

BOX CULVERTS

CONTENT

PROPOSED SMALL BOX CULVERTS

PACKAGE - IV DISTRICT - SENAPATI

Sl. No.	Description	Drawing No.	No. of Sheets
01.	Level Details Of Box Culverts	-	05
02.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with Catchpit & Sloped Protection (Normal Camber) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA	02
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/RCC	01
03.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with Catchpit & Stepped Protection (Normal Camber):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/RCC	01
04.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with Catchpit & Straight Protection (Normal Camber):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/NC/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/NC/RCC	01
05.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) without Catchpit & Straight Protection (Normal Camber):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/RCC	01
06.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with Catchpit & Sloped Protection (Super Elevation) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/SE/GA	02
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/SE/RCC	01
07.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with Catchpit & Stepped Protection (Super Elevation):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/SE/RCC	01
08.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) Without Catchpit & Straight Protection (Super Elevation):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/SE/RCC	01

Sl. No.	Description	Drawing No.	No. of Sheets
09.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) With Catchpit & Straight Protection (Super Elevation):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/SE/RCC	01
10.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with 3.0m Earth Cushion With Catchpit & Slope Protection (Normal Camber):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1.3M EC/CP/SLP/NC/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1.3M EC/CP/SLP/NC/RCC	01
11.	Single Cell R.C.C. Box Culvert (2.0m x 3.0m) with Catchpit & Stepped Protection (Super Elevation) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/STP/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/STP/SE/RCC	01
12.	Single Cell R.C.C. Box Culvert (2.0m x 3.0m) with Catchpit & Straight Protection (Super Elevation) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/F/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/F/SE/RCC	01
13.	Single Cell R.C.C. Box Culvert (2.0m x 3.0m) with Catchpit & Sloped Protection (Super Elevation) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/SLP/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/SLP/SE/RCC	01
14.	Single Cell R.C.C. Box Culvert (2.0m x 3.0m) without Catchpit & Sloped Protection (Super Elevation) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/SLP/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/SLP/SE/RCC	01
15.	Single Cell R.C.C. Box Culvert (2.0m x 3.0m) with 3.0m Earth Cushion With Catchpit & Sloped Protection (Normal Camber):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1.3M EC/CP/SLP/NC/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1.3M EC/CP/SLP/NC/RCC	01
16.	Single Cell R.C.C. Box Culvert (4.0m x 4.0m) with 4.0m Earth Cushion With Catchpit & Sloped Protection (Super Elevation):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/RCC	01
17.	Typical detail drawing of small box culvert		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/MISC.	01

LEVEL DETAILS OF PROPOSED BOX CULVERTS (NH- 102A)

PKG - 4

Structure No.	Proposed Chainage	Proposed Formation Level (M)	Size Span x Height x No. of cell	Cushion Height (m)	Super Elevation (%)	Slope side	Total Road width	Protection Type		Proposed Invert lvl.	Proposed Founding lvl.
								U/S	D/S		
83/1	82+245	2135.757	2X2X1 Cell	0.00	4.70	R TO L	11.00	With Catch pit	Slope	2133.577	2133.197
83/2	82+611	2123.783	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Slope	2121.218	2120.838
83/3	82+925	2130.632	2 X 3 X 1 CELL	0.00	7.00	R TO L	13.00	With Catch pit	Step	2127.637	2127.257
84/1	83+399	2106.451	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	2103.923	2103.543
84/2	83+730	2087.637	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	2085.109	2084.729
85/1	84+045	2068.069	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	2065.541	2065.161
85/2	84+188	2058.059	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Slope	2055.994	2055.614
85/3	84+740	2019.047	2X2X1 Cell	0.00	7.00	R TO L	10.00	With Catch pit	Slope	2016.947	2016.567
85/4	84+898	2006.759	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	2004.219	2003.839
86/1	85+068	1994.859	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Step	1992.331	1991.951
86/2	85+291	1979.249	2X2X1 Cell	0.00	7.00	R TO L	10.00	With Catch pit	Step	1977.149	1976.769
86/3	85+955	1942.306	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Straight	1940.241	1939.861
87/1	86+020	1939.848	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Slope	1937.783	1937.403
87/2	86+248	1931.229	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1928.689	1928.309
87/3	86+498	1921.779	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Step	1919.239	1918.859
87/4	86+618	1917.243	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1914.703	1914.323
87/5	86+768	1911.572	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	1909.045	1908.665
87/6	86+906	1906.355	2X2X1 Cell	0.00	7.00	L TO R	10.00	With Catch pit	Slope	1904.255	1903.875
88/1	87+138	1891.603	2X3X1 Cell	0.00	3.60	R TO L	11.00	With Catch pit	Slope	1888.348	1887.928
88/2	87+473	1888.724	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1886.184	1885.804

Structure No.	Proposed Chainage	Proposed Formation Level (M)	Size Span x Height x No. of cell	Cushion Height (m)	Super Elevation (%)	Slope side	Total Road width	Protection Type		Proposed Invert lvl.	Proposed Founding lvl.
								U/S	D/S		
88/3	87+800	1874.904	2X3X1 Cell	0.00	7.00	L TO R	10.00	With Catch pit	Step	1872.804	1872.424
88/4	87+978	1866.693	2X2X1 Cell	0.00	4.20	R TO L	11.00	With Catch pit	Step	1864.488	1864.108
89/1	88+058	1865.707	2X2X1 Cell	0.00	4.20	R TO L	11.00	With Catch pit	Step	1863.502	1863.122
89/2	88+132	1864.803	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1862.263	1861.883
89/3	88+158	1864.485	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Slope	1862.420	1862.040
89/4	88+355	1863.347	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Step	1860.807	1860.427
89/5	88+645	1865.044	2X2X1 Cell	0.00	3.60	R TO L	10.00	With Catch pit	Step	1862.791	1862.411
89/6	88+738	1865.572	2X2X1 Cell	0.00	3.60	R TO L	11.00	With Catch pit	Slope	1863.337	1862.957
90/1	89+000	1864.414	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1861.874	1861.494
90/2	89+350	1864.414	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Slope	1862.349	1861.969
90/3	89+612	1846.935	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1844.395	1844.015
90/4	89+685	1842.666	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1840.126	1839.746
90/5	89+790	1841.159	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1838.619	1838.239
90/6	89+994	1841.385	2X2X1 Cell	0.00	3.60	R TO L	11.00	With Catch pit	Straight	1839.150	1838.770
91/1	90+078	1838.794	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Straight	1836.254	1835.874
91/2	90+350	1826.717	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Slope	1824.152	1823.772
91/3	90+663	1810.067	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Step	1807.502	1807.122
92/1	91+453	1758.393	2X2X1 Cell	0.00	7.00	R TO L	13.00	With Catch pit	Straight	1756.398	1756.018
92/2	91+595	1748.453	2X2X1 Cell	0.00	7.00	R TO L	13.00	With Catch pit	Straight	1746.458	1746.078

Structure No.	Proposed Chainage	Proposed Formation Level (M)	Size Span x Height x No. of cell	Cushion Height (m)	Super Elevation (%)	Slope side	Total Road width	Protection Type		Proposed Invert lvl.	Proposed Founding lvl.
								U/S	D/S		
92/3	91+805	1733.753	2X3X1 Cell	0.00	7.00	L TO R	10.00	With Catch pit	Straight	1730.633	1730.213
93/2	92+432	1714.923	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Step	1712.395	1712.015
93/4	92+856	1728.451	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1725.911	1725.531
94/1	93+025	1734.606	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Straight	1732.541	1732.161
94/2	93+118	1736.188	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Step	1733.648	1733.268
94/3	93+431	1734.553	2X2X1 Cell	0.00	7.00	R TO L	12.00	No Catch pit	Straight	1732.523	1732.143
94/4	93+578	1739.542	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Straight	1737.002	1736.622
95/2	94+228	1734.880	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Straight	1732.353	1731.973
95/3	94+355	1743.771	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Straight	1741.243	1740.863
95/4	94+697	1767.712	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Step	1765.185	1764.805
95/5	94+828	1776.883	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1774.343	1773.963
95/6	94+908	1782.483	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1779.943	1779.563
96/1	95+058	1792.984	2X2X1 Cell	0.00	6.70	R TO L	11.00	With Catch pit	Straight	1790.904	1790.524
96/2	95+142	1797.496	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Step	1794.968	1794.588
96/3	95+318	1802.419	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Straight	1800.354	1799.974
96/4	95+372	1803.929	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1801.389	1801.009
96/5	95+555	1809.048	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Straight	1806.983	1806.603
96/6	95+858	1817.523	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Slope	1814.958	1814.578
97/1	96+312	1800.892	2X2X1 Cell	0.00	7.00	R TO L	13.00	With Catch pit	Step	1798.897	1798.517

Structure No.	Proposed Chainage	Proposed Formation Level (M)	Size Span x Height x No. of cell	Cushion Height (m)	Super Elevation (%)	Slope side	Total Road width	Protection Type		Proposed Invert lvl.	Proposed Founding lvl.
								U/S	D/S		
97/2	96+812	1763.325	2X2X1 Cell	0.00	7.00	R TO L	10.00	With Catch pit	Slope	1761.225	1760.845
99/1	98+046	1671.004	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	1668.476	1668.096
99/2	98+250	1655.630	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Straight	1653.565	1653.185
99/3	98+917	1605.739	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	1603.212	1602.832
100/1	99+168	1586.569	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Step	1584.504	1584.124
100/2	99+332	1575.089	2X2X1 Cell	0.00	5.60	R TO L	10.00	With Catch pit	Step	1572.926	1572.546
100/3	99+477	1564.939	2X2X1 Cell	0.00	5.60	R TO L	11.00	With Catch pit	Slope	1562.804	1562.424
101/1	100+250	1520.230	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Straight	1517.702	1517.322
101/2	100+667	1512.671	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1510.131	1509.751
101/3	100+692	1512.218	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Slope	1510.153	1509.773
101/4	100+995	1506.586	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Slope	1504.521	1504.141
102/1	101+105	1503.692	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	1501.165	1500.785
102/2	101+293	1500.212	2X2X1 Cell	0.00	Normal Camber		12.00	No Catch pit	Straight	1497.660	1497.280
102/3	101+708	1513.867	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Step	1511.340	1510.960
102/4	101+832	1518.206	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Slope	1516.141	1515.761
103/1	102+040	1521.487	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Slope	1519.422	1519.042
103/2	102+142	1521.682	2X2X1 Cell	0.00	7.00	R TO L	10.00	With Catch pit	Slope	1519.582	1519.202
103/3	102+318	1524.201	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1521.661	1521.281
103/4	102+468	1532.189	2X2X1 Cell Earth Cushion	3.00	Normal Camber		10.00	With Catch pit	Slope	1526.826	1526.526
103/5	102+599	1539.178	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Slope	1537.113	1536.733

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								U/S	D/S		
104/1	103+085	1534.282	2X3X1 Cell	0.00	4.70	L TO R	11.00	No Catch pit	Slope	1531.082	1530.662
104/2	103+463	1530.152	2X2X1 Cell	0.00	Normal Camber		13.00	No Catch pit	Straight	1527.587	1527.207
104/3	103+568	1531.903	2X3X1 Cell Earth Cushion	3.00	Normal Camber		13.00	With Catch pit	Slope	1525.473	1525.173
104/4	103+695	1540.126	4X4X1 Cell Earth Cushion	4.00	7.00	L TO R	13.00	With Catch pit	Slope	1531.626	1531.026
104/5	103+786	1546.130	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Slope	1543.565	1543.185
105/1	104+048	1565.926	2X2X1 Cell	0.00	Normal Camber		13.00	No Catch pit	Straight	1563.361	1562.981
105/2	104+180	1575.549	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Step	1572.984	1572.604
105/3	104+668	1612.527	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Slope	1609.962	1609.582
105/4	104+715	1615.817	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Straight	1613.252	1612.872
105/5	104+930	1632.322	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Straight	1629.757	1629.377
105/6	104+975	1635.617	2X2X1 Cell	0.00	7.00	R TO L	13.00	With Catch pit	Straight	1633.622	1633.242

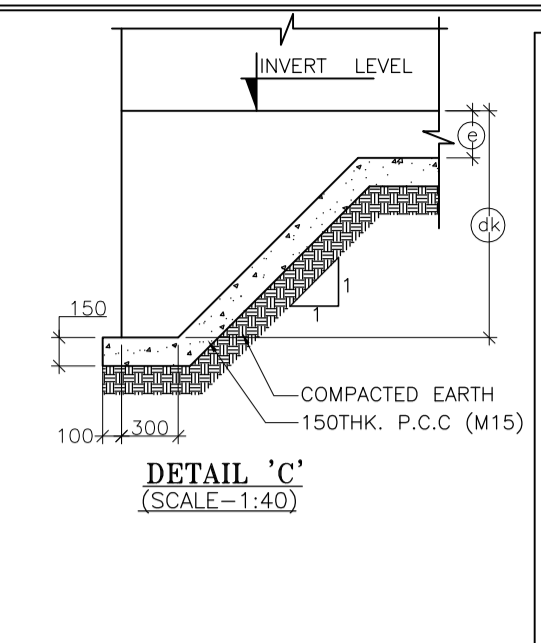
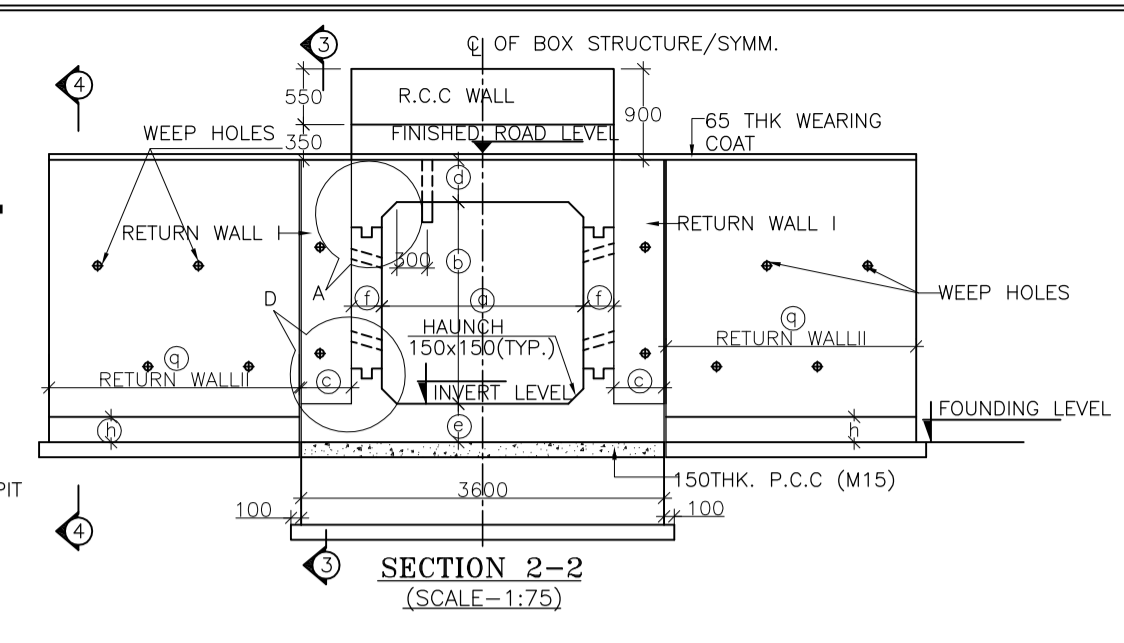
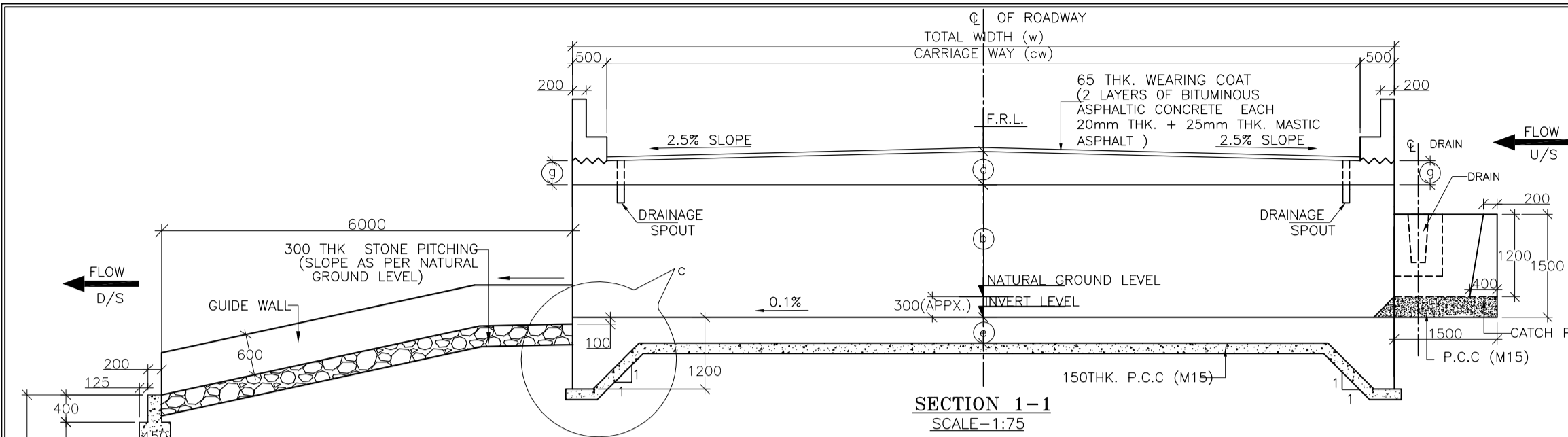
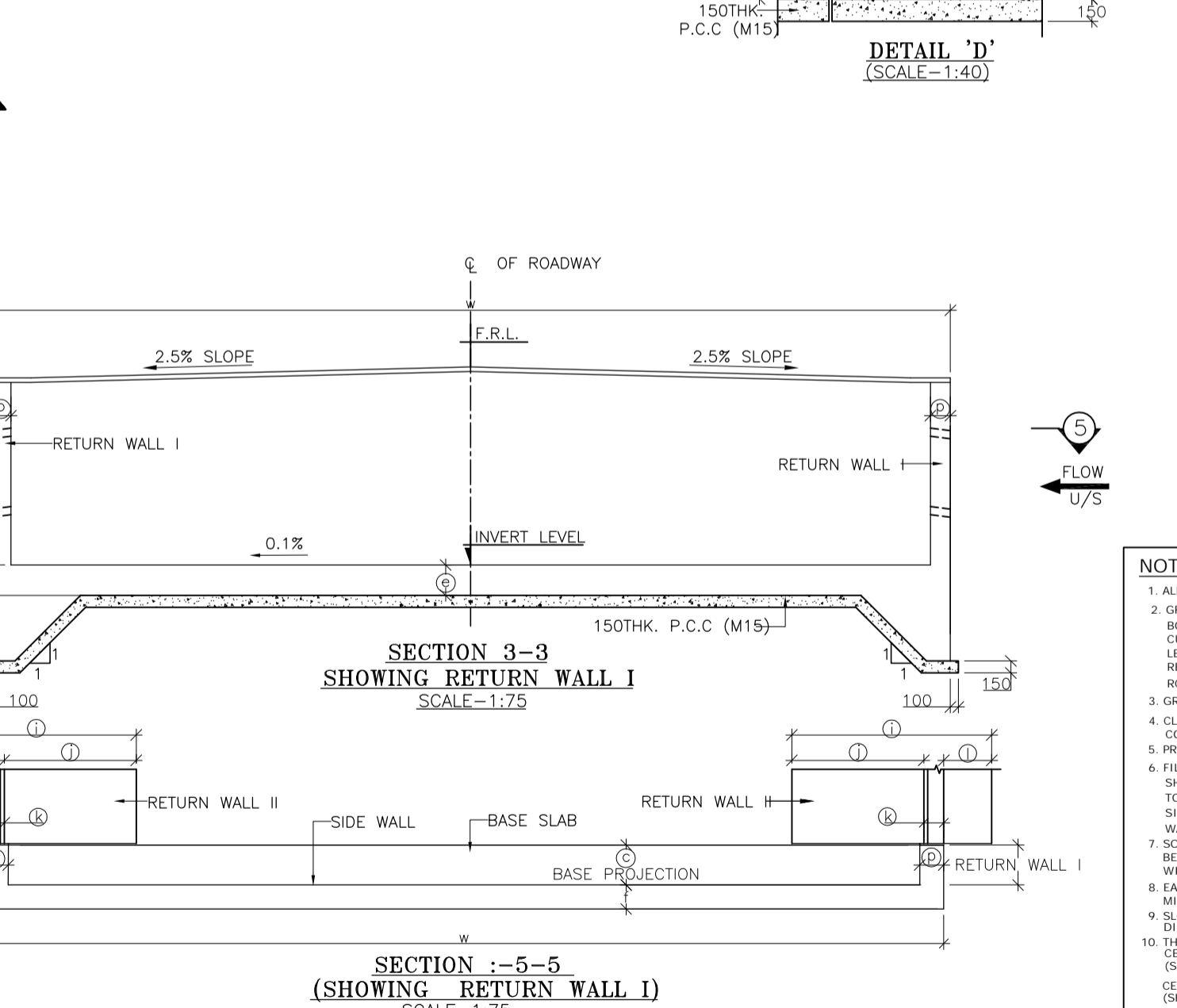
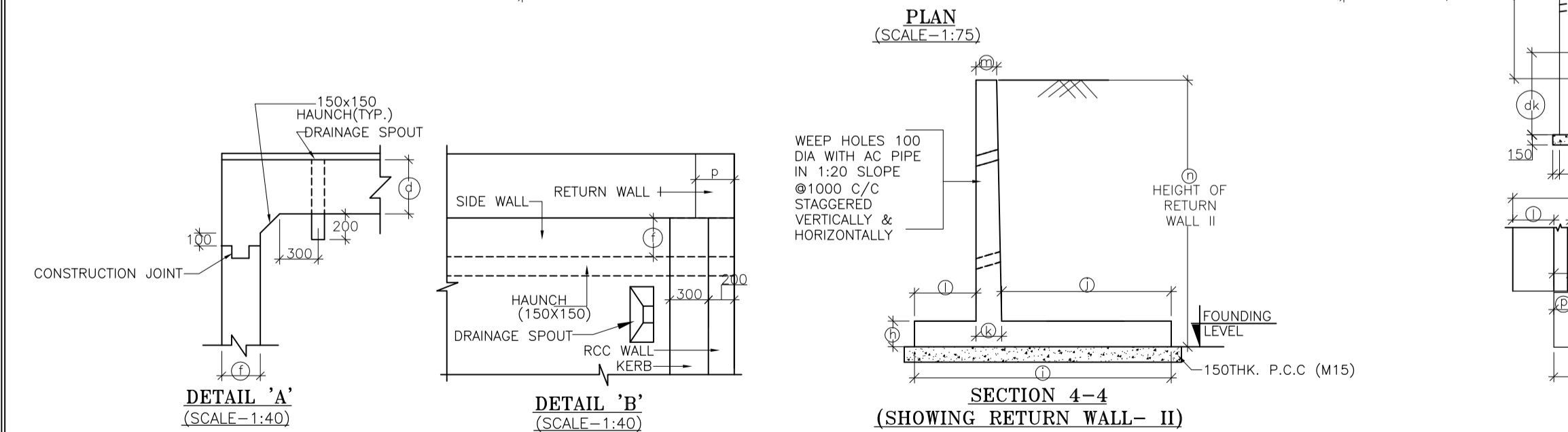
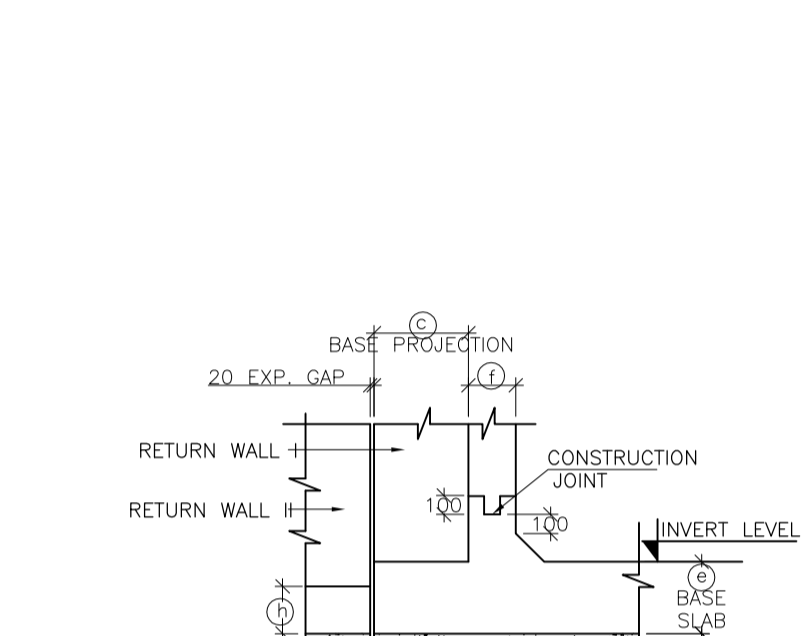
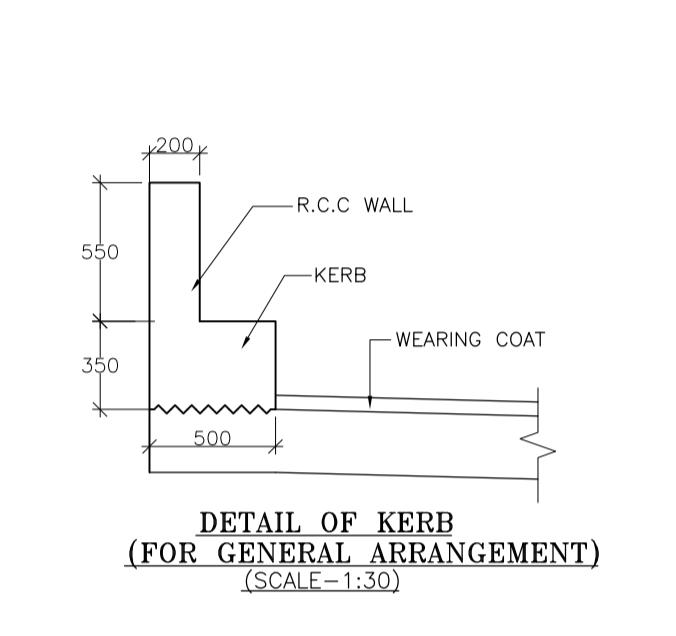
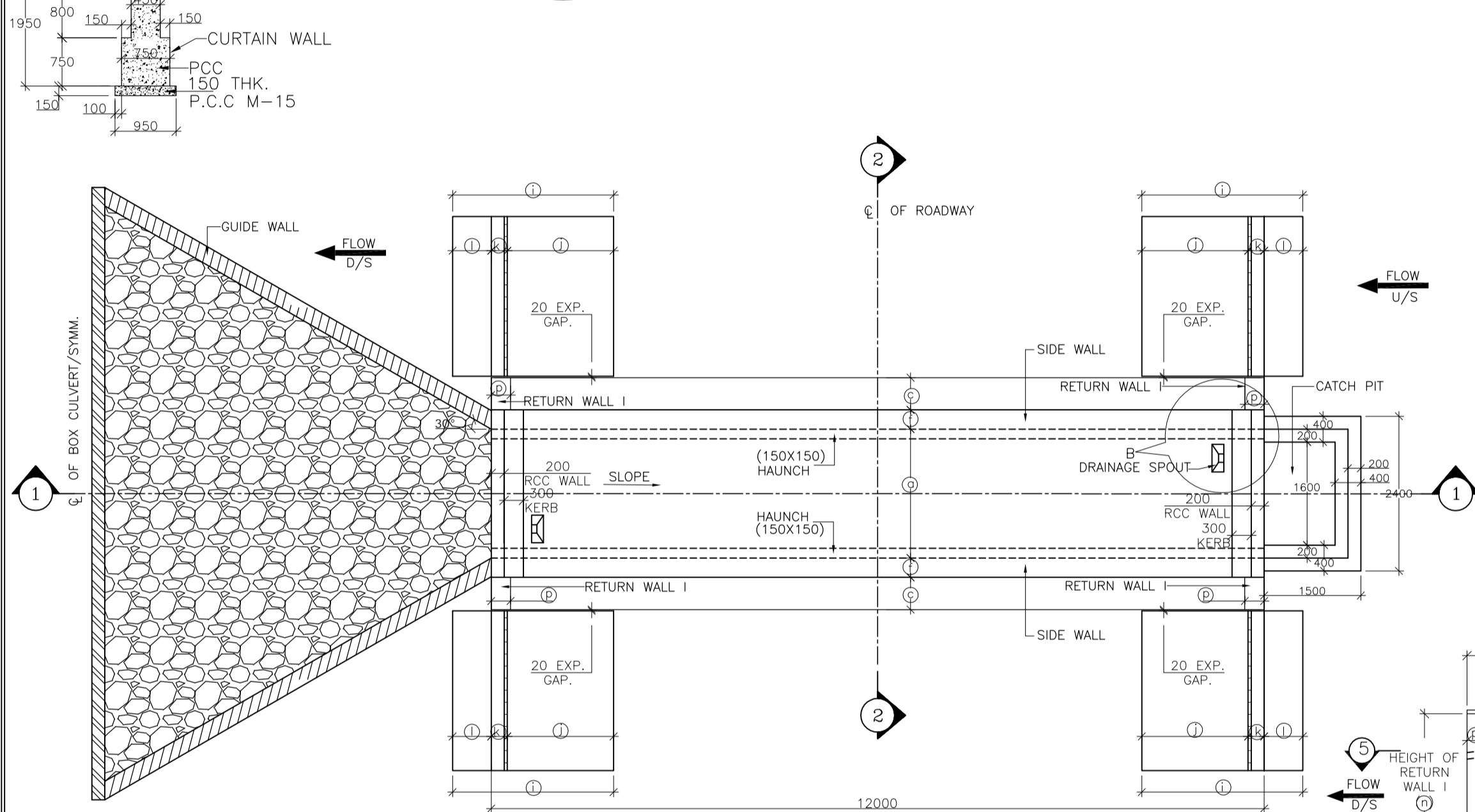


TABLE SHOWING SAILENT DIMENSIONS
BOX CELL DESIGNATION No./db/Ec

a	2000
b	2000
c	500
e	380
f	300
g	350
h	300
i	2200
j	950
k	300
l	950
m	250
n	2730
p	300
q	3100
dk	1200



- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE - M25
CURTAIN WALL - M25
LEVELLING COURSE (P.C.C.) - M15
RETURN WALL - M25
RCC WALL & KERB - M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS FOR TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $9-1.81/m^3$, $\theta=30\theta$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM $15\ m^2$ BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/RCC (SHEET NO-01)
CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA (SHEET NO-02)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
DATE: SEPT, 2016

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 - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIT & SLOPED PROTECTION

Package :- IV District :- SENAPATI
Existing Chainage :- 88+520 to 114+165
Design Chainage :- 81+870 to 105+825



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

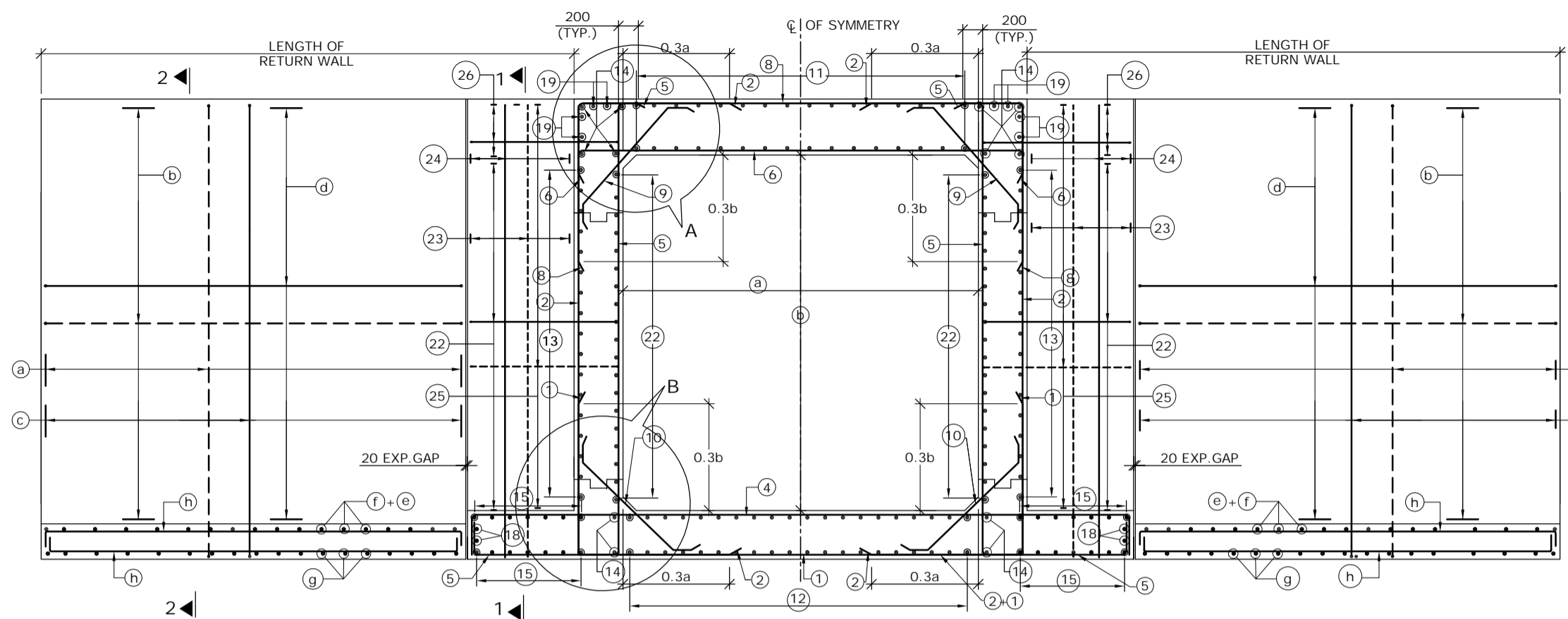
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA (SHEET NO-01 OF 02)

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu

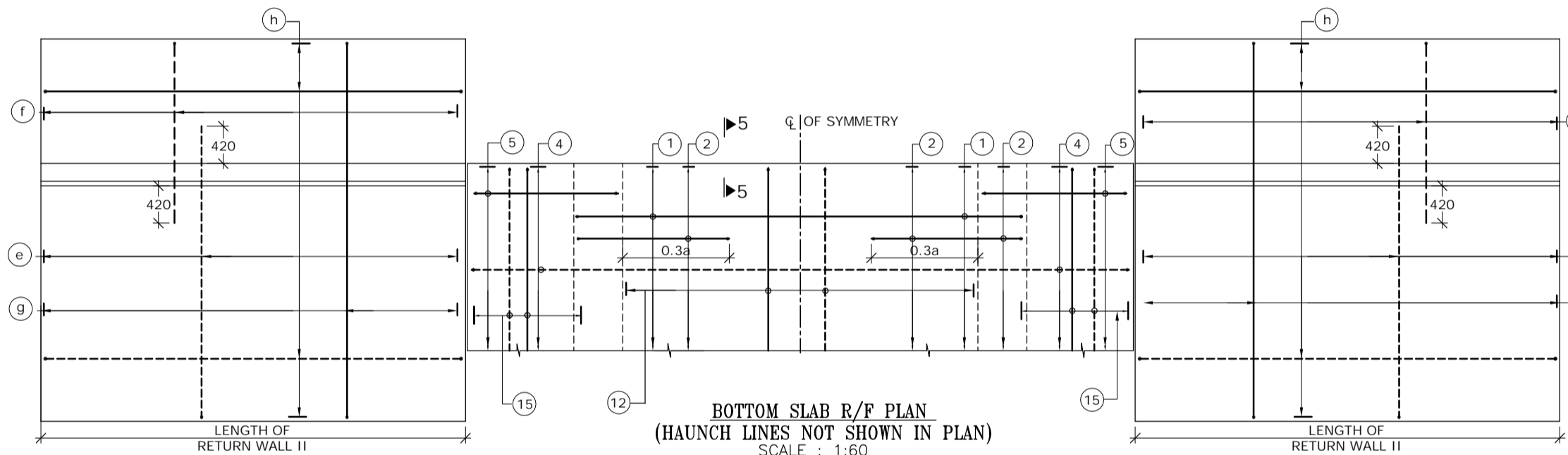
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	Total Road width	Protection Type		Top Slab Thickness at Centre	Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
						U/S	D/S			
83/2	82+611	2123.783	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Slope	0.500	2121.218	2120.838
84/1	83+399	2106.451	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	2103.923	2103.543
84/2	83+730	2087.637	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	2085.109	2084.729
85/1	84+045	2068.069	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	2065.541	2065.161
85/4	84+898	2006.759	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	2004.219	2003.839
87/2	86+248	1931.229	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1928.689	1928.309
87/4	86+618	1917.243	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1914.703	1914.323
87/5	86+768	1911.572	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	1909.045	1908.665
88/2	87+473	1888.724	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1886.184	1885.804
89/2	88+132	1864.803	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1862.263	1861.883
90/1	89+000	1864.414	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1861.874	1861.494
90/3	89+612	1846.935	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1844.395	1844.015
90/4	89+685	1842.666	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1840.126	1839.746
90/5	89+790	1841.159	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1838.619	1838.239
91/2	90+350	1826.717	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Slope	0.500	1824.152	1823.772
93/4	92+856	1728.451	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1725.911	1725.531
95/5	94+828	1776.883	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1774.343	1773.963
95/6	94+908	1782.483	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1779.943	1779.563
96/4	95+372	1803.929	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1801.389	1801.009
96/6	95+858	1817.523	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Slope	0.500	1814.958	1814.578
99/1	98+046	1671.004	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	1668.476	1668.096
99/3	98+917	1605.739	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	1603.212	1602.832
101/2	100+667	1512.671	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1510.131	1509.751
102/1	101+105	1503.692	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	1501.165	1500.785
103/3	102+318	1524.201	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1521.661	1521.281
104/5	103+786	1546.130	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Slope	0.500	1543.565	1543.185
105/3	104+668	1612.527	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Slope	0.500	1609.962	1609.582

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH
CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA
(SHEET NO-02)

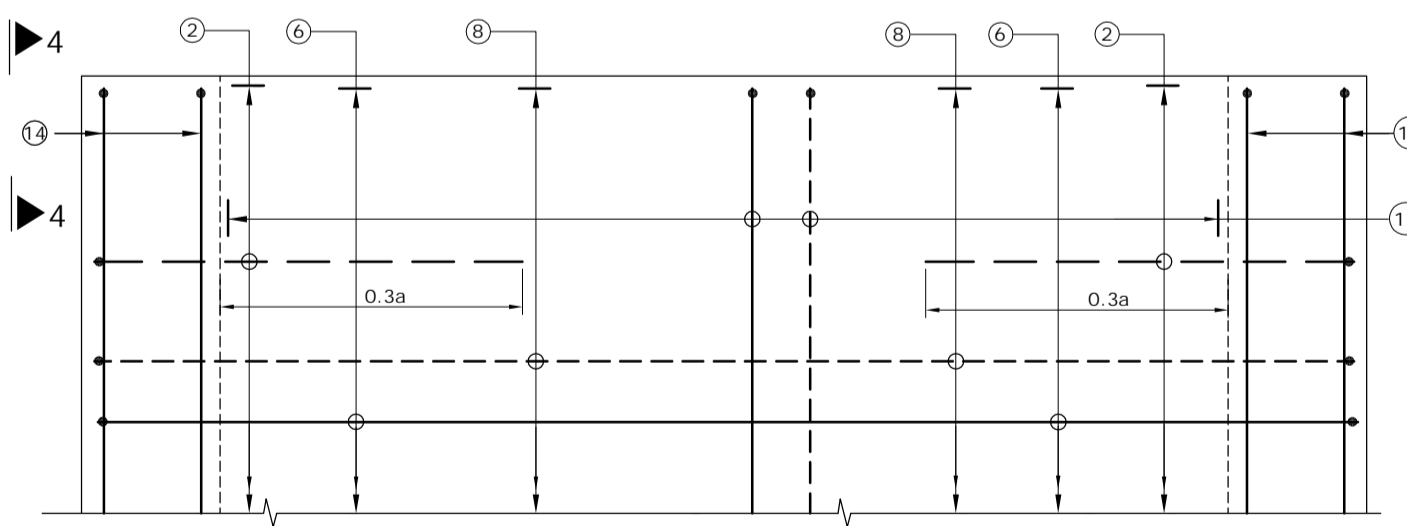
					SCALE: AS SHOWN	 CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIT & SLOPED PROTECTION		CONSULTANT :  CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.		DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA (SHEET NO-02 OF 02)			
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	DATE: SEPT, 2016		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.	Package :- IV	District :- SENAPATI			Drawn By.	Design By.	Checked By.
REVISIONS							Existing Chainage :- 88+520 to 114+165				S. Chattrjee	-	Avishek Dey	Soubhik Sadhu
							Design Chainage :- 81+870 to 105+825							



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

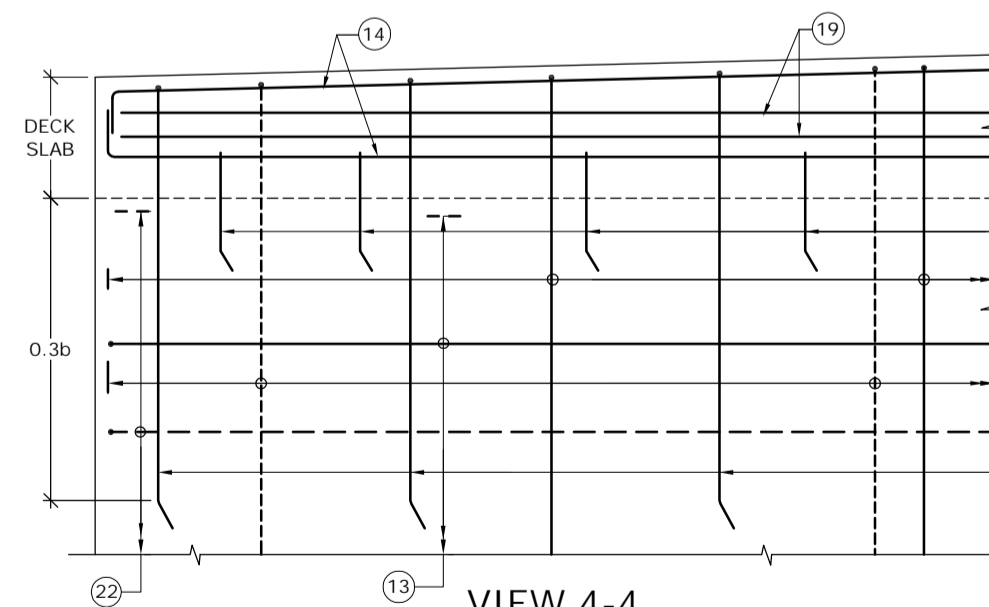


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

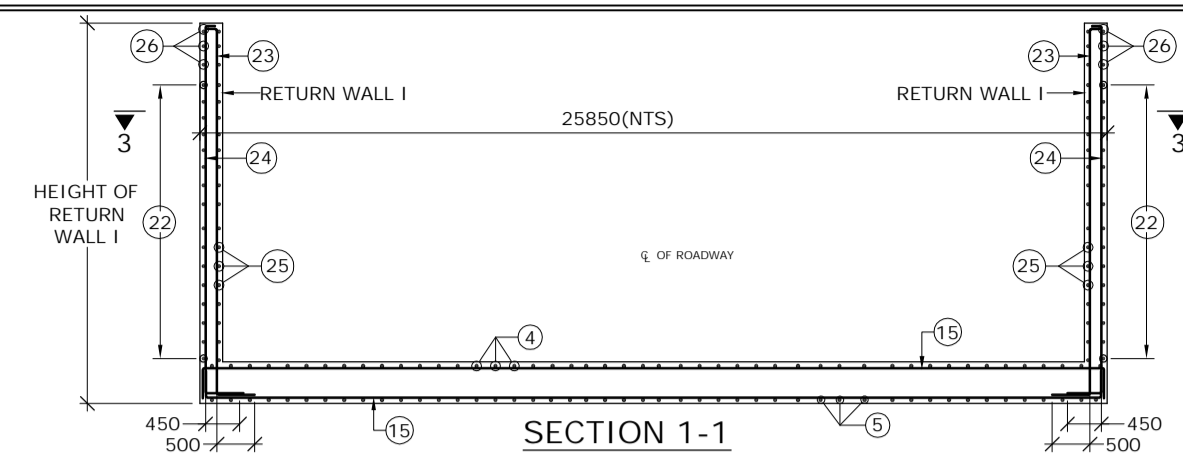


TOP SLAB R/F PLAN
SCALE : 1:30

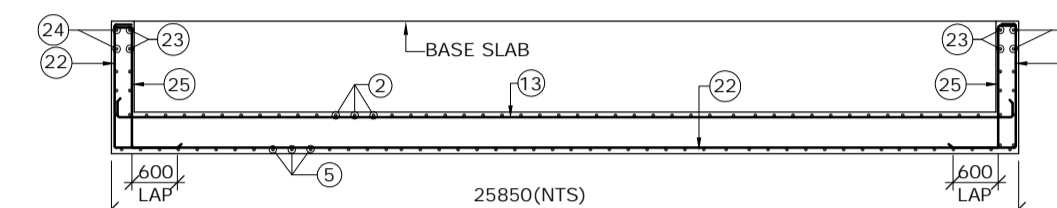
(BAR MARK (5), (19), KERB &
HAUNCH LINES NOT SHOWN IN PLAN)



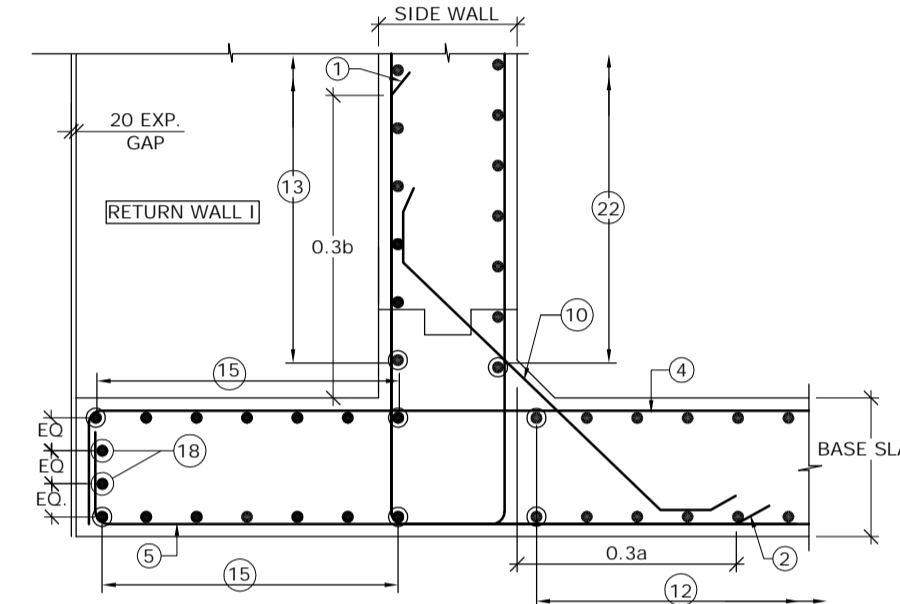
VIEW 4-4
SCALE : 1:30



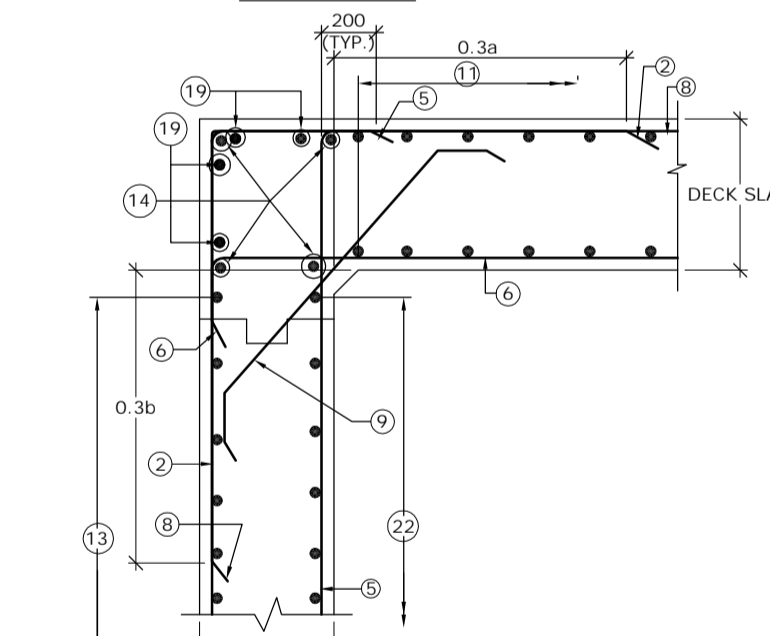
SECTION 1-1
SCALE : 1:100



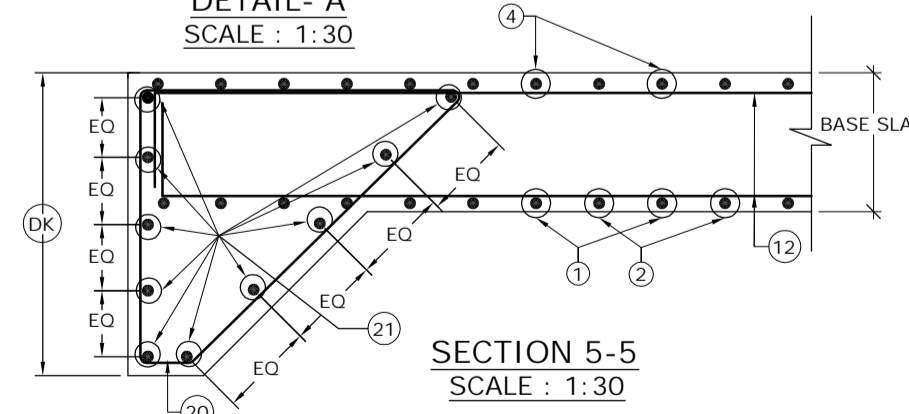
SECTIONAL PLAN 3-3
SCALE : 1:100



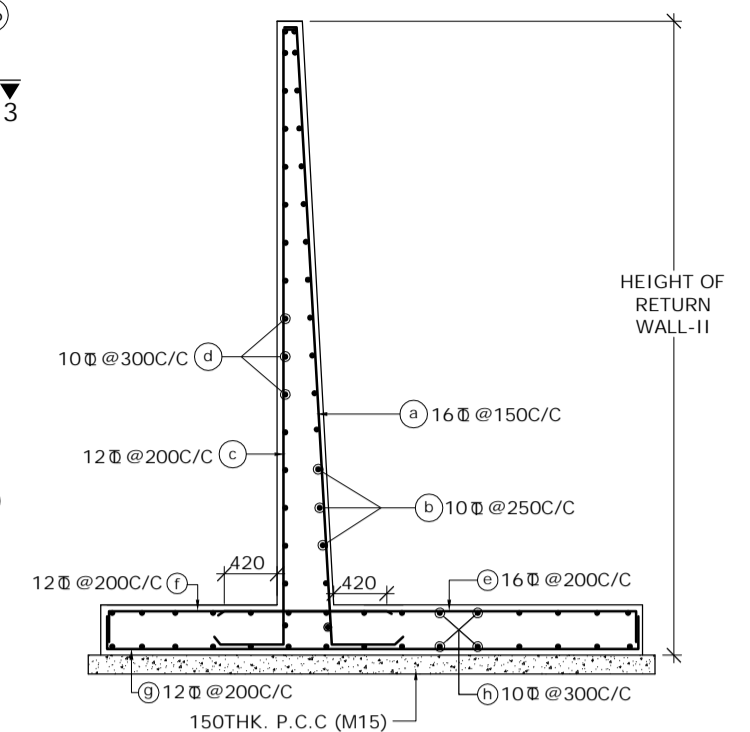
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND -
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

NOTES -
 1. CLEAR COVER SHALL BE 50mm.
 2. GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 3. LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 4. WELDING OF BARS SHALL NOT BE PERMITTED.
 5. SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 6. CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 7. THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 8. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/GA (SHEET NO-01 & 02)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

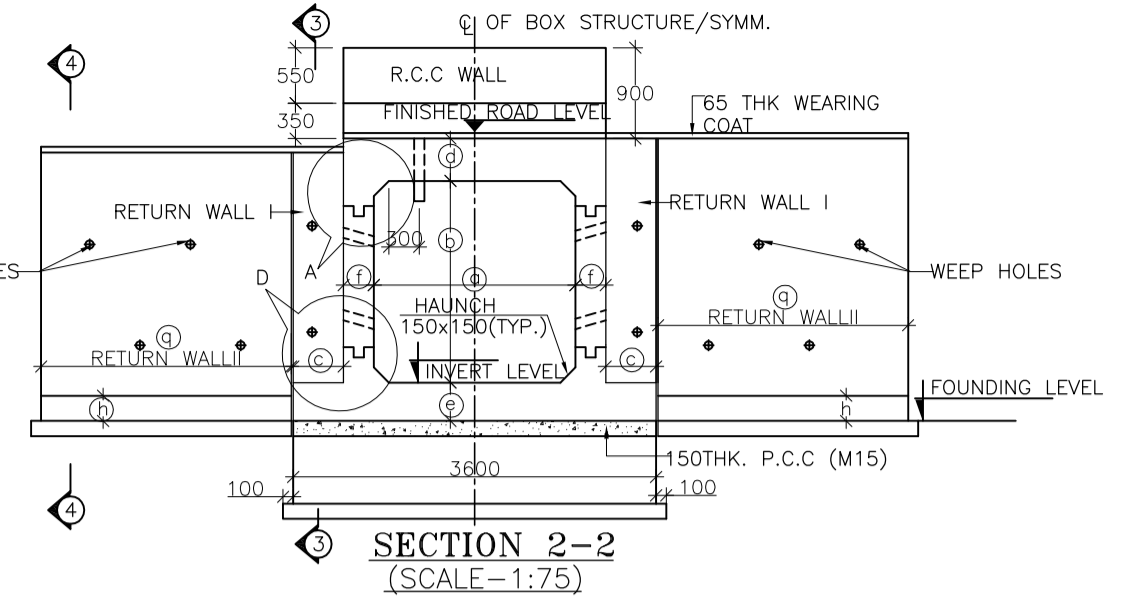
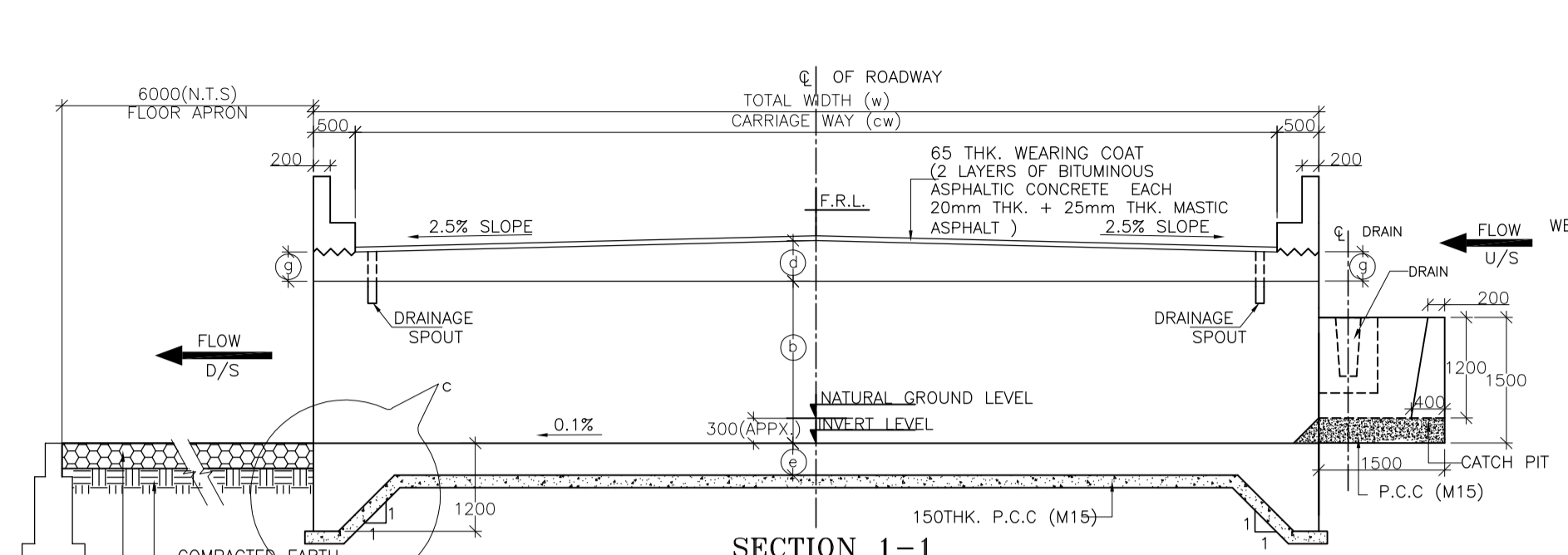
SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIP & STEPPED PROTECTION
 Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/RCC
 Drawn By: S. Chattrjee
 Design By: -
 Checked By: Avishek Dey
 Approved By: Soubhik Sadhu



STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	Total Road width	Protection Type		Top Slab Thickness at Centre	Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
						U/S	D/S			
91/1	90+078	1838.794	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Straight	0.475	1836.254	1835.874
94/4	93+578	1739.542	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Straight	0.475	1737.002	1736.622
95/2	94+228	1734.880	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Straight	0.463	1732.353	1731.973
95/3	94+355	1743.771	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Straight	0.463	1741.243	1740.863
101/1	100+250	1520.230	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Straight	0.463	1517.702	1517.322
105/4	104+715	1615.817	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Straight	0.500	1613.252	1612.872
105/5	104+930	1632.322	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Straight	0.500	1629.757	1629.377

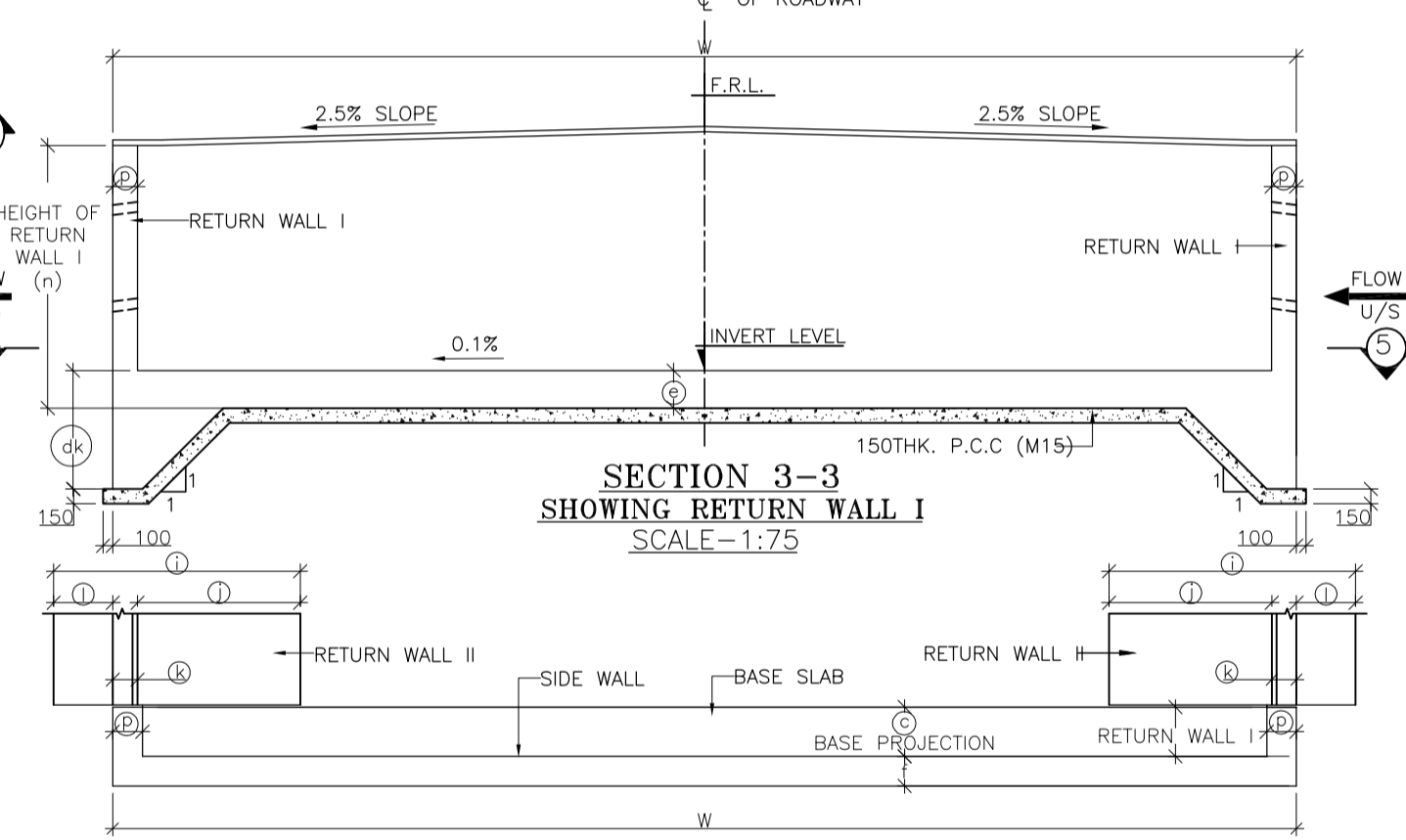
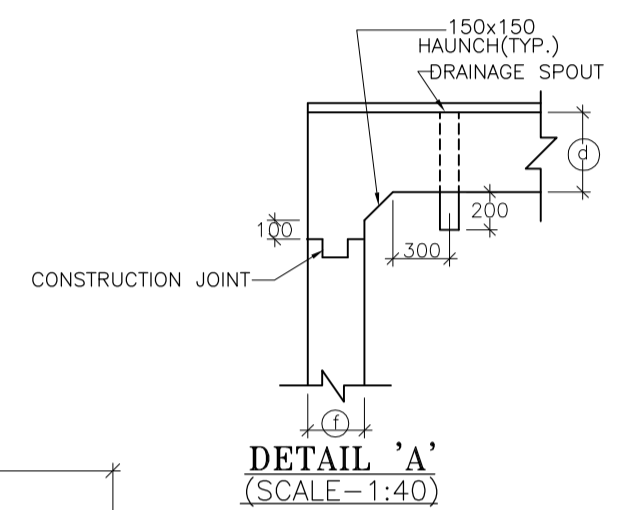
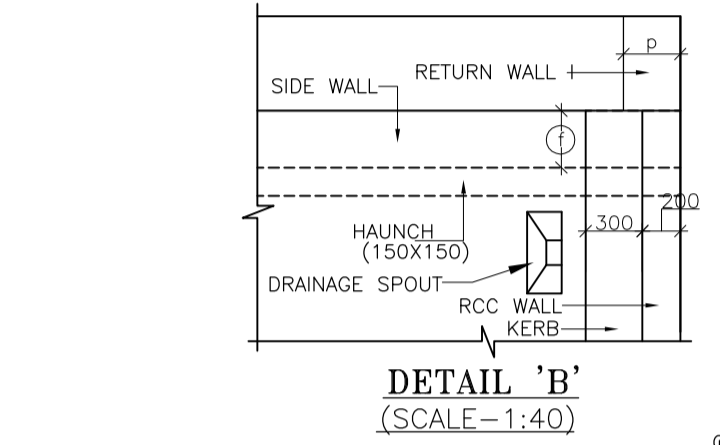
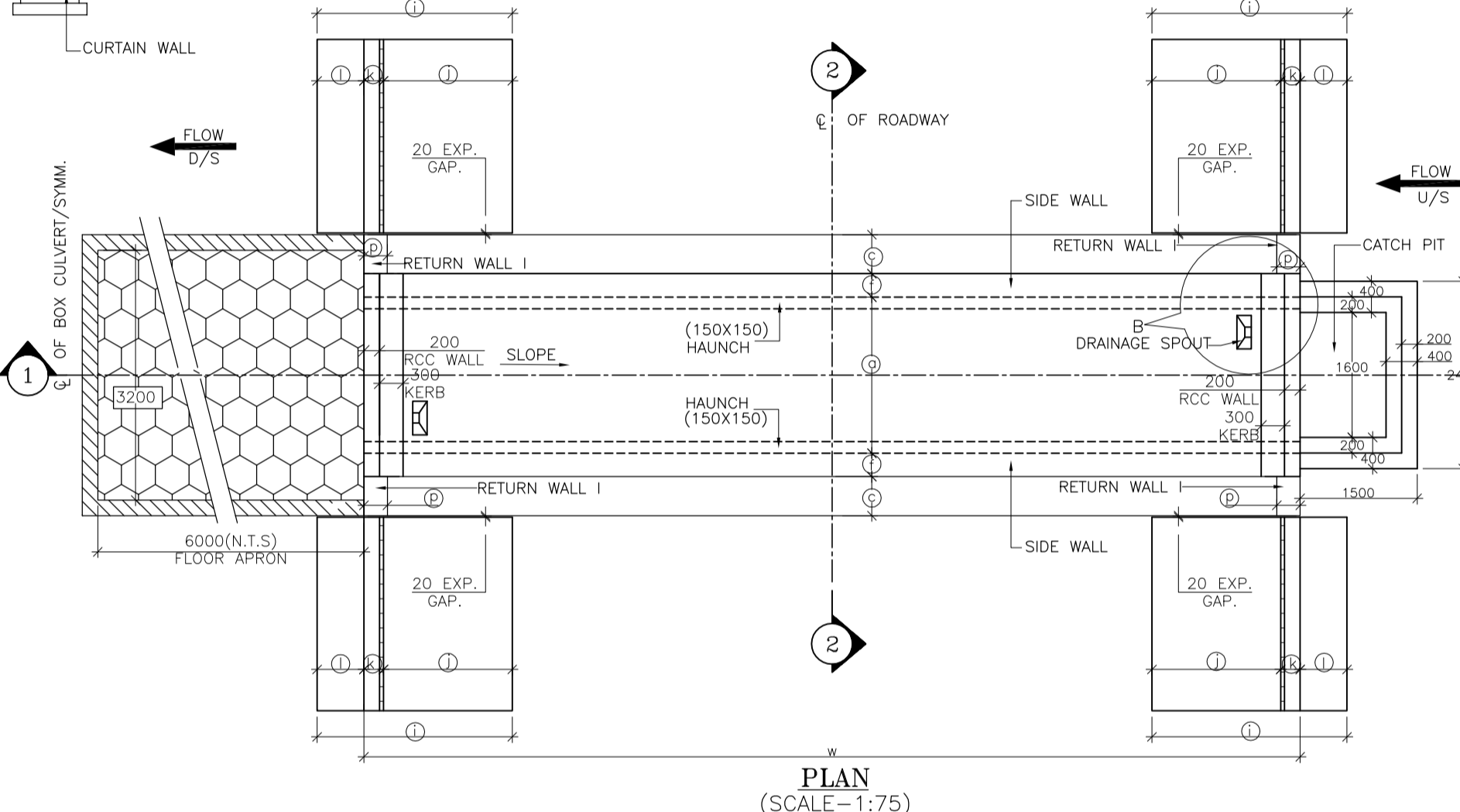
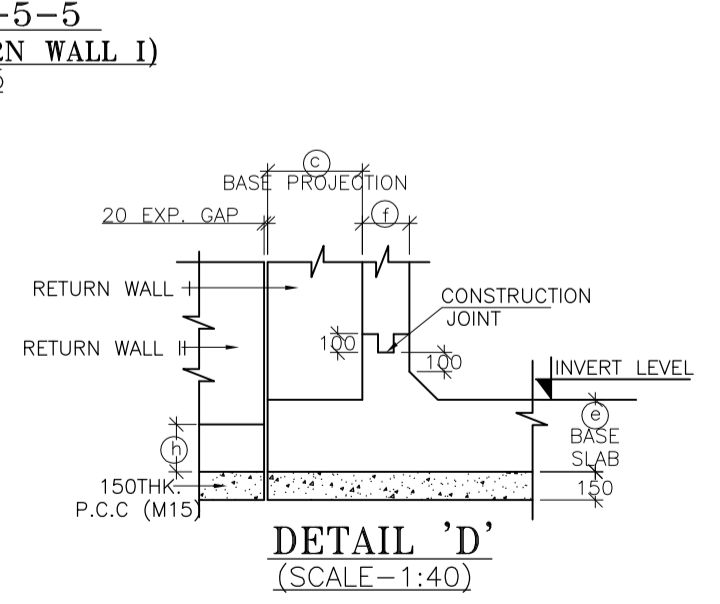
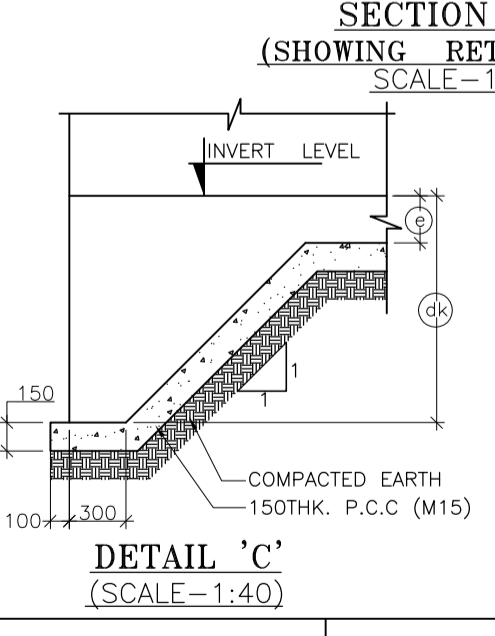
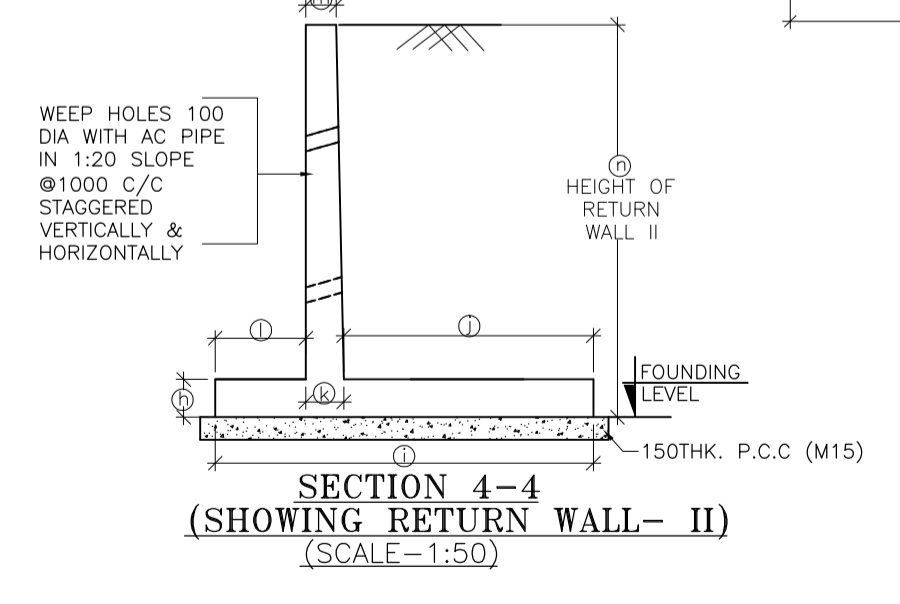
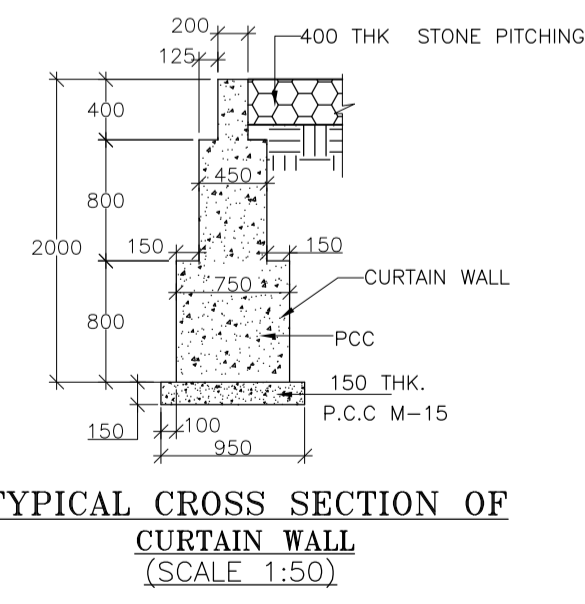
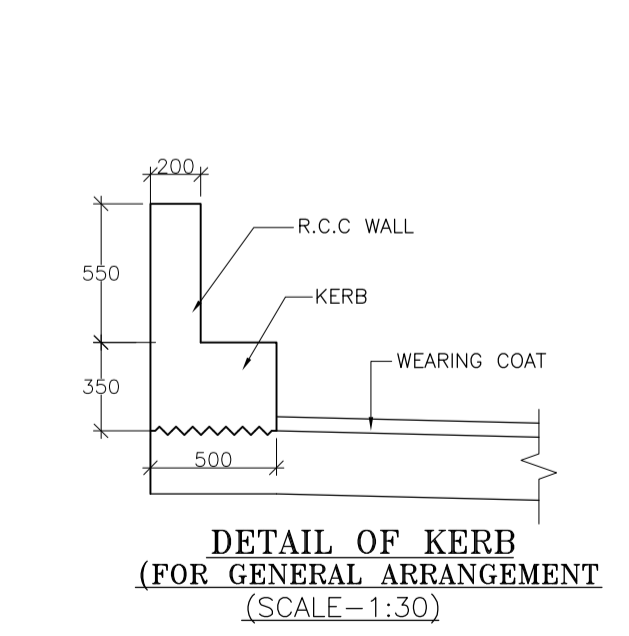


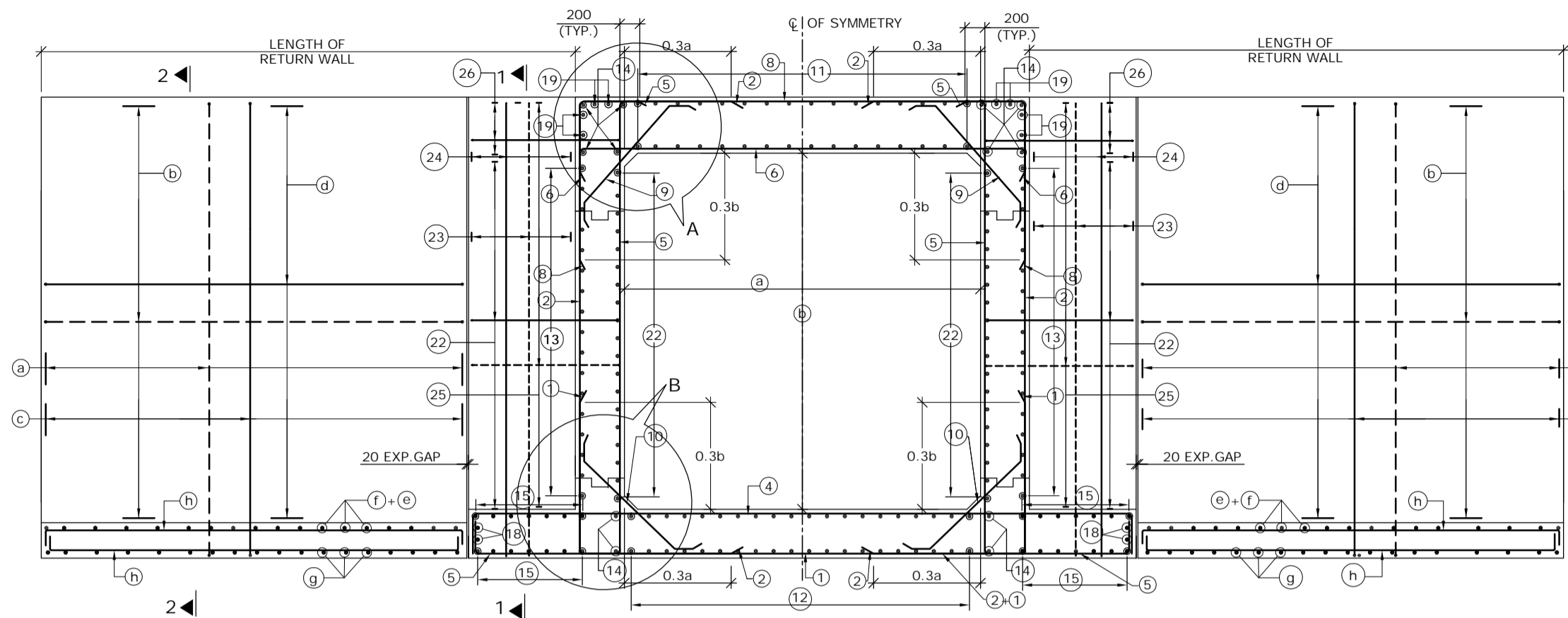


TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./db/ec	1/22/0
a	2000
b	2000
c	500
e	380
f	300
g	350
h	300
i	2200
j	950
k	300
l	950
m	250
n	2730
p	300
q	3100
dk	1200

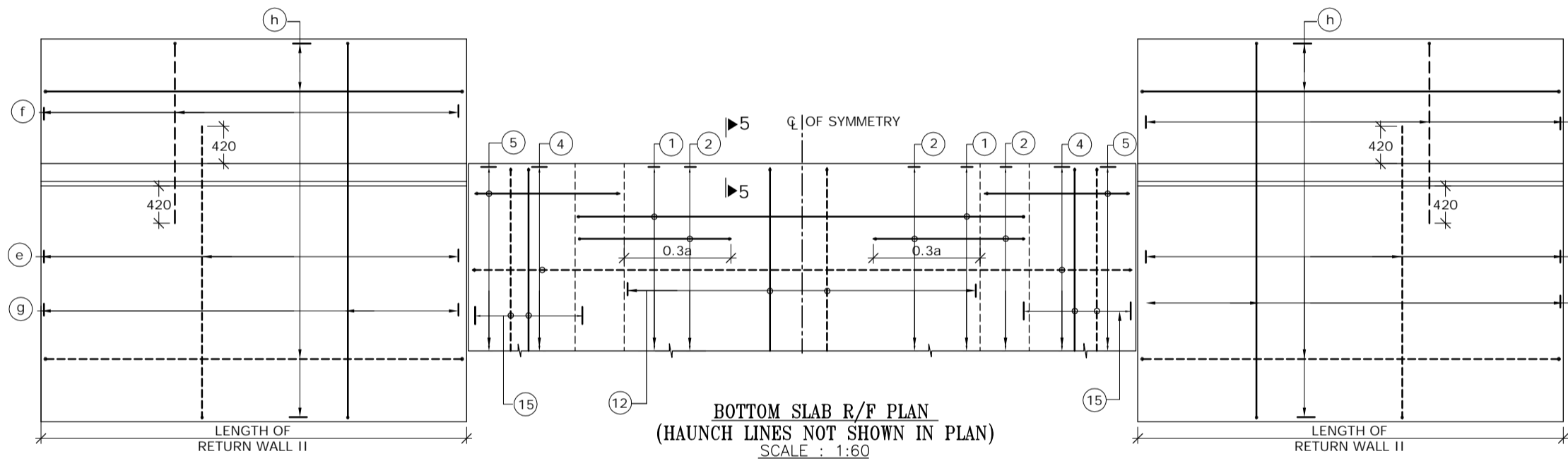


- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE : BOX CELL STRUCTURE = M25 CURTAIN WALL = M25 LEVELLING COURSE (P.C.C.) = M15 RETURN WALL = M25 RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\theta = 1.81/m^3$, $\phi = 30.8$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF BIRTH 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.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 T/m² BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/NC/RCC (SHEET NO-01)

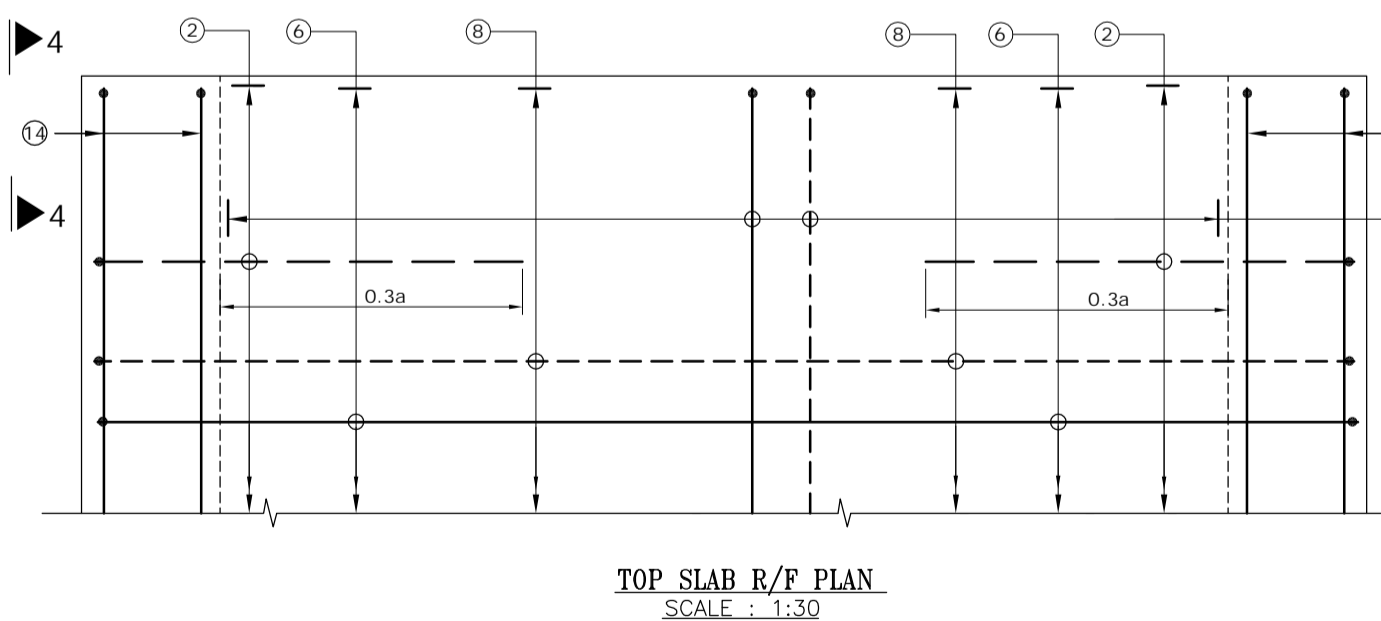
SCALE: AS SHOWN  PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIT & FLOOR APRON PROTECTION Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825					CONSULTANT :  CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/NC/GA Drawn By. S. Chattrjee Design By. - Checked By. Avishek Dey Approved By. Soubhik Sadhu				
MKD. DATE DESCRIPTION CHKD. APPRD. REVISIONS					DATE: SEPT, 2016																			



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

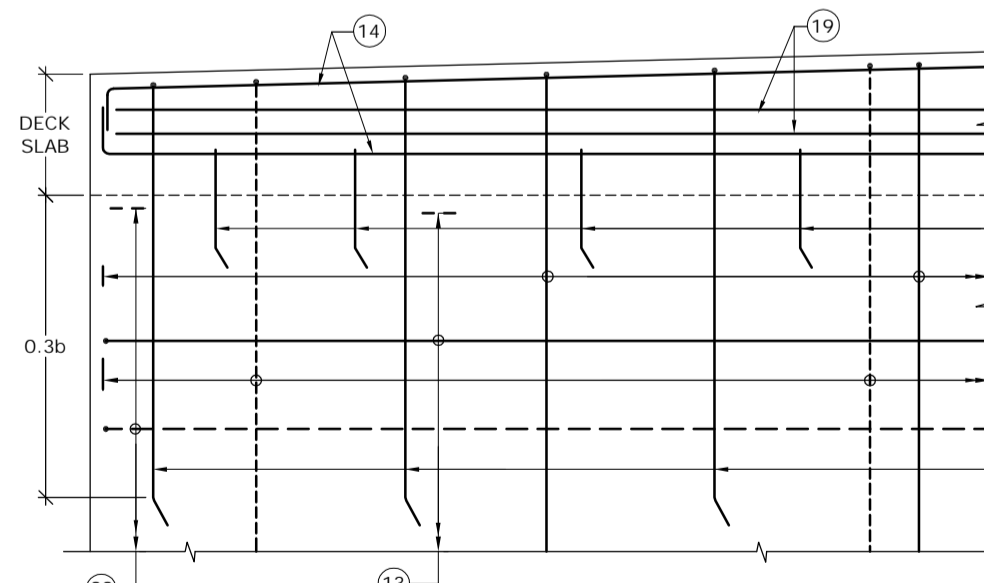


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

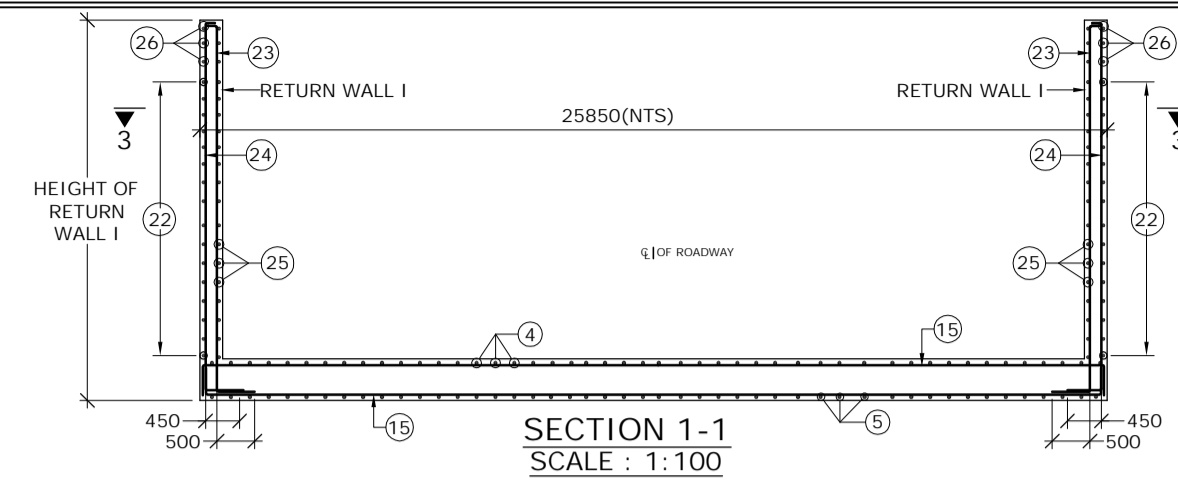


TOP SLAB R/F PLAN
SCALE : 1:30

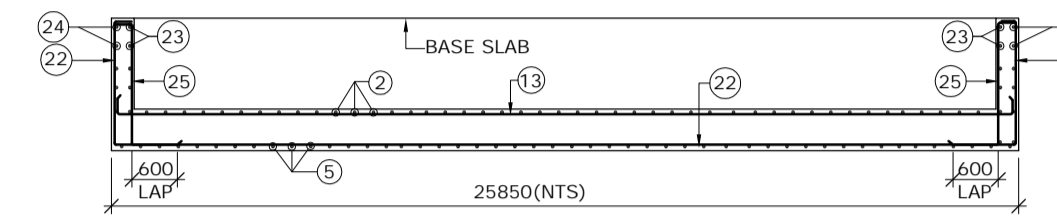
(BAR MARK (5), (19), KERB &
HAUNCH LINES NOT SHOWN IN PLAN)



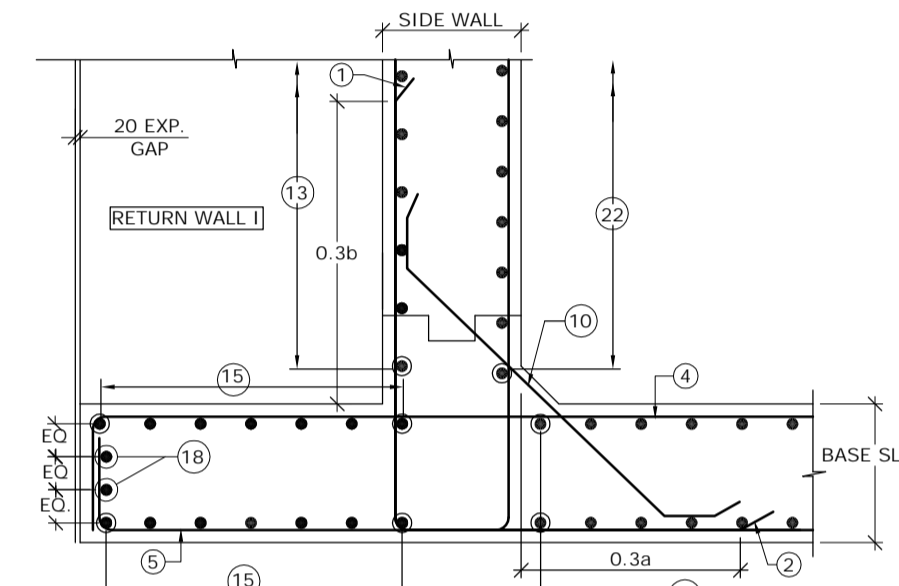
VIEW 4-4
SCALE : 1:30



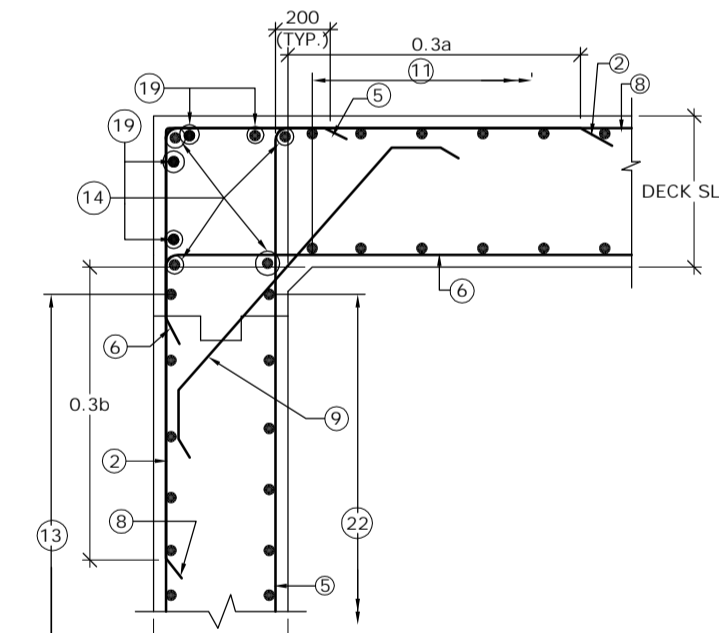
SECTION 1-1
SCALE : 1:100



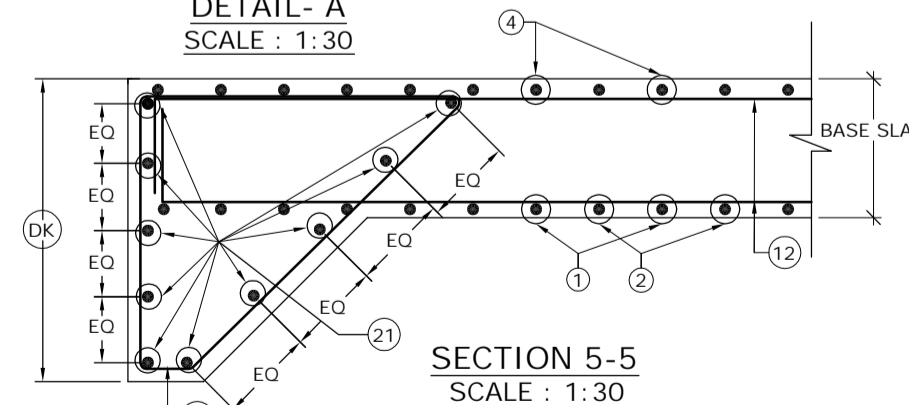
SECTIONAL PLAN 3-3
SCALE : 1:100



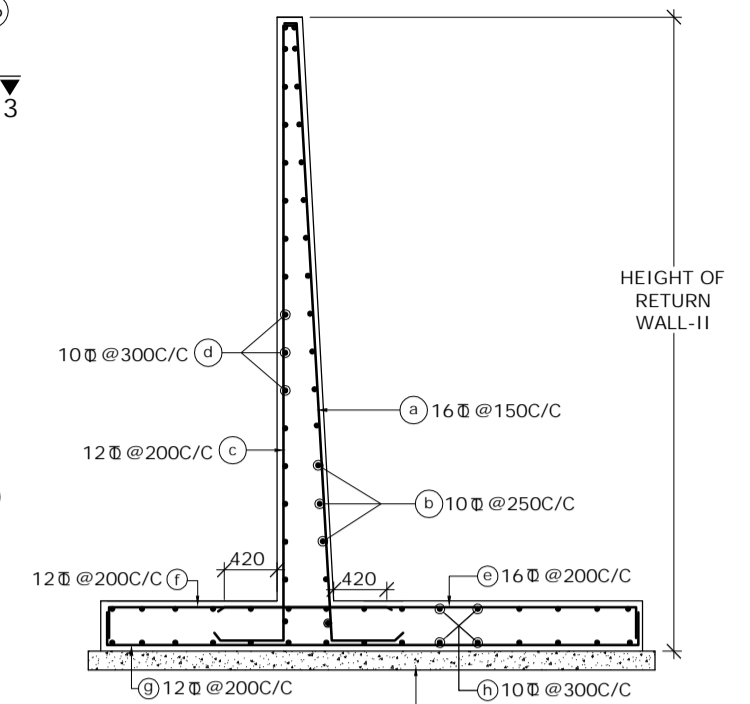
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/F/NC/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - ToloI - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

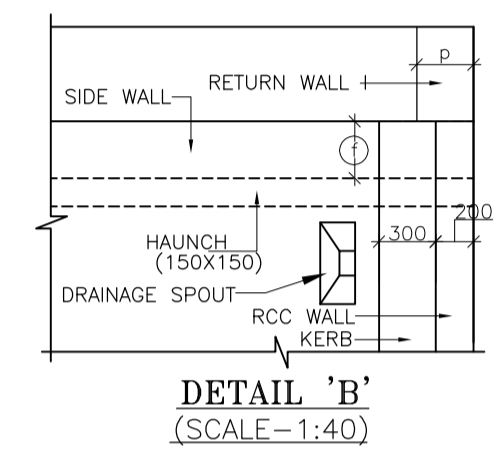
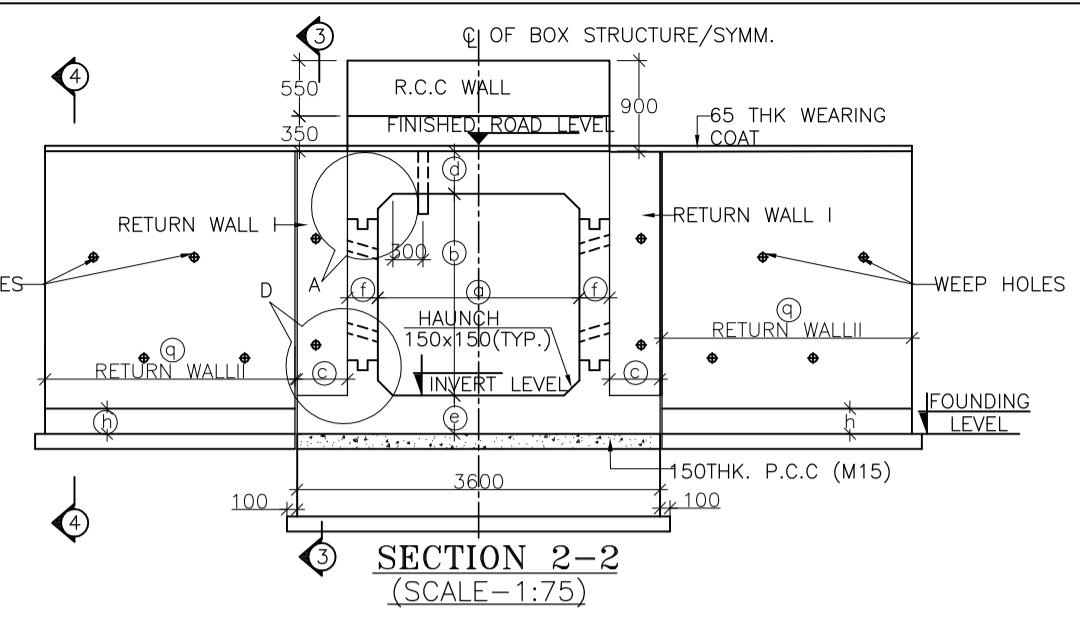
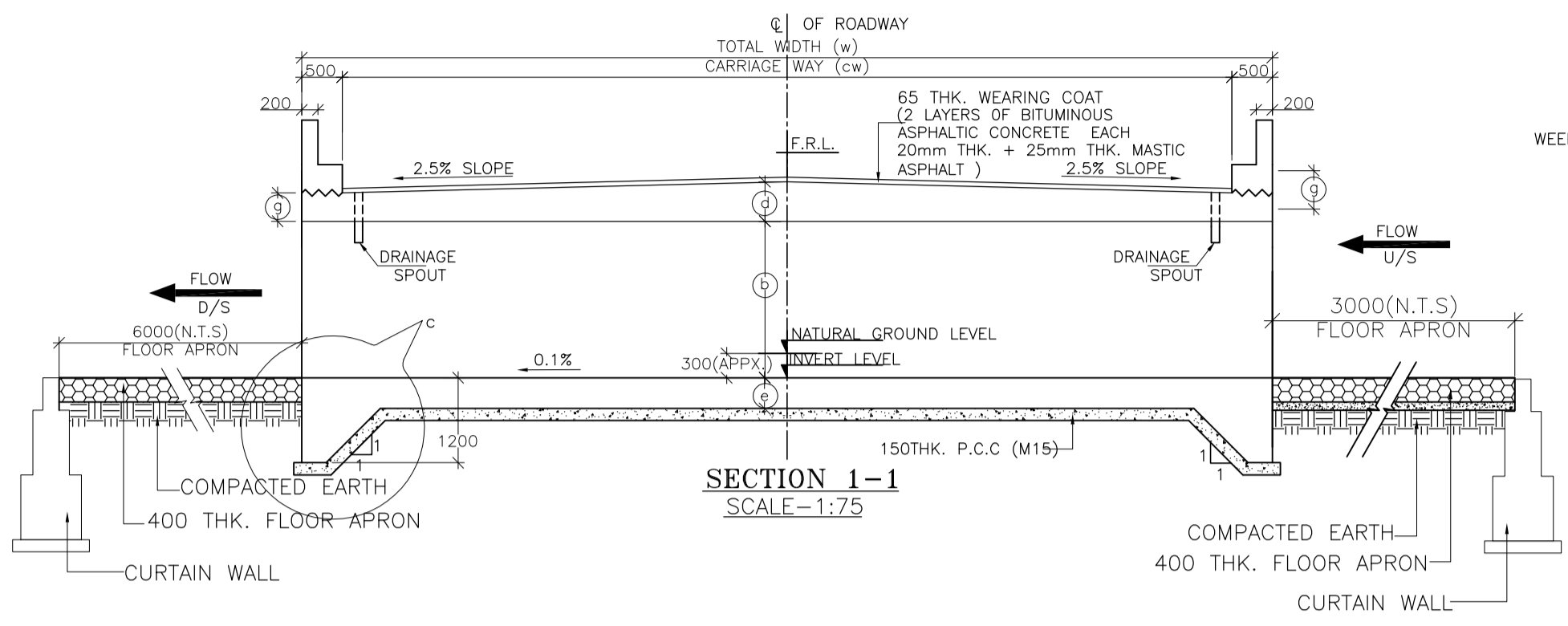
REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0)

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/F/NC/RCC

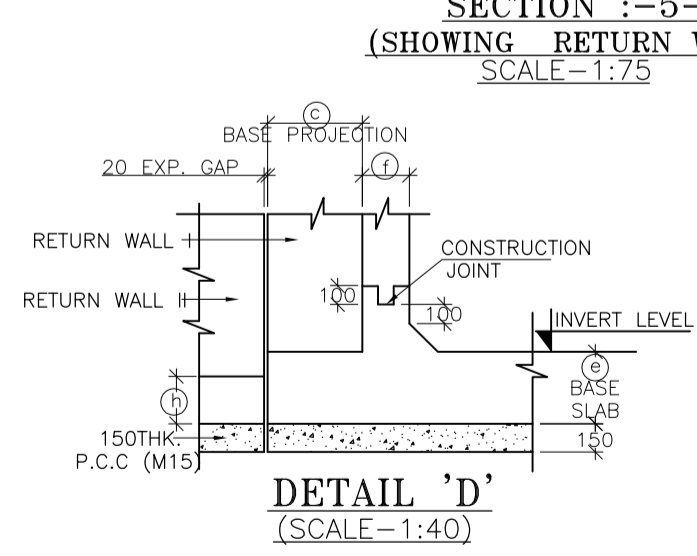
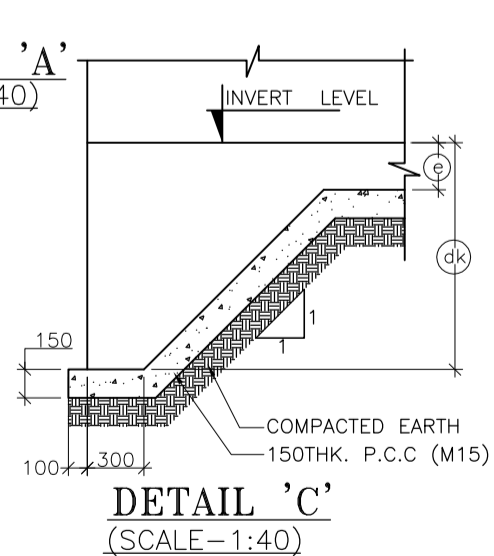
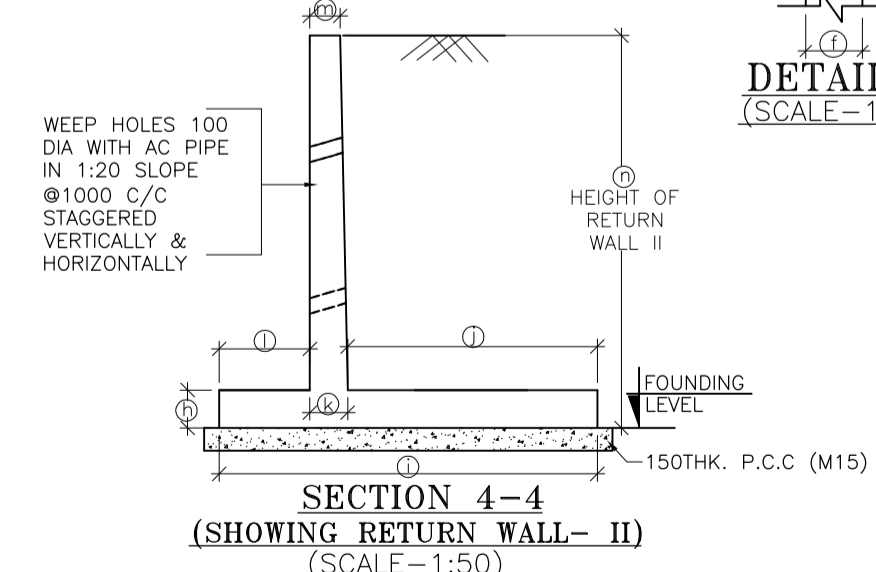
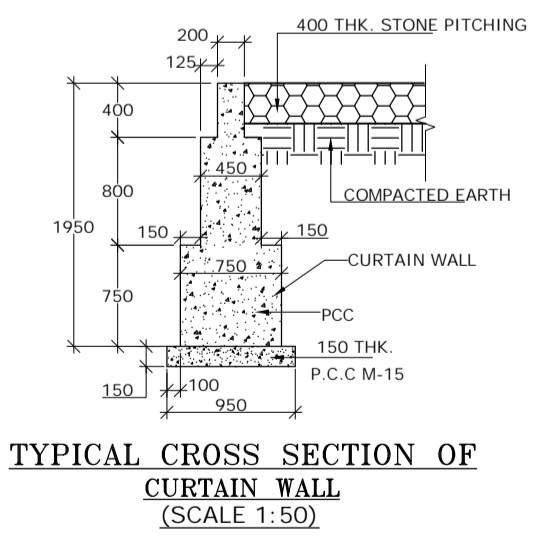
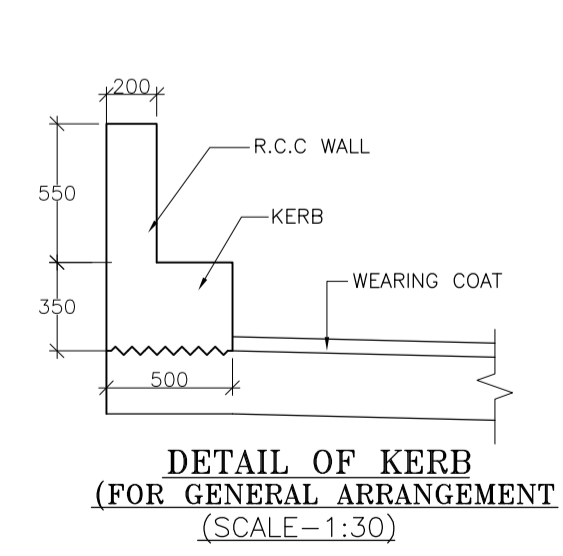
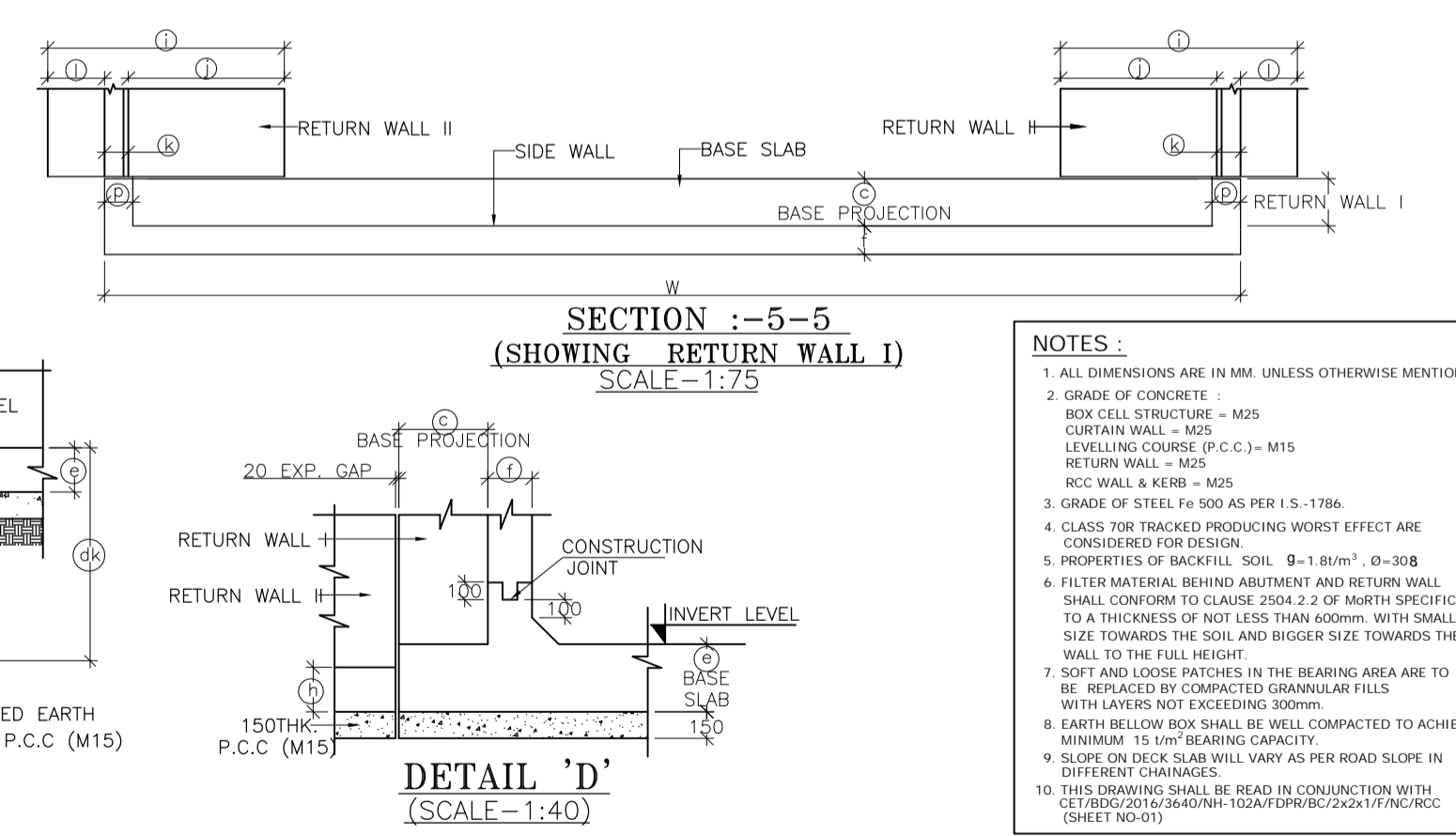
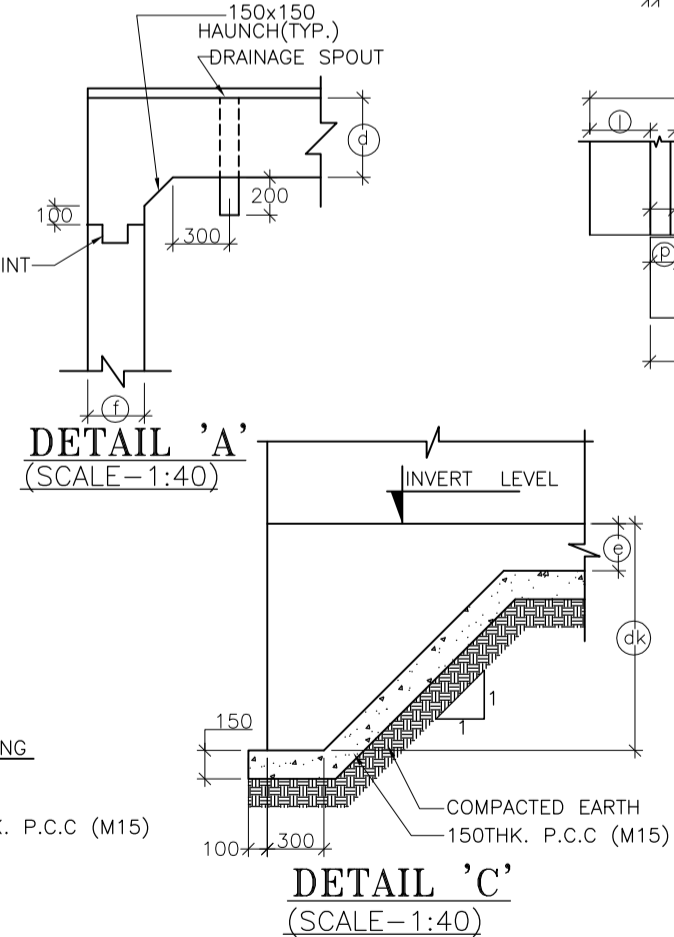
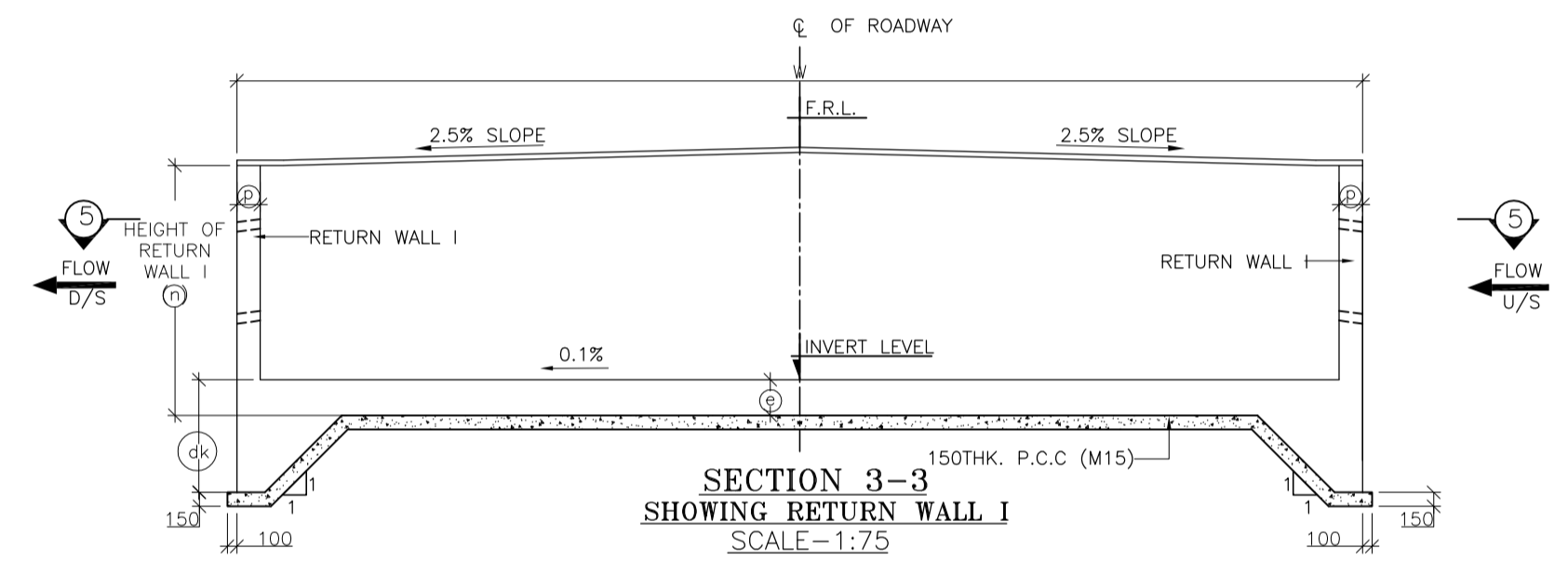
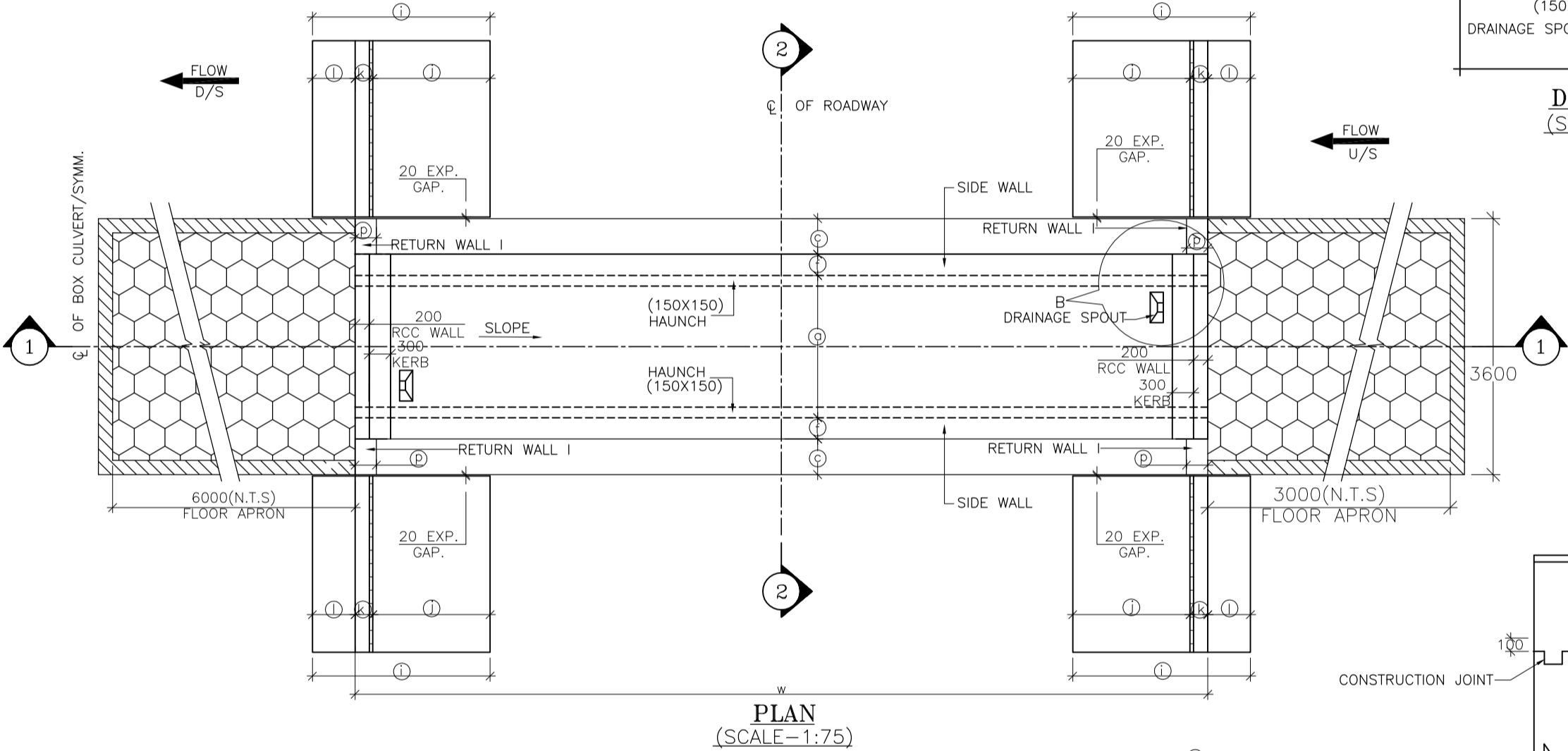
Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu




STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	Total Road width	Protection Type	Top Slab Thickness at Centre	Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
102/2	101+293	1500.212	2X2X1 Cell	Normal Camber	12.00	No Catch pit	0.488	1497.660	1497.280
104/2	103+463	1530.152	2X2X1 Cell	Normal Camber	13.00	No Catch pit	0.500	1527.587	1527.207
105/1	104+048	1565.926	2X2X1 Cell	Normal Camber	13.00	No Catch pit	0.500	1563.361	1562.981

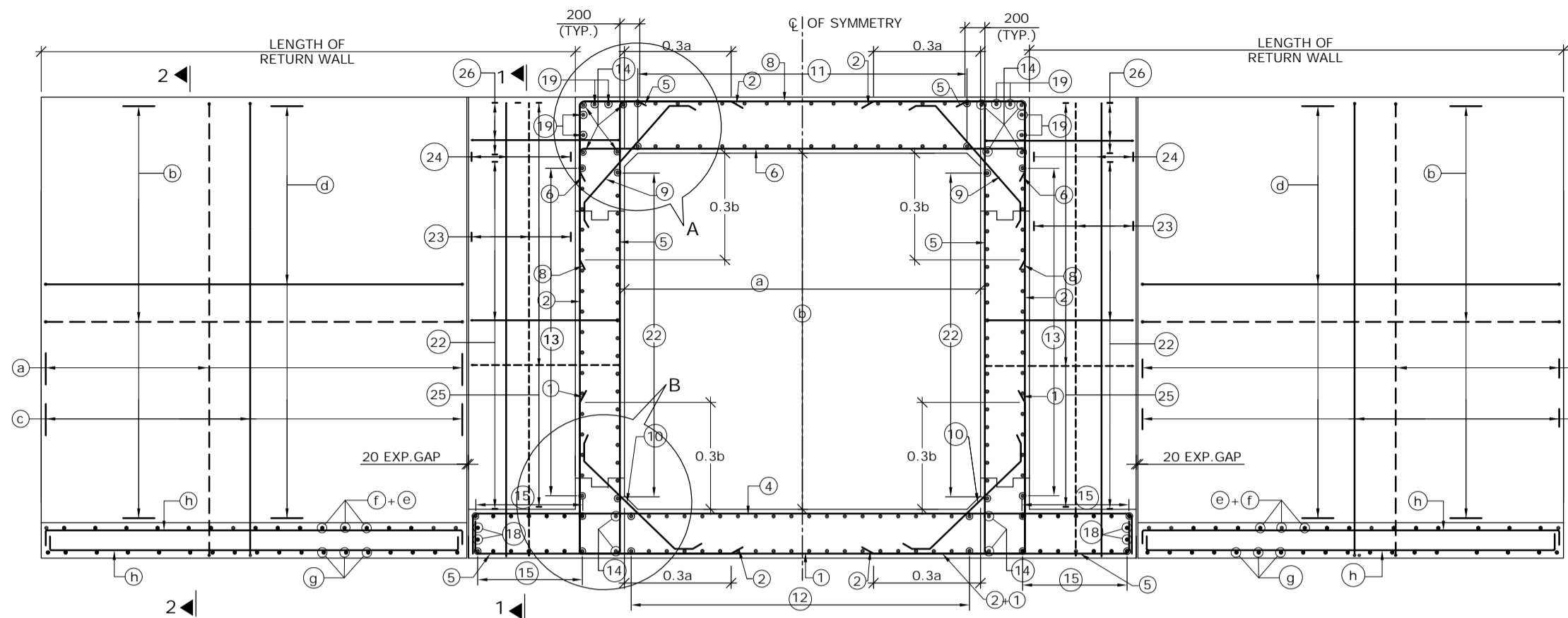
TABLE SHOWING SALIENT DIMENSIONS
BOX CELL DESIGNATION No/ab/EC - 17/22/0

a	2000
b	2000
c	500
e	380
f	300
g	350
h	300
i	2200
j	950
k	300
l	950
m	250
n	2730
p	300
q	3100
dk	1200

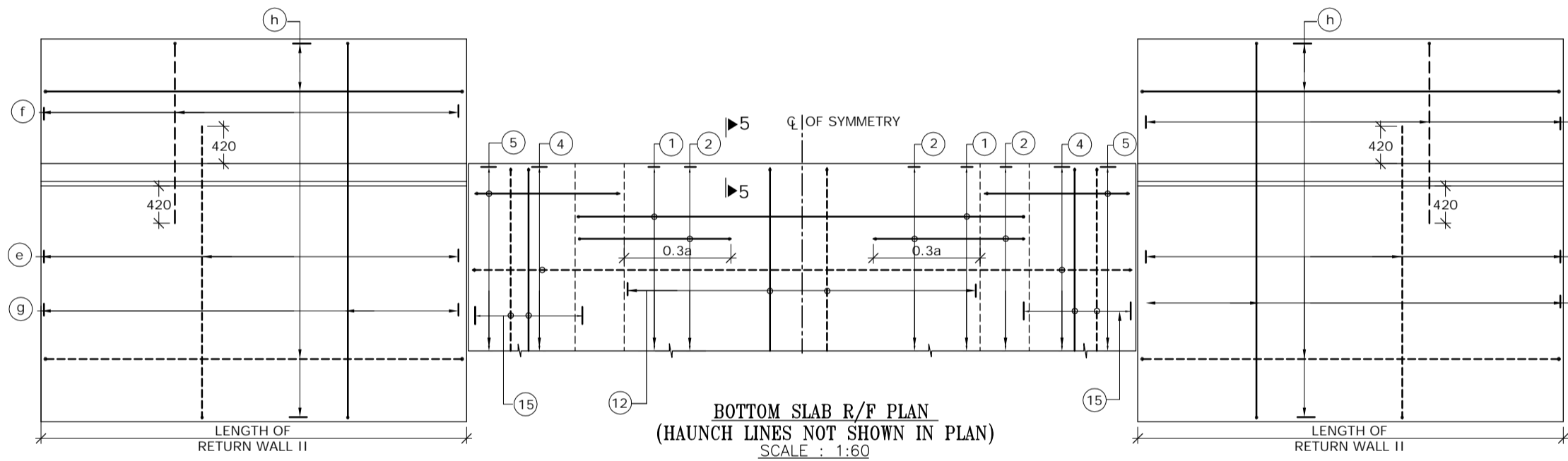


- NOTES :
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE - M25
CURTAIN WALL - M25
LEVELLING COURSE (P.C.C.) - M15
RETURN WALL - M25
RCC WALL & KERB - M25
 - GRADE OF STEEL Fe 500 AS PER IS-1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.81/m^3$, $\theta = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 t/m² BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/RCC (SHEET NO-01)

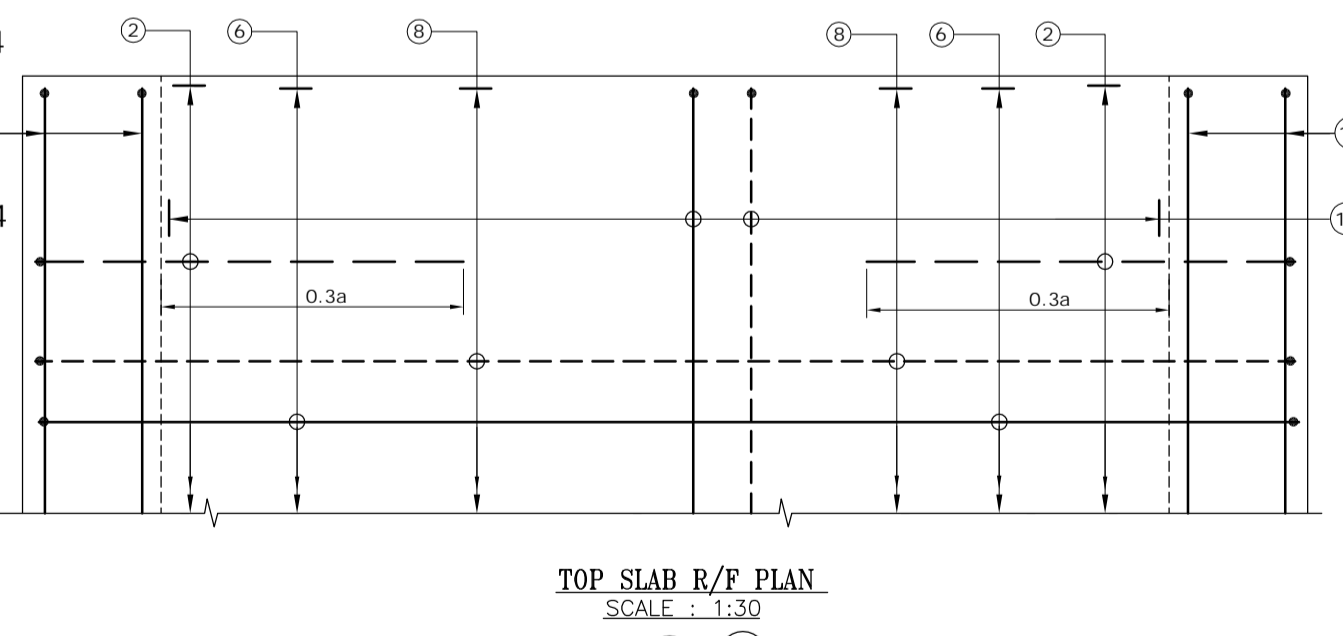
<p>SCALE: AS SHOWN</p>  <p>CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001</p>					<p>GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH BOTH SIDE FLOOR APRON</p> <p>Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Design Chainage :- 81+870 to 105+825</p>					<p>CONSULTANT : CETEST Engineering Consultants CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.</p>					<p>DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/GA</p> <p>Drawn By. S. Chattrjee Design By. - Checked By. Avishek Dey Approved By. Soubhik Sadhu</p>									
<p>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.</p> <p>DATE: SEPT, 2016</p>					<p>REVISIONS</p> <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> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>					MKD.	DATE	DESCRIPTION	CHKD.	APPRD.										
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.																				



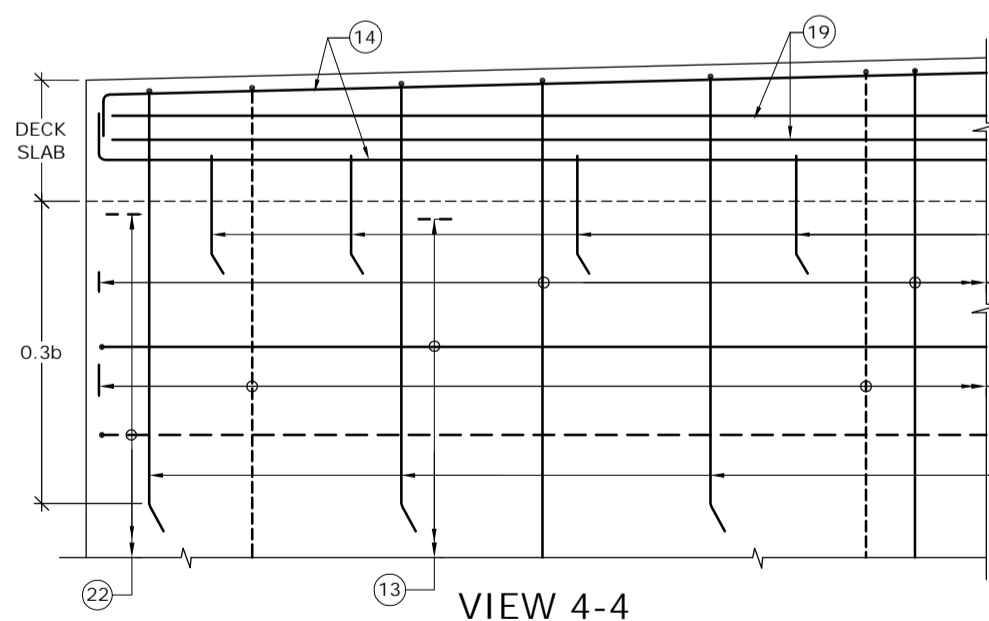
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60



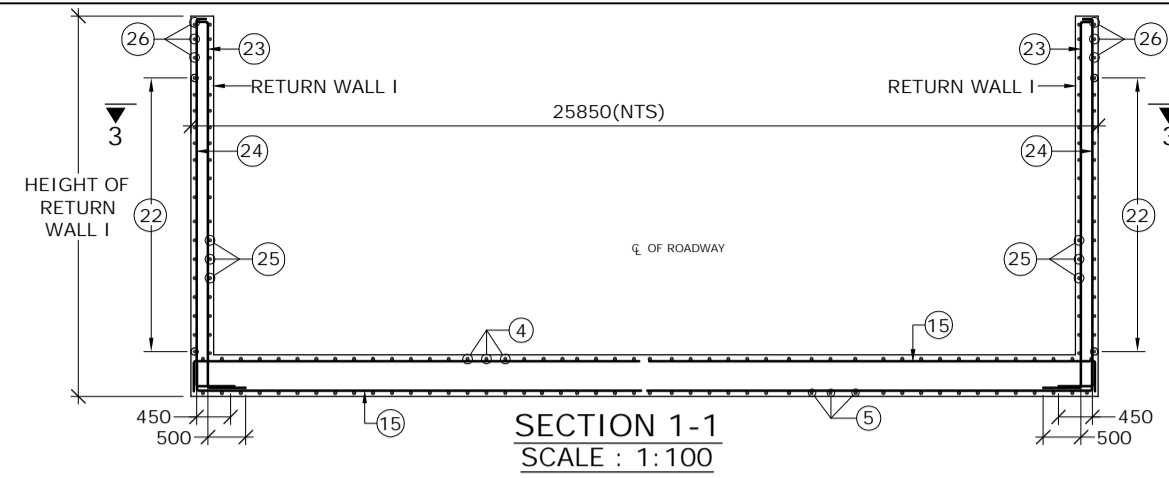
BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60



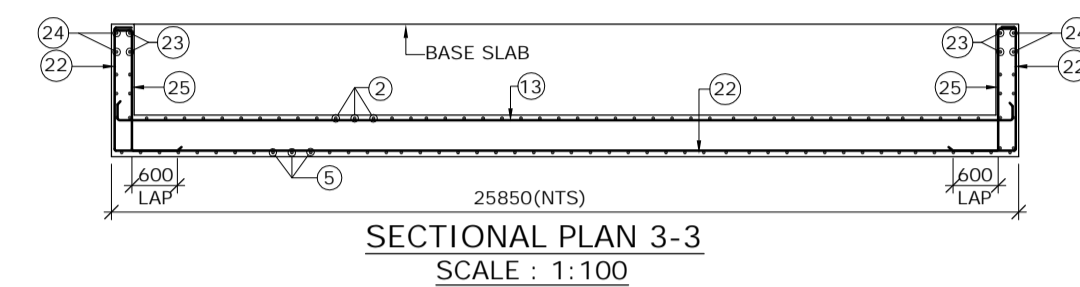
TOP SLAB R/F PLAN
SCALE : 1:30
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



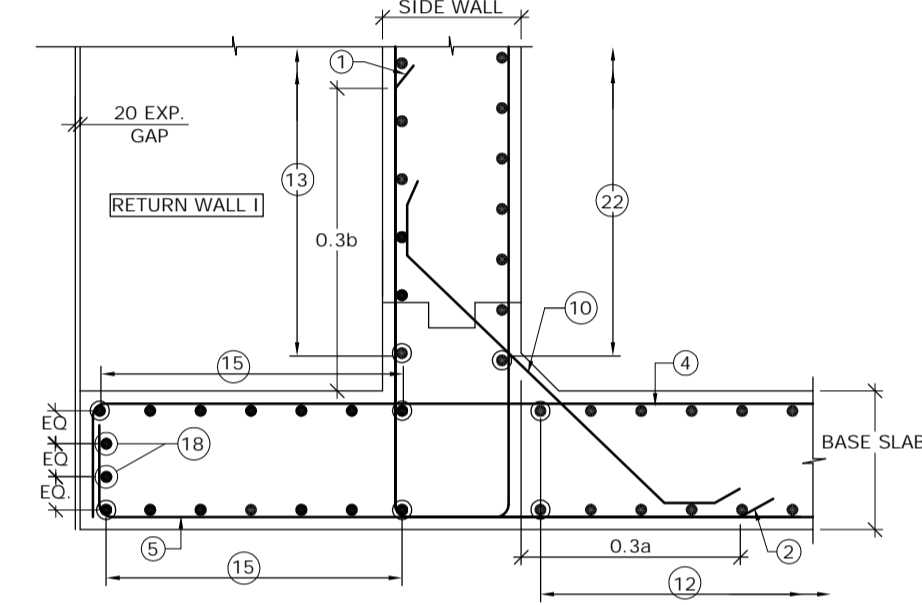
VIEW 4-4
SCALE : 1:30



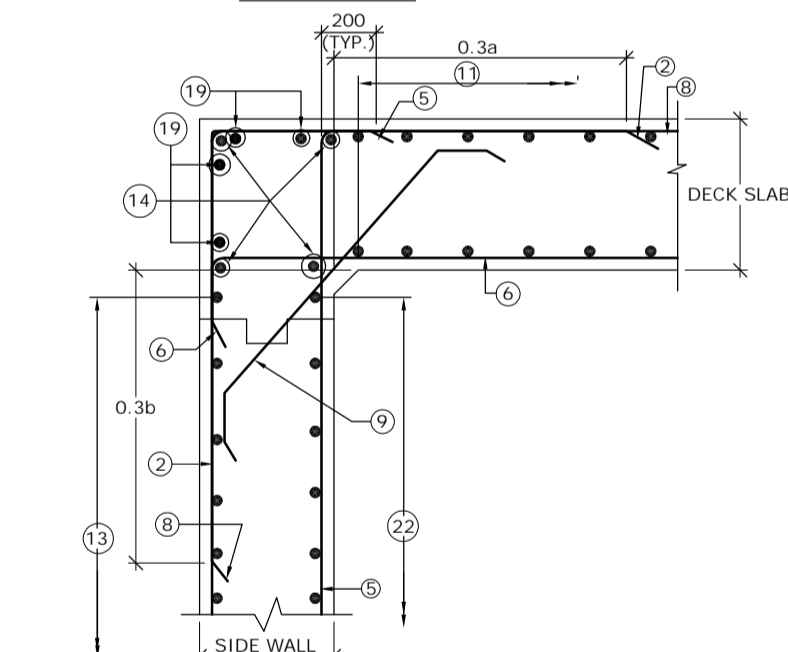
SECTION 1-1
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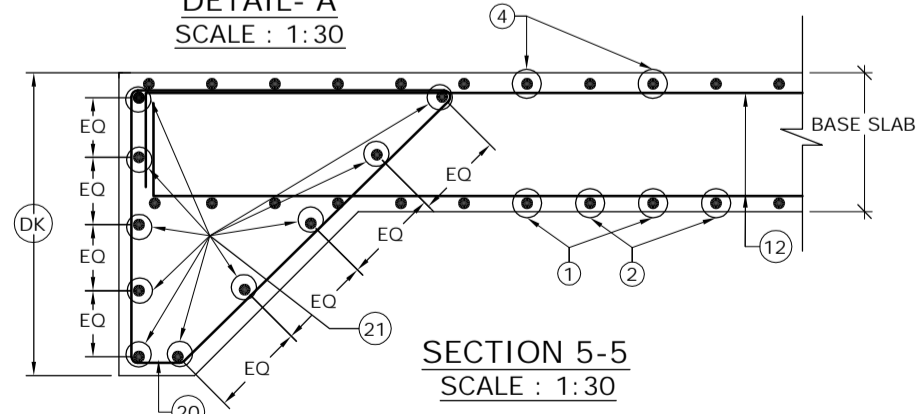
SECTIONAL PLAN 3-3
SCALE : 1:100



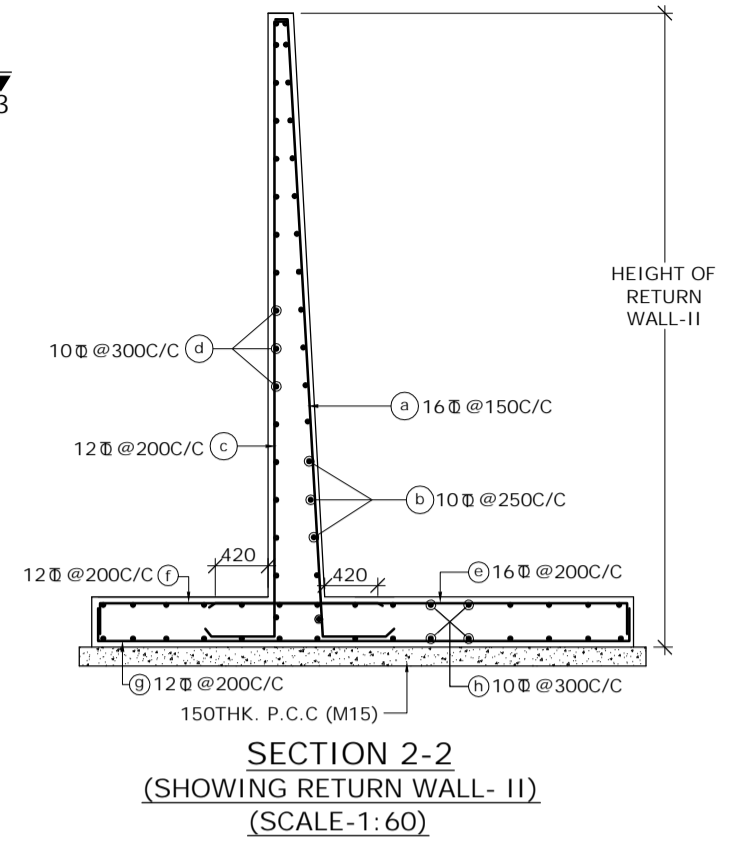
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
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MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - ToloI - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0)

Package :- IV District :- SENAPATI
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 Designe Chainage :- 81+870 to 105+825

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 Kolkata - 700092.

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/RCC

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu

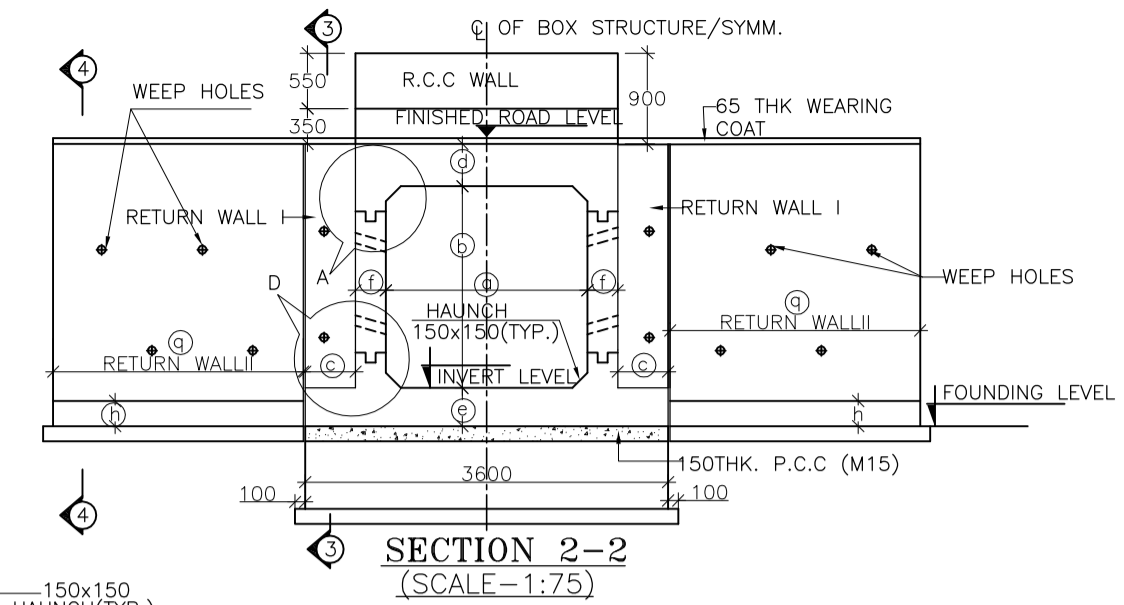
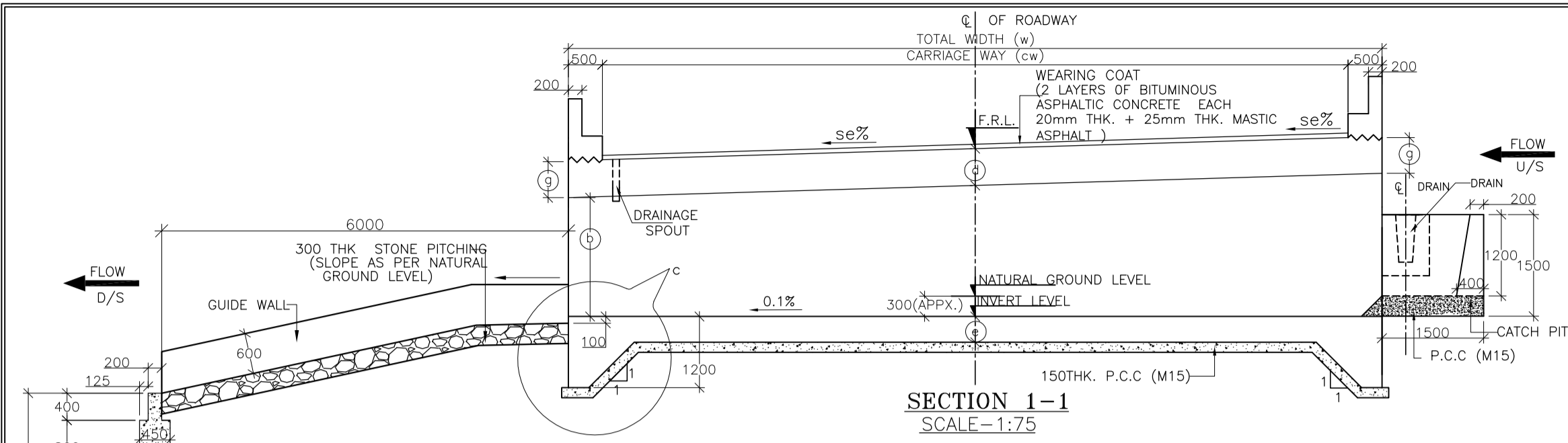
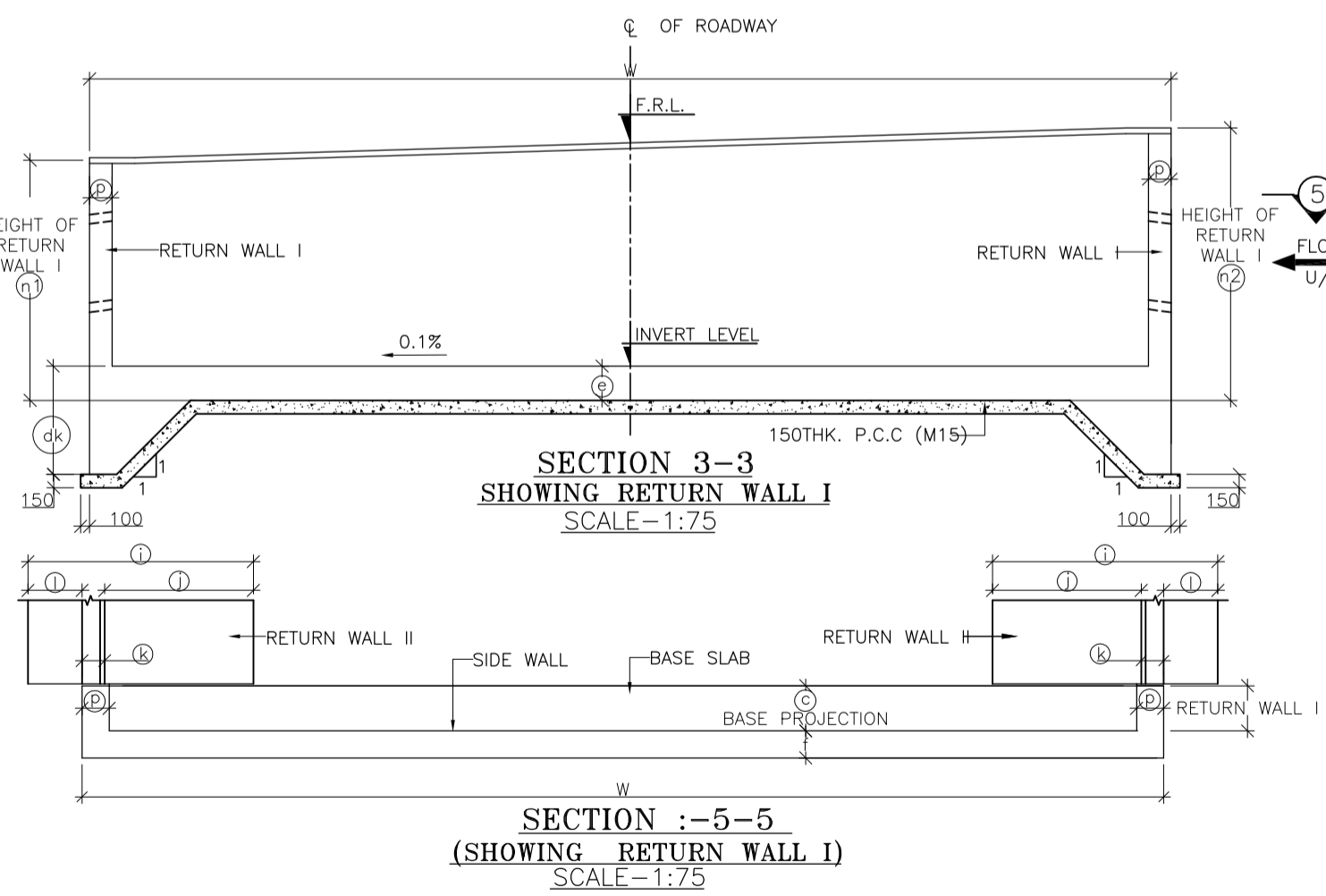
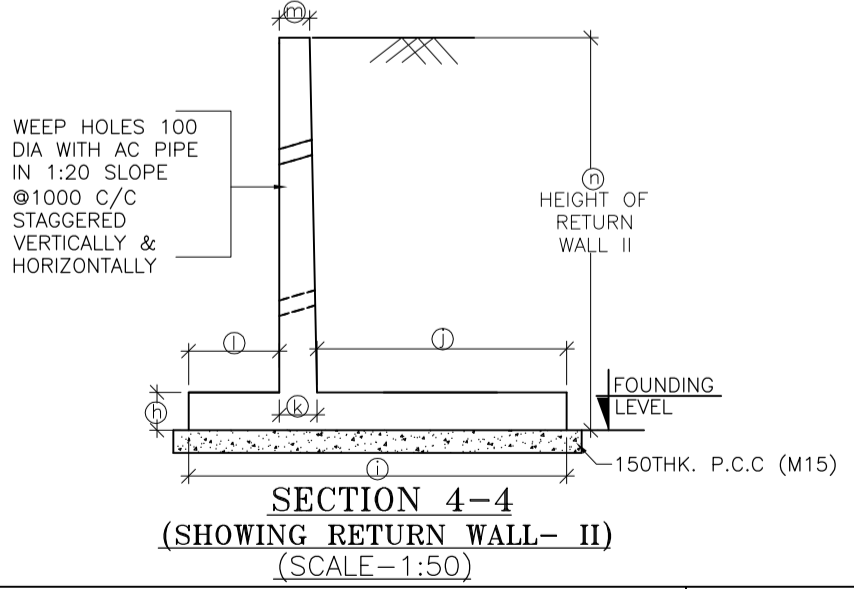
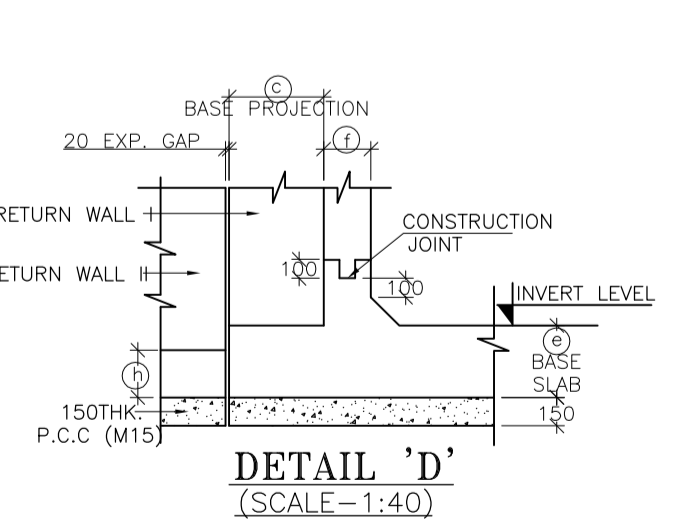
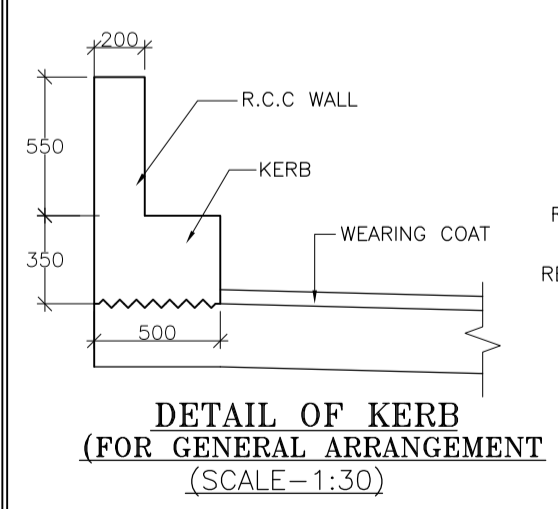
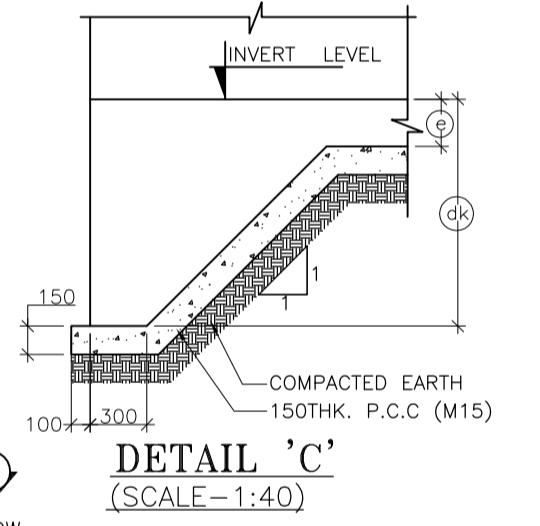
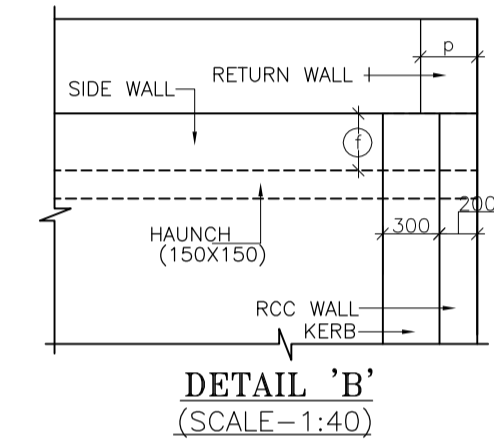
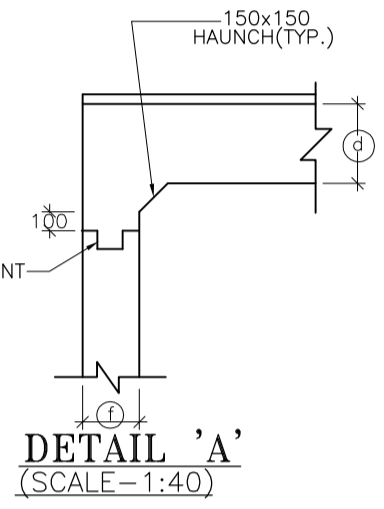
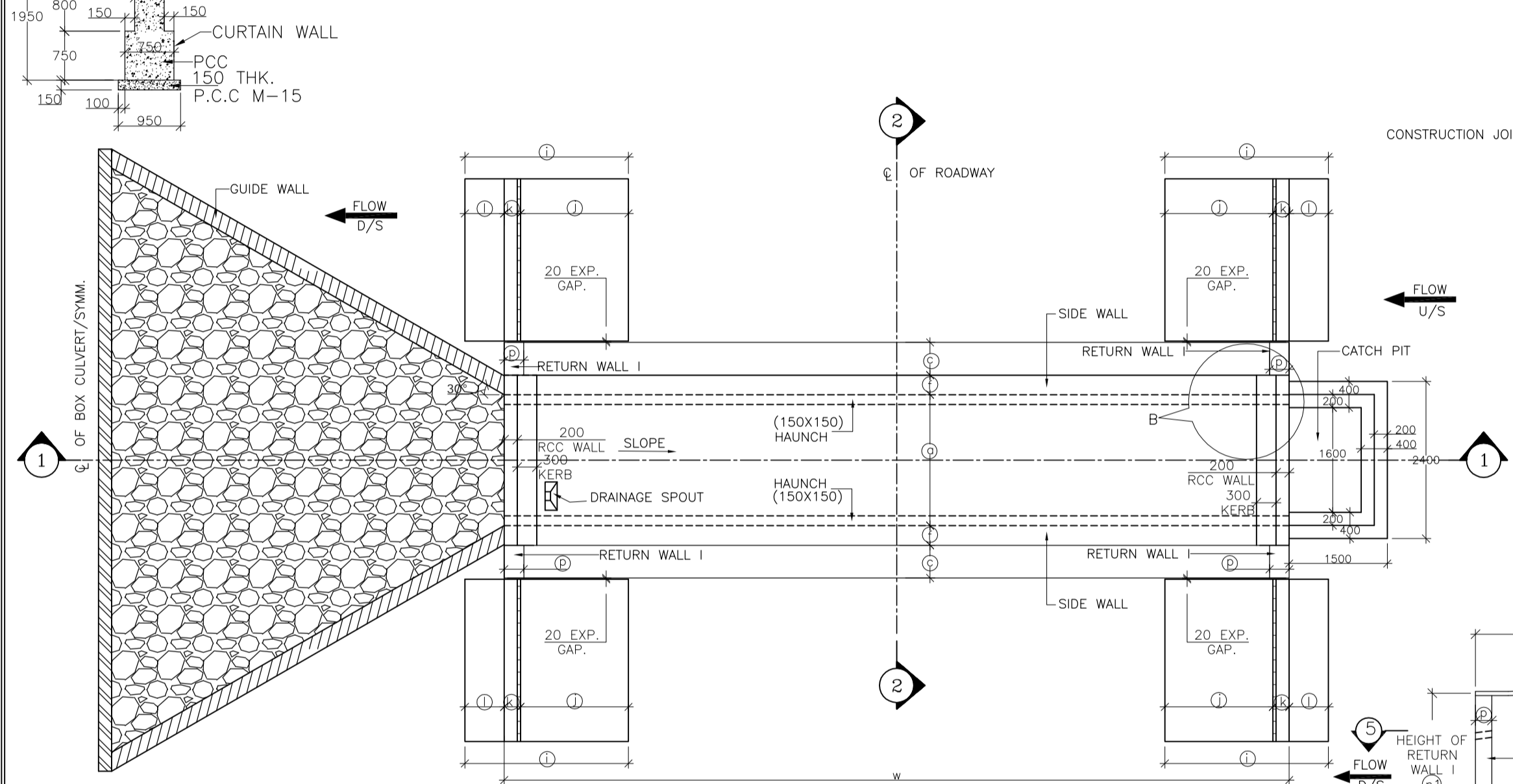


TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./ab/EC	
a	2000
b	2000
c	500
d	350
e	380
f	300
g	350
h	250
i	2320
j	1000
k	320
l	1000
m	250
p	300
q	3100
dk	1200



- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE = M25
CURTAIN WALL = M25
LEVELLING COURSE (P.C.C.) = M15
RETURN WALL = M25
RCC WALL & KERB = M25
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 - CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/SLP/SE/GA (SHEET NO-02)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN	PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANE WITH PAVED SHOULDER OF UKHRUL - TOLAI - TADUBI SECTION OF NH-102A (115 KM) IN THE STATE OF MANIPUR ON EPC MODE.
DATE: SEPT, 2016	



CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCH PIT & SLOPED PROTECTION
PACKAGE :- IV	DISTRICT :- SENAPATI
EXISTING CHAINAGE :- 88+520 TO 114+165	DESIGNE CHAINAGE :- 81+870 TO 105+825

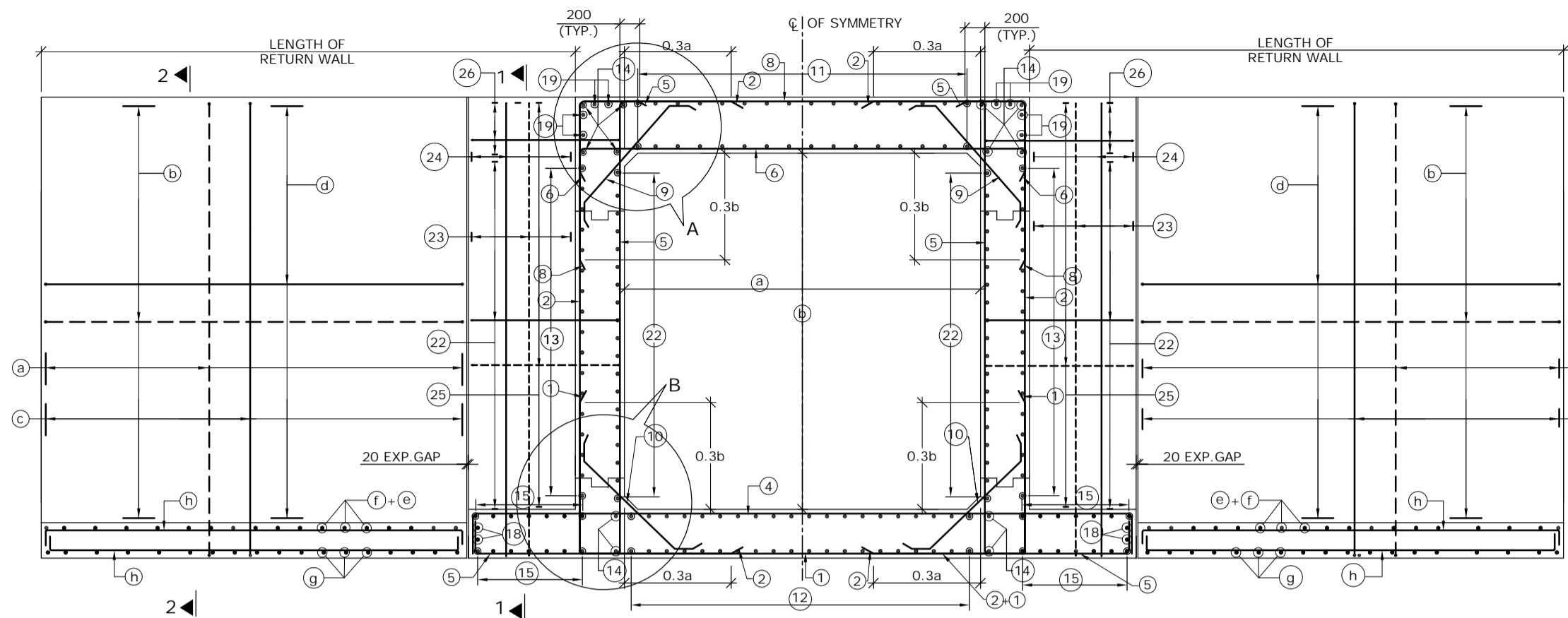
CONSULTANT : CETEST Engineering Consultants ARISU 3003, 34R3 ISORGANISMS Certified Company	124-A, N.S.C. Bose Road Kolkata - 700092.
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DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/SLP/SE/GA (SHEET NO-01 OF 02)	Drawn By: S. Chattrjee	Design By: -	Checked By: Avishek Dey	Approved By: Soubhik Sadhu
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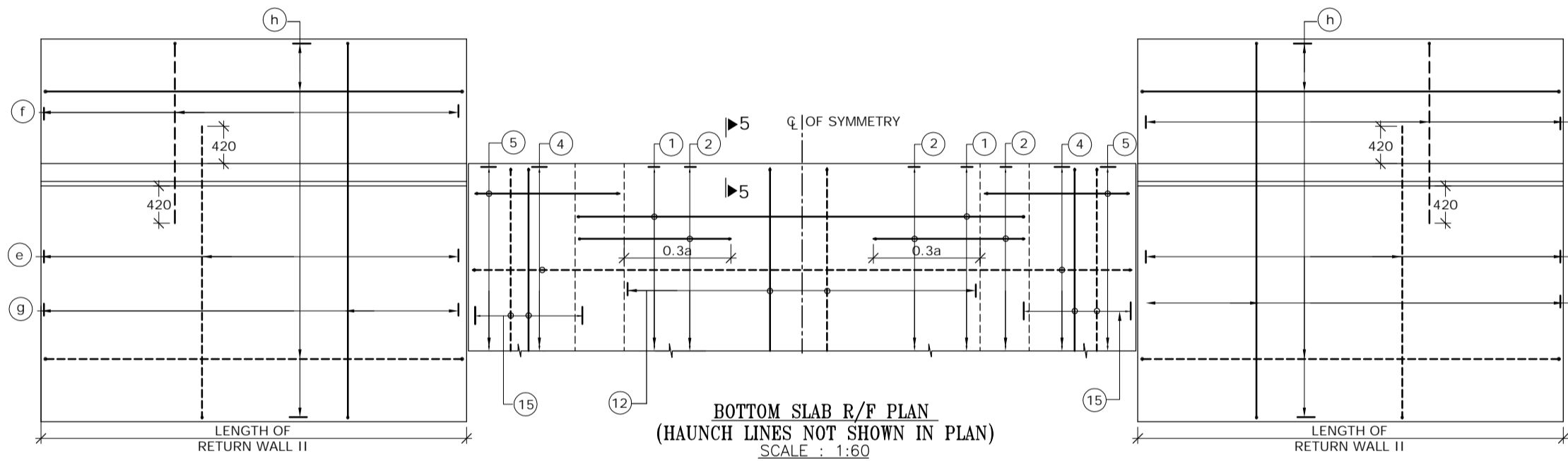
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
83/1	82+245	2135.757	2X2X1 Cell	4.70	R TO L	11.00	With Catch pit	Slope	2133.577	2133.197	2.730	3.200
85/2	84+188	2058.059	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Slope	2055.994	2055.614	2.730	3.430
85/3	84+740	2019.047	2X2X1 Cell	7.00	R TO L	10.00	With Catch pit	Slope	2016.947	2016.567	2.730	3.360
87/1	86+020	1939.848	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Slope	1937.783	1937.403	2.730	3.430
87/6	86+906	1906.355	2X2X1 Cell	7.00	L TO R	10.00	With Catch pit	Slope	1904.255	1903.875	2.730	3.360
89/3	88+158	1864.485	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Slope	1862.420	1862.040	2.730	3.430
89/6	88+738	1865.572	2X2X1 Cell	3.60	R TO L	11.00	With Catch pit	Slope	1863.337	1862.957	2.730	3.090
90/2	89+350	1864.414	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Slope	1862.349	1861.969	2.730	3.430
97/2	96+812	1763.325	2X2X1 Cell	7.00	R TO L	10.00	With Catch pit	Slope	1761.225	1760.845	2.730	3.360
100/3	99+477	1564.939	2X2X1 Cell	5.60	R TO L	11.00	With Catch pit	Slope	1562.804	1562.424	2.730	3.290
101/3	100+692	1512.218	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Slope	1510.153	1509.773	2.730	3.430
101/4	100+995	1506.586	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Slope	1504.521	1504.141	2.730	3.430
102/4	101+832	1518.206	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Slope	1516.141	1515.761	2.730	3.430
103/1	102+040	1521.487	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Slope	1519.422	1519.042	2.730	3.430
103/2	102+142	1521.682	2X2X1 Cell	7.00	R TO L	10.00	With Catch pit	Slope	1519.582	1519.202	2.730	3.360
103/5	102+599	1539.178	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Slope	1537.113	1536.733	2.730	3.430

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH
CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/GA
(SHEET NO-02)

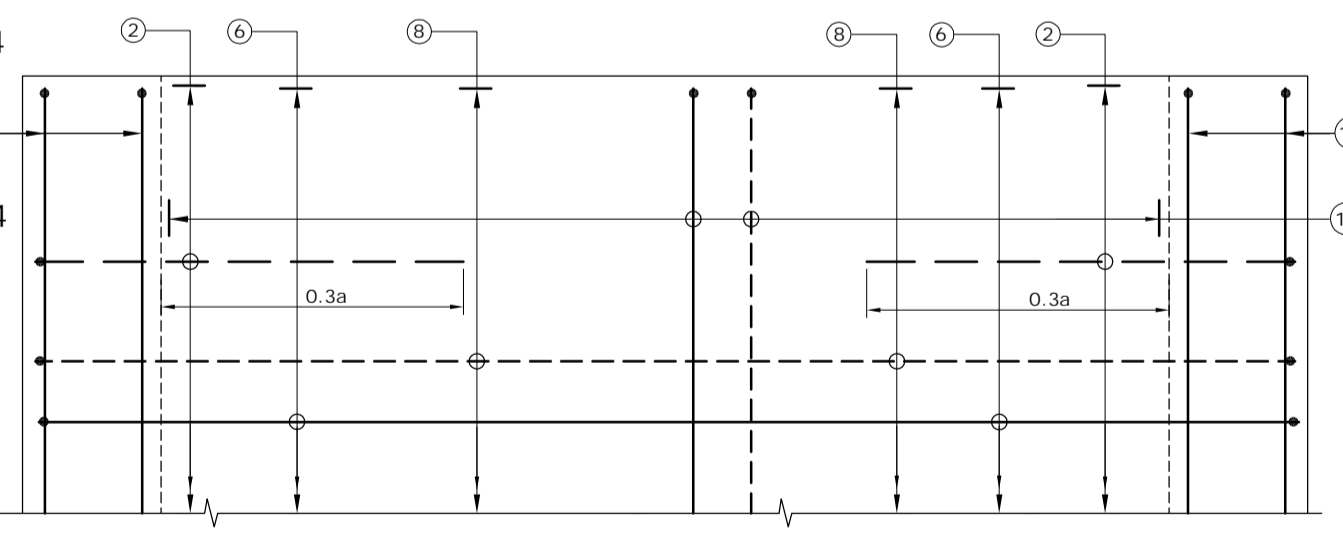
					SCALE: AS SHOWN		CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIT & SLOPED PROTECTION	CONSULTANT :  CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG. NO. CET/BDG/2016/3640/NH-102A/PPR/BC/2x2x1/CP/SLP/SE/GA (SHEET NO-02 OF 02)
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	DATE: SEPT, 2016		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.	Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Design Chainage :- 81+870 to 105+825		Drawn By. Design By. Checked By. Approved By.
REVISIONS										S. Chattrjee - Avishek Dey Soubhik Sadhu



