.497 1661.455 1661.413 1661.371 1661.329 1661.287 1661.245 1661.203 1661.161 1661.119 1661.077 1661.035 1660.993 1660.951 1660.909 1660.867 1660.825 1660.783 1660.741 1660.699 1660.657 1660.615 1660.573 1660.531 1660.489 1660.447 1660.405 1660.363 1660.321 1660.279 1660.237 1660.195 1660.153 1660.111 1660.069 1660.027 1659.985 1659.943 1659.901 1659.859 1659.817 1659.775 1659.733 1659.691 1659.649 1659.607 1659.565 1659.523 1659.481 1659.439 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1654.735 1654.693 1654.651 1654.609 1654.567 1654.525 1654.483 1654.441 1654.399 1654.357 1654.315 1654.273 1654.231 1654.189 1654.147 1654.105 1654.063 1654.021 1653.979 1653.937 1653.895 1653.853 1653.811 1653.769 1653.727 1653.685 1653.643 1653.601 1653.559 1653.517 1653.475 1653.433 1653.391 1653.349 1653.307 1653.265 1653.223 1653.181 1653.139 1653.097 1653.055 1653.013 1652.971 1652.929 1652.887 1652.845 1652.803 1652.761 1652.719 1652.677 1652.635 1652.593 1652.551 1652.509 1652.467 1652.425 1652.383 1652.341 1652.299 1652.257 1652.215 1652.173 1652.131 1652.089 1652.047 1652.005 1651.963 1651.921 1651.879 1651.837 1651.795 1651.753 1651.711 1651.669 1651.627 1651.585 1651.543 1651.501 1651.459 1651.417 1651.375 1651.333 1651.291 1651.249 1651.207 1651.165 1651.123 1651.081 1651.039 1650.997 1650.955 1650.913 1650.871 1650.829 1650.787 1650.745 1650.703 1650.661 1650.619 1650.577 1650.535 1650.493 1650.451 1650.409 1650.367 1650.325 1650.283 1650.241 1650.199 1650.157 1650.115 1650.073 1650.031 1649.989 1649.947 1649.905 1649.863 1649.821 1649.779 1649.737 1649.695 1649.653 1649.611 1649.569 1649.527 1649.485 1649.443 1649.401 1649.359 1649.317 1649.275 1649.233 1649.191 1649.149 1649.107 1649.065 1649.023 1648.981 1648.939 1648.897 1648.855 1648.813 1648.771 1648.729 1648.687 1648.645 1648.603 1648.561 1648.519 1648.477 1648.435 1648.393 1648.351 1648.309 1648.267 1648.225 1648.183 1648.141 1648.099 1648.057 1648.015 1647.973 1647.931 1647.889 1647.847 1647.805 1647.763 1647.721 1647.679 1647.637 1647.595 1647.553 1647.511 1647.469 1647.427 1647.385 1647.343 1647.301 1647.259 1647.217 1647.175 1647.133 1647.091 1647.049 1647.007 1646.965 1646.923 1646.881 1646.839 1646.797 1646.755 1646.713 1646.671 1646.629 1646.587 1646.545 1646.503 1646.461 1646.419 1646.377 1646.335 1646.293 1646.251 1646.209 1646.167 1646.125 1646.083 1646.041 1646.000 1645.958 1645.916 1645.874 1645.832 1645.790 1645.748 1645.706 1645.664 1645.622 16
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LEGEND:-	
PROP. CENTRE LINE:-	---
PROP. CARRIAGEWAY LINE:-	---
PROP. RIGHT OF WAY	---
PROP. HARD SHOULDER LINE:-	---
EARTHEN SHOULDER/	---
DRAIN LINE	---
CONTOUR	---
DESIGN CHAINAGE:-	0+000



MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

Scale :-
HOR-1:2000

DATE:
SEP, 2023

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
4, Parliament Street, New Delhi - 110001

PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

PLAN
Km 1+000 to 2+000 Km

UKHRUL BYPASS District:- UKHRUL

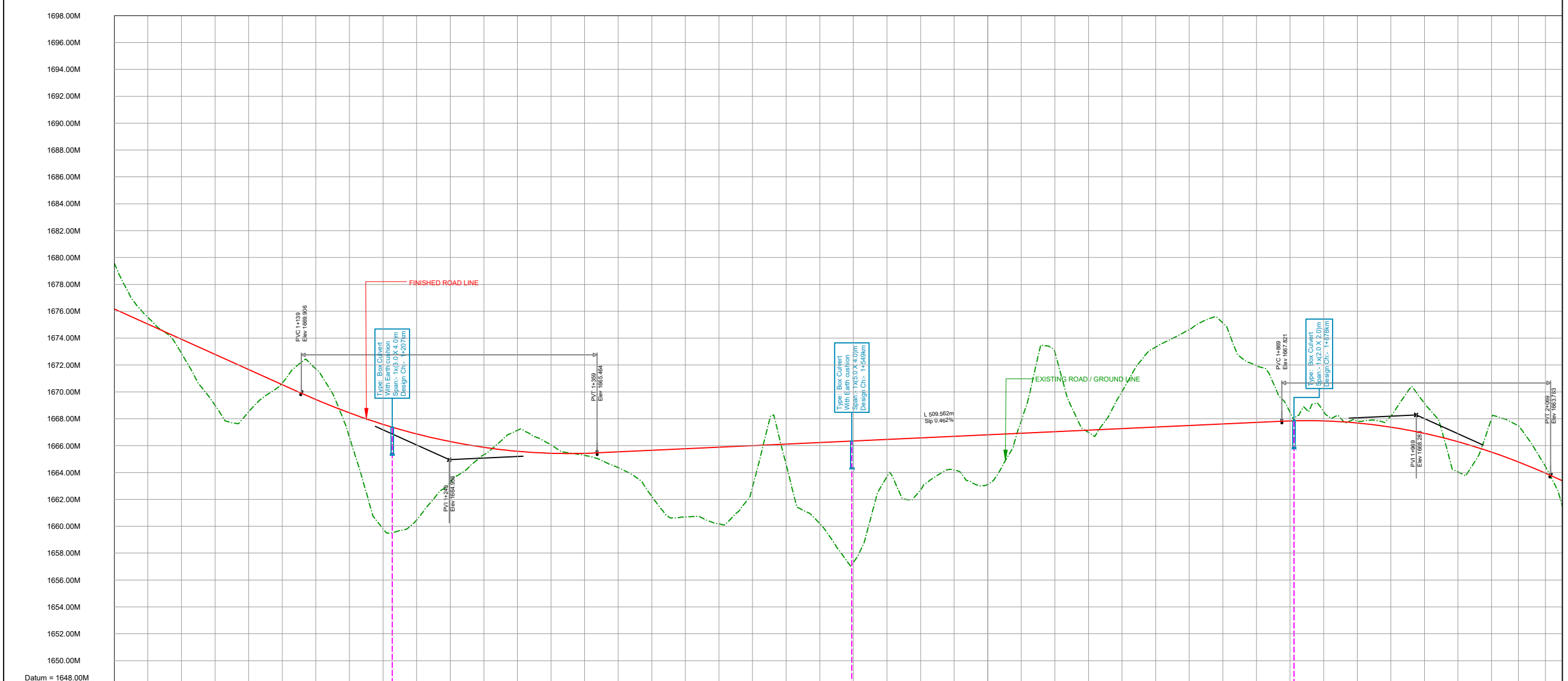
Detailed Project Report

Design chainage:- 0+000 Km to 6+571 Km

CONSULTANT :
CETEST Engineering Consultants
As ISO 9001, 14001 & 45001 Certified Company

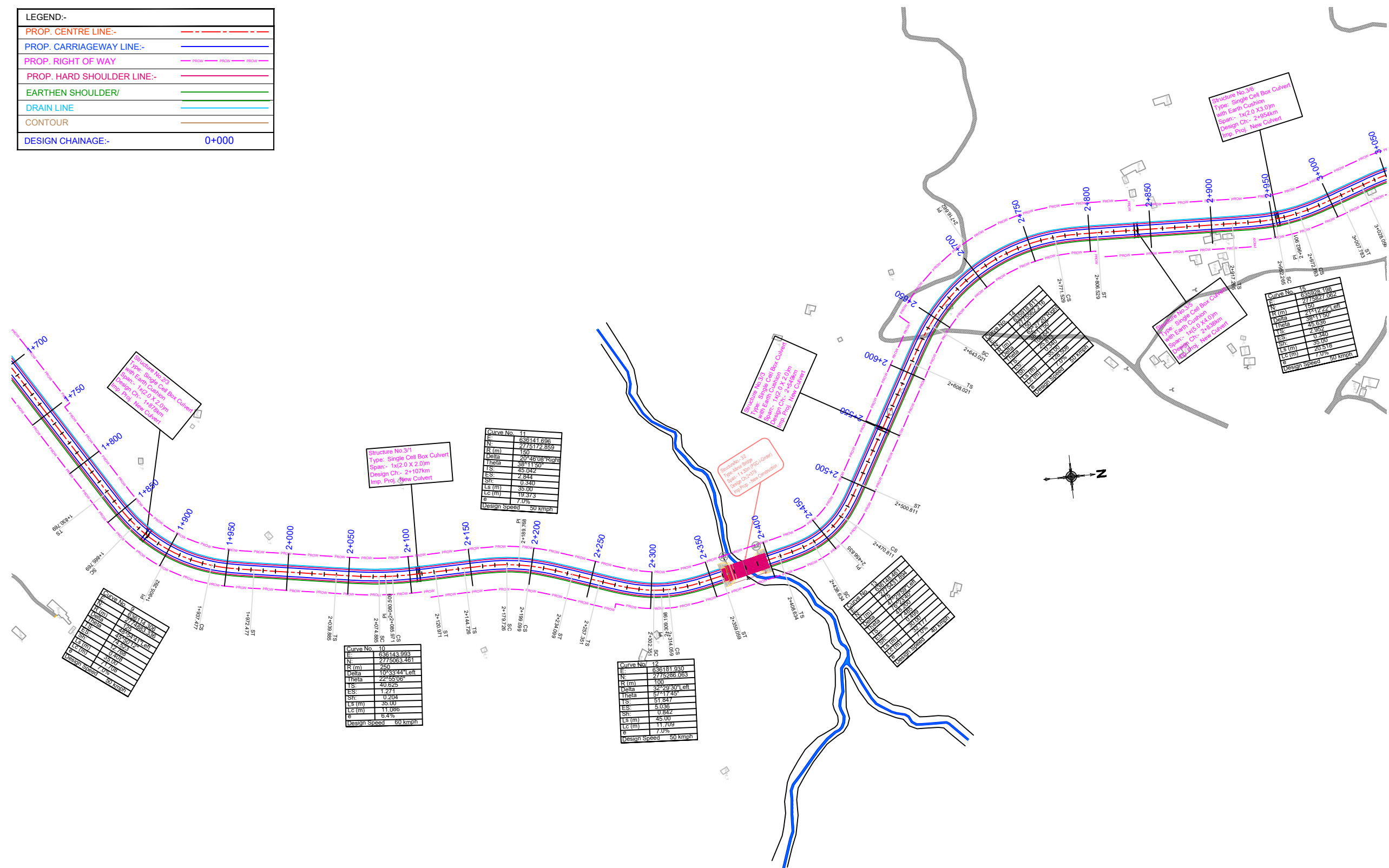
C.E. TESTING COMPANY PVT. LTD.
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG NO :- CET/2016/3640/NH-102A/DPR/PP-02



FINISHED ROAD LEVEL ALONG THE PROPOSED CL	1676.179 1675.729 1675.279 1674.829 1674.379 1673.929 1673.479 1673.029 1672.579 1672.129 1671.679 1671.229 1670.779 1670.329 1669.879 1669.429 1668.979 1668.529 1668.079 1667.629 1667.179 1666.729 1666.279 1665.829 1665.379 1664.929 1664.479 1664.029 1663.579 1663.129 1662.679 1662.229 1661.779 1661.329 1660.879 1660.429 1659.979 1659.529 1659.079 1658.629 1658.179 1657.729 1657.279 1656.829 1656.379 1655.929 1655.479 1655.029 1654.579 1654.129 1653.679 1653.229 1652.779 1652.329 1651.879 1651.429 1650.979 1650.529 1650.079 1649.629 1649.179 1648.729 1648.279 1647.829 1647.379 1646.929 1646.479 1646.029 1645.579 1645.129 1644.679 1644.229 1643.779 1643.329 1642.879 1642.429 1641.979 1641.529 1641.079 1640.629 1640.179 1639.729 1639.279 1638.829 1638.379 1637.929 1637.479 1637.029 1636.579 1636.129 1635.679 1635.229 1634.779 1634.329 1633.879 1633.429 1632.979 1632.529 1632.079 1631.629 1631.179 1630.729 1630.279 1629.829 1629.379 1628.929 1628.479 1628.029 1627.579 1627.129 1626.679 1626.229 1625.779 1625.329 1624.879 1624.429 1623.979 1623.529 1623.079 1622.629 1622.179 1621.729 1621.279 1620.829 1620.379 1619.929 1619.479 1619.029 1618.579 1618.129 1617.679 1617.229 1616.779 1616.329 1615.879 1615.429 1614.979 1614.529 1614.079 1613.629 1613.179 1612.729 1612.279 1611.829 1611.379 1610.929 1610.479 1610.029 1609.579 1609.129 1608.679 1608.229 1607.779 1607.329 1606.879 1606.429 1605.979 1605.529 1605.079 1604.629 1604.179 1603.729 1603.279 1602.829 1602.379 1601.929 1601.479 1601.029 1600.579 1600.129 1599.679 1599.229 1598.779 1598.329 1597.879 1597.429 1596.979 1596.529 1596.079 1595.629 1595.179 1594.729 1594.279 1593.829 1593.379 1592.929 1592.479 1592.029 1591.579 1591.129 1590.679 1590.229 1589.779 1589.329 1588.879 1588.429 1587.979 1587.529 1587.079 1586.629 1586.179 1585.729 1585.279 1584.829 1584.379 1583.929 1583.479 1583.029 1582.579 1582.129 1581.679 1581.229 1580.779 1580.329 1579.879 1579.429 1578.979 1578.529 1578.079 1577.629 1577.179 1576.729 1576.279 1575.829 1575.379 1574.929 1574.479 1574.029 1573.579 1573.129 1572.679 1572.229 1571.779 1571.329 1570.879 1570.429 1569.979 1569.529 1569.079 1568.629 1568.179 1567.729 1567.279 1566.829 1566.379 1565.929 1565.479 1565.029 1564.579 1564.129 1563.679 1563.229 1562.779 1562.329 1561.879 1561.429 1560.979 1560.529 1560.079 1559.629 1559.179 1558.729 1558.279 1557.829 1557.379 1556.929 1556.479 1556.029 1555.579 1555.129 1554.679 1554.229 1553.779 1553.329 1552.879 1552.429 1551.979 1551.529 1551.079 1550.629 1550.179 1549.729 1549.279 1548.829 1548.379 1547.929 1547.479 1547.029 1546.579 1546.129 1545.679 1545.229 1544.779 1544.329 1543.879 1543.429 1542.979 1542.529 1542.079 1541.629 1541.179 1540.729 1540.279 1539.829 1539.379 1538.929 1538.479 1538.029 1537.579 1537.129 1536.679 1536.229 1535.779 1535.329 1534.879 1534.429 1533.979 1533.529 1533.079 1532.629 1532.179 1531.729 1531.279 1530.829 1530.379 1529.929 1529.479 1529.029 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1478.629 1478.179 1477.729 1477.279 1476.829 1476.379 1475.929 1475.479 1475.029 1474.579 1474.129 1473.679 1473.229 1472.779 1472.329 1471.879 1471.429 1470.979 1470.529 1470.079 1469.629 1469.179 1468.729 1468.279 1467.829 1467.379 1466.929 1466.479 1466.029 1465.579 1465.129 1464.679 1464.229 1463.779 1463.329 1462.879 1462.429 1461.979 1461.529 1461.079 1460.629 1460.179 1459.729 1459.279 1458.829 1458.379 1457.929 1457.479 1457.029 1456.579 1456.129 1455.679 1455.229 1454.779 1454.329 1453.879 1453.429 1452.979 1452.529 1452.079 1451.629 1451.179 1450.729 1450.279 1449.829 1449.379 1448.929 1448.479 1448.029 1447.579 1447.129 1446.679 1446.229 1445.779 1445.329 1444.879 1444.429 1443.979 1443.529 1443.079 1442.629 1442.179 1441.729 1441.279 1440.829 1440.379 1439.929 1439.479 1439.029 1438.579 1438.129 1437.679 1437.229 1436.779 1436.329 1435.879 1435.429 1434.979 1434.529 1434.079 1433.629 1433.179 1432.729 1432.279 1431.829 1431.379 1430.929 1430.479 1430.029 1429.579 1429.129 1428.679 1428.229 1427.779 1427.329 1426.879 1426.429 1425.979 1425.529 1425.079 1424.629 1424.179 1423.729 1423.279 1422.829 1422.379 1421.929 1421.479 1421.029 1420.579 1420.129 1419.679 1419.229 1418.779 1418.329 1417.879 1417.429 1416.979 1416.529 1416.079 1415.629 1415.179 1414.729 1414.279 1413.829 1413.379 1412.929 1412.479 1412.029 1411.579 1411.129 1410.679 1410.229 1409.779 1409.329 1408.879 1408.429 1407.979 1407.529 1407.079 1406.629 1406.179 1405.729 1405.279 1404.829 1404.379 1403.929 1403.479 1403.029 1402.579 1402.129 1401.679 1401.229 1400.779 1400.329 1399.879 1399.429 1398.979 1398.529 1398.079 1397.629 1397.179 1396.729 1396.279 1395.829 1395.379 1394.929 1394.479 1394.029 1393.579 1393.129 1392.679 1392.229 1391.779 1391.329 1390.879 1390.429 1389.979 1389.529 1389.079 1388.629 1388.179 1387.729 1387.279 1386.829 1386.379 1385.929 1385.479 1385.029 1384.579 1384.129 1383.679 1383.229 1382.779 1382.329 1381.879 1381.429 1380.979 1380.529 1380.079 1379.629 1379.179 1378.729 1378.279 1377.829 1377.379 1376.929 1376.479 1376.029 1375.579 1375.129 1374.679 1374.229 1373.779 1373.329 1372.879 1372.429 1371.979 1371.529 1371.079 1370.629 1370.179 1369.729 1369.279 1368.829 1368.379 1367.929 1367.479 1367.029 1366.579 1366.129 1365.679 1365.229 1364.779 1364.329 1363.879 1363.429 1362.979 1362.529 1362.079 1361.629 1361.179 1360.729 1360.279 1359.829 1359.379 1358.929 1358.479 1358.029 1357.579 1357.129 1356.679 1356.229 1355.779 1355.329 1354.879 1354.429 1353.979 1353.529 1353.079 1352.629 1352.179 1351.729 1351.279 1350.829 1350.379 1349.929 1349.479 1349.029 1348.579 1348.129 1347.679 1347.229 1346.779 1346.329 1345.879 1345.429 1344.979 1344.529 1344.079 1343.629 1343.179 1342.729 1342.279 1341.829 1341.379 1340.929 1340.479 1340.029 1339.579 1339.129 1338.679 1338.229 1337.779 1337.329 1336.879 1336.429 1335.979 1335.529 1335.079 1334.629 1334.179 1333.729 1333.279 1332.829 1332.379 1331.929 1331.479 1331.029 1330.579 1330.129 1329.679 1329.229 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1228.879 1228.429 1227.979 1227.529 1227.079 1226.629 1226.179 1225.729 1225.279 1224.829 1224.379 1223.929 1223.479 1223.029 1222.579 1222.129 1221.679 1221.229 1220.779 1220.329 1219.879 1219.429 1218.979 1218.529 1218.079 1217.629 1217.179 1216.729 1216.279 1215.829 1215.379 1214.929 1214.479 1214.029 1213.579 1213.129 1212.679 1212.229 1211.779 1211.329 1210.879 1210.429 1209.979 1209.529 1209.079 1208.629 1208.179 1207.729 1207.279 1206.829 1206.379 1205.929 1205.479 1205.029 1204.579 1204.129 1203.679 1203.229 1202.779 1202.329 1201.879 1201.429 1200.979 1200.529 1199.979 1199.529 1199.079 1198.629 1198.179 1197.729 1197.279 1196.829 1196.379 1195.929 1195.479 1195.029 1194.579 1194.129 1193.679 1193.229 1192.779 1192.329 1191.879 1191.429 1190.979 1190.529 1190.079 1189.629 1189.179 1188.729 1188.279 1187.829 1187.379 1186.929 1186.479 1186.029 1185.579 1185.129 1184.679 1184.229 1183.779 1183.329 1182.879 1182.429 1181.979 1181.529 1181.079 1180.629 1180.179 1179.729 1179.279 1178.829 1178.379 1177.929 1177.479 1177.029 1176.579 1176.129 1175.679 1175.229 1174.779 1174.329 1173.879 1173.429 1172.979 1172.529 1172.079 1171.629 1171.179 1170.729 1170.279 1169.829 1169.379 1168.929 1168.479 1168.029 1167.579 1167.129 1166.679 1166.229 1165.779 1165.329 1164.879 1164.429 1163.979 1163.529 1163.079 1162.629 1162.179 1161.729 1161.279 1160.829 1160.379 1159.929 1159.479 1159.029 1158.579 1158.129 1157.679 1157.229 1156.779 1156.329 1155.879 1155.429 1154.979 1154.529 1154.079 1153.629 1153.179 1152.729 1152.279 1151.829 1151.379 1150.929 1150.479 1150.029 1149.579 1149.129 1148.679 1148.229 1147.779 1147.329 1146.879 1146.429 1145.979 1145.529 1145.079 1144.629 1144.179 1143.729 1143.279 1142.829 1142.379 1141.929 1141.479 1141.029 1140.579 1140.129 1139.679 1139.229 1138.779 1138.329 1137.879 1137.429 1136.979 1136.529 1136.079 1135.629 1135.179 1134.729 1134.279 1133.829 1133.379 1132.929 1132.479 1132.029 1131.579 1131.129 1130.679 1130.229 1129.779
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LEGEND:-	
PROP. CENTRE LINE:-	---
PROP. CARRIAGEWAY LINE:-	---
PROP. RIGHT OF WAY	---
PROP. HARD SHOULDER LINE:-	---
EARTHEN SHOULDER/	---
DRAIN LINE	---
CONTOUR	---
DESIGN CHAINAGE:-	0+000



MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

Scale :-
HOR-1:2000

DATE:
SEP, 2023

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
4, Parliament Street,
New Delhi - 110001

PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

PLAN
Km 2+000 to 3+000 Km

UKHRUL BYPASS District:- UKHRUL

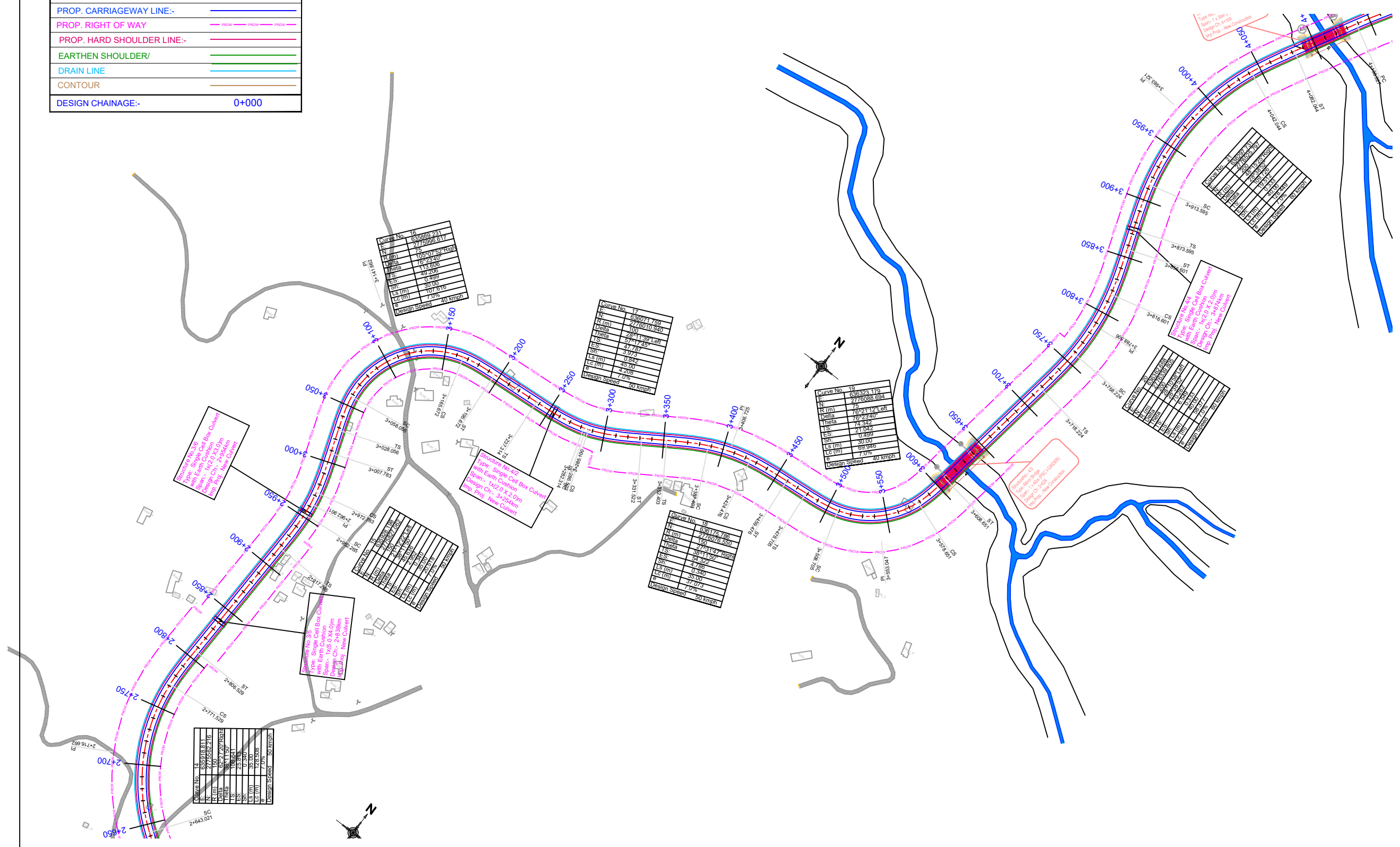
Detailed Project Report

Design chainage:- 0+000 Km to 6+571 Km

CONSULTANT :
CETEST C.E. TESTING COMPANY PVT. LTD.
Engineering Consultants
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG NO :- CET/2016/3640/NH-102A/DPR/PP-03

LEGEND:-	
PROP. CENTRE LINE:-	---
PROP. CARRIAGEWAY LINE:-	---
PROP. RIGHT OF WAY	---
PROP. HARD SHOULDER LINE:-	---
EARTHEN SHOULDER/	---
DRAIN LINE	---
CONTOUR	---
DESIGN CHAINAGE:-	0+000



MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

Scale :-
HOR-1:2000

DATE:
SEP, 2023

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
4, Parliament Street, New Delhi - 110001

PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

PLAN
Km 3+000 to 4+000 Km

UKHRUL BYPASS District:- UKHRUL

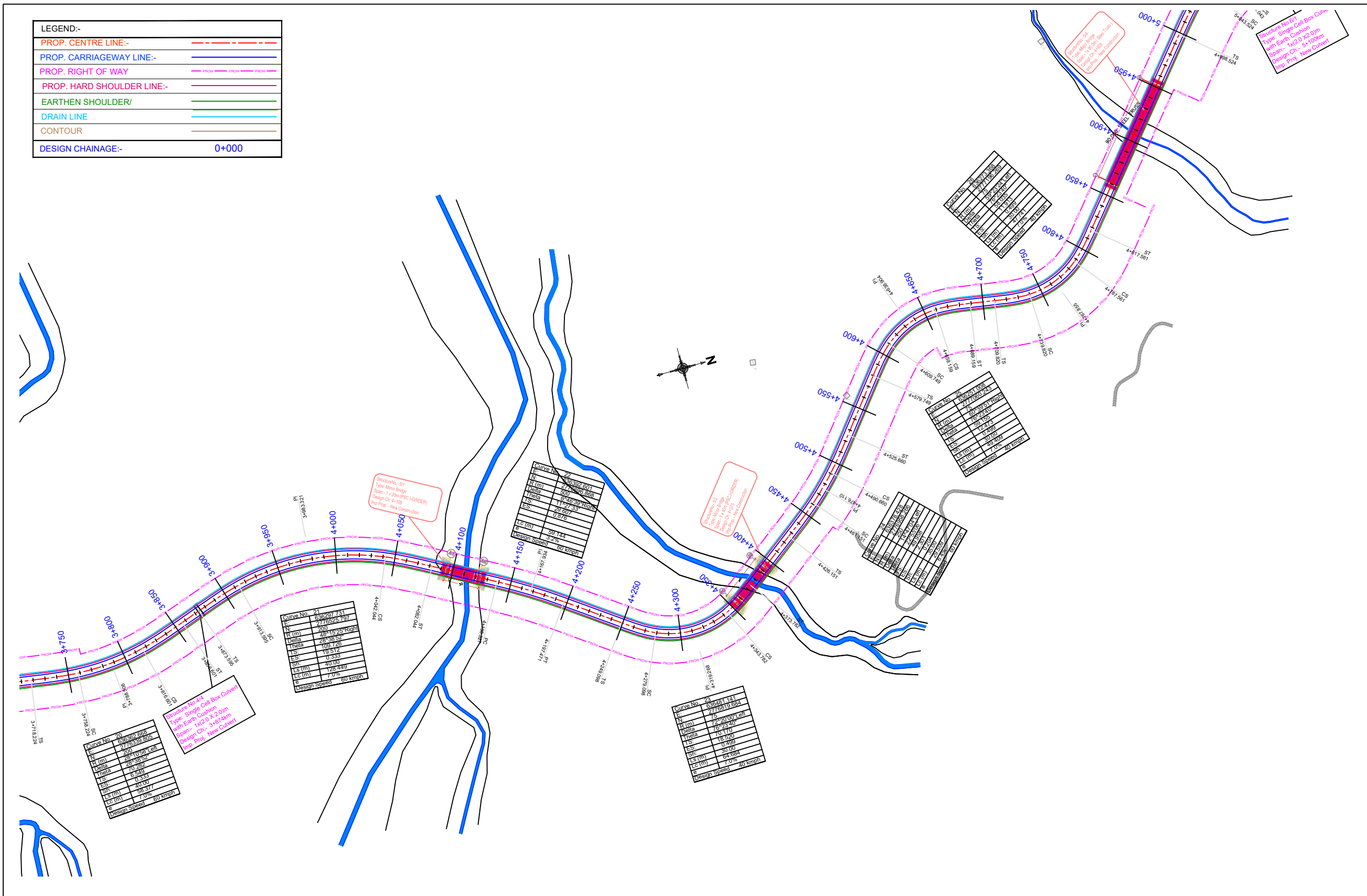
Detailed Project Report

Design chainage:- 0+000 Km to 6+571 Km

CONSULTANT :
CETEST C.E. TESTING COMPANY PVT. LTD.
Engineering Consultants
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG NO :- CET/2016/3640/NH-102A/DPR/PP-04

LEGEND:-	
PROP. CENTRE LINE:-	---
PROP. CARRIAGEWAY LINE:-	---
PROP. RIGHT OF WAY	---
PROP. HARD SHOULDER LINE:-	---
EARTHEN SHOULDER/	---
DRAIN LINE	---
CONTOUR	---
DESIGN CHAINAGE:-	0+000



MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

Scale :-
HOR-1:2000

DATE:
SEP, 2023

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
4, Parliament Street,
New Delhi - 110001

PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

PLAN
Km 4+000 to 5+000 Km

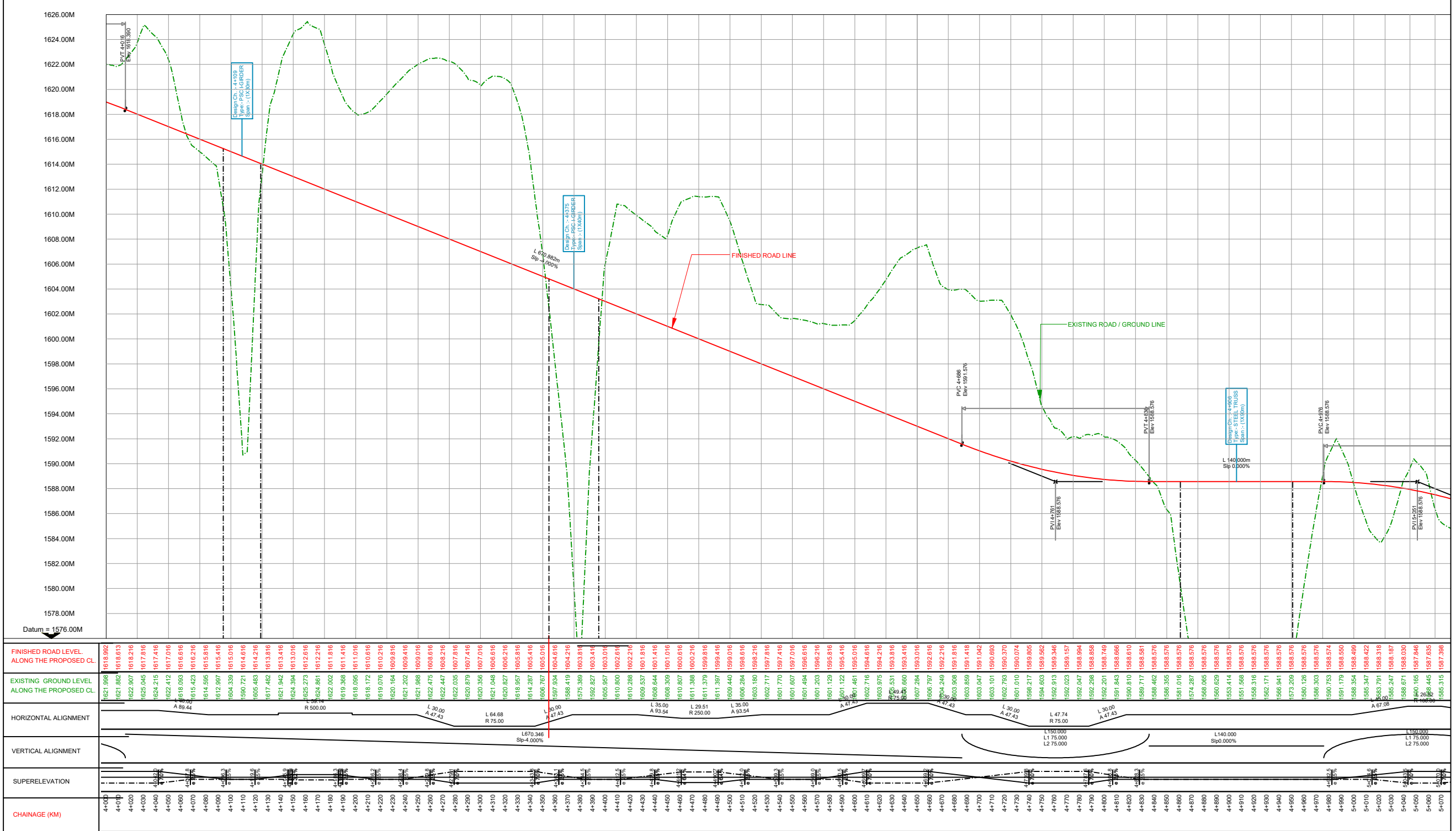
UKHRUL BYPASS District:- UKHRUL

Detailed Project Report

Design chainage:- 0+000 Km to 6+571 Km

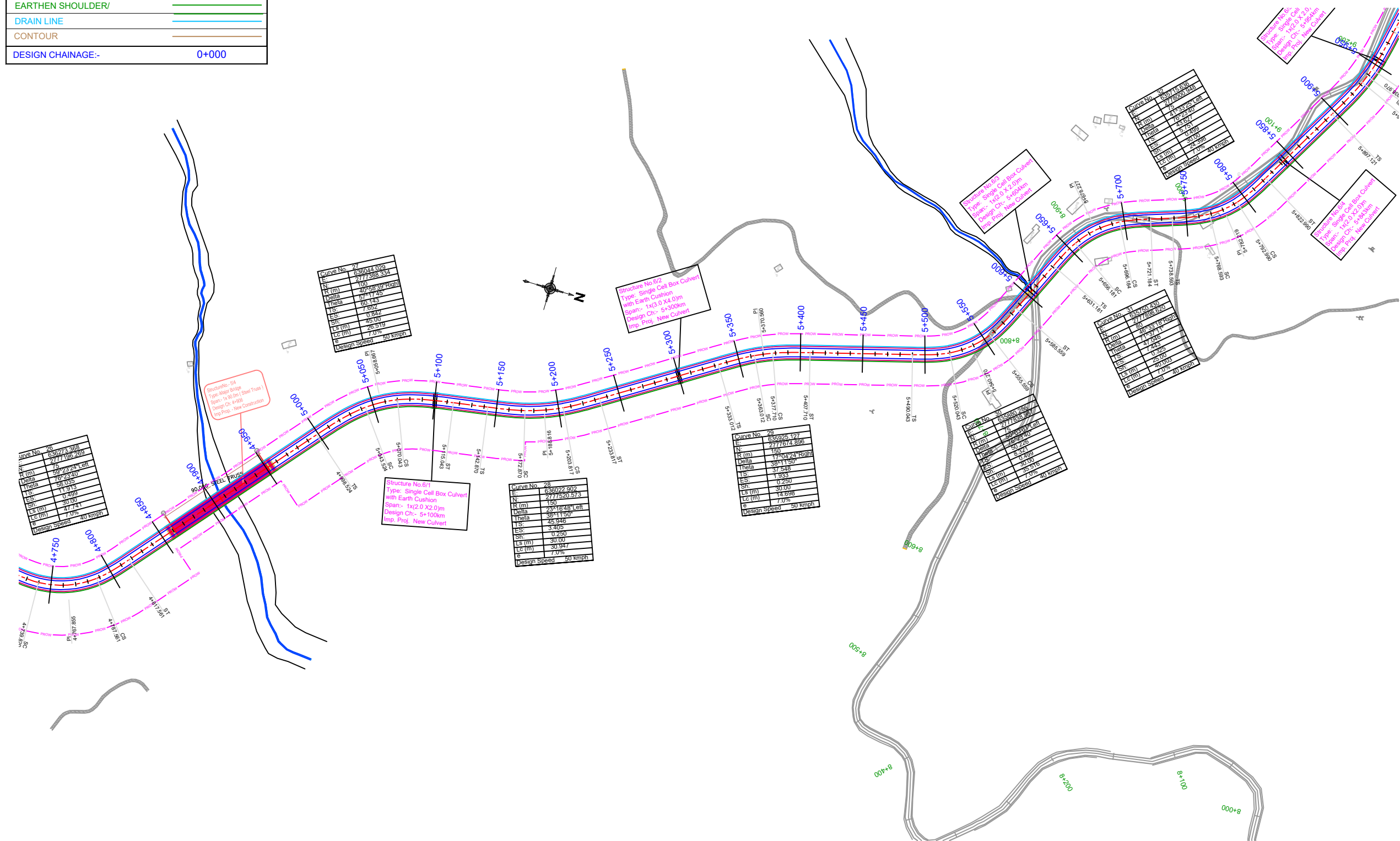
CONSULTANT :
CETEST C.E. TESTING COMPANY PVT. LTD.
Engineering Consultants
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG NO :- CET/2016/3640/NH-102A/DPR/PP-05



