

BIHAR STATE HIGHWAYS PROJECT

BID DOCUMENT

FOR

CIVIL WORKS

Improvement/Upgradation, Widening and Strengthening of Fungo halt–Simri Bakhtiyarpur Section of Mansi-Saharsa-Hardi Chaughara Road (SH-95) from KM 14+125 to KM 28+080 (Length- 13.955 KM) in the State of Bihar under Civil work Contract Package No. BSHP-II(Phase-2)/Pkg-4/SH-95

Invitation No. – BSHP-III(Phase-2)/Pkg-4/SH-95/ 2021-22, Patna, Dated 25.04.2022



BIHAR STATE ROAD DEVELOPMENT CORPORATION LIMITED

RCD Central Mechanical Workshop Campus (Near Patna Airport)

Sheikhpura, Patna-800014, Bihar, India

Phone- 91+-612-2226711

Fax : +91-612-2226723

IFB No. BSHP-III (Phase-2)/Pkg-4/SH-95

Patna, Dated-25.04.2022



Bihar State Road Development Corporation Ltd.

(A Government of Bihar Undertaking)

IMPROVEMENT/UPGRADATION, WIDENING AND STRENGTHENING OF FUNGO HALT-SIMRI BAKHTIYARPUR SECTION OF MANSI-SAHARSA-HARDI-CHAUGHARA ROAD (SH-95) UNDER CIVIL WORKS CONTRACT PACKAGE NO. BSHP-III (PHASE-2)/PKG-4/SH-95

Volume – III : DRAWINGS

BIHAR STATE ROAD DEVELOPMENT CORPORATION LIMITED

RCD Mech. Workshop Campus, Sheikhpura,

Patna - 800 014, BIHAR

April, 2022

INDEX

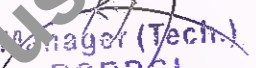
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PART-A
HIGHWAY DRAWINGS

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INDEX MAP			
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PLAN & PROFILE			
04	LAYOUT OF HORIZONTAL PLAN & VERTICAL PROFILE	15 OF 29	RHDHV/64801/DPR/P&P/15-29


 Manager (Tech.)
 BSRDCL
 PIU-Khagaria


 D.G.M. (Tech.)
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 PIU-Khagaria

Client :  Bihar State Road Development Corporation Ltd.	Scale : AS SHOWN	Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants :  HaskoningDHV Nederland B.V.	Title : CONTENT SHEET	DRAWING NO. RHDHV/64801/DPR/CNT/01 RO DATE: MARCH 2020 SHEET: DESIGNED (A) DRAWN (D) CHECKED (C) APPROVED (H)     R Singh J P Dohal R Singh S Pathuri									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION OF REVISIONS</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>						REV	DATE	DESCRIPTION OF REVISIONS						
REV	DATE	DESCRIPTION OF REVISIONS												

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LEGEND

LEGENDS USED IN EX. PLAN		
S.NO.	DESCRIPTION	SYMBOL
1.	CART TRACK	
2.	BUILDING	
3.	HUT	
4.	BOUNDARY WALL	
5.	RIVER/NALA/DRAIN	
6.	HANDPUMP	
7.	WATER LOGGED AREA/POND	
8.	TRANSFORMER	
9.	T1 (GIRTH 300 TO 500MM)	
10.	T2 (GIRTH 500 TO 800MM)	
11.	T3 (GIRTH 800 TO 1200MM)	
12.	T4 (GIRTH 1200 TO 1500MM)	
13.	T4 (GIRTH 1500 TO 1800MM)	
14.	T6 (MORE THAN 1800 MM)	
15.	TEMPLE	
16.	CHIMINEY	
17.	WELL	
18.	HIGH TENSION PAILON	
19.	RAILWAY TRACK	

LEGENDS USED PROPOSED IN PLAN		
S.NO.	DESCRIPTION	SYMBOL
23.	EARTHEN SHOULDER (EDGE)	
24.	PAVED SHOULDER (EDGE)	
25.	CENTER LINE	
26.	CARRIAGEWAY (EDGE)	
27.	EARTHWORK	
28.	DEGREE ^ MINUTE ^ SECOND "	(Deg)
29.	FINISHED ROAD LEVEL	FRL
30.	ROB/BRIDGE	
31.	BOX CULVERT/VUP/PUP	
32.	LVUP	
33.	NORTH	

LEGENDS USED IN PROFILE		
S.NO.	DESCRIPTION	SYMBOL
1.	ROB/BRIDGE	
2.	BOX CULVERT	
3.	BOX CULVERT/VUP/PUP	
4.	CENTRE LINE OF FINISHED ROAD LEVEL	
5.	EXISTING GROUND CENTER LINE	
6.	EXISTING RIGHT GROUND 15 CENTER LINE	
7.	EXISTING LEFT GROUND 15 CENTER LINE	

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Client : Bihar State Road Development Corporation Ltd.	SCALE NTS	Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants : HaskoningDHV Nederland B.V.	Title : TYPICAL DRAWING FOR LEGEND AND ABBREVIATIONS	DRAWING NO. : RHDHV/64081/DPR/LED/01 R0 DATE : NOVEMBER 2018 SHEET: 1 of 1														
<table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION OF REVISIONS</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>24/ Apr 2017</td> <td>LEGEND</td> </tr> </tbody> </table>				REV	DATE	DESCRIPTION OF REVISIONS	01	24/ Apr 2017	LEGEND	<table border="1"> <thead> <tr> <th>DESIGNED</th> <th>DRAWN</th> <th>CHECKED</th> <th>APPROVED</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		DESIGNED	DRAWN	CHECKED	APPROVED				
REV	DATE	DESCRIPTION OF REVISIONS																	
01	24/ Apr 2017	LEGEND																	
DESIGNED	DRAWN	CHECKED	APPROVED																

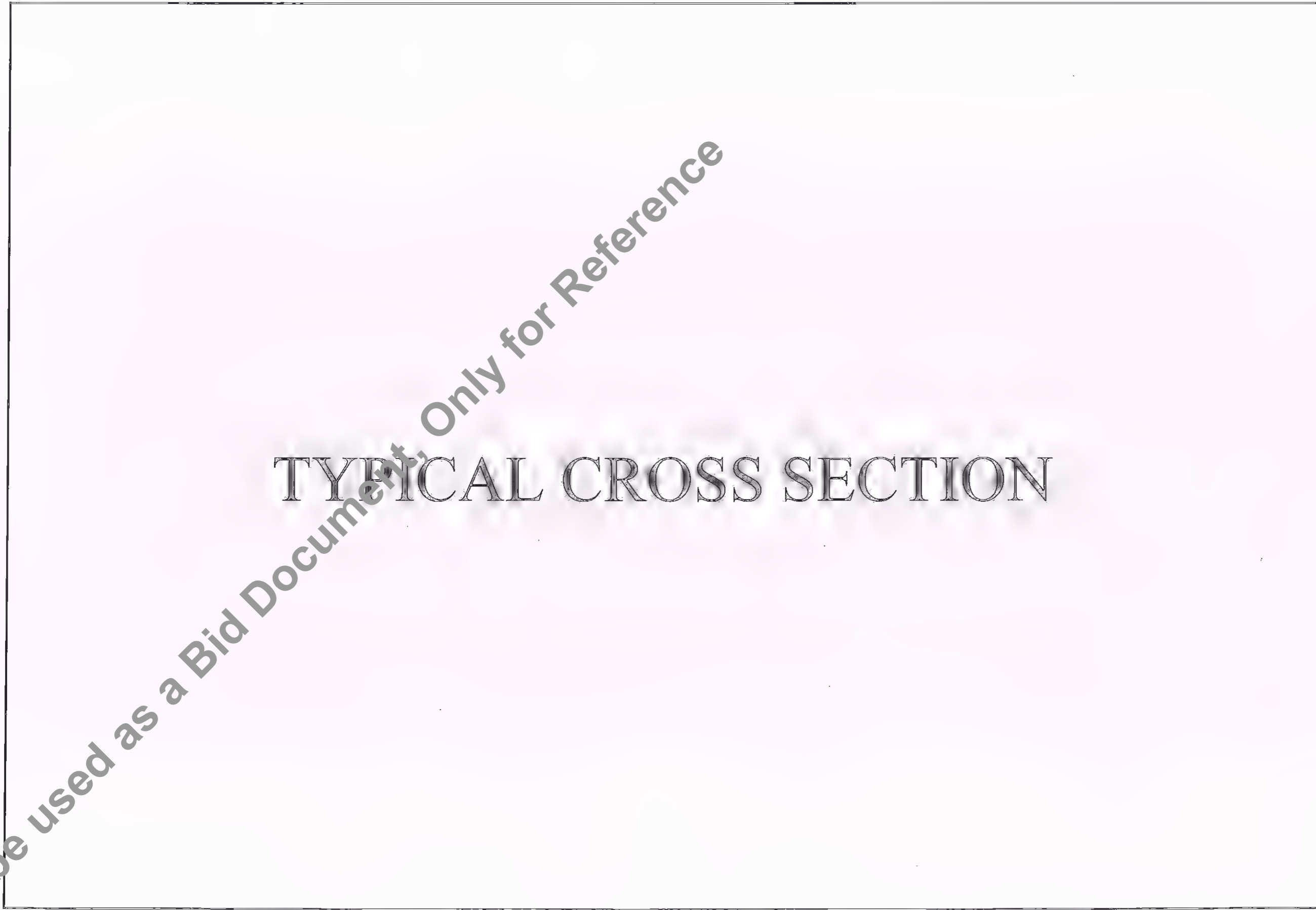


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Client: Bihar State Road Development Corporation Ltd.	Scale: AS SHOWN	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi-Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: HaskoningDHV Nederland B.V.	REV. DATE DESCRIPTION OF REVISIONS	Title: INDEX MAP	DRAWING NO. RHDHV/64801/DPR/INDX/01 R1 DATE: September 2018 DESIGNED BY: R Singh DRAWN BY: J.P. Dohal CHECKED BY: R Singh APPROVED BY: S Pathuri
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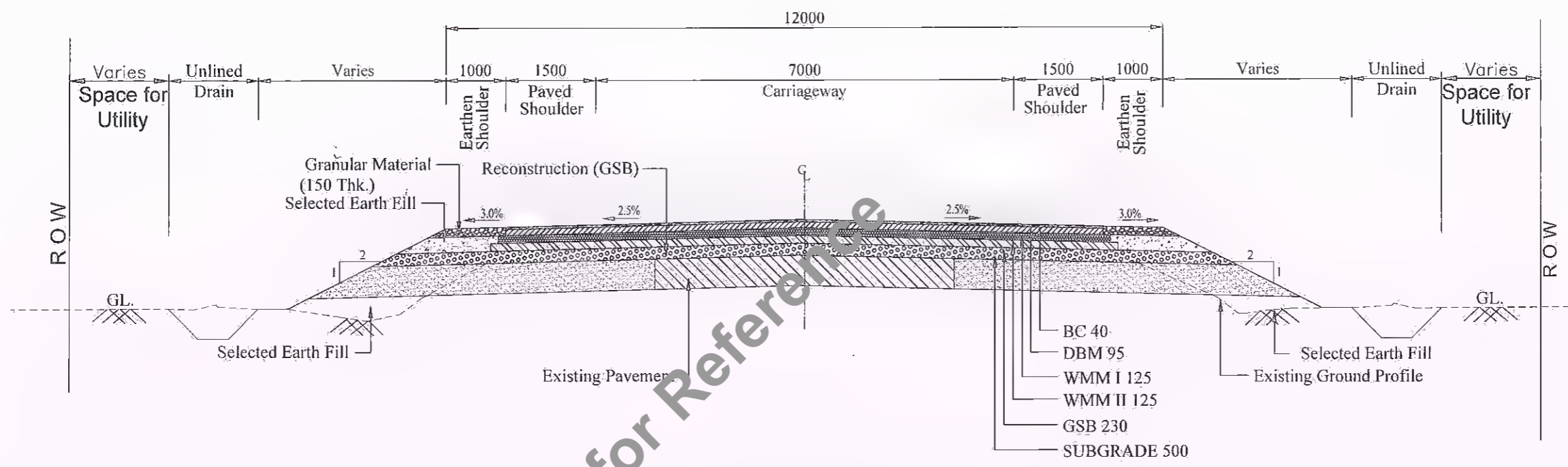
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TYPICAL CROSS SECTION

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TYPE - 01
TYPICAL CROSS SECTION OF 2 LANE CARRIAGEWAY
RECONSTRUCTION WITH TOP LAYER OF GSB FOR RURAL
AREAS (CONCENTRIC WIDENING)

12000

S.No.	Chainage		Length (Km)
	From	To	
1	14+445	14+700	0.255
2	15+200	16+050	0.850
3	16+400	17+650	1.250
4	19+050	22+000	2.950
5	22+250	22+820	0.570
6	24+150	24+400	0.250
7	24+500	26+030	1.530