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

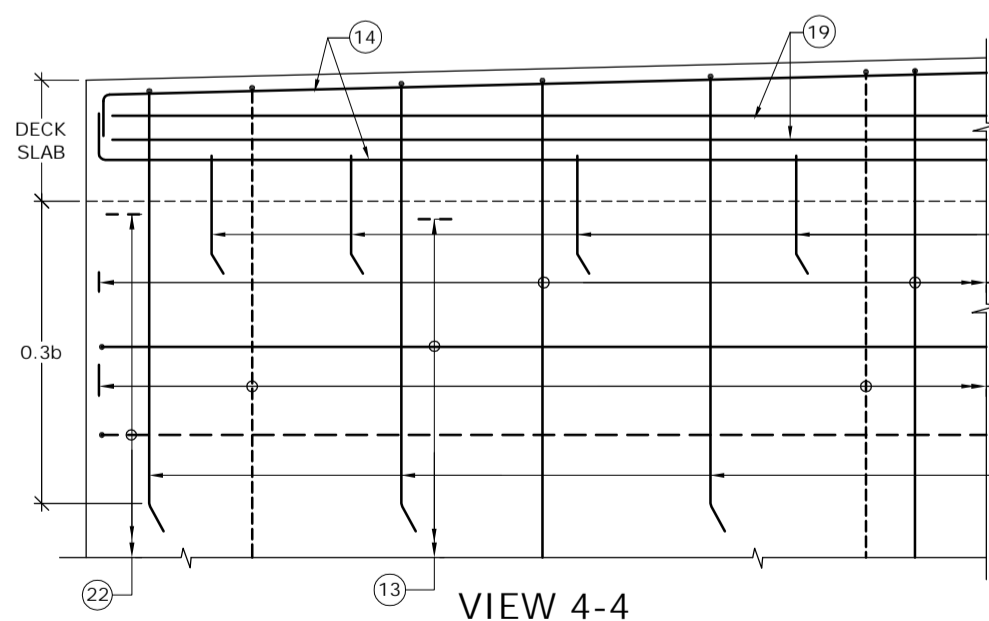


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

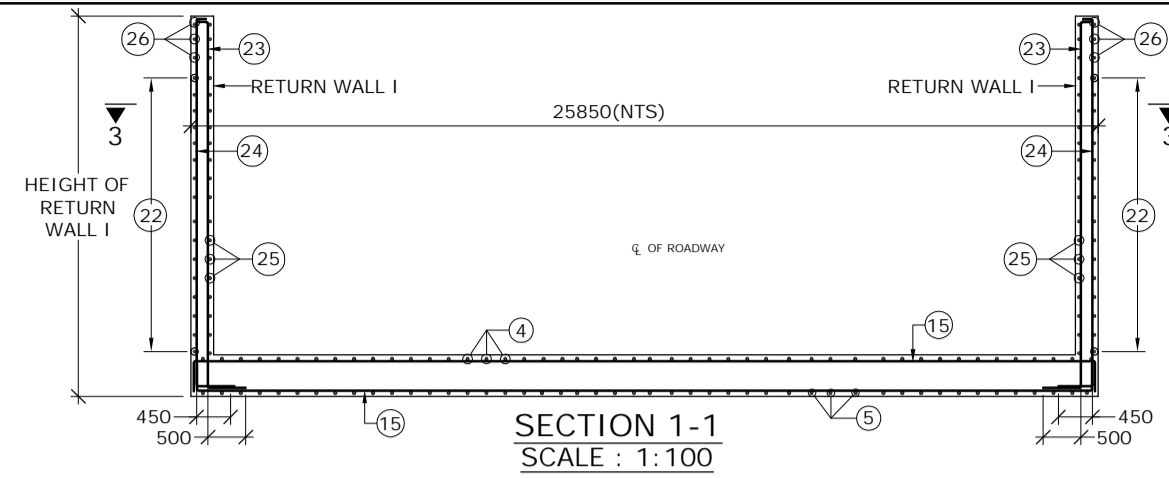


TOP SLAB R/F PLAN
SCALE : 1:30

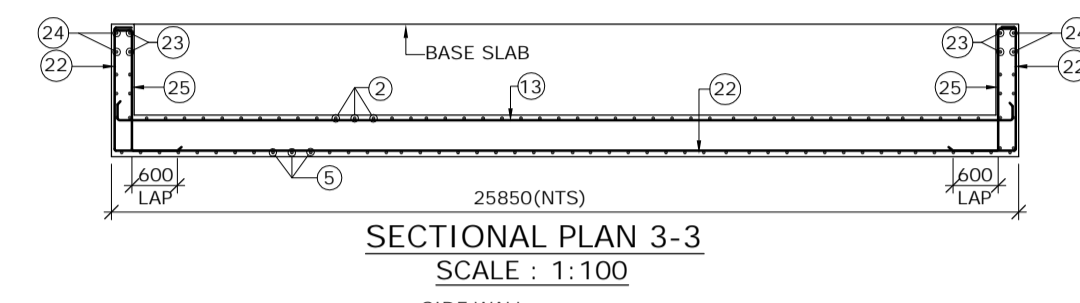
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



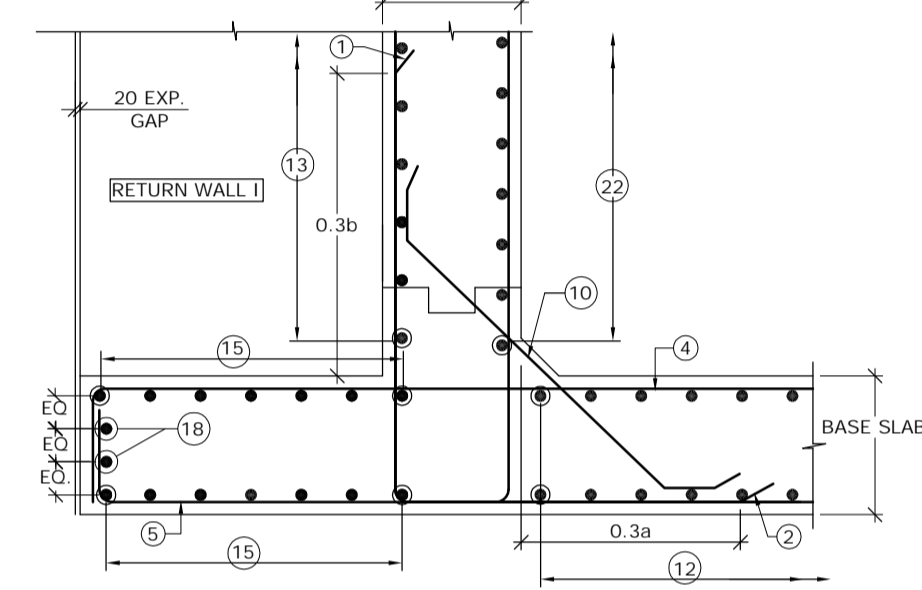
VIEW 4-4
SCALE : 1:30



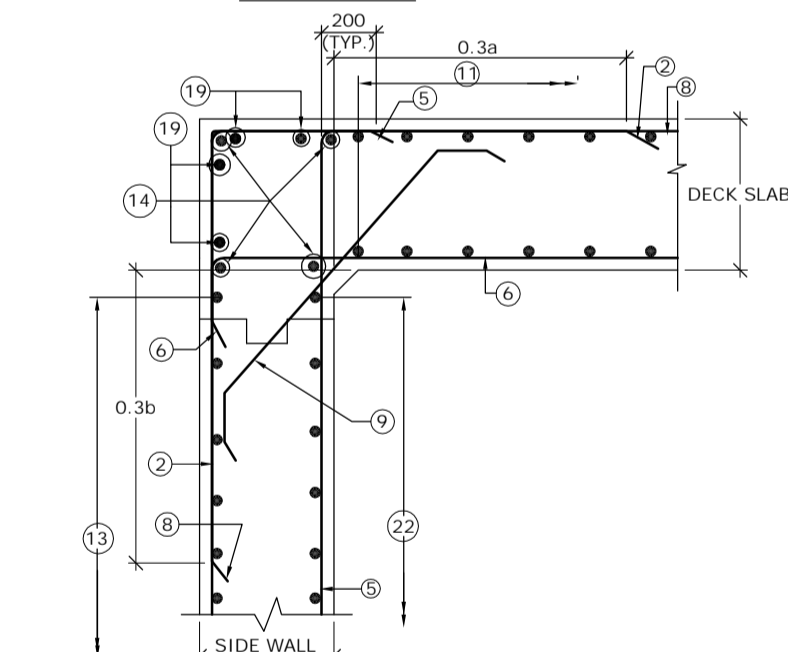
SECTION 1-1
SCALE : 1:100



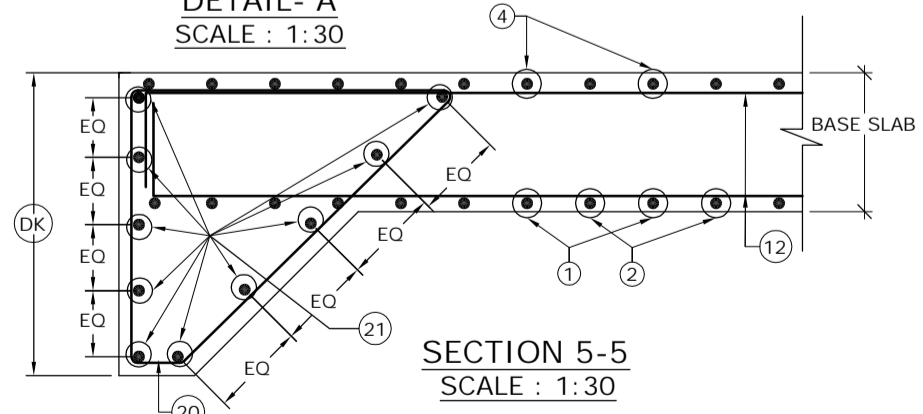
SECTIONAL PLAN 3-3
SCALE : 1:100



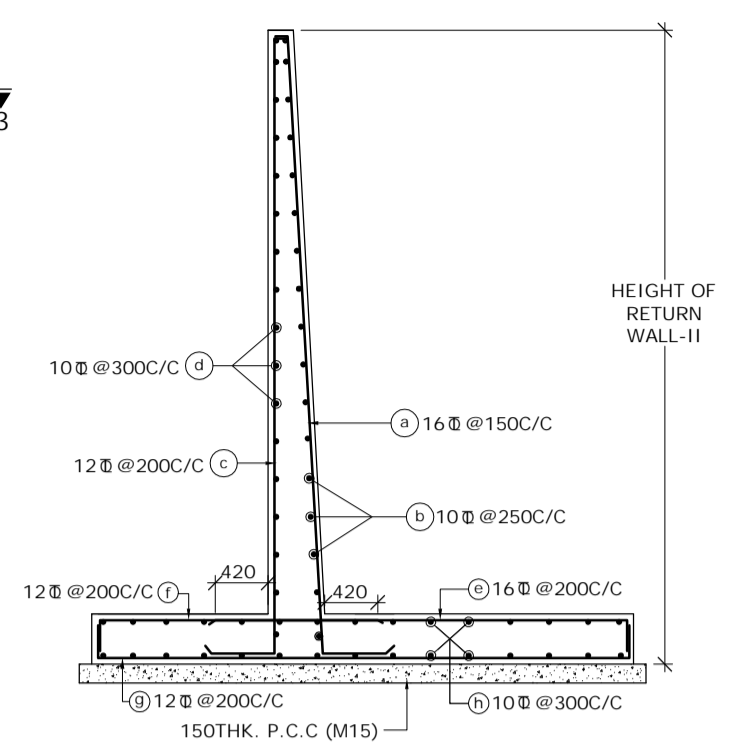
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/SLP/SE/GA (SHEET NO-01 & 02)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

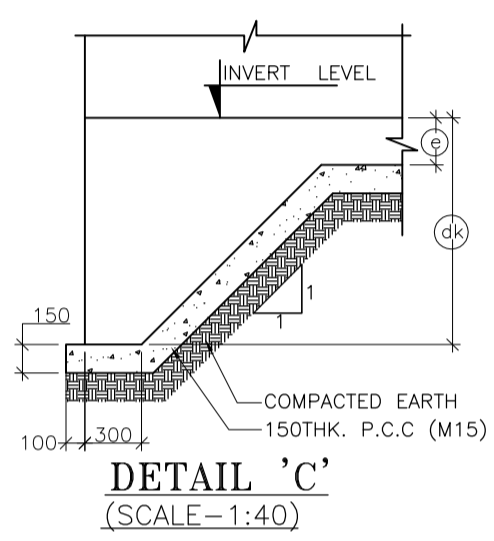
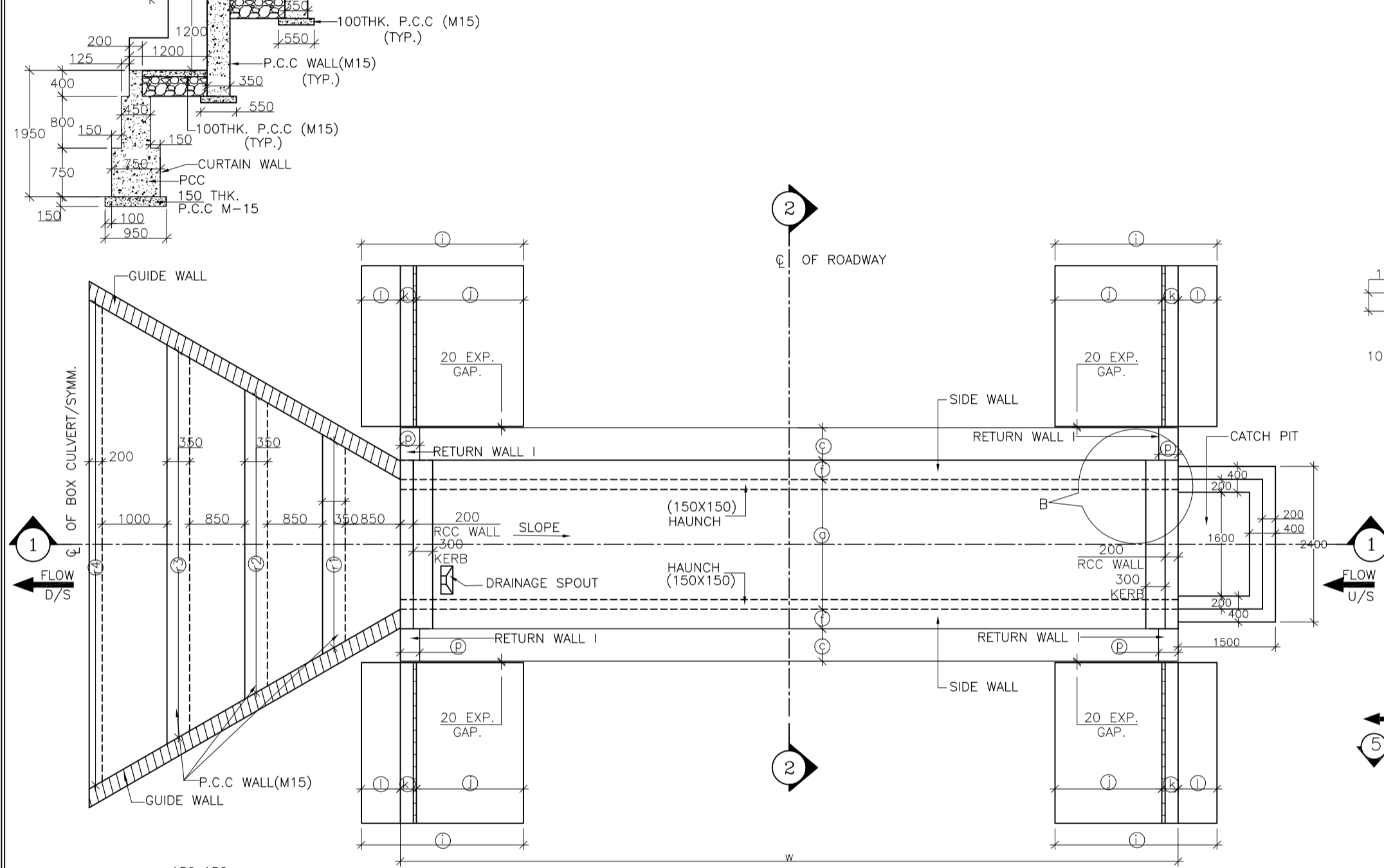
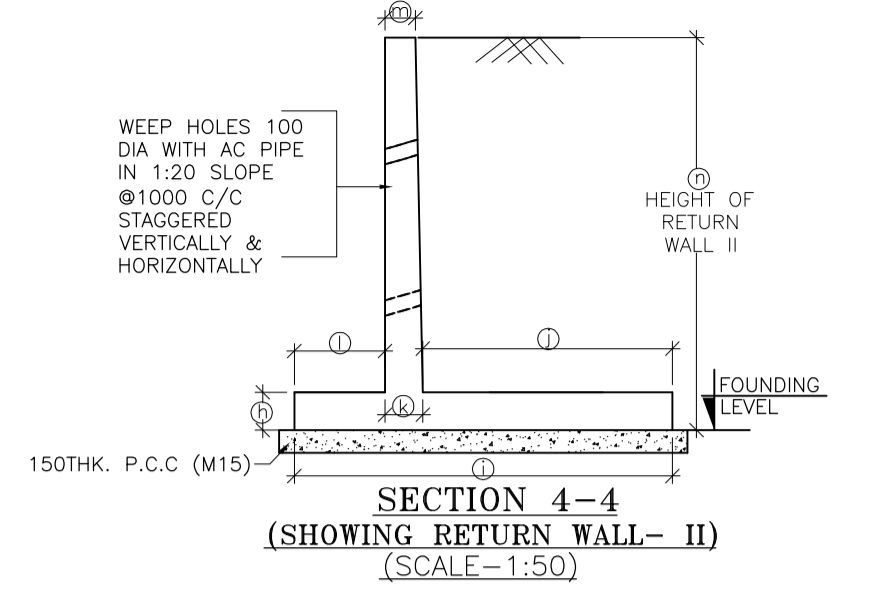
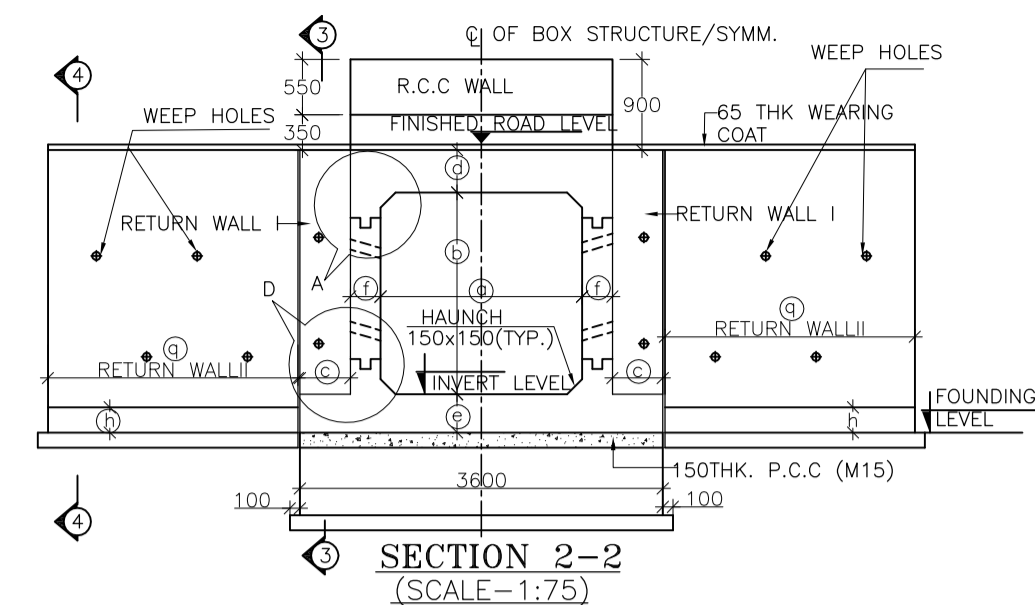
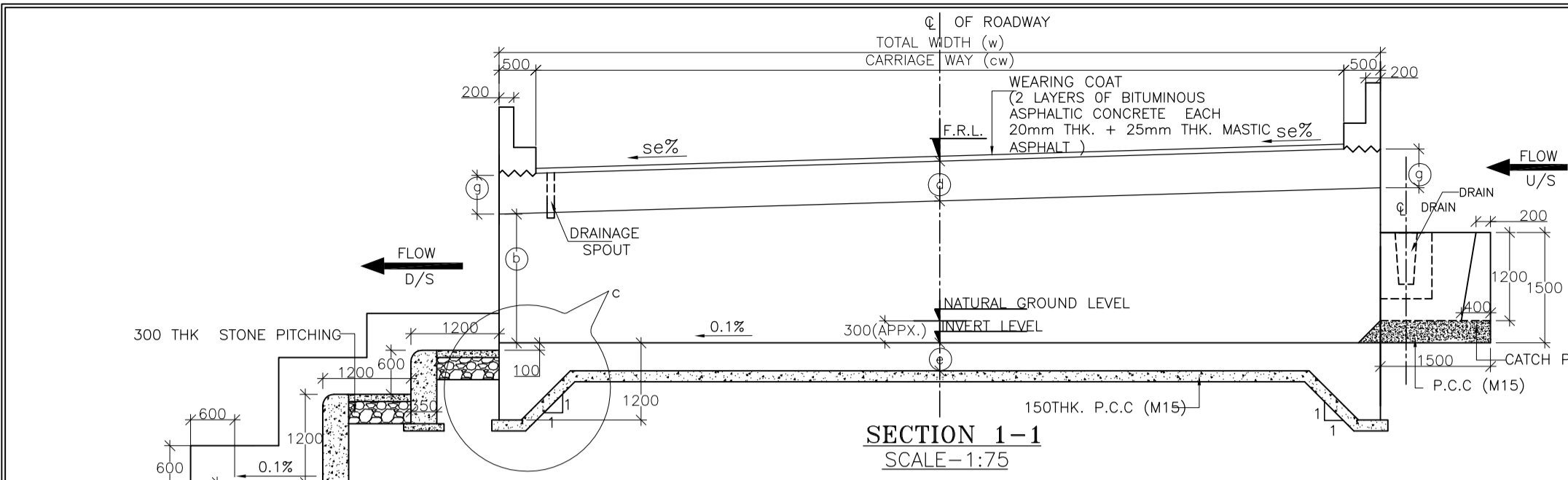
SCALE: AS SHOWN
 DATE: SEPT, 2016

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

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0)
 Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

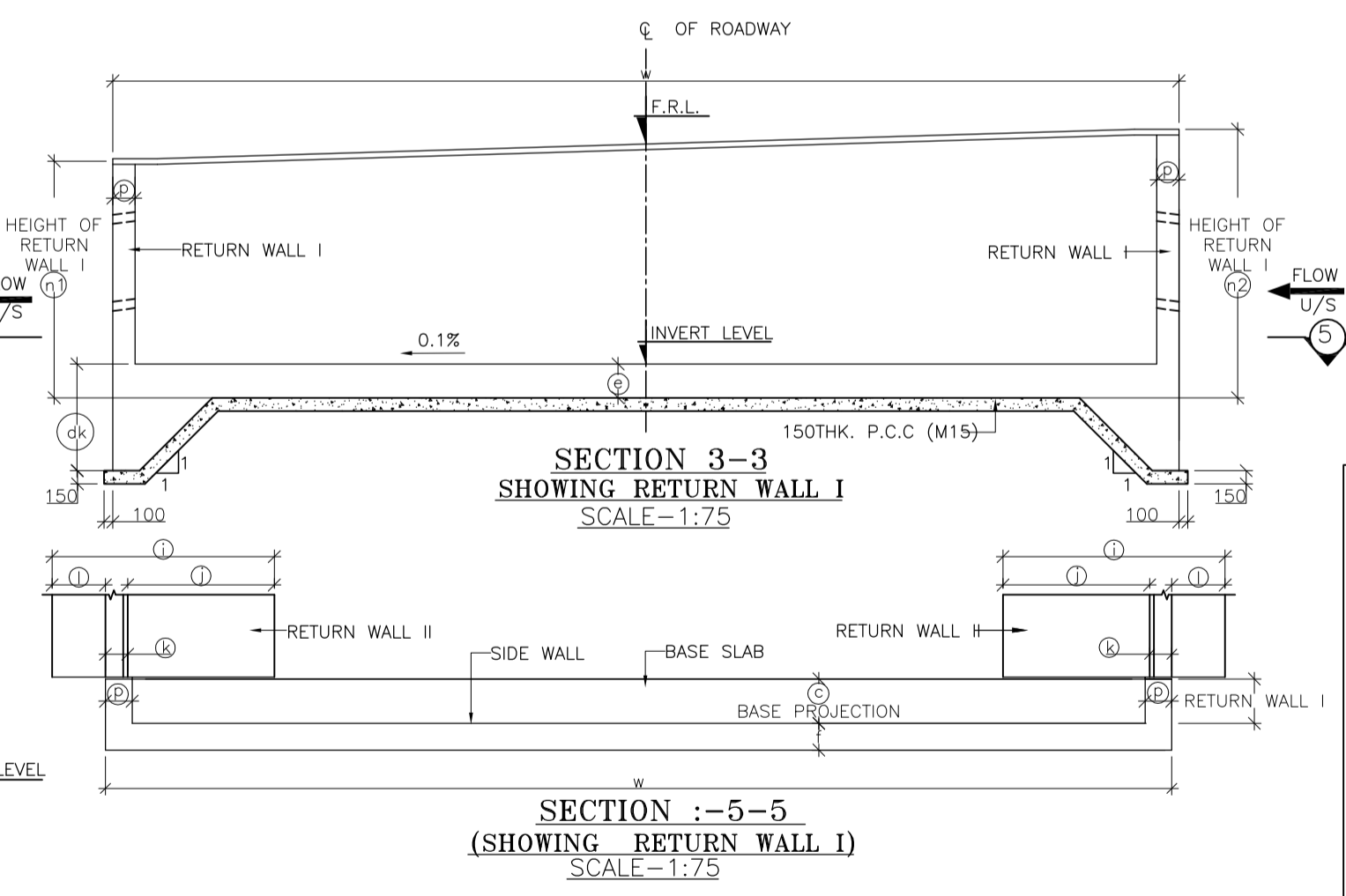
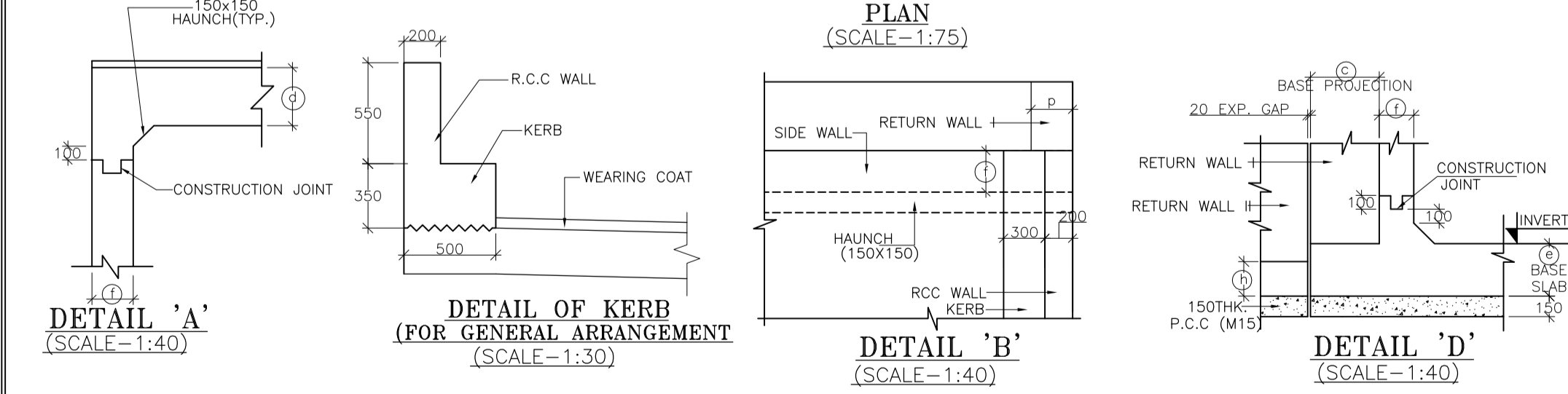
CONSULTANT : CE TESTING COMPANY PVT. LTD.
 124-A, N.S.C. Bose Road
 Kolkata - 700092.

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/SLP/SE/RCC (SHEET NO-01 OF 01)
 Drawn By: S. Chattrjee
 Design By: -
 Checked By: Avishek Dey
 Approved By: Soubhik Sadhu



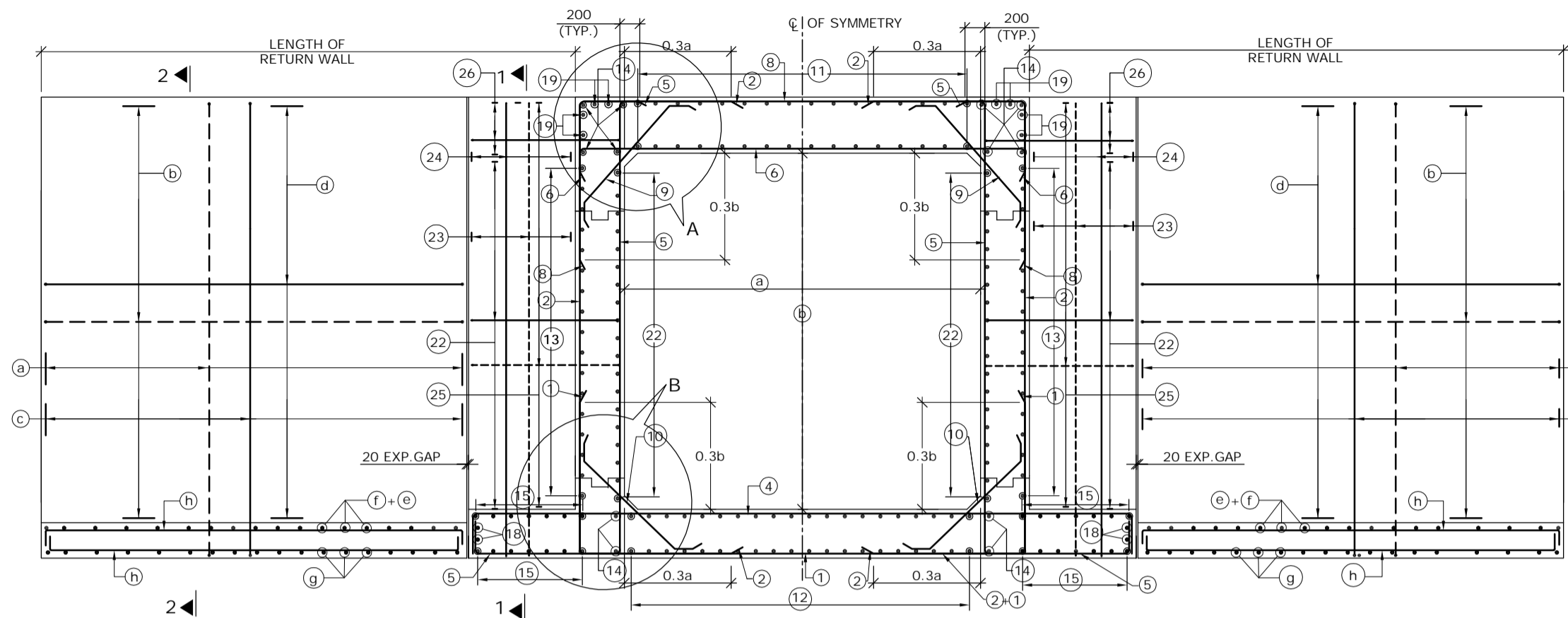
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
86/2	85+291	1979.249	2X2X1 Cell	7.00	R TO L	10.00	With Catch pit	Step	1977.149	1976.769	2.730	3.360
88/4	87+978	1866.693	2X2X1 Cell	4.20	R TO L	11.00	With Catch pit	Step	1864.488	1864.108	2.730	3.150
89/1	88+058	1865.707	2X2X1 Cell	4.20	R TO L	11.00	With Catch pit	Step	1863.502	1863.122	2.730	3.150
89/5	88+645	1865.044	2X2X1 Cell	3.60	R TO L	10.00	With Catch pit	Step	1862.791	1862.411	2.730	3.054
97/1	96+312	1800.892	2X2X1 Cell	7.00	R TO L	13.00	With Catch pit	Step	1798.897	1798.517	2.730	3.570
100/1	99+168	1586.569	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Step	1584.504	1584.124	2.730	3.430
100/2	99+332	1575.089	2X2X1 Cell	5.60	R TO L	10.00	With Catch pit	Step	1572.926	1572.546	2.730	3.234

BOX CELL DESIGNATION No./ab/EC	a	2000
	b	2000
	c	500
	d	350
	e	380
	f	300
	g	350
	h	320
	i	2320
	j	1000
	k	320
	l	1000
	m	250
	p	300
	q	3100
	dk	1200

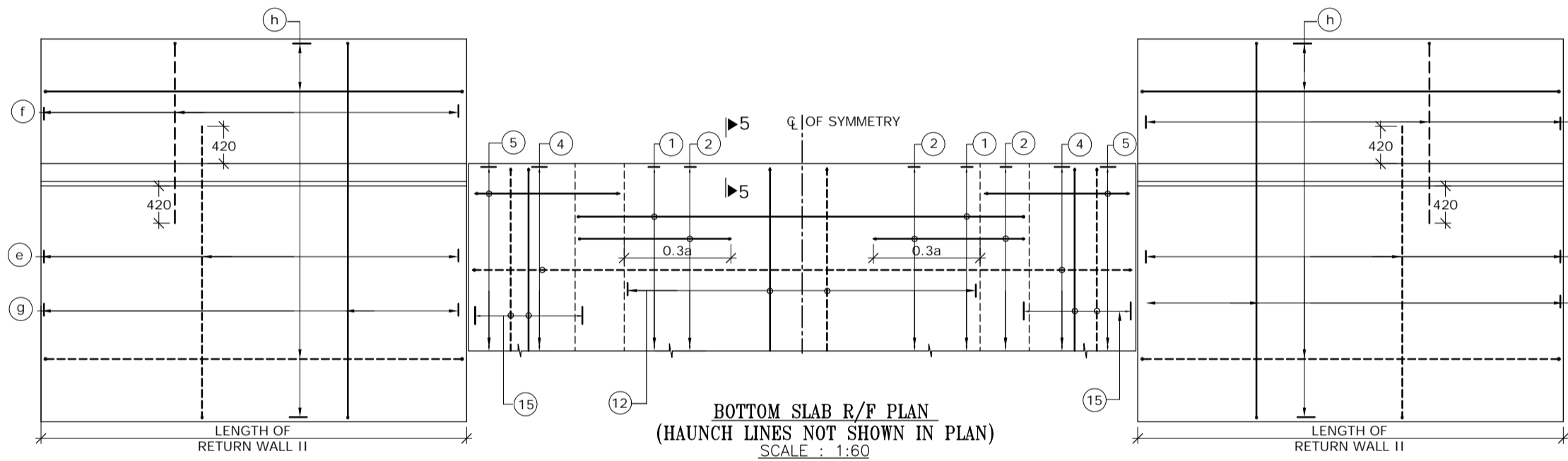


- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE = M25
CURTAIN WALL = M25
LEVELLING COURSE (P.C.C.) = M15
RETURN WALL = M25
RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.81/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 TONS BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/STP/SE/RCC (SHEET NO-01)

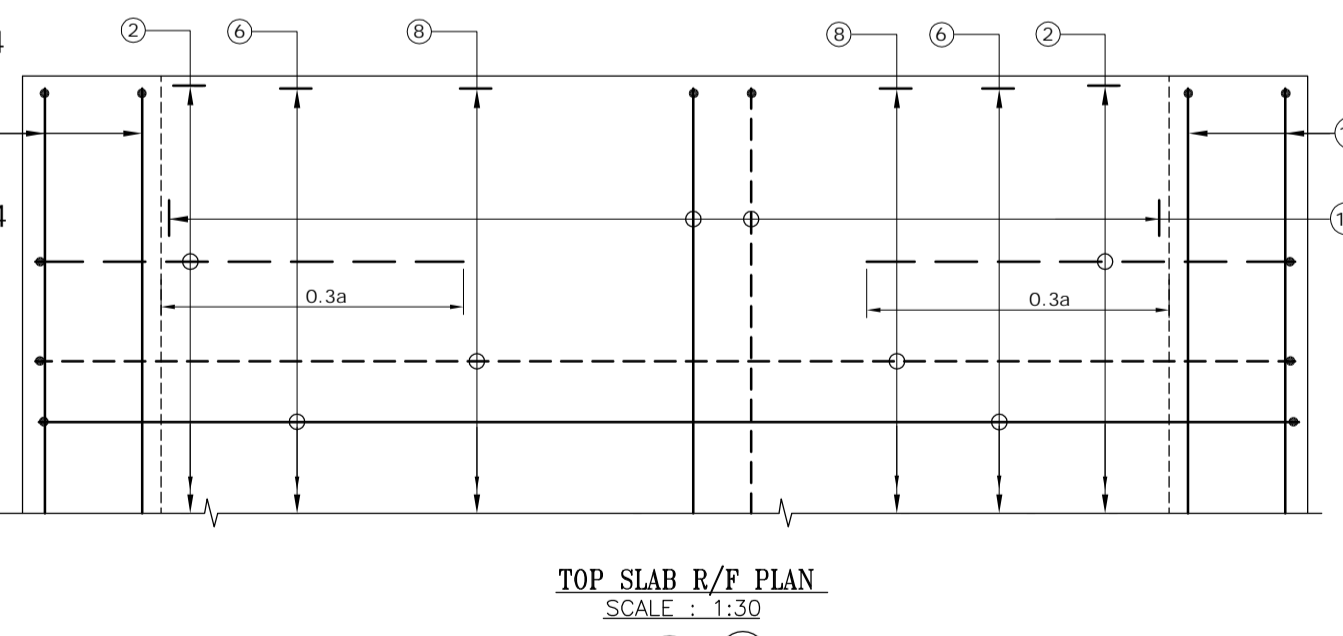
SCALE: AS SHOWN DATE: SEPT, 2016					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCH PIT & STEPPED PROTECTION					CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/STP/SE/GA (SHEET NO-01 OF 01)				
PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Lining with Paved Shoulder of Ukhrul - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.					Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825					Drawn By. A. Sahoo					Design By. - Checked By. Avishek Dey Approved By. Soubhik Sadhu									
REVISIONS																								



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

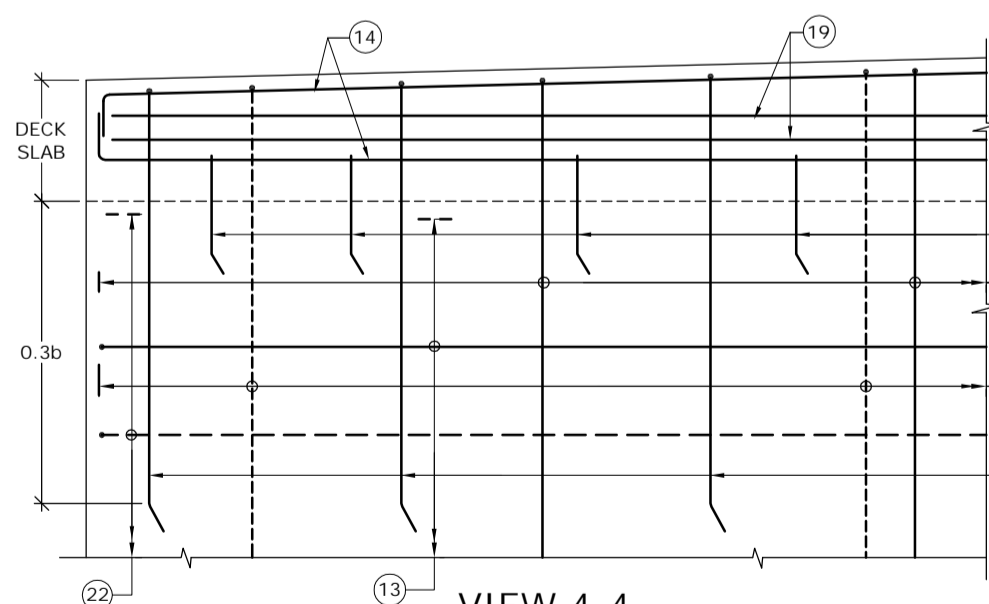


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

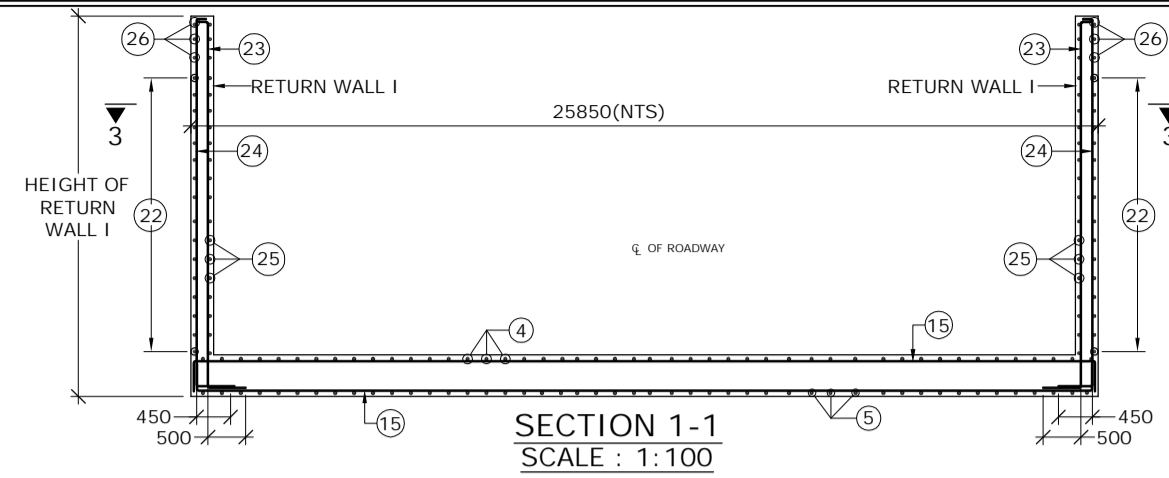


TOP SLAB R/F PLAN
SCALE : 1:30

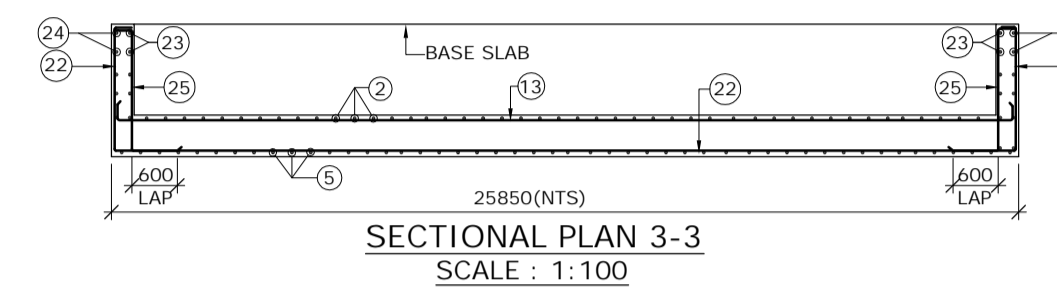
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



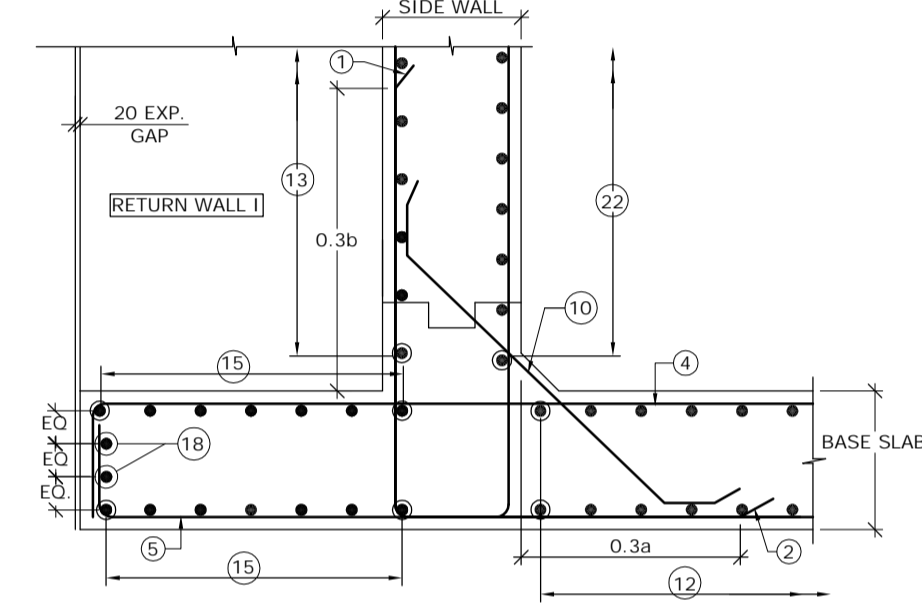
VIEW 4-4
SCALE : 1:30



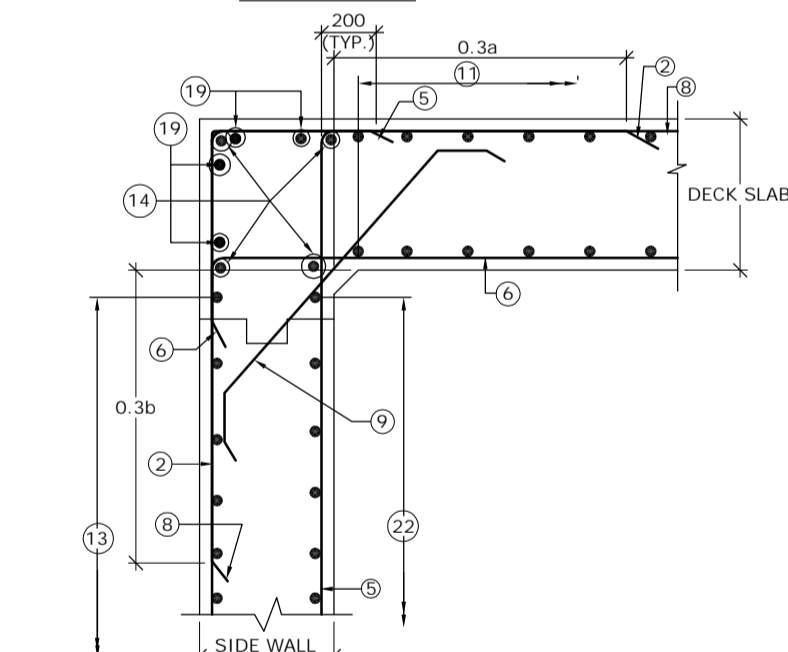
SECTION 1-1
SCALE : 1:100



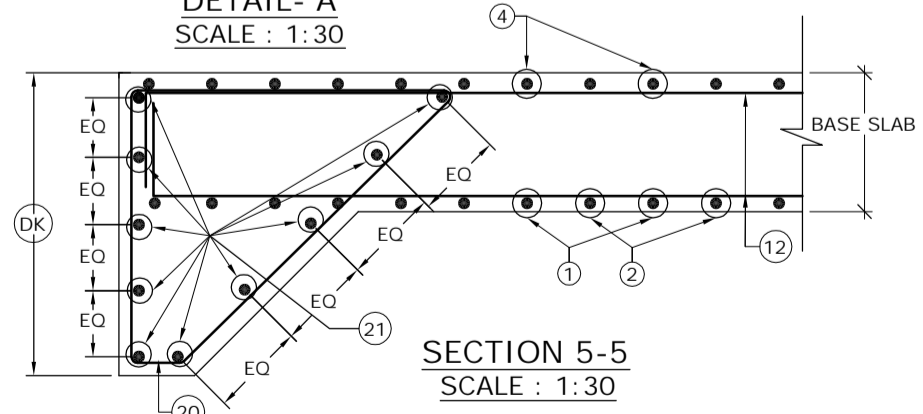
SECTIONAL PLAN 3-3
SCALE : 1:100



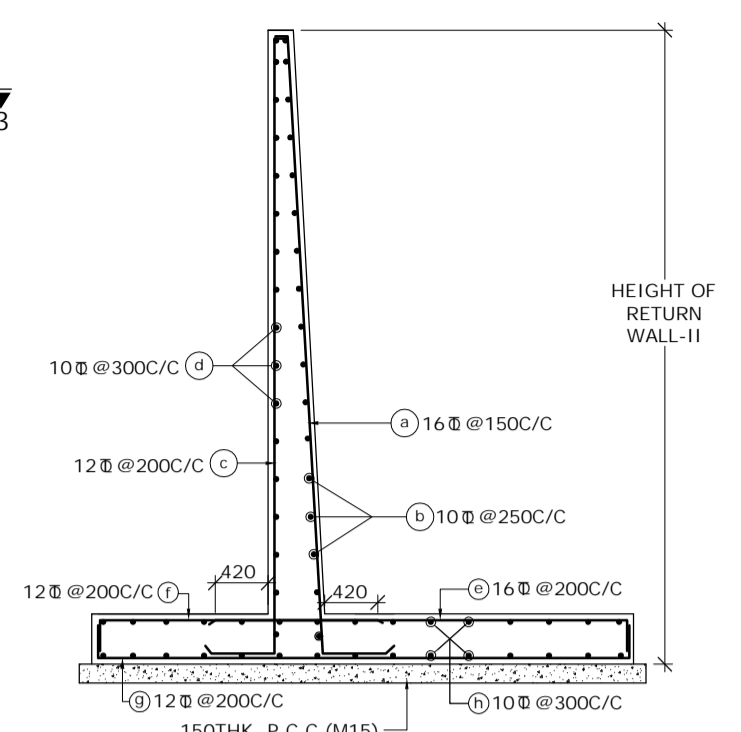
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE-1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	10	250	13	10	250
2	16	250	14	10	-
3	BAR NOT USED		15	10	250
4	16	250	16	12	-
5	16	250	17	12	250
6	16	250	18	10	-
7	BAR NOT USED		19	10	-
8	10	250	20	10	150
9	10	250	21	10	-
10	12	250	22	10	250
11	10	250	23	10	200
12	10	250	24	10	200
			25	12	125
			26	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/STP/SE/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0)

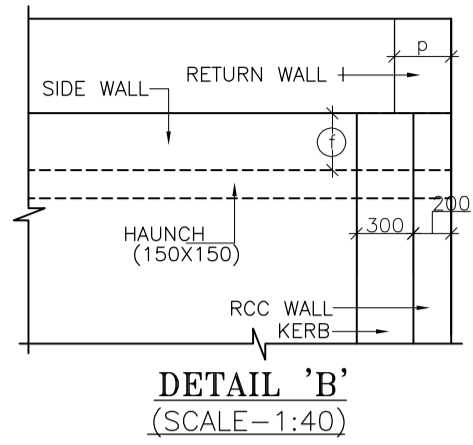
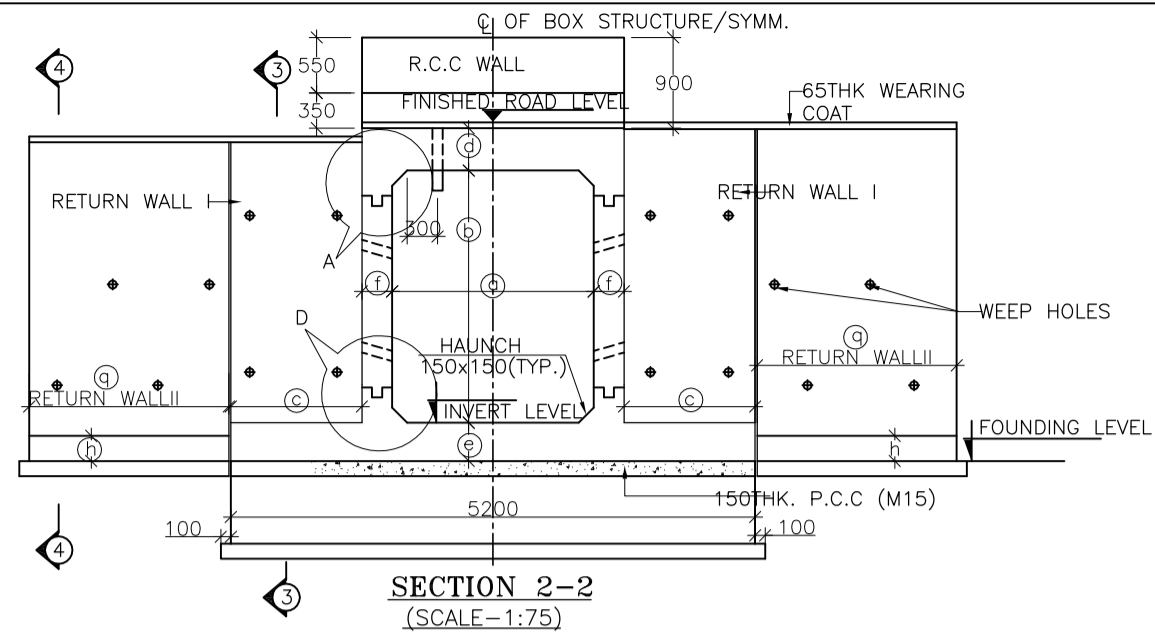
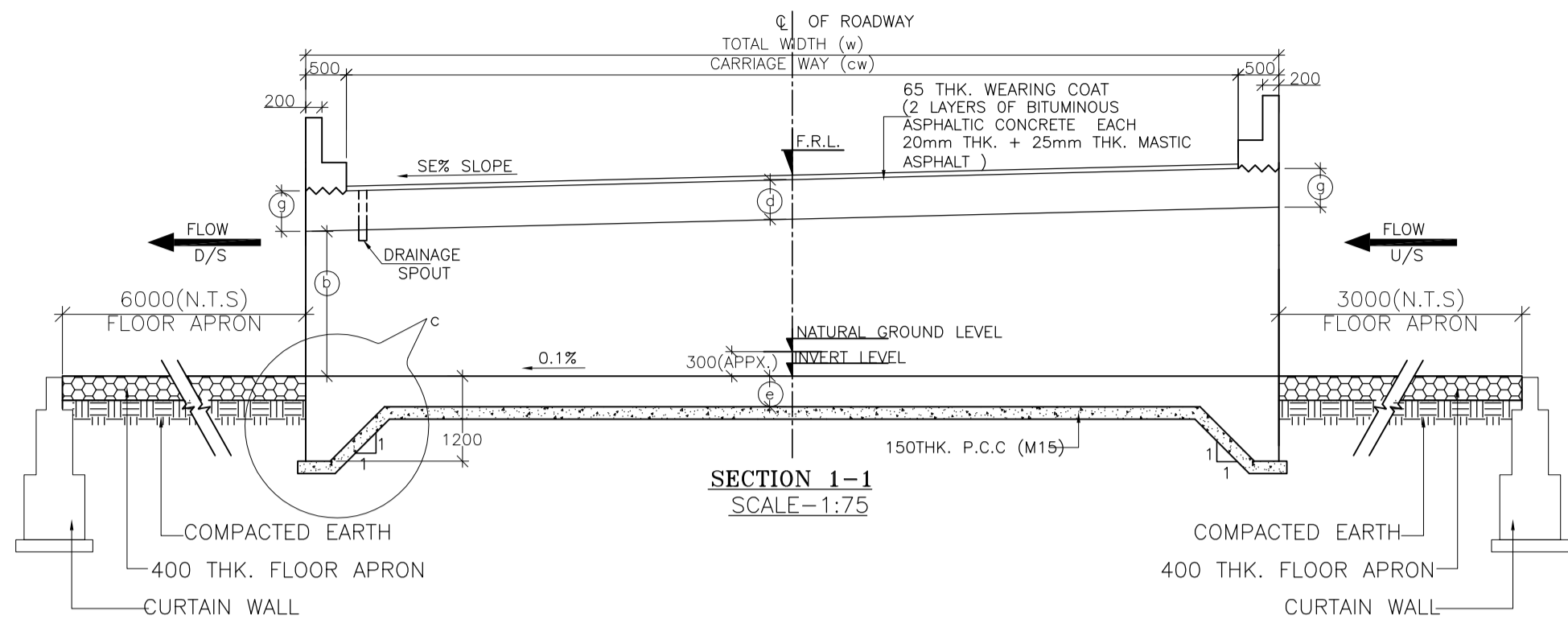
Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 ANISUWA, 3480, ISHIGAWA
 Certified Company

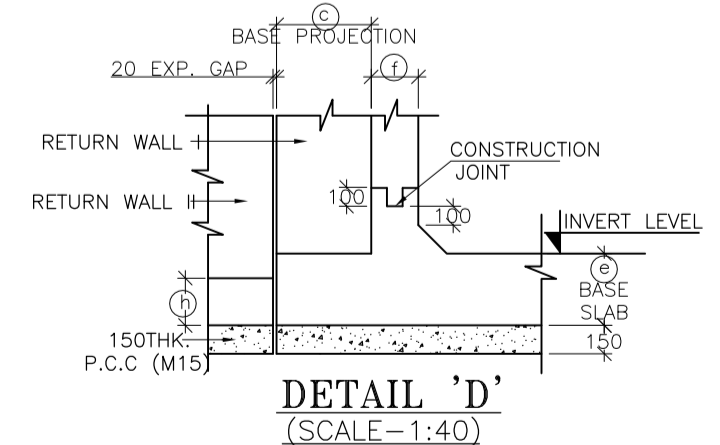
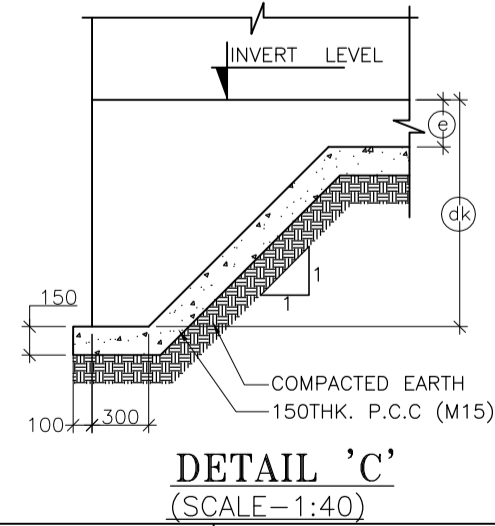
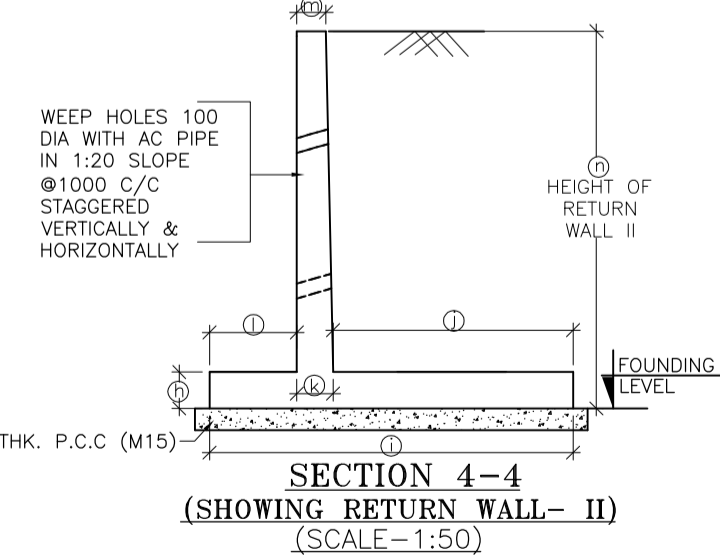
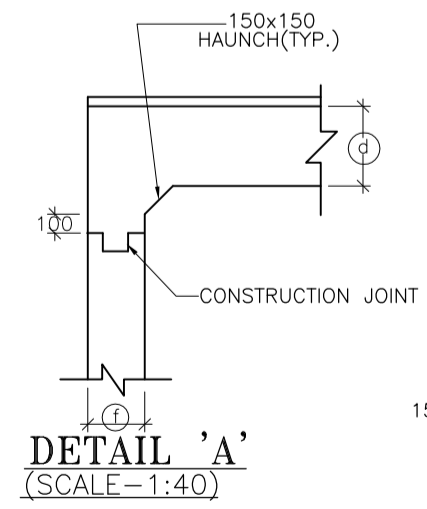
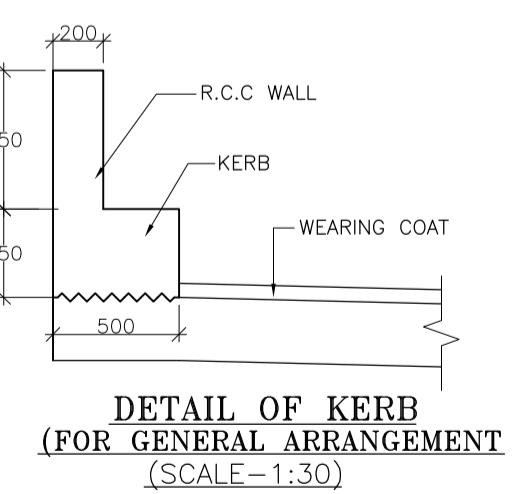
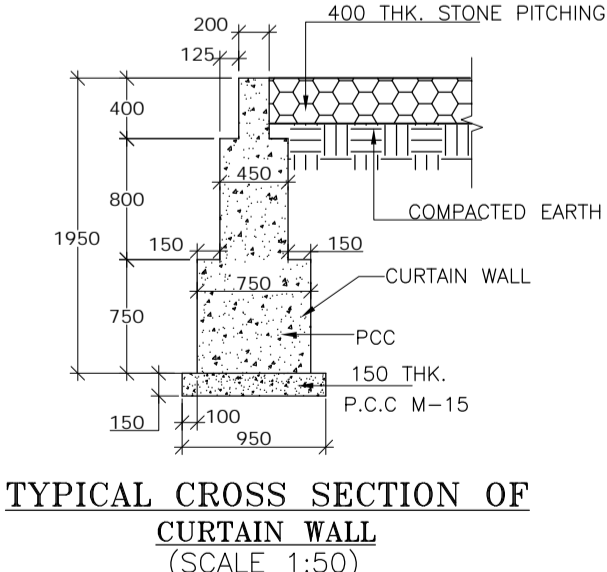
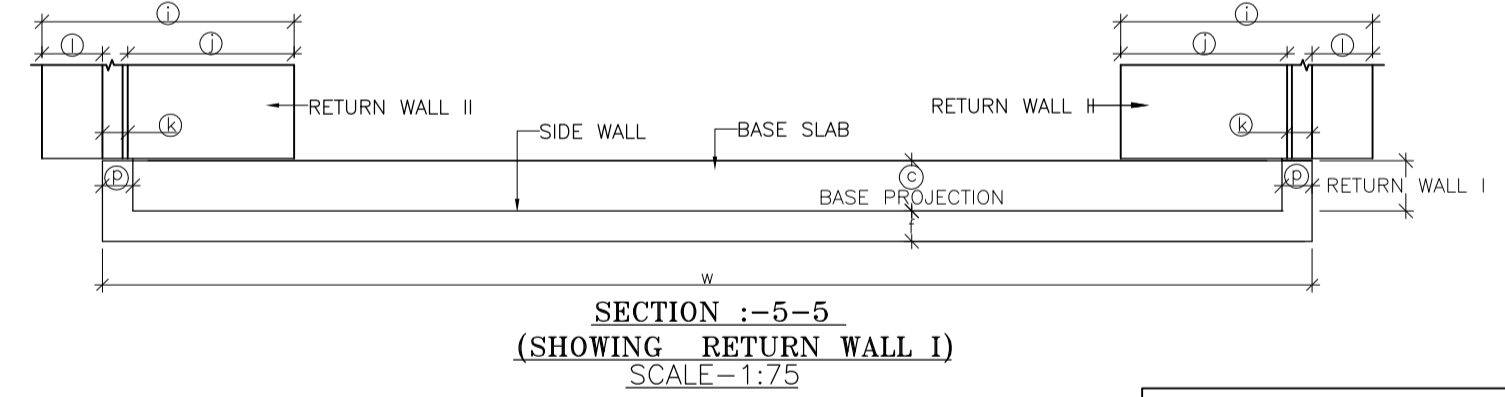
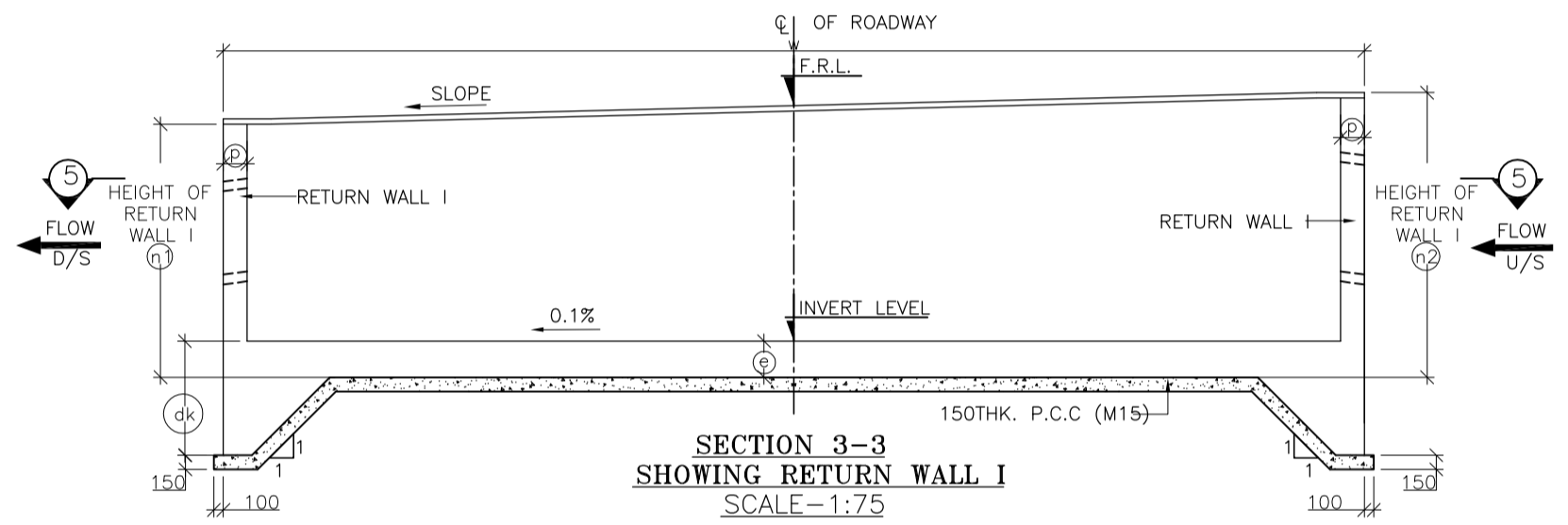
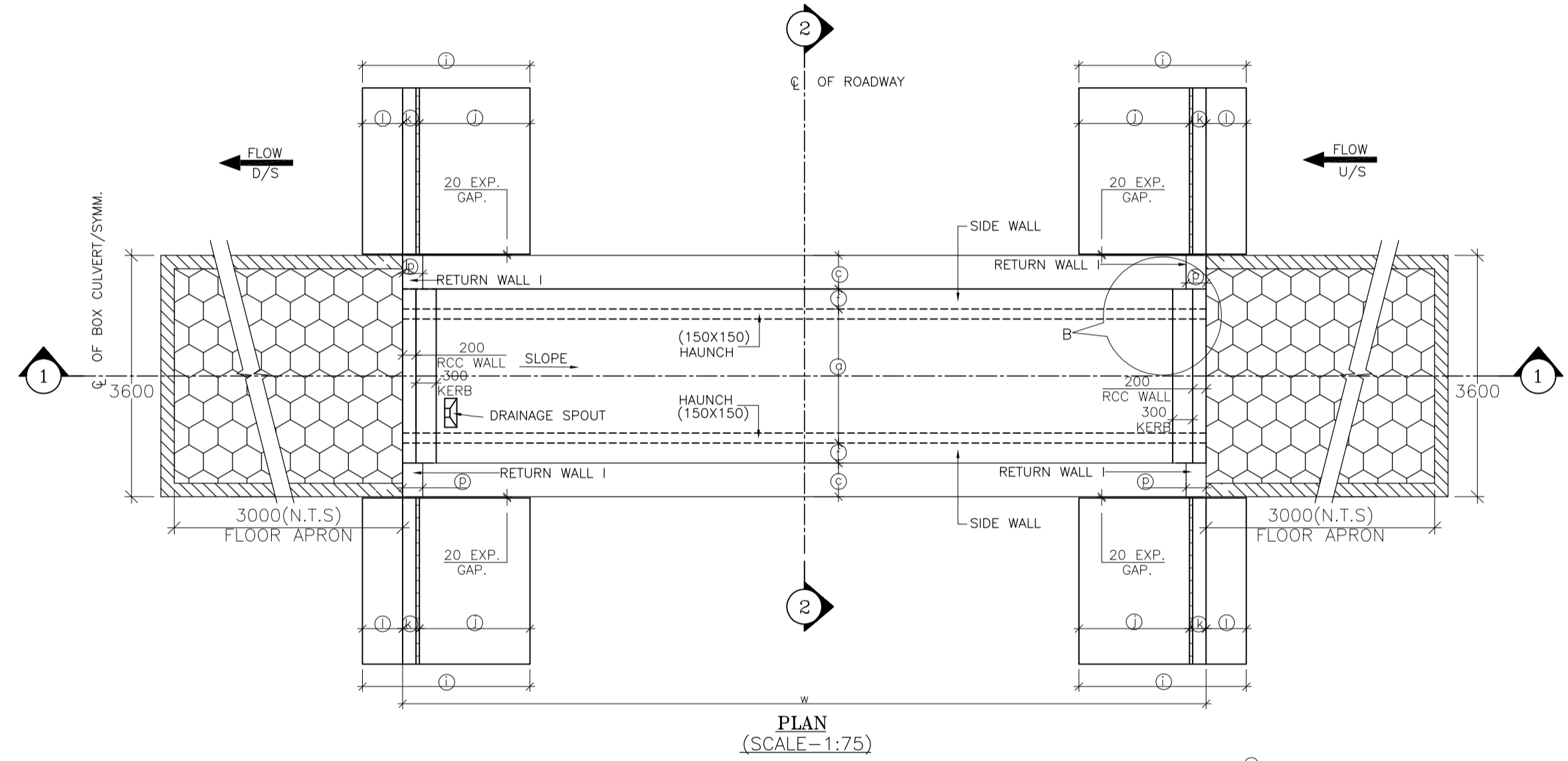
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/STP/SE/RCC (SHEET NO-01 OF 01)

Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu





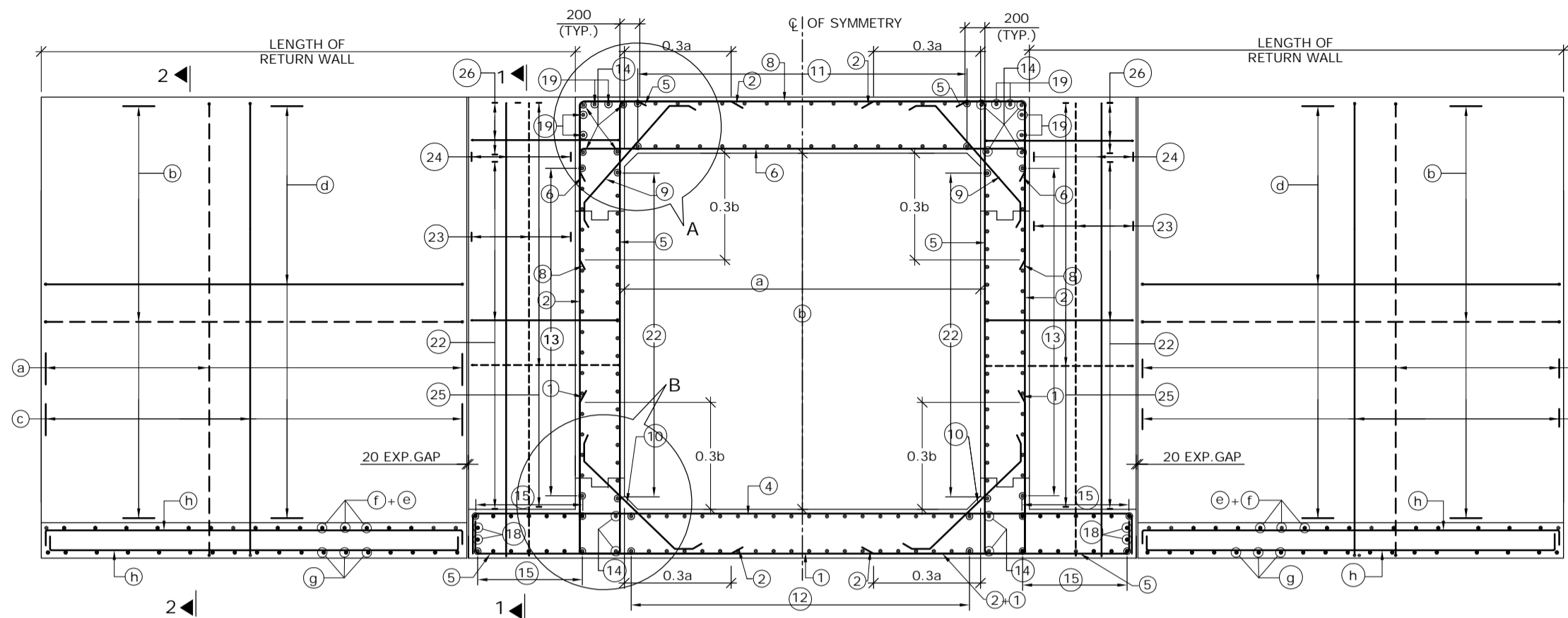
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	Slope Side	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
94/3	93+431	1734.553	2X2X1 Cell	7.00	R TO L	12.00	No Catch pit	Straight	1732.523	1732.143	2.730	3.500

TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./ob/EC	
a	2000
b	2000
c	500
d	350
e	380
f	300
g	350
h	300
i	2200
j	950
k	300
l	950
m	250
p	300
q	3100
dk	1200

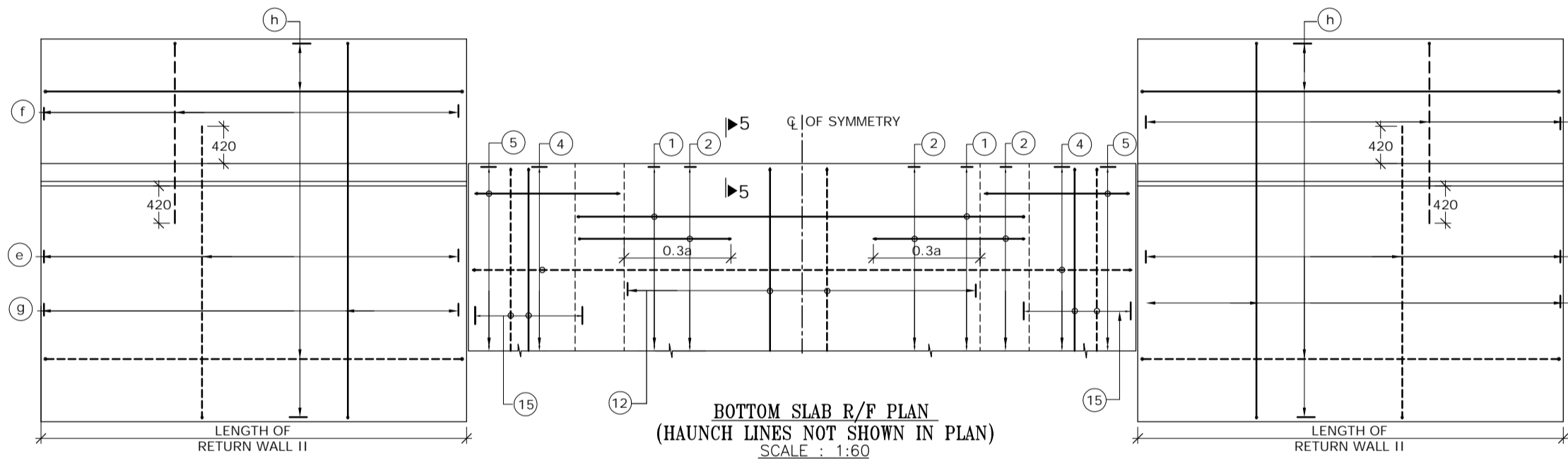


- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE : BOX CELL STRUCTURE - M25 CURTAIN WALL - M25 LEVELLING COURSE (P.C.C.) - M15 RETURN WALL - M25 RCC WALL & KERB - M25
 - GRADE OF STEEL Fe-500 AS PER IS-1786.
 - CLASS FOR TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\theta = 1.8/m^3$, $\phi = 30.8$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
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 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/SE/RCC (SHEET NO-01)

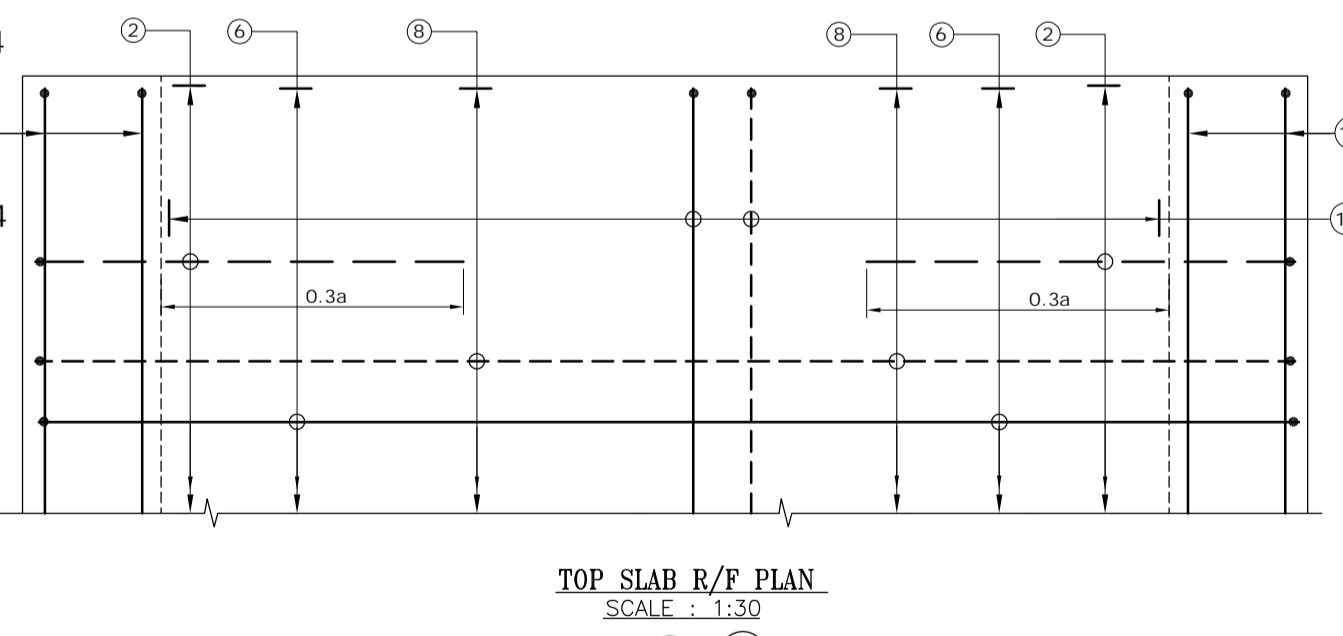
SCALE: AS SHOWN 					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH BOTH SIDE FLOOR APRON					CONSULTANT :  CETEST CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/SE/GA (SHEET NO-01 OF 01)									
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.					Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825					Drawn By. A. Sahoo					Design By. -					Checked By. Avishek Dey					Approved By. Soubhik Sadhu				
DATE: SEPT, 2016																													
REVISIONS																													



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

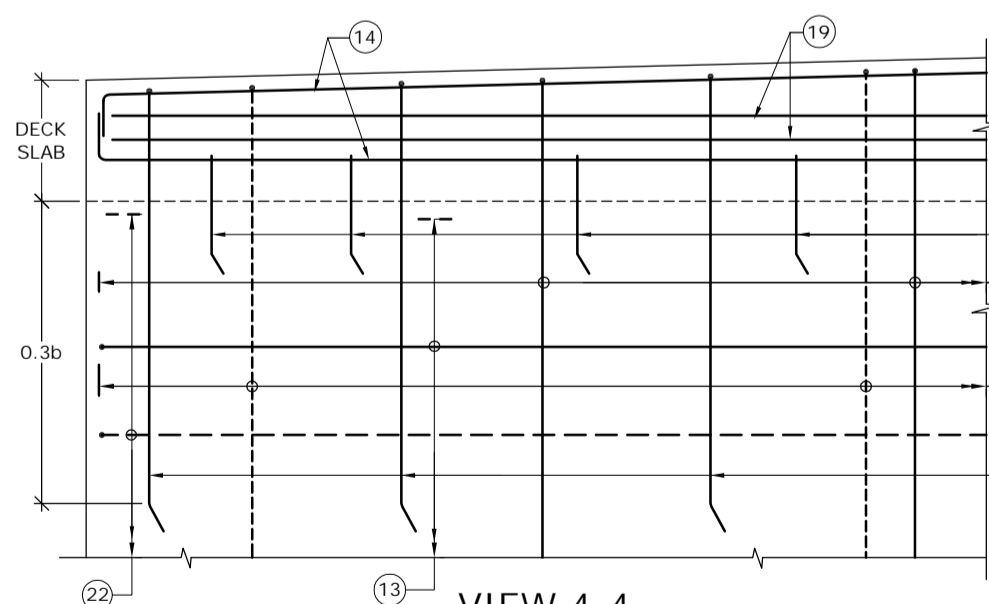


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

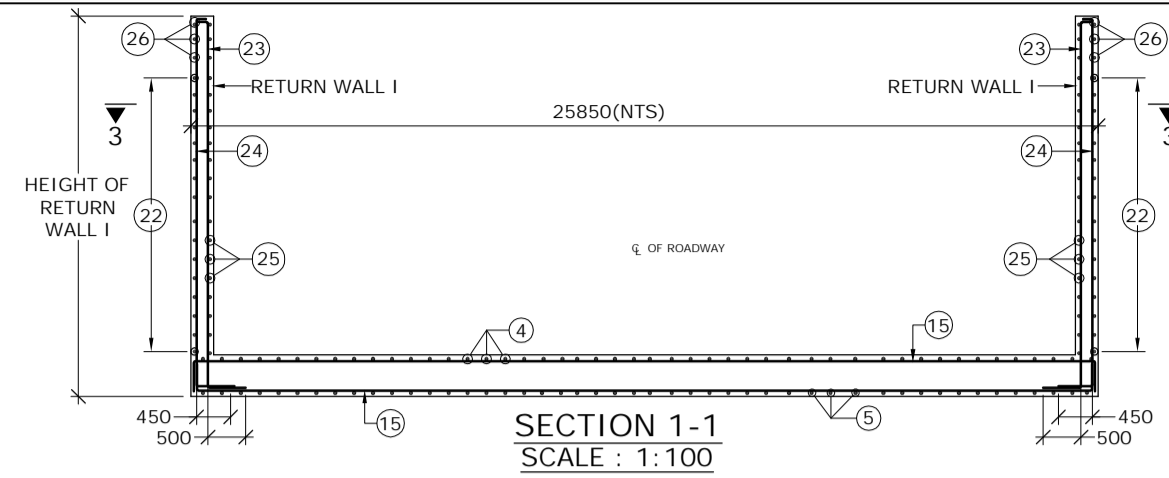


TOP SLAB R/F PLAN
SCALE : 1:30

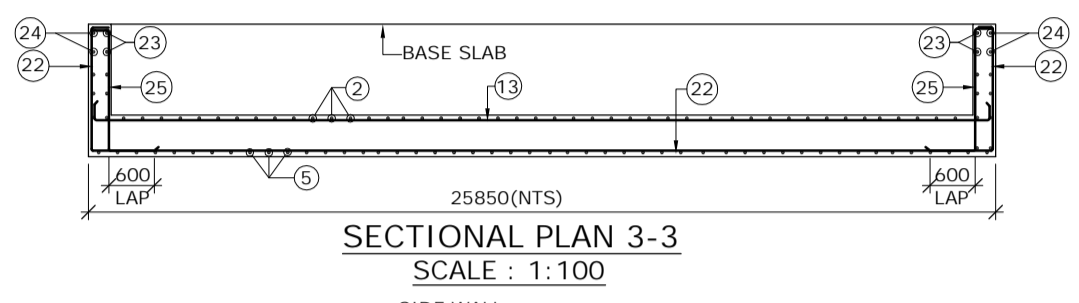
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



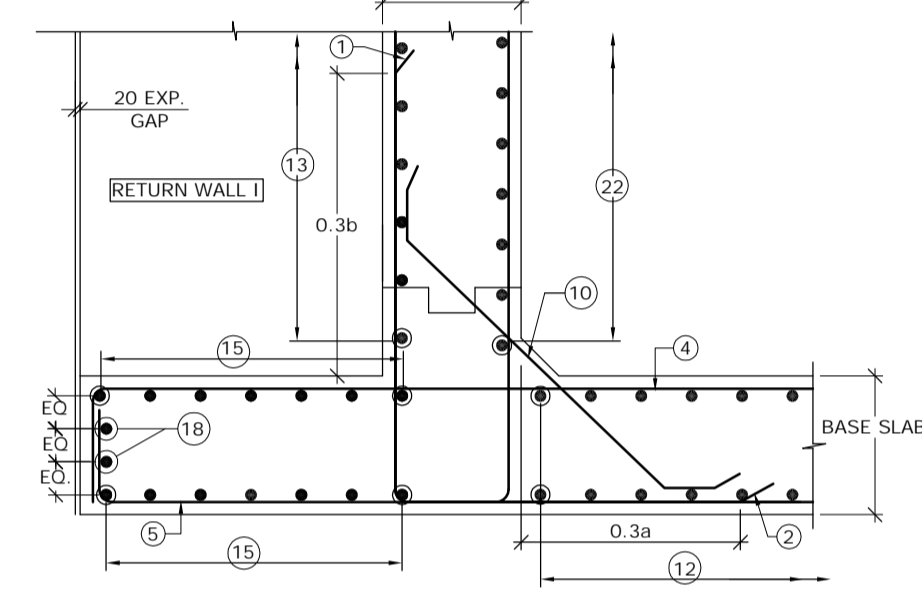
VIEW 4-4
SCALE : 1:30



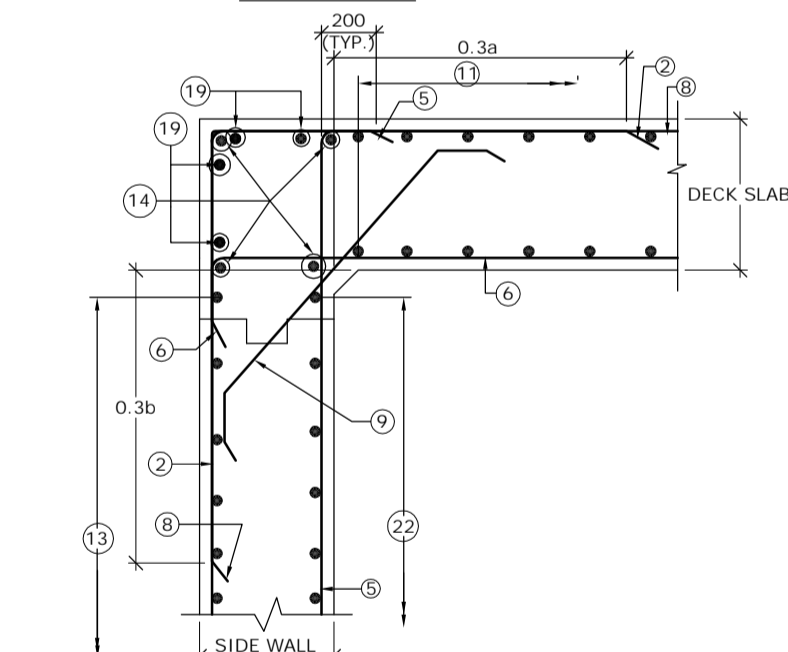
SECTION 1-1
SCALE : 1:100



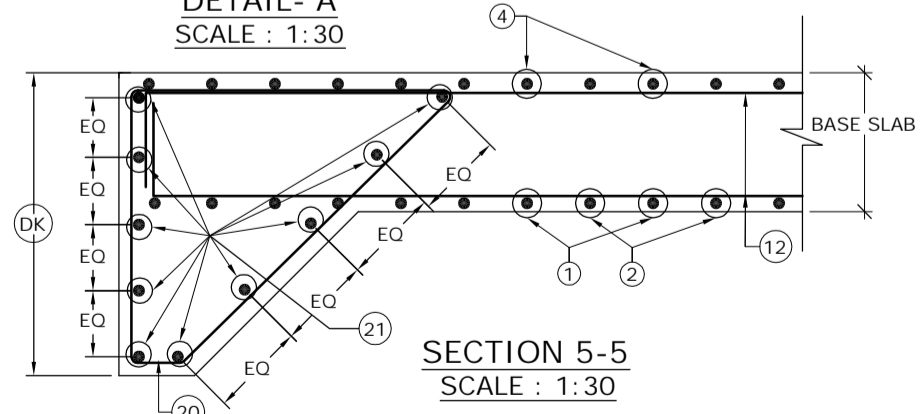
SECTIONAL PLAN 3-3
SCALE : 1:100



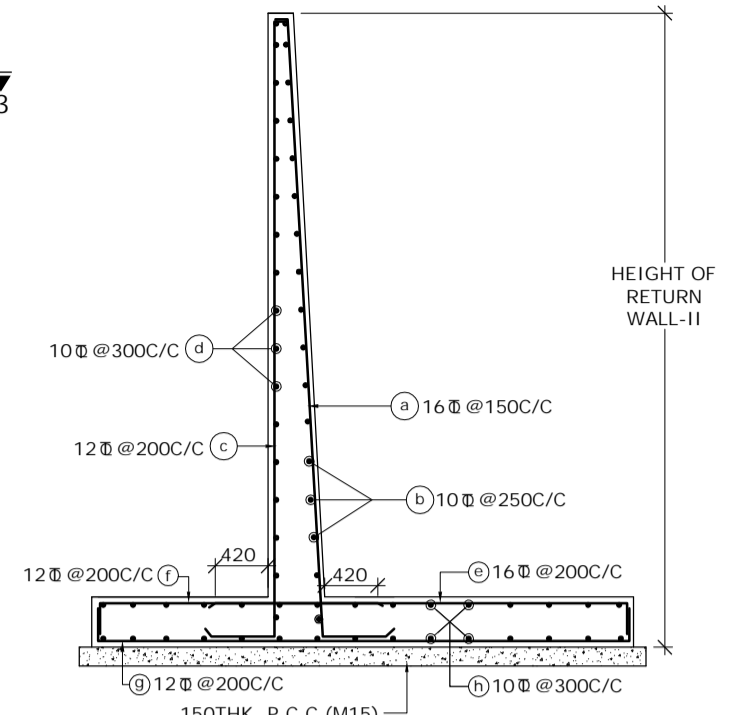
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	10	250	13	10	250
2	16	250	14	10	-
3	BAR NOT USED		15	10	250
4	16	250	16	12	-
5	16	250	17	12	250
6	16	250	18	10	-
7	BAR NOT USED		19	10	-
8	10	250	20	10	150
9	10	250	21	10	-
10	12	250	22	10	250
11	10	250	23	10	200
12	10	250	24	10	200
			25	12	125
			26	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

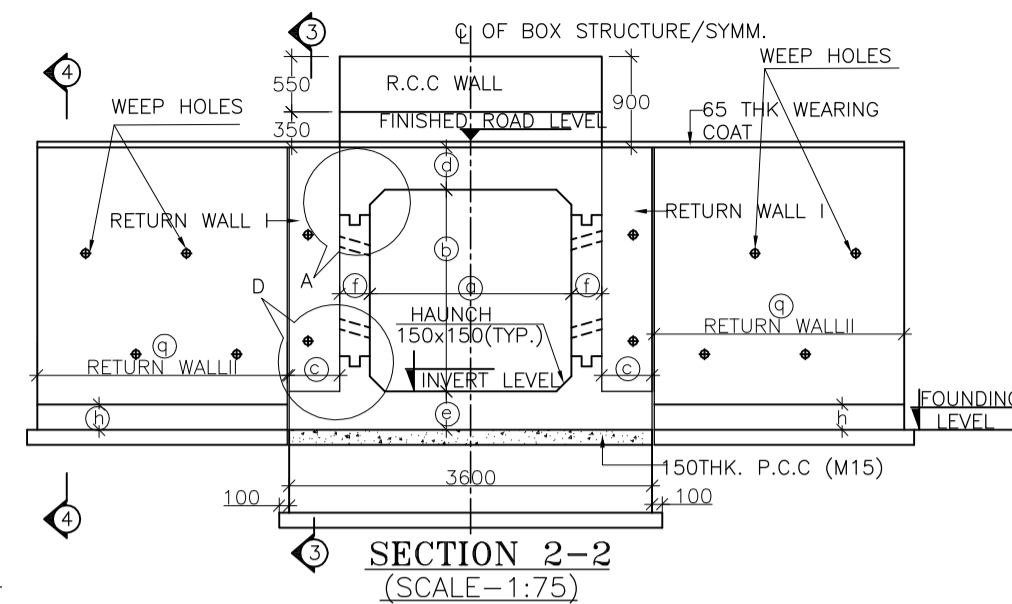
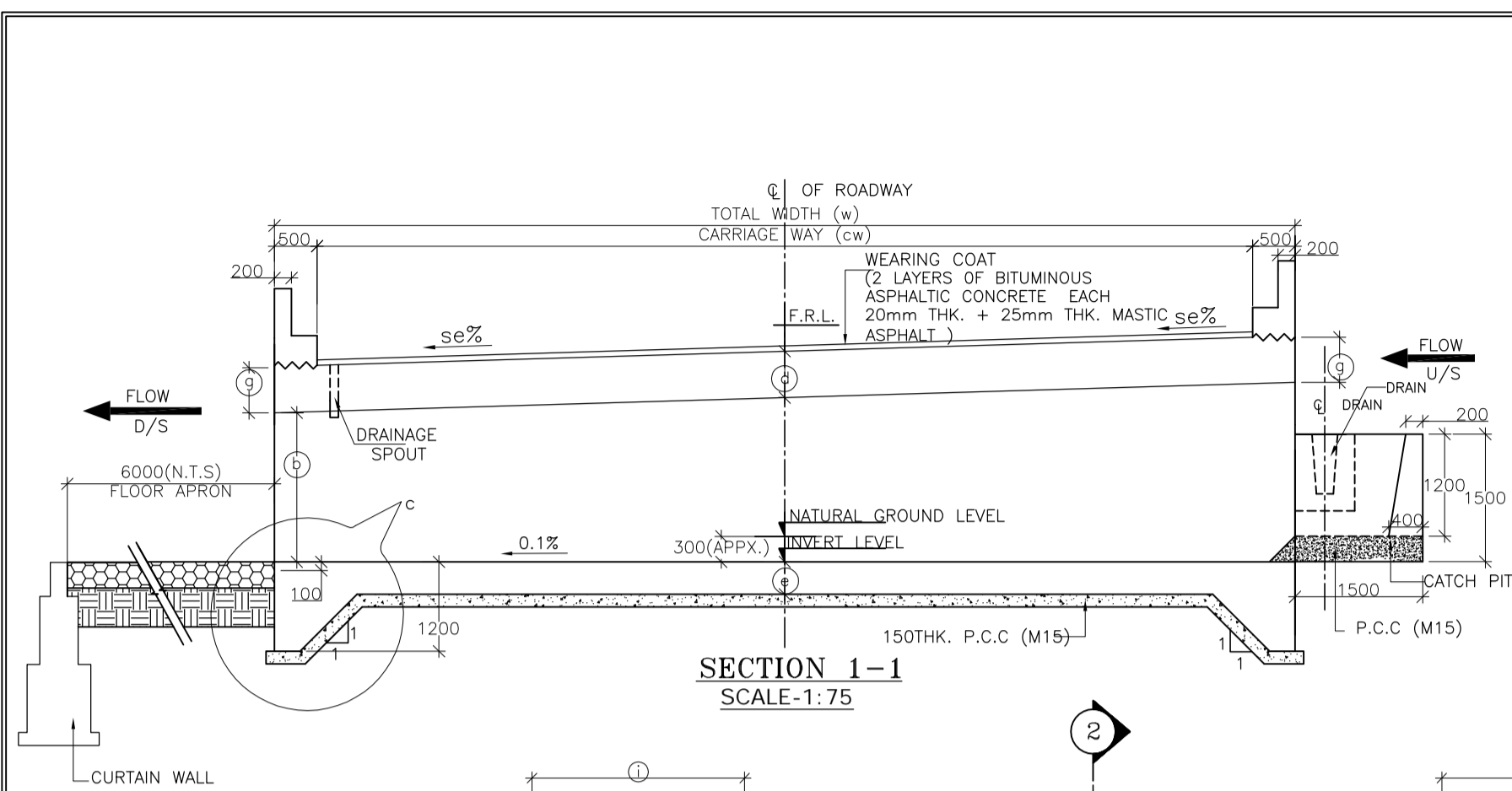
SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH OUT CATCH PIT & STEPPED PROTECTION
 Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

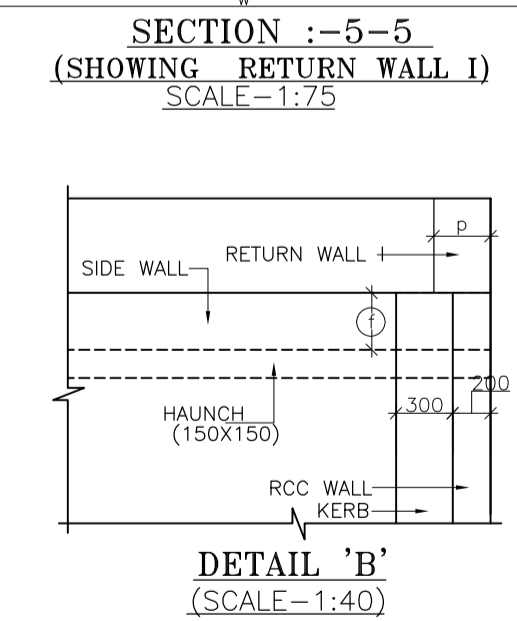
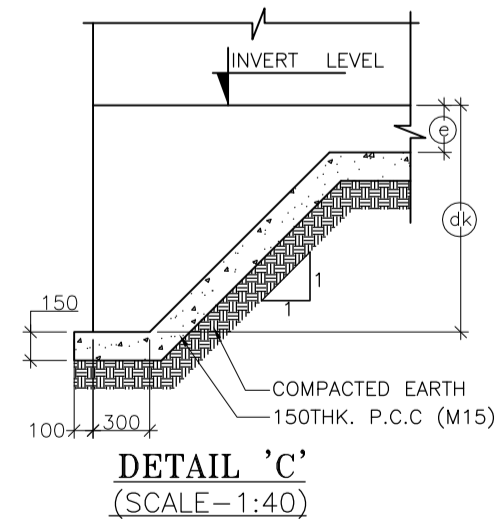
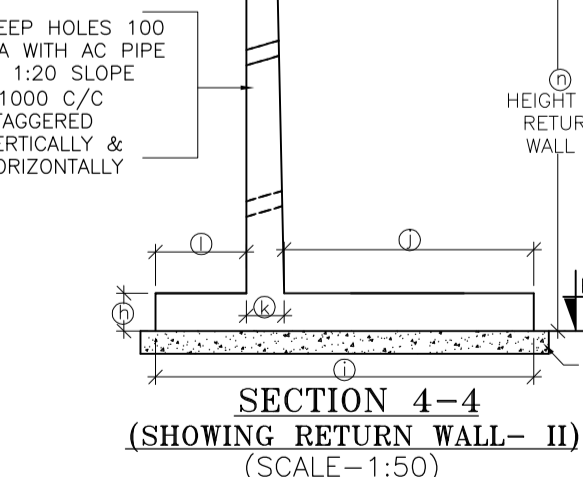
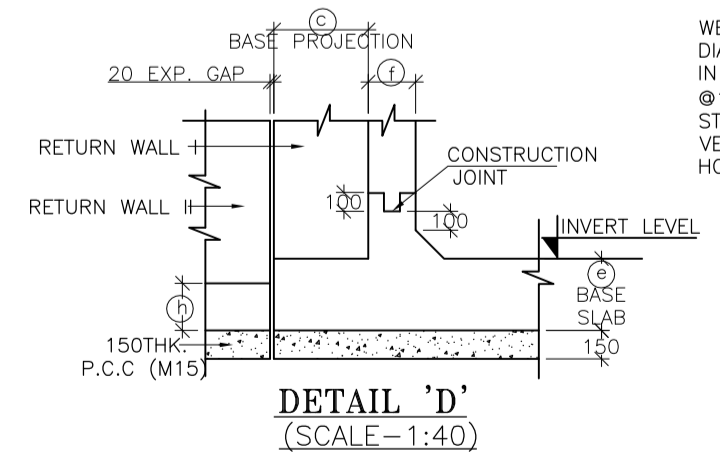
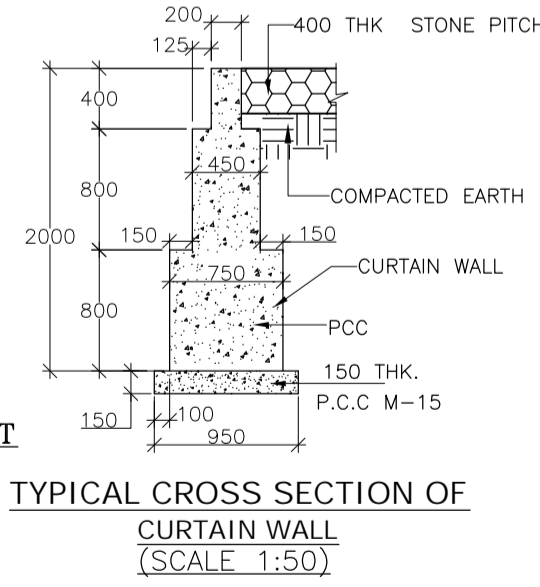
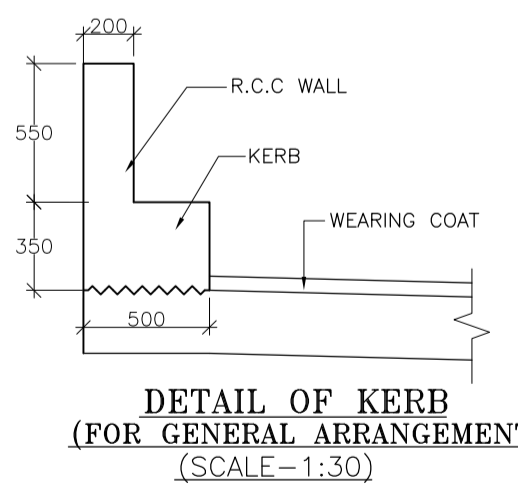
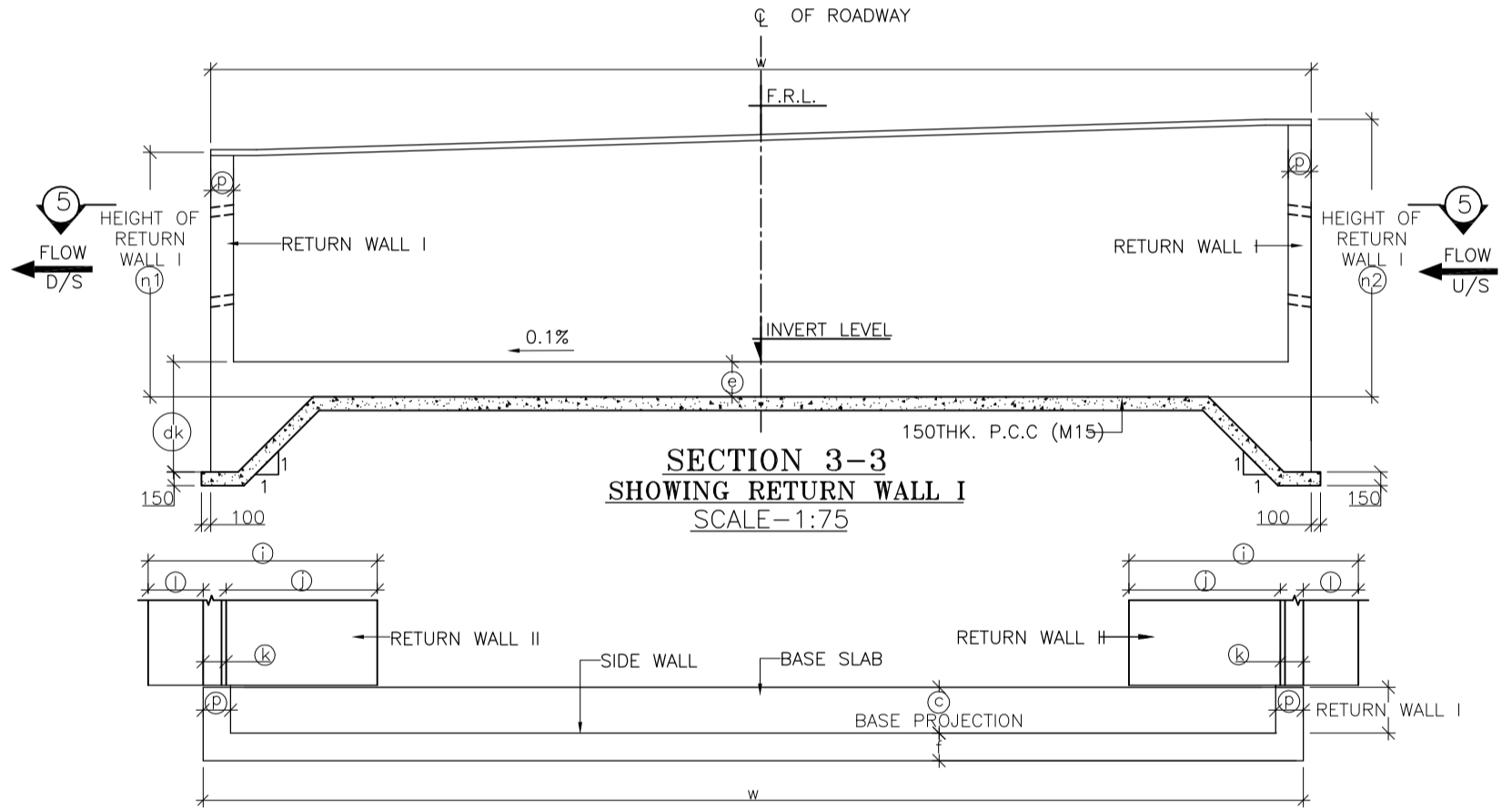
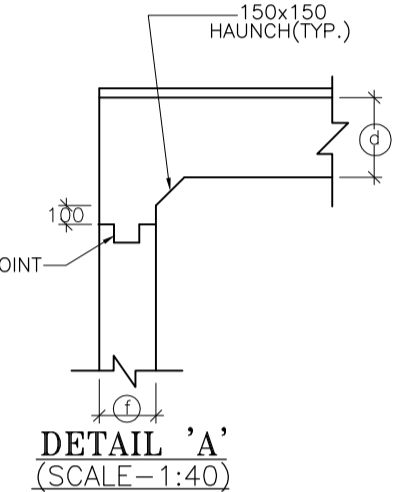
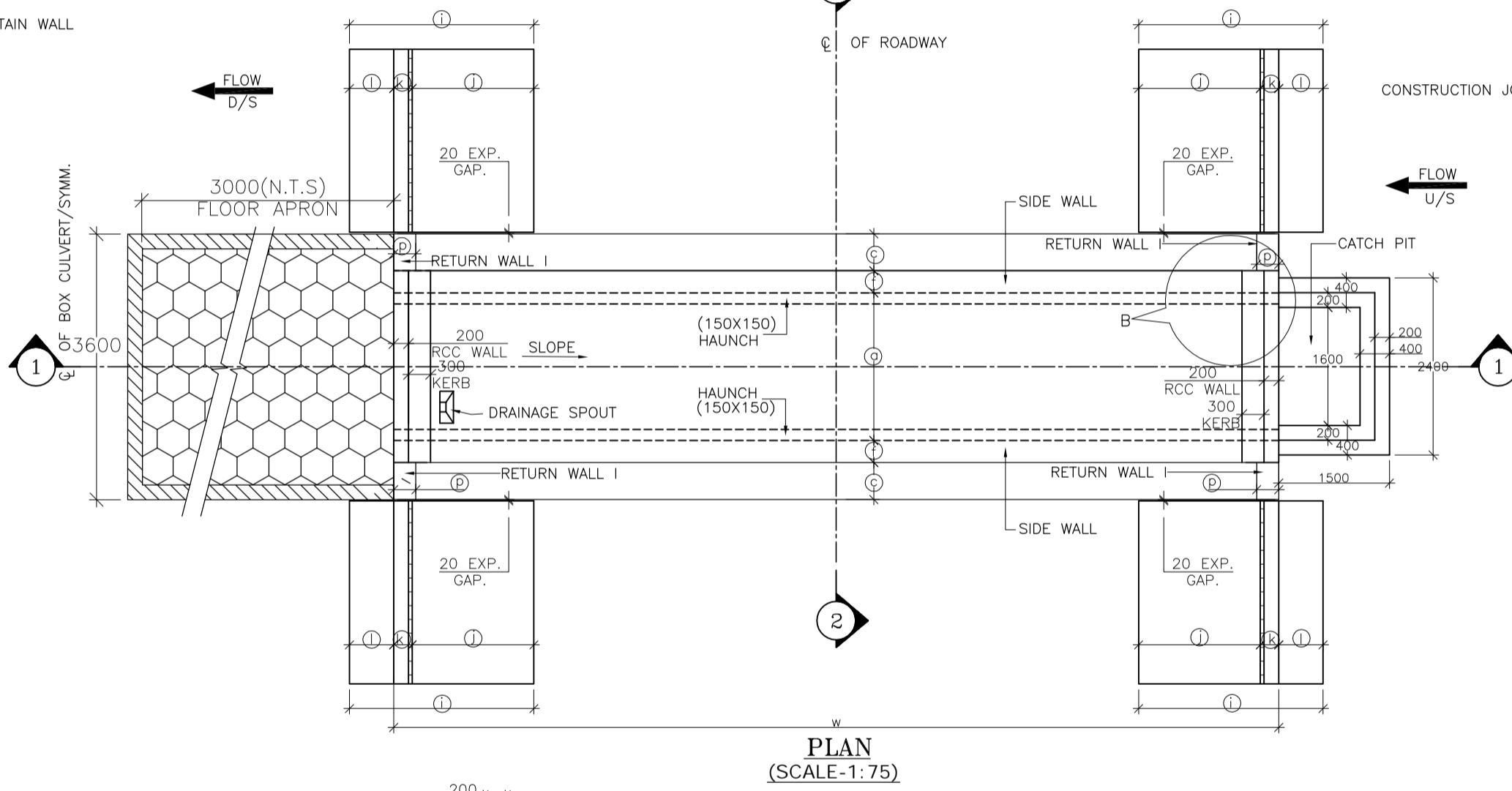
CONSULTANT : CETEST Engineering Consultants
 CE TESTING COMPANY PVT. LTD.
 124-A, N.S.C. Bose Road
 Kolkata - 700092.

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/SE/RCC (SHEET NO-01 OF 01)
 Drawn By: S. Chattrjee
 Design By: -
 Checked By: Avishek Dey
 Approved By: Soubhik Sadhu



STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
86/3	85+955	1942.306	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Straight	1940.241	1939.861	2.730	3.430
90/6	89+994	1841.385	2X2X1 Cell	3.60	R TO L	11.00	With Catch pit	Straight	1839.150	1838.770	2.730	3.090
92/1	91+453	1758.393	2X2X1 Cell	7.00	R TO L	13.00	With Catch pit	Straight	1756.398	1756.018	2.730	3.570
92/2	91+595	1748.453	2X2X1 Cell	7.00	R TO L	13.00	With Catch pit	Straight	1746.458	1746.078	2.730	3.570
94/1	93+025	1734.606	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Straight	1732.541	1732.161	2.730	3.430
96/1	95+058	1792.984	2X2X1 Cell	6.70	R TO L	11.00	With Catch pit	Straight	1790.904	1790.524	2.730	3.400
96/3	95+318	1802.419	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Straight	1800.354	1799.974	2.730	3.430
96/5	95+555	1809.048	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Straight	1806.983	1806.603	2.730	3.430
99/2	98+250	1655.630	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Straight	1653.565	1653.185	2.730	3.430
105/6	104+975	1635.617	2X2X1 Cell	7.00	R TO L	13.00	With Catch pit	Straight	1633.622	1633.242	2.730	3.570

TABLE SHOWING SAILENT DIMENSIONS	
BOX CELL DESIGNATION No./ab/1c	Height of Return wall
a	2000
b	2000
c	500
d	350
e	380
f	300
g	350
h	320
i	2320
j	1000
k	320
l	1000
m	250
p	300
q	3100
dk	1200



- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE = M25
CURTAIN WALL = M25
LEVELLING COURSE (P.C.C.) = M15
RETURN WALL = M25
RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS FOR TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.8/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 400mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
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MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN

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 Lining with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

DATE: SEPT, 2016

GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCH PIT & FLOOR APRON

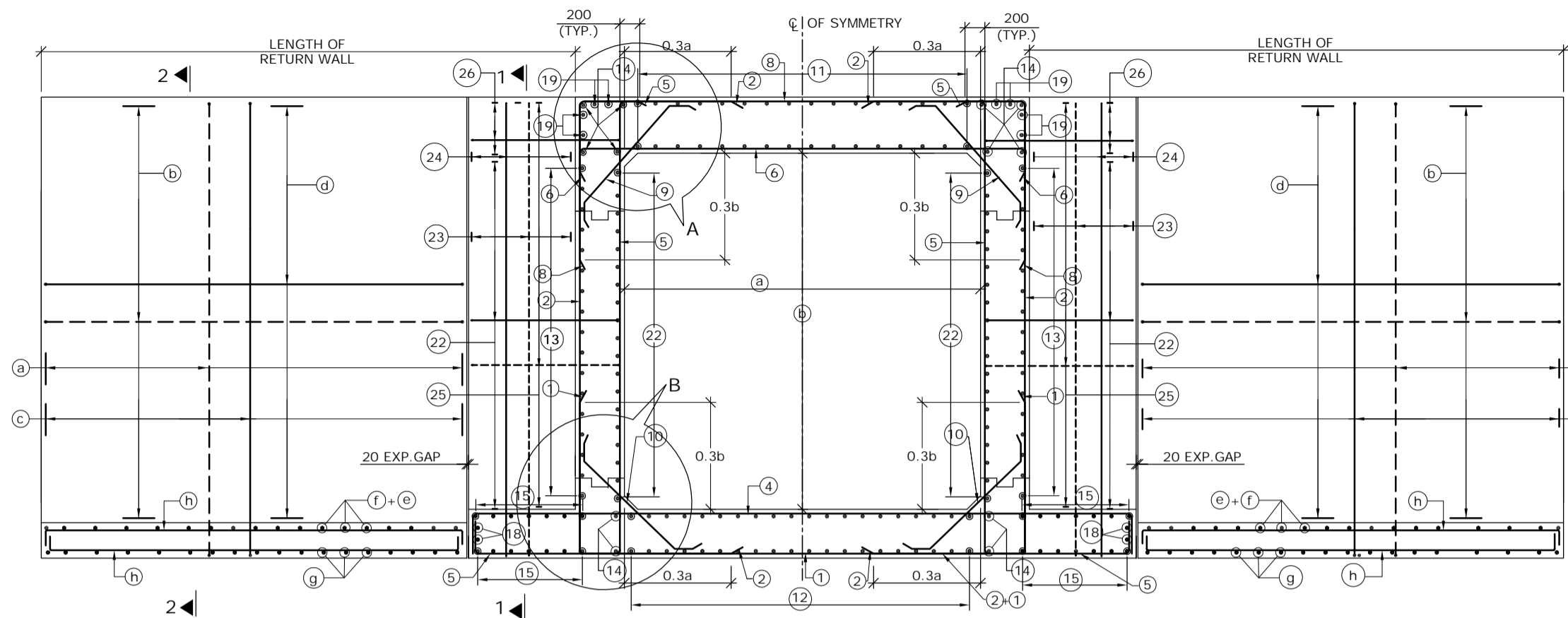
Package :- IV District :- SENAPATI
Existing Chainage :- 88+520 to 114+165
Design Chainage :- 81+870 to 105+825

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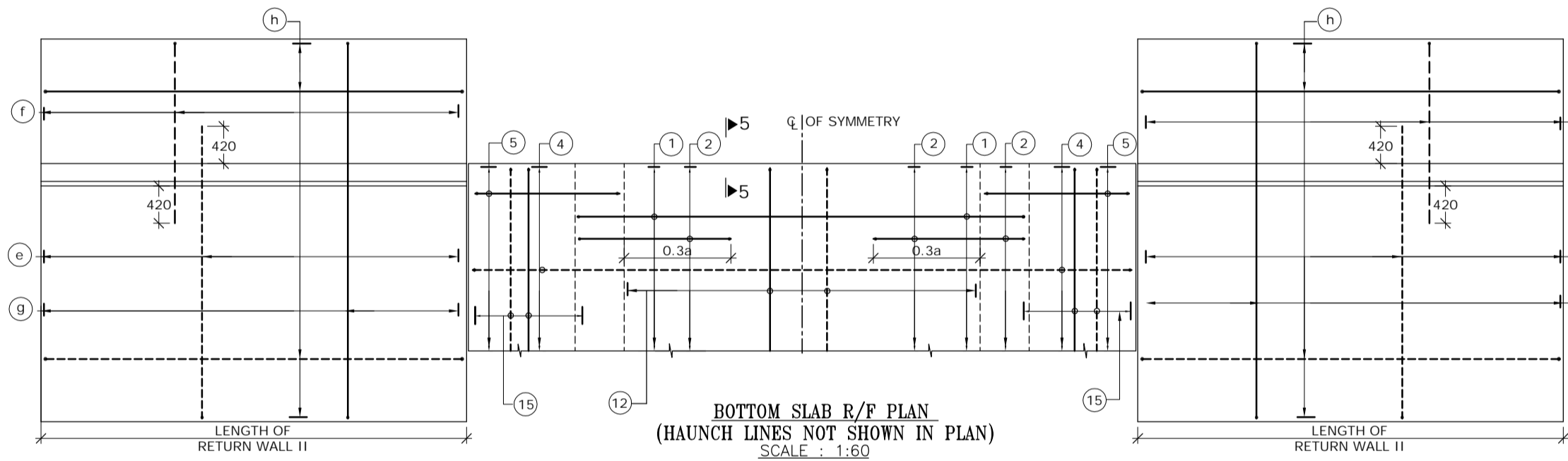
CETEST
Engineering Consultants

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/F/SE/GA (SHEET NO-01 OF 01)

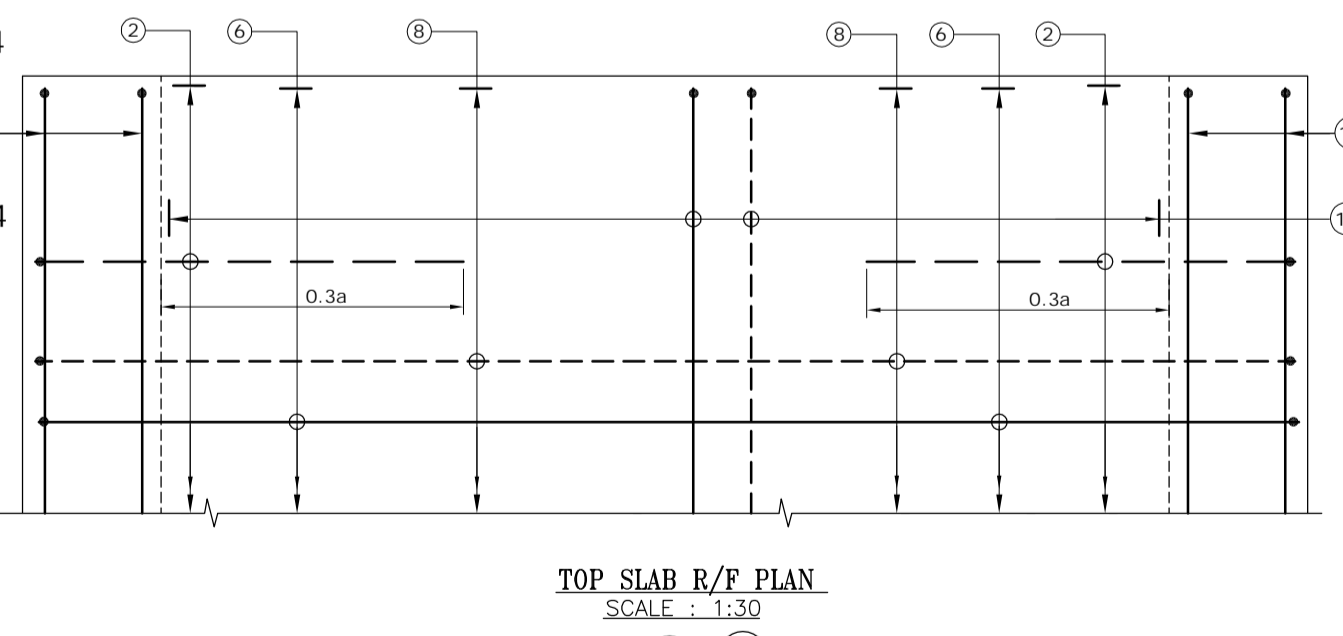
Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

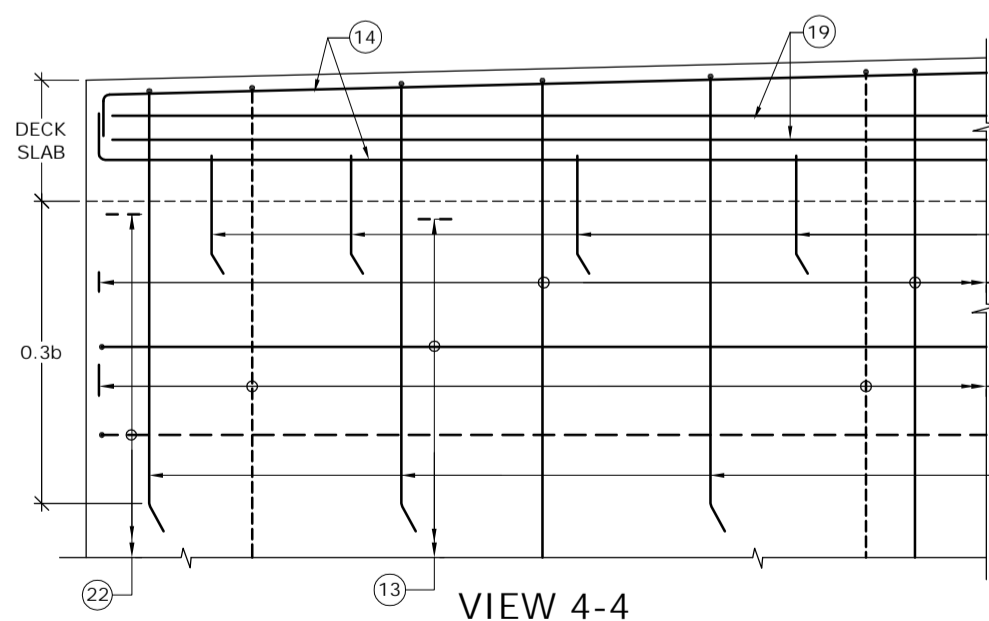


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

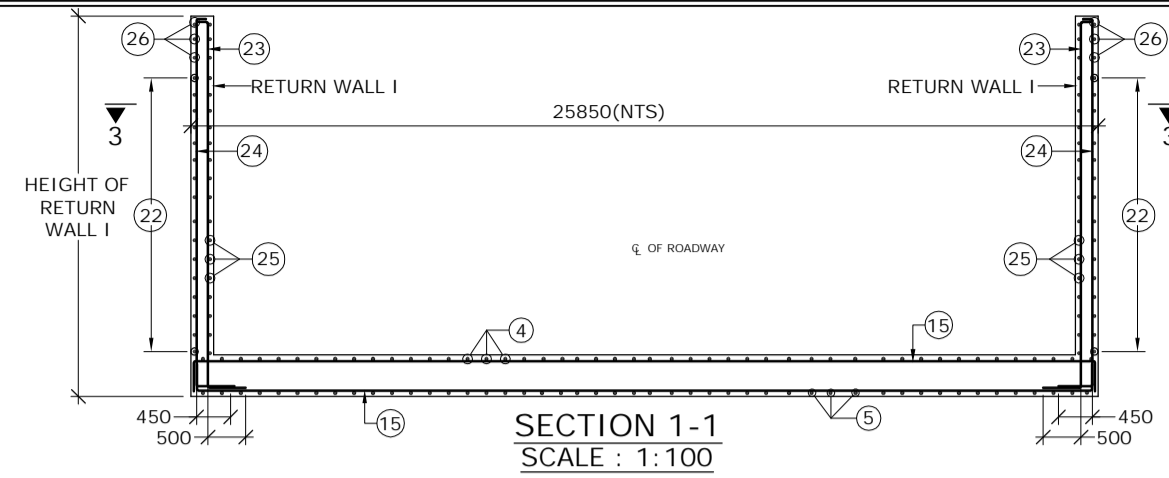


TOP SLAB R/F PLAN
SCALE : 1:30

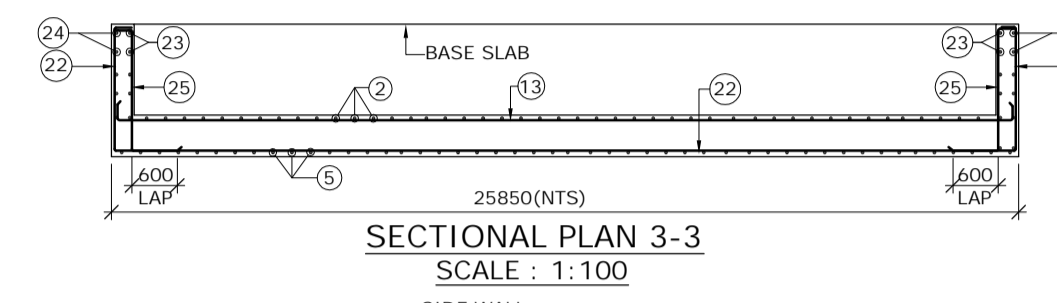
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



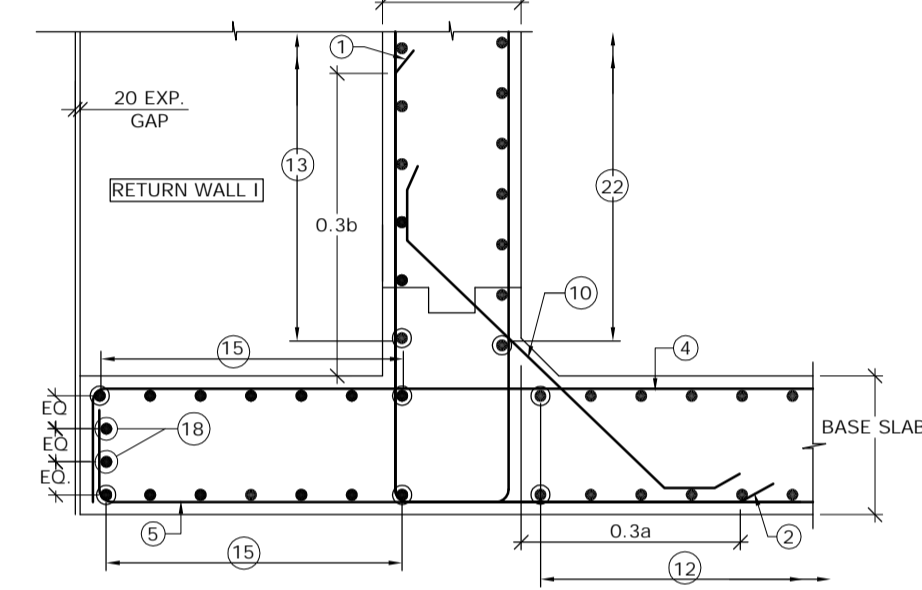
VIEW 4-4
SCALE : 1:30



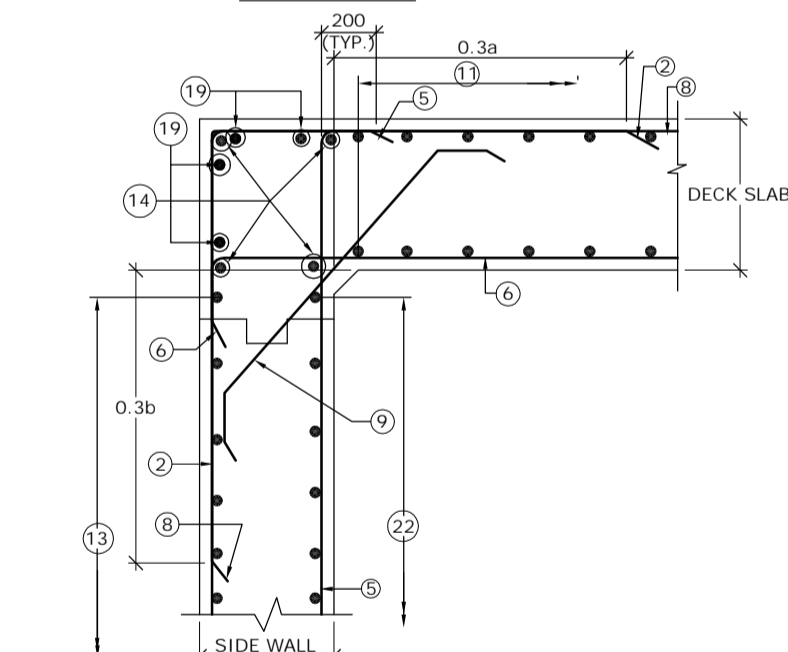
SECTION 1-1
SCALE : 1:100



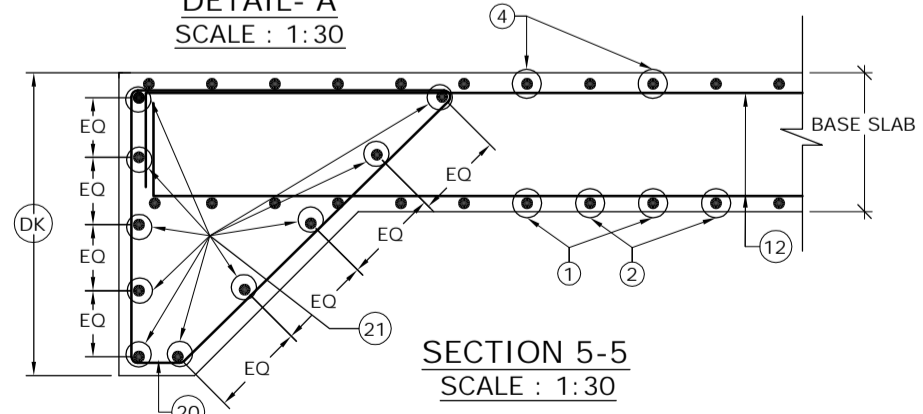
SECTIONAL PLAN 3-3
SCALE : 1:100



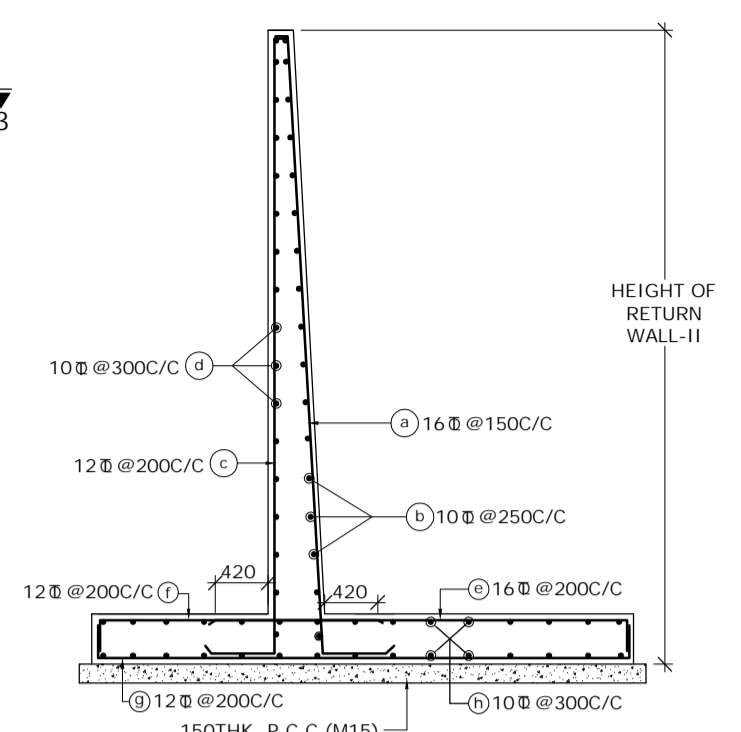
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE-1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
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MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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

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REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0)

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 ANISUWA, 3480, ISHIGAWA
 Certified Company

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/F/SE/RCC (SHEET NO-01 OF 02)

Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu

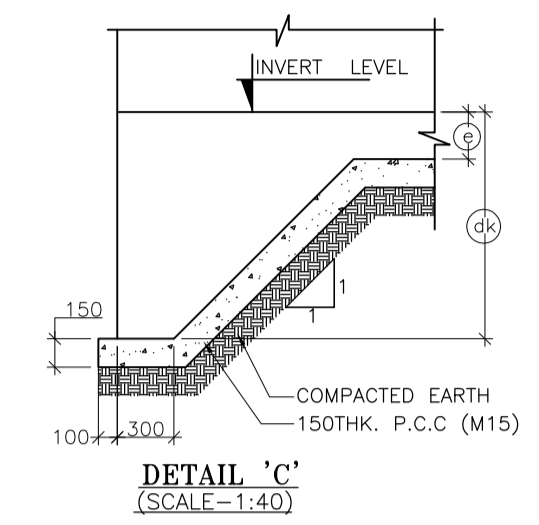
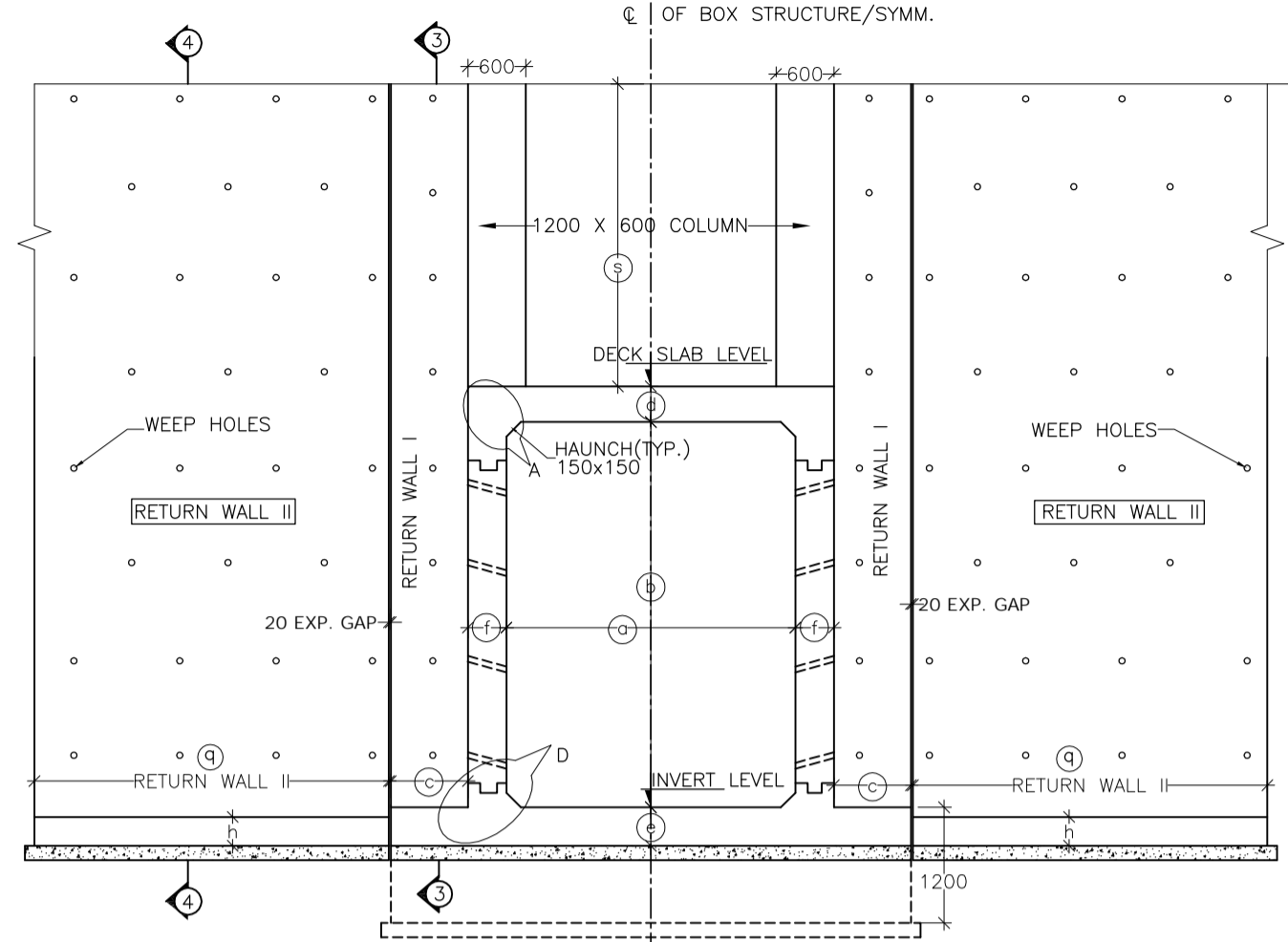
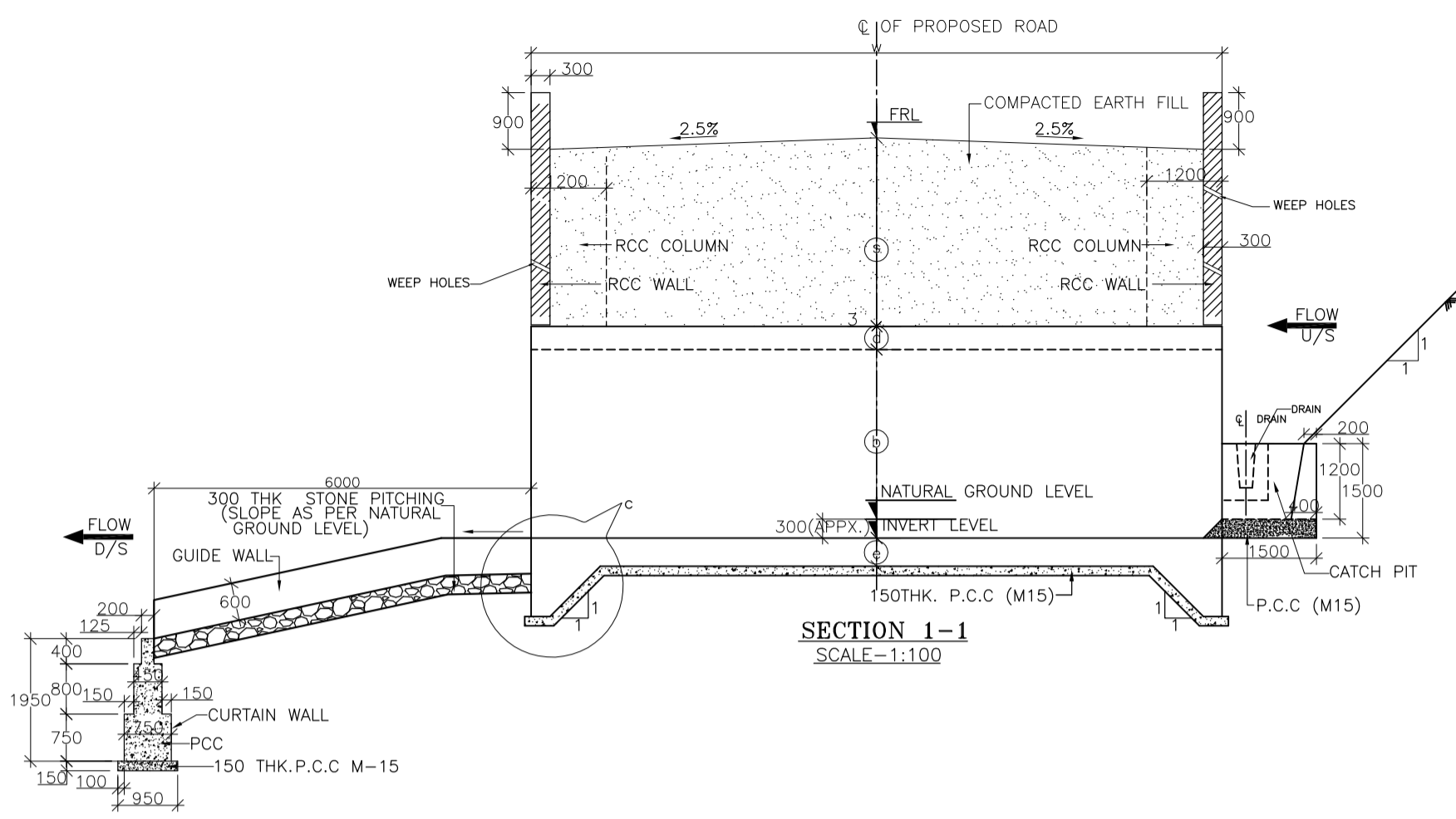
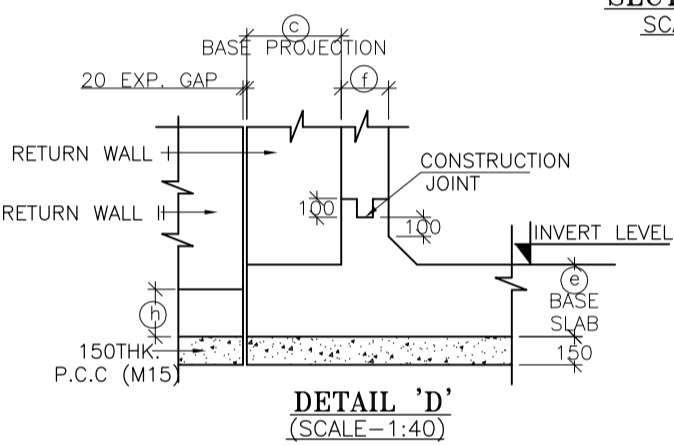
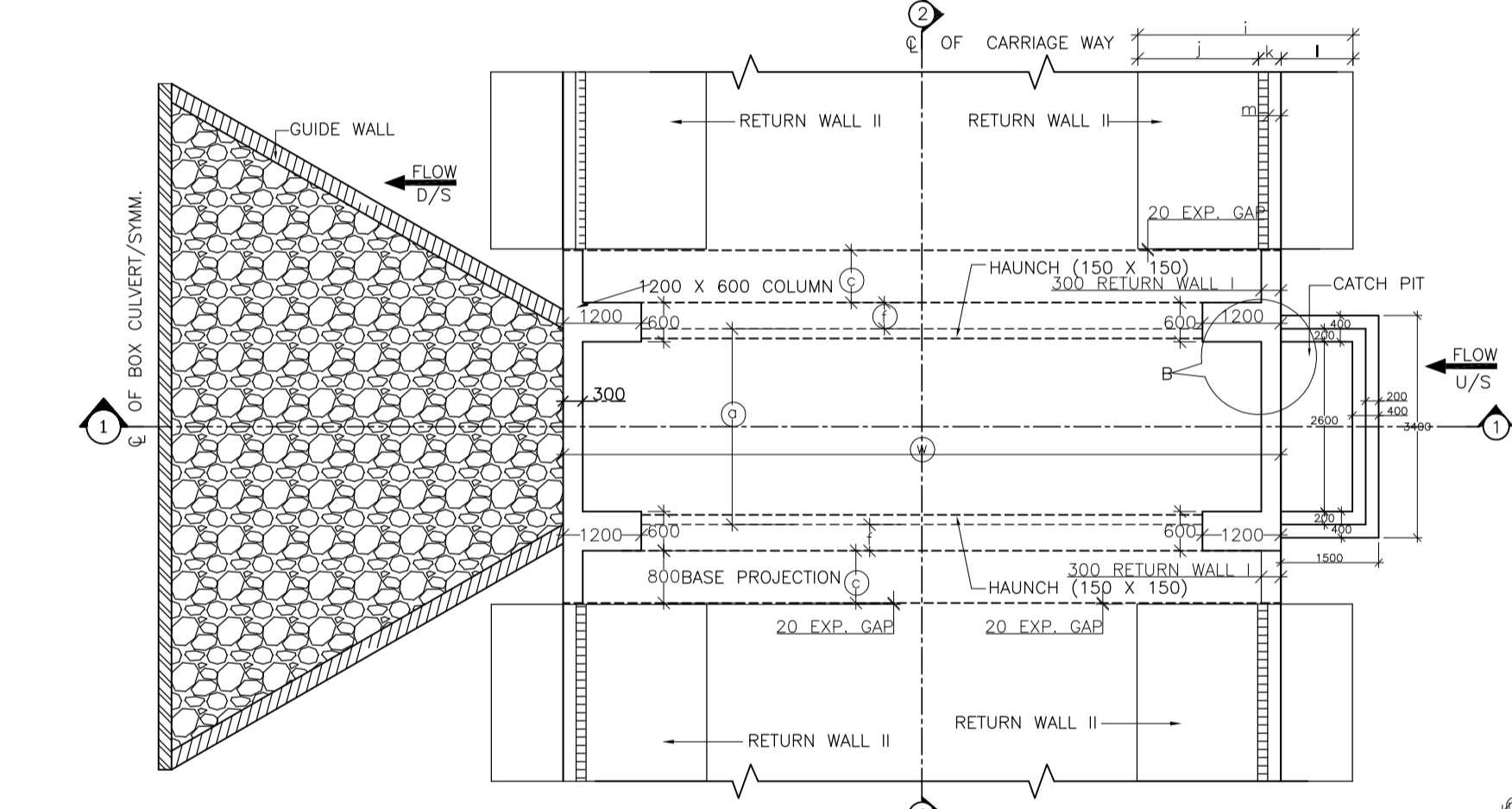
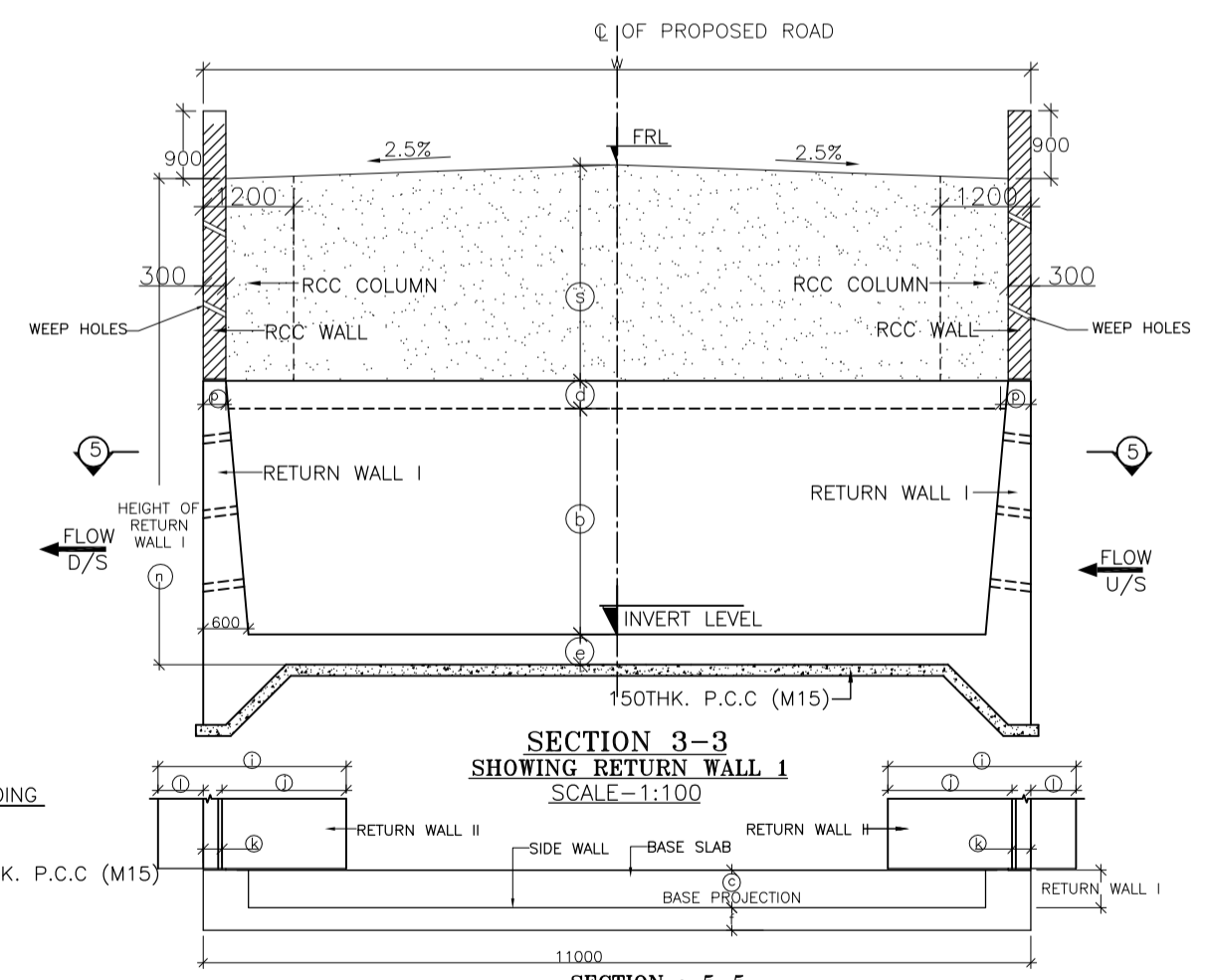
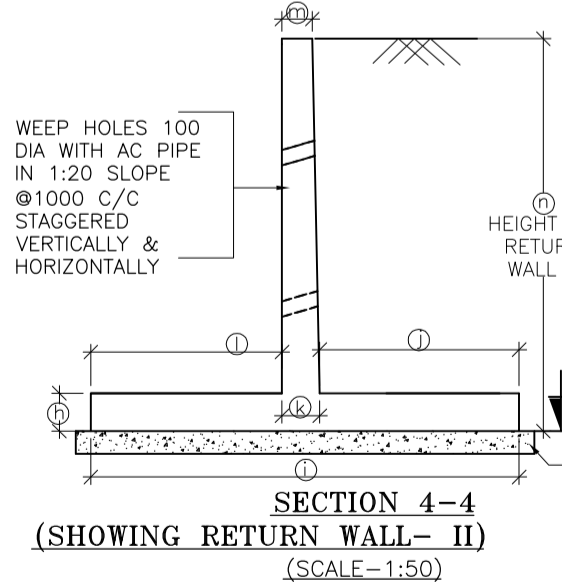
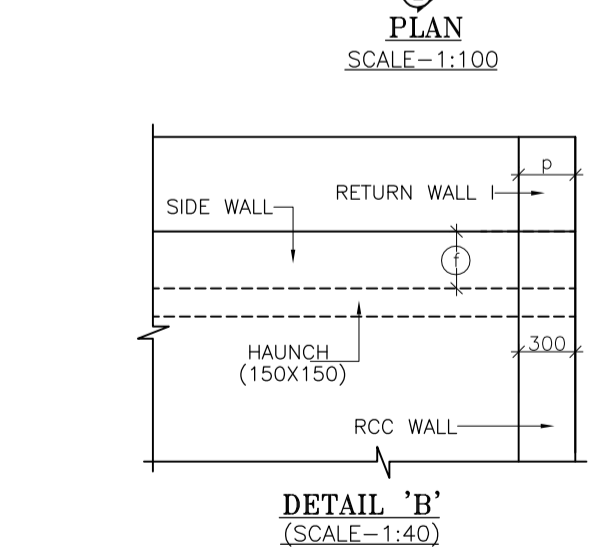
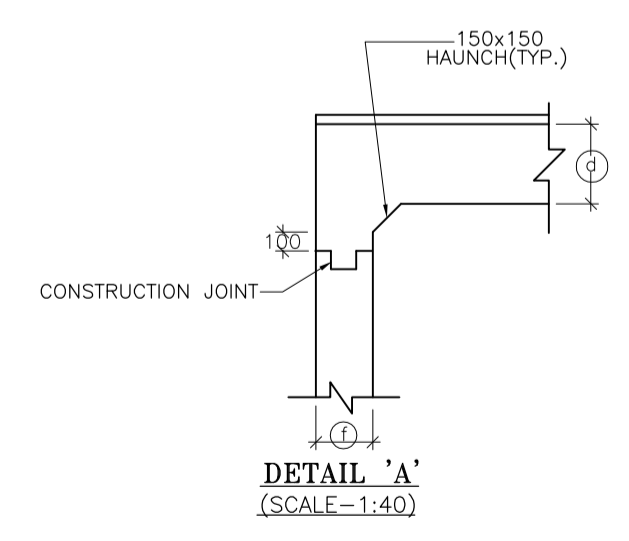


TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./AB/EC/2/2/1/3	
a	2000
b	2000
c	600
d	250
e	300
f	250
h	450
i	4900
j	2650
k	750
l	1700
m	300
n	5490
p	300
q	7300
s	3000
dk	1200



STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Cushion Height (m)	Super Elevation (%)	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
							U/S	D/S		
103/4	102+468	1532.189	2X2X1 Cell Earth Cushion	3.00	Normal Camber	10.00	With Catch pit	Slope	1526.826	1526.526



- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE - M25
CURTAIN WALL - M25
LEVELLING COURSE (P.C.C.) - M15
RETURN WALL - M25
RCC WALL & KERB - M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS FOR TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.81/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM $15 t/m^2$ BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1_3M_EC/CP/SLP/NC/RCC (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
DATE: SEPT, 2016

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 - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH 3.0M EARTH CUSHION WITH CATCH PIT & SLOPE PROTECTION

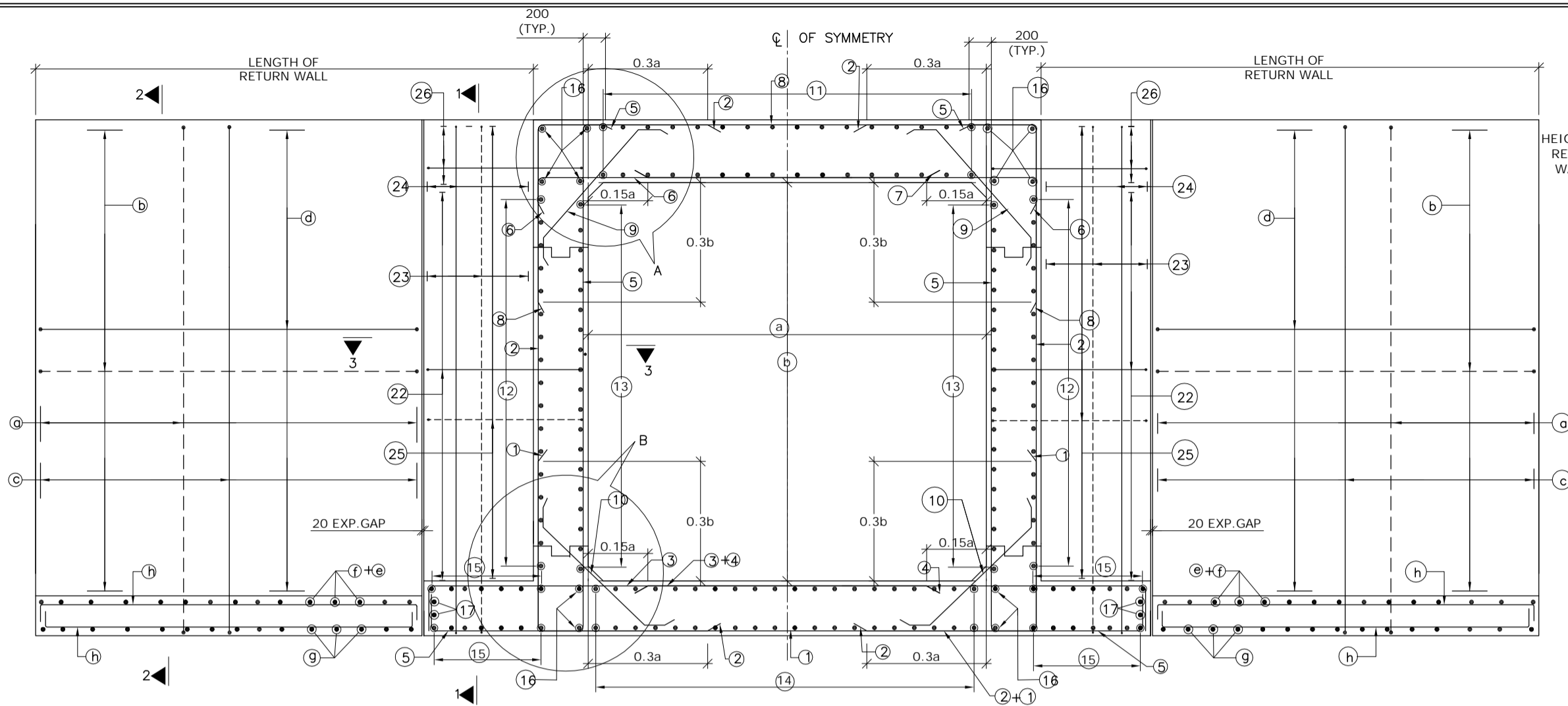
Package :- IV District :- SENAPATI
Existing Chainage :- 88+520 to 114+165
Design Chainage :- 81+870 to 105+825

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

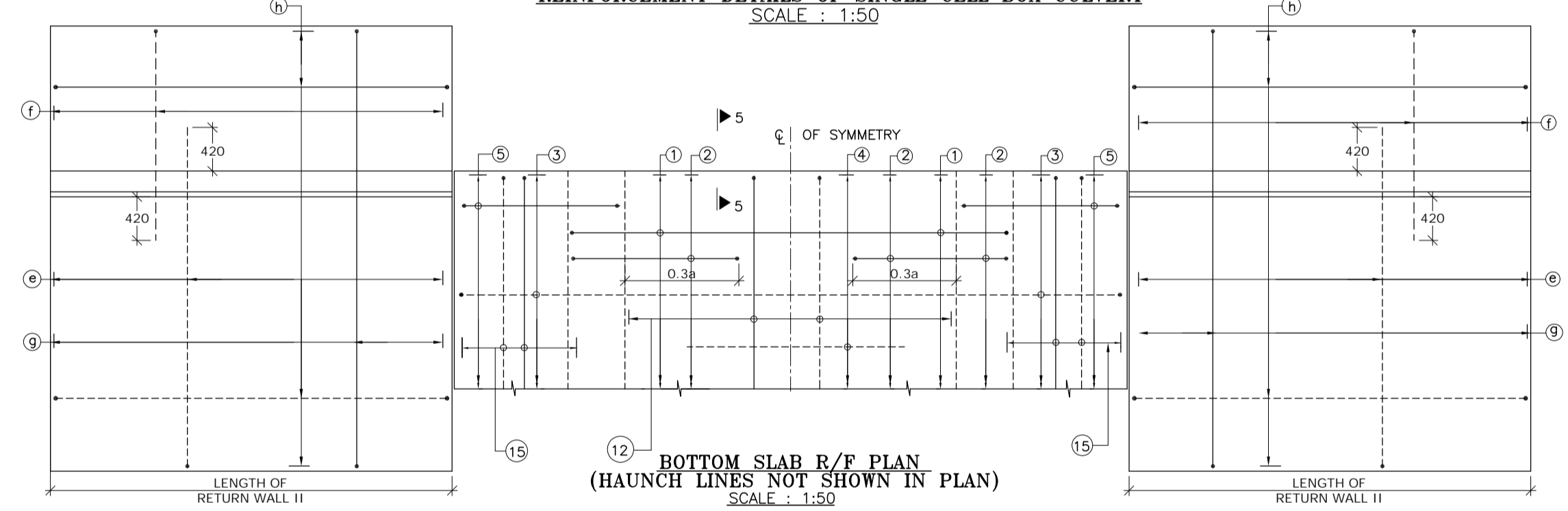
CETEST
Engineering Consultants

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1_3M_EC/CP/SLP/NC/GA

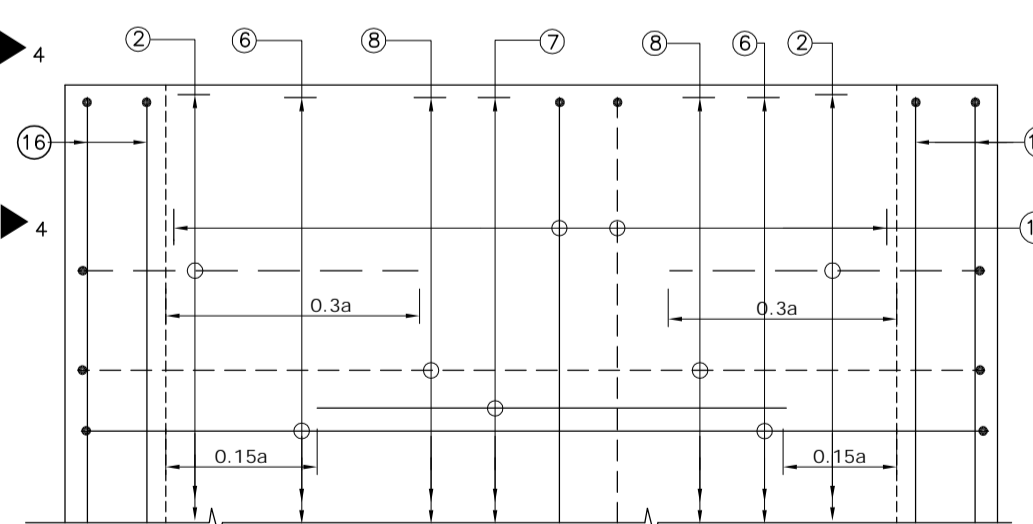
Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee		Avishek Dey	Soubhik Sadhu



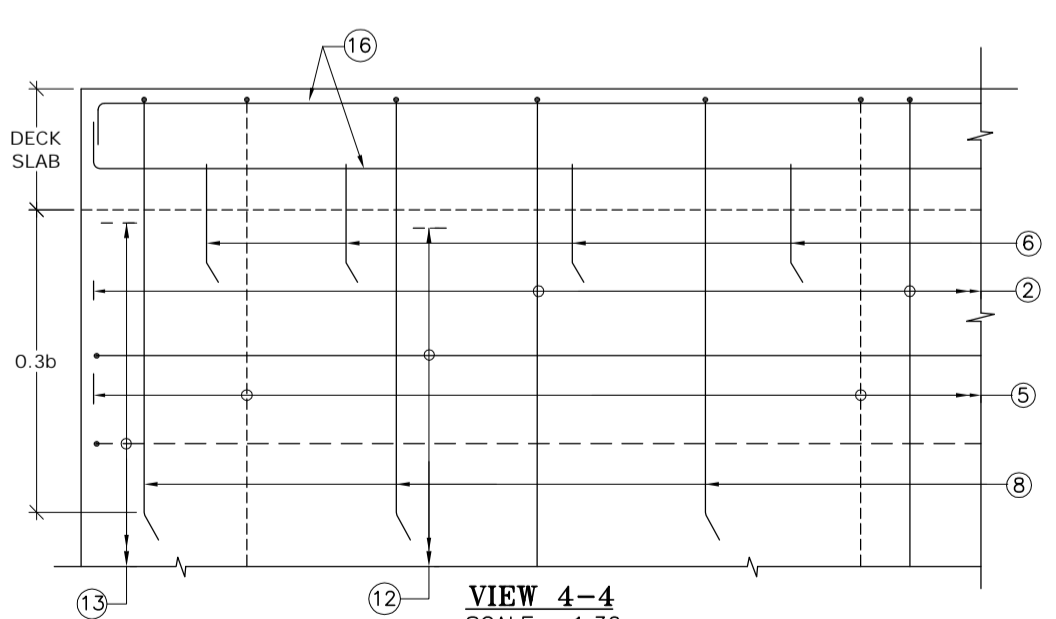
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:50



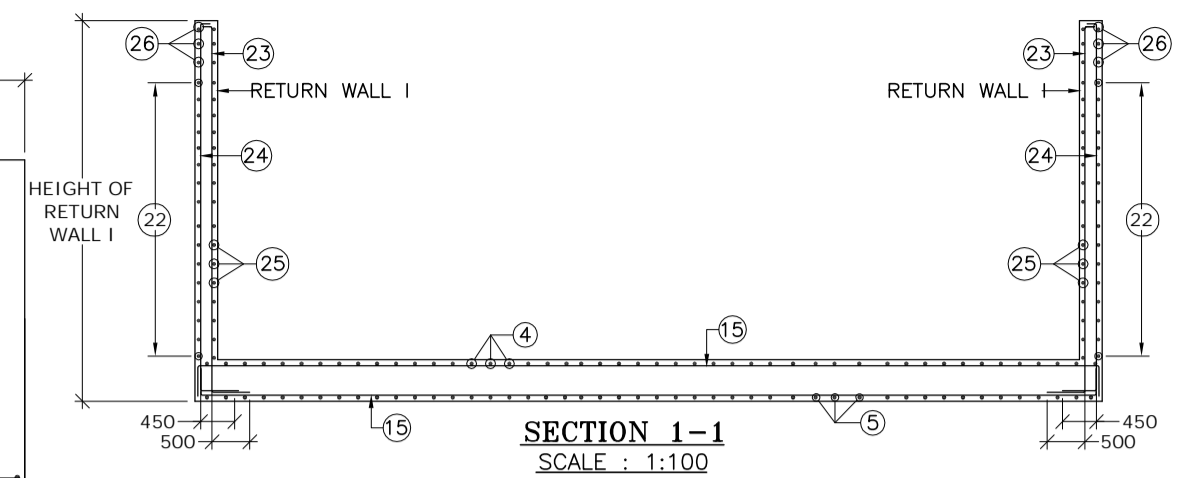
BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:50



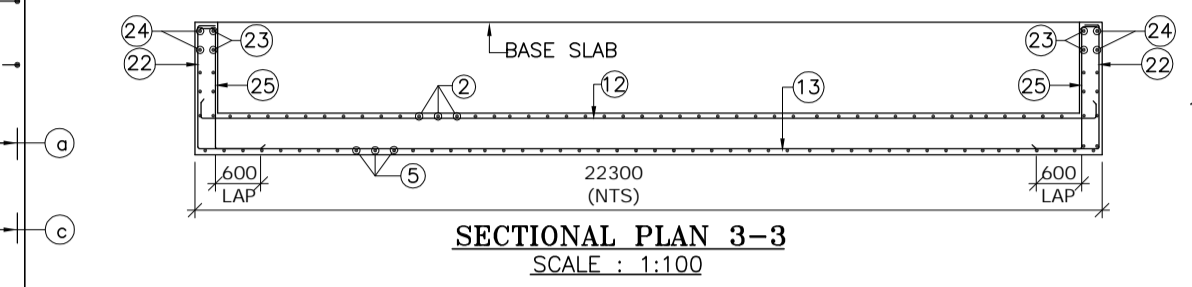
TOP SLAB R/F PLAN
SCALE : 1:30
(BAR MARK 5, 19, KERB & HAUNCH LINES NOT SHOWN IN PLAN)