Scale :- VER-1:200			CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001		PROFILE Km 4+000 to 5+000 Km		CONSULTANT : C.E. TESTING COMPANY PVT. LTD. Engineering Consultants Kolkata - 700092.		DWG NO :- CET/2016/3640/NH-102A/DPR/PP-05A
DATE: JULY, 2023			PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.		UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+799 Km				
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	REVISIONS				

LEGEND:-	
PROP. CENTRE LINE:-	---
PROP. CARRIAGEWAY LINE:-	---
PROP. RIGHT OF WAY	---
PROP. HARD SHOULDER LINE:-	---
EARTHEN SHOULDER/	---
DRAIN LINE	---
CONTOUR	---
DESIGN CHAINAGE:-	0+000



MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

Scale :-
HOR-1:2000

DATE:
SEP, 2023

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
4, Parliament Street, New Delhi - 110001

PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

PLAN
Km 5+000 to 6+000 Km

UKHRUL BYPASS District:- UKHRUL

Detailed Project Report

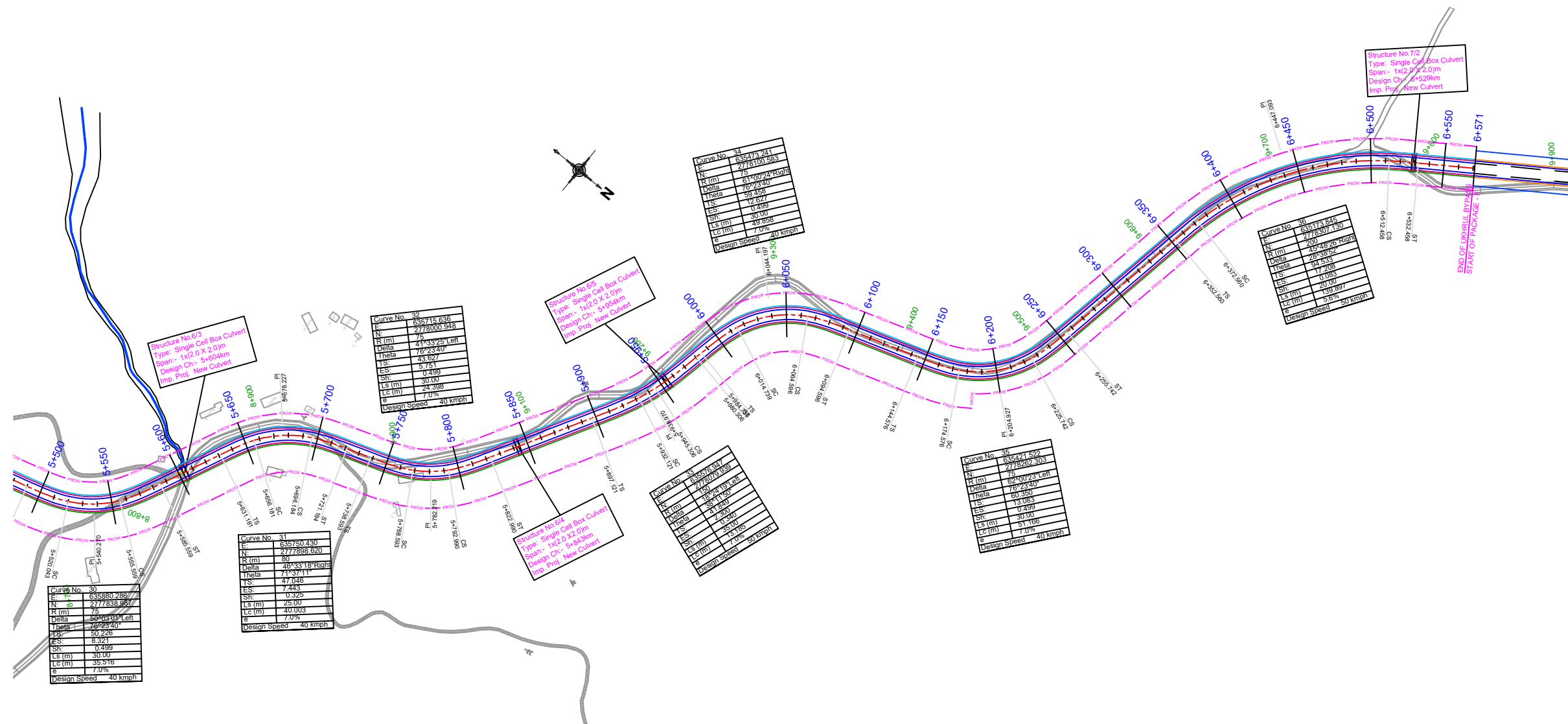
Design chainage:- 0+000 Km to 6+571 Km

CONSULTANT :
CETEST Engineering Consultants
As ISO 9001, 14001 & 45001 Certified Company

C.E. TESTING COMPANY PVT. LTD.
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG NO :- CET/2016/3640/NH-102A/DPR/PP-06

LEGEND:-	
PROP. CENTRE LINE:-	---
PROP. CARRIAGEWAY LINE:-	---
PROP. RIGHT OF WAY	---
PROP. HARD SHOULDER LINE:-	---
EARTHEN SHOULDER/	---
DRAIN LINE	---
CONTOUR	---
DESIGN CHAINAGE:-	0+000



MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

Scale :-
HOR-1:2000

DATE:
SEP, 2023

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
4, Parliament Street, New Delhi - 110001

PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

PLAN
Km 6+000 to 6+799 Km

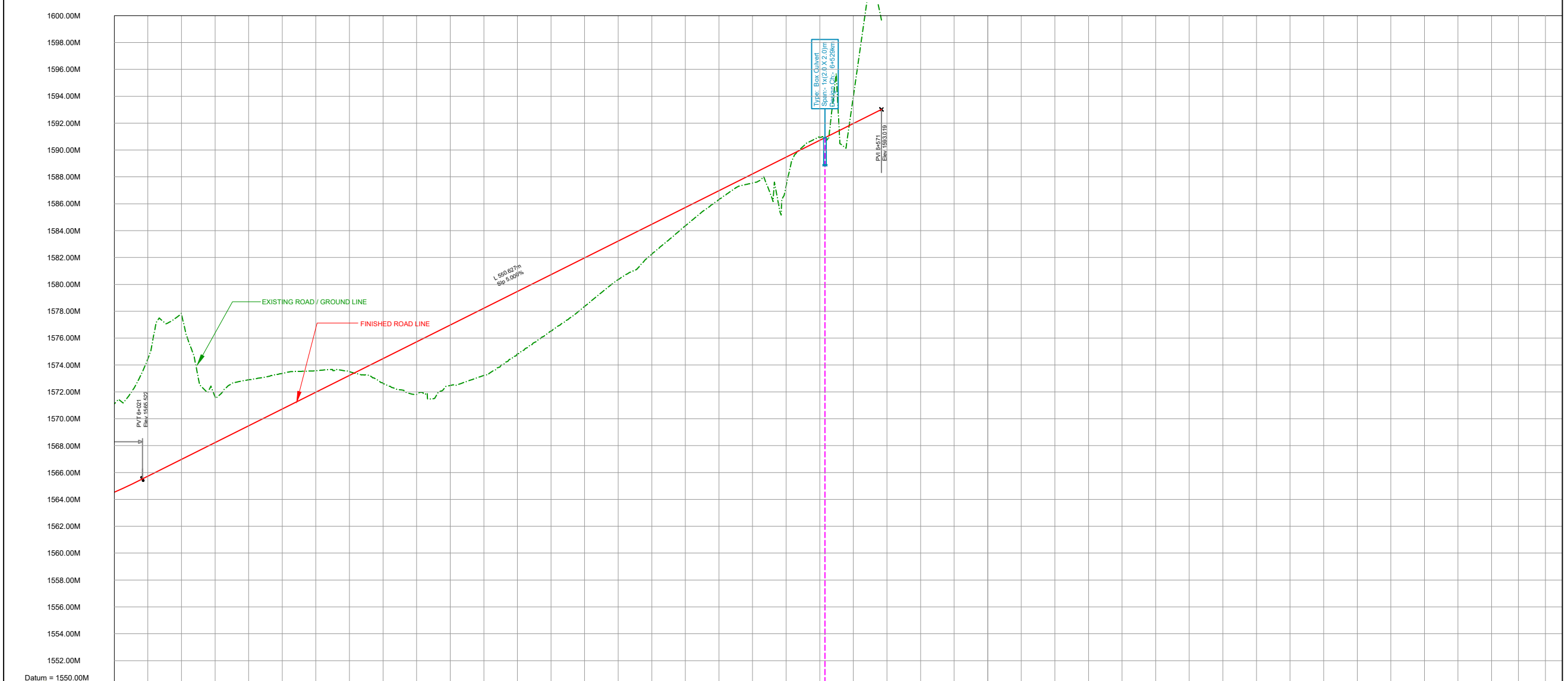
UKHRUL BYPASS District:- UKHRUL

Detailed Project Report

Design chainage:- 0+000 Km to 6+571 Km

CONSULTANT :
CETEST C.E. TESTING COMPANY PVT. LTD.
Engineering Consultants
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG NO :- CET/2016/3640/NH-102A/DPR/PP-07



FINISHED ROAD LEVEL ALONG THE PROPOSED CL.	1564.524 1565.983 1565.467 1565.967 1566.467 1566.967 1567.467 1567.967 1568.467 1568.967 1569.467 1569.967 1570.467 1570.967 1571.467 1571.967 1572.467 1572.967 1573.467 1573.967 1574.467 1574.967 1575.467 1575.967 1576.467 1576.967 1577.467 1577.967 1578.467 1578.967 1579.467 1579.967 1580.467 1580.967 1581.467 1581.967 1582.467 1582.967 1583.467 1583.967 1584.467 1584.967 1585.467 1585.967 1586.467 1586.967 1587.467 1587.967 1588.467 1588.967 1589.467 1589.967 1590.467 1590.967 1591.467 1591.967 1592.467 1592.967
EXISTING GROUND LEVEL ALONG THE PROPOSED CL.	1571.004 1571.502 1572.257 1573.405 1573.837 1574.412 1574.900 1575.190 1575.703 1576.806 1572.006 1573.309 1573.479 1573.533 1573.570 1573.659 1573.601 1573.367 1573.225 1572.648 1572.199 1571.876 1571.899 1571.762 1572.476 1572.695 1572.039 1573.429 1574.061 1574.810 1575.477 1576.146 1576.874 1577.547 1578.347 1579.172 1580.000 1580.675 1581.237 1582.226 1582.226 1583.080 1583.924 1584.767 1585.546 1586.302 1587.003 1587.426 1587.703 1588.300 1588.967 1589.294 1590.011 1590.734 1590.720 1590.967 1591.467 1591.967 1592.467 1592.967
HORIZONTAL ALIGNMENT	
VERTICAL ALIGNMENT	
SUPERELEVATION	
CHAINAGE (KM)	6+000, 6+010, 6+020, 6+030, 6+040, 6+050, 6+060, 6+070, 6+080, 6+090, 6+100, 6+110, 6+120, 6+130, 6+140, 6+150, 6+160, 6+170, 6+180, 6+190, 6+200, 6+210, 6+220, 6+230, 6+240, 6+250, 6+260, 6+270, 6+280, 6+290, 6+300, 6+310, 6+320, 6+330, 6+340, 6+350, 6+360, 6+370, 6+380, 6+390, 6+400, 6+410, 6+420, 6+430, 6+440, 6+450, 6+460, 6+470, 6+480, 6+490, 6+500, 6+510, 6+520, 6+530, 6+540, 6+550, 6+560, 6+570, 6+580, 6+590, 6+600

Scale :-				
VER-1:200				
DATE: JULY, 2023				
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF UKHRUL - TOLAI - TADUBI SECTION OF NH-102A (115 km) IN THE STATE OF MANIPUR ON EPC MODE.

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
4, Parliament Street, New Delhi - 110001

PROFILE
Km 6+000 to 6+799 Km

UKHRUL BYPASS District:- UKHRUL

Detailed Project Report



Design chainage:- 0+000 Km to 6+799 Km

CONSULTANT : C.E. TESTING COMPANY PVT. LTD.
Engineering Consultants
As per ISO 9001, 14001 & 45001 Certified Company



DWG NO :- CET/2016/3640/NH-102A/DPR/PP-07A

HORIZONTAL ALIGNMENT REPORT



HORIZONTAL ALIGNMENT REPORT																			
HIP/CURVE NO.	DEFLECTION ANGLE			ELEMENT	START			END			LENGTH (m)	CHORD LENGTH (m)	BEARING (dd mm ss)	RADIUS (m)	HAND OF ARC	SUPERELEVATION (%)	DESIGN SPEED	EXTRA WIDENING	
	DEG	MIN	SEC		CHAINAGE (m)	EASTING	NORTHING	CHAINAGE (m)	EASTING	NORTHING									
				Start	0.000	635691.017	2773296.943	63.767	635753.824	2773307.967	63.767								
1	79	48	24.95	Transition	63.767	635753.824	2773307.967	108.767	635797.342	2773319.019		45							
				Arc	108.767	635797.342	2773319.019	203.057	635855.901	2773388.458		94.289		100	Left	7.0	50	0.9	
				Transition	203.057	635855.901	2773388.458	248.057	635859.450	2773433.217		45							
2	27	17	6.5	Straight	248.057	635859.450	2773433.217	352.710	635859.885	2773537.869	104.653			N 0°14'17.20" E					
				Transition	352.710	635859.885	2773537.869	392.710	635861.383	2773577.823		40							
				Arc	392.710	635861.383	2773577.823	447.953	635874.594	2773631.283		55.243		200	Right	7.0	60	0.6	
3	18	29	30.34	Transition	447.953	635874.594	2773631.283	487.953	635891.878	2773667.336		40							
				Arc	487.953	635891.878	2773667.336	529.844	635911.237	2773704.486		41.891			N 27°31'23.70" E				
				Transition	529.844	635911.237	2773704.486	569.844	635928.521	2773740.539		40							
4	33	11	17.69	Arc	569.844	635928.521	2773740.539	594.392	635936.215	2773763.834		24.548							
				Transition	594.392	635936.215	2773763.834	634.392	635943.803	2773803.090		40							
				Straight	634.392	635943.803	2773803.090	716.902	635956.756	2773884.577		82.510			N 9°01'53.36" E				
5	73	11	3.95	Transition	716.902	635956.756	2773884.577	761.902	635967.105	2773928.266		45							
				Arc	761.902	635967.105	2773928.266	774.826	635972.691	2773939.911		12.924							
				Transition	774.826	635972.691	2773939.911	819.826	636000.287	2773975.329		45							
6	23	43	44.67	Straight	819.826	636000.287	2773975.329	848.844	636019.786	2773996.819	29.018			N 42°13'11.04" E					
				Transition	848.844	636019.786	2773996.819	898.844	636051.500	2774035.412		50							
				Arc	898.844	636051.500	2774035.412	1065.987	636067.238	2774195.130		167.143		170	Left	7.0	60	0.6	
7	10	28	8.54	Transition	1065.987	636067.238	2774195.130	1115.987	636043.666	2774239.170		50							
				Arc	1115.987	636043.666	2774239.170	1198.785	636001.066	2774310.168		82.797			N 30°57'52.90" W				
				Transition	1198.785	636001.066	2774310.168	1233.785	635984.249	2774340.839		35							
8	75	58	30.89	Arc	1233.785	635984.249	2774340.839	1260.907	635975.386	2774366.433		27.123							
				Transition	1260.907	635975.386	2774366.433	1295.907	635969.635	2774400.936		35							
				Straight	1295.907	635969.635	2774400.936	1331.349	635965.171	2774436.095		35.442			N 7°14'08.24" W				
9	48	54	41.27	Transition	1331.349	635965.171	2774436.095	1361.349	635960.897	2774465.786		30							
				Arc	1361.349	635960.897	2774465.786	1386.164	635955.540	2774490.009		24.816							
				Transition	1386.164	635955.540	2774490.009	1416.164	635946.896	2774518.733		30							
10	10	33	43.76	Straight	1416.164	635946.896	2774518.733	1571.114	635899.774	2774666.344	154.950			N 17°42'16.78" W					
				Transition	1571.114	635899.774	2774666.344	1601.114	635892.587	2774695.415		30							
				Arc	1601.114	635892.587	2774695.415	1670.565	635915.811	2774758.258		69.451		75	Right	7.0	40	0.9	
11	20	46	7.65	Transition	1670.565	635915.811	2774758.258	1700.565	635940.177	2774775.668		30							
				Arc	1700.565	635940.177	2774775.668	1830.769	636050.921	2774844.143		130.204			N 58°16'14.11" E				
				Transition	1830.769	636050.921	2774844.143	1865.769	636079.774	2774863.901		35							
12	32	29	30.1	Arc	1865.769	636079.774	2774863.901	1937.477	636119.135	2774922.666		71.708							
				Transition	1937.477	636119.135	2774922.666	1972.477	636126.425	2774956.867		35							
				Straight	1972.477	636126.425	2774956.867	2039.885	636137.387	2775023.377		67.407			N 9°21'32.84" E				
13	10	33	43.76	Transition	2039.885	636137.387	2775023.377	2074.885	636142.270	2775058.027		35							
				Arc	2074.885	636142.270	2775058.027	2085.971	636143.059	2775069.084		11.086							
				Transition	2085.971	636143.059	2775069.084	2120.971	636143.140	2775104.077		35							
14	20	46	7.65	Straight	2120.971	636143.140	2775104.077	2144.726	636142.642	2775127.826	23.755			N 1°12'10.92" W					
				Transition	2144.726	636142.642	2775127.826	2179.726	636143.267	2775162.800		35							
				Arc	2179.726	636143.267	2775162.800	2199.099	636146.356	2775181.911		19.373							
15	32	29	30.1	Transition	2199.099	636146.356	2775181.911	2234.099	636156.780	2775215.300		35							
				Arc	2234.099	636156.780	2775215.300	2257.351	636164.567	2775237.210		23.252			N 19°33'56.73" E				
				Transition	2257.351	636164.567	2775237.210	2302.351	636176.392	2775280.523		45							
16	10	33	43.76	Arc	2302.351	636176.392	2775280.523	2314.059	636177.070	2775292.206		11.709							
				Transition	2314.059	636177.070	2775292.206	2359.059	636170.332	2775336.596		45							
				Straight	2359.059	636170.332	2775336.596												

Scale :- NTS				CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001		HORIZONTAL ALIGNMENT REPORT		CONSULTANT: C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.		DWG NO :- CET/2016/3640/NH-102A/DPR/HAR-01	
PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.		DATE: SEPT, 2023		UKHRUL BYPASS District:- UKHRUL		Detailed Project Report					
REVISIONS						Design chainage:- 0+000 Km to 6+571 Km					

HORIZONTAL ALIGNMENT REPORT																			
HIP/CURVE NO.	DEFLECTION ANGLE			ELEMENT	START			END			LENGTH (m)	CHORD LENGTH (m)	BEARING (dd mm ss)	RADIUS (m)	HAND OF ARC	SUPER ELEVATION (%)	DESIGN SPEED	EXTRA WIDENING	
	DEG	MIN	SEC		CHAINAGE (m)	EASTING	NORTHING	CHAINAGE (m)	EASTING	NORTHING									
				Straight	2359.059	636170.332	2775336.596	2408.634	636159.243	2775384.915	49.575		N 12°55'33.37" W						
13	47	29	59.44	Transition	2408.634	636159.243	2775384.915	2438.634	636150.615	2775413.592		30							
				Arc	2438.634	636150.615	2775413.592	2470.811	636131.543	2775439.201		32.177		75	Left	7.0	40	0.9	
				Transition	2470.811	636131.543	2775439.201	2500.811	636106.540	2775455.683		30							
				Straight	2500.811	636106.540	2775455.683	2608.021	636013.298	2775508.596	107.209		N 60°25'32.81" W						
14	62	27	20.06	Transition	2608.021	636013.298	2775508.596	2643.021	635983.571	2775527.030		35							
				Arc	2643.021	635983.571	2775527.030	2771.529	635922.780	2775635.810		128.508		150	Right	7.0	50	0.6	
				Transition	2771.529	635922.780	2775635.810	2806.529	635922.659	2775670.789		35							
				Straight	2806.529	635922.659	2775670.789	2917.265	635926.581	2775781.455	110.736		N 2°01'47.25" E						
15	21	12	22.49	Transition	2917.265	635926.581	2775781.455	2952.265	635926.461	2775816.434		35							
				Arc	2952.265	635926.461	2775816.434	2972.783	635923.404	2775836.706		20.518		150	Left	7.0	50	0.6	
				Transition	2972.783	635923.404	2775836.706	3007.783	635913.207	2775870.166		35							
				Straight	3007.783	635913.207	2775870.166	3028.056	635906.548	2775889.315	20.274		N 19°10'35.23" W						
16	105	7	51.86	Transition	3028.056	635906.548	2775889.315	3058.056	635898.617	2775918.192		30							
				Arc	3058.056	635898.617	2775918.192	3165.672	635952.889	2776000.534		107.616		75	Right	7.0	40	0.9	
				Transition	3165.672	635952.889	2776000.534	3195.672	635982.554	2776004.631		30							
				Straight	3195.672	635982.554	2776004.631	3237.314	636024.091	2776007.569	41.641		N 85°57'16.63" E						
17	28	11	39.45	Transition	3237.314	636024.091	2776007.569	3282.314	636068.515	2776014.082		45							
				Arc	3282.314	636068.515	2776014.082	3286.522	636072.514	2776015.392		4.208		100	Left	7.0	50	0.9	
				Transition	3286.522	636072.514	2776015.392	3331.522	636112.178	2776036.432		45							
				Straight	3331.522	636112.178	2776036.432	3352.403	636129.840	2776047.572	20.881		N 57°45'37.18" E						
18	27	31	47.3	Transition	3352.403	636129.840	2776047.572	3387.403	636160.129	2776065.067		35							
				Arc	3387.403	636160.129	2776065.067	3424.476	636195.201	2776076.785		37.073		150	Right	7.0	50	0.6	
				Transition	3424.476	636195.201	2776076.785	3459.476	636229.924	2776081.010		35							
				Straight	3459.476	636229.924	2776081.010	3478.705	636249.088	2776082.589	19.229		N 85°17'24.48" E						
19	76	21	11.57	Transition	3478.705	636249.088	2776082.589	3508.705	636278.704	2776087.030		30							
				Arc	3508.705	636278.704	2776087.030	3578.651	636328.116	2776132.926		69.946		75	Left	7.0	40	0.9	
				Transition	3578.651	636328.116	2776132.926	3608.651	636334.728	2776162.133		30							
				Straight	3608.651	636334.728	2776162.133	3718.224	636351.750	2776270.376	109.573		N 8°56'12.91" E						
20	28	10	58.12	Transition	3718.224	636351.750	2776270.376	3758.224	636356.641	2776310.058		40							
				Arc	3758.224	636356.641	2776310.058	3816.601	636351.415	2776367.992		58.377		200	Left	7.0	60	0.6	
				Transition	3816.601	636351.415	2776367.992	3856.601	636339.501	2776406.158		40							
				Straight	3856.601	636339.501	2776406.158	3873.595	636333.900	2776422.203	16.994		N 19°14'45.22" W						
21	48	15	25.26	Transition	3873.595	636333.900	2776422.203	3913.595	636321.986	2776460.369		40							
				Arc	3913.595	636321.986	2776460.369	4042.044	636332.732	2776586.163		128.449		200	Right	7.0	60	0.6	
				Transition	4042.044	636332.732	2776586.163	4082.044	636350.946	2776621.756		40							
				Straight	4082.044	636350.946	2776621.756	4138.327	636378.243	2776670.976	56.283		N 29°00'40.04" E						
22	6	46	38.86	Arc	4138.327	636378.243	2776670.976	4197.471	636409.915	2776720.885		59.144		500	Right	3.2	60	--NA--	
				Straight	4197.471	636409.915	2776720.885	4249.098	636440.106	2776762.763									
				Transition	4249.098	636440.106	2776762.763	4279.098	636455.962	2776788.168		30							
23	72	20	0.08	Arc	4279.098	636455.962	2776788.168	4343.782	636455.549	2776850.864		64.684		75	Left	7.0	40	0.9	
				Transition	4343.782	636455.549	2776850.864	4373.782	636439.359	2776876.057		30							
				Straight	4373.782	636439.359	2776876.057	4426.151	636408.175	2776918.130									
24	14	47	3.62	Transition	4426.151	636408.175	2776918.130	4461.151	636386.689	2776945.749		35							
				Arc	4461.151	636386.689	2776945.749	4490.660	636366.225	2776966.986		29.509		250	Left	6.4	60	0.6	
				Transition	4490.660	636366.225	2776966.986	4525.660	636339.423	2776989.483		35							
				Straight	4525.660	636339.423	2776989.483	4579.749	636297.193	2777023.280	54.089		N 51°19'44.81" W						

Scale :- NTS					 CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					HORIZONTAL ALIGNMENT REPORT					CONSULTANT : C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.					DWG NO :- CET/2016/3640/NH-102A/DPR/HAR-02				
DATE: SEPT, 2023					PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.					UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km					 Engineering Consultants As per ISO 9001, 14001 & 45001 Certified Company									
REVISIONS																								



HORIZONTAL ALIGNMENT REPORT																			
HIP/CURVE NO.	DEFLECTION ANGLE			ELEMENT	START			END			LENGTH (m)	CHORD LENGTH (m)	BEARING (dd mm ss)	RADIUS (m)	HAND OF ARC	SUPER ELEVATION (%)	DESIGN SPEED	EXTRA WIDENING	
	DEG	MIN	SEC		CHAINAGE (m)	EASTING	NORTHING	CHAINAGE (m)	EASTING	NORTHING									
25	60	39	51.2	Transition	4579.749	636297.193	2777023.280	4609.749	636275.110	2777043.508		30							
				Arc	4609.749	636275.110	2777043.508	4659.159	636257.724	2777088.806		49.409			75	Right	7.0	40	0.9
				Transition	4659.159	636257.724	2777088.806	4689.159	636260.603	2777118.614		30							
				Straight	4689.159	636260.603	2777118.614	4709.820	636263.955	2777139.002	20.661								
26	59	23	23.62	Transition	4709.820	636263.955	2777139.002	4739.820	636266.834	2777168.810		30							
				Arc	4739.820	636266.834	2777168.810	4787.561	636250.503	2777212.817		47.741			75	Left	7.0	40	0.9
				Transition	4787.561	636250.503	2777212.817	4817.561	636228.875	2777233.530		30							
				Straight	4817.561	636228.875	2777233.530	4998.524	636090.139	2777349.718	180.963								
27	40	58	39.1	Transition	4998.524	636090.139	2777349.718	5043.524	636057.972	2777381.043		45							
				Arc	5043.524	636057.972	2777381.043	5070.043	636044.925	2777404.042		26.519			100	Right	7.0	50	0.9
				Transition	5070.043	636044.925	2777404.042	5115.043	636034.541	2777447.723		45							
				Straight	5115.043	636034.541	2777447.723	5142.870	636030.151	2777475.202	27.827								
28	23	16	48.23	Transition	5142.870	636030.151	2777475.202	5172.870	636024.436	2777504.639		30							
				Arc	5172.870	636024.436	2777504.639	5203.817	636013.507	2777533.533		30.947			150	Left	7.0	50	0.6
				Transition	5203.817	636013.507	2777533.533	5233.817	635998.312	2777559.385		30							
				Straight	5233.817	635998.312	2777559.385	5333.012	635945.223	2777643.177	99.195								
29	17	4	24.45	Transition	5333.012	635945.223	2777643.177	5363.012	635930.027	2777669.029		30							
				Arc	5363.012	635930.027	2777669.029	5377.710	635924.093	2777682.469		14.698			150	Right	7.0	50	0.6
				Transition	5377.710	635924.093	2777682.469	5407.710	635915.229	2777711.116		30							
				Straight	5407.710	635915.229	2777711.116	5490.043	635893.526	2777790.537	82.333								
30	50	3	1.11	Transition	5490.043	635893.526	2777790.537	5520.043	635883.726	2777818.835		30							
				Arc	5520.043	635883.726	2777818.835	5555.559	635860.964	2777845.666		35.516			75	Left	7.0	40	0.9
				Transition	5555.559	635860.964	2777845.666	5585.559	635834.643	2777859.948		30							
				Straight	5585.559	635834.643	2777859.948	5631.181	635793.183	2777878.987	45.622								
31	46	33	17.54	Transition	5631.181	635793.183	2777878.987	5656.181	635771.062	2777890.576		25							
				Arc	5656.181	635771.062	2777890.576	5696.184	635744.544	2777919.969		40.003			80	Right	7.0	40	0.9
				Transition	5696.184	635744.544	2777919.969	5721.184	635735.285	2777943.162		25							
				Straight	5721.184	635735.285	2777943.162	5738.593	635729.681	2777959.644	17.409								
32	41	33	24.67	Transition	5738.593	635729.681	2777959.644	5768.593	635718.174	2777987.291		30							
				Arc	5768.593	635718.174	2777987.291	5792.990	635702.704	2778006.019		24.398			75	Left	7.0	40	0.9
				Transition	5792.990	635702.704	2778006.019	5822.990	635677.727	2778022.540		30							
				Straight	5822.990	635677.727	2778022.540	5897.121	635613.312	2778059.227	74.130								
33	18	24	19.17	Transition	5897.121	635613.312	2778059.227	5932.121	635582.267	2778075.344		35							
				Arc	5932.121	635582.267	2778075.344	5945.306	635569.918	2778079.952		13.185			150	Left	7.0	50	0.6
				Transition	5945.306	635569.918	2778079.952	5980.306	635535.904	2778088.109		35							
				Straight	5980.306	635535.904	2778088.109	5984.739	635531.556	2778088.975	4.433								
34	61	0	24.12	Transition	5984.739	635531.556	2778088.975	6014.739	635502.640	2778096.764		30							
				Arc	6014.739	635502.640	2778096.764	6064.596	635466.131	2778129.363		49.858			75	Right	7.0	40	0.9
				Transition	6064.596	635466.131	2778129.363	6094.596	635455.130	2778157.216		30							
				Straight	6094.596	635455.130	2778157.216	6144.576	635439.905	2778204.821	49.980								
35	62	0	23.18	Transition	6144.576	635439.905	2778204.821	6174.576	635428.904	2778232.673		30							
				Arc	6174.576	635428.904	2778232.673	6225.742	635391.184	2778265.767		51.166			75	Left	7.0	40	0.9
				Transition	6225.742	635391.184	2778265.767	6255.742	635362.136	2778273.051		30							
				Straight	6255.742	635362.136	2778273.051	6352.560	635266.866	2778290.294	96.818								
36	45	48	26.13	Transition	6352.560	635266.866	2778290.294	6372.560	635247.250	2778294.183		20							
				Arc	6372.560	635247.250	2778294.183	6512.458	635132.512	2778369.158		139.897			200	Right	5.6	50	0.6
				Transition	6512.458	635132.512	2778369.158	6532.458	635121.073	2778385.562		20							
				Straight	6532.458	635121.073	2778385.562	6571.048	635099.531	2778417.579	38.590								

Scale :- NTS					 CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					HORIZONTAL ALIGNMENT REPORT UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km					CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.					DWG NO :- CET/2016/3640/NH-102A/DPR/HAR-03				
MKD. DATE DESCRIPTION CHKD. APPRD. DATE: SEPT, 2023 REVISIONS					PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.																			