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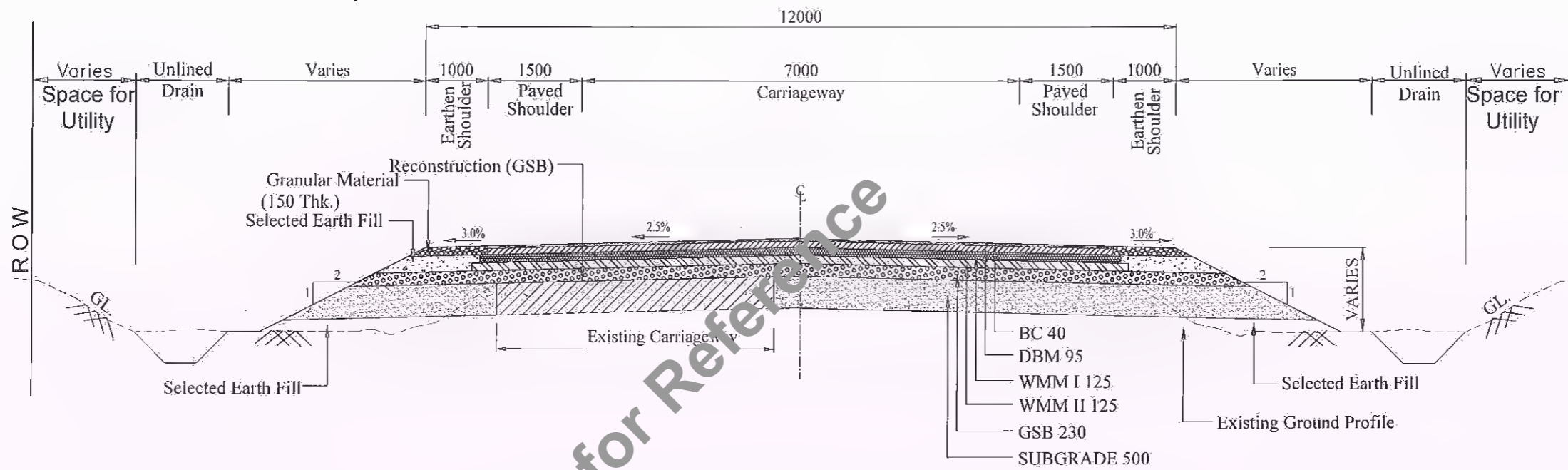
(Signature)
 D.G.M. (Tech.)
 BSRDCL
 PIU-Khagaria

NOTE :

1. ALL DIMENSIONS ARE IN MILLIMETRE, UNLESS OTHERWISE SPECIFIED.

Bihar State Road Development Corporation Ltd.	SCALE NTS	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: HaskoningDHV Nederland B.V.	Title: TYPICAL CROSS SECTION TCS - 1 (PKG: 02)	DRAWING NO. RHDHV/64801/DPR/TCS/01	R3
					DATE: December 2021	SHEET: 1 of 5
			DESIGNED BY: <i>(Signature)</i> DRAWN BY: <i>(Signature)</i> CHECKED BY: <i>(Signature)</i> APPROVED BY: <i>(Signature)</i>			

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TYPE - 02
TYPICAL CROSS SECTION OF 2 LANE CARRIAGEWAY
RECONSTRUCTION WITH GSB FOR RURAL AREAS
(ECCENTRIC WIDENING LHS/RHS)

S.No.	Chainage		Length (Km)
	From	To	
1	14+700	15+200	0.500
2	16+050	16+400	0.350
3	17+650	17+820	0.170
4	18+350	19+050	0.700
5	26+030	26+400	0.370
6	26+840	27+100	0.260

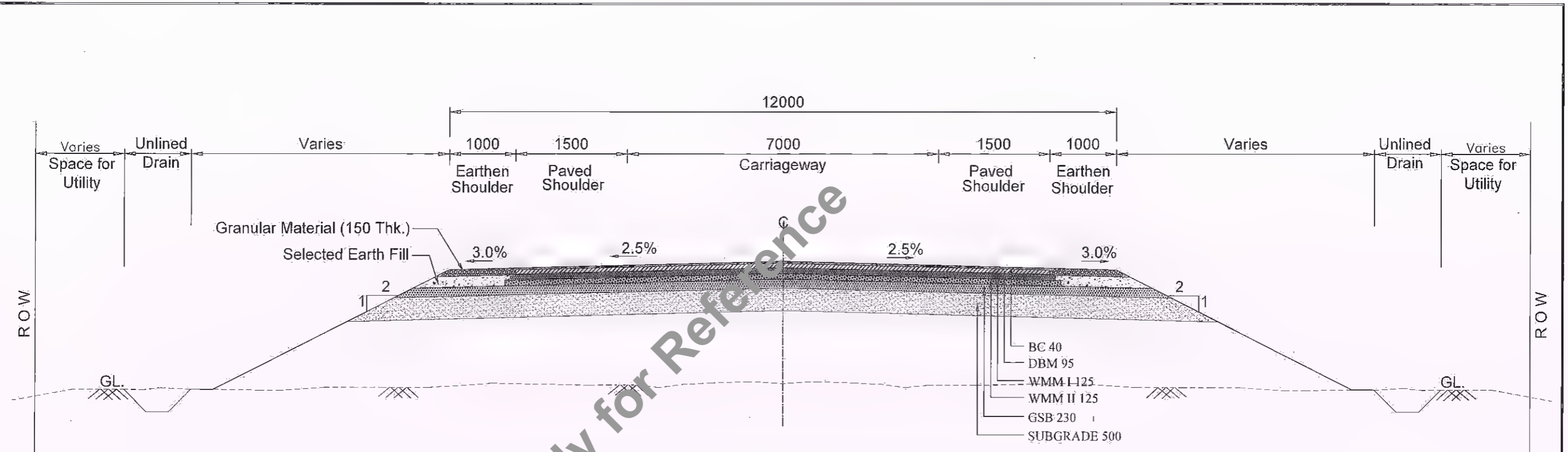
Manager (Tech.)
 BSRDCL
 PIU-Khagaria

D.G.M. (Tech.)
 BSRDCL
 PIU-Khagaria

NOTE :

1. ALL DIMENSIONS ARE IN MILLIMETRE, UNLESS OTHERWISE SPECIFIED.

Client: Bihar State Road Development Corporation Ltd.	SCALE: NTS	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title: TYPICAL CROSS SECTION TCS - 2 (PKG: 02)	DRAWING NO.: RHD/JV/64801/DPR/TCS/02 DATE: December 2021 DESIGNED (A): R Singh DRAWN (B): J.P. Dobhal CHECKED (C): R Singh APPROVED (D): S. Patra	R3 SHEET: 2 of 6
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TYPE - 03
TYPICAL CROSS SECTION OF 2 LANE CARRIAGEWAY FOR REALIGNMENT / BYPASS LOCATIONS

S.No.	Chainage		Length (Km)
	From	To	
1	14+125	14+445	0.320
2	17+820	18+350	0.530
3	22+820	23+030	0.210

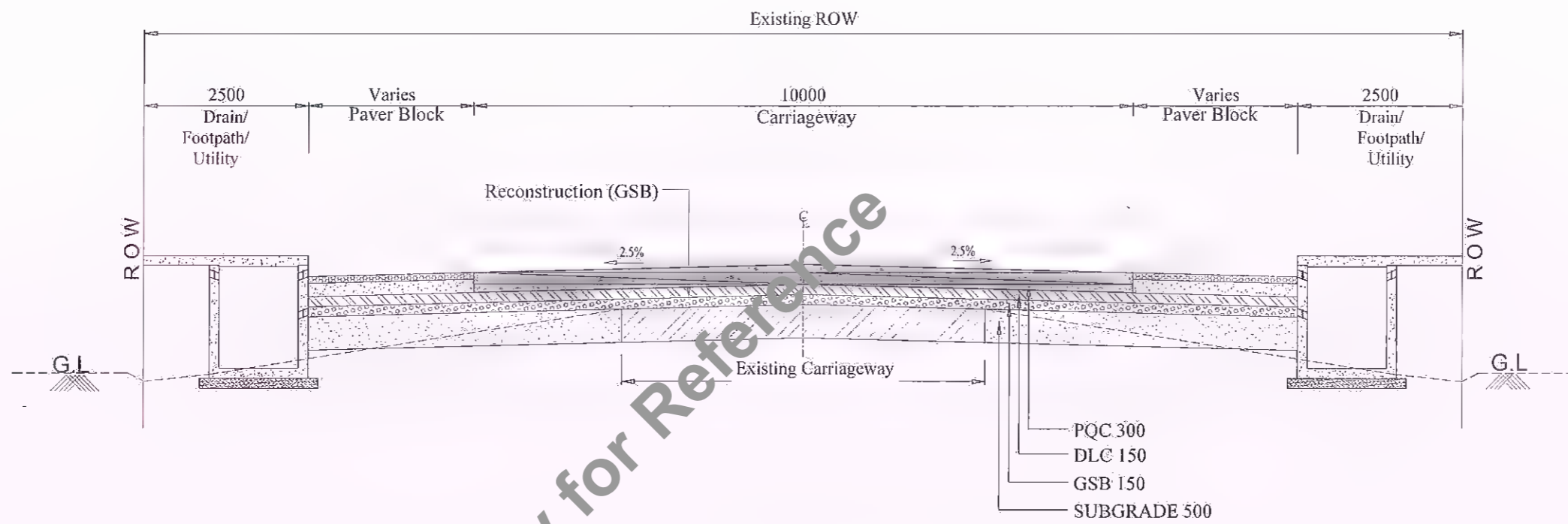
NOTE :
 1. ALL DIMENSIONS ARE IN MILLIMETRE, UNLESS OTHERWISE SPECIFIED.

Client : Bihar State Road Development Corporation Ltd.	SCALE : NTS	Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants : HaskoningDHW Nederland B.V.	Title : TYPICAL CROSS SECTION TCS - 3 (PKG: 02)	DRAWING NO. : RHDHV/64801/DPR/TCS/03 R3
					DATE : December 2021 SHEET: 3 of 6 DESIGNED (A) : DRAWN (B) : CHECKED (C) : APPROVED (D) :

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TCS - 04
TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY IN URBAN / HABITATION
AREA (RECONSTRUCTION WITH TOP LAYER OF GSB
(CONCENTRIC WIDENING)

S.No.	Chainage		Length (Km)
	From	To	
1	22+000	22+250	0.250
2	23+950	24+150	0.200
3	24+400	24+500	0.100
4	26+400	26+840	0.440

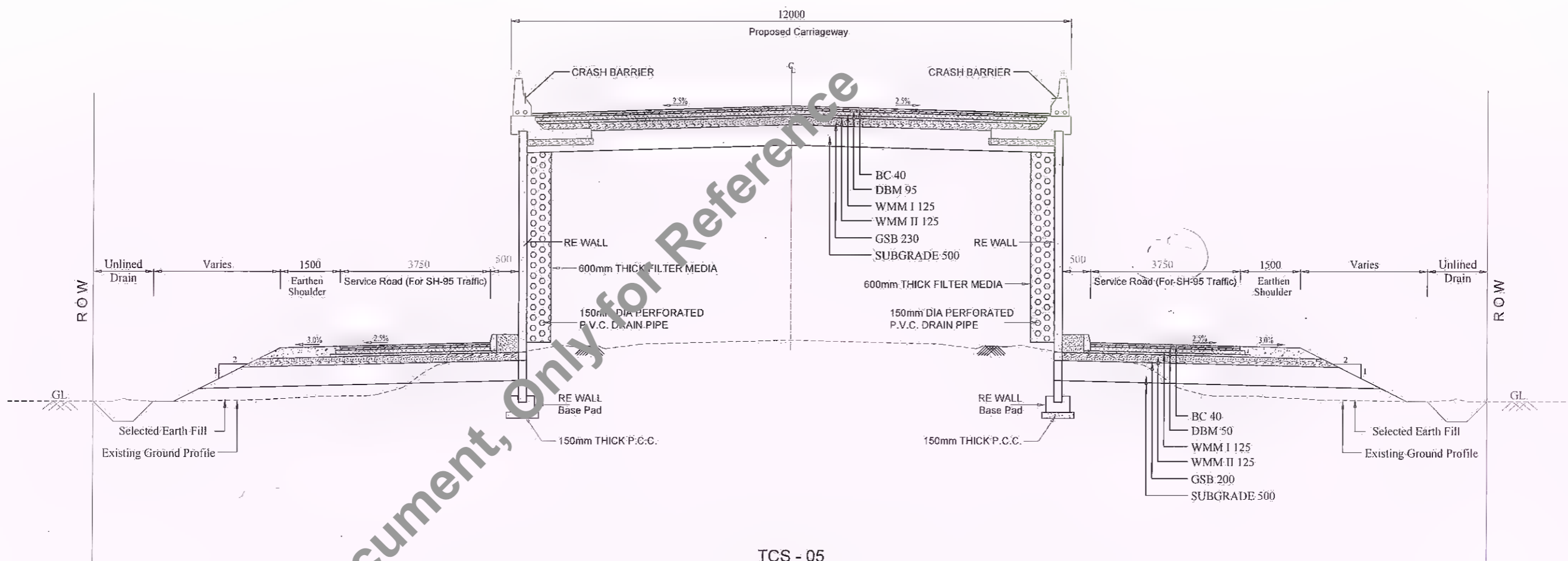
NOTE :

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Client: Bihar State Road Development Corporation Ltd.	SCALE: NTS	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title: TCS - 4 (PKG: 02)	DRAWING NO.: RHDHV/64801/DPR/TCS/04 R3 DATE: December 2021 SHEET: 4 of 6 DESIGNED (D) DRAWN (D) CHECKED (D) APPROVED (D) R Singh J J Dubhal R Singh S Pathari
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TCS - 05
 TYPICAL CROSS SECTION OF 2 LANE CARRIAGEWAY WITH SLIP ROAD ON BOTH SIDES IN APPROCHES OF ROB (tentative)