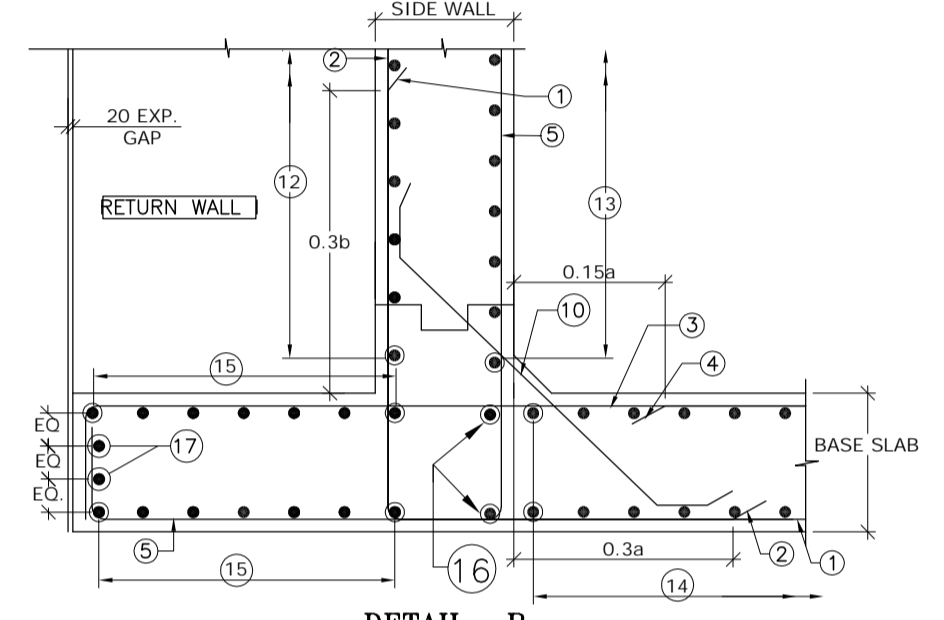
VIEW 4-4
SCALE : 1:30



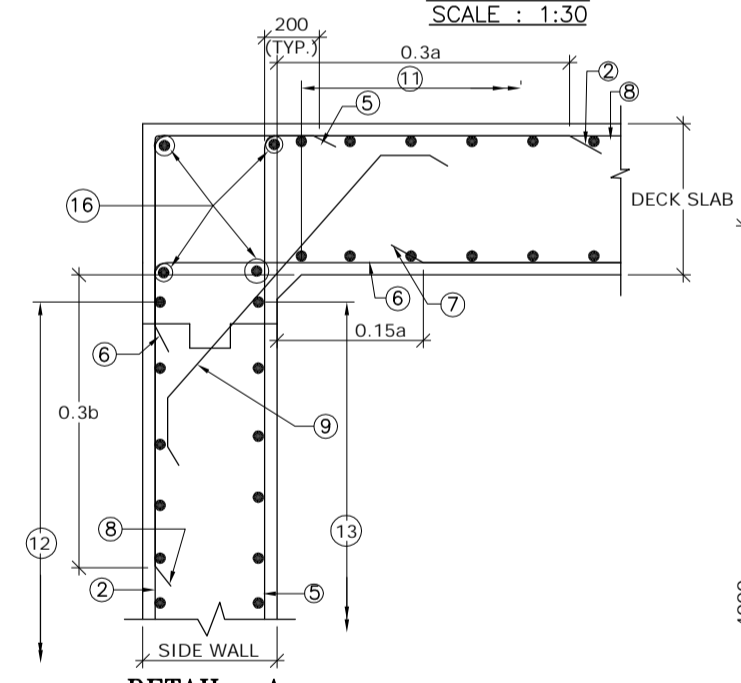
SECTION 1-1
SCALE : 1:100



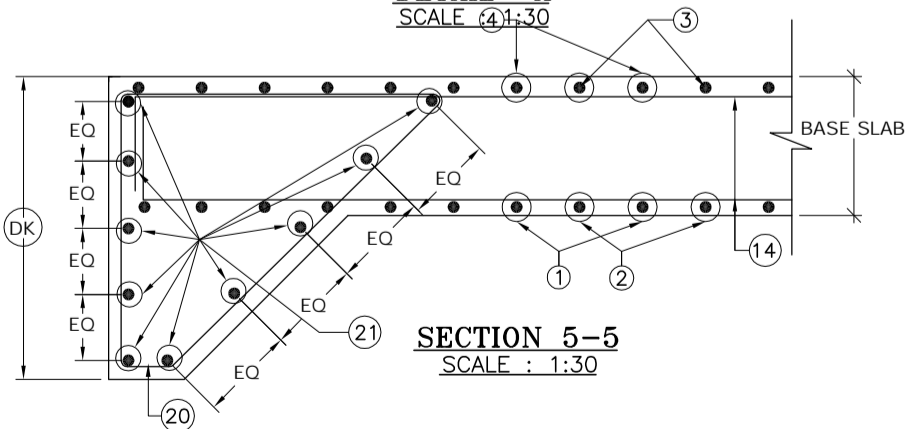
SECTIONAL PLAN 3-3
SCALE : 1:100



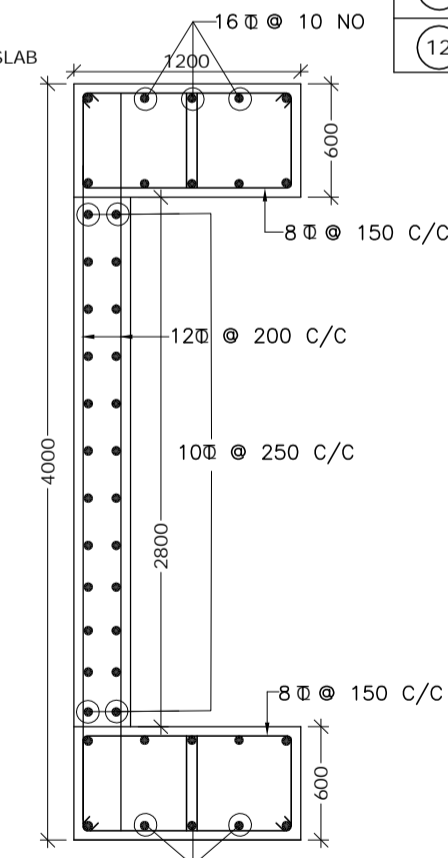
DETAIL- B
SCALE : 1:30



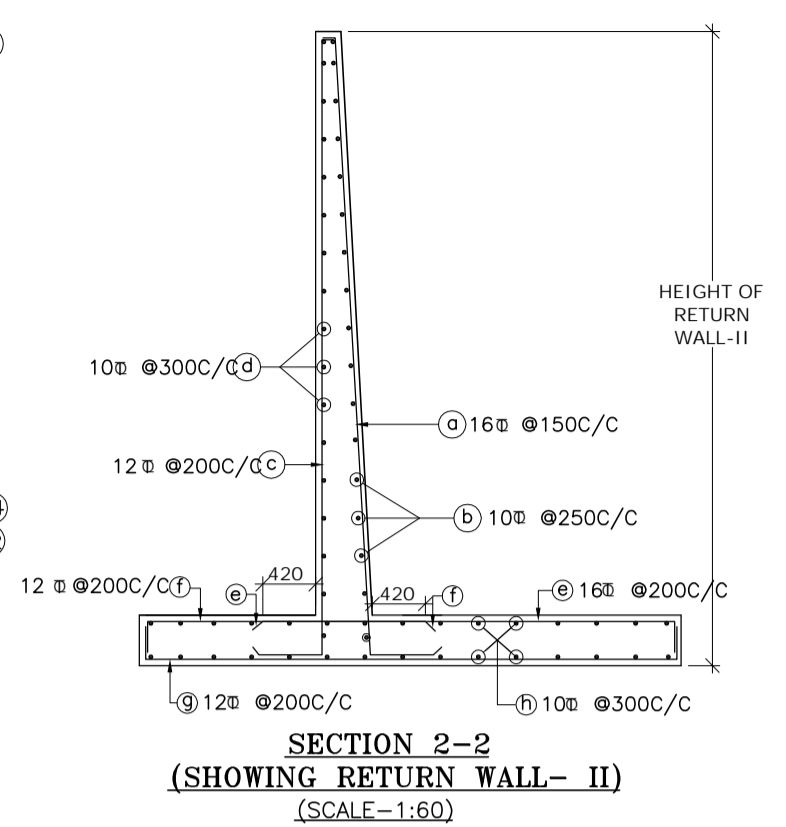
DETAIL- A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



REINFORCEMENT DETAILS OF COLUMN
SCALE : 1:40



SECTION 2-2
(SHOWING RETURN WALL- II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	10	200	13	10	250
2	10	200	14	10	250
3	12	125	15	10	250
4	-	-	16	10	-
5	10	200	17	-	-
6	10	100	18	10	150
7	-	-	19	10	-
8	10	200	20	10	150
9	10	200	21	12	-
10	10	200	22	10	250
11	10	250	23	10	200
12	10	250	24	10	200
			25	12	125
			26	10	250

--- TOP FACE BARS/OUTER FACE BARS/EARTH FACE BARS
 --- BOTTOM FACE BARS/INNER FACE BARS/OPP. TO EARTH FACE BARS

- NOTES :**
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH RELEVANT CLAUSE IRC : 112-2011
 - DEVELOPMENT LENGTH (Ld) :
 (a) FOR M25 = 46D
 (b) MINIMUM Ld :
 (i) FOR STRAIGHT BAR = 300MM
 (ii) FOR BENT BAR = 150MM
 BETWEEN (a) & (b) WHICHEVER IS GREATER.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MoRTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1_3M EC/CP/SLP/NC/GA (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - ToloI - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X2.0) UPTO 3.0M EARTH CUSHION

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Design Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 AN ISO 9001:2015 CERTIFIED COMPANY

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1_3M EC/CP/SLP/NC/RCC

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	Avishek Dey	Soubhik Sadhu	

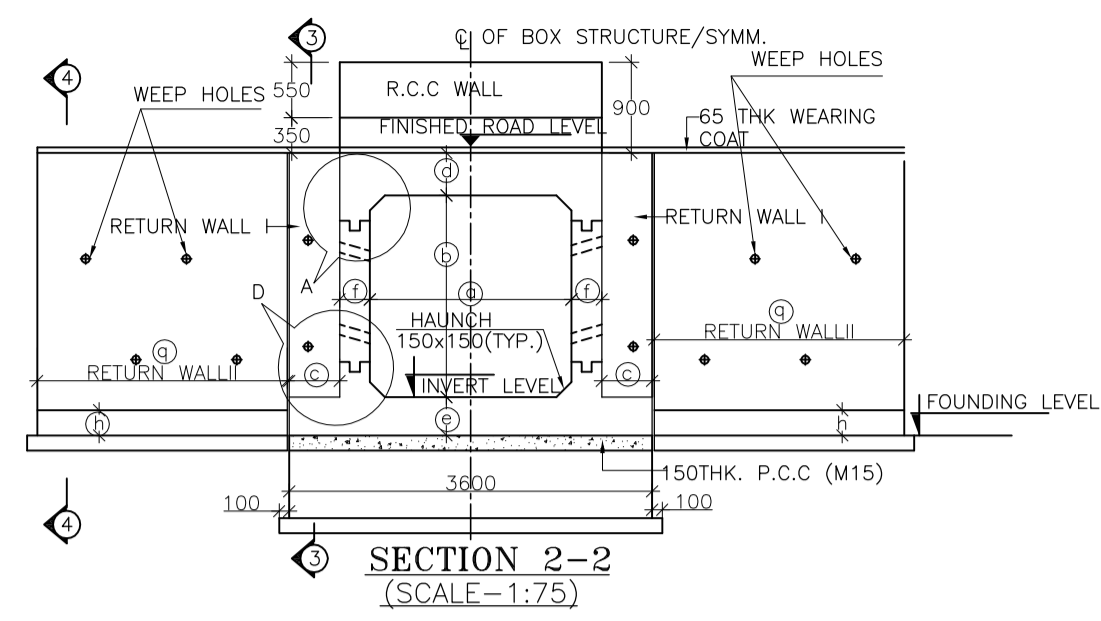
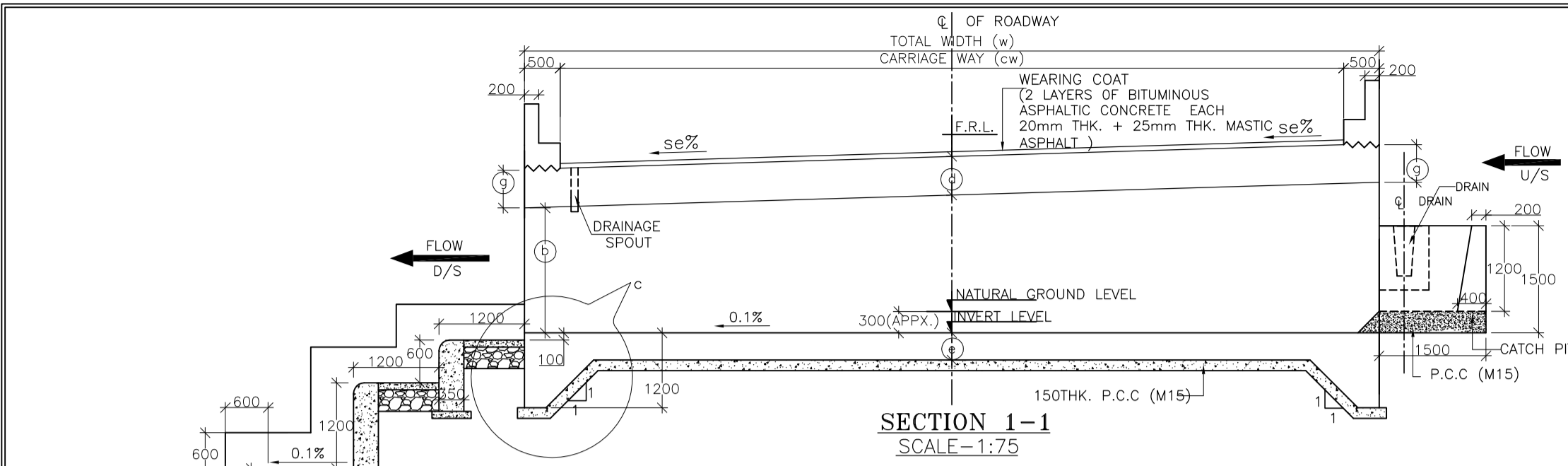
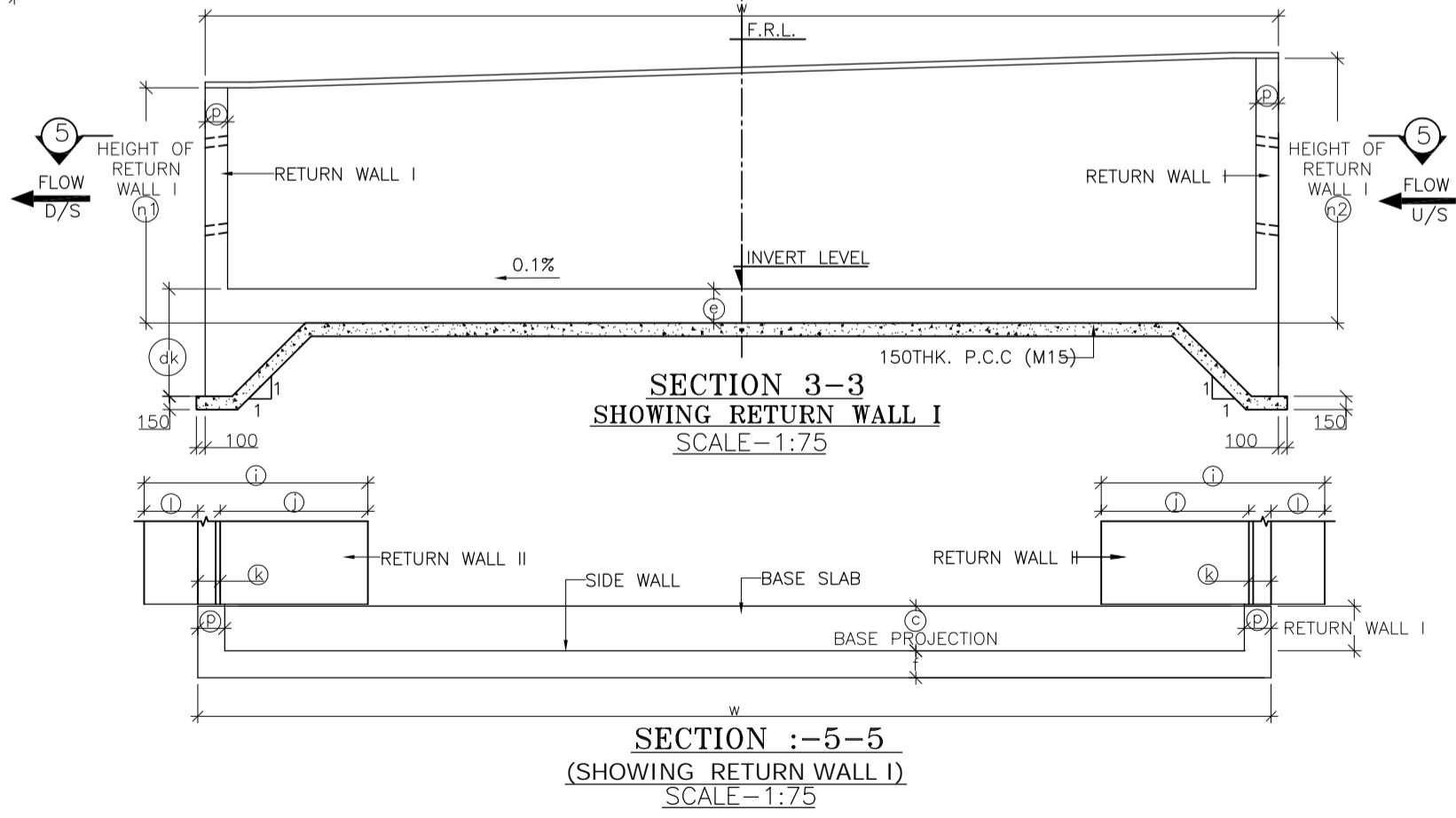
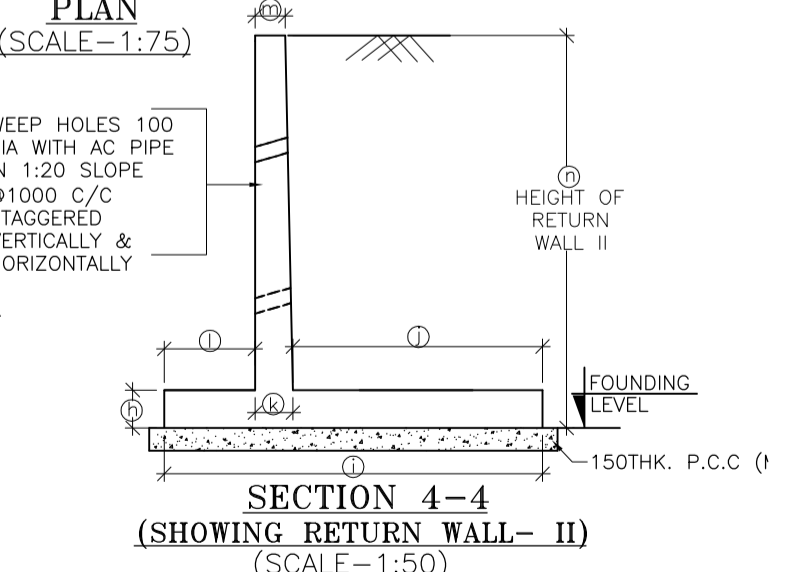
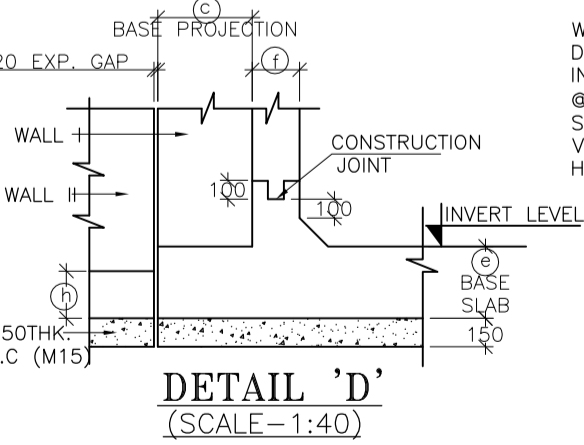
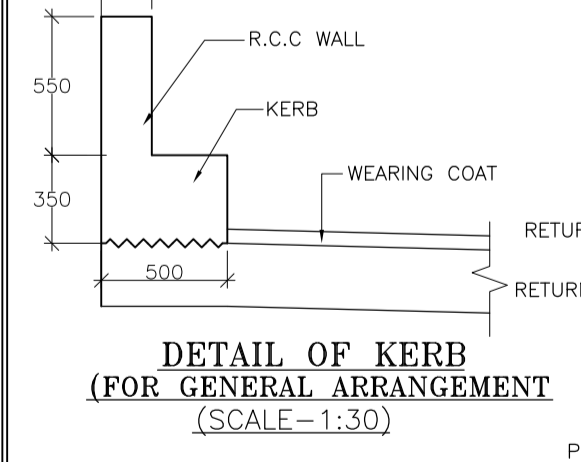
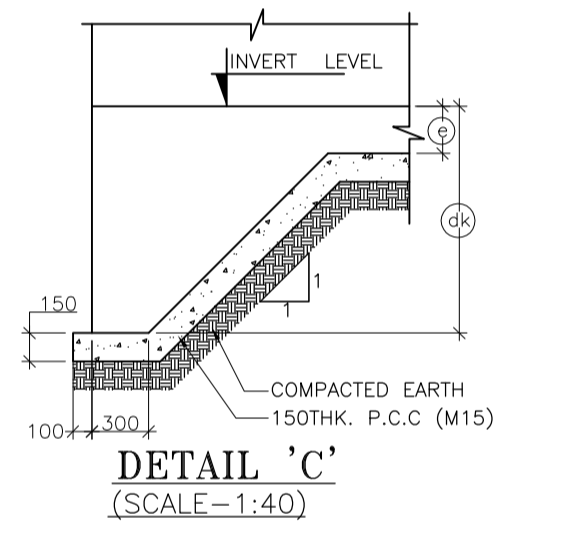
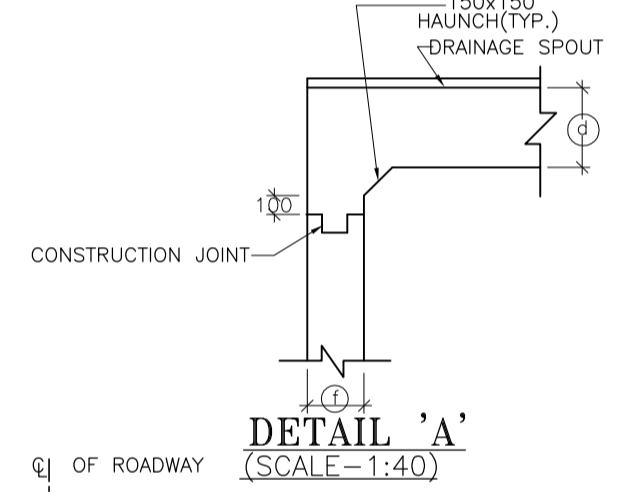
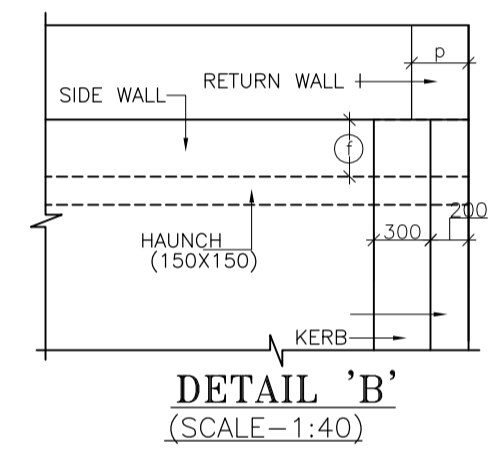
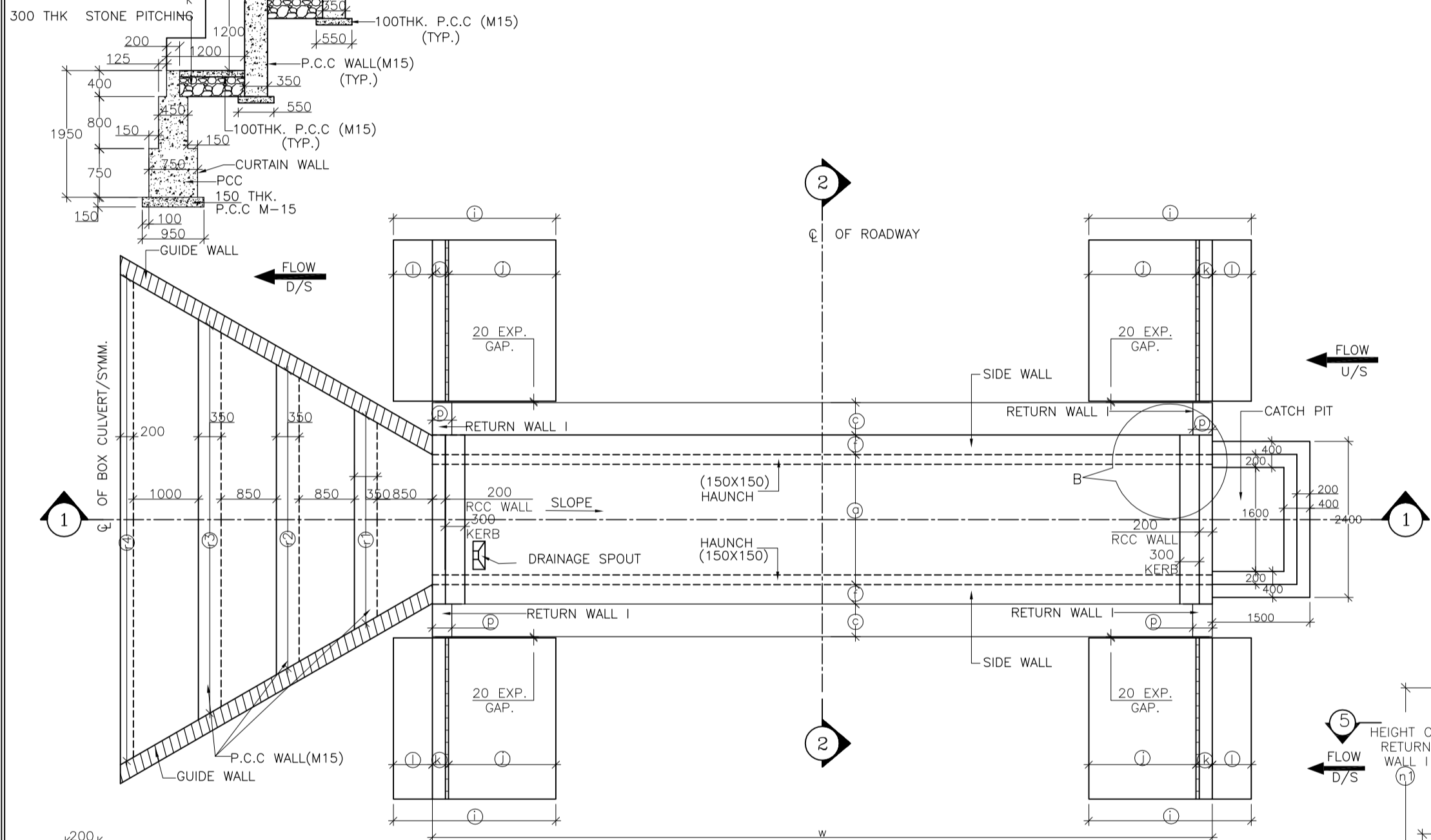



TABLE SHOWING SALIENT DIMENSIONS
BOX CELL DESIGNATION No./ab/Ec 1/23/0

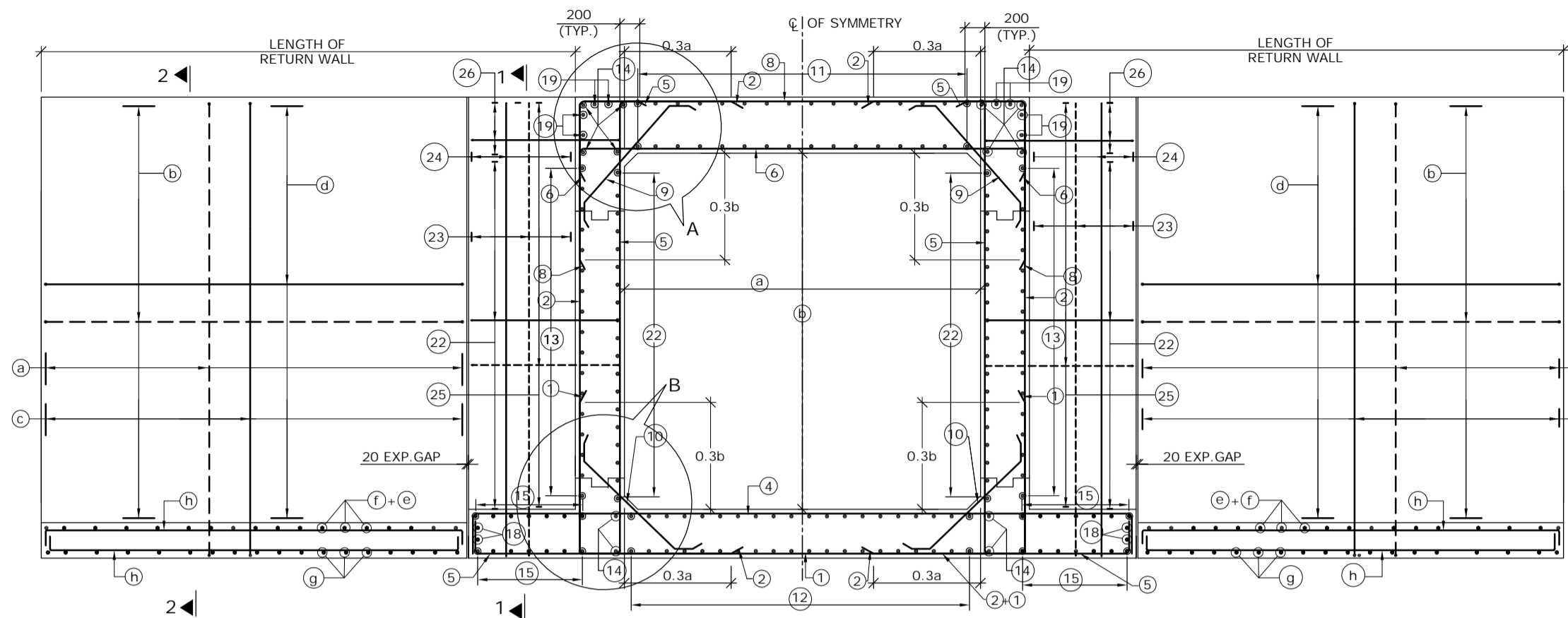
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b	3000
c	1300
d	370
e	420
f	350
g	370
h	300
i	3300
j	1850
k	350
l	1100
m	200
p	300
q	4000
dk	1200

STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
83/3	82+925	2130.632	2 X 3 X 1 CELL	7.00	R TO L	13.00	With Catch pit	Step	2127.637	2127.257	3.770	4.610
88/3	87+800	1874.904	2X3X1 Cell	7.00	L TO R	10.00	With Catch pit	Step	1872.804	1872.424	2.770	3.400

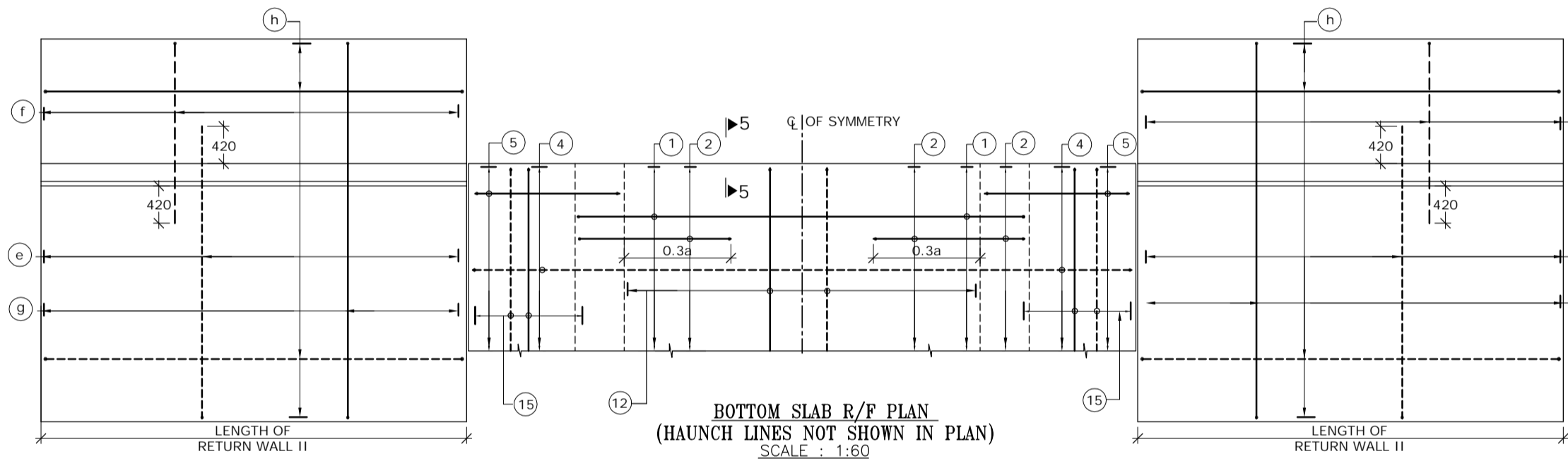


- NOTES :
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE = M25
CURTAIN WALL = M25
LEVELLING COURSE (P.C.C.) = M15
RETURN WALL = M25
RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $g=1.81/m^3$, $g=30B$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 T/m² BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/STP/SE/RCC (SHEET NO-01)

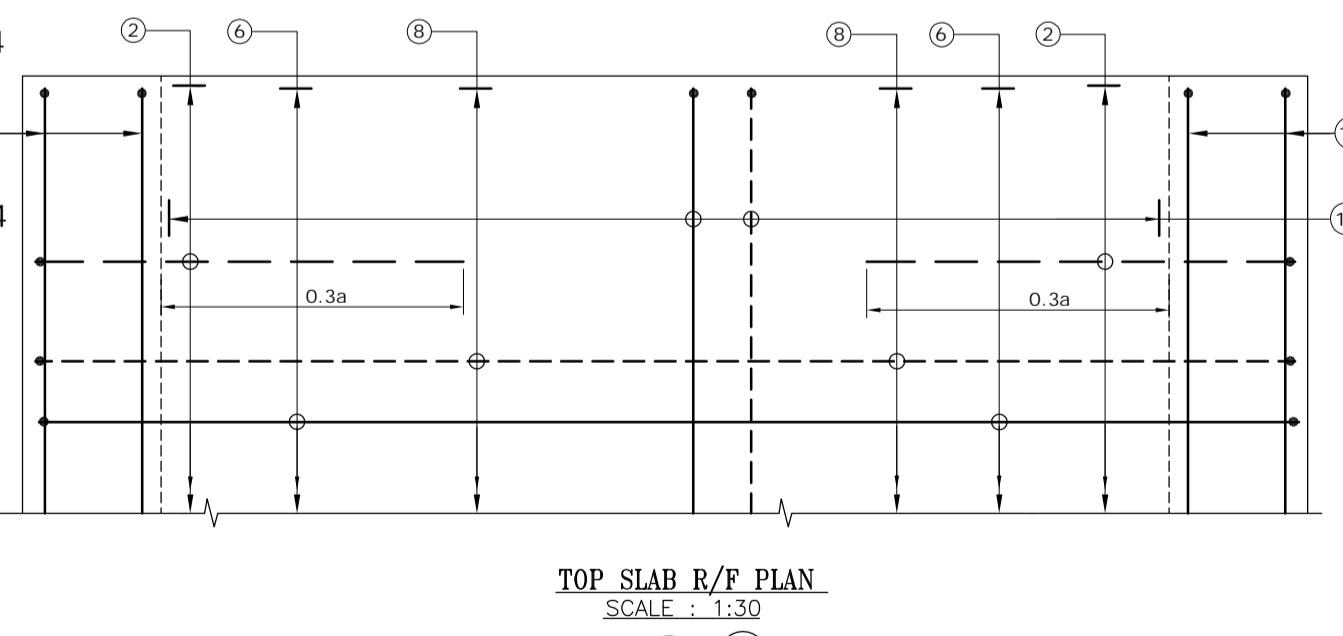
SCALE: AS SHOWN  CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0) WITH CATCH PIT & STEPPED PROTECTION CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/STP/SE/GA Drawn By. Design By. Checked By. Approved By.			
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.					Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825					A. Sahoo - Avishek Dey Soubhik Sadhu			
DATE: SEPT, 2016													
REVISIONS													



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

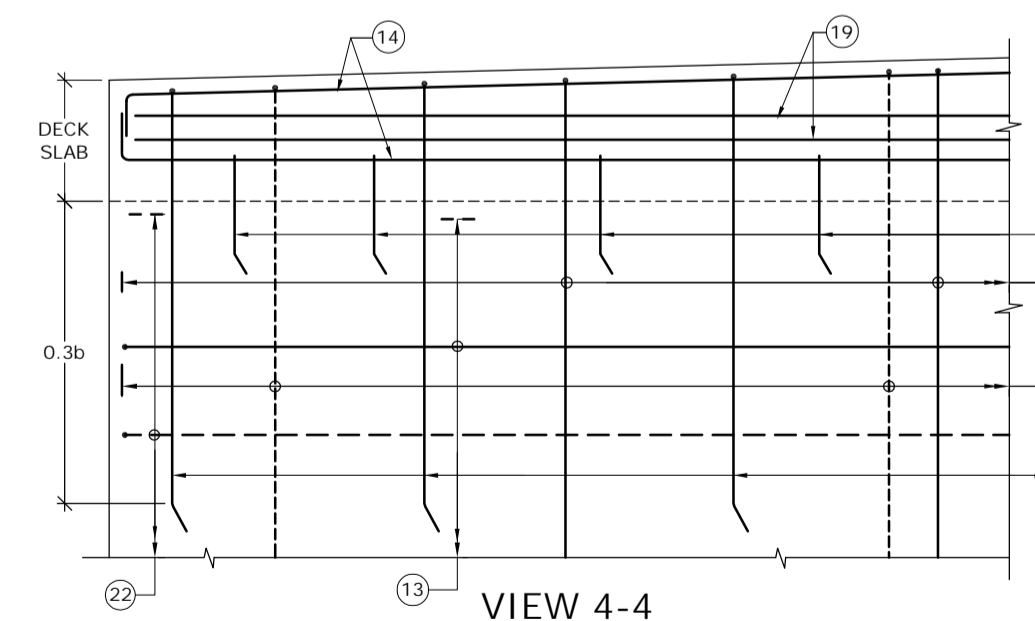


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

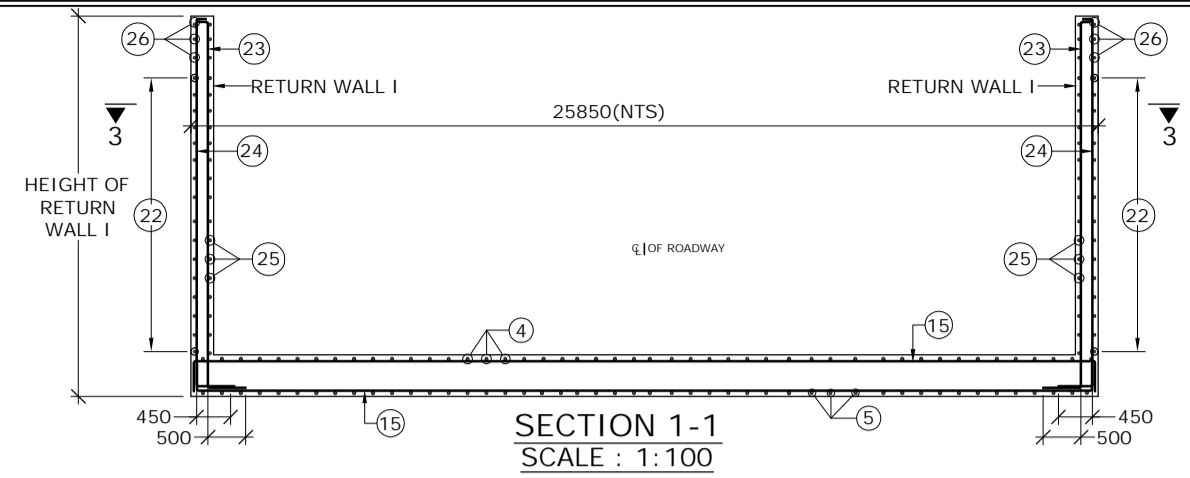


TOP SLAB R/F PLAN
SCALE : 1:30

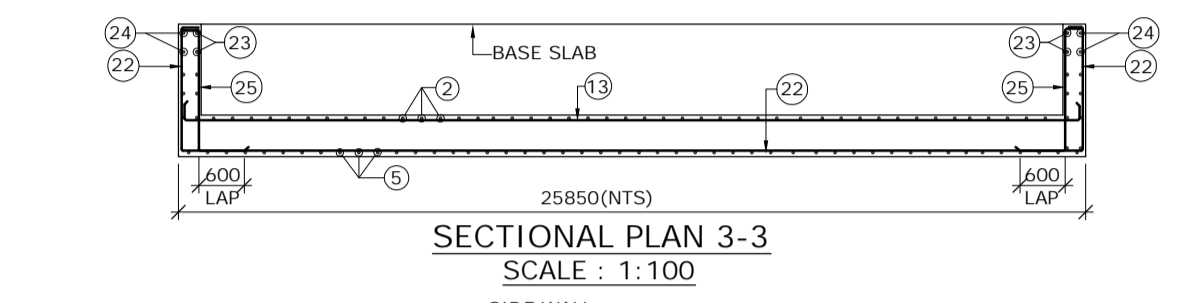
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



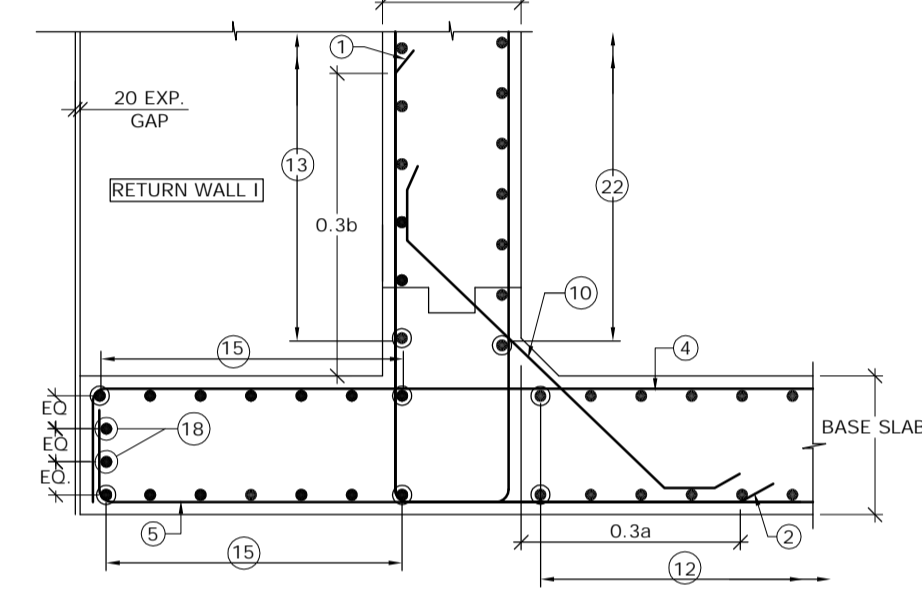
VIEW 4-4
SCALE : 1:30



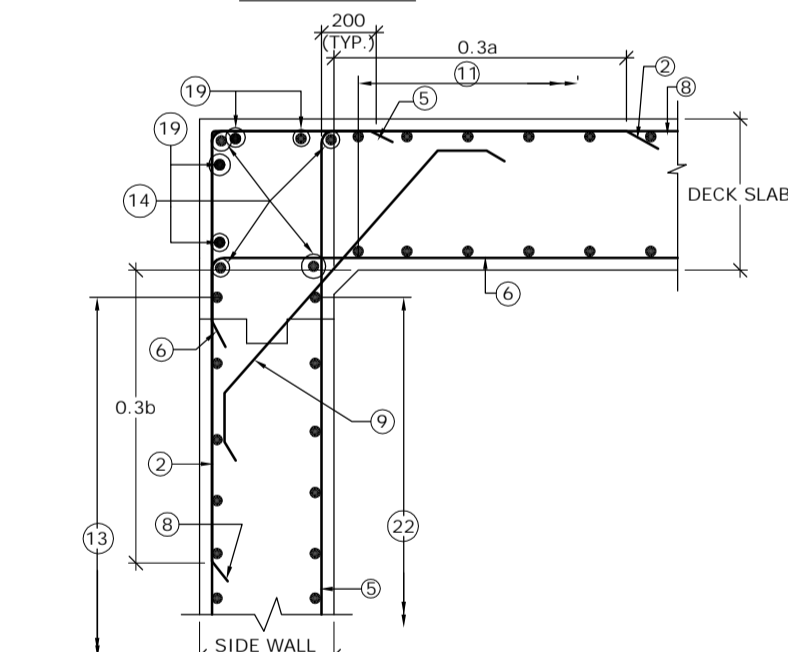
SECTION 1-1
SCALE : 1:100



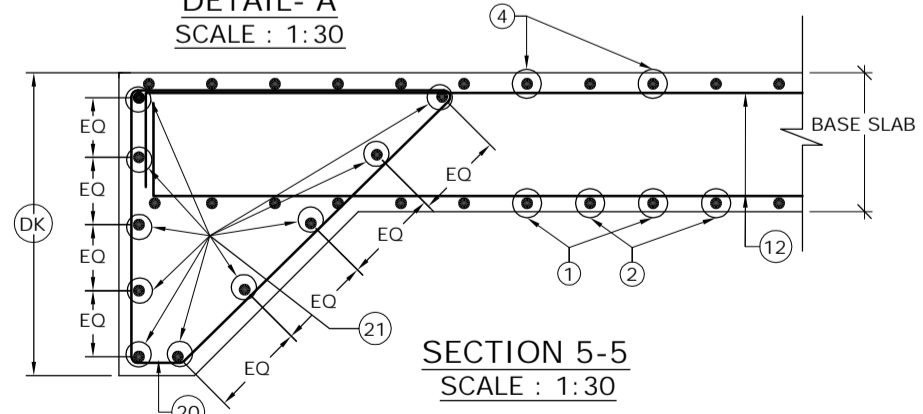
SECTIONAL PLAN 3-3
SCALE : 1:100



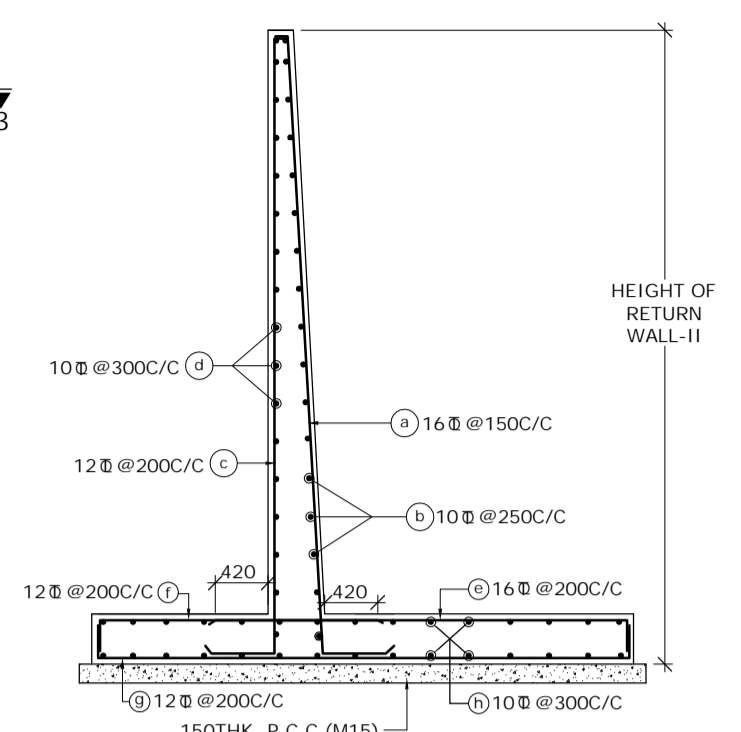
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE: 1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/STP/SE/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
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REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0)

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 ANISUWA, 3480, ISHAGANJORE
 Certified Company

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/STP/SE/RCC

Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu

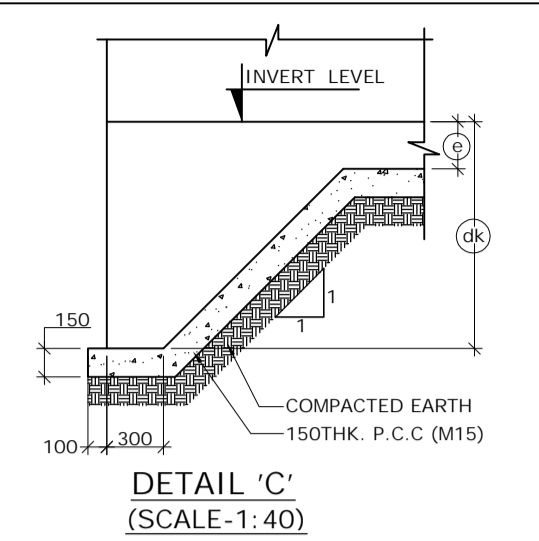
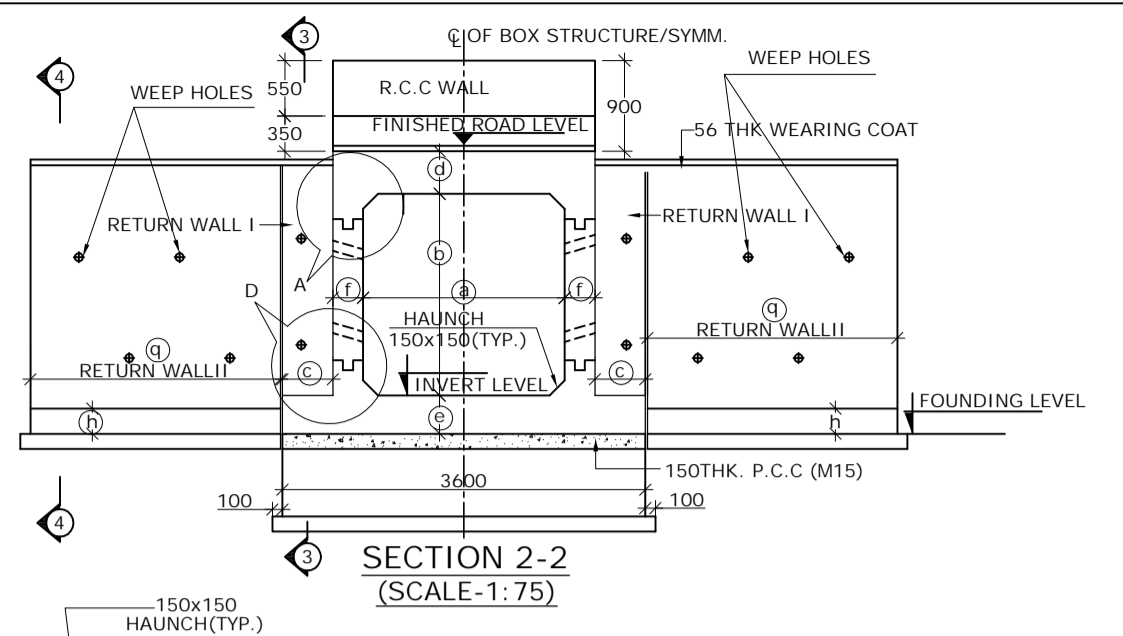
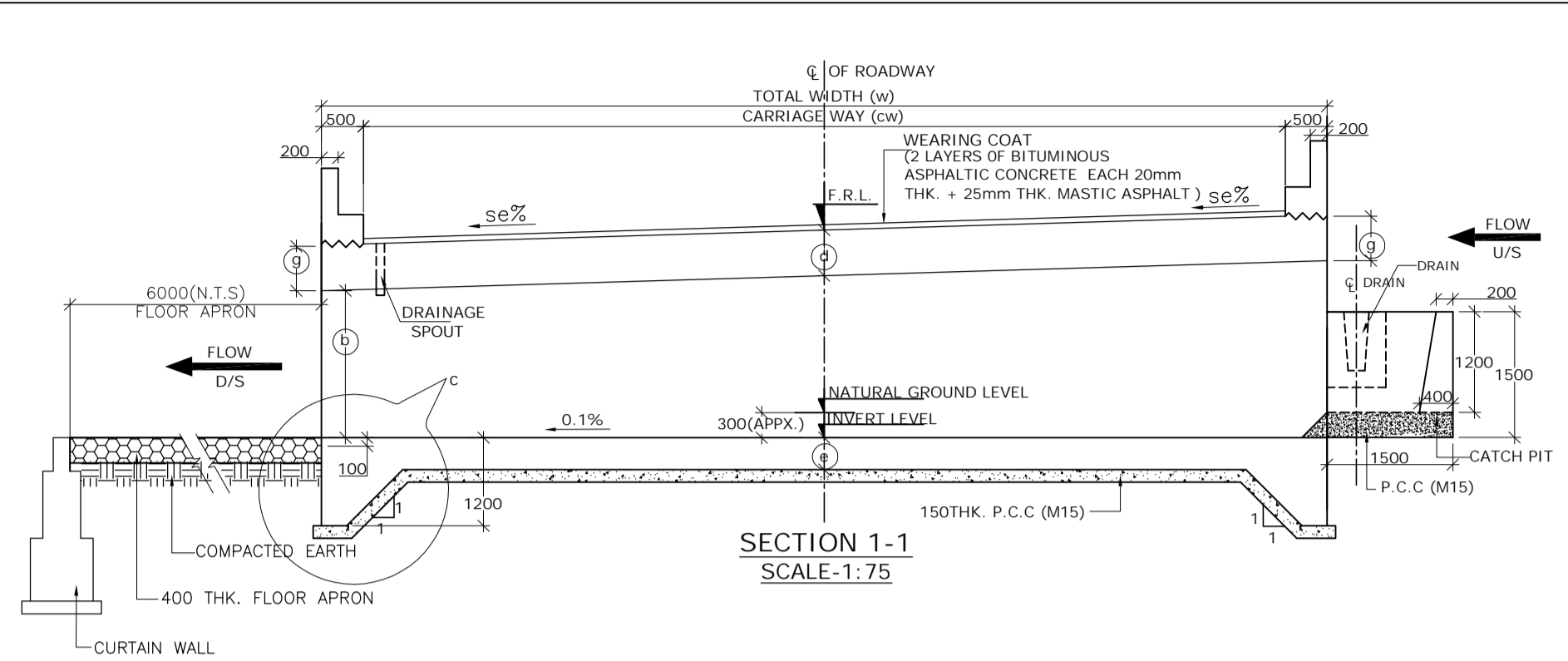
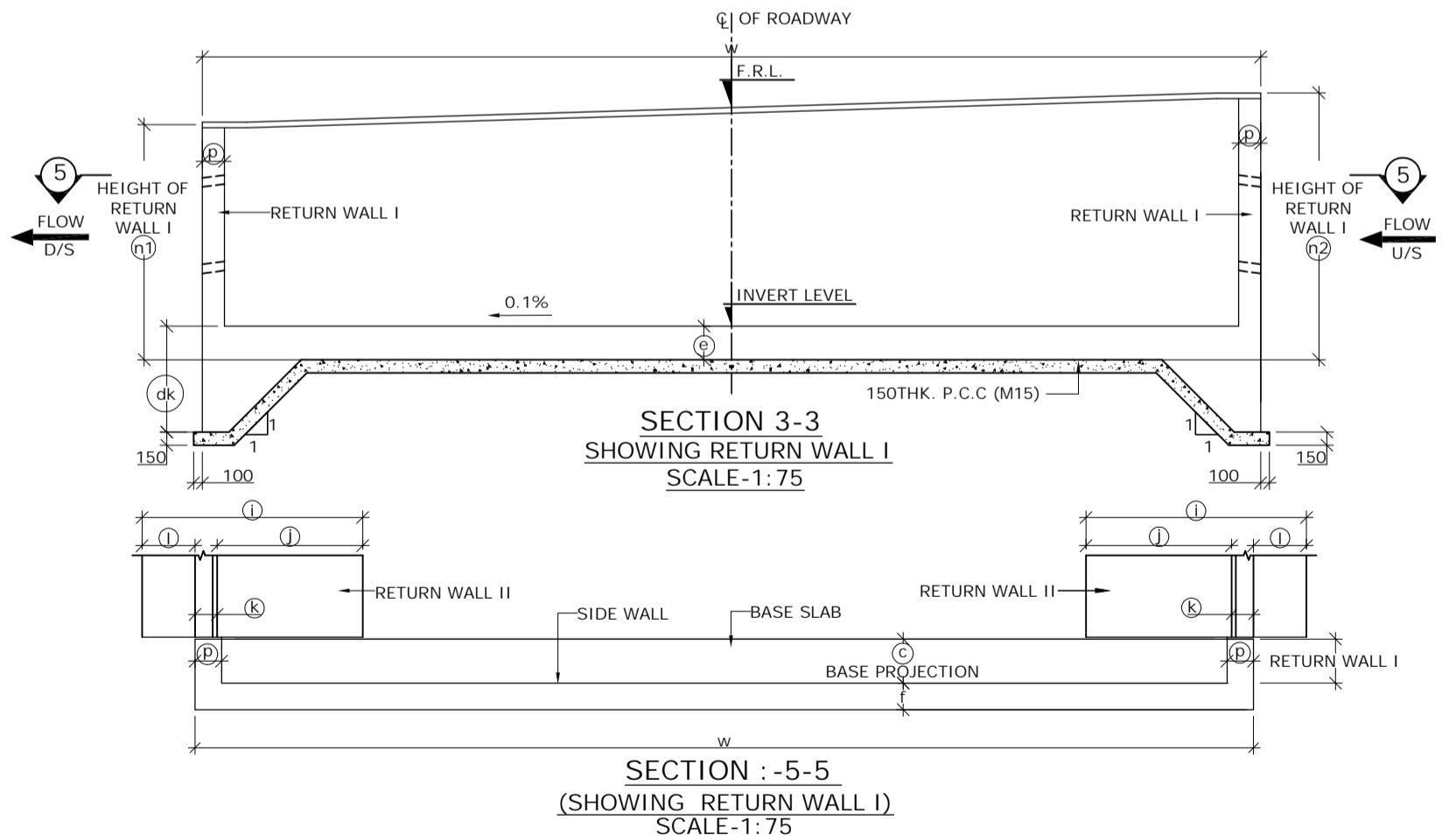
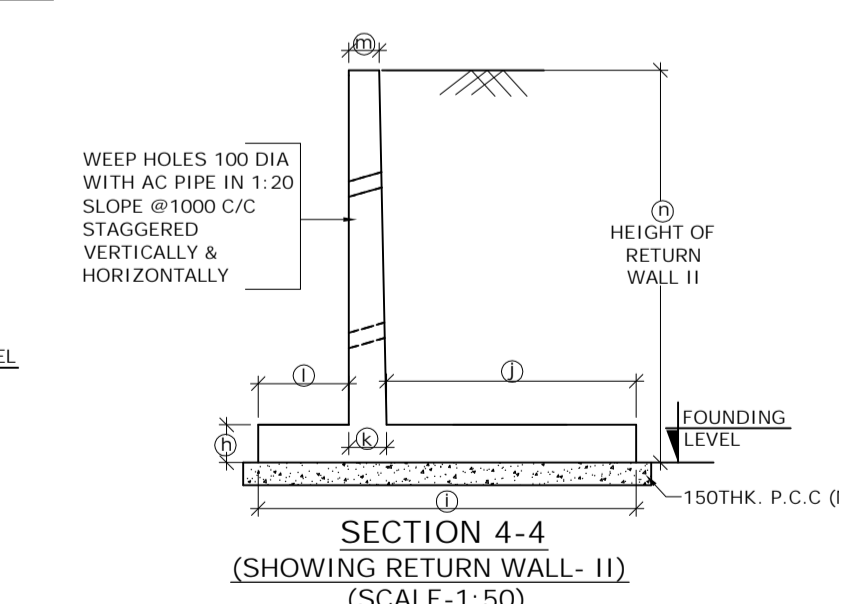
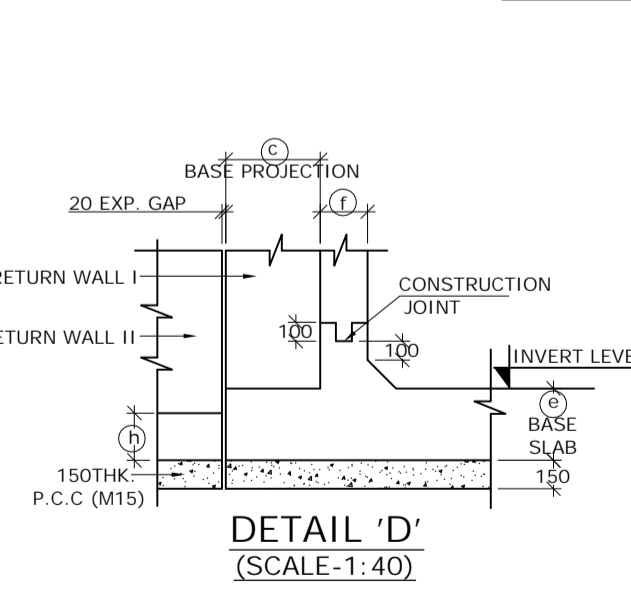
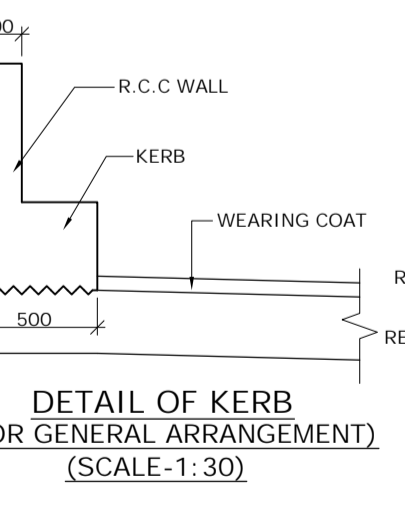
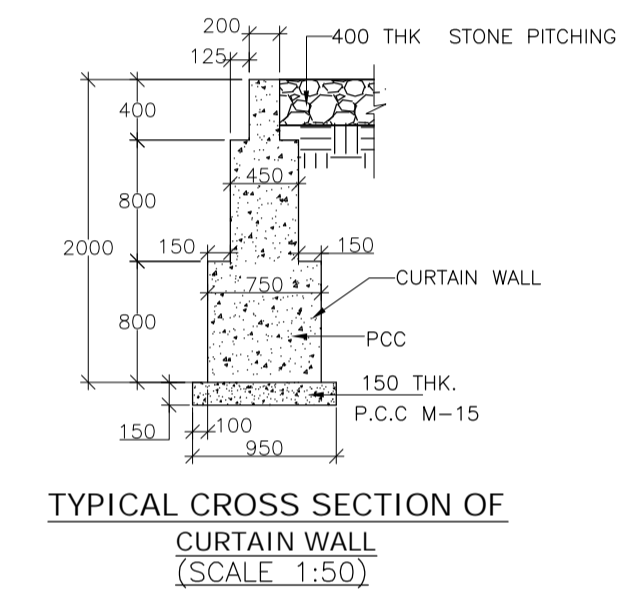
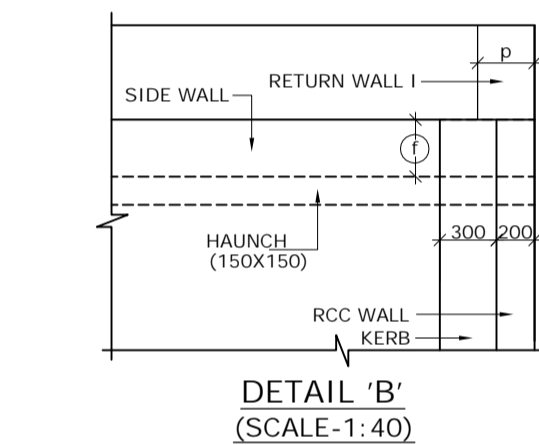
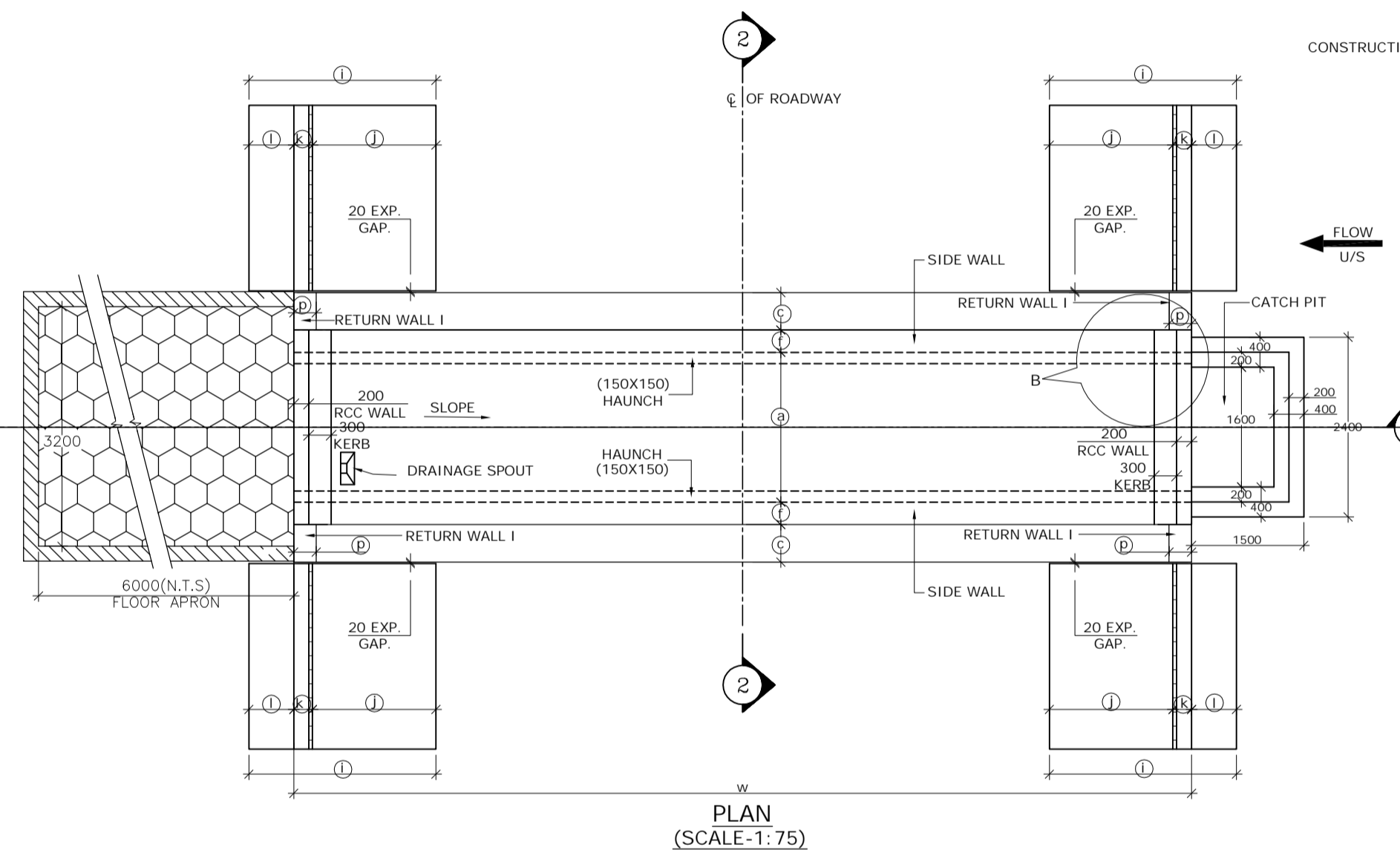
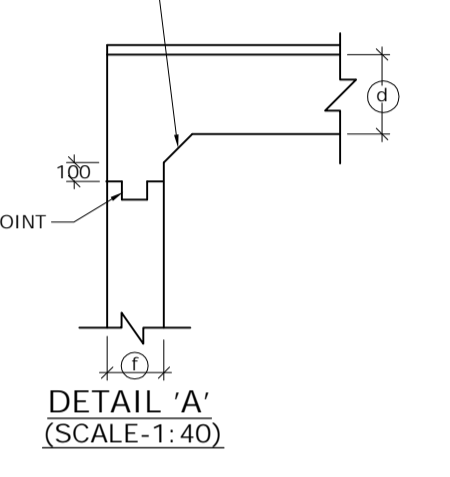




TABLE SHOWING SALIENT DIMENSIONS
BOX CELL DESIGNATION No./ab/Ec 1/23/0

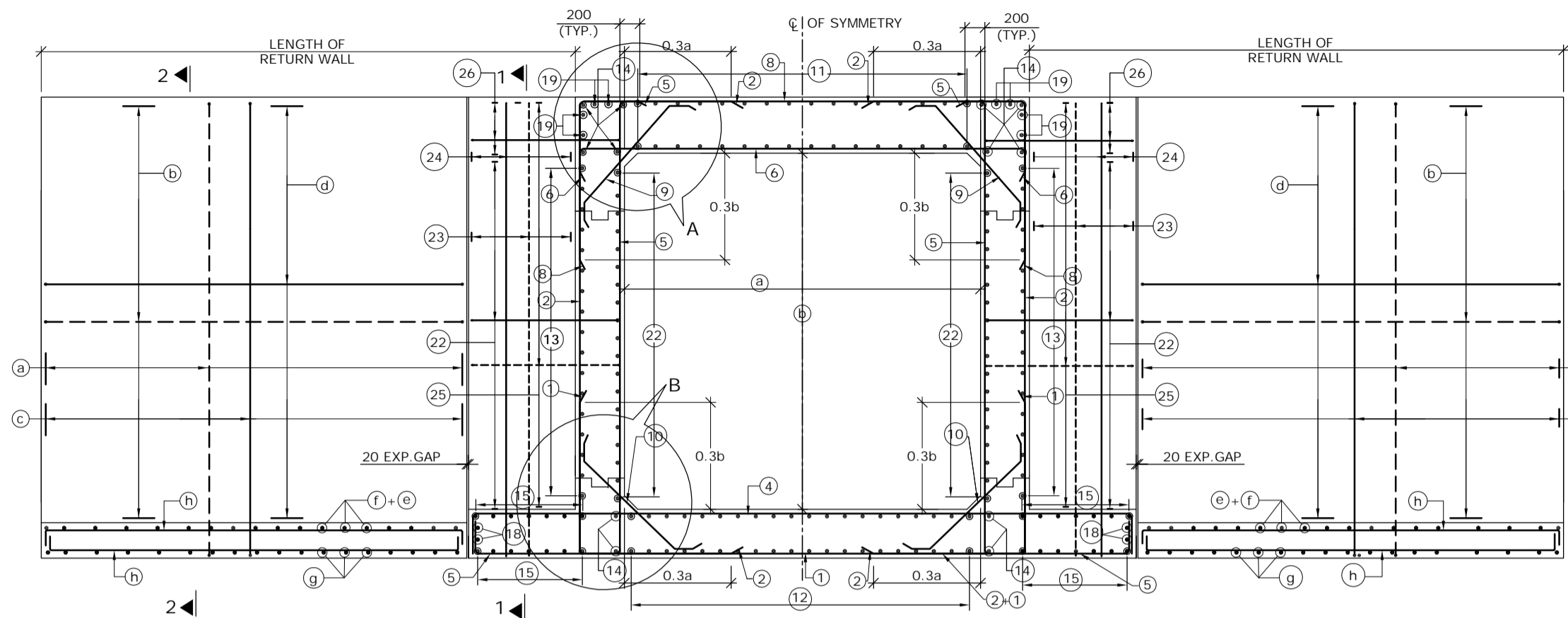
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b	3000
c	1300
d	370
e	420
f	350
g	370
h	300
i	3300
j	1850
k	350
l	1100
m	200
p	300
q	4000
dk	1200

STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
92/3	91+805	1733.753	2X3X1 Cell	7.00	L TO R	10.00	With Catch pit	Straight	1730.633	1730.213	3.790	4.420

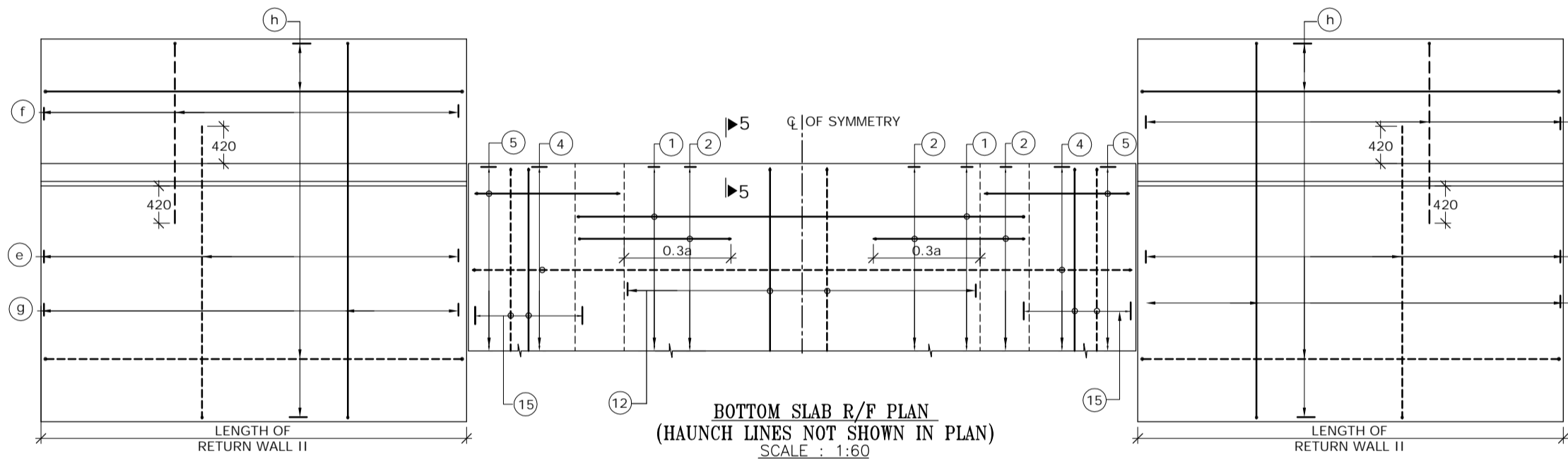


- NOTES :
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE = M25
CURTAIN WALL = M25
LEVELLING COURSE (P.C.C.) = M15
RETURN WALL = M25
RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.8t/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 t/m² BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/F/SE/RCC (SHEET NO-01)

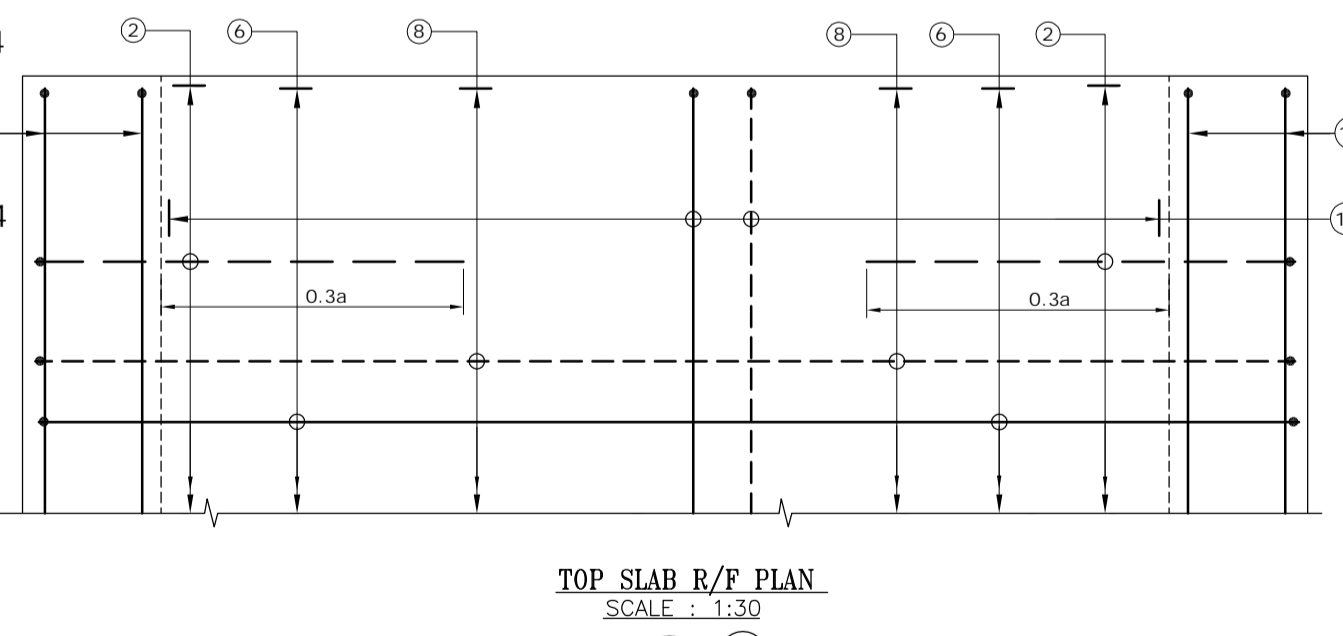
<p>SCALE: AS SHOWN</p>  <p>CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001</p>					<p>GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0) WITH CATCH PIT & FLOOR APRON</p> <p>Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Design Chainage :- 81+870 to 105+825</p>					<p>CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.</p> 					<p>DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/F/SE/GA</p> <p>Drawn By. Design By. Checked By. Approved By.</p> <p>A. Sahoo - Avishek Dey Soubhik Sadhu</p>									
<p>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.</p> <p>DATE: SEPT, 2016</p>					<p>REVISIONS</p> <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> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>					MKD.	DATE	DESCRIPTION	CHKD.	APPRD.										
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.																				



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

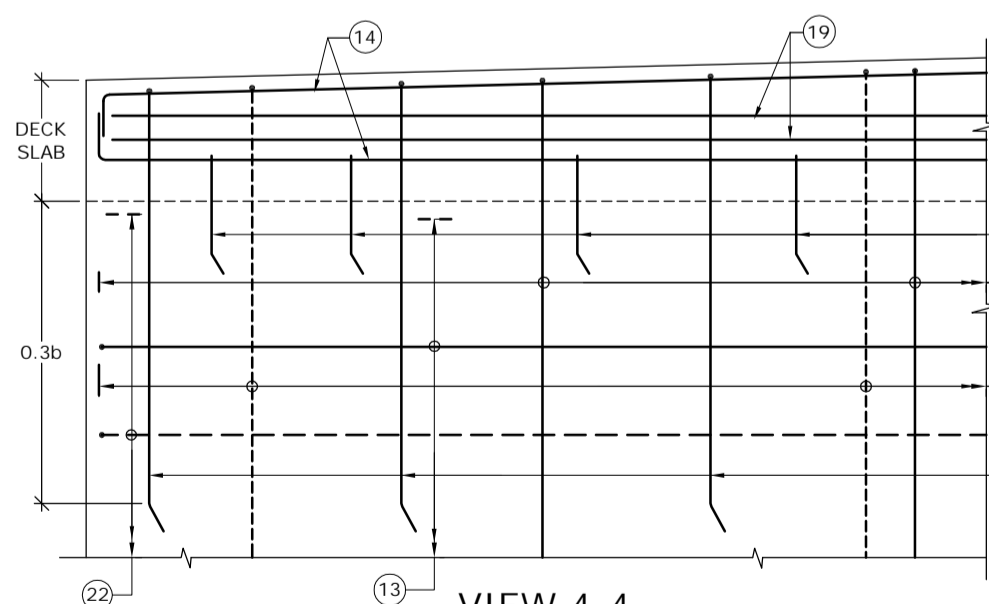


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

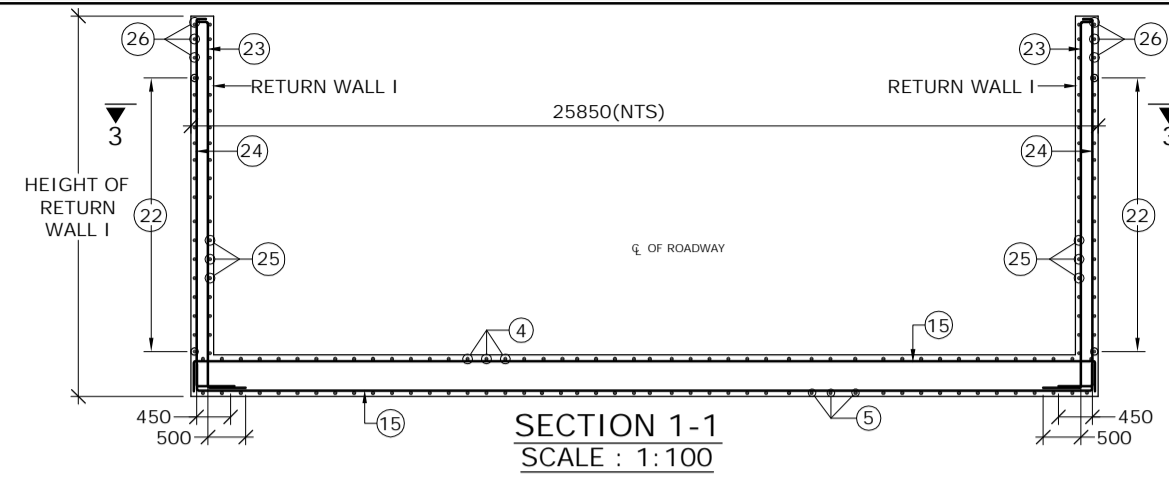


TOP SLAB R/F PLAN
SCALE : 1:30

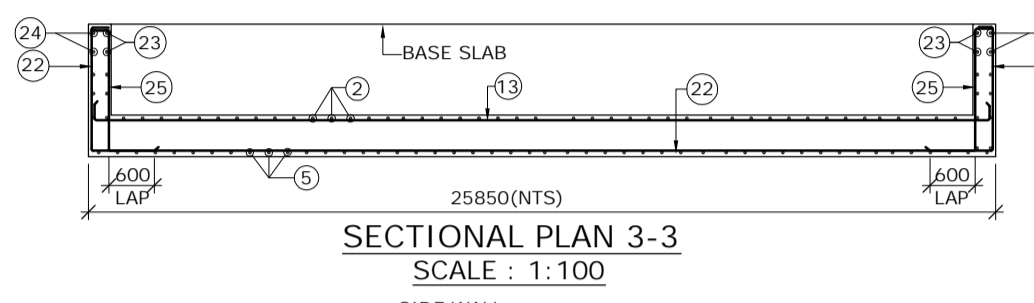
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



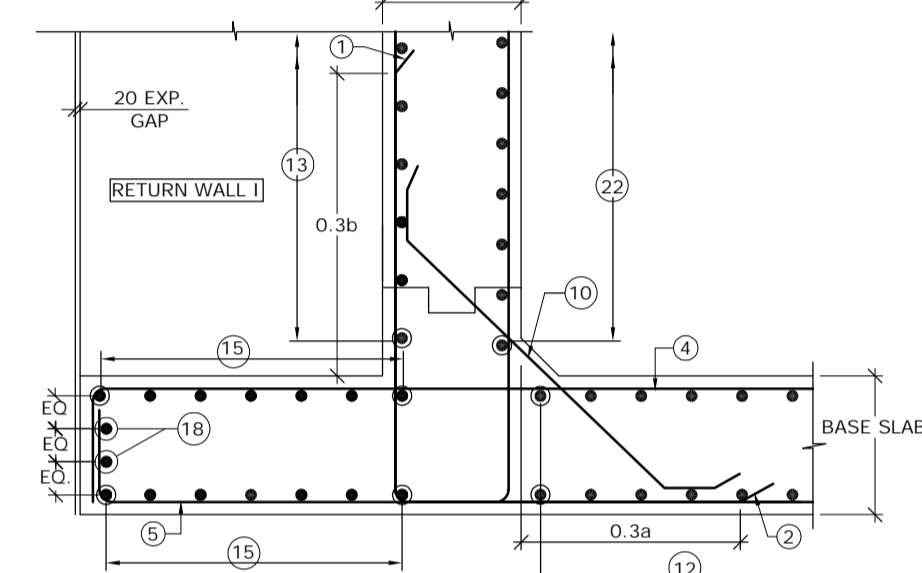
VIEW 4-4
SCALE : 1:30



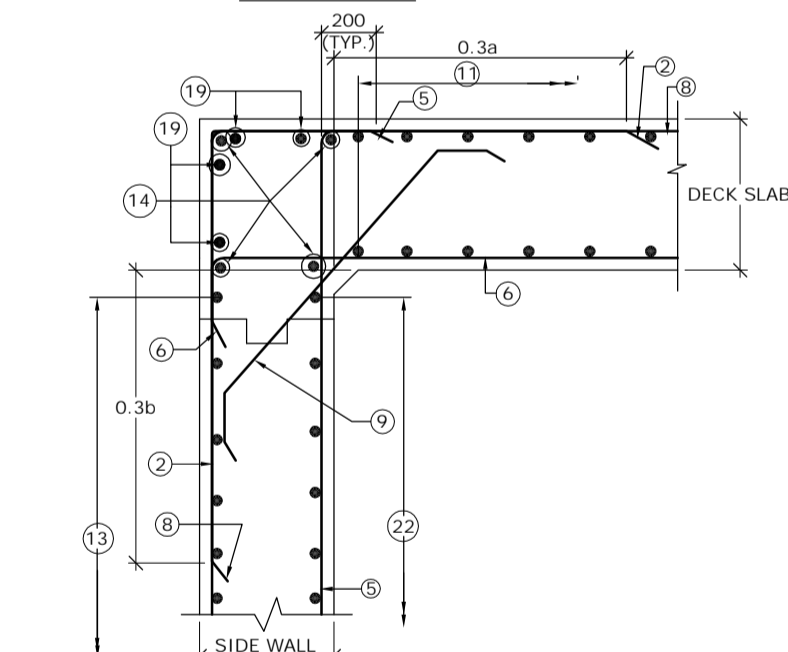
SECTION 1-1
SCALE : 1:100



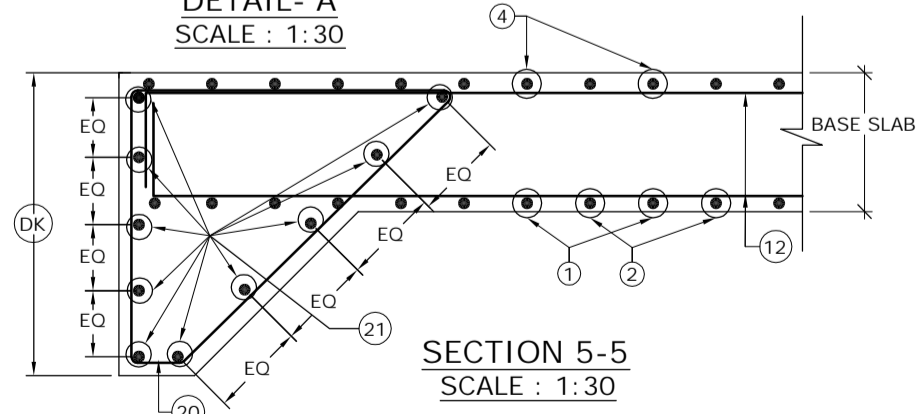
SECTIONAL PLAN 3-3
SCALE : 1:100



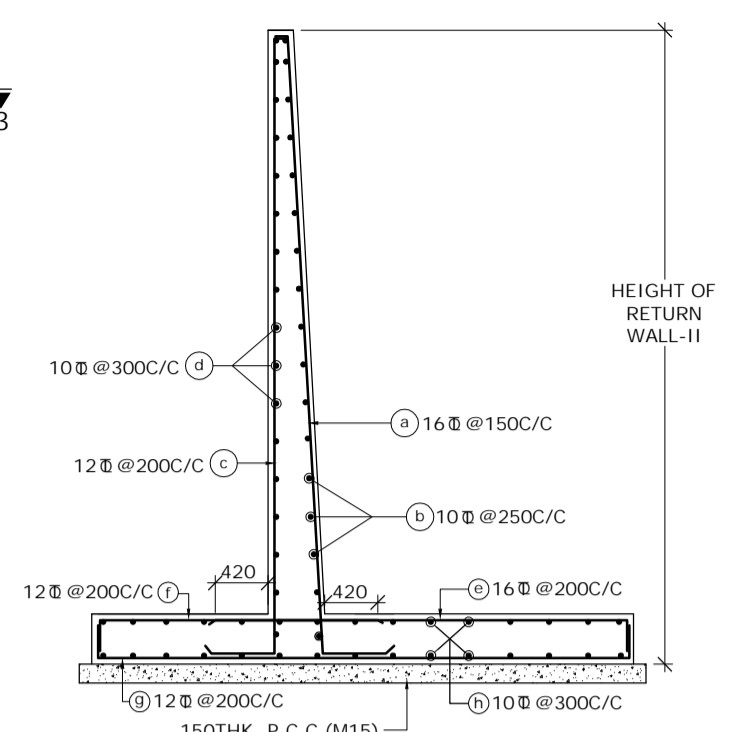
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/F/SE/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

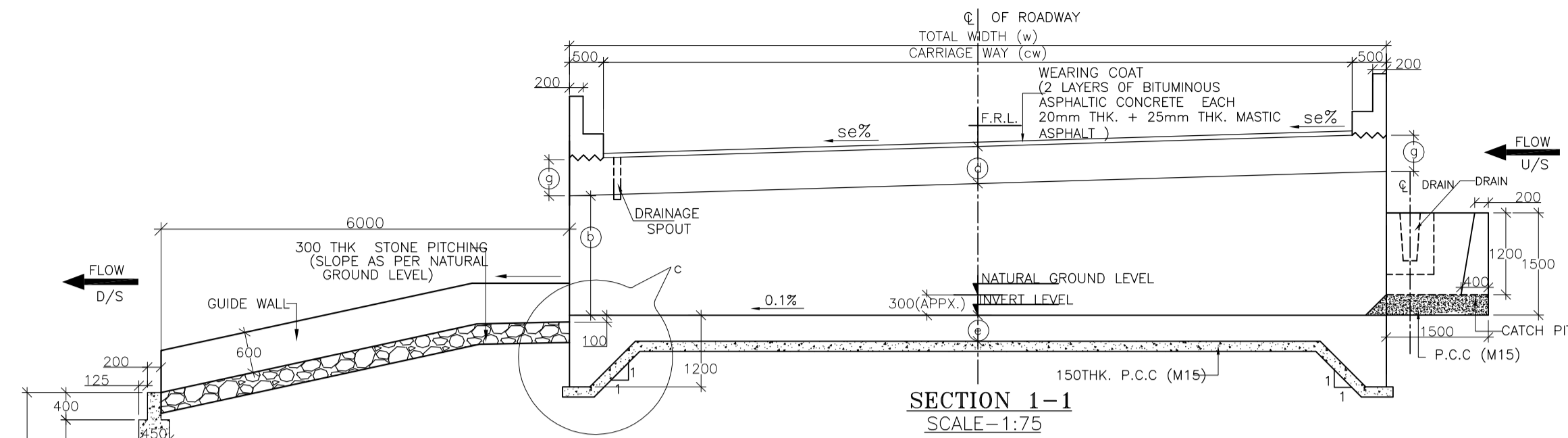
SCALE: AS SHOWN
 DATE: SEPT, 2016

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
 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.

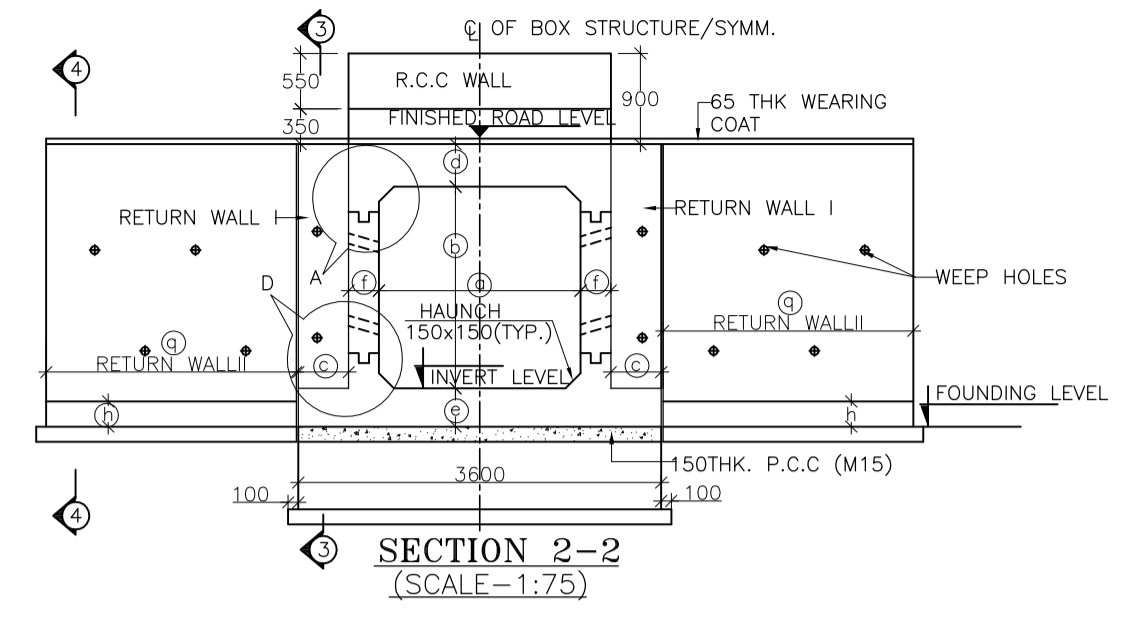
REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0)
 Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/F/SE/RCC
 Drawn By. S. Chattrjee
 Design By. -
 Checked By. Avishek Dey
 Approved By. Soubhik Sadhu



SECTION 1-1
SCALE=1:75

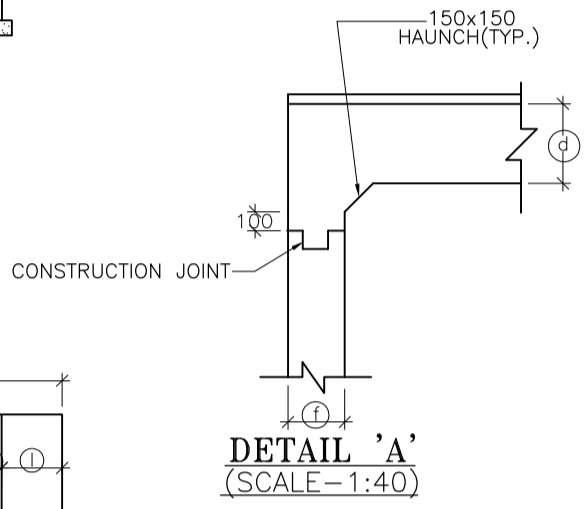


SECTION 2-2
SCALE=1:75

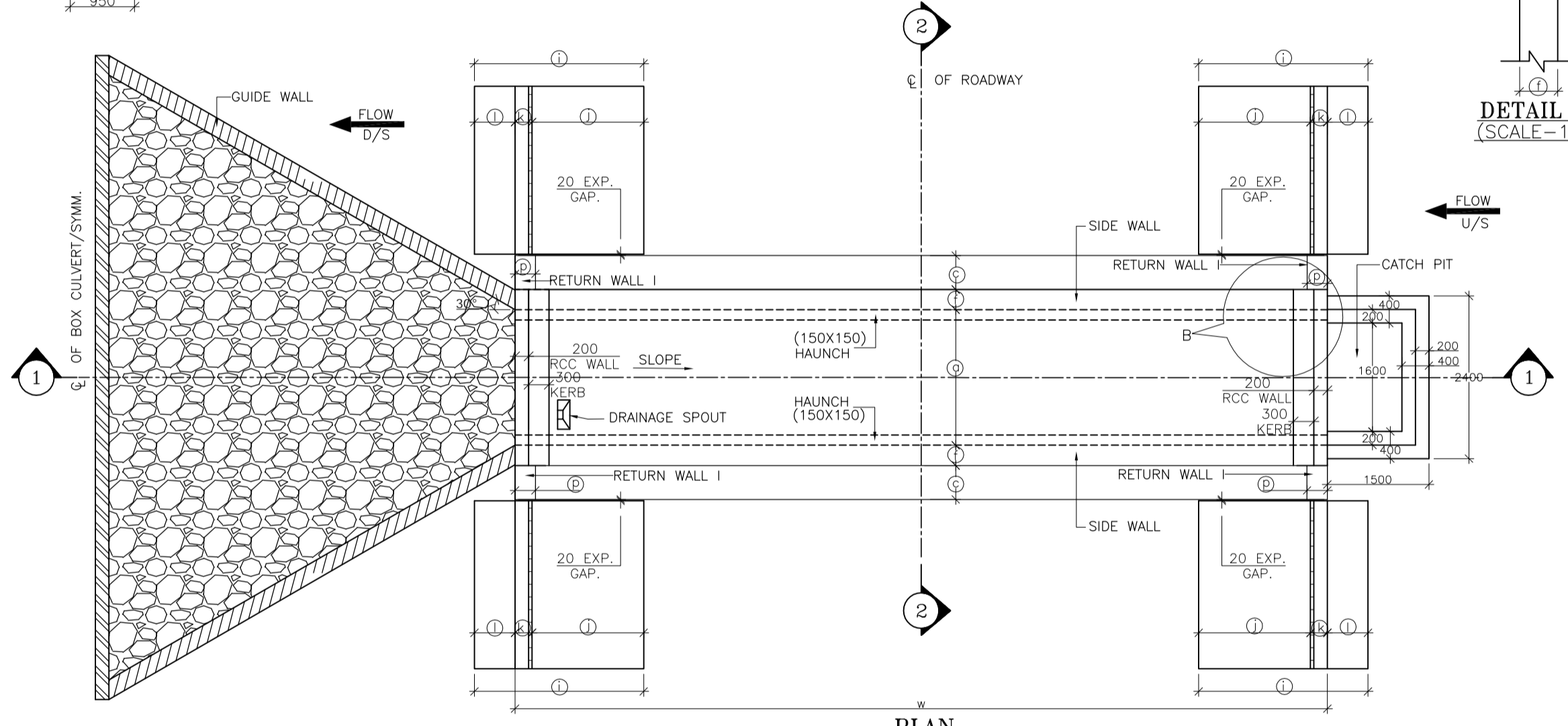
TABLE SHOWING SALIENT DIMENSIONS
BOX CELL DESIGNATION No.ab/Ec 1/23/0

a	2000
b	3000
c	1300
d	-
e	420
f	350
g	370
h	300
i	3300
j	1850
k	350
l	1100
m	200
p	300
q	4000
dk	1200

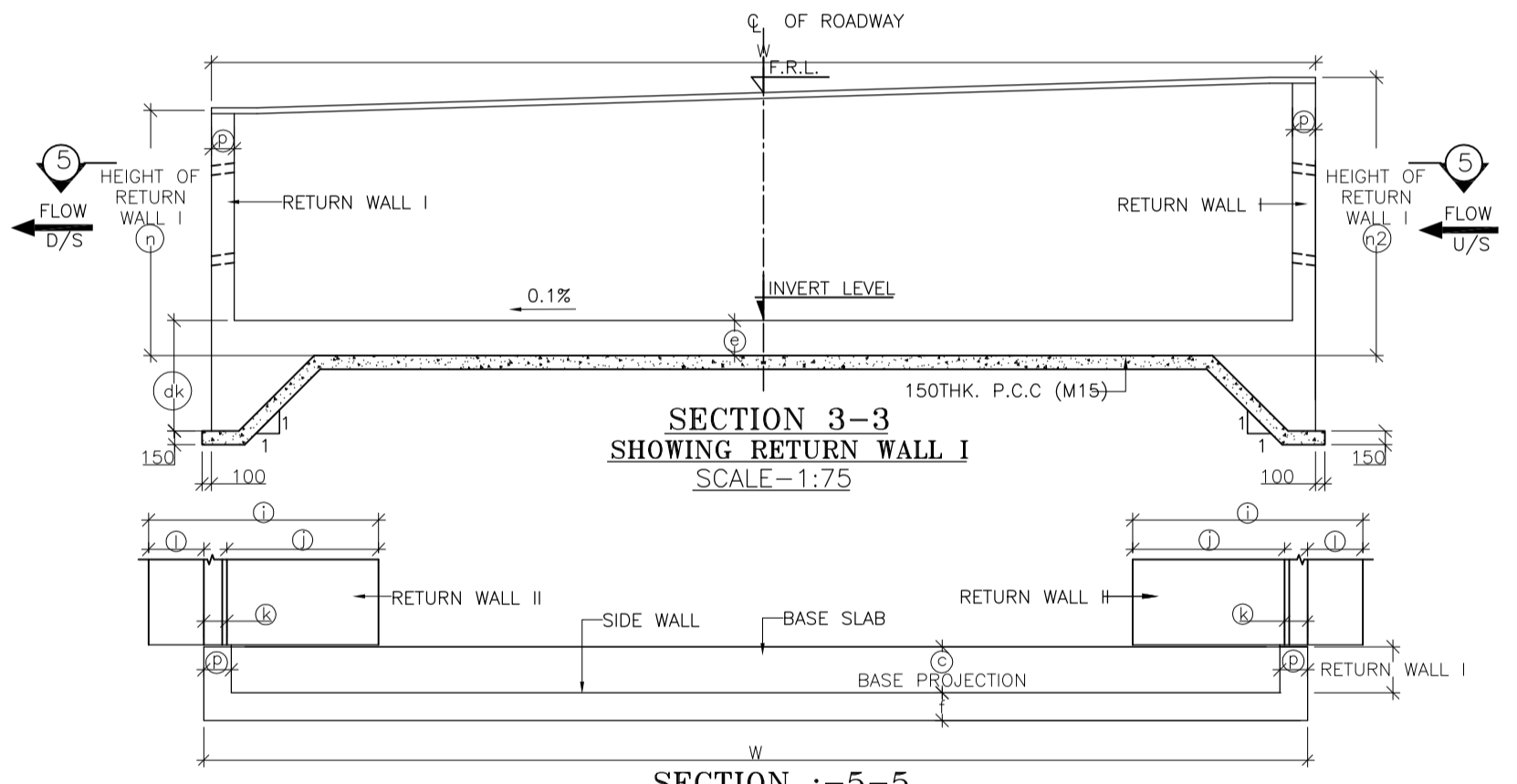
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
88/1	87+138	1891.603	2X3X1 Cell	3.60	R TO L	11.00	With Catch pit	Slope	1888.348	1887.928	3.790	4.150



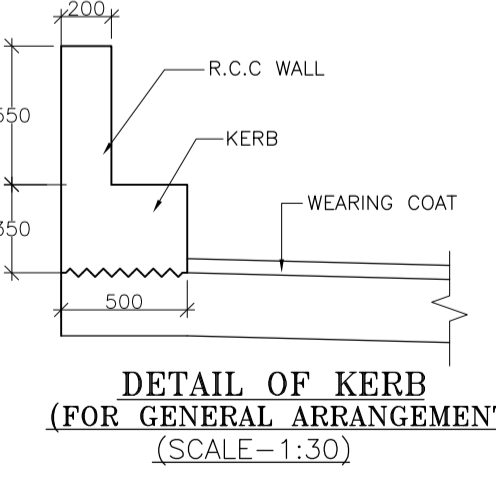
DETAIL 'A'
SCALE=1:40



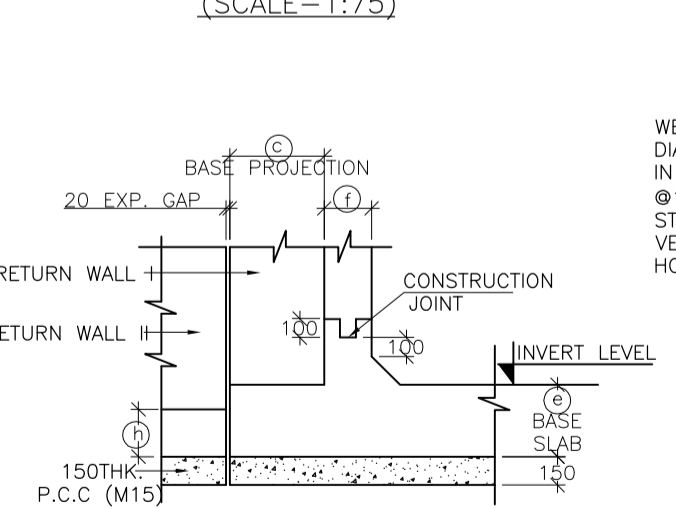
PLAN
SCALE=1:75



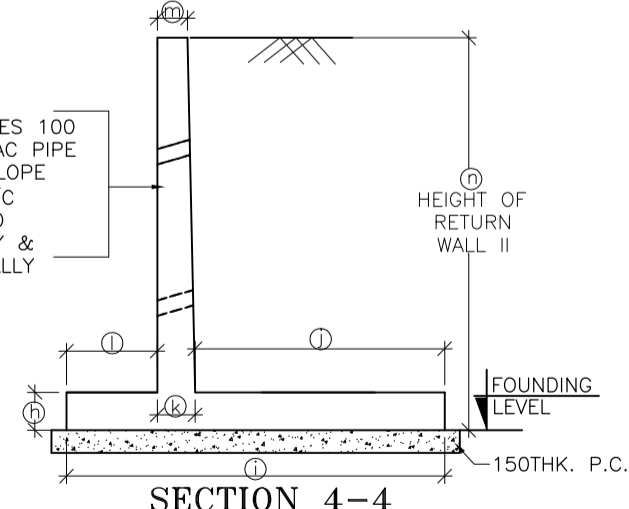
SECTION 3-3
SHOWING RETURN WALL I
SCALE=1:75



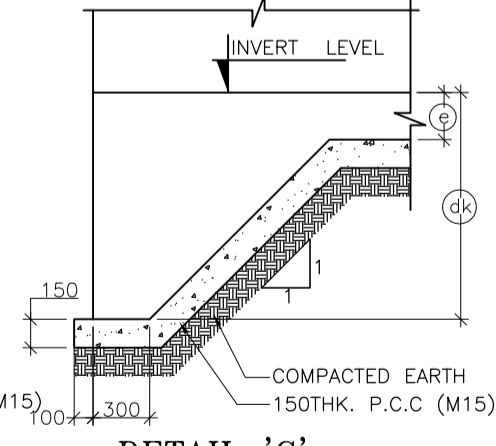
DETAIL OF KERB
(FOR GENERAL ARRANGEMENT)
SCALE=1:30



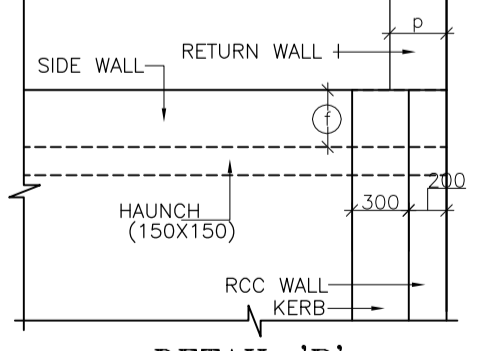
DETAIL 'D'
SCALE=1:40



SECTION 4-4
SHOWING RETURN WALL- II
SCALE=1:50



DETAIL 'C'
SCALE=1:40



DETAIL 'B'
SCALE=1:40

- NOTES :
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE : BOX CELL STRUCTURE = M25 CURTAIN WALL = M25 LEVELLING COURSE (P.C.C.) = M15 RETURN WALL = M25 RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786
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MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

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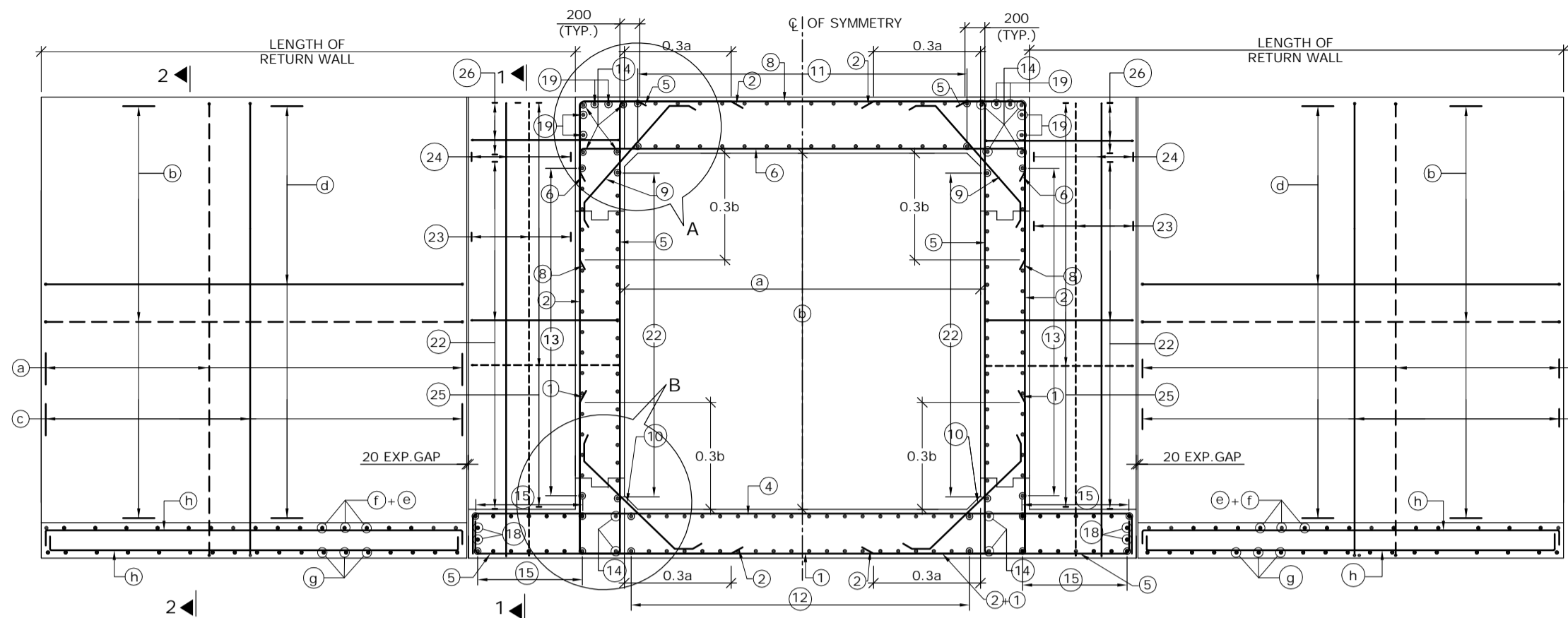
PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

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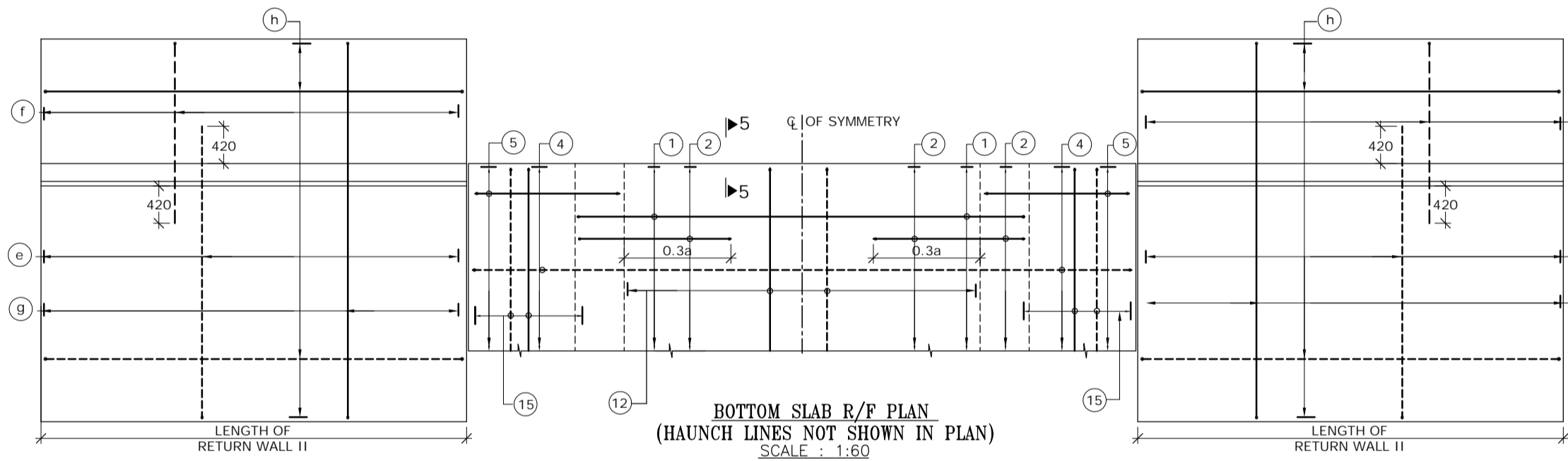
Package :- IV District :- SENAPATI
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Design Chainage :- 81+870 to 105+825

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

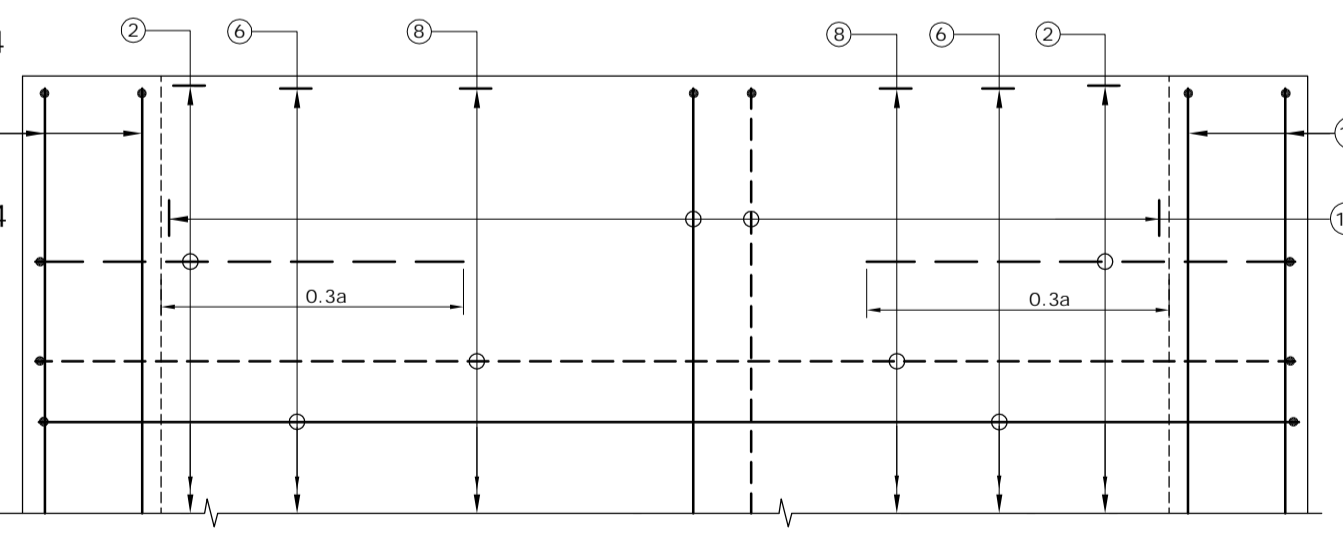
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/SLP/SE/GA (SHEET NO-01 OF 01)	Drawn By. S. Chattrjee	Design By. -	Checked By. Avishek Dey	Approved By. Soubhik Sadhu
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REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

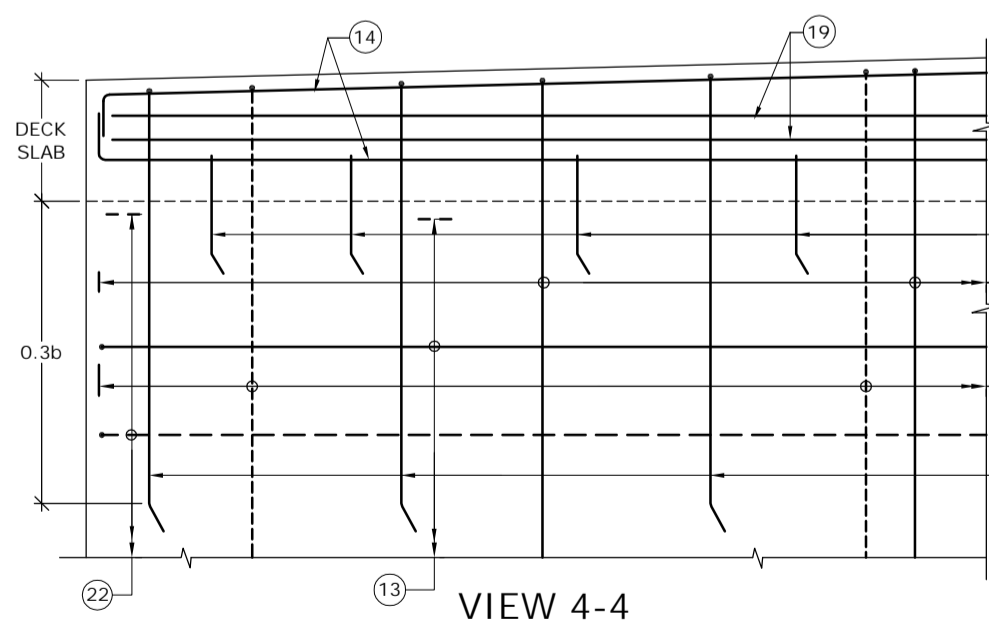


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

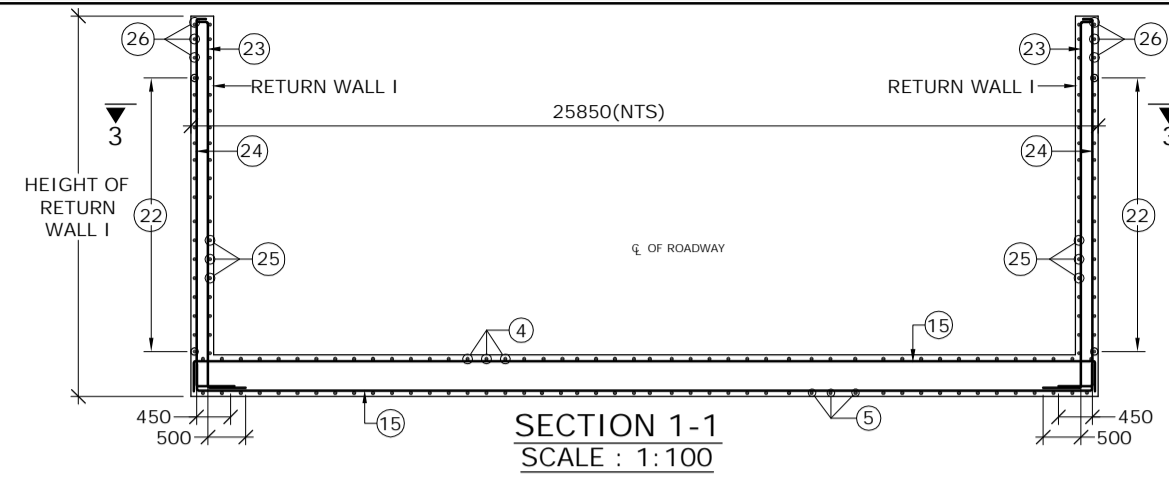


TOP SLAB R/F PLAN
SCALE : 1:30

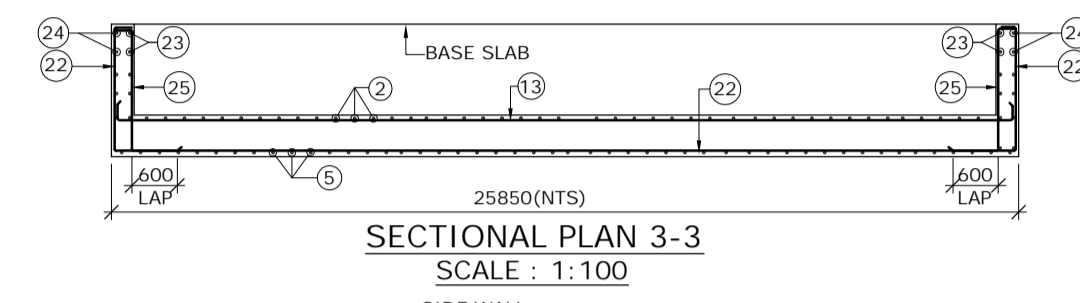
(BAR MARK (5), (19), KERB &
HAUNCH LINES NOT SHOWN IN PLAN)



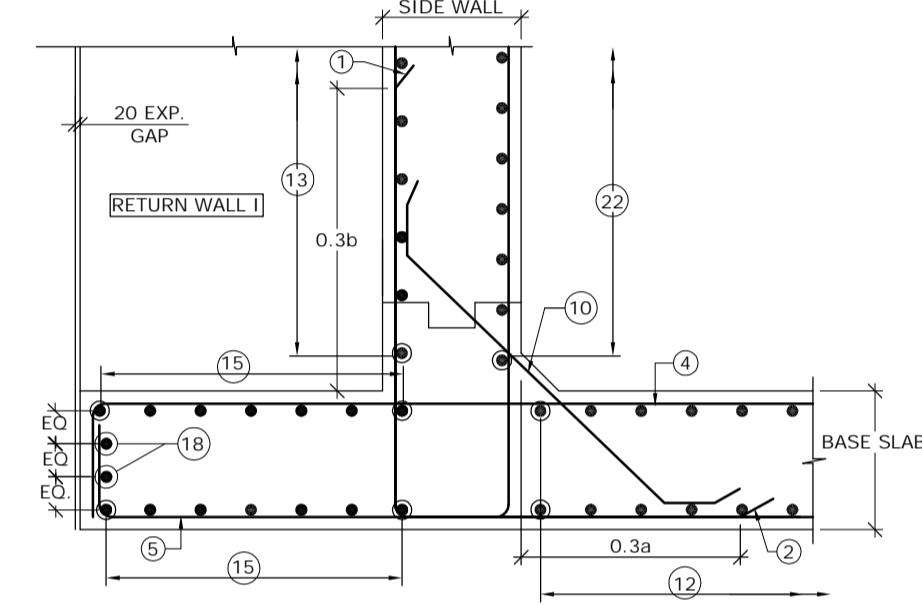
VIEW 4-4
SCALE : 1:30



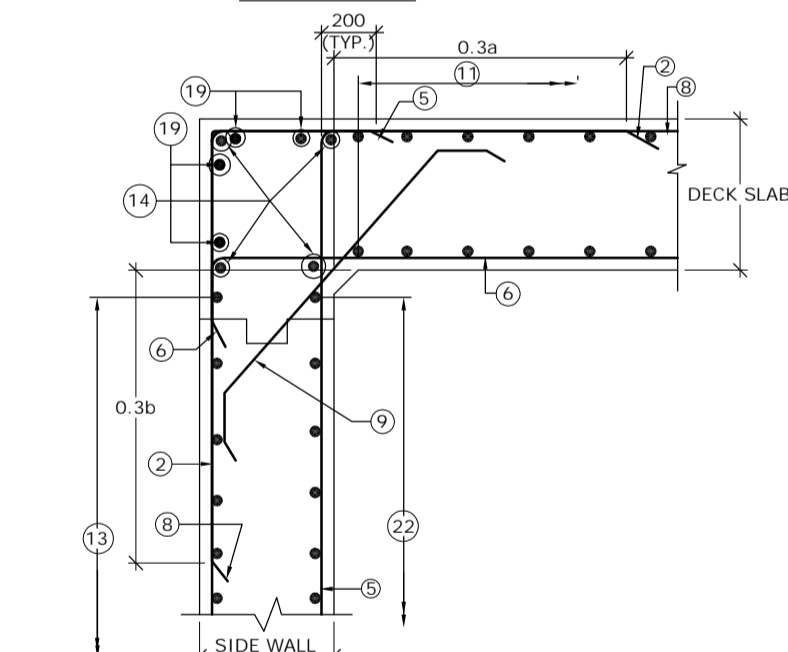
SECTION 1-1
SCALE : 1:100



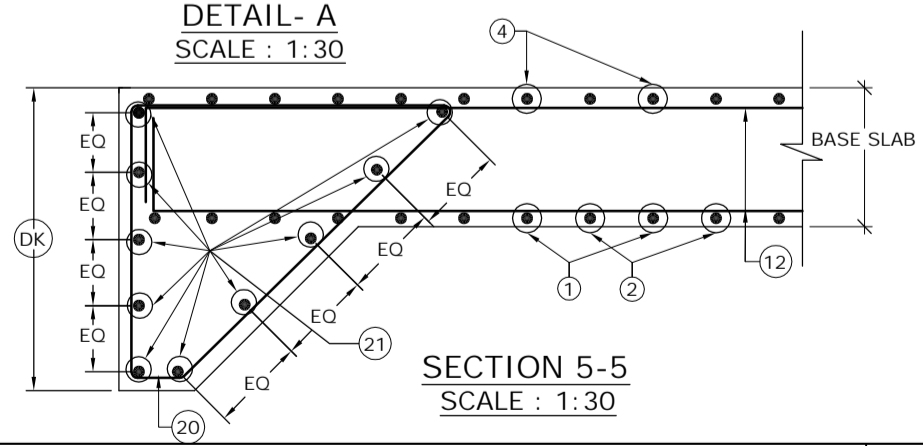
SECTIONAL PLAN 3-3
SCALE : 1:100



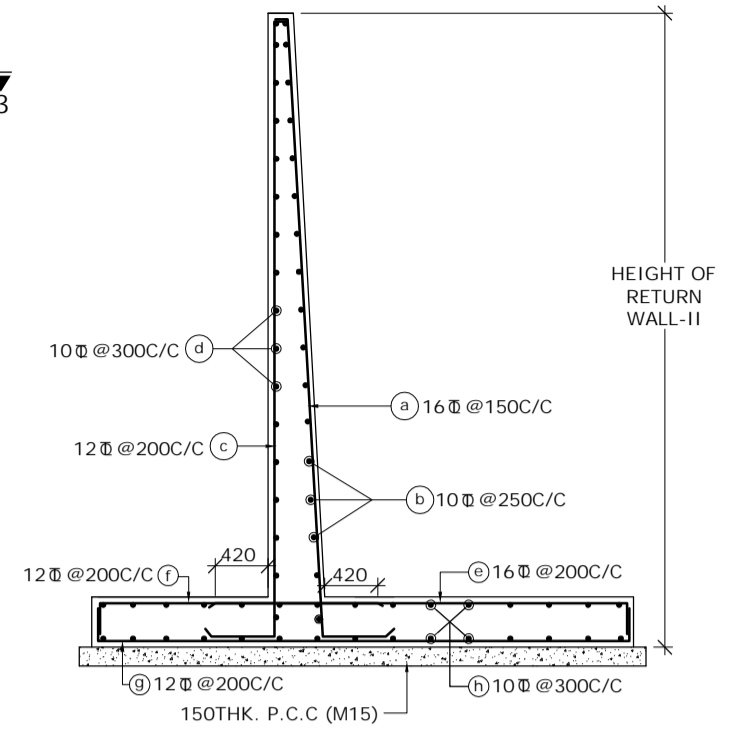
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

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BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
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(4)	16	250	(16)	12	-
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(6)	16	250	(18)	10	-
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(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
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 Drawn By: S. Chattrjee
 Design By: -
 Checked By: Avishek Dey
 Approved By: Soubhik Sadhu

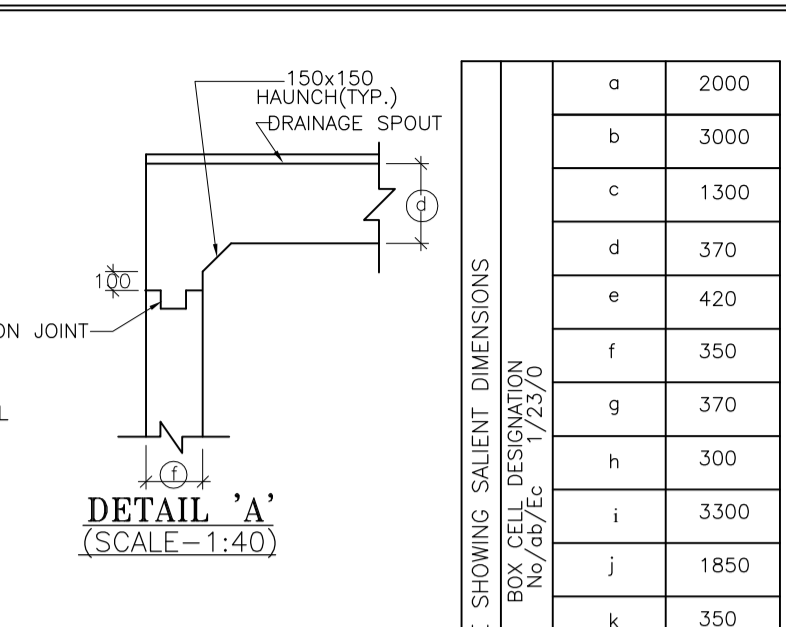
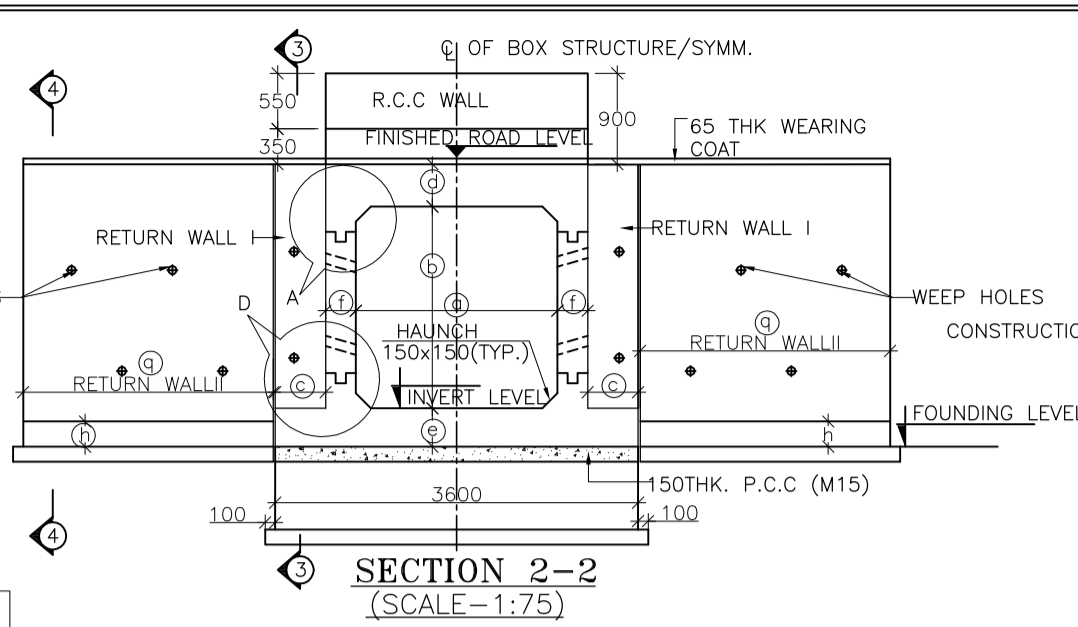
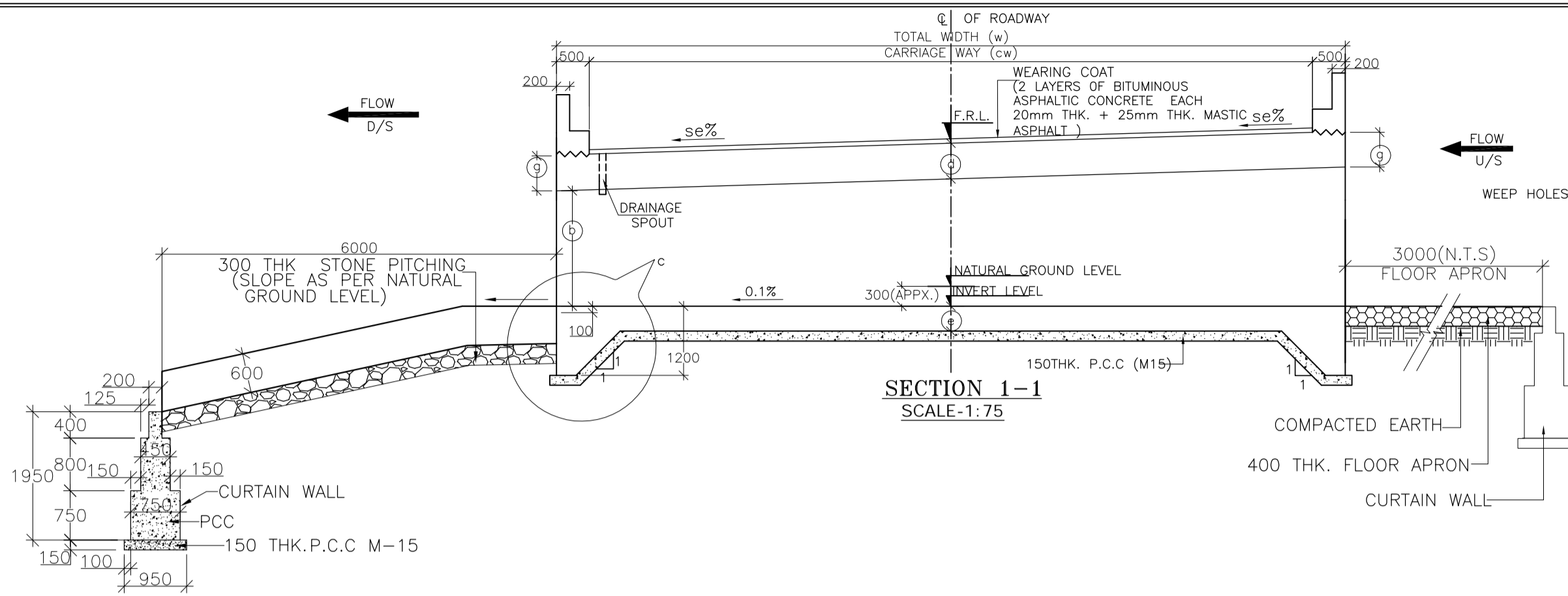
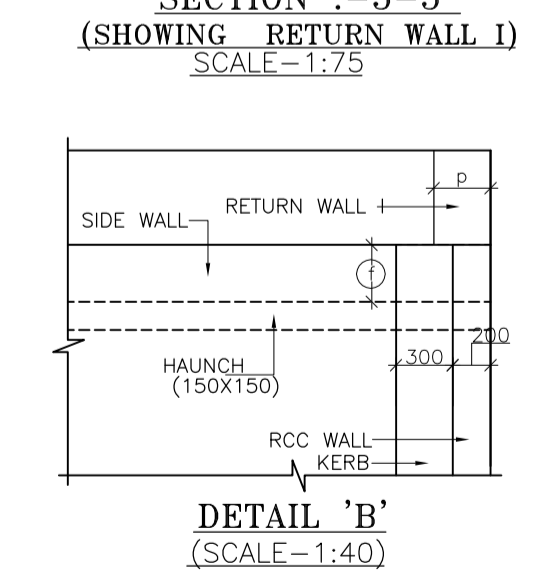
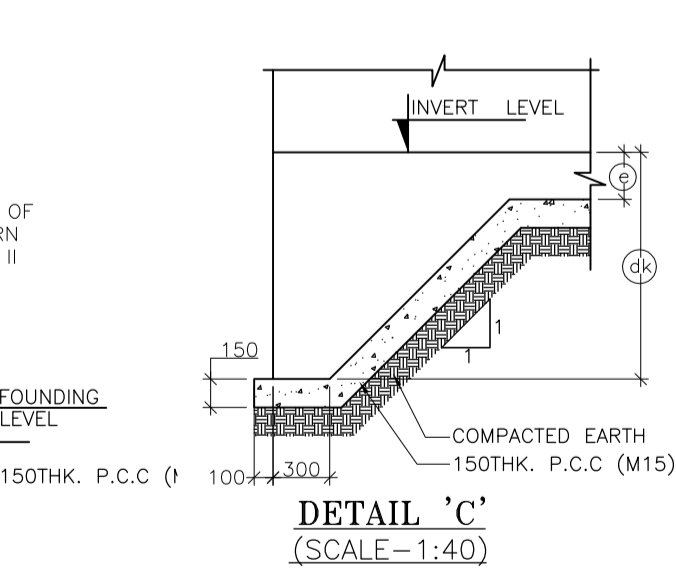
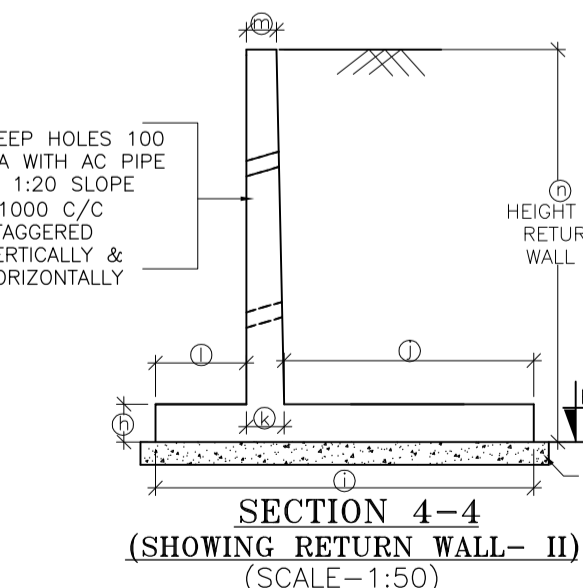
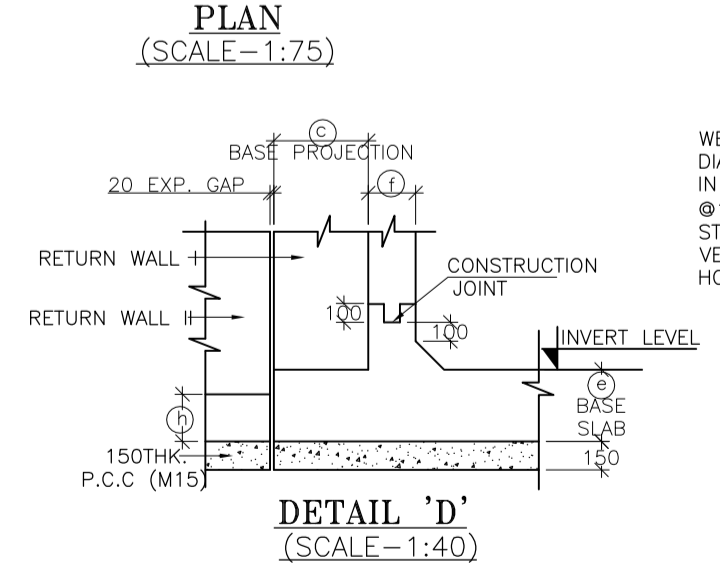
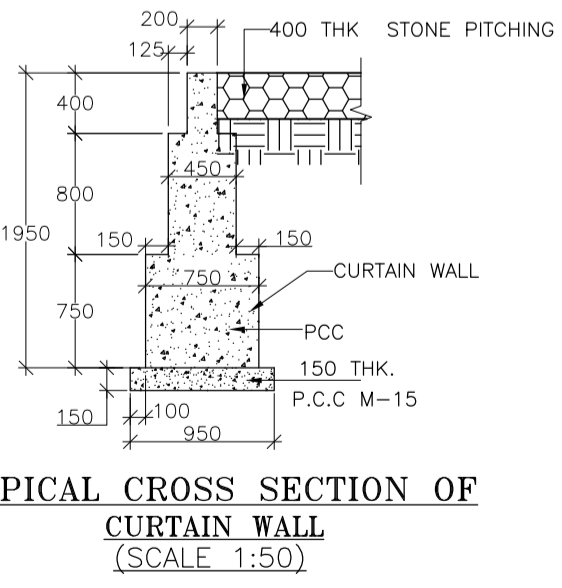
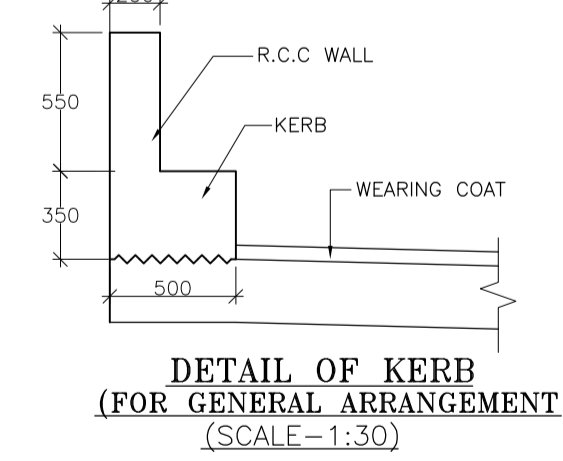
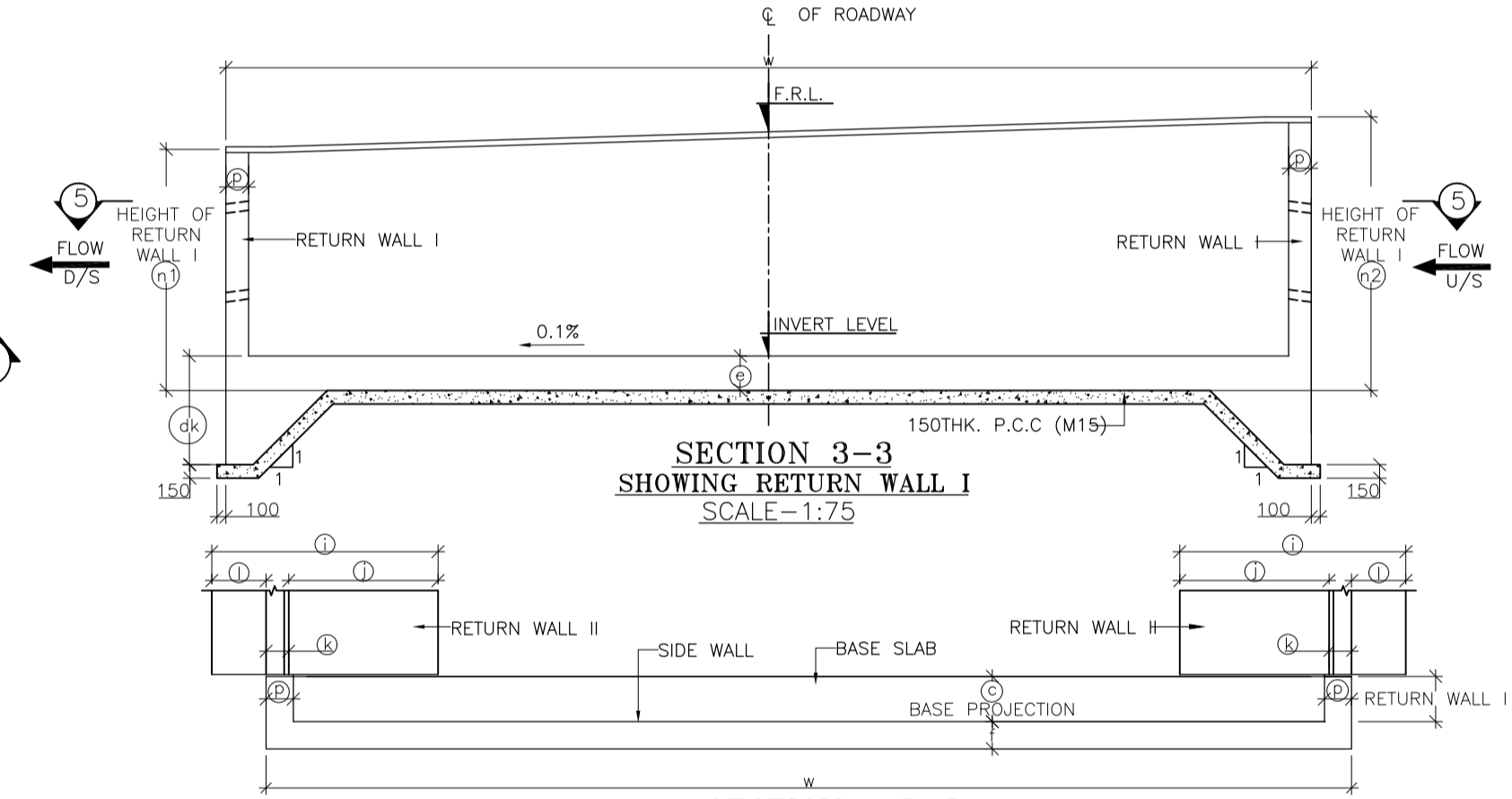
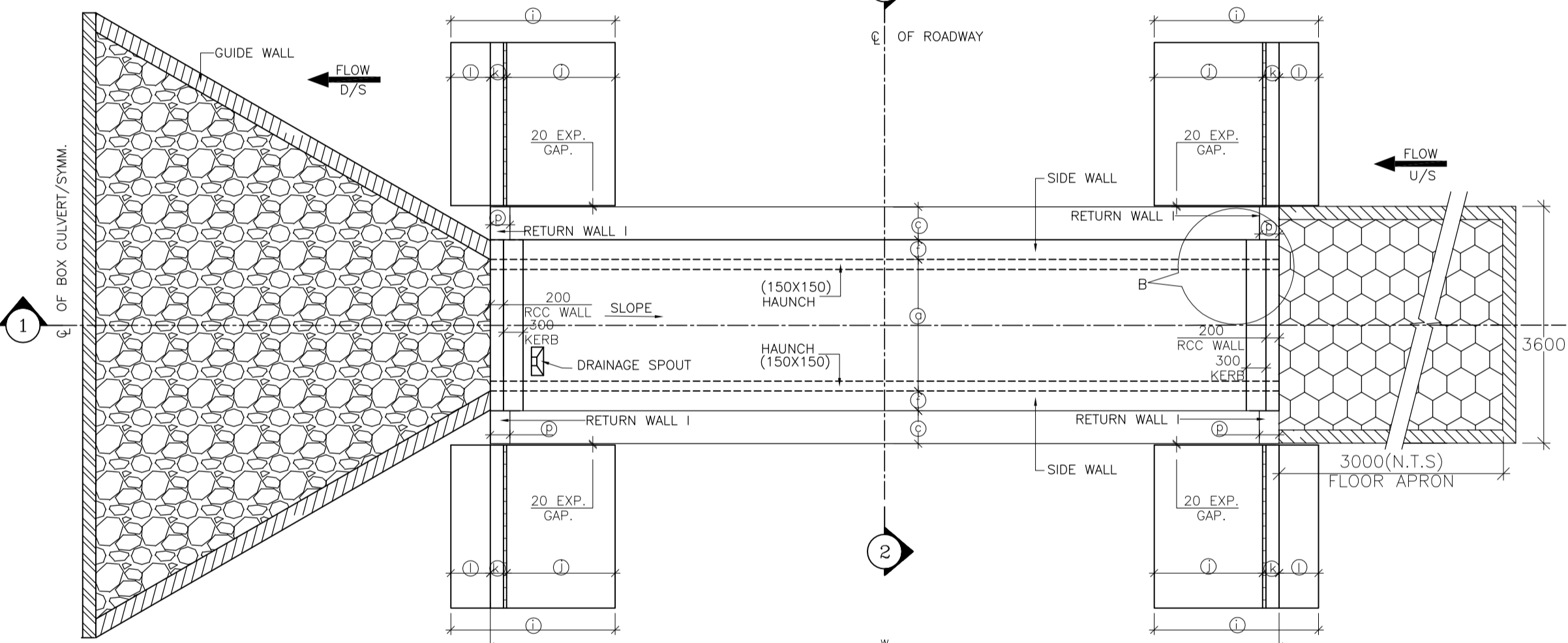


TABLE SHOWING SALIENT DIMENSIONS

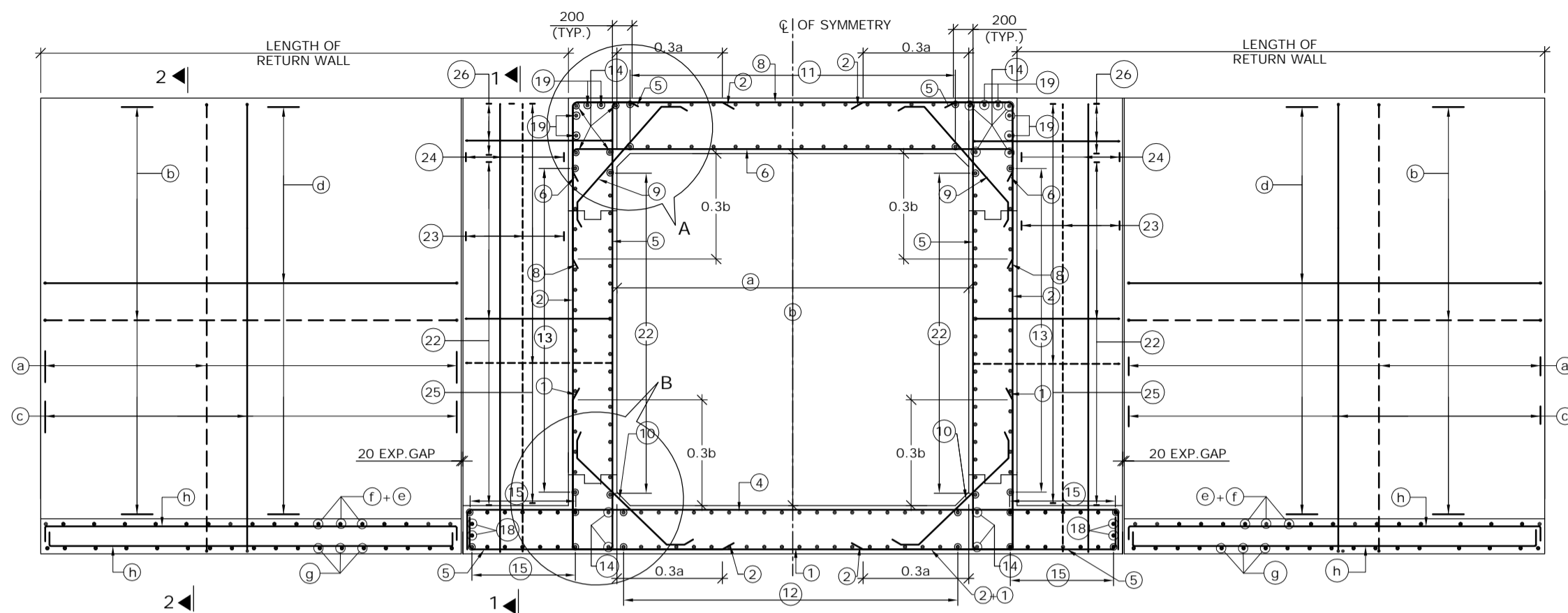
BOX CELL DESIGNATION No./Sp/Ec	TABLE NO.	HEIGHT
a	2000	
b	3000	
c	1300	
d	370	
e	420	
f	350	
g	370	
h	300	
i	3300	
j	1850	
k	350	
l	1100	
m	200	
n1	3532	
n2	4049	
p	300	
q	4000	
dk	1200	

STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
104/1	103+085	1534.282	2X3X1 Cell	4.70	L TO R	11.00	No Catch pit	Slope	1531.082	1530.662	3.790	4.260

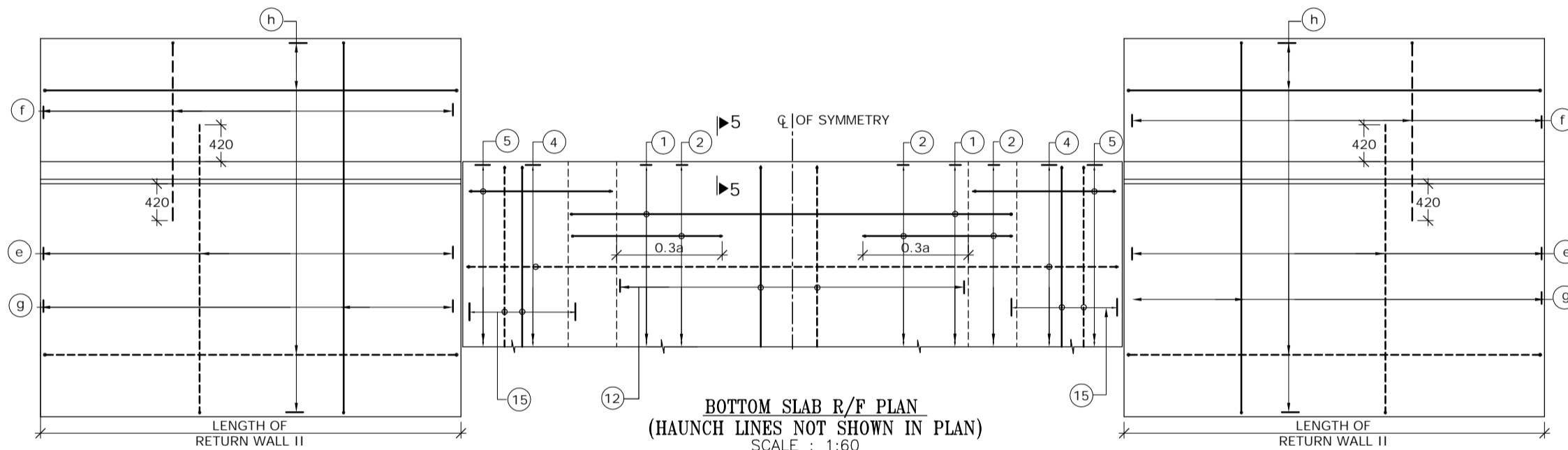


- NOTES :
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE = M25
CURTAIN WALL = M25
LEVELLING COURSE (P.C.C.) = M15
RETURN WALL = M25
RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS 7R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.8 \text{ t/m}^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 t/m² BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/SLP/F/SE/RCC (SHEET NO-01)

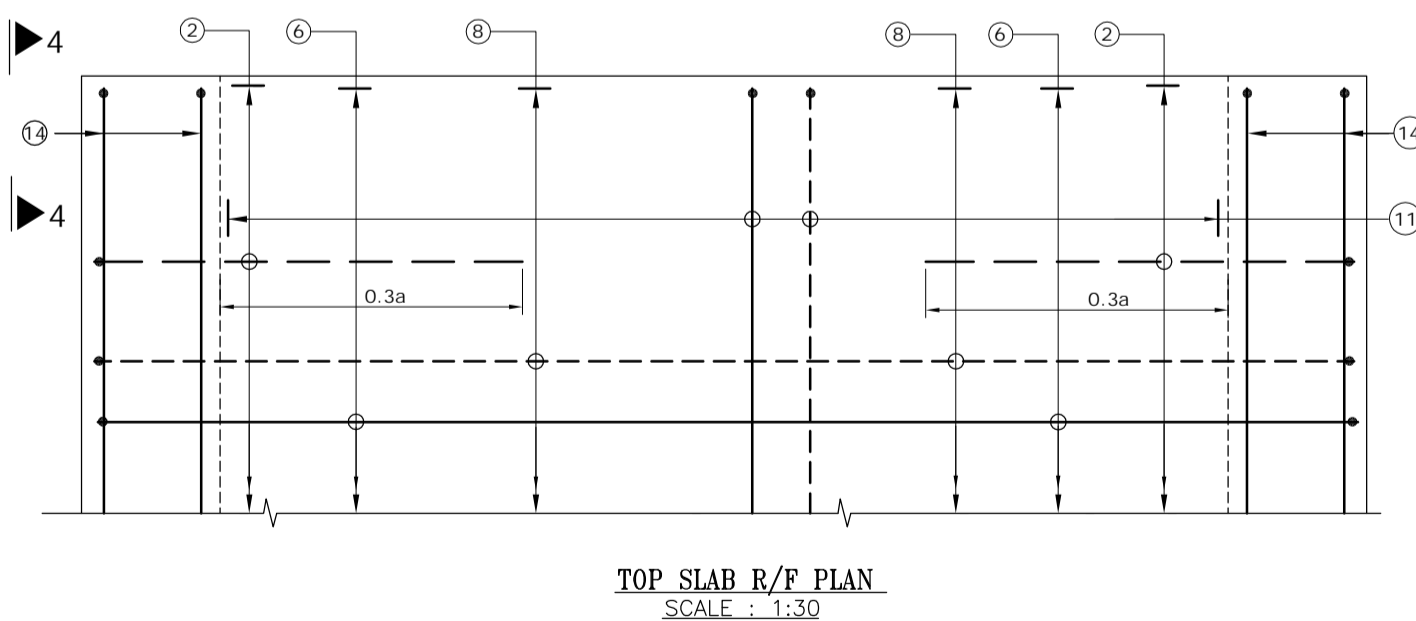
SCALE: AS SHOWN DATE: SEPT, 2016					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0) WITH FLOOR APRON & SLOPPED PROTECTION					CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/SLP/F/SE/GA				
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.					Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825					Drawn By: A. Sahoo Design By: - Checked By: Avishek Dey Approved By: Soubhik Sadhu														



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

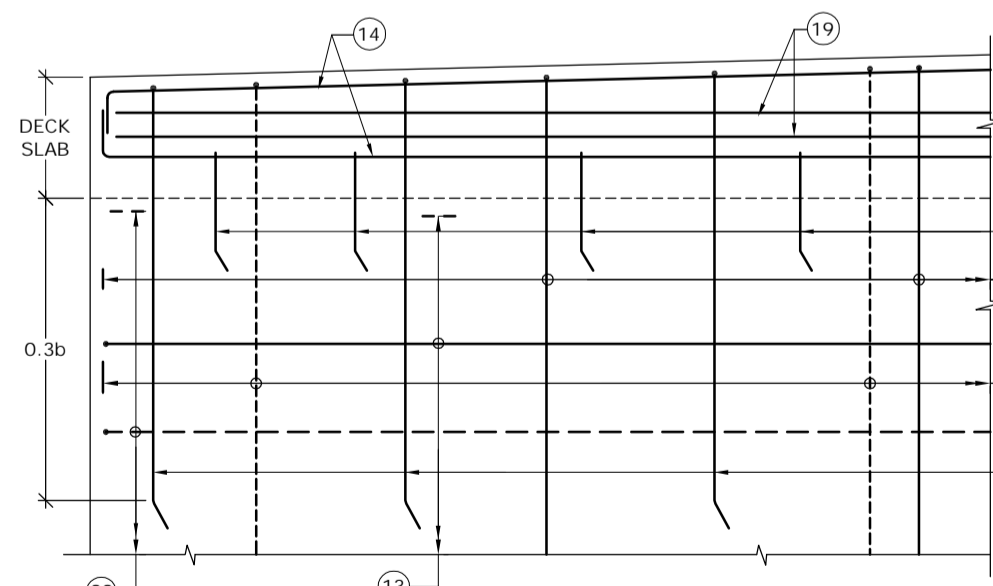


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

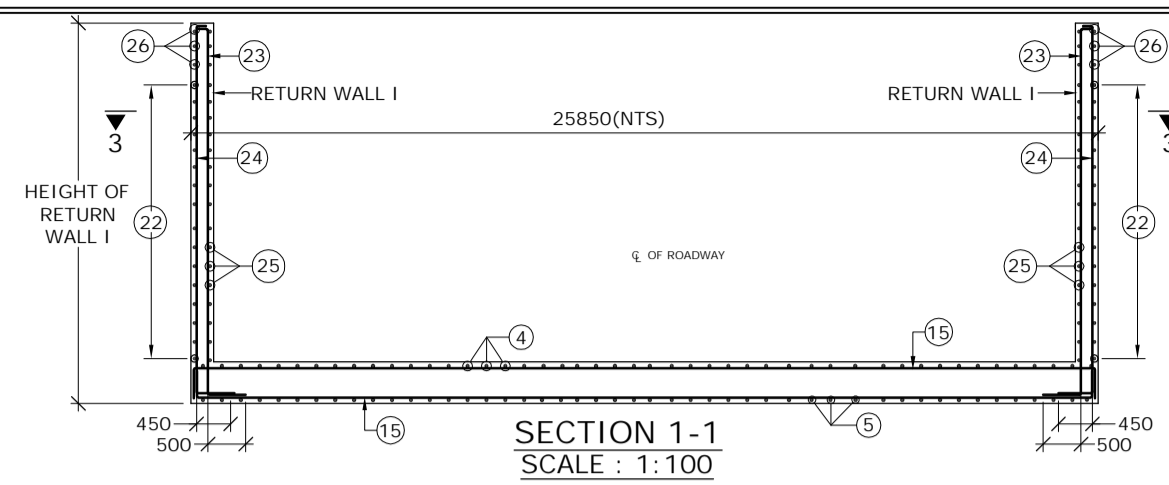


TOP SLAB R/F PLAN
SCALE : 1:30

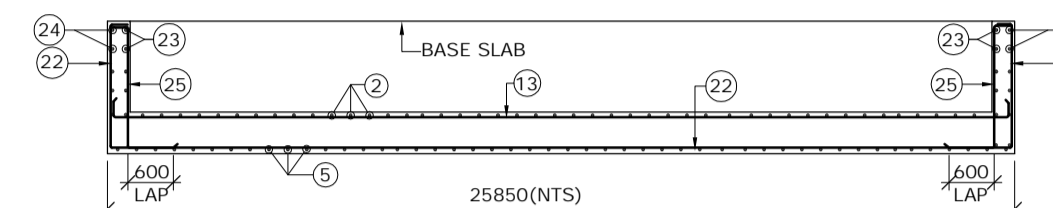
(BAR MARK (5), (19), KERB &
HAUNCH LINES NOT SHOWN IN PLAN)



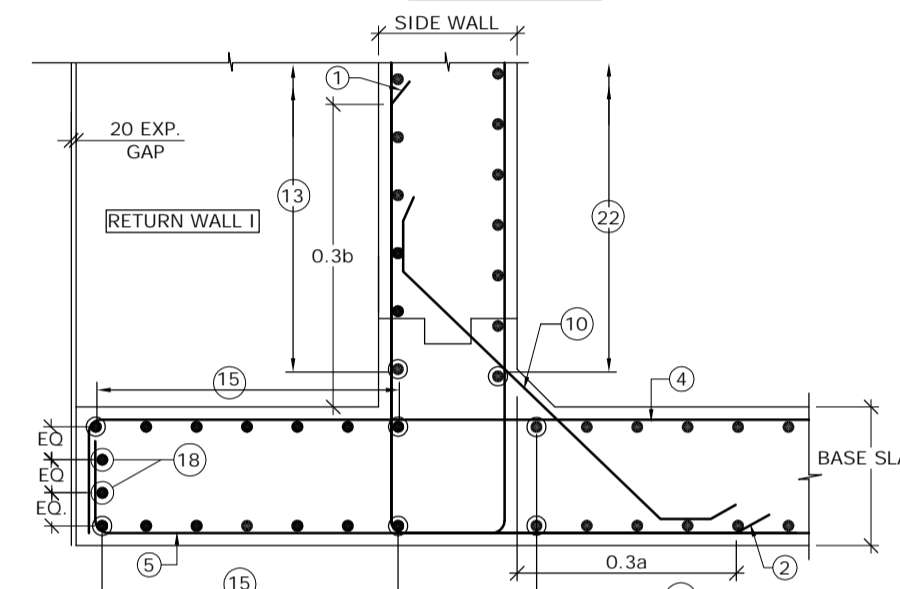
VIEW 4-4
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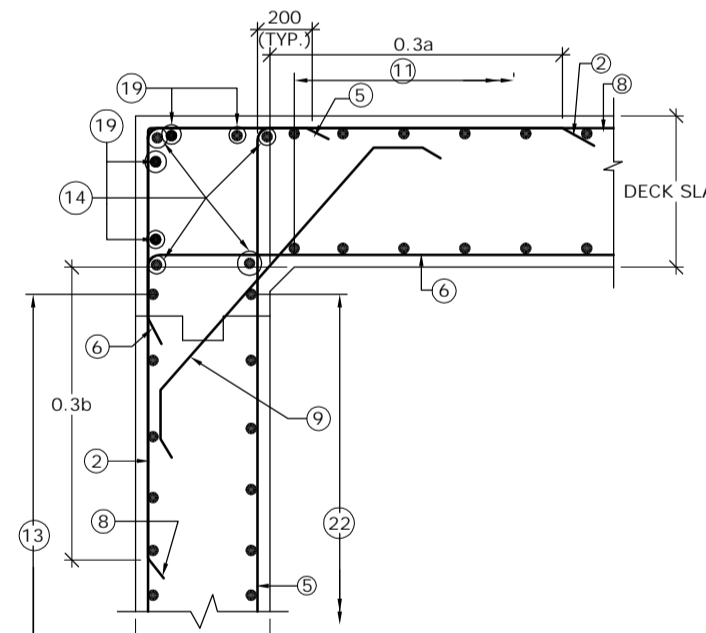
SECTION 1-1
SCALE : 1:100



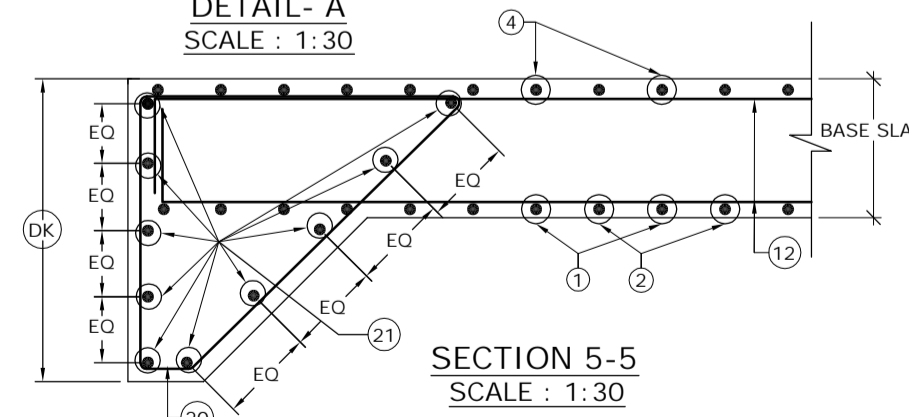
SECTIONAL PLAN 3-3
SCALE : 1:100



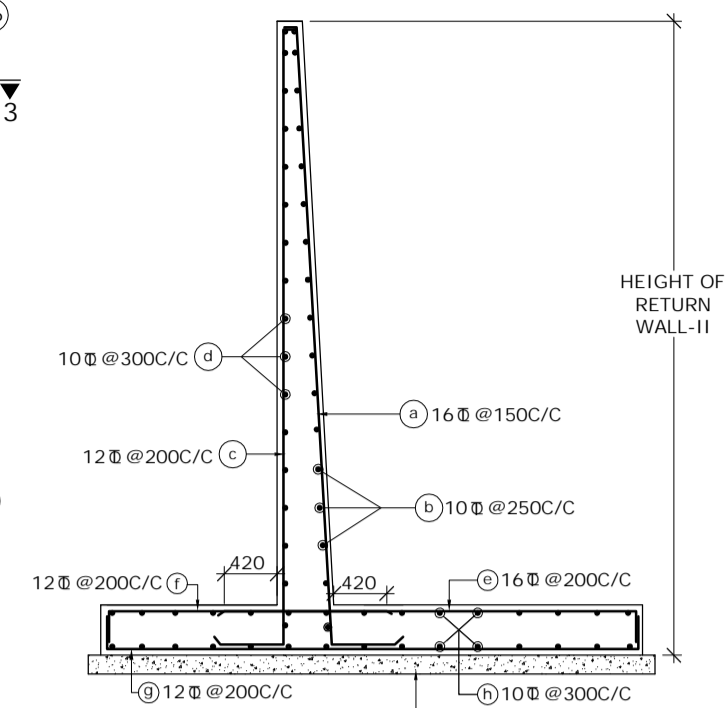
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/SLP/F/SE/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0)

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 ANISUWA, 3480, 8, CHHISLA BLDG
 Central Company