VERTICAL ALIGNMENT REPORT



VERTICAL CURVE REPORT

CURVE NO.	IP		TYPE OF CURVE	CURVE LENGTH	M VALUE	START		END		GRADIENT		K' VALUE
	CHAINAGE	LEVEL				CHAINAGE	LEVEL	CHAINAGE	LEVEL	IN	OUT	
1	658.104	1691.564	Hog	150	-0.708	583.104	1692.106	733.104	1688.189	-0.723	-4.500	39.714
2	1249.407	1664.956	Sag	220	1.365	1139.407	1669.906	1359.407	1665.464	-4.500	0.462	44.337
3	1968.964	1668.283	Hog	200	-1.241	1868.964	1667.821	2068.964	1663.783	0.462	-4.500	40.306
4	2838.000	1629.176	Sag	200	1.164	2738.000	1633.676	2938.000	1629.334	-4.500	0.158	42.937
5	3226.454	1629.789	Hog	100	-0.311	3176.454	1629.710	3276.454	1628.624	0.158	-2.330	40.193
6	3544.000	1622.390	Sag	100	0.291	3494.000	1623.555	3594.000	1622.390	-2.330	0.000	42.918
7	3915.654	1622.390	Hog	200	-1.000	3815.654	1622.390	4015.654	1618.390	0.000	-4.000	50.000
8	4761.000	1588.576	Sag	150	0.750	4686.000	1591.576	4836.000	1588.576	-4.000	0.000	37.500
9	5051.000	1588.576	Hog	150	-0.750	4976.000	1588.576	5126.000	1585.576	0.000	-4.000	37.500
10	5846.104	1556.772	Sag	350	3.937	5671.104	1563.772	6021.104	1565.522	-4.000	5.000	38.889

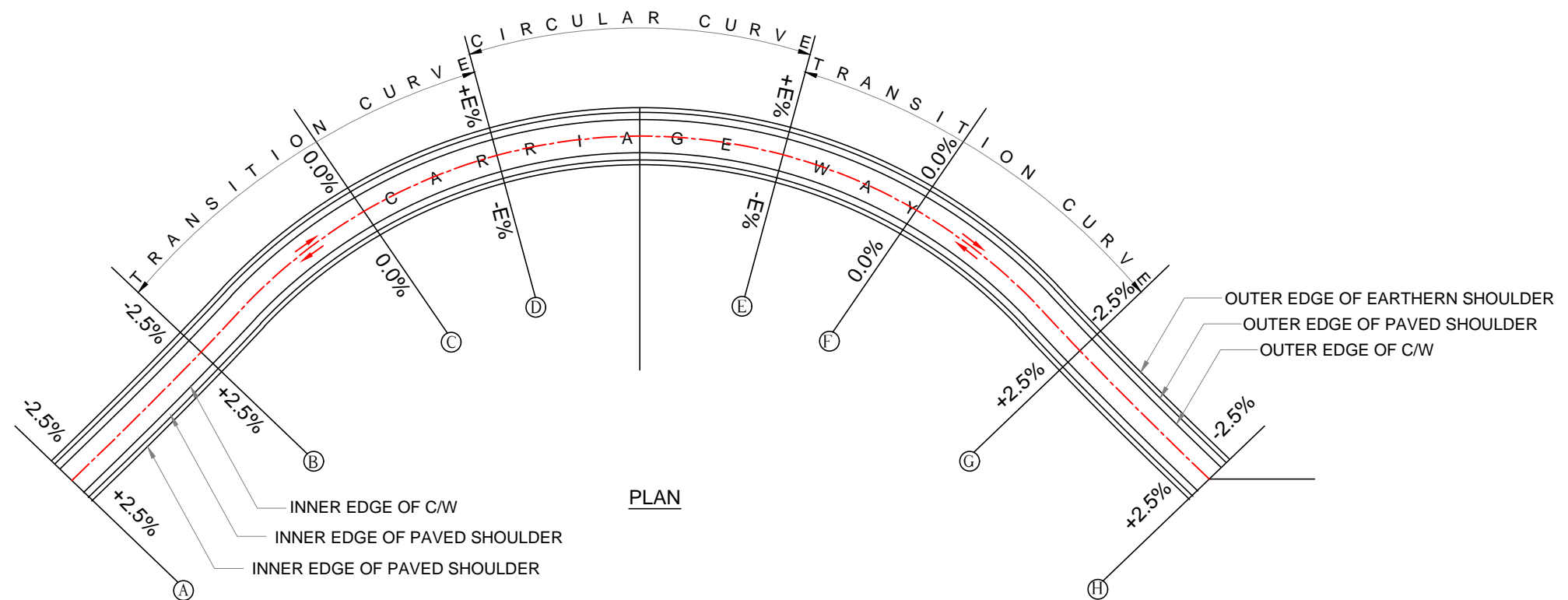
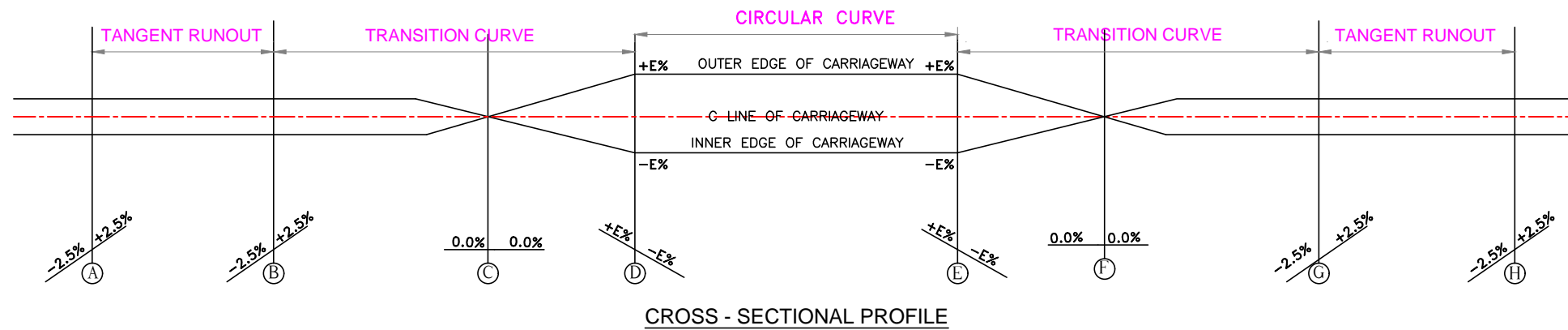
Scale :- NTS						CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	VERTICAL CURVE REPORT		CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/DPR/VAR-01
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.			PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.	UKHRUL BYPASS		
REVISIONS					DATE: SEPT, 2023	Detailed Project Report				
						Design chainage:- 0+000 Km to 6+799 Km				

CURVE DETAIL REPORT

CURVE DETAILS												
HIP NO.	CHAINAGE			HIP COORDINATES		RADIUS	DEFLECTION	Ls (M)	Lc (M)	e (%)	HAND OF ARC	DESIGN SPEED
	PC/SC	HIP/PI	PT/CS	NORTHING	EASTING							
1	0+108.767	0+170.557	0+203.057	2773326.428	635859.006	100	79°48'24.95"	45	94.289	7.0	Left	50
2	0+392.710	0+421.326	0+447.953	2773606.485	635860.170	200	27°17'06.50"	40	55.243	7.0	Right	60
3	0+569.844	0+582.448	0+594.392	2773751.137	635935.546	200	18°29'30.34"	40	24.548	7.0	Left	60
4	0+761.902	0+769.415	0+774.826	2773936.439	635964.999	100	33°11'17.69"	45	12.924	7.0	Right	50
5	0+898.844	1+000.498	1+065.987	2774109.129	636121.694	170	73°11'03.95"	50	167.143	7.0	Left	60
6	1+233.785	1+247.861	1+260.907	2774352.250	635975.816	150	23°43'44.67"	35	27.123	7.0	Right	50
7	1+361.349	1+373.843	1+386.164	2774478.251	635959.819	300	10°28'08.54"	30	24.816	5.3	Left	60
8	1+601.114	1+645.054	1+670.565	2774736.782	635877.288	75	75°58'30.89"	30	69.451	7.0	Right	40
9	1+865.769	1+905.292	1+937.477	2774883.336	636114.306	125	48°54'41.27"	35	71.708	7.0	Left	50
10	2+074.885	2+080.509	2+085.971	2775063.461	636143.993	250	10°33'43.76"	35	11.086	6.4	Left	60
11	2+179.726	2+189.768	2+199.099	2775172.859	636141.696	150	20°46'07.65"	35	19.373	7.0	Right	50
12	2+302.351	2+309.198	2+314.059	2775286.063	636181.930	100	32°29'30.10"	45	11.709	7.0	Left	50
13	2+438.634	2+456.835	2+470.811	2775431.894	636148.461	75	47°29'59.44"	30	32.177	7.0	Left	40
14	2+643.021	2+716.662	2+771.529	2775562.216	635918.811	150	62°27'20.06"	35	128.508	7.0	Right	50
15	2+952.265	2+962.901	2+972.783	2775827.062	635928.198	150	21°12'22.49"	35	20.518	7.0	Left	50
16	3+058.056	3+141.662	3+165.672	2775996.617	635869.231	75	105°07'51.86"	30	107.616	7.0	Right	40
17	3+282.314	3+285.100	3+286.522	2776010.940	636071.759	100	28°11'39.45"	45	4.208	7.0	Left	50
18	3+387.403	3+406.725	3+424.476	2776076.550	636175.786	150	27°31'47.30"	35	37.073	7.0	Right	50
19	3+508.705	3+553.047	3+578.651	2776088.694	636323.179	75	76°21'11.57"	30	69.946	7.0	Left	40
20	3+758.224	3+788.506	3+816.601	2776339.805	636362.668	200	28°10'58.12"	40	58.377	7.0	Left	60
21	3+913.595	3+983.321	4+042.044	2776525.797	636297.731	200	48°15'25.26"	40	128.449	7.0	Right	60
22	4+138.327	4+167.934	4+197.471	2776696.868	636392.601	500	6°46'38.86"	--NA--	59.144	3.2	Right	60
23	4+279.098	4+319.268	4+343.782	2776819.684	636481.141	75	72°20'00.08"	30	64.684	7.0	Left	40
24	4+461.151	4+476.110	4+490.660	2776958.266	636378.428	250	14°47'03.62"	35	29.509	6.4	Left	60
25	4+609.749	4+638.904	4+659.159	2777060.243	636251.008	75	60°39'51.20"	30	49.409	7.0	Right	40
26	4+739.820	4+767.855	4+787.561	2777196.269	636273.368	75	59°23'23.62"	30	47.741	7.0	Left	40
27	5+043.524	5+058.667	5+070.043	2777388.334	636044.029	100	40°58'39.10"	45	26.519	7.0	Right	50
28	5+172.870	5+188.816	5+203.817	2777520.573	636022.902	150	23°16'48.23"	30	30.947	7.0	Left	50
29	5+363.012	5+370.560	5+377.710	2777674.896	635925.127	150	17°04'24.45"	30	14.698	7.0	Right	50
30	5+520.043	5+540.270	5+555.559	2777838.987	635880.286	75	50°03'01.11"	30	35.516	7.0	Left	40
31	5+656.181	5+678.227	5+696.184	2777898.620	635750.430	80	46°33'17.54"	25	40.003	7.0	Right	40
32	5+768.593	5+782.219	5+792.990	2778000.948	635715.636	75	41°33'24.67"	30	24.398	7.0	Left	40
33	5+932.121	5+938.970	5+945.306	2778079.939	635576.947	150	18°24'19.17"	35	13.185	7.0	Left	50
34	6+014.739	6+044.197	6+064.596	2778100.583	635473.241	75	61°00'24.12"	30	49.858	7.0	Right	40
35	6+174.576	6+204.927	6+225.742	2778262.303	635421.522	75	62°00'23.18"	30	51.166	7.0	Left	40
36	6+372.560	6+447.093	6+512.458	2778307.130	635173.845	200	45°48'26.13"	20	139.897	5.6	Right	50

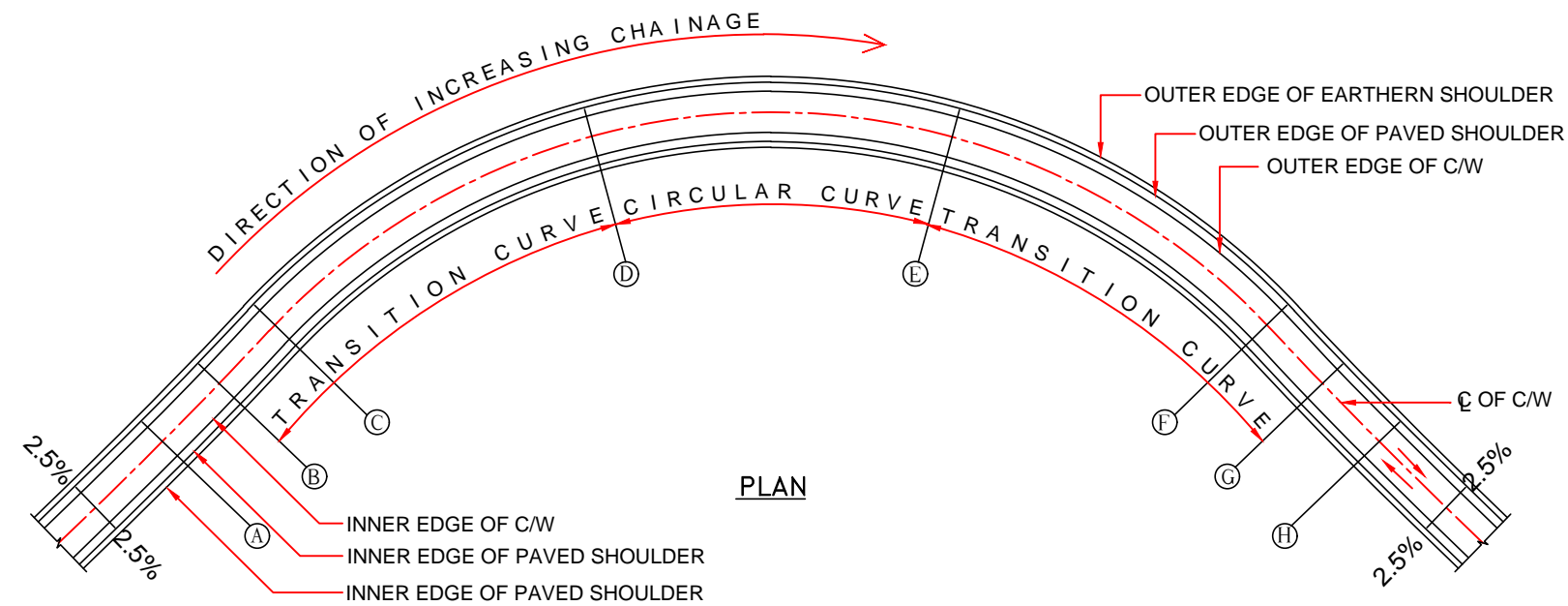
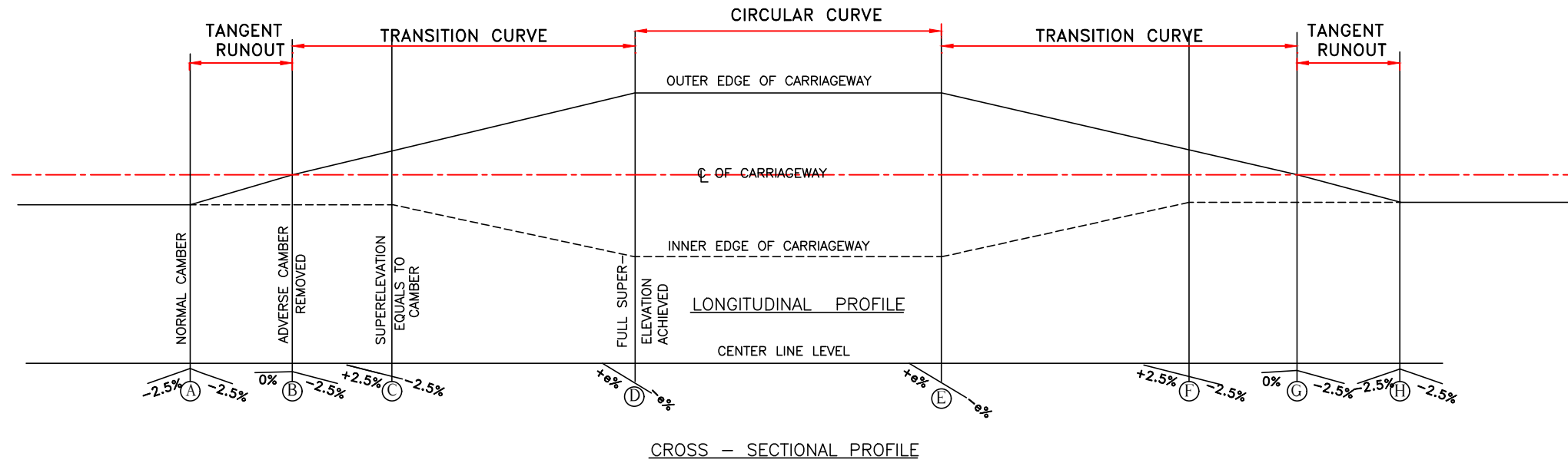
Scale :- NTS					 CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001		CURVE DETAILS		CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.		DWG NO :- CET/2016/3640/NH-102A/DPR/CD-01	
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.		UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km					
REVISIONS												

MISCELLANEOUS DRAWING



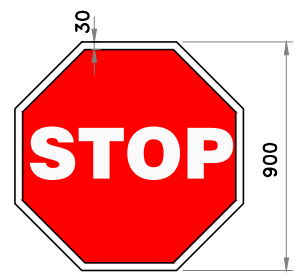
**TYPICAL DETAILS OF SUPERELEVATION ATTAINMENT FOR A SIMPLE CIRCULAR CURVE
(WITH TRANSITION)**

	Scale :- NTS	 CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	DETAILS OF CURVE COMPONENT	CONSULTANT : C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/ DPR /M2
REVISIONS	DATE: SEPT, 2023	PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.	UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km		



**TYPICAL DETAILS OF SUPERELEVATION ATTAINMENT FOR A CIRCULAR CURVE WITH TRANSITION CURVE
(ROTATION ABOUT CARRIAGEWAY CENTRE LINE FOR THROUGH CUTTING)**

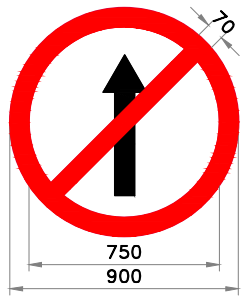
	Scale :- NTS	 CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	DETAILS OF CURVE COMPONENT	CONSULTANT : C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/ DPR /M1
REVISIONS	DATE: SEPT, 2023	PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.	UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km		



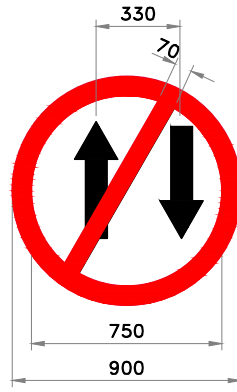
MS - 1
STOP SIGNAL



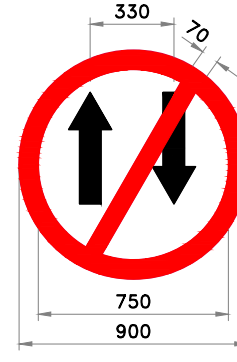
MS - 2
GIVE WAY SIGN



MS - 3
NO ENTRY



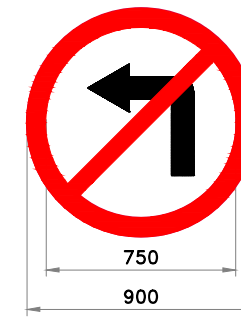
MS - 4
ONE WAY SIGNS



MS - 5



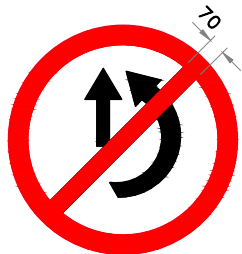
MS - 6
RIGHT TURN PROHIBITED



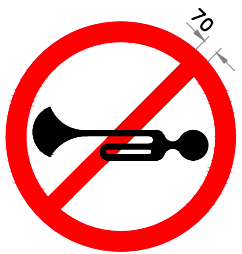
MS - 7
LEFT TURN PROHIBITED



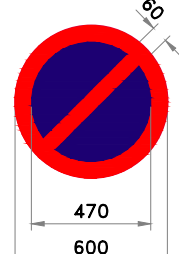
MS - 8
U - TURN PROHIBITED



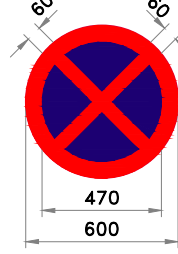
MS - 9
OVERTAKING PROHIBITED



MS - 10
HORN PROHIBITED



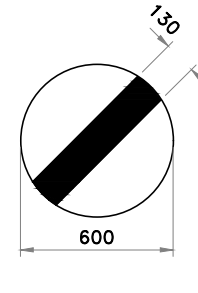
MS - 11
NO PARKING



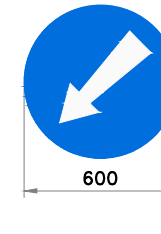
MS - 12
NO STOPPING
OR STANDING



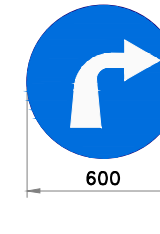
MS - 13
SPEED LIMIT



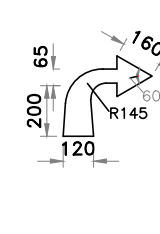
MS - 14
RESTRICTION END



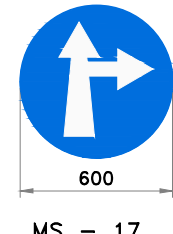
MS - 15
COMPULSORY
KEEP LEFT



MS - 16
COMPULSORY TURN
RIGHT AHEAD



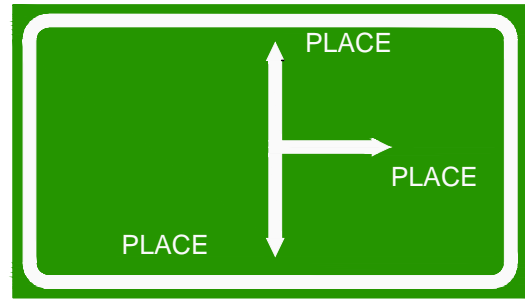
MS - 16
COMPULSORY TURN
LEFT AHEAD



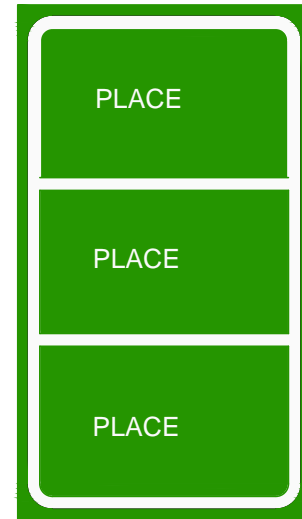
MS - 17
COMPULSORY AHEAD
OR TURN RIGHT



MS - 19
COMPULSORY AHEAD
OR TURN LEFT



IS - 1
ADVANCE DIRECTION SIGN



IS - 2
REASSURANCE SIGN



IS - 3
PLACE IDENTIFICATION SIGN



IS - 4
PLACE IDENTIFICATION SIGN

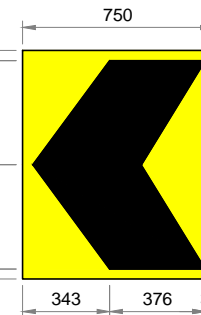
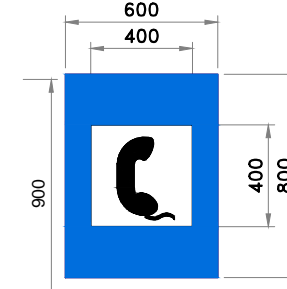
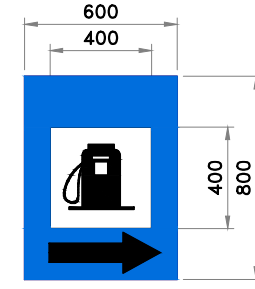


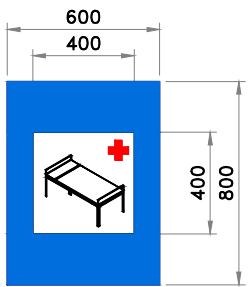
Fig. 15.72
CHEVRON SIGN



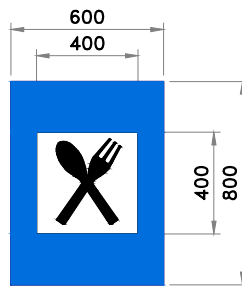
IS - 5
PUBLIC TELEPHONE



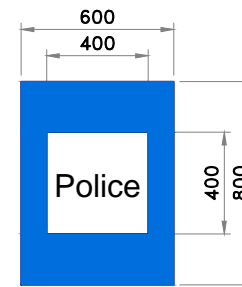
IS - 6
FILLING STATION



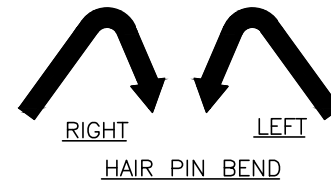
IS - 7
HOSPITAL



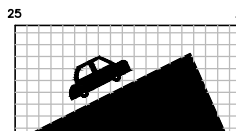
IS - 8
EATING PLACE



IS - 9
POLICE STATION



RIGHT LEFT
HAIR PIN BEND



STEEP ASCENT



STEEP DESCENT

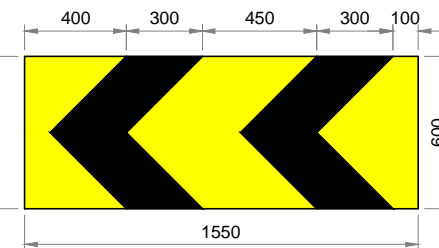
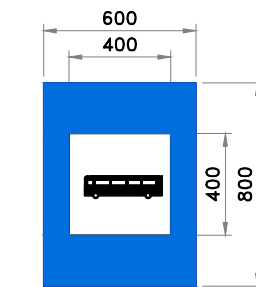
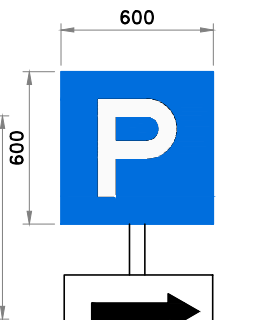


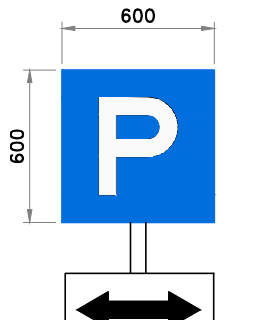
Fig. 15.74
DOUBLE CHEVRON



IS - 11
BUS STOP



IS - 12
PARKING THIS SIDE

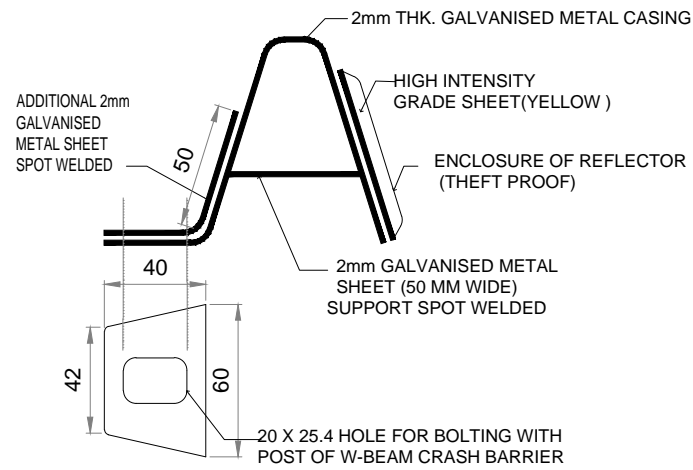


IS - 13
PARKING BOTH SIDE

NOTE:

1. ALL DIMENSIONS ARE IN MM UNLESS AND OTHERWISE SPECIFIED.
2. FOR DETAILS OF ROAD SIGN REFER IRC: 67-2012.

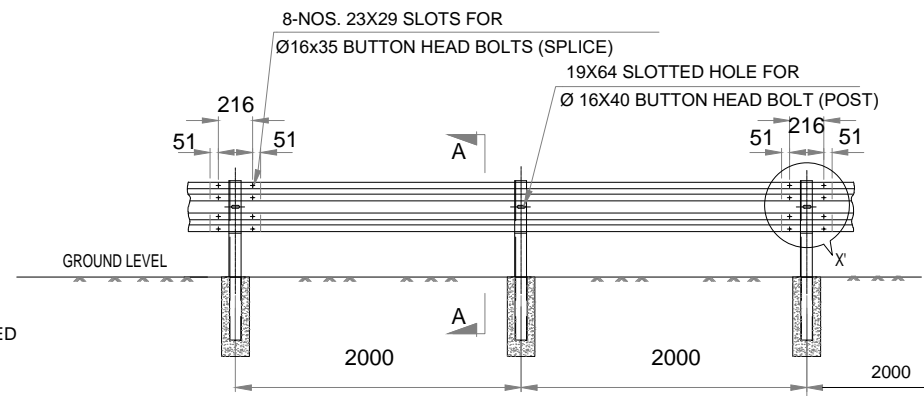
Scale :- NTS					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					CONSULTANT : CETEST Engineering Consultants An ISO 9001, 14001 & 45001 Certified Company					C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.					DWG NO :- CET/2016/3640/NH-102A/ DPR /M3				
PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.					TYPICAL DETAILS OF ROAD SIGNS					UKHRUL BYPASS District:- UKHRUL					Detailed Project Report					Design chainage:- 0+000 Km to 6+571 Km				
DATE: SEPT, 2023																								
REVISIONS																								



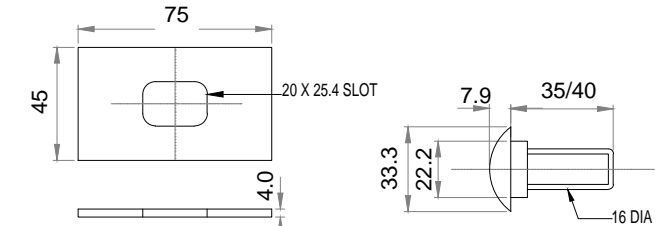
GUARD RAIL REFLECTOR

SHAPE : Equilateral Trapezium
 DIMENSIONS :
 FRONT CASING
 Top: 95 mm
 Bottom: 70 mm
 Height: 80 mm
 REFLECTIVE PORTION
 Top: 70 mm
 Bottom: 50 mm
 Height: 50 mm

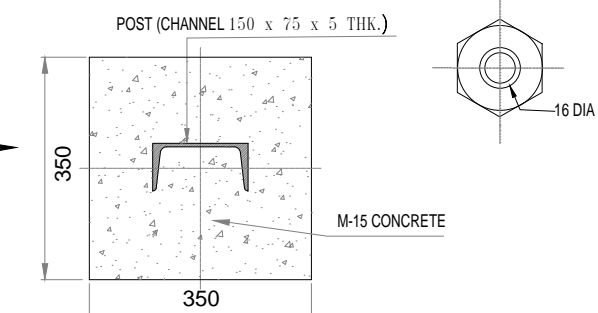
GUARD RAIL REFLECTOR WILL BE BOLTED REPLACING SPLICE WASHER EVERY 10 POSTS INTERVAL



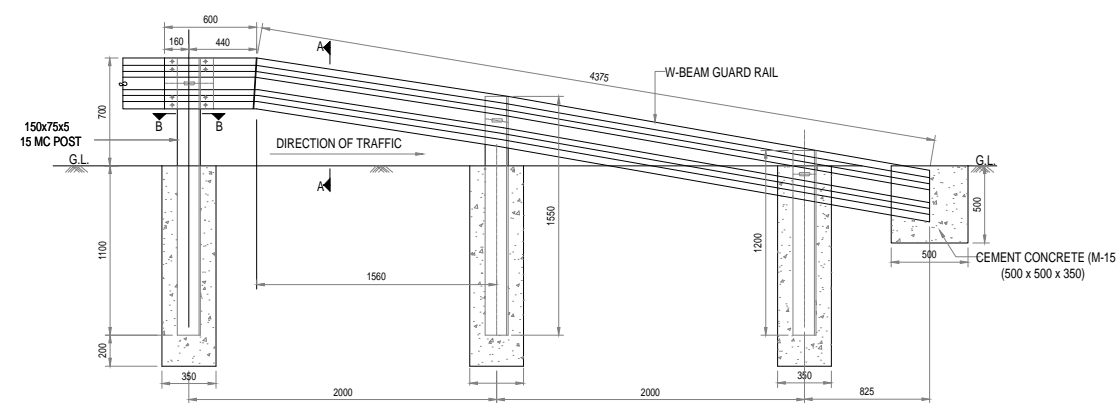
ELEVATION OF SINGLE SIDED GUARD RAIL



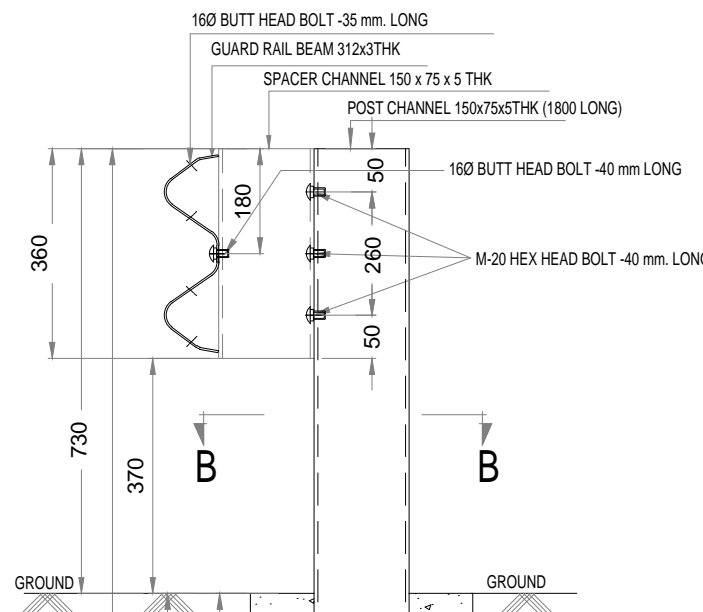
SPLICE WASHER



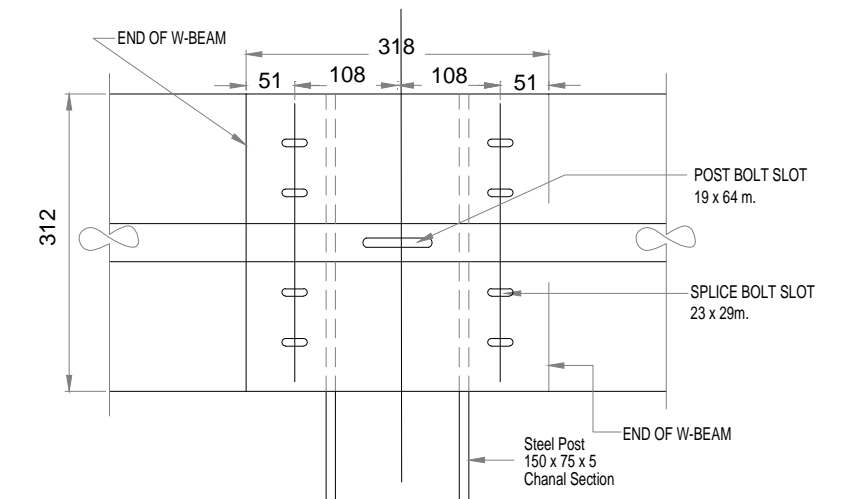
SECTION 'B-B'



ELEVATION SHOWING SINGLE SIDED GAURD RAIL SYSTEM - END SIDE ARRANGEMENT



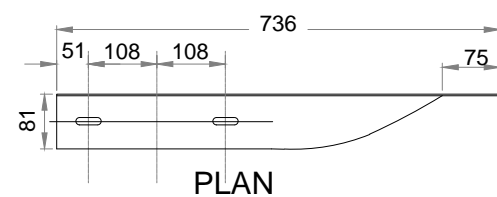
CROSS SECTION A-A



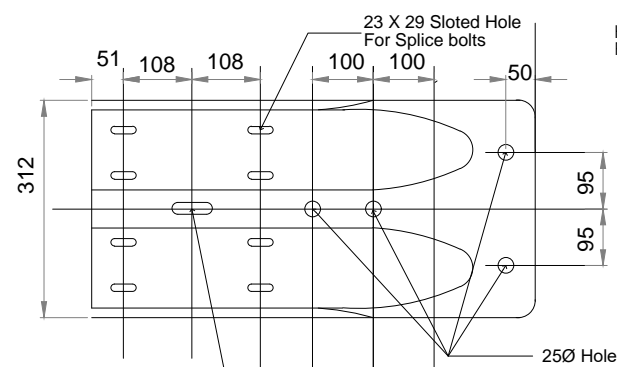
DETAILS OF 'X'

NOTES :

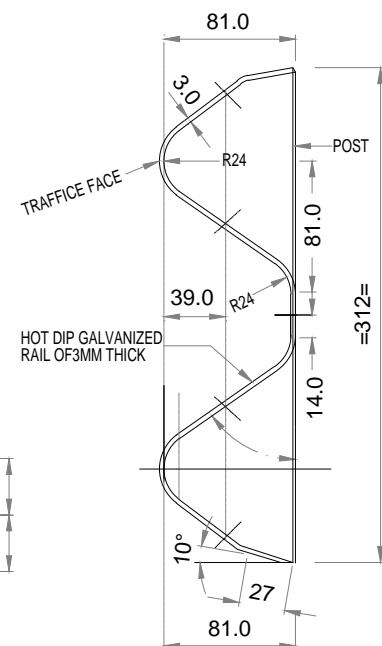
01. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.
02. ALL PUNCHING DIMENSIONS UNLESS OTHERWISE STATED = ± 1mm.
03. WELDING ELECTRODES SHALL CONFORM TO IS:314.
04. FOR GUARD RAIL BEAMS, POSTS & SPACER MATERIAL SHALL CONFORM TO IS:10748, GRADE-II. IS 808, IS 2062
05. BOLTS,NUTS & WASHERS SHALL BE ELECTRO GALVANISED.
06. GUARD RAIL, POSTS, SPACERS, FOUNDATION BOLTS SHALL BE HOT DIP GALVANISED.
07. THE OVER LAPPING OF THE GAURD RAIL BEAM SHALL BE ACHIEVED USING SUITABLE SIZE WASHERS.
08. GUARD RAILS ARE TO BE PROVIDED WHEREVER:-
 a) HEIGHT OF THE EMBANKMENT IS MORE THAN 3M
 b) OUTER SIDE OF SUPERELEVATED SECTION, UNDERPASS,PIER OBSTRUCTION AND BOTH SIDES OF BRIDGE APPROACHES.
09. ALL FITTINGS TO CONFORM TO IS : 1367 AND IS : 1364
10. W-BEAM GUARDRAIL ARE TO BE FABRICATED AND INSTALLED AS PER SECTION 810 OF MORT&H'S SPECIFICATION FOR METAL BEAM CRASH BARRIER.