S.No.	Chainage		Length (Km)
	From	To	
1	23+030	23+950	0.920

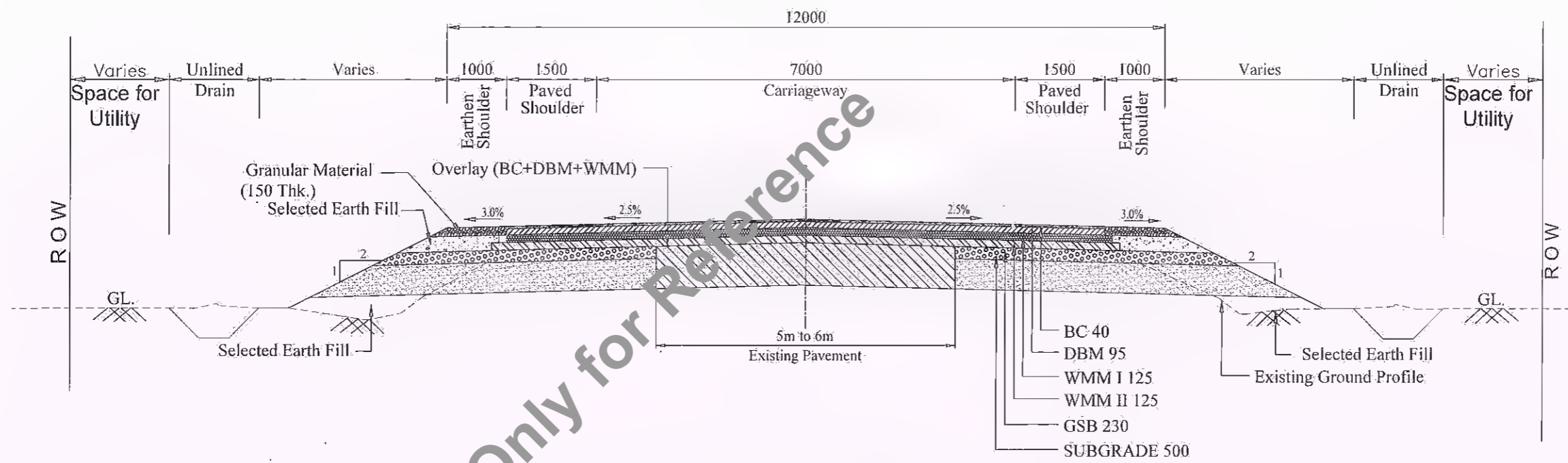
A
 D.G.M. (Tech.)
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Manager (Tech.)
 BSRDCL
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NOTE :
 1. ALL DIMENSIONS ARE IN MILLIMETRE, UNLESS OTHERWISE SPECIFIED.

Client : Bihar State Road Development Corporation Ltd.	SCALE : NTS	Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants : Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title : TCS - 5 (PKG: 02)	DRAWING No. : RH/DHV/64801/DP/TC/05 R3 DATE : December 2021 SHEET: 5 of 6 DESIGNED (A) : R. Singh DRAWN (B) : J.P. Dabhal CHECKED (C) : R. Singh APPROVED (D) : S. Pattnaik
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TYPE - 06
TYPICAL CROSS SECTION OF 2 LANE CARRIAGEWAY FOR
EXISTING NH-107 OVERLAPPING LOCATIONS

S.No.	Chainage		Length (Km)
	From	To	
1	27+100	28+080	0.980

Manager (Tech.)
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NOTE :

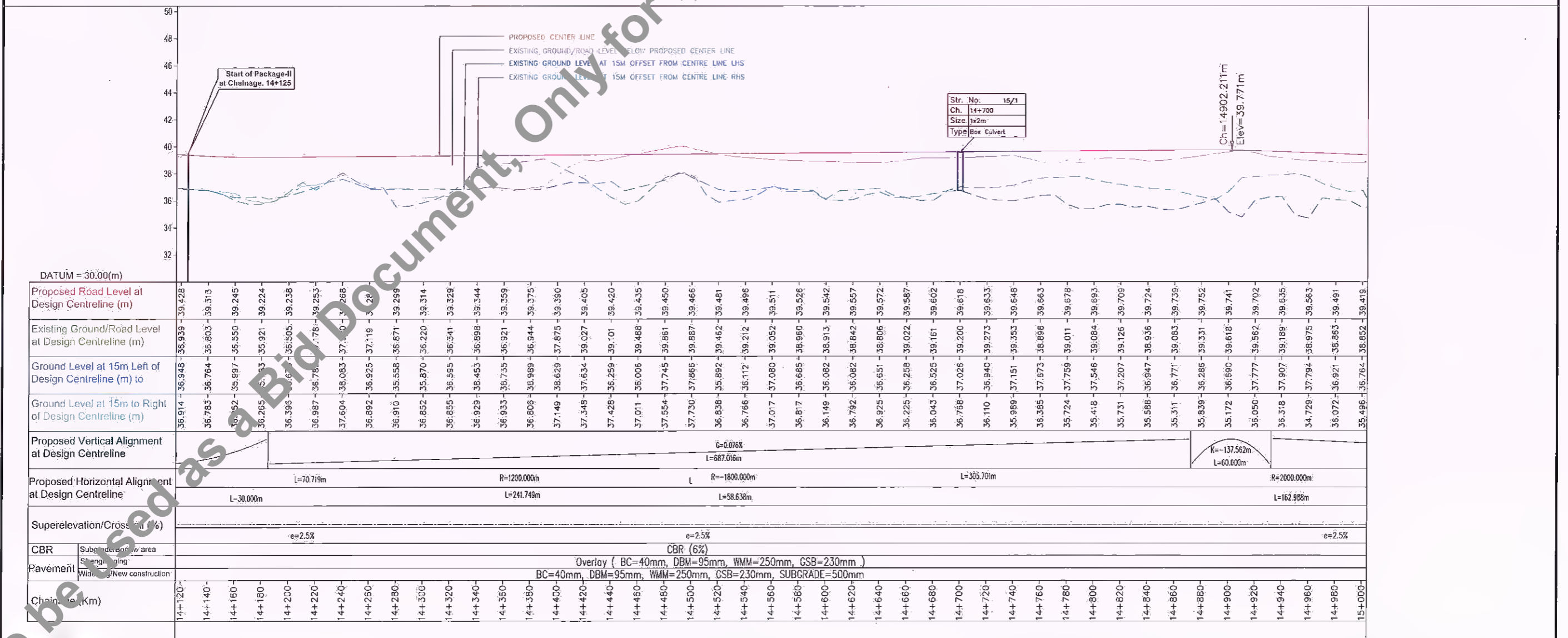
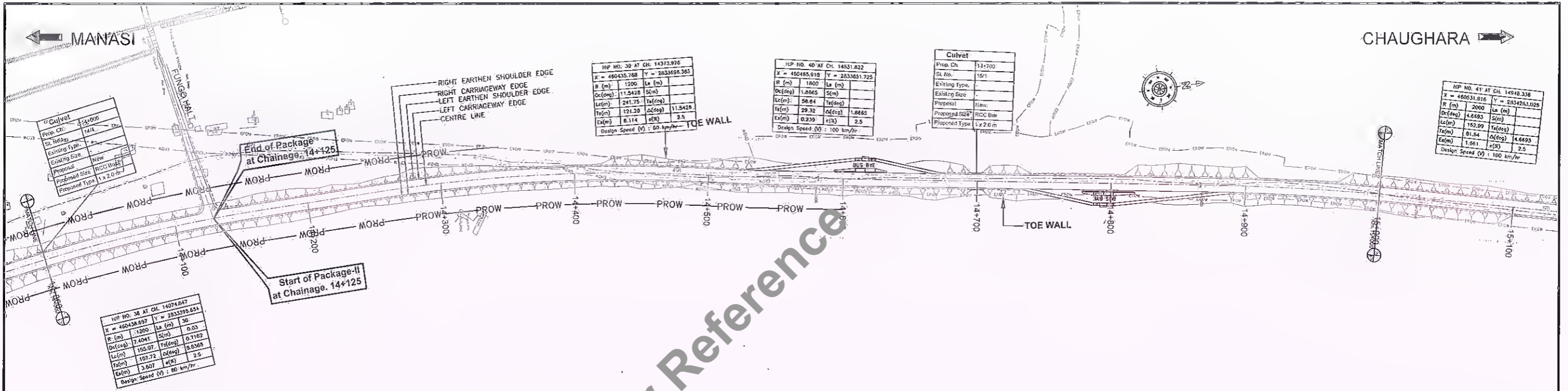
1. ALL DIMENSIONS ARE IN MILLIMETRE, UNLESS OTHERWISE SPECIFIED.

Client : Bihar State Road Development Corporation Ltd.	SCALE : NTS	Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi-Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants : Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title : TCS - 6 (PKG: 02)	DRAWING NO : RHDHV/64801/DPR/TCS/06 R3 DATE : December 2021 SHEET: 6 of 6 DESIGNED (A) : R. Singh DRAWN (D) : J.P. Dabhi CHECKED (C) : R. Singh APPROVED (I) : S. Patra
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PLAN & PROFILE



Project :	Design Consultants :	Title :	DRAWING No :
Bihar State Road Development Corporation Ltd.	Royal HaskoningDHV HaskoningDHV Nederland B.V.	PLAN & PROFILE	RHDHV/64801/DPR/P&P/15
Project :	Design Consultants :	(Ch. 14+125 to 15+000)	R3
Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Royal HaskoningDHV HaskoningDHV Nederland B.V.		
Scale :	Project :	DATE :	SHEET 15 of 79
HORIZONTAL = 1:2000 VERTICAL = 1:200	Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	December 2021	
		DESIGNED :	CHECKED :
		R Singh	R Singh
		DRAWN :	APPROVED :
		J P Dahiya	S Pathari
		REV. DATE :	
		DESCRIPTION OF REVISIONS :	

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PIU-Khagaria

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MANASI ←

CHAUGHARA →

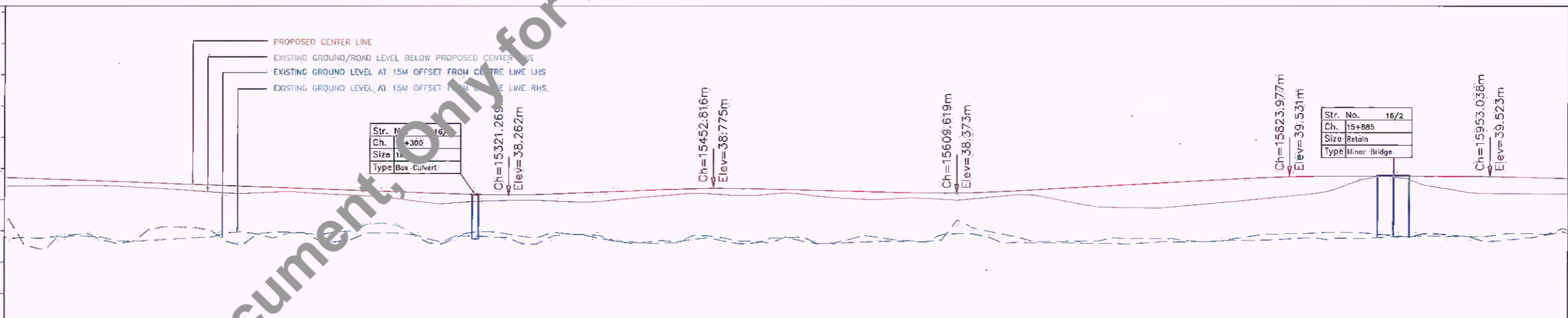
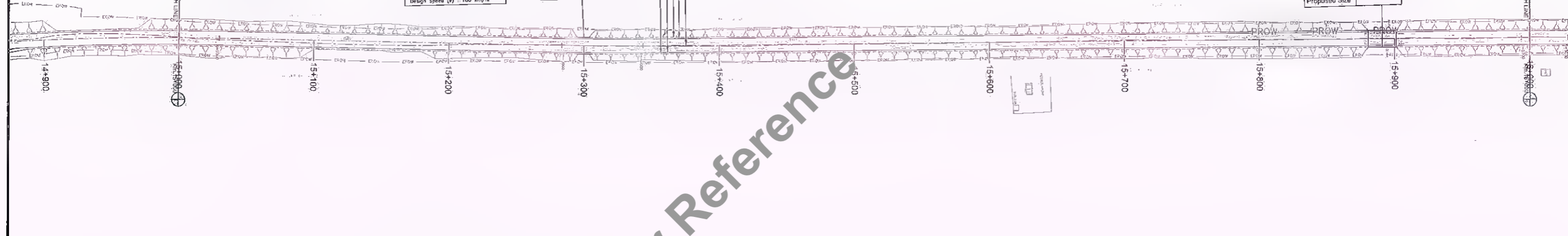
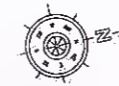
HP No. 41 AT CL 14948.330	
X = 455631.916	Y = 2634763.625
R (m) = 2000	Ls (m) =
Ds(deg) = 4.6583	S(deg) =
Lc(m) = 162.98	Ts(deg) =
Ls(m) = 61.54	Ts(deg) = 4.6583
Ea(m) = 1.681	As(deg) = 2.5
Design Speed (V) = 100 km/hr.	