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/SLP/F/SE/RCC

Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu

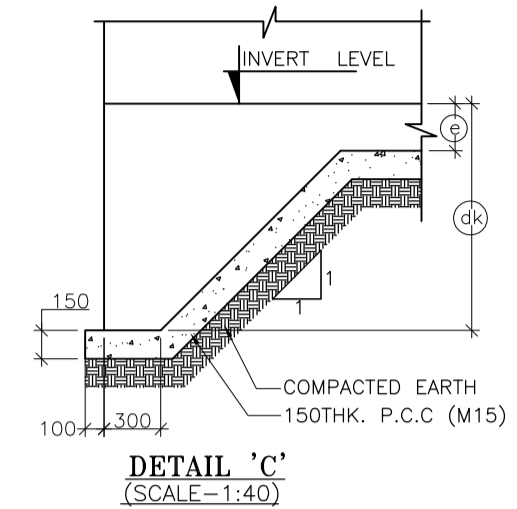
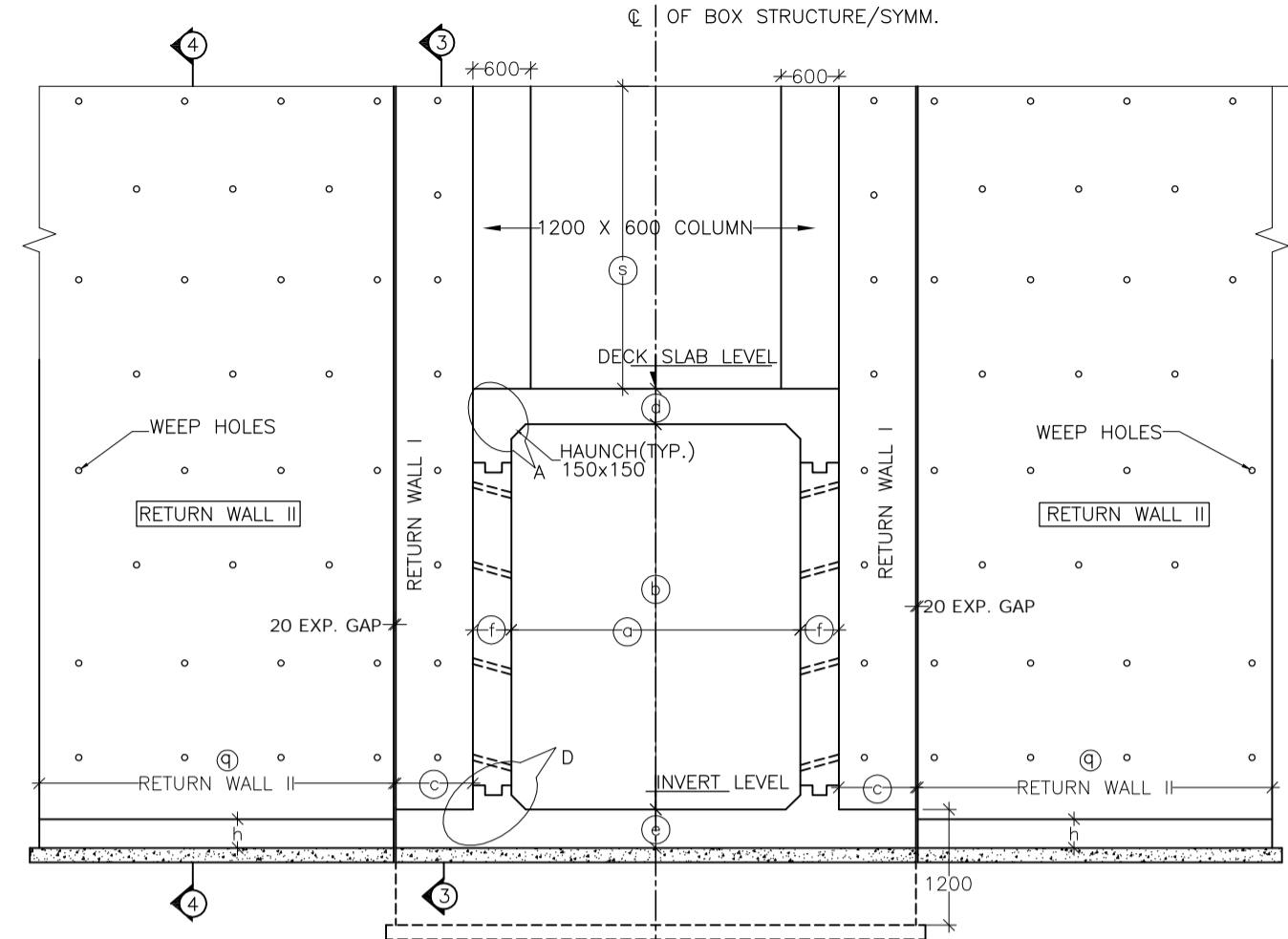
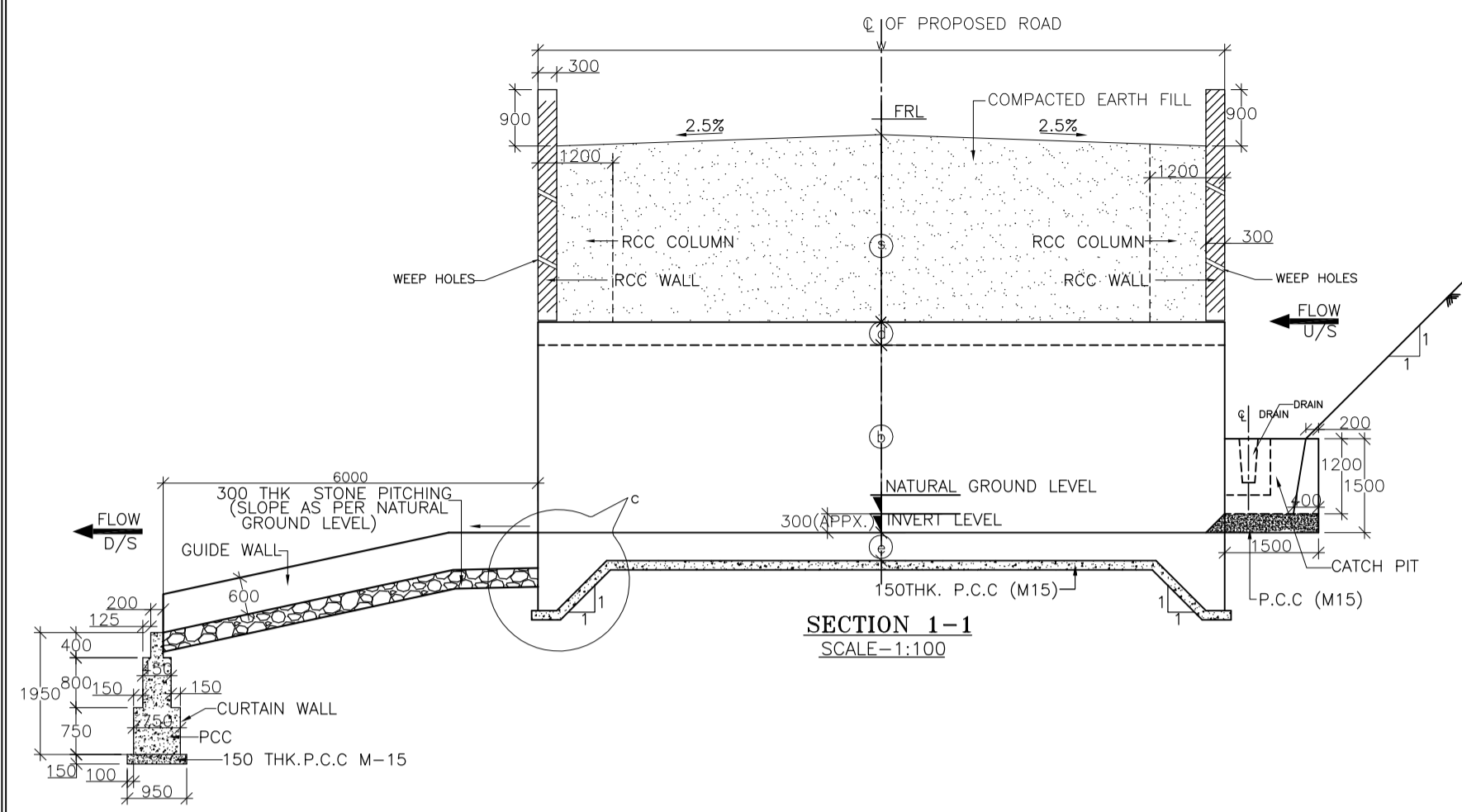
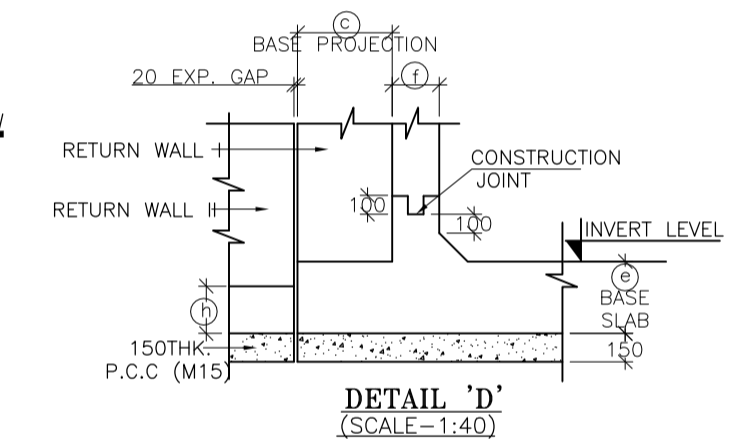
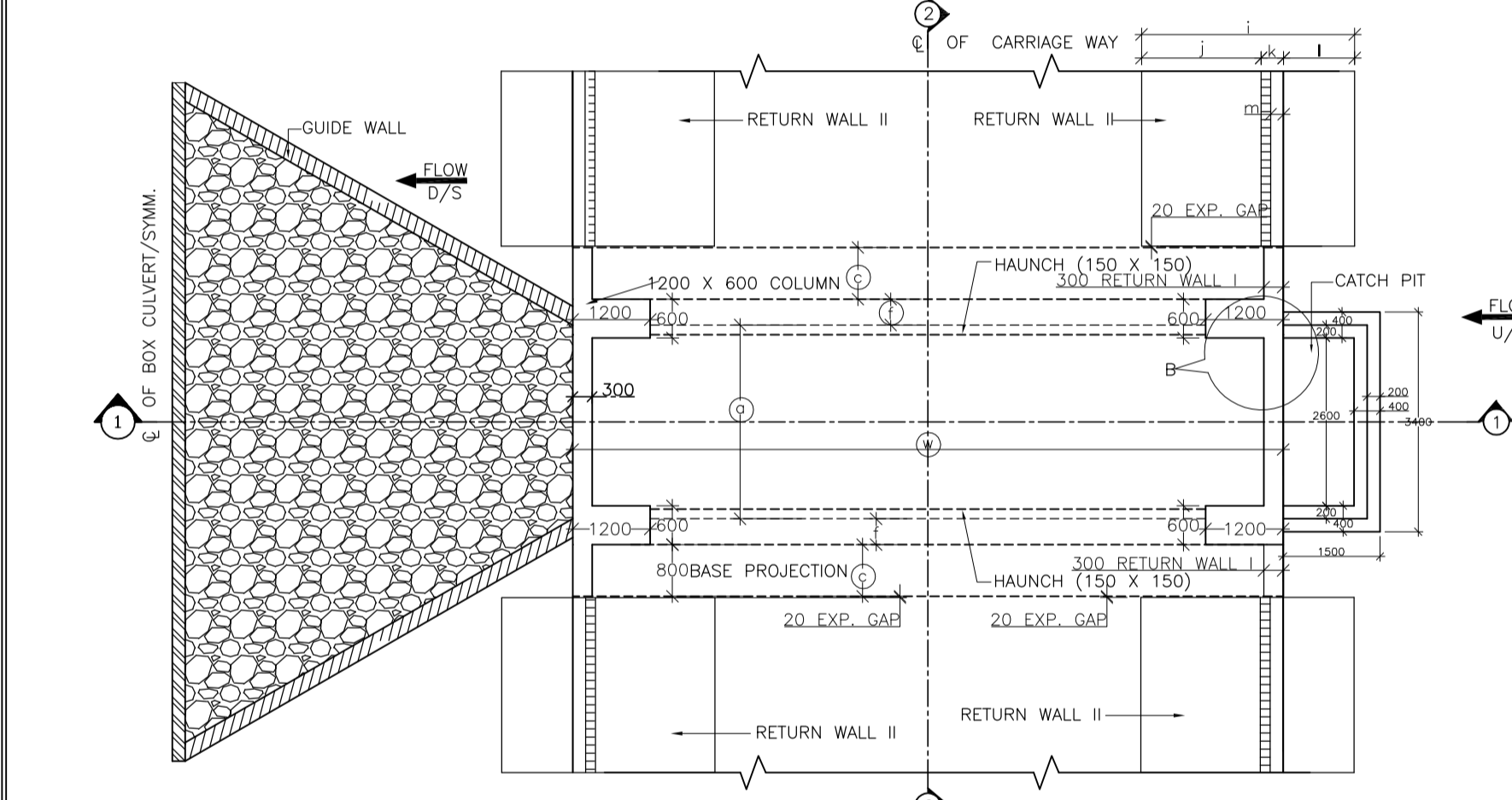
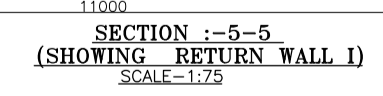
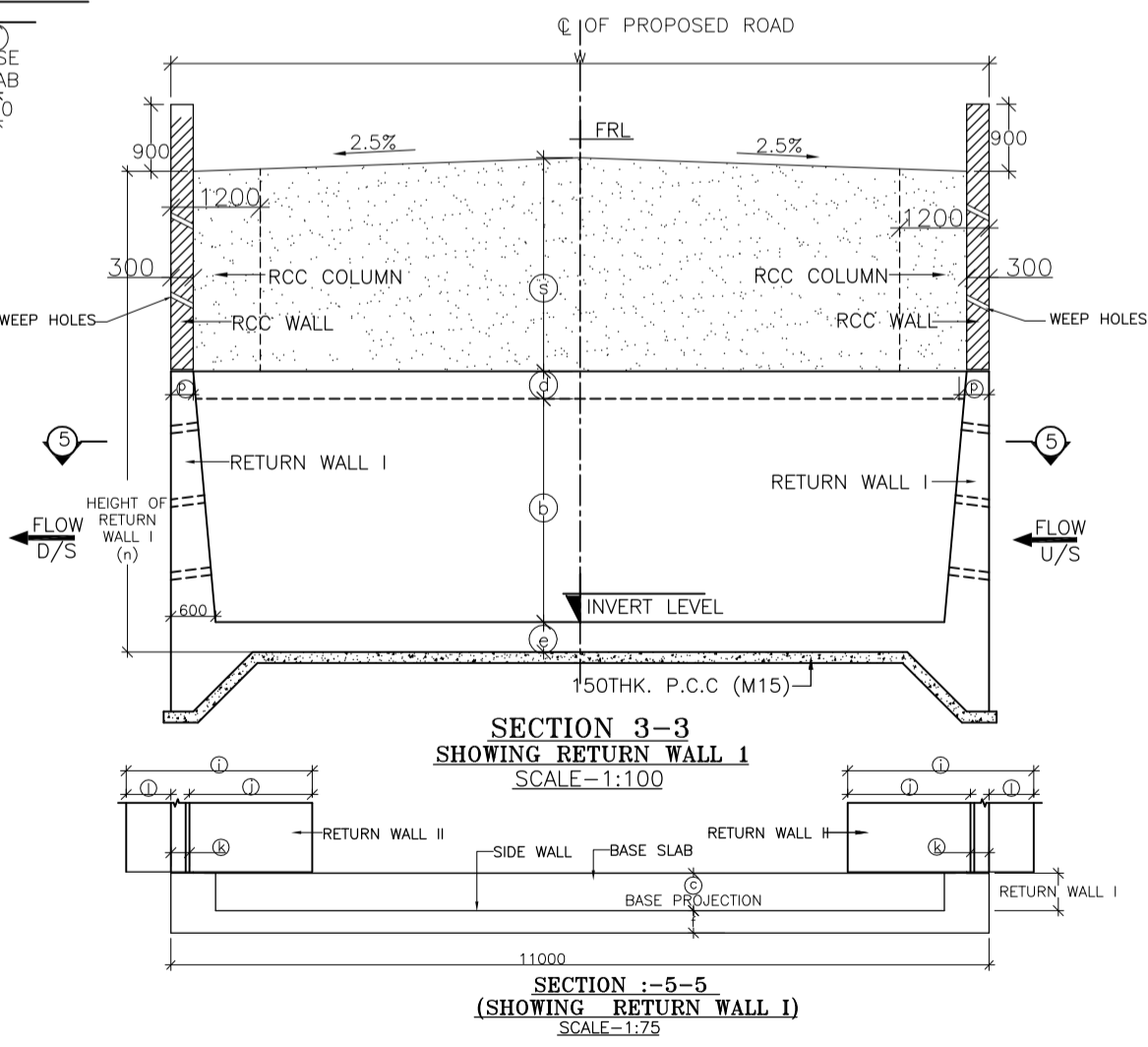
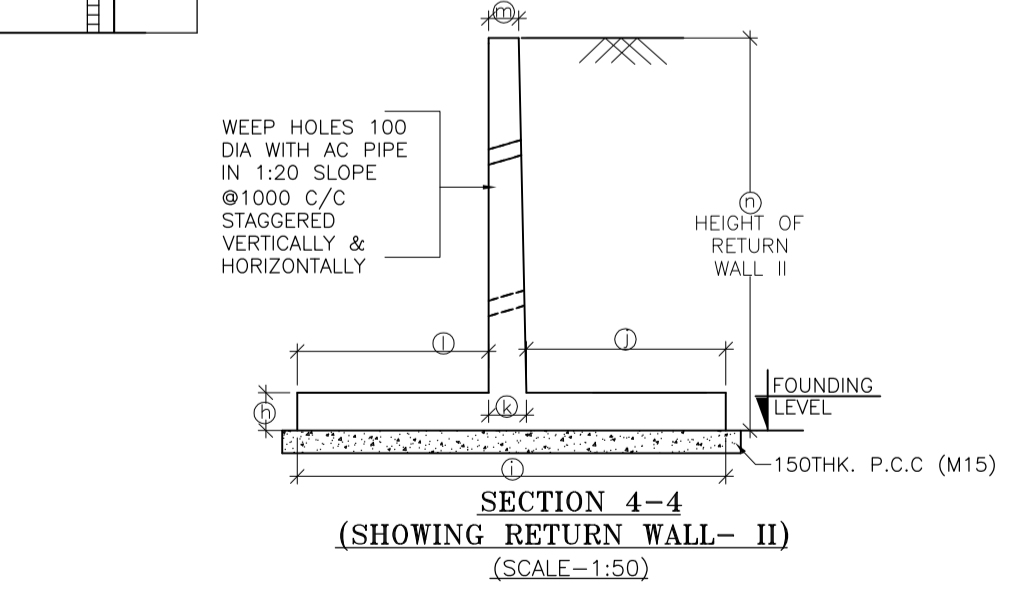
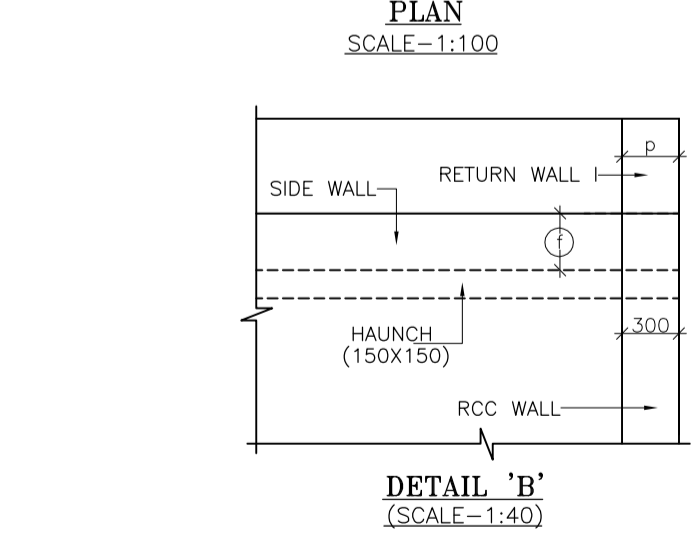
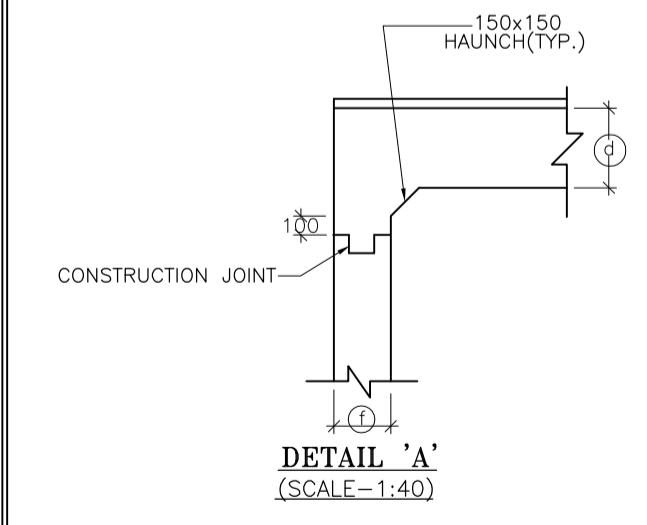


TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION	No. of Cell / 2.5/1.5
a	2000
b	3000
c	1100
d	280
e	300
f	350
h	300
i	5600
j	3100
k	600
l	1900
m	300
n	6520
p	300
q	8400
s	3000
dk	1200

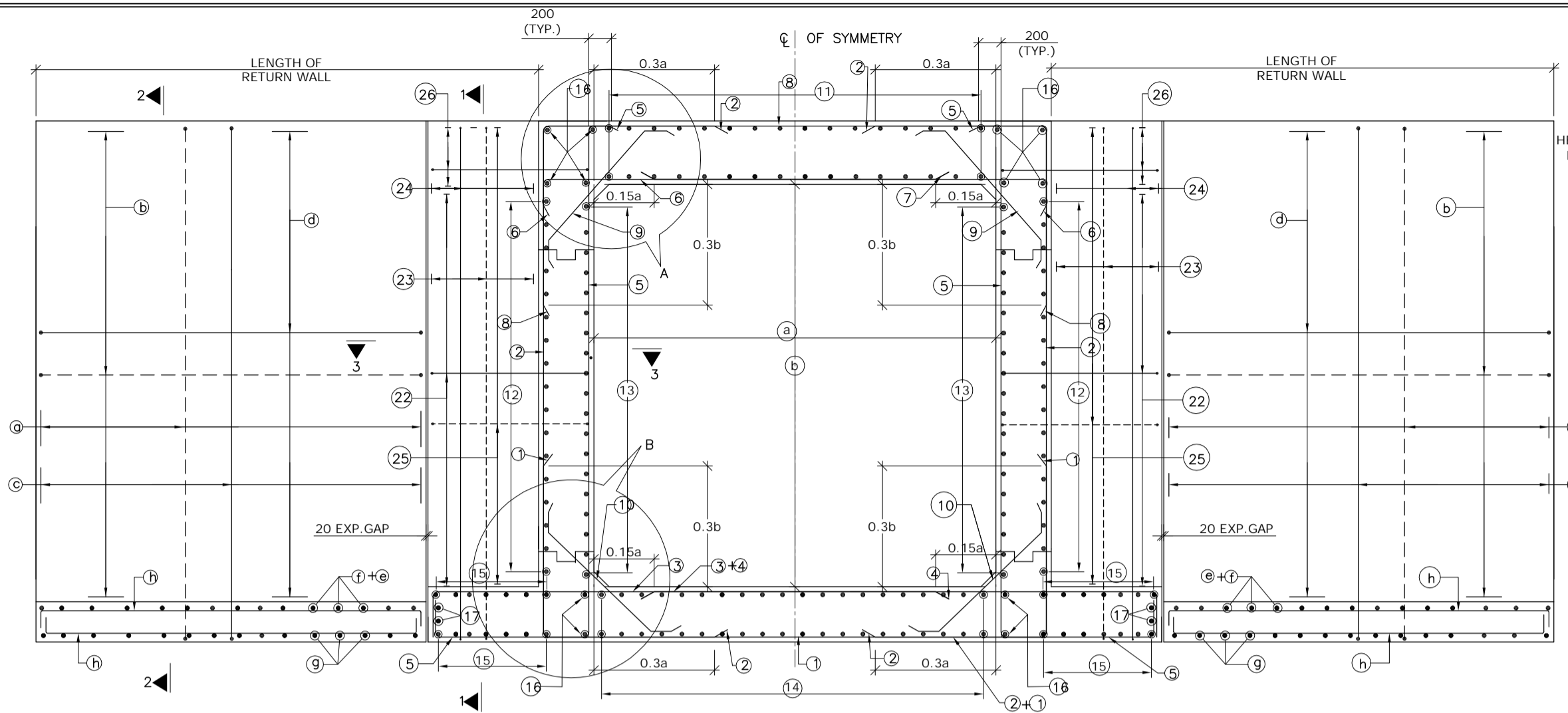


STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Cushion Height (m)	Super Elevation (%)	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
							U/S	D/S		
104/3	103+568	1531.903	2X3X1 Cell Earth Cushion	3.00	Normal Camber	13.00	With Catch pit	Slope	1525.473	1525.173

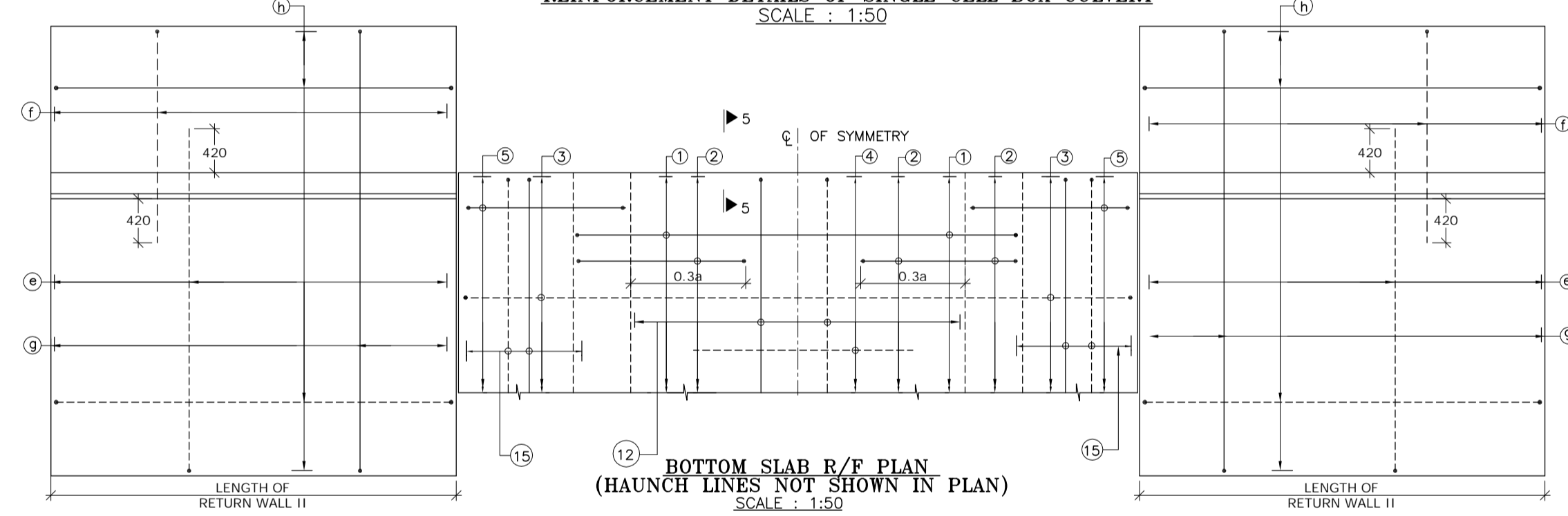


- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE - M25
CURTAIN WALL - M25
LEVELLING COURSE (P.C.C.) - M15
RETURN WALL - M25
RCC WALL & KERB - M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS FOR TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.8t/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM $15 t/m^2$ BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1.3M EC/CP/SLP/NC/RCC (SHEET NO-01)

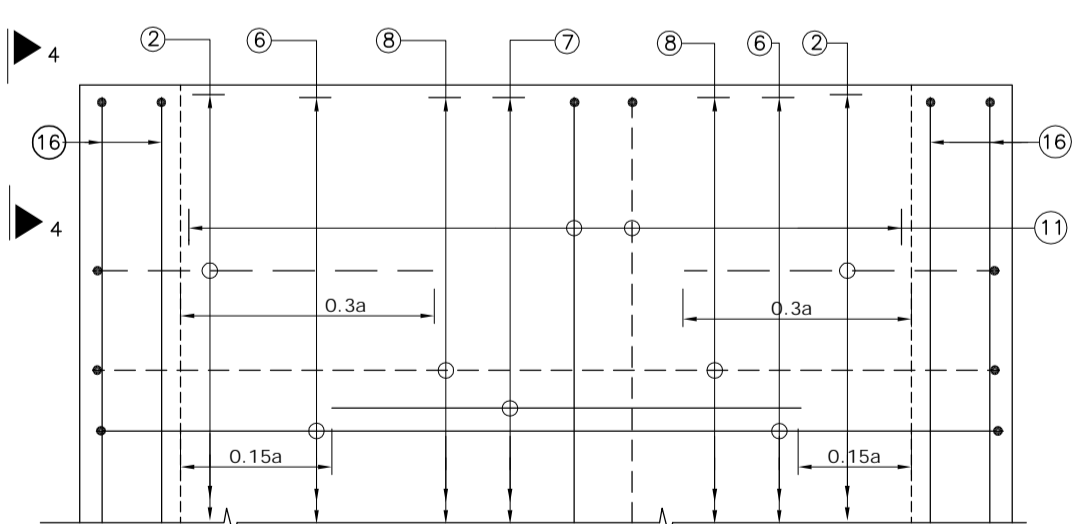
<table border="1"> <thead> <tr> <th>MKD.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>CHKD.</th> <th>APPRD.</th> </tr> </thead> <tbody> <tr> <td colspan="5">REVISIONS</td> </tr> </tbody> </table>					MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	REVISIONS					SCALE: AS SHOWN PROJECT:	CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0) WITH 3.0M EARTH CUSHION WITH CATCH PIT & SLOPE PROTECTION Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Design Chainage :- 81+870 to 105+825	CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092.	DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1.3M EC/CP/SLP/NC/GA Drawn By: S. Chattrjee Design By: Avishek Dey Checked By: Avishek Dey Approved By: Soubhik Sadhu
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.															
REVISIONS																			
DATE: SEPT, 2016		PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.			DATE: SEPT, 2016														



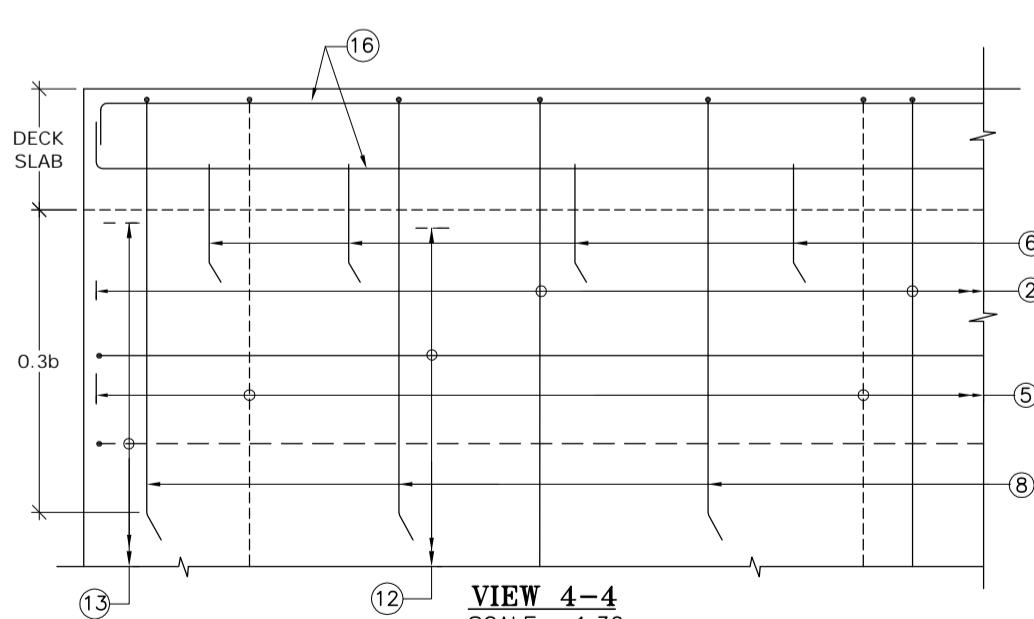
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:50



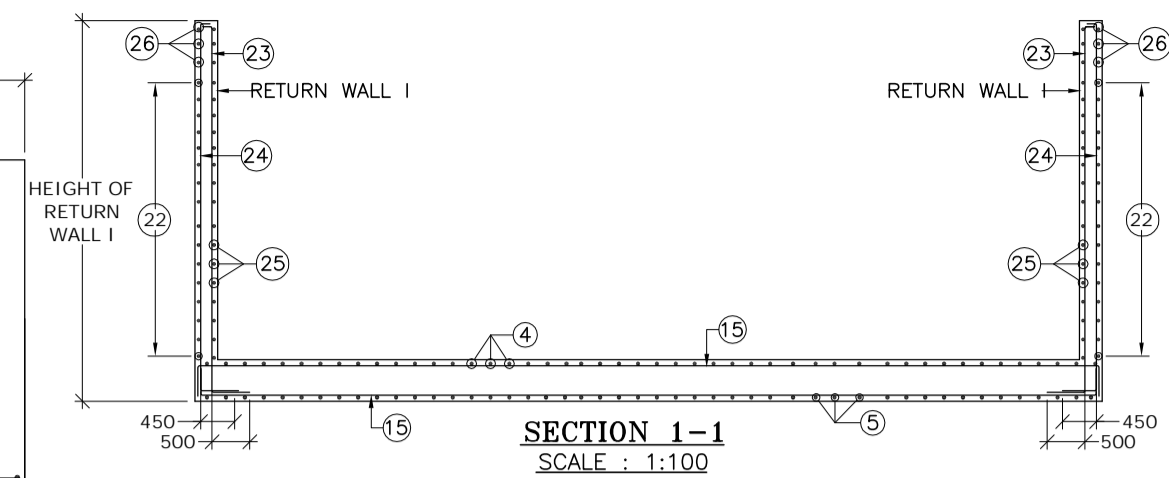
BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:50



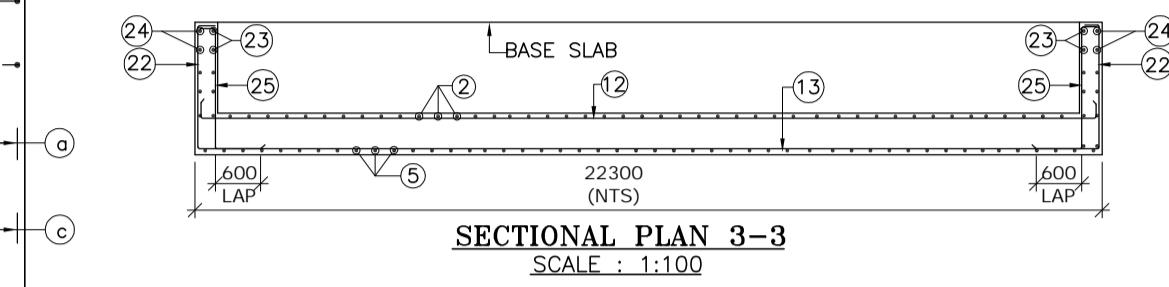
TOP SLAB R/F PLAN
SCALE : 1:30
(BAR MARK 5, 19, 9 KERB & HAUNCH LINES NOT SHOWN IN PLAN)



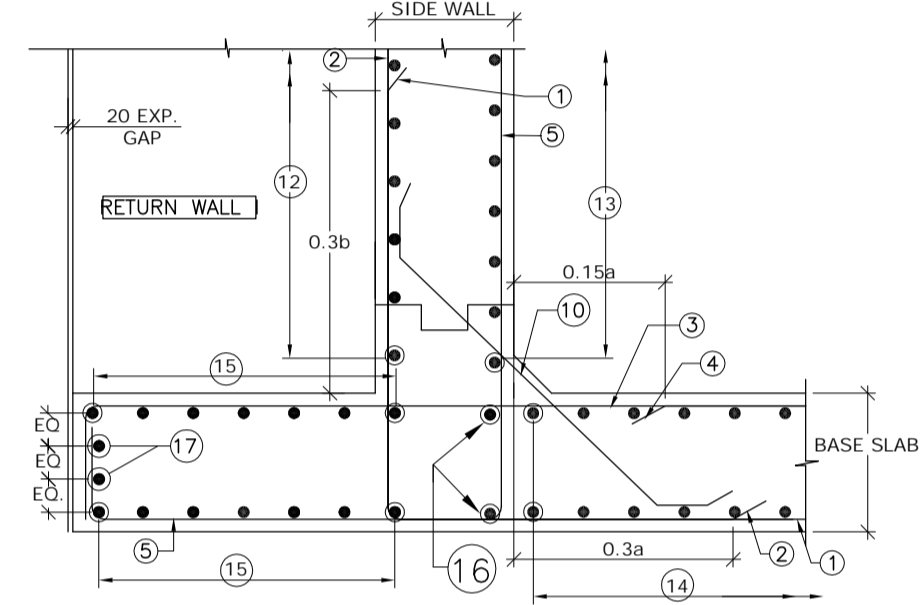
VIEW 4-4
SCALE : 1:30



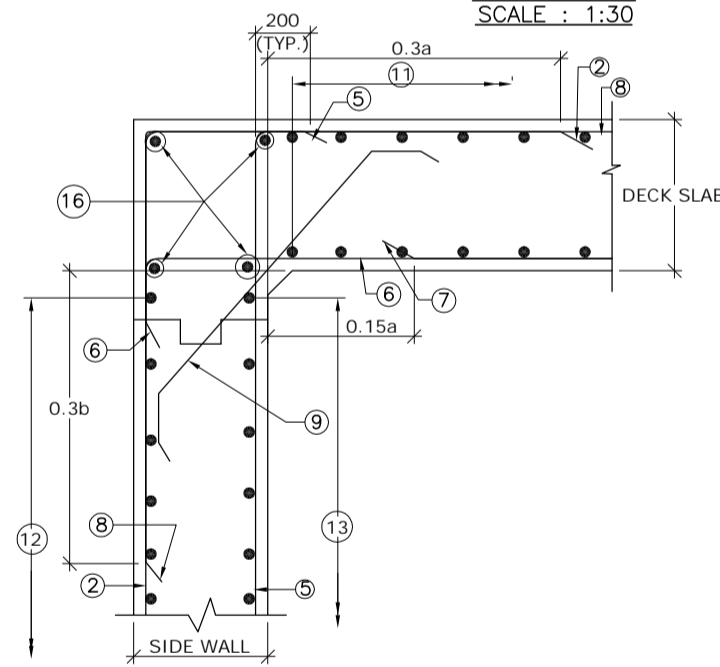
SECTION 1-1
SCALE : 1:100



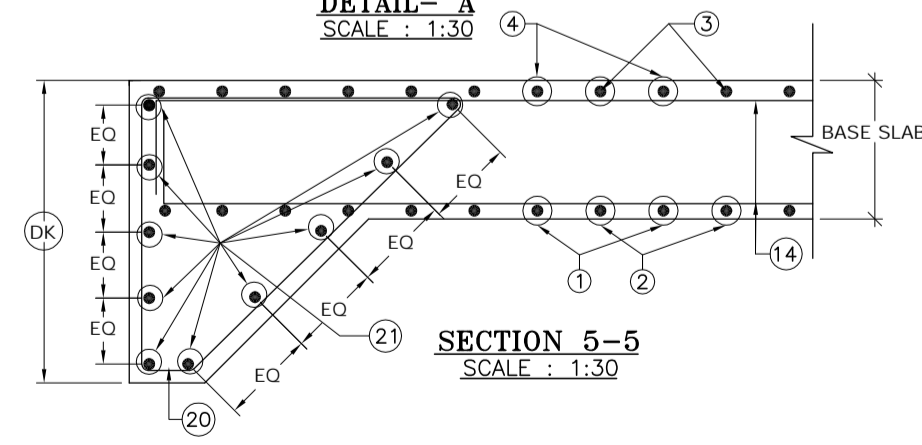
SECTIONAL PLAN 3-3
SCALE : 1:100



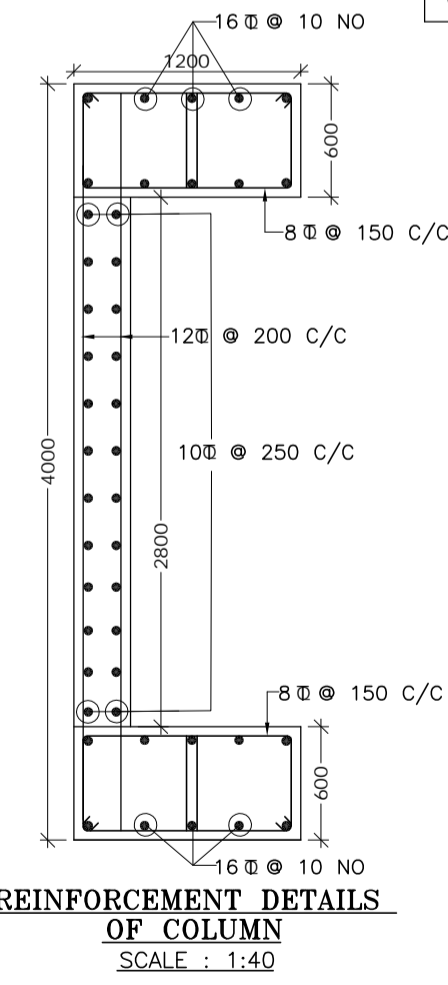
DETAIL- B
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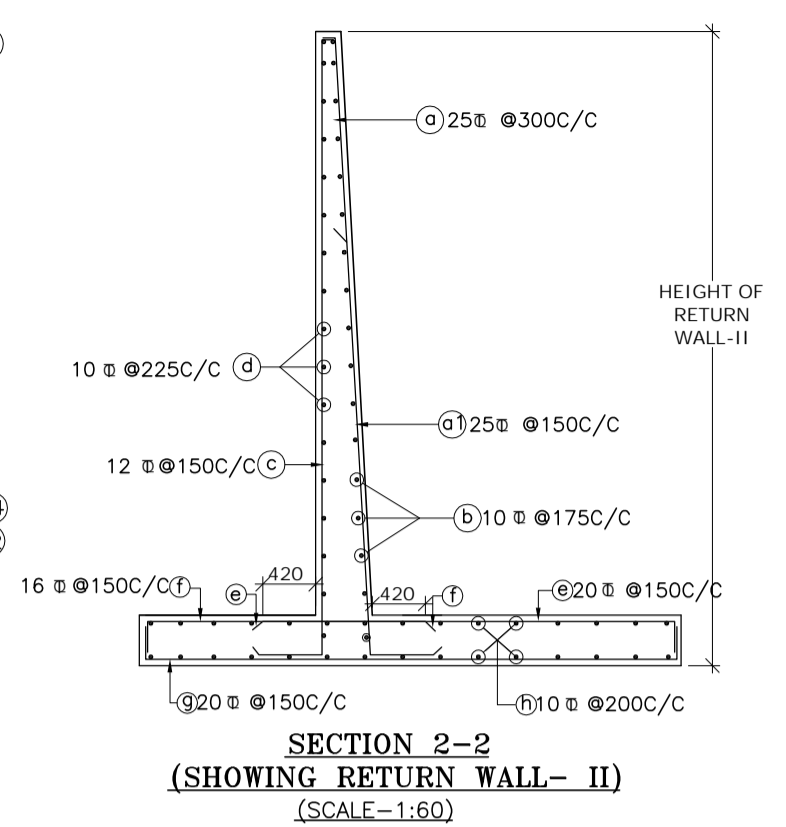
DETAIL- A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



REINFORCEMENT DETAILS OF COLUMN
SCALE : 1:40



SECTION 2-2
(SHOWING RETURN WALL- II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	12	200	13	10	250
2	12	200	14	10	250
3	12	130	15	10	250
4	-	-	16	10	-
5	10	200	17	-	-
6	12	180	18	10	150
7	-	-	19	10	-
8	12	200	20	10	150
9	10	200	21	12	-
10	10	200	22	10	250
11	10	250	23	10	200
12	10	250	24	10	200
			25	12	125
			26	10	250

--- TOP FACE BARS/OUTER FACE BARS/EARTH FACE BARS
 --- BOTTOM FACE BARS/INNER FACE BARS/OPP. TO EARTH FACE BARS

- NOTES :**
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH RELEVANT CLAUSE IRC : 112-2011
 - DEVELOPMENT LENGTH (Ld) :
 (a) FOR M25 = 46D
 (b) MINIMUM Ld :
 (i) FOR STRAIGHT BAR = 300MM
 (ii) FOR BENT BAR = 150MM
 BETWEEN (a) & (b) WHICHEVER IS GREATER.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MoRTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1_3M EC/CP/SLP/NC/GA (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X3.0) UP TO 3.0M EARTH CUSHION
 Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1_3M EC/CP/SLP/NC/RCC
 Drawn By: S. Chattrjee
 Design By: Avishek Dey
 Checked By: Avishek Dey
 Approved By: Soubhik Sadhu

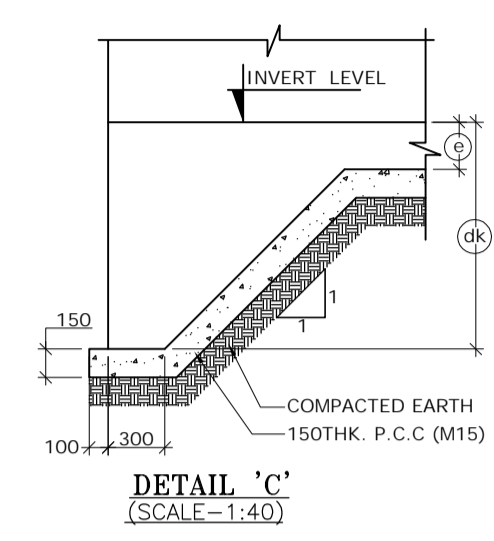
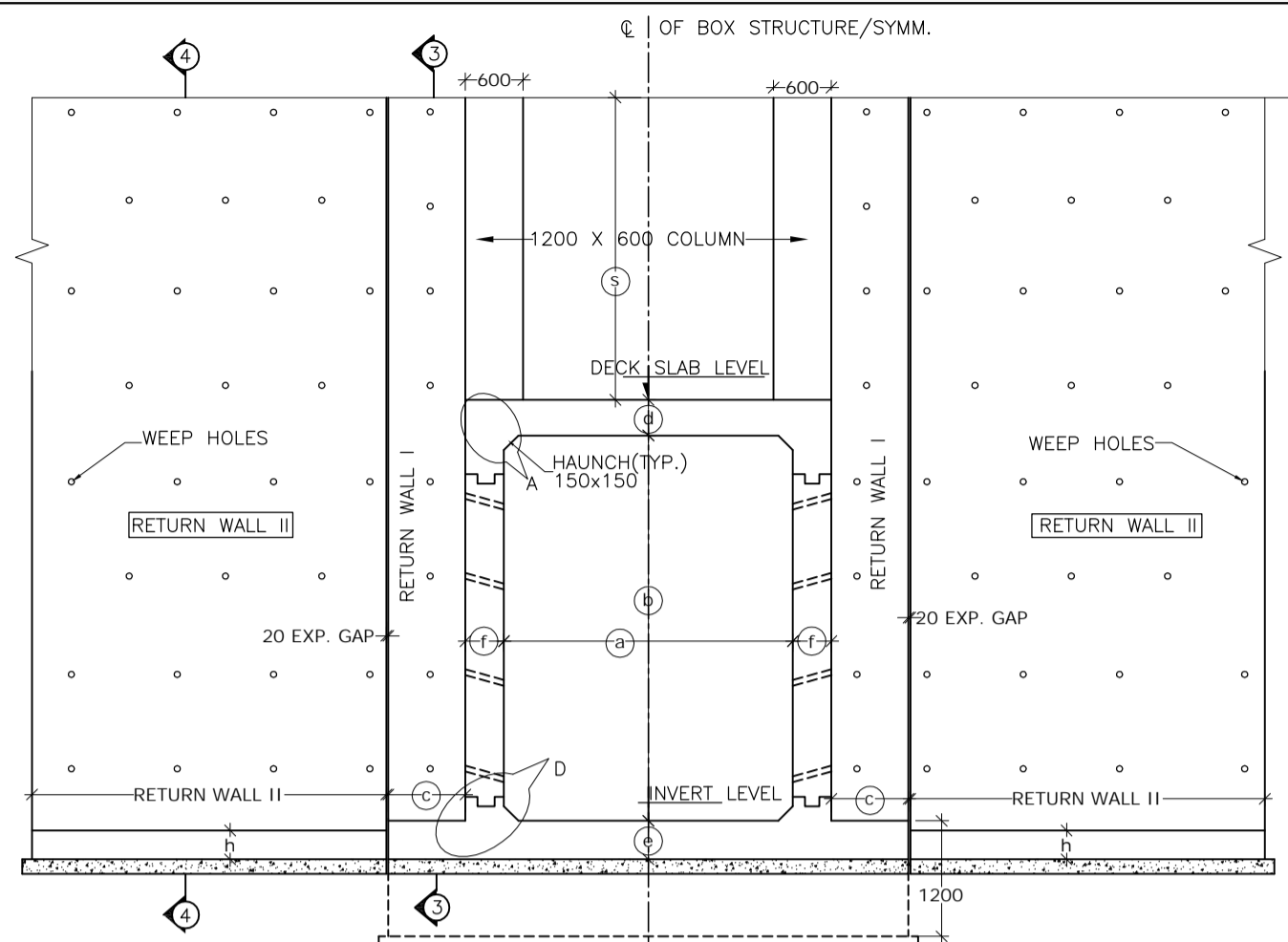
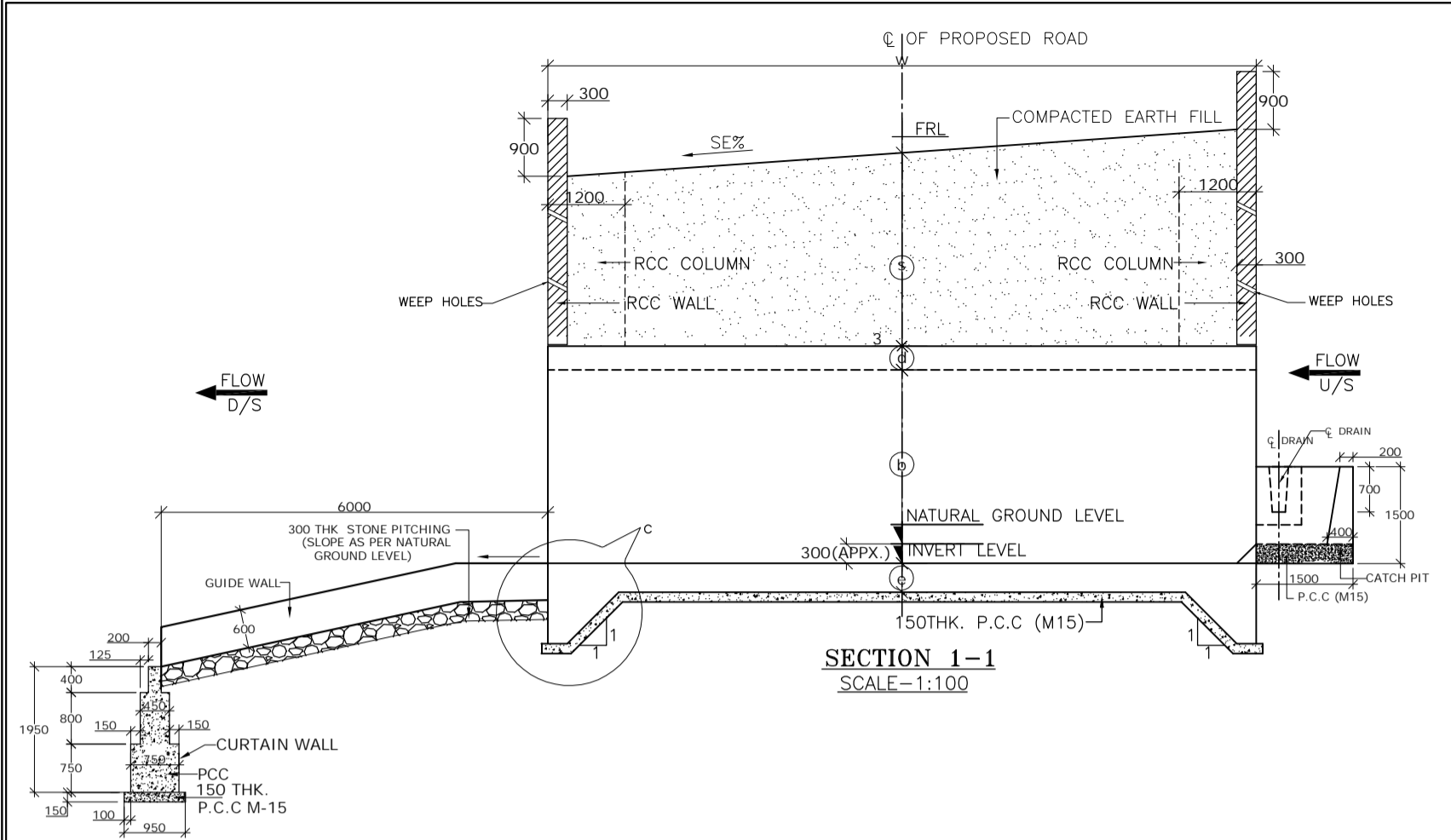
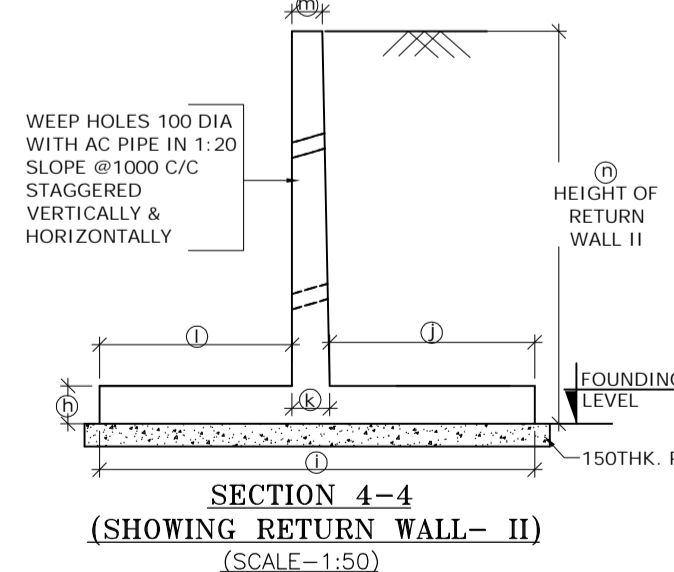
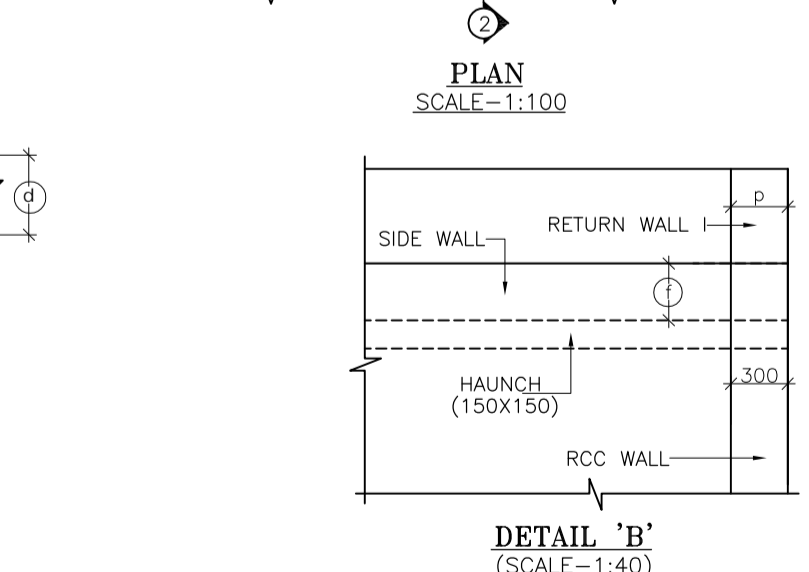
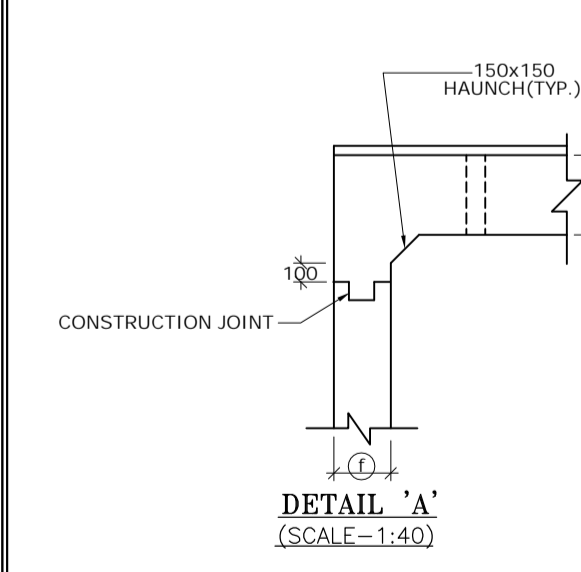
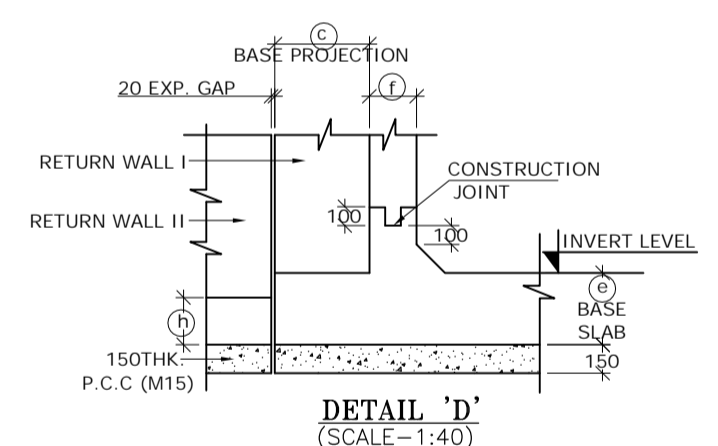
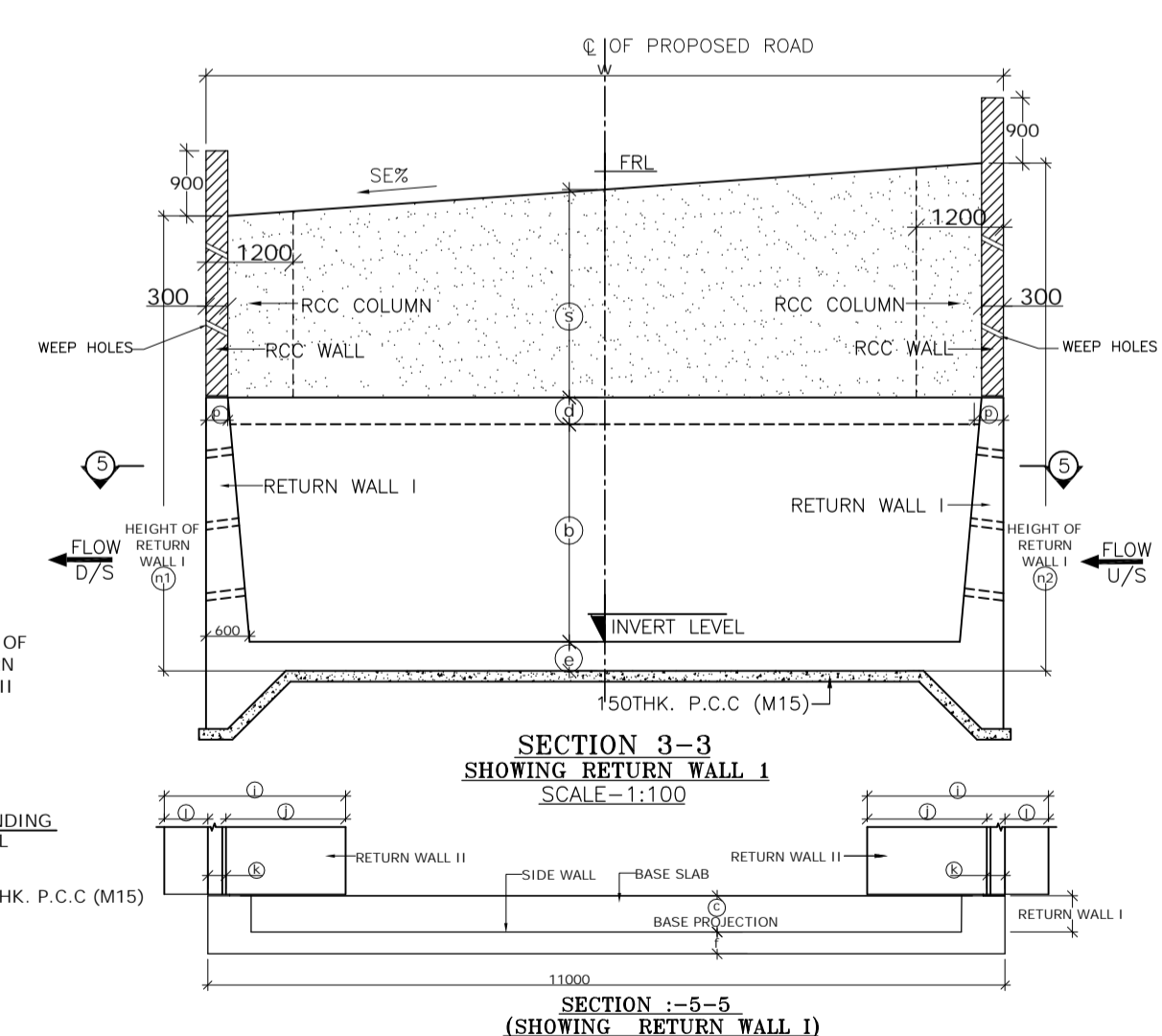
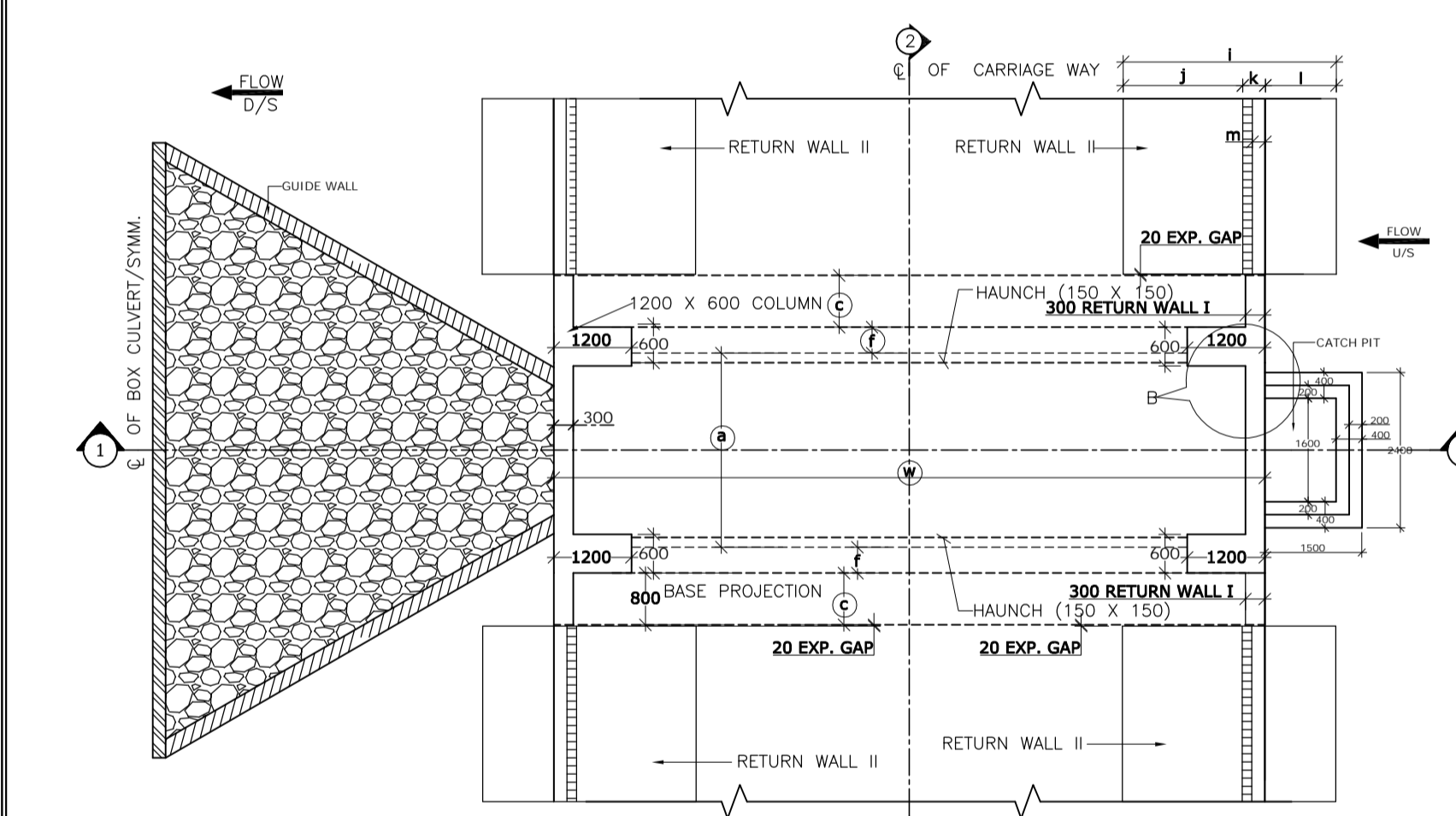


TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./gb/Ec/1/4/4/4	
a	4000
b	4000
c	1000
d	500
e	600
f	550
g	500
h	1200
i	10200
j	4500
k	1200
l	4500
m	300
n1	8815
n2	9515
p	300
q	12000
s	4000
dk	1200



STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Cushion Height (m)	Super Elevation (%)	Slope Side	Total Road width	Protection Type	Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall
								U/S D/S			n1 n2
104/4	103+695	1540.126	4X4X1 Cell Earth Cushion	4.00	7.00	L TO R	13.00	With Catch pit	1531.626	1531.026	8.645 9.555

- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE - M25
CURTAIN WALL - M25
LEVELLING COURSE (P.C.C.) - M15
RETURN WALL - M25
RCC WALL & KERB - M25
 - GRADE OF STEEL Fe 500 AS PER I.S. - 1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\gamma = 1.81/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 $1/m^2$ BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/RCC (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
DATE: SEPT, 2016

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.

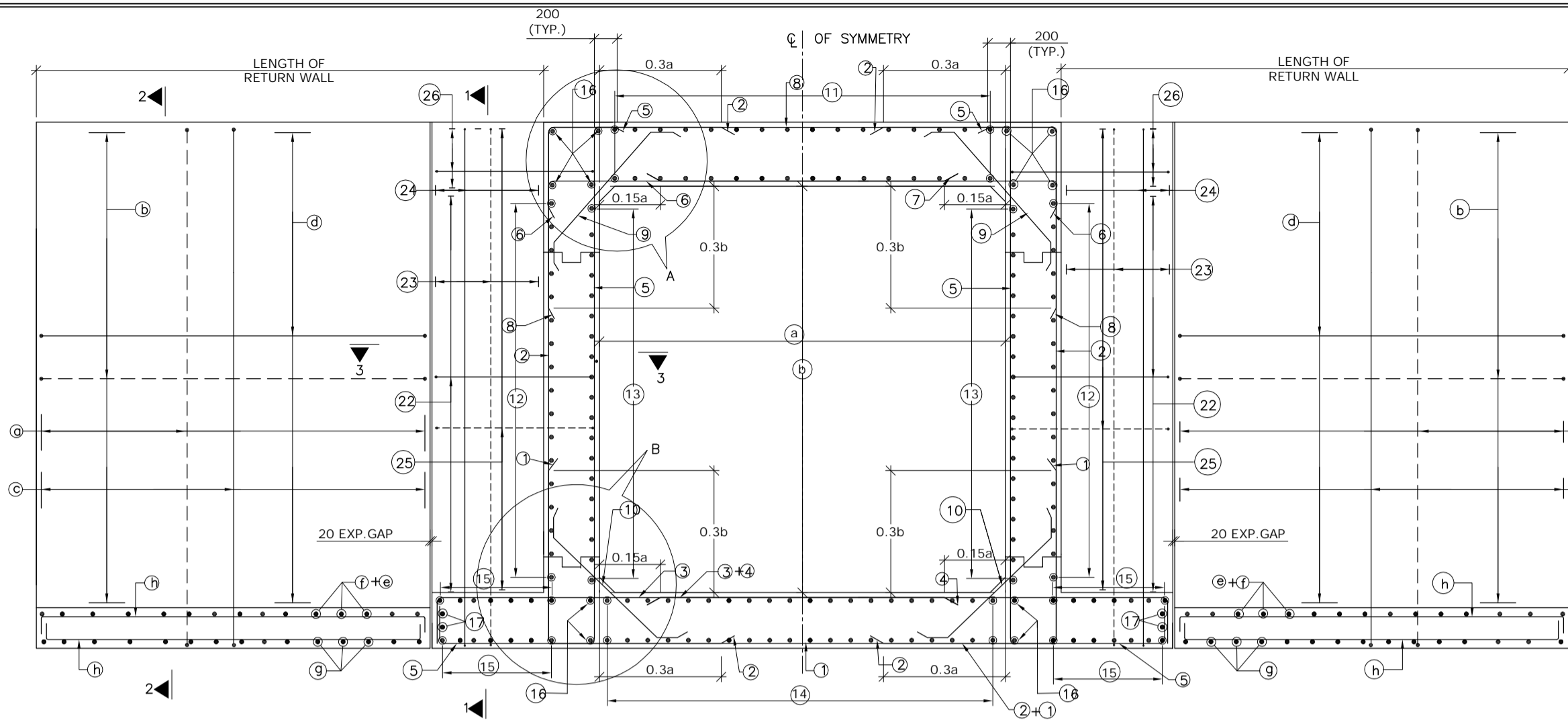
GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (4.0 X 4.0) WITH 4.0M EARTH CUSHION CATCHPIT & SLOPPED PROTECTION

Package :- IV District :- SENAPATI
Existing Chainage :- 88+520 to 114+165
Design Chainage :- 81+870 to 105+825

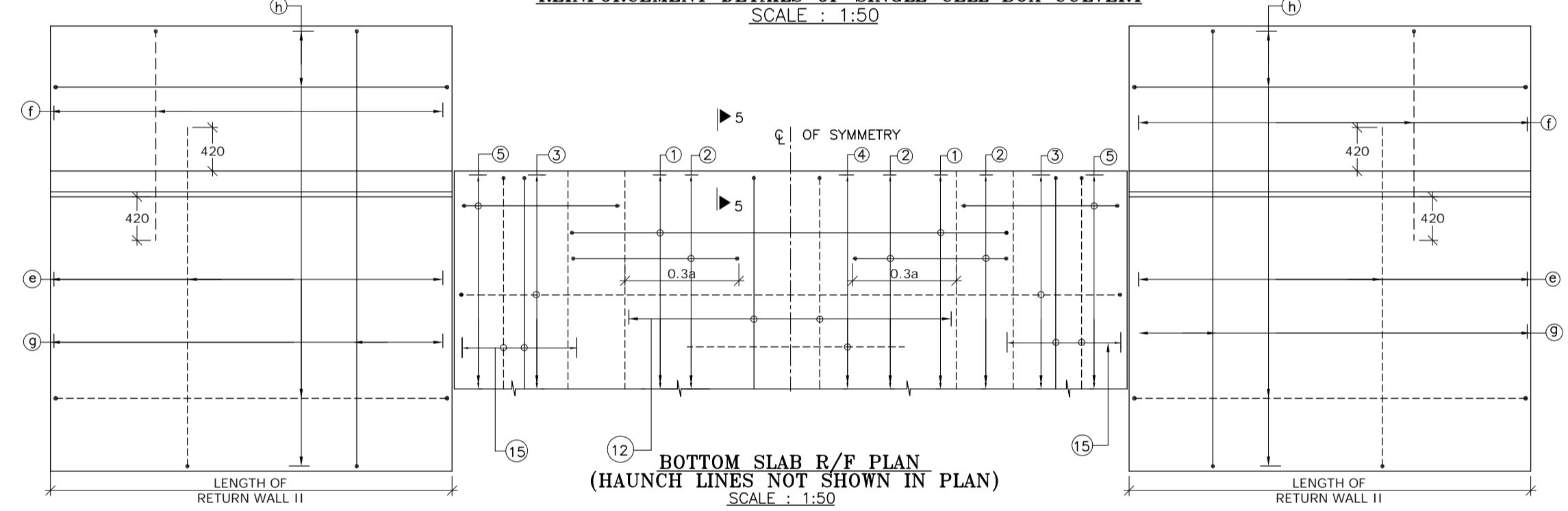
CONSULTANT : CE TESTING COMPANY PVT. LTD.
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/GA

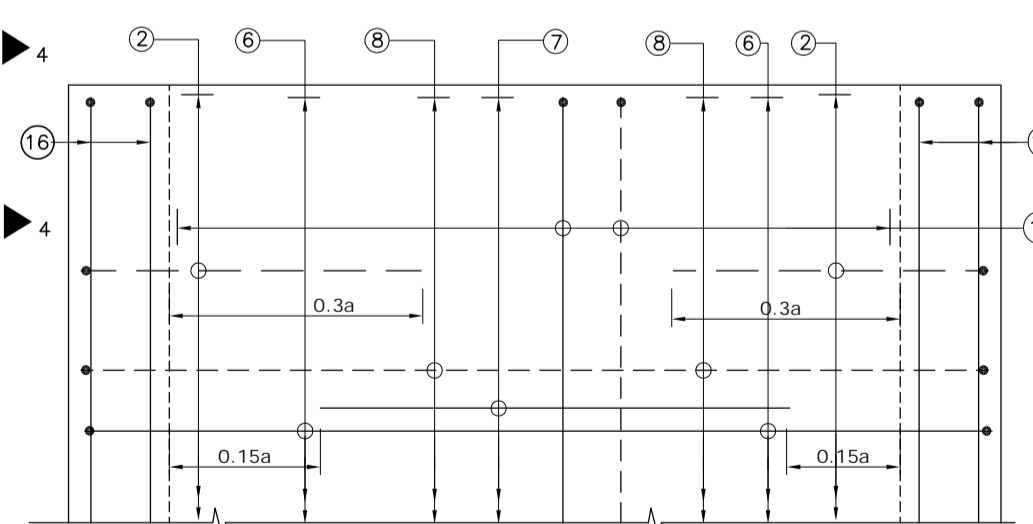
Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee		Avishek Dey	Soubhik Sadhu



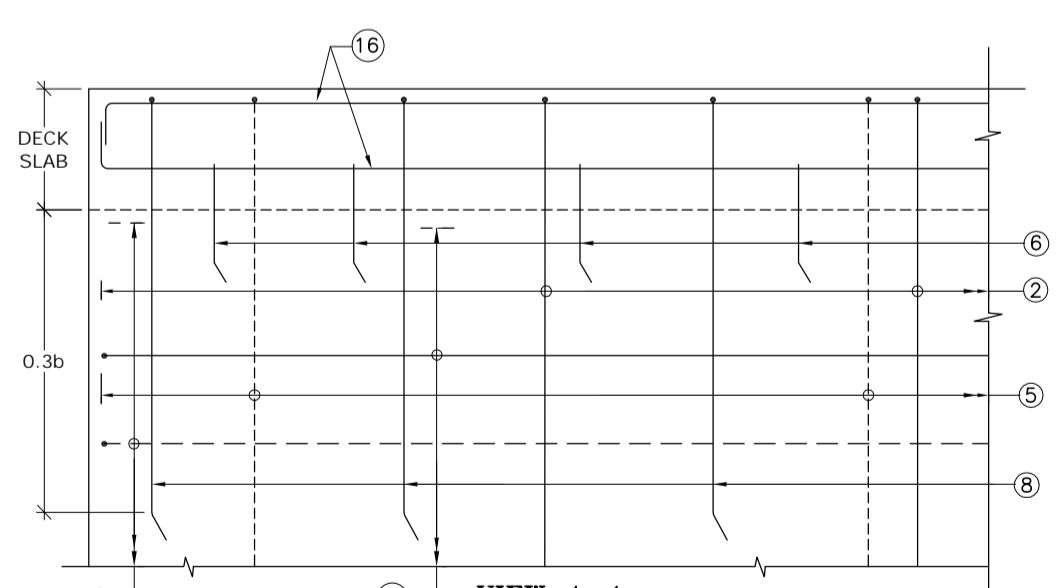
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:50



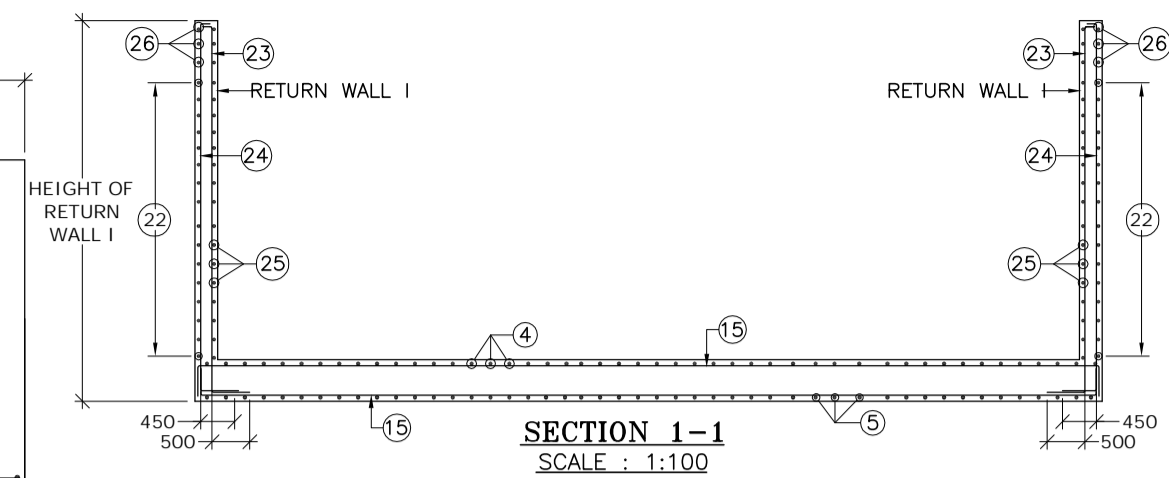
BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:50



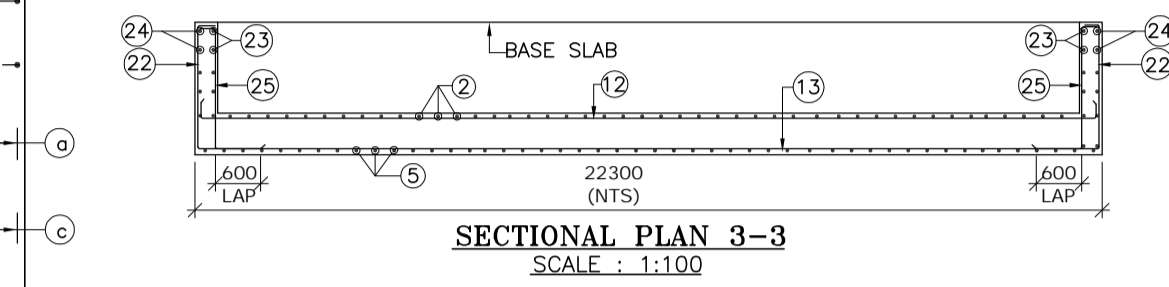
TOP SLAB R/F PLAN
SCALE : 1:30
(BAR MARK 5, 19, KERB & HAUNCH LINES NOT SHOWN IN PLAN)



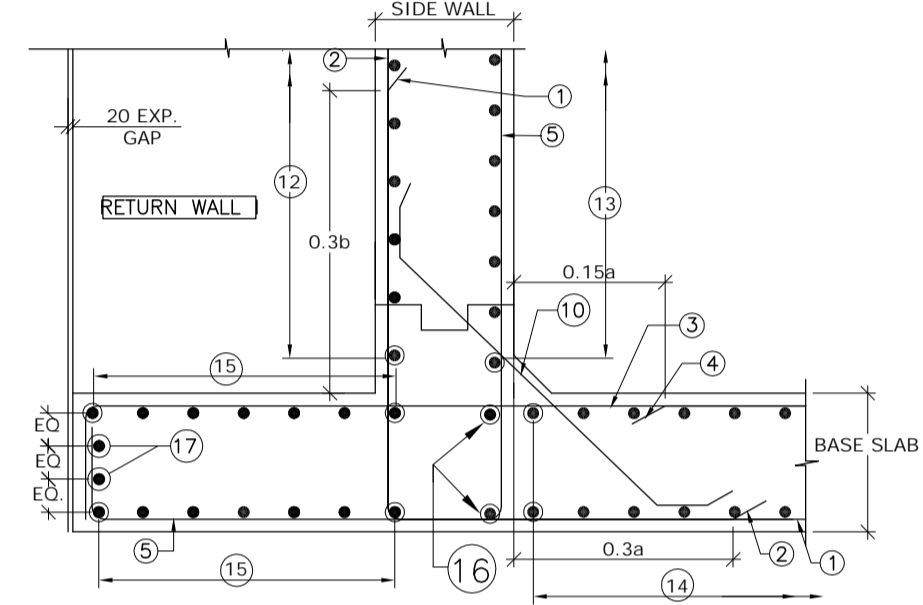
VIEW 4-4
SCALE : 1:30



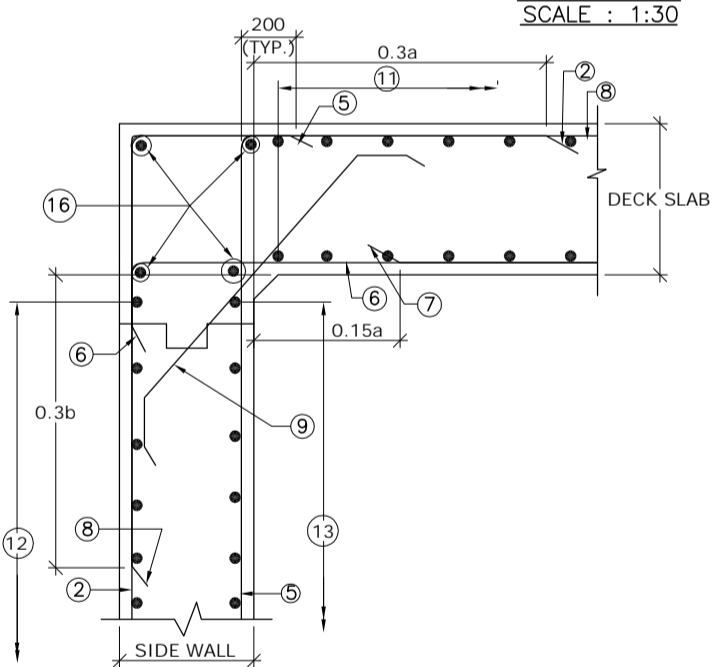
SECTION 1-1
SCALE : 1:100



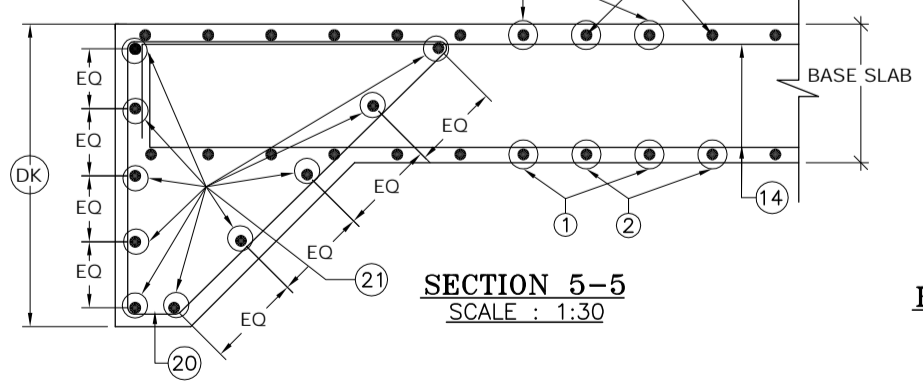
SECTIONAL PLAN 3-3
SCALE : 1:100



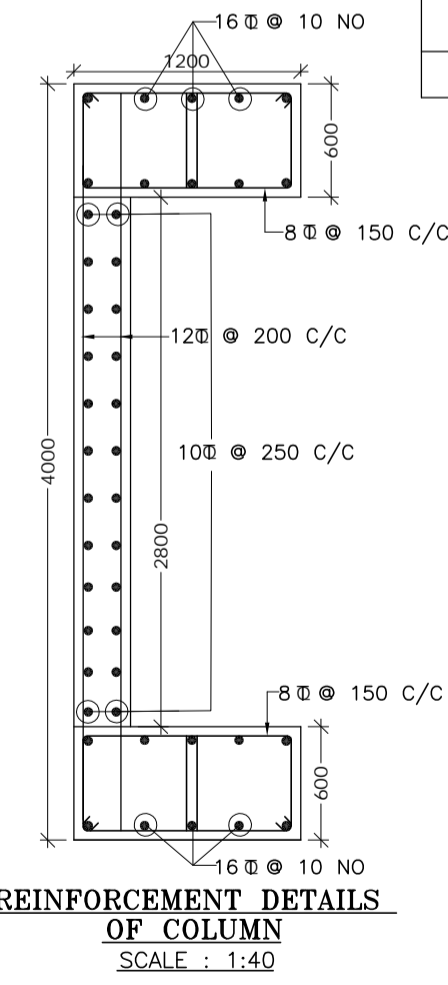
DETAIL- B
SCALE : 1:30



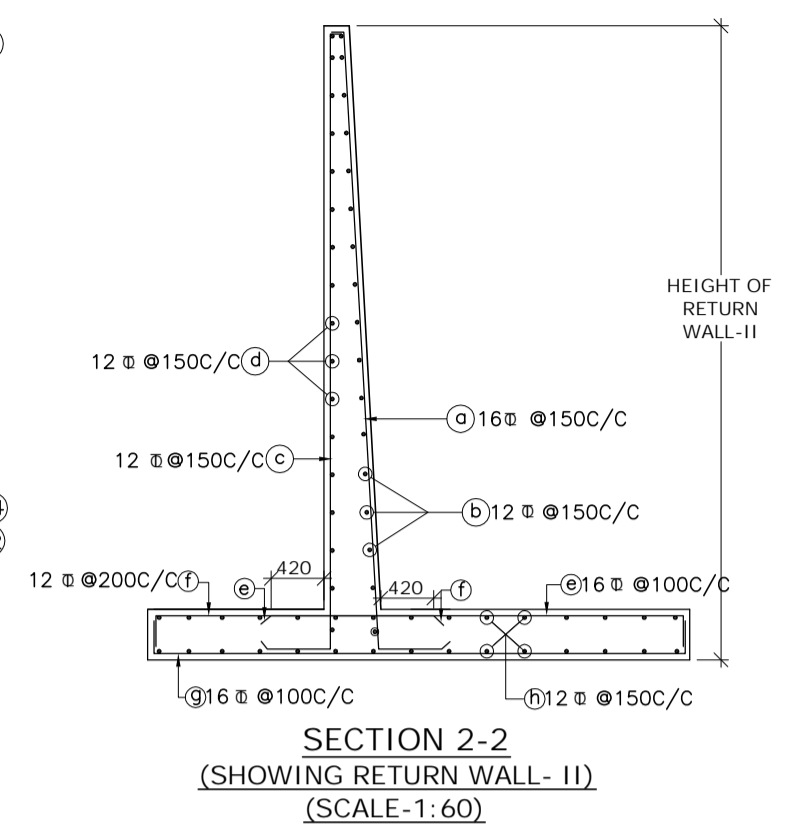
DETAIL- A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



REINFORCEMENT DETAILS OF COLUMN
SCALE : 1:40



SECTION 2-2
(SHOWING RETURN WALL- II)
SCALE-1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	16	220	15	10	200
2	16	220	16	10	-
3	25	280	17	10	-
4	12	280	18	10	150
5	10	200	19	10	-
6	20	250	20	10	150
7	12	250	21	12	-
8	16	220	23	10	200
9	10	280	24	16	125
10	10	280	25	12	125
11	10	200	26	10	250
12	10	180	27	10	225
13	10	220	28	12	150
14	10	200	29	12	150

--- TOP FACE BARS/OUTER FACE BARS/EARTH FACE BARS
 --- BOTTOM FACE BARS/INNER FACE BARS/OPP. TO EARTH FACE BARS

- NOTES :**
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH RELEVANT CLAUSE IRC : 112-2011
 - DEVELOPMENT LENGTH (Ld) :
 (a) FOR M25 = 46D
 (b) MINIMUM Ld :
 (i) FOR STRAIGHT BAR = 300MM
 (ii) FOR BENT BAR = 150MM
 BETWEEN (a) & (b) WHICHEVER IS GREATER.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MoRTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/GA (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - ToloI - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (4.0 X4.0) UP TO 4.0M EARTH CUSHION

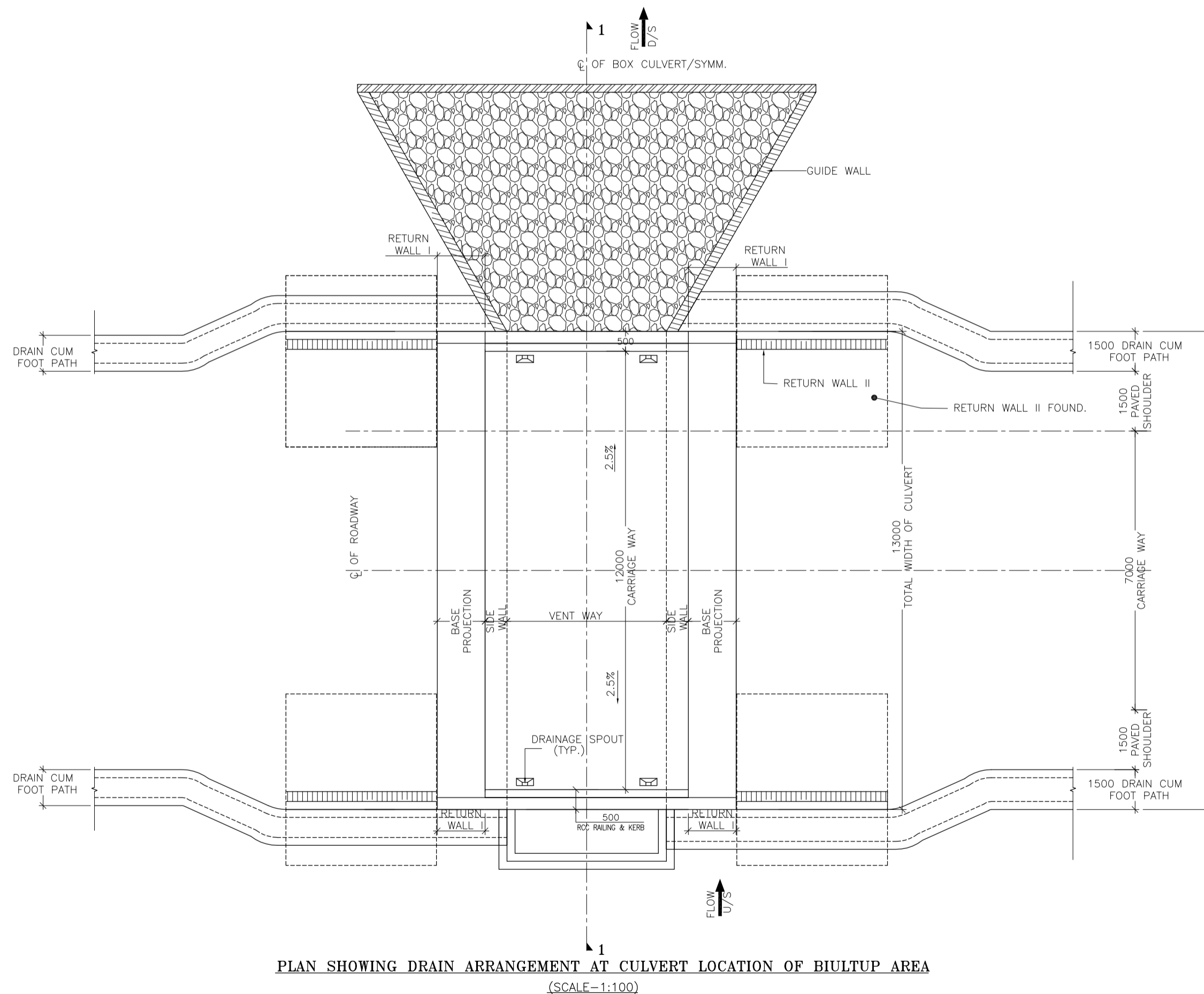
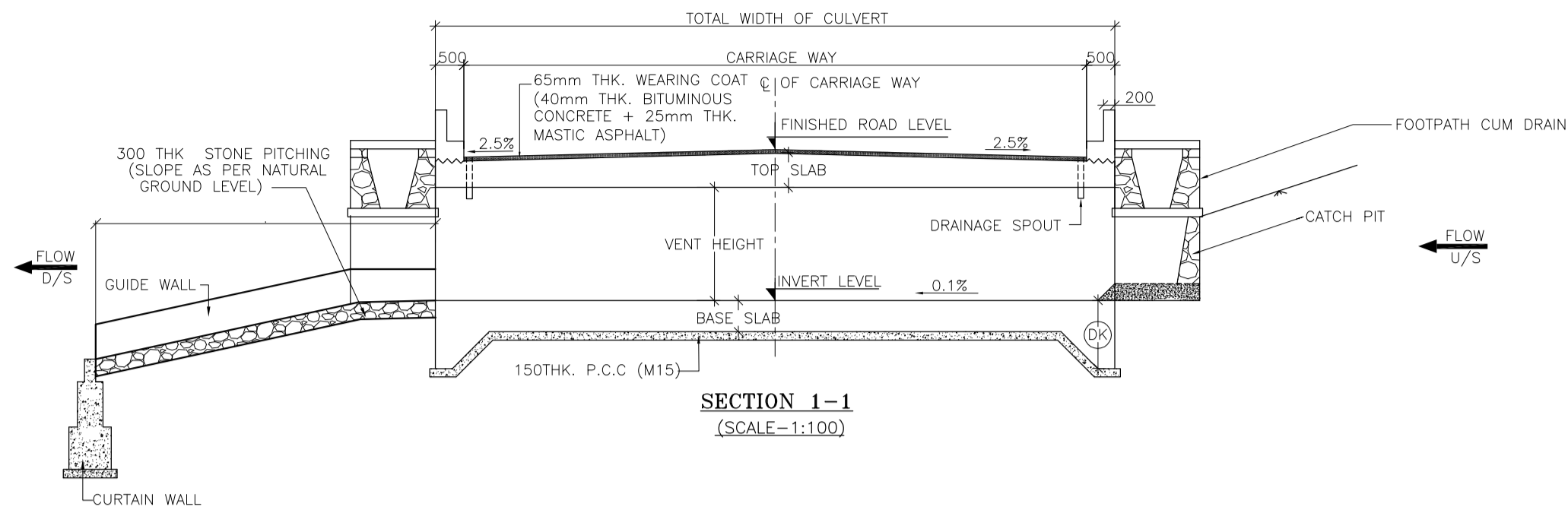
Package :- IV District :-SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/RCC

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee		Avishek Dey	Soubhik Sadhu



NOTES :

1. ALL DIMENSIONS ARE IN MM. ALL LEVEL ARE IN M. UNLESS OTHERWISE MENTIONED.

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE:
AS SHOWN

DATE:
SEPT, 2016



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.

TYPICAL DETAILS DRAWING OF SMALL BOX CULVERT

CONSULTANT :



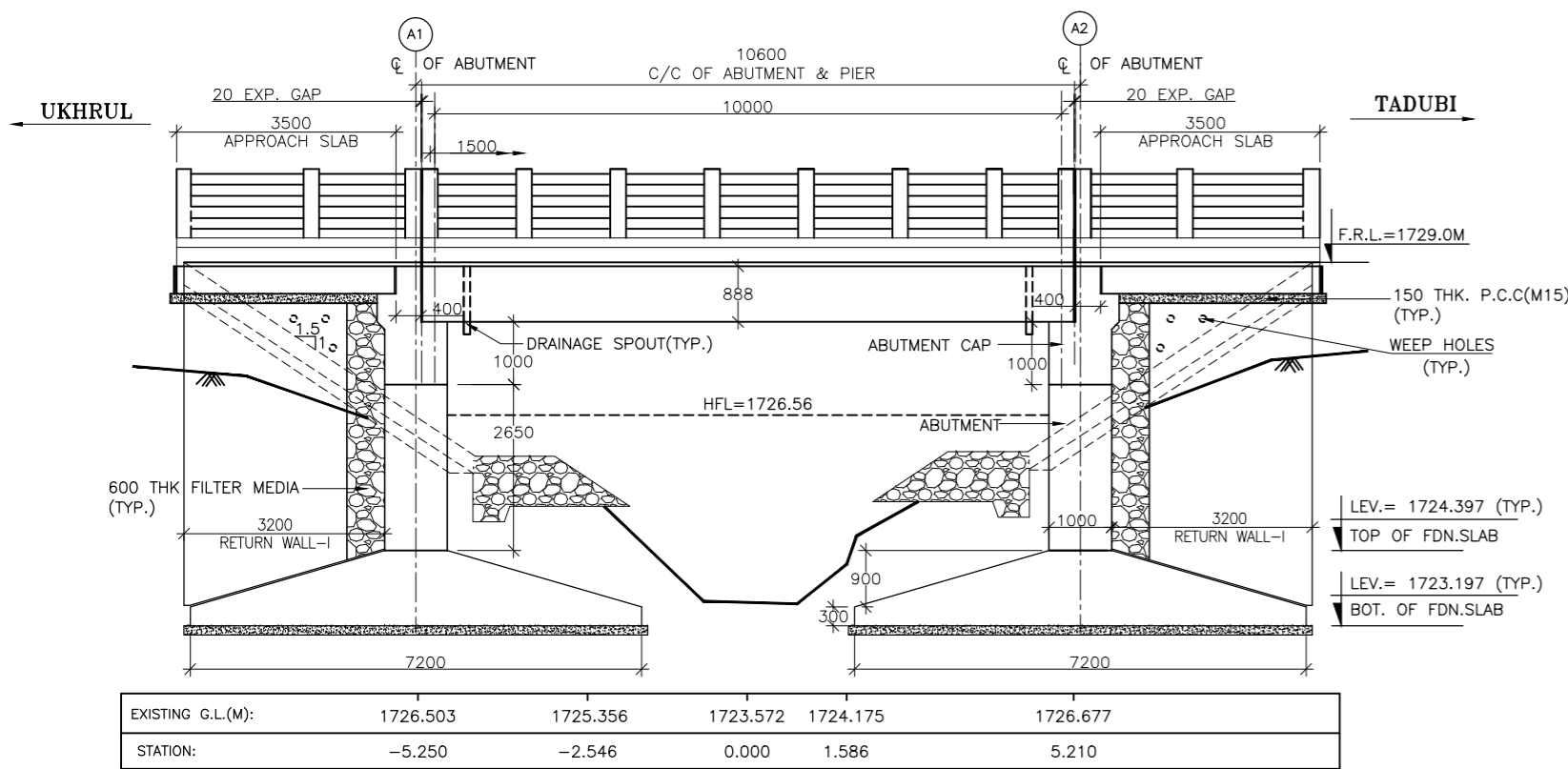
CE TESTING COMPANY PVT. LTD.
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/MISC (SHEET NO. 01 OF 01)			
Drawn By.	Design By.	Checked By.	Approved By
S. Chattrjee	R.Majumder	A. Dey	S. Sadhu

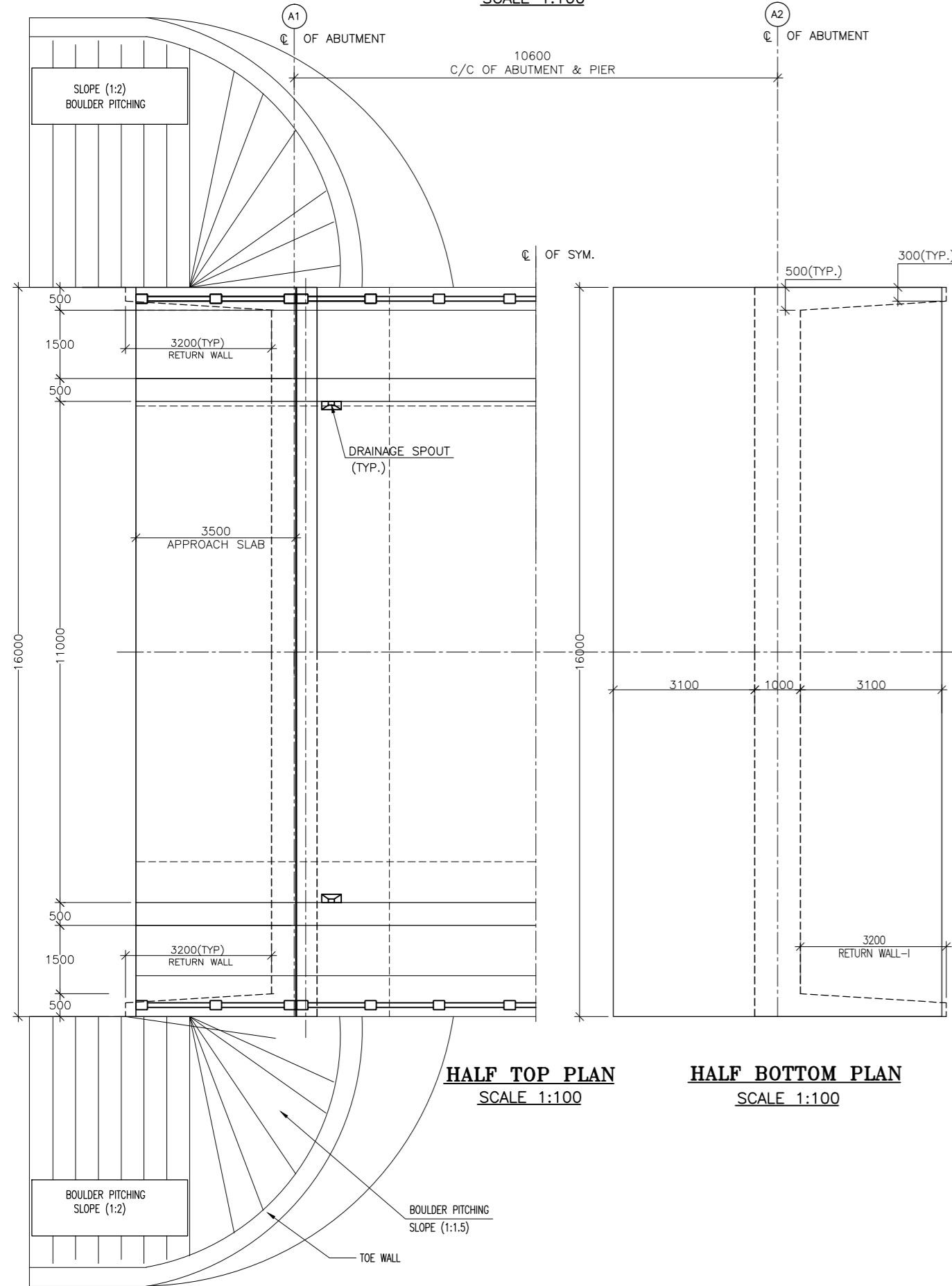
CONTENTS

(PROPOSED MINOR BRIDGES FOR NH - 102A)

Sl. No.	Chainage	Str. No.	Description	Drawing No.	No. of Sheets
			1 X 10.00 M R.C.C SLAB :-		
1.	94.098 KM	95/1	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/GA	01 - 02
			Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/RCC	01 - 02
			Miscellaneous Drawing	CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/MISC	01

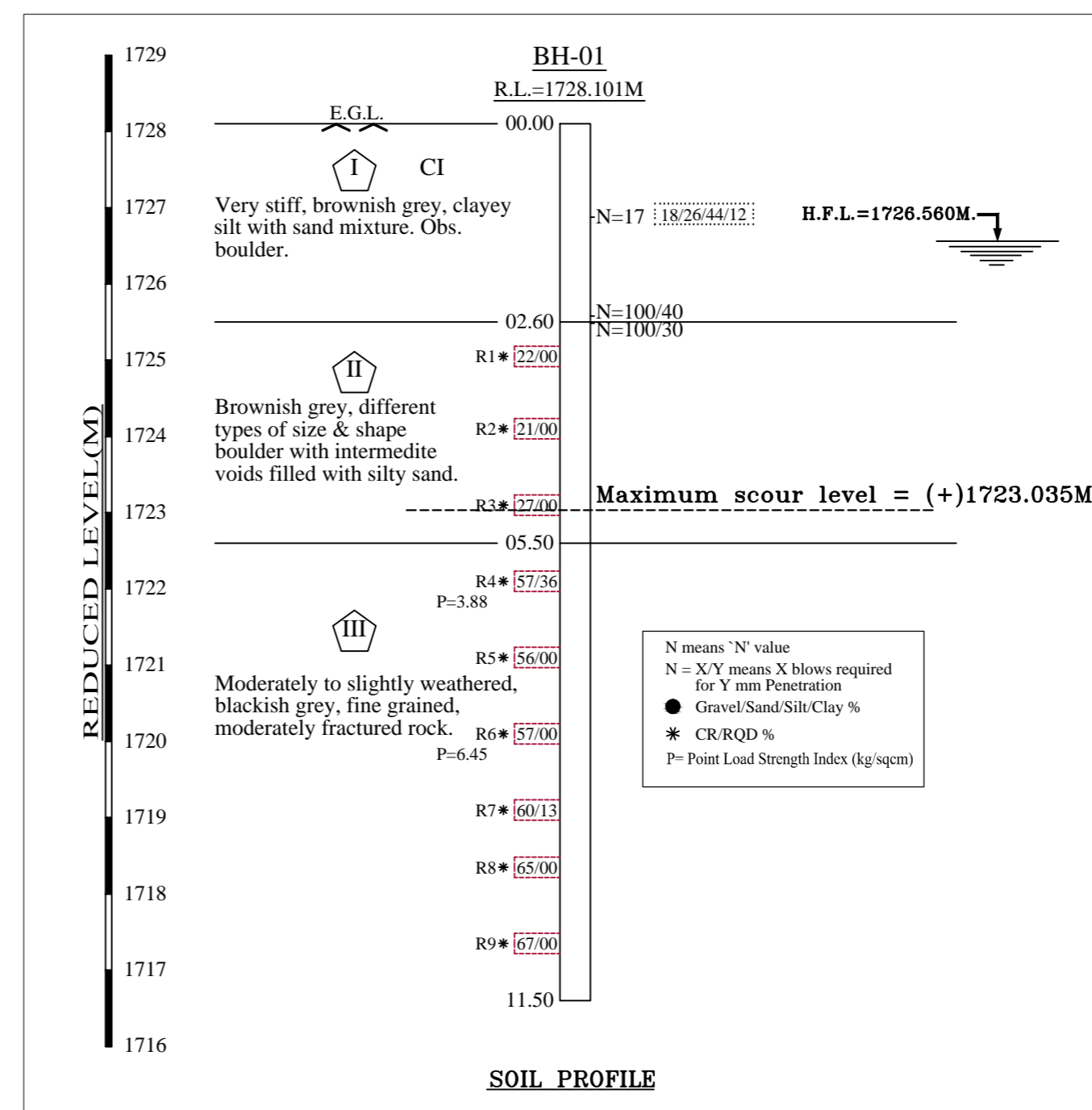


SECTIONAL ELEVATION OF BRIDGE
SCALE 1:100

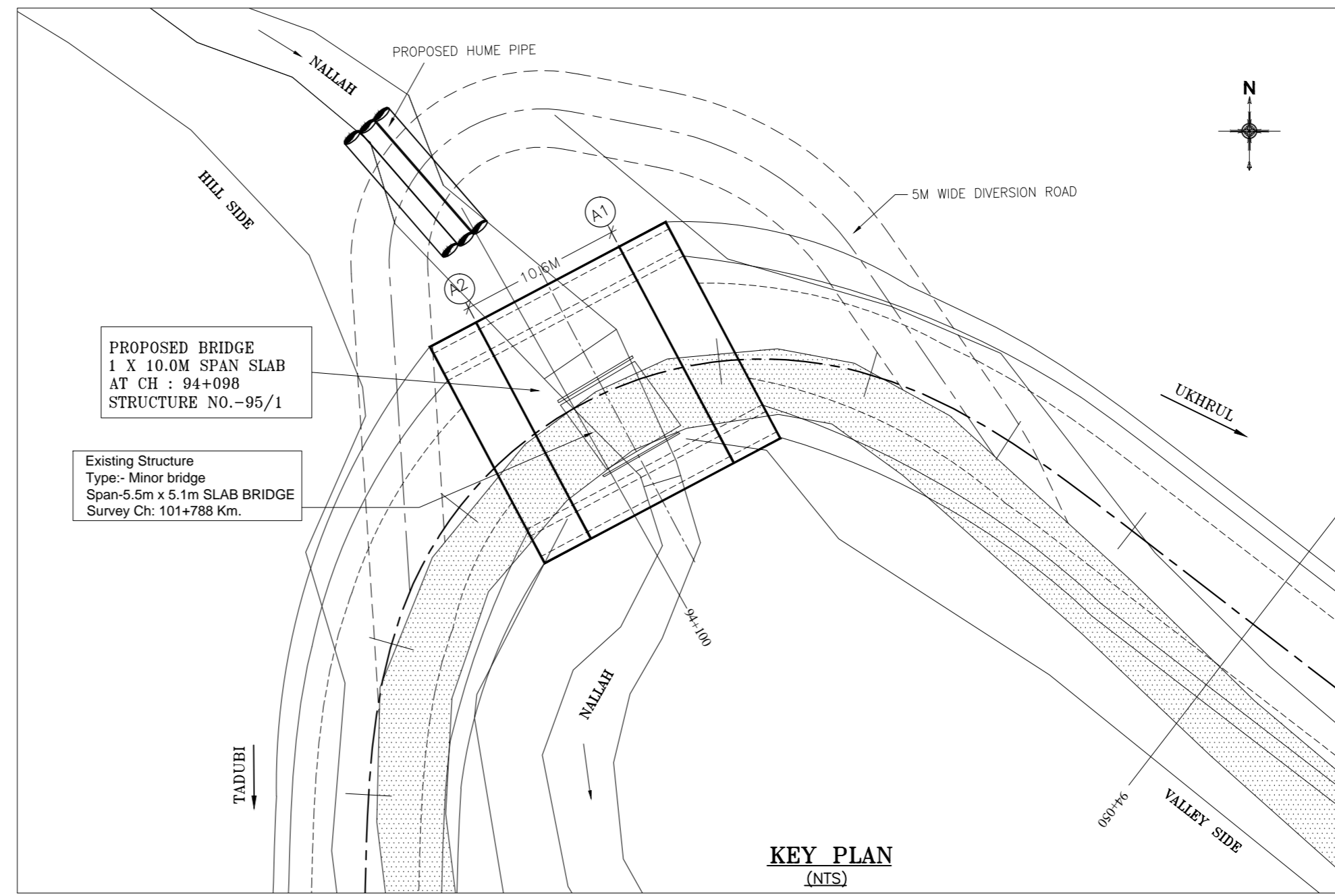


HALF TOP PLAN
SCALE 1:100

HALF BOTTOM PLAN
SCALE 1:100



SOIL PROFILE



KEY PLAN
(NTS)

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 :-
- A) (I) SUPERSTRUCTURE = M30, (VII) APPROACH SLAB = M30,
 - (II) RETURN WALL = M30, (VIII) P.C.C. BELOW APPROACH SLAB = M15,
 - (III) ABUTMENT = M30, (IX) R.C.C. RAILING & KERB = M30,
 - (IV) ABUTMENT CAP = M30, (X) PEDESTAL = M35,
 - (V) FOUNDATION SLAB = M30 (XI) REACTION BLOCK = M35,
 - (VI) DIRT WALL = M30, (XII) CRASH BARRIER = M40.
- B) CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
- C) 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.
- D) 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 TABLE-5, IRC -21,2000
- F) MAXIMUM WATER CEMENT RATIO SHALL BE AS PER TABLE-5,IRC-21,2000.
- G) THE FILTER MATERIAL SHALL BE WELL PACKED WITH SMALLER SIZE TOWARDS THE SOIL & BIGGER SIZE TOWARDS THE WALL & PROVIDED OVER THE ENTIRE SURFACE BEHIND ABUTMENT & RETURN WALLS TO THE FULL HEIGHT.

- REINFORCEMENT :**
- ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe 500) CONFORMING TO IS : 1786 (EXCEPT FOR MESH REINFORCEMENT WHICH SHALL BE MS BARS GRADE DESIGNATION Fe 240 CONFORMING TO IS : 432 PART 1 MILD STEEL)
- SPECIFICATION FOR**
- H.D BOLT-STELL CONFORMING TO GRADE 8.8 SHALL BE USED.
- TIE BOLT- STELL CONFORMING TO GRADE 8.8 SHALL BE USED.
- ANCHOR BOLT
- BOLT:- 8.8 GRADE TO 1367(PART 3) 1991
- NUT:- PROPERTY CLASS 8 TO IS 1367 (PART IV) 1980 FOR CASE IN BOLT (8.8 GRADE)
- NUT + BOLT TO HAVE MATCHING ROLLED THREAD.

WATER

WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO CLAUSE 302.4 OF IRC : 21 - 2000.

EXPANSION JOINTS :

THE EXPANSION JOINTS MUST BE ROBUST, DURABLE, WATER TIGHT AND REPLACEABLE. (WHERE RELEVANT).

- WORKMANSHIP / DETAILING**
- MINIMUM CLEAR COVER
SUPERSTRUCTURE= 40MM
SUBSTRUCTURE= 50MM
FOUNDATION= 75MM
 - 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.
 - SUPPORTING CHAIRS OF 16 MM DIAMETER SHALL BE PROVIDED AT SUITABLE INTERVALS AS PER IS : 2502.
 - CONCRETE SHALL BE PRODUCED IN A MECHANICAL MIXER OF CAPACITY NOT LESS THAN 200 LITRES HAVING INTEGRAL WEIGH-BATCHING FACILITY AND AUTOMATIC WATER MEASURING AND DISPENSING DEVICE.
 - 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 LOCATION OF JACKS FOR LIFTING UP THE SUPERSTRUCTURE TO REPLACE BEARINGS ETC. IS SHOWN THUS ↑ THIS SHALL BE DISTINCTLY ETCHED ON END CROSS GIRDERS AND ABUTMENT CAPS.
 - MAXIMUM SCOUR LEVEL :**
AT ABUTMENT- 1723.035 M.

11. THIS DRAWING IS PREPARED IN CONNECTION WITH :
- CET/BDG/2016/3640/NH-102A/FDPPR/MN/STR-95-1/GA (SHEET NO. 02)
 - CET/BDG/2016/3640/NH-102A/FDPPR/MN/STR-95-1/RCC (SHEET NO. 01 TO 02).
 - CET/BDG/2016/3640/NH-102A/FDPPR/MN/STR-95-1/MISC (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

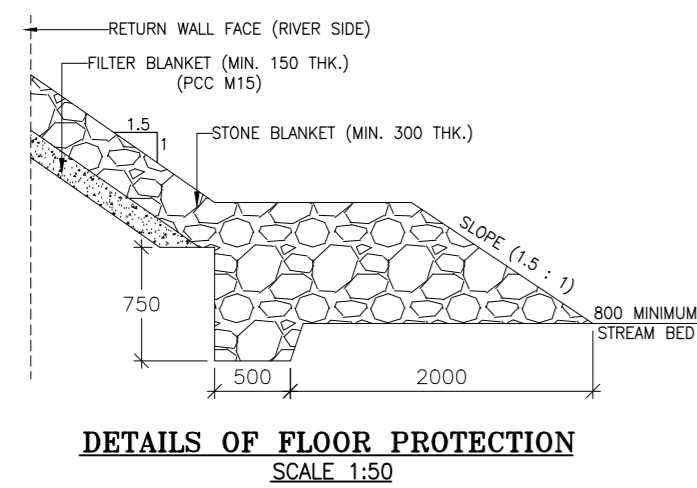
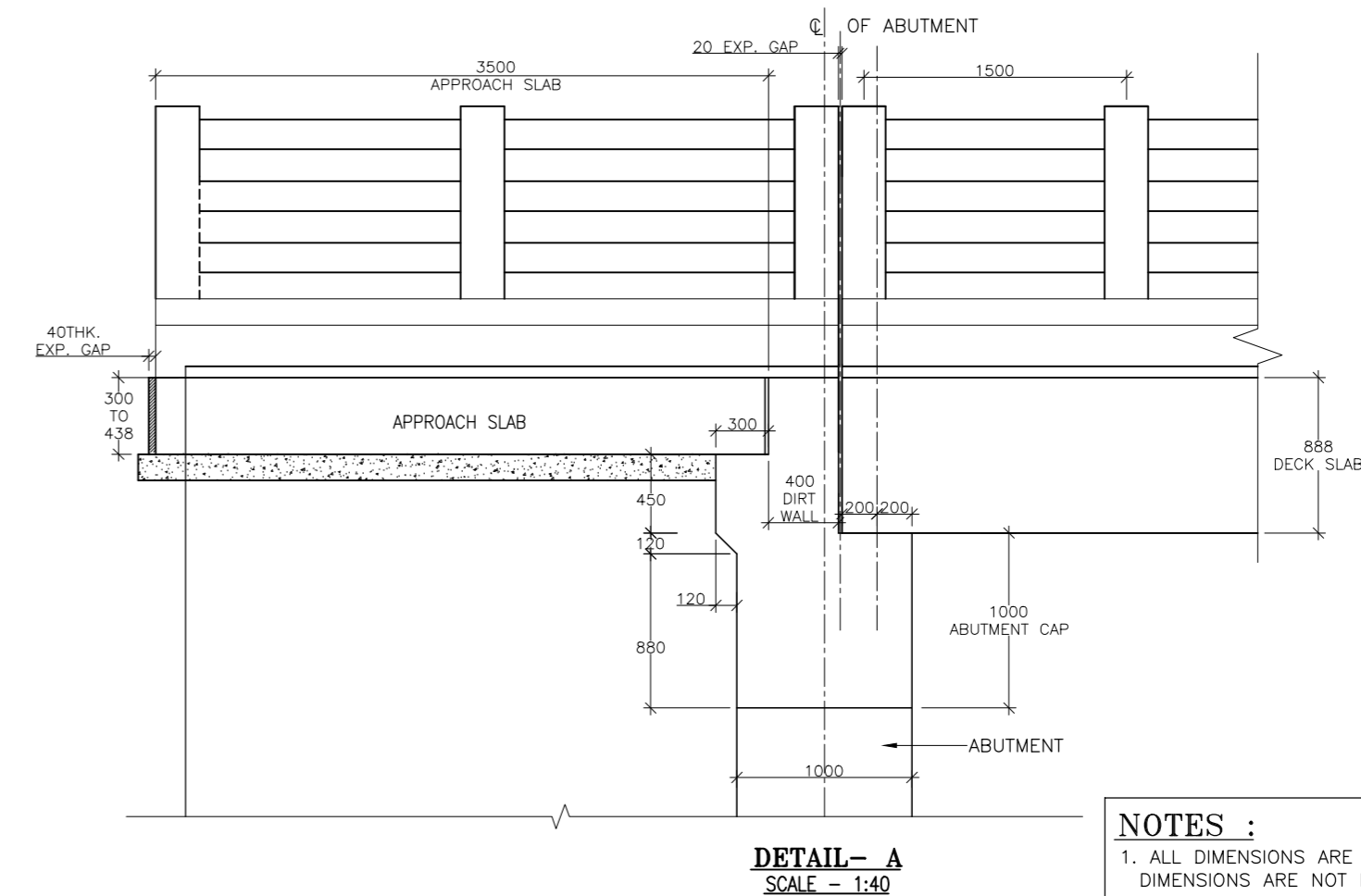
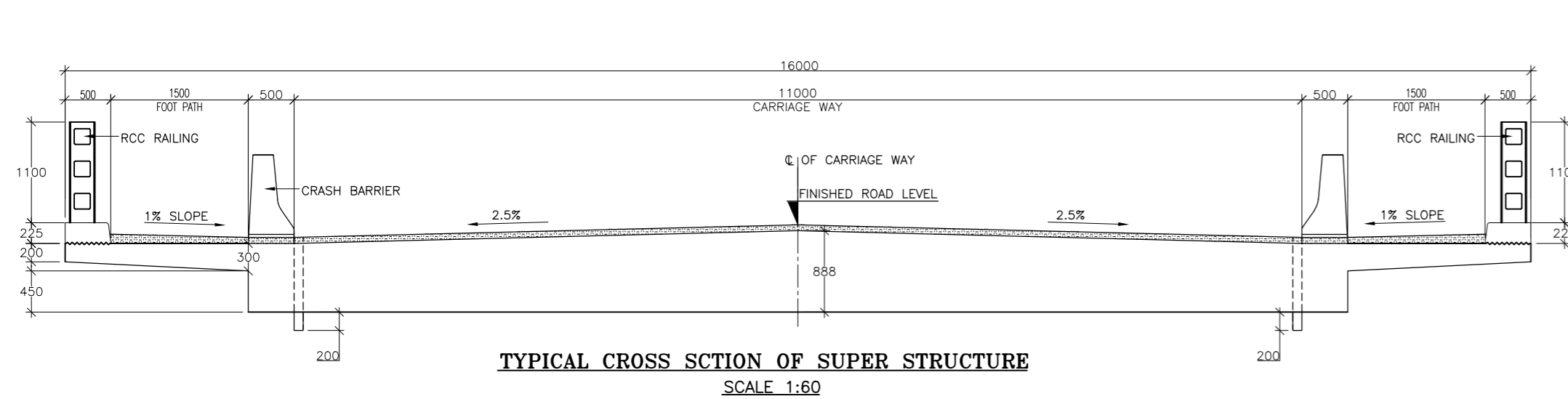
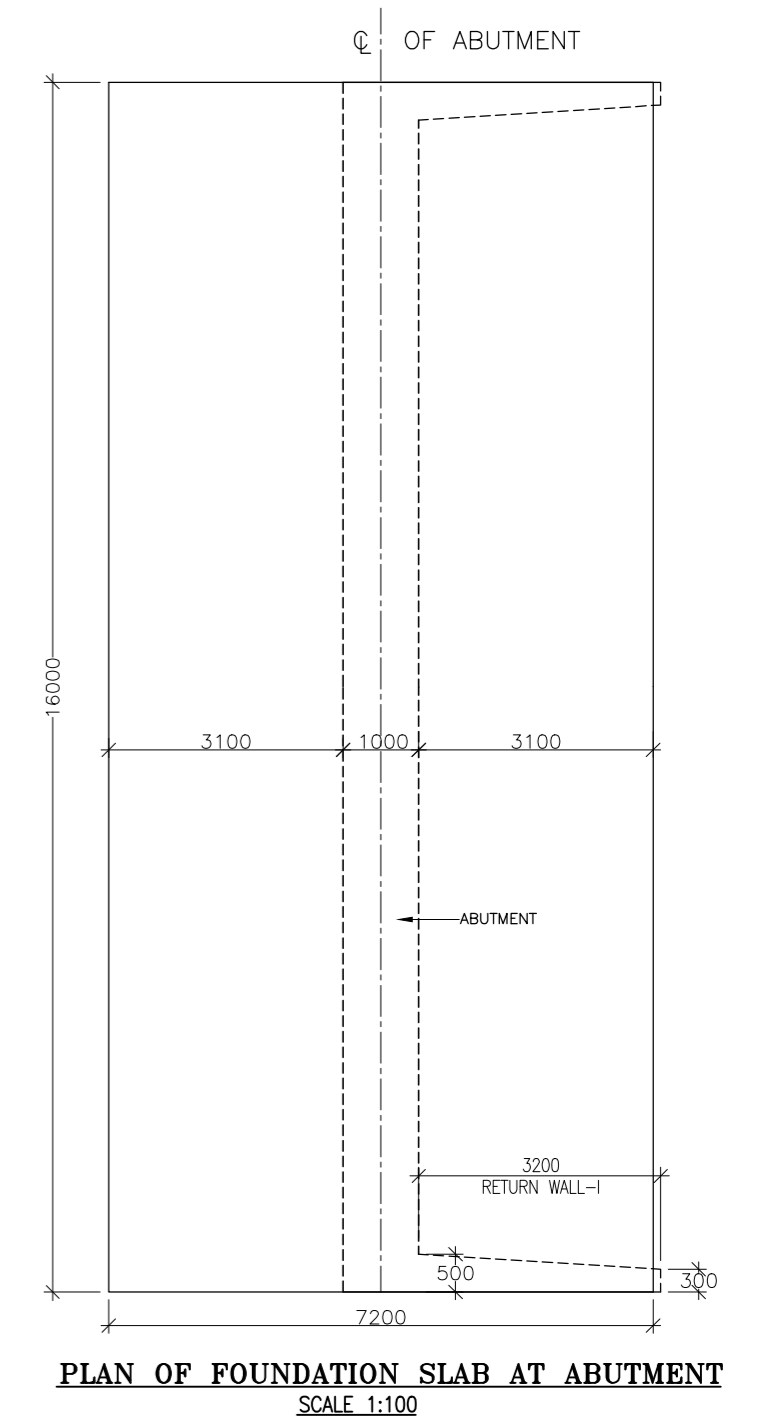
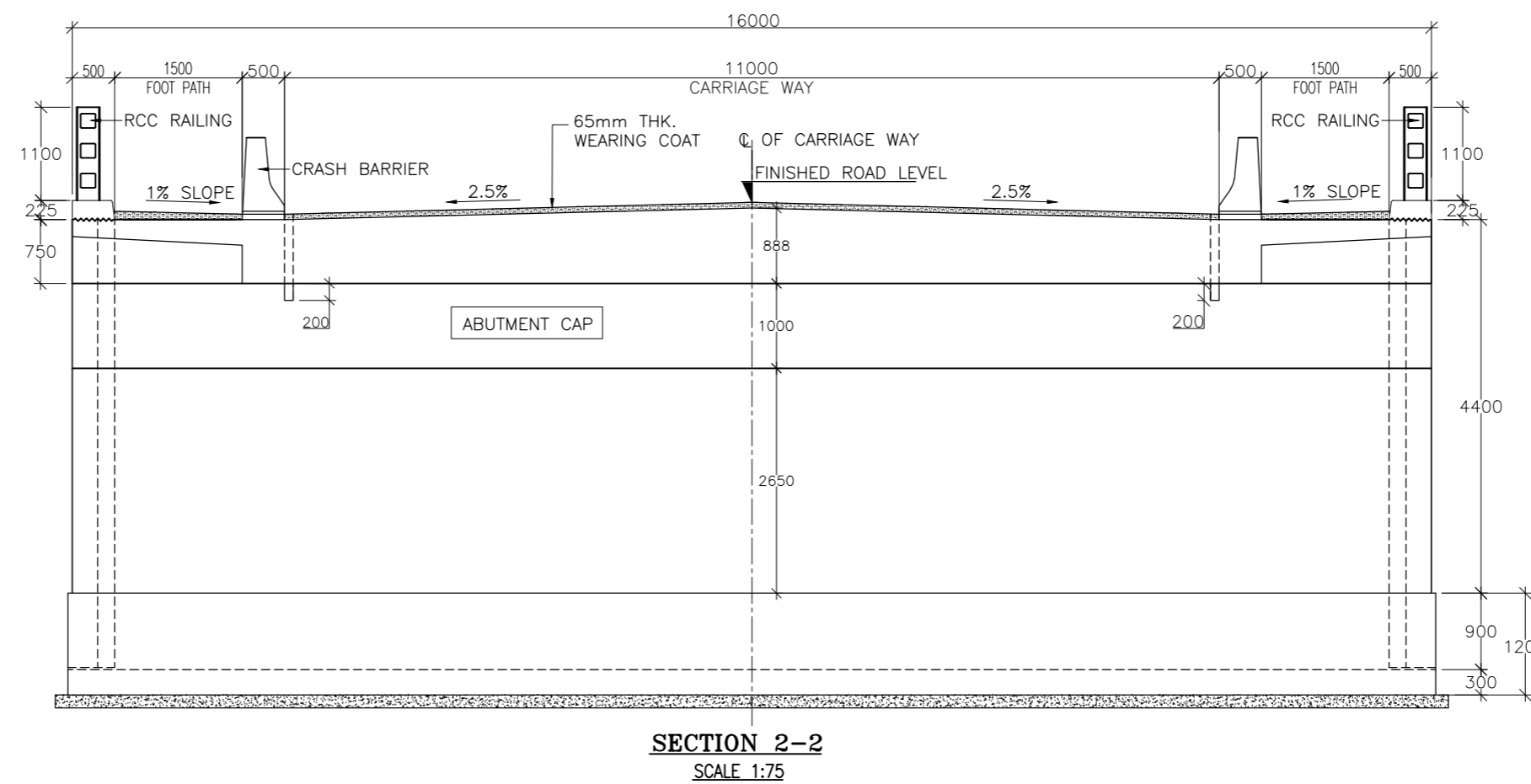
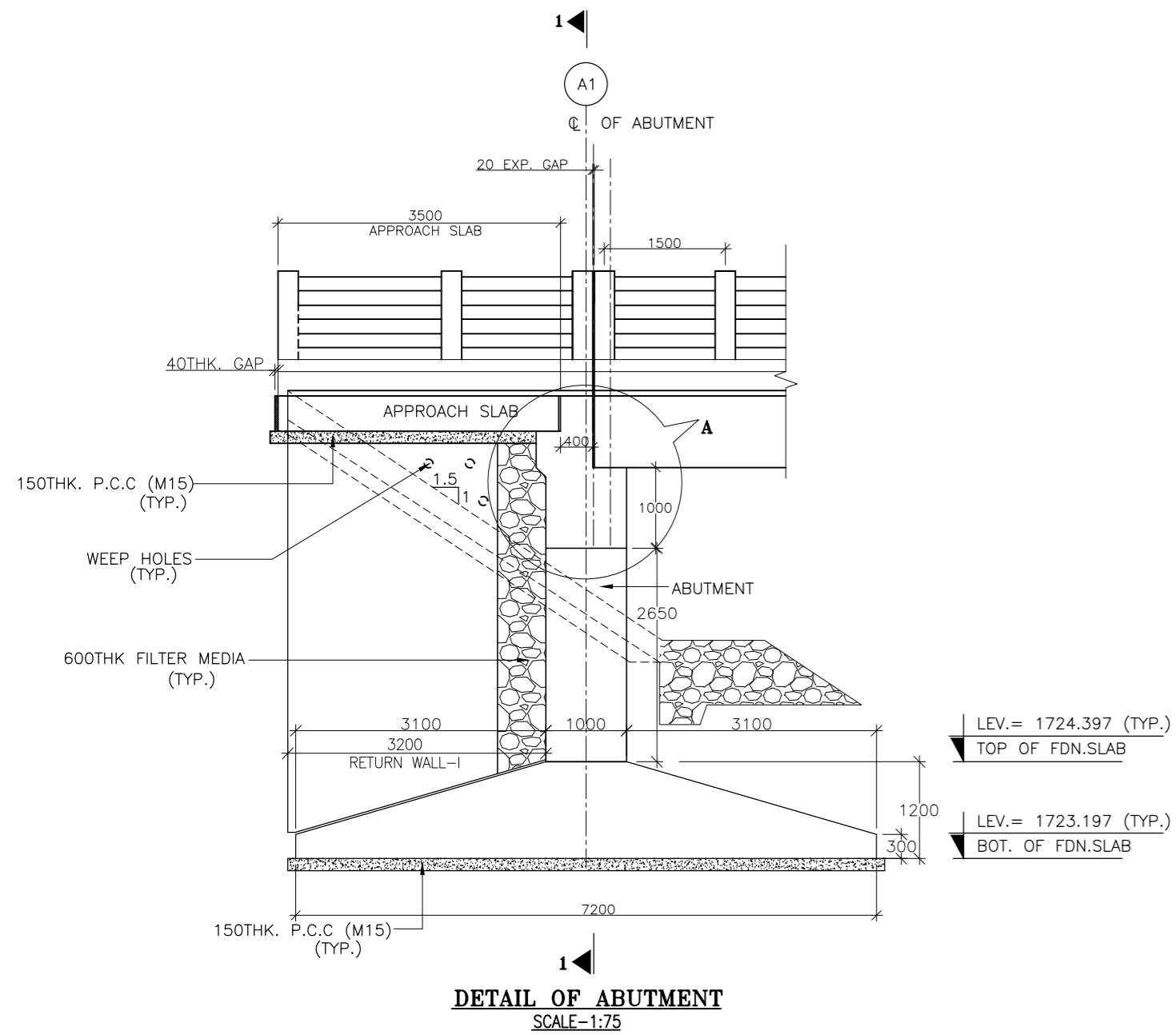
SCALE: AS SHOWN	PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF UKHRUL - TOLAI - TADUBI SECTION OF NH-102A (115 KM) IN THE STATE OF MANIPUR ON EPC MODE.
DATE: SEPT, 2016	

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	GENERAL ARRANGEMENT OF 1 X 10.00 M R.C.C SLAB (AT CHAINAGE - 94.098 KM.)
	Package :- IV District :- SENAPATI Design Chainage :- 81+870 to 105+825 Existing Chainage :- 88+520 to 114+165

CONSULTANT : CETEST Engineering Consultants 124-A, N.S.C. Bose Road Kolkata - 700092.
--

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPPR/MN/STR-95-1/GAD (SHEET NO. 01 OF 02)			
Drawn By. S.Roy	Design By. R. Majumdar	Checked By. Avishek Dey	Approved By. Soubhik Sadhu

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPPR/MN/STR-95-1/GAD (SHEET NO. 01 OF 02)			
Drawn By. S.Roy	Design By. R. Majumdar	Checked By. Avishek Dey	Approved By. Soubhik Sadhu



NOTES :

- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED. DIMENSIONS ARE NOT IN SCALE. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO. :-
CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/GAD (SHEET NO. 01)
CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/RCC (SHEET NO. 01 & 02)
CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/MISC (SHEET NO. 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
DATE: SEPT, 2016



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

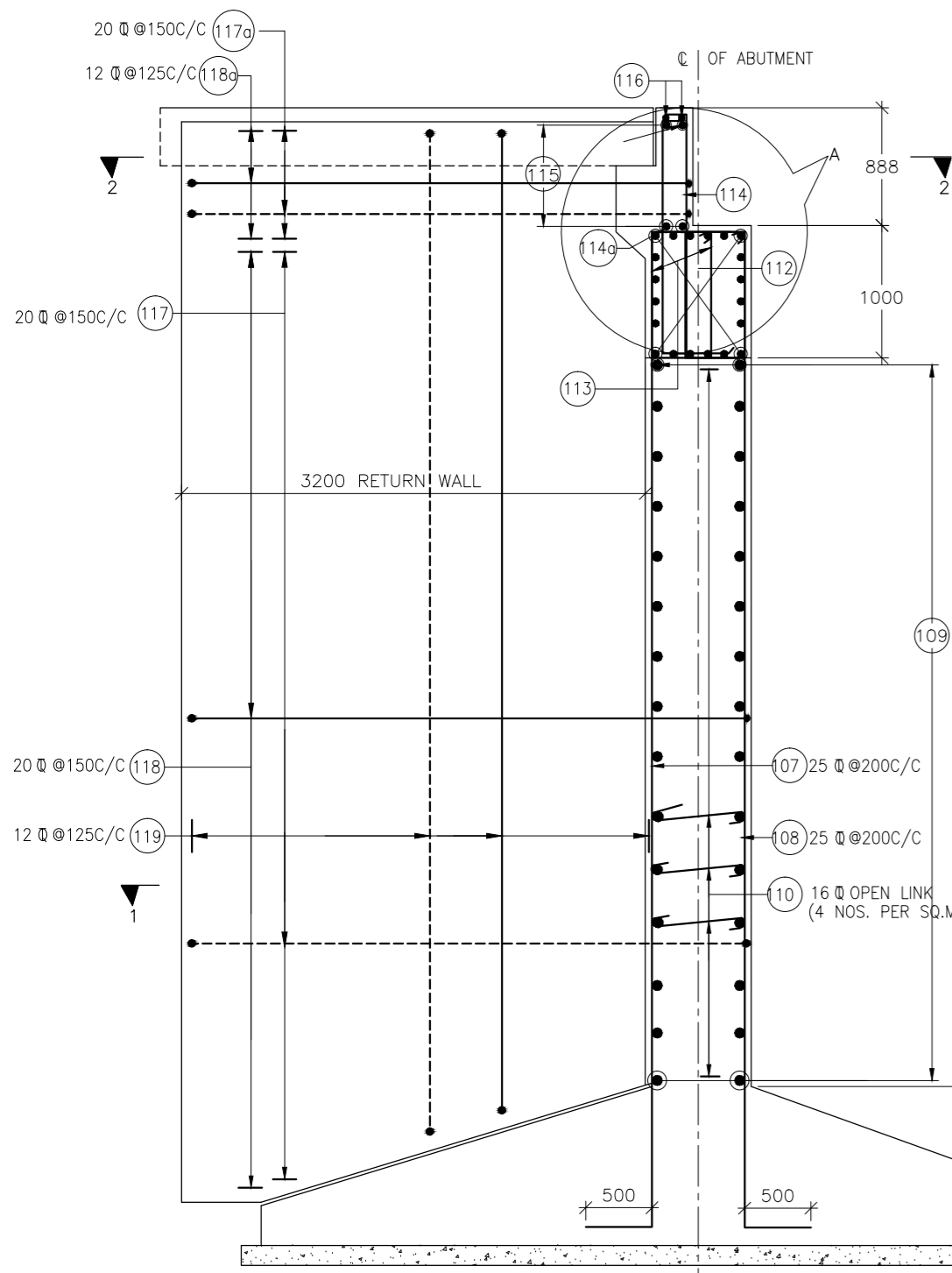
PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - ToloI - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

DETAILS OF ABUTMENT

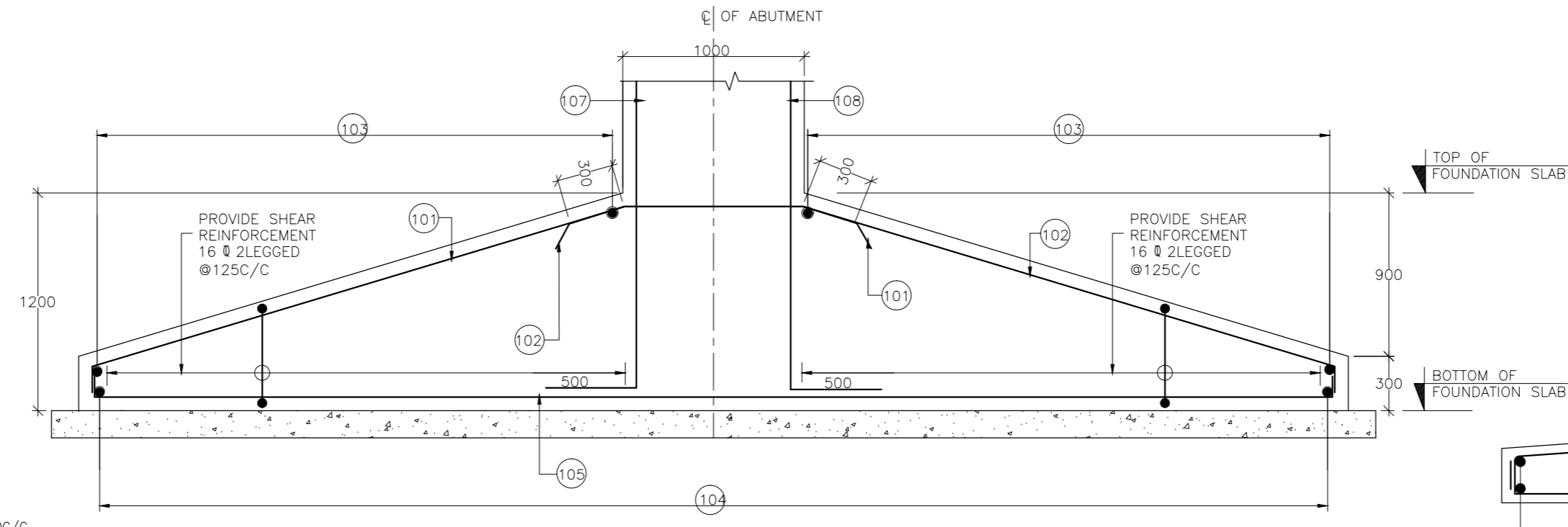
Package :- IV District :-SENAPATI
Designe Chainage :- 81+870 to 105+825
Existing Chainage :- 88+520 to 114+165

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

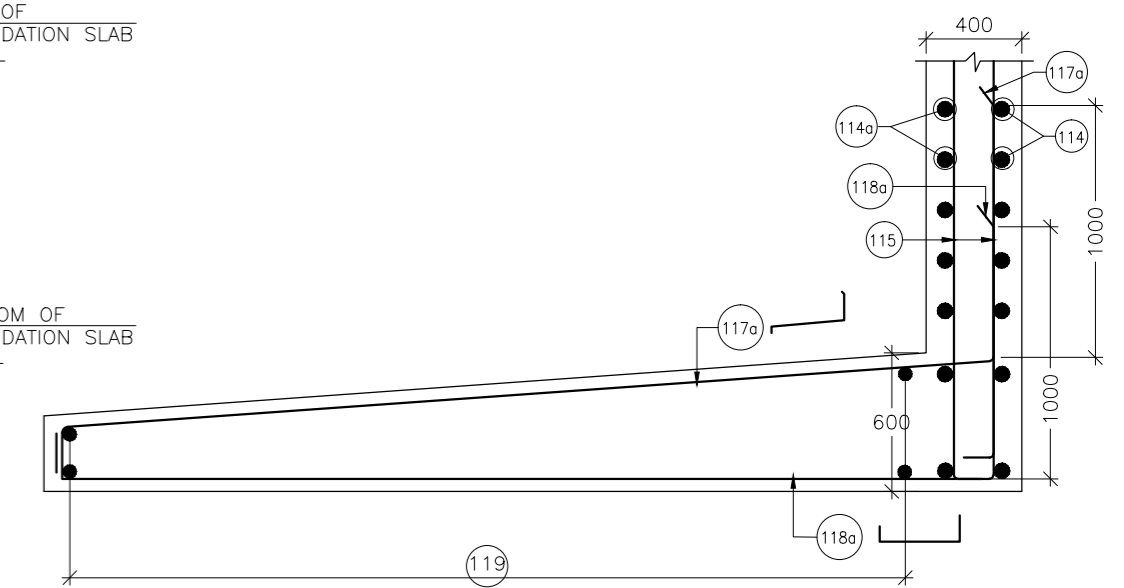
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/GAD (SHEET NO. 02 OF 02)			
Drawn By.	Design By.	Checked By.	Approved By.
S.Roy	R. Majumdar	Avishek Dey	Soubhik Sadhu



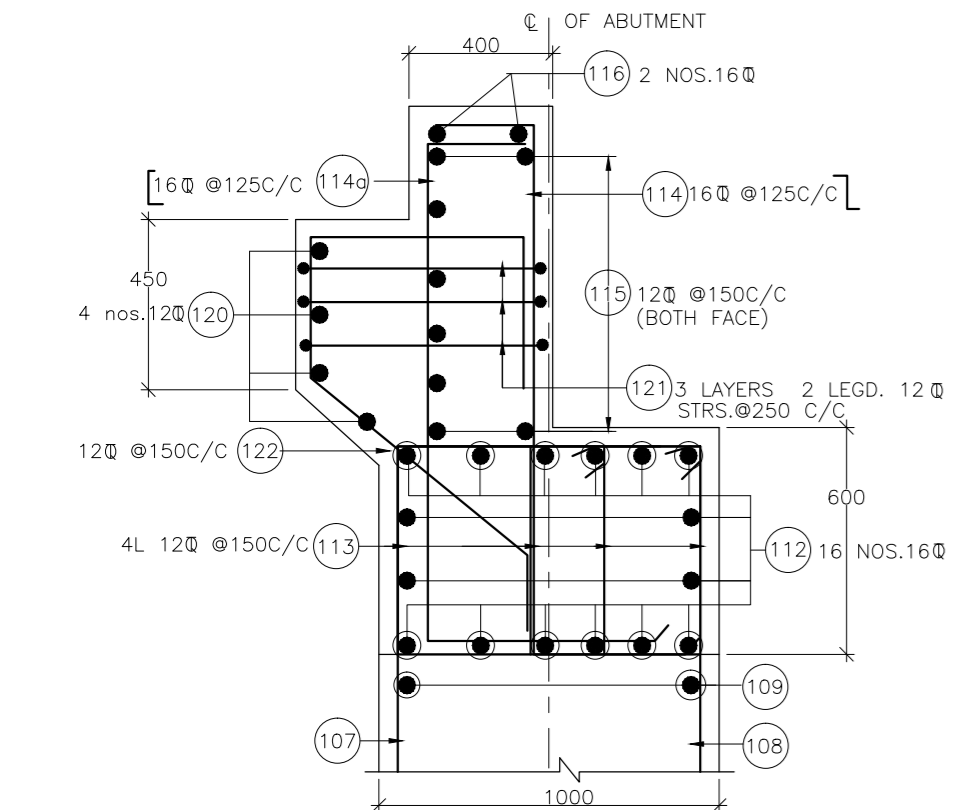
REINFORCEMENT DETAIL OF ABUTMENT
SCALE-1:50



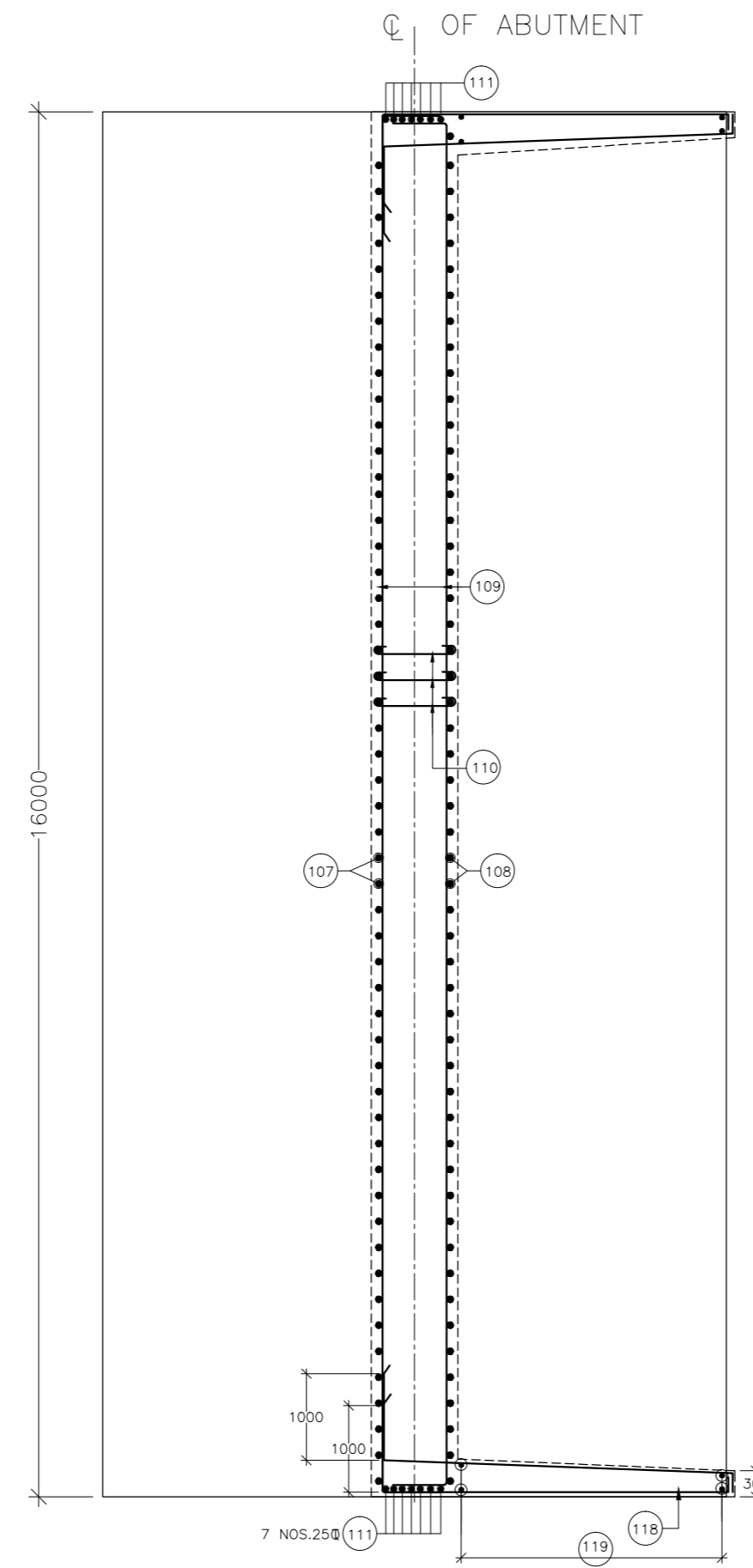
REINFORCEMENT DETAIL OF FOUNDATION SLAB AT ABUTMENT
(SCALE 1:30)



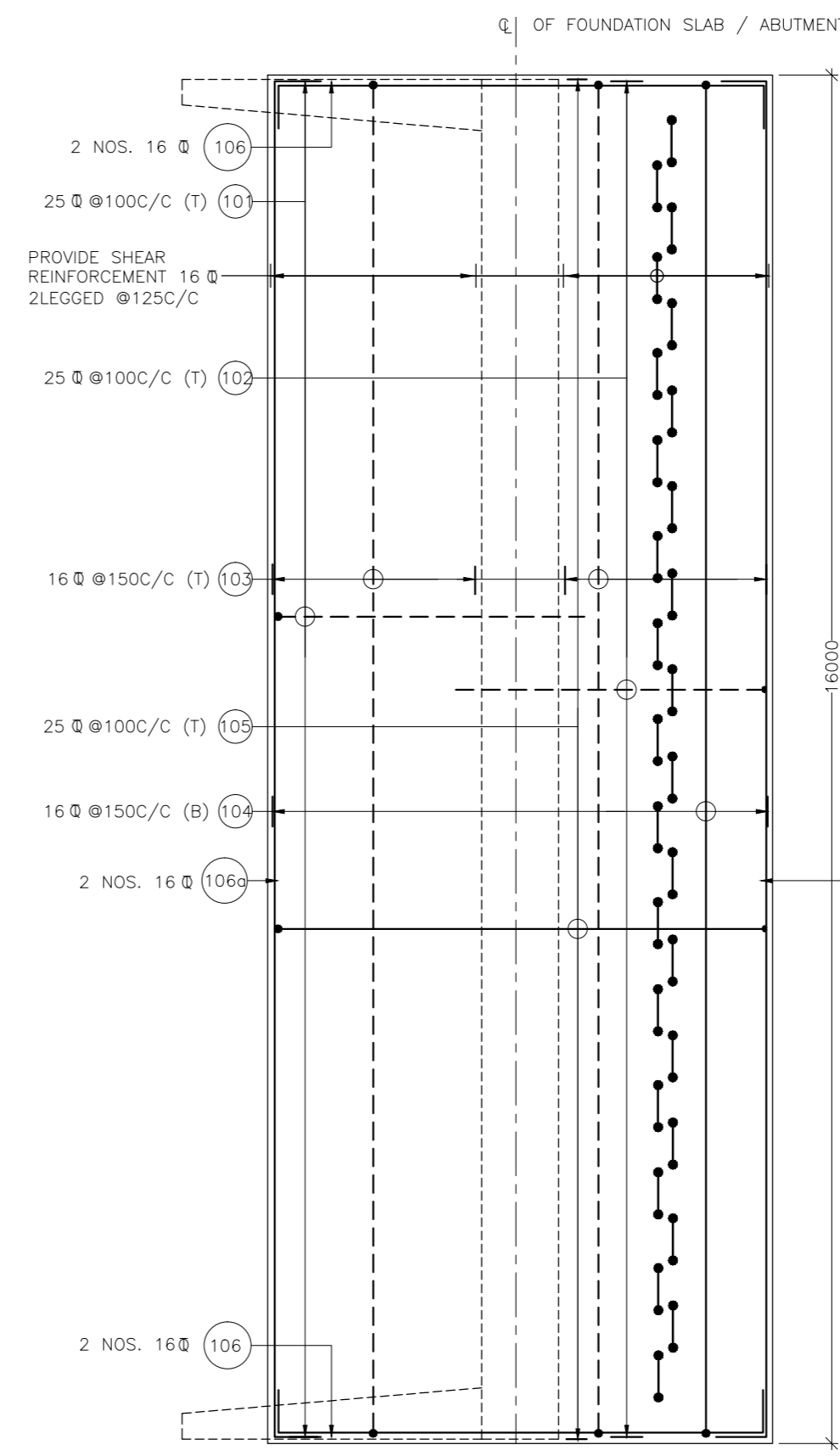
SECTIONAL PLAN AT 2-2
SCALE - 1:30



DETAIL - A
SCALE 1:20



SECTION AT 1-1
(SCALE-1:75)



PLAN SHOWING REINFORCEMENT DETAIL OF FOUNDATION SLAB
SCALE 1:75

LEGENDED:-

REAR FACE / TOP BAR /	-----
EARTH FACE BAR	-----
FRONT FACE / BOTTOM BAR /	-----
OPP. TO EARTH FACE BAR	-----

- NOTES :**
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.
 - CONCRETE GRADE SHALL BE SUBSTRUCTURE & FOUNDATION M30
 - ALL REINFORCING STEEL SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS: 1786.
 - CLEAR COVER :-
a. FOR FOUNDATION = 75MM
b. FOR SUBSTRUCTURE = 75MM
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH SECTION 16 IRC:112-2011.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE WILL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - BARS SHOULD BE STAGGERED AS FAR AS PRACTICABLE.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO:
CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/GA (SHEET NO. 01 & 02)
CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/RCC (SHEET NO. 02)
CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/MISC (SHEET NO. 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
DATE: SEPT, 2016



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.