PLAN



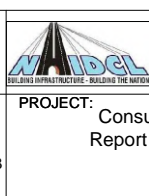
ELEVATION OF W BEAM END SECTION (FLARED)



TYPICAL CROSS SECTION OF W-BEAM

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

Scale :-
NTS
DATE:
SEPT, 2023

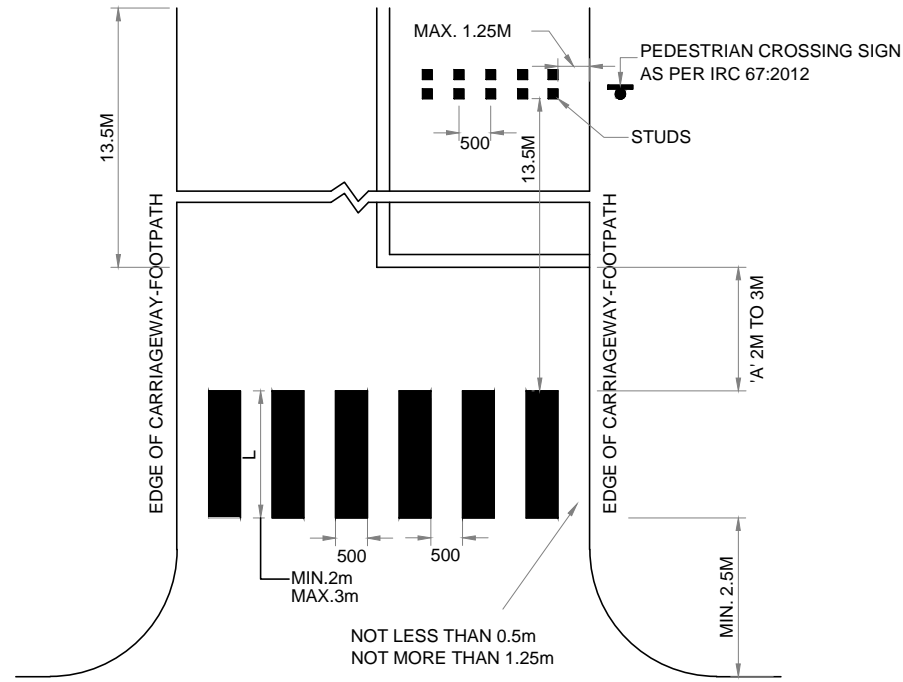


CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
 4, Parliament Street,
 New Delhi - 110001
 PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

DETAILS OF W-BEAM METAL CRASH BARRIER
 UKHRUL BYPASS District:- UKHRUL
 Detailed Project Report
 Design chainage:- 0+000 Km to 6+571 Km

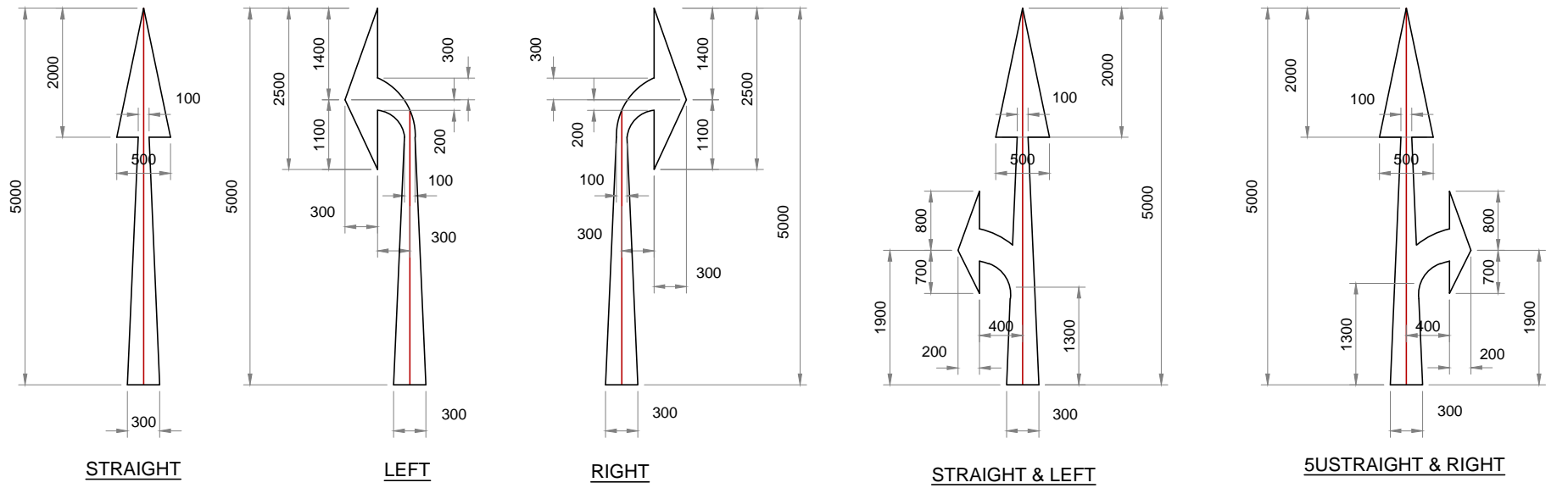
CONSULTANT :
CETEST
 Engineering Consultants
 An ISO 9001, 14001 & 45001 Certified Company
 C.E. TESTING COMPANY PVT. LTD.
 124-A, N.S.C. Bose Road
 Kolkata - 700092.

DWG NO :- CET/2016/3640/NH-102A/ DPR /M9



DETAILS OF PEDESTRIAN CROSSING MARKING

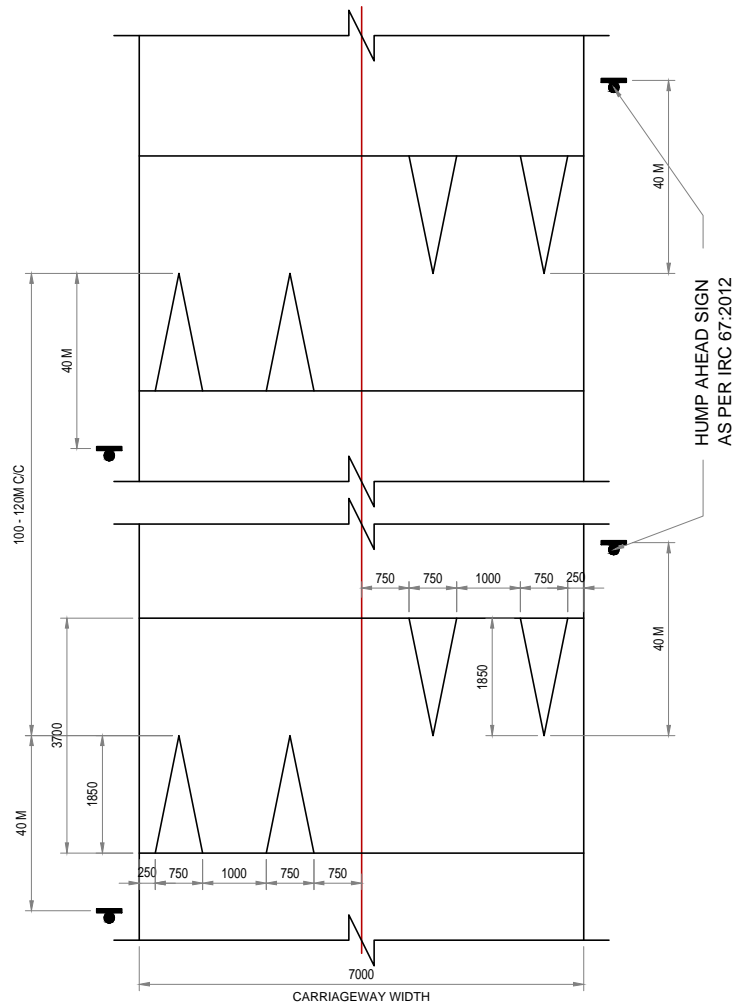
SCALE=1:80



ARROW MARKINGS FOR ROUTE DIRECTION FOR DESIGN SPEED

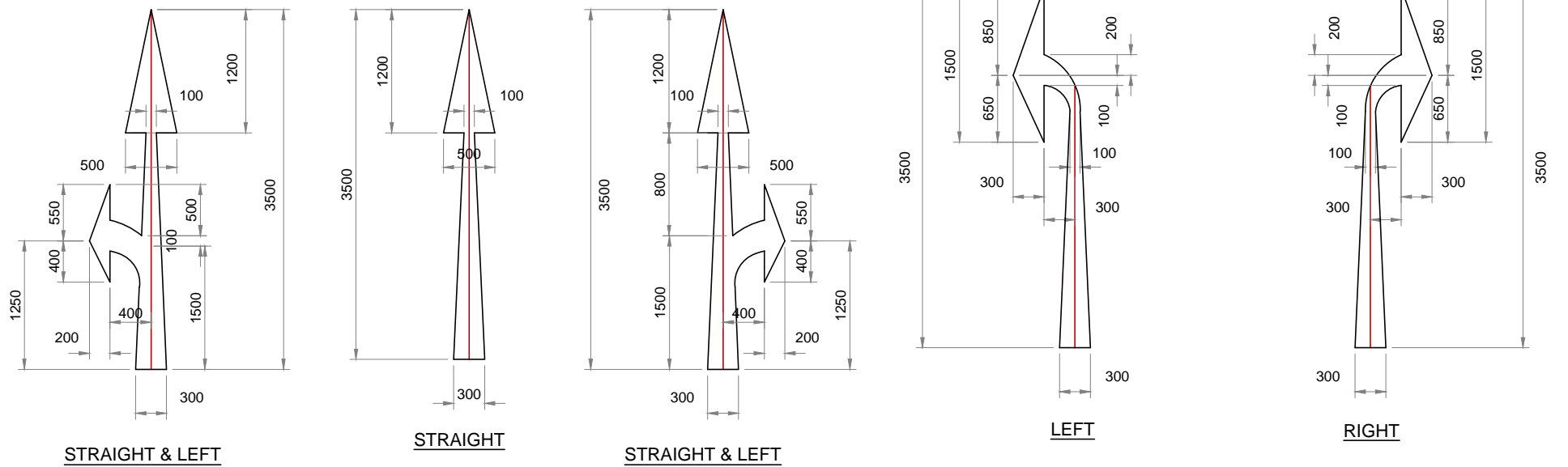
MORE THAN 50 Km/Hr

SCALE=1:60



DETAILS OF SPEED BREAKERS MARKING

SCALE=1:80



ARROW MARKINGS FOR ROUTE DIRECTION FOR DESIGN SPEED



OF 50 Km/Hr. OR LESS

SCALE=1:60

NOTE:

- 1: ALL DIMENSIONS ARE IN MM.
- 2: ALL DIMENSIONS SHOULD


IRC CODE NO. IRC :35-2015

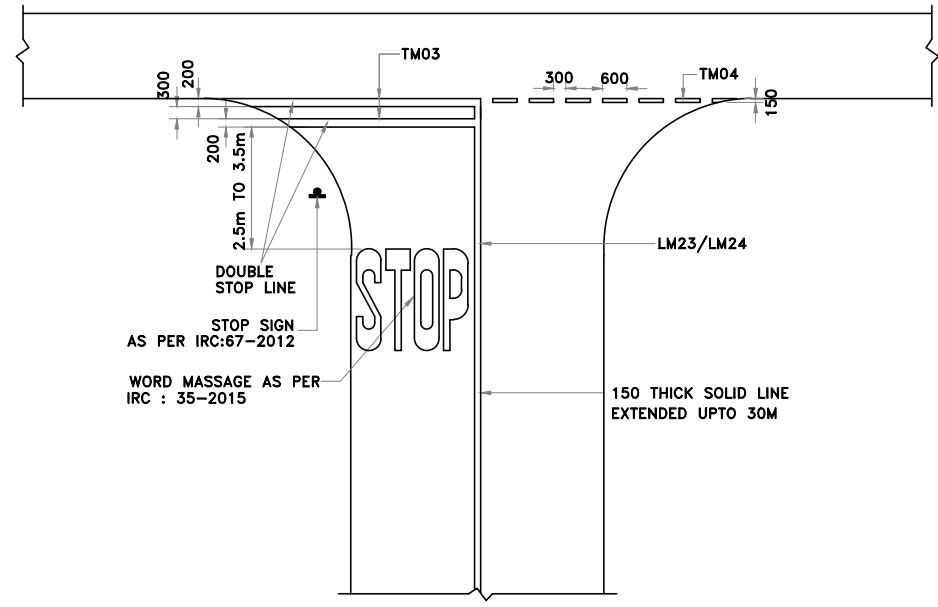
Scale :- NTS						CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	PAVEMENT MARKING	CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/ DPR /M7
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.					
REVISIONS					DATE: SEPT, 2023				



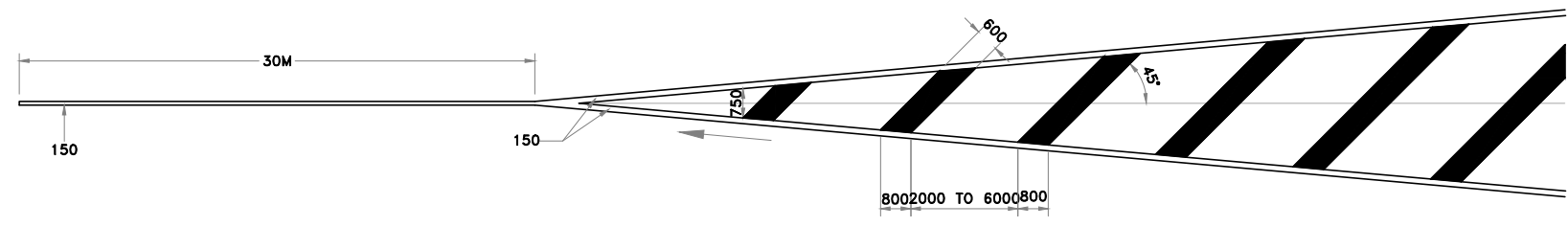
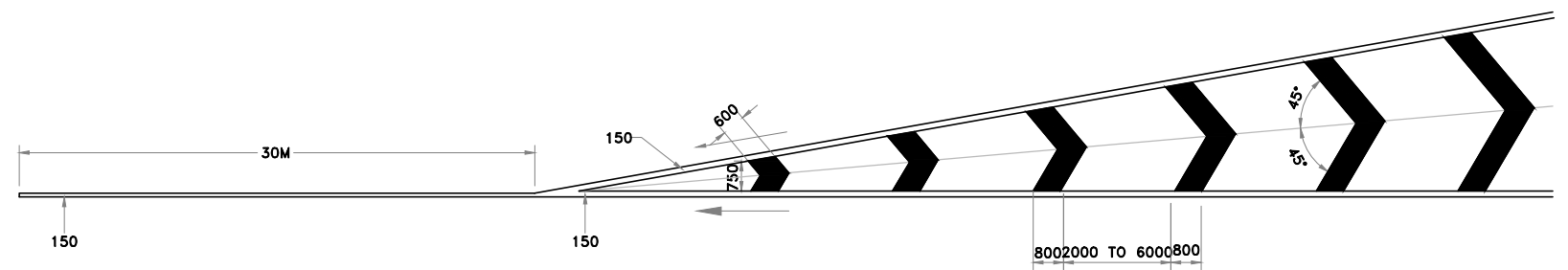
NOTE:

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE SPECIFIDE
2. FOR DETAILS OF ROAD SIGN REFER IRC-67:2012

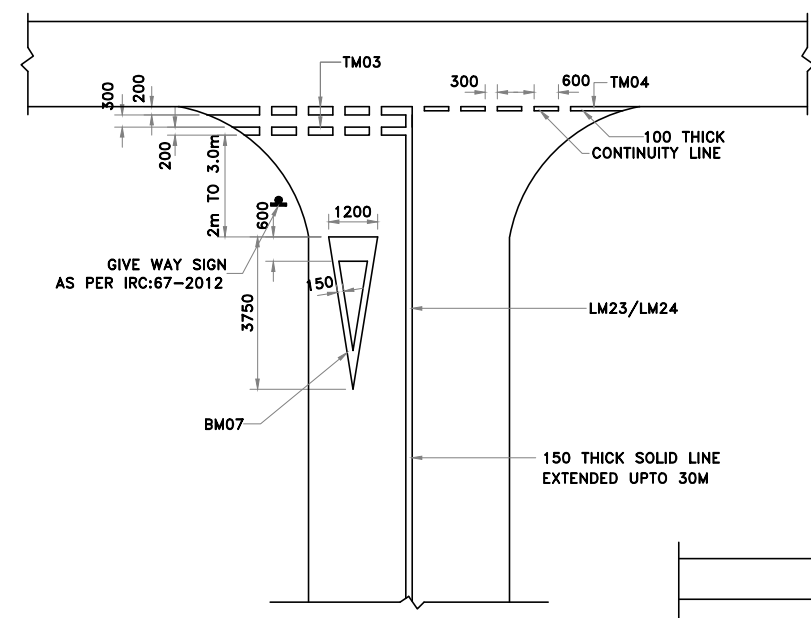
					Scale :- NTS		CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	TYPICAL DETAILS OF ROAD SIGNS		CONSULTANT : CETEST Engineering Consultants An ISO 9001, 14001 & 45001 Certified Company	DWG NO :- CET/2016/3640/NH-102A/ DPR /M4 124-A, N.S.C. Bose Road Kolkata - 700092.
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	DATE: SEPT, 2023		PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.	UKHRUL BYPASS District:- UKHRUL	Detailed Project Report		
REVISIONS								Design chainage:- 0+000 Km to 6+571 Km			



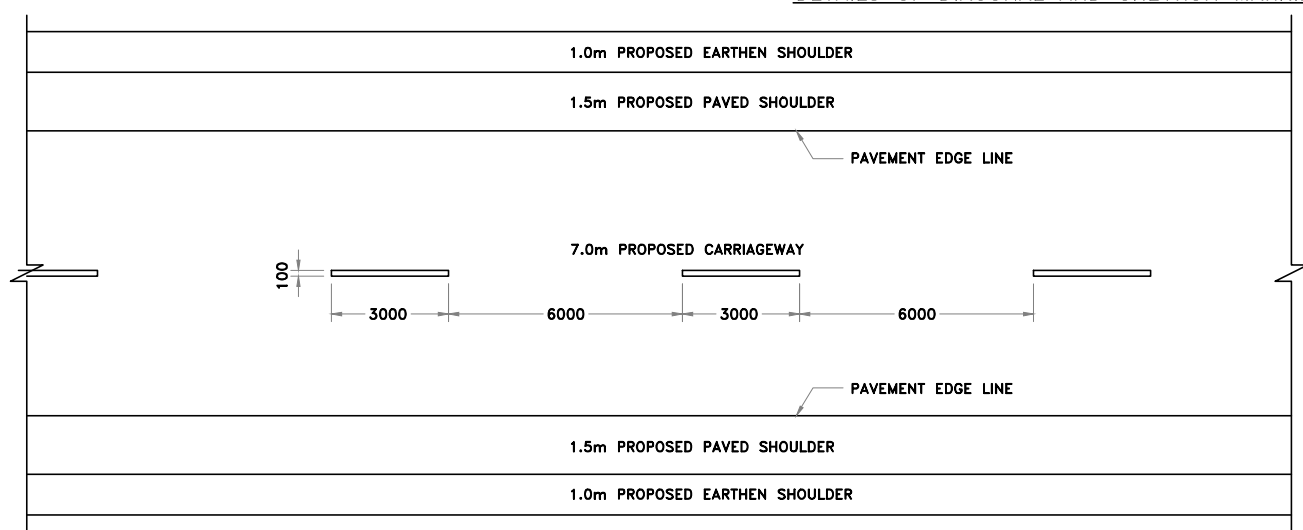
STOP LINES



DETAILS OF DIAGONAL AND CHEVRON MARKINGS





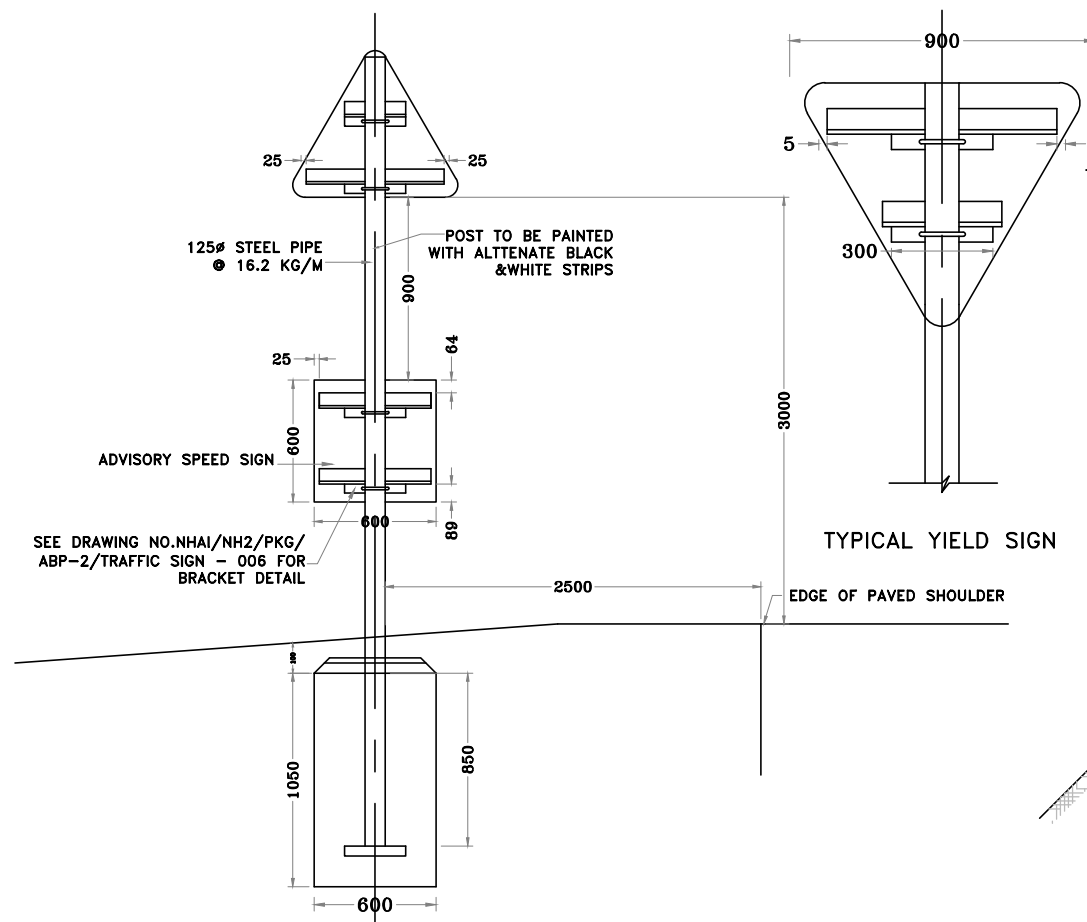
GIVEWAY LINES



CENTERLINE MARKING FOR A TWO LANE ROAD WITH EARTHEN SHOULDER

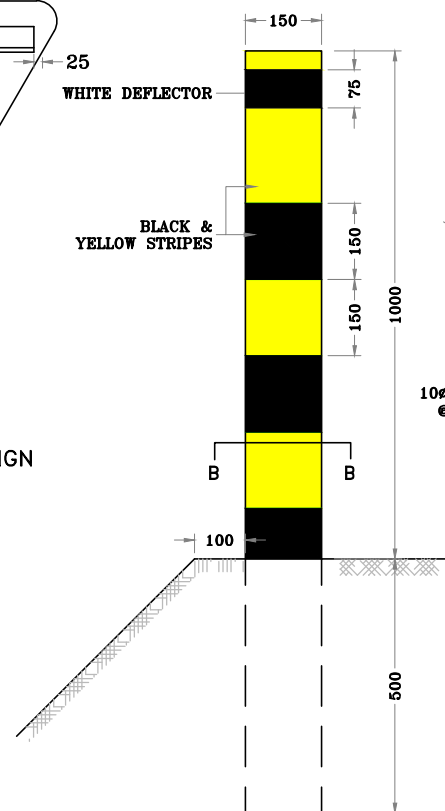
NOTE:
 1: ALL DIMENSIONS ARE IN MM.
 2: ALL DIMENSIONS SHOULD FOLLOW RELEVANT IRC CODE NO. IRC :35-2015

Scale :- NTS					 CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	PAVEMENT MARKING UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km	CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/ DPR /M6
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.				
REVISIONS								

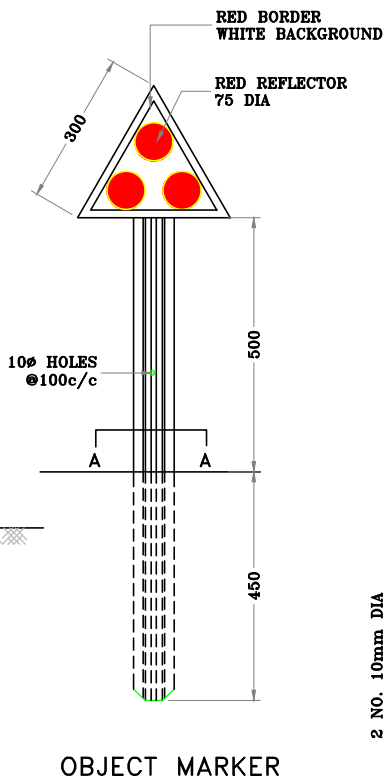


TYPICAL WARNING SIGN
SCALE 1:20

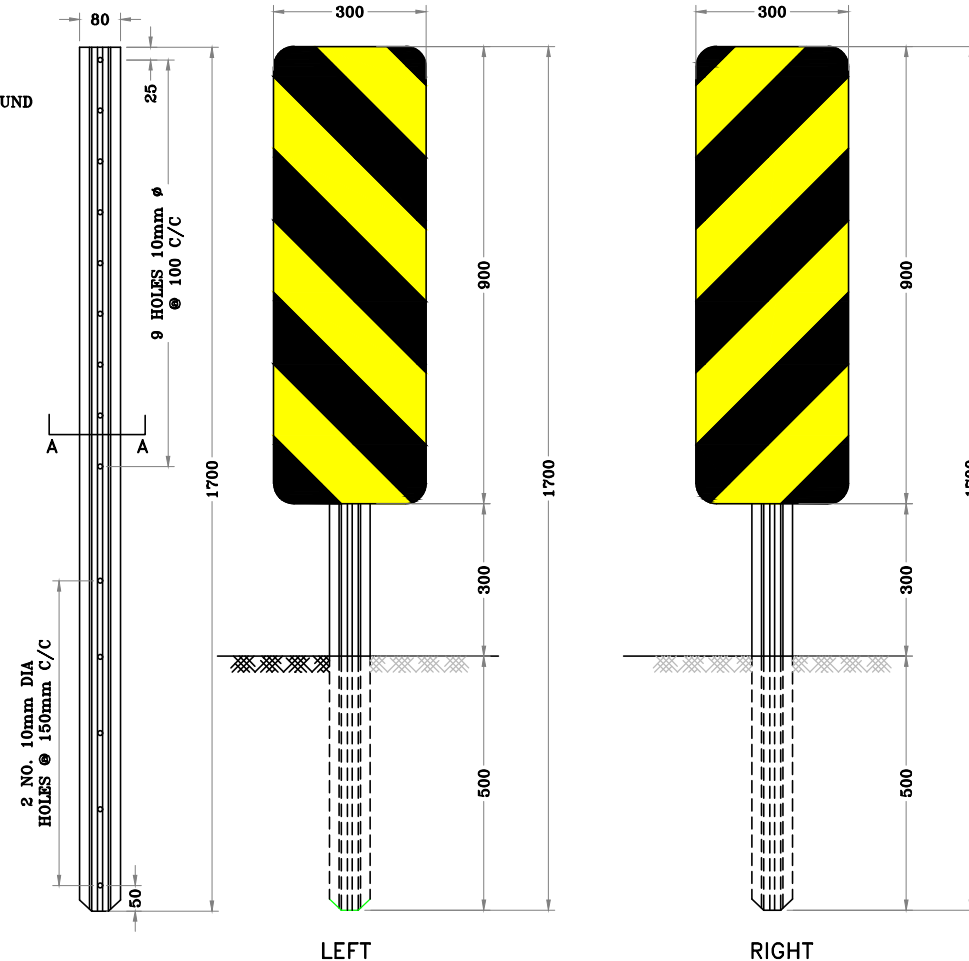
TYPICAL YIELD SIGN



ROADWAY INDICATORS
(TO BE INSTALLED AT 50M/C/C ON BOTH EDGES OF ROAD WAY ON EMBANKMENT HEIGHT LESS THAN 3M AND AT CARRIAGE WAY TRANSITION)
SCALE 1:10

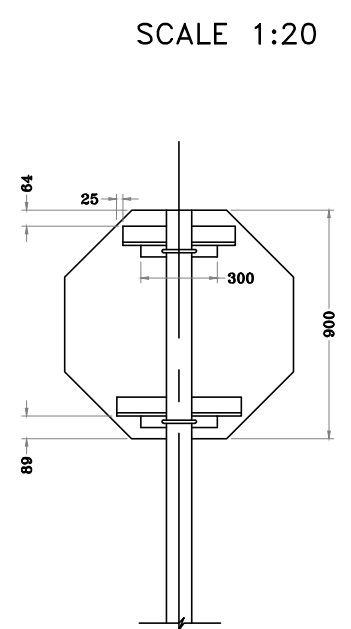


OBJECT MARKER

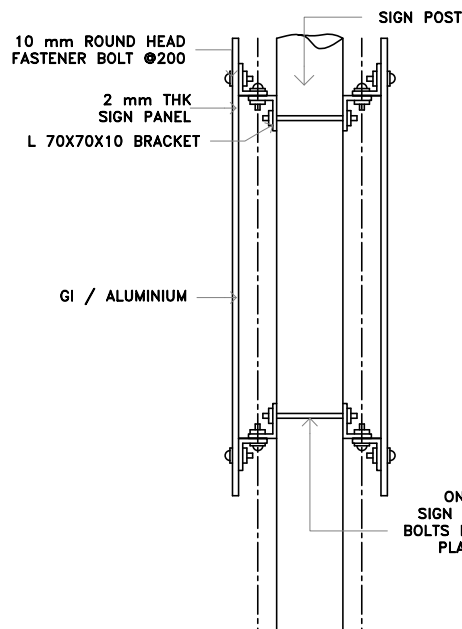


GALVANISED STEEL POST
(1700 FOR HAZARD MARKER & 1200 FOR OBJECT MARKER)
SCALE 1:10

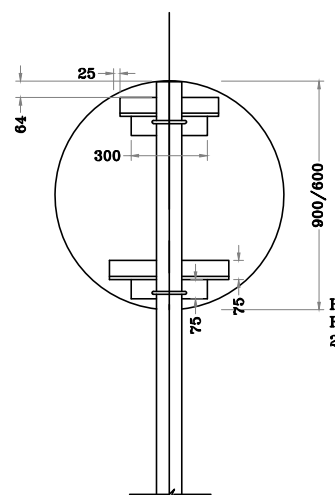
HAZZARD MARKERS
SCALE 1:10



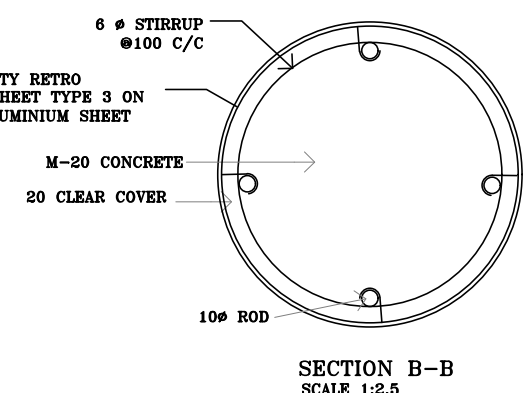
TYPICAL STOP SIGN



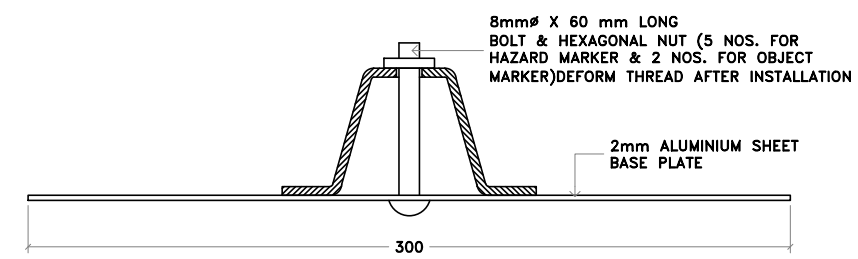
BACK TO BACK SIGN ASSEMBLY



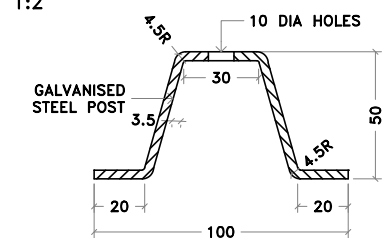
TYPICAL NO ENTRY SIGN



SECTION B-B
SCALE 1:2.5





MOUNTING DETAILS OF BACK PLATE
SCALE 1:2

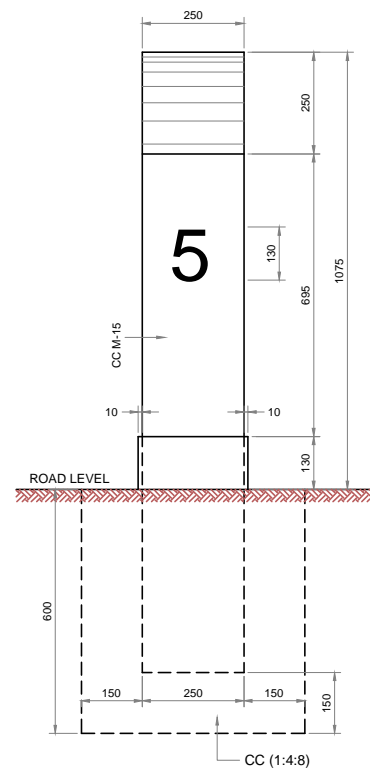


SECTION A-A'
SCALE 1:2

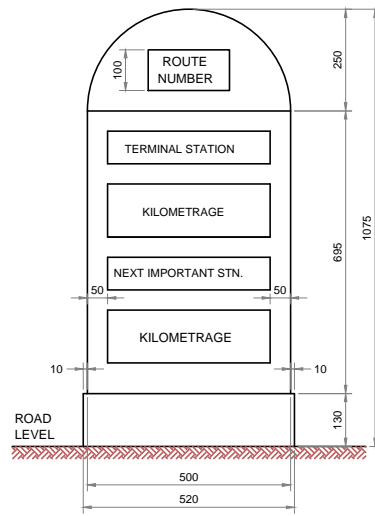
NOTES

- ALL DIMENSIONS ARE IN MM. AND LEVELS IN METERS, UNLESS OTHERWISE SPECIFIED.
- SIGNS SHOULD CONFORM TO IRC:67 - 2012 TO SECTION 801 OF MORT & H SPECIFICATION FOR ROAD AND BRIDGEWORKS(5TH. REV)
- DELINEATORS SHOULD CONFORM TO IRC:79 - 1981 TO SECTION 805 OF MORT&H SPECIFICATION FOR ROAD AND BRIDGE WORKS (5TH REV)

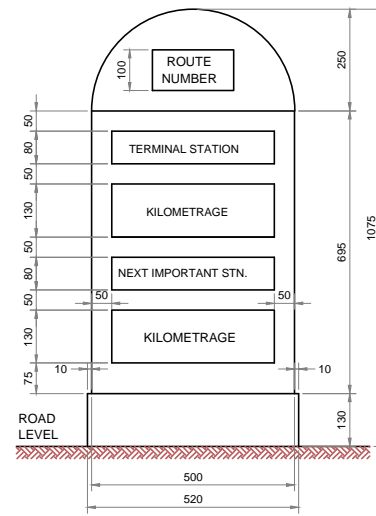
Scale :- NTS							CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001		SUPPORTING DETAILS OF ROAD SIGNS		CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.		DWG NO :- CET/2016/3640/NH-102A/ DPR /M5	
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	DATE:	PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.		UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km						
REVISIONS					SEPT, 2023									