HP No. 42 AT CL 15313.803	
X = 456418.02	Y = 2634618.04
R (m) = 2000	Ls (m) =
Ds(deg) = 1.7163	S(deg) =
Lc(m) = 60.01	Ts(deg) =
Ls(m) = 30.01	Ts(deg) = 1.7163
Ea(m) = 0.225	As(deg) = 2.5
Design Speed (V) = 100 km/hr.	

Culvert	
Prop. Ch.	15+300
Sl. No.	18/1
Existing Type	
Existing Size	
Proposal	New
Proposed Size	RCC Box
Proposed Type	1 x 2.0 m

MINOR BRIDGE	
Prop. Ch.	15+891
Sl. No.	16/2
Existing Type	Minor Bridge
Existing Size	2 x 10.3m
Proposal	Retain
Proposed Type	
Proposed Size	

- RIGHT EARTHEN SHOULDER EDGE
- RIGHT CARRIAGEWAY EDGE
- LEFT EARTHEN SHOULDER EDGE
- LEFT CARRIAGEWAY EDGE
- CENTRE LINE



DÁTUM = 30.00(m)	
Proposed Road Level at Design Centreline (m)	39.419, 39.552, 39.547, 39.275, 39.203, 39.131, 39.059, 39.087, 39.191, 38.842, 38.770, 38.698, 38.626, 38.554, 38.482, 38.410, 38.338, 38.266, 38.194, 38.122, 38.050, 37.978, 37.906, 37.834, 37.762, 37.690, 37.618, 37.546, 37.474, 37.402, 37.330, 37.258, 37.186, 37.114, 37.042, 36.970, 36.898, 36.826, 36.754, 36.682, 36.610, 36.538, 36.466, 36.394, 36.322, 36.250, 36.178, 36.106, 36.034, 35.962, 35.890, 35.818, 35.746, 35.674, 35.602, 35.530, 35.458, 35.386, 35.314, 35.242, 35.170, 35.098, 35.026, 34.954, 34.882, 34.810, 34.738, 34.666, 34.594, 34.522, 34.450, 34.378, 34.306, 34.234, 34.162, 34.090, 34.018, 33.946, 33.874, 33.802, 33.730, 33.658, 33.586, 33.514, 33.442, 33.370, 33.298, 33.226, 33.154, 33.082, 33.010, 32.938, 32.866, 32.794, 32.722, 32.650, 32.578, 32.506, 32.434, 32.362, 32.290, 32.218, 32.146, 32.074, 32.002, 31.930, 31.858, 31.786, 31.714, 31.642, 31.570, 31.498, 31.426, 31.354, 31.282, 31.210, 31.138, 31.066, 30.994, 30.922, 30.850, 30.778, 30.706, 30.634, 30.562, 30.490, 30.418, 30.346, 30.274, 30.202, 30.130, 30.058, 30.000, 30.000
Existing Ground/Road Level at Design Centreline (m)	38.652, 38.885, 39.347, 39.275, 39.203, 39.131, 39.059, 39.087, 39.191, 38.842, 38.770, 38.698, 38.626, 38.554, 38.482, 38.410, 38.338, 38.266, 38.194, 38.122, 38.050, 37.978, 37.906, 37.834, 37.762, 37.690, 37.618, 37.546, 37.474, 37.402, 37.330, 37.258, 37.186, 37.114, 37.042, 36.970, 36.898, 36.826, 36.754, 36.682, 36.610, 36.538, 36.466, 36.394, 36.322, 36.250, 36.178, 36.106, 36.034, 35.962, 35.890, 35.818, 35.746, 35.674, 35.602, 35.530, 35.458, 35.386, 35.314, 35.242, 35.170, 35.106, 35.034, 34.962, 34.890, 34.818, 34.746, 34.674, 34.602, 34.530, 34.458, 34.386, 34.314, 34.242, 34.170, 34.106, 34.034, 33.962, 33.890, 33.818, 33.746, 33.674, 33.602, 33.530, 33.458, 33.386, 33.314, 33.242, 33.170, 33.106, 33.034, 32.962, 32.890, 32.818, 32.746, 32.674, 32.602, 32.530, 32.458, 32.386, 32.314, 32.242, 32.170, 32.106, 32.034, 31.962, 31.890, 31.818, 31.746, 31.674, 31.602, 31.530, 31.458, 31.386, 31.314, 31.242, 31.170, 31.106, 31.034, 30.962, 30.890, 30.818, 30.746, 30.674, 30.602, 30.530, 30.458, 30.386, 30.314, 30.242, 30.170, 30.106, 30.034, 30.000, 30.000
Ground Level at 15m Left of Design Centreline (m) to	36.764, 36.520, 35.749, 35.749, 35.606, 35.344, 35.456, 35.568, 35.879, 35.805, 35.876, 35.770, 35.003, 35.509, 35.824, 35.376, 35.948, 35.823, 35.593, 35.824, 35.726, 35.324, 35.237, 35.710, 35.551, 35.330, 35.620, 35.189, 35.449, 35.590, 35.375, 35.415, 36.211, 35.794, 35.310, 35.335, 35.349, 35.512, 35.521, 35.360, 35.381, 35.423, 35.494, 35.605, 35.548, 35.590, 35.627, 35.699, 35.649, 35.818, 35.862, 35.820, 35.920, 35.940, 35.960, 35.980, 35.990, 35.990
Ground Level at 15m to Right of Design Centreline (m)	36.498, 36.845, 36.587, 35.606, 35.344, 35.456, 35.568, 35.879, 35.805, 35.876, 35.770, 35.003, 35.509, 35.824, 35.376, 35.948, 35.823, 35.593, 35.824, 35.726, 35.324, 35.237, 35.710, 35.551, 35.330, 35.620, 35.189, 35.449, 35.590, 35.375, 35.415, 36.211, 35.794, 35.310, 35.335, 35.349, 35.512, 35.521, 35.360, 35.381, 35.423, 35.494, 35.605, 35.548, 35.590, 35.627, 35.699, 35.649, 35.818, 35.862, 35.820, 35.920, 35.940, 35.960, 35.980, 35.990, 35.990
Proposed Vertical Alignment at Design Centreline	G=-0.360% L=359.057m R=7996.317m, Lv=60.0m G=0.390% L=71.548m R=7534.168m, Lv=60.0m G=-0.256% L=96.802m R=7534.168m, Lv=60.0m G=0.540% L=154.358m R=-10969.250m, Lv=60.0m G=-0.006% L=69.061m R=-23026.124m Lv=60.0m
Proposed Horizontal Alignment at Design Centreline	D=253.703m, Lc=60.014m, R=-2000.0m, D=650.151m, Lc=154.358m
Superelevation/Crossfall (%)	e=2.5%
CBR	Subgrade Strength Area
Pavement	Overlay (BC=40mm, DBM=95mm, WMM=250mm, GSB=230mm) BC=40mm, DBM=95mm, WMM=250mm, GSB=230mm, SUBGRADE=500mm
Chainage (Km)	15+000, 15+020, 15+040, 15+060, 15+080, 15+100, 15+120, 15+140, 15+160, 15+180, 15+200, 15+220, 15+240, 15+260, 15+280, 15+300, 15+320, 15+340, 15+360, 15+380, 15+400, 15+420, 15+440, 15+460, 15+480, 15+500, 15+520, 15+540, 15+560, 15+580, 15+600, 15+620, 15+640, 15+660, 15+680, 15+700, 15+720, 15+740, 15+760, 15+780, 15+800, 15+820, 15+840, 15+860, 15+880, 15+900, 15+920, 15+940, 15+960, 15+980, 16+000

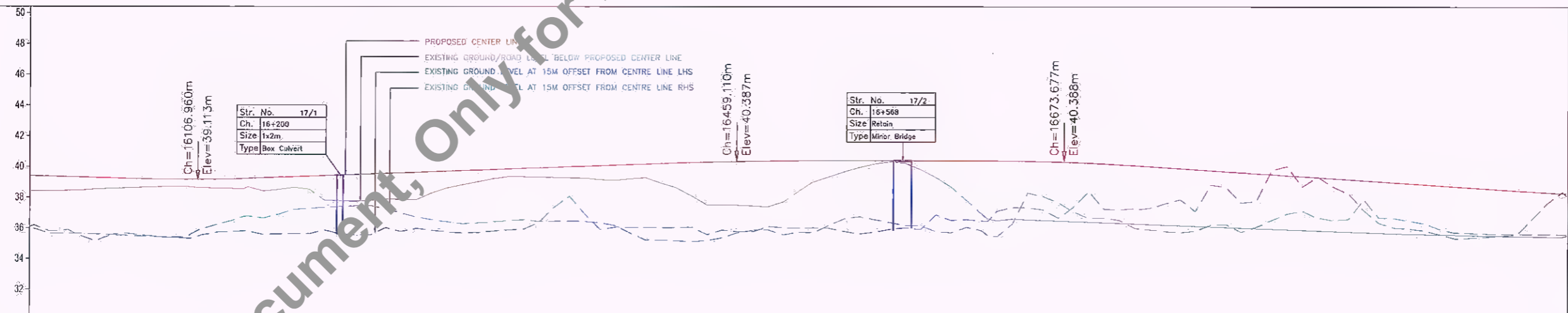
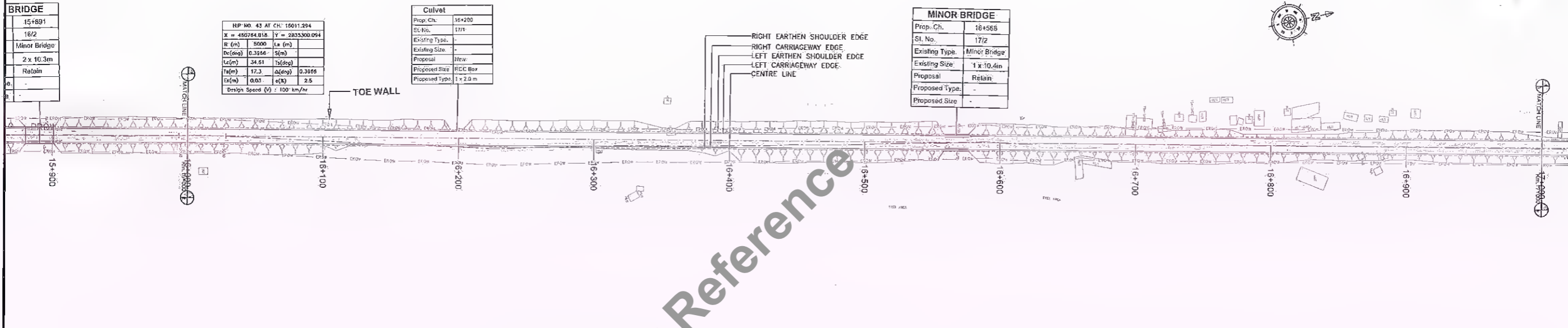
Client Bihar State Road Development Corporation Ltd.	SCALE HORIZONTAL = 1:3000 VERTICAL = 1:300	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V.	Design Consultants: HaskoningDHV Nederland B.V.	Title: PLAN & PROFILE (Ch. 15+000 to 16+000)			DRAWING NO: RHDHV/64801/DPR/P&P/16	SHEET: 17 of 79			
				RS 25 th Nov 2021	Alignment Modified at Kajant Jangle	DESIGNED: <i>Reigh</i>			DRAWN: <i>J.P. Dobhal</i>	CHECKED: <i>Reigh</i>	APPROVED: <i>S. Paturi</i>
				RS 10 th Jan 2022	Alignment Modified at Udaip						
				RS 22 nd Nov 2018	Alignment Modified at Subgrade Design						
RS 24 th April 2017	Plan & Profile										
REV	DATE	DESCRIPTION OF REVISIONS									