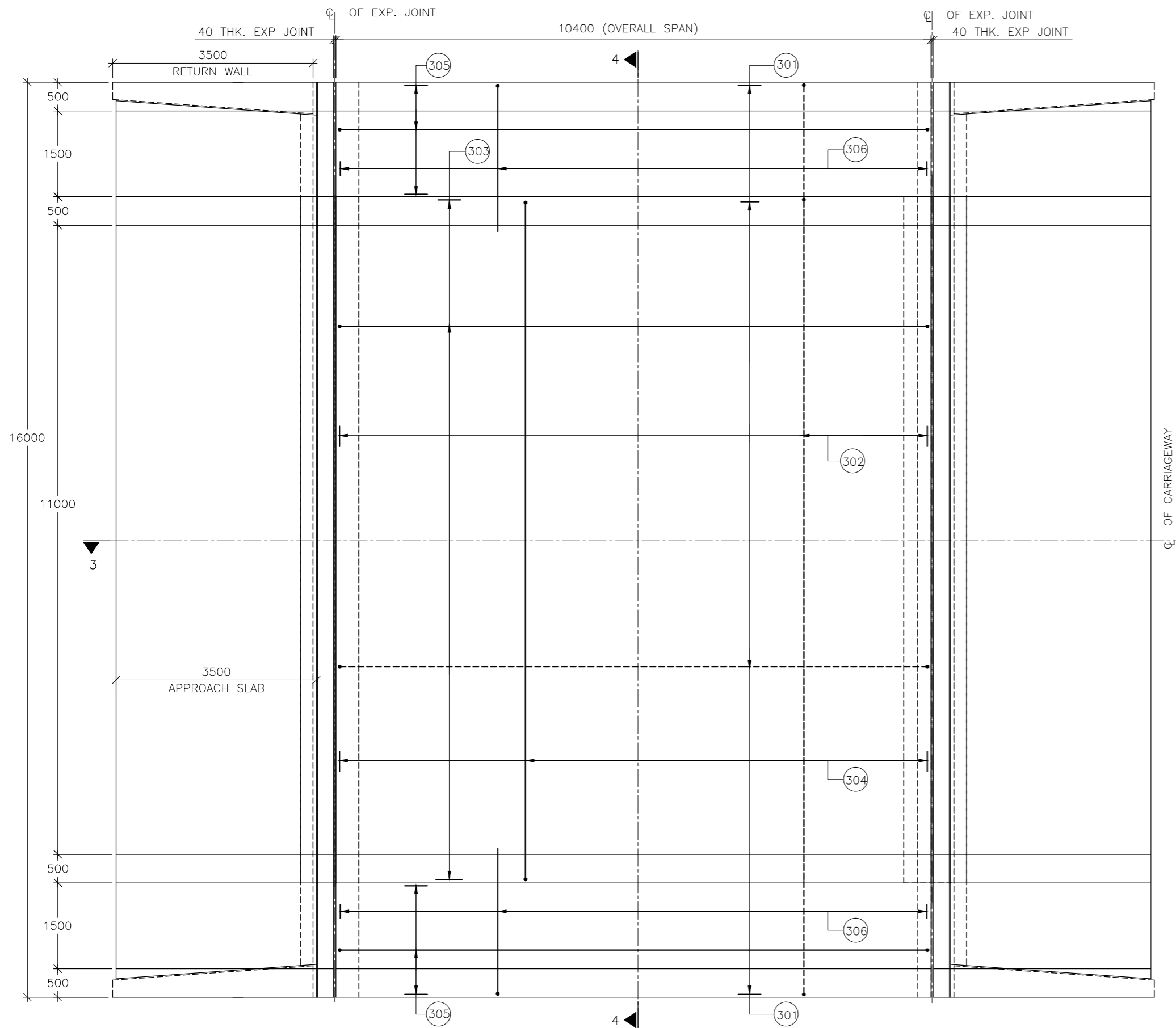
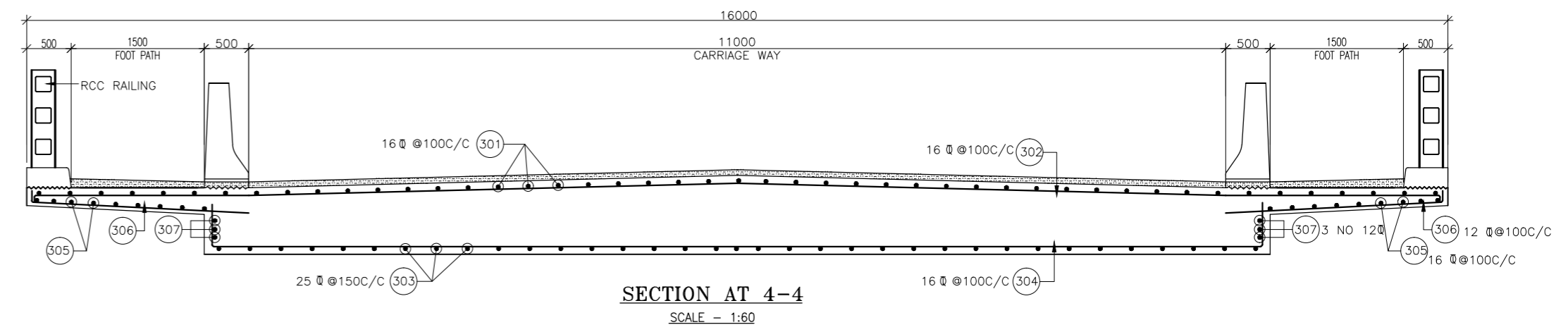
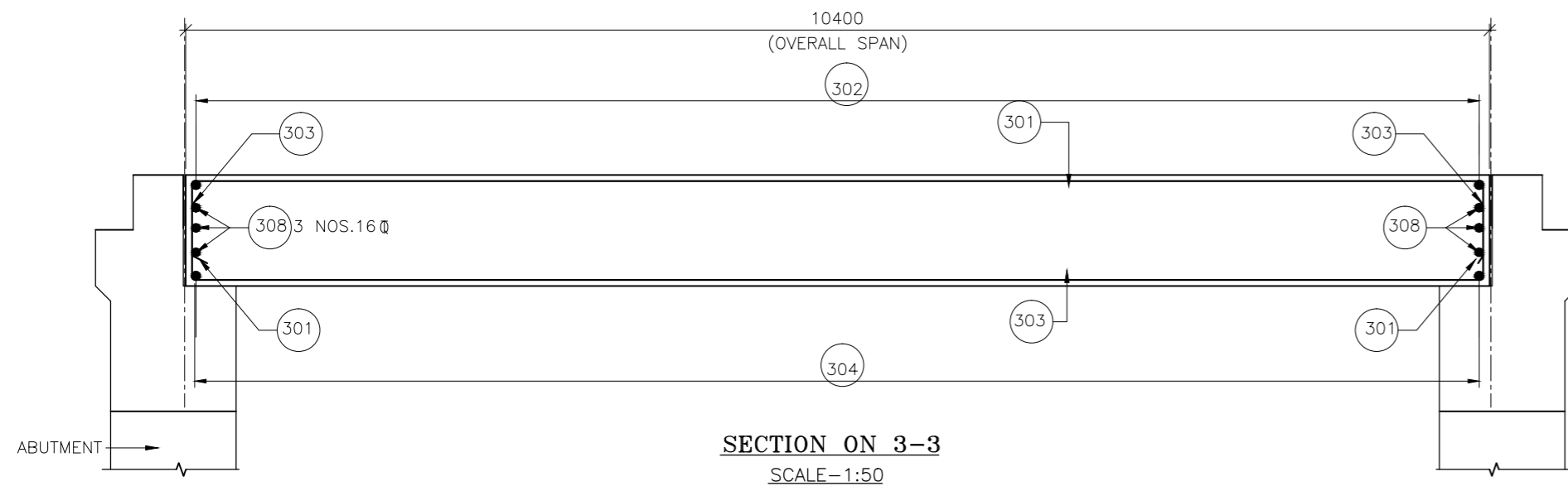
REINFORCEMENT DETAILS OF ABUTMENT & FOUNDATION SLAB

Package :- IV District :-SENAPATI
Design Chainage :- 81+870 to 105+825
Existing Chainage :- 88+520 to 114+165

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

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/RCC (SHEET NO. 01 OF 02)

Drawn By.	Design By.	Checked By.	Approved By.
S.Roy	-	Avishek Dey	Soubhik Sadhu



LEGENED:-

REAR FACE / TOP BAR / - - - - -
 EARTH FACE BAR
 FRONT FACE / BOTTOM BAR / _____
 OPP. TO EARTH FACE BAR

NOTES :

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.
2. CONCRETE GRADE SHALL BE SUBSTRUCTURE & FOUNDATION M30
3. ALL REINFORCING STEEL SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS: 1786.
4. CLEAR COVER :-
 a. FOR FOUNDATION = 75MM
 b. FOR SUBSTRUCTURE = 75MM
5. LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH SECTION 16 IRC:112-2011.
6. WELDING OF BARS SHALL NOT BE PERMITTED.
7. SHARP EDGES OF CONCRETE WILL NOT BE PERMITTED.
8. CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
9. BARS SHOULD BE STAGGERED AS FAR AS PRACTICABLE.
10. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO:
 CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/GA (SHEET NO. 01 & 02)
 CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/RCC (SHEET NO. 01)
 CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/MISC

PLAN SHOWING REINFORCEMENT DETAILS OF DECK SLAB

SCALE- 1:75

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016



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

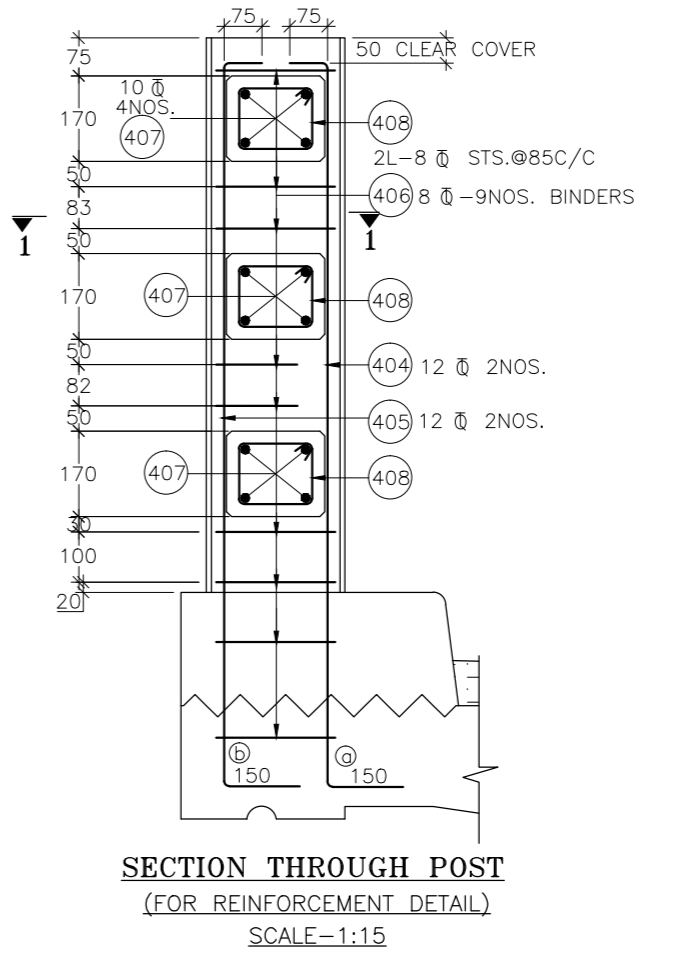
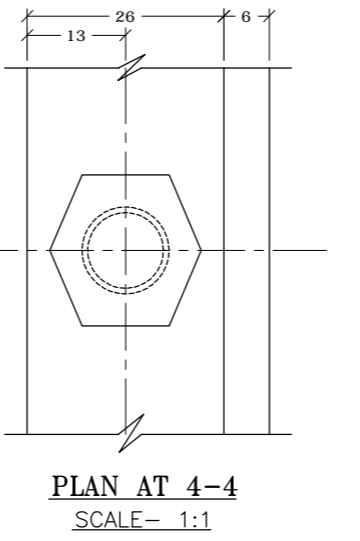
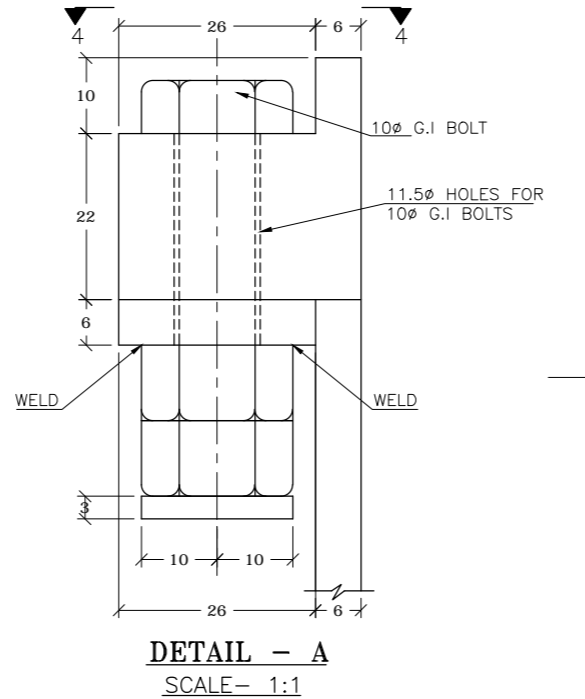
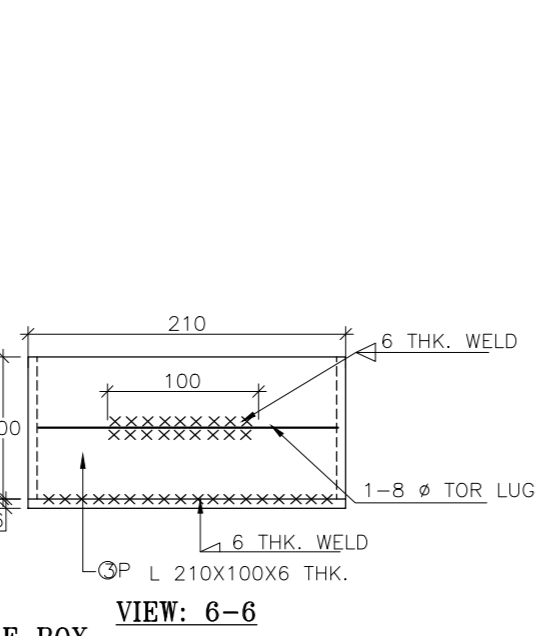
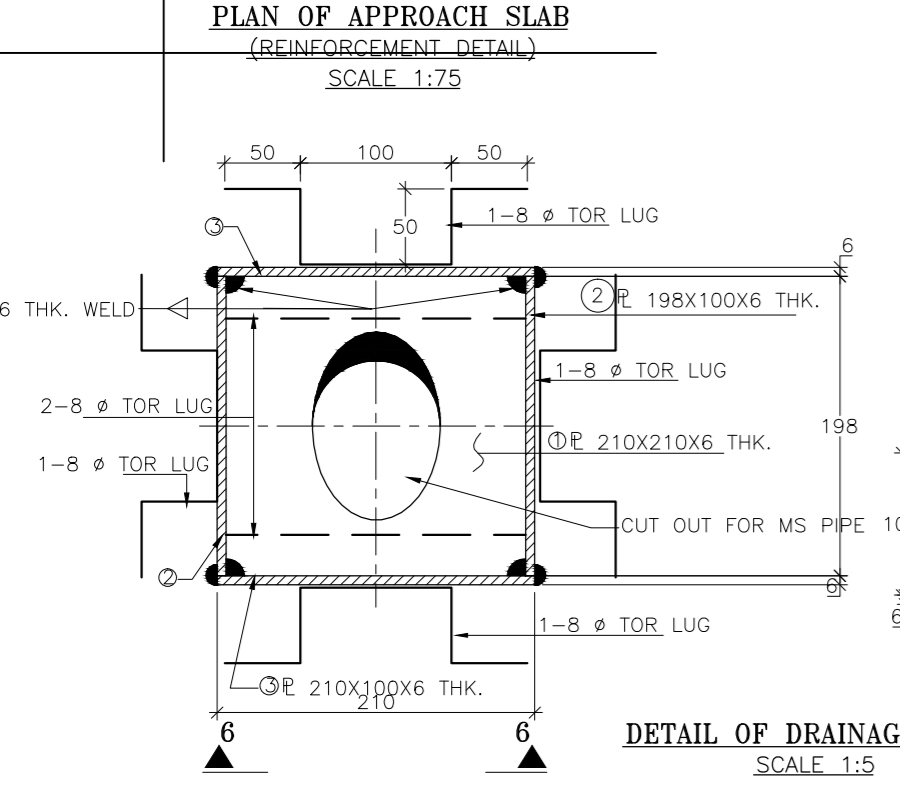
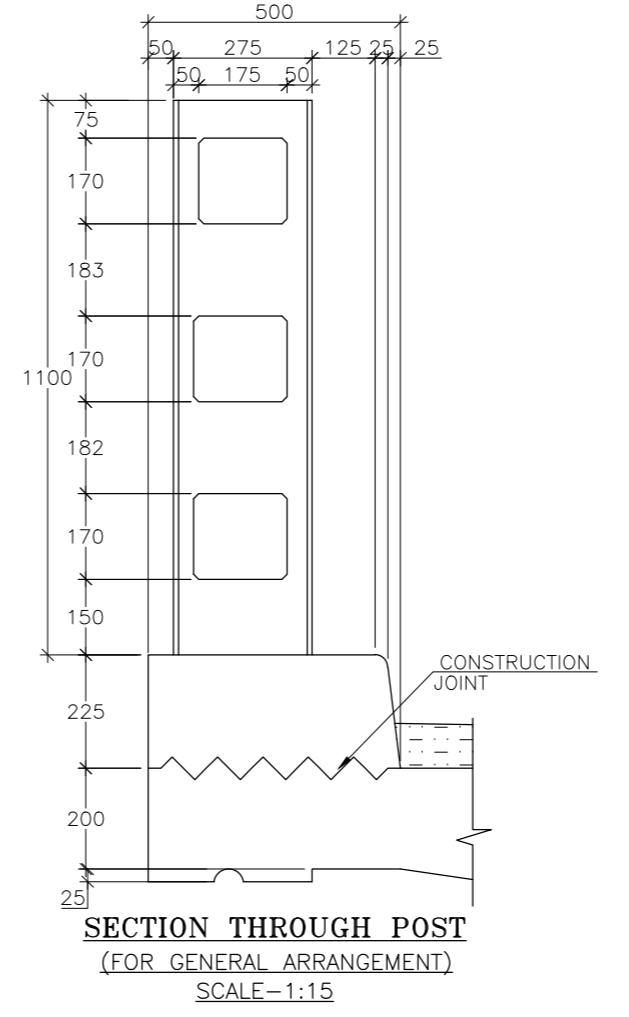
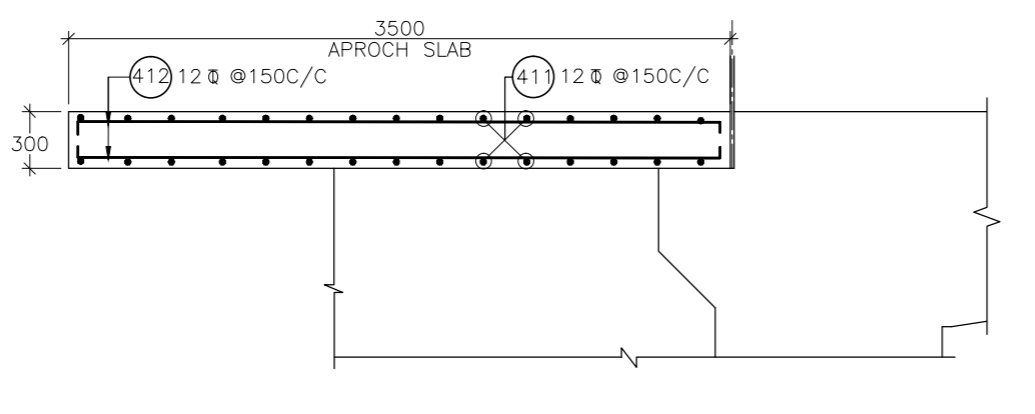
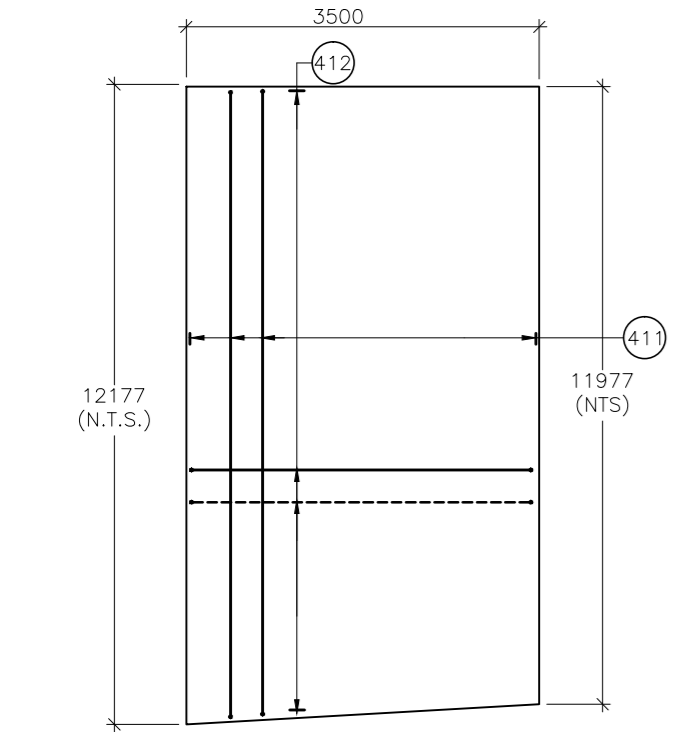
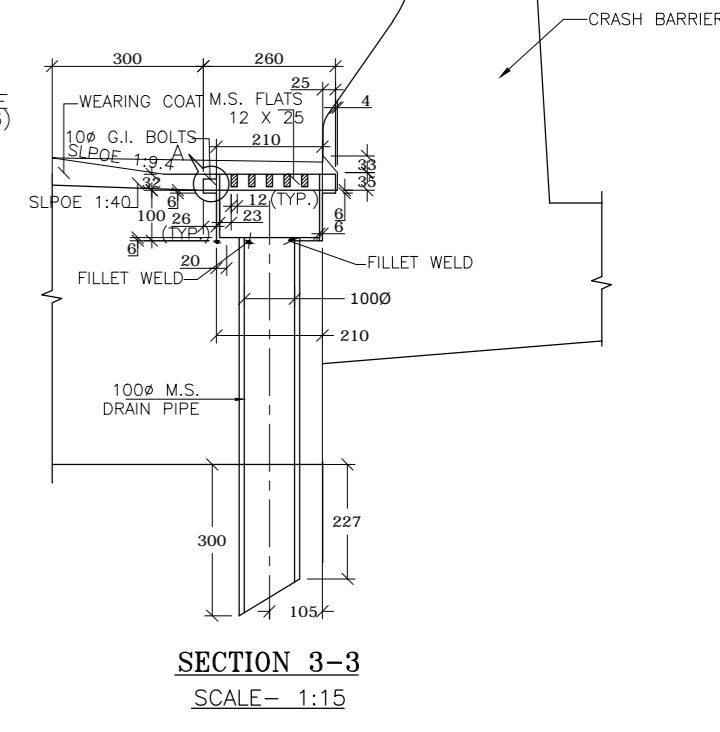
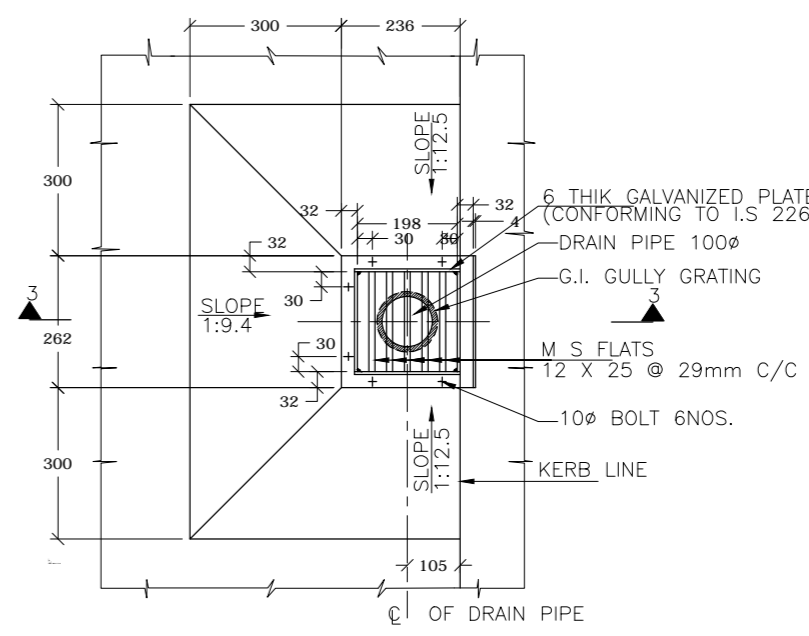
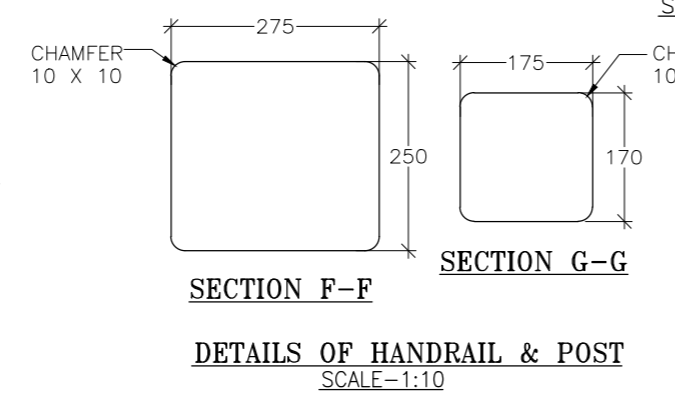
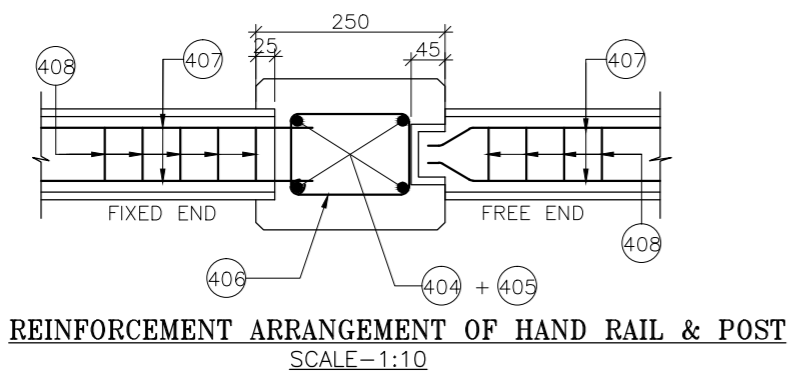
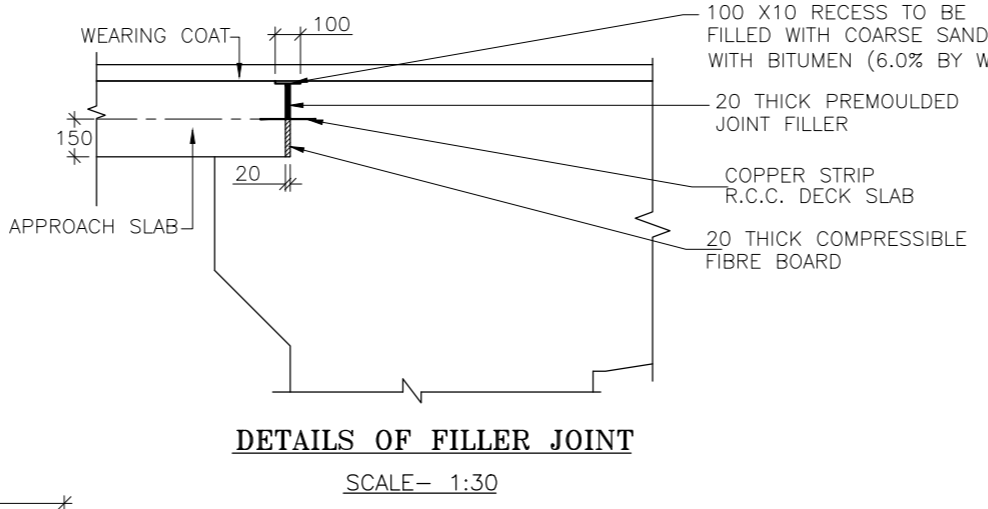
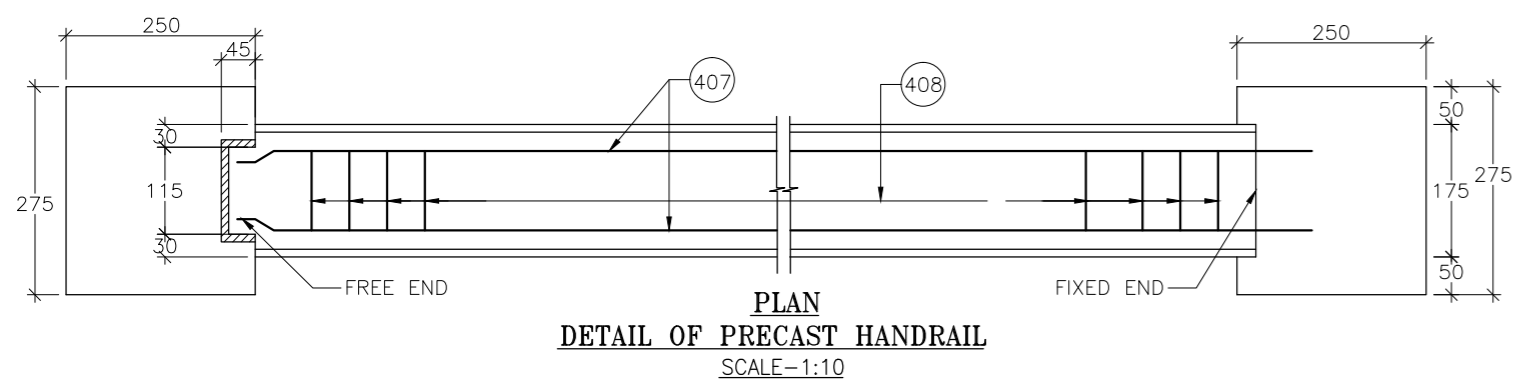
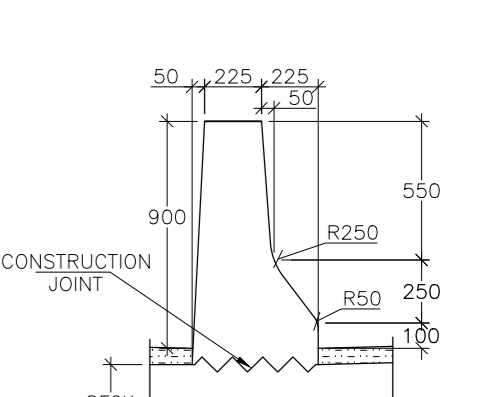
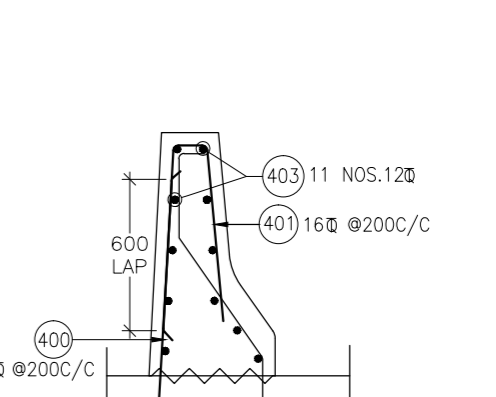
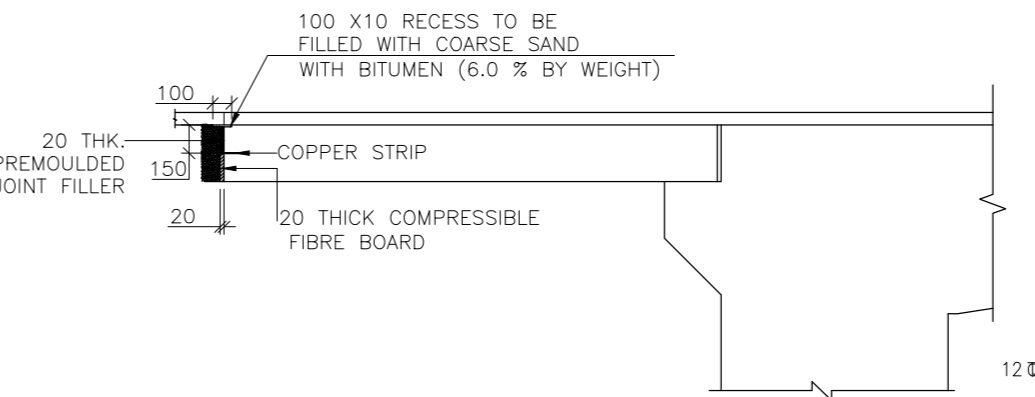
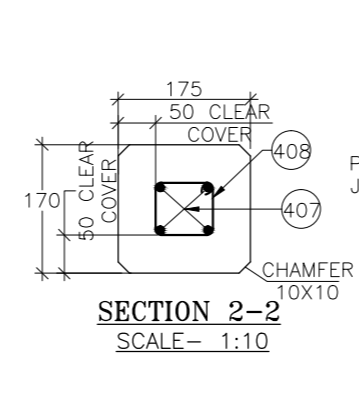
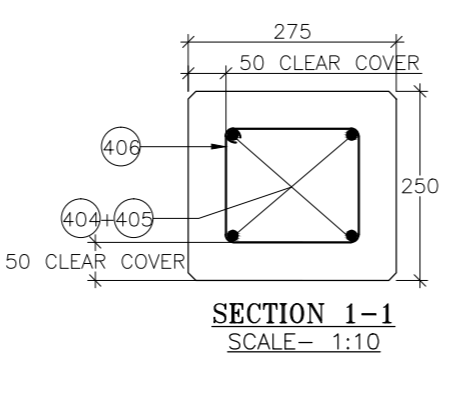
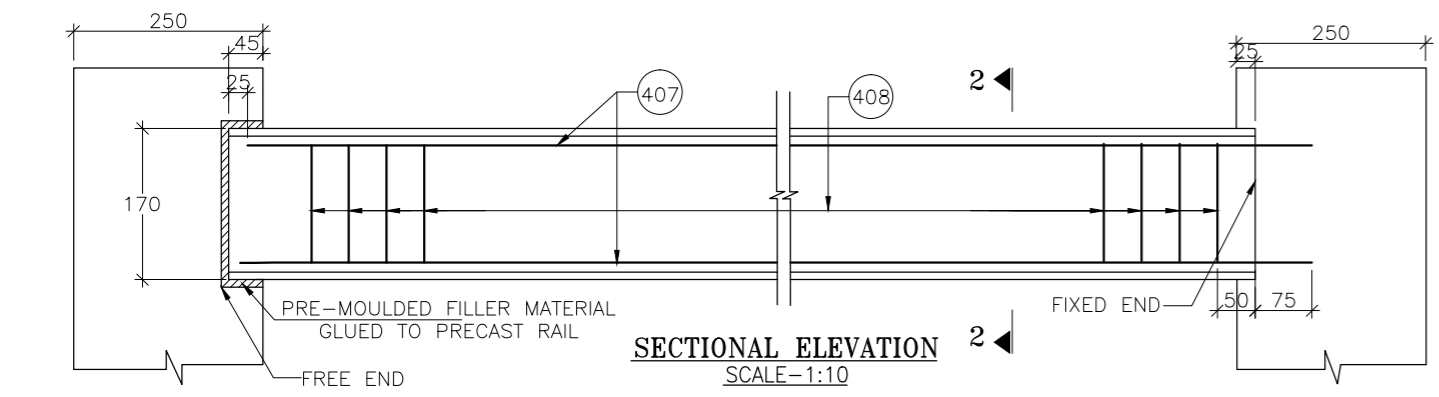
PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Laning with Paved Shoulder of Ukhrul - ToloI - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF DECK SLAB

Package :- IV District :-SENAPATI
 Designe Chainage :- 81+870 to 105+825
 Existing Chainage :- 88+520 to 114+165

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

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/RCC (SHEET NO.02 OF 02)			
Drawn By.	Design By.	Checked By.	Approved By.
S.Roy	-	Avishek Dey	Soubhik Sadhu



NOTE :

- ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE NOTED.

RAILING :

- REINFORCEMENT OF RAILING POST SHOULD BE SUITABLY ANCHORED IN DECK SLAB.
- CASTING OF POST SHALL BE DONE IN SINGLE POUR AFTER ACCURATELY POSITIONING THE PRECAST HANDRAIL.
- RAILING SHALL BE CONSTRUCTED ONLY AFTER THE STRUCTURAL CONCRETE OF SUPERSTRUCTURE HAS HARDENED AND SHUTTERING IS RELEASED.
- EXPANSION GAPS IN RAILING SHALL BE PROVIDED AT THE SAME LOCATIONS AS IN THE DECK SLAB.

NOTES FOR DRAINAGE SPOUT


- ONLY FIGURED DIMENSIONS ARE TO BE FOLLOWED.
- ALL STEEL WORK SHALL BE AS PER IS - 2062.
- DRAINAGE SPOUT & COLLECTION PIT ASSEMBLY SHALL BE FABRICATED FROM MILD STEEL & AFTER FABRICATION, THE COMPLETE ASSEMBLY EXCEPT GRATING SHALL BE GIVEN A HOT DIPPED GALVANISED COATING.
- THE REINFORCEMENT OF TOP SLAB OF BOX SHALL BE SUITABLY MODIFIED TO ACCOMMODATE THE DRAINAGE SPOUT.
- THE DRAINAGE SPOUT SHALL BE GALVANIZED AFTER WELDING THE PLATES & FLATS.

REFERENCE DRAWINGS :

CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/GA (SHEET NO. 01 & 02)
CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/RCC (SHEET NO. 01 & 02)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN

PROJECT: 

DATE: SEPT, 2016

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

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.

DETAILS OF DRAINAGE SPOUT, EXP. GAP, RCC RAILING AND CRASH BARRIER

Package :- IV District :- SENAPATI
Design Chainage :- 81+870 to 105+825
Existing Chainage :- 88+520 to 114+165

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

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/MN/STR-95-1/MISC

Drawn By.	Design By.	Checked By.	Approved By.
S.Roy	R. Majumdar	Avishek Dey	Soubhik Sadhu

BOX CULVERTS

CONTENT

PROPOSED SMALL BOX CULVERTS

PACKAGE - IV DISTRICT - SENAPATI

Sl. No.	Description	Drawing No.	No. of Sheets
01.	Level Details Of Box Culverts	-	05
02.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with Catchpit & Sloped Protection (Normal Camber) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA	02
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/RCC	01
03.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with Catchpit & Stepped Protection (Normal Camber):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/RCC	01
04.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with Catchpit & Straight Protection (Normal Camber):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/NC/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/NC/RCC	01
05.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) without Catchpit & Straight Protection (Normal Camber):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/RCC	01
06.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with Catchpit & Sloped Protection (Super Elevation) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/SE/GA	02
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/SE/RCC	01
07.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with Catchpit & Stepped Protection (Super Elevation):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/SE/RCC	01
08.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) Without Catchpit & Straight Protection (Super Elevation):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/SE/RCC	01

Sl. No.	Description	Drawing No.	No. of Sheets
09.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) With Catchpit & Straight Protection (Super Elevation):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/SE/RCC	01
10.	Single Cell R.C.C. Box Culvert (2.0m x 2.0m) with 3.0m Earth Cushion With Catchpit & Slope Protection (Normal Camber):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1.3M EC/CP/SLP/NC/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1.3M EC/CP/SLP/NC/RCC	01
11.	Single Cell R.C.C. Box Culvert (2.0m x 3.0m) with Catchpit & Stepped Protection (Super Elevation) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/STP/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/STP/SE/RCC	01
12.	Single Cell R.C.C. Box Culvert (2.0m x 3.0m) with Catchpit & Straight Protection (Super Elevation) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/F/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/F/SE/RCC	01
13.	Single Cell R.C.C. Box Culvert (2.0m x 3.0m) with Catchpit & Sloped Protection (Super Elevation) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/SLP/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/CP/SLP/SE/RCC	01
14.	Single Cell R.C.C. Box Culvert (2.0m x 3.0m) without Catchpit & Sloped Protection (Super Elevation) :-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/SLP/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2x3x1/SLP/SE/RCC	01
15.	Single Cell R.C.C. Box Culvert (2.0m x 3.0m) with 3.0m Earth Cushion With Catchpit & Sloped Protection (Normal Camber):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1.3M EC/CP/SLP/NC/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1.3M EC/CP/SLP/NC/RCC	01
16.	Single Cell R.C.C. Box Culvert (4.0m x 4.0m) with 4.0m Earth Cushion With Catchpit & Sloped Protection (Super Elevation):-		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/GA	01
	Reinforcement Details	CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/RCC	01
17.	Typical detail drawing of small box culvert		
	General Arrangement	CET/BDG/2016/3640/NH-102A/FDPR/BC/MISC.	01

LEVEL DETAILS OF PROPOSED BOX CULVERTS (NH- 102A)
PKG - 4

Structure No.	Proposed Chainage	Proposed Formation Level (M)	Size Span x Height x No. of cell	Cushion Height (m)	Super Elevation (%)	Slope side	Total Road width	Protection Type		Proposed Invert lvl.	Proposed Founding lvl.
								U/S	D/S		
83/1	82+245	2135.757	2X2X1 Cell	0.00	4.70	R TO L	11.00	With Catch pit	Slope	2133.577	2133.197
83/2	82+611	2123.783	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Slope	2121.218	2120.838
83/3	82+925	2130.632	2 X 3 X 1 CELL	0.00	7.00	R TO L	13.00	With Catch pit	Step	2127.637	2127.257
84/1	83+399	2106.451	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	2103.923	2103.543
84/2	83+730	2087.637	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	2085.109	2084.729
85/1	84+045	2068.069	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	2065.541	2065.161
85/2	84+188	2058.059	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Slope	2055.994	2055.614
85/3	84+740	2019.047	2X2X1 Cell	0.00	7.00	R TO L	10.00	With Catch pit	Slope	2016.947	2016.567
85/4	84+898	2006.759	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	2004.219	2003.839
86/1	85+068	1994.859	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Step	1992.331	1991.951
86/2	85+291	1979.249	2X2X1 Cell	0.00	7.00	R TO L	10.00	With Catch pit	Step	1977.149	1976.769
86/3	85+955	1942.306	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Straight	1940.241	1939.861
87/1	86+020	1939.848	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Slope	1937.783	1937.403
87/2	86+248	1931.229	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1928.689	1928.309
87/3	86+498	1921.779	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Step	1919.239	1918.859
87/4	86+618	1917.243	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1914.703	1914.323
87/5	86+768	1911.572	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	1909.045	1908.665
87/6	86+906	1906.355	2X2X1 Cell	0.00	7.00	L TO R	10.00	With Catch pit	Slope	1904.255	1903.875
88/1	87+138	1891.603	2X3X1 Cell	0.00	3.60	R TO L	11.00	With Catch pit	Slope	1888.348	1887.928
88/2	87+473	1888.724	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1886.184	1885.804

Structure No.	Proposed Chainage	Proposed Formation Level (M)	Size Span x Height x No. of cell	Cushion Height (m)	Super Elevation (%)	Slope side	Total Road width	Protection Type		Proposed Invert lvl.	Proposed Founding lvl.
								U/S	D/S		
88/3	87+800	1874.904	2X3X1 Cell	0.00	7.00	L TO R	10.00	With Catch pit	Step	1872.804	1872.424
88/4	87+978	1866.693	2X2X1 Cell	0.00	4.20	R TO L	11.00	With Catch pit	Step	1864.488	1864.108
89/1	88+058	1865.707	2X2X1 Cell	0.00	4.20	R TO L	11.00	With Catch pit	Step	1863.502	1863.122
89/2	88+132	1864.803	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1862.263	1861.883
89/3	88+158	1864.485	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Slope	1862.420	1862.040
89/4	88+355	1863.347	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Step	1860.807	1860.427
89/5	88+645	1865.044	2X2X1 Cell	0.00	3.60	R TO L	10.00	With Catch pit	Step	1862.791	1862.411
89/6	88+738	1865.572	2X2X1 Cell	0.00	3.60	R TO L	11.00	With Catch pit	Slope	1863.337	1862.957
90/1	89+000	1864.414	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1861.874	1861.494
90/2	89+350	1864.414	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Slope	1862.349	1861.969
90/3	89+612	1846.935	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1844.395	1844.015
90/4	89+685	1842.666	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1840.126	1839.746
90/5	89+790	1841.159	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1838.619	1838.239
90/6	89+994	1841.385	2X2X1 Cell	0.00	3.60	R TO L	11.00	With Catch pit	Straight	1839.150	1838.770
91/1	90+078	1838.794	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Straight	1836.254	1835.874
91/2	90+350	1826.717	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Slope	1824.152	1823.772
91/3	90+663	1810.067	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Step	1807.502	1807.122
92/1	91+453	1758.393	2X2X1 Cell	0.00	7.00	R TO L	13.00	With Catch pit	Straight	1756.398	1756.018
92/2	91+595	1748.453	2X2X1 Cell	0.00	7.00	R TO L	13.00	With Catch pit	Straight	1746.458	1746.078

Structure No.	Proposed Chainage	Proposed Formation Level (M)	Size Span x Height x No. of cell	Cushion Height (m)	Super Elevation (%)	Slope side	Total Road width	Protection Type		Proposed Invert lvl.	Proposed Founding lvl.
								U/S	D/S		
92/3	91+805	1733.753	2X3X1 Cell	0.00	7.00	L TO R	10.00	With Catch pit	Straight	1730.633	1730.213
93/2	92+432	1714.923	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Step	1712.395	1712.015
93/4	92+856	1728.451	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1725.911	1725.531
94/1	93+025	1734.606	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Straight	1732.541	1732.161
94/2	93+118	1736.188	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Step	1733.648	1733.268
94/3	93+431	1734.553	2X2X1 Cell	0.00	7.00	R TO L	12.00	No Catch pit	Straight	1732.523	1732.143
94/4	93+578	1739.542	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Straight	1737.002	1736.622
95/2	94+228	1734.880	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Straight	1732.353	1731.973
95/3	94+355	1743.771	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Straight	1741.243	1740.863
95/4	94+697	1767.712	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Step	1765.185	1764.805
95/5	94+828	1776.883	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1774.343	1773.963
95/6	94+908	1782.483	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1779.943	1779.563
96/1	95+058	1792.984	2X2X1 Cell	0.00	6.70	R TO L	11.00	With Catch pit	Straight	1790.904	1790.524
96/2	95+142	1797.496	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Step	1794.968	1794.588
96/3	95+318	1802.419	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Straight	1800.354	1799.974
96/4	95+372	1803.929	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1801.389	1801.009
96/5	95+555	1809.048	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Straight	1806.983	1806.603
96/6	95+858	1817.523	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Slope	1814.958	1814.578
97/1	96+312	1800.892	2X2X1 Cell	0.00	7.00	R TO L	13.00	With Catch pit	Step	1798.897	1798.517

Structure No.	Proposed Chainage	Proposed Formation Level (M)	Size Span x Height x No. of cell	Cushion Height (m)	Super Elevation (%)	Slope side	Total Road width	Protection Type		Proposed Invert lvl.	Proposed Founding lvl.
								U/S	D/S		
97/2	96+812	1763.325	2X2X1 Cell	0.00	7.00	R TO L	10.00	With Catch pit	Slope	1761.225	1760.845
99/1	98+046	1671.004	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	1668.476	1668.096
99/2	98+250	1655.630	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Straight	1653.565	1653.185
99/3	98+917	1605.739	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	1603.212	1602.832
100/1	99+168	1586.569	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Step	1584.504	1584.124
100/2	99+332	1575.089	2X2X1 Cell	0.00	5.60	R TO L	10.00	With Catch pit	Step	1572.926	1572.546
100/3	99+477	1564.939	2X2X1 Cell	0.00	5.60	R TO L	11.00	With Catch pit	Slope	1562.804	1562.424
101/1	100+250	1520.230	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Straight	1517.702	1517.322
101/2	100+667	1512.671	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1510.131	1509.751
101/3	100+692	1512.218	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Slope	1510.153	1509.773
101/4	100+995	1506.586	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Slope	1504.521	1504.141
102/1	101+105	1503.692	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Slope	1501.165	1500.785
102/2	101+293	1500.212	2X2X1 Cell	0.00	Normal Camber		12.00	No Catch pit	Straight	1497.660	1497.280
102/3	101+708	1513.867	2X2X1 Cell	0.00	Normal Camber		10.00	With Catch pit	Step	1511.340	1510.960
102/4	101+832	1518.206	2X2X1 Cell	0.00	7.00	L TO R	11.00	With Catch pit	Slope	1516.141	1515.761
103/1	102+040	1521.487	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Slope	1519.422	1519.042
103/2	102+142	1521.682	2X2X1 Cell	0.00	7.00	R TO L	10.00	With Catch pit	Slope	1519.582	1519.202
103/3	102+318	1524.201	2X2X1 Cell	0.00	Normal Camber		11.00	With Catch pit	Slope	1521.661	1521.281
103/4	102+468	1532.189	2X2X1 Cell Earth Cushion	3.00	Normal Camber		10.00	With Catch pit	Slope	1526.826	1526.526
103/5	102+599	1539.178	2X2X1 Cell	0.00	7.00	R TO L	11.00	With Catch pit	Slope	1537.113	1536.733

Structure No.	Proposed Chainage	Proposed Formation Level (M)	Size Span x Height x No. of cell	Cushion Height (m)	Super Elevation (%)	Slope side	Total Road width	Protection Type		Proposed Invert lvl.	Proposed Founding lvl.
								U/S	D/S		
104/1	103+085	1534.282	2X3X1 Cell	0.00	4.70	L TO R	11.00	No Catch pit	Slope	1531.082	1530.662
104/2	103+463	1530.152	2X2X1 Cell	0.00	Normal Camber		13.00	No Catch pit	Straight	1527.587	1527.207
104/3	103+568	1531.903	2X3X1 Cell Earth Cushion	3.00	Normal Camber		13.00	With Catch pit	Slope	1525.473	1525.173
104/4	103+695	1540.126	4X4X1 Cell Earth Cushion	4.00	7.00	L TO R	13.00	With Catch pit	Slope	1531.626	1531.026
104/5	103+786	1546.130	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Slope	1543.565	1543.185
105/1	104+048	1565.926	2X2X1 Cell	0.00	Normal Camber		13.00	No Catch pit	Straight	1563.361	1562.981
105/2	104+180	1575.549	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Step	1572.984	1572.604
105/3	104+668	1612.527	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Slope	1609.962	1609.582
105/4	104+715	1615.817	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Straight	1613.252	1612.872
105/5	104+930	1632.322	2X2X1 Cell	0.00	Normal Camber		13.00	With Catch pit	Straight	1629.757	1629.377
105/6	104+975	1635.617	2X2X1 Cell	0.00	7.00	R TO L	13.00	With Catch pit	Straight	1633.622	1633.242

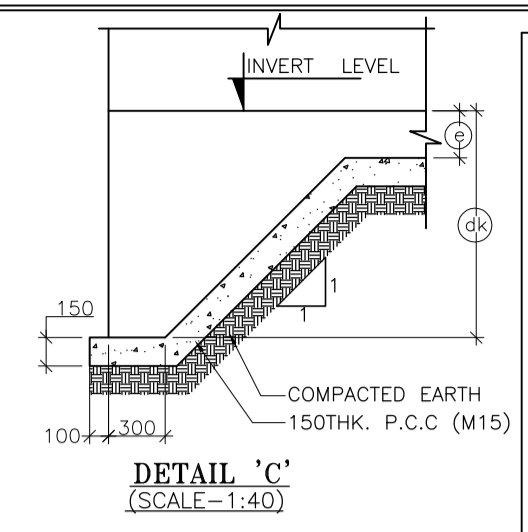
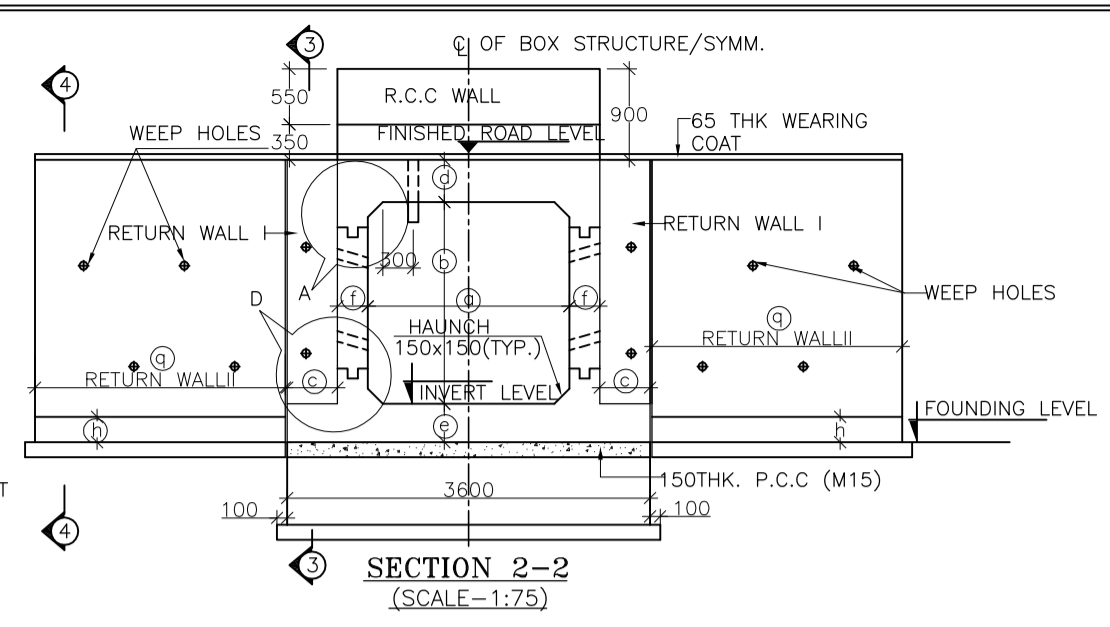
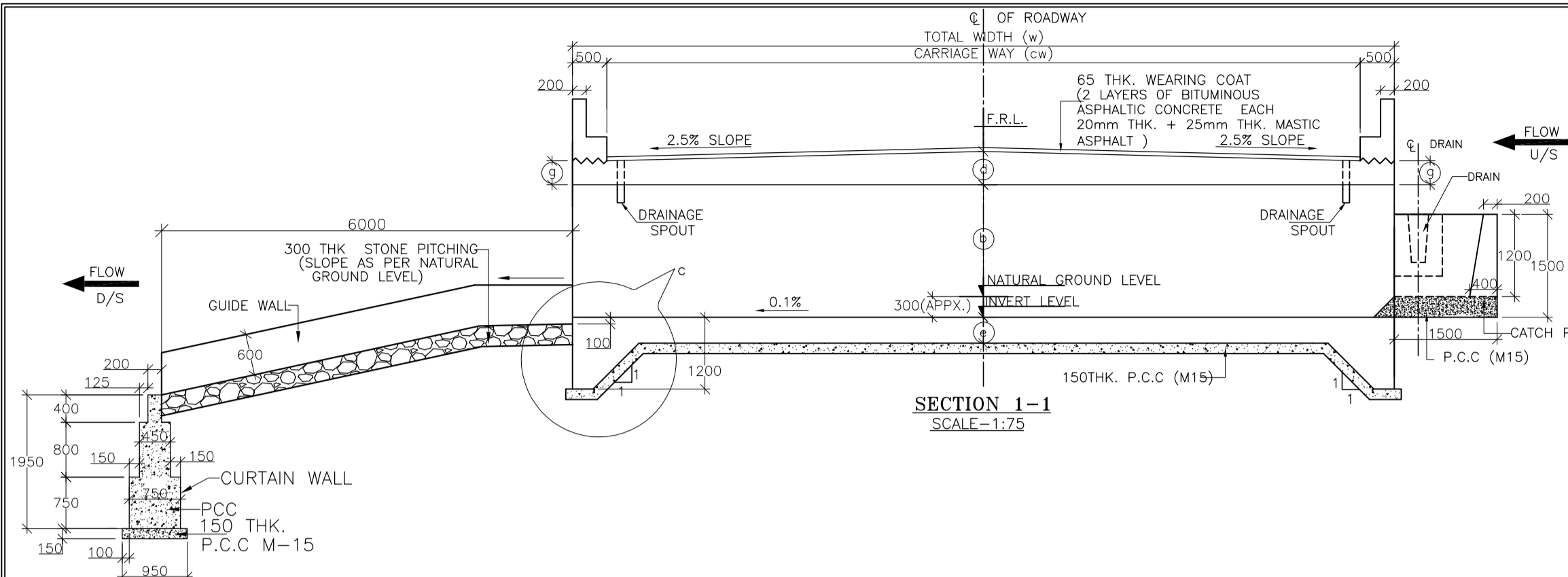
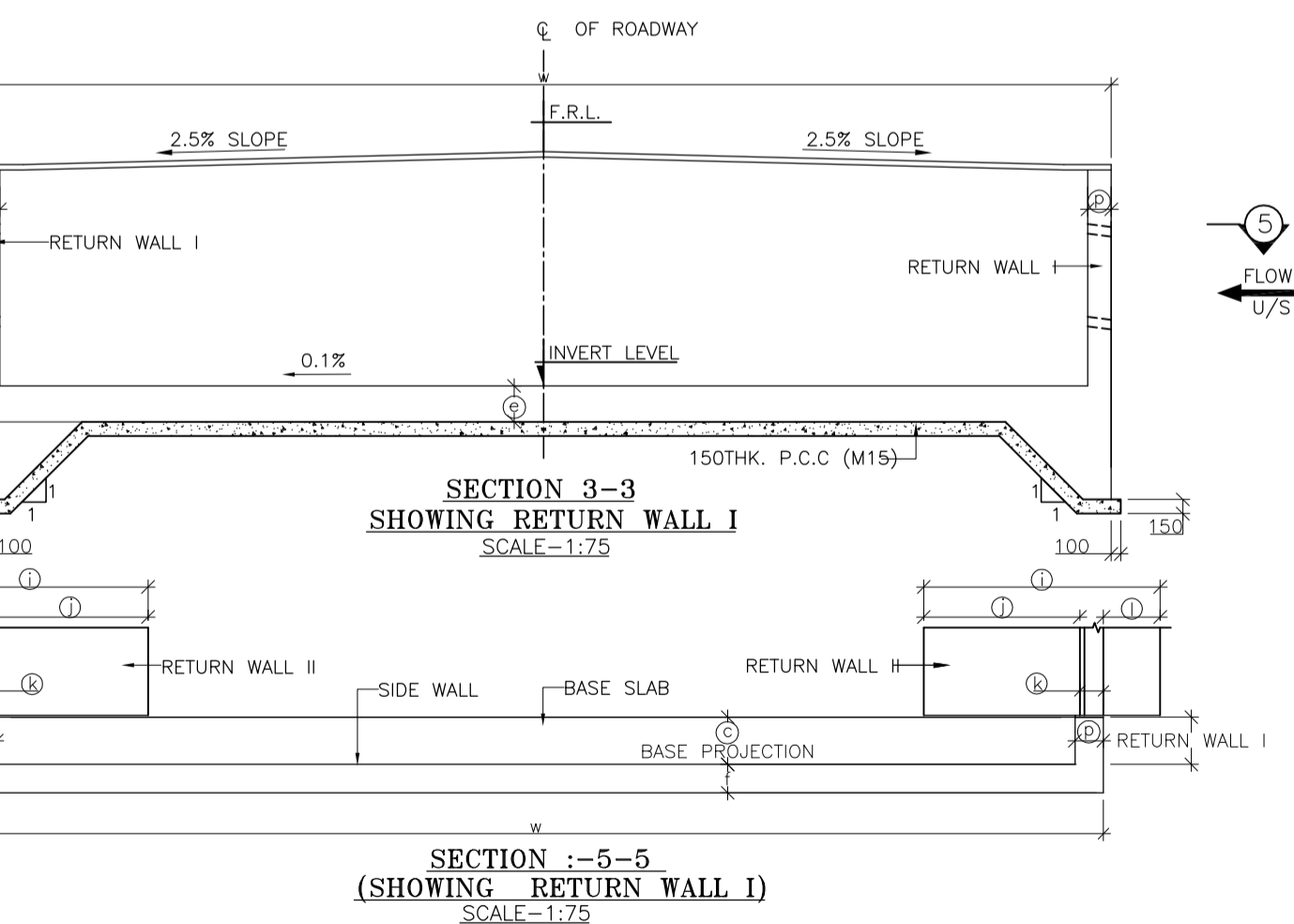
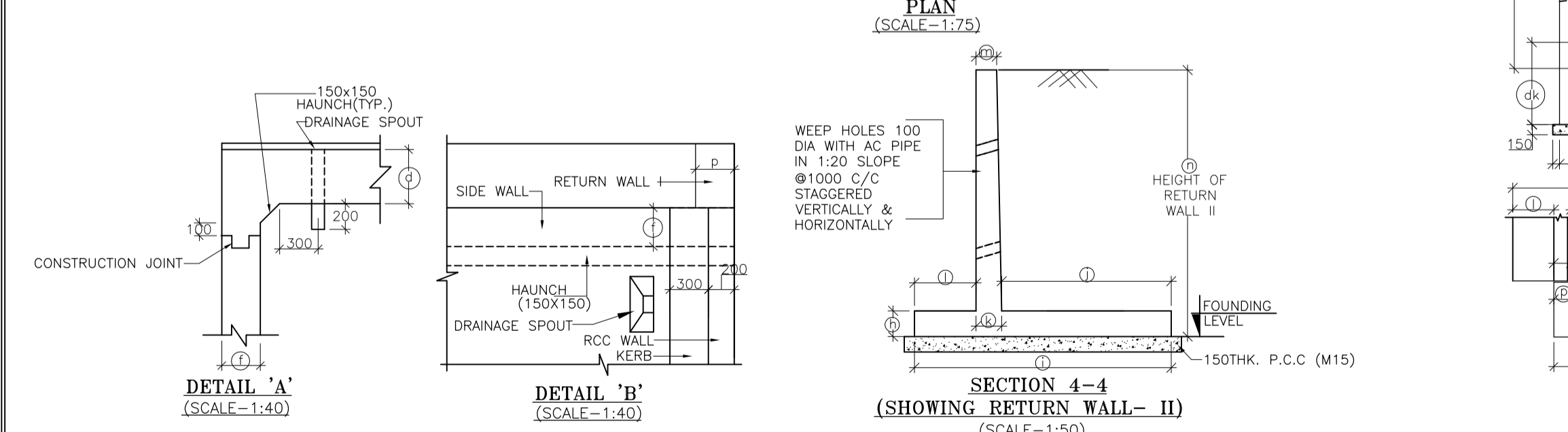
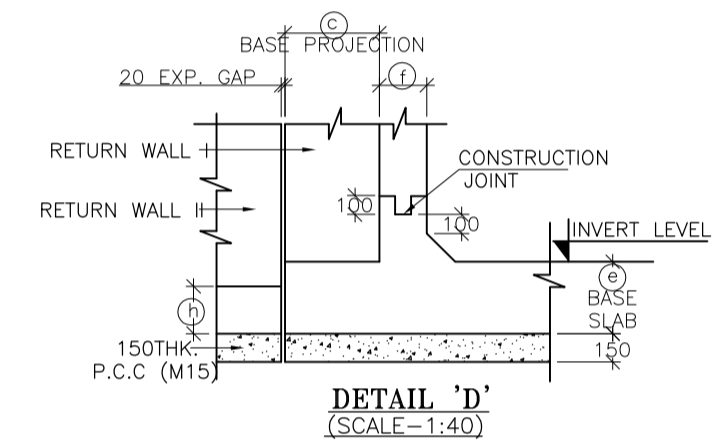
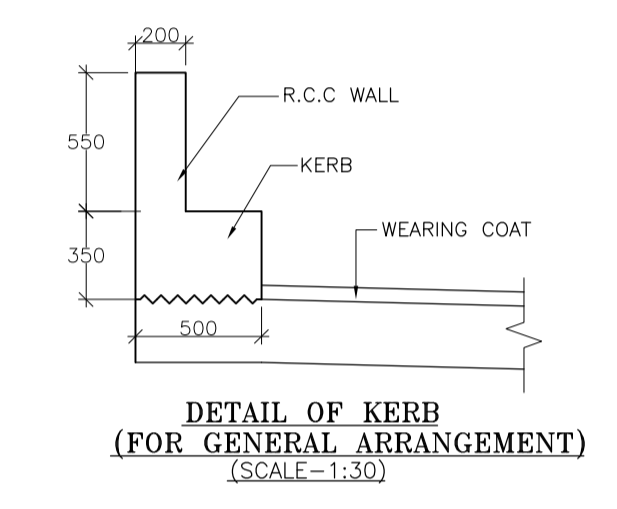
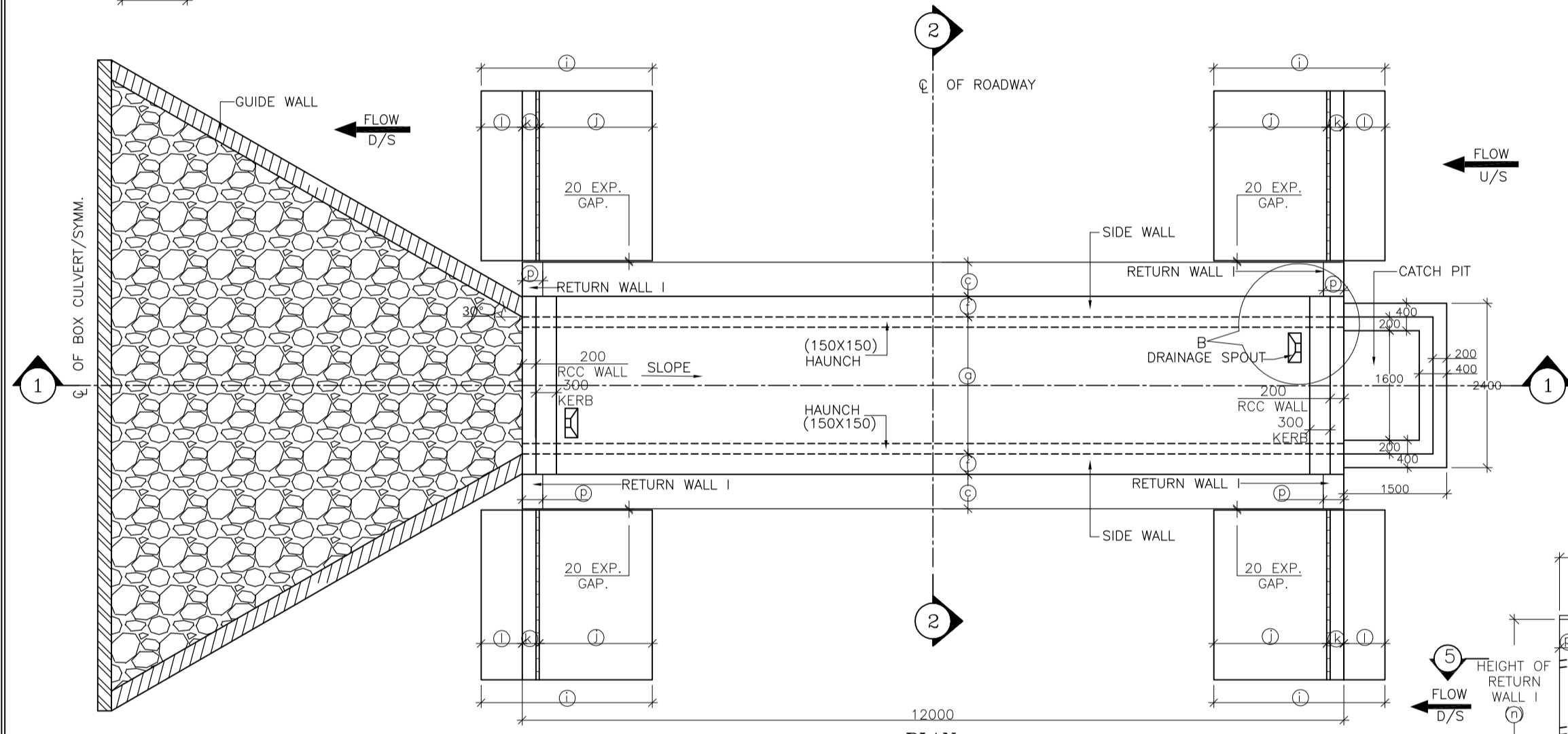


TABLE SHOWING SAILENT DIMENSIONS	
BOX CELL DESIGNATION No./ab/Ec	
a	2000
b	2000
c	500
e	380
f	300
g	350
h	300
i	2200
j	950
k	300
l	950
m	250
n	2730
p	300
q	3100
dk	1200



- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE - M25
CURTAIN WALL - M25
LEVELLING COURSE (P.C.C.) - M15
RETURN WALL - M25
RCC WALL & KERB - M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS FOR TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN
 - PROPERTIES OF BACKFILL SOIL $9-1.81/m^3$, $\theta=30\theta$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM $15\ 1/m^3$ BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/RCC (SHEET NO-01)
CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA (SHEET NO-02)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
DATE: SEPT, 2016

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 - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIT & SLOPED PROTECTION

Package :- IV District :- SENAPATI
Existing Chainage :- 88+520 to 114+165
Design Chainage :- 81+870 to 105+825



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

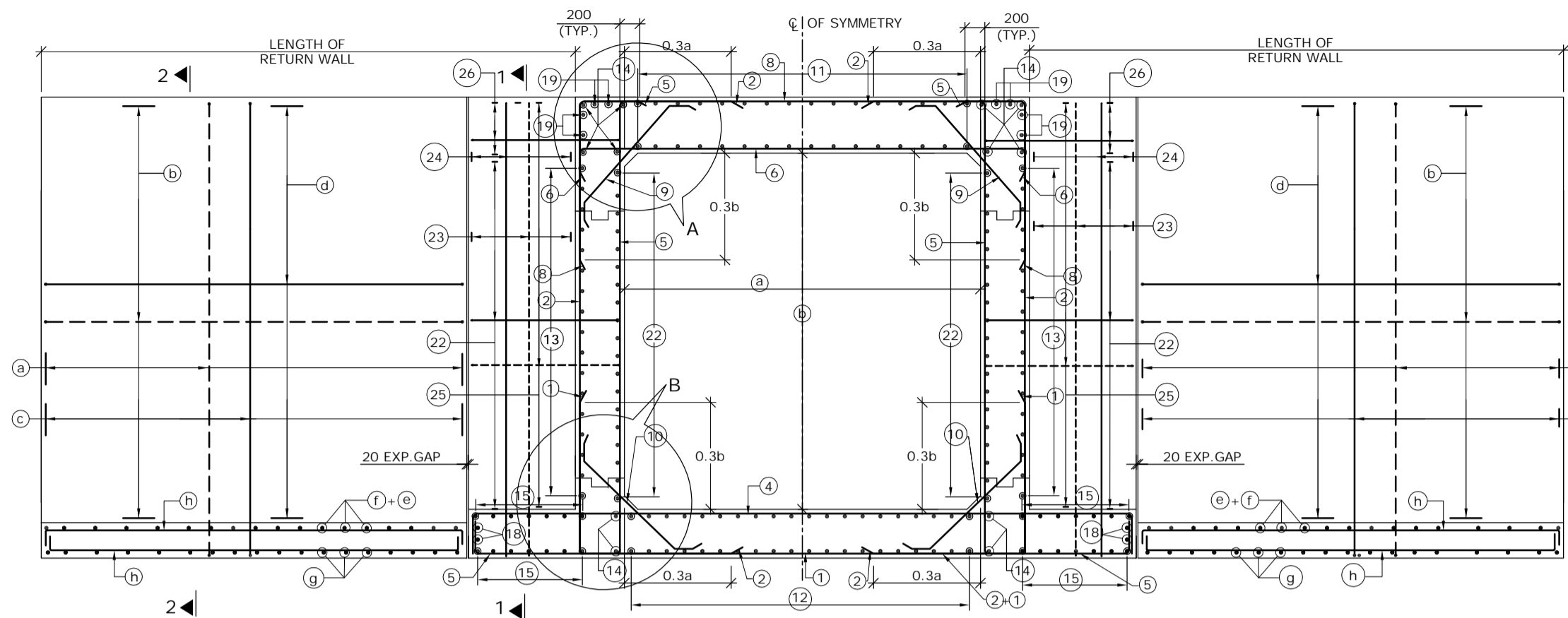
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA (SHEET NO-01 OF 02)

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu

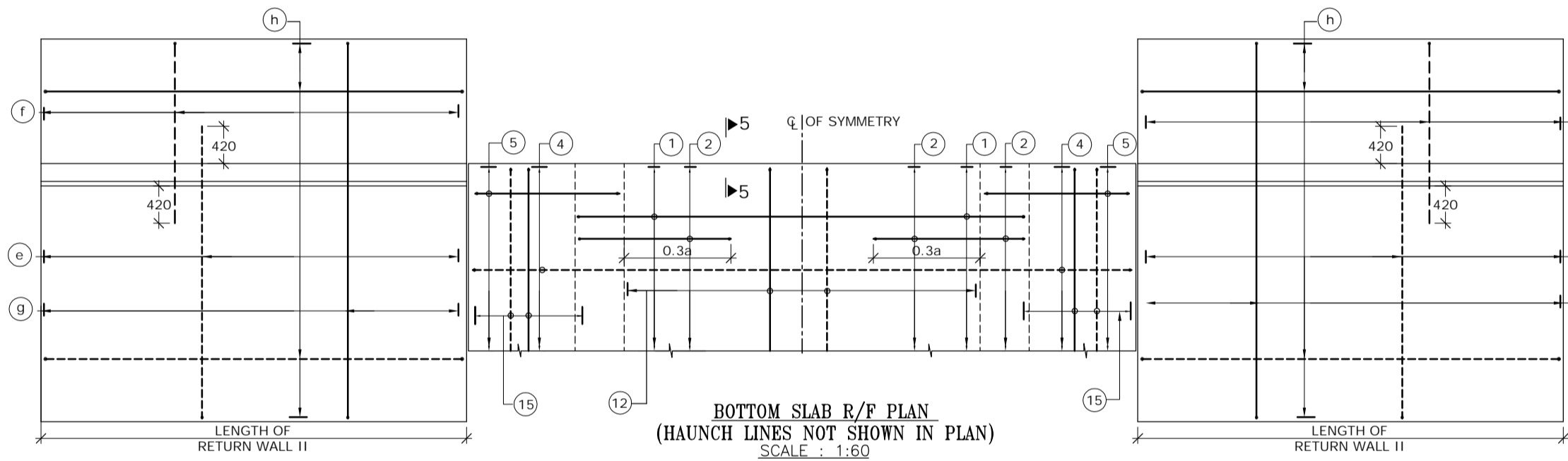
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	Total Road width	Protection Type		Top Slab Thickness at Centre	Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
						U/S	D/S			
83/2	82+611	2123.783	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Slope	0.500	2121.218	2120.838
84/1	83+399	2106.451	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	2103.923	2103.543
84/2	83+730	2087.637	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	2085.109	2084.729
85/1	84+045	2068.069	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	2065.541	2065.161
85/4	84+898	2006.759	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	2004.219	2003.839
87/2	86+248	1931.229	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1928.689	1928.309
87/4	86+618	1917.243	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1914.703	1914.323
87/5	86+768	1911.572	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	1909.045	1908.665
88/2	87+473	1888.724	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1886.184	1885.804
89/2	88+132	1864.803	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1862.263	1861.883
90/1	89+000	1864.414	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1861.874	1861.494
90/3	89+612	1846.935	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1844.395	1844.015
90/4	89+685	1842.666	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1840.126	1839.746
90/5	89+790	1841.159	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1838.619	1838.239
91/2	90+350	1826.717	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Slope	0.500	1824.152	1823.772
93/4	92+856	1728.451	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1725.911	1725.531
95/5	94+828	1776.883	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1774.343	1773.963
95/6	94+908	1782.483	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1779.943	1779.563
96/4	95+372	1803.929	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1801.389	1801.009
96/6	95+858	1817.523	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Slope	0.500	1814.958	1814.578
99/1	98+046	1671.004	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	1668.476	1668.096
99/3	98+917	1605.739	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	1603.212	1602.832
101/2	100+667	1512.671	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1510.131	1509.751
102/1	101+105	1503.692	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Slope	0.463	1501.165	1500.785
103/3	102+318	1524.201	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Slope	0.475	1521.661	1521.281
104/5	103+786	1546.130	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Slope	0.500	1543.565	1543.185
105/3	104+668	1612.527	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Slope	0.500	1609.962	1609.582

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH
CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA
(SHEET NO-02)

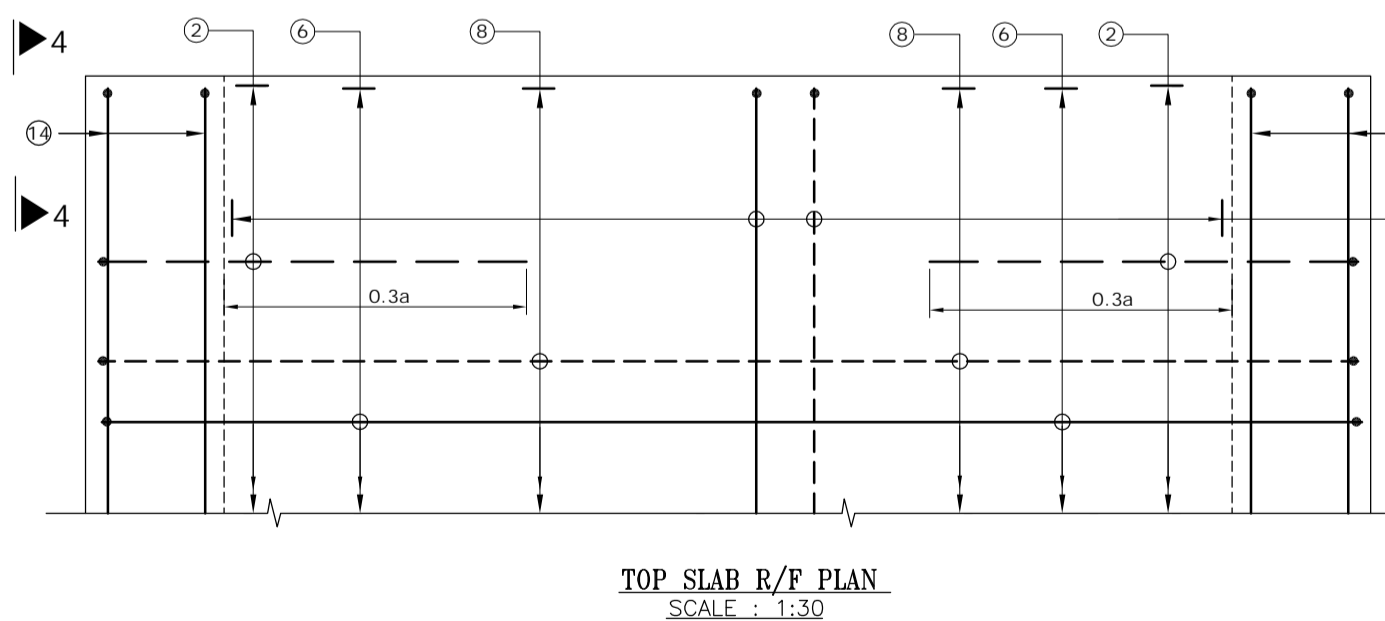
SCALE: AS SHOWN					 CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001		GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIT & SLOPED PROTECTION		CONSULTANT :  CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.		DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA (SHEET NO-02 OF 02)			
DATE: SEPT, 2016					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.		Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Design Chainage :- 81+870 to 105+825		Drawn By. Design By. Checked By. Approved By.		S. Chattrjee - Avishek Dey Soubhik Sadhu			
REVISIONS														



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

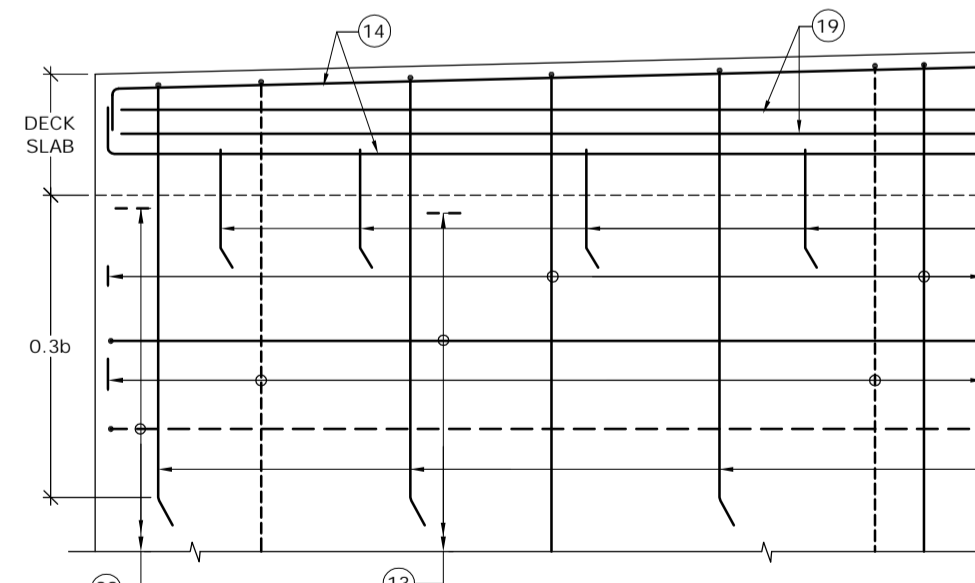


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

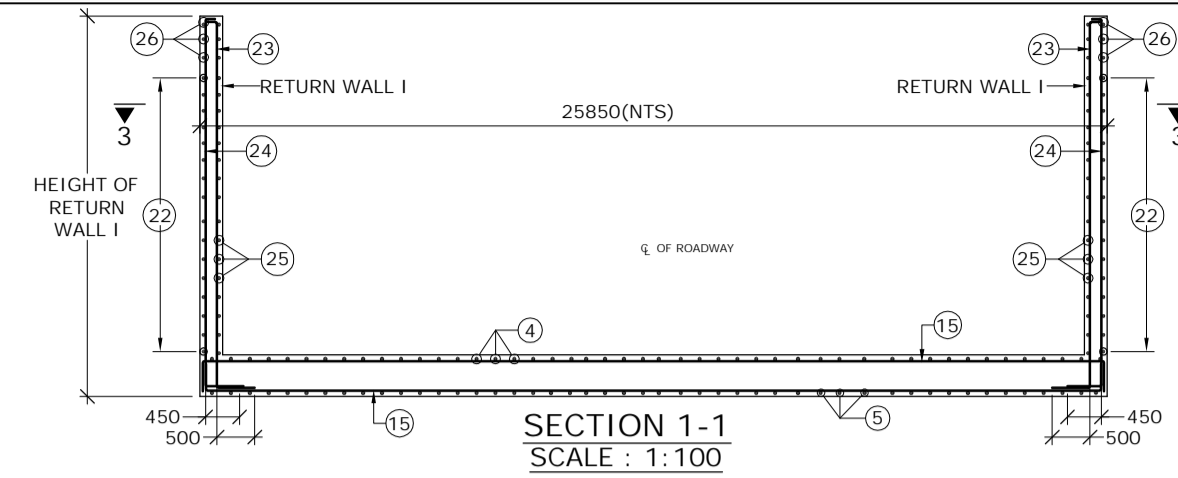


TOP SLAB R/F PLAN
SCALE : 1:30

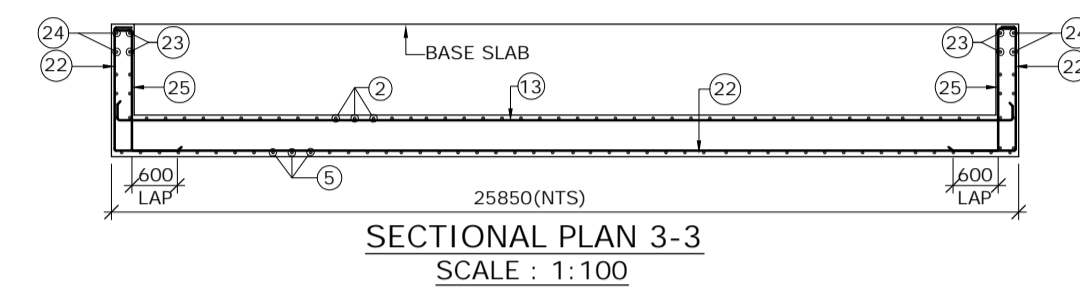
(BAR MARK (5), (19), KERB &
HAUNCH LINES NOT SHOWN IN PLAN)



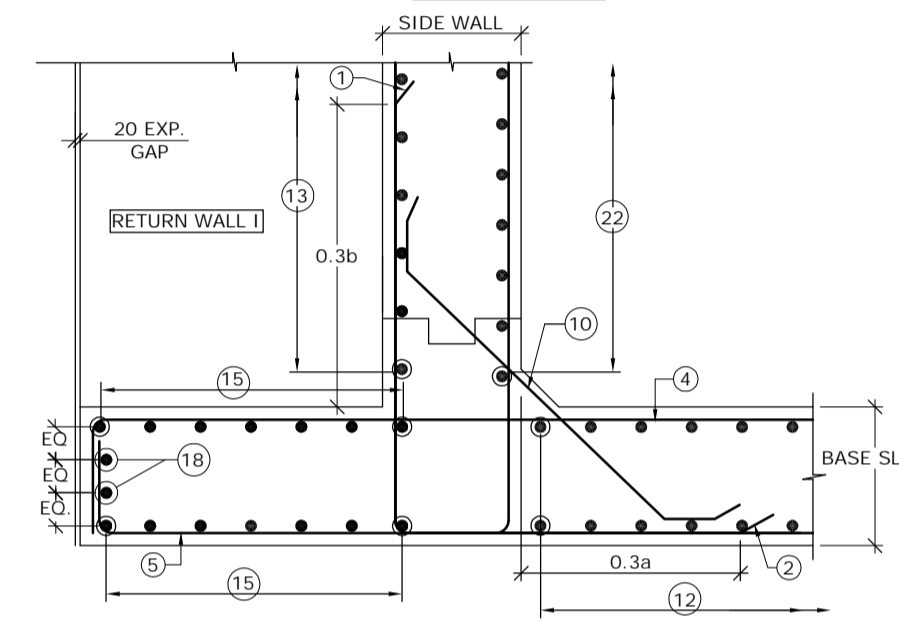
VIEW 4-4
SCALE : 1:30



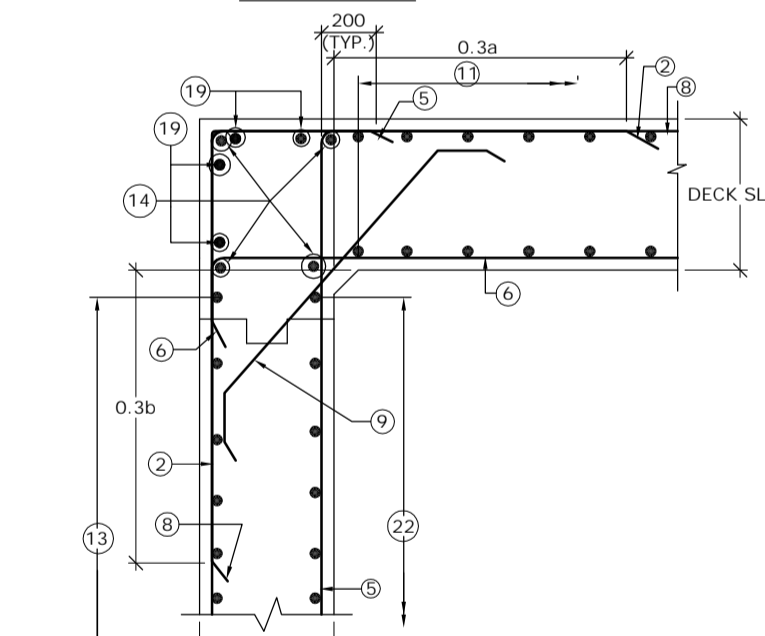
SECTION 1-1
SCALE : 1:100



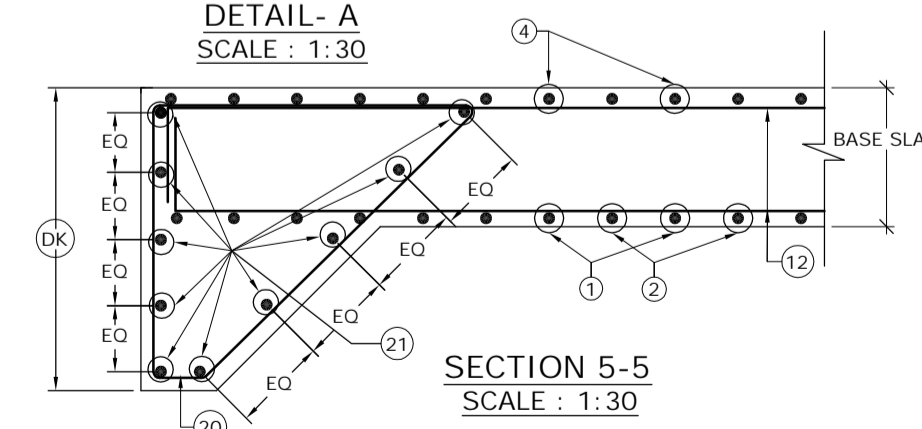
SECTIONAL PLAN 3-3
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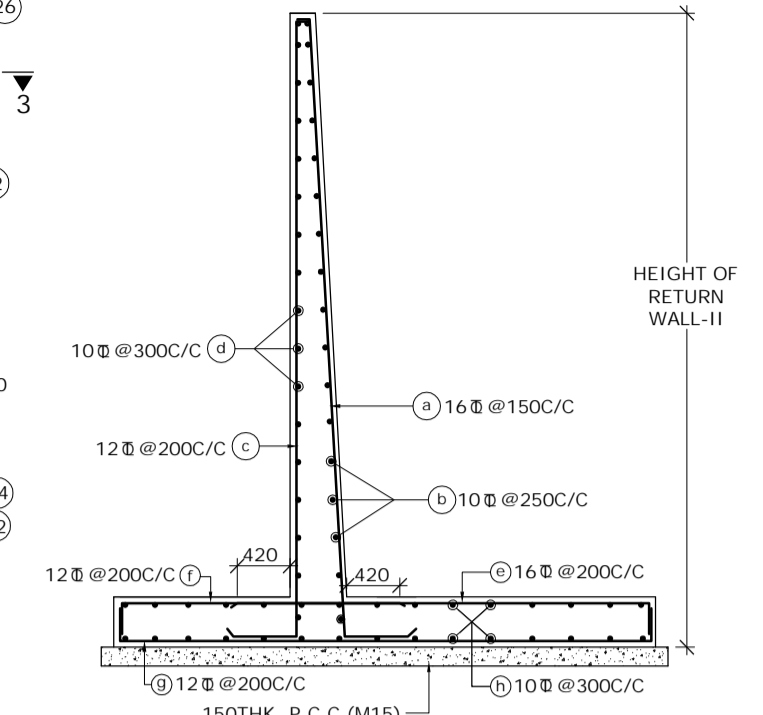
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/GA (SHEET NO-01 & 02)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - Toloi - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

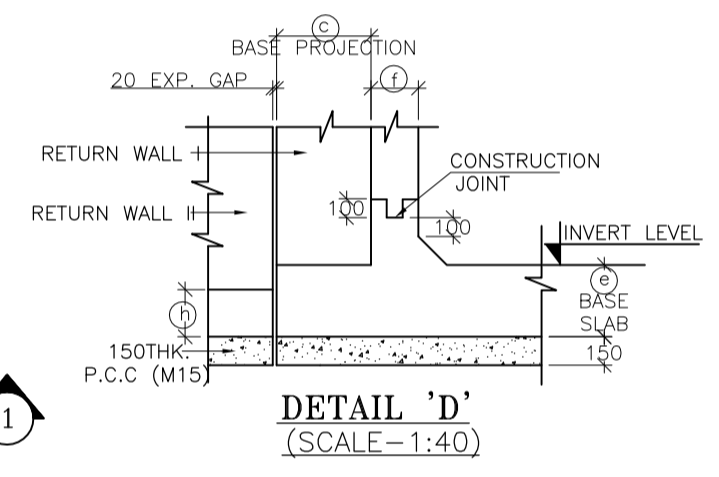
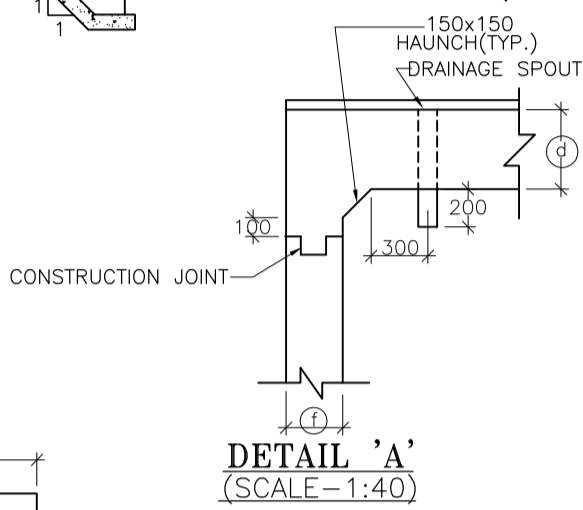
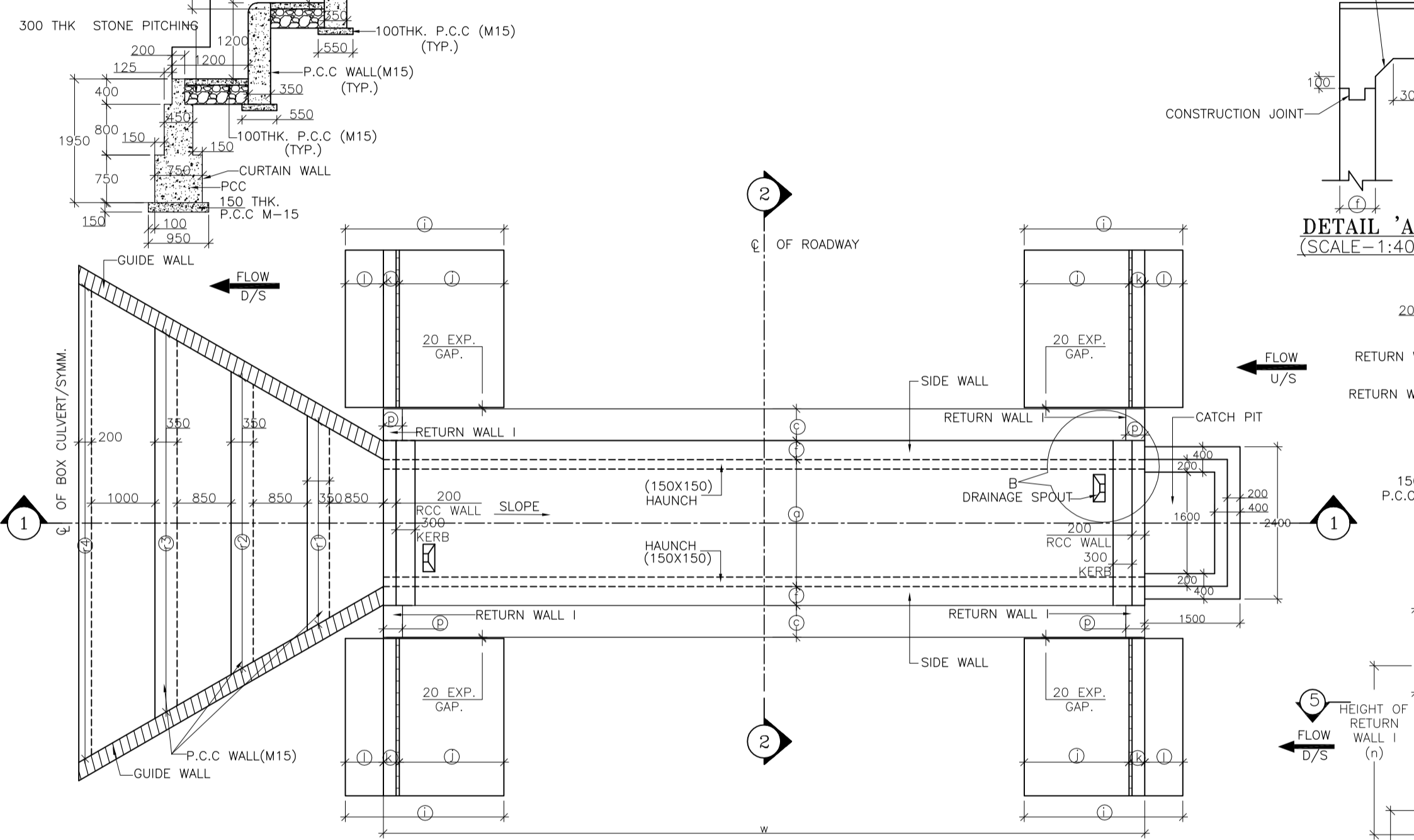
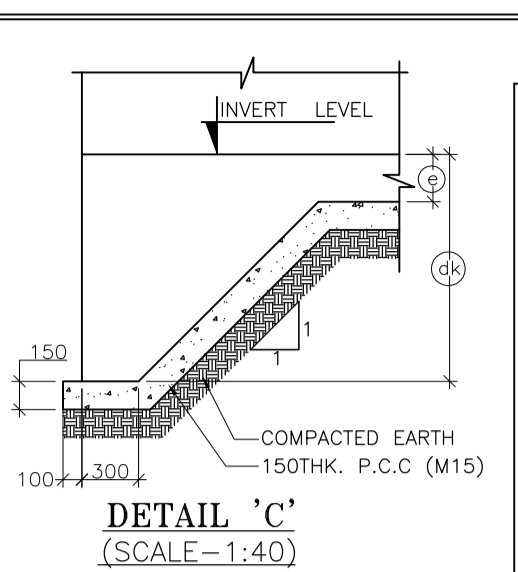
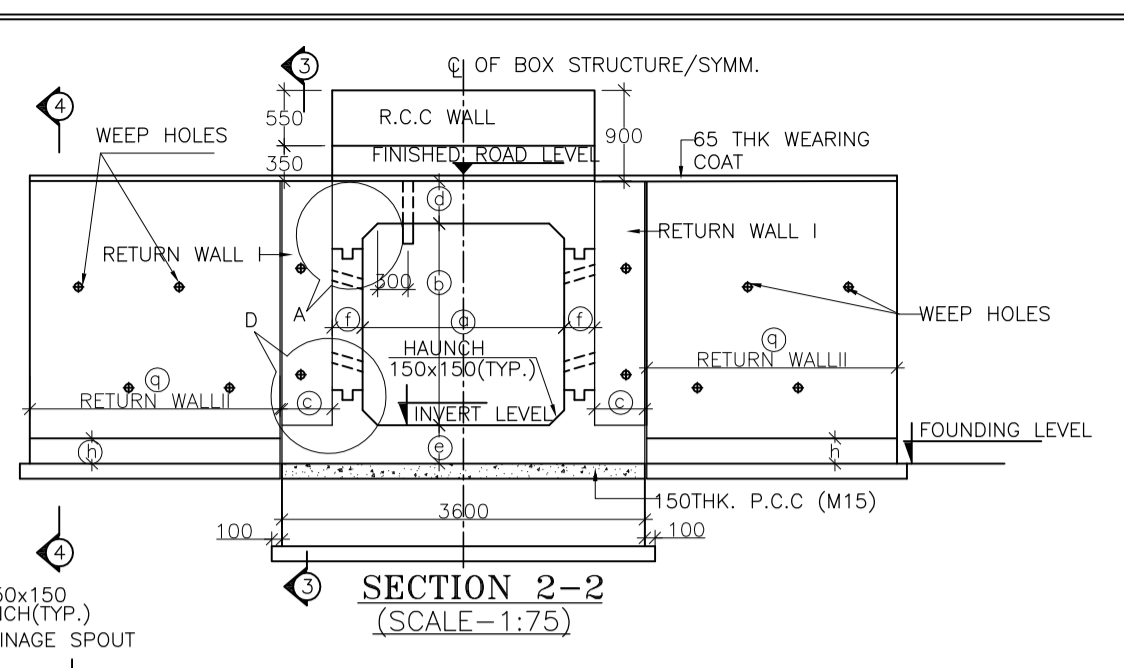
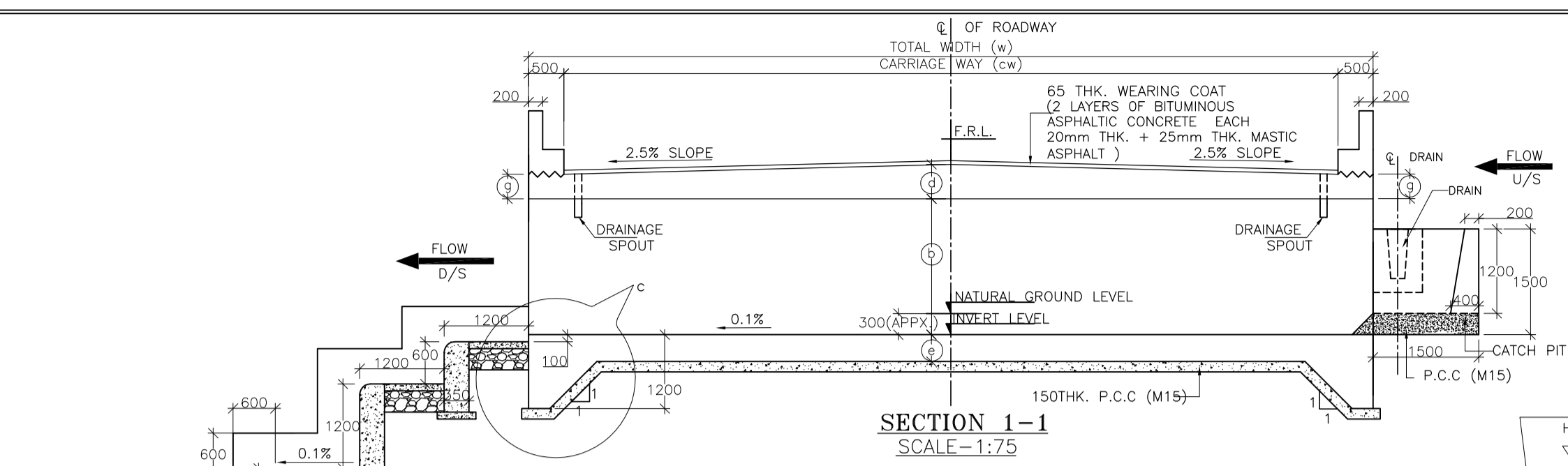
REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0)

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

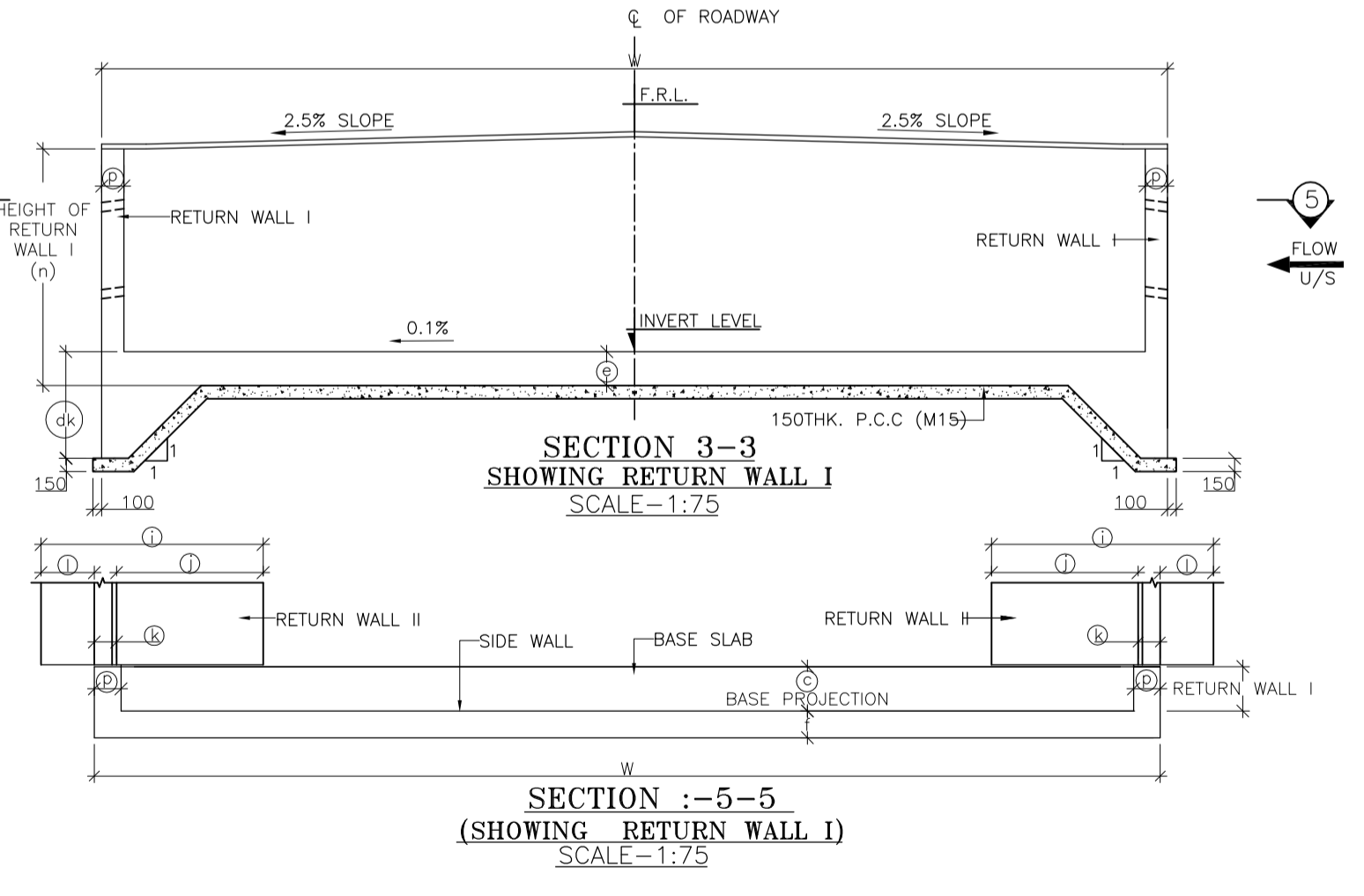
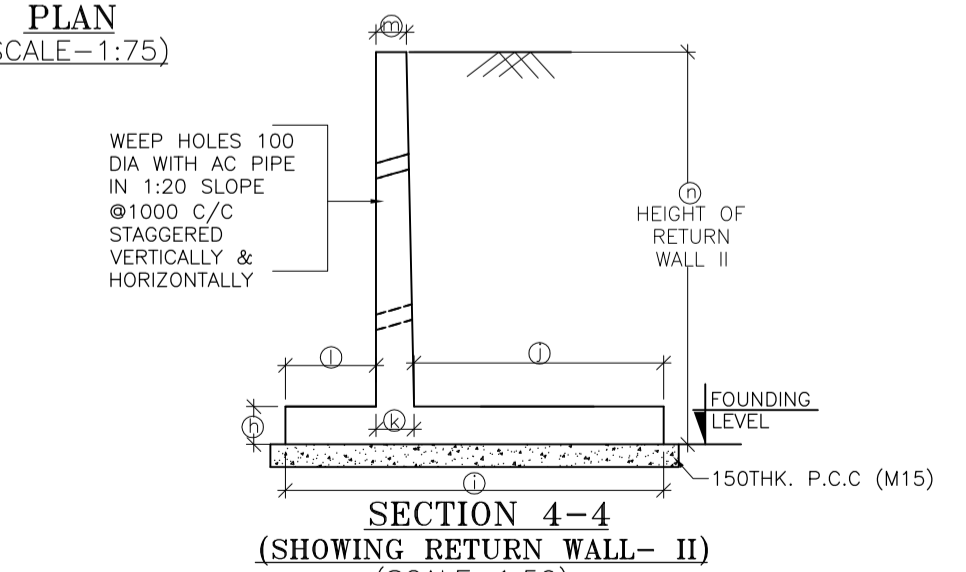
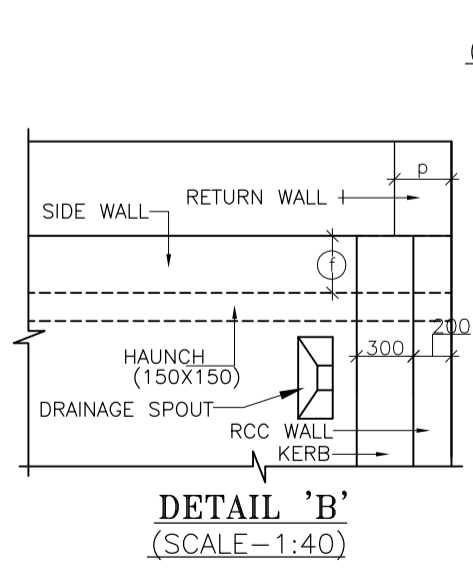
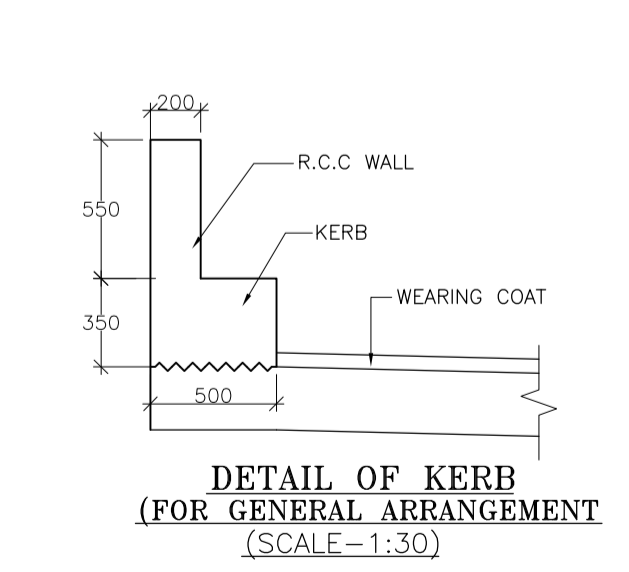
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/SLP/NC/RCC

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu



STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	Total Road width	Protection Type		Top Slab Thickness at Centre	Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
						U/S	D/S			
86/1	85+068	1994.859	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Step	0.463	1992.331	1991.951
87/3	86+498	1921.779	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Step	0.475	1919.239	1918.859
89/4	88+355	1863.347	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Step	0.475	1860.807	1860.427
91/3	90+663	1810.067	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Step	0.500	1807.502	1807.122
93/2	92+432	1714.923	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Step	0.463	1712.395	1712.015
94/2	93+118	1736.188	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Step	0.475	1733.648	1733.268
95/4	94+697	1767.712	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Step	0.463	1765.185	1764.805
96/2	95+142	1797.496	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Step	0.463	1794.968	1794.588
102/3	101+708	1513.867	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Step	0.463	1511.340	1510.960
105/2	104+180	1575.549	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Step	0.500	1572.984	1572.604

TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./ob/EC	1/22/0
a	2000
b	2000
c	500
e	380
f	300
g	350
h	300
i	2200
j	950
k	300
l	950
m	250
n	2730
p	300
q	3100
dk	1200



- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE : BOX CELL STRUCTURE = M25 CURTAIN WALL = M25 LEVELLING COURSE (P.C.C.) = M15 RETURN WALL = M25 RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\theta = 1.81/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF BIRTH 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.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
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 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/RCC (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN

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.

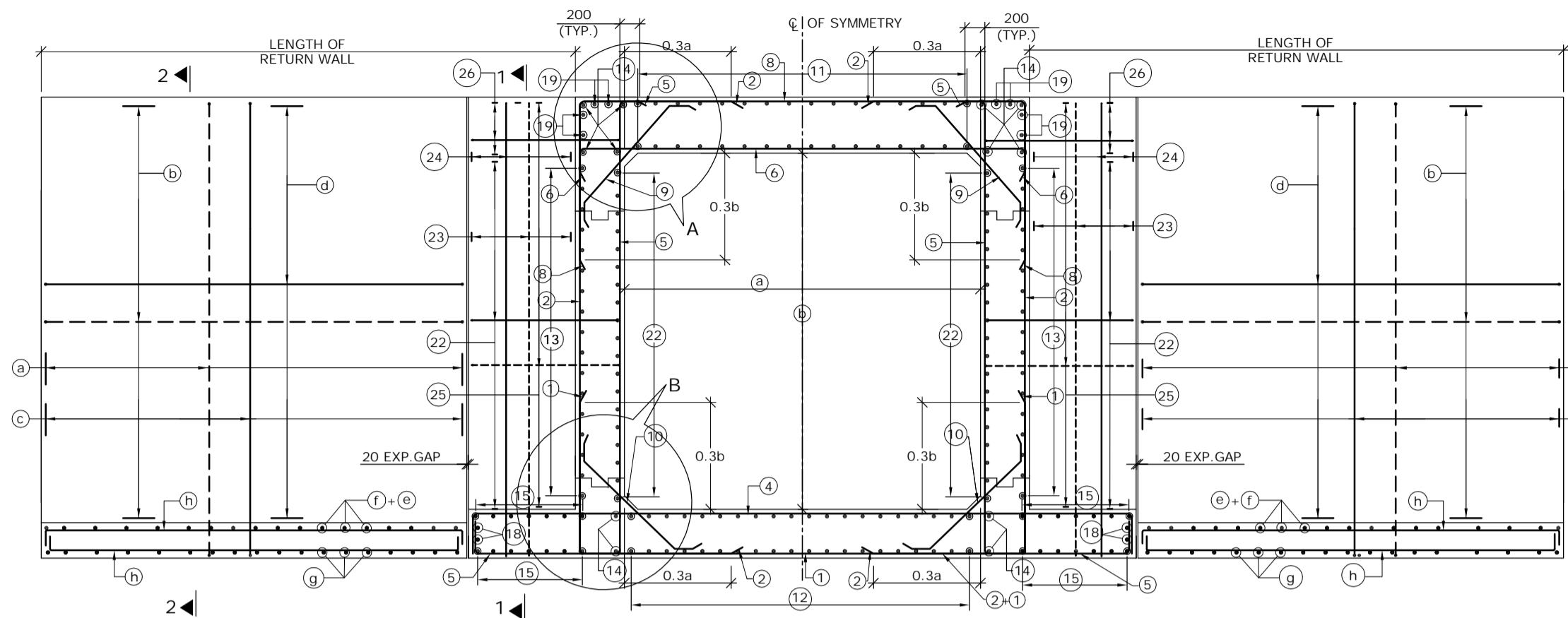
DATE: SEPT, 2016

GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIT & STEPPED PROTECTION

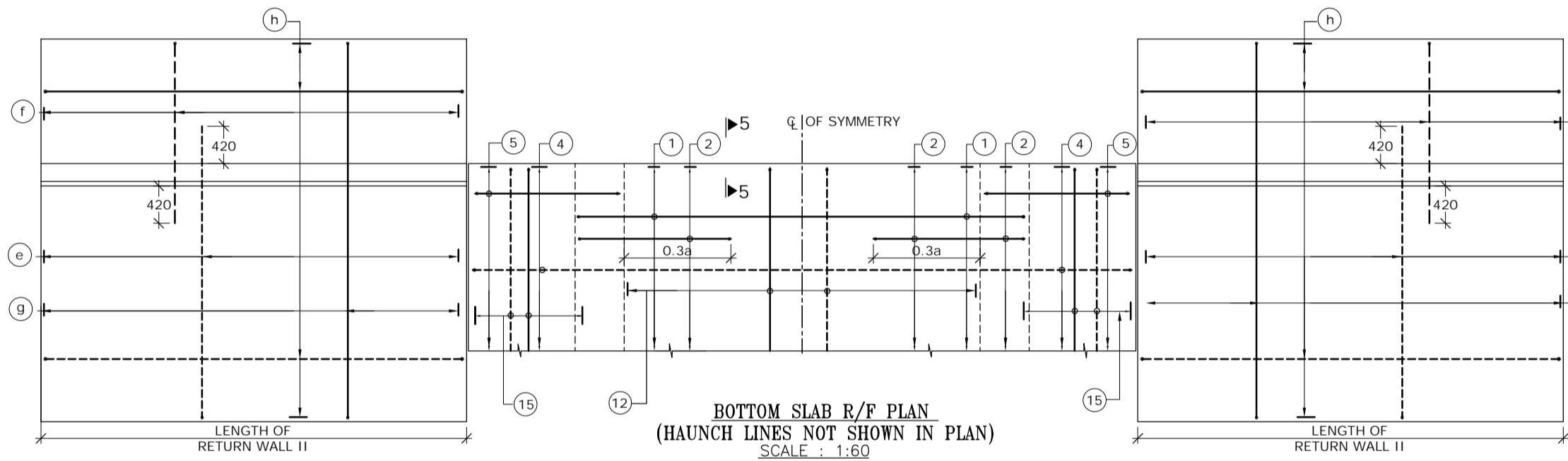
Package :- IV District :- SENAPATI
Existing Chainage :- 88+520 to 114+165
Design Chainage :- 81+870 to 105+825

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

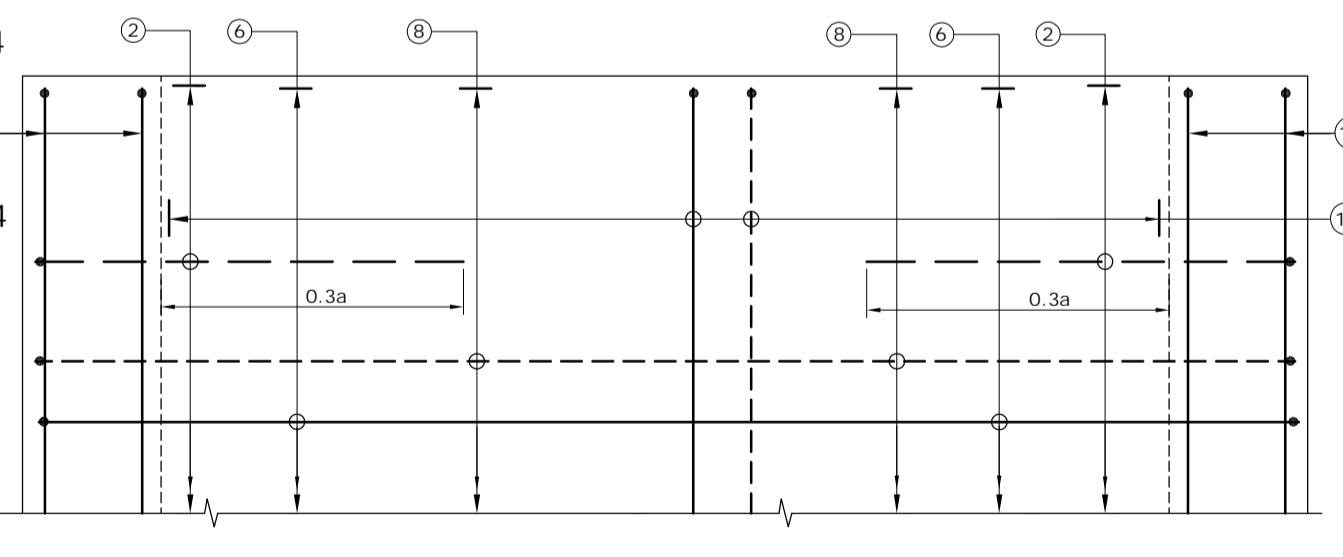
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/GA (SHEET NO-01 OF 01)			
Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu



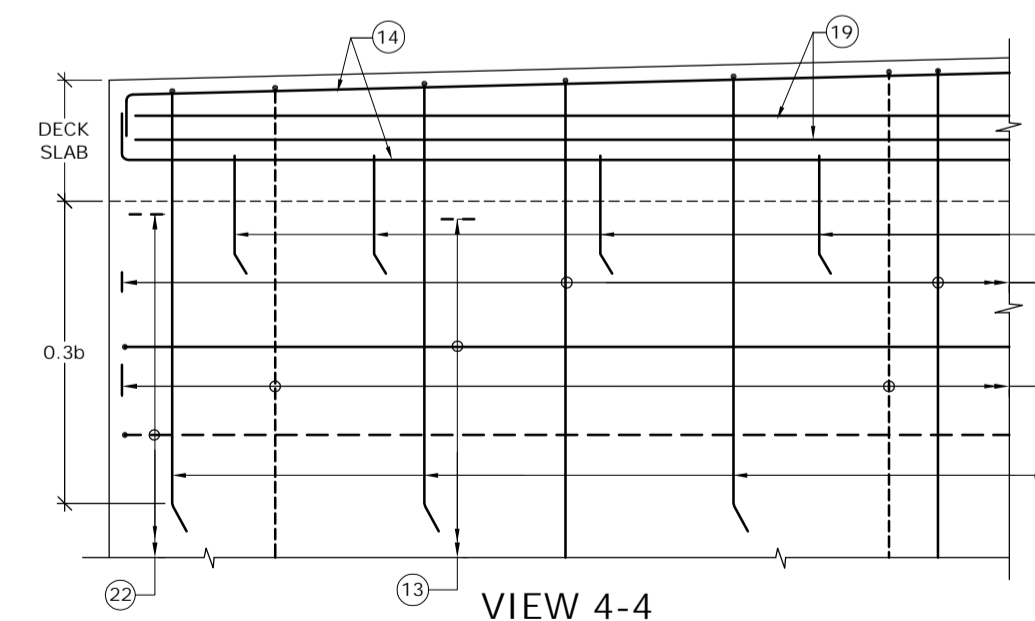
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60



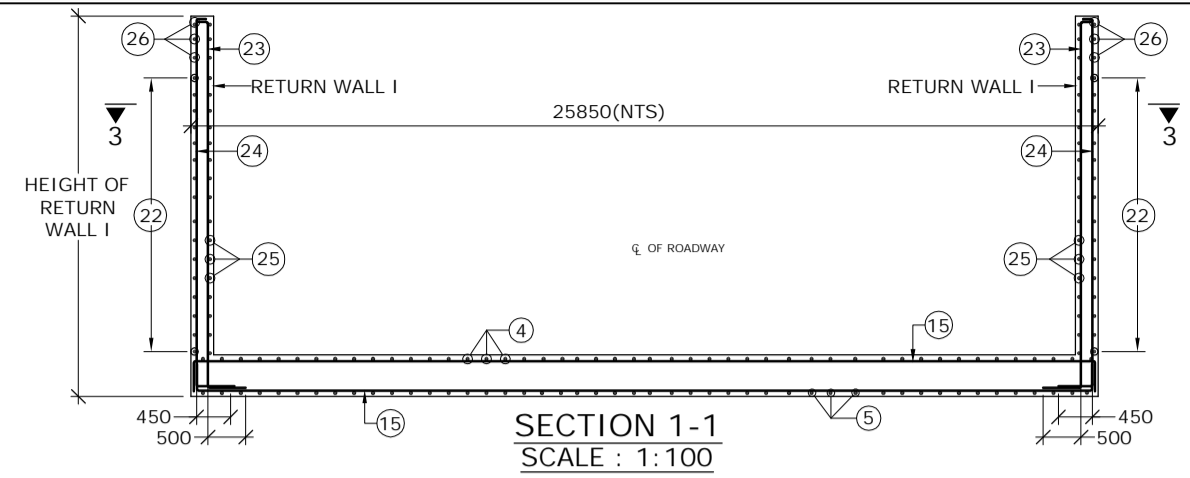
BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60



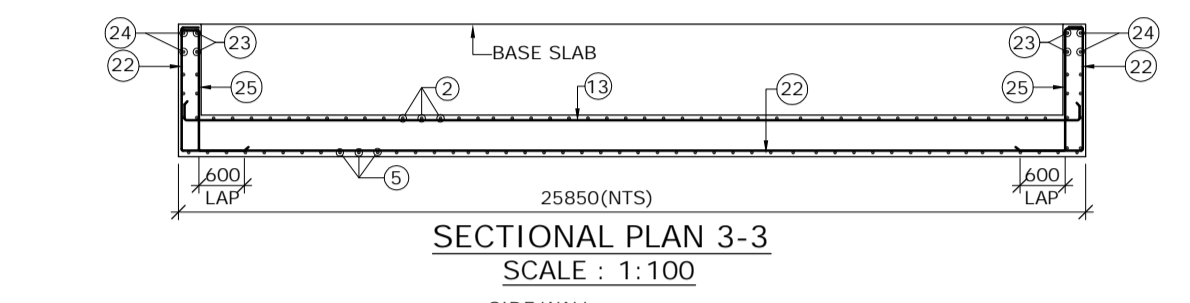
TOP SLAB R/F PLAN
SCALE : 1:30
(BAR MARK 5, 19, KERB & HAUNCH LINES NOT SHOWN IN PLAN)



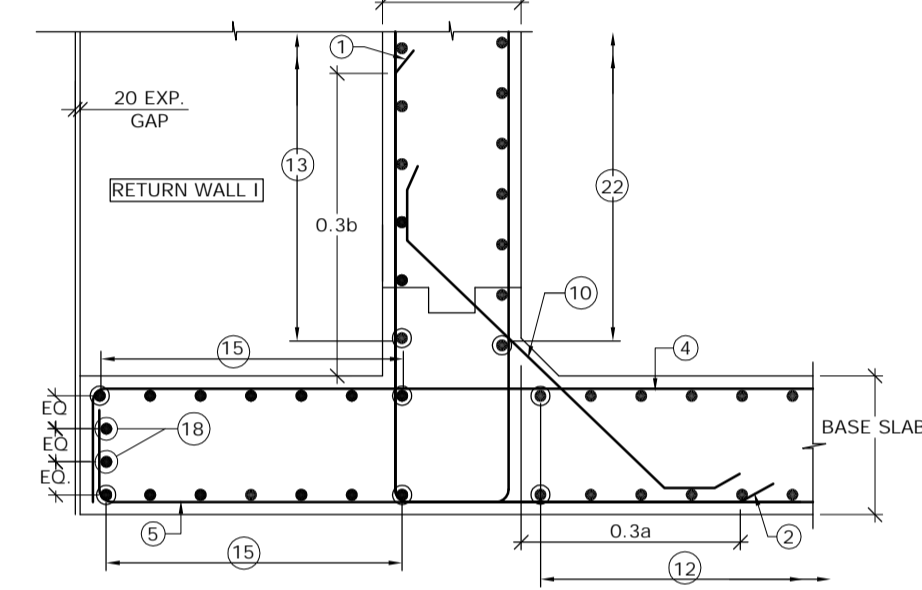
VIEW 4-4
SCALE : 1:30



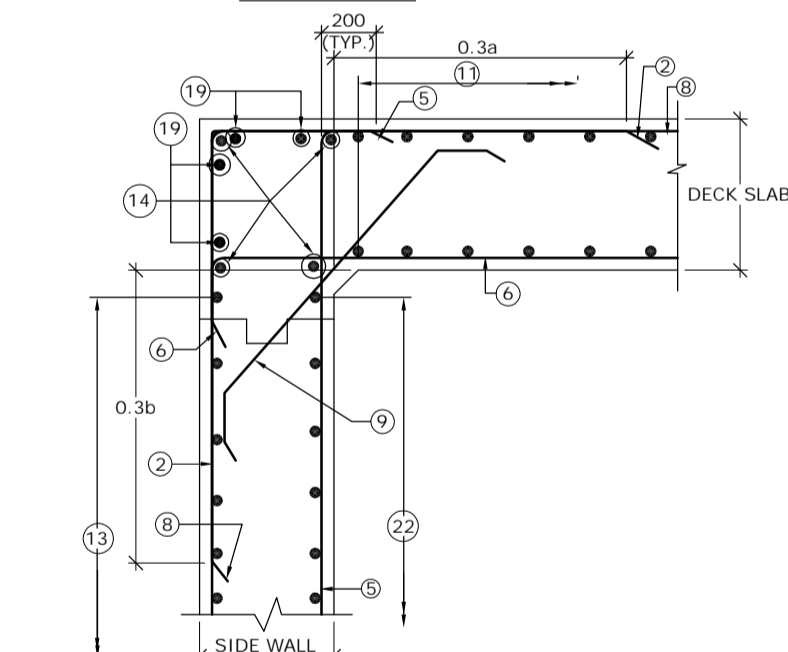
SECTION 1-1
SCALE : 1:100



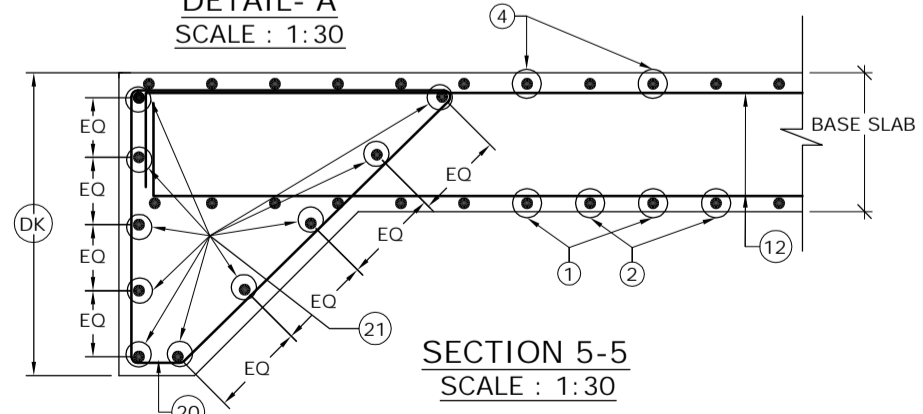
SECTIONAL PLAN 3-3
SCALE : 1:100



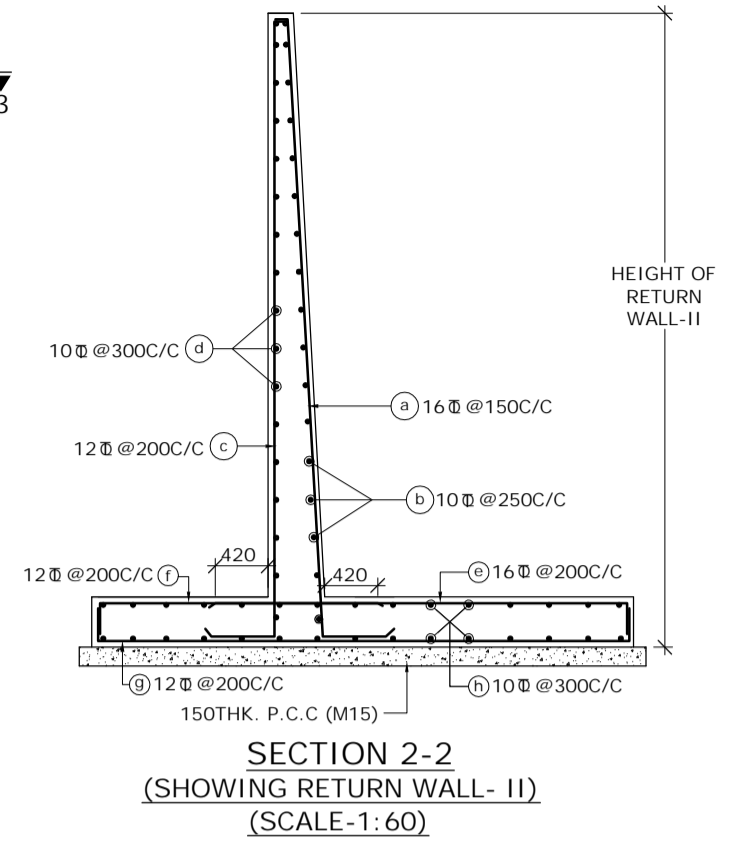
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE: 1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	10	250	13	10	250
2	16	250	14	10	-
3	BAR NOT USED		15	10	250
4	16	250	16	12	-
5	16	250	17	12	250
6	16	250	18	10	-
7	BAR NOT USED		19	10	-
8	10	250	20	10	150
9	10	250	21	10	-
10	12	250	22	10	250
11	10	250	23	10	200
12	10	250	24	10	200
			25	12	125
			26	10	250

LEGEND -
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES -
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
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SCALE: AS SHOWN
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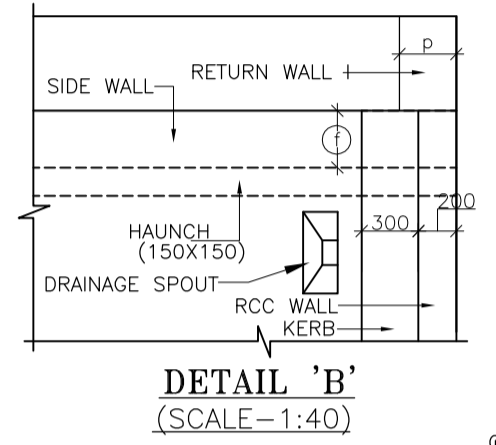
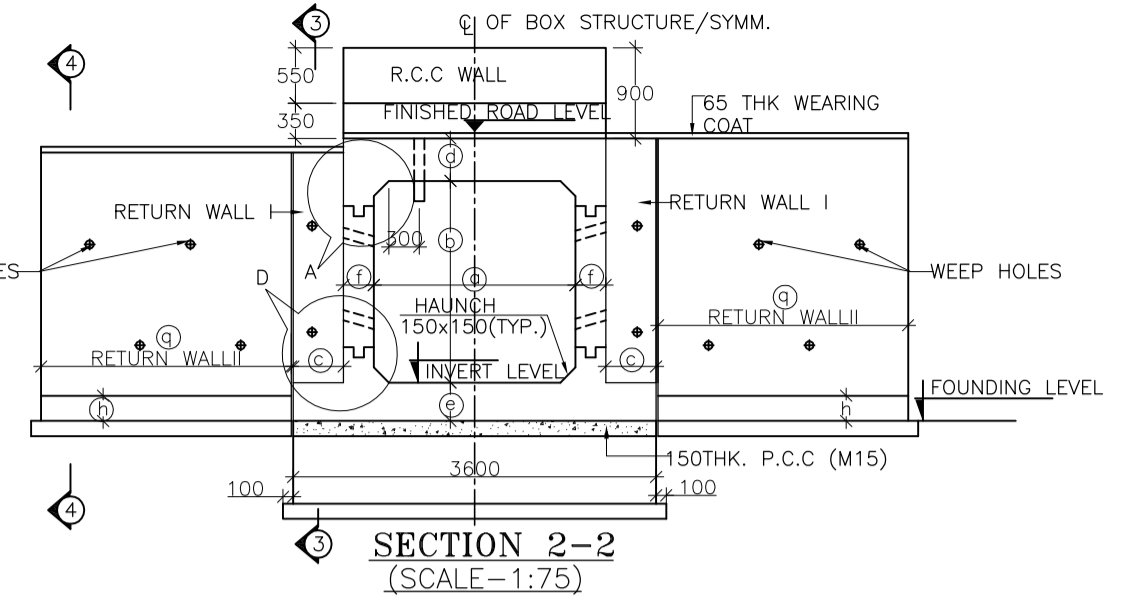
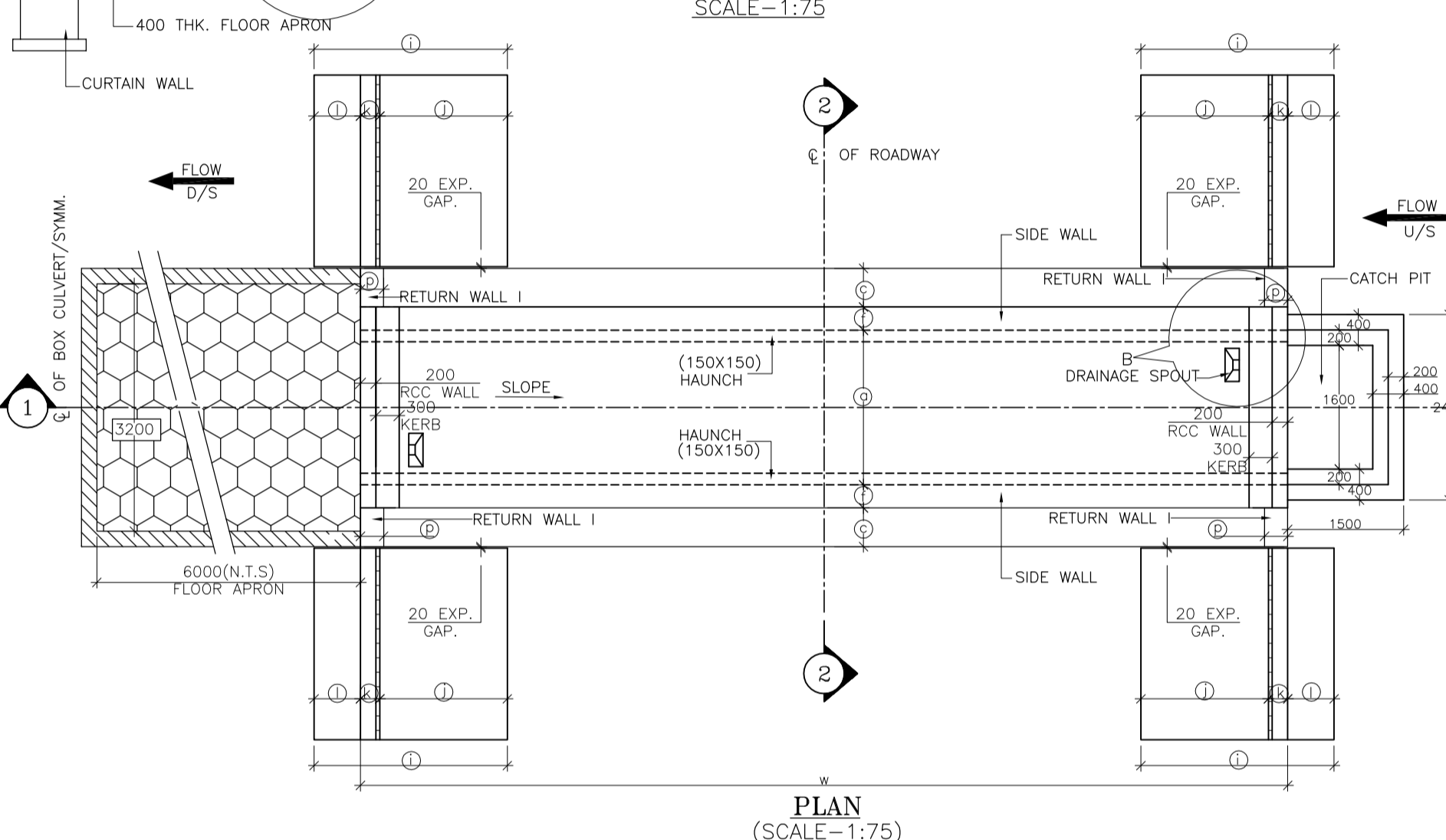
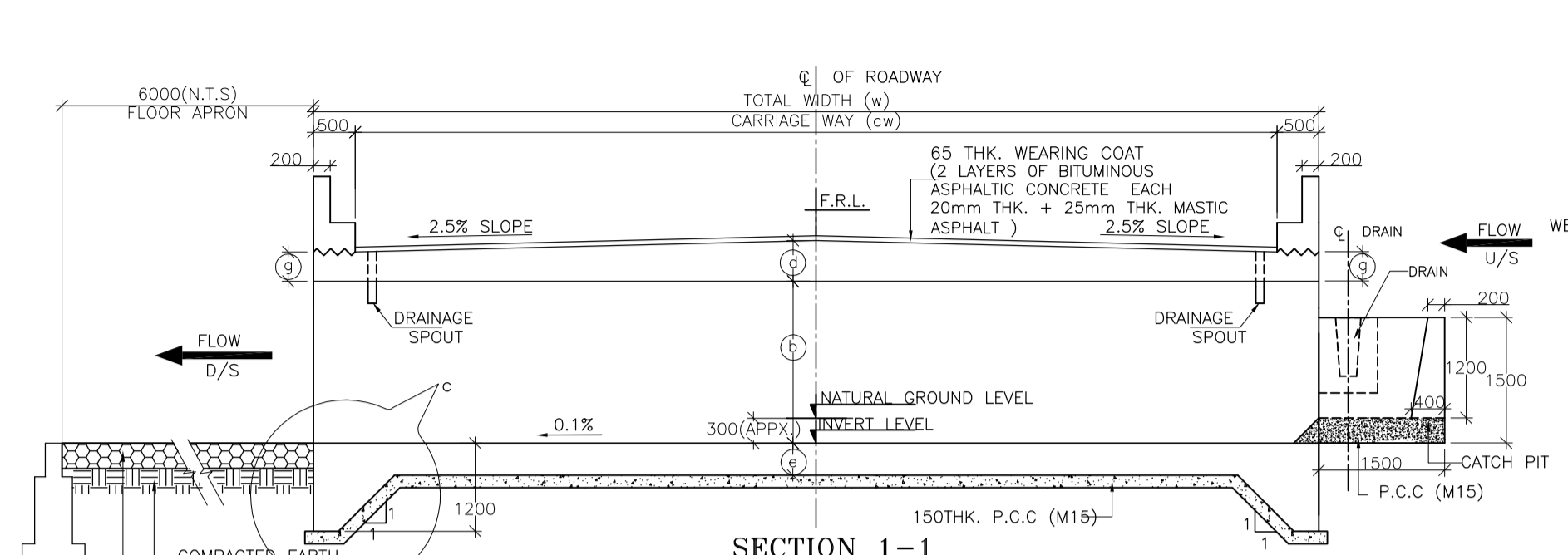
REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIP & STEPPED PROTECTION

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/RCC

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu



STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	Total Road width	Protection Type		Top Slab Thickness at Centre	Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
						U/S	D/S			
91/1	90+078	1838.794	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Straight	0.475	1836.254	1835.874
94/4	93+578	1739.542	2X2X1 Cell	Normal Camber	11.00	With Catch pit	Straight	0.475	1737.002	1736.622
95/2	94+228	1734.880	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Straight	0.463	1732.353	1731.973
95/3	94+355	1743.771	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Straight	0.463	1741.243	1740.863
101/1	100+250	1520.230	2X2X1 Cell	Normal Camber	10.00	With Catch pit	Straight	0.463	1517.702	1517.322
105/4	104+715	1615.817	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Straight	0.500	1613.252	1612.872
105/5	104+930	1632.322	2X2X1 Cell	Normal Camber	13.00	With Catch pit	Straight	0.500	1629.757	1629.377

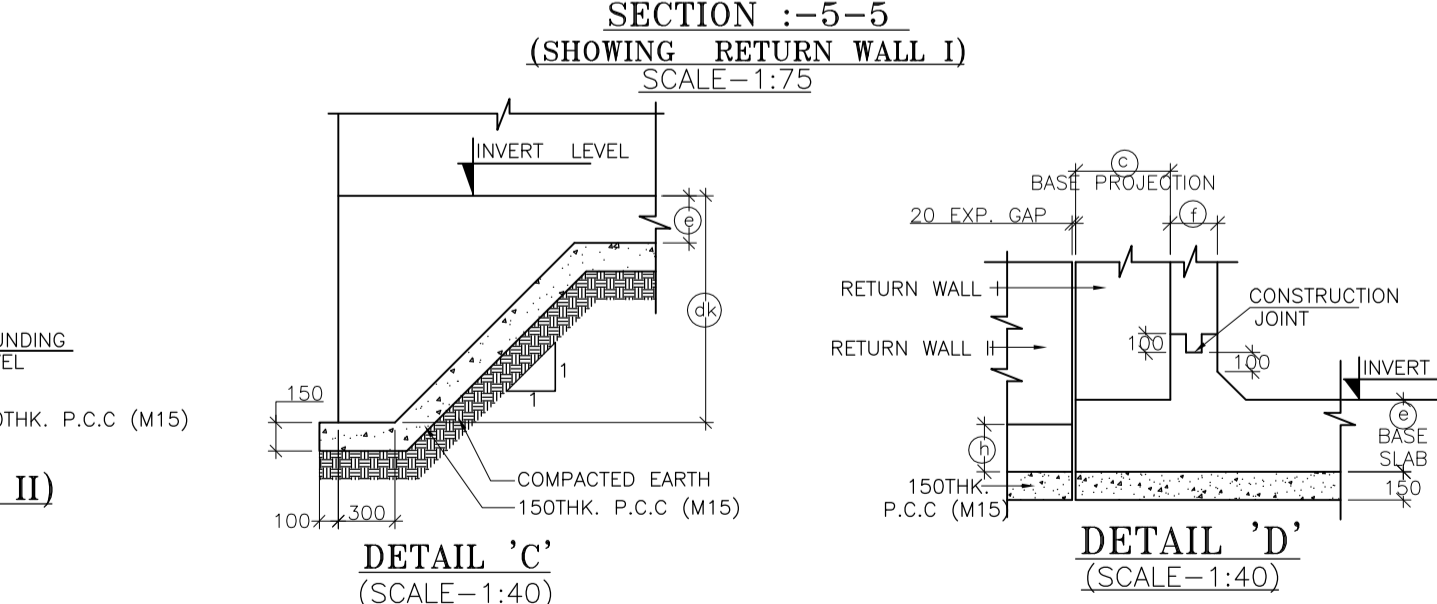
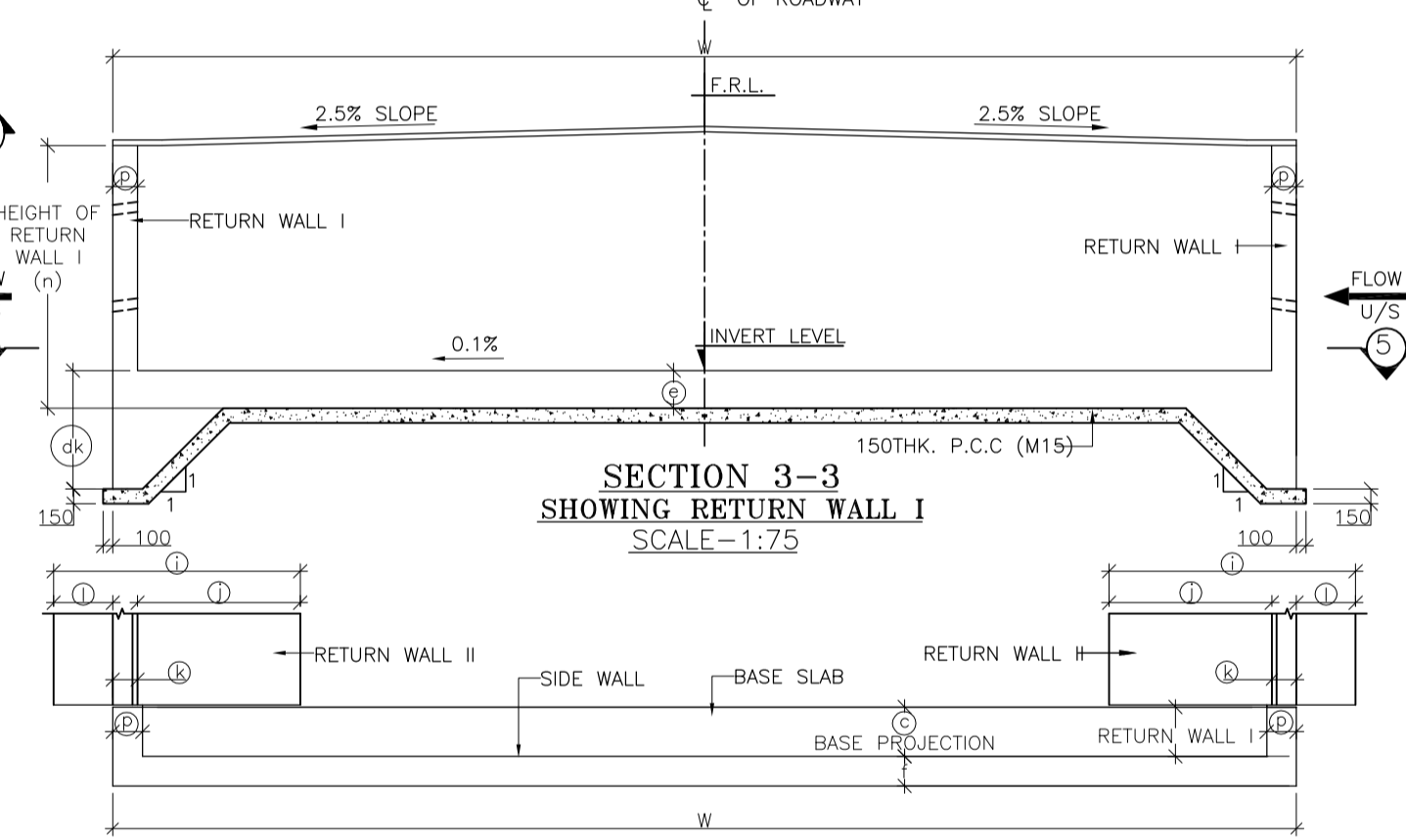
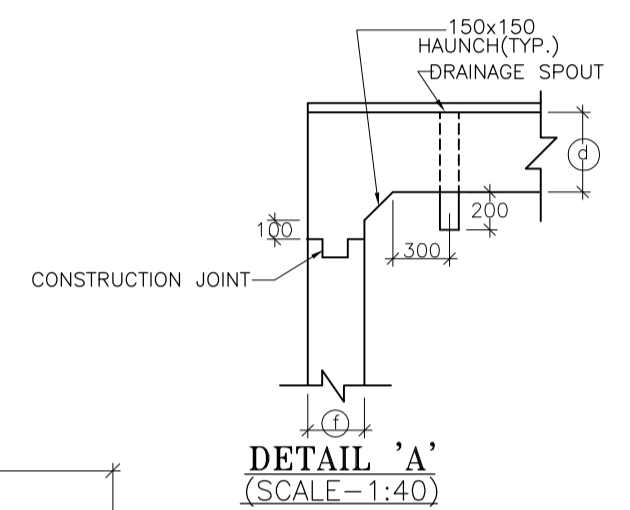
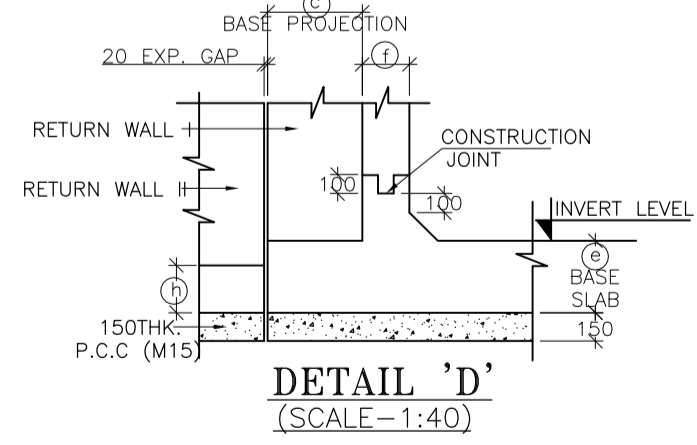
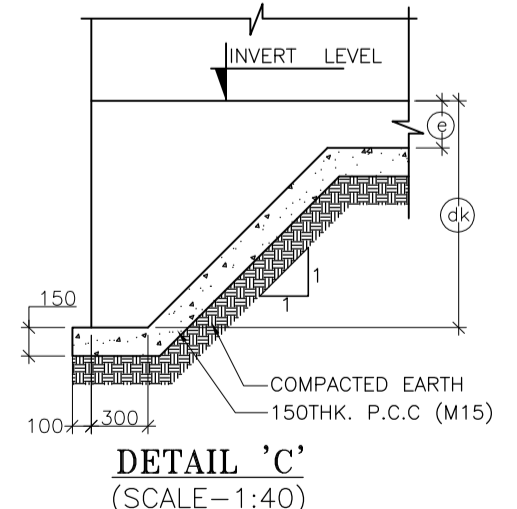
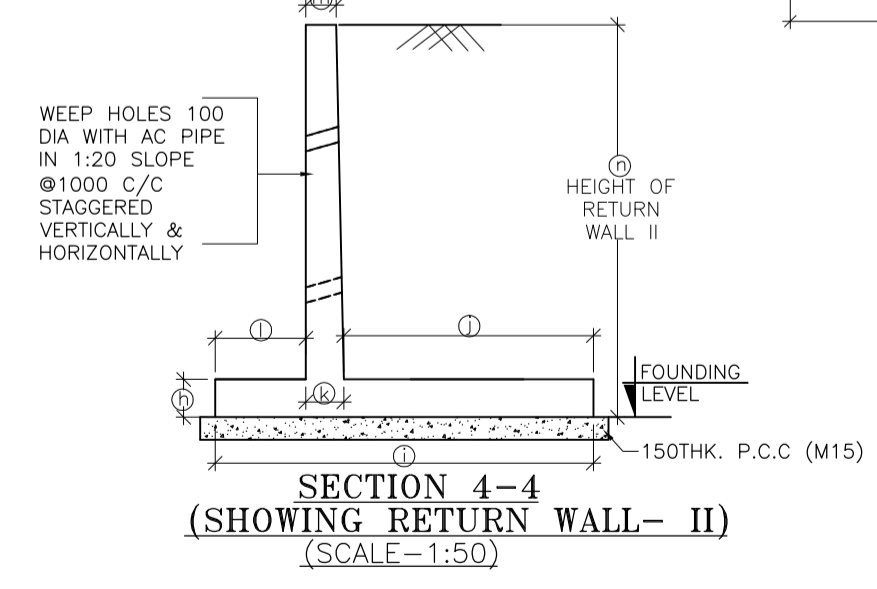
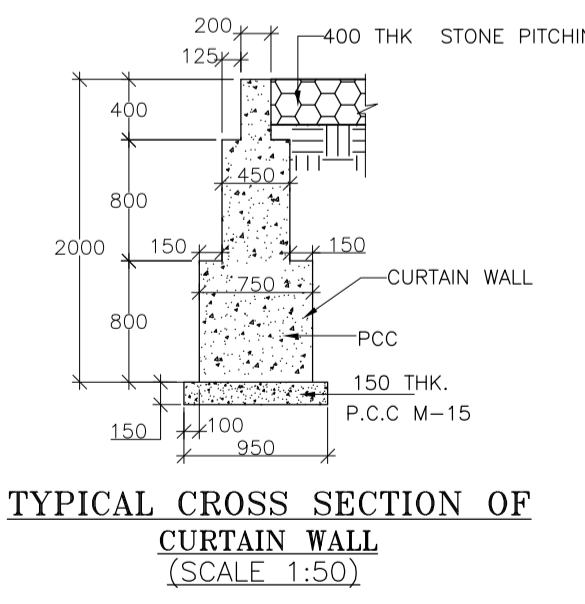
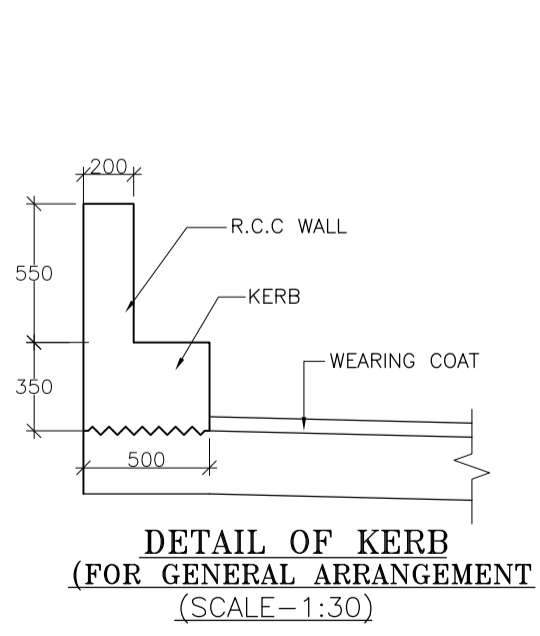
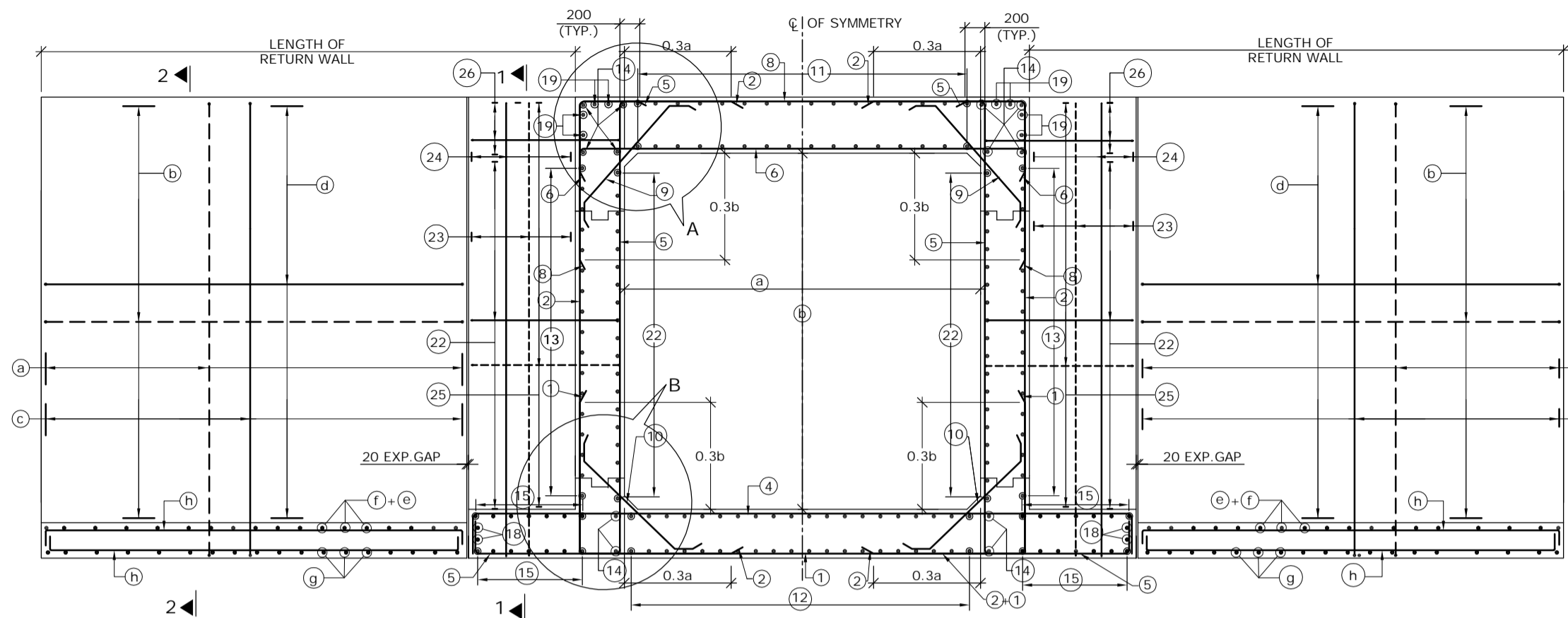


TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./db/ec	1/22/0
a	2000
b	2000
c	500
e	380
f	300
g	350
h	300
i	2200
j	950
k	300
l	950
m	250
n	2730
p	300
q	3100
dk	1200

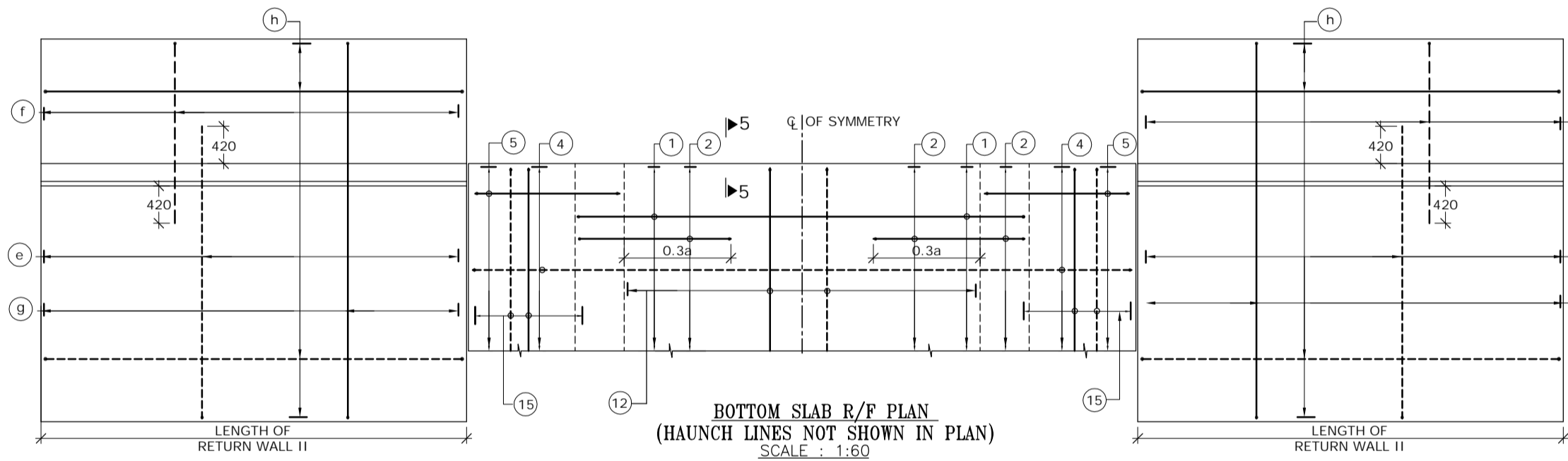


- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE : BOX CELL STRUCTURE = M25 CURTAIN WALL = M25 LEVELLING COURSE (P.C.C.) = M15 RETURN WALL = M25 RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
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 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF BIRTH 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.
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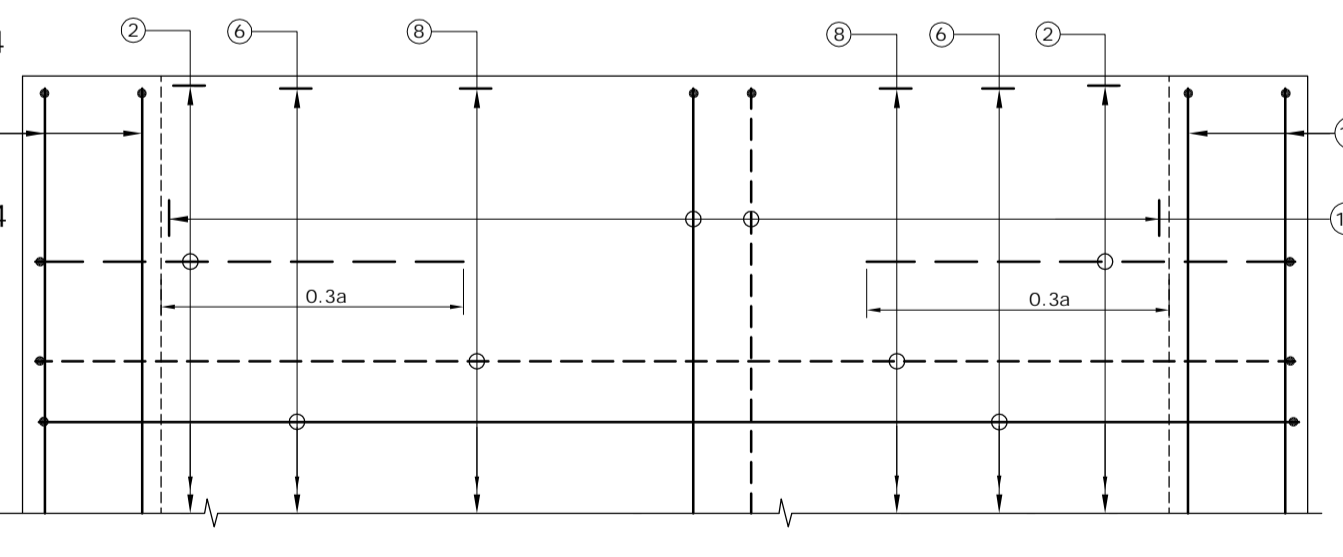
SCALE: AS SHOWN DATE: SEPT, 2016					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIT & FLOOR APRON PROTECTION					CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/F/NC/GA				
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.					Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825					Drawn By: S. Chattrjee Design By: - Checked By: Avishek Dey Approved By: Soubhik Sadhu														
REVISIONS																								



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

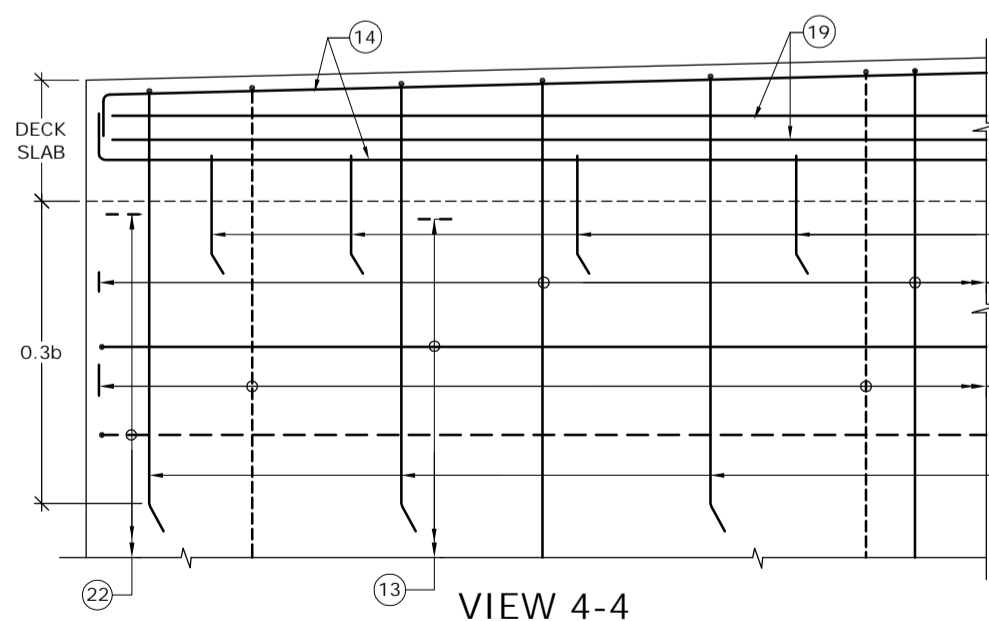


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

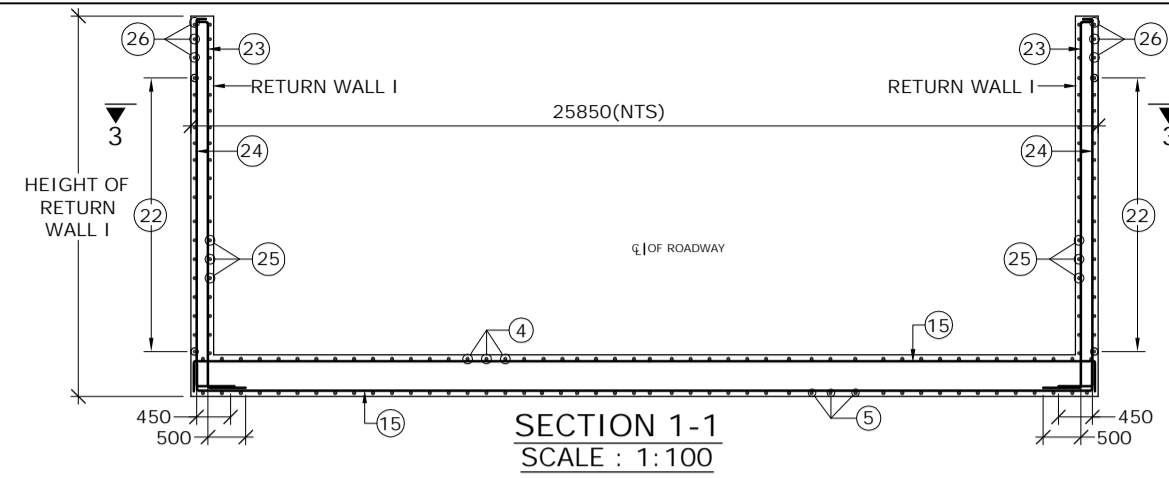


TOP SLAB R/F PLAN
SCALE : 1:30

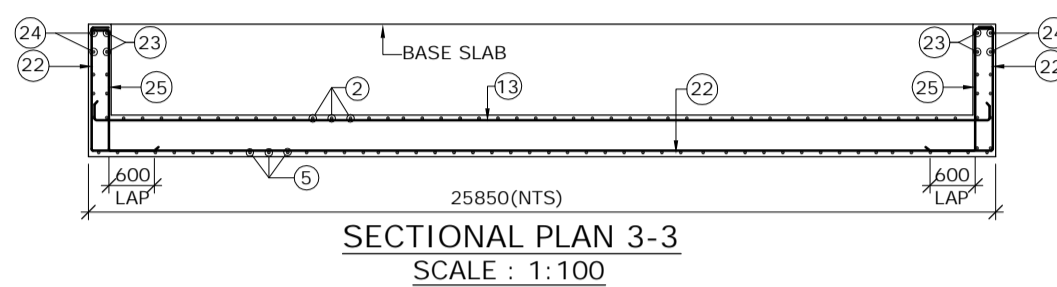
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



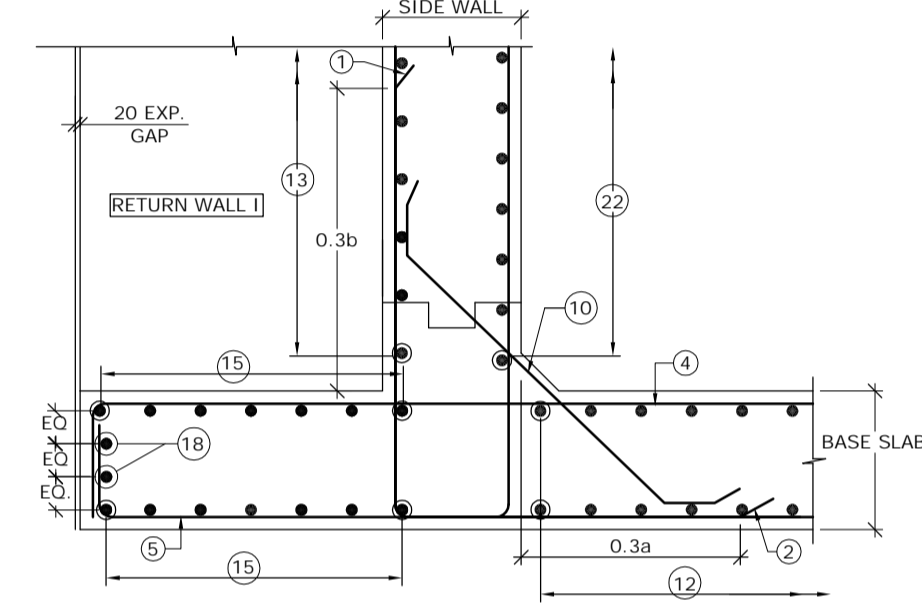
VIEW 4-4
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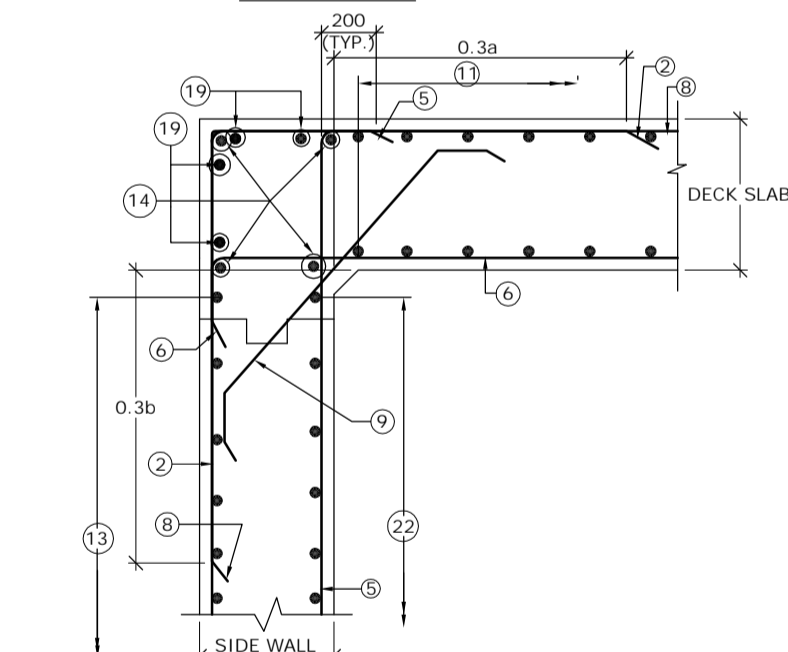
SECTION 1-1
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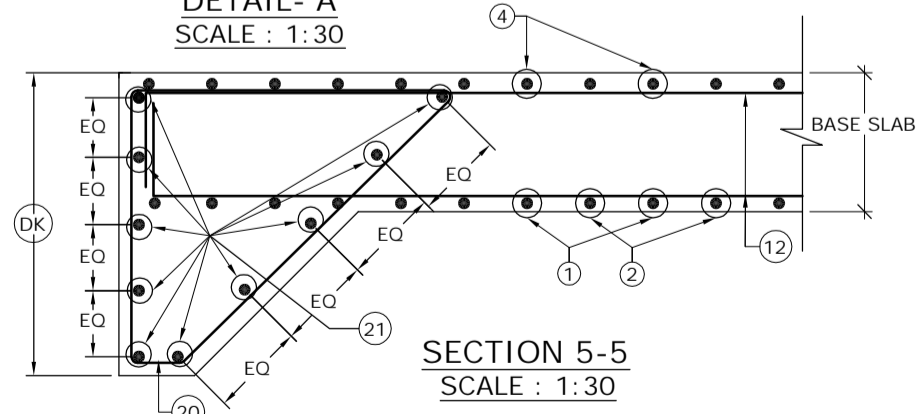
SECTIONAL PLAN 3-3
SCALE : 1:100



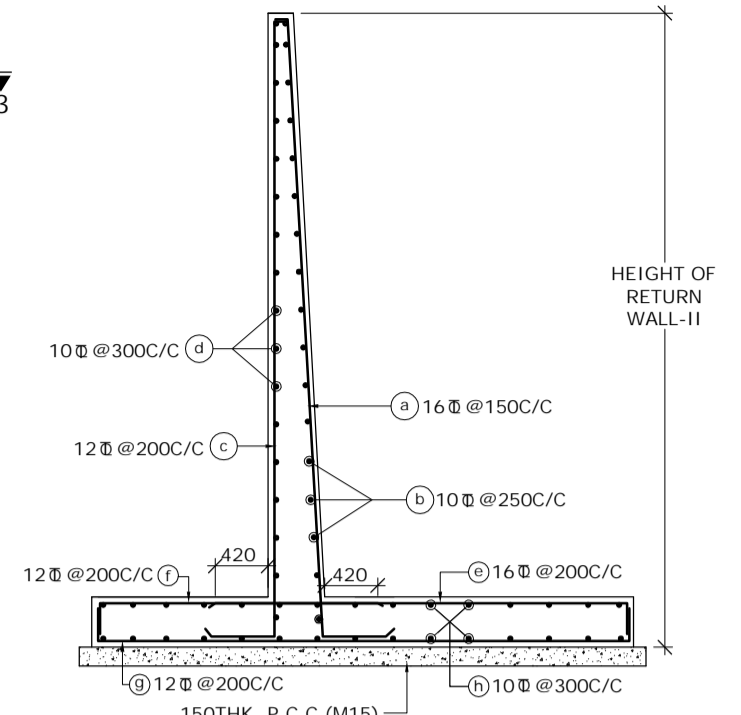
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE: 1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/F/NC/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - ToloI - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

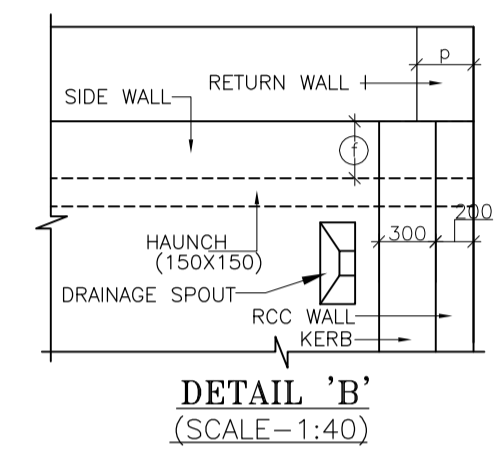
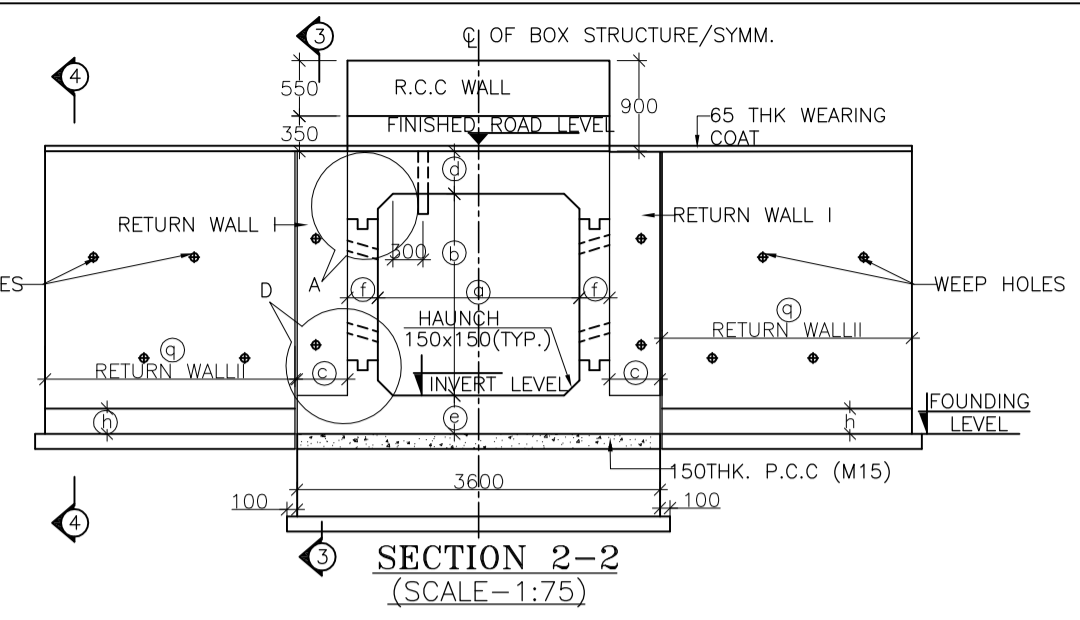
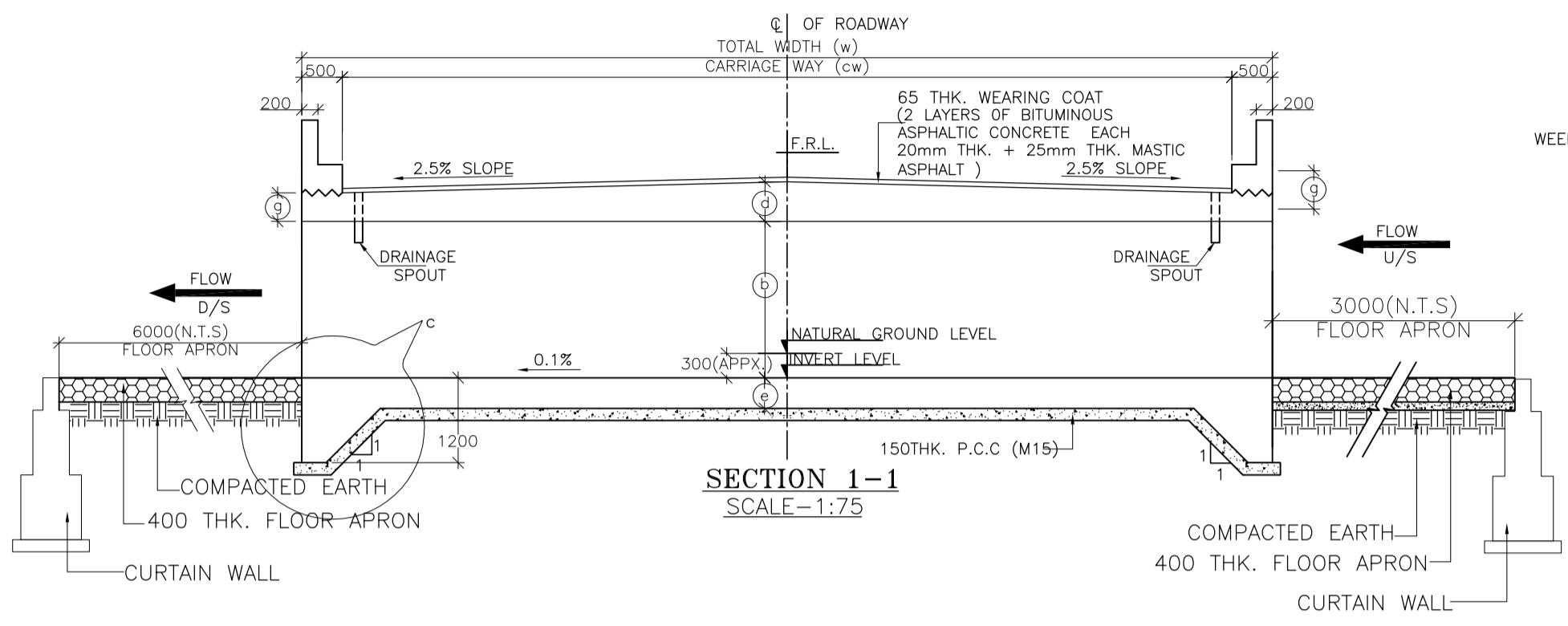
REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0)