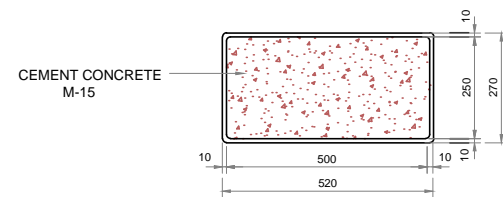
SIDE ELEVATION



FACE - 1

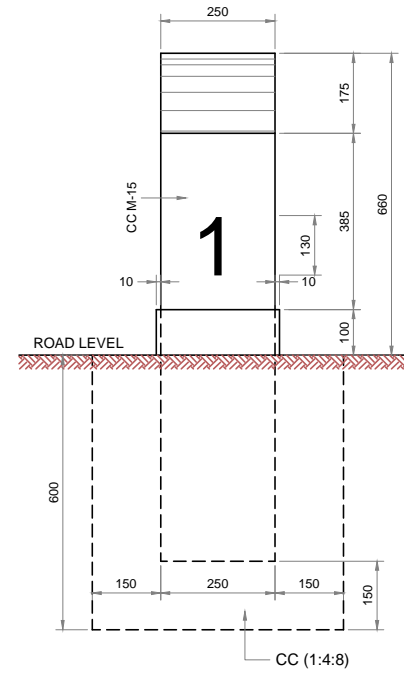


FACE - 2

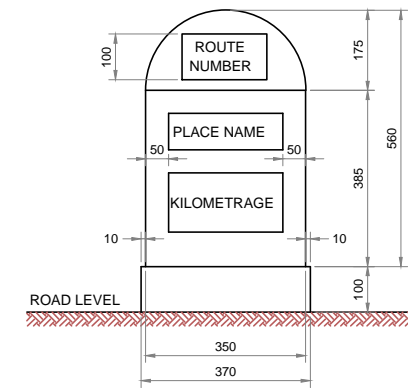


SECTIONAL PLAN

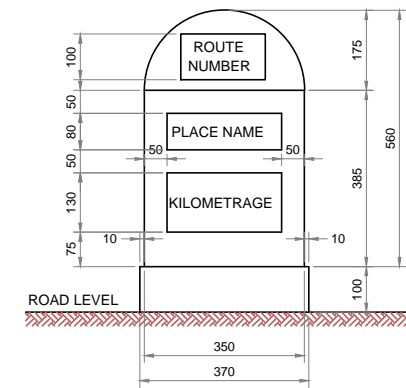
TYPE DESIGN FOR THE 5TH KILOMETRE STONE



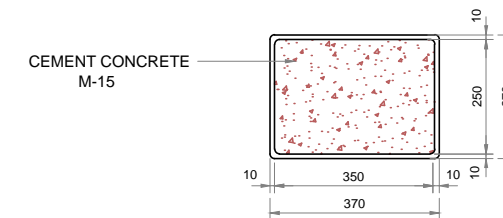
SIDE ELEVATION



FACE - 1

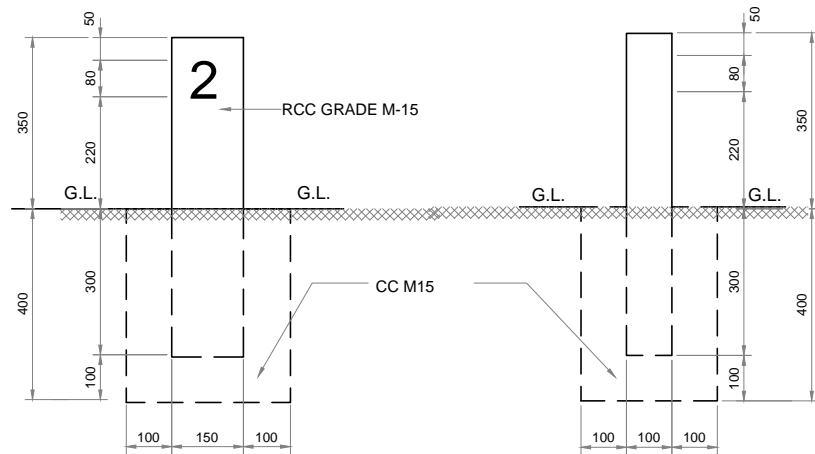


FACE - 2



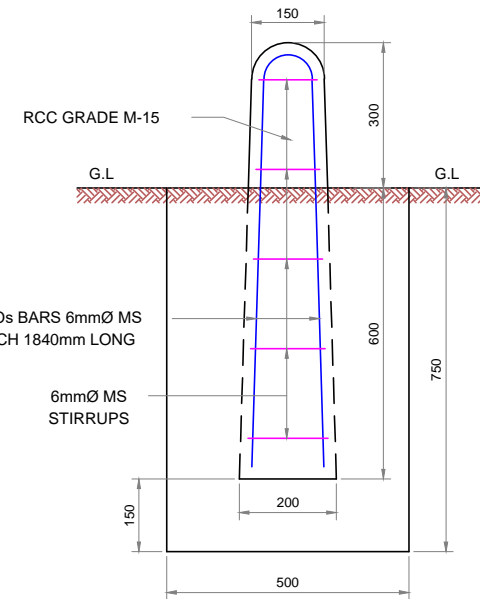
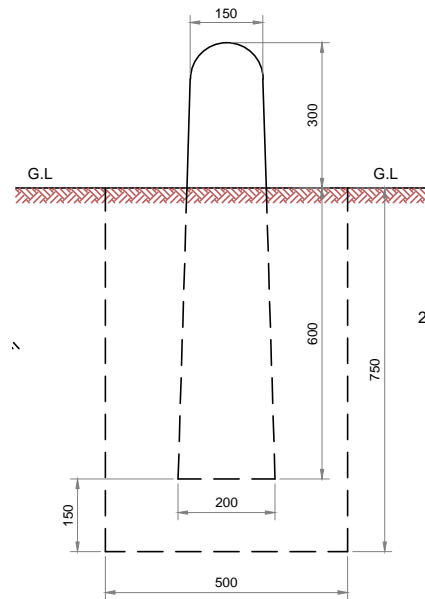
SECTIONAL PLAN

TYPE DESIGN FOR THE ORDINARY KILOMETRE STONE

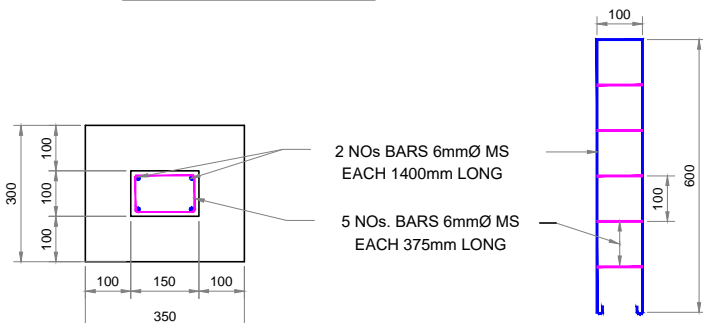


FRONT ELEVATION

SIDE ELEVATION



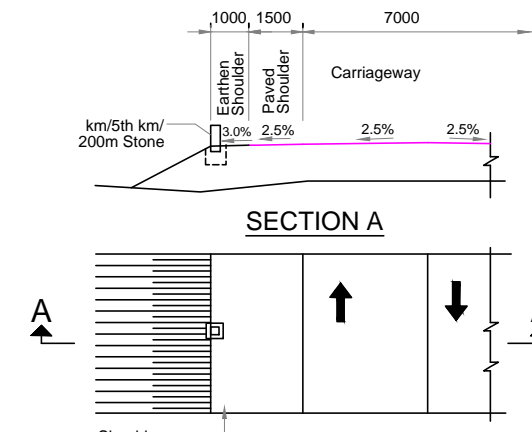
2 NOs BARS 6mmØ MS
EACH 1840mm LONG
6mmØ MS
STIRRUPS



PLAN

SCHEDULE OF REINFORCEMENT

TYPE DESIGN FOR 200 - METRE STONES



SECTION A

PLAN
LOCATION OF DISTANCE STONE

Notes:

1. Details of kilometre stones and 5th kilometre stones are generally based on IRC:8-1980
2. Details of 200m stones are generally based on IRC:26-1967.
3. The distance stones shall be provided on left side of the road as shown independently for each direction of traffic flow.
4. The letters and numerals on distance stones shall be as per IRC:8-1980.
5. Details of boundary stones are generally based on IRC:25-1967.
6. Reinforcement - Mild steel bars conforming to I.S.432/1966 Grade 1 tested steel
7. CONCRETE MIX -
RCC : GRADE M-15
CC :- 1:4:8
8. All dimensions are in millimetres unless otherwise mentioned.

TYPE DESIGN FOR BOUNDARY STONES

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

Scale :- NTS
DATE: SEPT, 2023



CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
4, Parliament Street,
New Delhi - 110001

PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

DETAILS OF KM STONE, 5TH KM STONE, 200 M STONE, BOUNDARY STONE

UKHRUL BYPASS District:- UKHRUL

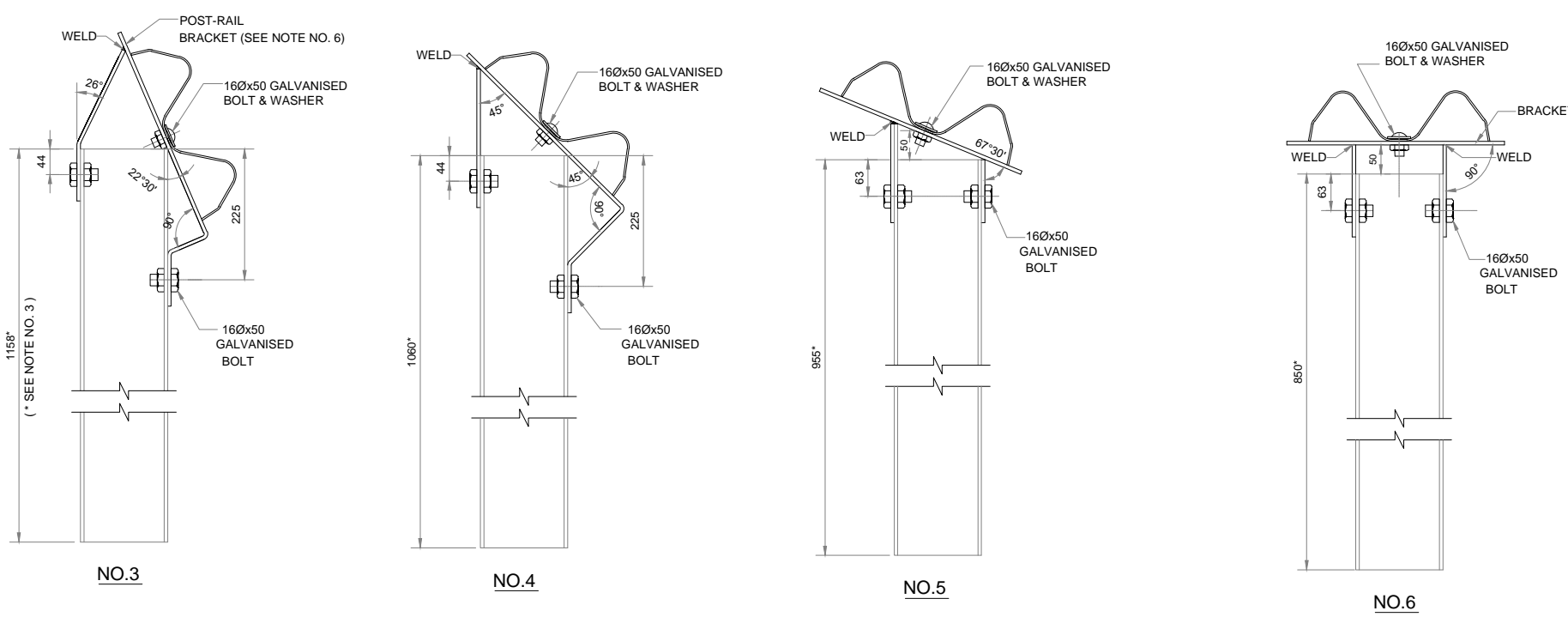
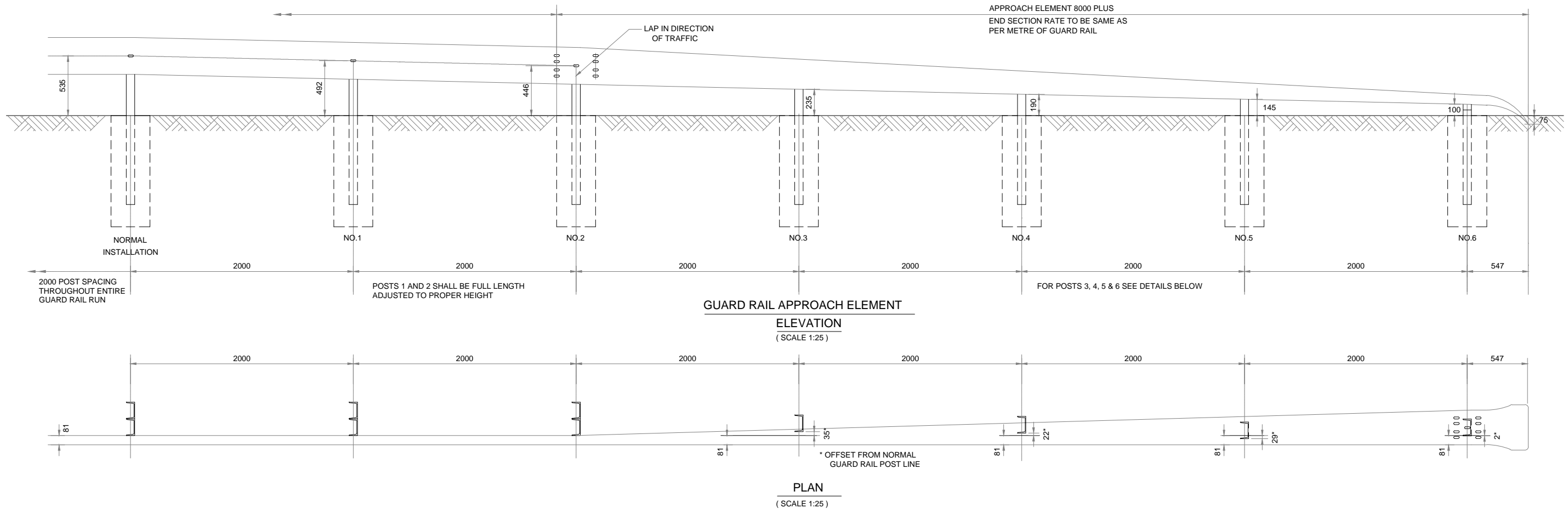
Detailed Project Report

Design chainage:- 0+000 Km to 6+571 Km

CONSULTANT :
CETEST
Engineering Consultants
An ISO 9001, 14001 & 45001
Certified Company

C.E. TESTING COMPANY PVT. LTD.
124-A, N.S.C. Bose Road
Kolkata - 700092.



DWG NO :- CET/2016/3640/NH-102A/ DPR /M8

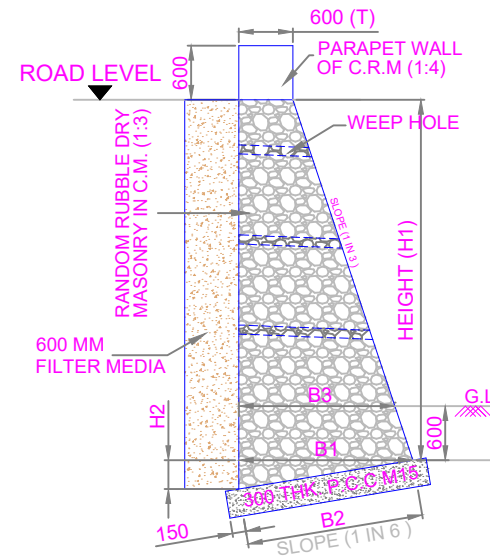


(SCALE 1:7.5)

NOTES :

1. THE APPROACH ELEMENT SHALL BE TWISTED TO HORIZONTAL AND SECURED TO THE POSTS, AS SHOWN, WITH THE END SECTION TIP BURIED.
2. PLACE DELINEATOR POST ADJACENT TO THE BEGINNING OF THE APPROACH ELEMENT.
3. THE HEIGHT OF POST NOS. 3,4,5 & 6. IS INDICATIVE ONLY. THIS SHALL BE ADJUSTED TO PRODUCE A STRAIGHT LINE AT THE CENTRE OF RAIL.
4. THE APPROACH END ELEMENT SHALL BE TANGENT TO THE NORMAL GUARD RAIL LINE.
5. FOR POST, RAIL & TRAILING END ELEMENT DETAILS SEE SEPARATE DRAWING.
6. THE POST-RAIL BRACKET SHALL BE 178 MM WIDE AND HAVE A 25 MM OVERHANG ON EACH SIDE OF THE GUARD RAIL.
7. MANUFACTURERS ARE TO VERIFY DIMENSIONS BEFORE INSTALLATION AND MAKE ADJUSTMENTS, IF NECESSARY, WITH APPROVAL OF ENGINEERS.

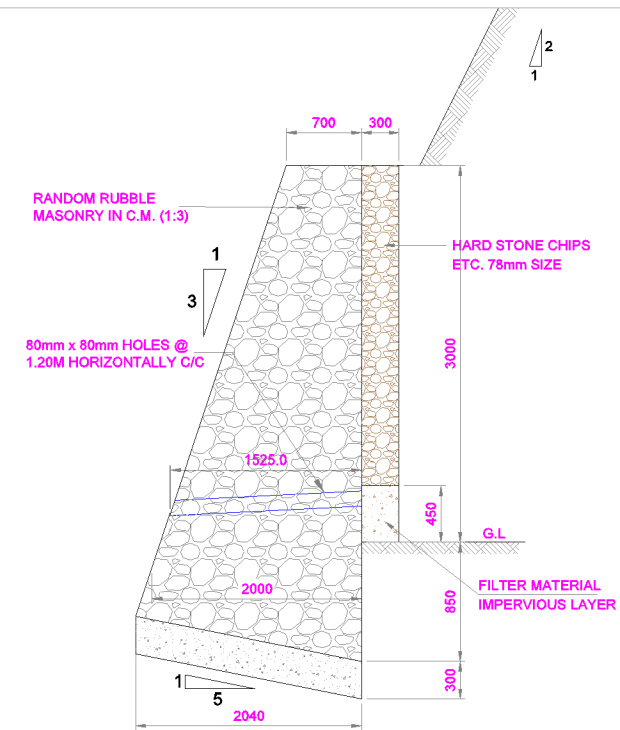
<table border="1"> <tr> <td>MKD.</td> <td>DATE</td> <td>DESCRIPTION</td> <td>CHKD.</td> <td>APPRD.</td> </tr> <tr> <td colspan="5">REVISIONS</td> </tr> </table>					MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	REVISIONS					Scale :- NTS DATE: SEPT, 2023	 <p>PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.</p>	CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	DETAILS OF W-BEAM METAL CRASH BARRIER UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km	CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/ DPR /M10
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.																
REVISIONS																				



TYPICAL CROSS SECTION OF RR MASONRY RETAINING WALL (3.0 M HIGH)
(SCALE 1:50)



DIMENSION DETAILS OF RR MASONRY RETAINING WALL						
H1	T	B1	B2	B3	H2	FOUNDATION BED
3	0.60	1.60	1.622	1.6	0.267	300mm Thk. PCC (M15)

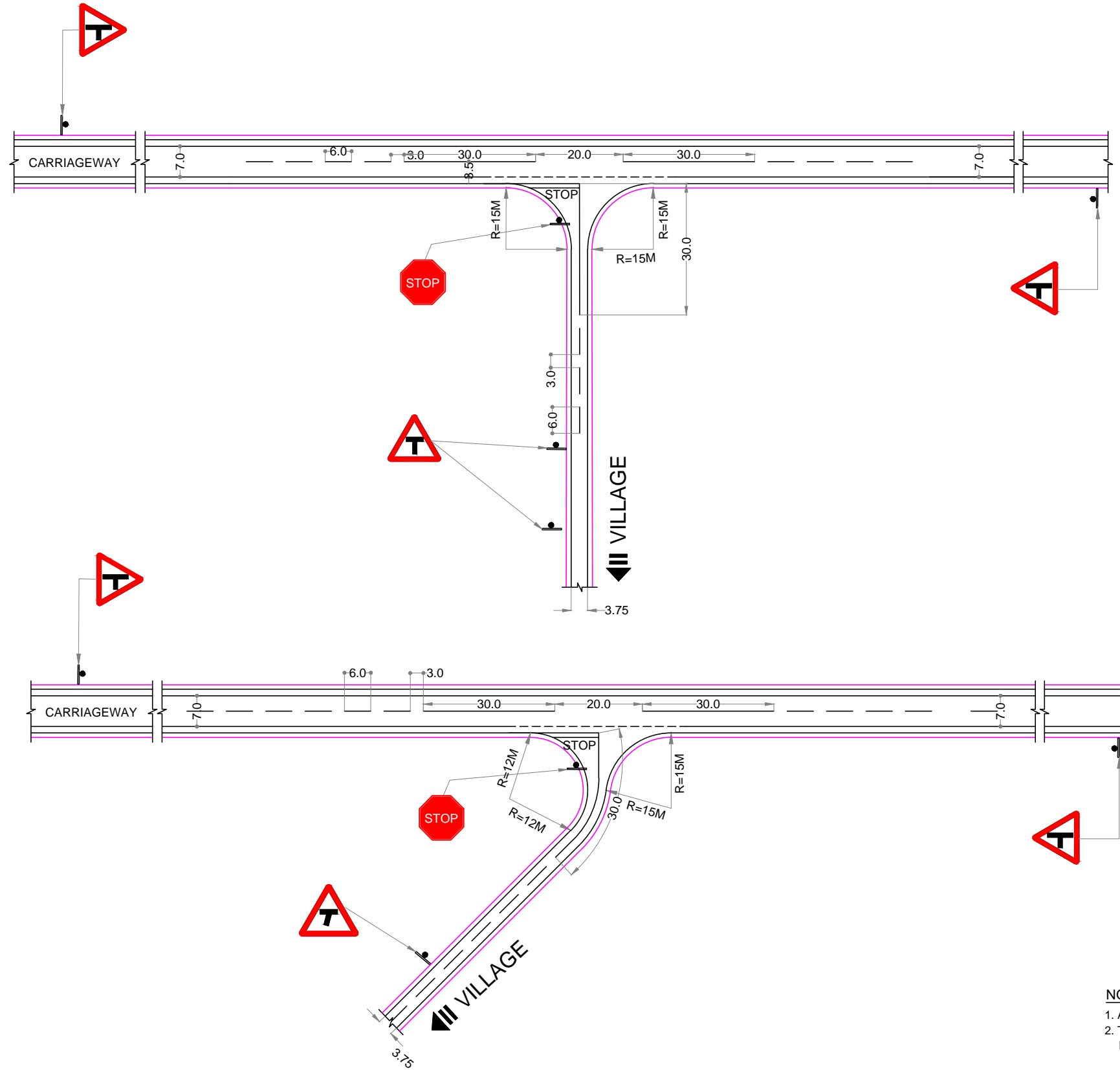
Location of RR Masnoray Retaing Wall							
Chainage		Side	Avg. Height	Length	CD Length	Net Length	TCS
From	To						
50	90	Valley	3	40	2	38	TCS-3
1050	1130	Valley	3	80		80	TCS-3
1130	1150	Valley	3	20		20	TCS-6
1270	1290	Valley	3	20		20	TCS-3
1290	1320	Valley	3	30		30	TCS-6
1710	1730	Valley	3	20		20	TCS-3
2080	2100	Valley	3	20		20	TCS-3
2100	2110	Valley	3	10	2	8	TCS-9
2110	2150	Valley	3	40		40	TCS-6
2150	2180	Valley	3	30		30	TCS-3
2400	2420	Valley	3	20		20	TCS-3
3220	3260	Valley	3	40	2	38	TCS-3
3820	3870	Valley	3	50		50	TCS-3
3870	3910	Valley	3	40	2	38	TCS-9
5690	5790	Valley	3	100		100	TCS-3
6180	6270	Valley	3	90		90	TCS-3
6440	6460	Valley	3	20		20	TCS-3



TYPE-1:- TYPICAL CROSS SECTION OF BREAST WALL OF 3.0 MTR. HIGH
(SCALE 1:25)



Location of Breast Wall						
TCS Type	Length (m)	Deduction for Structure (m)	Effective Length (m)	Height (m)	Side	Net Length (m)
TCS-4	735	0	735	3	Single	735
TCS-5	105	5	100	3	Single	105
TCS-6	90	0	90	3	Single	90
TCS-8	370	0	370	3	Single	370

Scale :- NTS					 CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001		DETAILS OF RETAINING WALL & BREAST WALL UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km		CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.		DWG NO :- CET/2016/3640/NH-102A/ DPR /M11
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.		Date: SEPT, 2023				
REVISIONS											



NOTES :

1. ALL DIMENSION ARE IN METER UNLESS OTHERWISE MENTIONED
2. THE DESIGN IS SUITABLE FOR AN INTERSECTION OF A TWO LANE STATE HIGHWAY AND A SINGLE LANE OTHER DISTRICT ROAD / VILLAGE ROAD

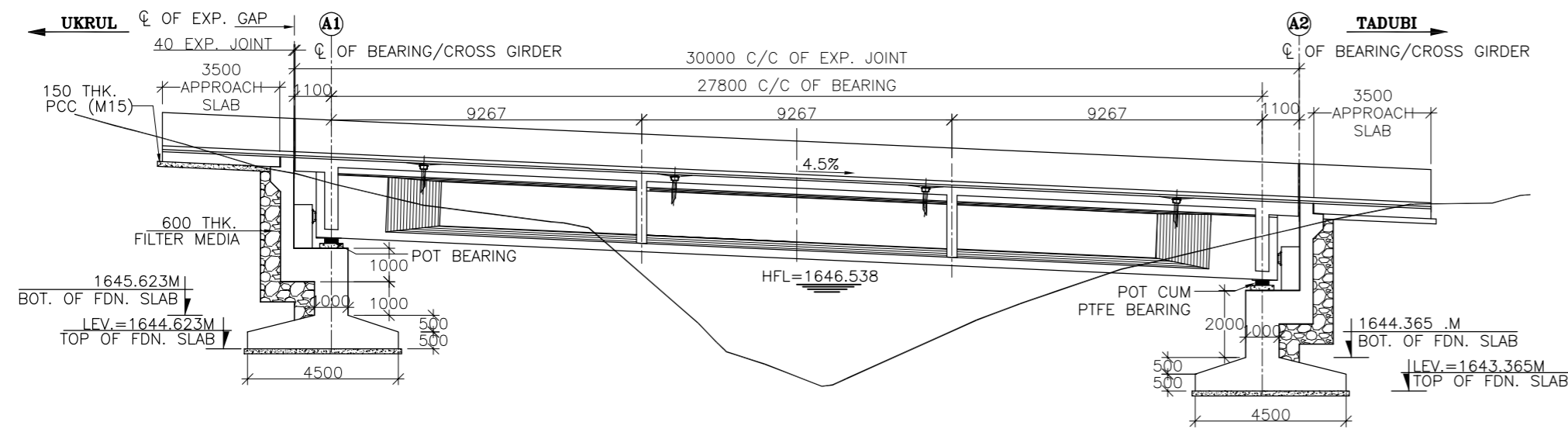
Scale :-						CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	MINOR INTER SECTION UKHRUL BYPASS District:- UKHRUL Detailed Project Report Design chainage:- 0+000 Km to 6+571 Km		CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG NO :- CET/2016/3640/NH-102A/ DPR /M12
NTS										
DATE:					PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.					
SEPT, 2023										
REVISIONS										
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.						

STRUCTURAL DRAWING

CONTENT
PROPOSED BRIDGE
ROAD NAME : UKHRUL - TOLOI - TADUBI

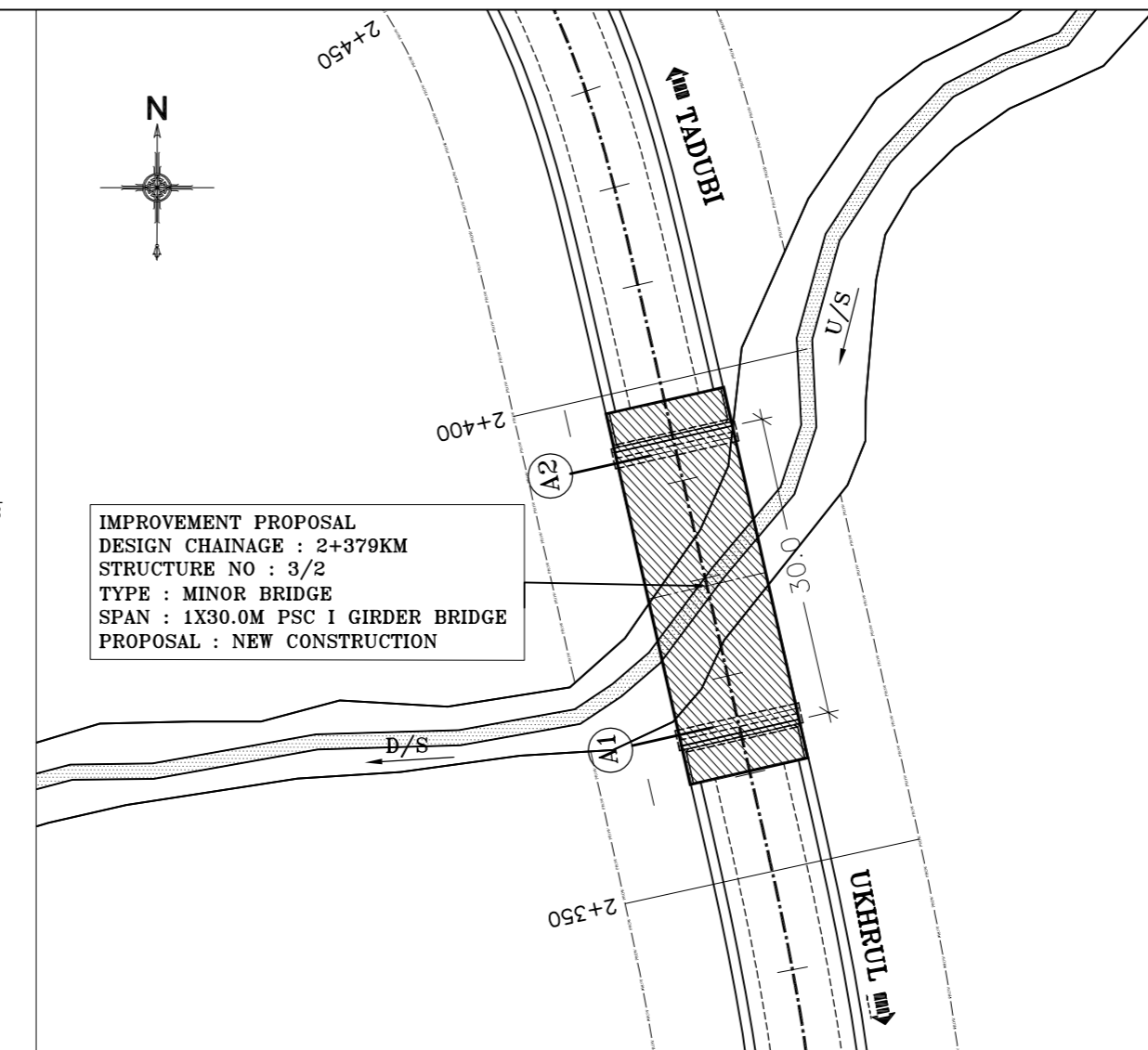
GENERAL ARRANGEMENT DRAWING

SL. NO.	DESIGN CHAINAGE	STR. NO.	IMPROVEMENT TYPE	DESCRIPTION	DRAWING NO.	NO. OF SHEETS
01.	2.379KM	3/2	NEW CONSTRUCTION	1X30.0M PSC-I GIRDER :-		
				GENERAL ARRANGEMENT	CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-3/2)/GAD	01
02.	3.624KM	4/3	NEW CONSTRUCTION	1X40.0M PSC-I GIRDER :-		
				GENERAL ARRANGEMENT	CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-4/3)/GAD	01
03.	4.109KM	5/1	NEW CONSTRUCTION	1X30.0M PSC-I GIRDER :-		
				GENERAL ARRANGEMENT	CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-5/1)/GAD	01
04.	4.375KM	5/2	NEW CONSTRUCTION	1X40.0M PSC-I GIRDER :-		
				GENERAL ARRANGEMENT	CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-5/2)/GAD	01
05.	4.906 KM	5/4	NEW CONSTRUCTION	1 X 90.0M STEEL TRUSS BRIDGE :-		
				GENERAL ARRANGEMENT	CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MJ/(STR-5/4)/GAD	01

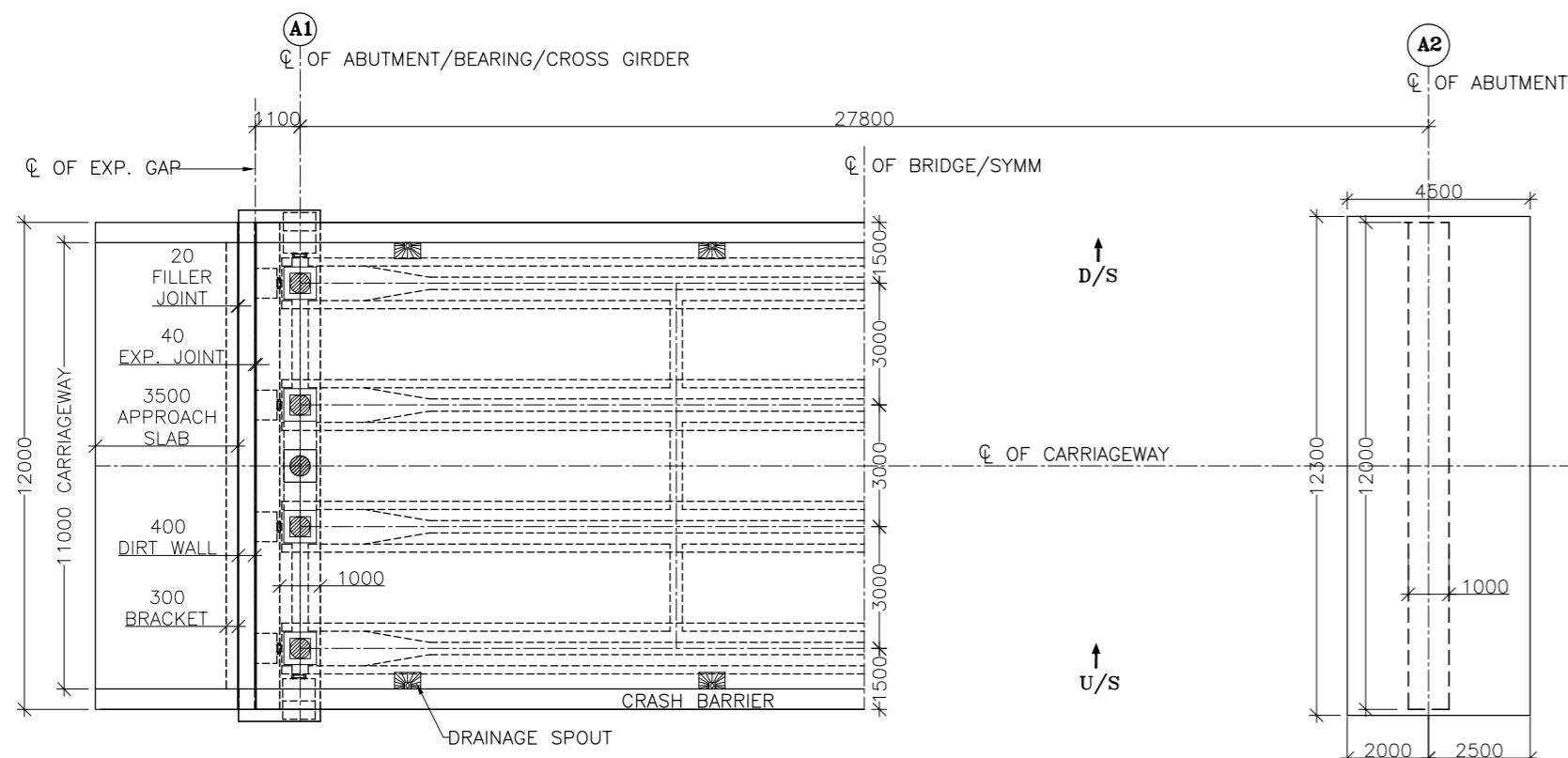


FRL (RL IN METRE)	1650.686	1650.457	1650.236	1649.786	1649.336	1649.206	1648.886
EGL (RL IN METRE)	1650.924	1649.560	1648.628	1643.533	1647.290	1647.983	1649.034
CHAINAGE(KM)	2+360	2+365.098	2+370	2+380	2+390	2+392.898	2+400