Manager (Tech.)
BSRDCL
PIU-Khagaria

D.G.M. (Tech.)
BSRDCL
PIU-Khagaria

← MANASI

CHAUGHARA →



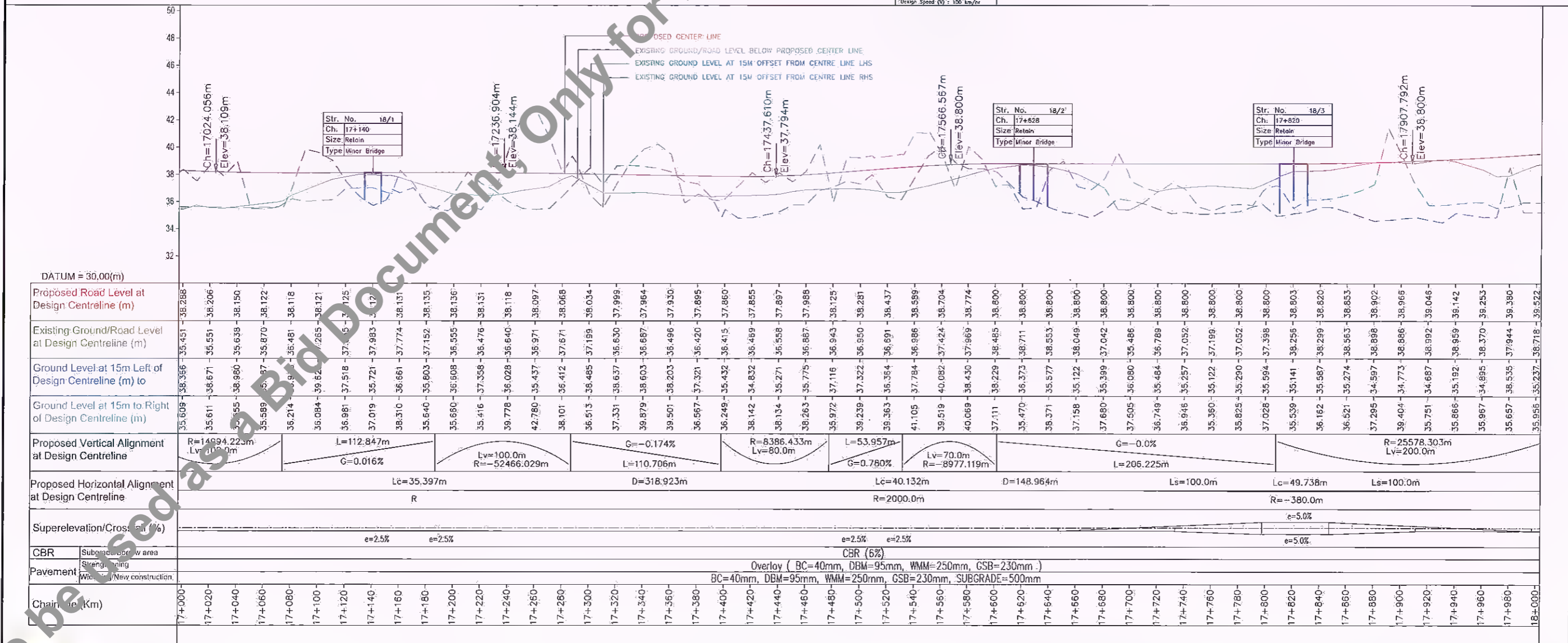
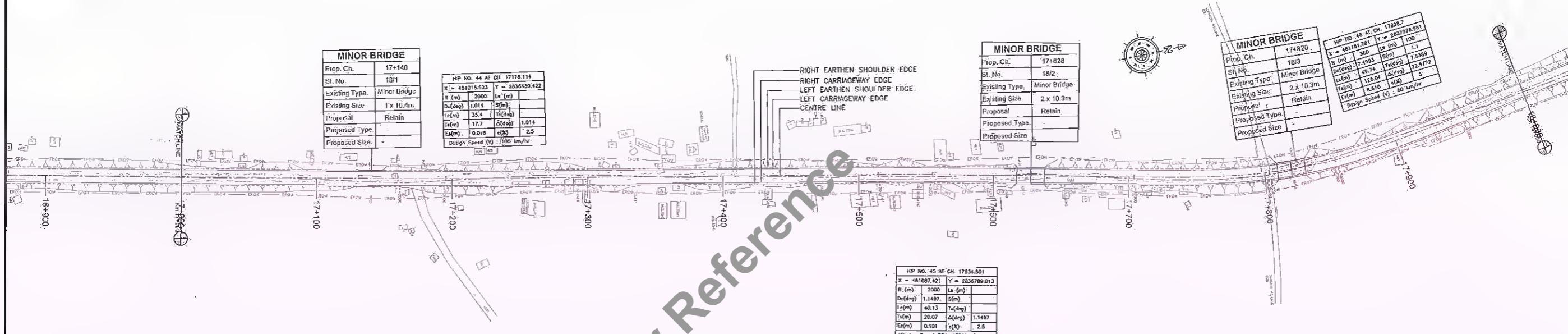
Station (Km)	Proposed Road Level at Design Centreline (m)	Existing Ground/Road Level at Design Centreline (m)	Ground Level at 15m Left of Design Centreline (m)	Ground Level at 15m to Right of Design Centreline (m)	Proposed Vertical Alignment at Design Centreline	Proposed Horizontal Alignment at Design Centreline	Superelevation/Crossfall (%)	CBR	Pavement
16+000	39.398	38.404	35.974	36.201	G = -0.266%	R	e = 2.5%	Subgrade	BC=40mm, DBM=95mm, WMM=250mm, GSB=230mm, SUBGRADE=500mm
16+020	39.345	38.435	35.865	36.239	Lv=60.0m		e = 2.5%	Strengthening	
16+040	39.292	38.537	35.812	36.272	G = 0.362%		e = 2.5%	New construction	
16+060	39.239	38.614	35.759	36.305	L = 272.150m				
16+080	39.186	38.678	35.706	36.338	L = 114.568m				
16+100	39.160	38.724	35.652	36.371	G = 0.0%				
16+120	39.176	38.771	35.635	36.404	Lv=100.0m				
16+140	39.23	38.882	35.618	36.437	R = -15362.260m				
16+160	39.305	38.909	35.601	36.470	G = -0.650%				
16+180	39.378	38.928	35.584	36.503	L = 250.379m				
16+200	39.450	38.979	35.567	36.536					
16+220	39.522	39.061	35.550	36.569					
16+240	39.595	39.143	35.533	36.602					
16+260	39.667	39.225	35.516	36.635					
16+280	39.739	39.307	35.499	36.668					
16+300	39.812	39.389	35.482	36.701					
16+320	39.884	39.471	35.465	36.734					
16+340	39.956	39.553	35.448	36.767					
16+360	40.029	39.635	35.431	36.800					
16+380	40.101	39.717	35.414	36.833					
16+400	40.173	39.800	35.397	36.866					
16+420	40.244	39.882	35.380	36.899					
16+440	40.301	39.964	35.363	36.932					
16+460	40.344	40.046	35.346	36.965					
16+480	40.372	40.128	35.329	37.000					
16+500	40.388	40.210	35.312	37.035					
16+520	40.388	40.292	35.295	37.070					
16+540	40.388	40.374	35.278	37.105					
16+560	40.388	40.456	35.261	37.140					
16+580	40.388	40.538	35.244	37.175					
16+600	40.388	40.620	35.227	37.210					
16+620	40.388	40.702	35.210	37.245					
16+640	40.379	40.784	35.193	37.280					
16+660	40.345	40.866	35.176	37.315					
16+680	40.285	40.948	35.159	37.350					
16+700	40.199	41.030	35.142	37.385					
16+720	40.088	41.112	35.125	37.420					
16+740	39.957	41.194	35.108	37.455					
16+760	39.827	41.276	35.091	37.490					
16+780	39.697	41.358	35.074	37.525					
16+800	39.566	41.440	35.057	37.560					
16+820	39.435	41.522	35.040	37.595					
16+840	39.305	41.604	35.023	37.630					
16+860	39.175	41.686	35.006	37.665					
16+880	39.045	41.768	34.989	37.700					
16+900	38.915	41.850	34.972	37.735					
16+920	38.786	41.932	34.955	37.770					
16+940	38.656	42.014	34.938	37.805					
16+960	38.526	42.096	34.921	37.840					
16+980	38.397	42.178	34.904	37.875					
17+000	38.268	42.260	34.887	37.910					

<p>Bihar State Road Development Corporation Ltd.</p>	<p>SCALE</p> <p>HORIZONTAL = 1:2000</p> <p>VERTICAL = 1:200</p>	<p>Project:</p> <p>Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V</p>	<p>Design Consultants:</p> <p>HaskoningDHV Nederland B.V.</p>	<p>Title:</p> <p>PLAN & PROFILE</p> <p>(Ch. 16+000 to 17+000)</p>	<p>DRAWING NO: RHDHV/64801/DPR/P&P/17</p> <p>DATE: December 2021</p> <p>SHEET: 18 of 79</p>																					
						<p>Manager (Tech.)</p> <p>BSRDCL</p> <p>PIU-Khagaria</p>	<p>D.G.M (Tech.)</p> <p>BSRDCL</p> <p>PIU-Khagaria</p>	<p>REV</p> <table border="1"> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION OF REVISIONS</th> </tr> <tr> <td>R1</td> <td>23rd Nov 2021</td> <td>Alignment Modified at Kajjoi Temple</td> </tr> <tr> <td>R2</td> <td>10th Jan 2022</td> <td>Alignment Modified at Manasi</td> </tr> <tr> <td>R3</td> <td>20th Nov 2018</td> <td>Alignment Modified at Sainhabad Bypass</td> </tr> <tr> <td>RB</td> <td>24th April 2017</td> <td>Plan & Profile</td> </tr> </table>	REV	DATE	DESCRIPTION OF REVISIONS	R1	23 rd Nov 2021	Alignment Modified at Kajjoi Temple	R2	10 th Jan 2022	Alignment Modified at Manasi	R3	20 th Nov 2018	Alignment Modified at Sainhabad Bypass	RB	24 th April 2017	Plan & Profile	<table border="1"> <tr> <td>DESIGNED</td> <td>DRAWN</td> <td>CHECKED</td> <td>APPROVED</td> </tr> <tr> <td>R Singh</td> <td>J P Dabhal</td> <td>R Singh</td> <td>S Pathari</td> </tr> </table>	DESIGNED	DRAWN
REV	DATE	DESCRIPTION OF REVISIONS																								
R1	23 rd Nov 2021	Alignment Modified at Kajjoi Temple																								
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R3	20 th Nov 2018	Alignment Modified at Sainhabad Bypass																								
RB	24 th April 2017	Plan & Profile																								
DESIGNED	DRAWN	CHECKED	APPROVED																							
R Singh	J P Dabhal	R Singh	S Pathari																							

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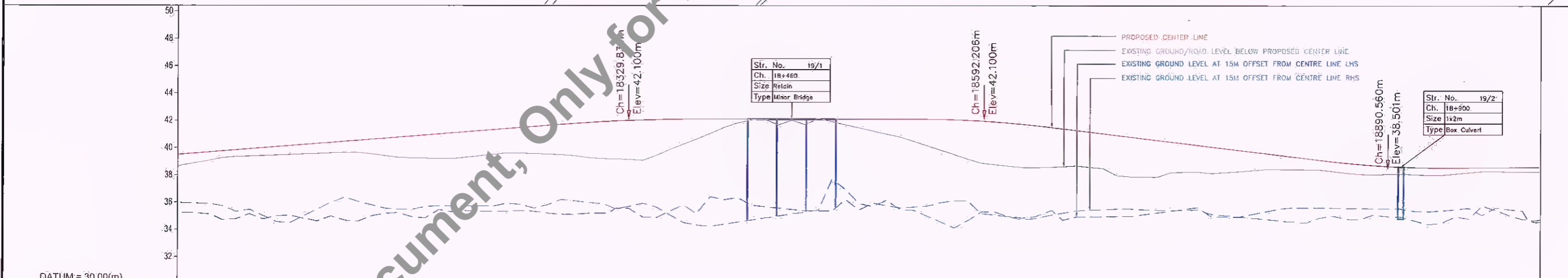
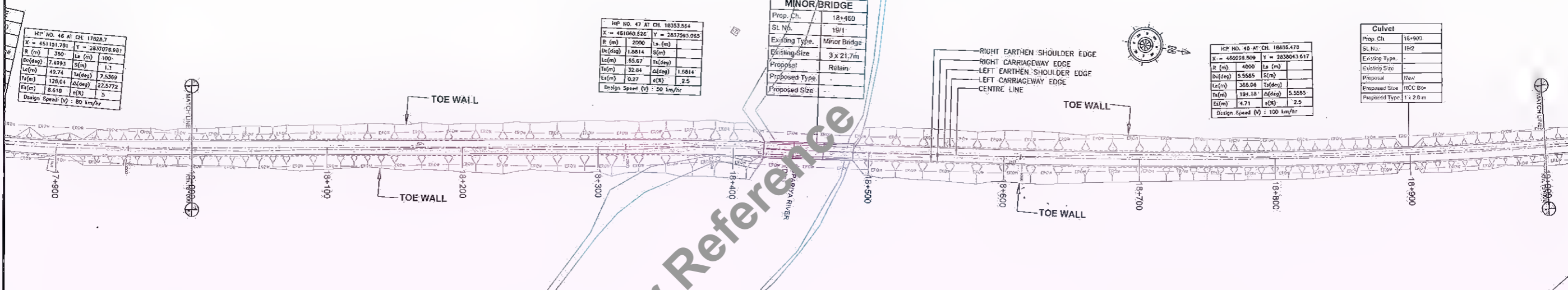


Client: Bihar State Road Development Corporation Ltd.	SCALE: HORIZONTAL = 1:2000, VERTICAL = 1:200	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: HaskoningDHV Nederland B.V.	Title: PLAN & PROFILE (Ch. 17+000 to 18+000)	DRAWING NO.: RHDHV/64801/DPR/P&P/18	R3
Manager (Tech.) BSRDCL PIU-Khagaria		D.G.M. (Tech.) BSRDCL PIU-Khagaria			DESIGNED: R Singh, DRAWN: J P. Dobhal, CHECKED: R Singh, APPROVED: S Pathari	SHEET: 19 of 79