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

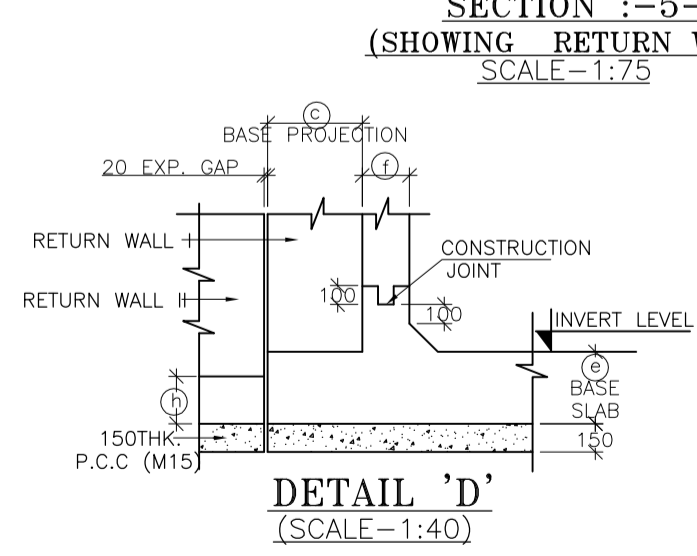
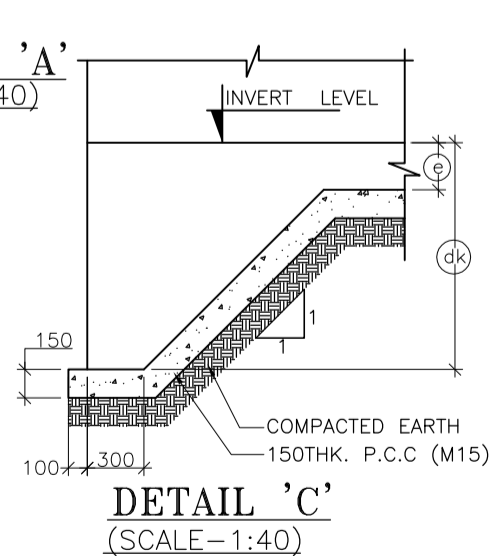
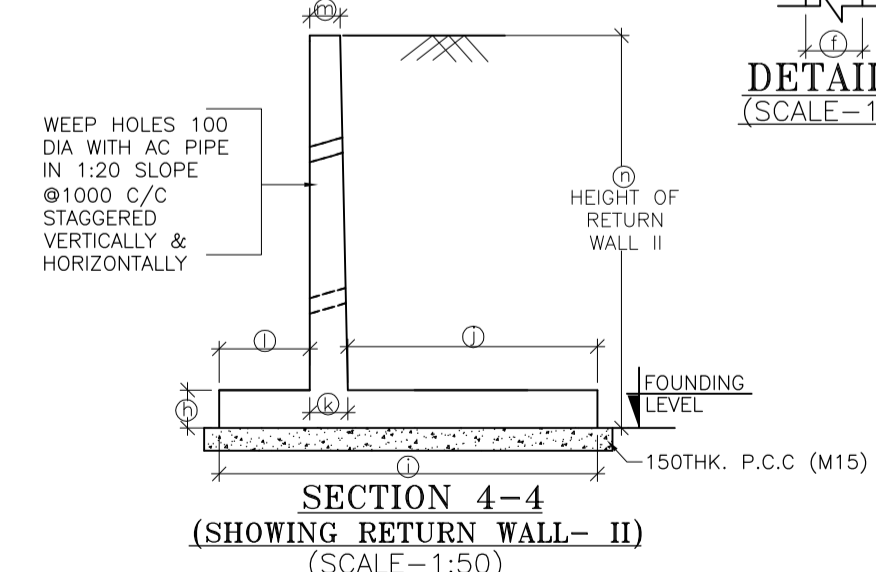
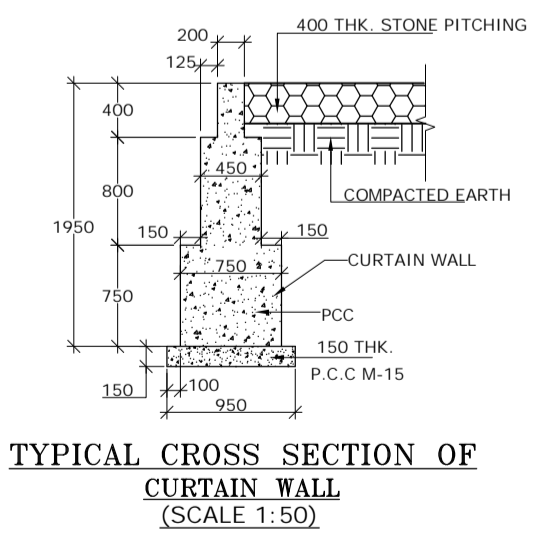
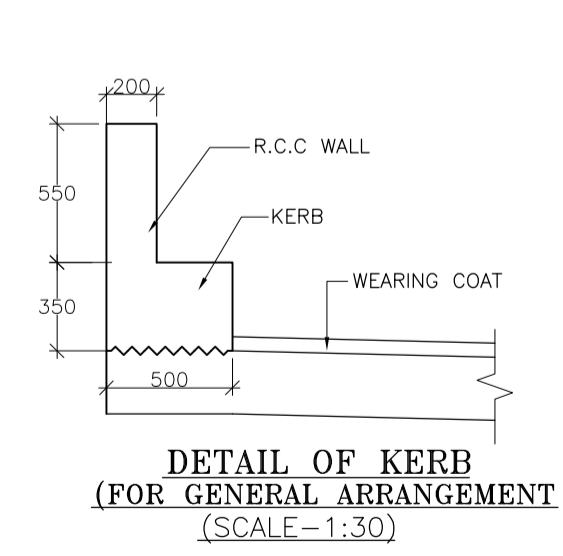
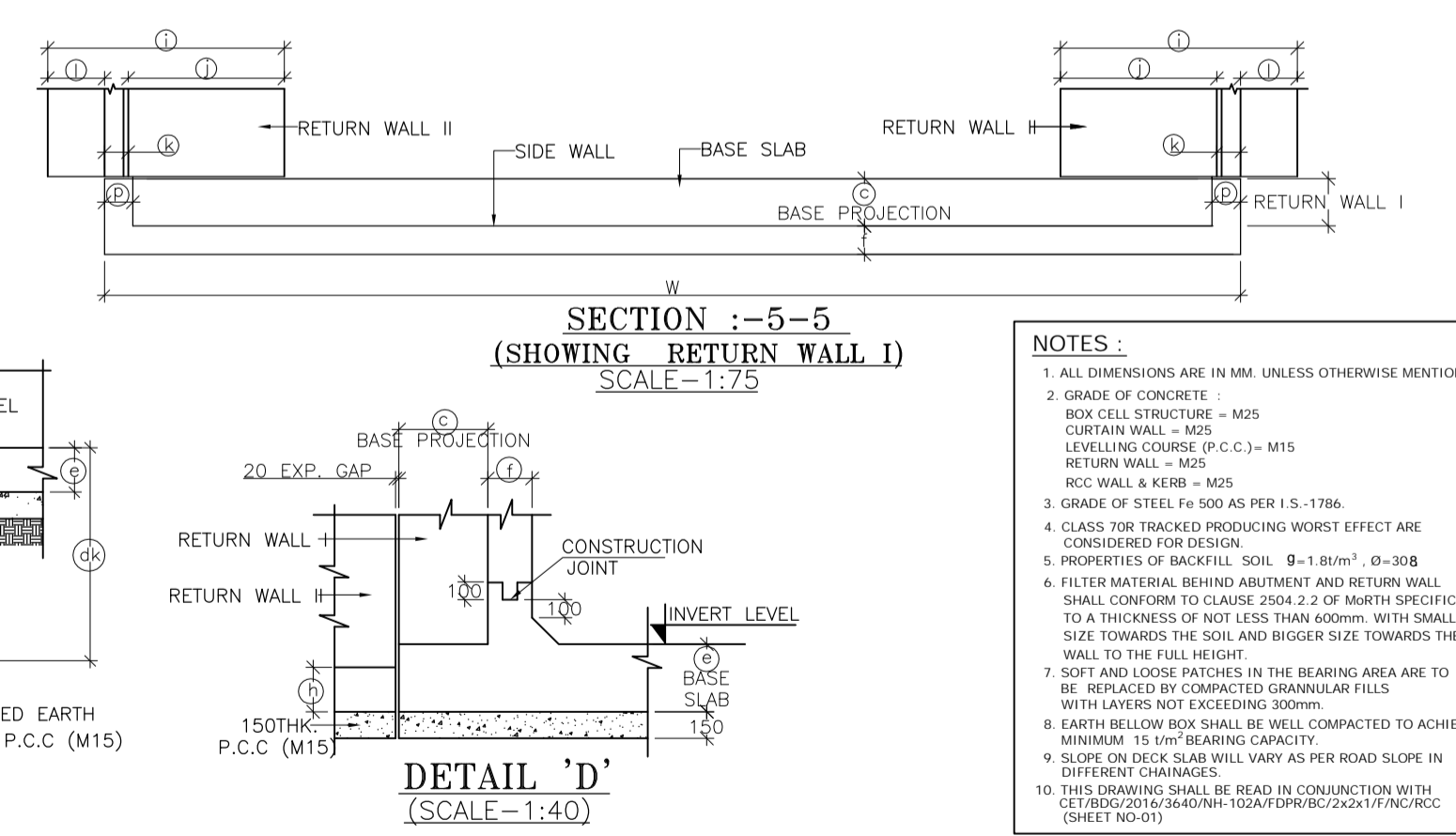
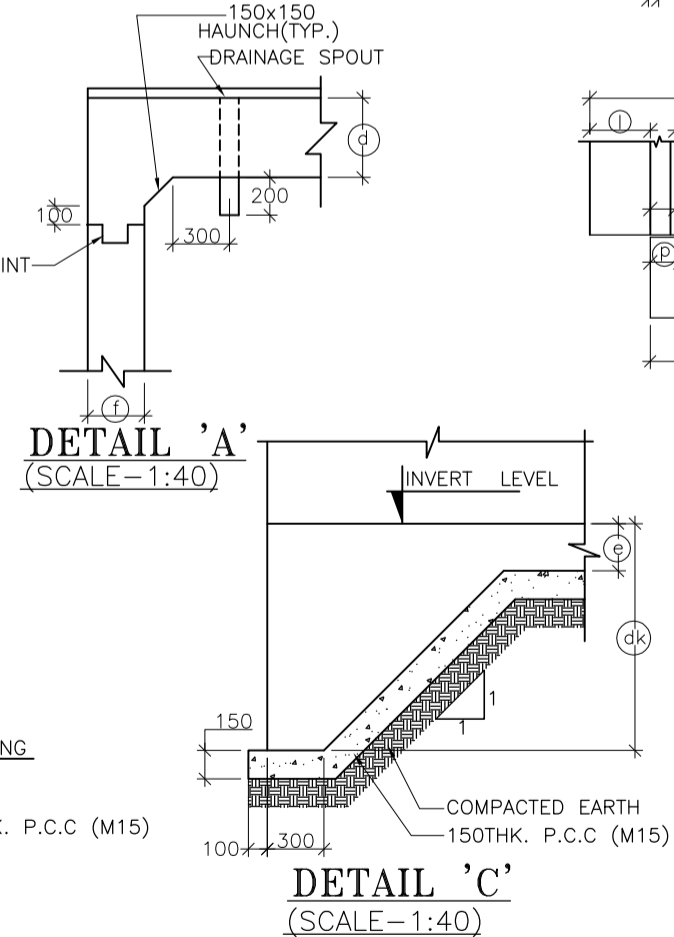
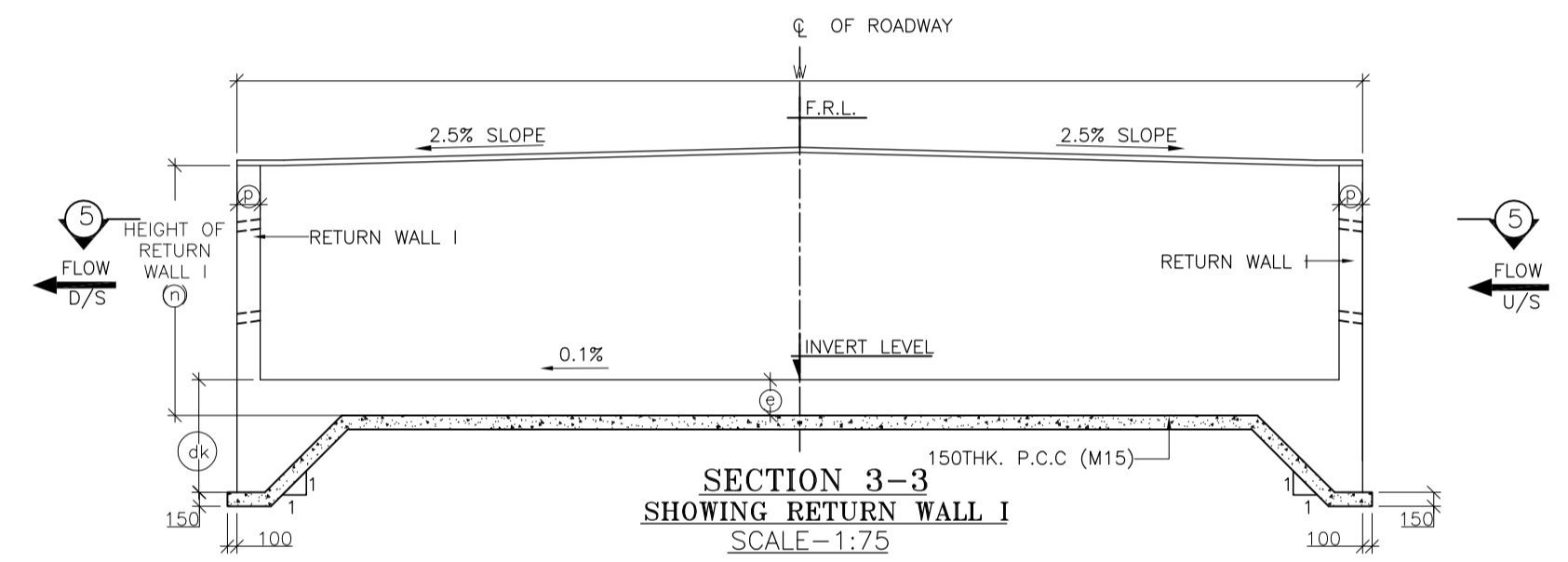
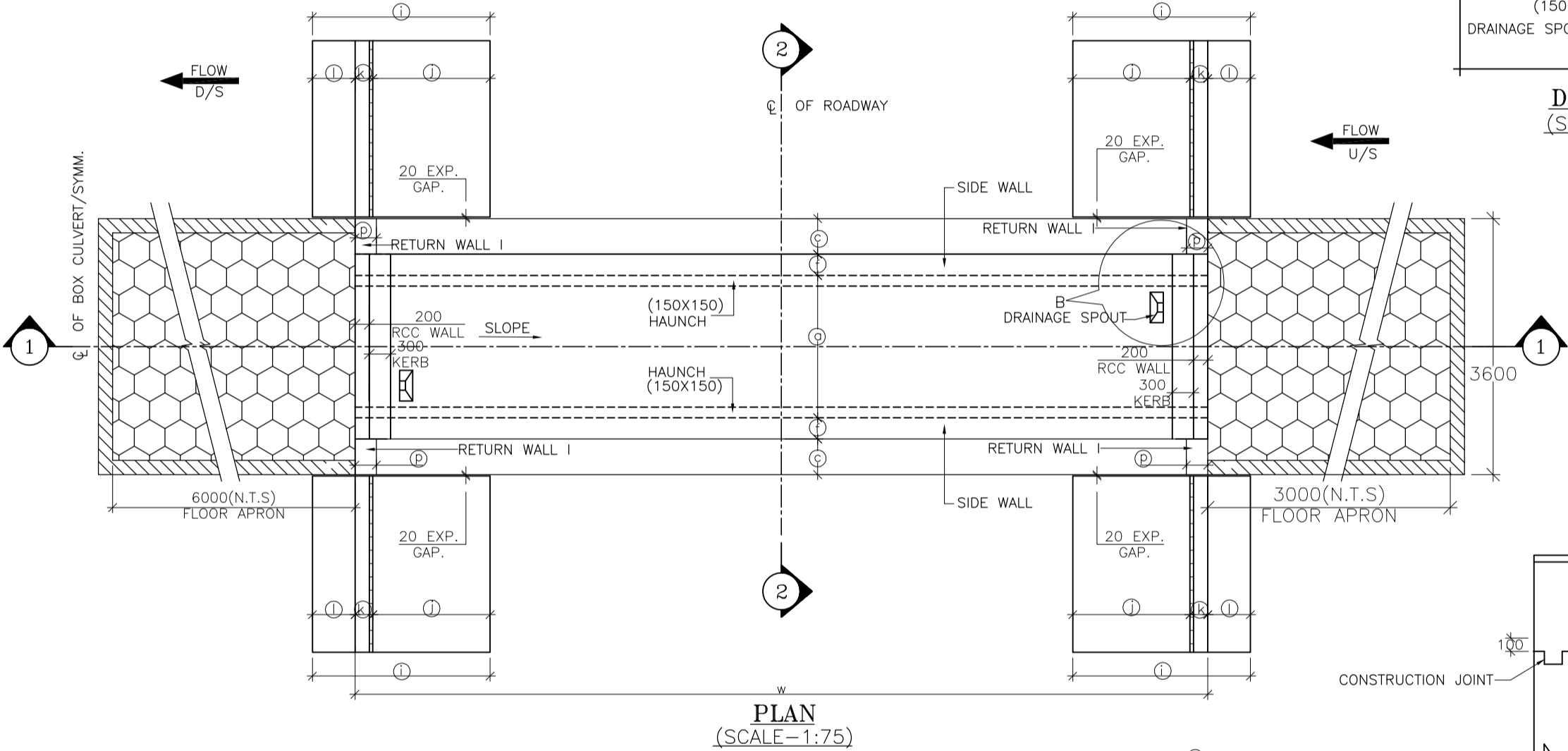
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/F/NC/RCC

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu



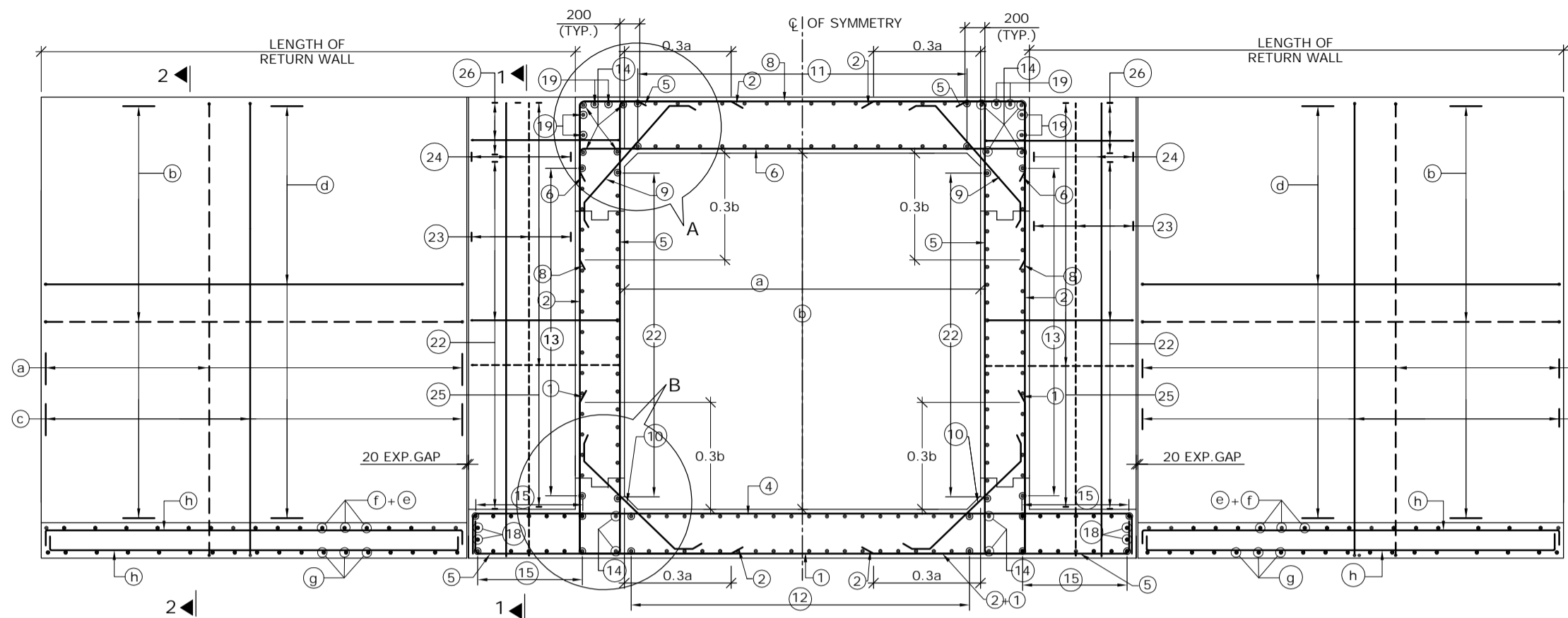
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	Total Road width	Protection Type	Top Slab Thickness at Centre	Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
102/2	101+293	1500.212	2X2X1 Cell	Normal Camber	12.00	No Catch pit	0.488	1497.660	1497.280
104/2	103+463	1530.152	2X2X1 Cell	Normal Camber	13.00	No Catch pit	0.500	1527.587	1527.207
105/1	104+048	1565.926	2X2X1 Cell	Normal Camber	13.00	No Catch pit	0.500	1563.361	1562.981

TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION	Dimensions
a	2000
b	2000
c	500
e	380
f	300
g	350
h	300
i	2200
j	950
k	300
l	950
m	250
n	2730
p	300
q	3100
dk	1200

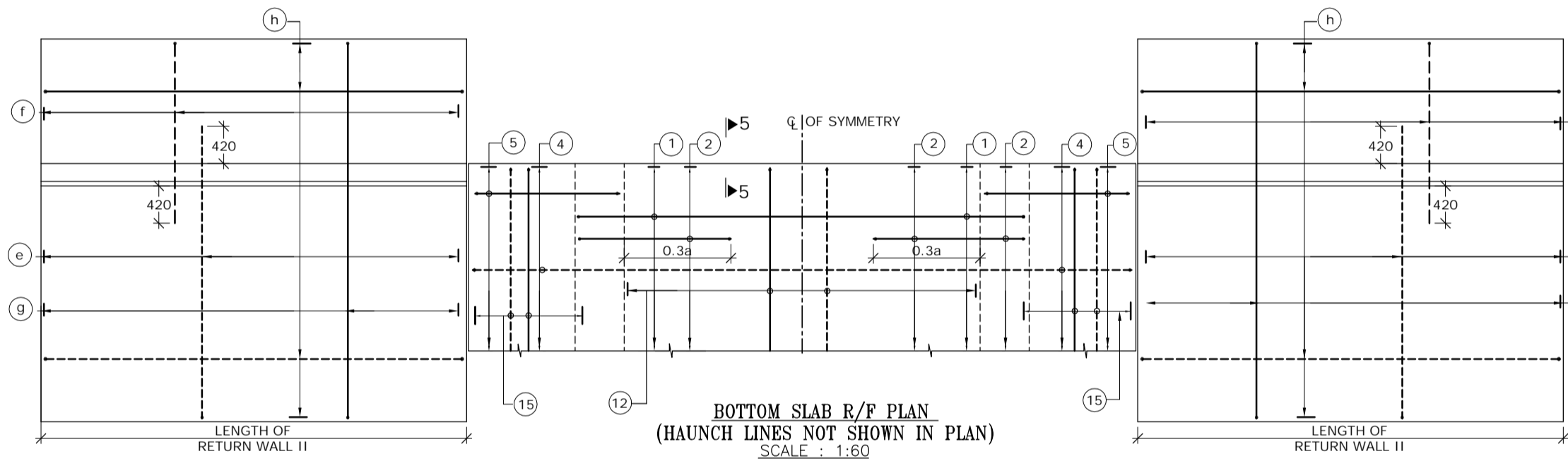


- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE - M25
CURTAIN WALL - M25
LEVELLING COURSE (P.C.C.) - M15
RETURN WALL - M25
RCC WALL & KERB - M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.81/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 t/m² BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/RCC (SHEET NO-01)

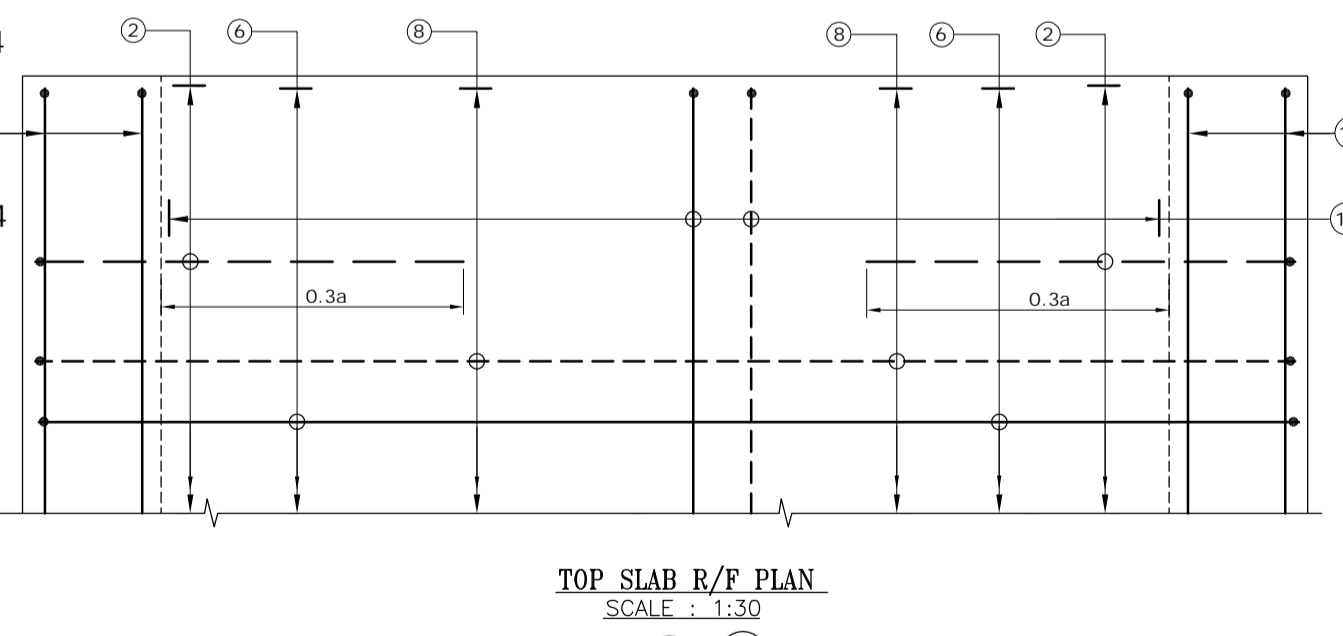
<table border="1"> <thead> <tr> <th>MKD.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>CHKD.</th> <th>APPRD.</th> </tr> </thead> <tbody> <tr> <td colspan="5">REVISIONS</td> </tr> </tbody> </table>					MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	REVISIONS					SCALE: AS SHOWN DATE: SEPT, 2016	PROJECT: Consultancy 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.	CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH BOTH SIDE FLOOR APRON Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825	CONSULTANT : CETEST CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/GA Drawn By. S. Chattrjee Design By. - Checked By. Avishek Dey Approved By. Soubhik Sadhu
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.																
REVISIONS																				



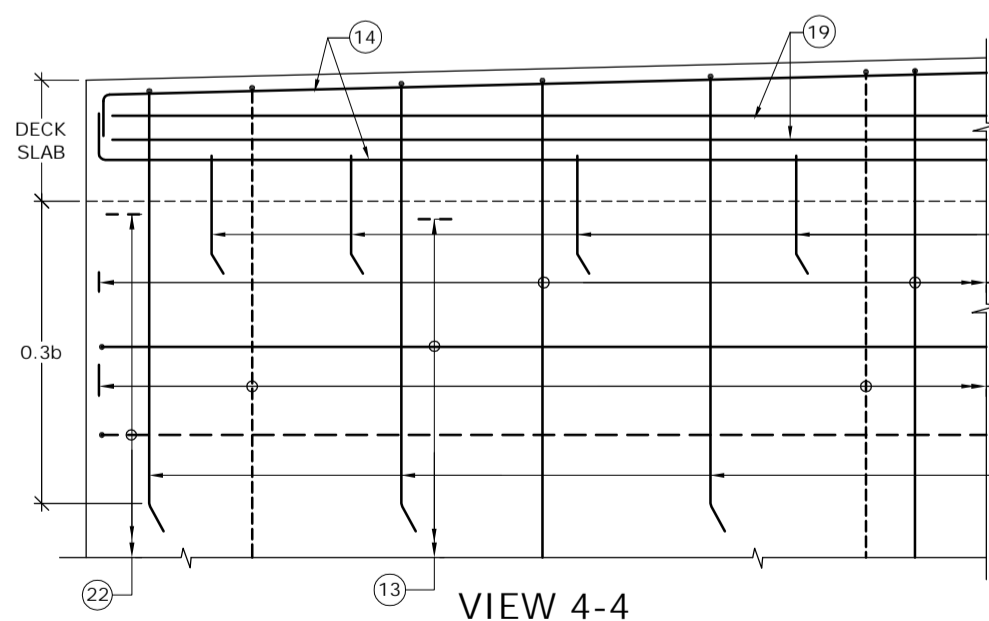
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60



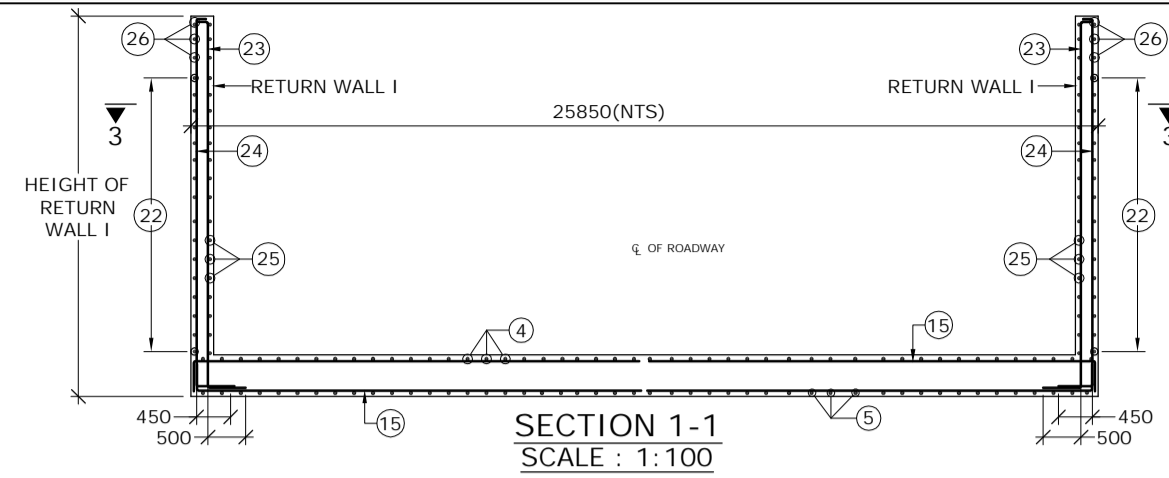
BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60



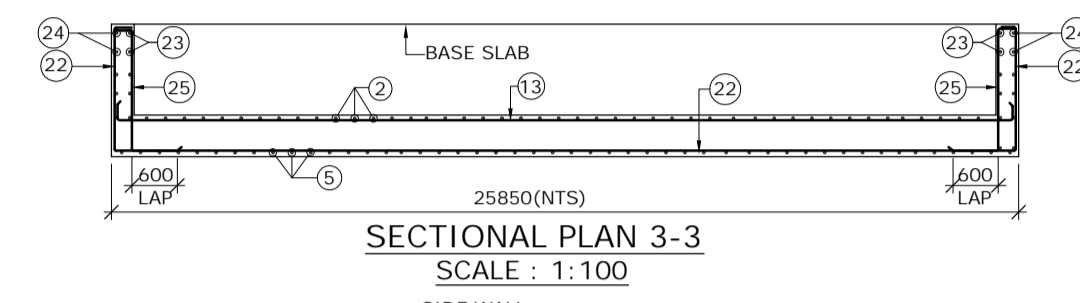
TOP SLAB R/F PLAN
SCALE : 1:30
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



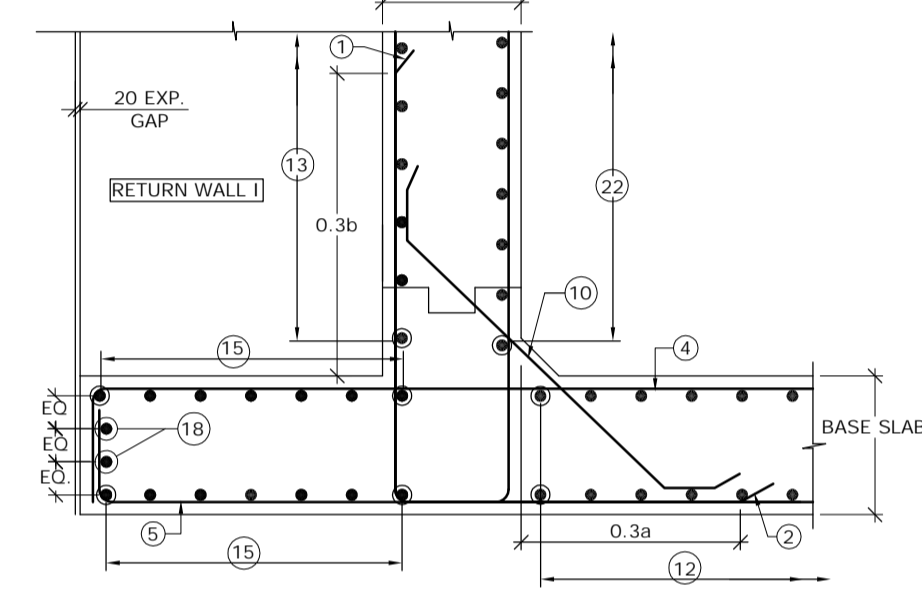
VIEW 4-4
SCALE : 1:30



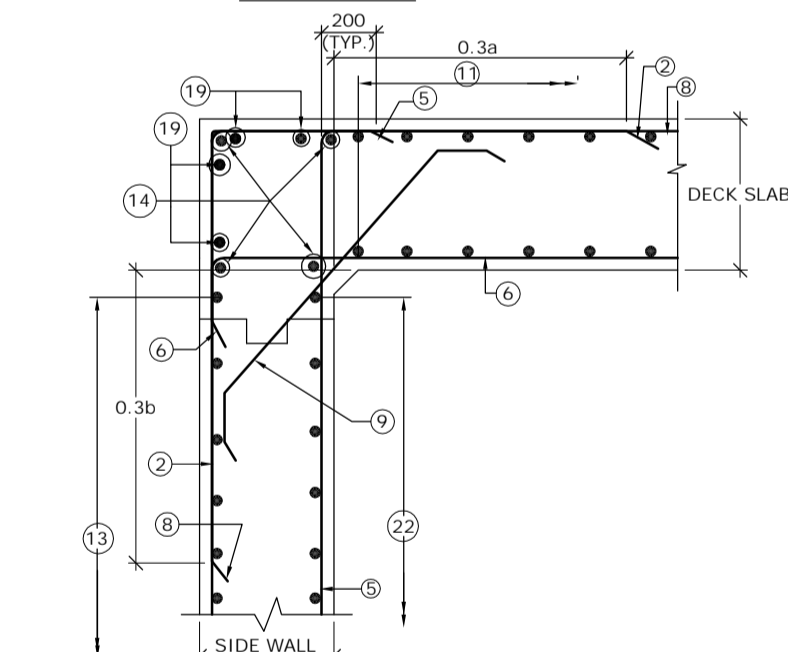
SECTION 1-1
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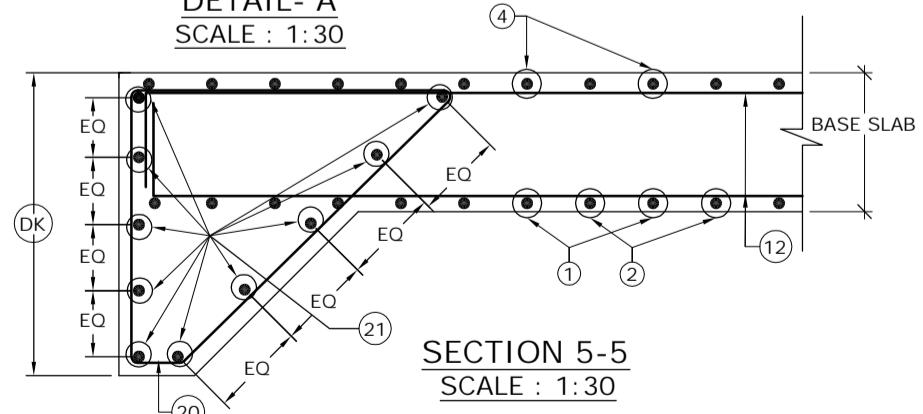
SECTIONAL PLAN 3-3
SCALE : 1:100



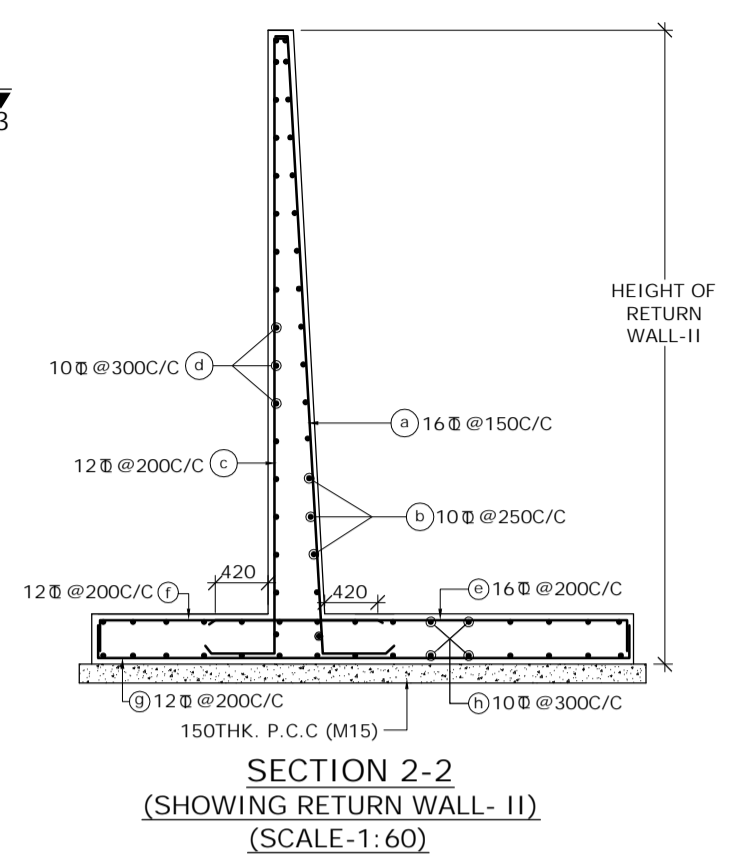
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE-1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	10	250	13	10	250
2	16	250	14	10	-
3	BAR NOT USED		15	10	250
4	16	250	16	12	-
5	16	250	17	12	250
6	16	250	18	10	-
7	BAR NOT USED		19	10	-
8	10	250	20	10	150
9	10	250	21	10	-
10	12	250	22	10	250
11	10	250	23	10	200
12	10	250	24	10	200
			25	12	125
			26	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
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 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
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MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0)

Package :- IV District :- SENAPATI
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 Designe Chainage :- 81+870 to 105+825

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 124-A, N.S.C. Bose Road
 Kolkata - 700092.

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/NC/RCC

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu

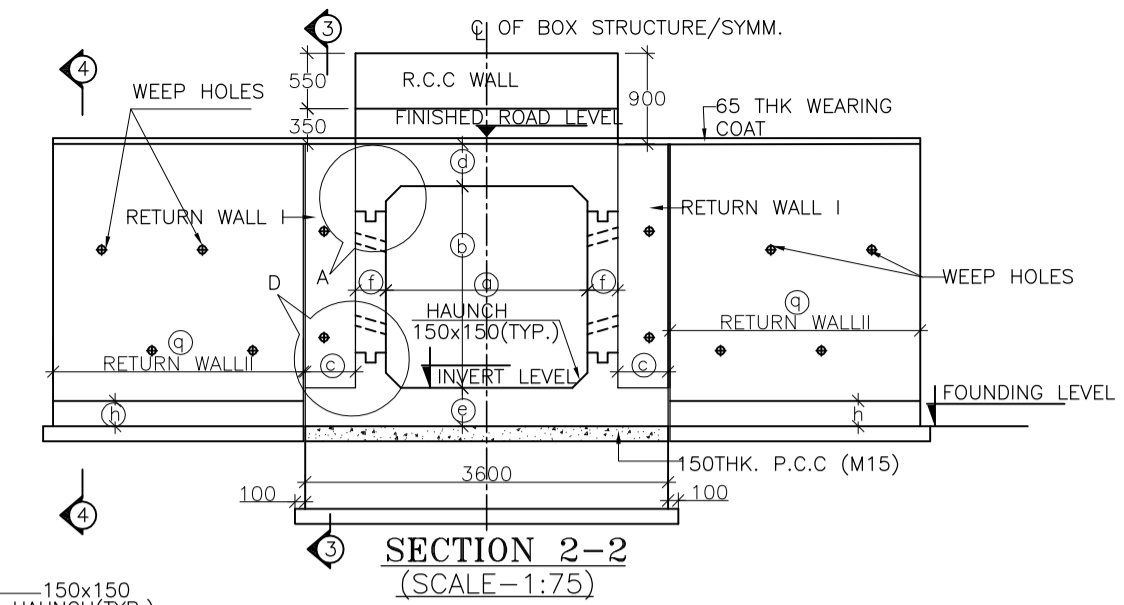
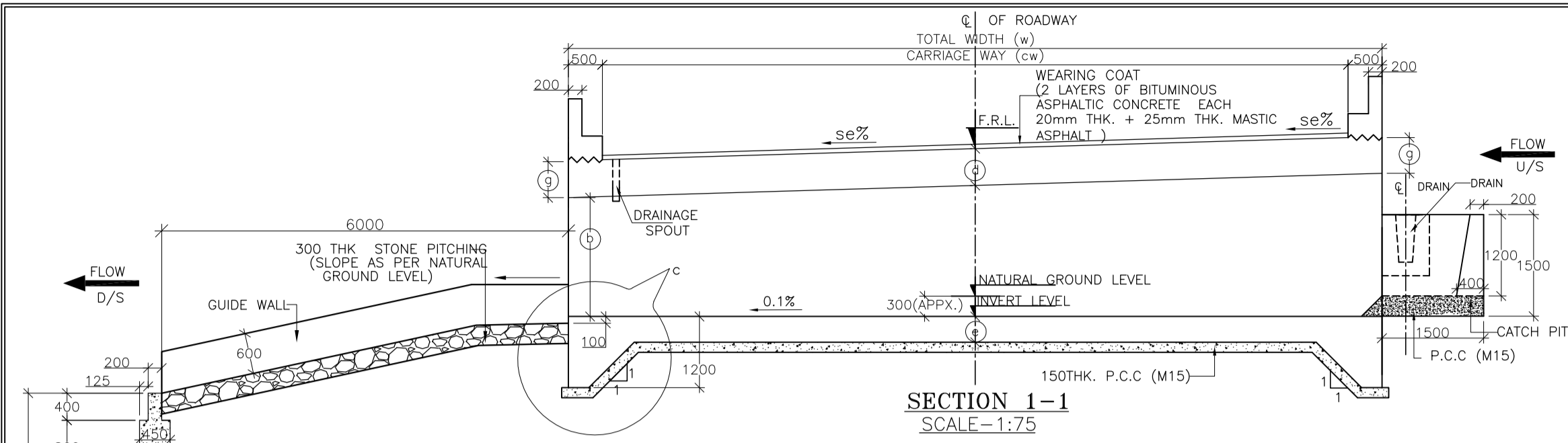
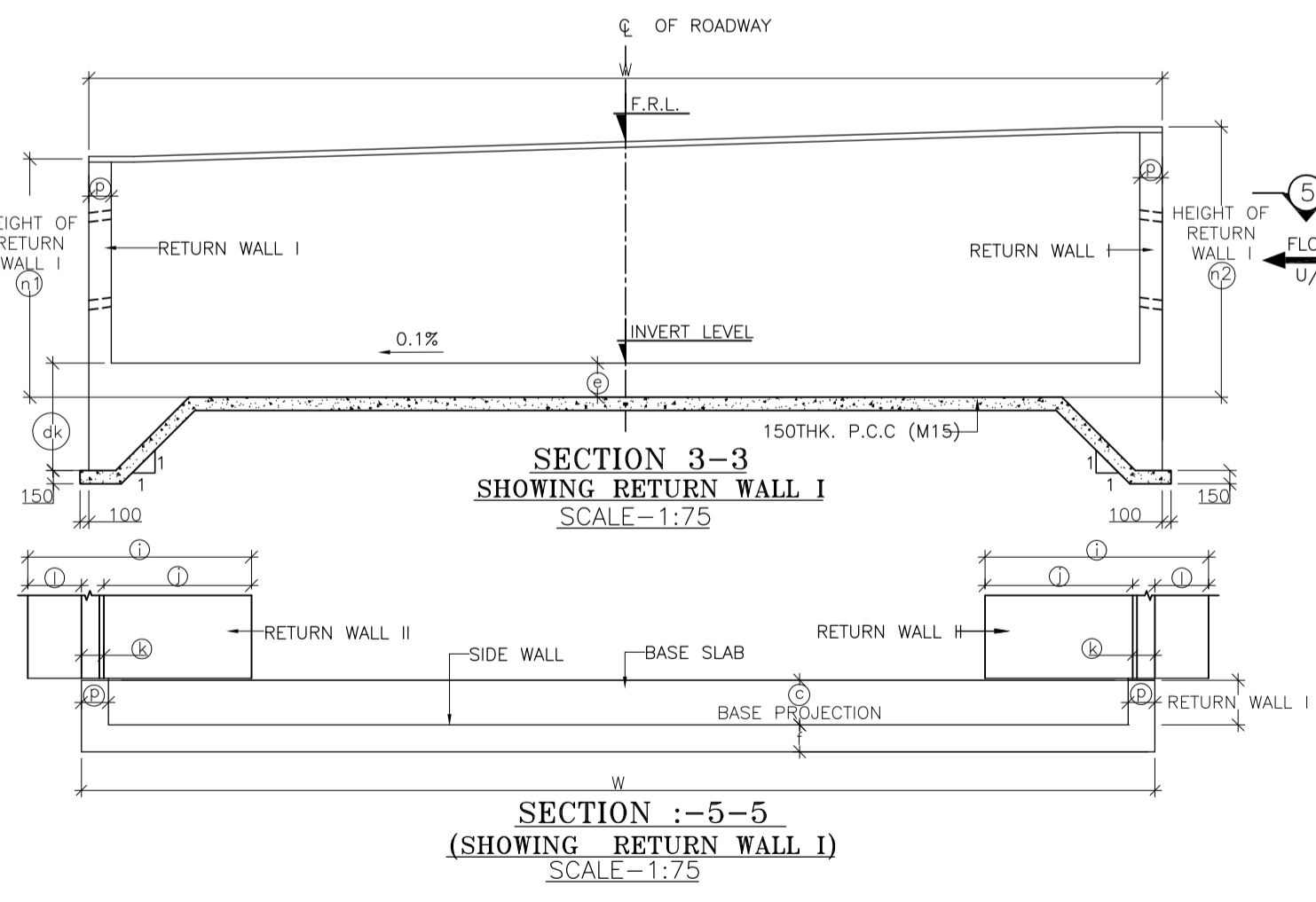
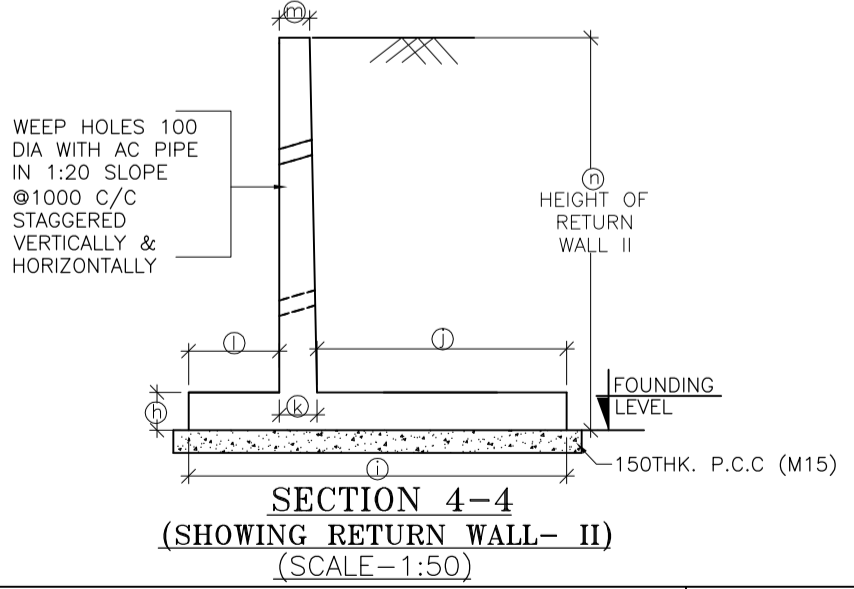
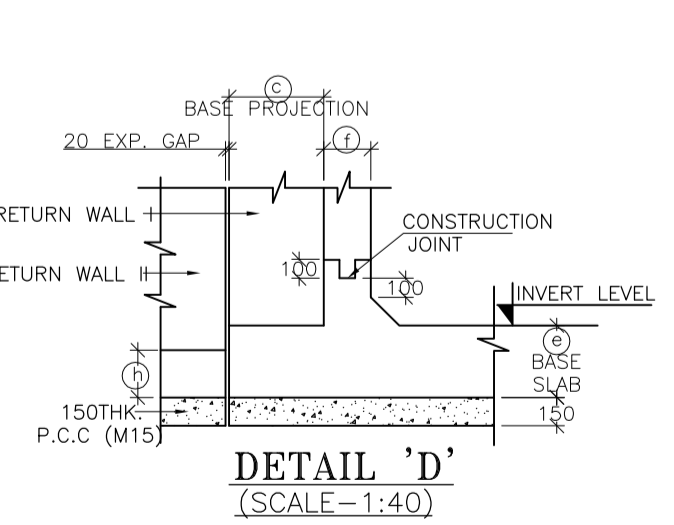
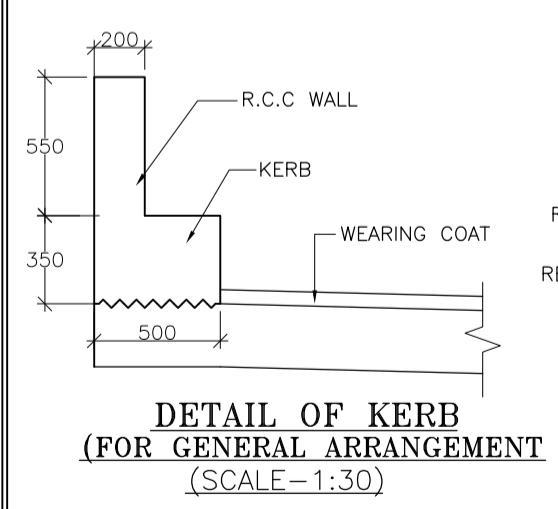
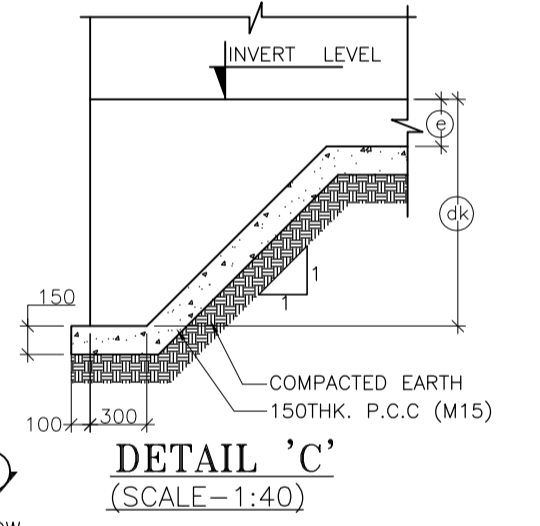
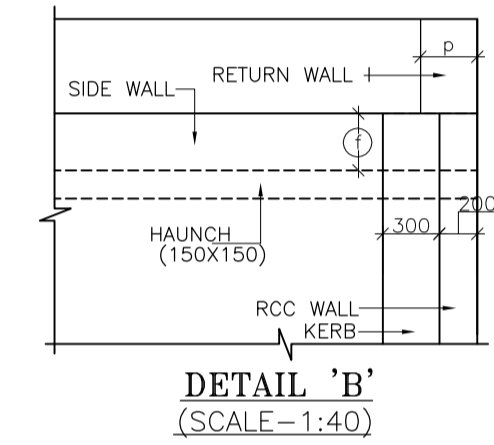
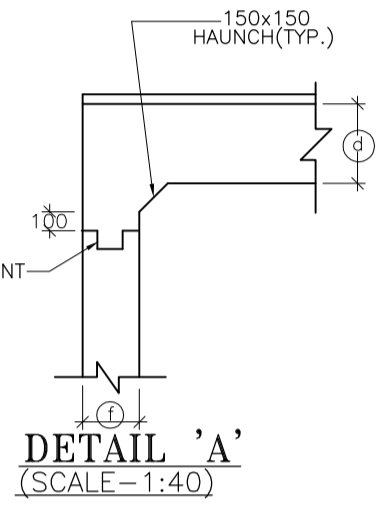
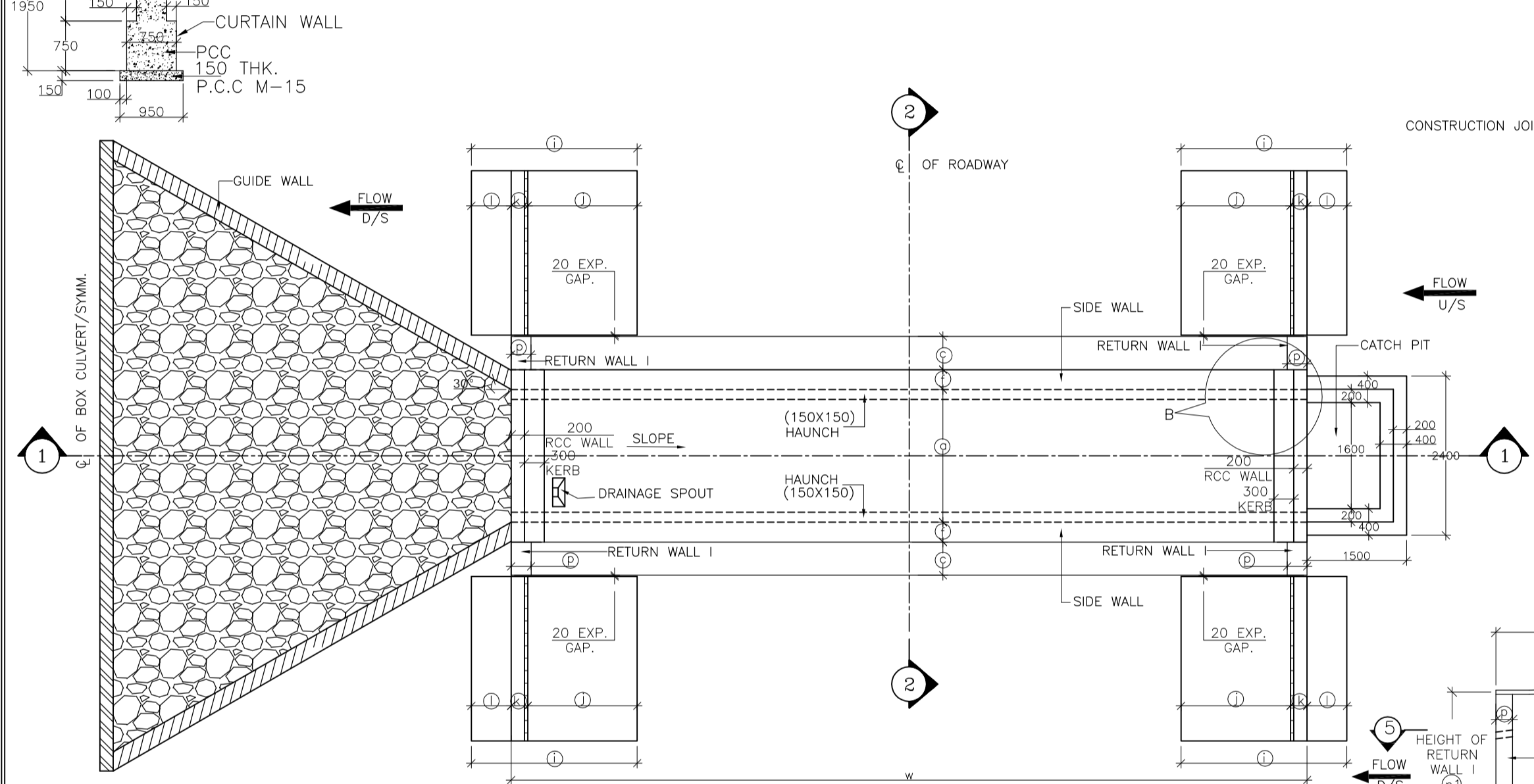


TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./ab/Ec	
a	2000
b	2000
c	500
d	350
e	380
f	300
g	350
h	250
i	2320
j	1000
k	320
l	1000
m	250
p	300
q	3100
dk	1200



- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE = M25
CURTAIN WALL = M25
LEVELLING COURSE (P.C.C.) = M15
RETURN WALL = M25
RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
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 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/SLP/SE/RCC (SHEET NO-01)
 - CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/SLP/SE/GA (SHEET NO-02)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
DATE: SEPT, 2016

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
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GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCH PIT & SLOPED PROTECTION

Package :- IV District :- SENAPATI
Existing Chainage :- 88+520 to 114+165
Design Chainage :- 81+870 to 105+825

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



CETEST
Engineering Consultants

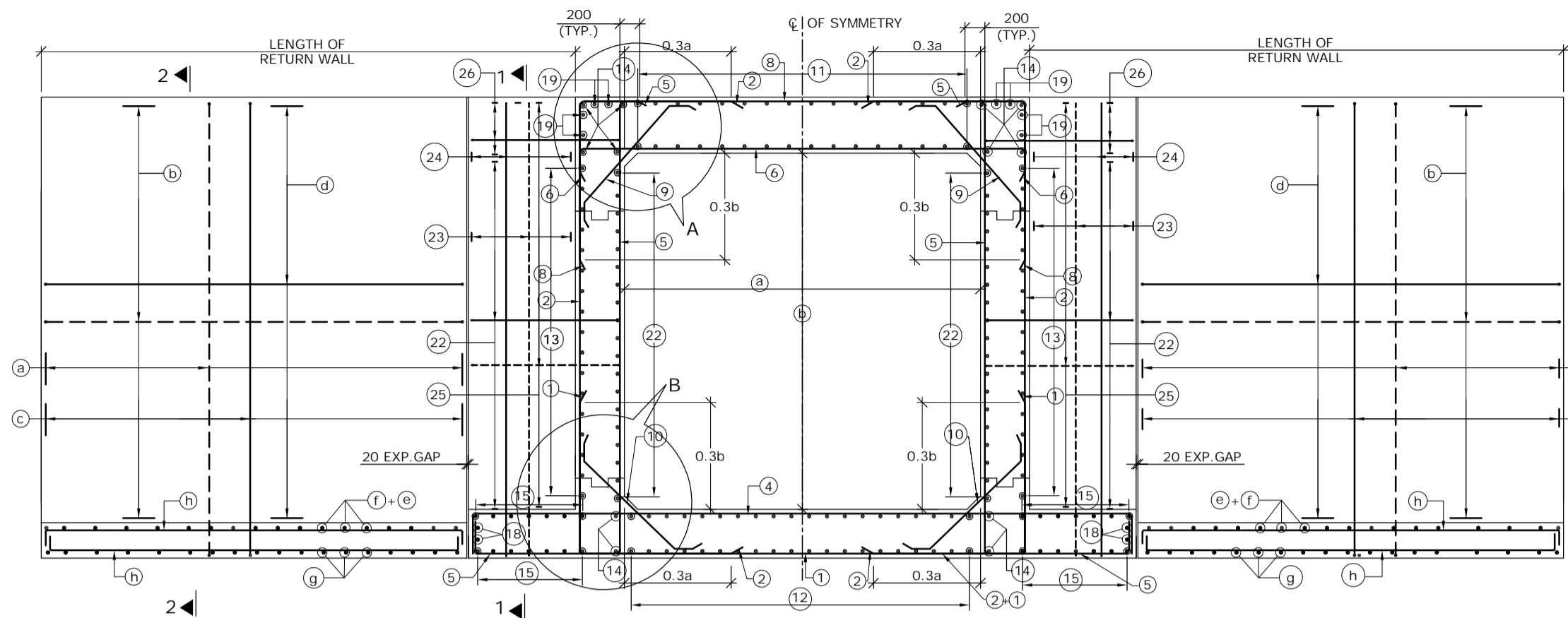
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/SLP/SE/GA (SHEET NO-01 OF 02)

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu

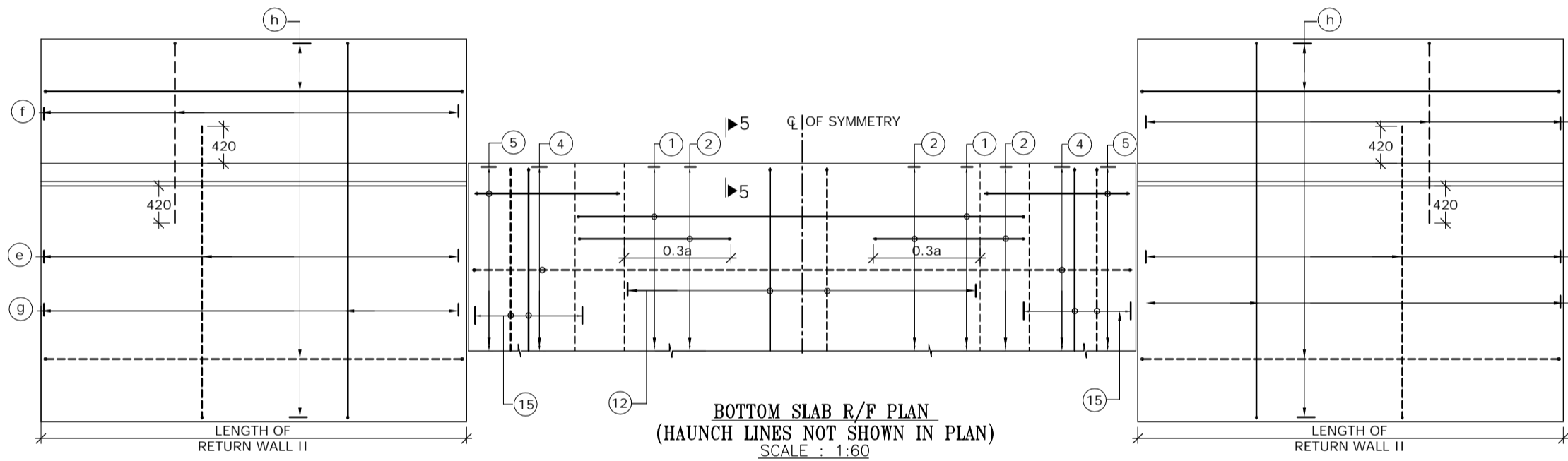
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
83/1	82+245	2135.757	2X2X1 Cell	4.70	R TO L	11.00	With Catch pit	Slope	2133.577	2133.197	2.730	3.200
85/2	84+188	2058.059	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Slope	2055.994	2055.614	2.730	3.430
85/3	84+740	2019.047	2X2X1 Cell	7.00	R TO L	10.00	With Catch pit	Slope	2016.947	2016.567	2.730	3.360
87/1	86+020	1939.848	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Slope	1937.783	1937.403	2.730	3.430
87/6	86+906	1906.355	2X2X1 Cell	7.00	L TO R	10.00	With Catch pit	Slope	1904.255	1903.875	2.730	3.360
89/3	88+158	1864.485	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Slope	1862.420	1862.040	2.730	3.430
89/6	88+738	1865.572	2X2X1 Cell	3.60	R TO L	11.00	With Catch pit	Slope	1863.337	1862.957	2.730	3.090
90/2	89+350	1864.414	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Slope	1862.349	1861.969	2.730	3.430
97/2	96+812	1763.325	2X2X1 Cell	7.00	R TO L	10.00	With Catch pit	Slope	1761.225	1760.845	2.730	3.360
100/3	99+477	1564.939	2X2X1 Cell	5.60	R TO L	11.00	With Catch pit	Slope	1562.804	1562.424	2.730	3.290
101/3	100+692	1512.218	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Slope	1510.153	1509.773	2.730	3.430
101/4	100+995	1506.586	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Slope	1504.521	1504.141	2.730	3.430
102/4	101+832	1518.206	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Slope	1516.141	1515.761	2.730	3.430
103/1	102+040	1521.487	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Slope	1519.422	1519.042	2.730	3.430
103/2	102+142	1521.682	2X2X1 Cell	7.00	R TO L	10.00	With Catch pit	Slope	1519.582	1519.202	2.730	3.360
103/5	102+599	1539.178	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Slope	1537.113	1536.733	2.730	3.430

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH
CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/CP/STP/NC/GA
(SHEET NO-02)

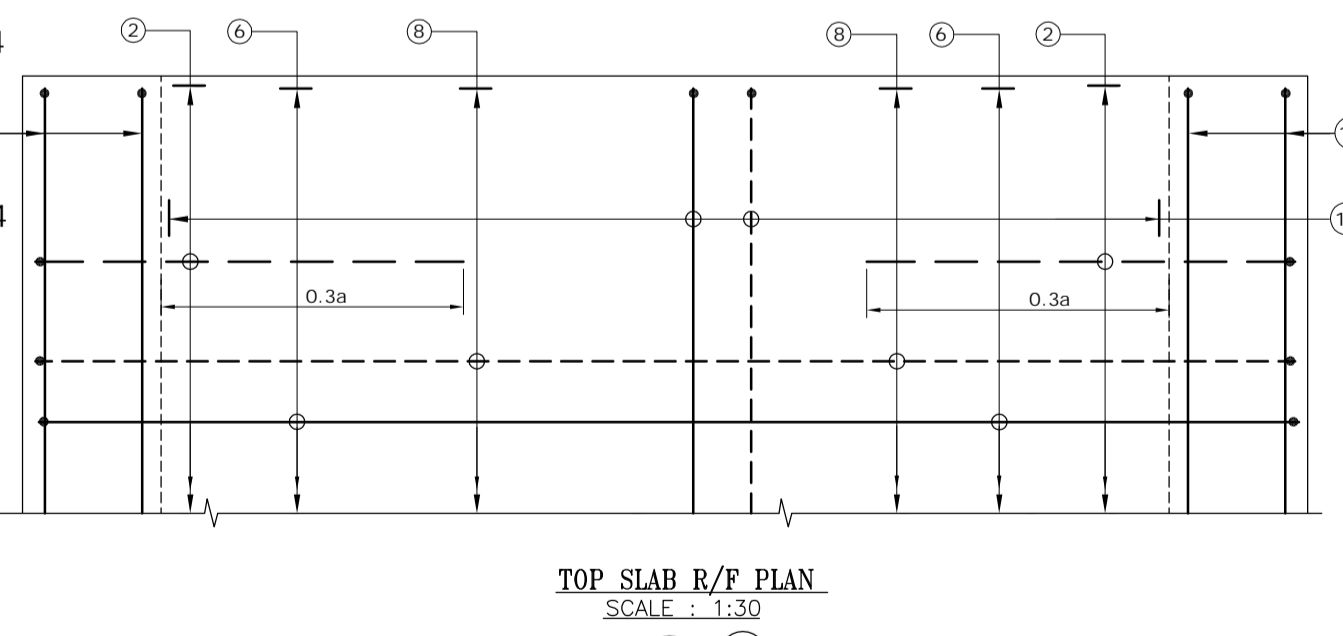
					SCALE: AS SHOWN		CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCHPIT & SLOPED PROTECTION	CONSULTANT :  CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG. NO. CET/BDG/2016/3640/NH-102A/PPR/BC/2x2x1/CP/SLP/SE/GA (SHEET NO-02 OF 02)
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	DATE: SEPT, 2016		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.	Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Design Chainage :- 81+870 to 105+825		Drawn By. Design By. Checked By. Approved By.
REVISIONS										S. Chattrjee - Avishek Dey Soubhik Sadhu



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

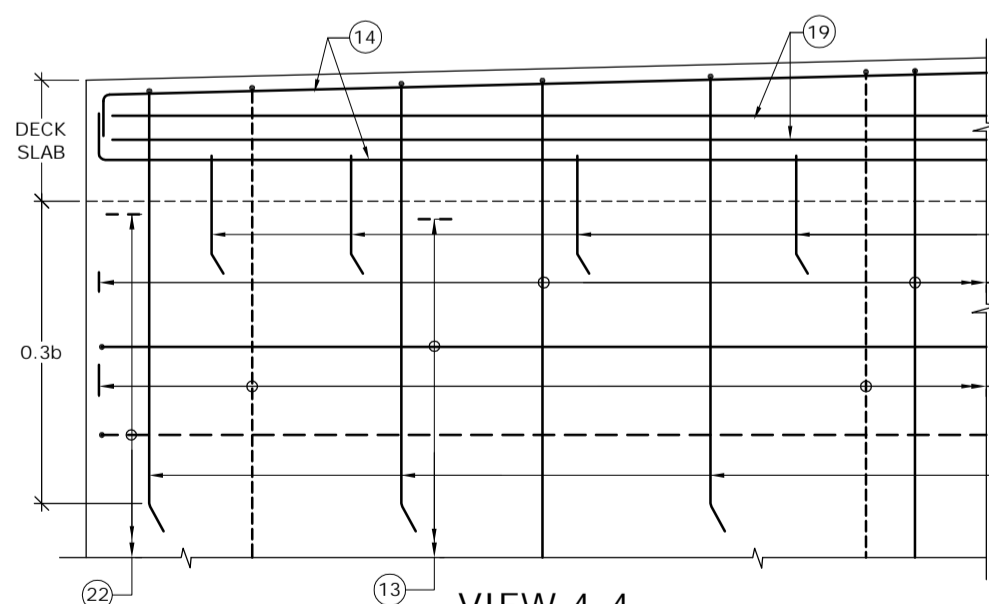


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

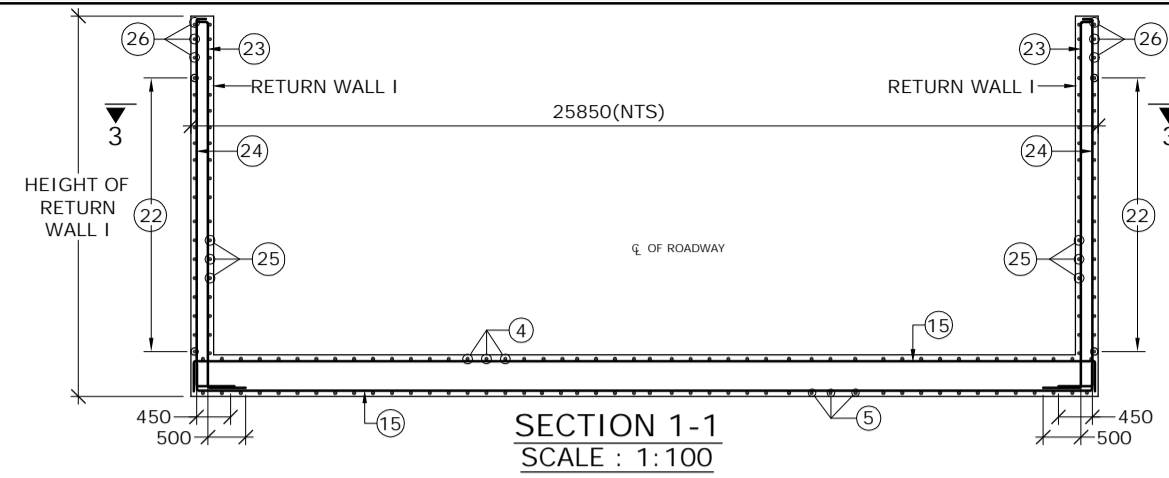


TOP SLAB R/F PLAN
SCALE : 1:30

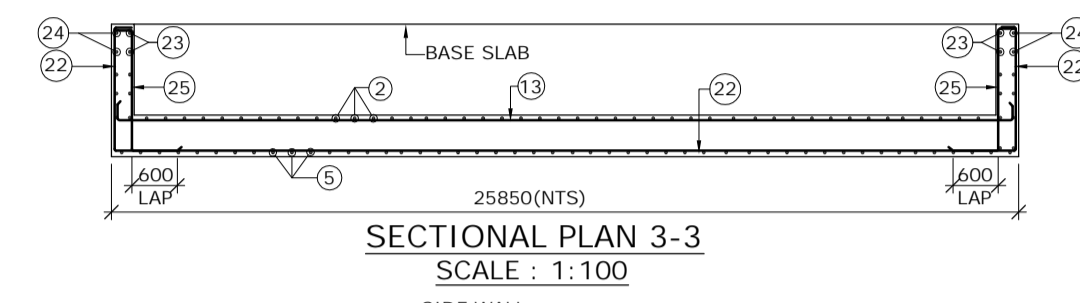
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



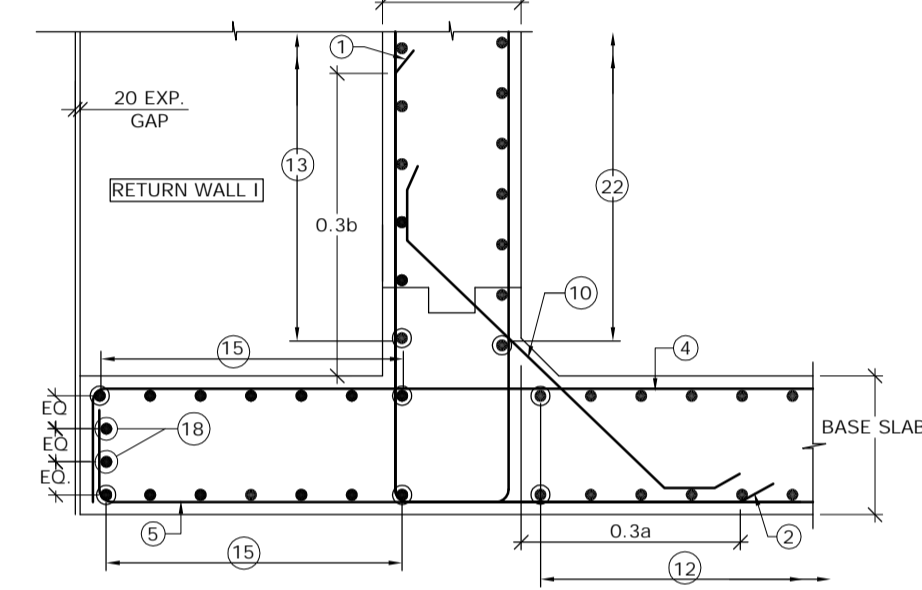
VIEW 4-4
SCALE : 1:30



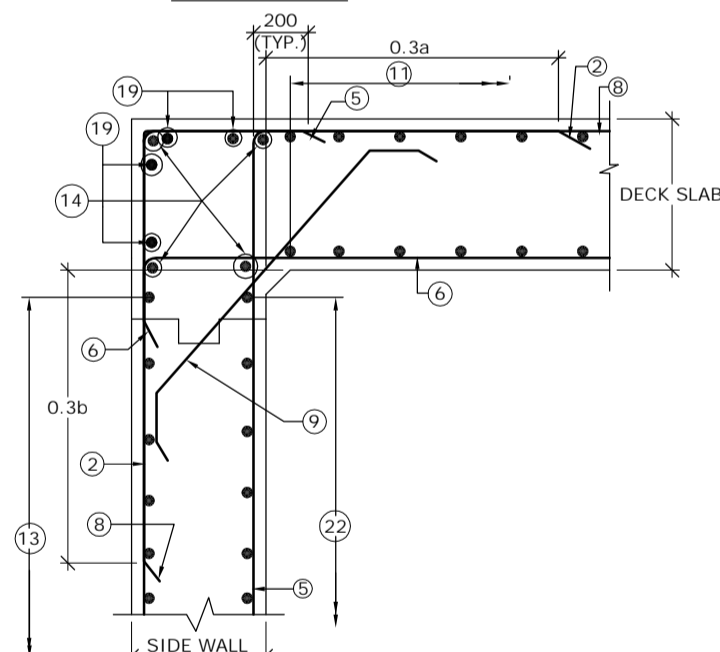
SECTION 1-1
SCALE : 1:100



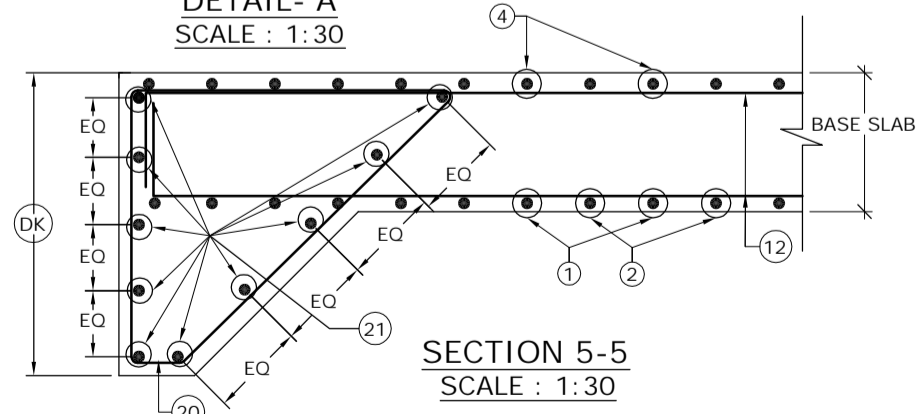
SECTIONAL PLAN 3-3
SCALE : 1:100



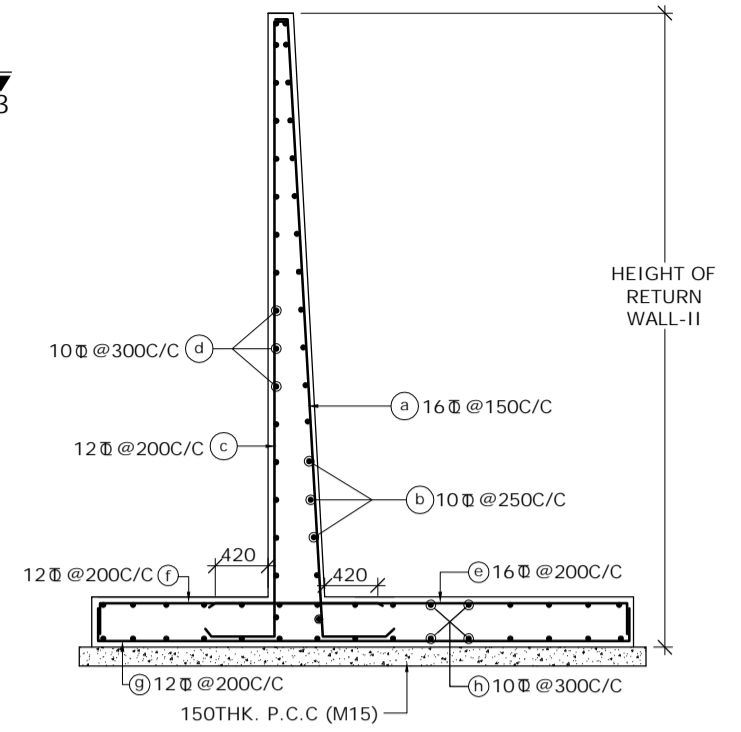
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE-1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/SLP/SE/GA (SHEET NO-01 & 02)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

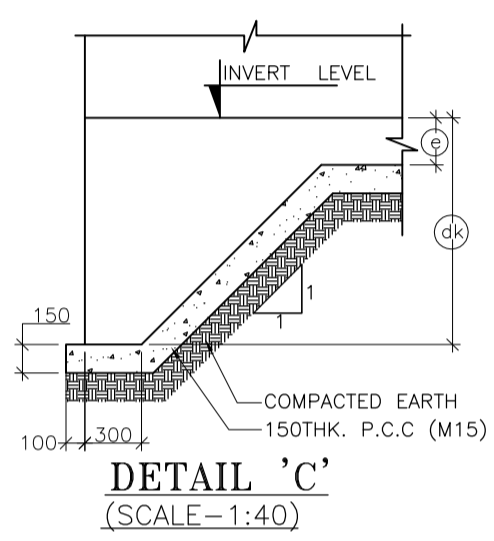
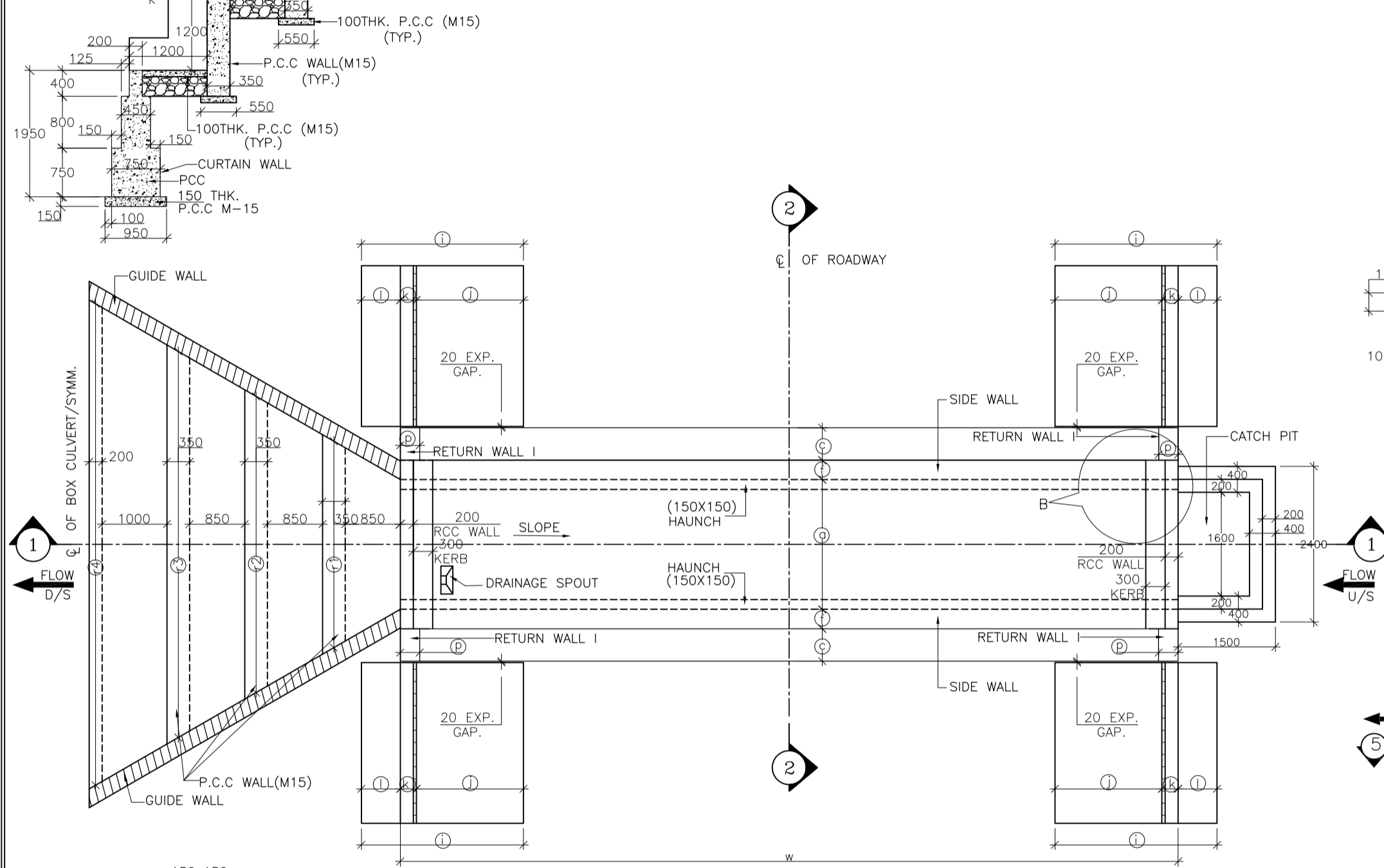
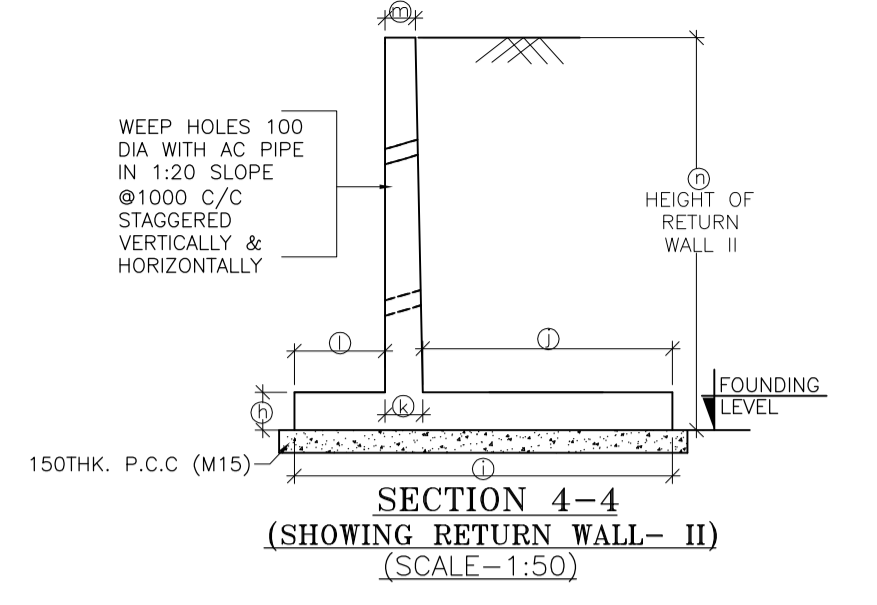
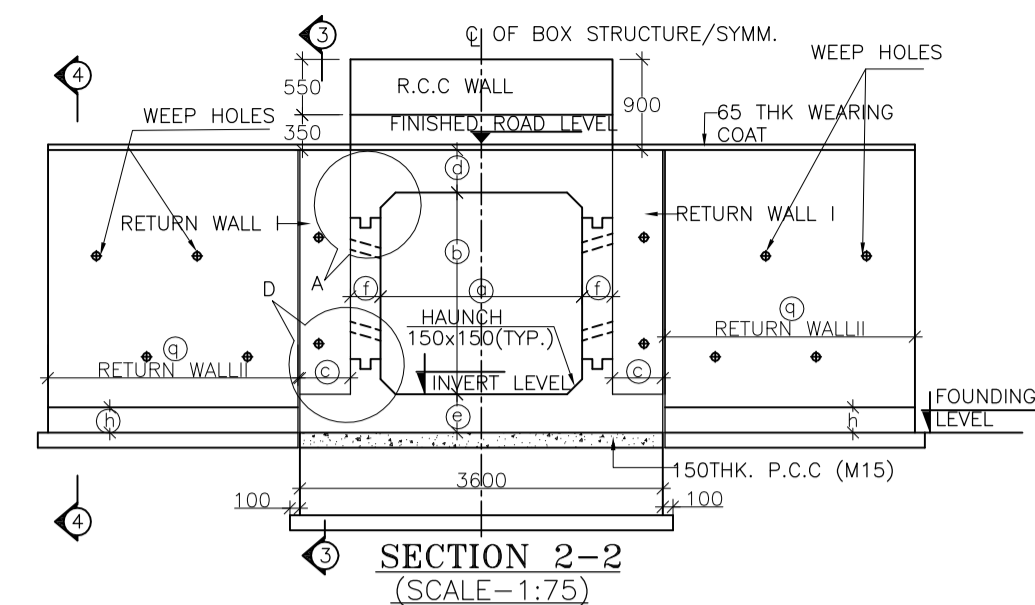
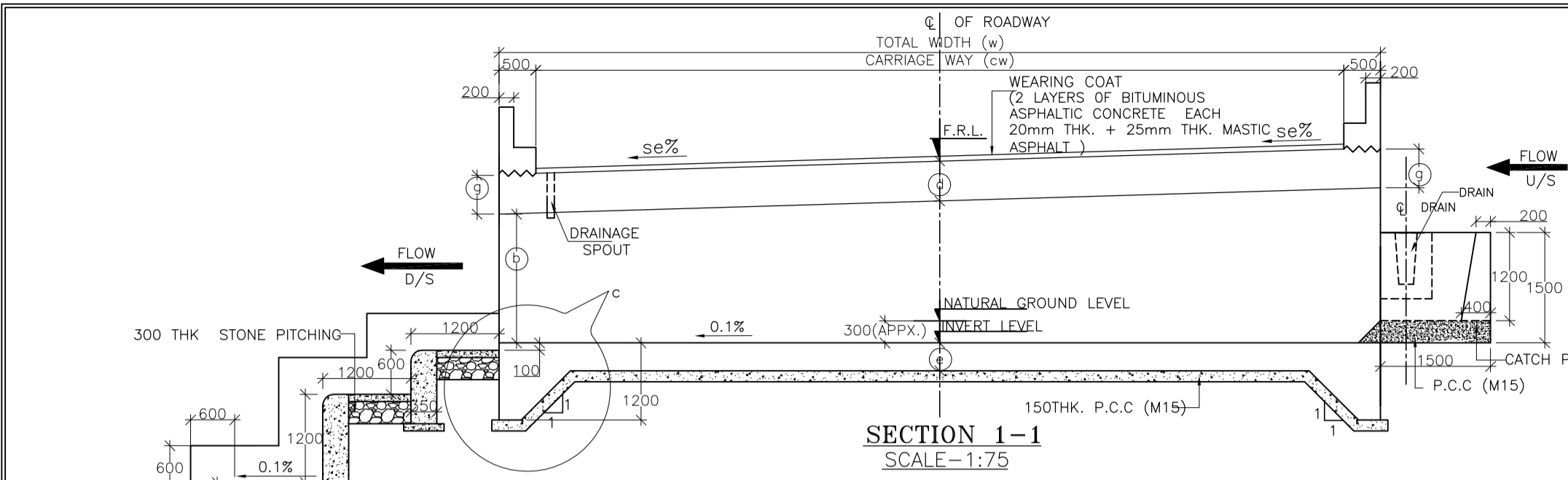
SCALE: AS SHOWN
 DATE: SEPT, 2016

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

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0)
 Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

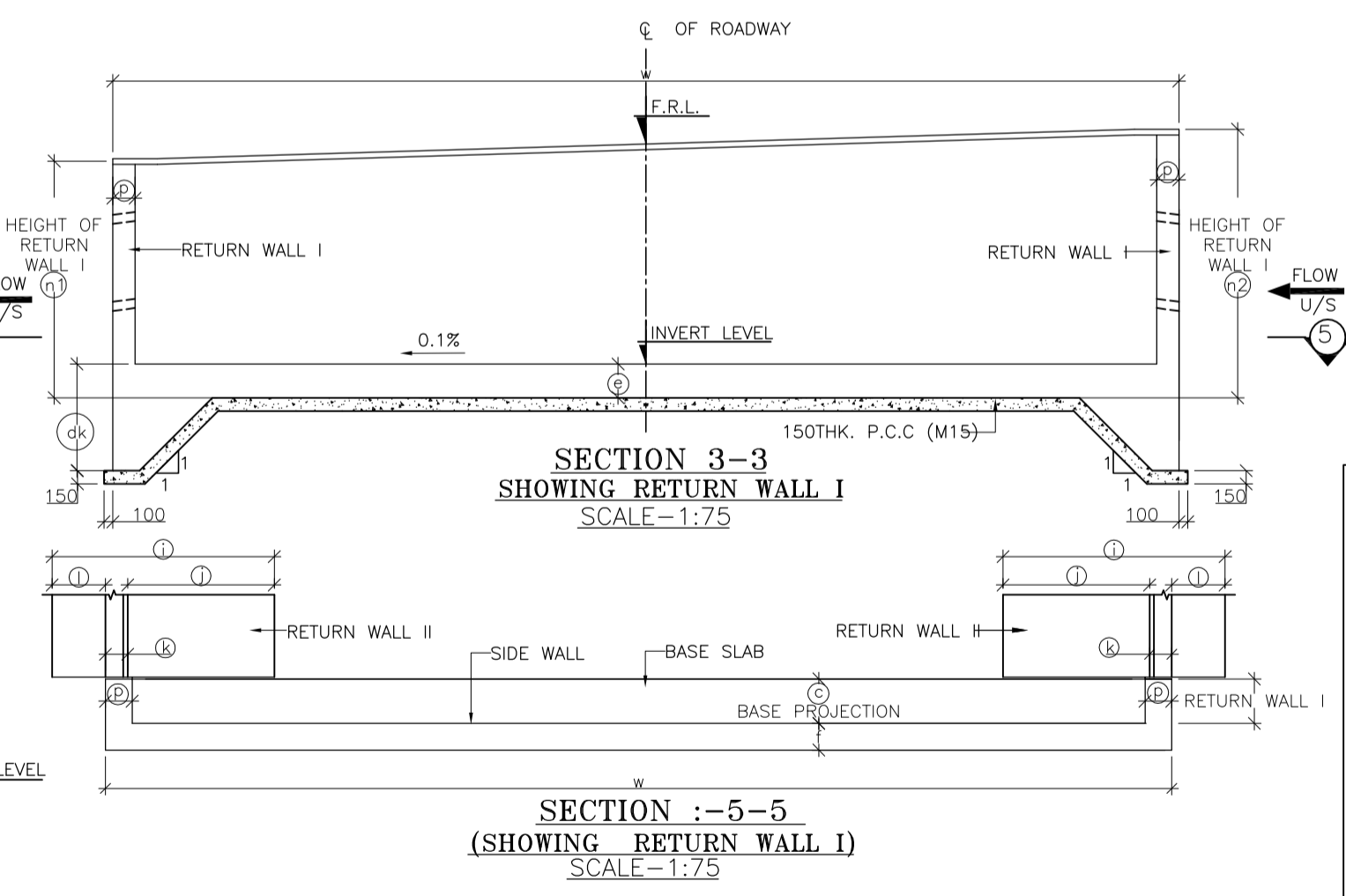
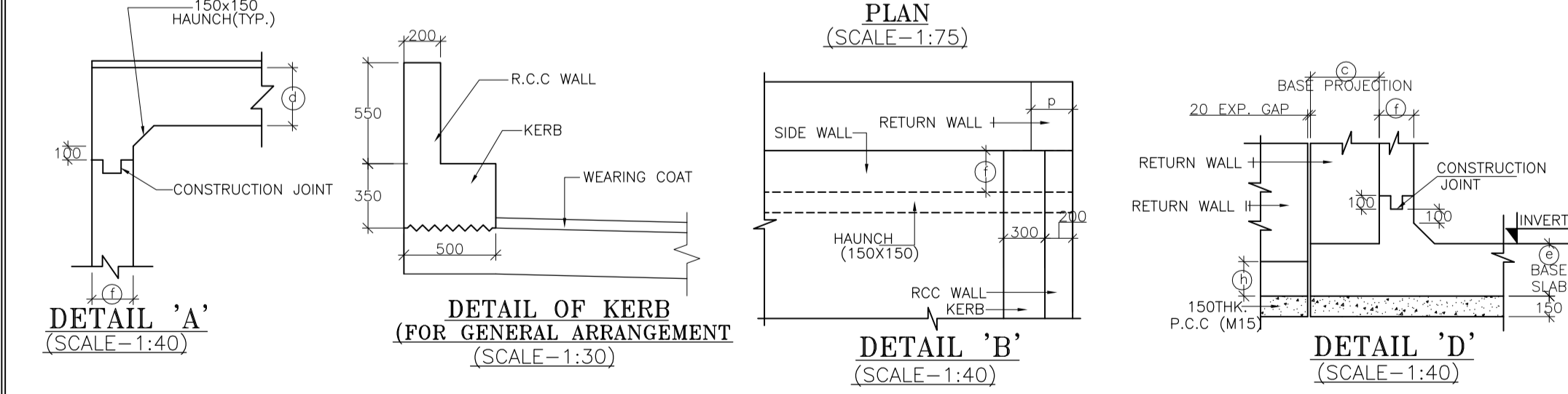
CONSULTANT : CE TESTING COMPANY PVT. LTD.
 124-A, N.S.C. Bose Road
 Kolkata - 700092.

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/SLP/SE/RCC (SHEET NO-01 OF 01)
 Drawn By: S. Chattrjee
 Design By: -
 Checked By: Avishek Dey
 Approved By: Soubhik Sadhu



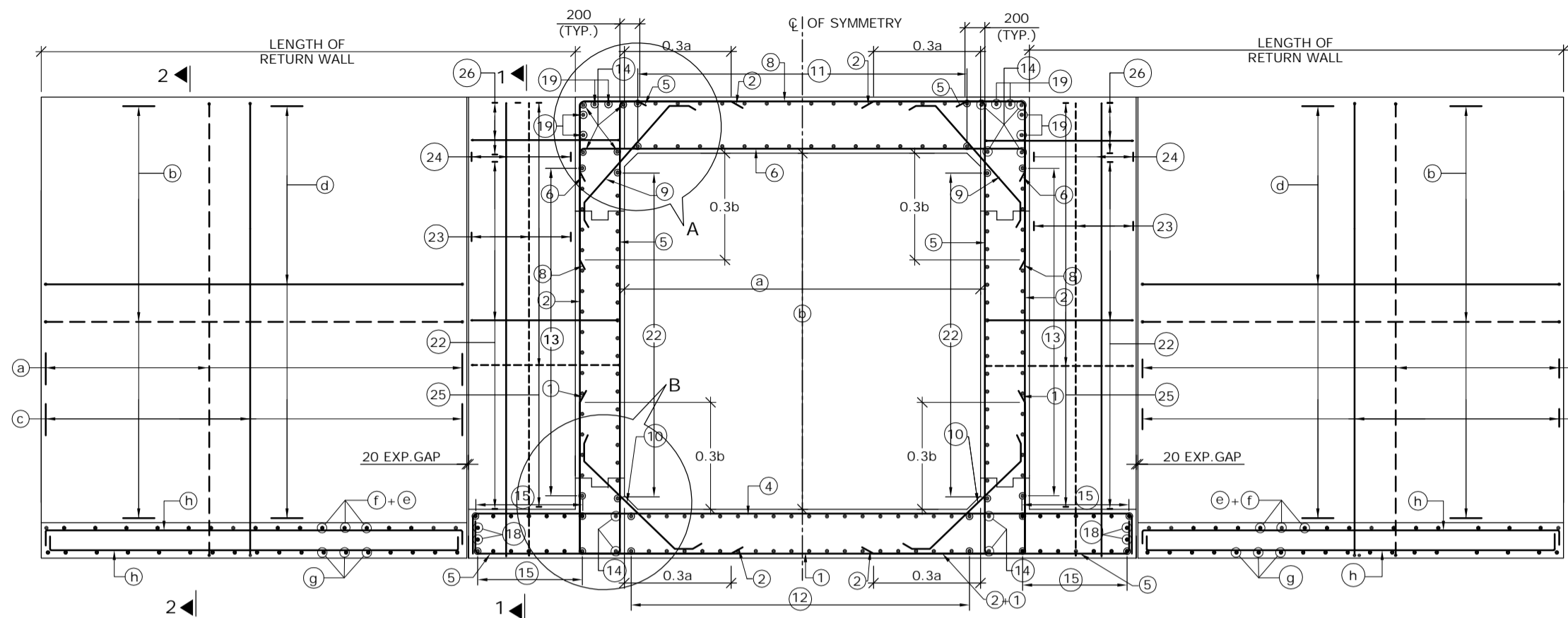
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
86/2	85+291	1979.249	2X2X1 Cell	7.00	R TO L	10.00	With Catch pit	Step	1977.149	1976.769	2.730	3.360
88/4	87+978	1866.693	2X2X1 Cell	4.20	R TO L	11.00	With Catch pit	Step	1864.488	1864.108	2.730	3.150
89/1	88+058	1865.707	2X2X1 Cell	4.20	R TO L	11.00	With Catch pit	Step	1863.502	1863.122	2.730	3.150
89/5	88+645	1865.044	2X2X1 Cell	3.60	R TO L	10.00	With Catch pit	Step	1862.791	1862.411	2.730	3.054
97/1	96+312	1800.892	2X2X1 Cell	7.00	R TO L	13.00	With Catch pit	Step	1798.897	1798.517	2.730	3.570
100/1	99+168	1586.569	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Step	1584.504	1584.124	2.730	3.430
100/2	99+332	1575.089	2X2X1 Cell	5.60	R TO L	10.00	With Catch pit	Step	1572.926	1572.546	2.730	3.234

BOX CELL DESIGNATION No./ab/EC	a	2000
b	2000	
c	500	
d	350	
e	380	
f	300	
g	350	
h	320	
i	2320	
j	1000	
k	320	
l	1000	
m	250	
p	300	
q	3100	
dk	1200	

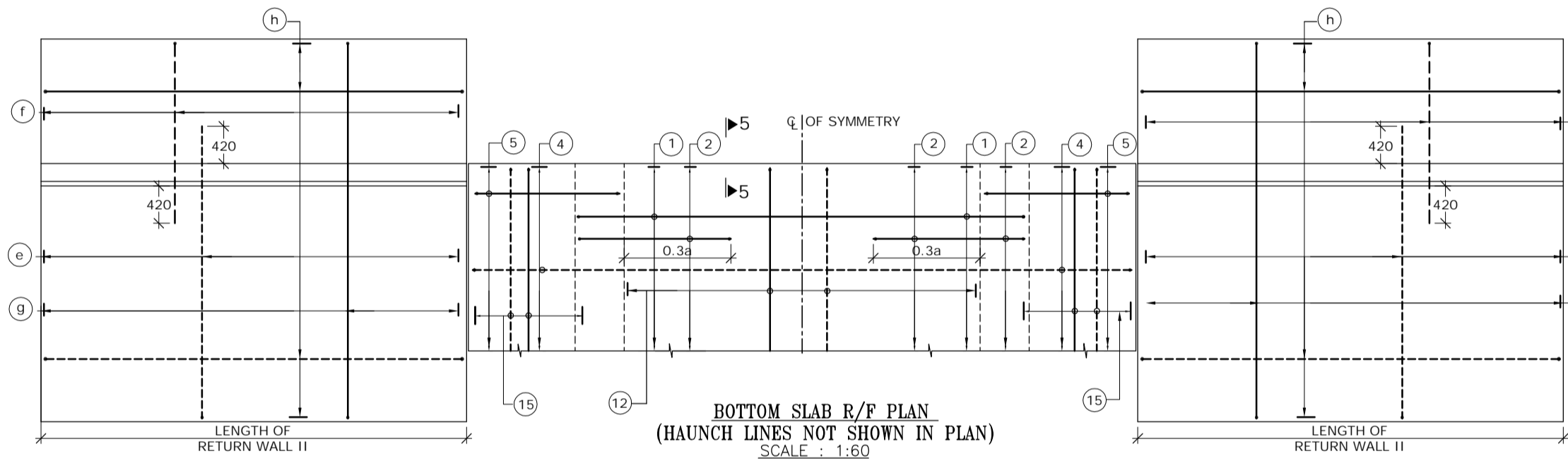


- NOTES :**
1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 2. GRADE OF CONCRETE : BOX CELL STRUCTURE = M25 CURTAIN WALL = M25 LEVELLING COURSE (P.C.C.) = M15 RETURN WALL = M25 RCC WALL & KERB = M25
 3. GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 4. CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 5. PROPERTIES OF BACKFILL SOIL $\rho = 1.81/m^3$, $\phi = 30^\circ$
 6. FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 7. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 8. EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 TONS BEARING CAPACITY.
 9. SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 10. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/STP/SE/RCC (SHEET NO-01)

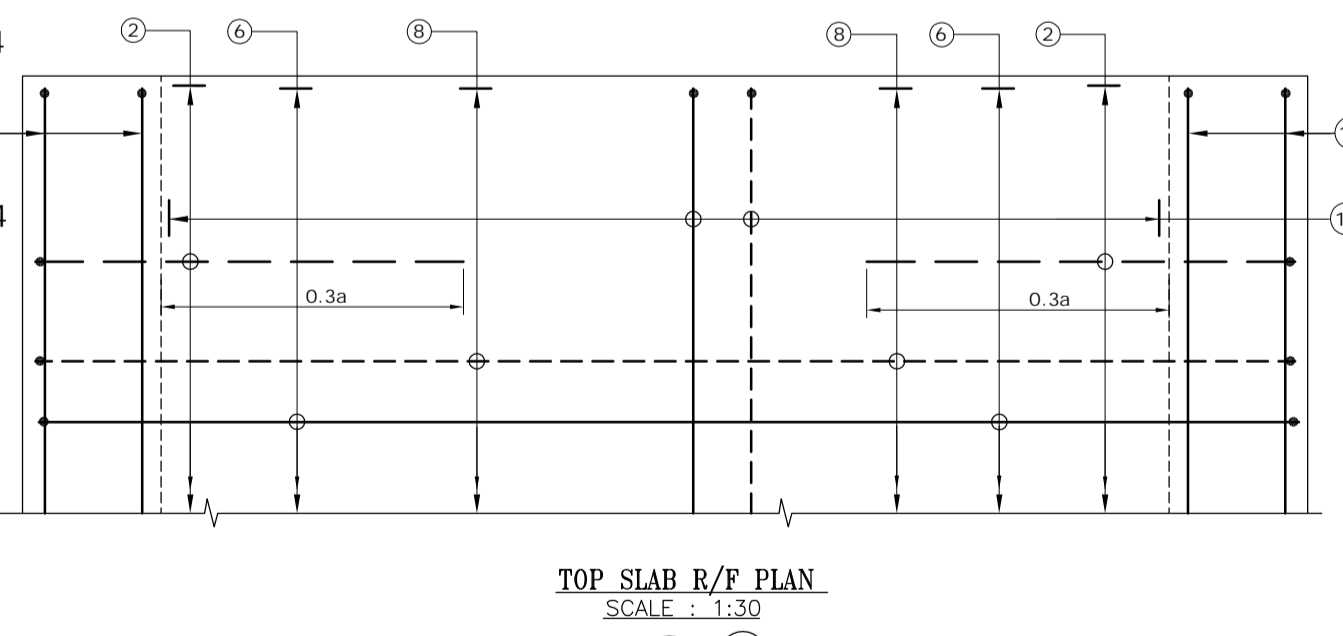
SCALE: AS SHOWN DATE: SEPT, 2016					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH CATCH PIT & STEPPED PROTECTION					CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/STP/SE/GA (SHEET NO-01 OF 01)									
PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Lining with Paved Shoulder of Ukhrul - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.					Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825					Drawn By. A. Sahoo					Design By. -					Checked By. Avishek Dey					Approved By. Soubhik Sadhu				
REVISIONS																													



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

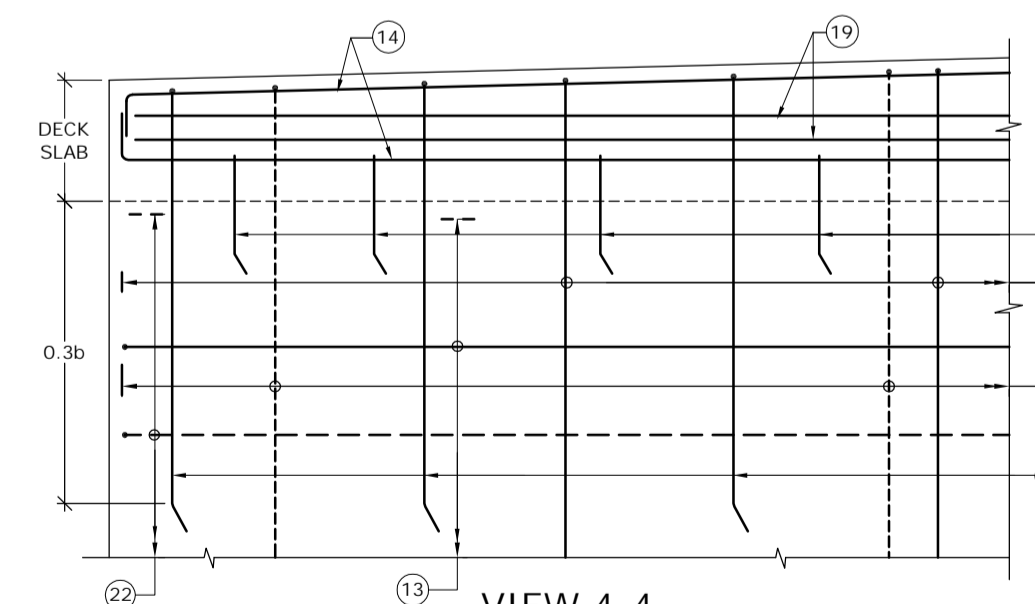


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

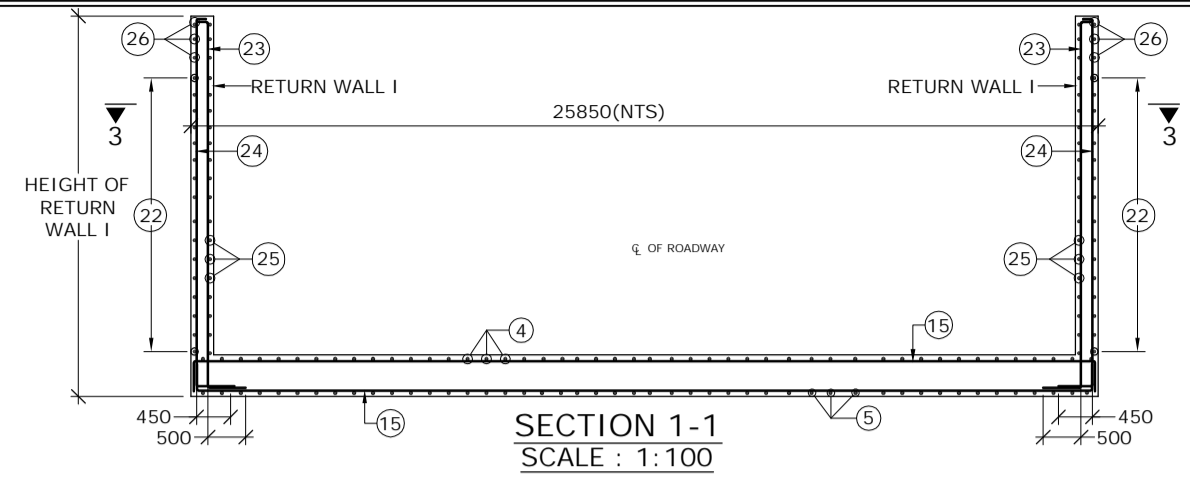


TOP SLAB R/F PLAN
SCALE : 1:30

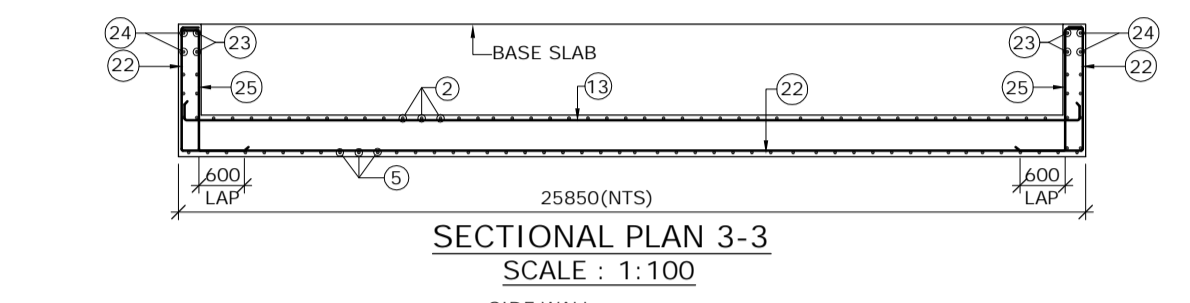
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



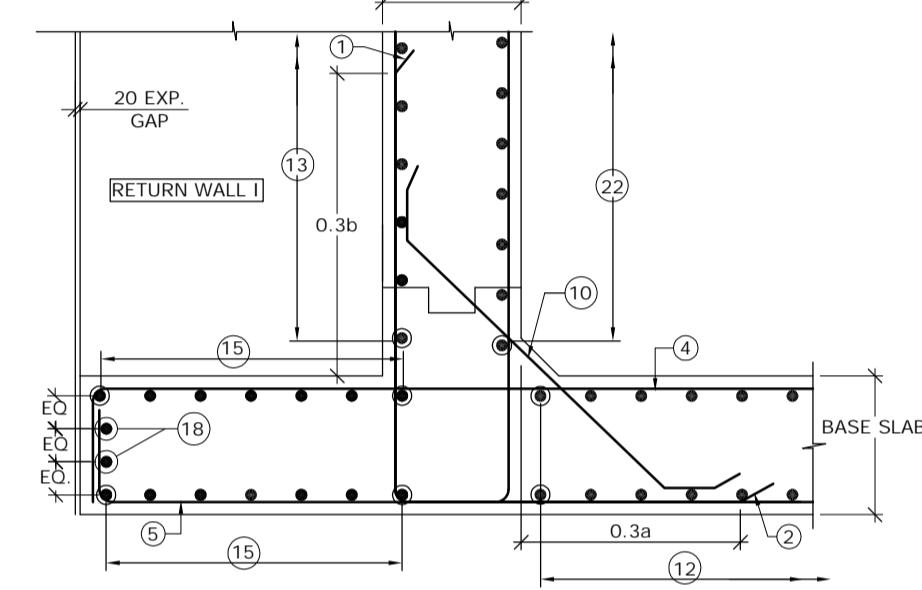
VIEW 4-4
SCALE : 1:30



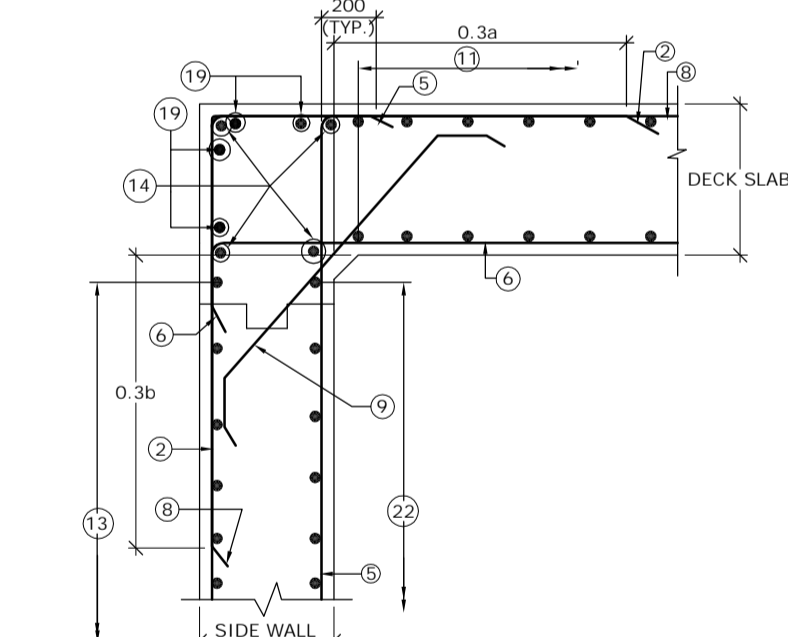
SECTION 1-1
SCALE : 1:100



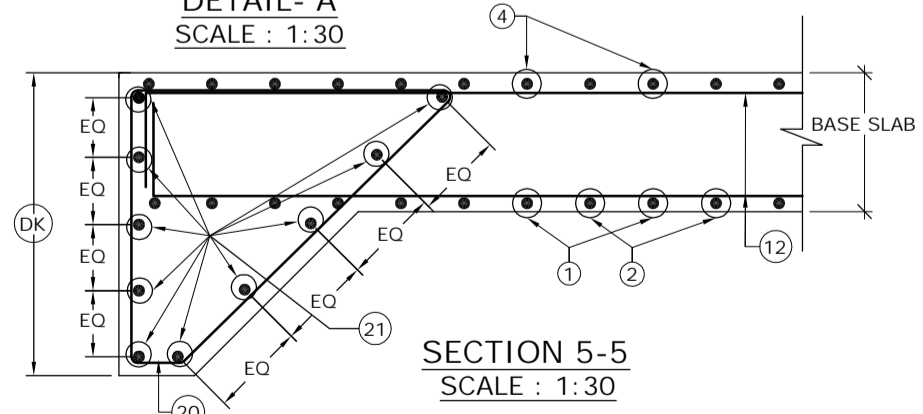
SECTIONAL PLAN 3-3
SCALE : 1:100



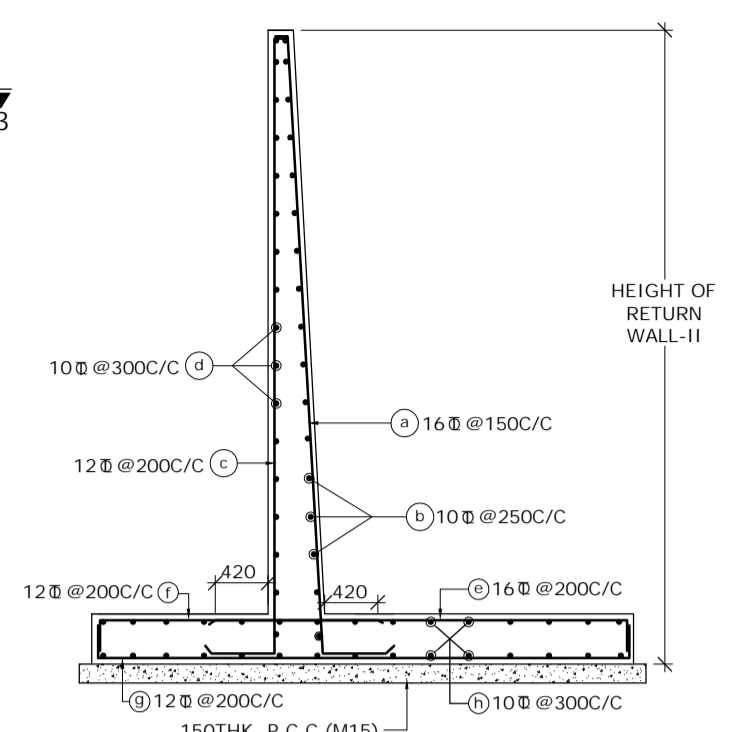
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/STP/SE/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0)

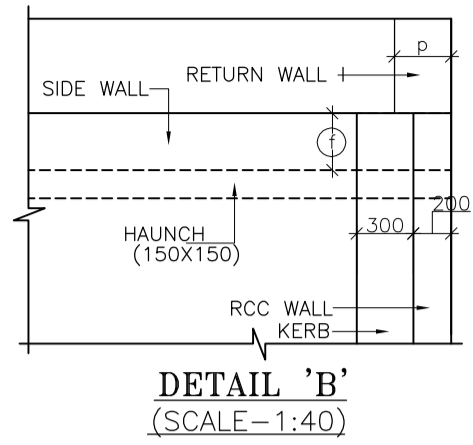
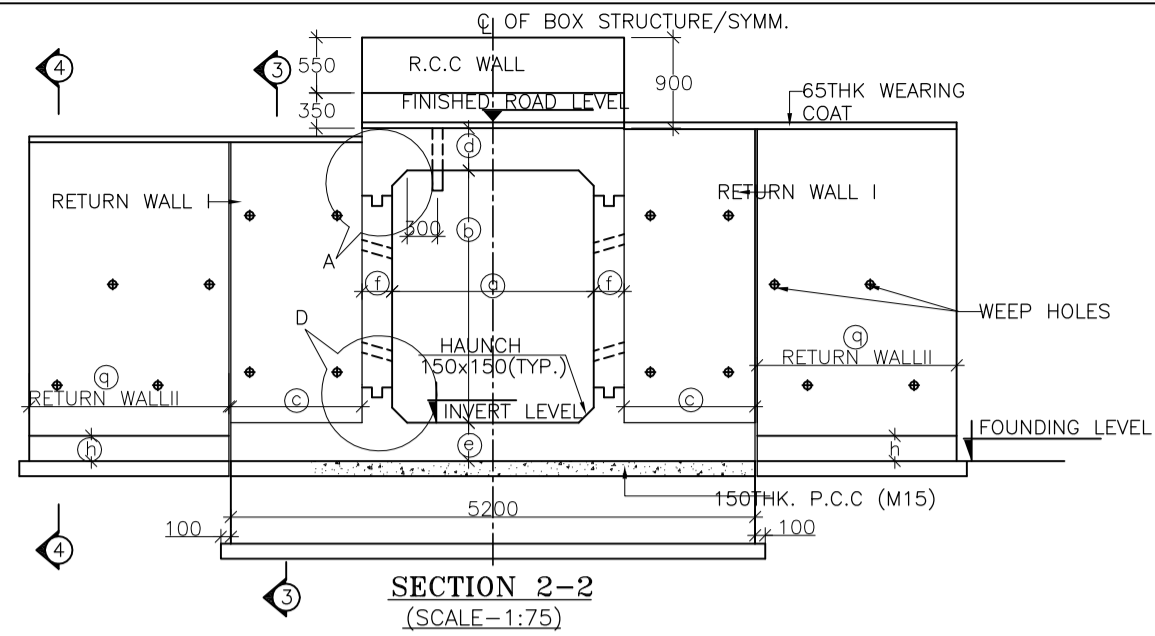
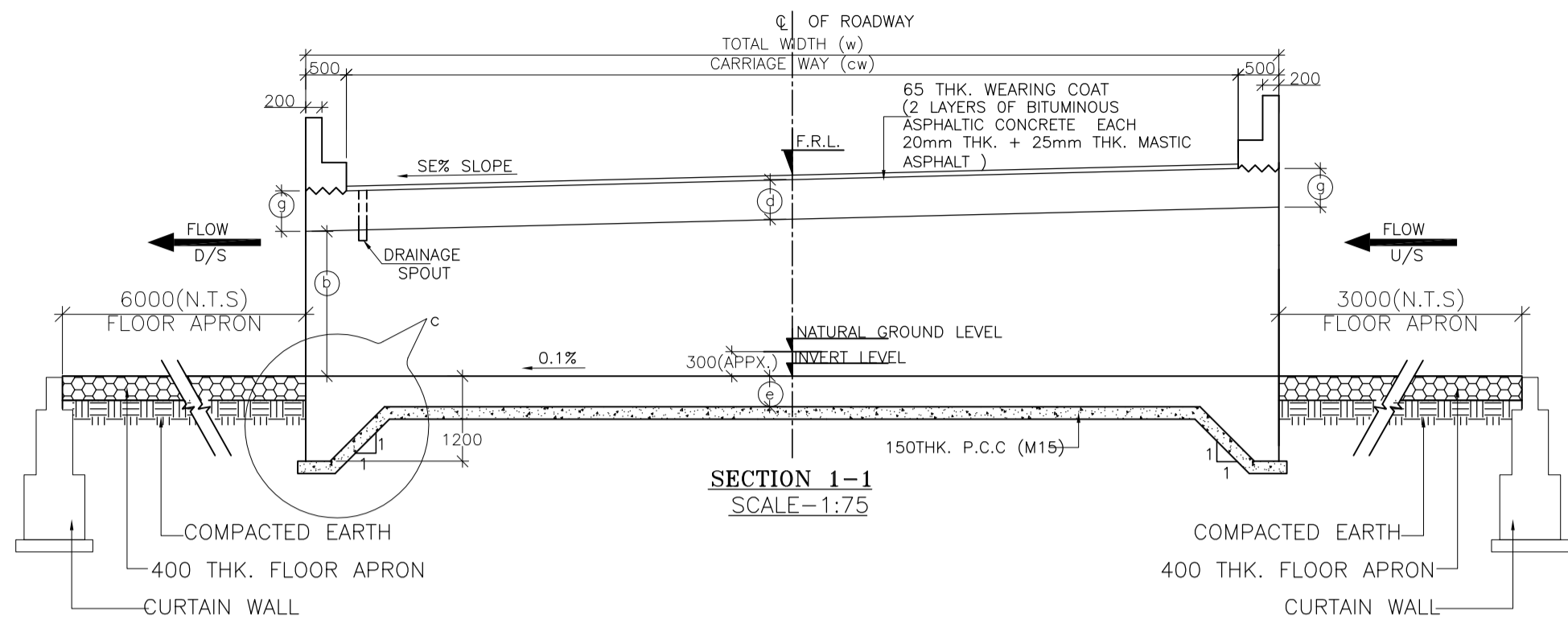
Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 ANISUWA, 3480, ISHIGAWA
 Certified Company

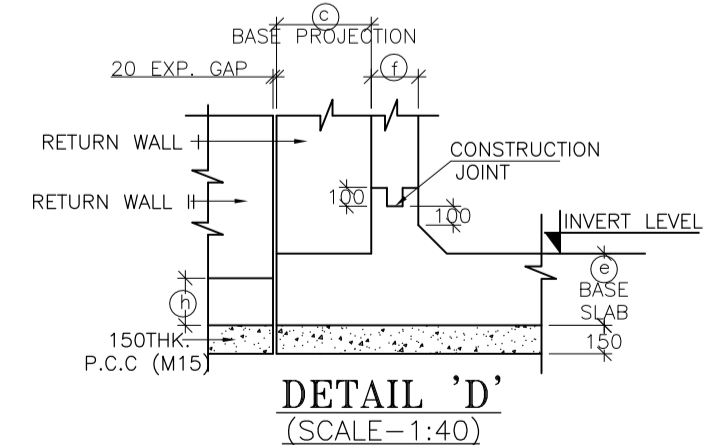
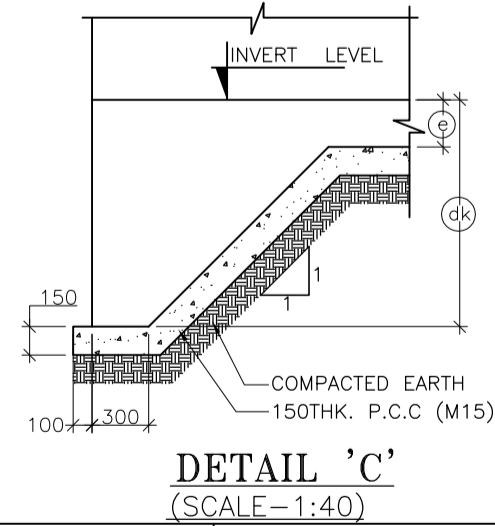
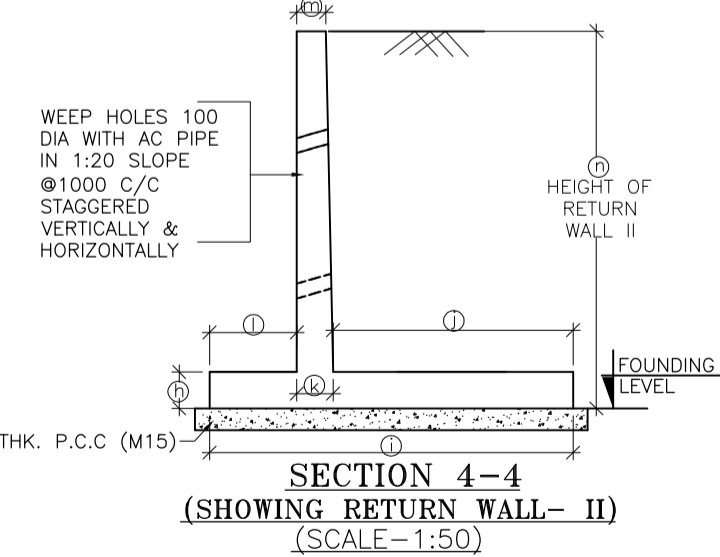
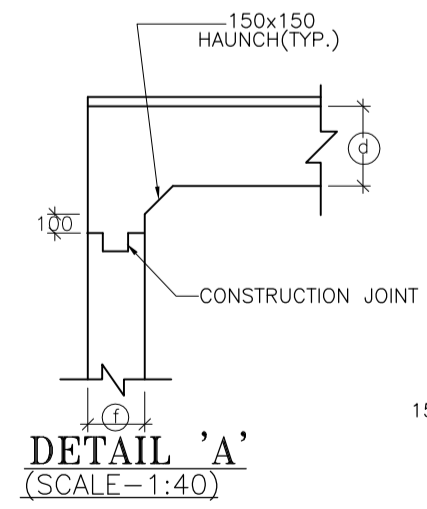
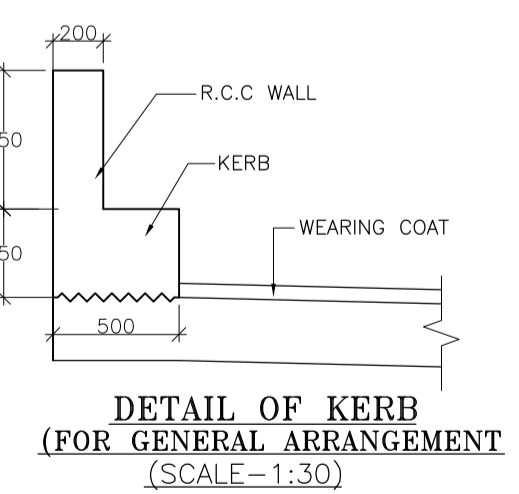
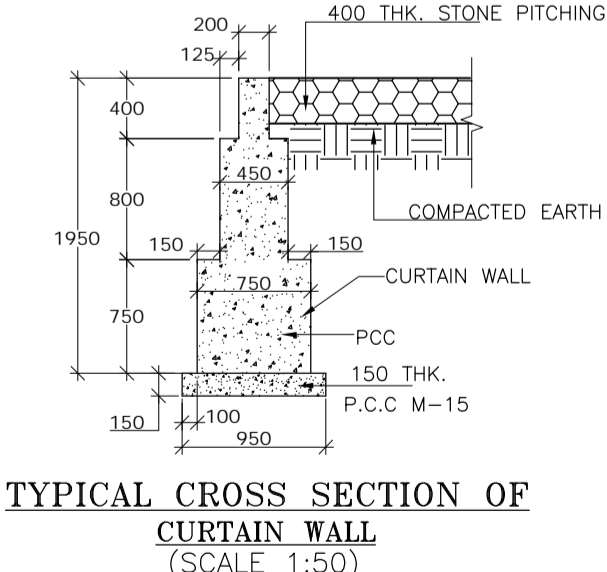
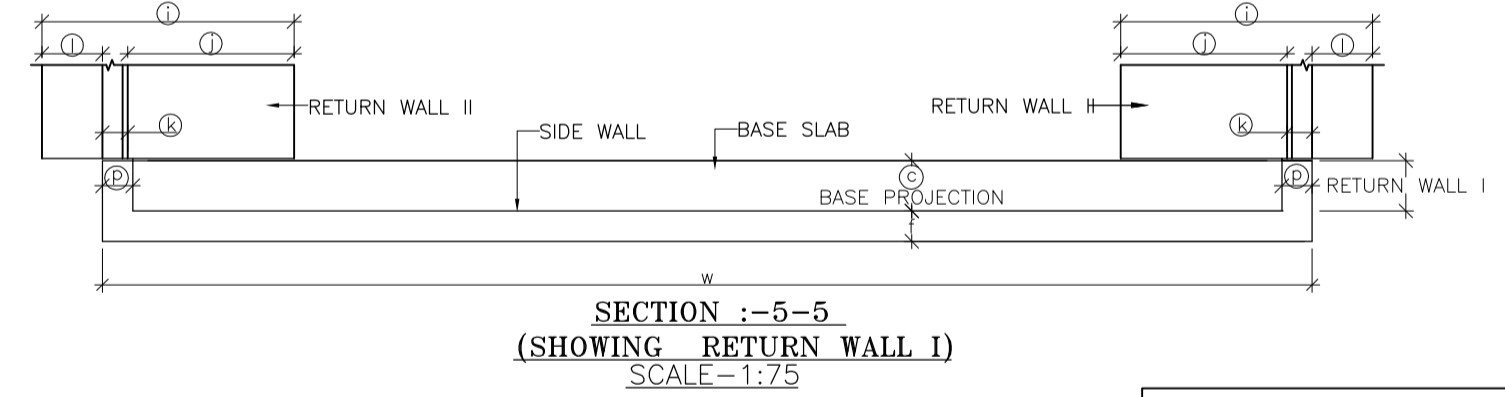
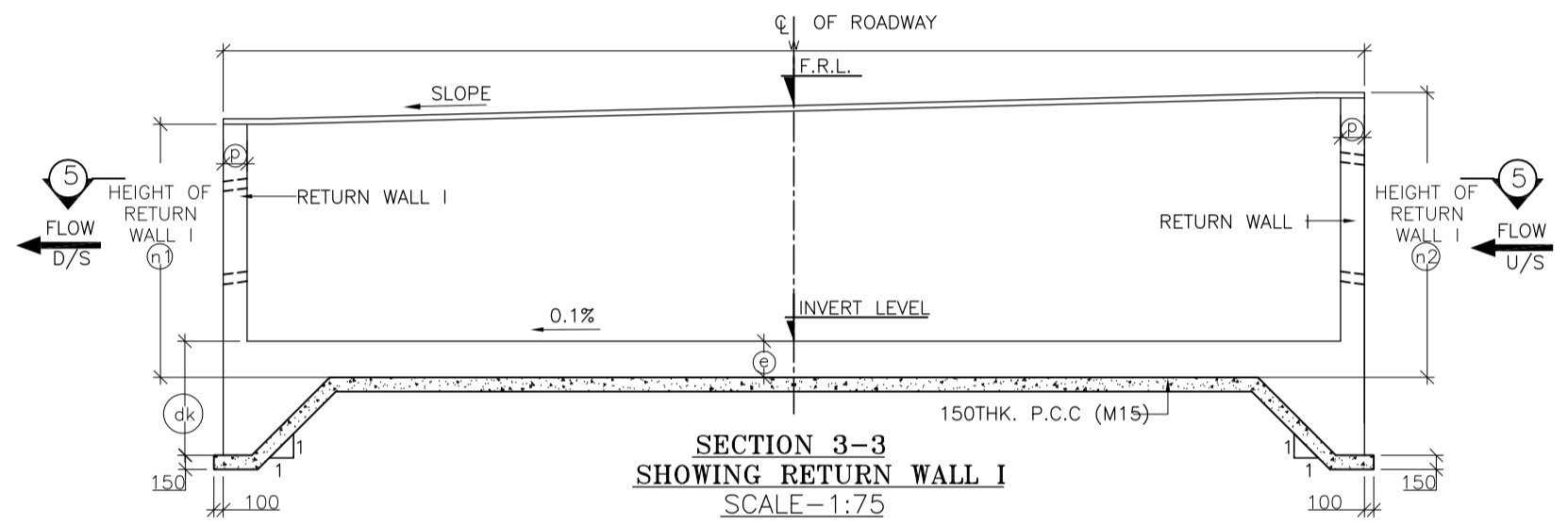
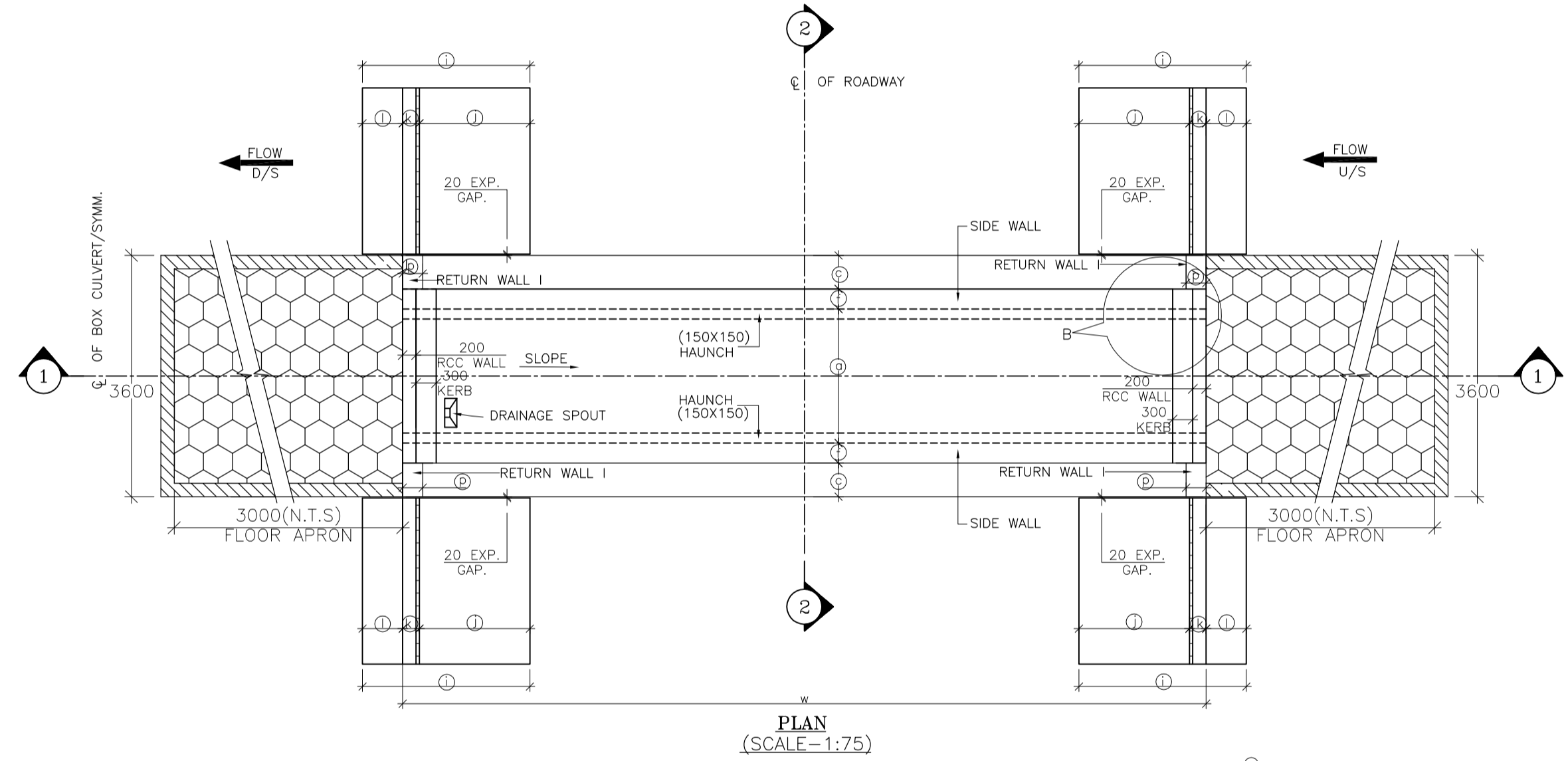
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/STP/SE/RCC (SHEET NO-01 OF 01)

Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu



STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	Slope Side	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
94/3	93+431	1734.553	2X2X1 Cell	7.00	R TO L	12.00	No Catch pit	Straight	1732.523	1732.143	2.730	3.500

TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./ob/EC	
a	2000
b	2000
c	500
d	350
e	380
f	300
g	350
h	300
i	2200
j	950
k	300
l	950
m	250
p	300
q	3100
dk	1200



- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE : BOX CELL STRUCTURE - M25 CURTAIN WALL - M25 LEVELLING COURSE (P.C.C.) - M15 RETURN WALL - M25 RCC WALL & KERB - M25
 - GRADE OF STEEL Fe-500 AS PER IS-1786.
 - CLASS FOR TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\theta = 1.8/m^3$, $\phi = 30.8$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM $15 t/m^2$ BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/SE/RCC (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

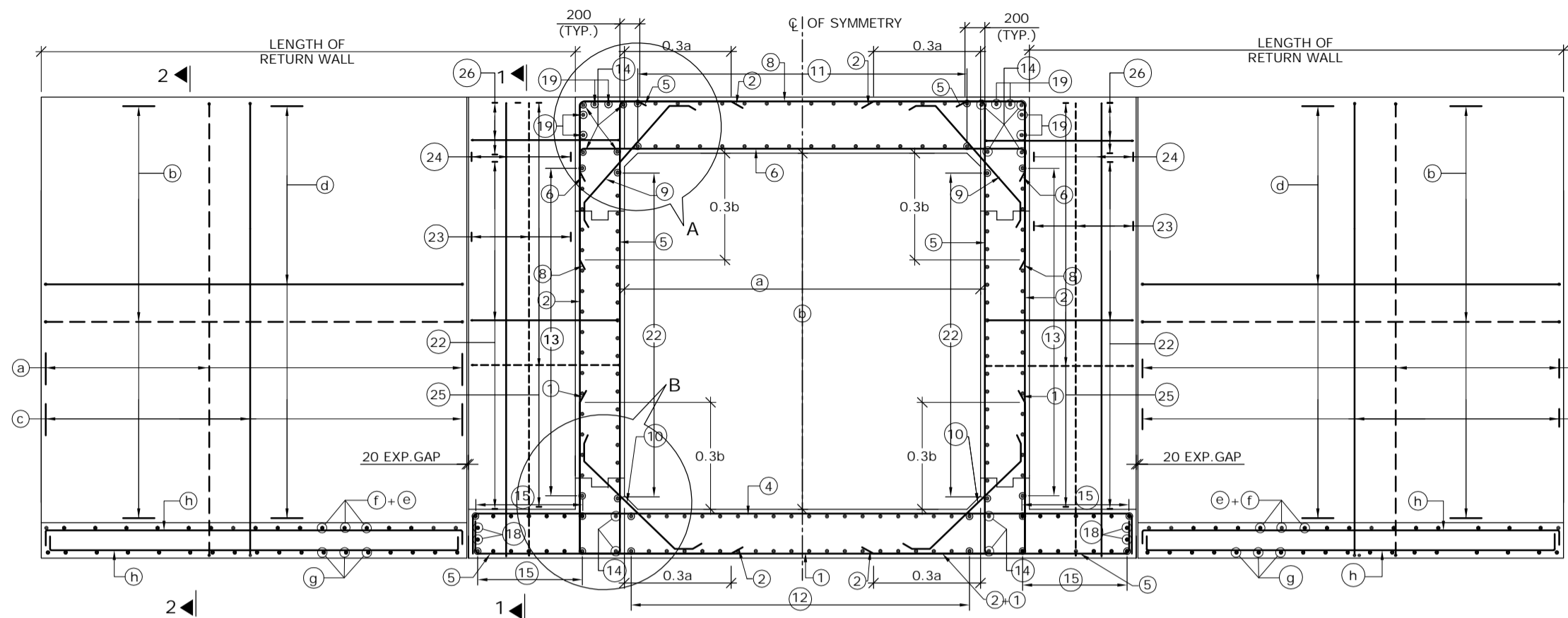
GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH BOTH SIDE FLOOR APRON

Package :- IV District :- SENAPATI
Existing Chainage :- 88+520 to 114+165
Design Chainage :- 81+870 to 105+825

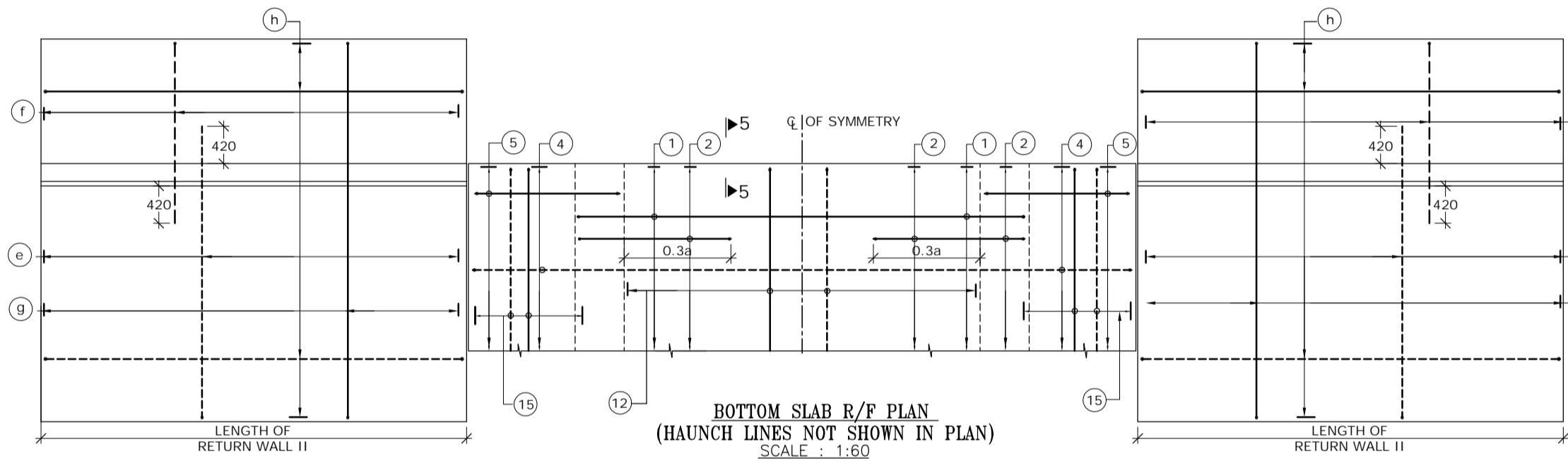
CONSULTANT :
CETEST
Engineering Consultants
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124-A, N.S.C. Bose Road
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DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/SE/GA (SHEET NO-01 OF 01)

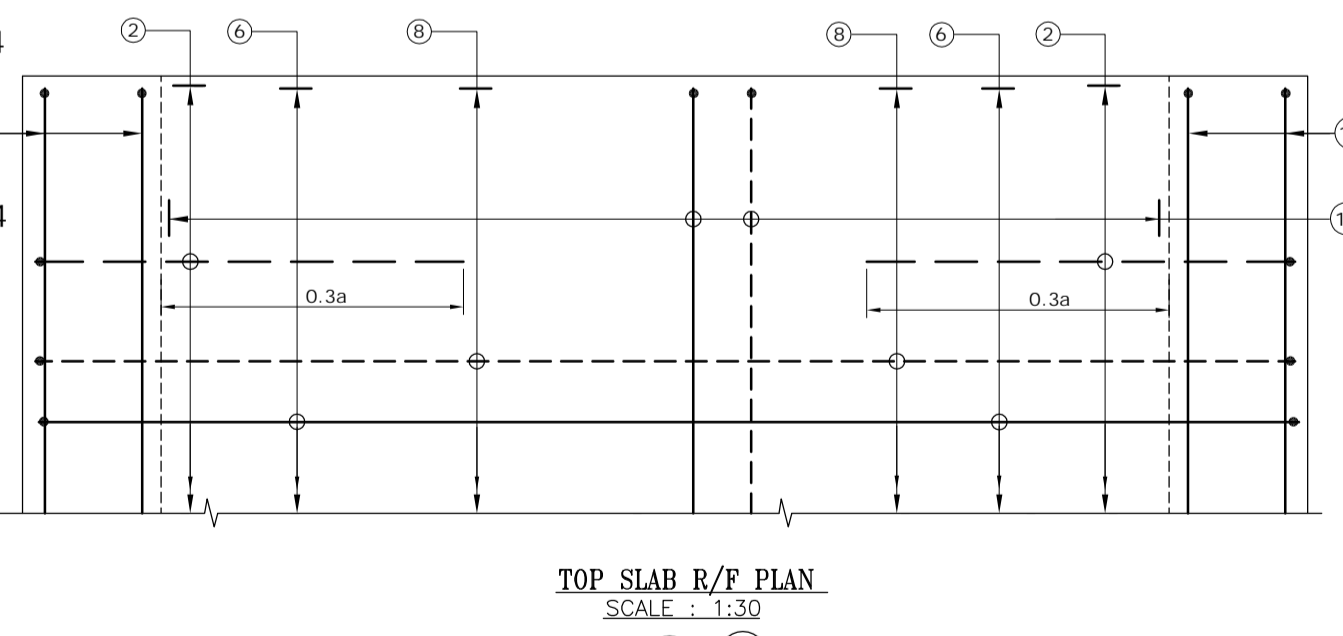
Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

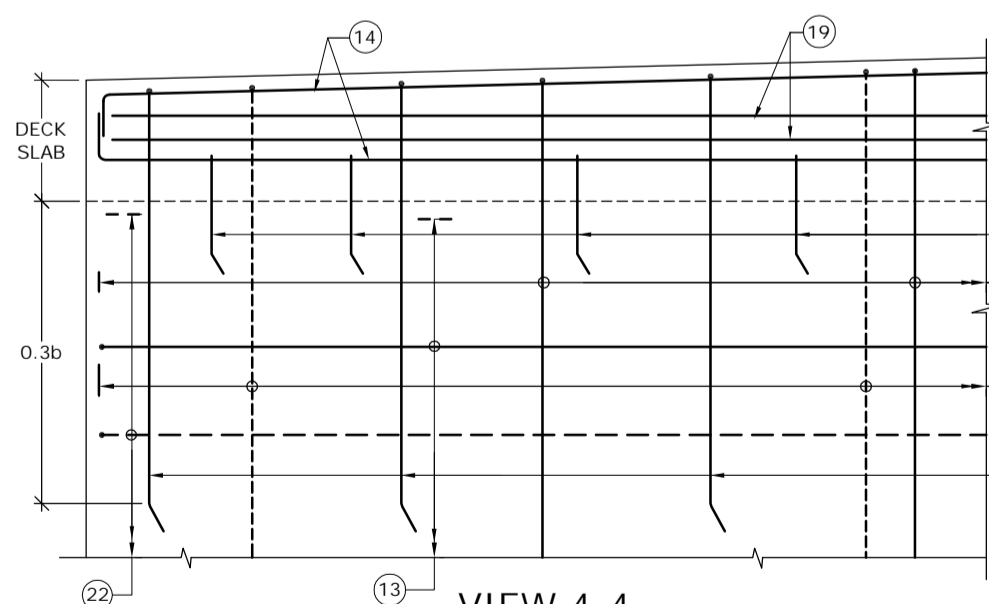


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

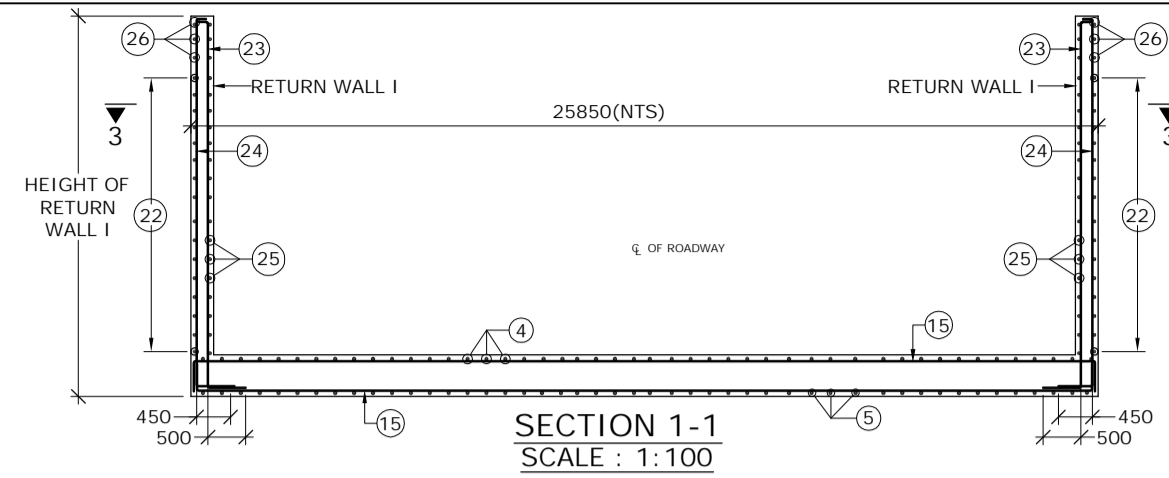


TOP SLAB R/F PLAN
SCALE : 1:30

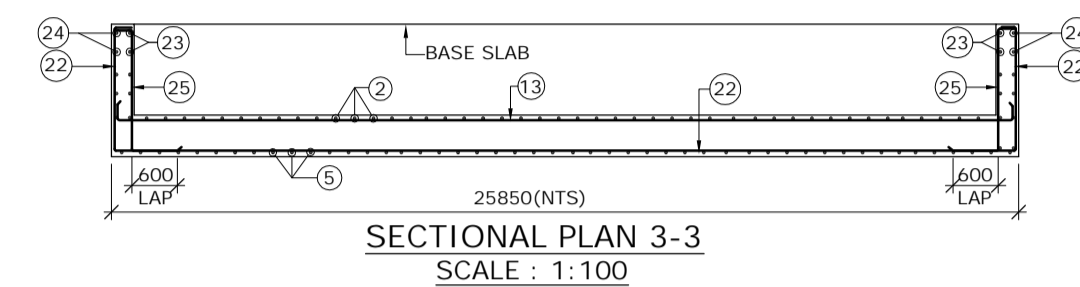
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



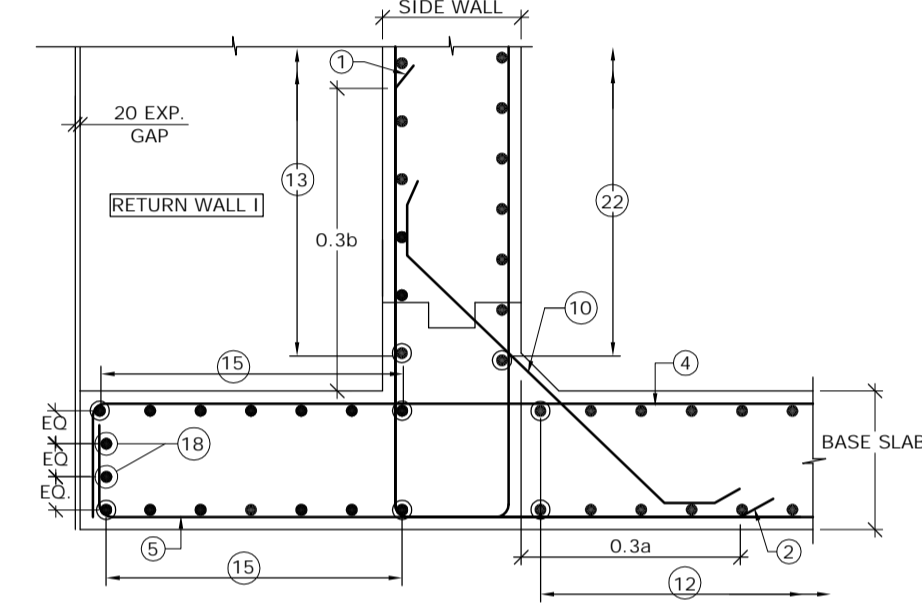
VIEW 4-4
SCALE : 1:30



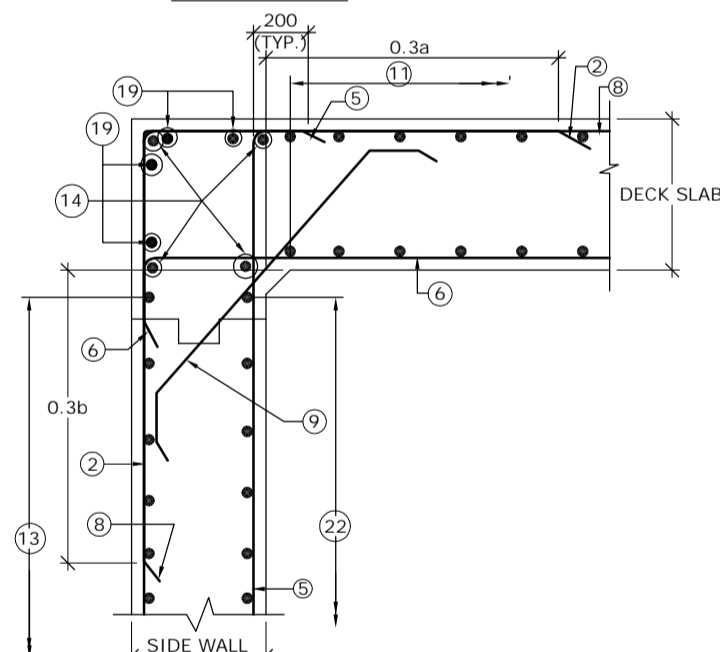
SECTION 1-1
SCALE : 1:100



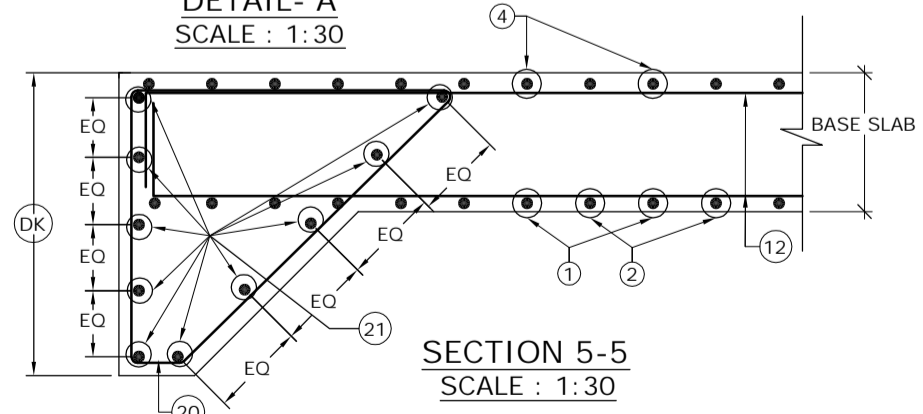
SECTIONAL PLAN 3-3
SCALE : 1:100



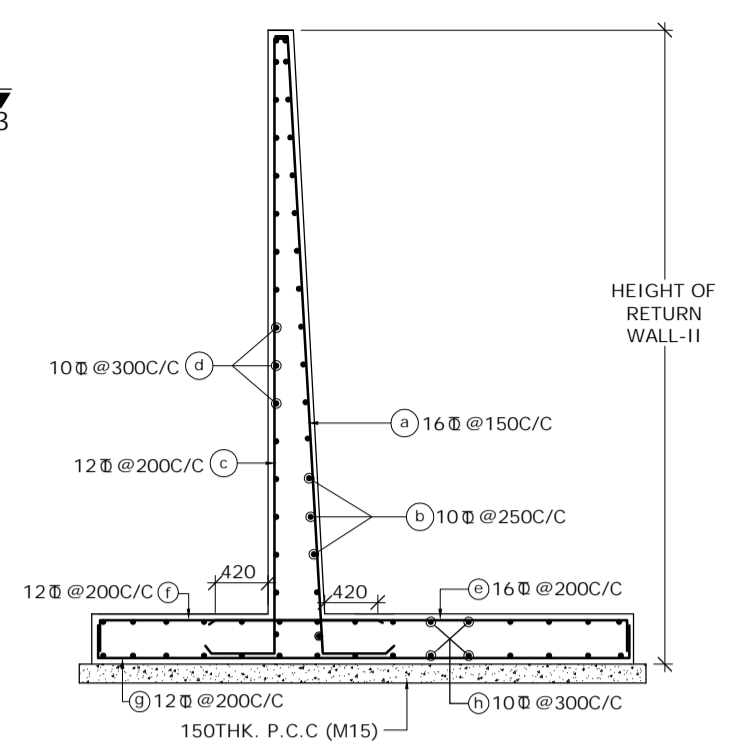
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE: 1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
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REVISIONS				

SCALE: AS SHOWN
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 4, Parliament Street, New Delhi - 110001

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

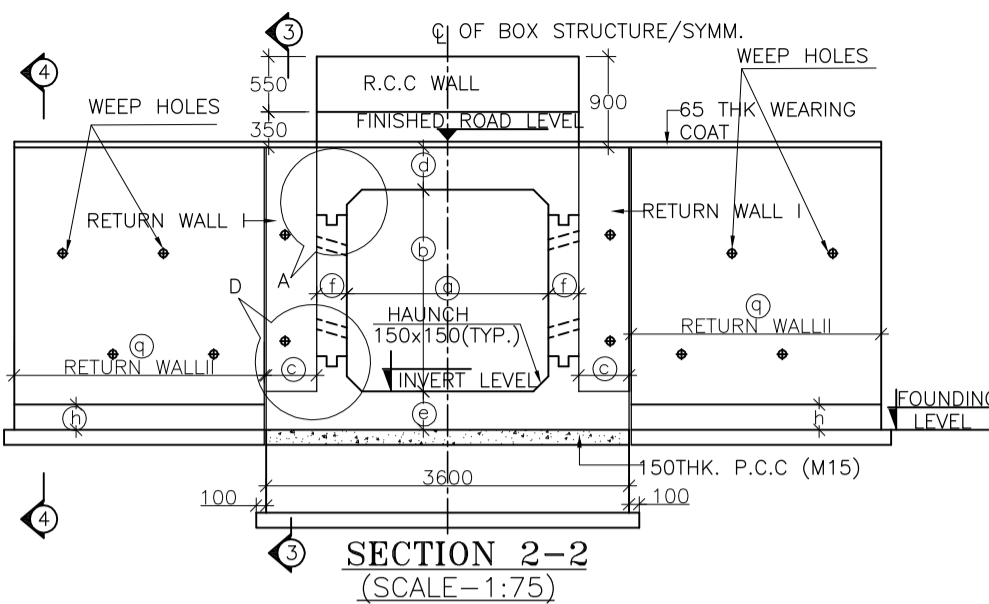
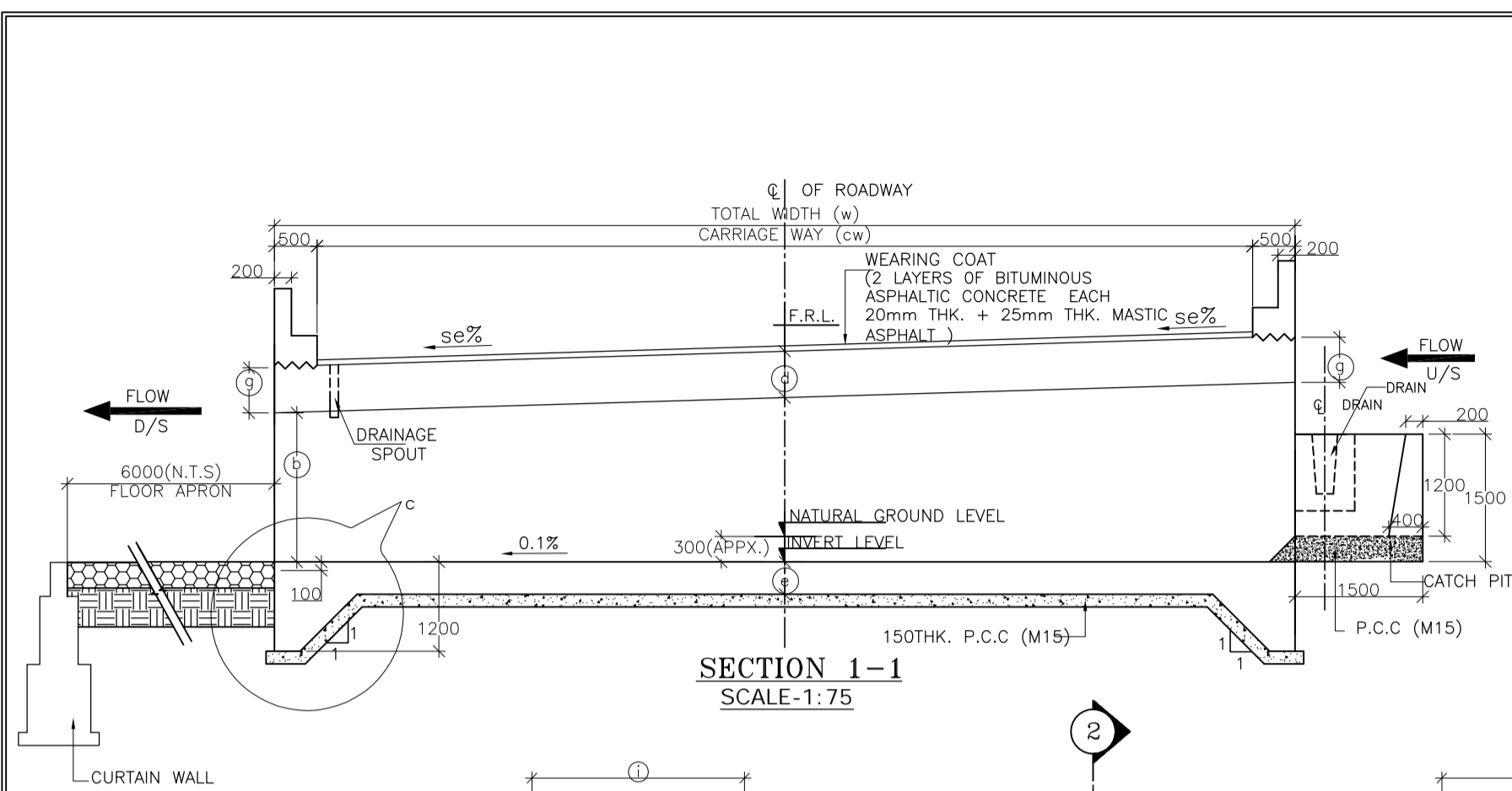
REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH OUT CATCH PIT & STEPPED PROTECTION