SECTIONAL ELEVATION
SCALE-1:175



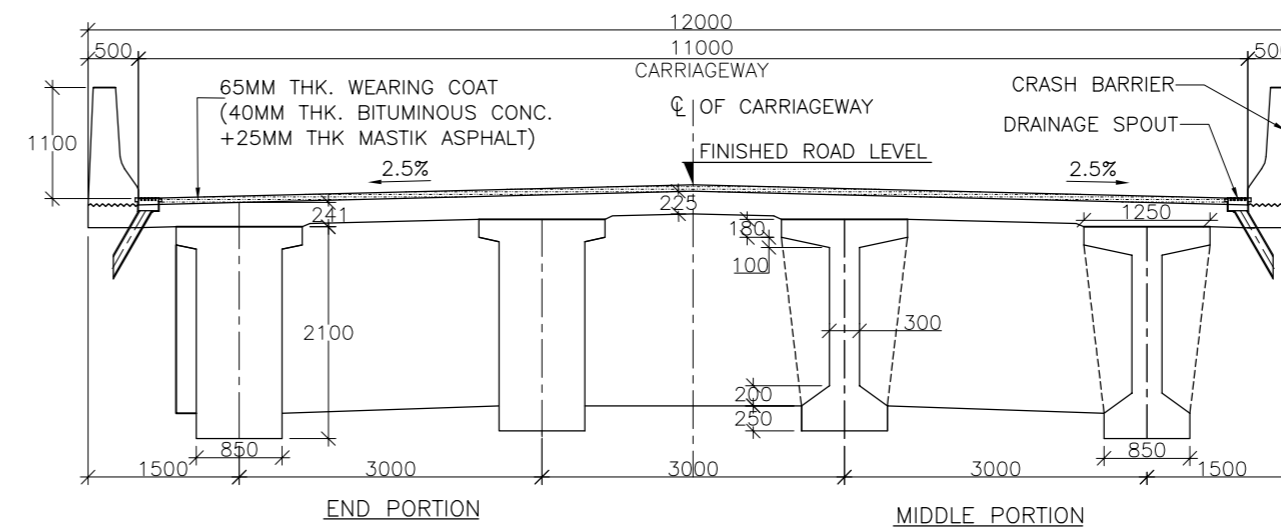
LOCATION PLAN
SCALE: NTS



HALF SUPER STRUCTURE PLAN

PLAN
SCALE-1:175

HALF FOUNDATION PLAN



TYPICAL CROSS SECTION OF SUPERSTRUCTURE
SCALE-1:75

GENERAL NOTES :

- A. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M. UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- B. **MATERIALS SPECIFICATIONS :**
 - (I) **CONCRETE :**
 1. GRADE OF CONCRETE USED :-
 - a) DECK SLAB=M40,
 - b) GIRDER=M45,
 - c) SUB STRUCTURE=M30,
 - d) DIRT WALL=M30,
 - e) APPROACH SLAB = M30,
 - f) P.C.C. BELOW APPROACH SLAB = M15,
 - g) CRASH BARRIER = M40,
 - h) PEDESTAL = M35
 - i) REACTION BLOCK = M40.
 2. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
 3. 33/43/53 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 269, IS : 8112, IS : 12269 OR PORTLAND SLAG CEMENT CONFORMING TO IS : 455 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
 4. TO IMPROVE WORKABILITY OF CONCRETE, ADMIXTURES CONFORMING TO IS:9103 MAY BE USED SUBJECT TO SATISFACTORY PROVEN USE.
 5. THE MINIMUM CEMENT CONTENT IN CONCRETE SHALL BE AS PER TABLE 14.2, IRC -112-2020
 6. MAX. WATER CEMENT RATIO SHALL BE AS PER TABLE-14.2, IRC:112-2020.
 - (II) **REINFORCEMENT :**
 - ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe 500D) CONFORMING TO IS : 1786 (EXCEPT FOR MESH REINFORCEMENT WHICH SHALL BE MS BARS GRADE, DESIGNATION Fe 250 CONFORMING TO IS:432 PART-I MILD STEEL)
 - (III) **WATER :**
 - WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO IRC : 112 - 2020.
 - (IV) **EXPANSION JOINTS :**
 - THE EXPANSION JOINTS SHOULD BE STRIP SEAL TYPE.
 - (V) BEARING SHALL BE OF POT & POT CUM PTFE TYPE. THE SIZE & DIMENSIONS OF THE BEARINGS SHALL BE FINALIZED AS PER THE DETAILS PROVIDED BY THE APPROVED VENDOR.
 - (VI) FILTER MATERIAL BEHIND ABUTMENT SHALL CONFORM TO CLAUSE MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - (VII) PROPERTIES OF BACKFILL SOIL $\gamma=2.0t/m^3$, $\phi=30^\circ$.
- C. **WORKMANSHIP/DETAILING :**
 1. MINIMUM CLEAR COVER :
 - a) SUPERSTRUCTURE = 40MM
 - b) SUBSTRUCTURE : ABUTMENT, ABUTMENT CAP = 75MM
FIN WALL = 50MM
 - c) FOUNDATION SLAB = 75MM
 2. DESIGN LOAD :
 - a) CLASS A THREE LANES OR CLASS A ONE LANE + CLASS 70R TRACKED/WHEELED OR IRC CLASS SV LOADING WHICHEVER PRODUCES WORST EFFECT IS CONSIDERED FOR DESIGN.
 - b) THE BRIDGE IS IN SEISMIC ZONE-V.
 - c) SEISMIC LOADING :- AS PER CL. NO. 219 OF IRC:6-2017.
 3. FOR ENSURING PROPER COVER OF CONCRETE TO REINFORCEMENT SPECIALLY MADE POLYMER COVER BLOCKS SHALL ONLY BE USED.
 4. BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502.
 5. PROPER COMPACTION OF CONCRETE SHALL BE ENSURED BY USE OF FORM VIBRATOR OR NEEDLE VIBRATORS. USE OF FULL WIDTH SCREED VIBRATORS FOR COMPACTION OF CONCRETE IN DECK SLAB SHALL BE ENSURED.
 6. SHUTTERING PLATES SHALL SUITABLY BE STIFFENED TO ENABLE THE COMPACTION BY FORM VIBRATORS.
 7. SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
 8. THE WEEP HOLES SHALL BE WITH 100MM DIA ARC PIPE IN 1:20 SLOPE @ 1M C/C STAGGERED HORIZONTALLY & VERTICALLY AT ABUTMENT & FIN WALL.
 9. THE SUB STRUCTURE & FOUNDATION DIMENSIONS MAY VARY ON THE BASIS OF DETAILED GEOTECHNICAL INVESTIGATION & STRUCTURAL DESIGN.

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE :	AS SHOWN
DATE :	OCTOBER, 2023

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001

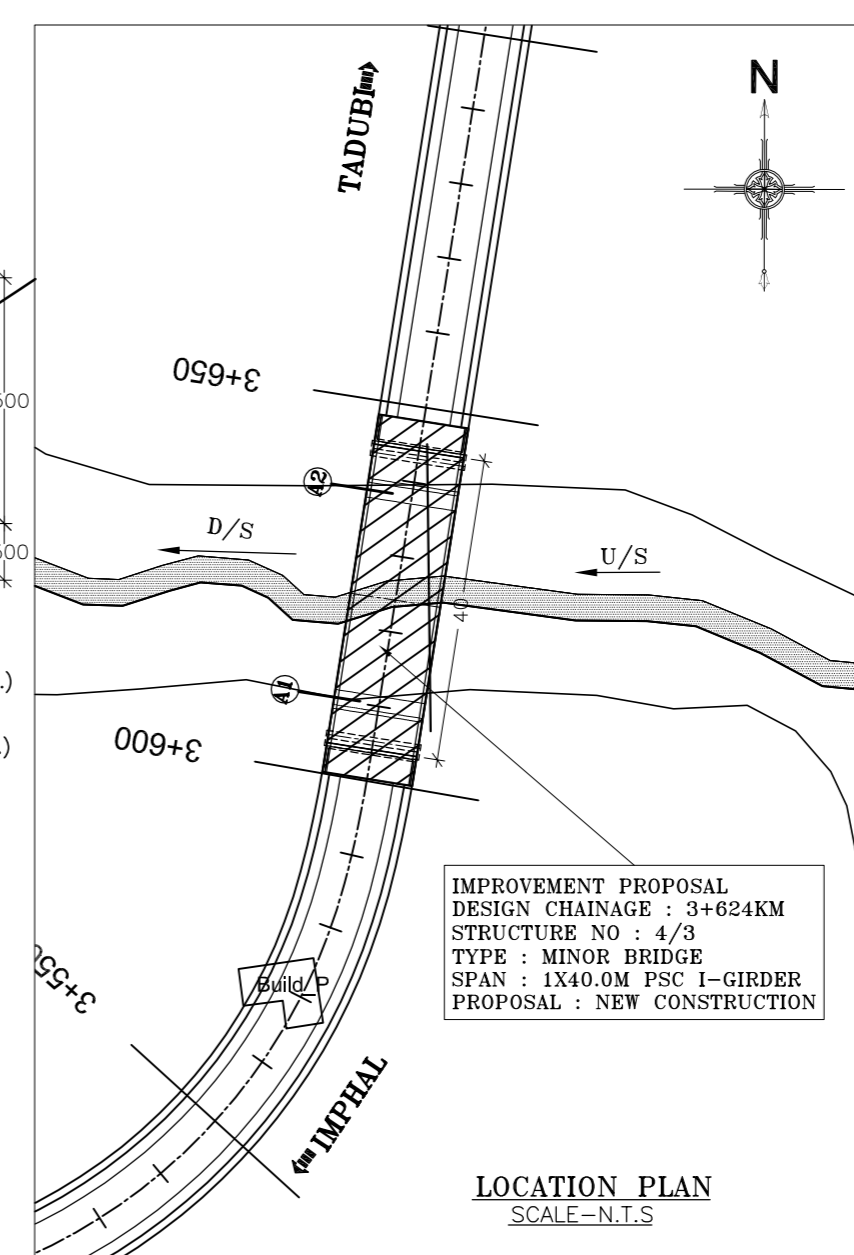
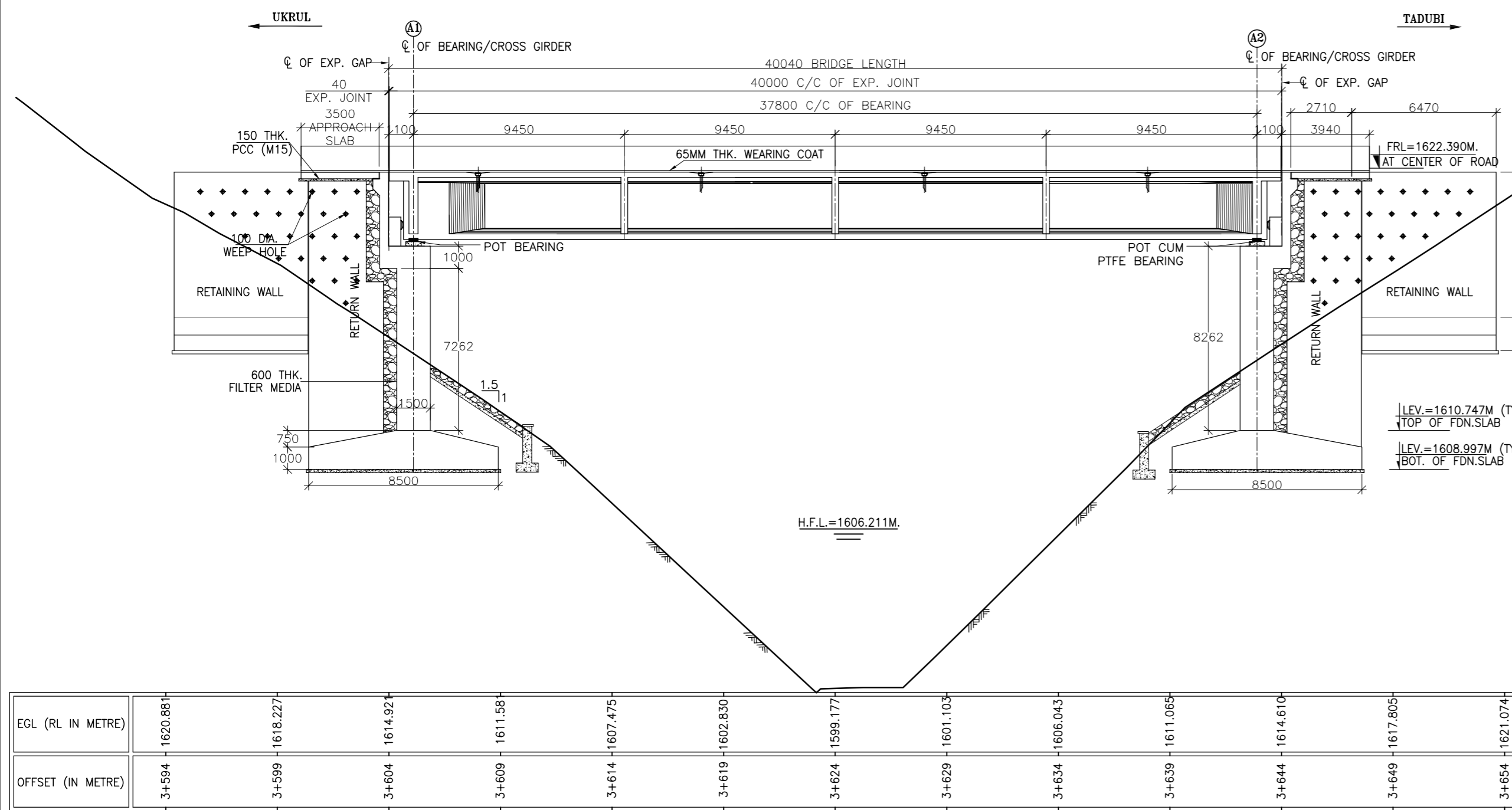
PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM) IN THE STATE OF MANIPUR ON EPC MODE.

TITLE: GENERAL ARRANGEMENT DRAWING OF 1X30.0M PSC-I GIRDER (AT CHAINAGE 2+379KM)

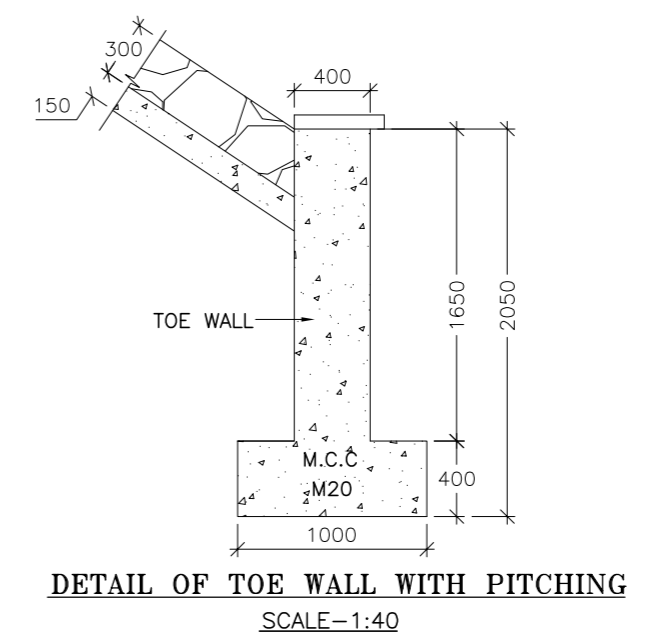
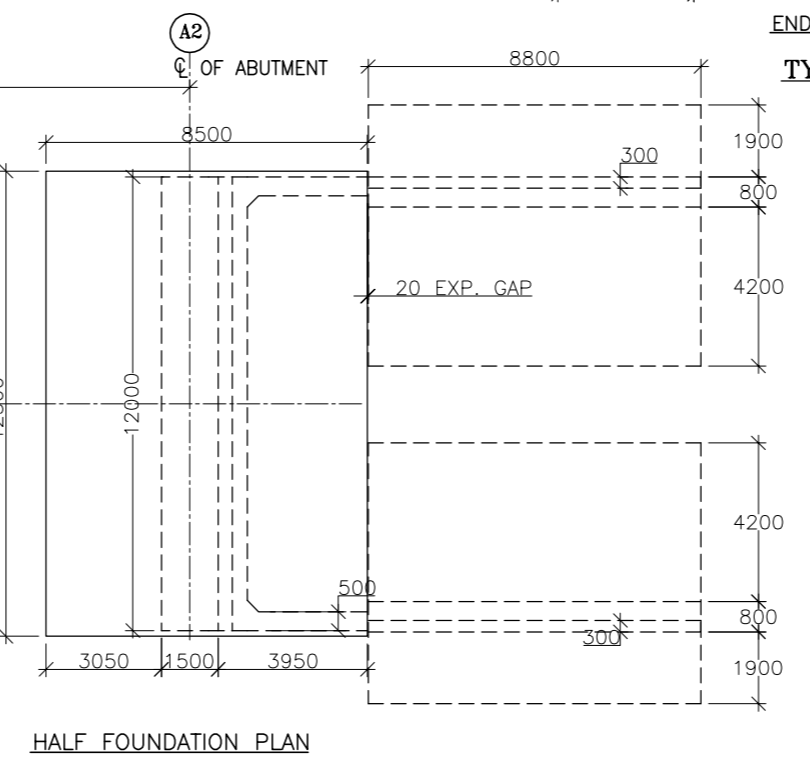
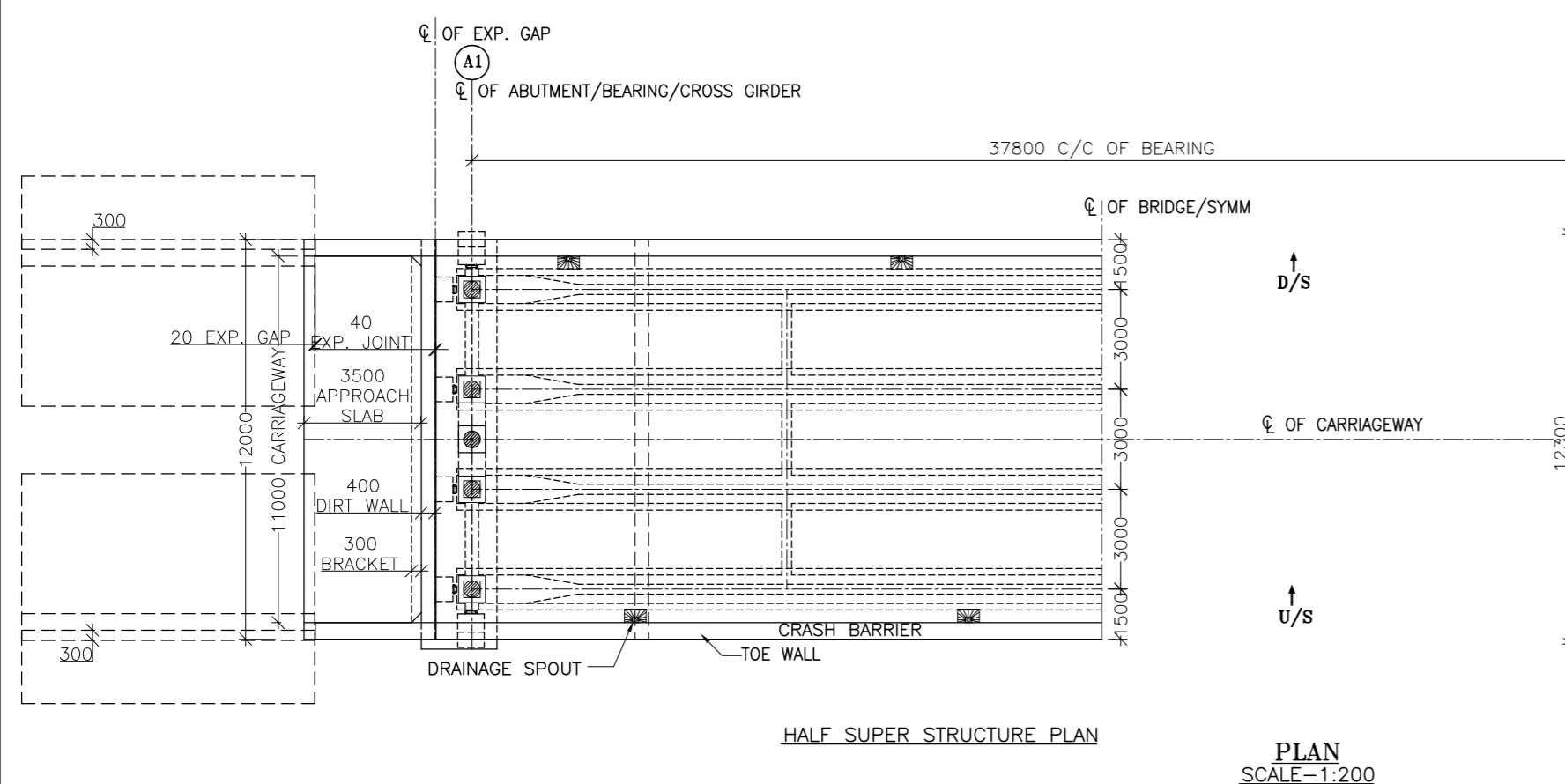
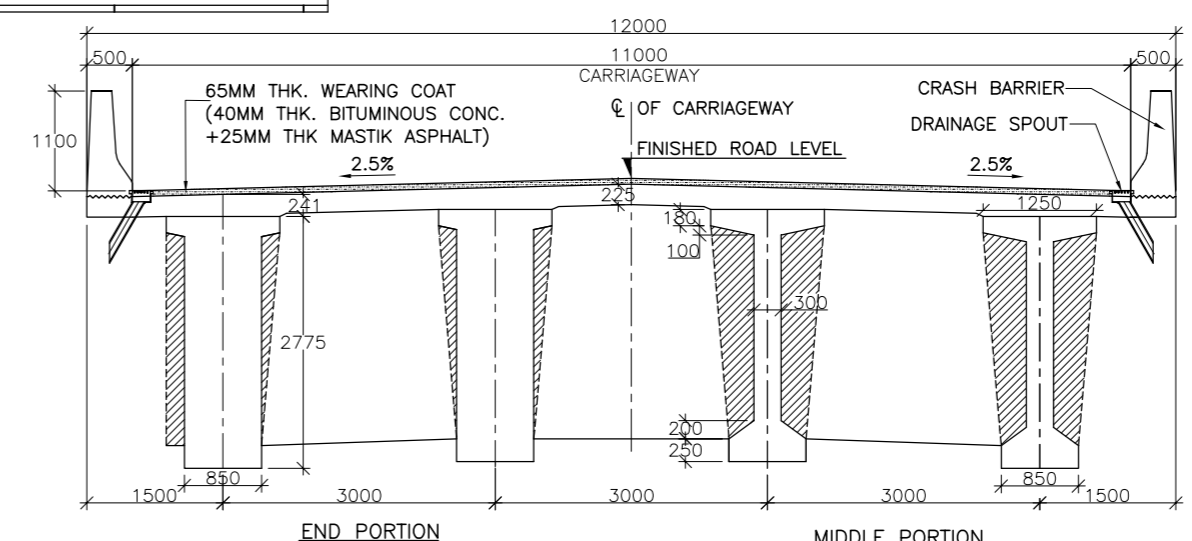
SUBMISSION TYPE: DRAFT DETAILED PROJECT REPORT

CONSULTANT: C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092

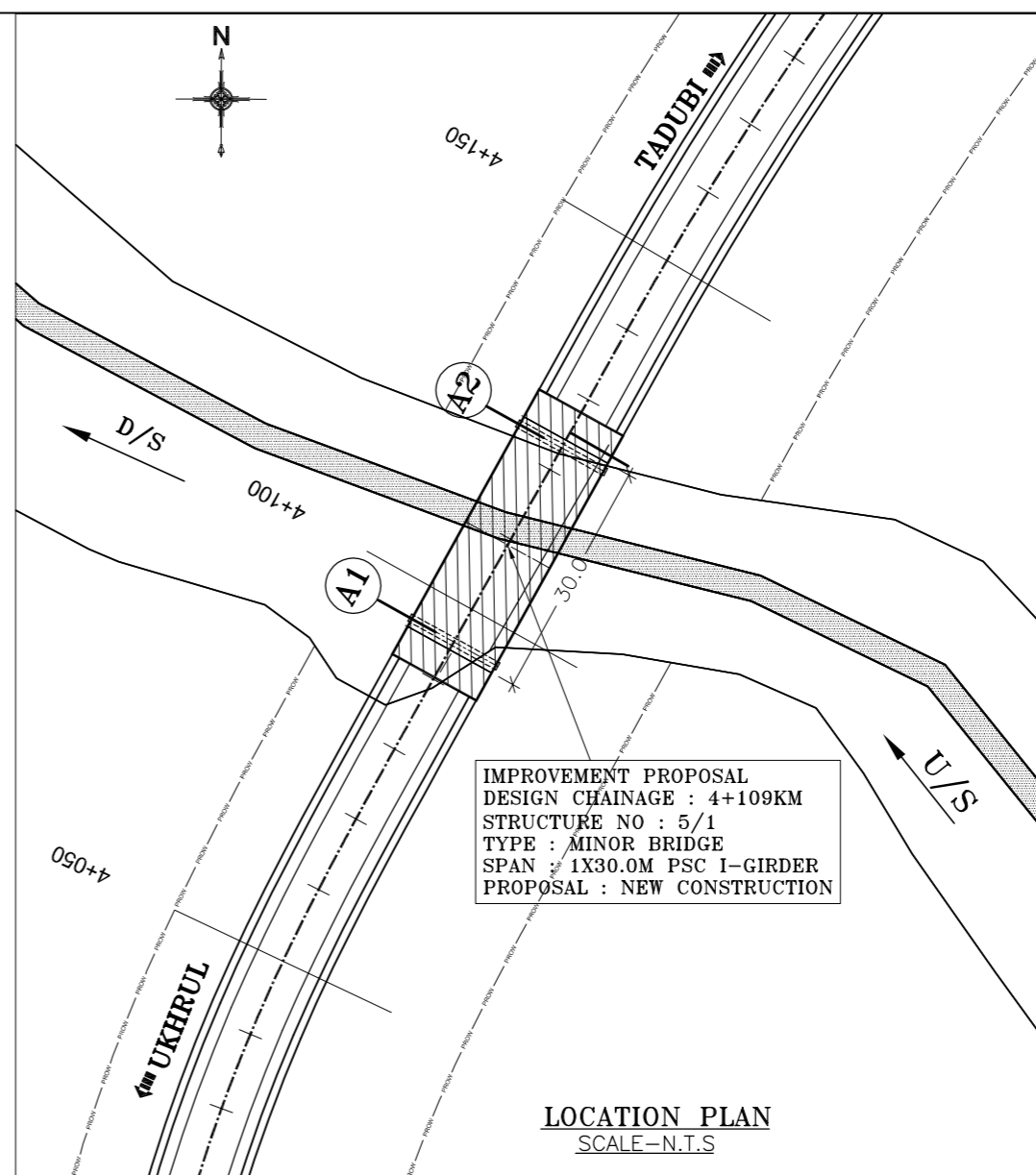
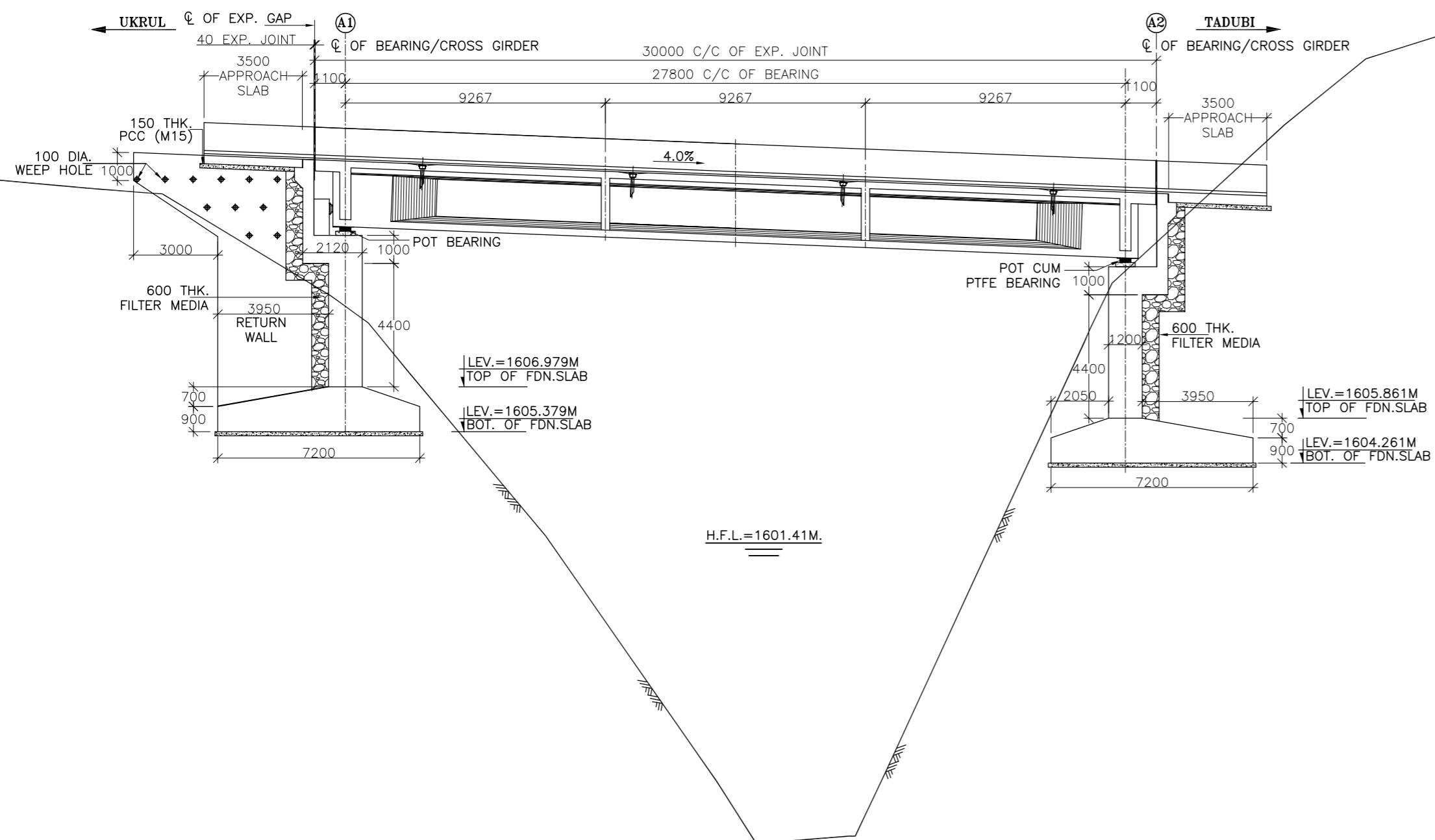
DWG NO : CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-3/2)/GAD			
REVISION MKD. - R0		SHEET NO. - 01 OF 01	
DRAWN BY	DESIGN BY	CHECKED BY	APPROVED BY
N.BHATTACHARJEE		P.SAHA	S.DEB



- GENERAL NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M . UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- B. MATERIALS SPECIFICATIONS :**
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 - GIRDER=M45,
 - SUB STRUCTURE=M30,
 - DIRT WALL=M30,
 - APPROACH SLAB = M30,
 - P.C.C. BELOW APPROACH SLAB = M15,
 - CRASH BARRIER = M40,
 - PEDESTAL = M35
 - REACTION BLOCK = M40.
 - FIN WALL = M30.
 - CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
 - 33/43/53 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 269, IS : 8112, IS : 12269 OR PORTLAND SLAG CEMENT CONFORMING TO IS : 455 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
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 - WATER :**
 - WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO IRC : 112 - 2020.
 - EXPANSION JOINTS :**
 - THE EXPANSION JOINTS SHOULD BE STRIP SEAL TYPE.
 - BEARING SHALL BE OF POT & POT CUM PTFE TYPE. THE SIZE & DIMENSIONS OF THE BEARINGS SHALL BE FINALIZED AS PER THE DETAILS PROVIDED BY THE APPROVED VENDOR.
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 - PROPERTIES OF BACKFILL SOIL $\gamma=2.0t/m^3$, $\phi=30^\circ$.
- C. WORKMANSHIP/DETAILING :**
- MINIMUM CLEAR COVER :
 - SUPERSTRUCTURE = 40MM
 - SUBSTRUCTURE : ABUTMENT, ABUTMENT CAP = 75MM
FIN WALL = 50MM
 - FOUNDATION SLAB = 75MM
 - DESIGN LOAD :
 - CLASS A THREE LANES OR CLASS A ONE LANE + CLASS 70R TRACKED/WHEELED OR IRC CLASS SV LOADING WHICHEVER PRODUCES WORST EFFECT IS CONSIDERED FOR DESIGN.
 - THE BRIDGE IS IN SEISMIC ZONE-V.
 - SEISMIC LOADING :- AS PER CL. NO. 219 OF IRC:6-2017.
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 - BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502.
 - PROPER COMPACTION OF CONCRETE SHALL BE ENSURED BY USE OF FORM VIBRATOR OR NEEDLE VIBRATORS. USE OF FULL WIDTH SCREED VIBRATORS FOR COMPACTION OF CONCRETE IN DECK SLAB SHALL BE ENSURED.
 - SHUTTERING PLATES SHALL SUITABLY BE STIFFENED TO ENABLE THE COMPACTION BY FORM VIBRATORS.
 - SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
 - THE WEEP HOLES SHALL BE WITH 100MM DIA AC PIPE IN 1:20 SLOPE @ 1M C/C STAGGERED HORIZONTALLY & VERTICALLY AT ABUTMENT & FIN WALL.
 - THE SUB STRUCTURE & FOUNDATION DIMENSIONS MAY VARY ON THE BASIS OF DETAILED GEOTECHNICAL INVESTIGATION & STRUCTURAL DESIGN.