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Proposed Road Level at Design Centreline (m)	Existing Ground/Road Level at Design Centreline (m)	Ground Level at 15m Left of Design Centreline (m)	Ground Level at 15m to Right of Design Centreline (m)	Proposed Vertical Alignment at Design Centreline	Proposed Horizontal Alignment at Design Centreline	Superlevation/Crossfall (%)	CBR	Pavement	Chainage (Km)
39.522	38.718	35.237	35.956	L=272.042m G=0.782%	D=367.159m	e=2.5%	Subgrade Strengthening	Overlay (BC=40mm, DBM=95mm, WMM=250mm, GSB=230mm) BC=40mm, DBM=95mm, WMM=250mm, GSB=230mm, SUBGRADE=500mm	18+000
39.677	39.058	35.131	35.906						18+020
39.834	39.350	34.768	35.312	L=100.0m R=-12789.152m	Lc=65.674m	e=2.5%	New construction	18+040	
39.990	39.422	34.633	35.012					18+060	
40.147	39.501	34.505	34.505	G=-0.0%	D=226.049m	e=2.5%	New construction	18+080	
40.303	39.572	34.372	34.459					18+100	
40.459	39.648	34.241	34.801	L=162.372m	D=226.049m	e=2.5%	New construction	18+120	
40.615	39.718	34.115	34.993					18+140	
40.772	39.794	33.988	35.149	L=100.0m R=-8289.848m	Lc=388.056m	e=2.5%	New construction	18+160	
40.928	39.869	33.863	35.303					18+180	
41.085	39.945	33.738	35.457	G=-1.206%	Lc=388.056m	e=2.5%	New construction	18+200	
41.241	40.020	33.613	35.611					18+220	
41.398	40.095	33.488	35.765	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+240	
41.554	40.170	33.363	35.919					18+260	
41.710	40.245	33.238	36.073	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+280	
41.866	40.320	33.113	36.227					18+300	
42.023	40.395	32.988	36.381	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+320	
42.179	40.470	32.863	36.535					18+340	
42.335	40.545	32.738	36.689	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+360	
42.491	40.620	32.613	36.843					18+380	
42.647	40.695	32.488	36.997	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+400	
42.803	40.770	32.363	37.151					18+420	
42.959	40.845	32.238	37.305	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+440	
43.115	40.920	32.113	37.459					18+460	
43.271	40.995	31.988	37.613	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+480	
43.427	41.070	31.863	37.767					18+500	
43.583	41.145	31.738	37.921	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+520	
43.739	41.220	31.613	38.075					18+540	
43.895	41.295	31.488	38.229	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+560	
44.051	41.370	31.363	38.383					18+580	
44.207	41.445	31.238	38.537	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+600	
44.363	41.520	31.113	38.691					18+620	
44.519	41.595	30.988	38.845	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+640	
44.675	41.670	30.863	39.000					18+660	
44.831	41.745	30.738	39.154	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+680	
44.987	41.820	30.613	39.308					18+700	
45.143	41.895	30.488	39.462	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+720	
45.299	41.970	30.363	39.616					18+740	
45.455	42.045	30.238	39.770	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+760	
45.611	42.120	30.113	39.924					18+780	
45.767	42.195	29.988	40.078	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+800	
45.923	42.270	29.863	40.232					18+820	
46.079	42.345	29.738	40.386	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+840	
46.235	42.420	29.613	40.540					18+860	
46.391	42.495	29.488	40.694	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+880	
46.547	42.570	29.363	40.848					18+900	
46.703	42.645	29.238	41.002	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+920	
46.859	42.720	29.113	41.156					18+940	
47.015	42.795	28.988	41.310	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	18+960	
47.171	42.870	28.863	41.464					18+980	
47.327	42.945	28.738	41.618	R=7713.521m Lv=100.0m	R=4000.0m	e=2.5%	New construction	19+000	
47.483	43.020	28.613	41.772						

<p>Bihar State Road Development Corporation Ltd.</p>	<p>SCALE: HORIZONTAL = 1:2000, VERTICAL = 1:200</p>	<p>Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V</p>	<p>Design Consultants: HaskoningDHV Nederland B.V.</p>	<p>Title: PLAN & PROFILE (Ch. 18+000 to 19+000)</p>	<p>DRAWING NO.: RHDHV/64801/DPR/P&P/19</p>	<p>SHEET: 20 of 79</p>

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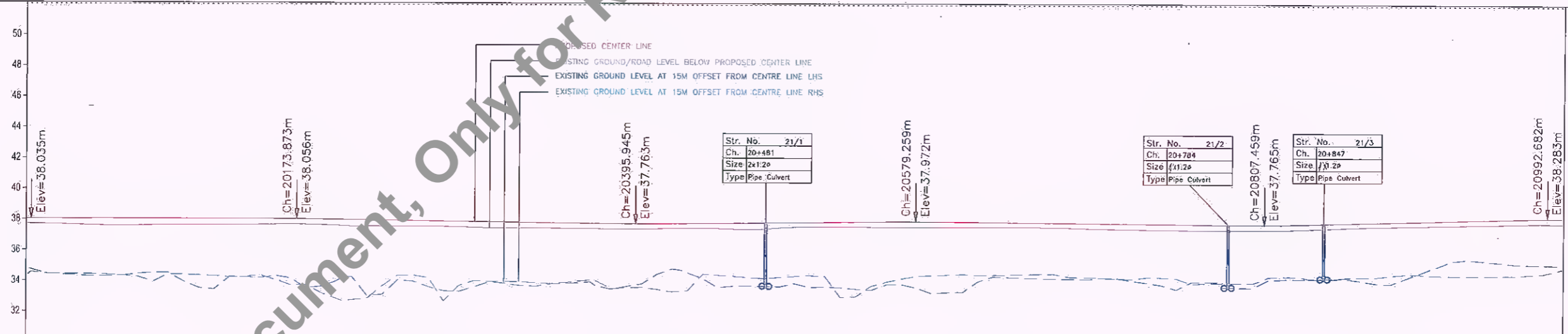
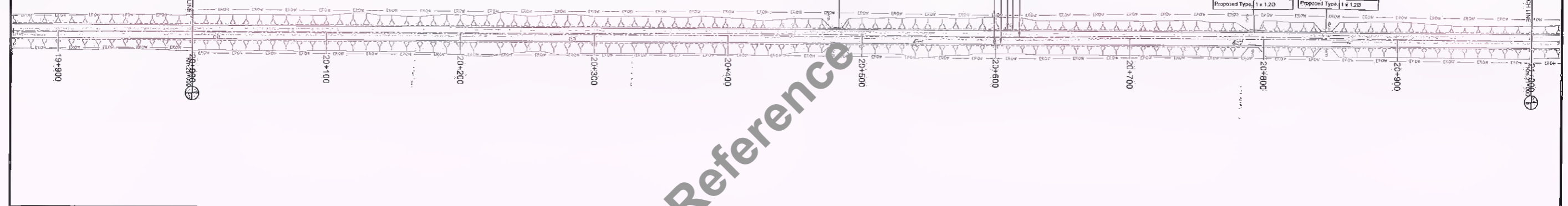
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0+AT CH	19857.352
475	Y = 2830068.054
200	La (m)
199	S (m)
12	Ta (deg)
0	Δ(deg)
09	e (ft)
0	v (km/hr)

Culvert	
Prop. Ch.	20+481
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Existing Type	HPC
Existing Size	3 x 0.600
Proposed Size	3 x 0.600
Proposed Type	HPC

Culvert	
Prop. Ch.	20+784
St. No.	212
Existing Type	HPC
Existing Size	2 x 0.600
Proposed Size	2 x 0.600
Proposed Type	HPC

Culvert	
Prop. Ch.	20+847
St. No.	213
Existing Type	HPC
Existing Size	2 x 0.600
Proposed Size	2 x 0.600
Proposed Type	HPC



DATUM = 30.00(m)	
Proposed Road Level at Design Centreline (m)	38.030
Existing Ground/Road Level at Design Centreline (m)	37.713
Ground Level at 15m Left of Design Centreline (m)	34.749
Ground Level at 15m to Right of Design Centreline (m)	34.563
Proposed Vertical Alignment at Design Centreline	L=113.564m, G=0.012%, R=1702.812m
Proposed Horizontal Alignment at Design Centreline	D=1761.614m
Superelevation/Cross Slope (%)	e=2.5%
CBR	Subgrade area
Pavement	Strengthening
Chainage (m)	20+000 to 21+000

Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V

Design Consultants: HaskoningDHV Nederland B.V.

Title: PLAN & PROFILE (Ch. 20+000 to 21+000)

DRAWING No. RHDHV/G4801/DPR/P&P/21 SHEET: 22 of 79

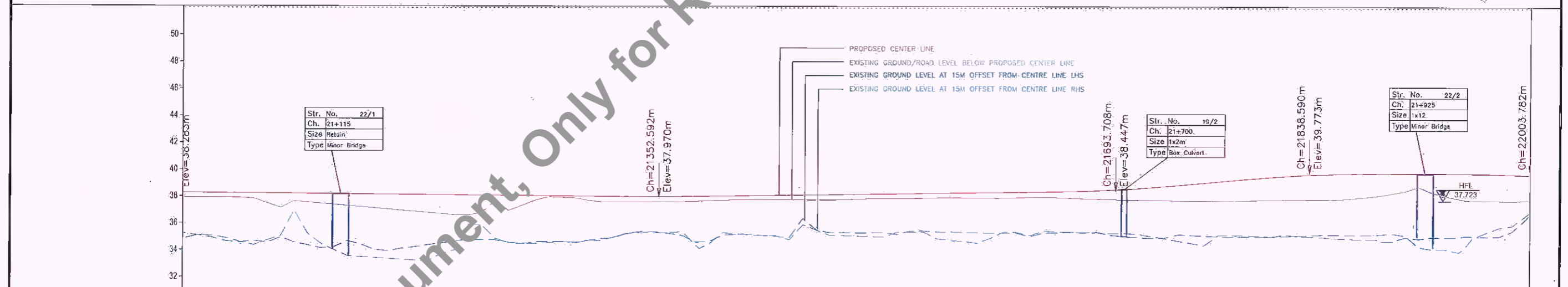
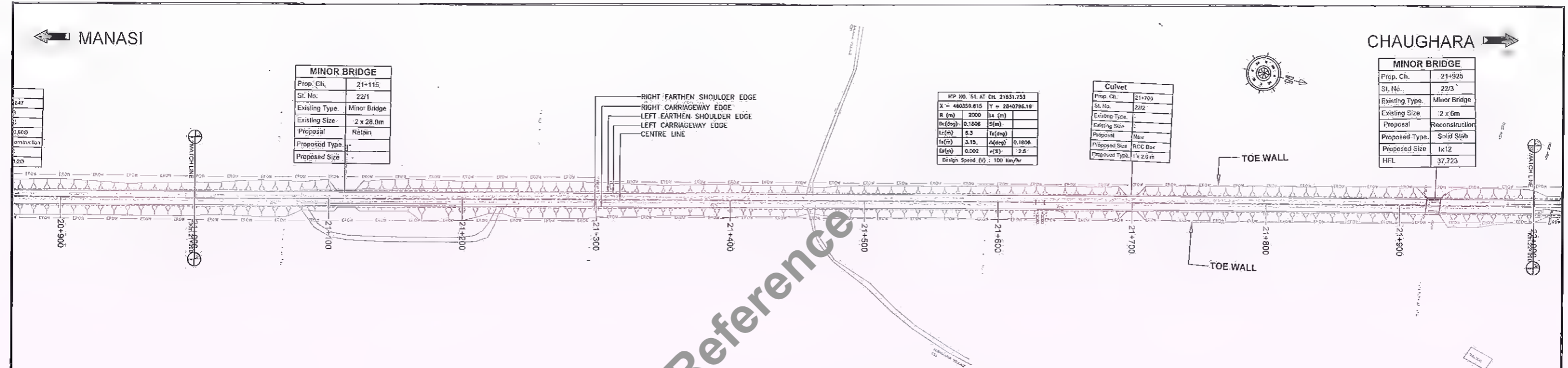
DATE: December 2021