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

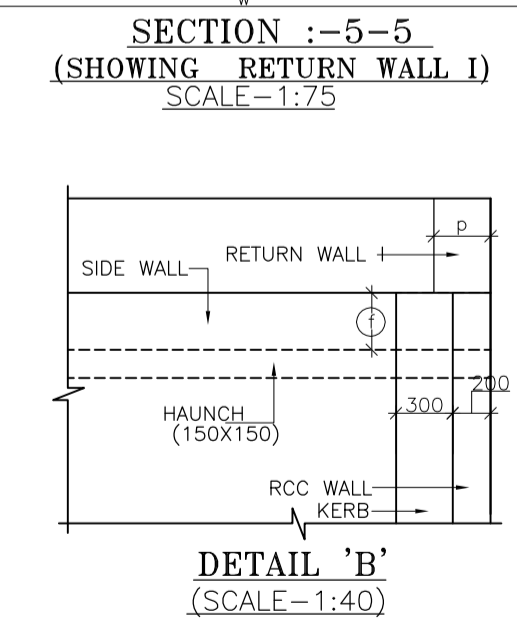
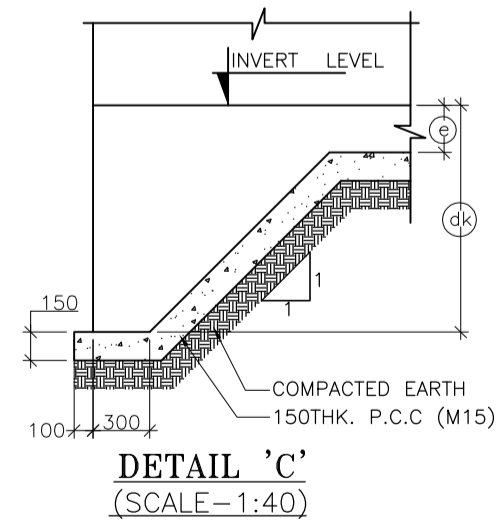
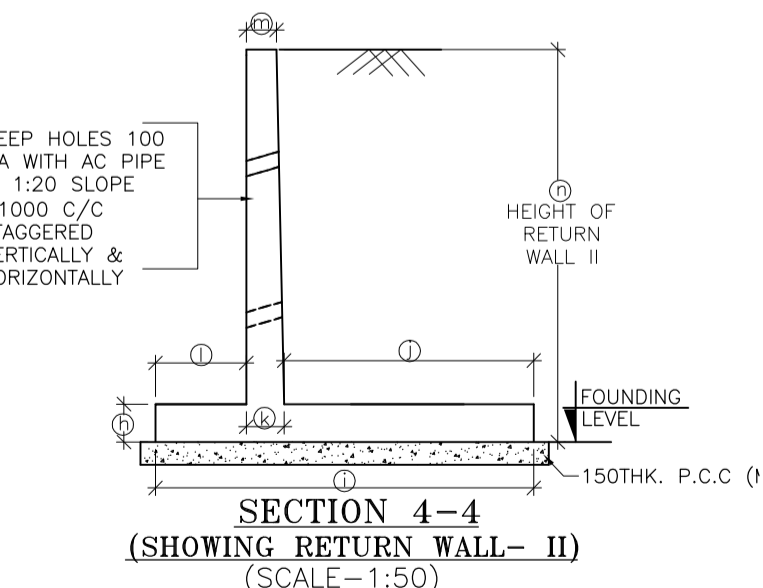
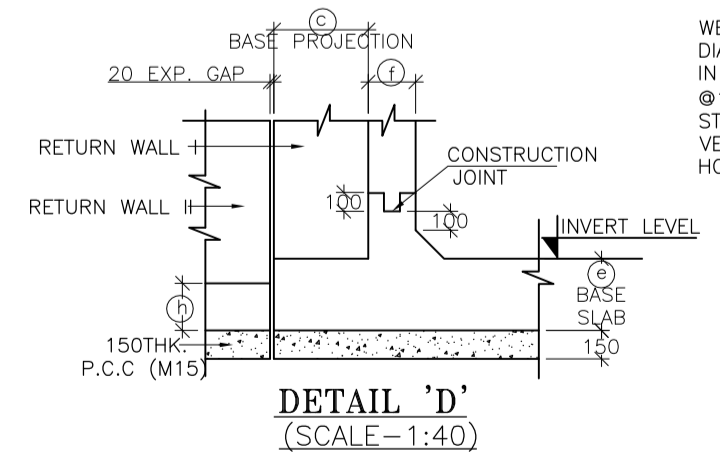
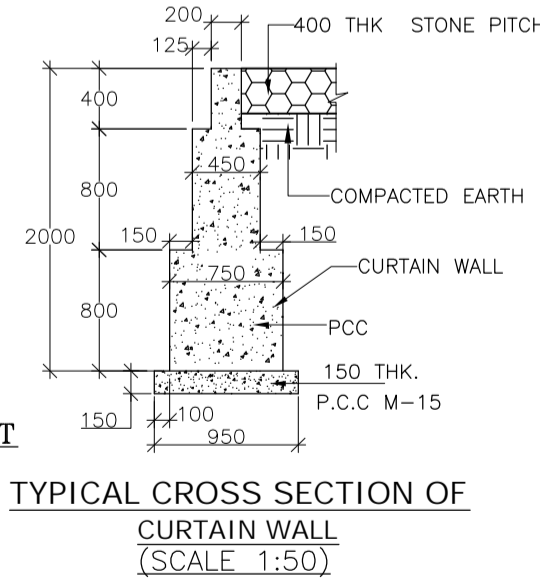
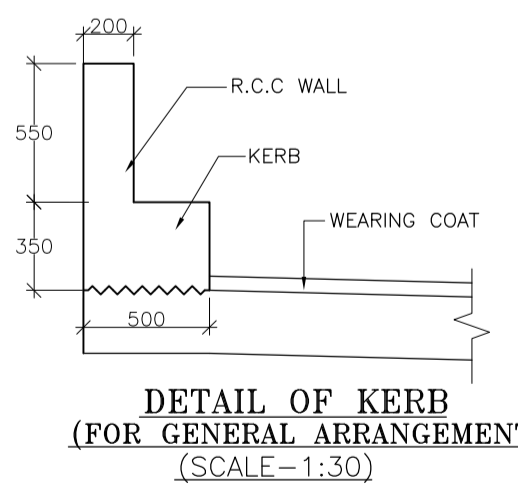
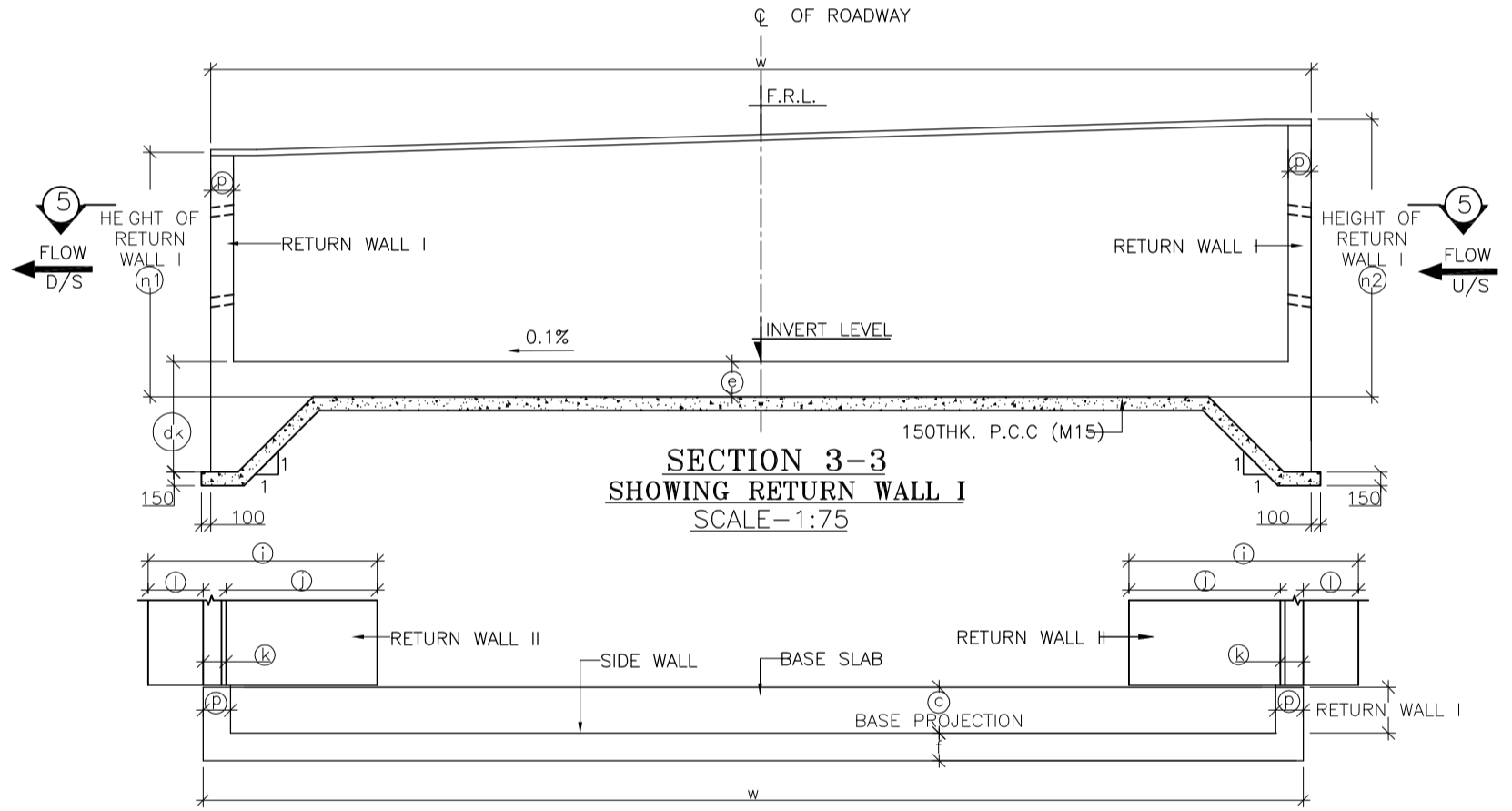
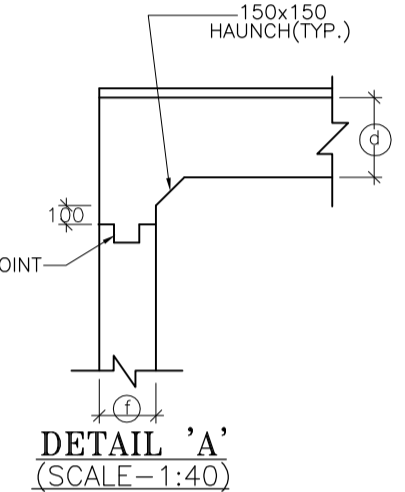
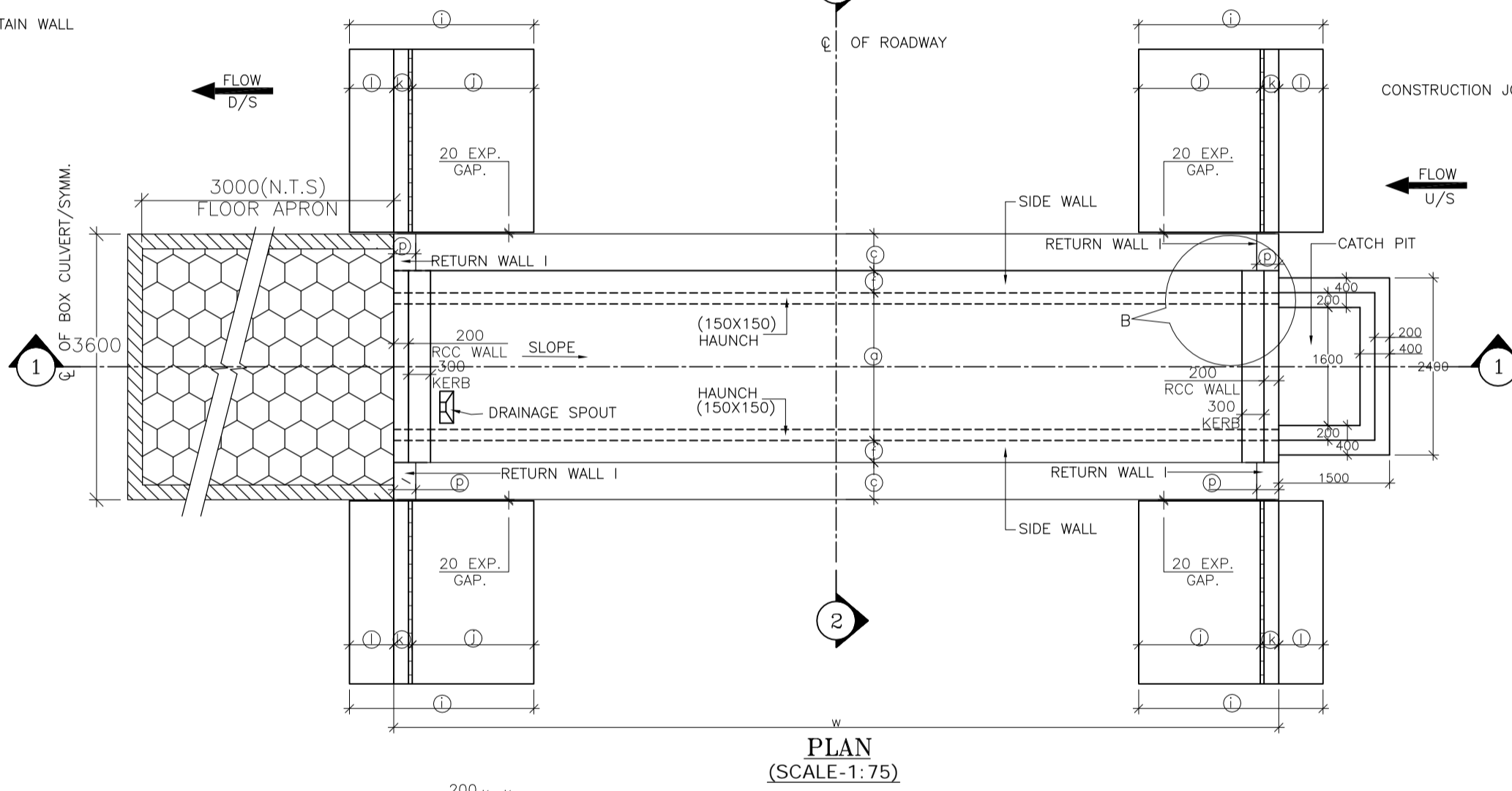
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2x2x1/F/SE/RCC (SHEET NO-01 OF 01)

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu



STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
86/3	85+955	1942.306	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Straight	1940.241	1939.861	2.730	3.430
90/6	89+994	1841.385	2X2X1 Cell	3.60	R TO L	11.00	With Catch pit	Straight	1839.150	1838.770	2.730	3.090
92/1	91+453	1758.393	2X2X1 Cell	7.00	R TO L	13.00	With Catch pit	Straight	1756.398	1756.018	2.730	3.570
92/2	91+595	1748.453	2X2X1 Cell	7.00	R TO L	13.00	With Catch pit	Straight	1746.458	1746.078	2.730	3.570
94/1	93+025	1734.606	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Straight	1732.541	1732.161	2.730	3.430
96/1	95+058	1792.984	2X2X1 Cell	6.70	R TO L	11.00	With Catch pit	Straight	1790.904	1790.524	2.730	3.400
96/3	95+318	1802.419	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Straight	1800.354	1799.974	2.730	3.430
96/5	95+555	1809.048	2X2X1 Cell	7.00	L TO R	11.00	With Catch pit	Straight	1806.983	1806.603	2.730	3.430
99/2	98+250	1655.630	2X2X1 Cell	7.00	R TO L	11.00	With Catch pit	Straight	1653.565	1653.185	2.730	3.430
105/6	104+975	1635.617	2X2X1 Cell	7.00	R TO L	13.00	With Catch pit	Straight	1633.622	1633.242	2.730	3.570

TABLE SHOWING SAILENT DIMENSIONS	
BOX CELL DESIGNATION No./ab/1c	Height of Return wall
a	2000
b	2000
c	500
d	350
e	380
f	300
g	350
h	320
i	2320
j	1000
k	320
l	1000
m	250
p	300
q	3100
dk	1200



- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE = M25
CURTAIN WALL = M25
LEVELLING COURSE (P.C.C.) = M15
RETURN WALL = M25
RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS FOR TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.8/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 400mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
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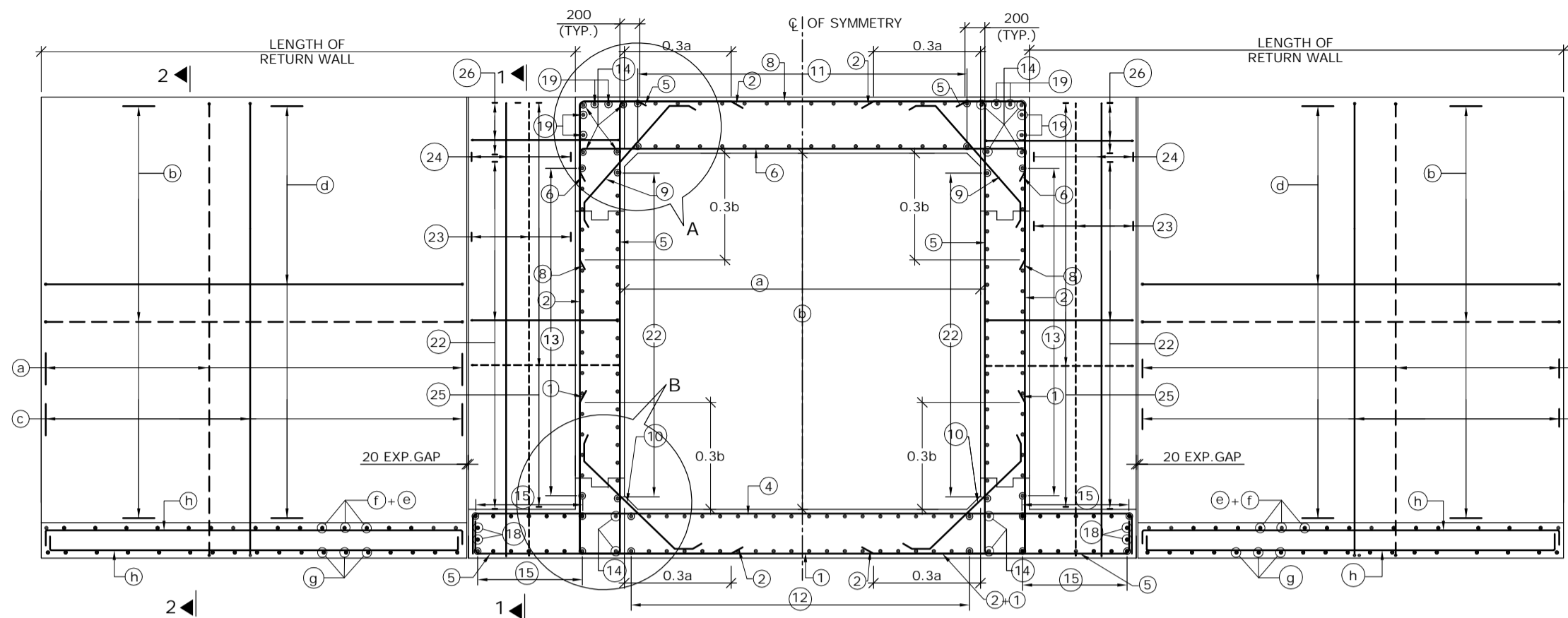
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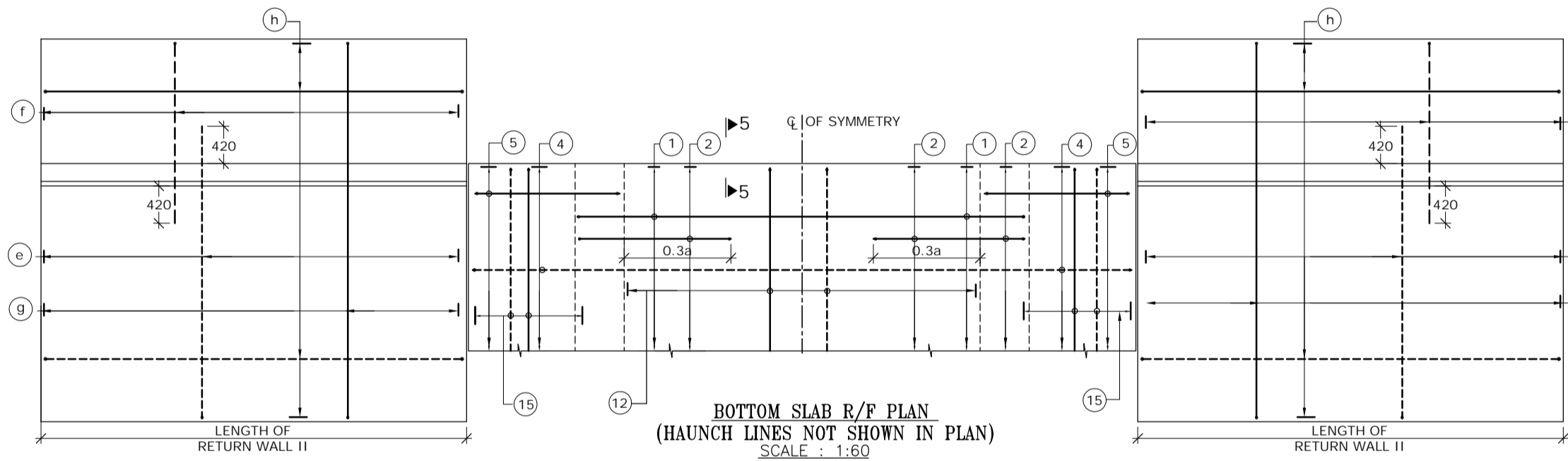
CETEST
Engineering Consultants

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/F/SE/GA (SHEET NO-01 OF 01)

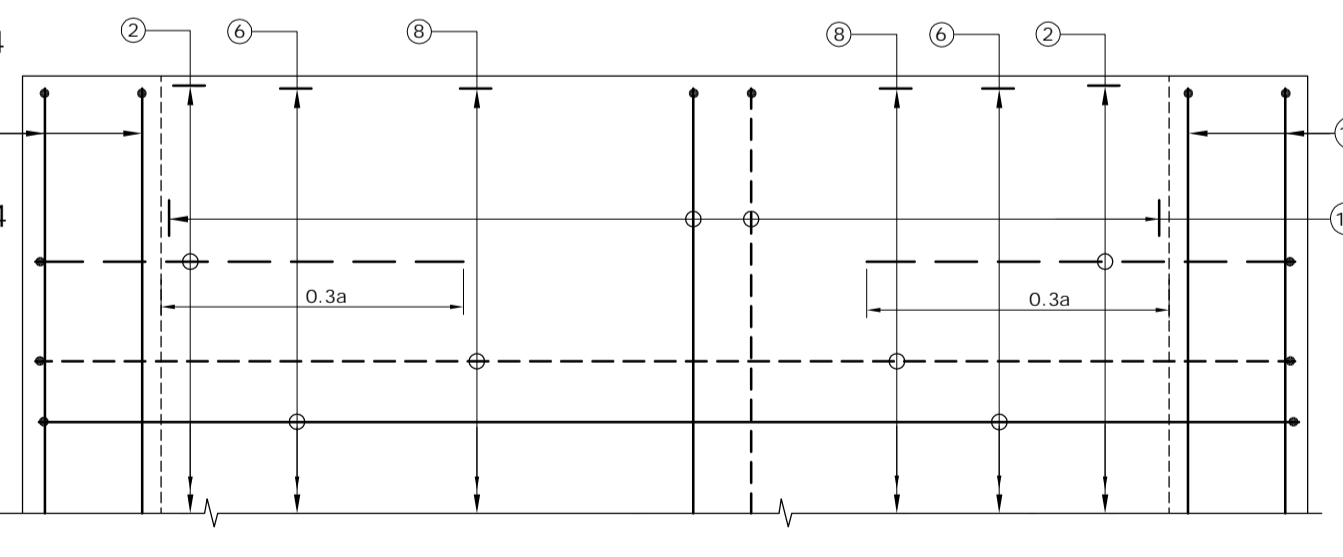
Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

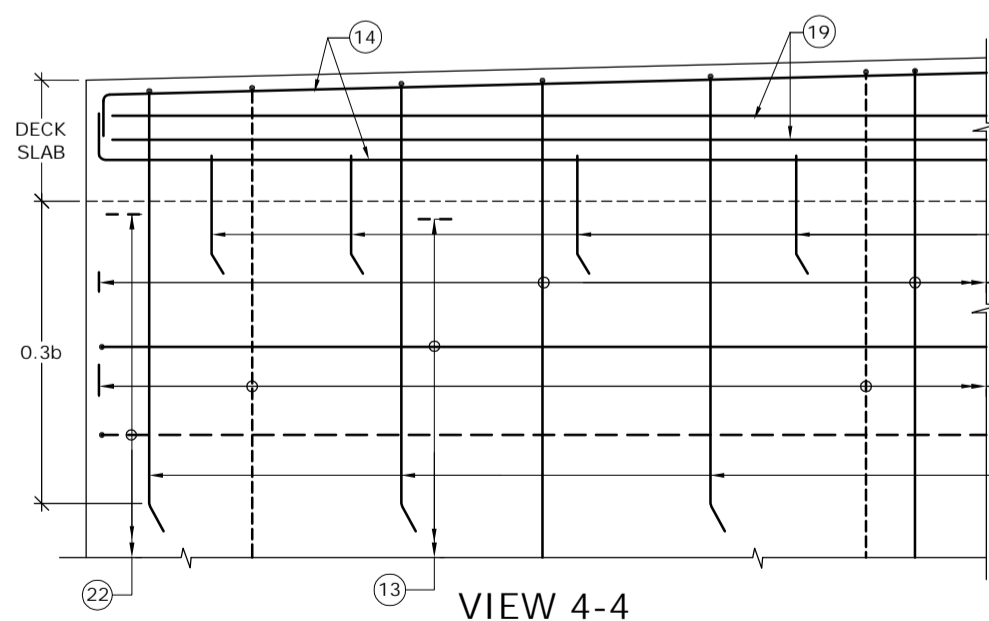


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

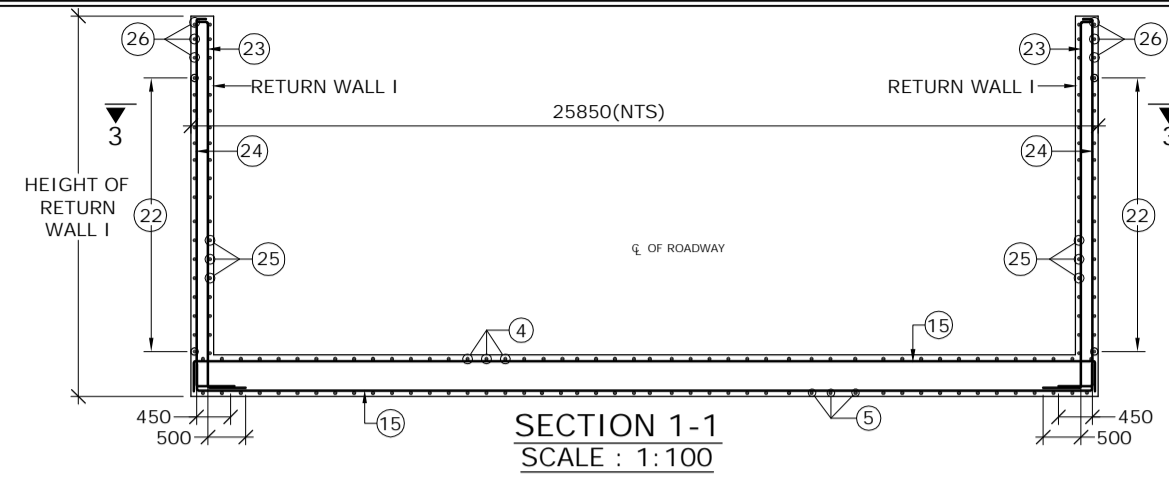


TOP SLAB R/F PLAN
SCALE : 1:30

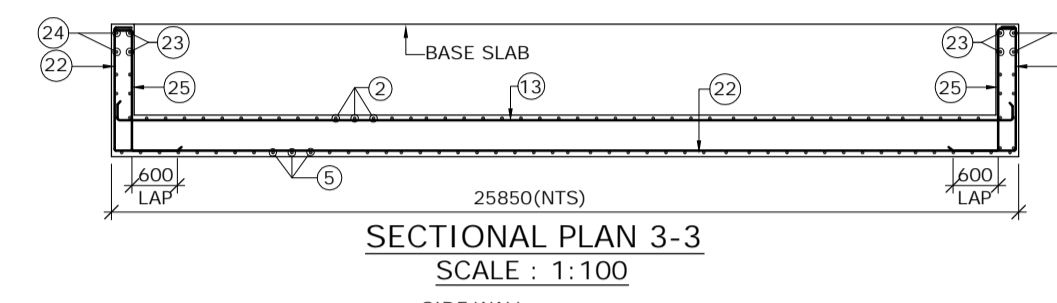
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



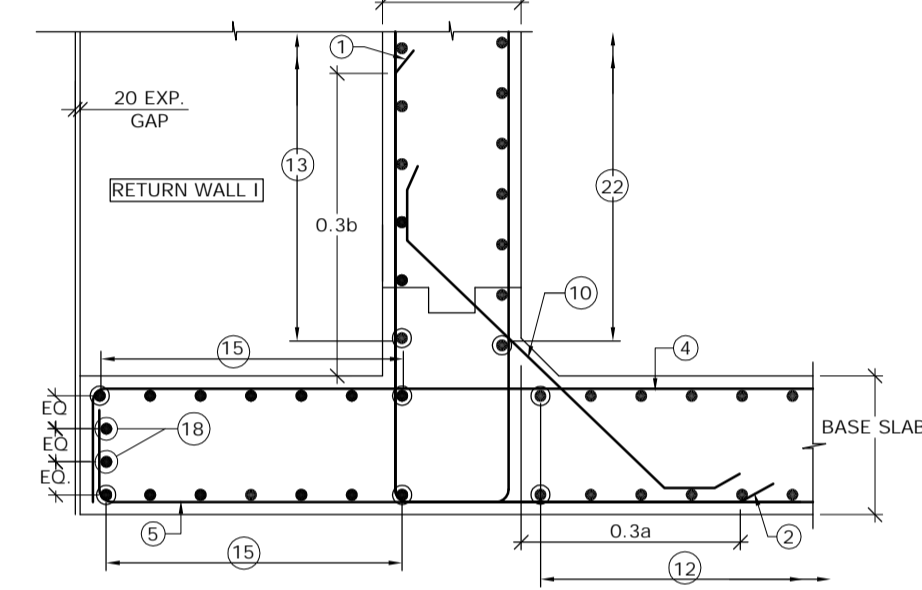
VIEW 4-4
SCALE : 1:30



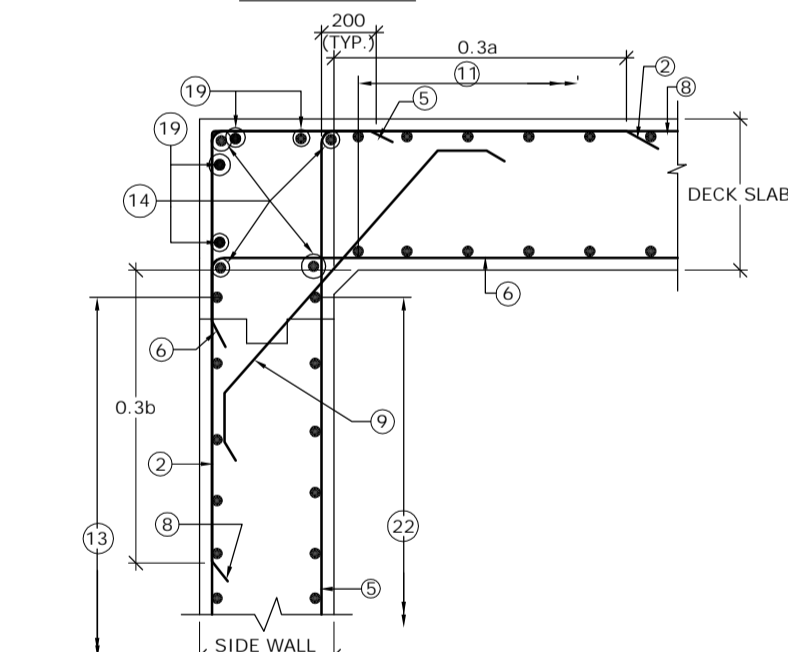
SECTION 1-1
SCALE : 1:100



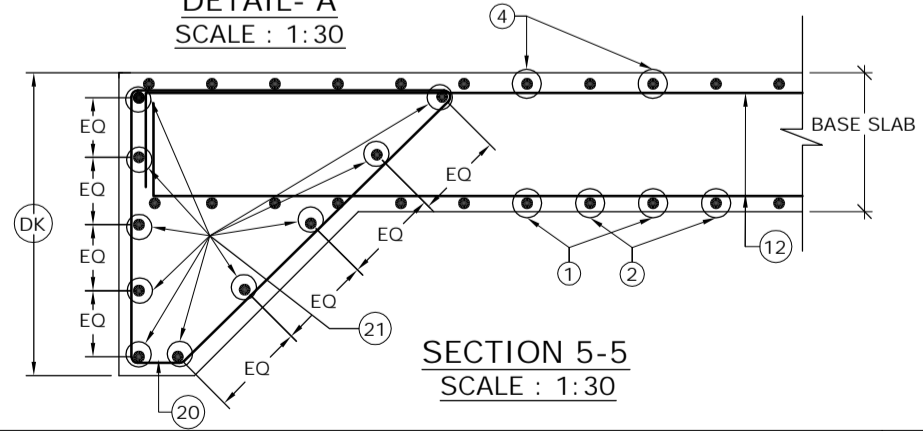
SECTIONAL PLAN 3-3
SCALE : 1:100



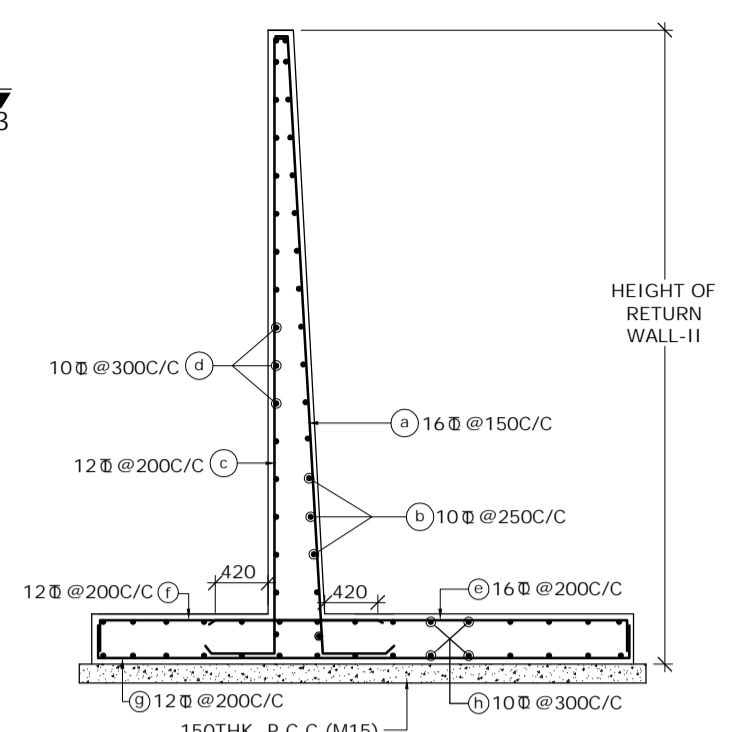
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE-1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
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(10)	12	250	(22)	10	250
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LEGEND :-
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- NOTES :-
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CETEST
 Engineering Consultants
 ANISUWA, 3480, 8, CHHAGANPUR
 Certified Company

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X2_1/CP/F/SE/RCC (SHEET NO-01 OF 02)

Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu

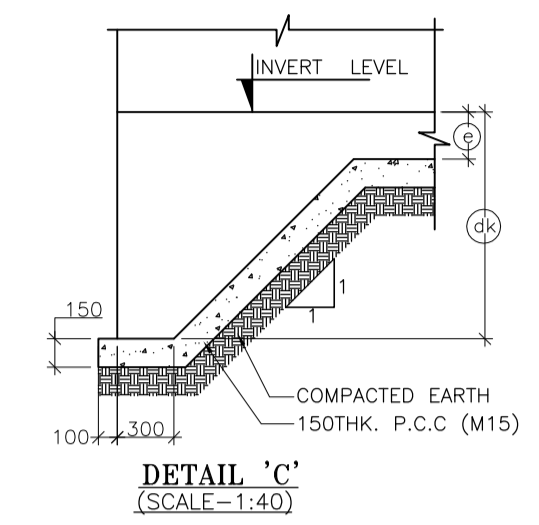
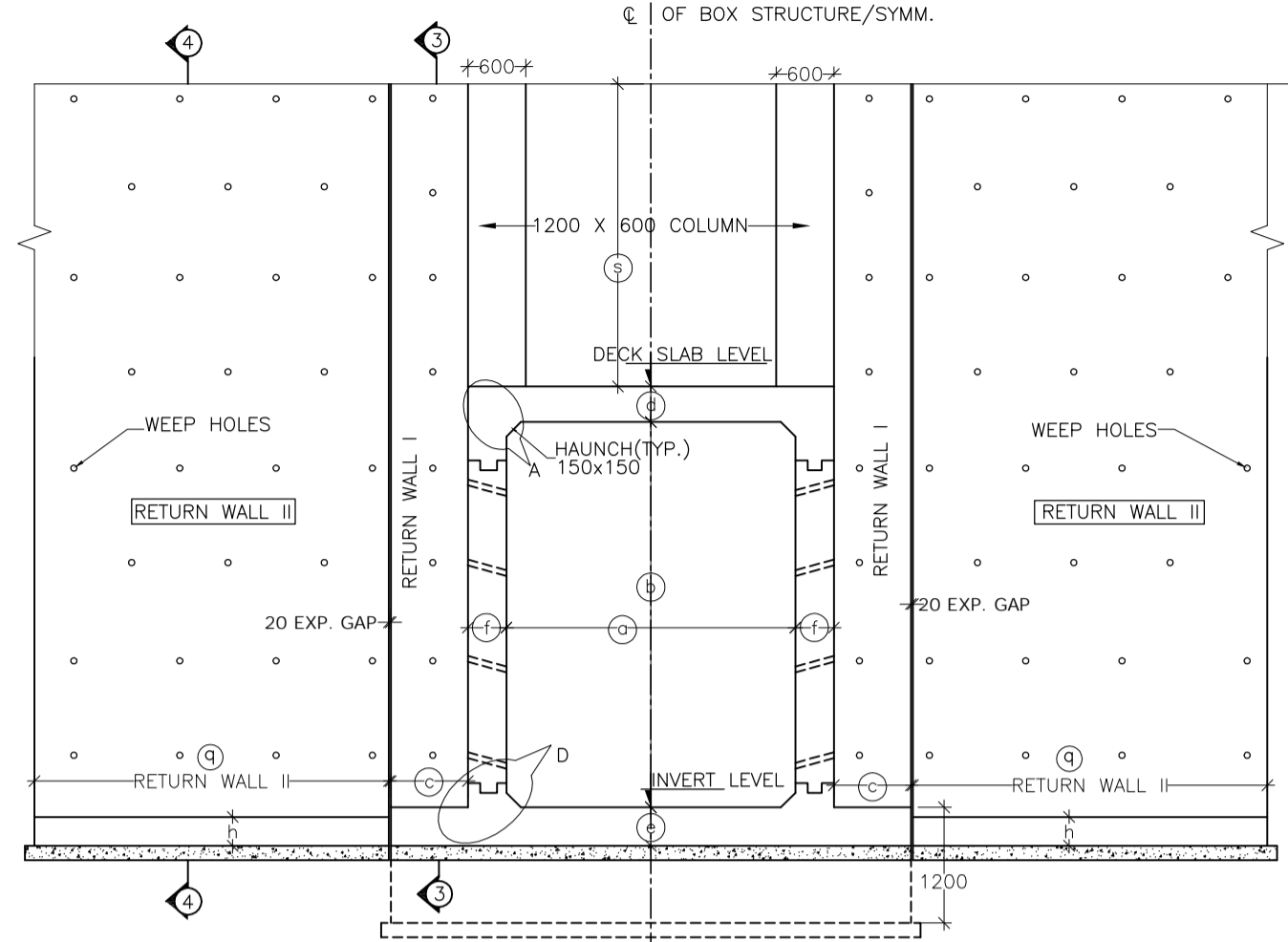
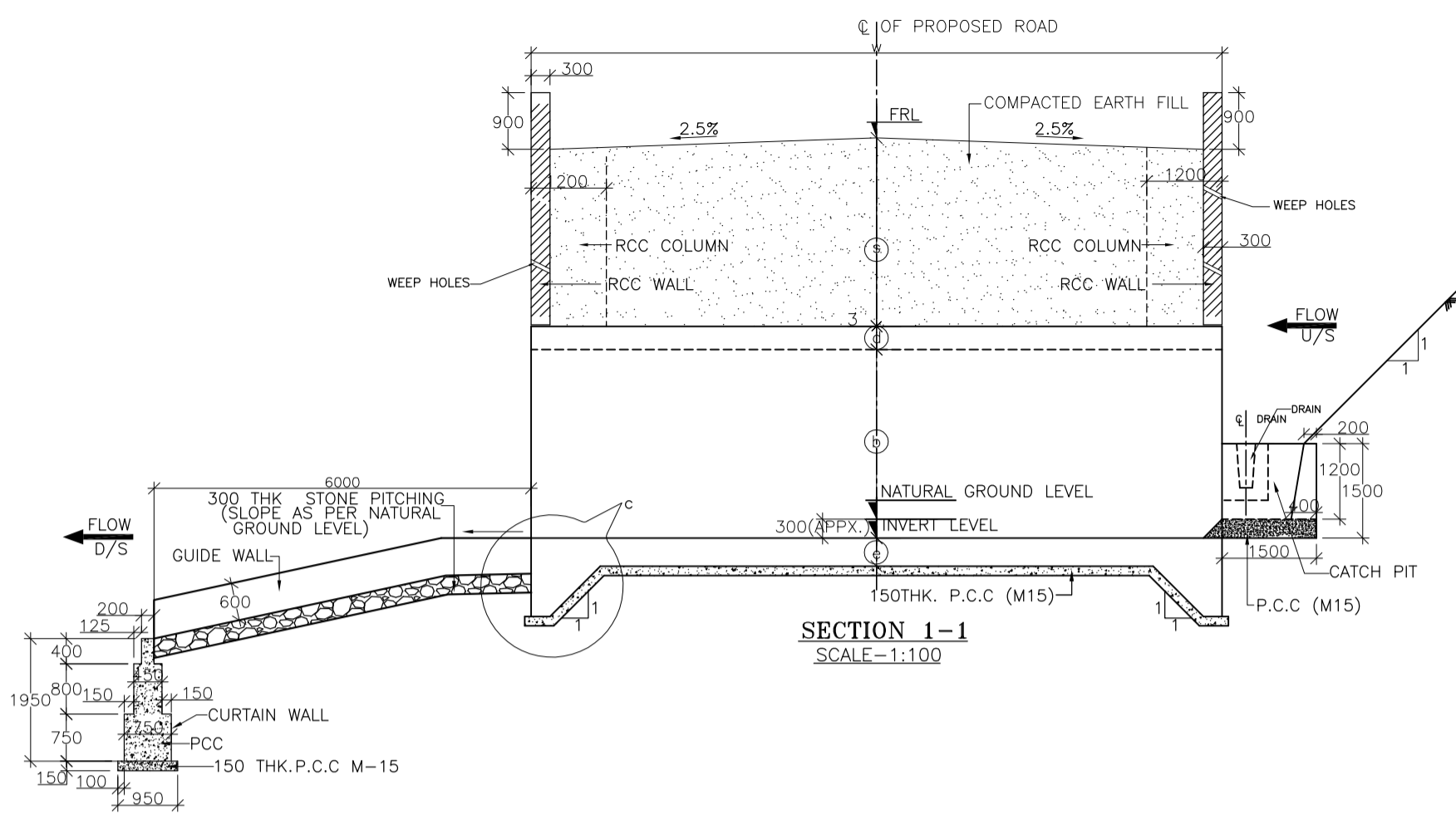
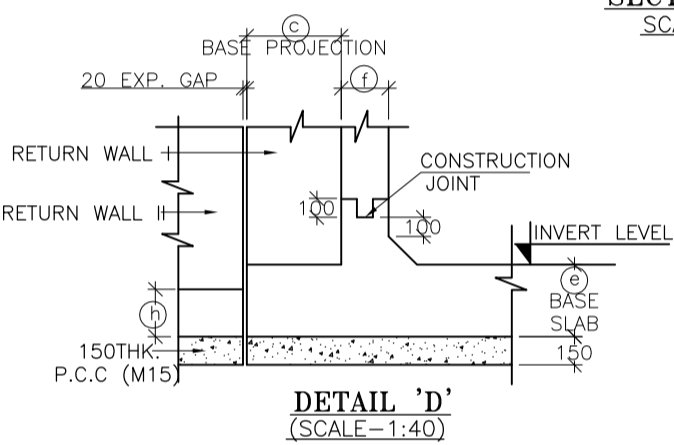
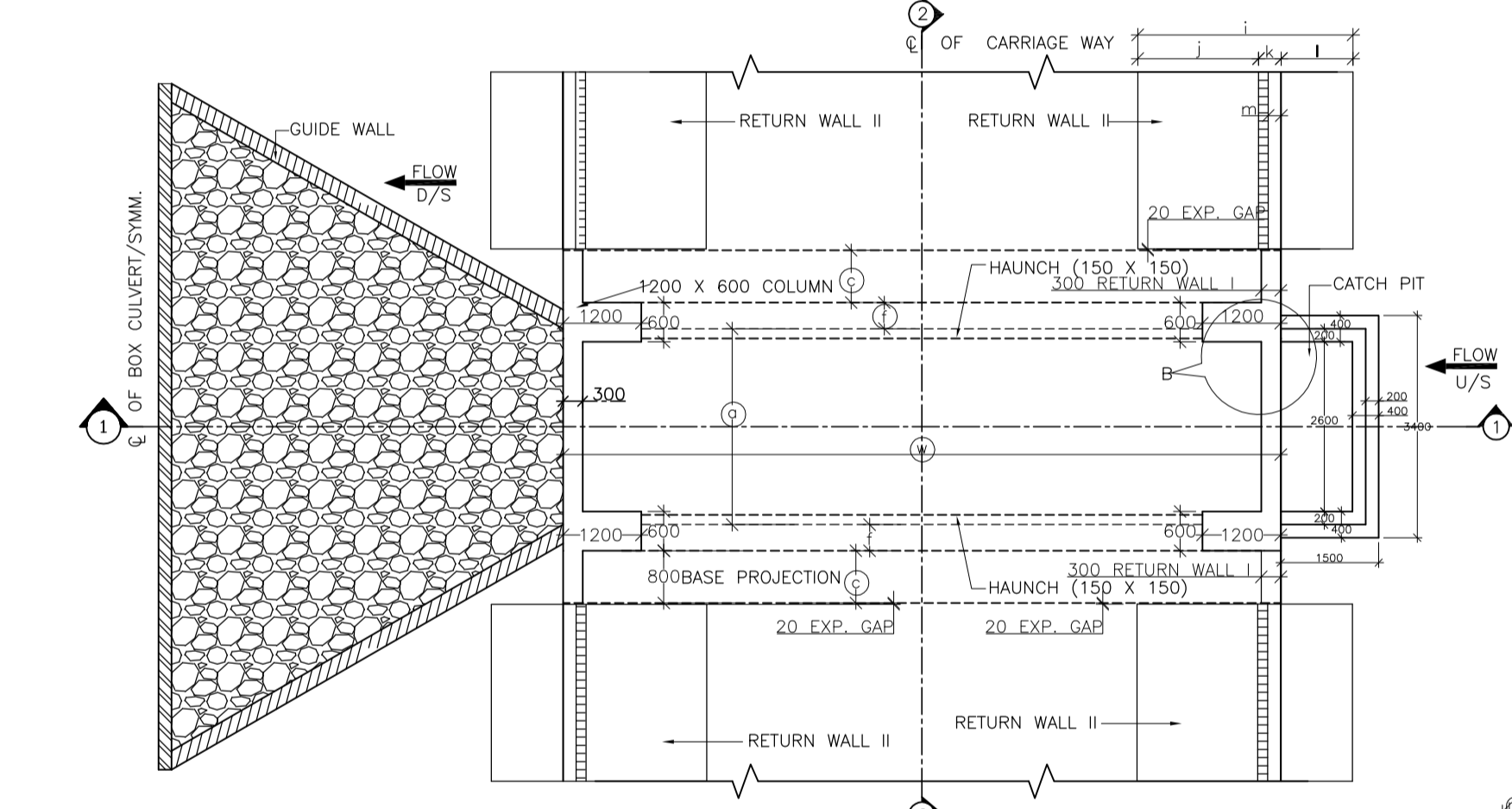
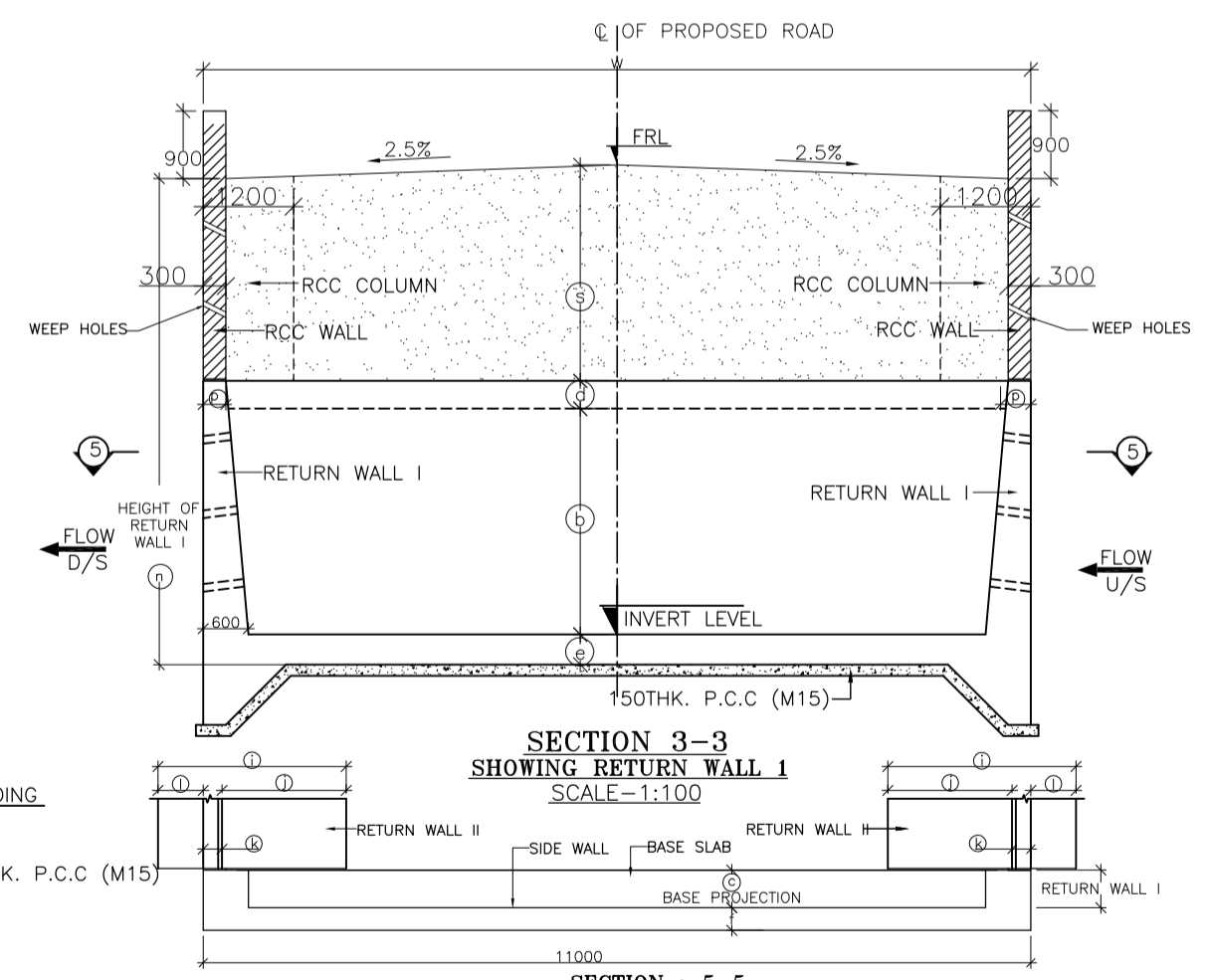
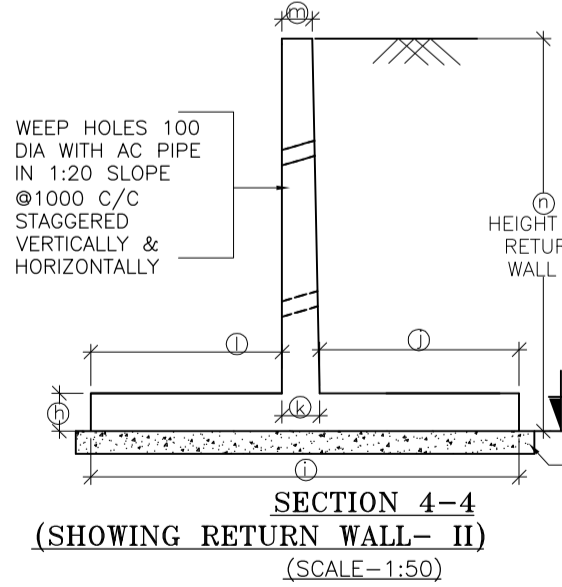
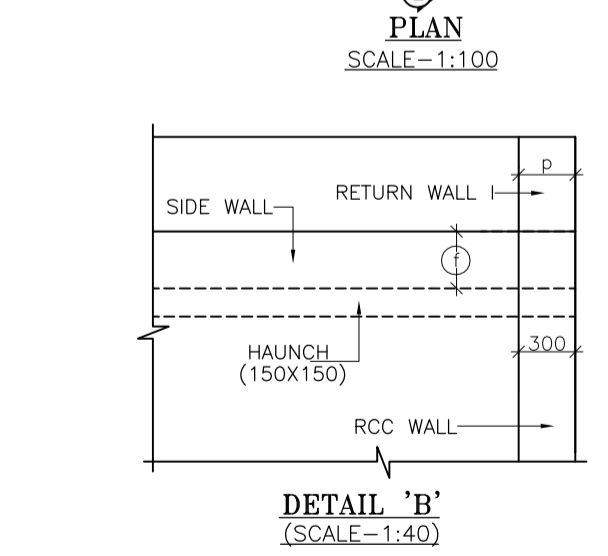
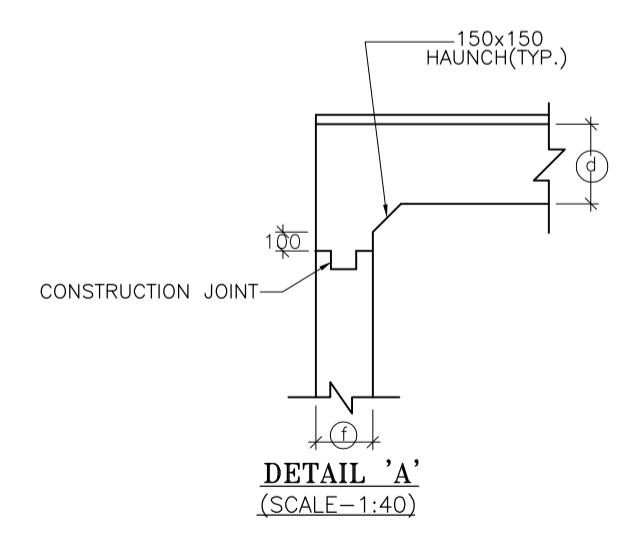


TABLE SHOWING SALENT DIMENSIONS	
BOX CELL DESIGNATION	No. of Cells / 2.27/3
a	2000
b	2000
c	600
d	250
e	300
f	250
h	450
i	4900
j	2650
k	750
l	1700
m	300
n	5490
p	300
q	7300
s	3000
dk	1200

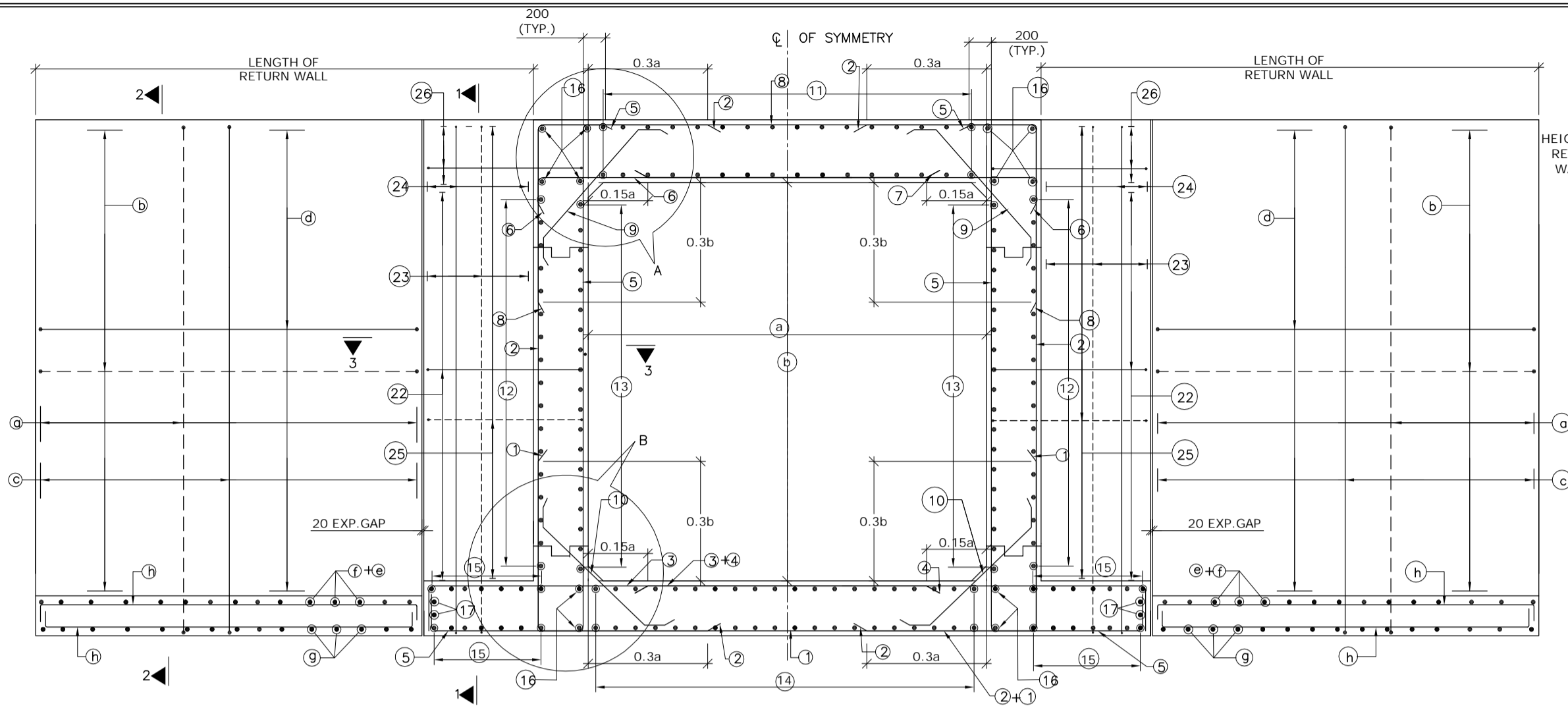


STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Cushion Height (m)	Super Elevation (%)	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
							U/S	D/S		
103/4	102+468	1532.189	2X2X1 Cell Earth Cushion	3.00	Normal Camber	10.00	With Catch pit	Slope	1526.826	1526.526

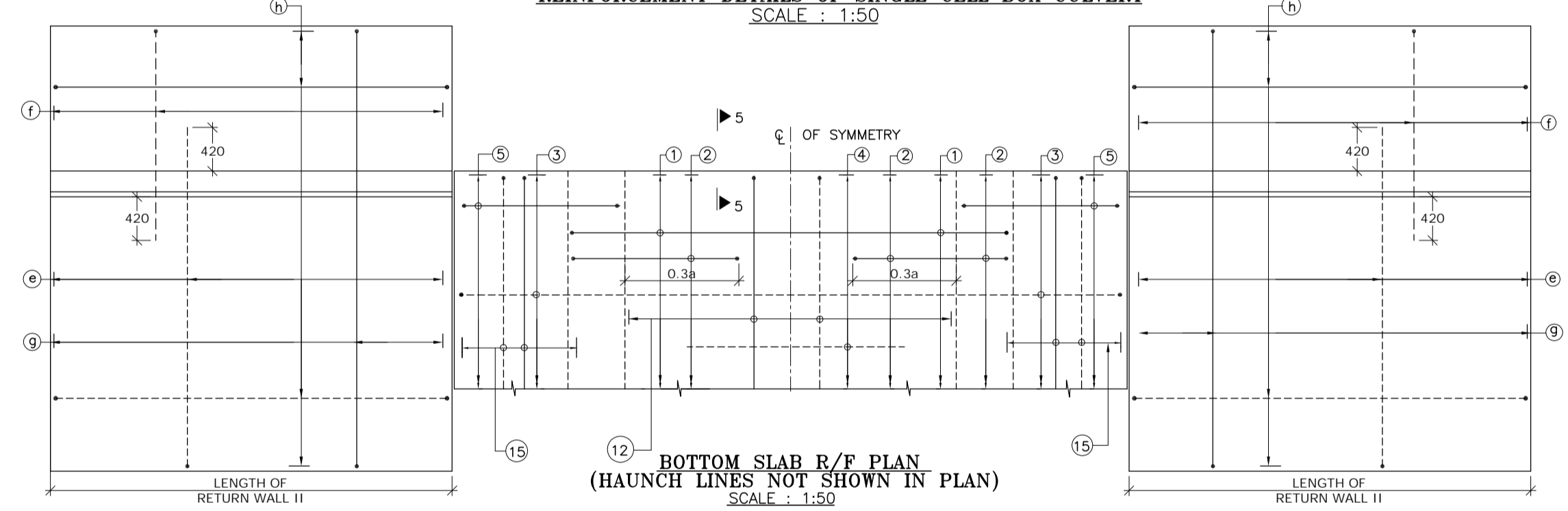


- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE - M25
CURTAIN WALL - M25
LEVELLING COURSE (P.C.C.) - M15
RETURN WALL - M25
RCC WALL & KERB - M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS FOR TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.81/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM $15 t/m^2$ BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1_3M_EC/CP/SLP/NC/RCC (SHEET NO-01)

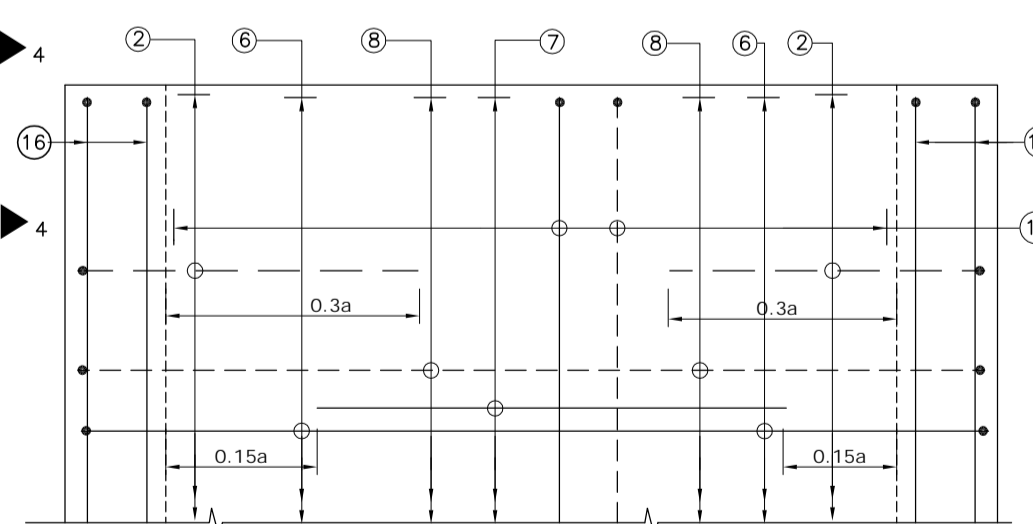
<table border="1"> <thead> <tr> <th>MKD.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>CHKD.</th> <th>APPRD.</th> </tr> </thead> <tbody> <tr> <td colspan="5">REVISIONS</td> </tr> </tbody> </table>					MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	REVISIONS					SCALE: AS SHOWN DATE: SEPT, 2016		CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 2.0) WITH 3.0M EARTH CUSHION WITH CATCH PIT & SLOPE PROTECTION Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825	CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1_3M_EC/CP/SLP/NC/GA Drawn By. S. Chattrjee Design By. Avishek Dey Checked By. Avishek Dey Approved By. Soubhik Sadhu
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.																
REVISIONS																				



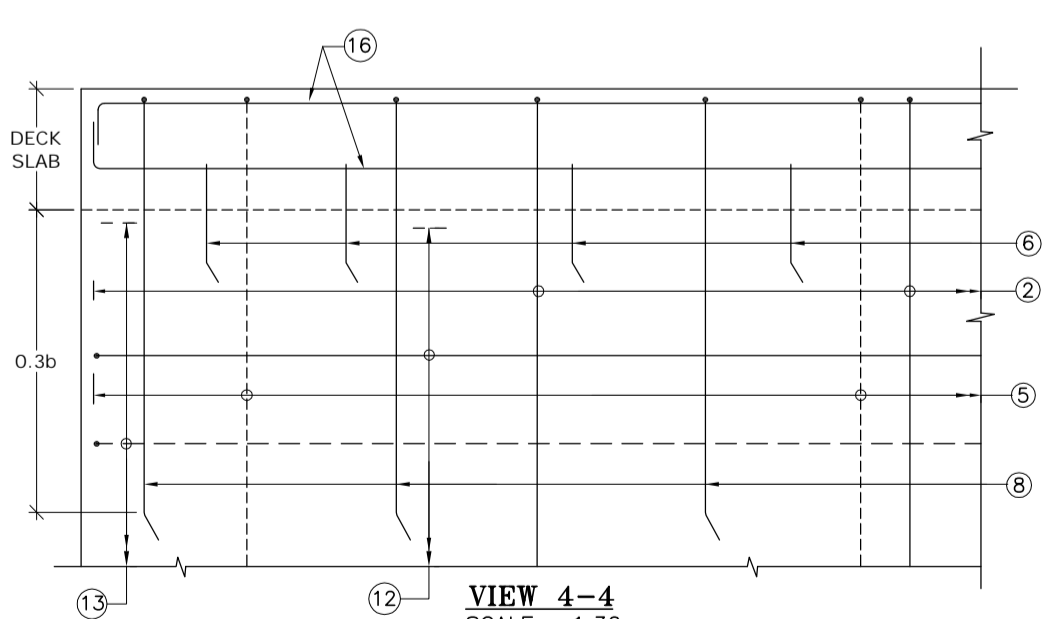
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:50



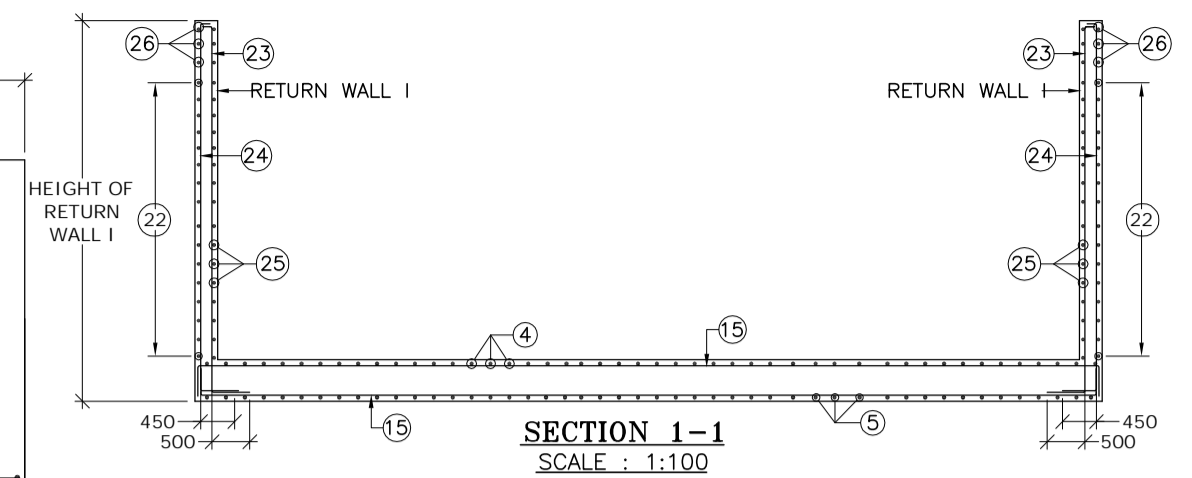
BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:50



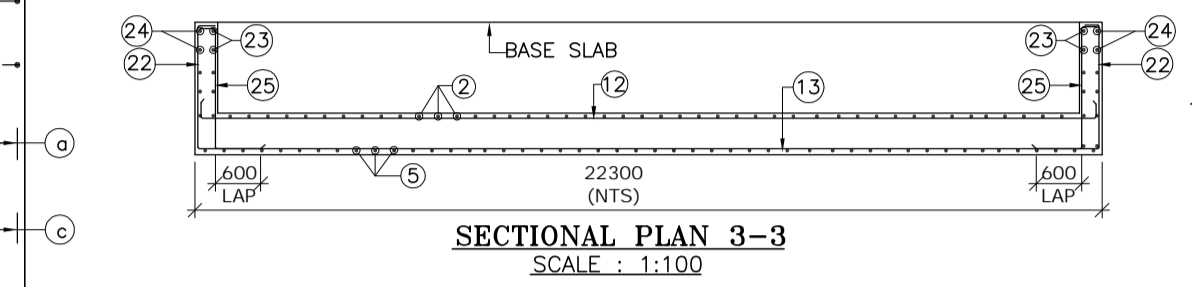
TOP SLAB R/F PLAN
SCALE : 1:30
(BAR MARK 5, 19, KERB & HAUNCH LINES NOT SHOWN IN PLAN)



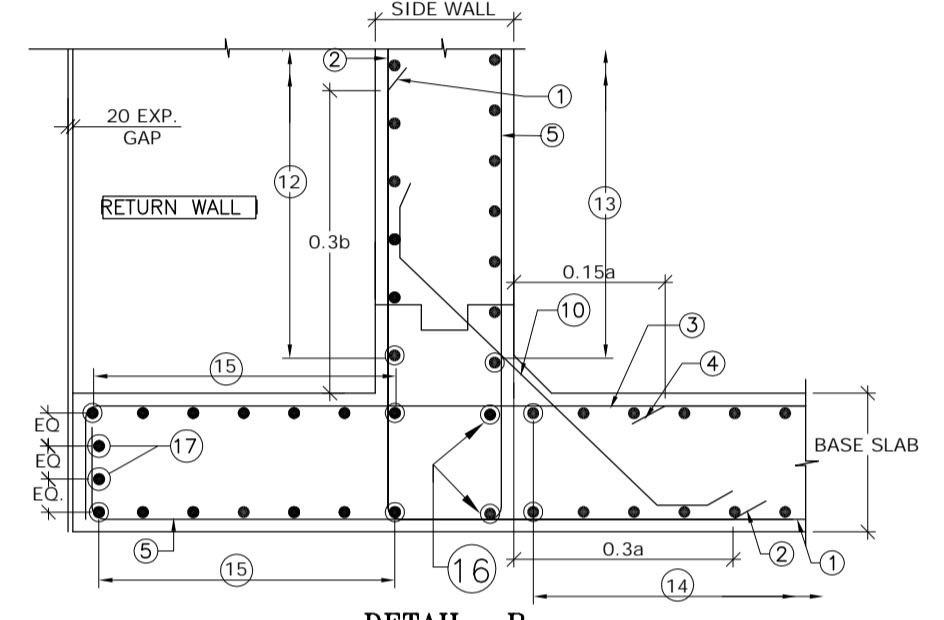
VIEW 4-4
SCALE : 1:30



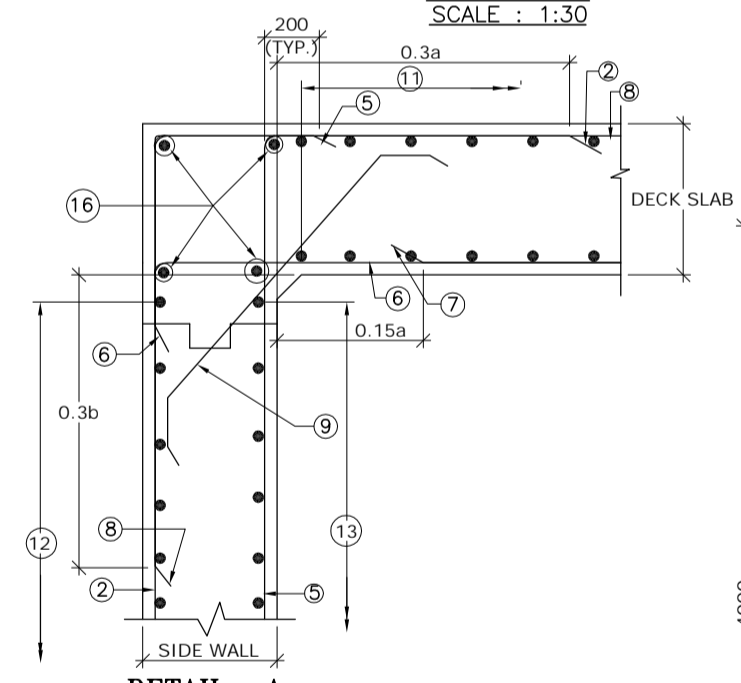
SECTION 1-1
SCALE : 1:100



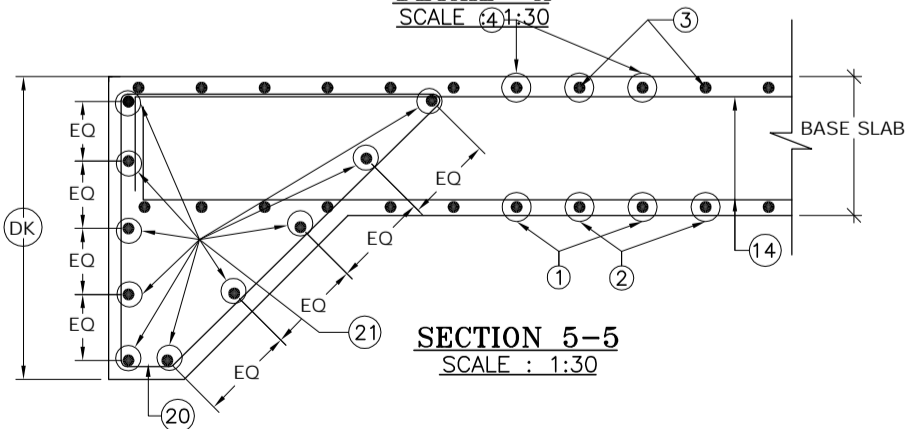
SECTIONAL PLAN 3-3
SCALE : 1:100



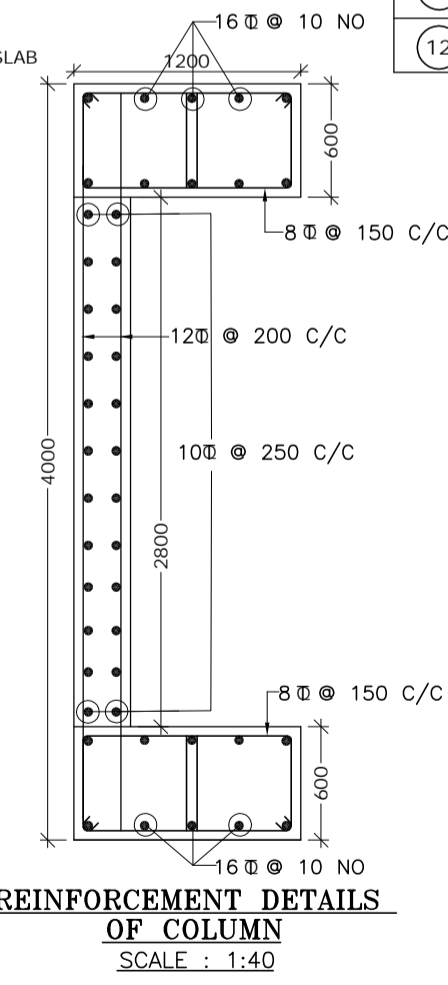
DETAIL- B
SCALE : 1:30



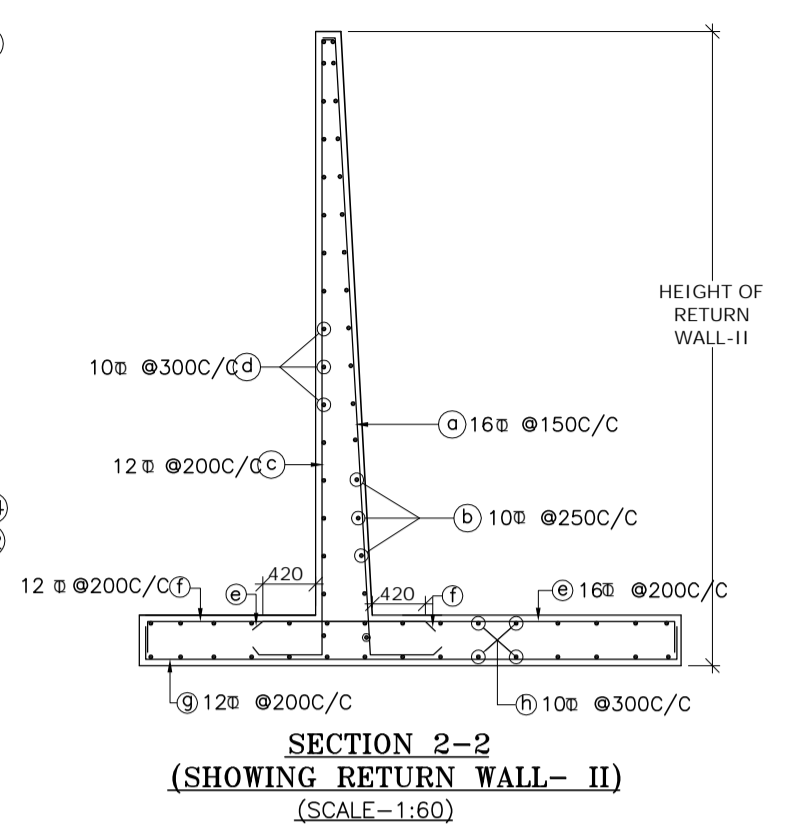
DETAIL- A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



REINFORCEMENT DETAILS OF COLUMN
SCALE : 1:40



SECTION 2-2
(SHOWING RETURN WALL- II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	10	200	13	10	250
2	10	200	14	10	250
3	12	125	15	10	250
4	-	-	16	10	-
5	10	200	17	-	-
6	10	100	18	10	150
7	-	-	19	10	-
8	10	200	20	10	150
9	10	200	21	12	-
10	10	200	22	10	250
11	10	250	23	10	200
12	10	250	24	10	200
			25	12	125
			26	10	250

--- TOP FACE BARS/OUTER FACE BARS/EARTH FACE BARS
 --- BOTTOM FACE BARS/INNER FACE BARS/OPP.TO EARTH FACE BARS

- NOTES :**
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH RELEVANT CLAUSE IRC : 112-2011
 - DEVELOPMENT LENGTH (Ld) :
 (a) FOR M25 = 46D
 (b) MINIMUM Ld :
 (i) FOR STRAIGHT BAR = 300MM
 (ii) FOR BENT BAR = 150MM
 BETWEEN (a) & (b) WHICHEVER IS GREATER.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MoRTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1_3M EC/CP/SLP/NC/GA (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - ToloI - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X2.0) UPTO 3.0M EARTH CUSHION

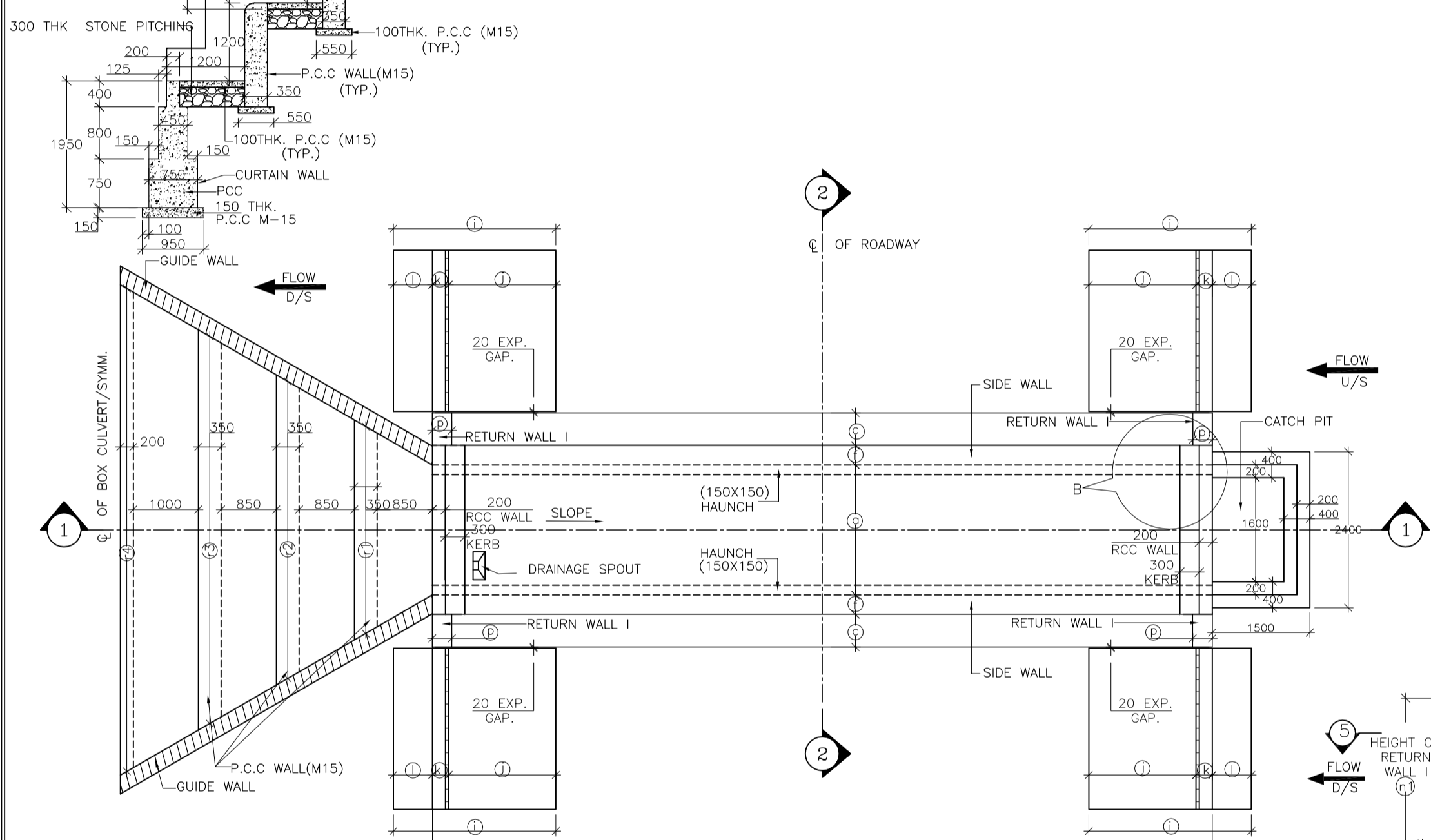
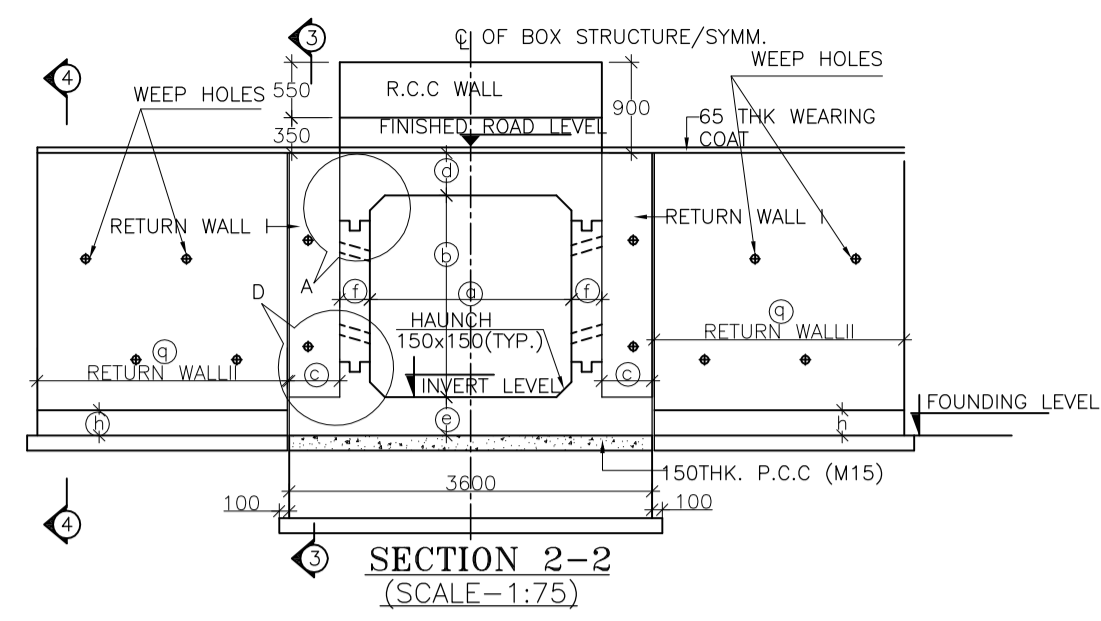
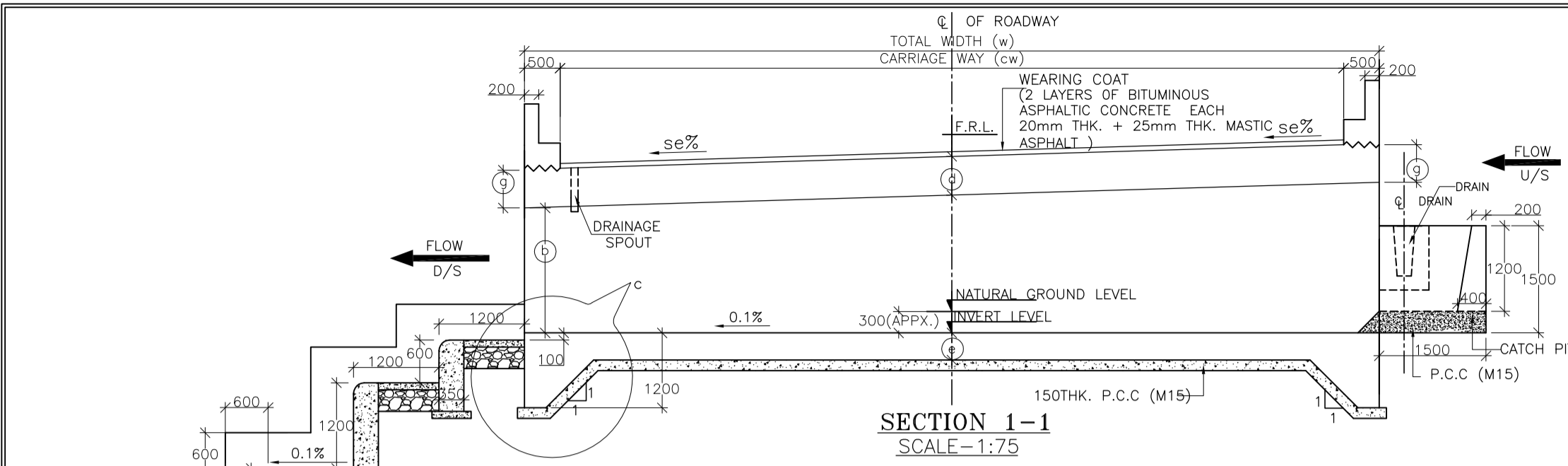
Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Design Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 AN ISO 9001:2015 CERTIFIED COMPANY

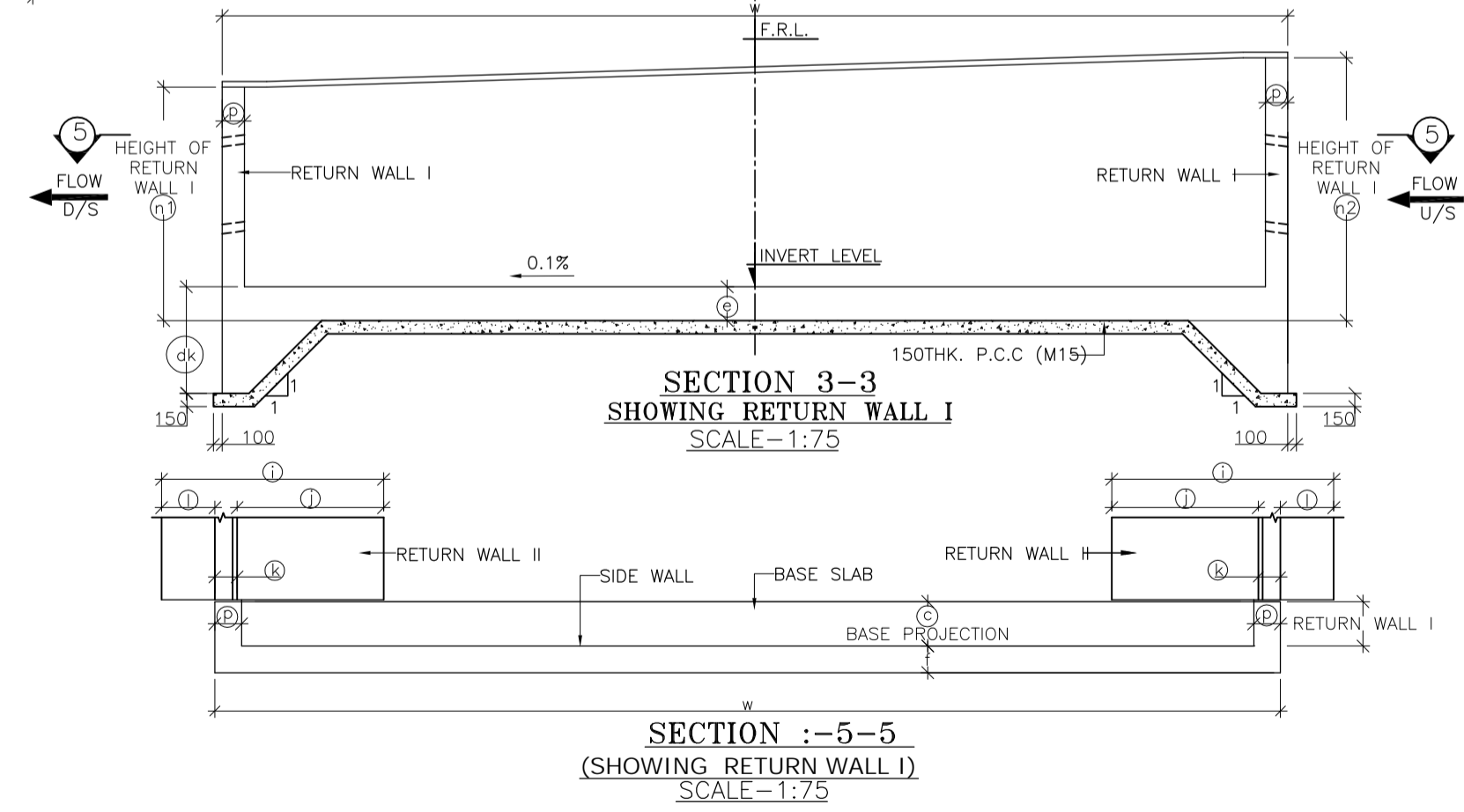
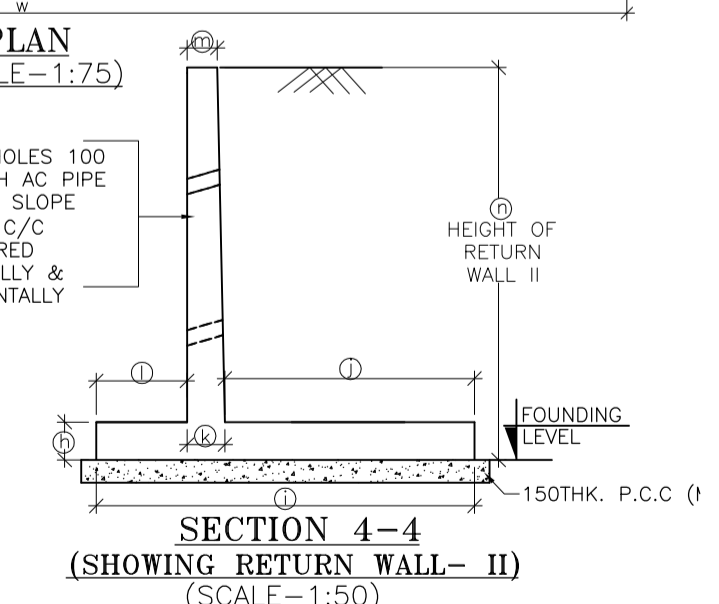
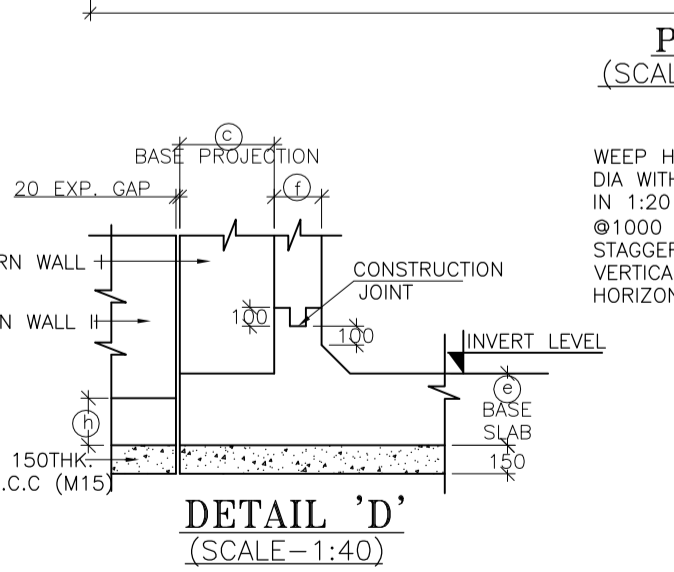
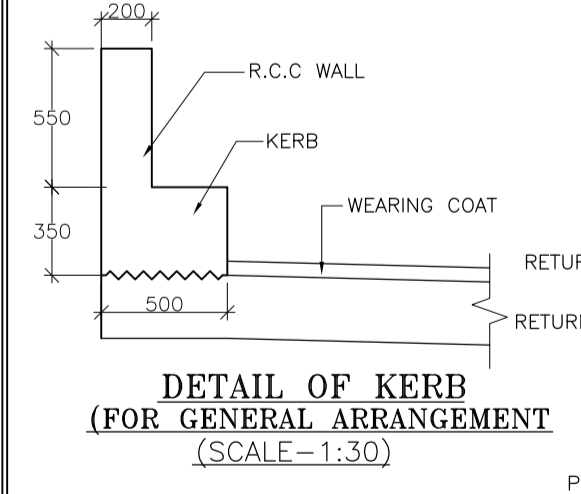
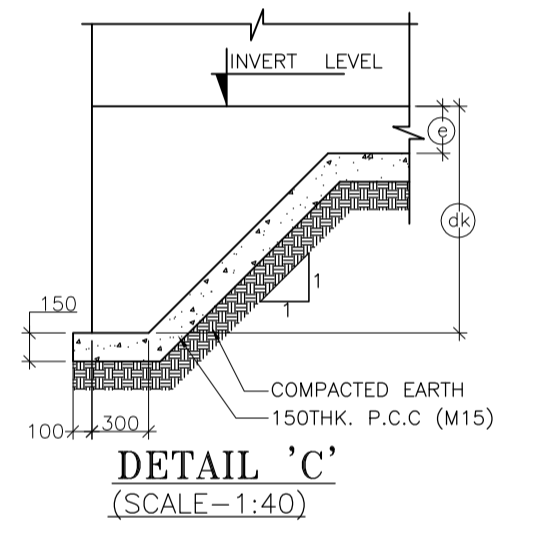
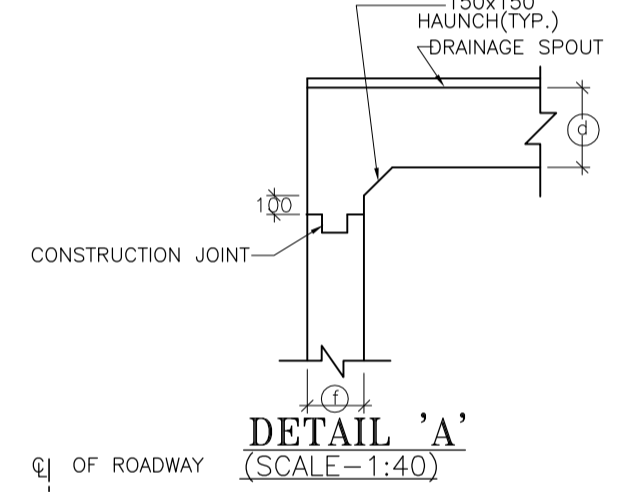
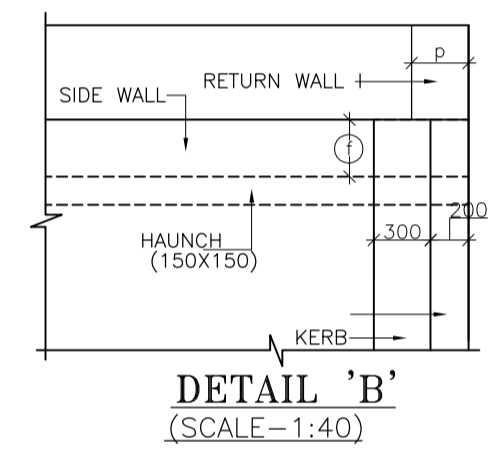
DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X2.0X1_3M EC/CP/SLP/NC/RCC

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	Avishek Dey	Soubhik Sadhu	





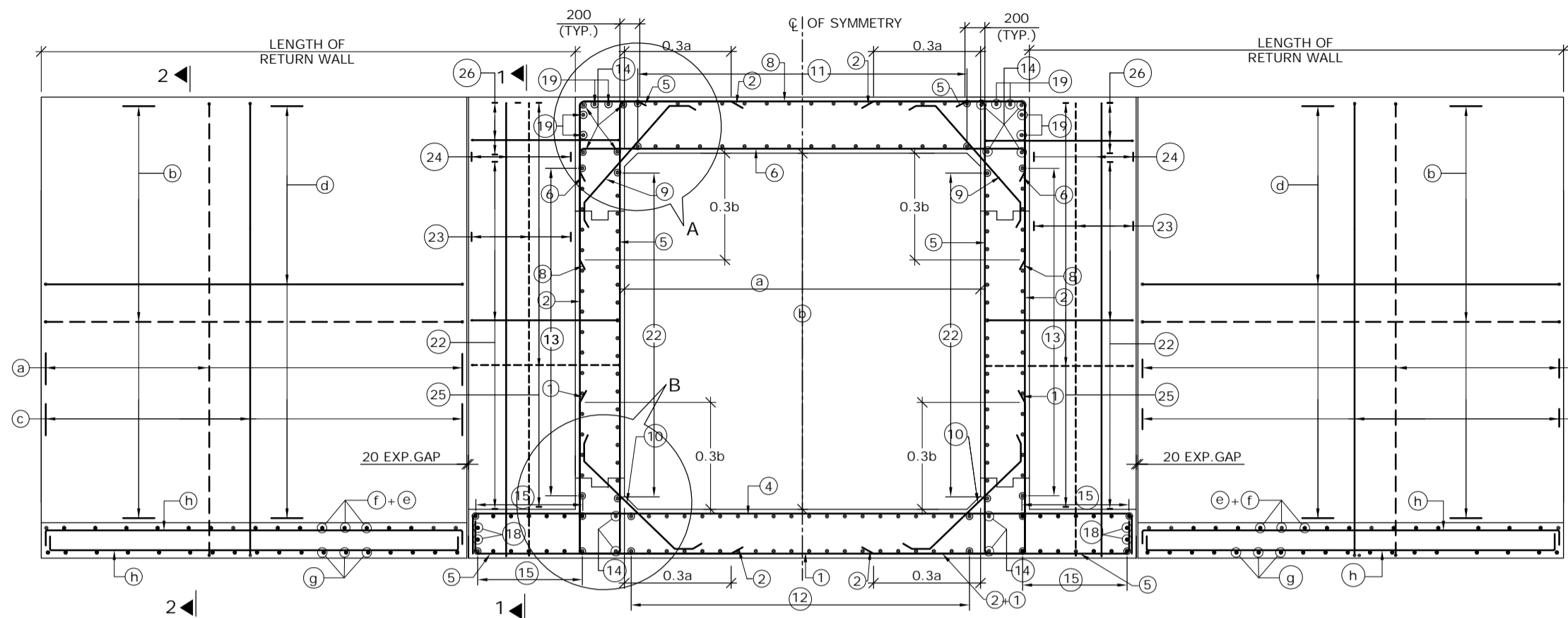
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
83/3	82+925	2130.632	2 X 3 X 1 CELL	7.00	R TO L	13.00	With Catch pit	Step	2127.637	2127.257	3.770	4.610
88/3	87+800	1874.904	2X3X1 Cell	7.00	L TO R	10.00	With Catch pit	Step	1872.804	1872.424	2.770	3.400

TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./ab/Ec	1/23/0
a	2000
b	3000
c	1300
d	370
e	420
f	350
g	370
h	300
i	3300
j	1850
k	350
l	1100
m	200
p	300
q	4000
dk	1200

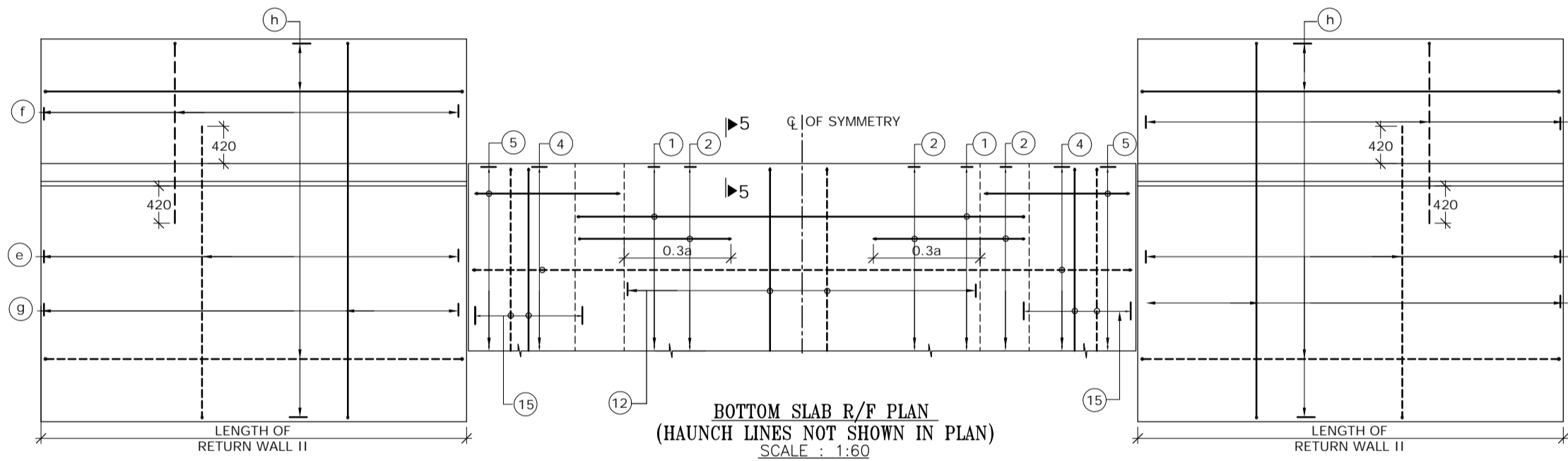


- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE : BOX CELL STRUCTURE = M25 CURTAIN WALL = M25 LEVELLING COURSE (P.C.C.) = M15 RETURN WALL = M25 RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.81/m^3$, $\rho = 30\theta$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 T/M² BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/STP/SE/RCC (SHEET NO-01)

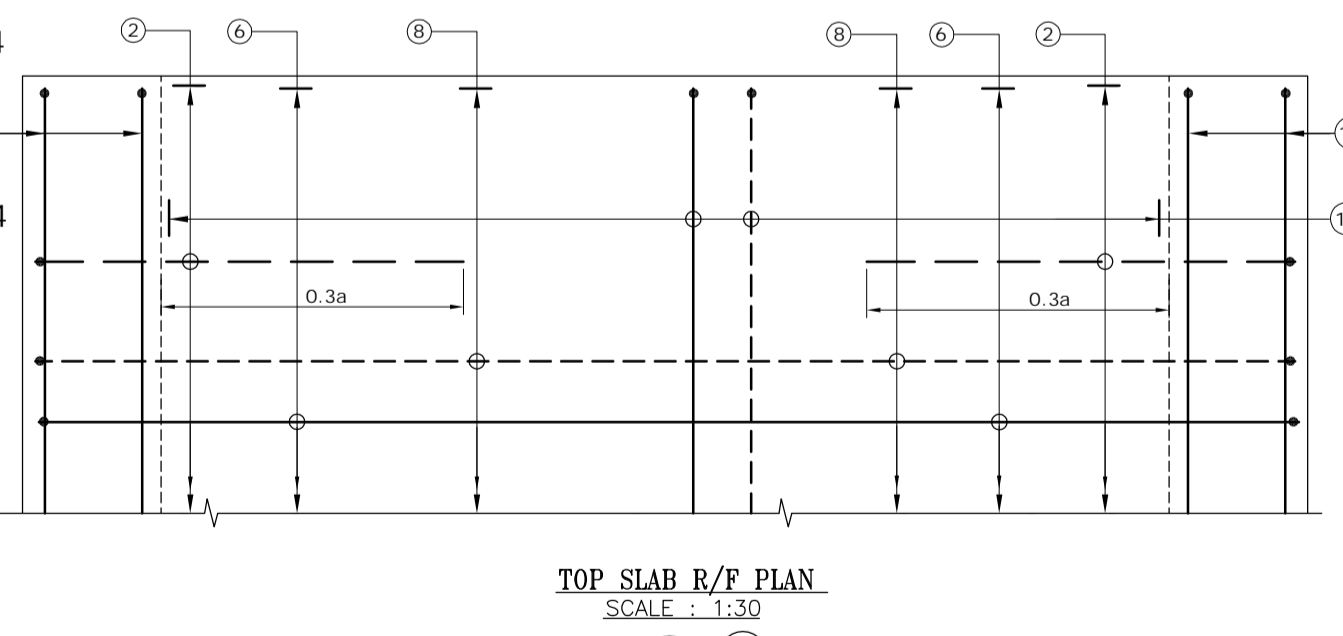
SCALE: AS SHOWN 					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0) WITH CATCH PIT & STEPPED PROTECTION					CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/STP/SE/GA				
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.					Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825										Drawn By. A. Sahoo Design By. - Checked By. Avishek Dey Approved By. Soubhik Sadhu									
DATE: SEPT, 2016																								
REVISIONS																								



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

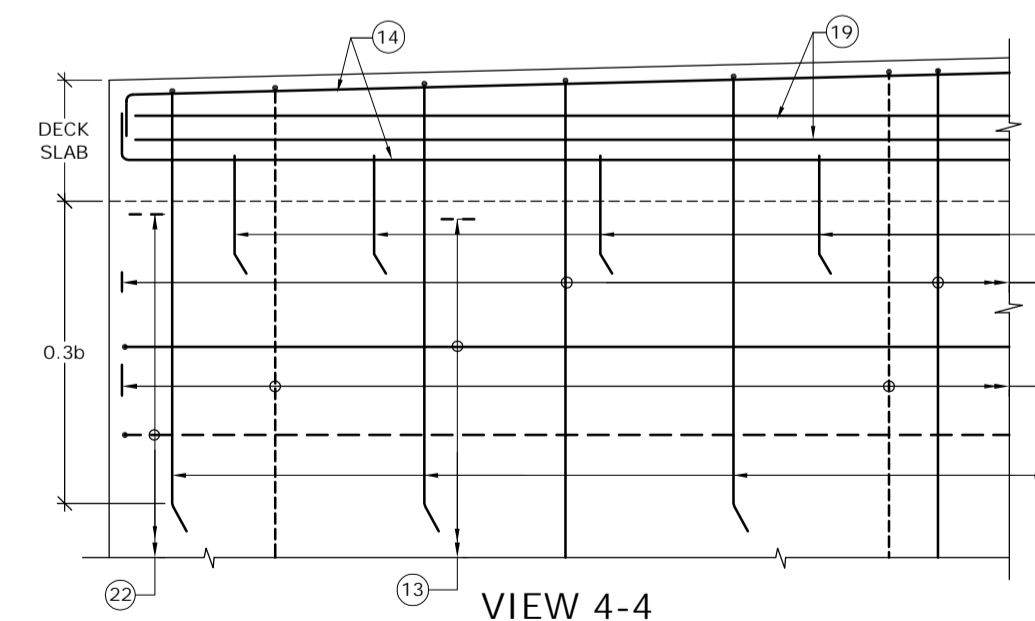


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

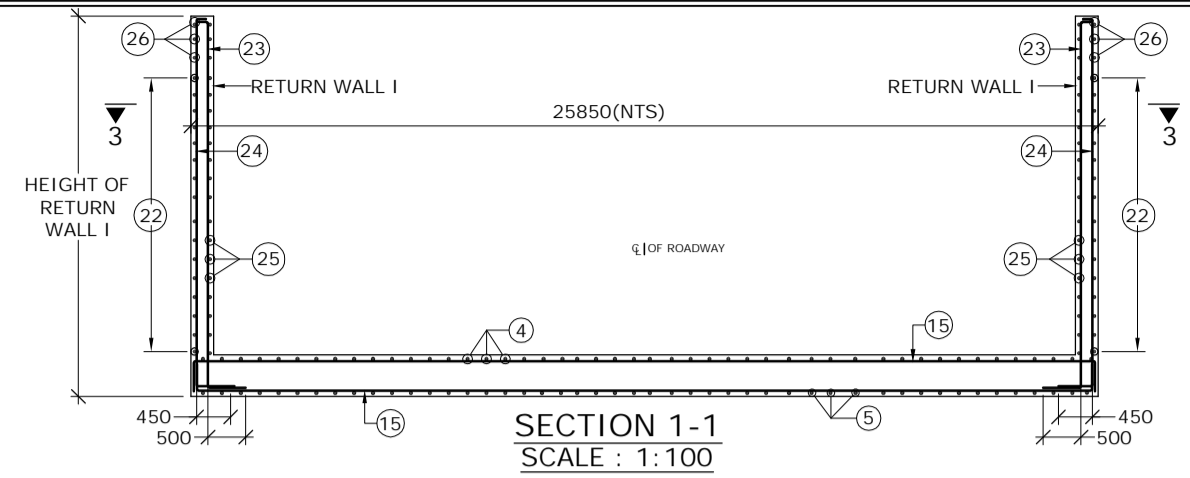


TOP SLAB R/F PLAN
SCALE : 1:30

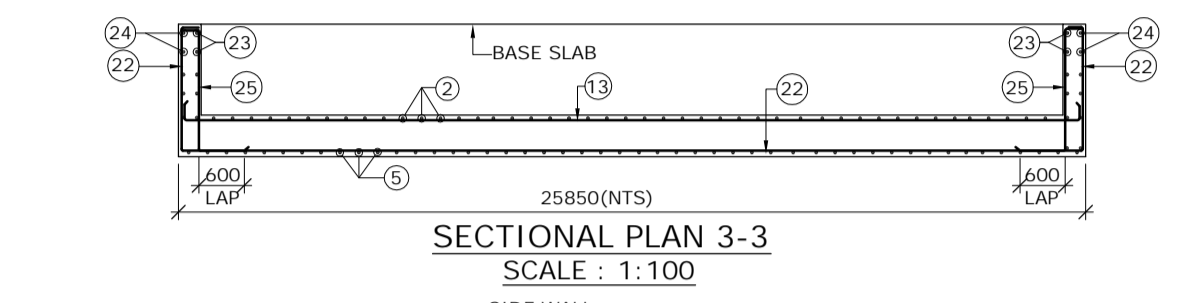
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



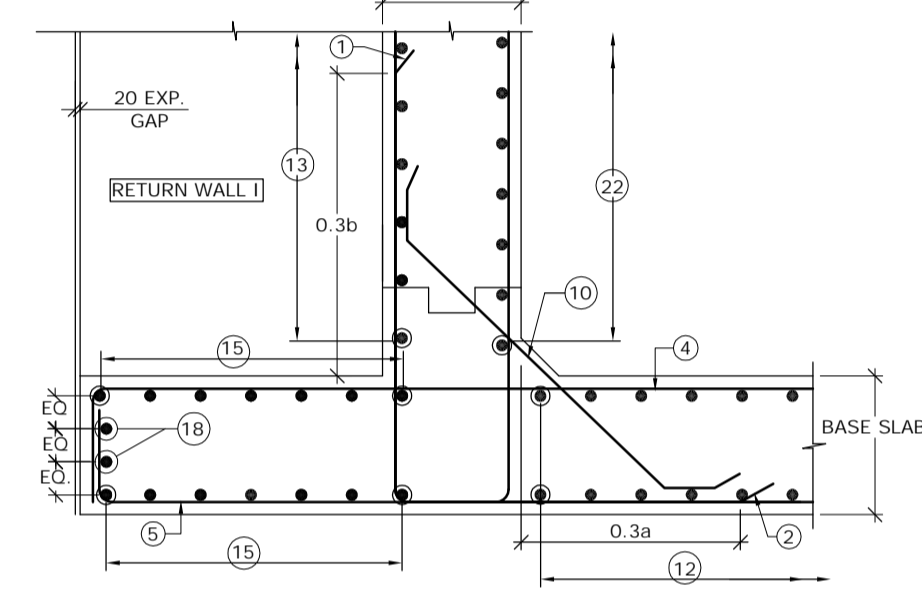
VIEW 4-4
SCALE : 1:30



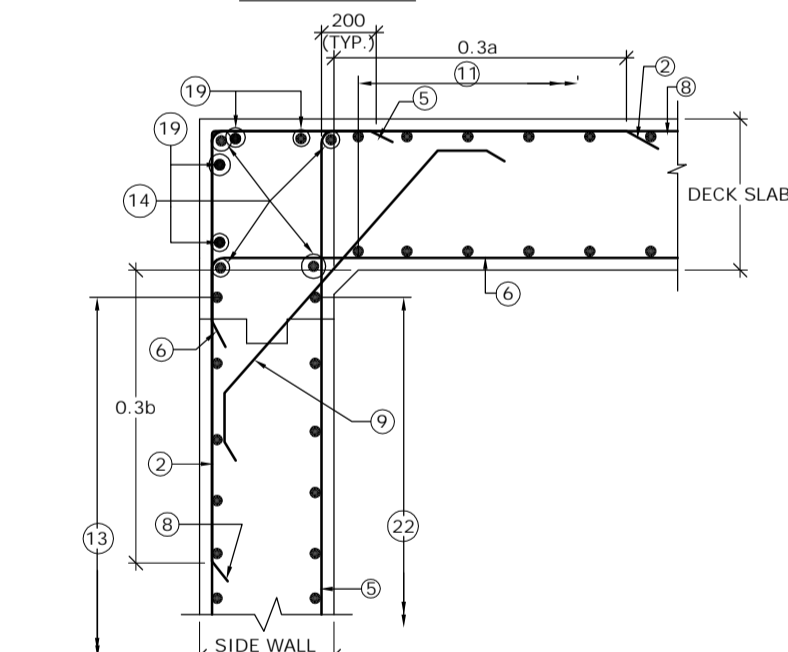
SECTION 1-1
SCALE : 1:100



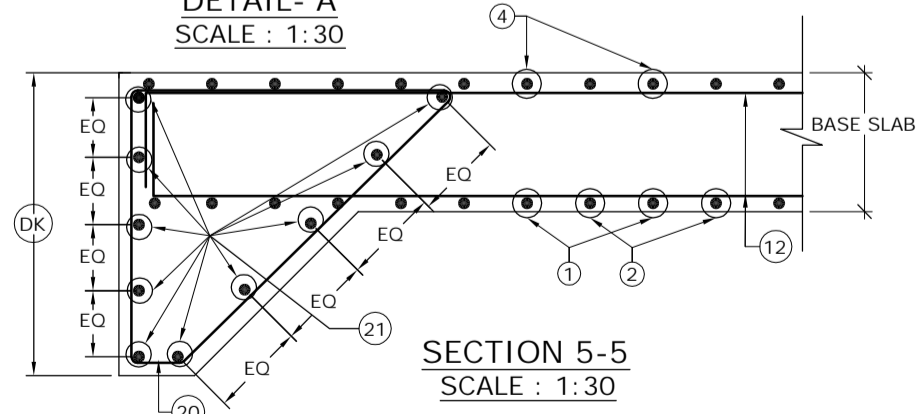
SECTIONAL PLAN 3-3
SCALE : 1:100



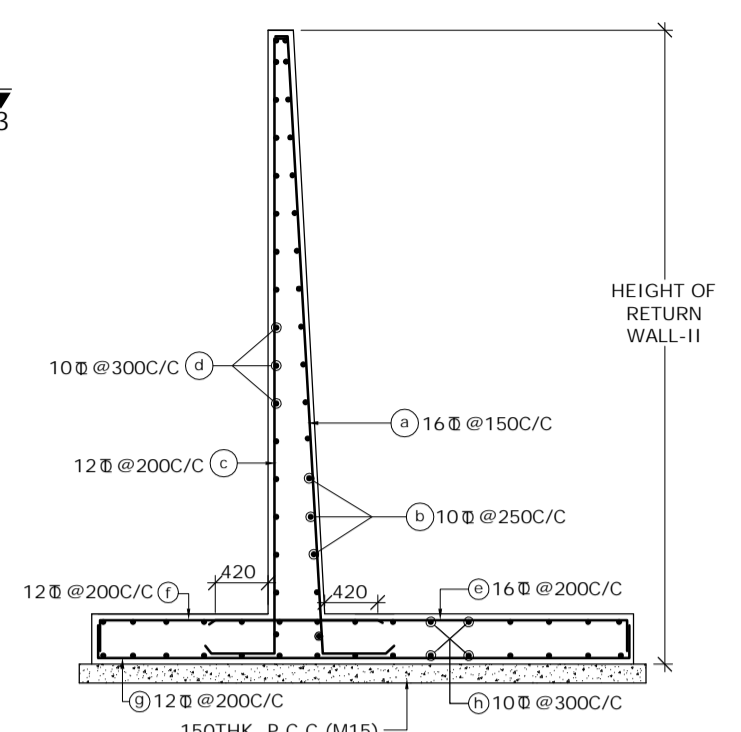
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE: 1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	10	250	13	10	250
2	16	250	14	10	-
3	BAR NOT USED		15	10	250
4	16	250	16	12	-
5	16	250	17	12	250
6	16	250	18	10	-
7	BAR NOT USED		19	10	-
8	10	250	20	10	150
9	10	250	21	10	-
10	12	250	22	10	250
11	10	250	23	10	200
12	10	250	24	10	200
			25	12	125
			26	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
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MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
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REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0)

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 ANISUWA, 3480, ISHAGANJORE
 Certified Company

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/STP/SE/RCC

Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu

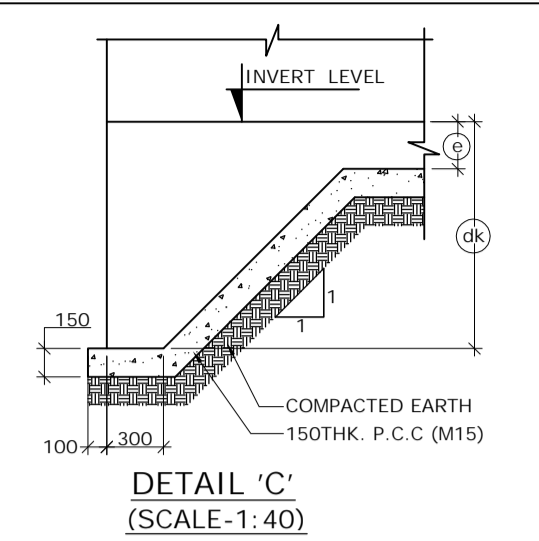
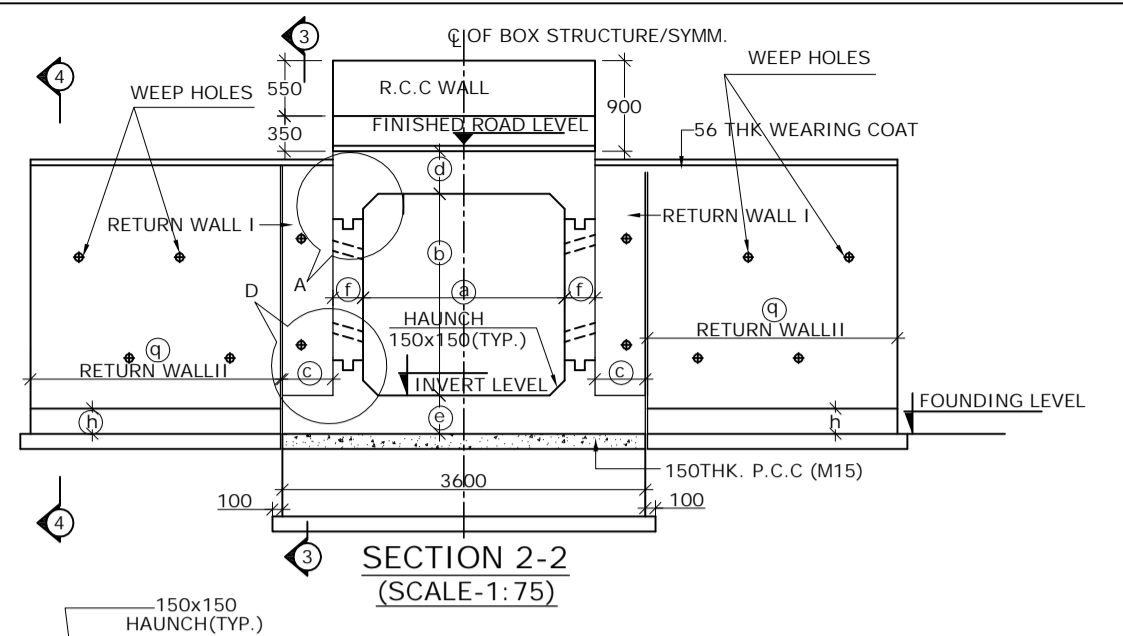
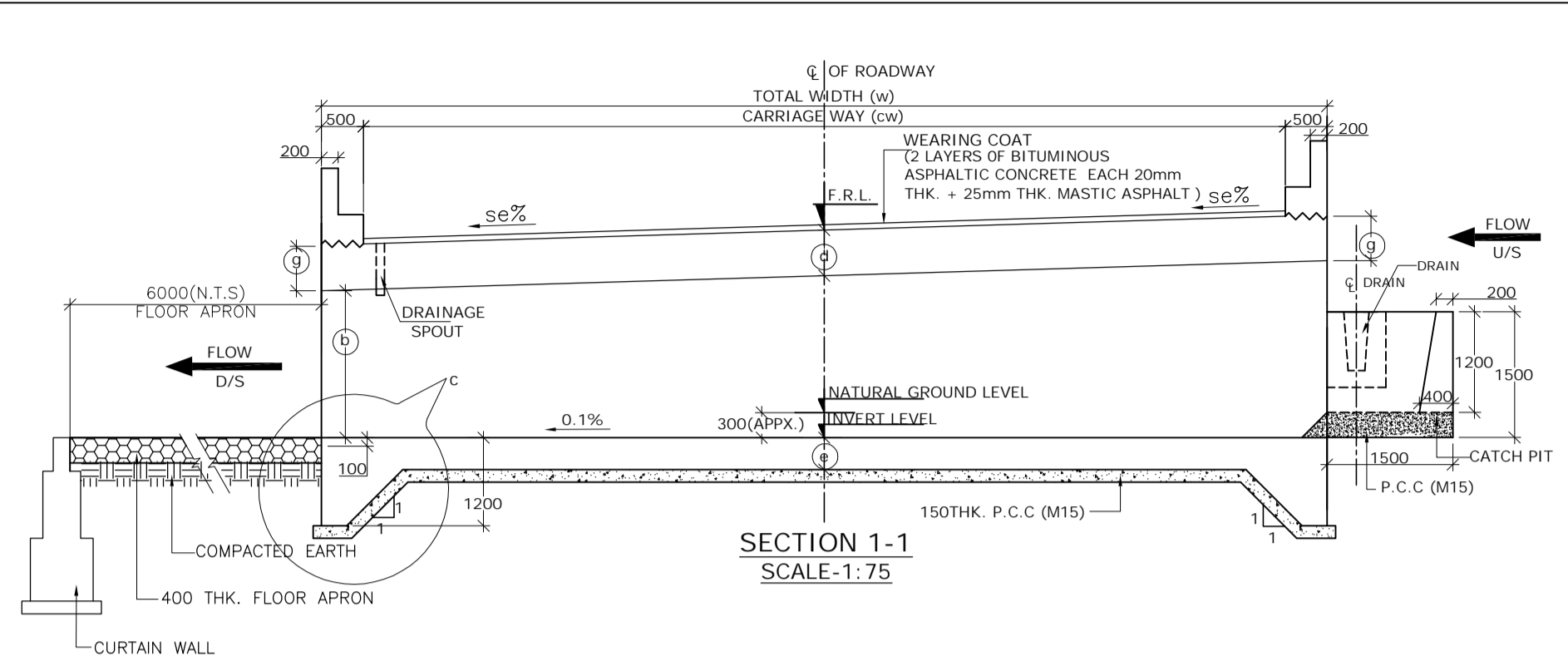
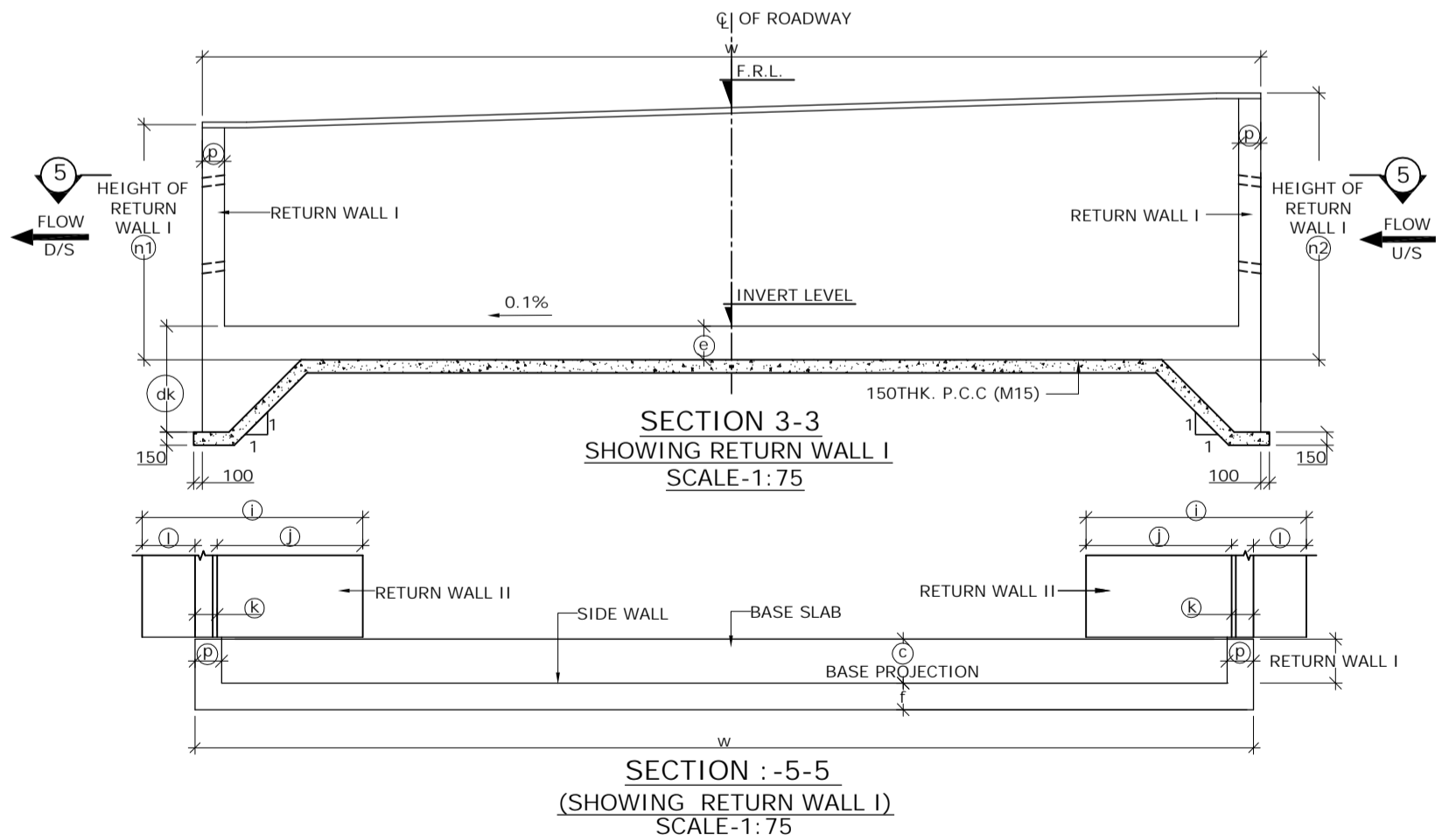
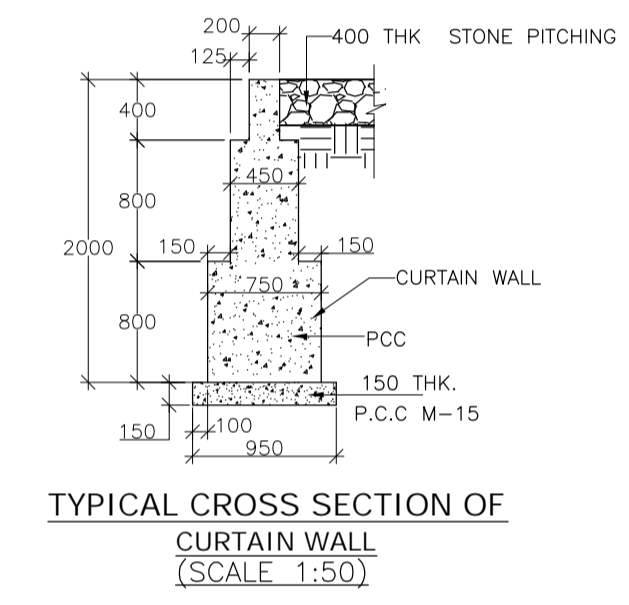
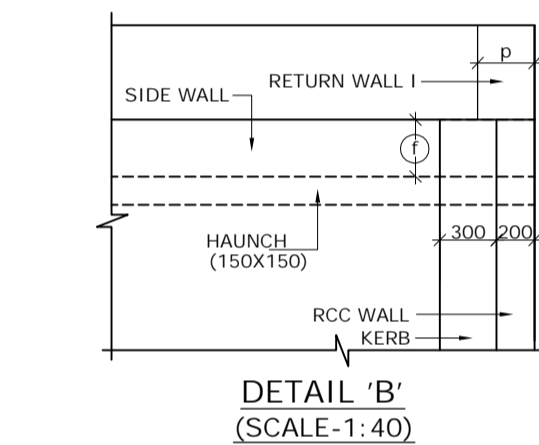
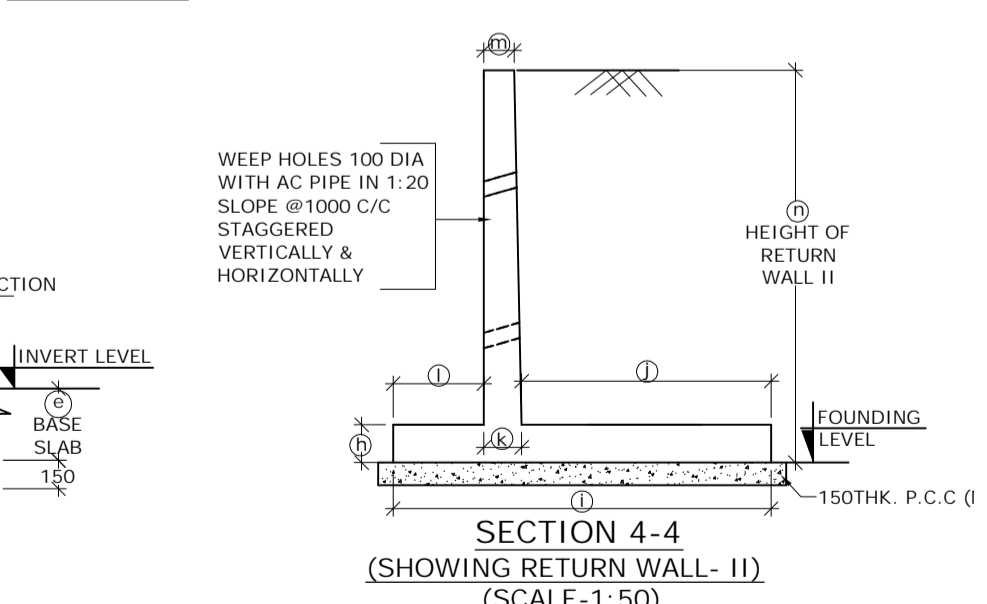
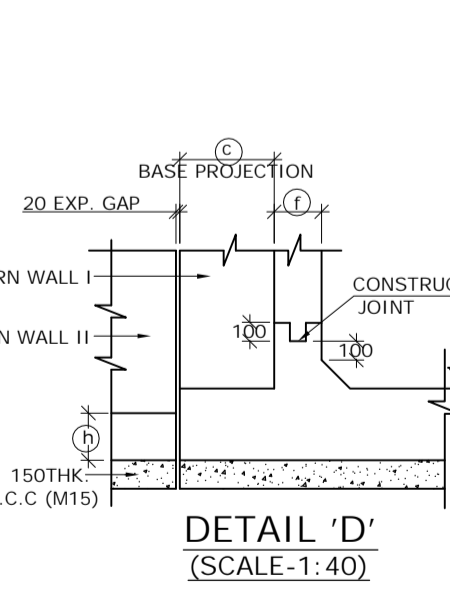
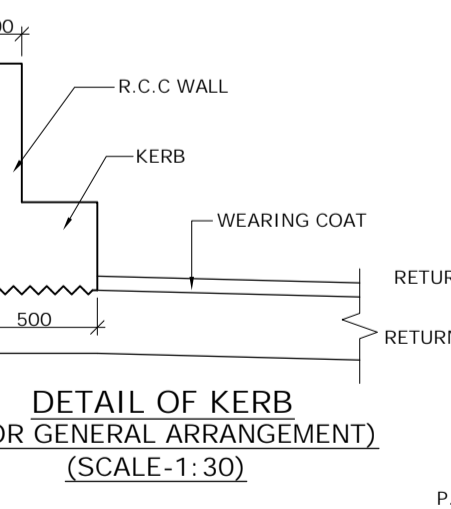
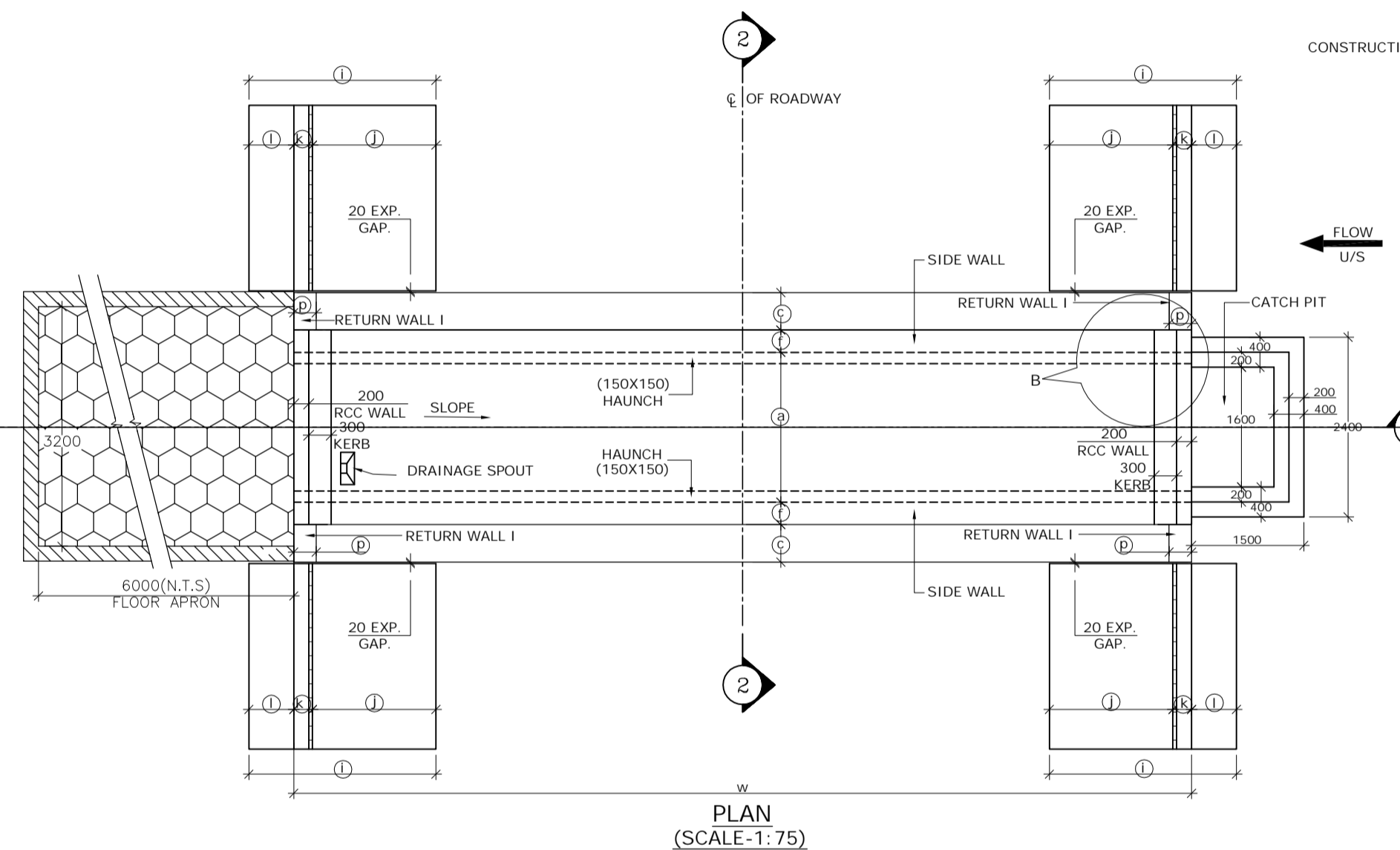
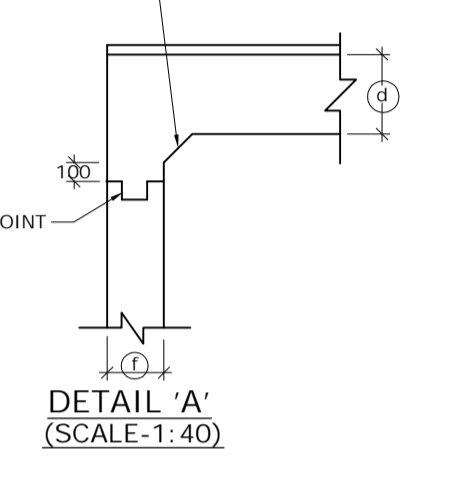




TABLE SHOWING SALIENT DIMENSIONS
BOX CELL DESIGNATION No./ab/EC 1/23/0

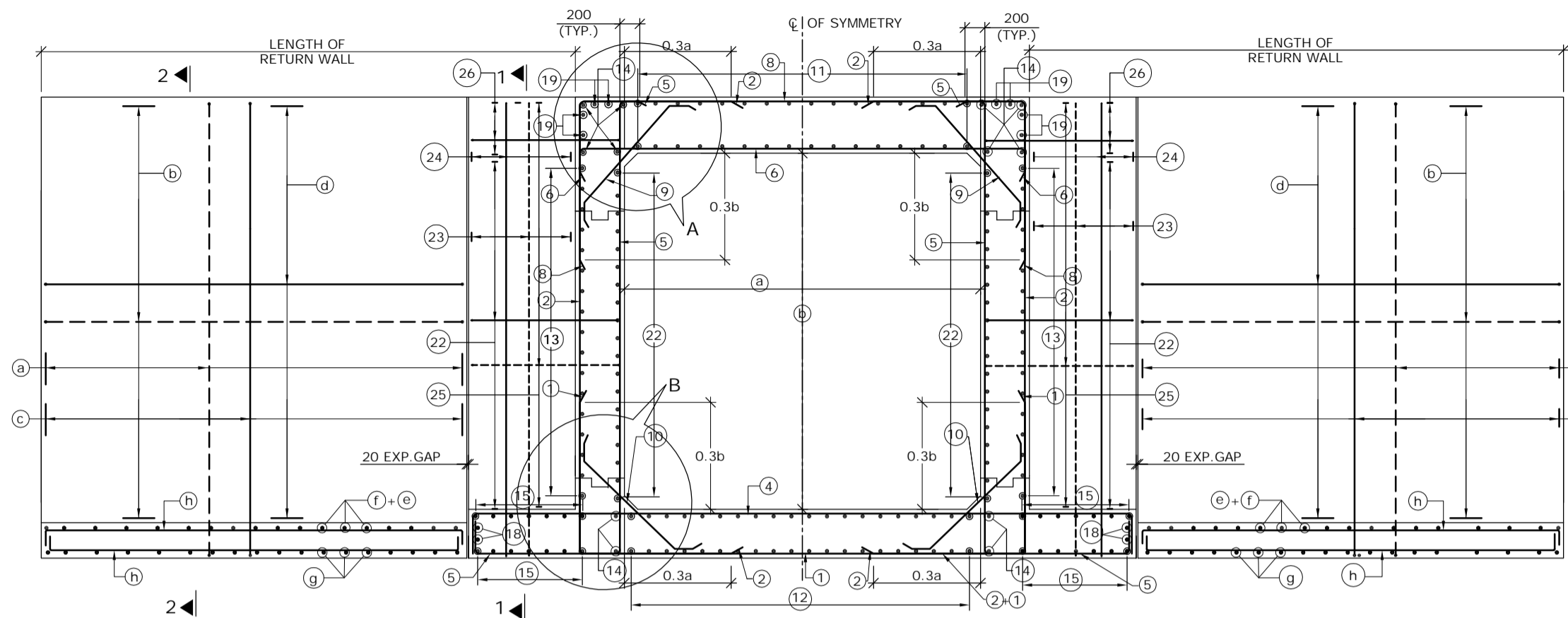
a	2000
b	3000
c	1300
d	370
e	420
f	350
g	370
h	300
i	3300
j	1850
k	350
l	1100
m	200
p	300
q	4000
dk	1200

STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
92/3	91+805	1733.753	2X3X1 Cell	7.00	L TO R	10.00	With Catch pit	Straight	1730.633	1730.213	3.790	4.420

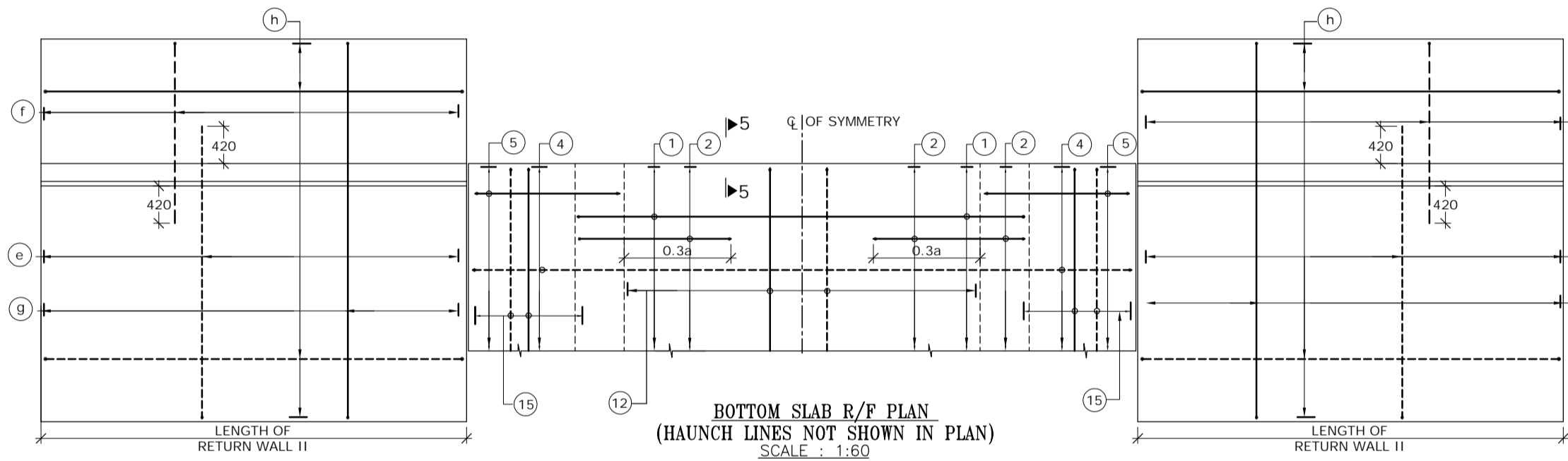


- NOTES :
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE = M25
CURTAIN WALL = M25
LEVELLING COURSE (P.C.C.) = M15
RETURN WALL = M25
RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.81/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 T/M² BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/F/SE/RCC (SHEET NO-01)

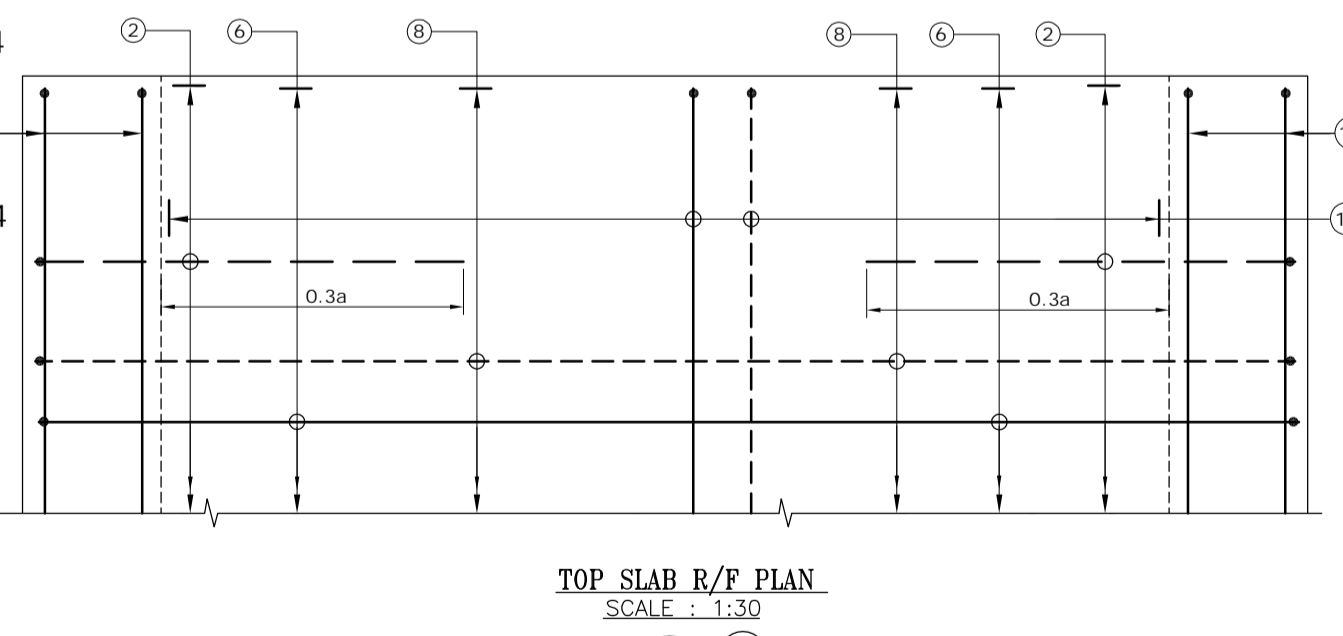
<p>SCALE: AS SHOWN</p>  <p>CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001</p>					<p>GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0) WITH CATCH PIT & FLOOR APRON</p>					<p>CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.</p> 					<p>DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/F/SE/GA</p>														
<p>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.</p>					<p>Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Design Chainage :- 81+870 to 105+825</p>					<p>Drawn By. Design By. Checked By. Approved By.</p>																			
<p>DATE: SEPT, 2016</p>					<p>A. Sahoo - Avishek Dey Soubhik Sadhu</p>																								
<p>REVISIONS</p> <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> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>										MKD.	DATE	DESCRIPTION	CHKD.	APPRD.															
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.																									