SCALE : AS SHOWN DATE : OCTOBER, 2023					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001					TITLE: GENERAL ARRANGEMENT DRAWING OF 1X40.0M PSC-I GIRDER (AT CHAINAGE - 3+624KM)					CONSULTANT : C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092					DWG NO :- CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-4/3)/GAD									
PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM) IN THE STATE OF MANIPUR ON EPC MODE.					SUBMISSION TYPE : DRAFT DETAILED PROJECT REPORT					SHEET NO. - 01 OF 01					REVISION MKD. - R0														
REVISIONS					MKD. DATE DESCRIPTION CHKD. APPRD.					DRAWN BY: N.BHATTACHARJEE					DESIGN BY:					CHECKED BY: P.SAHA					APPROVED BY: S.DEB				



- GENERAL NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M . UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - MATERIALS SPECIFICATIONS :**
 - CONCRETE :**
 - GRADE OF CONCRETE USED :-
 - DECK SLAB=M40,
 - GIRDER=M45,
 - SUB STRUCTURE=M30,
 - DIRT WALL=M30,
 - APPROACH SLAB = M30, j) FIN WALL = M30.
 - P.C.C. BELOW APPROACH SLAB = M15,
 - CRASH BARRIER = M40,
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 - REACTION BLOCK = M40.
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 - TO IMPROVE WORKABILITY OF CONCRETE, ADMIXTURES CONFORMING TO IS:9103 MAY BE USED SUBJECT TO SATISFACTORY PROVEN USE.
 - THE MINIMUM CEMENT CONTENT IN CONCRETE SHALL BE AS PER TABLE 14.2, IRC -112-2020
 - MAX. WATER CEMENT RATIO SHALL BE AS PER TABLE-14.2, IRC:112-2020.
 - REINFORCEMENT :**

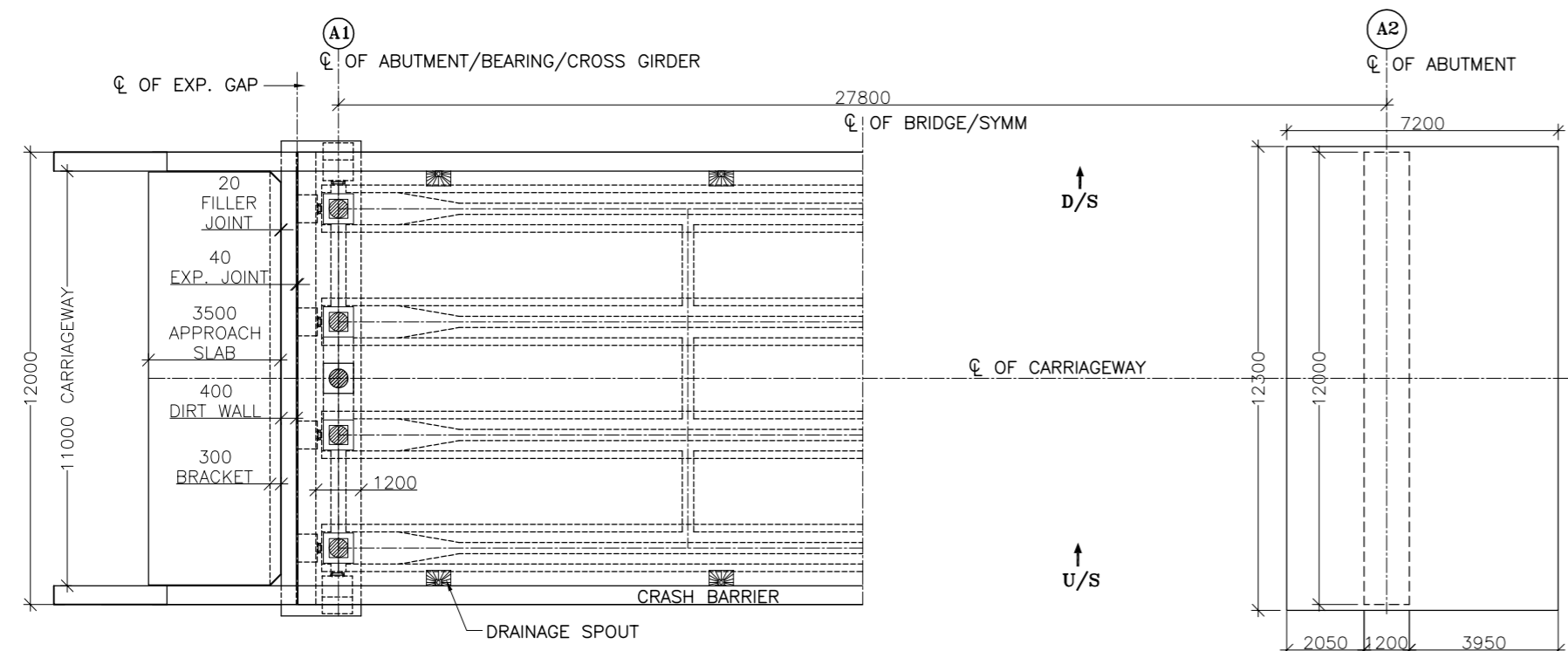
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 - WATER :**

WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO IRC : 112 - 2020.
 - EXPANSION JOINTS :**

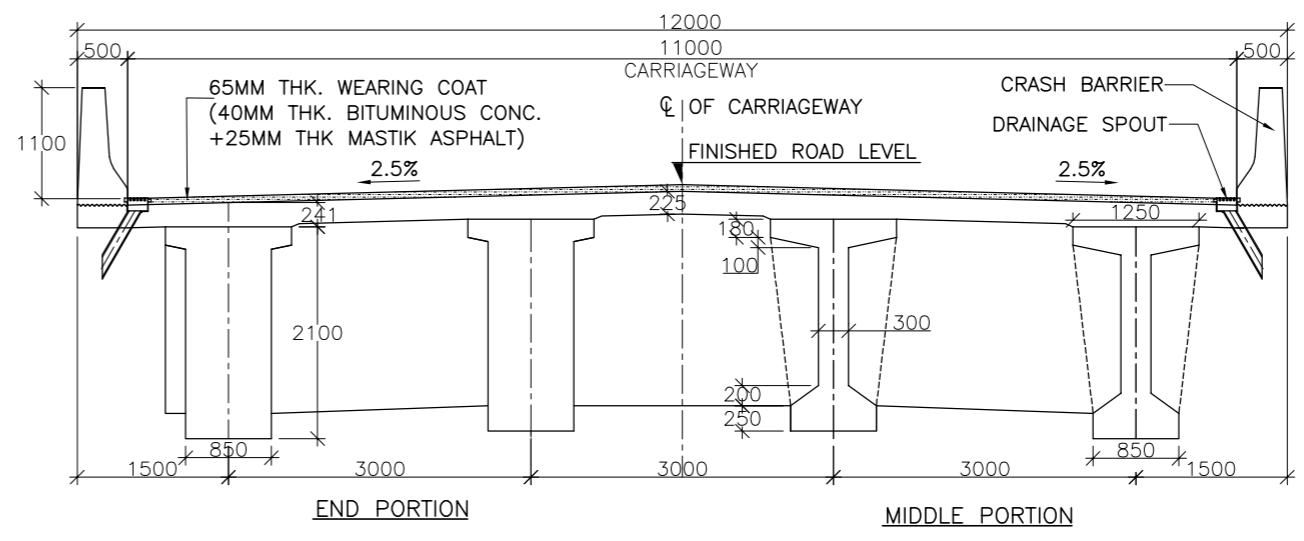
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 - BEARING SHALL BE OF POT & POT CUM PTFE TYPE. THE SIZE & DIMENSIONS OF THE BEARINGS SHALL BE FINALIZED AS PER THE DETAILS PROVIDED BY THE APPROVED VENDOR.
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 - PROPERTIES OF BACKFILL SOIL $\gamma=2.0t/m^3$, $\phi=30^\circ$.
- WORKMANSHIP/DETAILING :**
 - MINIMUM CLEAR COVER :
 - SUPERSTRUCTURE = 40MM
 - SUBSTRUCTURE : ABUTMENT, ABUTMENT CAP = 75MM
FIN WALL = 50MM
 - FOUNDATION SLAB = 75MM
 - DESIGN LOAD :
 - CLASS A THREE LANES OR CLASS A ONE LANE + CLASS 70R TRACKED/WHEELED OR IRC CLASS SV LOADING WHICHEVER PRODUCES WORST EFFECT IS CONSIDERED FOR DESIGN.
 - THE BRIDGE IS IN SEISMIC ZONE-V.
 - SEISMIC LOADING :- AS PER CL. NO. 219 OF IRC:6-2017.
 - FOR ENSURING PROPER COVER OF CONCRETE TO REINFORCEMENT SPECIALLY MADE POLYMER COVER BLOCKS SHALL ONLY BE USED.
 - BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502.
 - PROPER COMPACTION OF CONCRETE SHALL BE ENSURED BY USE OF FORM VIBRATOR OR NEEDLE VIBRATORS. USE OF FULL WIDTH SCREED VIBRATORS FOR COMPACTION OF CONCRETE IN DECK SLAB SHALL BE ENSURED.
 - SHUTTERING PLATES SHALL SUITABLY BE STIFFENED TO ENABLE THE COMPACTION BY FORM VIBRATORS.
 - SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
 - THE WEEP HOLES SHALL BE WITH 100MM DIA AC PIPE IN 1:20 SLOPE @ 1M C/C STAGGERED HORIZONTALLY & VERTICALLY AT ABUTMENT & FIN WALL.
 - THE SUB STRUCTURE & FOUNDATION DIMENSIONS MAY VARY ON THE BASIS OF DETAILED GEOTECHNICAL INVESTIGATION & STRUCTURAL DESIGN.

FRL (RL IN METRE)	4+090-1612.997-1615.416	4+095-1609.849-1615.212	4+100-1604.339-1615.016	4+110-1590.721-1614.616	4+120-1605.483-1614.216	4+123-1611.115-1614.100	4+130-1617.482-1613.816
EGL (RL IN METRE)							
OFFSET (IN METRE)							

SECTIONAL ELEVATION
SCALE-1:175

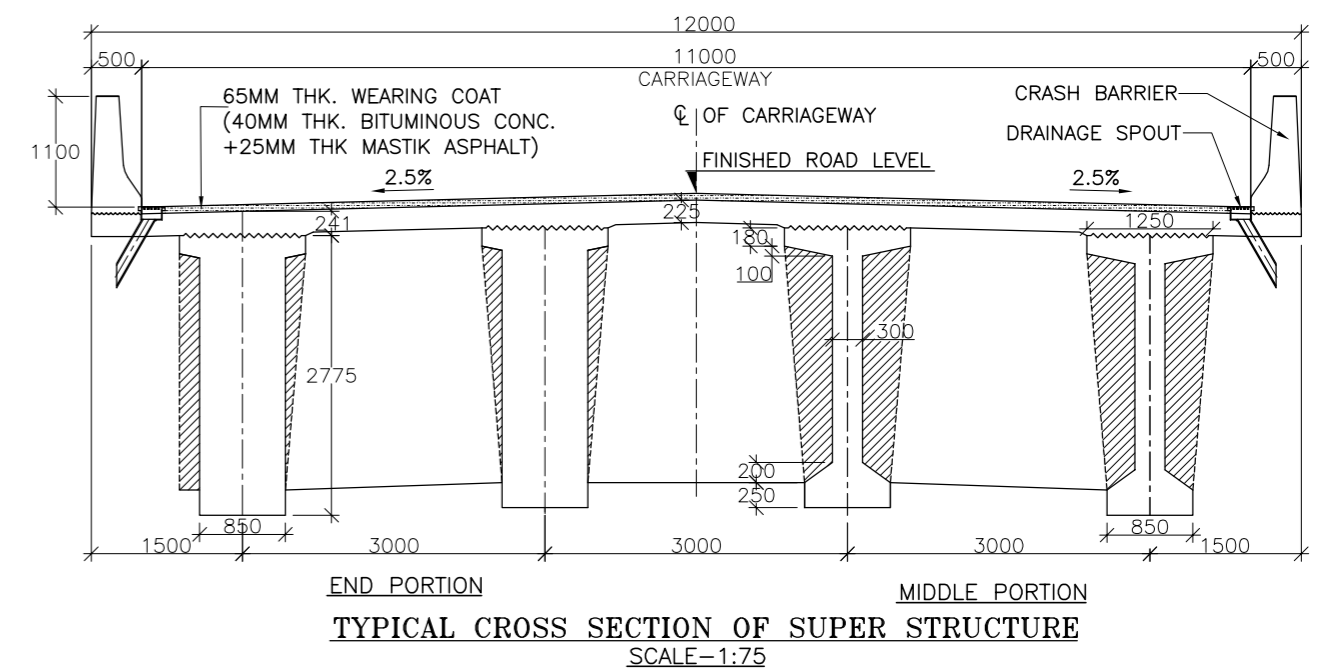
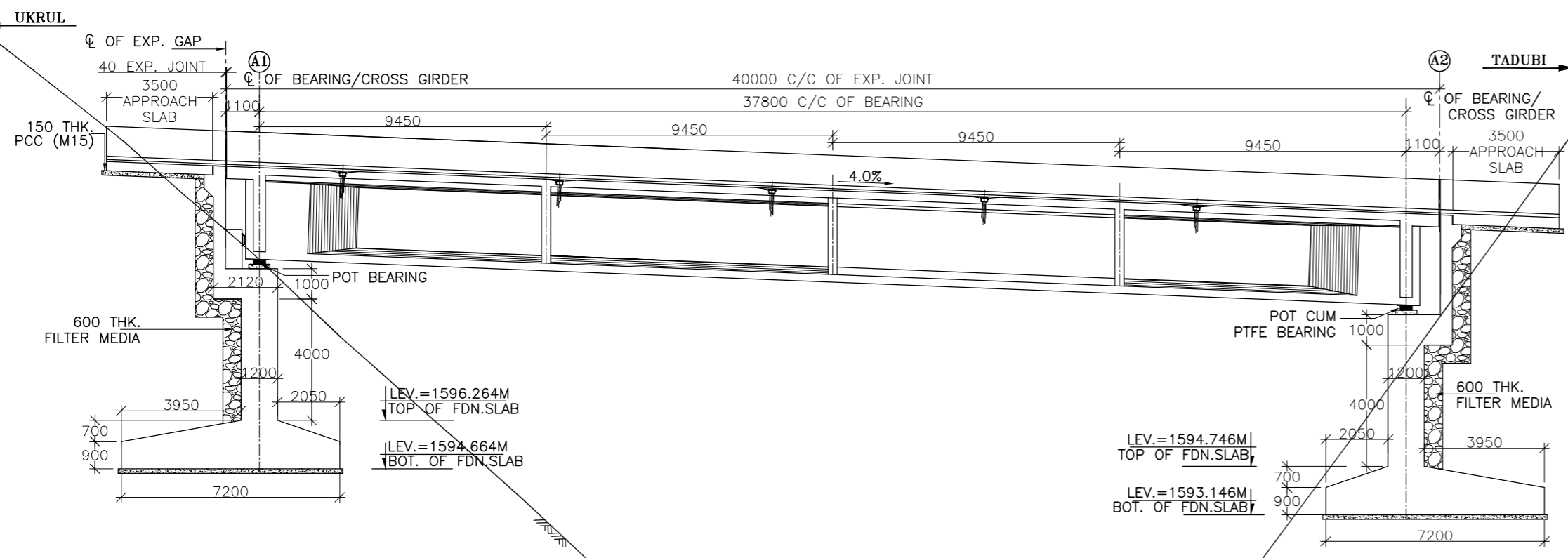


PLAN
SCALE-1:175



TYPICAL CROSS SECTION OF SUPERSTRUCTURE
SCALE-1:75

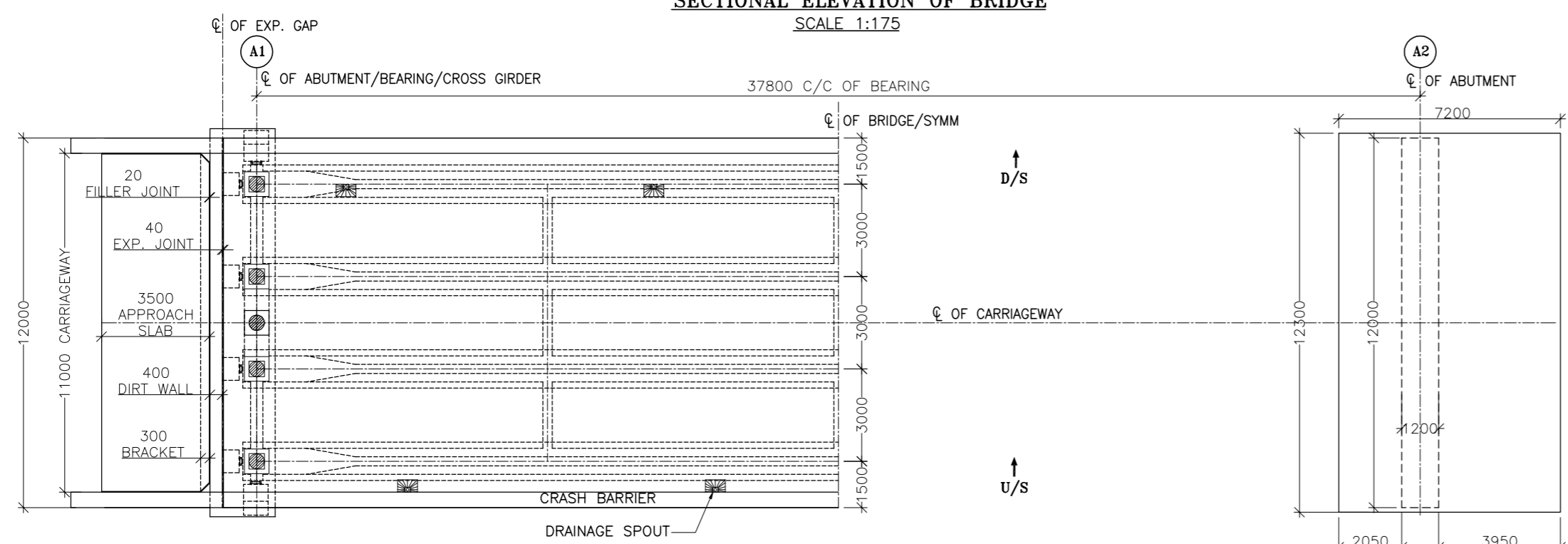
SCALE : AS SHOWN				CLIENT : NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001		TITLE : GENERAL ARRANGEMENT DRAWING OF 1X30.0M PSC-I GIRDER (AT CHAINAGE - 4+109KM)		CONSULTANT : CETEST Engineering Consultants Pvt. Ltd. Kolkata - 700092		DWG NO : CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-51)/GAD	
DATE : OCTOBER, 2023				PROJECT : CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM) IN THE STATE OF MANIPUR ON EPC MODE.		SUBMISSION TYPE : DRAFT DETAILED PROJECT REPORT		C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092		REVISION MKD. - R0	
REVISIONS										SHEET NO. - 01 OF 01	
										DRAWN BY : N.BHATTACHARJEE	
										DESIGN BY : P.SAHA	
										CHECKED BY : S.DEB	
										APPROVED BY : S.DEB	



H.F.L. = 1586.386M.

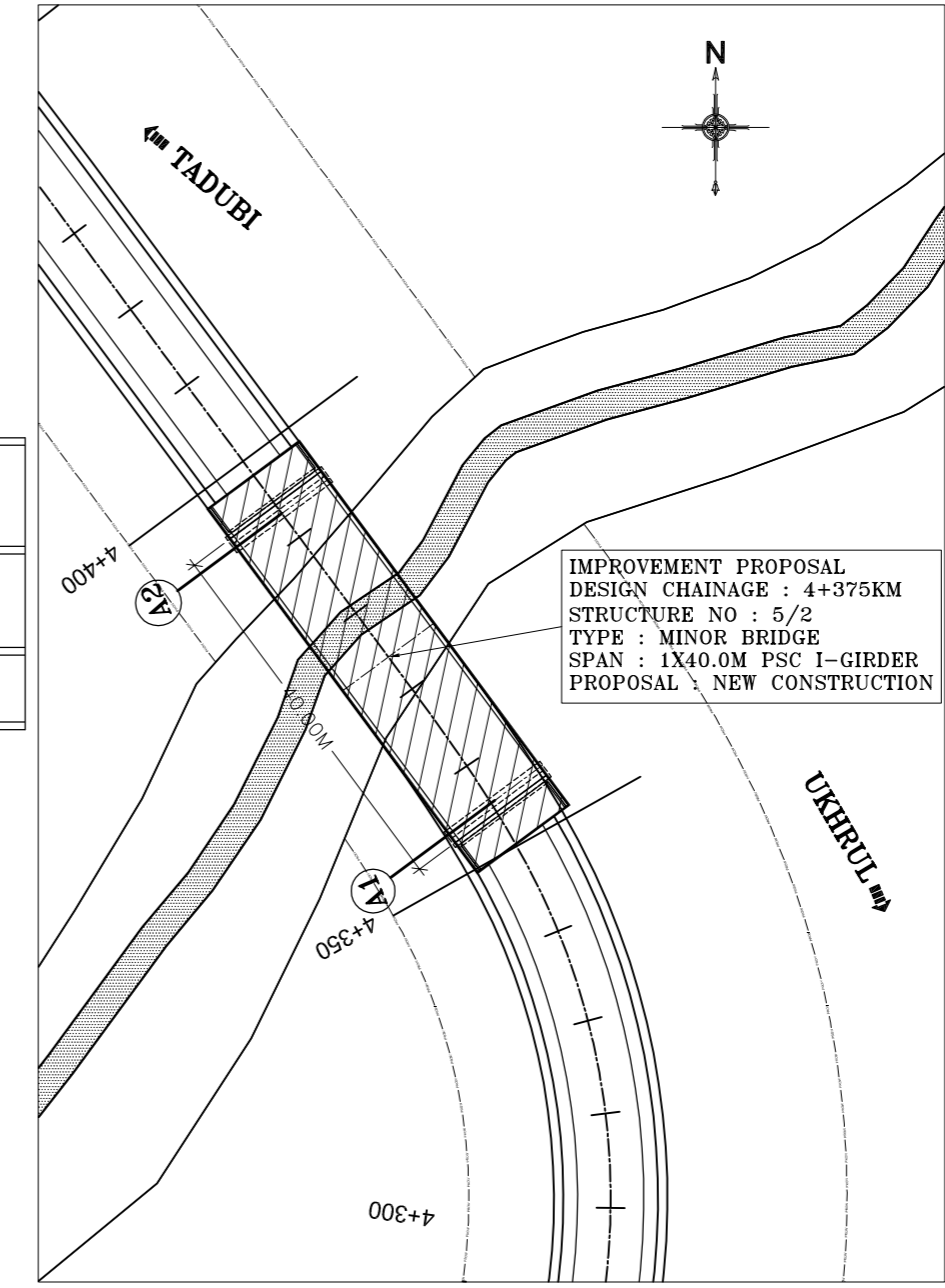
FRL (RL IN METRE)	1605.016	1604.772	1604.616	1604.216	1603.816	1603.416	1603.280	1603.016
EGL (RL IN METRE)	1606.767	1601.558	1597.934	1588.419	1575.389	1592.827	1598.140	1605.957
OFFSET (IN METRE)	4+350	4+356	4+360	4+370	4+380	4+390	4+394	4+400

SECTIONAL ELEVATION OF BRIDGE
SCALE 1:175



HALF SUPER STRUCTURE PLAN
SCALE 1:175

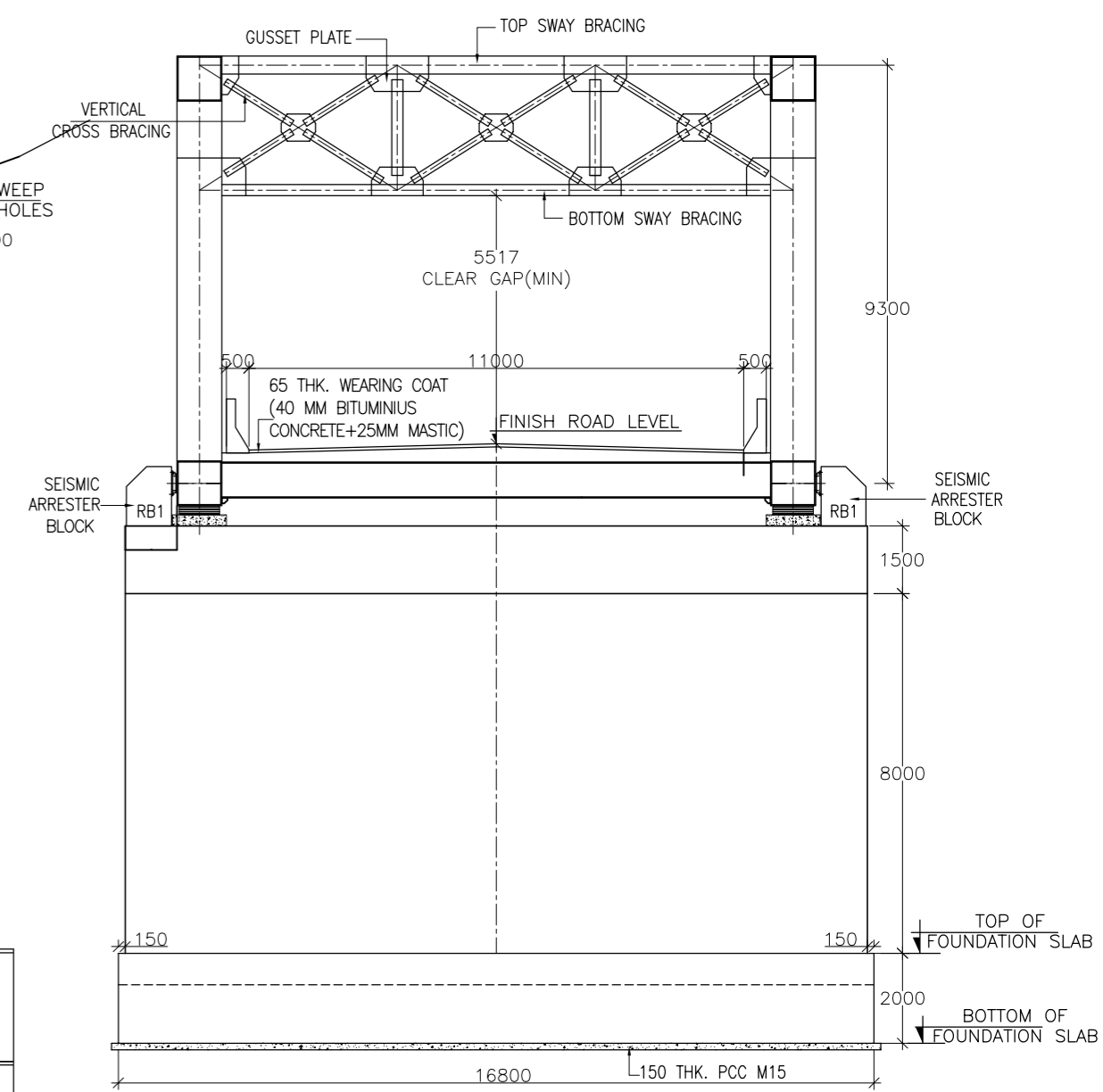
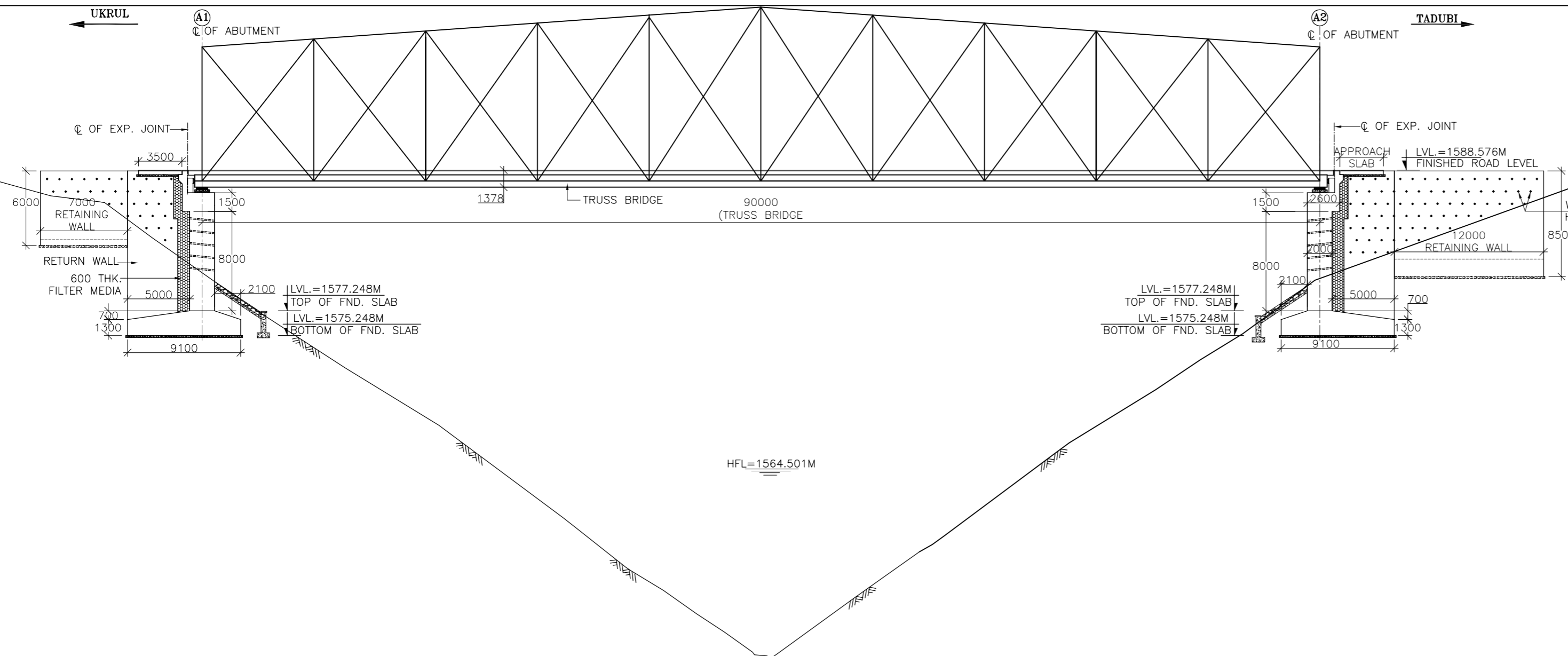
HALF FOUNDATION PLAN
SCALE 1:175



LOCATION PLAN
SCALE-N.T.S

- GENERAL NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M . UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - MATERIALS SPECIFICATIONS :**
 - CONCRETE :**
 - GRADE OF CONCRETE USED :-
 - DECK SLAB=M40,
 - GIRDER=M45,
 - SUB STRUCTURE=M30,
 - DIRT WALL=M30,
 - APPROACH SLAB = M30,
 - P.C.C. BELOW APPROACH SLAB = M15,
 - CRASH BARRIER = M40,
 - PEDESTAL = M35,
 - REACTION BLOCK = M40,
 - FIN WALL = M30.
 - CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
 - 33/43/53 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 269, IS : 8112, IS : 12269 OR PORTLAND SLAG CEMENT CONFORMING TO IS : 455 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
 - TO IMPROVE WORKABILITY OF CONCRETE, ADMIXTURES CONFORMING TO IS:9103 MAY BE USED SUBJECT TO SATISFACTORY PROVEN USE.
 - THE MINIMUM CEMENT CONTENT IN CONCRETE SHALL BE AS PER TABLE 14.2, IRC -112-2020
 - MAX. WATER CEMENT RATIO SHALL BE AS PER TABLE-14.2, IRC:112-2020.
 - REINFORCEMENT :**
 - ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe 500D) CONFORMING TO IS : 1786 (EXCEPT FOR MESH REINFORCEMENT WHICH SHALL BE MS BARS GRADE, DESIGNATION Fe 250 CONFORMING TO IS:432 PART-I MILD STEEL)
 - WATER :**
 - WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO IRC : 112 - 2020.
 - EXPANSION JOINTS :**
 - THE EXPANSION JOINTS SHOULD BE STRIP SEAL TYPE.
 - BEARING SHALL BE OF POT & POT CUM PTFE TYPE. THE SIZE & DIMENSIONS OF THE BEARINGS SHALL BE FINALIZED AS PER THE DETAILS PROVIDED BY THE APPROVED VENDOR.
 - FILTER MATERIAL BEHIND ABUTMENT SHALL CONFORM TO CLAUSE WORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - PROPERTIES OF BACKFILL SOIL $\gamma=2.0t/m^3$, $\phi=30^\circ$.
 - WORKMANSHIP/DETAILING :**
 - MINIMUM CLEAR COVER :
 - SUPERSTRUCTURE = 40MM
 - SUBSTRUCTURE : ABUTMENT, ABUTMENT CAP = 75MM
FIN WALL = 50MM
 - FOUNDATION SLAB = 75MM
 - DESIGN LOAD :
 - CLASS A THREE LANES OR CLASS A ONE LANE + CLASS 70R TRACKED/WHEELED OR IRC CLASS SV LOADING WHICHEVER PRODUCES WORST EFFECT IS CONSIDERED FOR DESIGN.
 - THE BRIDGE IS IN SEISMIC ZONE-V.
 - SEISMIC LOADING :- AS PER CL. NO. 219 OF IRC:6-2017.
 - FOR ENSURING PROPER COVER OF CONCRETE TO REINFORCEMENT SPECIALLY MADE POLYMER COVER BLOCKS SHALL ONLY BE USED.
 - BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502.
 - PROPER COMPACTION OF CONCRETE SHALL BE ENSURED BY USE OF FORM VIBRATOR OR NEEDLE VIBRATORS. USE OF FULL WIDTH SCREED VIBRATORS FOR COMPACTION OF CONCRETE IN DECK SLAB SHALL BE ENSURED.
 - SHUTTERING PLATES SHALL SUITABLY BE STIFFENED TO ENABLE THE COMPACTION BY FORM VIBRATORS.
 - SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
 - THE WEEP HOLES SHALL BE WITH 100MM DIA AC PIPE IN 1:20 SLOPE @ 1M C/C STAGGERED HORIZONTALLY & VERTICALLY AT ABUTMENT & FIN WALL.
 - THE SUB STRUCTURE & FOUNDATION DIMENSIONS MAY VARY ON THE BASIS OF DETAILED GEOTECHNICAL INVESTIGATION & STRUCTURAL DESIGN.