DESIGNED: R Singh, DRAWN: J P Dubhal, CHECKED: R Singh, APPROVED: S Pathari

Manager (Tech.)
BSROCL
PIU-Khagaria

D.G.M. (Tech.)
BSROCL
PIU-Khagaria

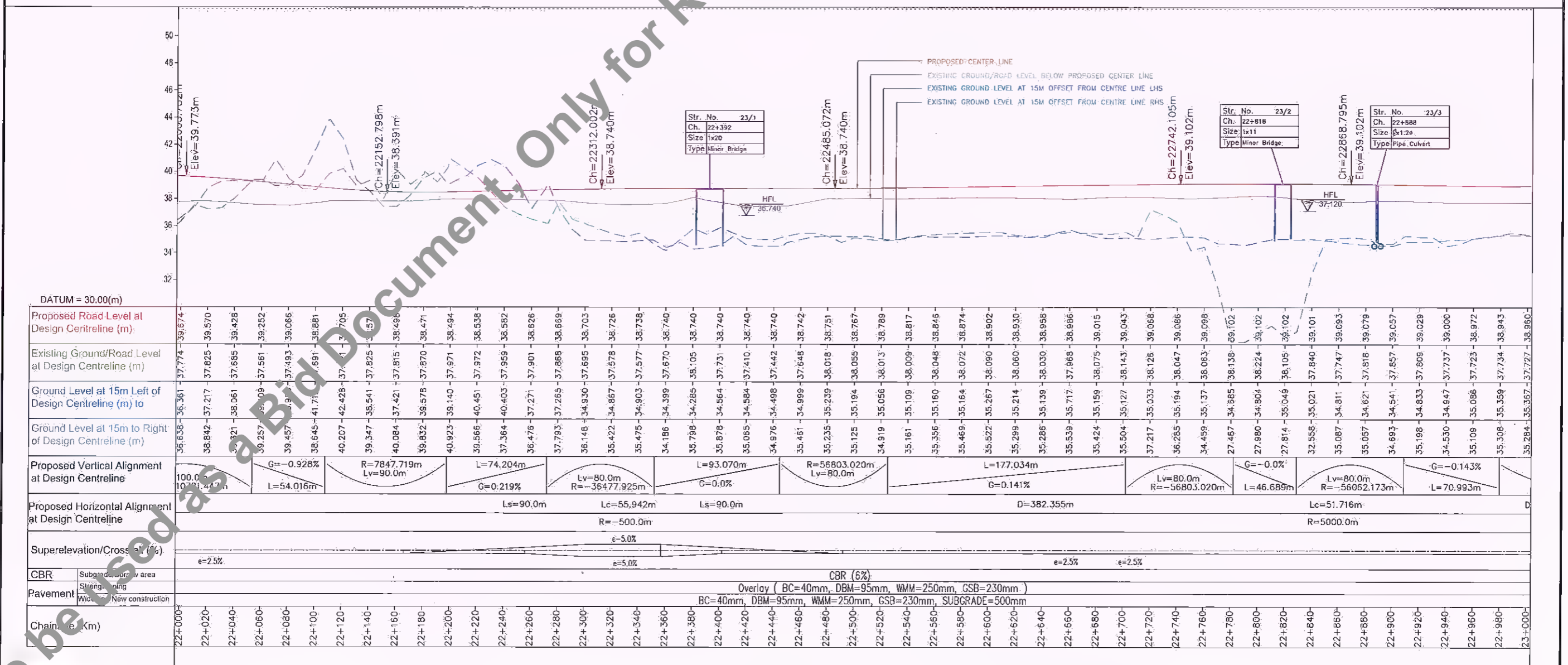
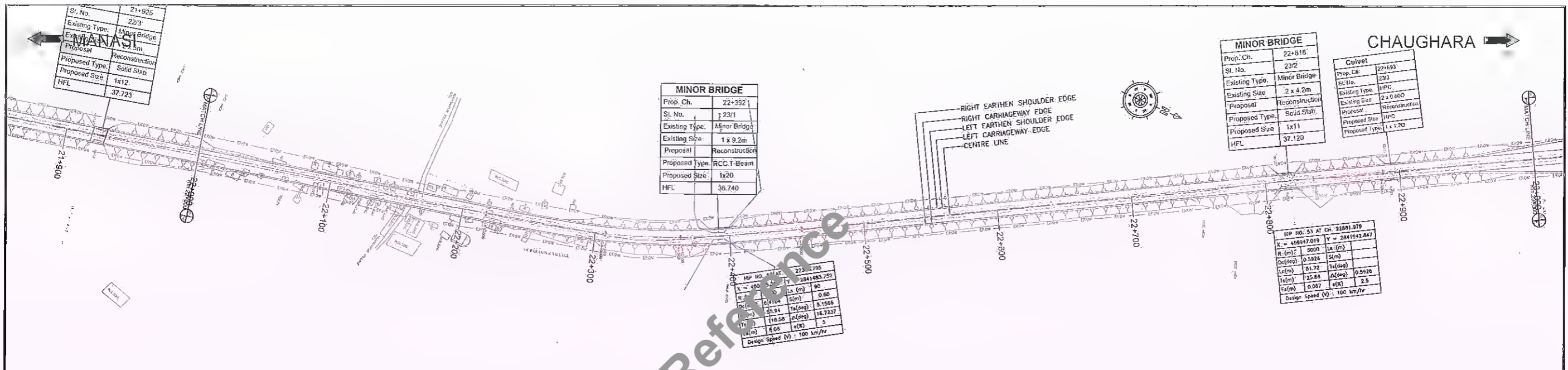
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Station (km)	Proposed Road Level at Design Centreline (m)	Existing Ground/Road Level at Design Centreline (m)	Ground Level at 15m Left of Design Centreline (m)	Ground Level at 15m to Right of Design Centreline (m)	Proposed Vertical Alignment at Design Centreline	Proposed Horizontal Alignment at Design Centreline	Superelevation/Cross Fall (%)	CBR	Pavement	Chainage (km)
21+000	38.261	37.917	35.224	34.914	G=-0.087%	L=299.909m	e=2.5%	Subgrade area	New construction	21+000
21+020	38.259	37.894	34.898	35.038						21+020
21+040	38.241	37.903	34.875	34.803	R=26461.447m Lv=60.0m	G=0.140%	e=2.5%	Subgrade area	New construction	21+040
21+060	38.224	37.899	34.861	34.748						21+060
21+080	38.207	37.846	34.827	34.719	R=12902.729m Lv=100.0m	G=0.0%	e=2.5%	Subgrade area	New construction	21+080
21+100	38.189	37.820	34.799	34.679						21+100
21+120	38.172	37.815	34.772	34.652	L=44.881m	G=0.915%	e=2.5%	Subgrade area	New construction	21+120
21+140	38.15	37.813	34.755	34.635						21+140
21+160	38.13	37.811	34.738	34.618	L=100.0m R=-10929.517m	G=0.0%	e=2.5%	Subgrade area	New construction	21+160
21+180	38.115	37.809	34.721	34.601						21+180
21+200	38.103	37.807	34.704	34.584	L=65.192m	G=0.0%	e=2.5%	Subgrade area	New construction	21+200
21+220	38.085	37.805	34.687	34.567						21+220
21+240	38.068	37.803	34.670	34.550	L=10.0m R=-10	G=0.0%	e=2.5%	Subgrade area	New construction	21+240
21+260	38.050	37.801	34.653	34.533						21+260
21+280	38.033	37.799	34.636	34.516						21+280
21+300	38.016	37.797	34.619	34.499						21+300
21+320	37.998	37.795	34.602	34.482						21+320
21+340	37.987	37.793	34.585	34.465						21+340
21+360	37.990	37.791	34.568	34.448						21+360
21+380	38.009	37.789	34.551	34.431						21+380
21+400	38.036	37.787	34.534	34.414						21+400
21+420	38.064	37.785	34.517	34.397						21+420
21+440	38.092	37.783	34.500	34.380						21+440
21+460	38.120	37.781	34.483	34.363						21+460
21+480	38.148	37.779	34.466	34.346						21+480
21+500	38.176	37.777	34.449	34.329						21+500
21+520	38.204	37.775	34.432	34.312						21+520
21+540	38.232	37.773	34.415	34.295						21+540
21+560	38.260	37.771	34.398	34.278						21+560
21+580	38.288	37.769	34.381	34.261						21+580
21+600	38.316	37.767	34.364	34.244						21+600
21+620	38.344	37.765	34.347	34.227						21+620
21+640	38.372	37.763	34.330	34.210						21+640
21+660	38.401	37.761	34.313	34.193						21+660
21+680	38.429	37.759	34.296	34.176						21+680
21+700	38.457	37.757	34.279	34.159						21+700
21+720	38.485	37.755	34.262	34.142						21+720
21+740	38.513	37.753	34.245	34.125						21+740
21+760	38.541	37.751	34.228	34.108						21+760
21+780	38.569	37.749	34.211	34.091						21+780
21+800	38.597	37.747	34.194	34.074						21+800
21+820	38.625	37.745	34.177	34.057						21+820
21+840	38.653	37.743	34.160	34.040						21+840
21+860	38.681	37.741	34.143	34.023						21+860
21+880	38.709	37.739	34.126	34.006						21+880
21+900	38.737	37.737	34.109	33.989						21+900
21+920	38.765	37.735	34.092	33.972						21+920
21+940	38.793	37.733	34.075	33.955						21+940
21+960	38.821	37.731	34.058	33.938						21+960
21+980	38.849	37.729	34.041	33.921						21+980
22+000	38.877	37.727	34.024	33.904						22+000

Client: Bihar State Road Development Corporation Ltd.	SCALE: HORIZONTAL = 1:2000, VERTICAL = 1:200	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: HaskoningDHV Nederland B.V.	Title: PLAN & PROFILE (Ch. 21+000 to 22+000)	DRAWING NO: RHDHV/64801/DPR/P&P/22, R3
Manager (Tech.) BSRDCL PIU-Khagaria	D.G.M. (Tech.) BSRDCL PIU-Khagaria				DATE: December, 2021
					DESIGNED: R Singh, DRAWN: J.P. Dohal, CHECKED: R Singh, APPROVED: S Pathari

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Station (Km)	Proposed Road Level at Design Centreline (m)	Existing Ground/Road Level at Design Centreline (m)	Ground Level at 15m Left of Design Centreline (m)	Ground Level at 15m to Right of Design Centreline (m)	Proposed Vertical Alignment at Design Centreline	Proposed Horizontal Alignment at Design Centreline	Superelevation/Crossfall (%)	CBR	Pavement
22+000	39.674	37.774	36.361	36.638	100.00%		e=2.5%	Subgrade	
22+020	39.570	37.825	37.217	38.842	G=-0.928%			Strengthening	
22+040	39.428	37.685	38.061	39.321	L=54.016m			New construction	
22+060	39.252	37.561	38.009	39.257	R=7847.719m				
22+080	39.066	37.493	37.993	39.457	Lv=90.0m				
22+100	38.881	37.399	37.999	38.645	G=0.219%				
22+120	38.705	37.305	37.905	40.207	L=74.204m				
22+140	38.529	37.211	37.811	39.347	R=55.942m				
22+160	38.353	37.117	37.717	40.084	L=93.070m				
22+180	38.177	37.023	37.623	40.084	R=56803.020m				
22+200	38.001	36.929	37.529	39.632	Lv=80.0m				
22+220	37.825	36.835	37.435	39.632	R=-36477.925m				
22+240	37.649	36.741	37.341	37.793	G=0.0%				
22+260	37.473	36.647	37.247	36.148	L=177.034m				
22+280	37.297	36.553	37.153	35.422	G=0.141%				
22+300	37.121	36.459	37.059	35.475	Lv=80.0m				
22+320	36.945	36.365	36.965	35.475	R=56803.020m				
22+340	36.769	36.271	36.871	34.188	L=46.689m				
22+360	36.593	36.177	36.777	35.788	G=-0.0%				
22+380	36.417	36.083	36.683	35.788	L=51.716m				
22+400	36.241	35.989	36.589	35.461	R=5000.0m				
22+420	36.065	35.895	36.495	35.235	e=5.0%				
22+440	35.889	35.801	36.401	35.125					
22+460	35.713	35.707	36.307	34.919					
22+480	35.537	35.613	36.213	35.161					
22+500	35.361	35.519	36.119	35.358					
22+520	35.185	35.425	36.025	35.469					
22+540	35.009	35.331	35.931	35.469					
22+560	34.833	35.237	35.837	35.522					
22+580	34.657	35.143	35.743	35.299					
22+600	34.481	35.049	35.649	35.286					
22+620	34.305	34.955	35.555	35.539					
22+640	34.129	34.861	35.461	35.424					
22+660	33.953	34.767	35.367	35.504					
22+680	33.777	34.673	35.273	37.217					
22+700	33.601	34.579	35.179	36.285					
22+720	33.425	34.485	35.085	34.459					
22+740	33.249	34.391	34.991	27.487					
22+760	33.073	34.297	34.897	27.980					
22+780	32.897	34.203	34.803	27.814					
22+800	32.721	34.109	34.709	32.558					
22+820	32.545	34.015	34.615	35.087					
22+840	32.369	33.921	34.521	35.057					
22+860	32.193	33.827	34.427	34.893					
22+880	32.017	33.733	34.333	35.198					
22+900	31.841	33.639	34.239	34.530					
22+920	31.665	33.545	34.145	35.109					
22+940	31.489	33.451	34.051	35.308					
22+960	31.313	33.357	33.957	35.284					
22+980	31.137	33.263	33.863	35.284					
23+000	30.961	33.169	33.769	35.284					