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

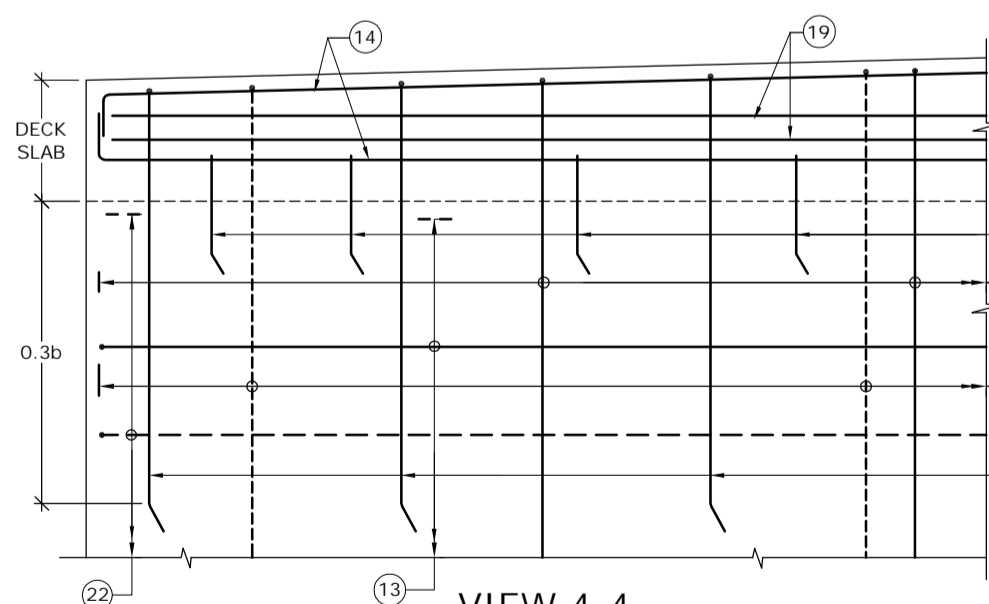


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

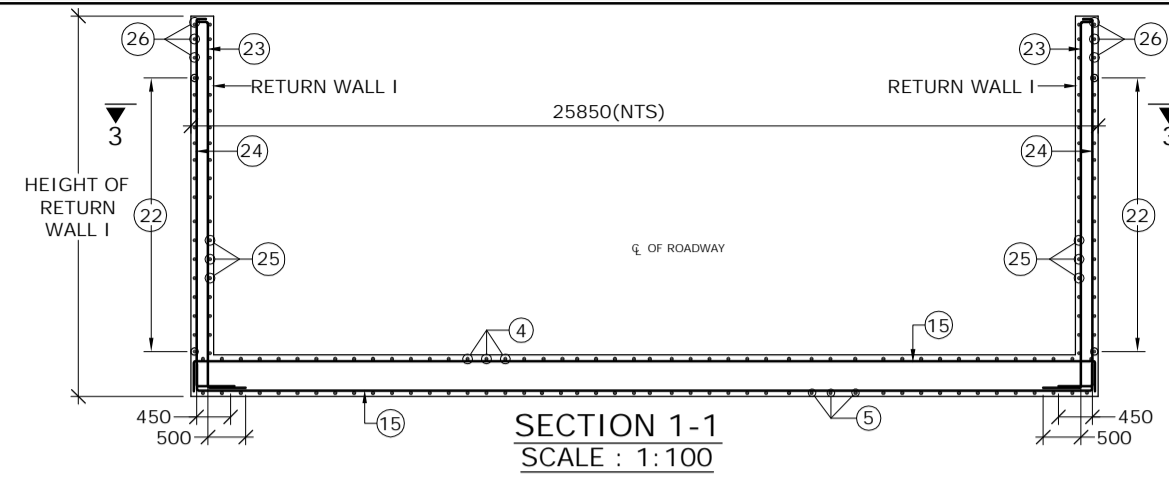


TOP SLAB R/F PLAN
SCALE : 1:30

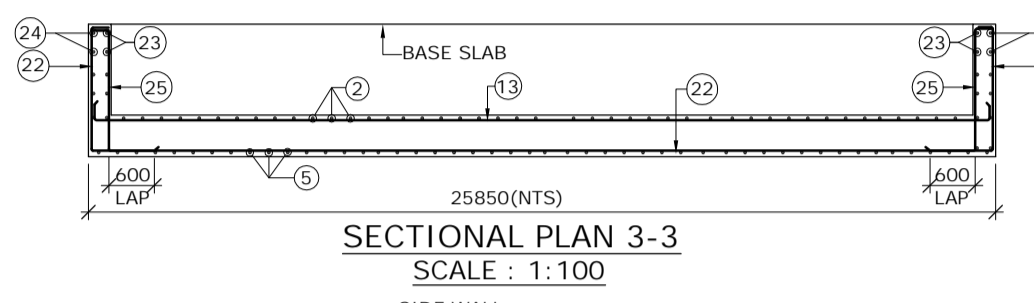
(BAR MARK (5), (19), KERB & HAUNCH LINES NOT SHOWN IN PLAN)



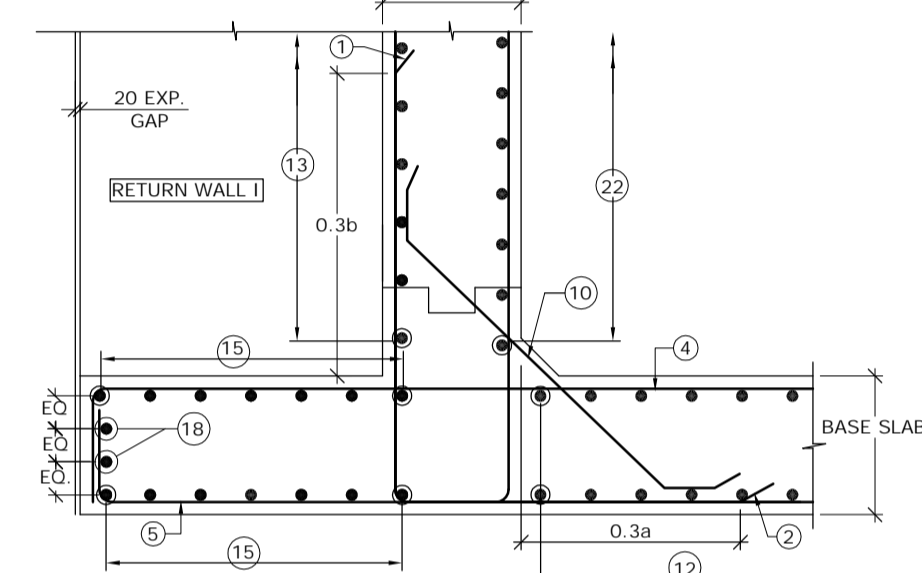
VIEW 4-4
SCALE : 1:30



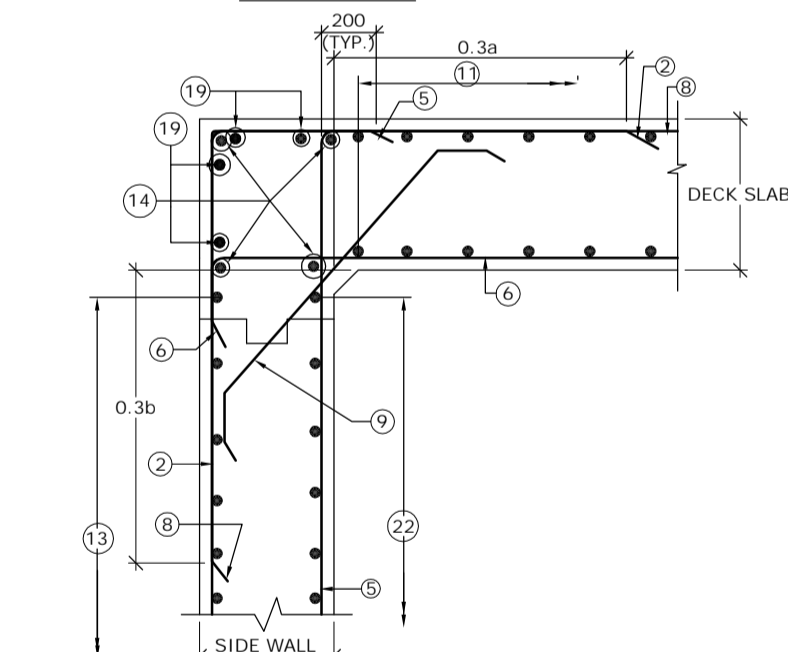
SECTION 1-1
SCALE : 1:100



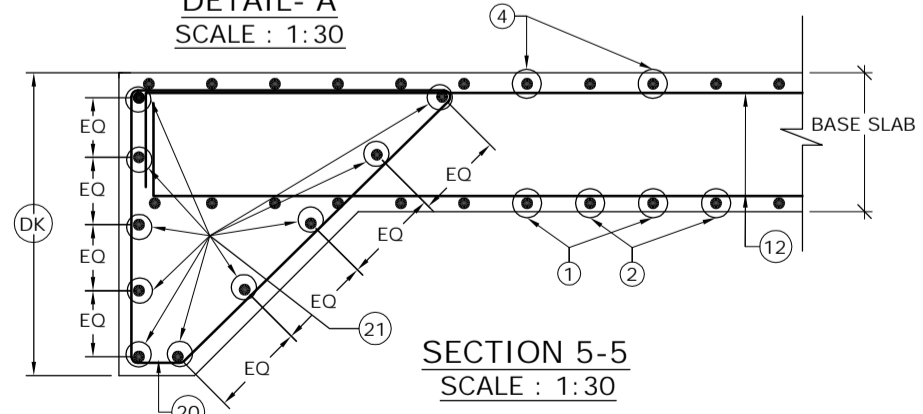
SECTIONAL PLAN 3-3
SCALE : 1:100



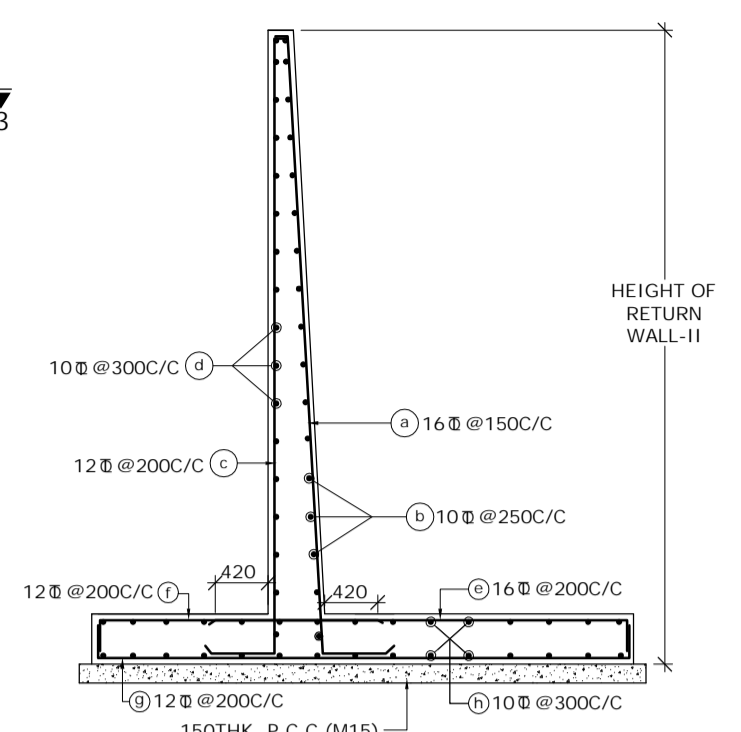
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
SCALE: 1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/F/SE/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

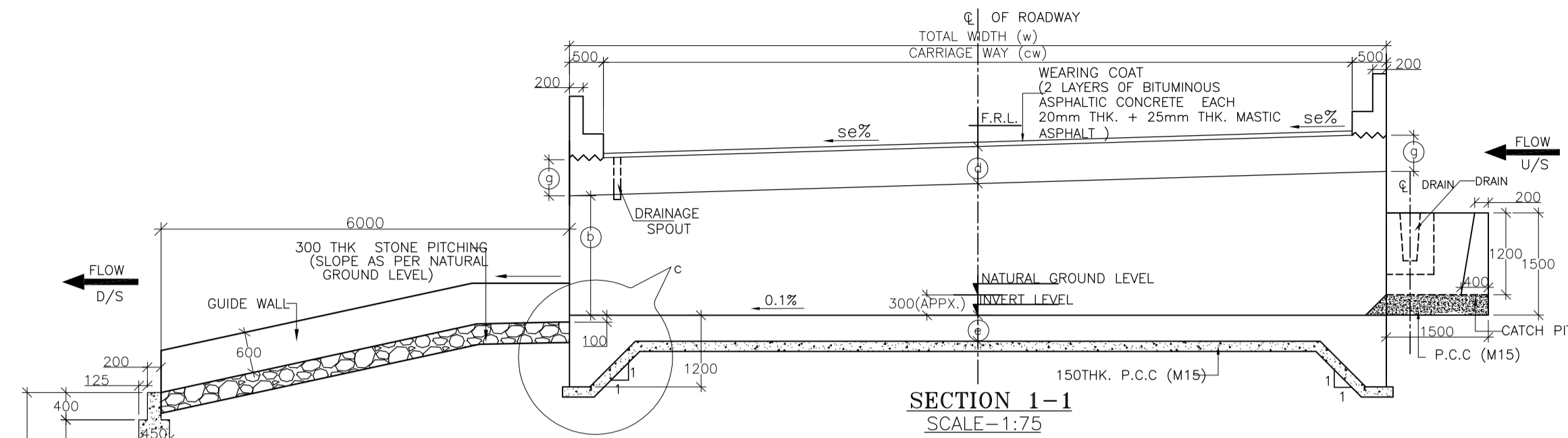
SCALE: AS SHOWN
 DATE: SEPT, 2016

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

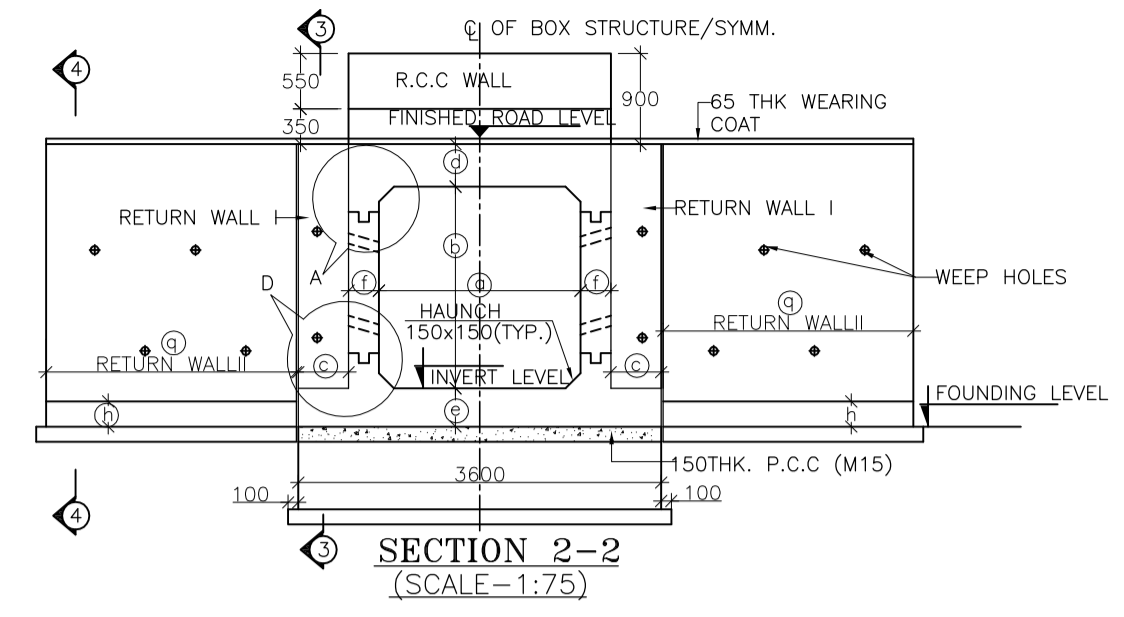
REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0)
 Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/F/SE/RCC
 Drawn By. S. Chattrjee
 Design By. -
 Checked By. Avishek Dey
 Approved By. Soubhik Sadhu



SECTION 1-1
SCALE=1:75

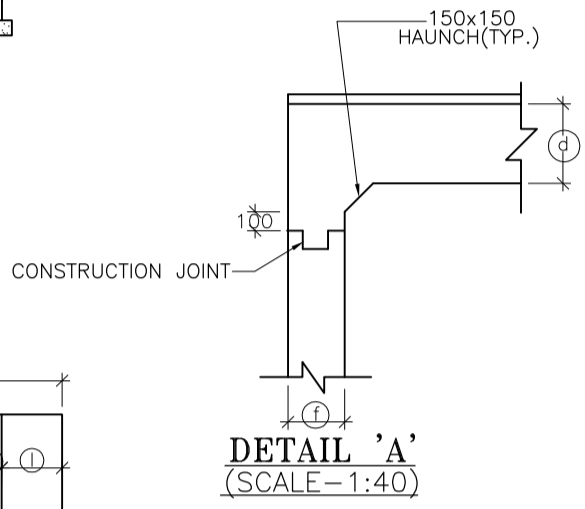


SECTION 2-2
SCALE=1:75

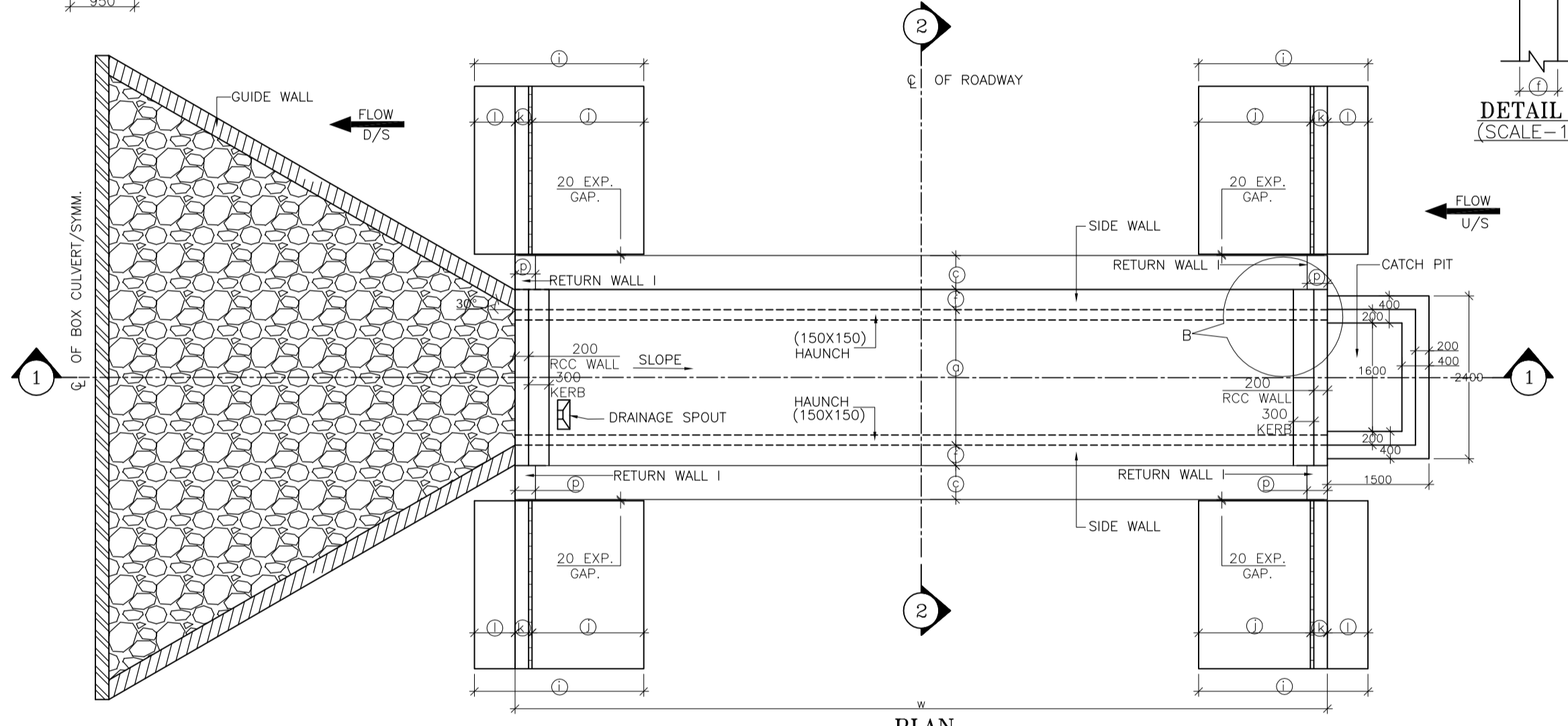
TABLE SHOWING SALIENT DIMENSIONS
BOX CELL DESIGNATION No./ab/Ec 1/23/0

a	2000
b	3000
c	1300
d	-
e	420
f	350
g	370
h	300
i	3300
j	1850
k	350
l	1100
m	200
p	300
q	4000
dk	1200

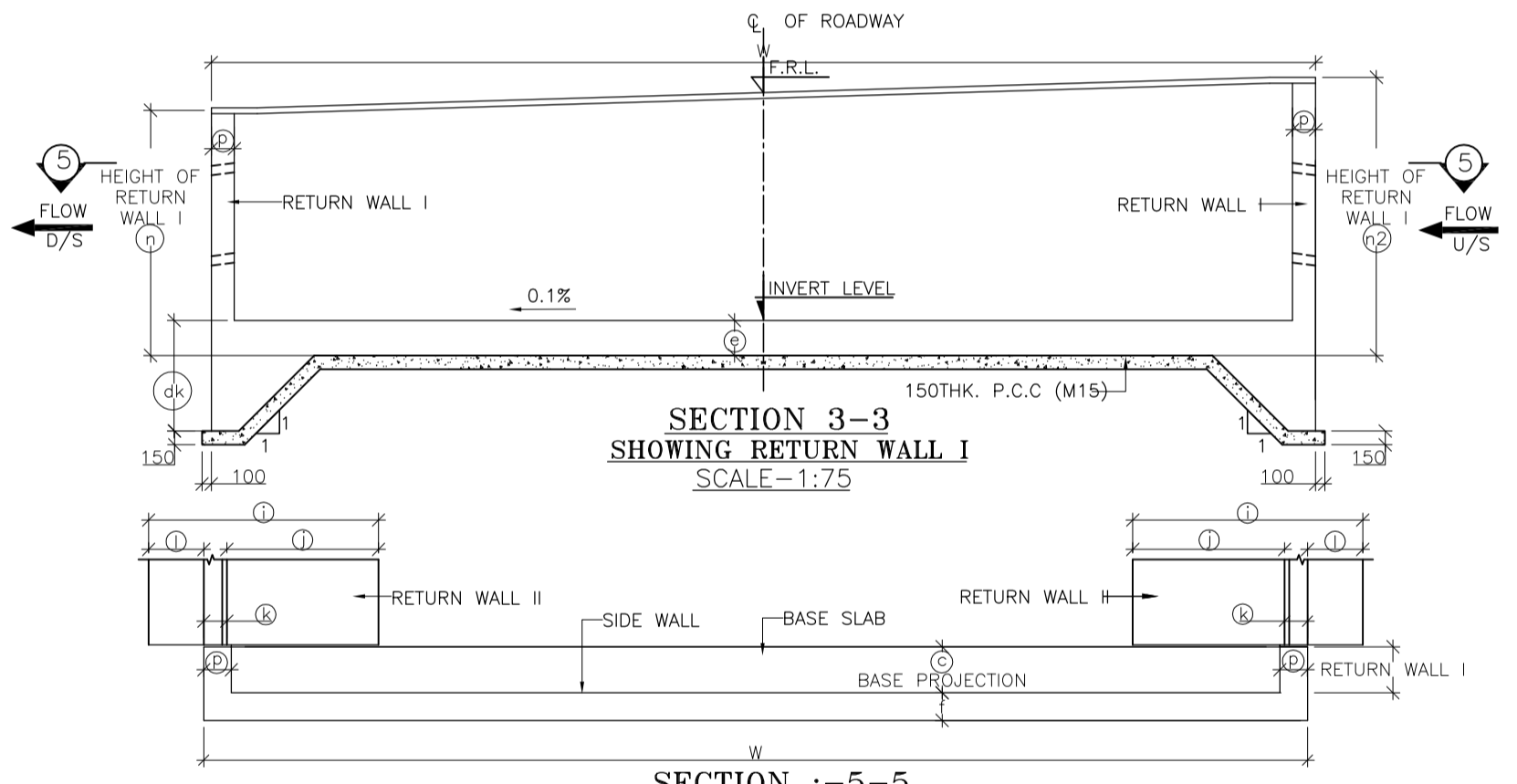
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall	
							U/S	D/S			n1	n2
88/1	87+138	1891.603	2X3X1 Cell	3.60	R TO L	11.00	With Catch pit	Slope	1888.348	1887.928	3.790	4.150



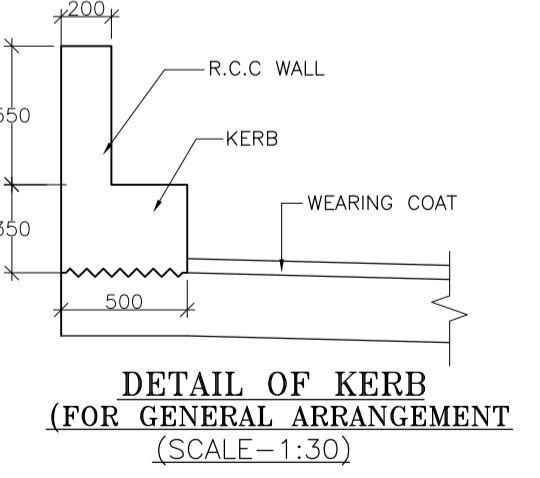
DETAIL 'A'
SCALE=1:40



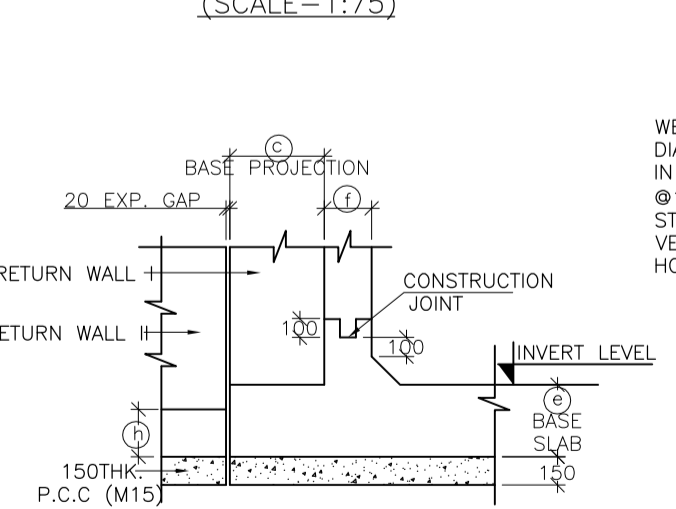
PLAN
SCALE=1:75



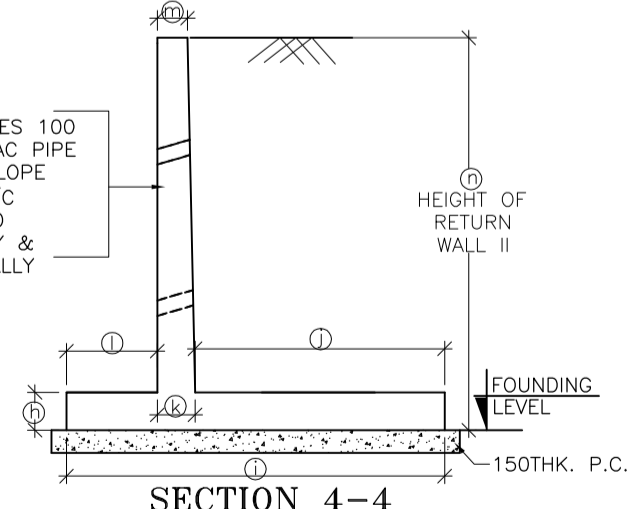
SECTION :-3-3
(SHOWING RETURN WALL I)
SCALE=1:75



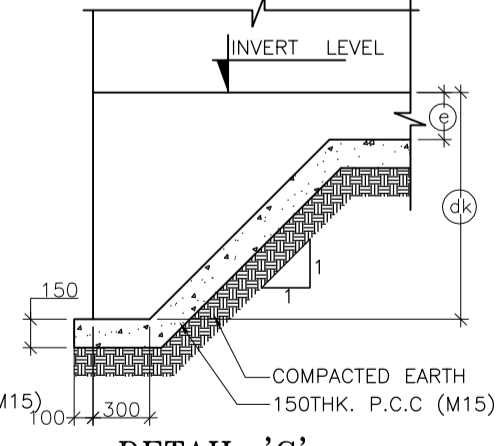
DETAIL OF KERB
(FOR GENERAL ARRANGEMENT)
SCALE=1:30



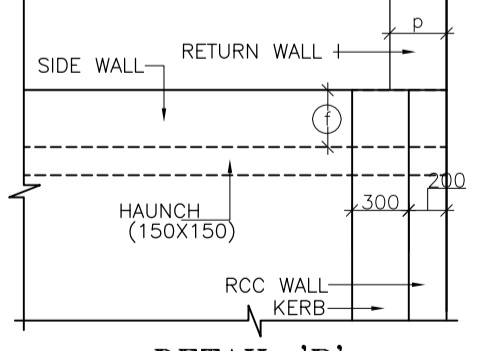
DETAIL 'D'
SCALE=1:40



SECTION 4-4
(SHOWING RETURN WALL- II)
SCALE=1:50



DETAIL 'C'
SCALE=1:40



DETAIL 'B'
SCALE=1:40

- NOTES :
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE : BOX CELL STRUCTURE = M25 CURTAIN WALL = M25 LEVELLING COURSE (P.C.C.) = M15 RETURN WALL = M25 RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\phi = 1.81/m^3$, $\phi = 30^{\circ}$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 UN³ BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/SLP/SE/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN

DATE: SEPT, 2016

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 - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0) WITH CATCH PIT & SLOPED PROTECTION

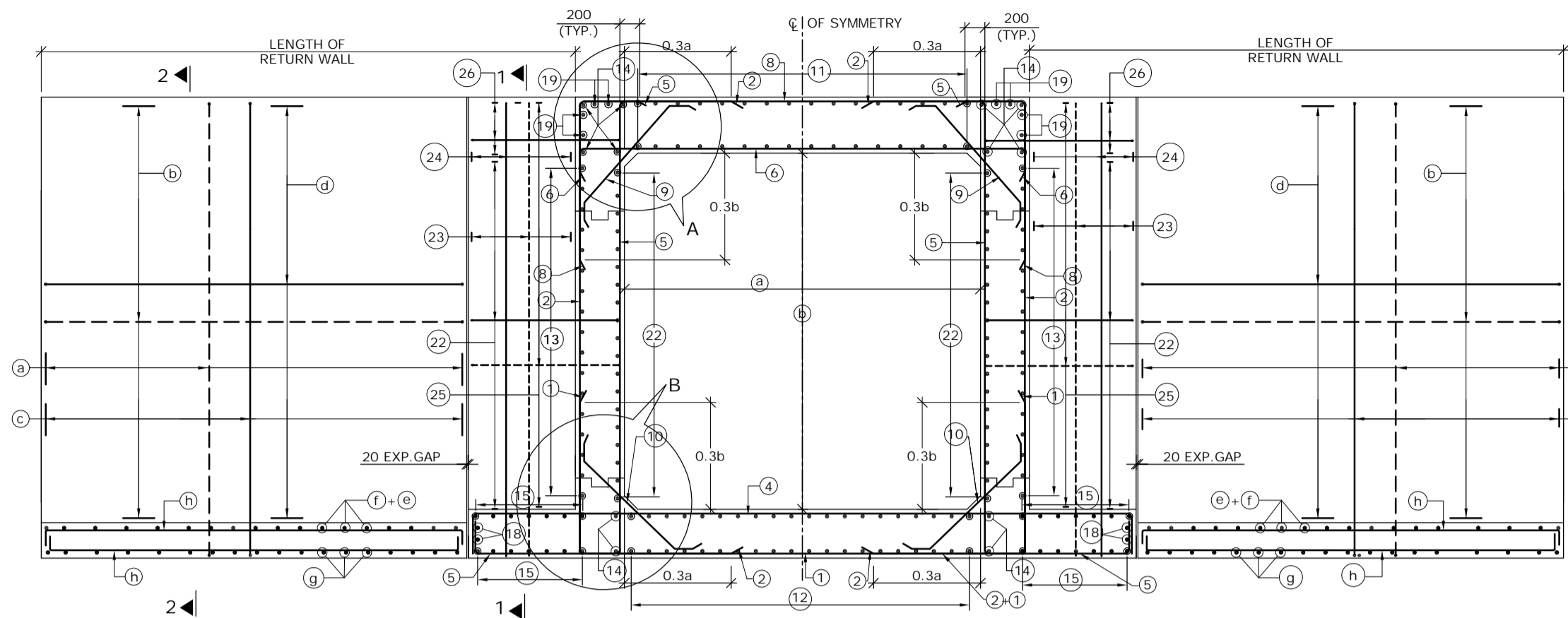
Package :- IV District :- SENAPATI
Existing Chainage :- 88+520 to 114+165
Design Chainage :- 81+870 to 105+825

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

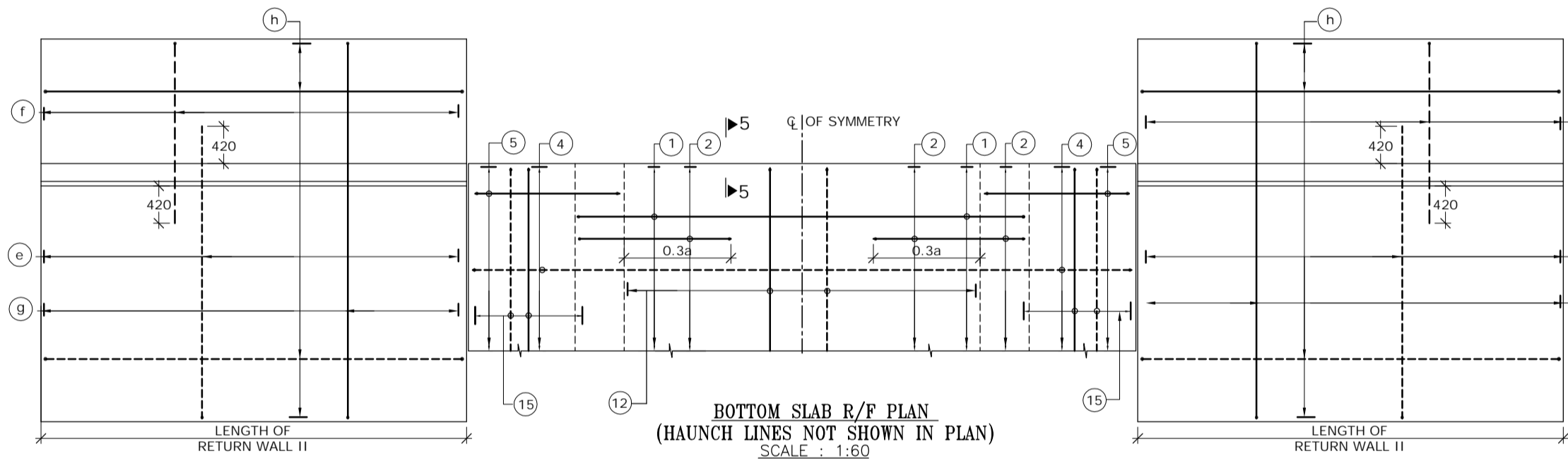
CETEST
Engineering Consultants

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/SLP/SE/GA (SHEET NO-01 OF 01)

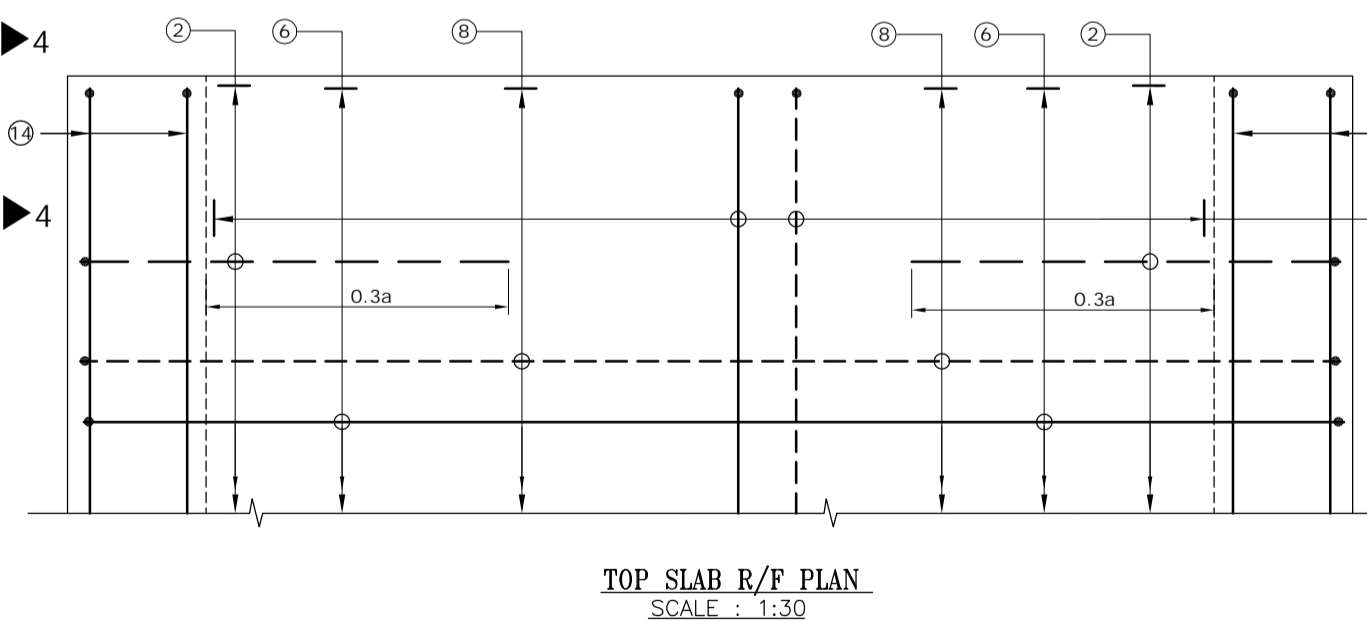
Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	-	Avishek Dey	Soubhik Sadhu



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

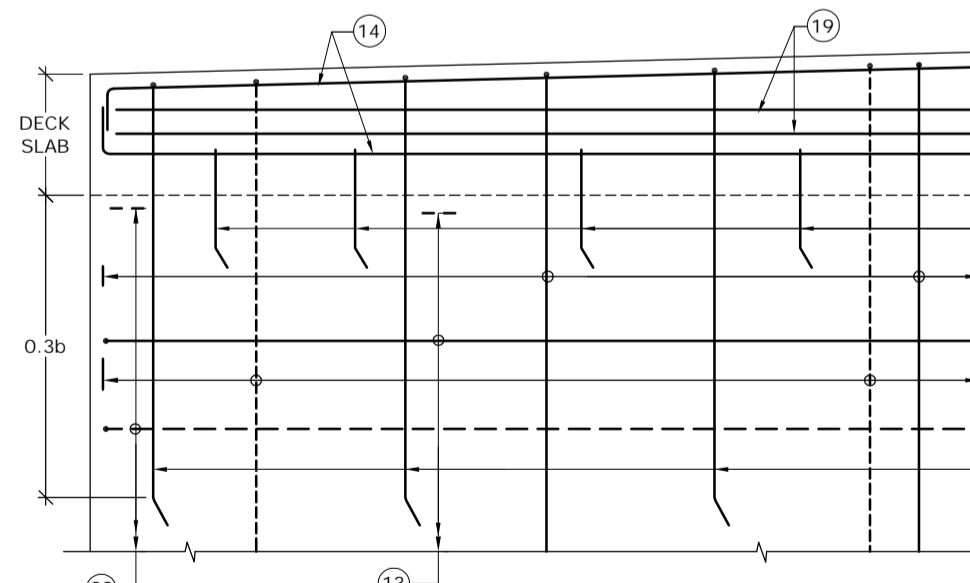


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

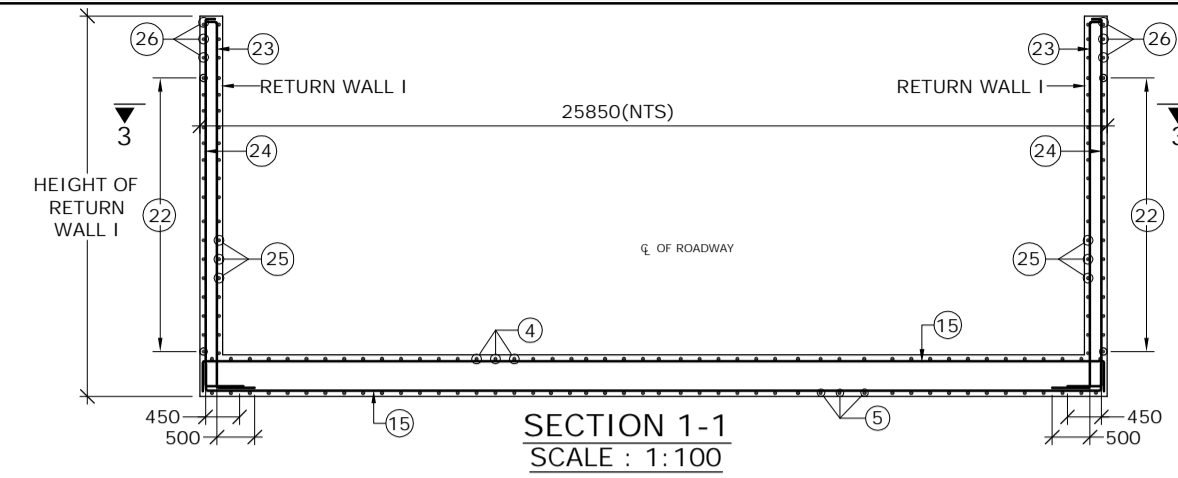


TOP SLAB R/F PLAN
SCALE : 1:30

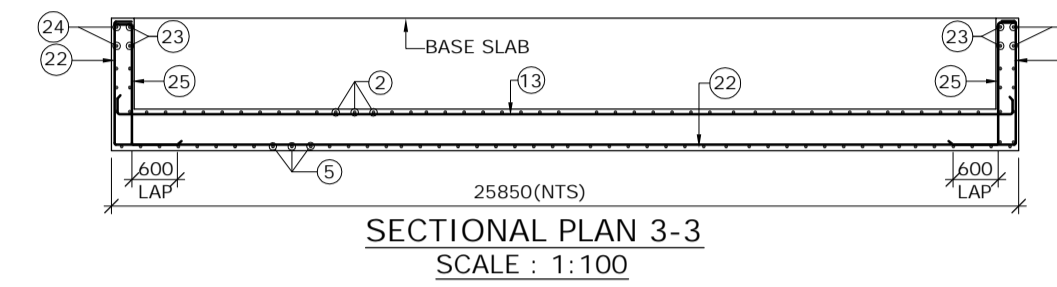
(BAR MARK (5), (19), KERB &
HAUNCH LINES NOT SHOWN IN PLAN)



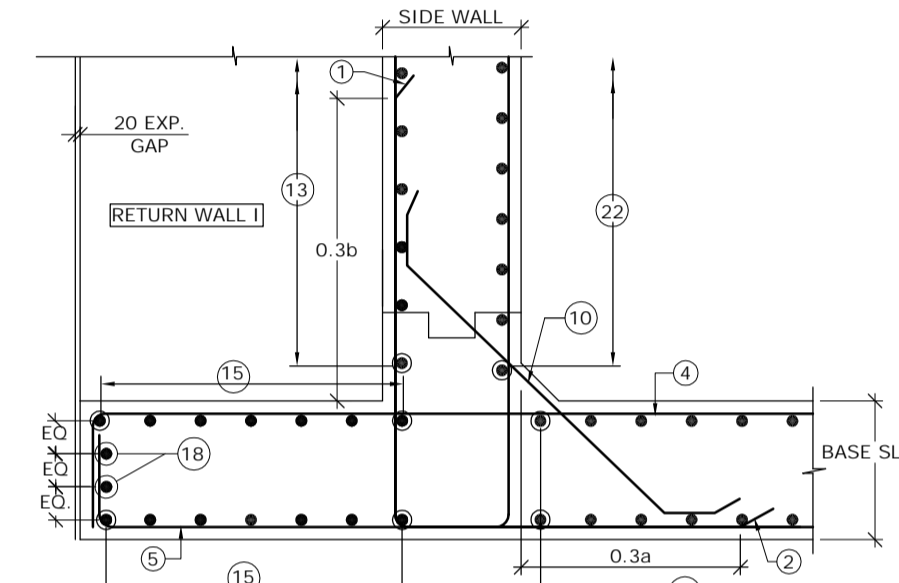
VIEW 4-4
SCALE : 1:30



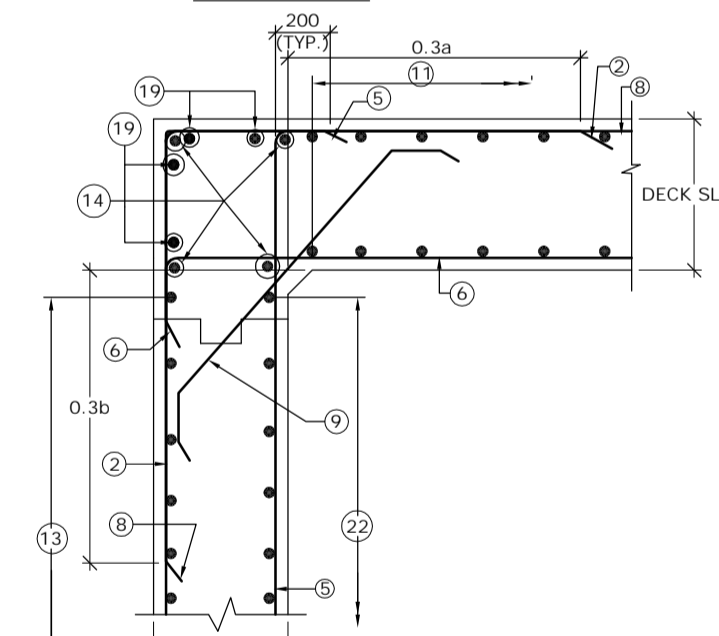
SECTION 1-1
SCALE : 1:100



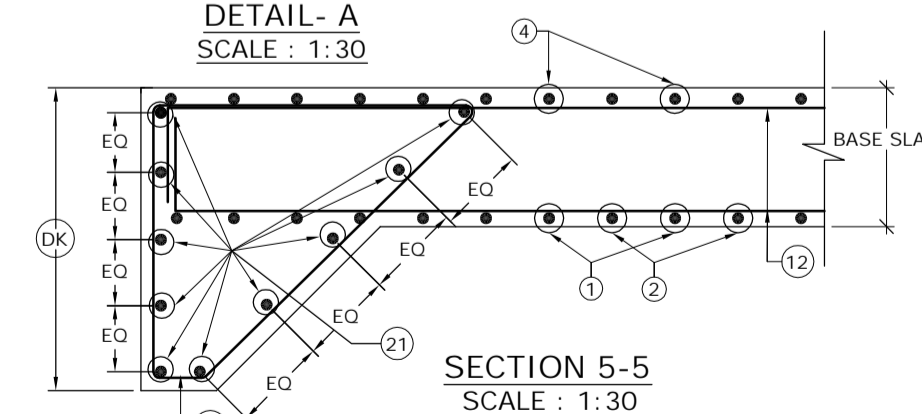
SECTIONAL PLAN 3-3
SCALE : 1:100



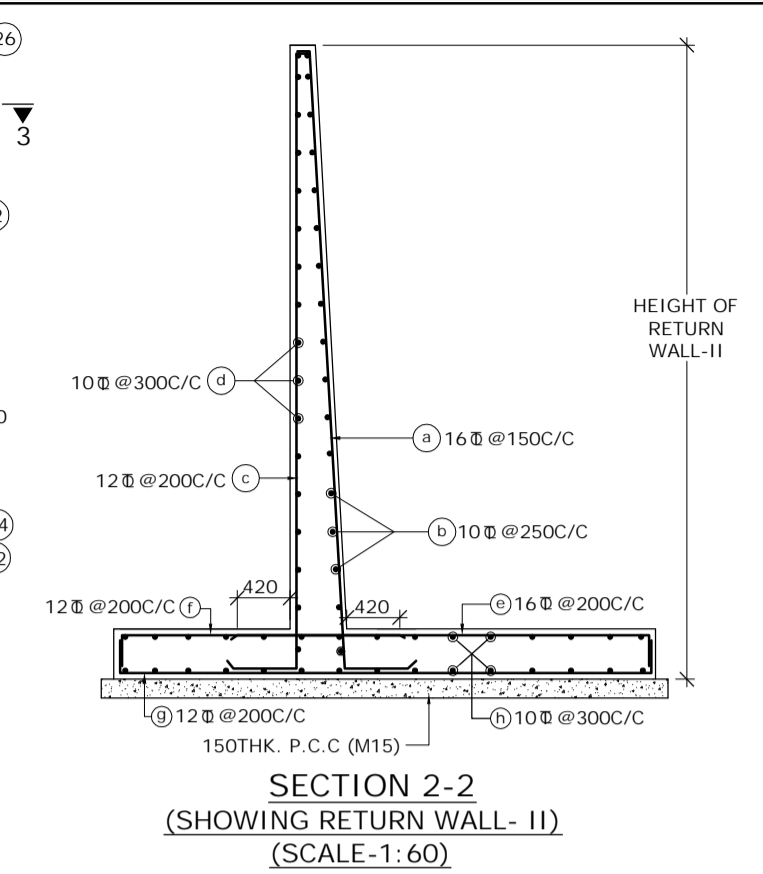
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30





SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
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(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
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 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
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SCALE: AS SHOWN 					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.					REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0)					CONSULTANT : CE TESTING COMPANY PVT. LTD.  124-A, N.S.C. Bose Road Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/CP/SLP/SE/RCC				
PROJECT: Consultancy Services for Preparation of Feasibility Study and Detailed Project Report for Two Lining with Paved Shoulder of Ukhrul - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.					Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825					Drawn By. S. Chattrjee Design By. - Checked By. Avishek Dey Approved By. Soubhik Sadhu					DATE: SEPT, 2016									
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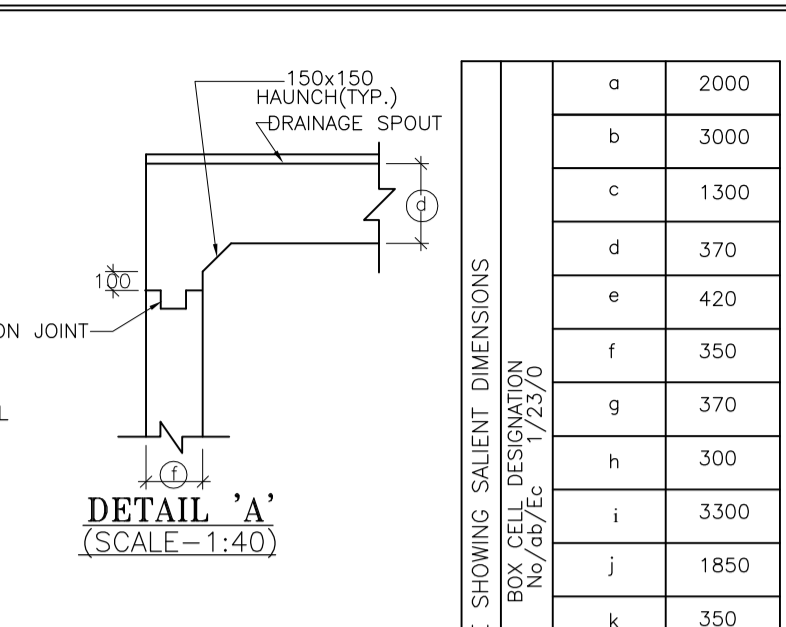
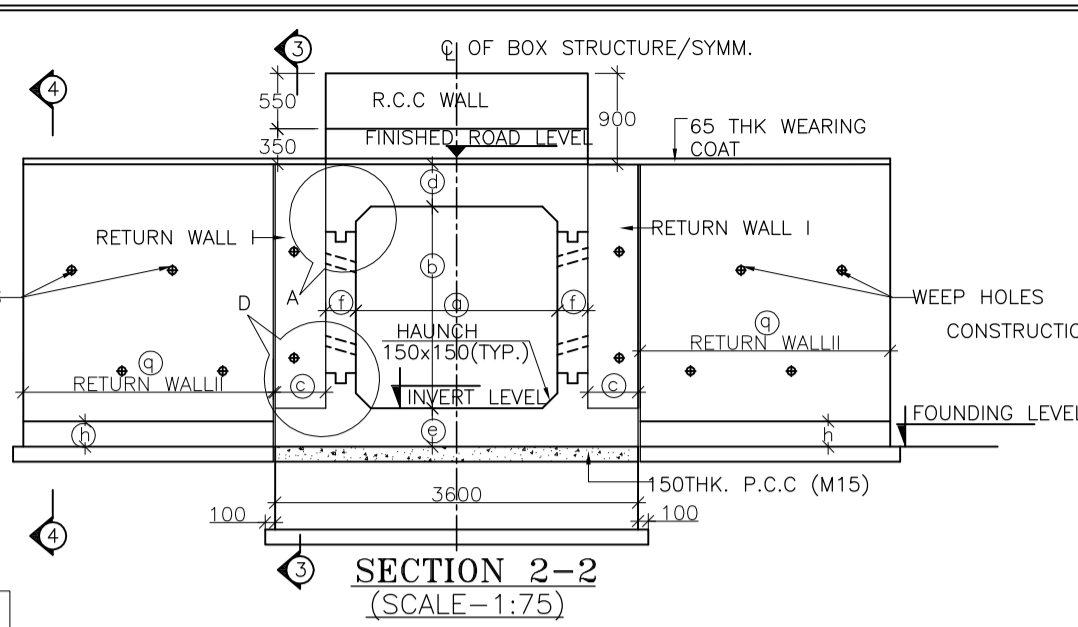
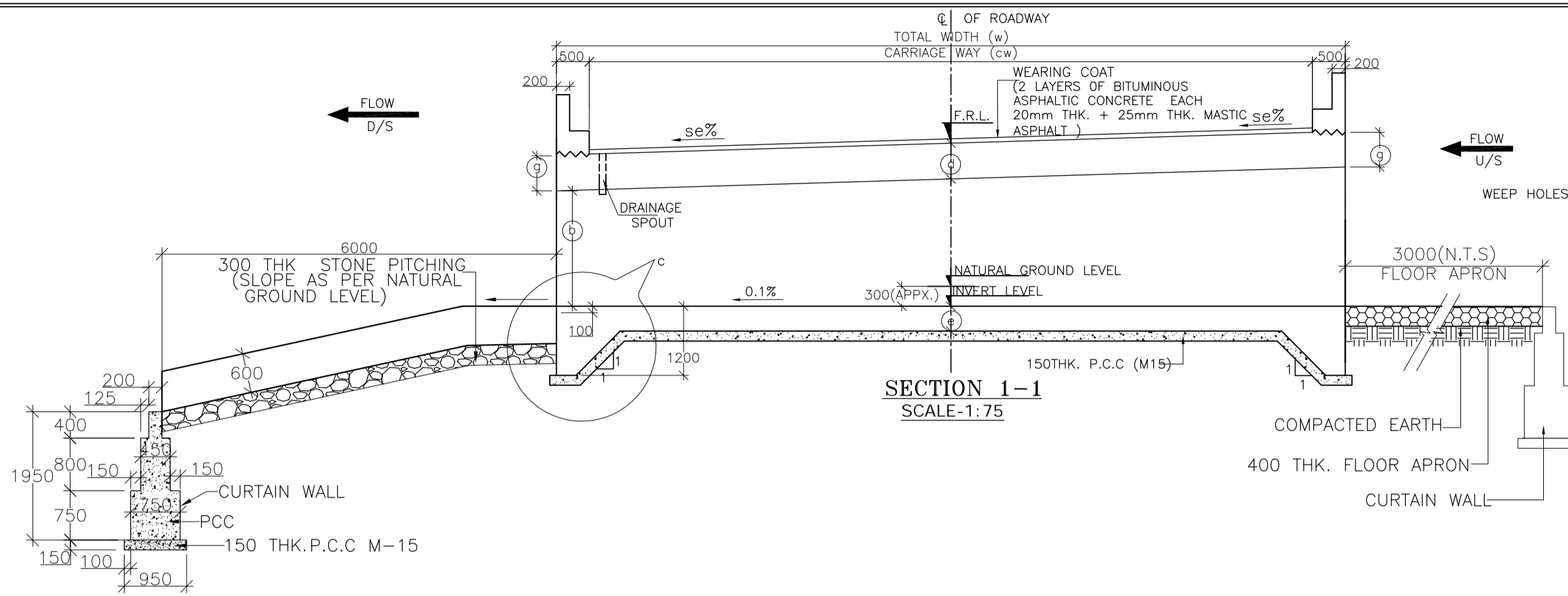
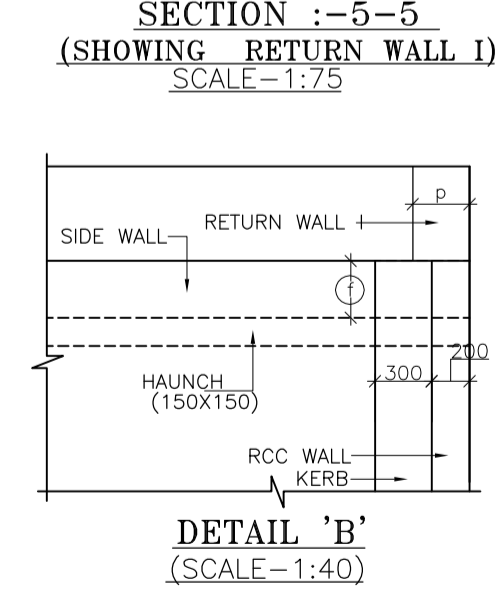
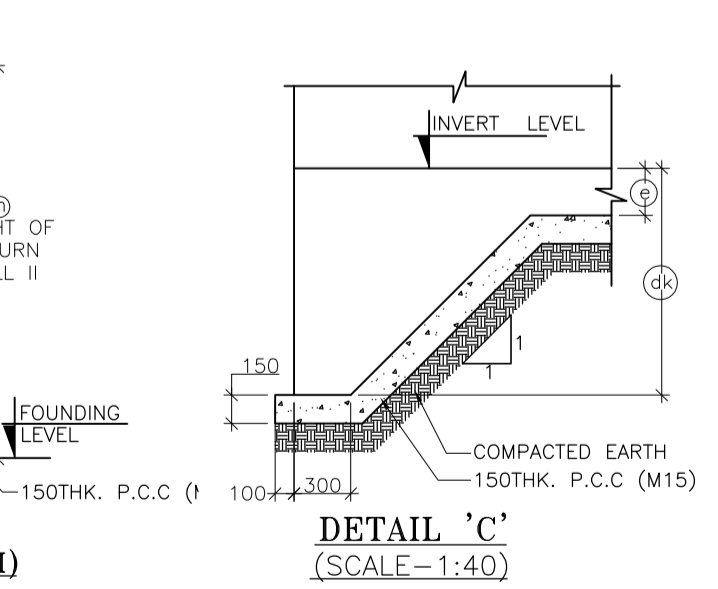
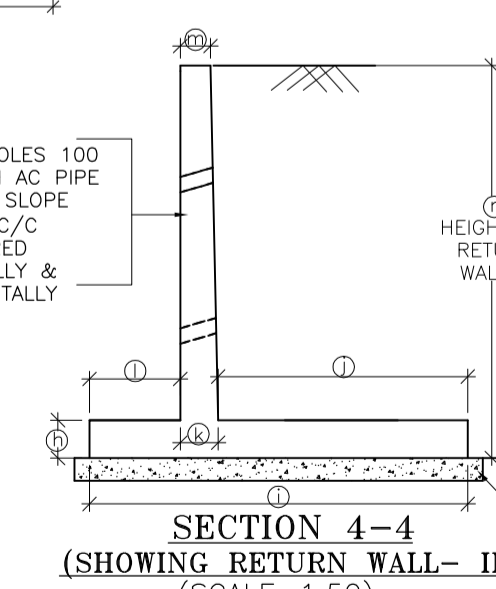
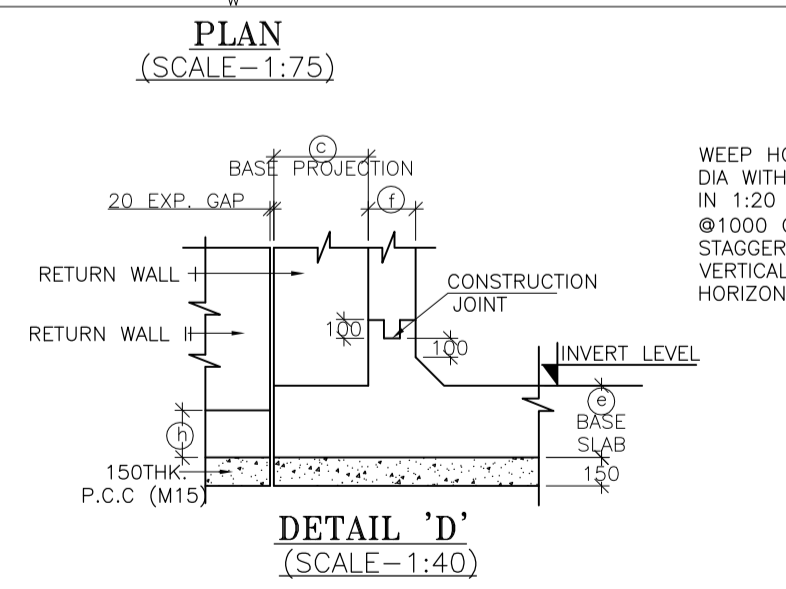
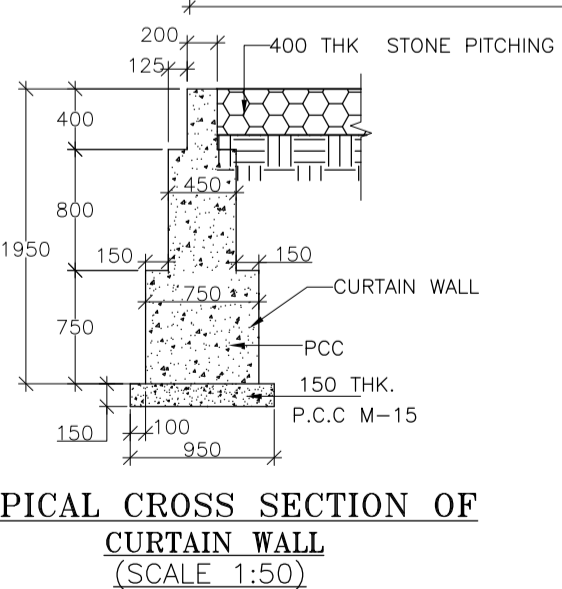
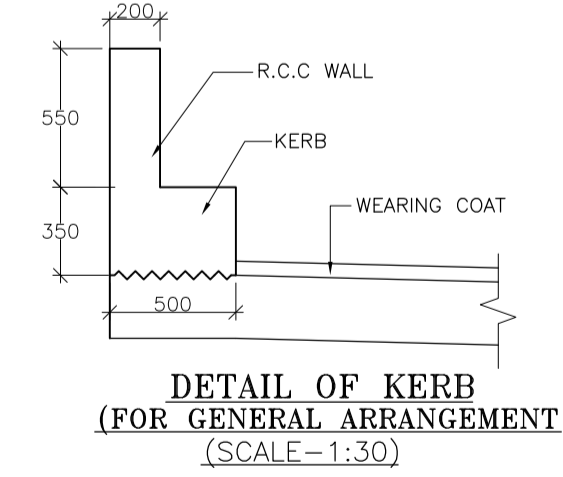
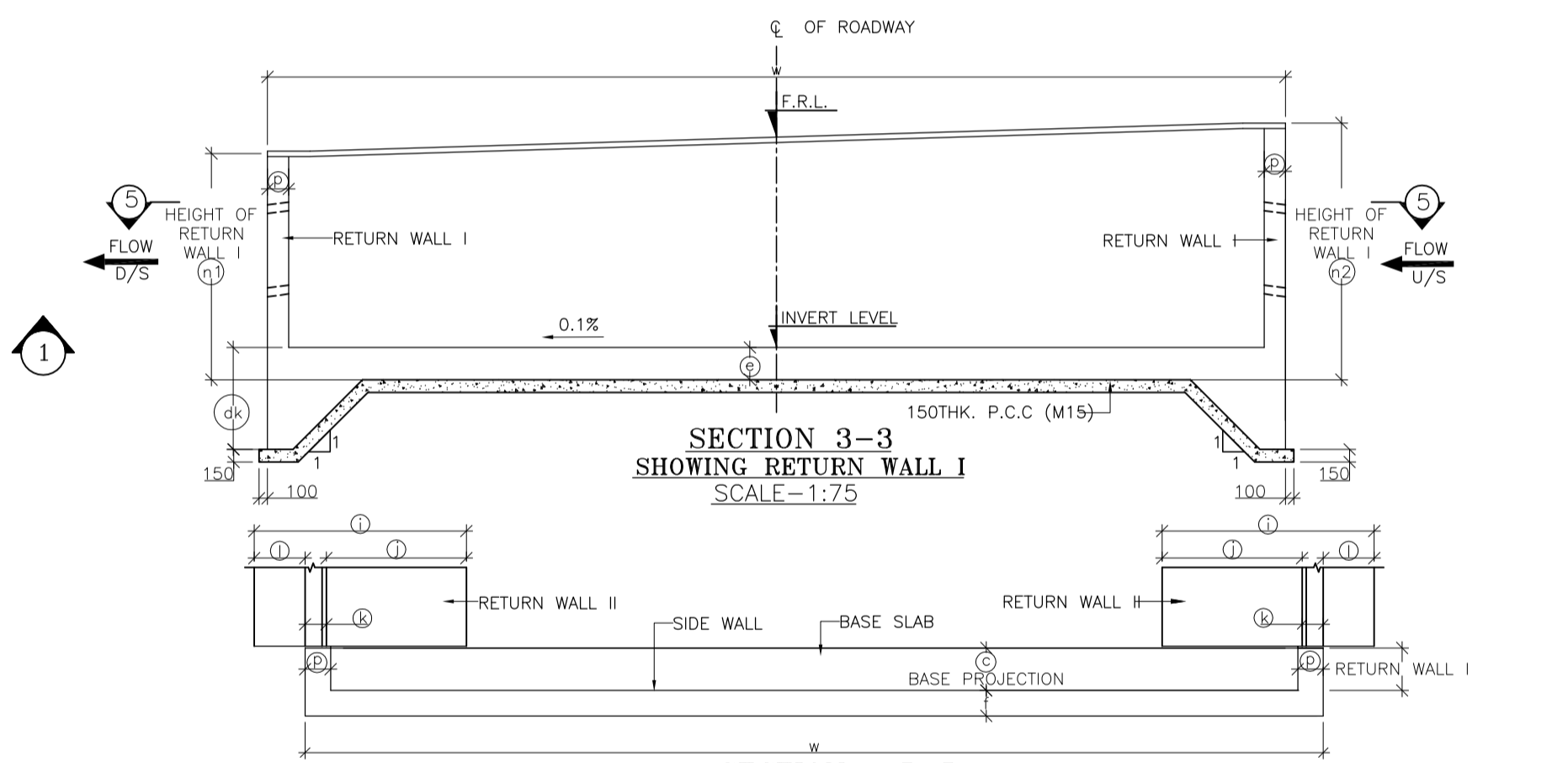
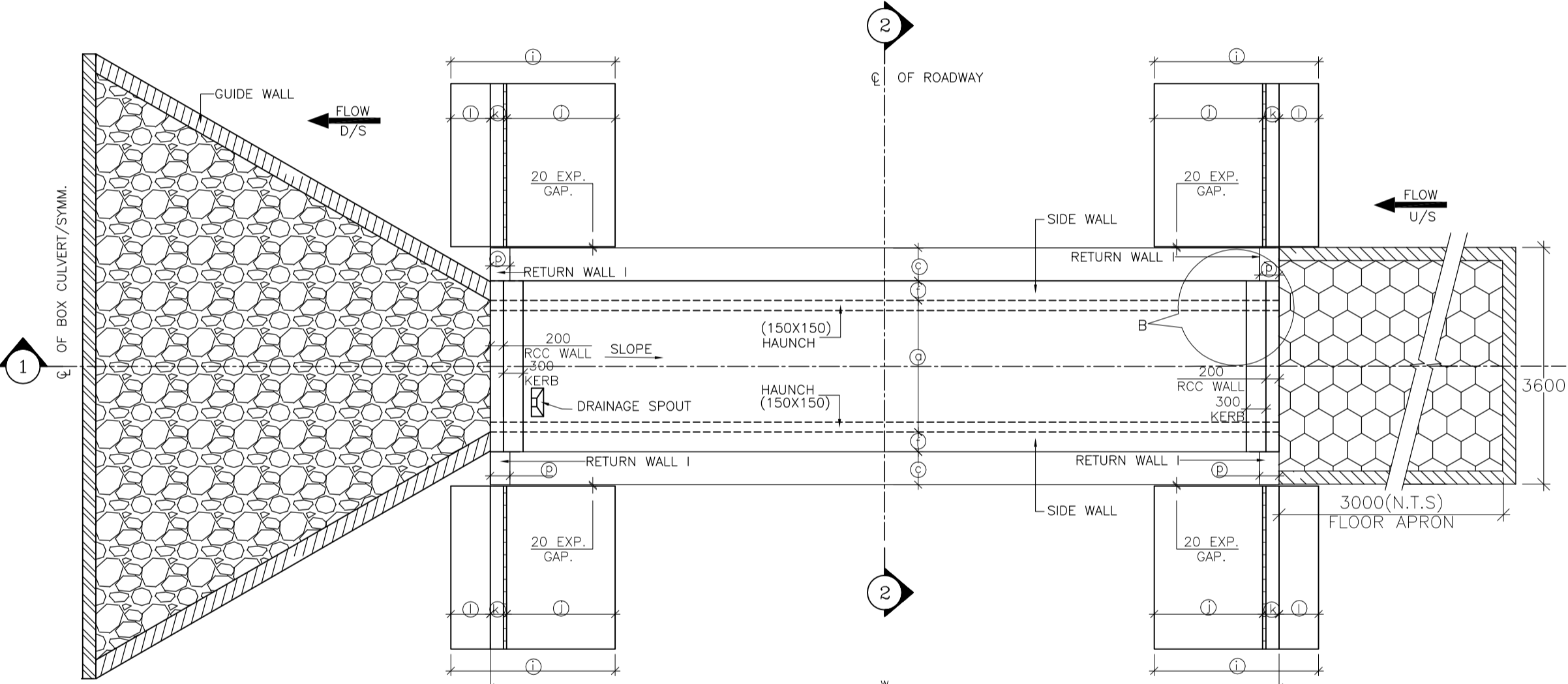


TABLE SHOWING SALIENT DIMENSIONS

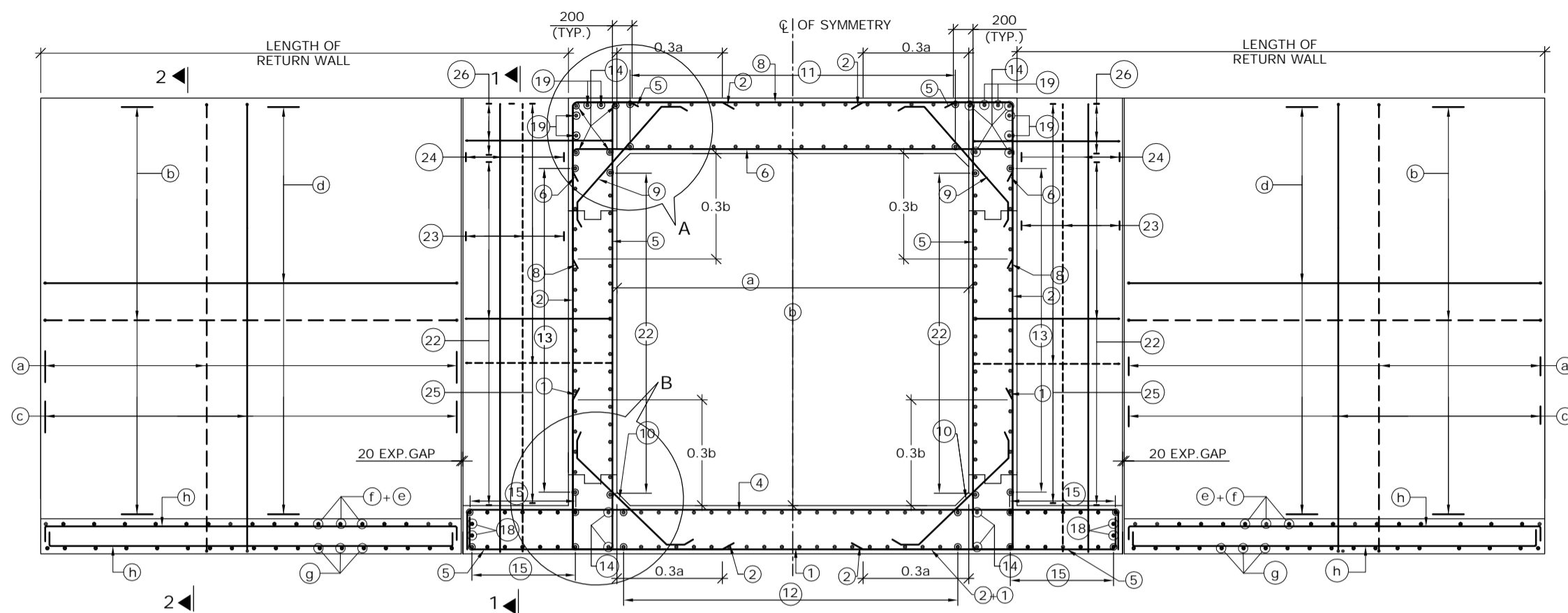
BOX CELL DESIGNATION No./Sp/Ec	1/23/0
a	2000
b	3000
c	1300
d	370
e	420
f	350
g	370
h	300
i	3300
j	1850
k	350
l	1100
m	200
n1	3532
n2	4049
p	300
q	4000
dk	1200

STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Super Elevation (%)	SLOPE SIDE	Total Road width	Protection Type	Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall
							U/S D/S			n1 n2
104/1	103+085	1534.282	2X3X1 Cell	4.70	L TO R	11.00	No Catch pit Slope	1531.082	1530.662	3.790 4.260

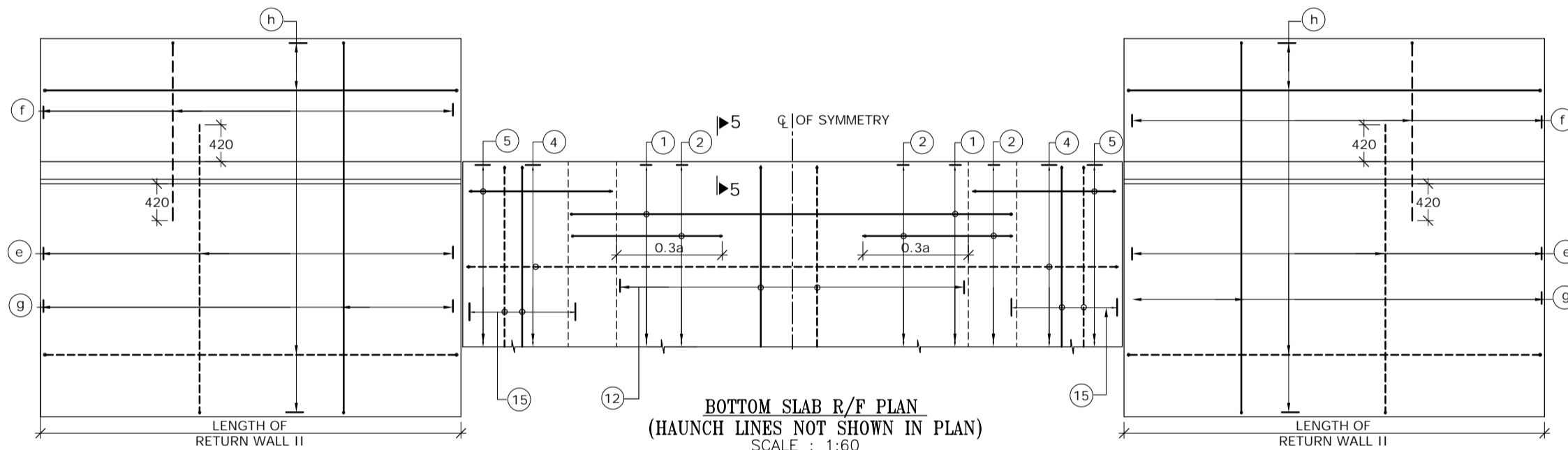


- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE = M25
CURTAIN WALL = M25
LEVELLING COURSE (P.C.C.) = M15
RETURN WALL = M25
RCC WALL & KERB = M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS 7R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.8 \text{ t/m}^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 t/m² BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/SLP/F/SE/RCC (SHEET NO-01)

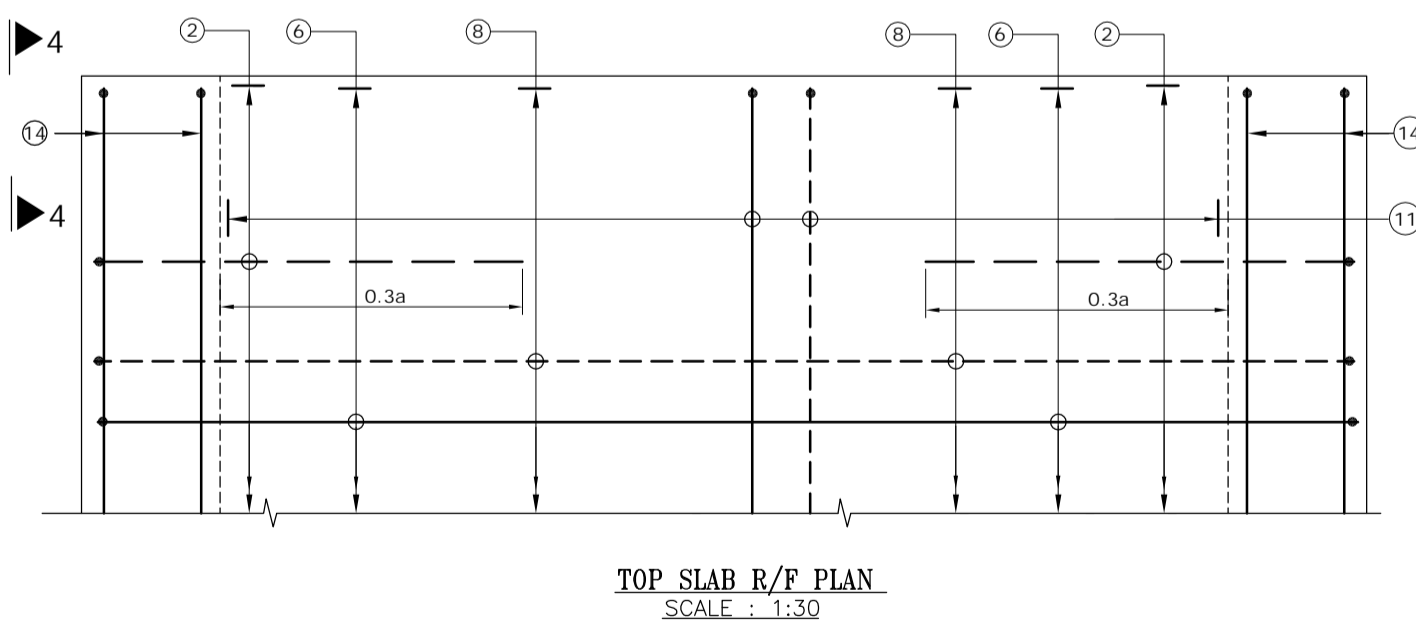
SCALE: AS SHOWN DATE: SEPT, 2016					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0) WITH FLOOR APRON & SLOPPED PROTECTION					CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road, Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/SLP/F/SE/GA				
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.					Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825					Drawn By. A. Sahoo					Design By. - Checked By. Avishek Dey Approved By. Soubhik Sadhu									
REVISIONS																								



REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:60

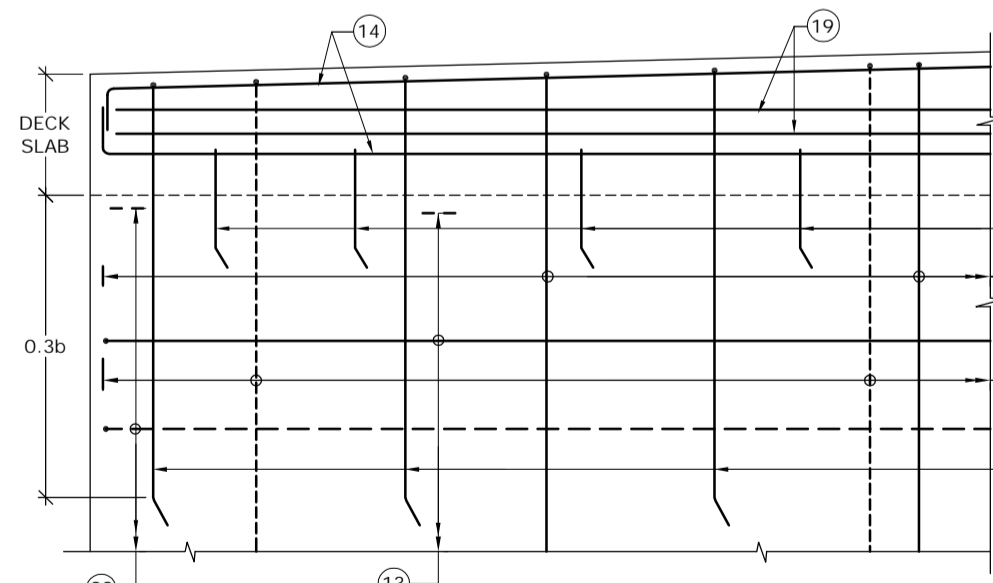


BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:60

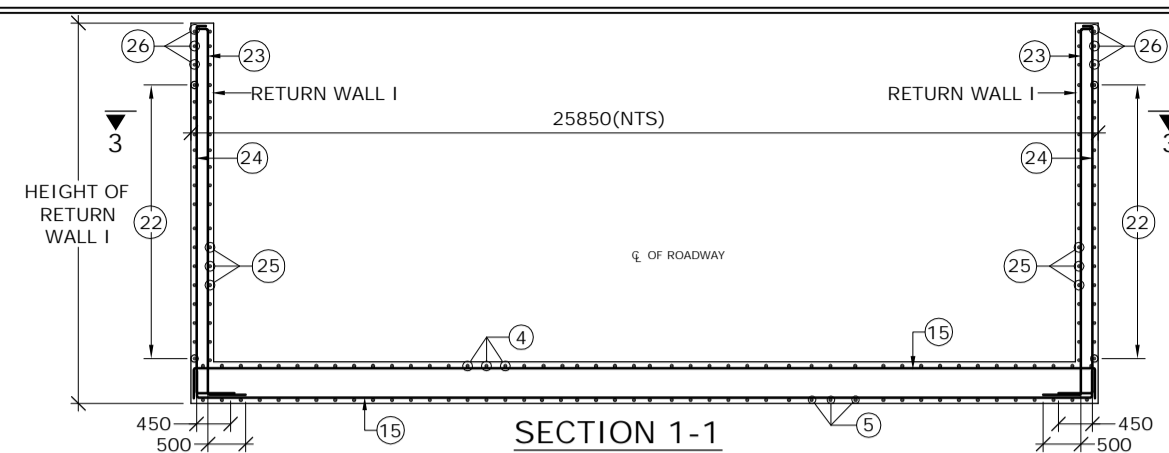


TOP SLAB R/F PLAN
SCALE : 1:30

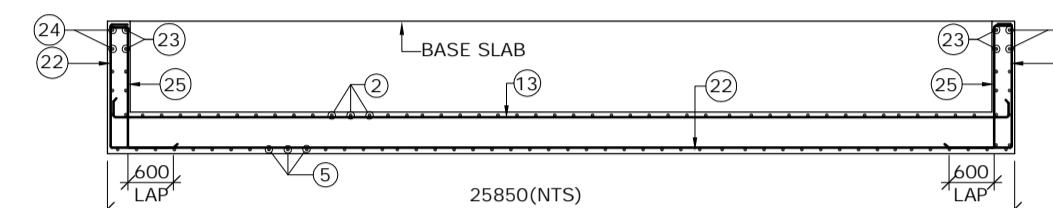
(BAR MARK (5), (19), KERB &
HAUNCH LINES NOT SHOWN IN PLAN)



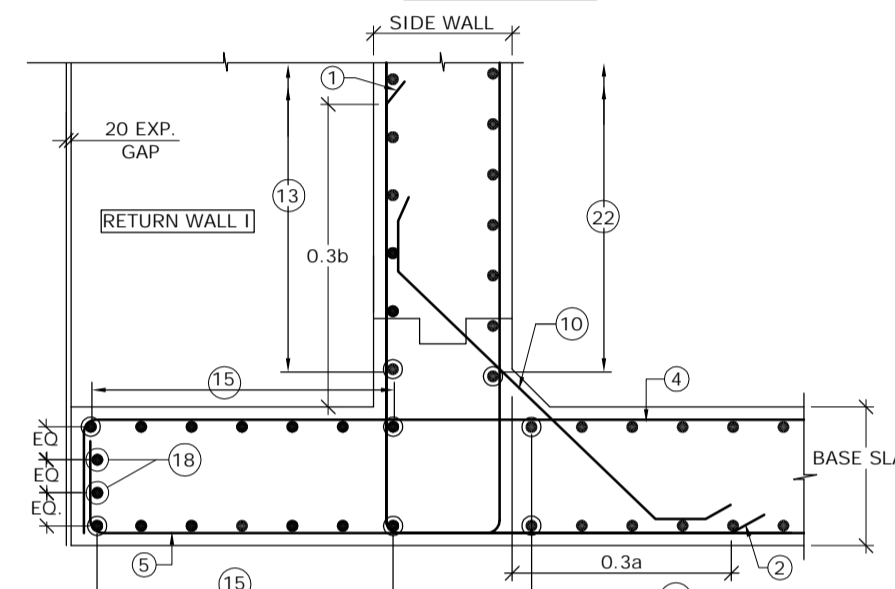
VIEW 4-4
SCALE : 1:30



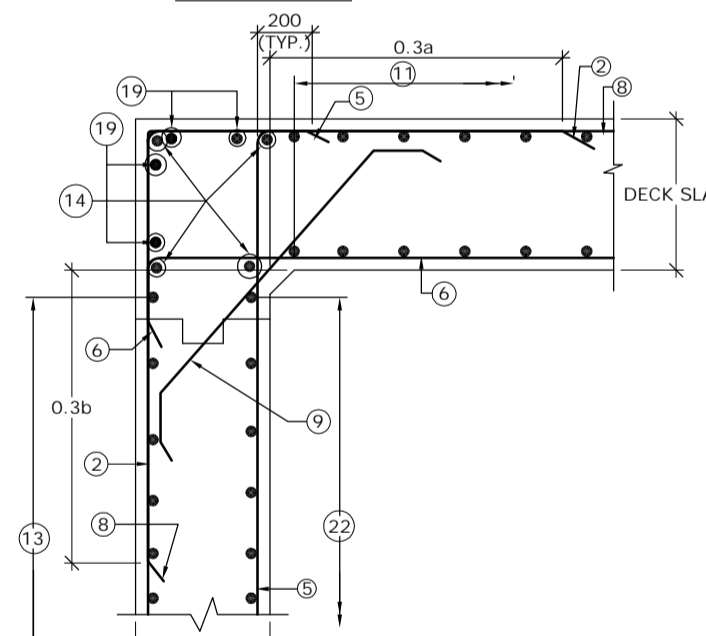
SECTION 1-1
SCALE : 1:100



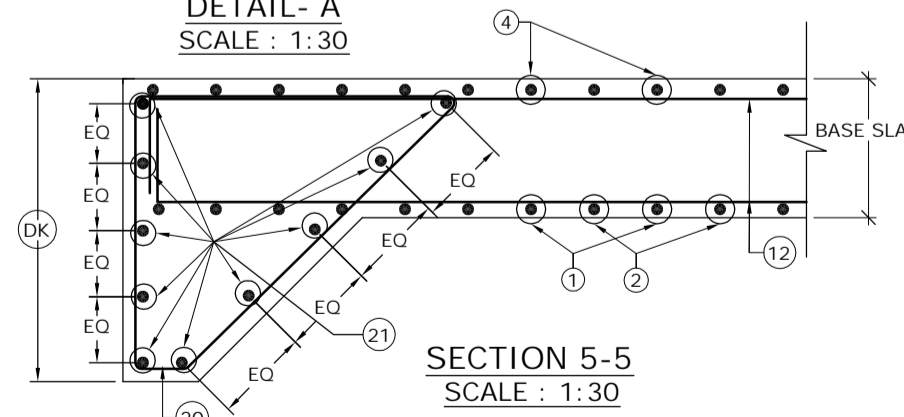
SECTIONAL PLAN 3-3
SCALE : 1:100



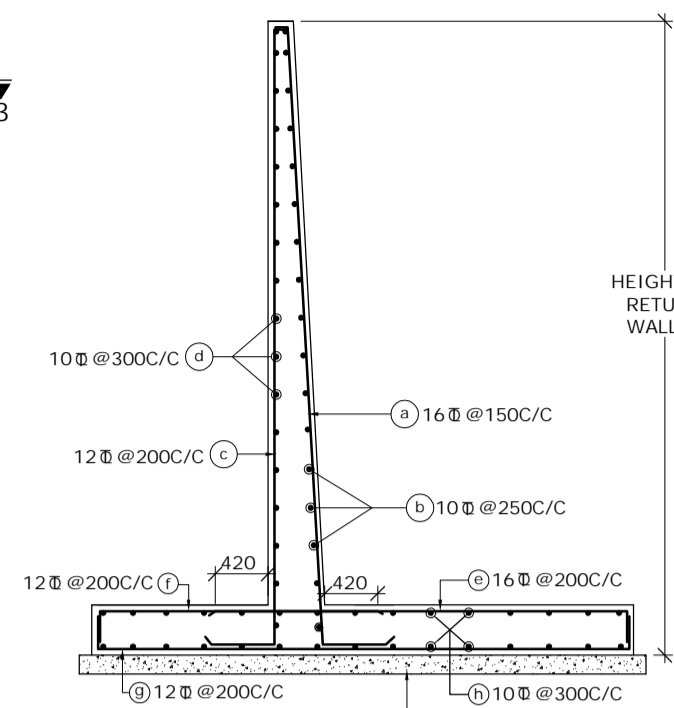
DETAIL - B
SCALE : 1:30



DETAIL - A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



SECTION 2-2
(SHOWING RETURN WALL - II)
(SCALE-1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
(1)	10	250	(13)	10	250
(2)	16	250	(14)	10	-
(3)	BAR NOT USED		(15)	10	250
(4)	16	250	(16)	12	-
(5)	16	250	(17)	12	250
(6)	16	250	(18)	10	-
(7)	BAR NOT USED		(19)	10	-
(8)	10	250	(20)	10	150
(9)	10	250	(21)	10	-
(10)	12	250	(22)	10	250
(11)	10	250	(23)	10	200
(12)	10	250	(24)	10	200
			(25)	12	125
			(26)	10	250

LEGEND :-
 REAR FACE / TOP FACE / EARTH FACE BAR - - - - -
 FRONT FACE / BOTTOM FACE / OPPOSITE TO EARTH FACE BAR - - - - -

- NOTES :-
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MORTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/SLP/F/SE/GA (SHEET NO-01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 - Tolo - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0)

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 ANISUWA, 3480, 8, CHHAGANPUR
 Certified Company

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2X3_1/SLP/F/SE/RCC

Drawn By.	Design By.	Checked By.	Approved By.
A. Sahoo	-	Avishek Dey	Soubhik Sadhu

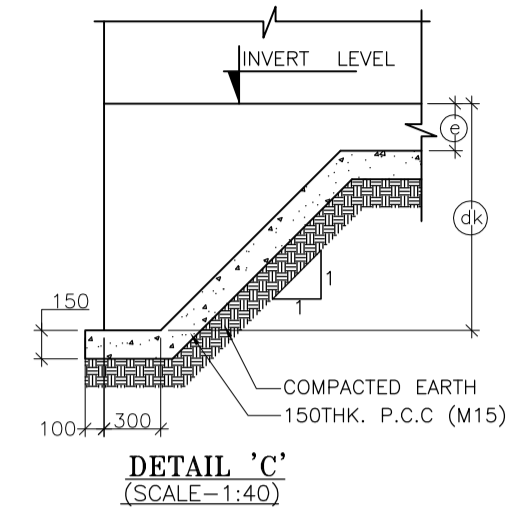
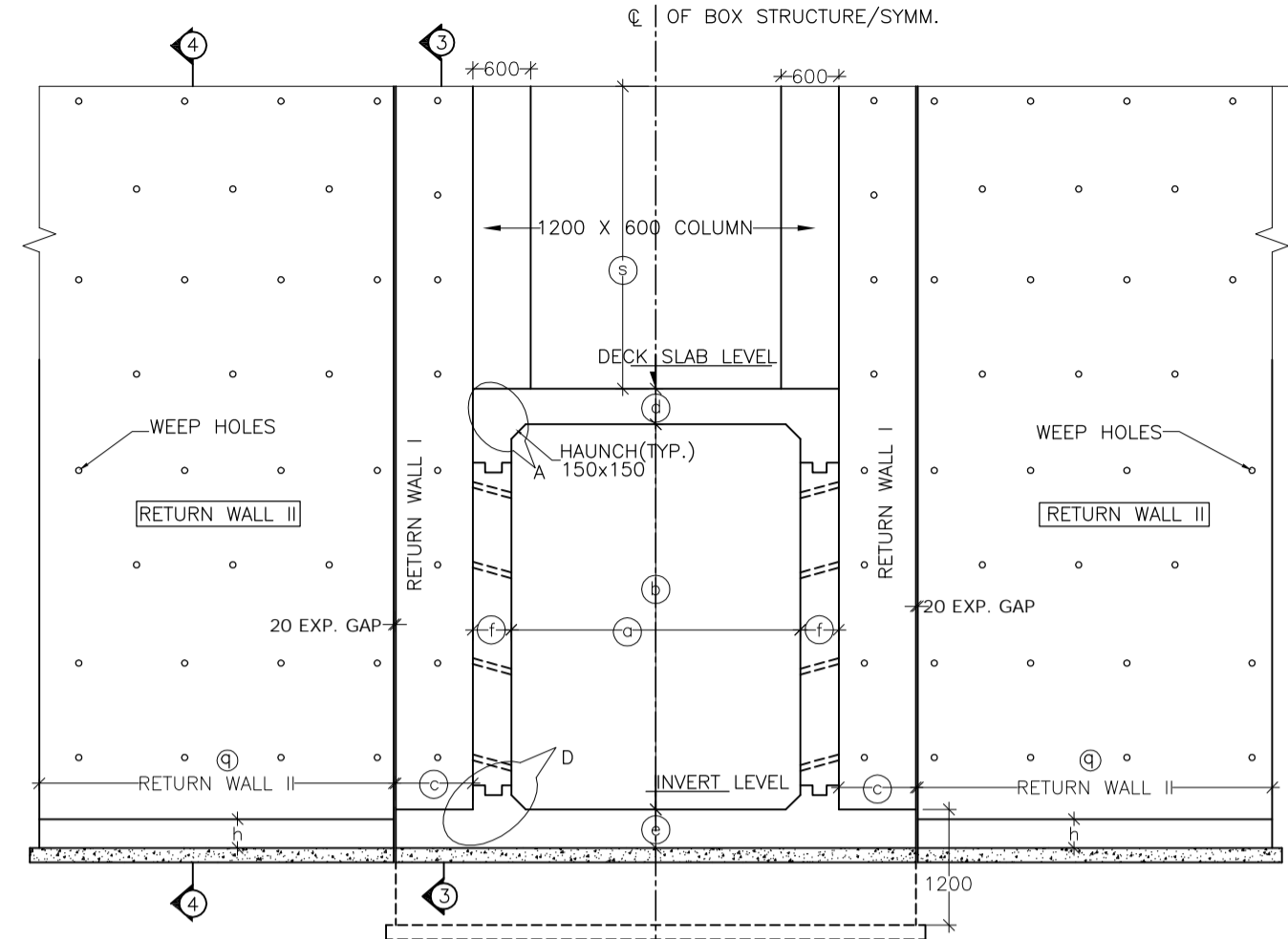
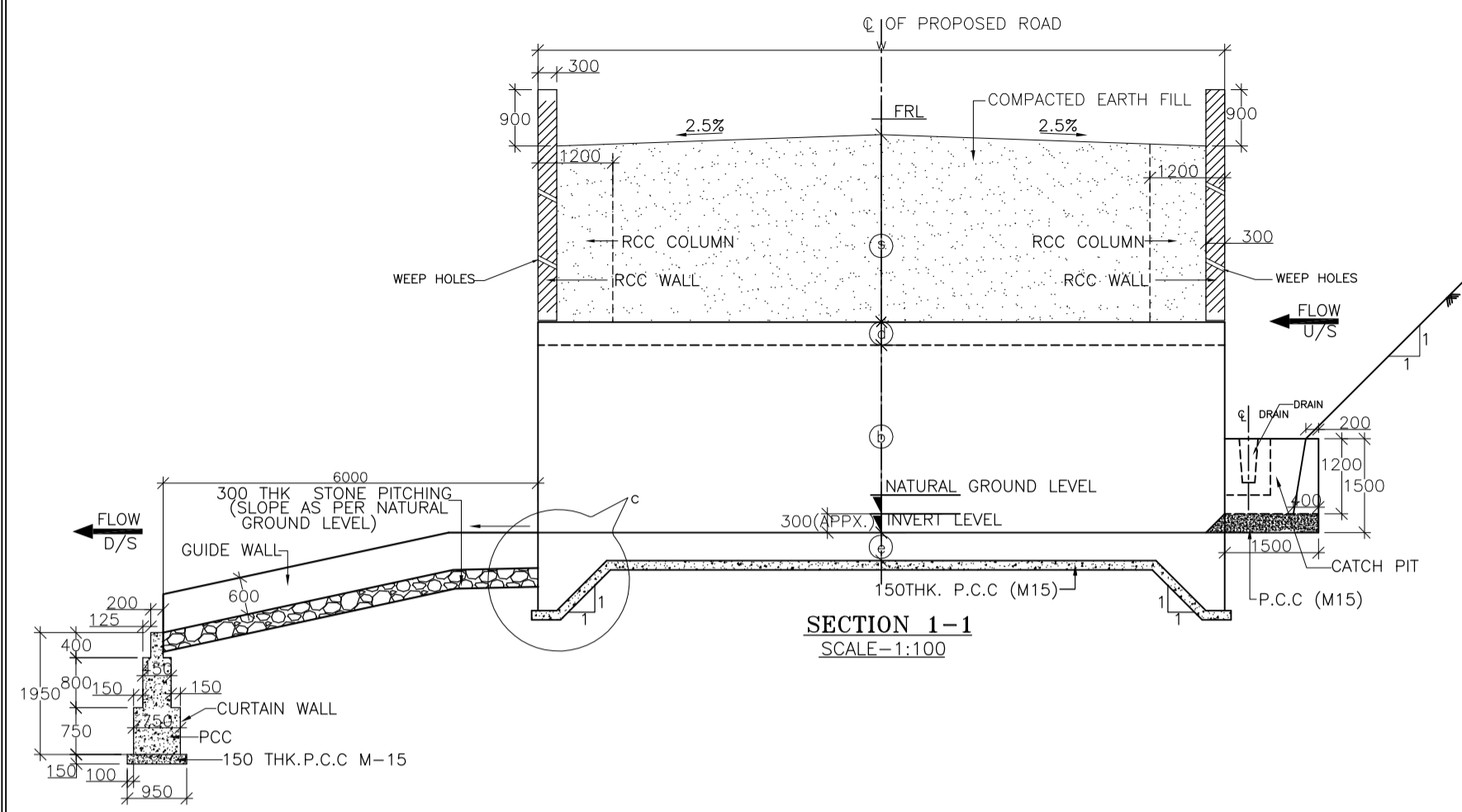
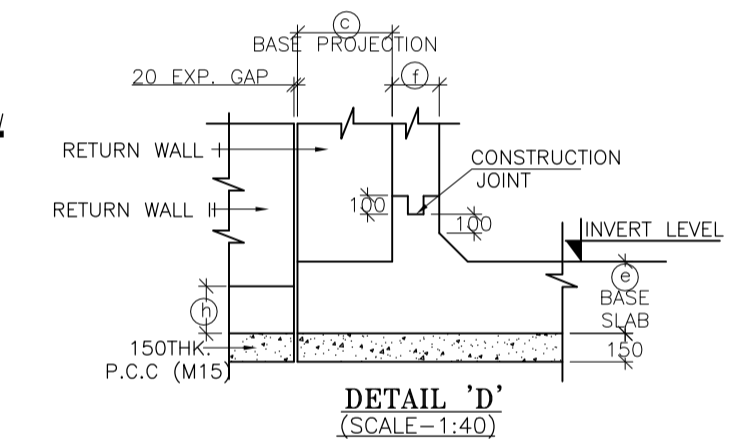
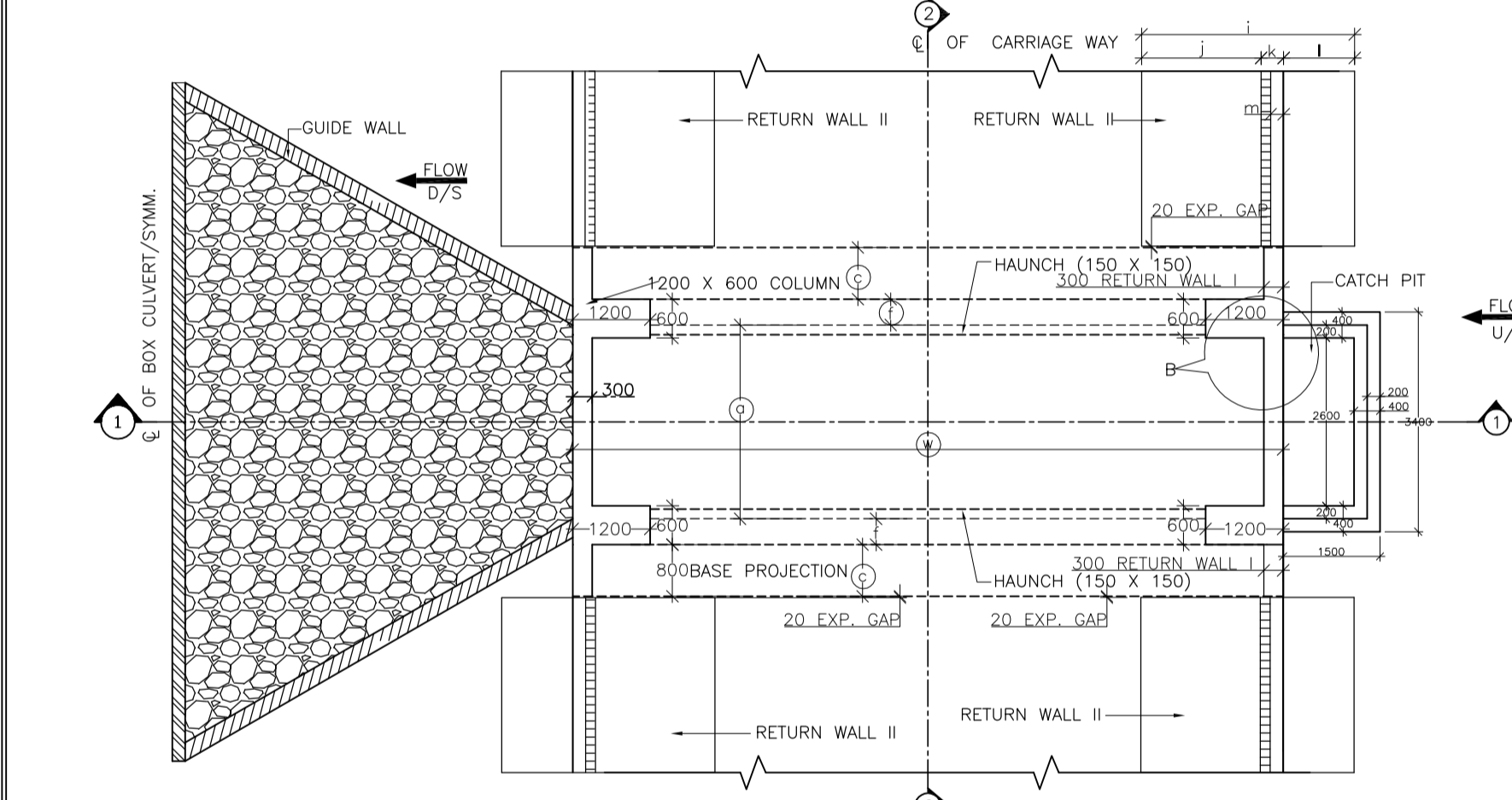
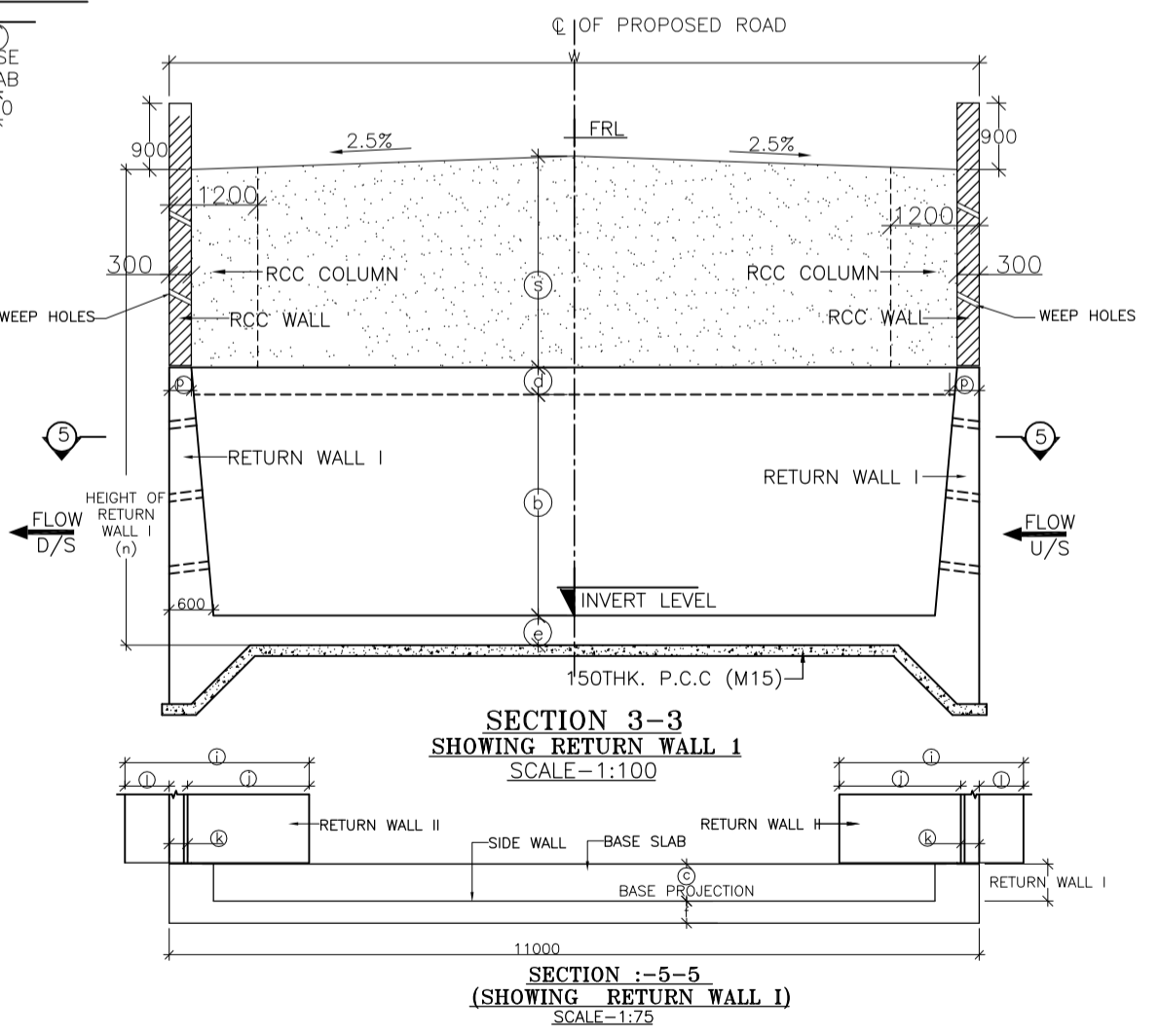
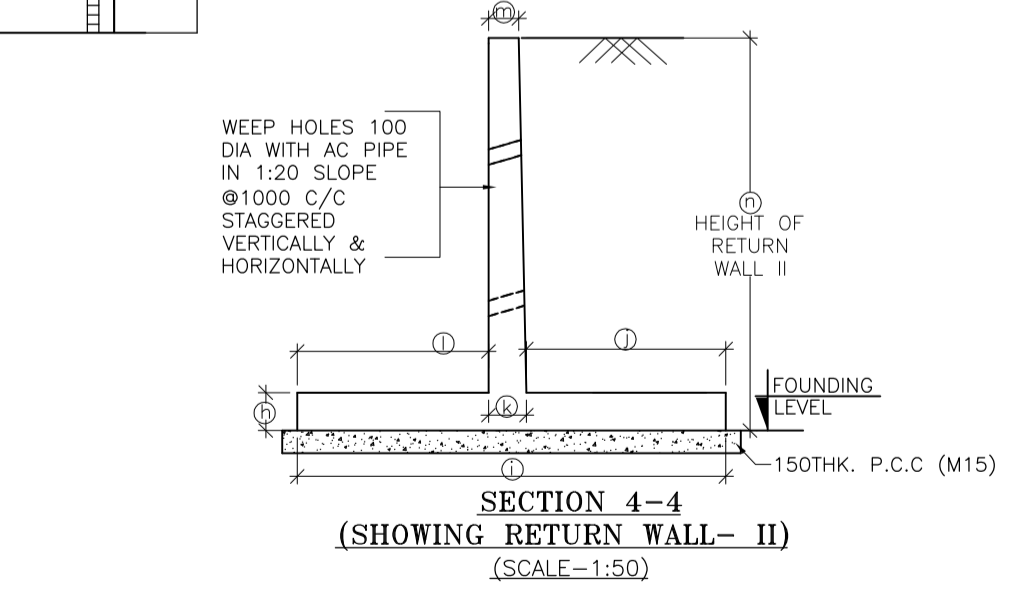
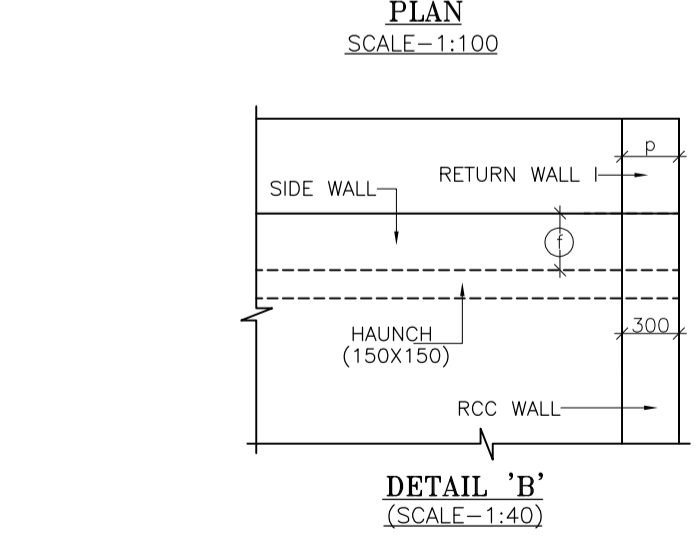
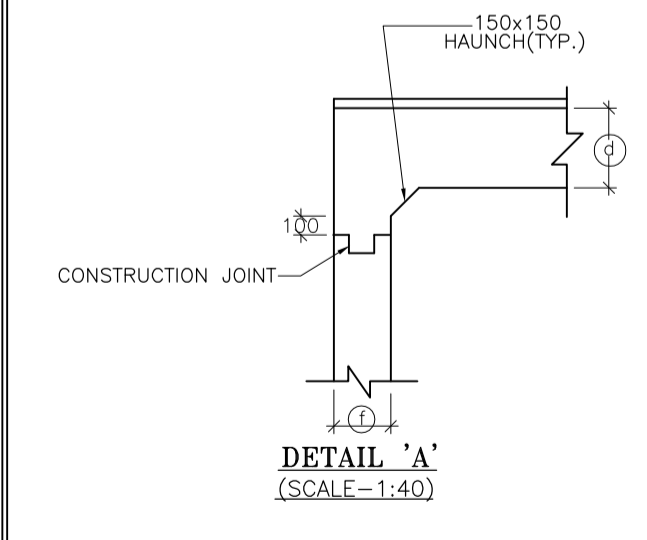


TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION	No. of Cell / 2.5/1.5
a	2000
b	3000
c	1100
d	280
e	300
f	350
h	300
i	5600
j	3100
k	600
l	1900
m	300
n	6520
p	300
q	8400
s	3000
dk	1200

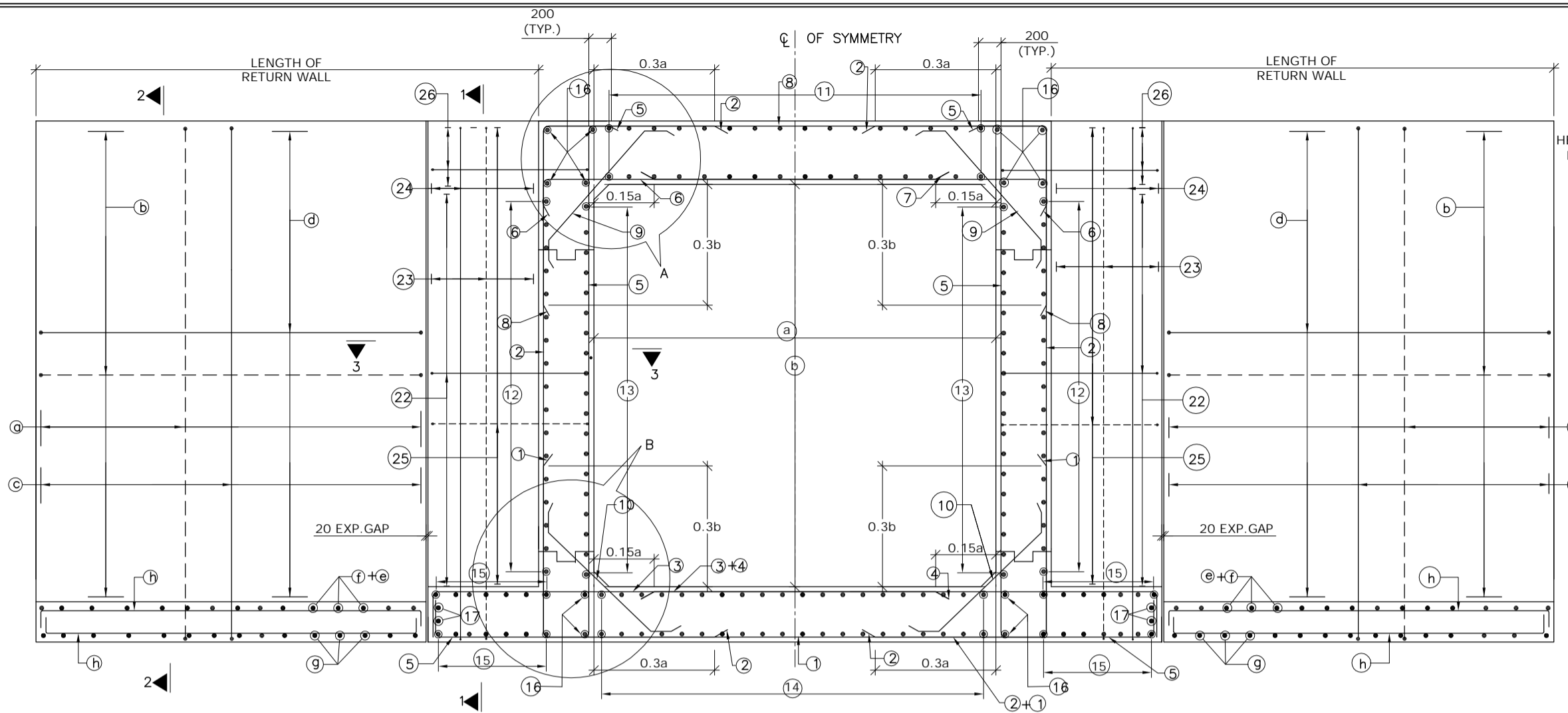


STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Cushion Height (m)	Super Elevation (%)	Total Road width	Protection Type		Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)
							U/S	D/S		
104/3	103+568	1531.903	2X3X1 Cell Earth Cushion	3.00	Normal Camber	13.00	With Catch pit	Slope	1525.473	1525.173

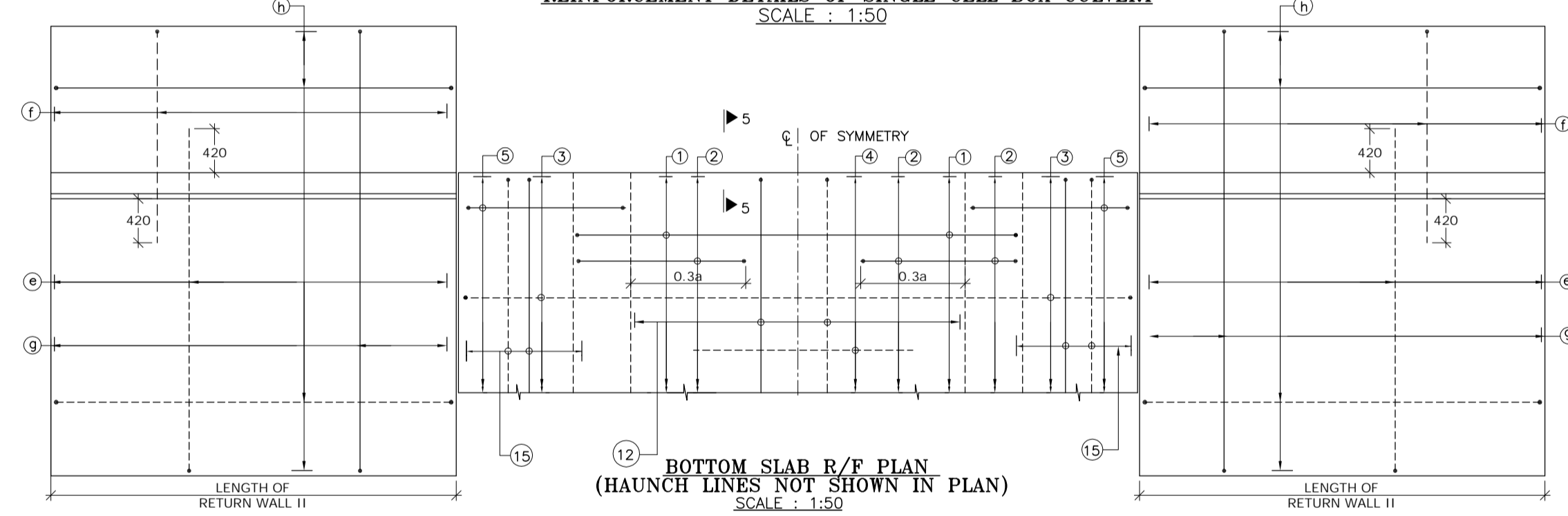


- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE :
BOX CELL STRUCTURE - M25
CURTAIN WALL - M25
LEVELLING COURSE (P.C.C.) - M15
RETURN WALL - M25
RCC WALL & KERB - M25
 - GRADE OF STEEL Fe 500 AS PER I.S.-1786.
 - CLASS FOR TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\rho = 1.8t/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM $15 t/m^2$ BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1.3M EC/CP/SLP/NC/RCC (SHEET NO-01)

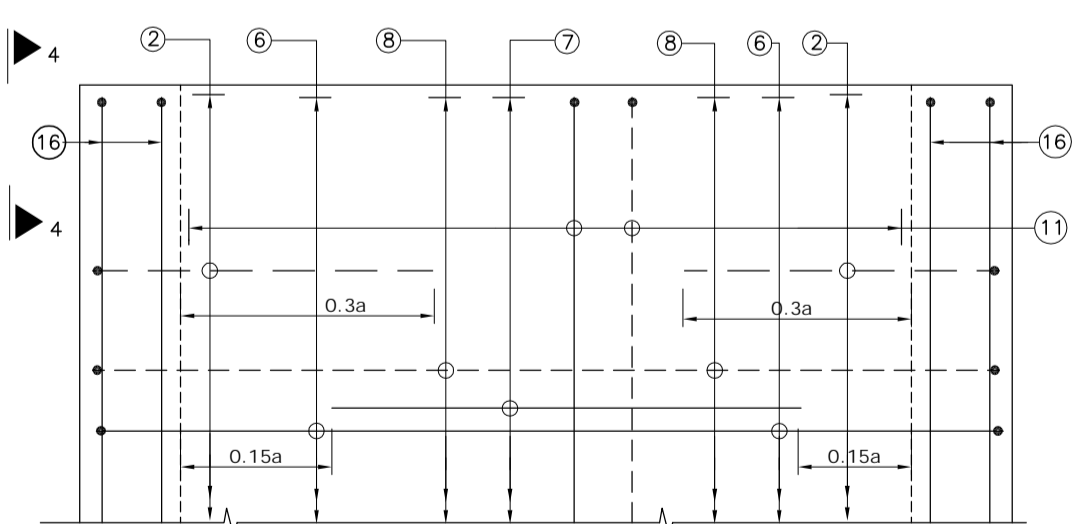
<table border="1"> <thead> <tr> <th>MKD.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>CHKD.</th> <th>APPRD.</th> </tr> </thead> <tbody> <tr> <td colspan="5">REVISIONS</td> </tr> </tbody> </table>					MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	REVISIONS					SCALE: AS SHOWN DATE: SEPT, 2016		CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (2.0 X 3.0) WITH 3.0M EARTH CUSHION WITH CATCH PIT & SLOPE PROTECTION Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Design Chainage :- 81+870 to 105+825	CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.	DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1.3M EC/CP/SLP/NC/GA Drawn By. S. Chattrjee Design By. Avishek Dey Checked By. Avishek Dey Approved By. Soubhik Sadhu
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.																
REVISIONS																				



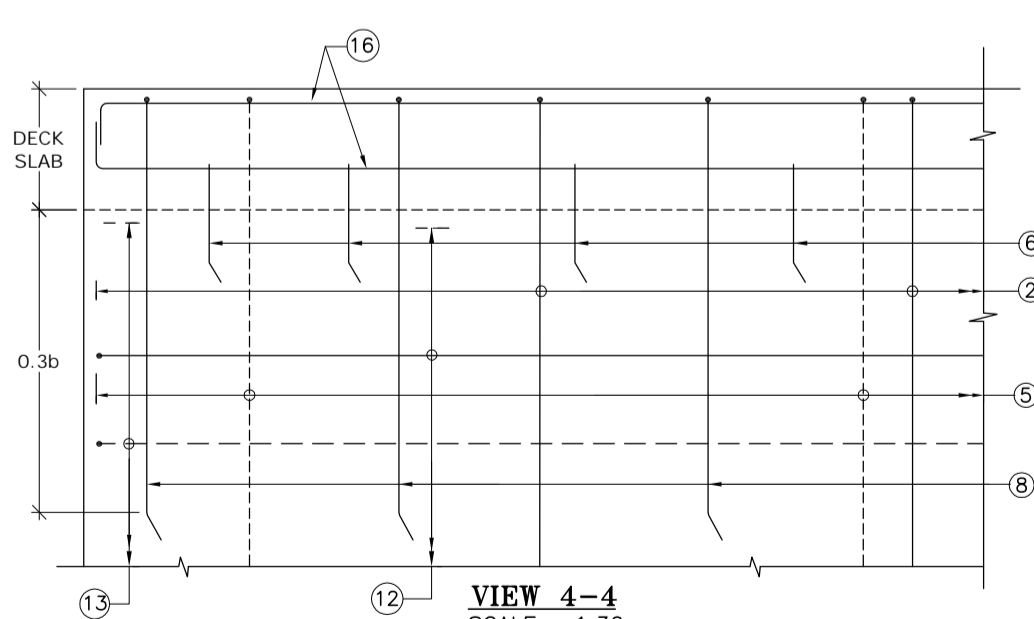
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:50



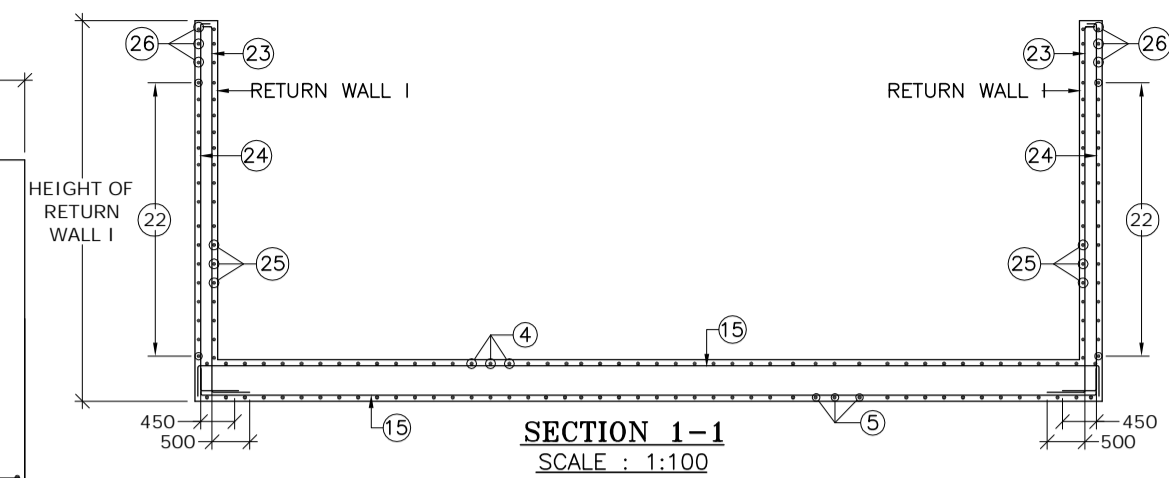
BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:50



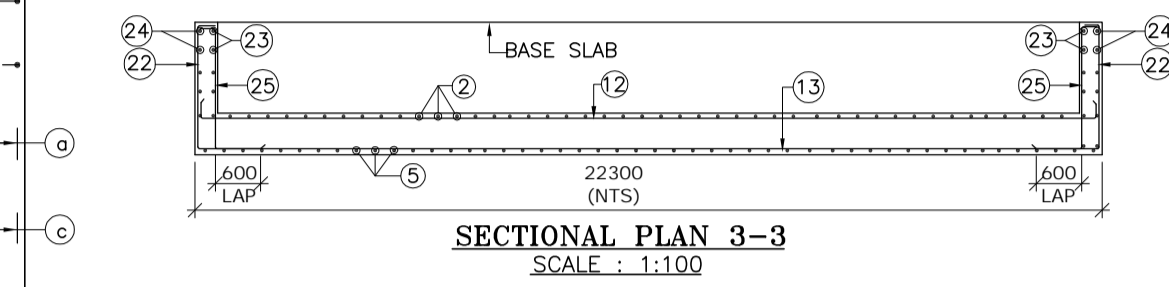
TOP SLAB R/F PLAN
SCALE : 1:30
(BAR MARK 5, 19, 9 KERB & HAUNCH LINES NOT SHOWN IN PLAN)



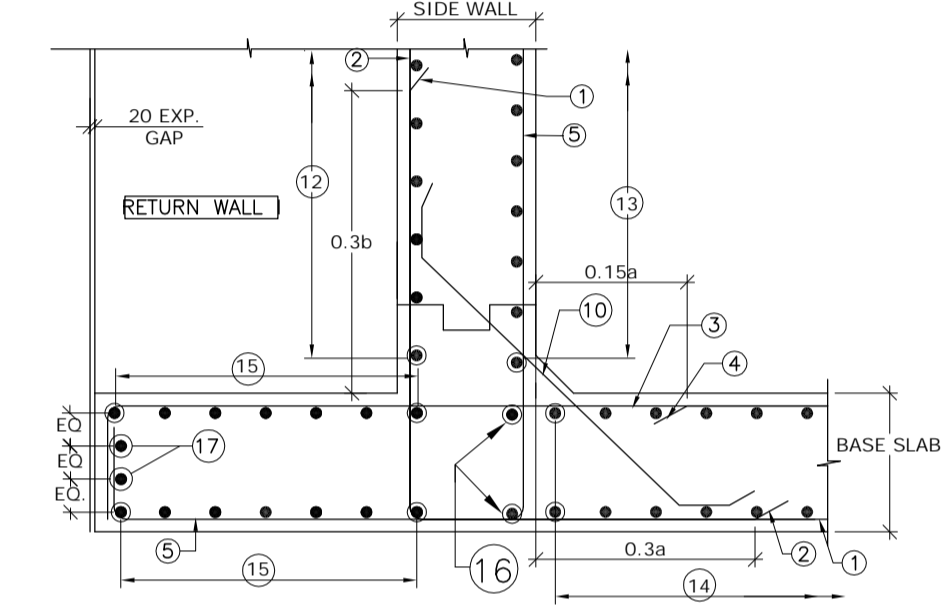
VIEW 4-4
SCALE : 1:30



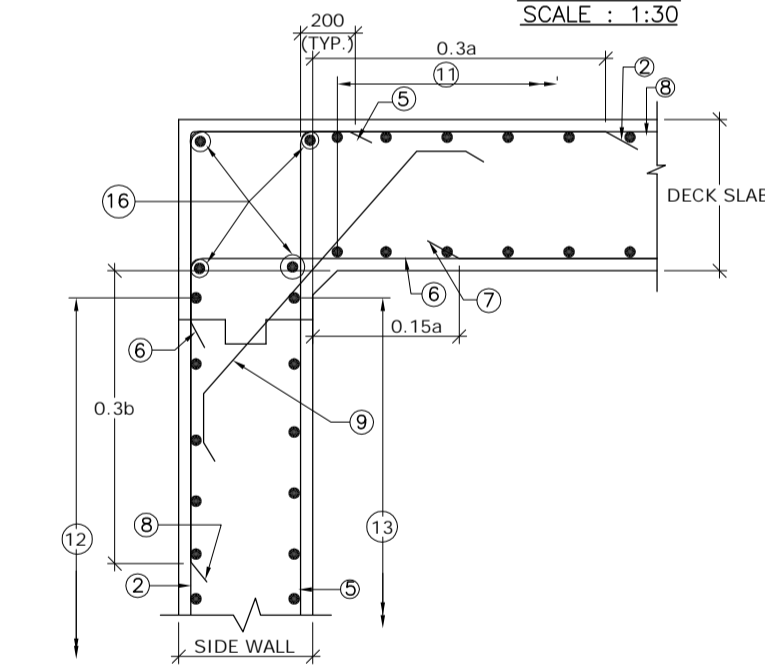
SECTION 1-1
SCALE : 1:100



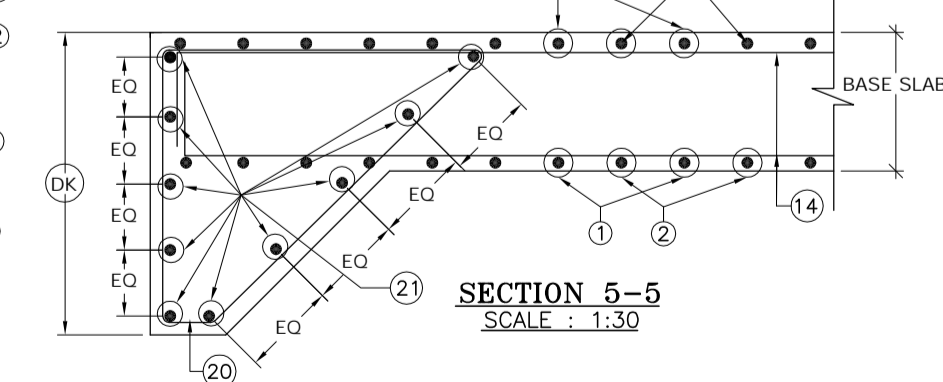
SECTIONAL PLAN 3-3
SCALE : 1:100



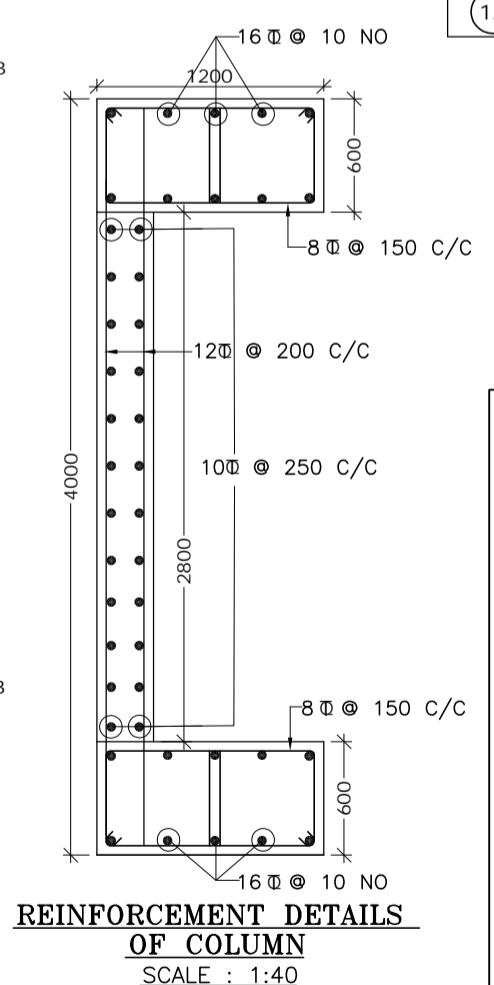
DETAIL- B
SCALE : 1:30



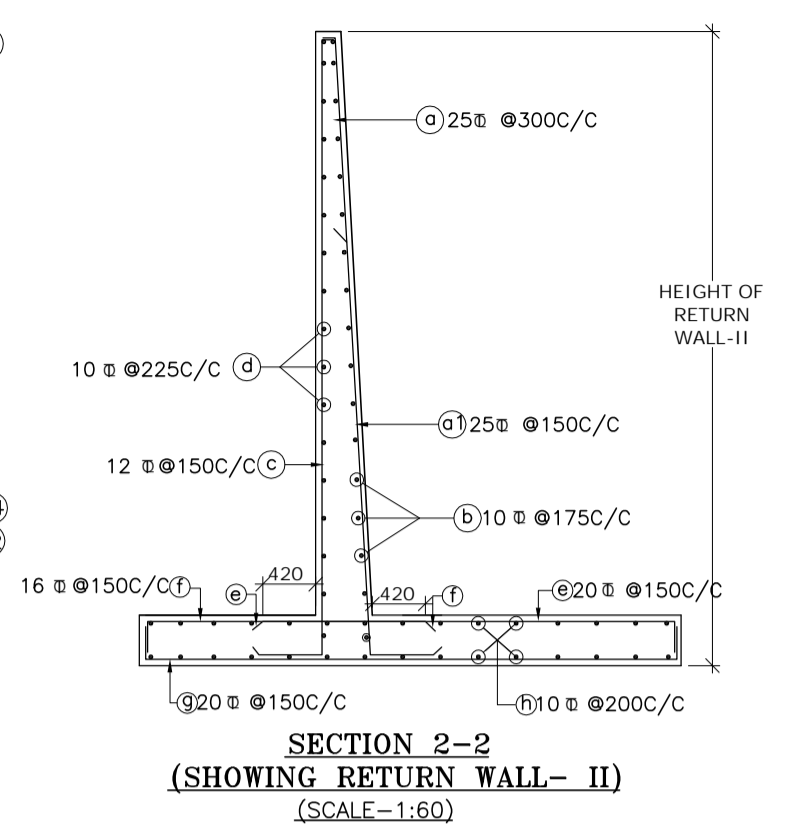
DETAIL- A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



REINFORCEMENT DETAILS OF COLUMN
SCALE : 1:40



SECTION 2-2
(SHOWING RETURN WALL- II)
(SCALE:1:60)

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	12	200	13	10	250
2	12	200	14	10	250
3	12	130	15	10	250
4	-	-	16	10	-
5	10	200	17	-	-
6	12	180	18	10	150
7	-	-	19	10	-
8	12	200	20	10	150
9	10	200	21	12	-
10	10	200	22	10	250
11	10	250	23	10	200
12	10	250	24	10	200
			25	12	125
			26	10	250

--- TOP FACE BARS/OUTER FACE BARS/EARTH FACE BARS
 --- BOTTOM FACE BARS/INNER FACE BARS/OPP. TO EARTH FACE BARS

- NOTES :**
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH RELEVANT CLAUSE IRC : 112-2011
 - DEVELOPMENT LENGTH (Ld) :
 (a) FOR M25 = 46D
 (b) MINIMUM Ld :
 (i) FOR STRAIGHT BAR = 300MM
 (ii) FOR BENT BAR = 150MM
 BETWEEN (a) & (b) WHICHEVER IS GREATER.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MoRTH.
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MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (2.0 X3.0) UP TO 3.0M EARTH CUSHION

Package :- IV District :- SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 AN ISO 9001:2015 CERTIFIED COMPANY

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/2.0X3.0X1_3M EC/CP/SLP/NC/RCC

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee	Avishek Dey	Soubhik Sadhu	

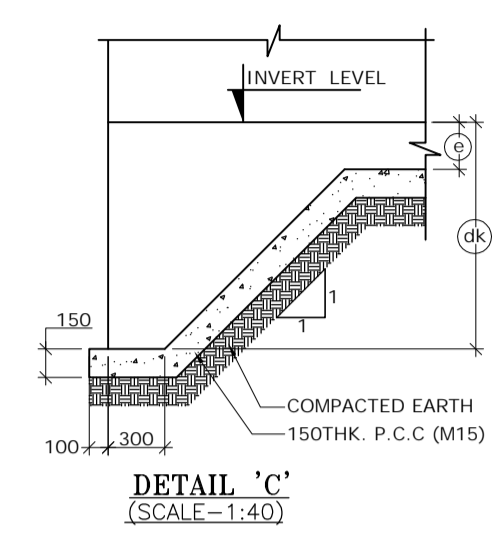
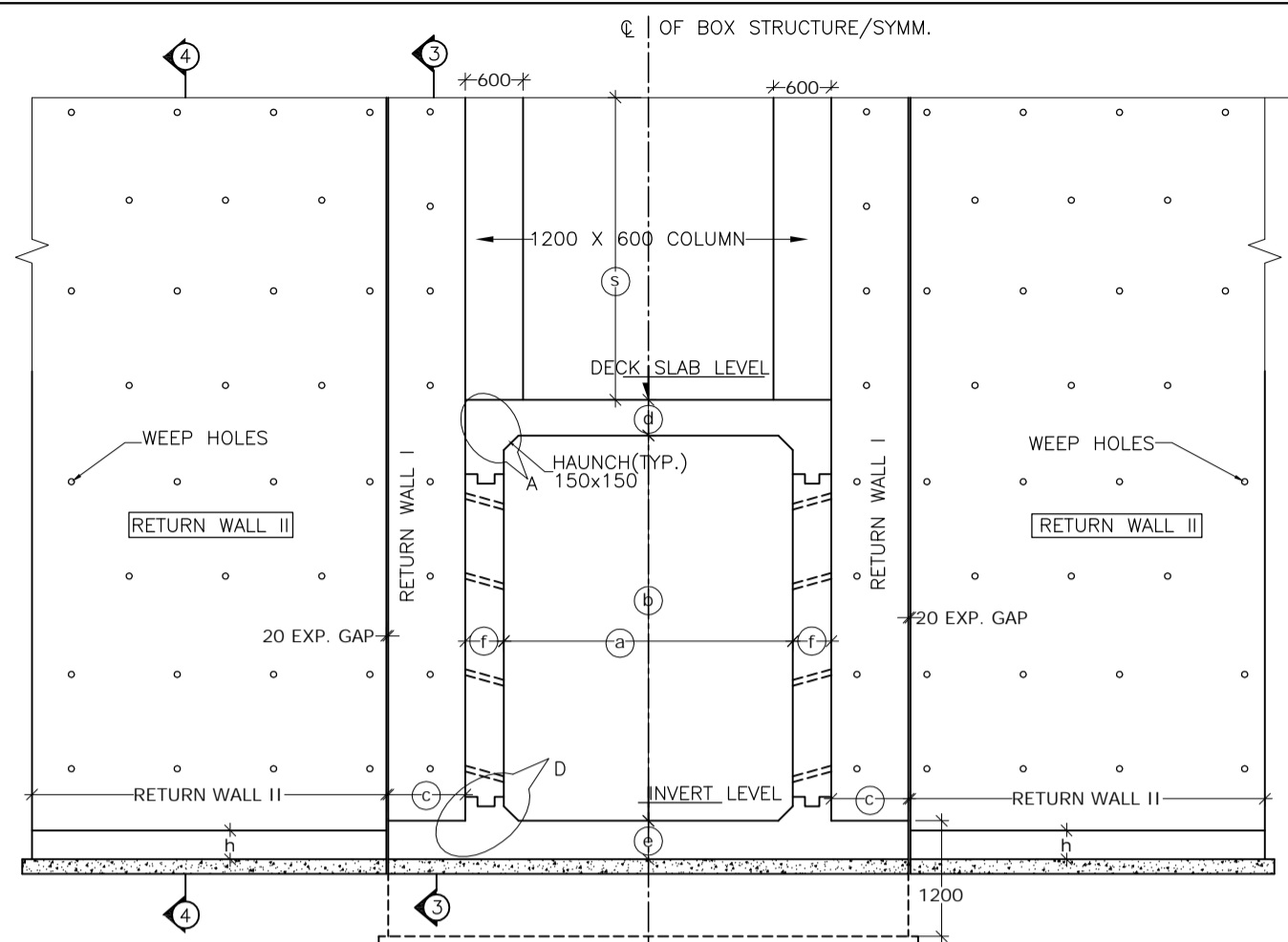
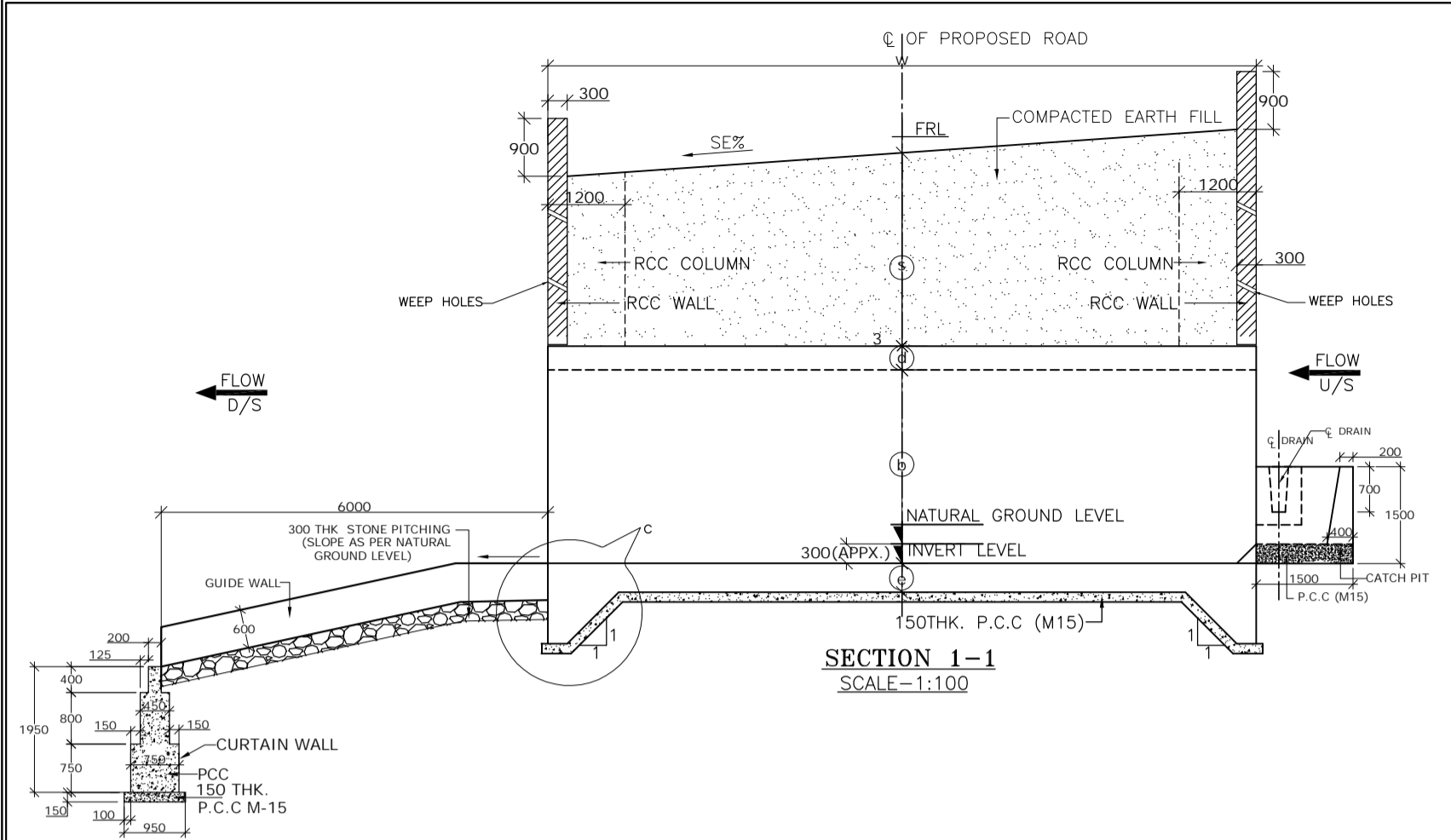
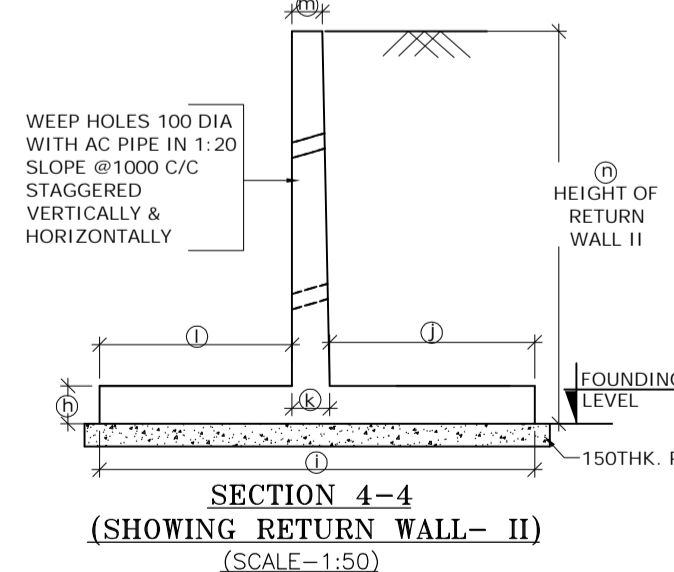
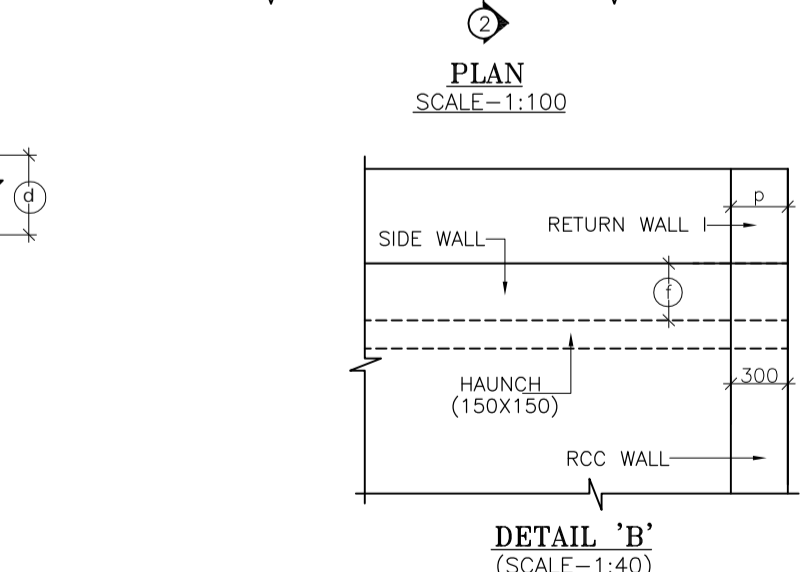
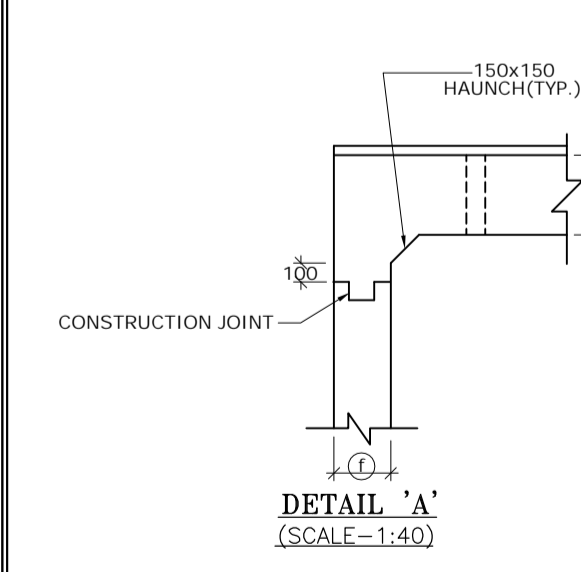
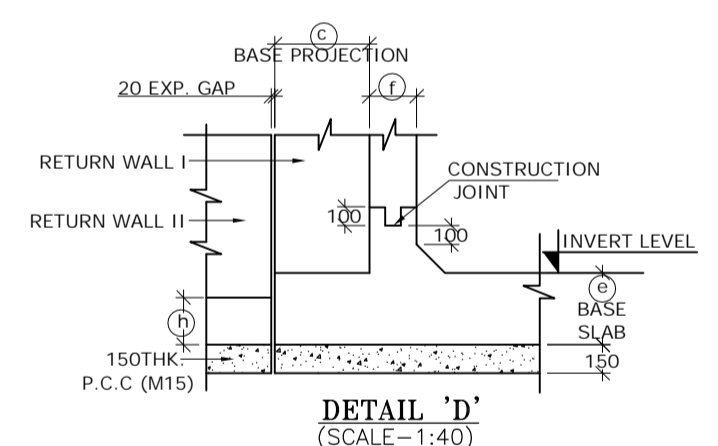
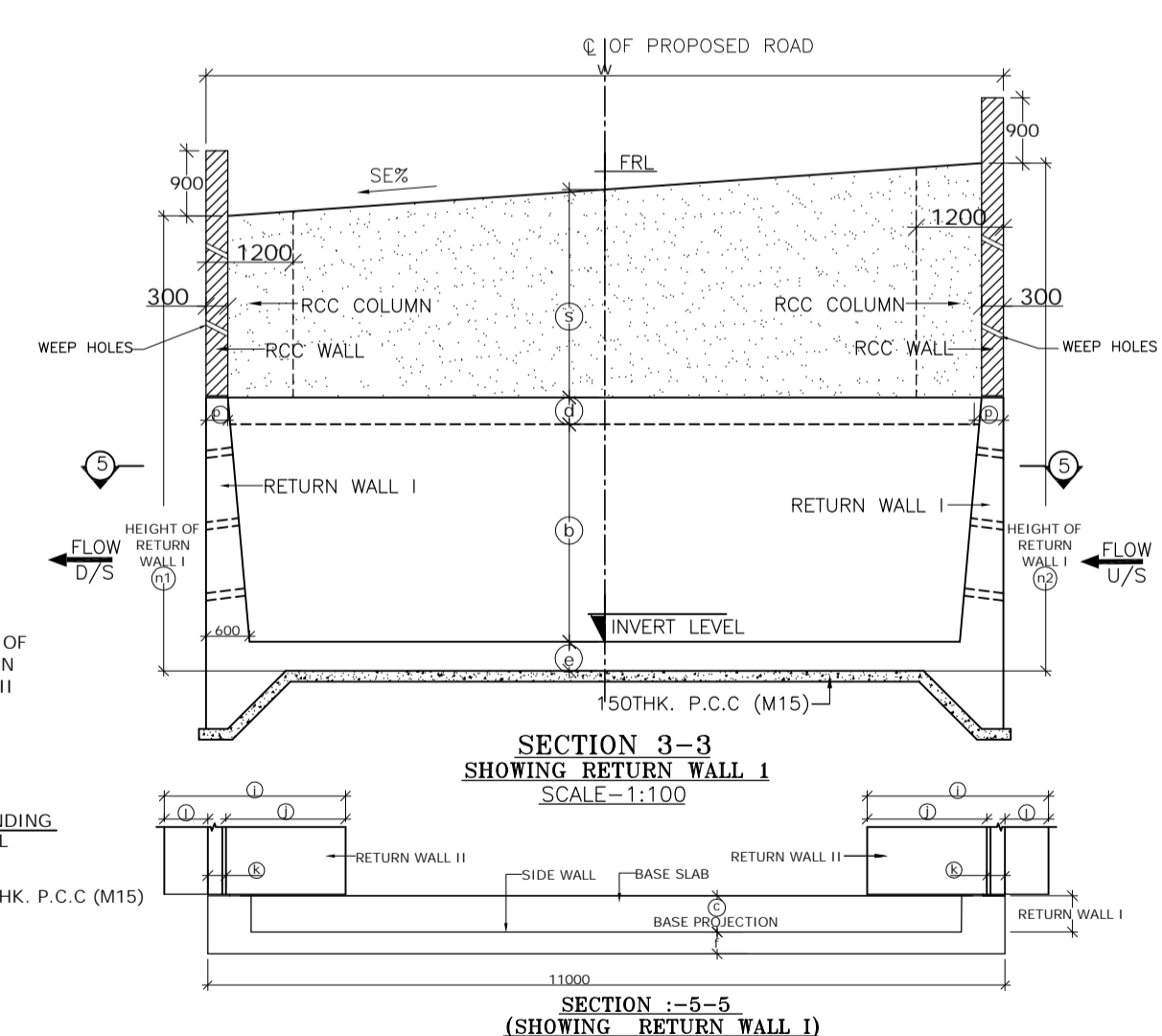
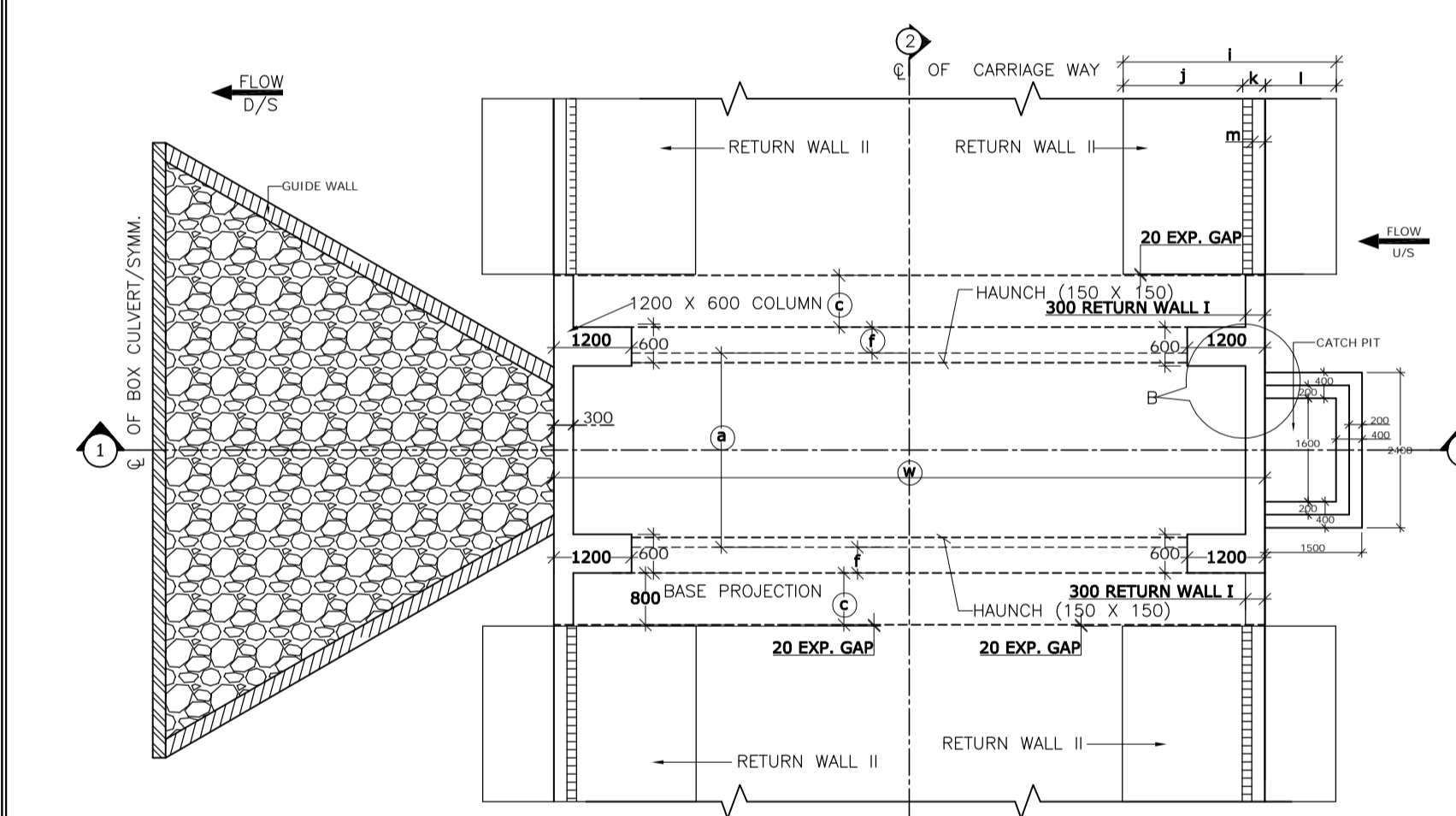


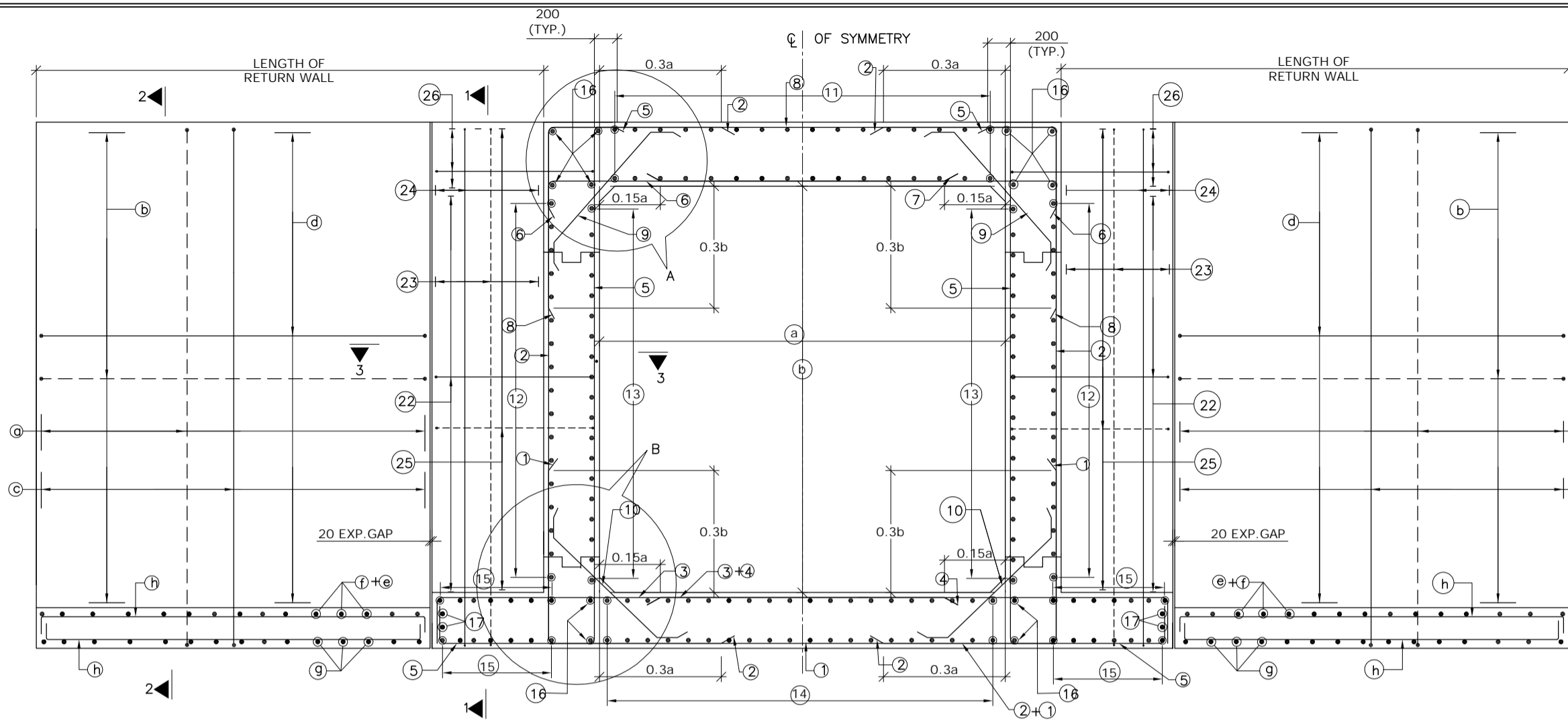
TABLE SHOWING SALIENT DIMENSIONS	
BOX CELL DESIGNATION No./gb/Ec/1/4/4/4	
a	4000
b	4000
c	1000
d	500
e	600
f	550
g	500
h	1200
i	10200
j	4500
k	1200
l	4500
m	300
n1	8815
n2	9515
p	300
q	12000
s	4000
dk	1200



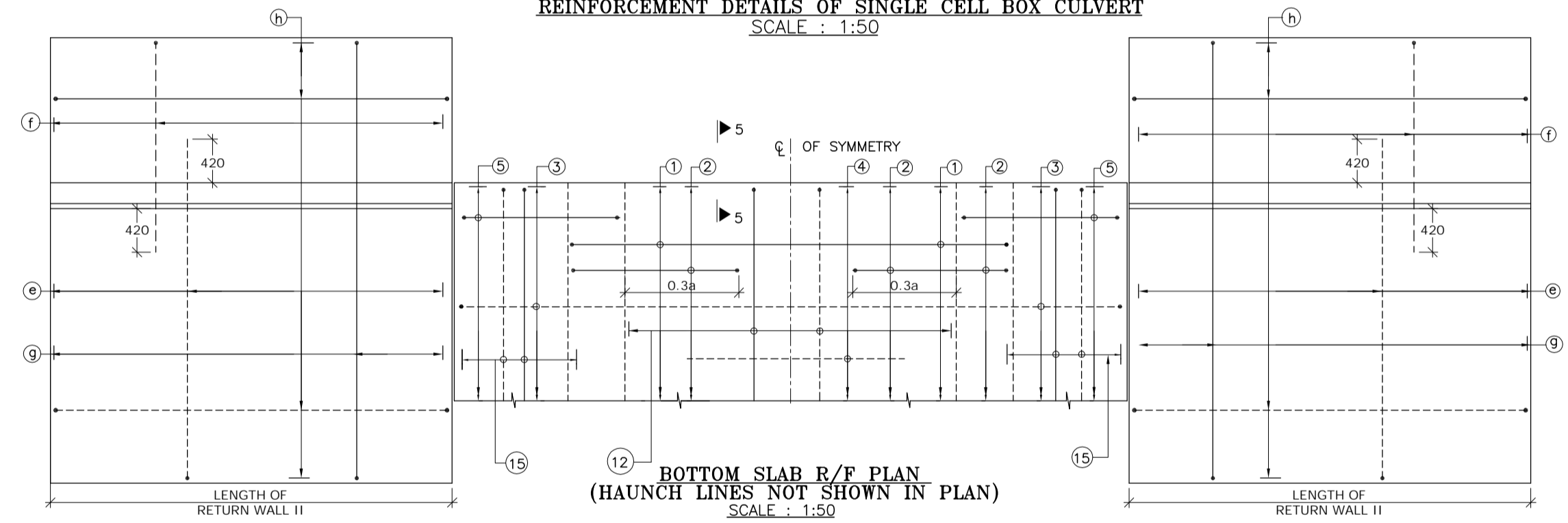
STRUC. NO.	Proposed Chainage	Proposed Formation Level (M)	Span	Cushion Height (m)	Super Elevation (%)	Slope Side	Total Road width	Protection Type	Proposed Invert (M) of Box Culvert	Proposed Founding Level (M)	Height of Return wall
								U/S D/S			n1 n2
104/4	103+695	1540.126	4X4X1 Cell Earth Cushion	4.00	7.00	L TO R	13.00	With Catch pit	1531.626	1531.026	8.645 9.555

- NOTES :**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
 - GRADE OF CONCRETE : BOX CELL STRUCTURE - M25 CURTAIN WALL - M25 LEVELLING COURSE (P.C.C.) - M15 RETURN WALL - M25 RCC WALL & KERB - M25
 - GRADE OF STEEL Fe 500 AS PER I.S. -1786.
 - CLASS 70R TRACKED PRODUCING WORST EFFECT ARE CONSIDERED FOR DESIGN.
 - PROPERTIES OF BACKFILL SOIL $\gamma = 1.81/m^3$, $\phi = 30^\circ$
 - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MORTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
 - EARTH BELOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM 15 $1/m^2$ BEARING CAPACITY.
 - SLOPE ON DECK SLAB WILL VARY AS PER ROAD SLOPE IN DIFFERENT CHAINAGES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/RCC (SHEET NO-01)

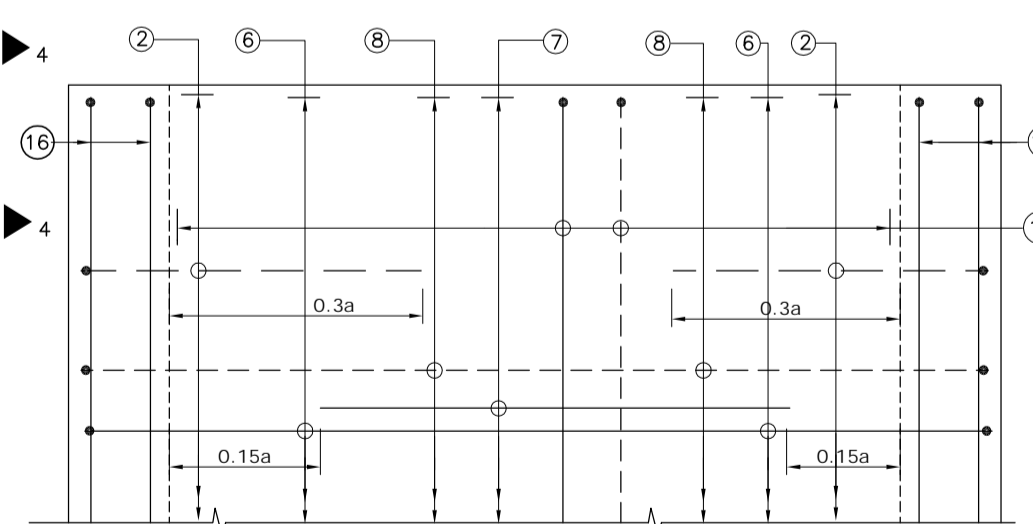
SCALE: AS SHOWN 					CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001					GENERAL ARRANGEMENT OF SINGLE CELL R.C.C BOX CULVERT (4.0 X 4.0) WITH 4.0M EARTH CUSHION CATCHPIT & SLOPPED PROTECTION					CONSULTANT : CE TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.					DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/GA									
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.					Package :- IV District :- SENAPATI Existing Chainage :- 88+520 to 114+165 Designe Chainage :- 81+870 to 105+825					Drawn By. S. Chattrjee					Design By. Avishek Dey					Checked By. Soubhik Sadhu					Approved By.				
DATE: SEPT, 2016																													
REVISIONS																													



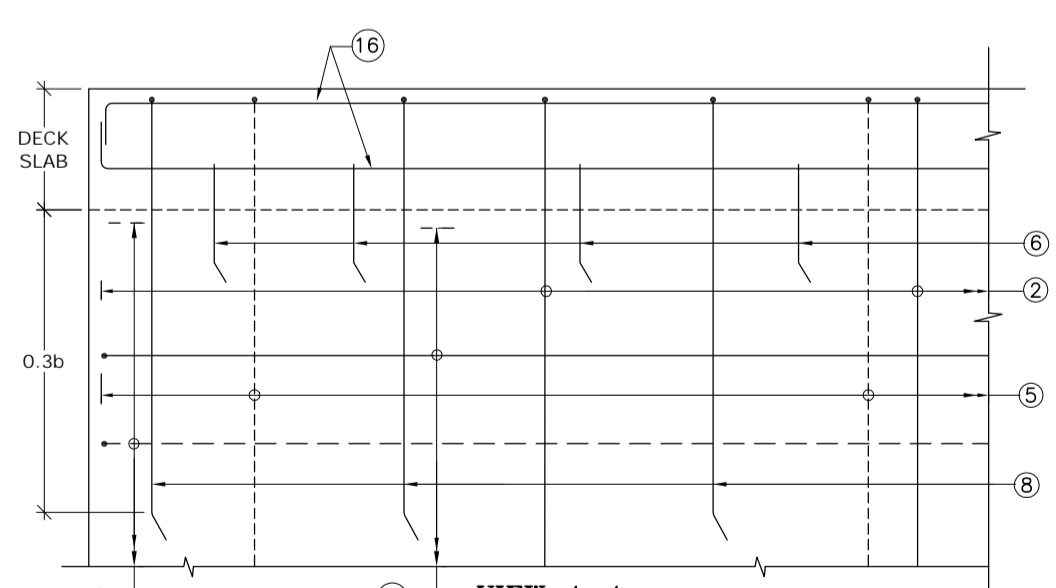
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT
SCALE : 1:50



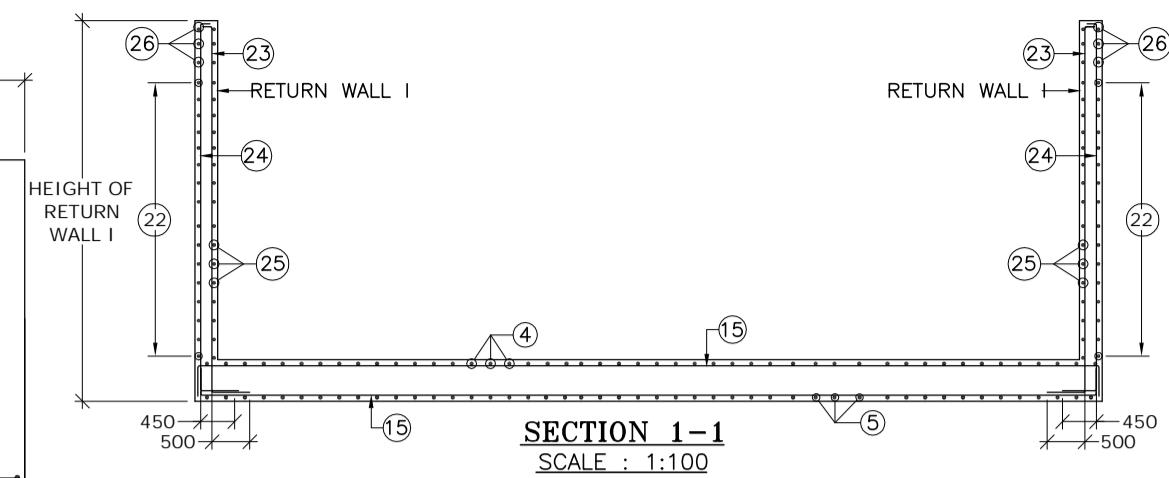
BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)
SCALE : 1:50



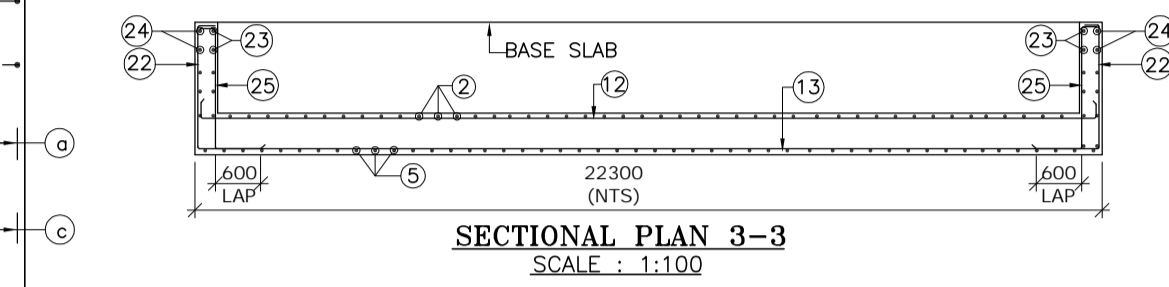
TOP SLAB R/F PLAN
SCALE : 1:30
(BAR MARK 5, 19, KERB & HAUNCH LINES NOT SHOWN IN PLAN)



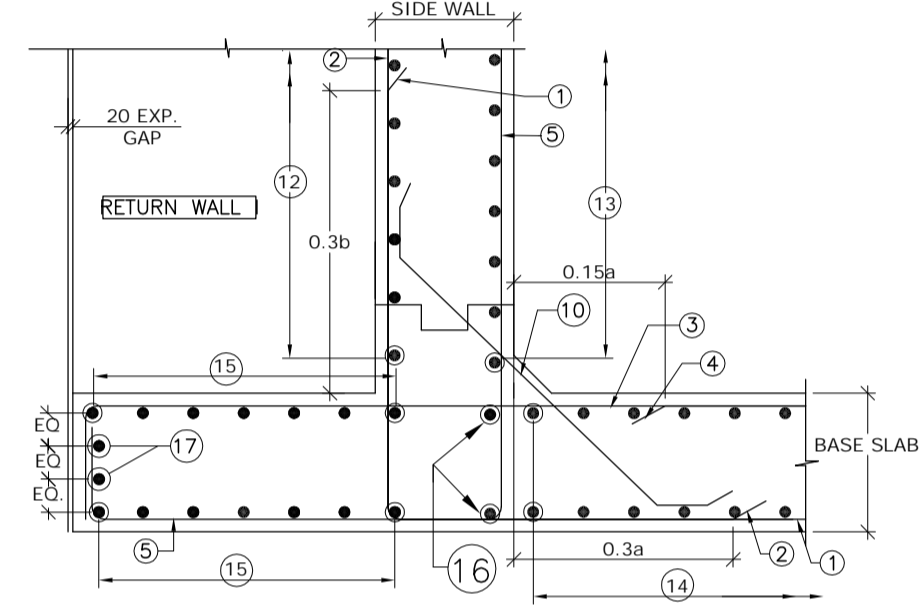
VIEW 4-4
SCALE : 1:30



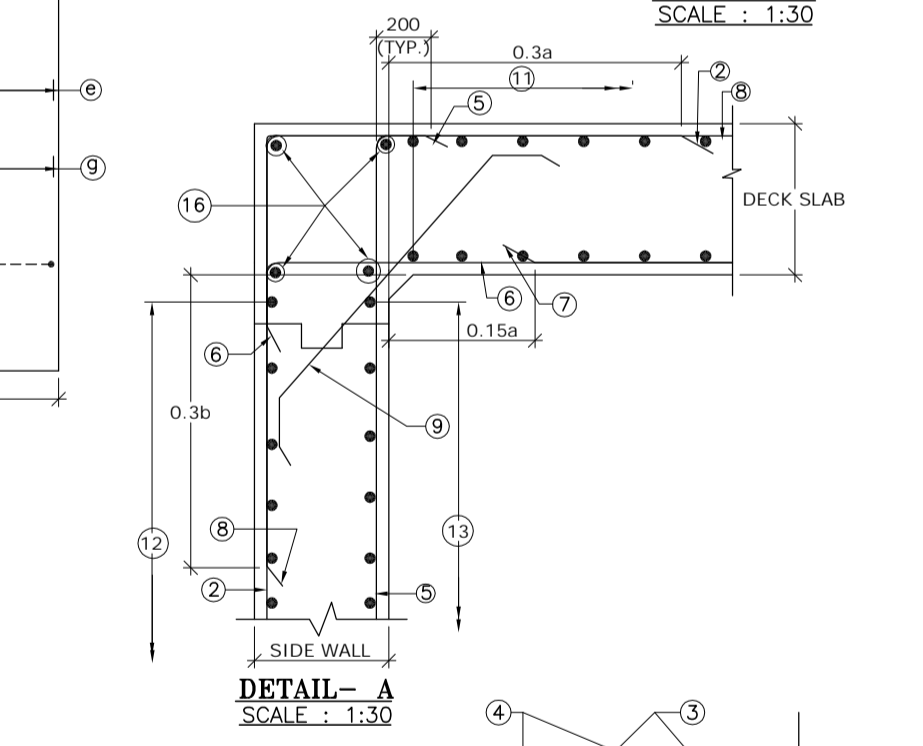
SECTION 1-1
SCALE : 1:100



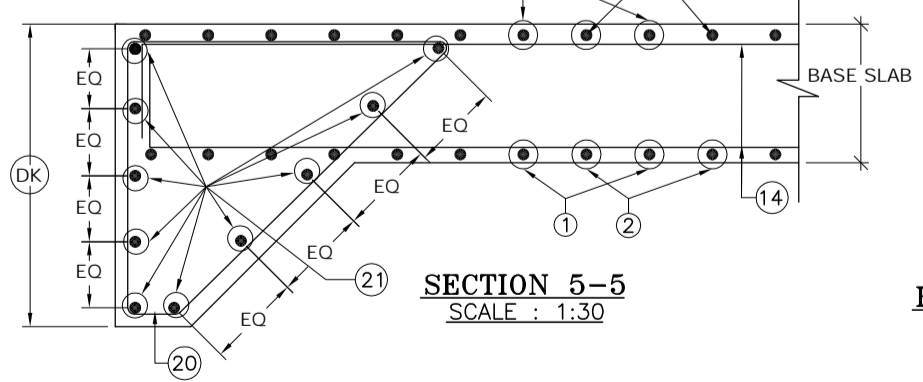
SECTIONAL PLAN 3-3
SCALE : 1:100



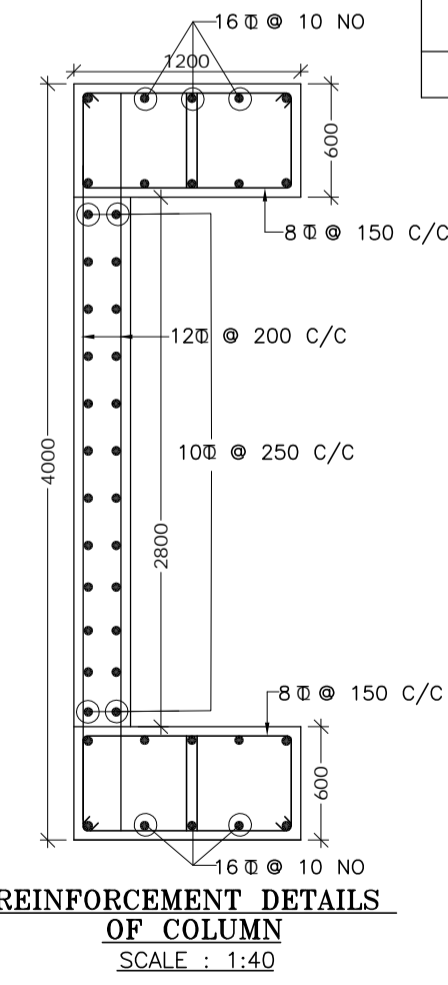
DETAIL- B
SCALE : 1:30



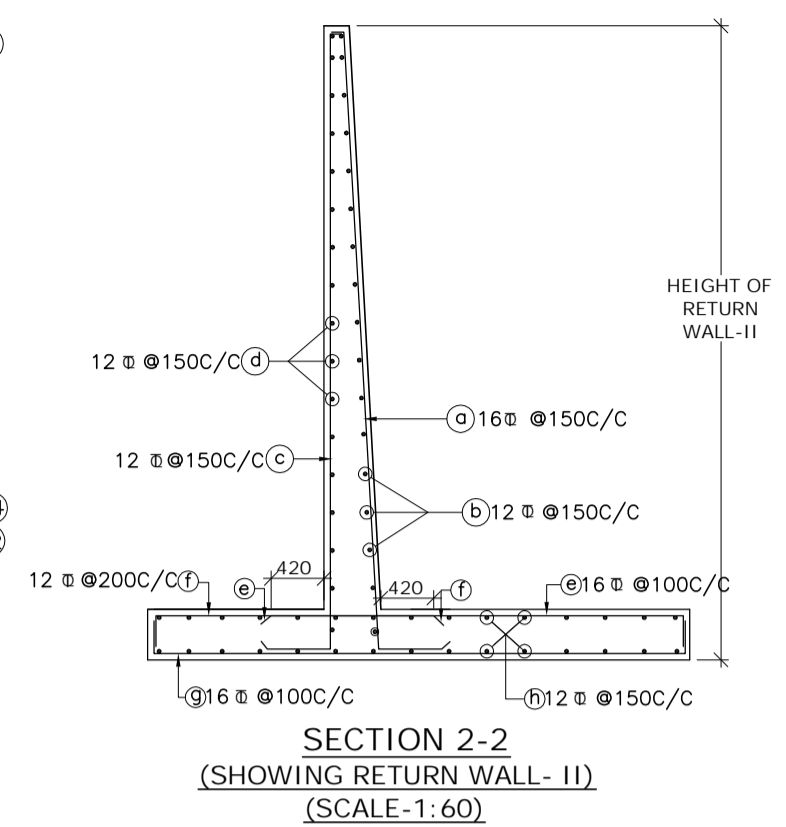
DETAIL- A
SCALE : 1:30



SECTION 5-5
SCALE : 1:30



REINFORCEMENT DETAILS OF COLUMN
SCALE : 1:40



SECTION 2-2
(SHOWING RETURN WALL- II)
SCALE-1:60

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA. OF BARS (mm)	SPACING (mm)	BAR MARK	DIA. OF BARS (mm)	SPACING (mm)
1	16	220	15	10	200
2	16	220	16	10	-
3	25	280	17	10	-
4	12	280	18	10	150
5	10	200	19	10	-
6	20	250	20	10	150
7	12	250	21	12	-
8	16	220	23	10	200
9	10	280	24	16	125
10	10	280	25	12	125
11	10	200	26	10	250
12	10	180	27	10	225
13	10	220	28	12	150
14	10	200	29	12	150

--- TOP FACE BARS/OUTER FACE BARS/EARTH FACE BARS
 --- BOTTOM FACE BARS/INNER FACE BARS/OPP. TO EARTH FACE BARS

- NOTES :**
- CLEAR COVER SHALL BE 50mm.
 - GRADE OF CONCRETE FOR BOX STRUCTURE = M25
 - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH RELEVANT CLAUSE IRC : 112-2011
 - DEVELOPMENT LENGTH (Ld) :
 (a) FOR M25 = 46D
 (b) MINIMUM Ld :
 (i) FOR STRAIGHT BAR = 300MM
 (ii) FOR BENT BAR = 150MM
 BETWEEN (a) & (b) WHICHEVER IS GREATER.
 - WELDING OF BARS SHALL NOT BE PERMITTED.
 - SHARP EDGES OF CONCRETE SHALL NOT BE PERMITTED.
 - CONCRETING SHALL BE CARRIED OUT CONTINUOUSLY UP TO CONSTRUCTION JOINT AS SHOWN IN DRAWING.
 - THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MoRTH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/GA (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN
 DATE: SEPT, 2016

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 Lining with Paved Shoulder of Ukhrul - Toloj - Tadubi Section of NH-102A (115 km) in the State of Manipur on EPC mode.

REINFORCEMENT DETAILS OF SINGLE CELL R.C.C BOX CULVERT (4.0 X4.0) UP TO 4.0M EARTH CUSHION

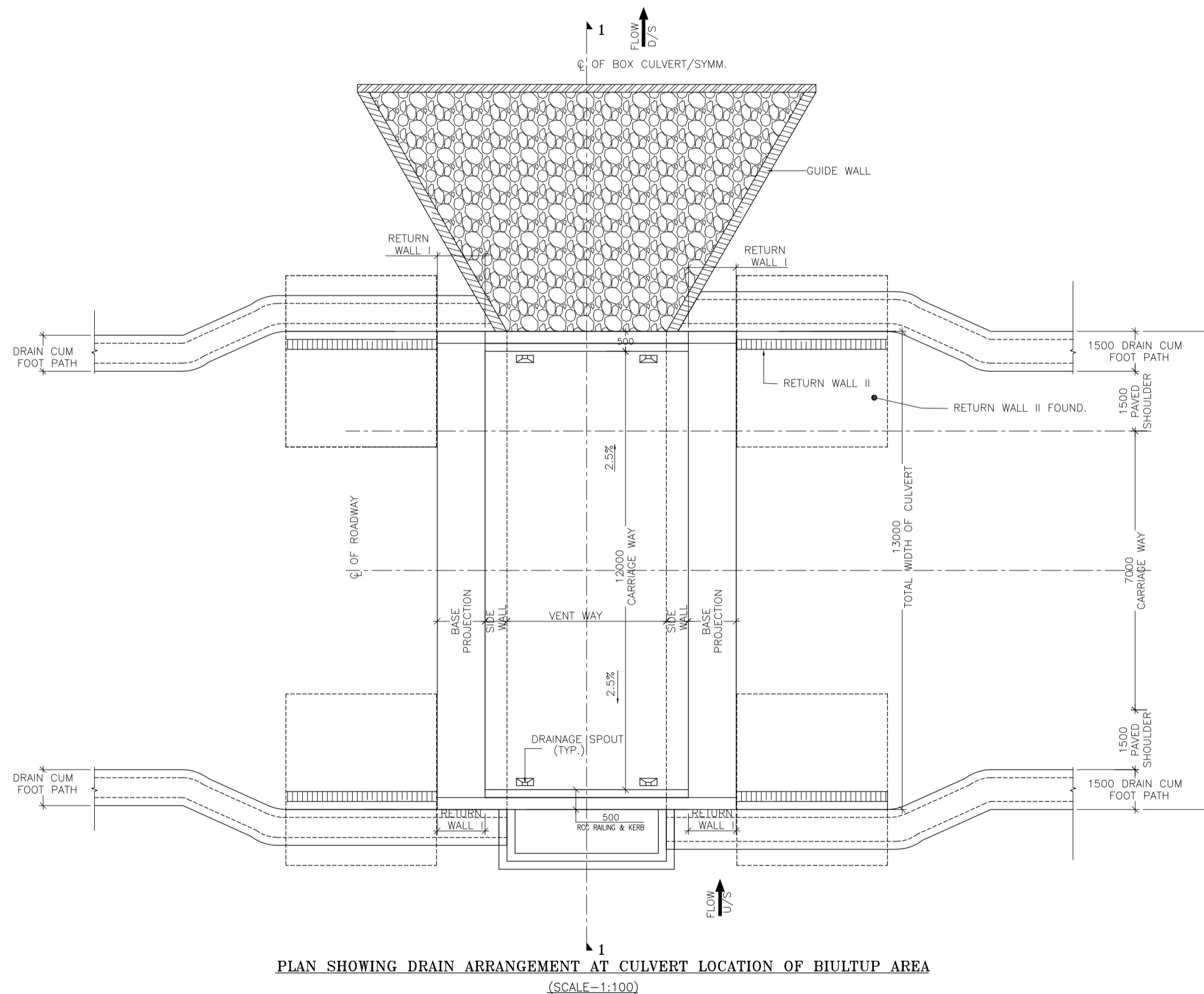
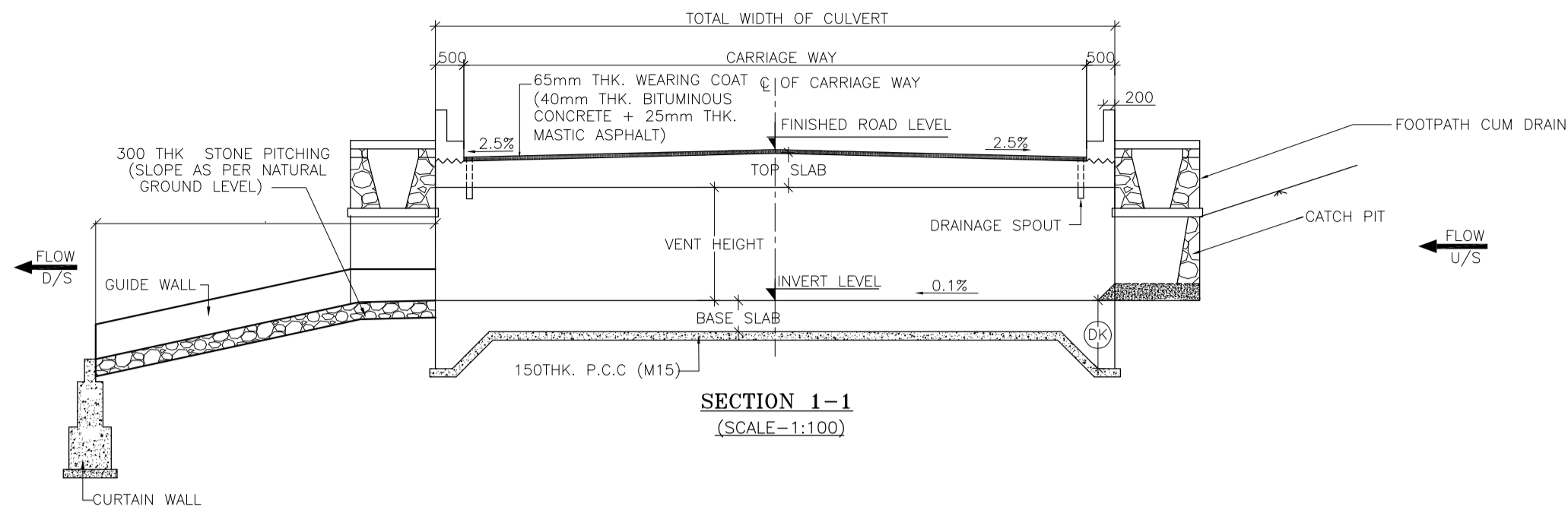
Package :- IV District :-SENAPATI
 Existing Chainage :- 88+520 to 114+165
 Designe Chainage :- 81+870 to 105+825

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

CETEST
 Engineering Consultants
 ARTISAN, 34/35, BOHAGICHAUN, Kolkata

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/4.0X4.0X1.4M EC/CP/SLP/SE/RCC

Drawn By.	Design By.	Checked By.	Approved By.
S. Chattrjee		Avishek Dey	Soubhik Sadhu



NOTES :

1. ALL DIMENSIONS ARE IN MM. ALL LEVEL ARE IN M. UNLESS OTHERWISE MENTIONED.

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE:
AS SHOWN

DATE:
SEPT, 2016



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.

TYPICAL DETAILS DRAWING OF SMALL BOX CULVERT

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

DWG. NO. CET/BDG/2016/3640/NH-102A/FDPR/BC/MISC (SHEET NO. 01 OF 01)			
Drawn By.	Design By.	Checked By.	Approved By
S. Chattrjee	R.Majumder	A. Dey	S. Sadhu