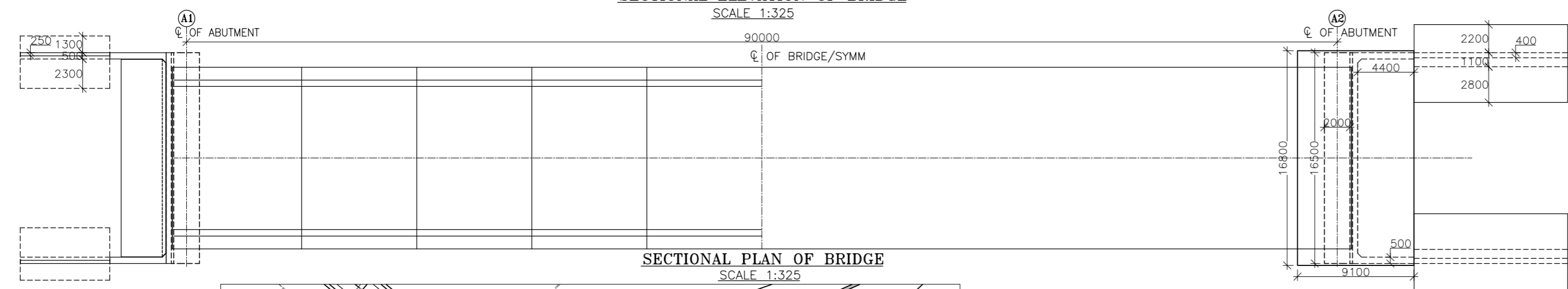
SCALE : AS SHOWN					CLIENT : NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001					TITLE : GENERAL ARRANGEMENT DRAWING OF 1X40.0M PSC-I GIRDER (AT CHAINAGE - 4+375KM)					CONSULTANT : CETEST Engineering Consultants Pvt. Ltd. Kolkata - 700092					DWG NO :- CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-5/2)/GAD				
DATE : OCTOBER, 2023					PROJECT : CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM) IN THE STATE OF MANIPUR ON EPC MODE.					SUBMISSION TYPE : DRAFT DETAILED PROJECT REPORT					SHEET NO. - 01 OF 01									
REVISIONS															DRAWN BY : N.BHATTACHARJEE									
															DESIGN BY : P.SAHA									
															CHECKED BY : S.DEB									
															APPROVED BY : S.DEB									



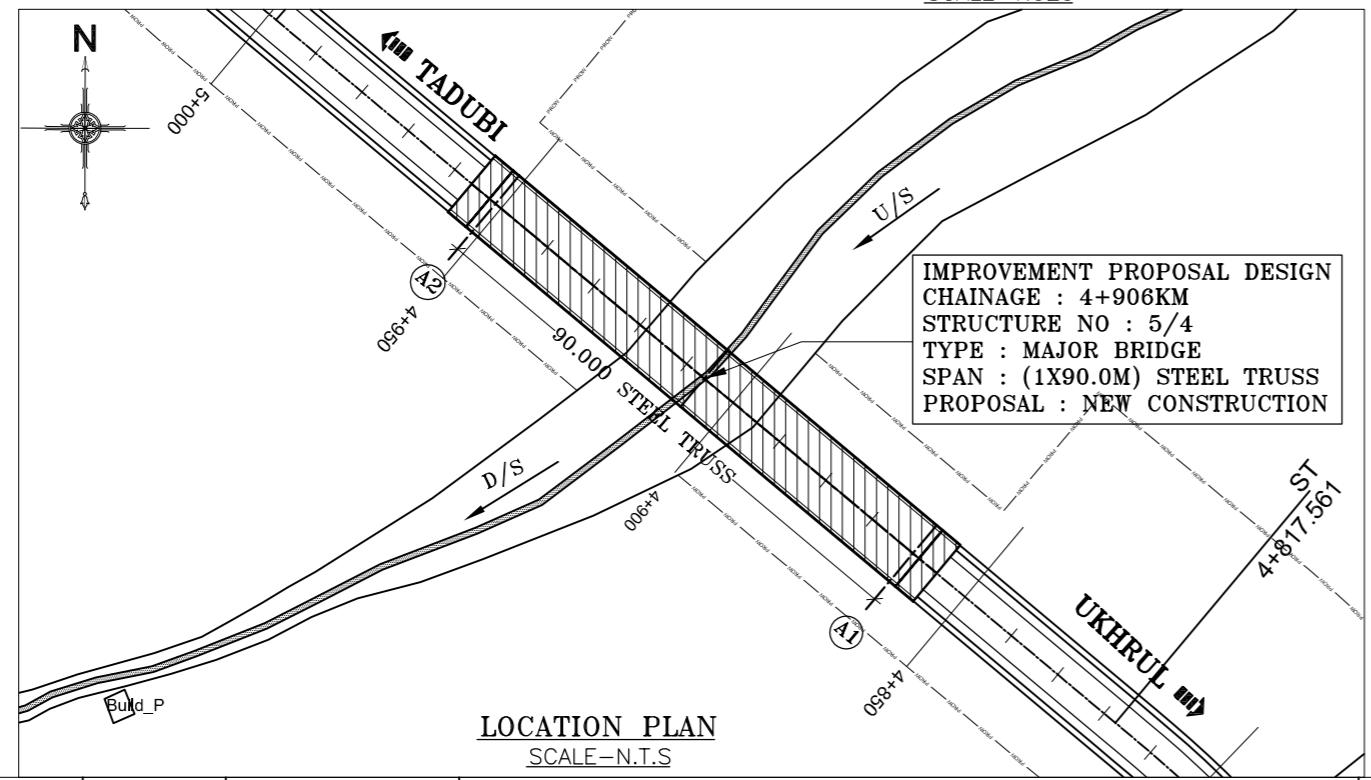
EGL (RL IN METRE)	1586.355	1581.016	1574.287	1568.065	1560.629	1553.414	1551.568	1558.562	1565.996	1572.373	1579.244	1583.091	1586.701
OFFSET (IN METRE)	4+850	4+860	4+870	4+880	4+890	4+900	4+910	4+920	4+930	4+940	4+950	4+960	4+970

SECTIONAL ELEVATION OF BRIDGE
SCALE 1:325

TYPICAL CROSS SECTIONAL AT ABUTMENT
SCALE 1:150



SECTIONAL PLAN OF BRIDGE
SCALE 1:325



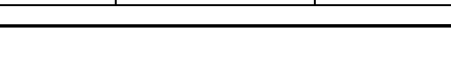
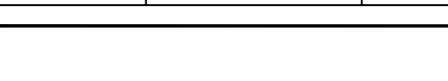
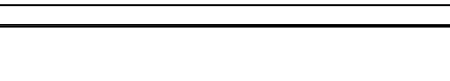
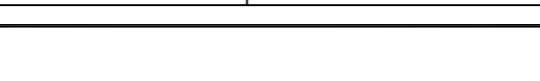
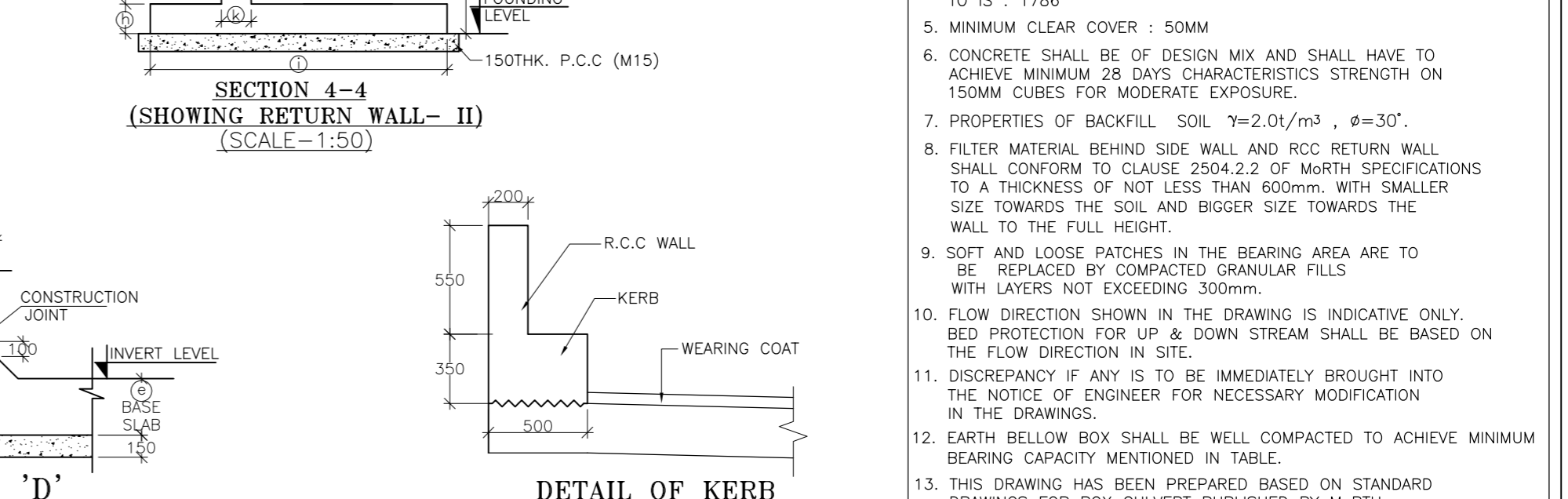
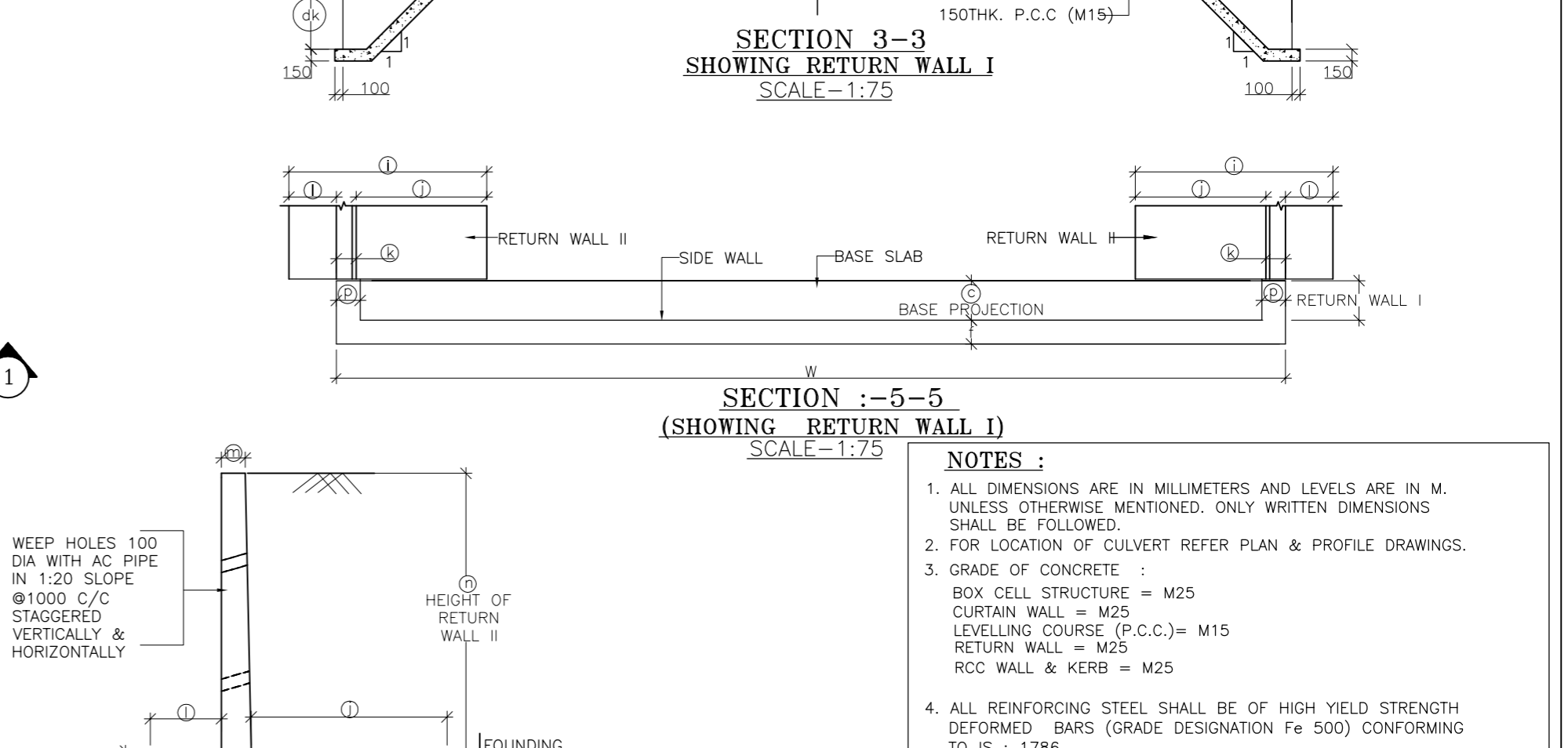
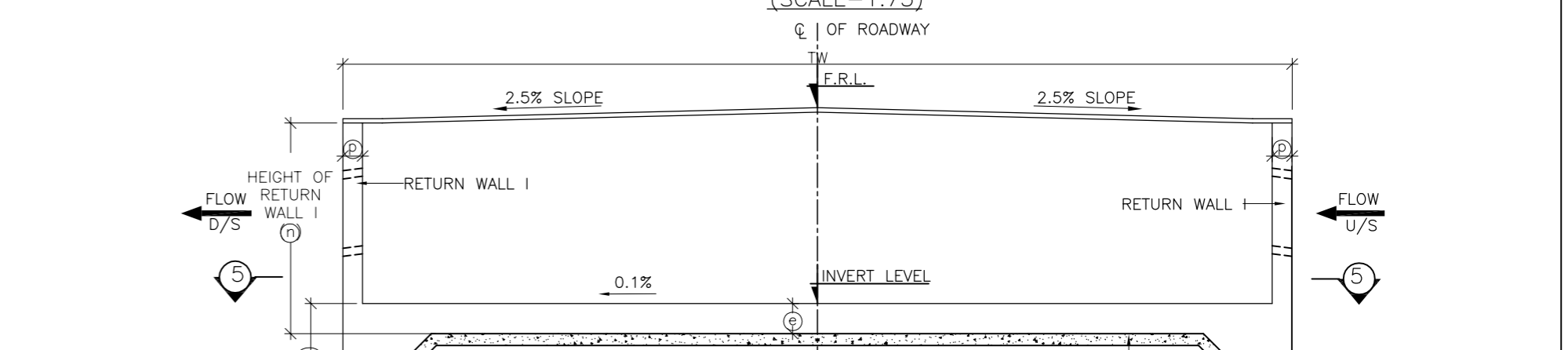
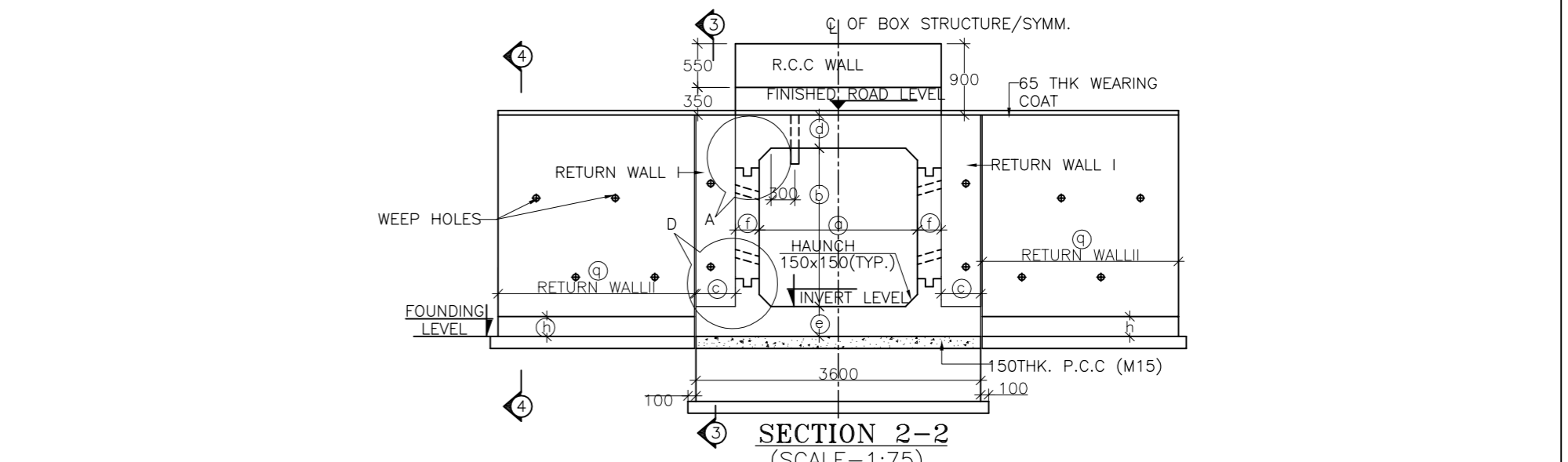
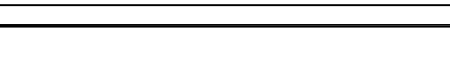
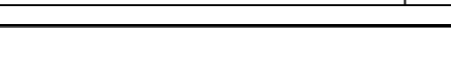
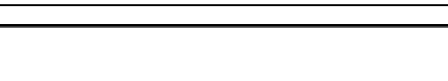
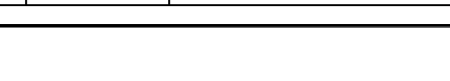
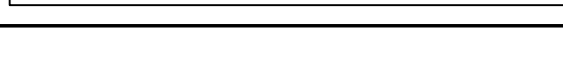
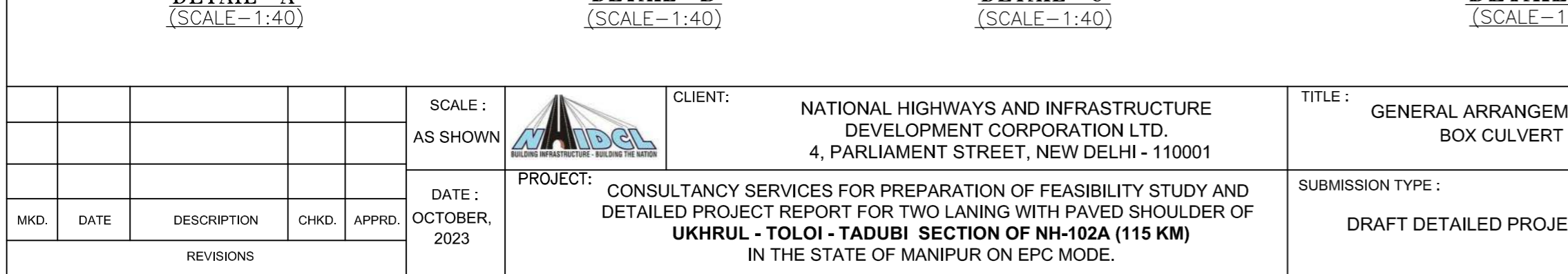
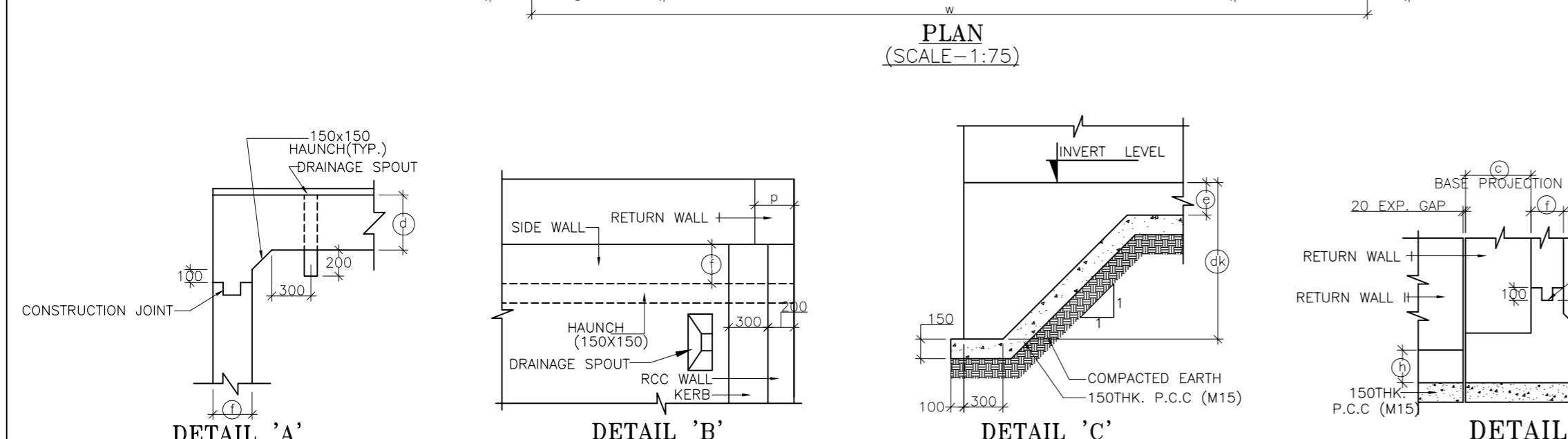
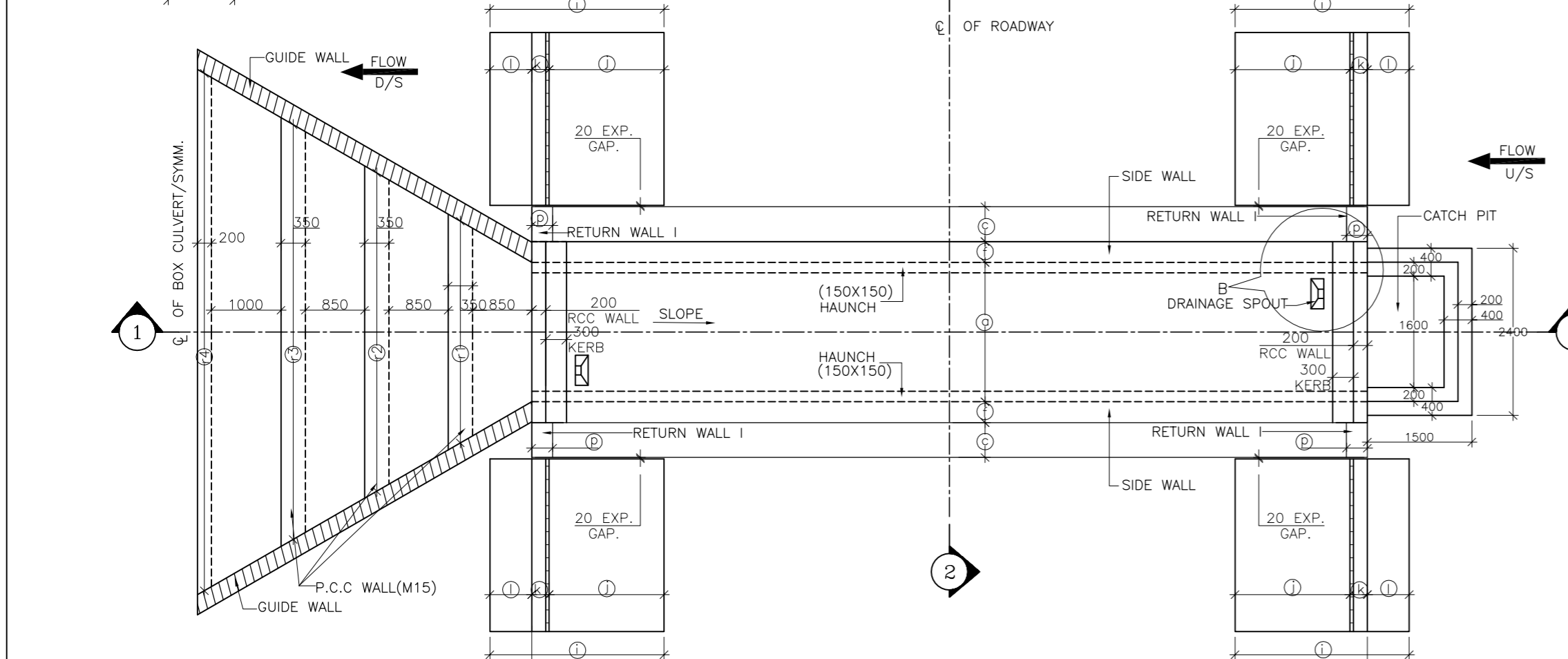
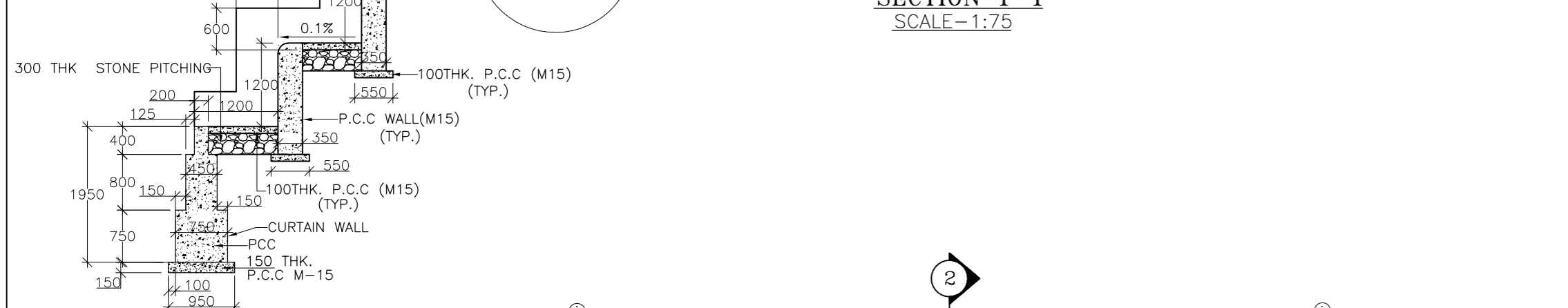
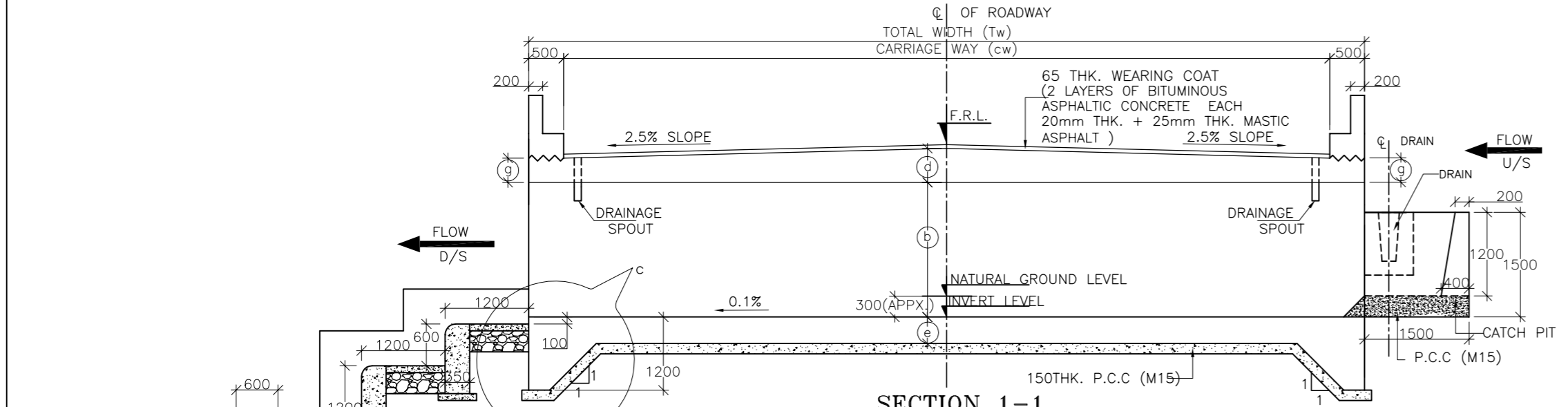
LOCATION PLAN
SCALE-N.T.S

IMPROVEMENT PROPOSAL DESIGN
CHAINAGE : 4+906KM
STRUCTURE NO : 5/4
TYPE : MAJOR BRIDGE
SPAN : (1X90.0M) STEEL TRUSS
PROPOSAL : NEW CONSTRUCTION

- NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS. UNLESS OTHERWISE MENTIONED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED
 - MATERIALS:
STRUCTURAL STEEL: B₃ KILLED STEEL F_y ≤ 540 N/mm² (Fe 540)
REINFORCING STEEL (R) : HYSD BARS CONFORM TO IS : 1786 GRADE Fe 500D.
 - ALL BEARING SHALL BE OF POT CUM PTFE TYPE. THE LONGITUDINAL GUIDED BEARING SHALL BE CAPABLE OF ACCOMMODATING A MOVEMENT OF 100mm.
 - THE SUB STRUCTURE & FOUNDATION DIMENSIONS MAY VARY ON THE BASIS OF DETAILED GEOTECHNICAL INVESTIGATION & STRUCTURAL DESIGN.
- MATERIALS SPECIFICATIONS :-**
- CONCRETE :**
- GRADE OF CONCRETE USED :-
(I) SUB STRUCTURE = M30,
(II) FOUNDATION SLAB = M30,
 - CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
 - 43 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 8112 OR 33 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 269 OR PORTLAND SLAG CEMENT CONFORMING TO IS. 455 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
 - TO IMPROVE WORKABILITY OF CONCRETE, ADMIXTURES CONFORMING TO IS : 9103 MAY BE USED SUBJECT TO SATISFACTORY PROVEN USE.
E) THE MINIMUM CEMENT CONTENT IN CONCRETE SHALL BE AS PER IRC-112 : 2020.
F) MAXIMUM WATER CEMENT RATIO SHALL BE AS PER IRC-112 : 2020.

SCALE : AS SHOWN					CLIENT : NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001					TITLE : GENERAL ARRANGEMENT DRAWING OF (90.0M) STEEL TRUSS (AT CHAINAGE 4+906KM)					CONSULTANT : CETEST C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092				
DATE : OCTOBER, 2023					PROJECT : CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM) IN THE STATE OF MANIPUR ON EPC MODE.					SUBMISSION TYPE : DRAFT DETAILED PROJECT REPORT					DWG NO : CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MJ/(STR-5/4)/GAD				
REVISIONS															REVISION MKD. - R0				
															SHEET NO. - 01 OF 01				
															DRAWN BY : N.BHATTACHARJEE				
															DESIGN BY : -				
															CHECKED BY : P.SAHA				
															APPROVED BY : S.DEB				

CULVERT



- NOTES :**
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M. UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 2. FOR LOCATION OF CULVERT REFER PLAN & PROFILE DRAWINGS.
 3. GRADE OF CONCRETE :
 BOX CELL STRUCTURE = M25
 CURTAIN WALL = M25
 LEVELLING COURSE (P.C.C.)= M15
 RETURN WALL = M25
 RCC WALL & KERB = M25
 4. ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe 500) CONFORMING TO IS : 1786
 5. MINIMUM CLEAR COVER : 50MM
 6. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
 7. PROPERTIES OF BACKFILL SOIL $\gamma=2.0t/m^3$, $\phi=30^\circ$.
 8. FILTER MATERIAL BEHIND SIDE WALL AND RCC RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 9. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 10. FLOW DIRECTION SHOWN IN THE DRAWING IS INDICATIVE ONLY. BED PROTECTION FOR UP & DOWN STREAM SHALL BE BASED ON THE FLOW DIRECTION IN SITE.
 11. DISCREPANCY IF ANY IS TO BE IMMEDIATELY BROUGHT INTO THE NOTICE OF ENGINEER FOR NECESSARY MODIFICATION IN THE DRAWINGS.
 12. EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM BEARING CAPACITY MENTIONED IN TABLE.
 13. THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MoRTH.

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE :	AS SHOWN
DATE :	OCTOBER, 2023

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001

PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF UKHRUL - TOLAI - TADUBI SECTION OF NH-102A (115 KM) IN THE STATE OF MANIPUR ON EPC MODE.

TITLE: GENERAL ARRANGEMENT DRAWING OF BOX CULVERT (TYPICAL)

SUBMISSION TYPE: DRAFT DETAILED PROJECT REPORT

CONSULTANT: C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092

DWG NO :- CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/CULVERT/GAD			
REVISION MKD. - R0		SHEET NO. - 01 OF 01	
DRAWN BY	DESIGN BY	CHECKED BY	APPROVED BY
N.BHATTACHARJEE	P.SAHA		S.DEB

SI No.	Design Chainage (Km)	No of Cell (Clr Span X Clr Height) (M X M)	Nc/ab/EC	Height of Earth Cushion (s) (M)	Total Width (Tw) (M)	Proposed Carriageway (Cw) (M)	Clear Span of Proposed Box (a)(M)	Vent Height of Proposed Box (b)(M)	Vent Height (b1) (M)	Vent Height (b2) (M)	Top Slab Thickness at Edge (g) (M)	Top Slab Thickness at Centre (d) (M)	Bottom Slab Thickness (e) (M)	Side Wall Thickness (f) (M)	Projection of Slab (c) (M)	Total Length of Box Culvert (M)	Barrel length of Box Culvert (r) (M)
1	0.066	2.0 X 2.0	01/22/0		11	10	2	2			0.350	0.475	0.380	0.300	0.500	2.600	11.000
2	0.190	3.0 X 4.0	01/34/3	1.630	11	10	3	4			0.390	0.390	0.470	0.480	1.400	3.960	17.521
3	0.451	3.0 X 4.0	01/34/3	1.846	11	10	3	4			0.390	0.390	0.470	0.480	1.400	3.960	18.384
4	0.579	2.0 X 3.0	01/23/3	0.588	11	10	2	3			0.294	0.294	0.300	0.350	1.100	2.700	13.354
5	0.714	2.0 X 2.0	01/22/3	0.340	11	10	2	2			0.263	0.263	0.300	0.250	0.600	2.500	12.362
6	1.207	3.0 X 4.0	01/34/3	2.939	11	10	3	4			0.390	0.390	0.470	0.480	1.400	3.960	22.755
7	1.549	5.0 X 4.0	01/54/3	3.840	11	10	5	4			0.580	0.580	0.700	0.530	0.800	6.060	26.359
8	1.878	2.0 X 2.0	01/22/0		11	10	2	2	2	2.700	0.350	0.350	0.380	0.300	0.500	2.600	11.000
9	2.107	2.0 X 2.0	01/22/3	0.866	11	10	2	2			0.263	0.263	0.300	0.250	0.600	2.500	14.464
10	2.549	2.0 X 2.0	01/22/0		11	10	2	2			0.350	0.475	0.380	0.300	0.500	2.600	11.000
11	2.838	5.0 X 4.0	01/54/3	6.066	11	10	5	4			0.580	0.580	0.700	0.530	0.800	6.060	35.262
12	2.954	2.0 X 3.0	01/23/3	1.021	11	10	2	3			0.294	0.294	0.300	0.350	1.100	2.700	15.084
13	3.254	2.0 X 2.0	01/22/0		11	10	2	2	2	2.700	0.350	0.350	0.380	0.300	0.500	2.600	11.000
14	3.874	2.0 X 2.0	01/22/0		11	10	2	2	2	2.560	0.350	0.350	0.380	0.300	0.500	2.600	11.000
15	5.100	2.0 X 2.0	01/22/0		12	11	2	2	2	2.770	0.350	0.350	0.380	0.300	0.500	2.600	12.000
16	5.300	3.0 X 4.0	01/34/3	2.079	11	10	3	4			0.390	0.390	0.470	0.480	1.400	3.960	19.317
17	5.604	2.0 X 2.0	01/22/0		11	10	2	2			0.350	0.475	0.380	0.300	0.500	2.600	11.000
18	5.843	2.0 X 2.0	01/22/0		11	10	2	2			0.350	0.475	0.380	0.300	0.500	2.600	11.000
19	5.954	2.0 X 2.0	01/22/0		11	10	2	2	2	2.570	0.350	0.350	0.380	0.300	0.500	2.600	11.000
20	6.529	2.0 X 2.0	01/22/0		11	10	2	2	2	2.560	0.350	0.350	0.380	0.300	0.500	2.600	11.000

SI No.	Design Chainage (Km)	Length of Return Wall -I (M)	Height of Return Wall-I (o) (M)	Height of Return Wall-I Inner Side of Curve (o1) (M)	Height of Return Wall-I (outer side of curve) (o2) (M)	Thickness of Return Wall-I (p) (M)	Length of Return Wall -II (q) (M)	Total Height of Return Wall-II (n) (M)	Return Wall ht Inner Side of curve (n1) (M)	Return Wall ht Outer Side of curve (n2) (M)	Retaining wall height for adopting section	h	i	j	k	l	m	Finished Road Level (M)
1	0.066	0.500	2.350			0.250	3.010	2.730	-	-	3.0	0.250	2.500	1.650	0.250	0.600	0.200	1689.374
2	0.190	1.400	4.390			0.300	8.130		6.140	6.840	7.0	0.650	5.300	2.800	0.650	1.850	0.250	1693.877
3	0.451	1.400	4.390			0.300	8.360		6.426	6.986	7.0	0.650	5.300	2.800	0.650	1.850	0.250	1689.782
4	0.579	1.100	3.294			0.300	5.130		3.902	4.462	5.0	0.400	4.150	2.200	0.450	1.500	0.200	1688.94
5	0.714	0.600	2.263			0.250	2.590	2.437	-	-	3.0	0.250	2.500	1.650	0.250	0.600	0.200	1687.095
6	1.207	1.400	4.390			0.300	4.980	4.735	-	-	5.0	0.400	4.150	2.200	0.450	1.500	0.200	1662.692
7	1.549	0.800	4.580			0.250	5.870	5.155	-	-	6.0	0.450	4.300	2.300	0.500	1.500	0.250	1660.28
8	1.878	0.500		2.350	3.050	0.250	4.060		2.730	3.430	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1669.7
9	2.107	0.600	2.263			0.250	4.410		3.208	3.648	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1658.998
10	2.549	0.500	2.350			0.250	3.010	2.730	-	-	3.0	0.250	2.500	1.650	0.250	0.600	0.200	1642.786
11	2.838	0.800	4.580			0.250	15.680		10.996	11.696	12.0	1.350	8.000	3.500	1.350	3.150	0.400	1628.597
12	2.954	1.100	3.294			0.300	3.640	3.468	-	-	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1625.395
13	3.254	0.500		2.350	3.050	0.250	4.060		2.730	3.430	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1632.146
14	3.874	0.500		2.350	2.910	0.250	3.850		2.730	3.290	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1619.884
15	5.100	0.500		2.350	3.120	0.250	4.160		2.730	3.500	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1587.152
16	5.300	1.400	4.390			0.300	4.980	4.735	-	-	5.0	0.400	4.150	2.200	0.450	1.500	0.200	1573.933
17	5.604	0.500	2.350			0.250	3.010	2.730	-	-	3.0	0.250	2.500	1.650	0.250	0.600	0.200	1565.629
18	5.843	0.500	2.350			0.250	3.010	2.730	-	-	3.0	0.250	2.500	1.650	0.250	0.600	0.200	1562.043
19	5.954	0.500		2.350	2.920	0.250	3.860		2.730	3.300	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1563.752
20	6.529	0.500		2.350	2.910	0.250	3.850		2.730	3.290	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1585.706

SI No.	Design Chainage (Km)	Proposed Invert Level (M)	Proposed Founding Level (M)	Protection Type	Cross Fall	SE (e%)	NC	SE (e%)
1	0.066	1686.834	1686.454	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
2	0.190	1687.792	1687.322	Catch Pit With Stepped Protection	SE	7.0		7.0%
3	0.451	1683.481	1683.011	Catch Pit With Stepped Protection	SE	5.6		5.6%
4	0.579	1684.993	1684.693	Catch Pit With Stepped Protection	SE	5.6		5.6%
5	0.714	1684.427	1684.127	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
6	1.207	1655.298	1654.828	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
7	1.549	1651.795	1651.095	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
8	1.878	1666.935	1666.555	Catch Pit With Stepped Protection	SE	7.0		7.0%
9	2.107	1655.805	1655.505	Catch Pit With Stepped Protection	SE	4.4		4.4%
10	2.549	1640.246	1639.866	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
11	2.838	1617.886	1617.186	Catch Pit With Stepped Protection	SE	7.0		7.0%
12	2.954	1621.016	1620.716	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
13	3.254	1629.381	1629.001	Catch Pit With Stepped Protection	SE	7.0		7.0%
14	3.874	1617.189	1616.809	Catch Pit With Stepped Protection	SE	5.6		5.6%
15	5.100	1584.352	1583.972	Catch Pit With Stepped Protection	SE	7.0		7.0%
16	5.300	1567.399	1566.929	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
17	5.604	1563.089	1562.709	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
18	5.843	1559.503	1559.123	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
19	5.954	1561.052	1560.672	Catch Pit With Stepped Protection	SE	5.7		5.7%
20	6.529	1583.011	1582.631	Catch Pit With Stepped Protection	SE	5.6		5.6%