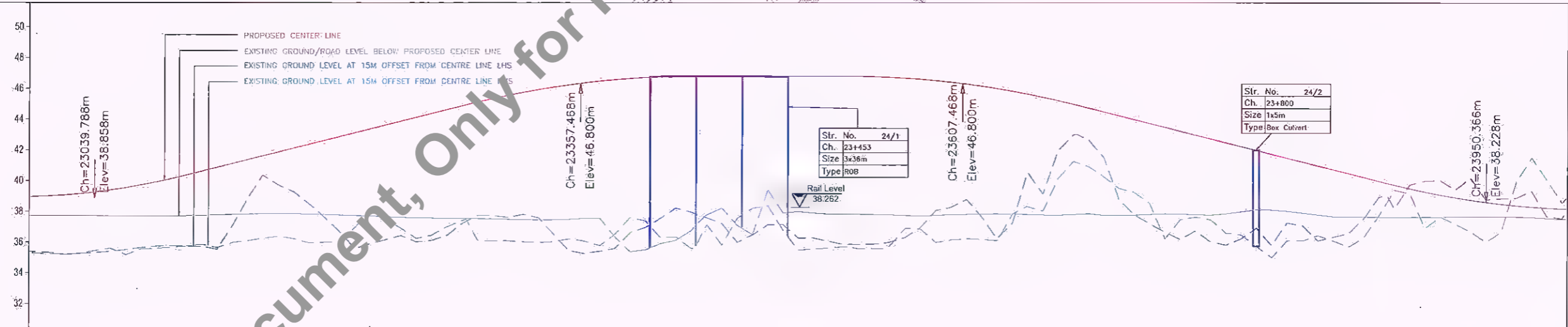
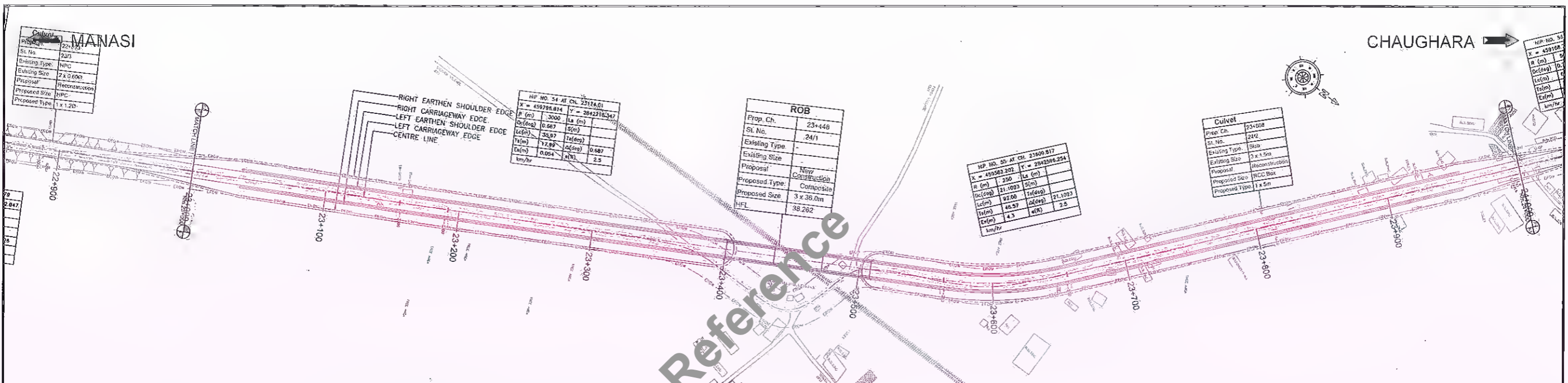
Client: Bihar State Road Development Corporation Ltd. | SCALE: HORIZONTAL = 1:2000, VERTICAL = 1:200 | Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V | Design Consultants: HaskoningDHV Nederland B.V. | Title: PLAN & PROFILE (Ch. 22+000 to 23+000) | DRAWING NO: RHDHV/64801/DPR/P&P/23 | SHEET: 24 of 79 | R3

Manager Tech.)
BSRDCL
PIU-Khagaria

D.G.M. (Tech.)
BSRDCL
PIU-Khagaria

REV	DATE	DESCRIPTION OF REVISIONS
R3	25 th Nov 2021	Alignment Modified at Rajpat Temple
R2	12 th Jun 2021	Alignment Modified at Manasi
R1	20 th May 2018	Alignment Modified at Saharsa Bypass
RD	24 th Apr 2017	Plan & Profile

DESIGNED: R Singh | DRAWN: J.P. Dobhal | CHECKED: R Singh | APPROVED: S.P. Pathuri



Station (m)	Proposed Road Level at Design Centreline (m)	Existing Ground/Road Level at Design Centreline (m)	Ground Level at 15m Left of Design Centreline (m)	Ground Level at 15m to Right of Design Centreline (m)	Proposed Vertical Alignment at Design Centreline	Proposed Horizontal Alignment at Design Centreline	Superelevation/Cross (%)	CBR	Pavement
23+000	38.960	37.727	35.367	35.284	R=4540.813m L=120.0m G=2.500%	D=263.188m Lc=35.971m R	e=2.5%	Subgrade Strengthening	
23+020	39.064	37.743	35.196	35.214					
23+040	39.257	37.725	35.319	35.451	L=182.680m G=2.500%	D=371.783m	e=2.5%	New construction	
23+060	39.536	37.699	35.506	35.174					
23+080	39.906	37.693	35.750	35.600	L=150.0m R=-6000.0m	D=371.783m	e=5.0%	Overlay (BC=40mm, DBM=95mm, WMM=250mm, GSB=230mm) BC=40mm, DBM=95mm, WMM=250mm, GSB=230mm, SUBGRADE=500mm	
23+100	40.363	37.716	35.750	35.750					
23+120	40.863	37.716	35.528	35.639	L=100.0m G=0.0%	D=371.783m	e=5.0%		
23+140	41.363	37.827	35.875	36.108					
23+160	41.863	37.875	35.716	36.389	L=150.0m R=-6000.0m	D=457.835m	e=5.0%		
23+180	42.363	37.821	35.489	35.944					
23+200	42.863	37.766	35.678	36.018	G=-2.500%	D=457.835m	e=5.0%		
23+220	43.363	37.694	35.896	36.028					
23+240	43.863	37.612	35.420	36.911	G=-2.500%	D=457.835m	e=5.0%		
23+260	44.363	37.566	35.108	36.447					
23+280	44.863	37.544	35.207	37.403	G=-2.500%	D=457.835m	e=5.0%		
23+300	45.363	37.512	35.726	36.079					
23+320	45.746	37.462	35.795	36.030	G=-2.500%	D=457.835m	e=5.0%		
23+340	46.087	37.448	35.486	36.040					
23+360	46.362	37.545	35.259	36.063	G=-2.500%	D=457.835m	e=5.0%		
23+380	46.571	37.528	35.581	36.529					
23+400	46.712	37.512	35.955	37.379	G=-2.500%	D=457.835m	e=5.0%		
23+420	46.787	37.512	35.424	36.341					
23+440	46.900	37.774	35.584	37.135	G=-2.500%	D=457.835m	e=5.0%		
23+460	46.900	37.099	35.988	37.568					
23+480	46.900	37.399	35.137	38.360	G=-2.500%	D=457.835m	e=5.0%		
23+500	46.900	37.992	35.265	35.484					
23+520	46.900	37.825	35.063	35.627	G=-2.500%	D=457.835m	e=5.0%		
23+540	46.795	37.813	35.862	35.564					
23+560	46.737	37.779	35.015	35.793	G=-2.500%	D=457.835m	e=5.0%		
23+580	46.612	37.708	35.958	36.859					
23+600	46.420	37.802	35.277	36.151	G=-2.500%	D=457.835m	e=5.0%		
23+620	46.162	37.833	35.652	36.191					
23+640	45.836	37.848	37.242	37.857	G=-2.500%	D=457.835m	e=5.0%		
23+660	45.445	37.777	35.140	38.038					
23+680	44.986	37.808	42.997	41.260	G=-2.500%	D=457.835m	e=5.0%		
23+700	44.487	37.764	41.520	40.279					
23+720	43.987	37.773	37.795	39.251	G=-2.500%	D=457.835m	e=5.0%		
23+740	43.487	37.871	36.670	36.242					
23+760	42.987	37.815	36.746	37.645	G=-2.500%	D=457.835m	e=5.0%		
23+780	42.487	37.869	35.828	36.609					
23+800	41.987	38.131	36.937	35.750	G=-2.500%	D=457.835m	e=5.0%		
23+820	41.487	38.035	37.278	36.110					
23+840	40.987	37.793	36.102	36.441	G=-2.500%	D=457.835m	e=5.0%		
23+860	40.487	37.663	36.580	35.703					
23+880	39.987	37.641	38.958	37.765	G=-2.500%	D=457.835m	e=5.0%		
23+900	39.507	37.640	39.743	39.193					
23+920	39.098	37.652	40.036	37.663	G=-2.500%	D=457.835m	e=5.0%		
23+940	38.764	37.683	40.196	36.696					
23+960	38.503	37.677	38.862	36.675	G=-2.500%	D=457.835m	e=5.0%		
23+980	38.317	37.643	39.349	41.522					
24+000	38.206	37.527	37.567	38.379					

<p>Bihar State Road Development Corporation Ltd.</p>	<p>SCALE: HORIZONTAL = 1:2000, VERTICAL = 1:200</p>	<p>Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V</p>	<p>Design Consultants: HaskoningDHV Nederland B.V.</p>	<p>Title: PLAN & PROFILE (Ch. 23+000 to 24+000)</p>	<p>DRAWING NO: RHDHV/64801/DPR/P&P/24 R3</p>

Manager (Tech.)
BSRDCL
PIU-Khagaria

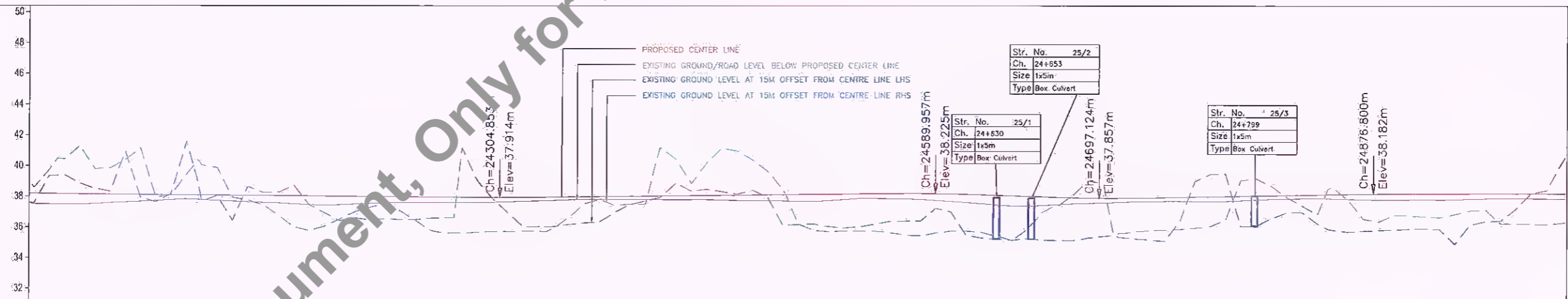
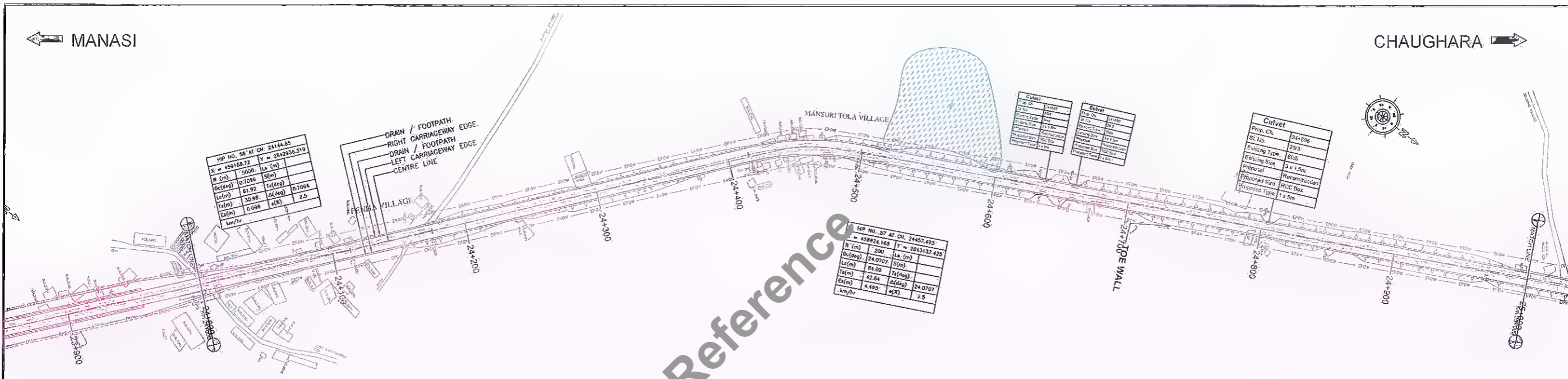
D.G.M. (Tech.)
BSRDCL
PIU-Khagaria

REV	DATE	DESCRIPTION OF REVISIONS
R3	22 nd Nov 2021	Alignment Modified at Rajayal Temple
R2	19 th Nov 2021	Alignment Modified at Manasi
R1	20 th Nov 2021	Alignment Modified at Saharsa Bypass
R0	24 th Nov 2021	Plan & Profile

DESIGNED	DRAWN	CHECKED	APPROVED
Rishabh R Singh	J P Dohal	Rishabh R Singh	S Pathari

← MANASI

CHAUGHARA →



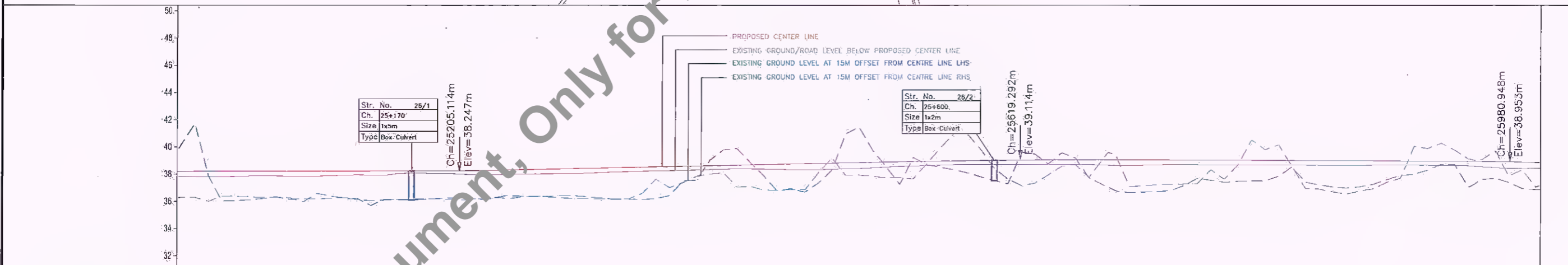
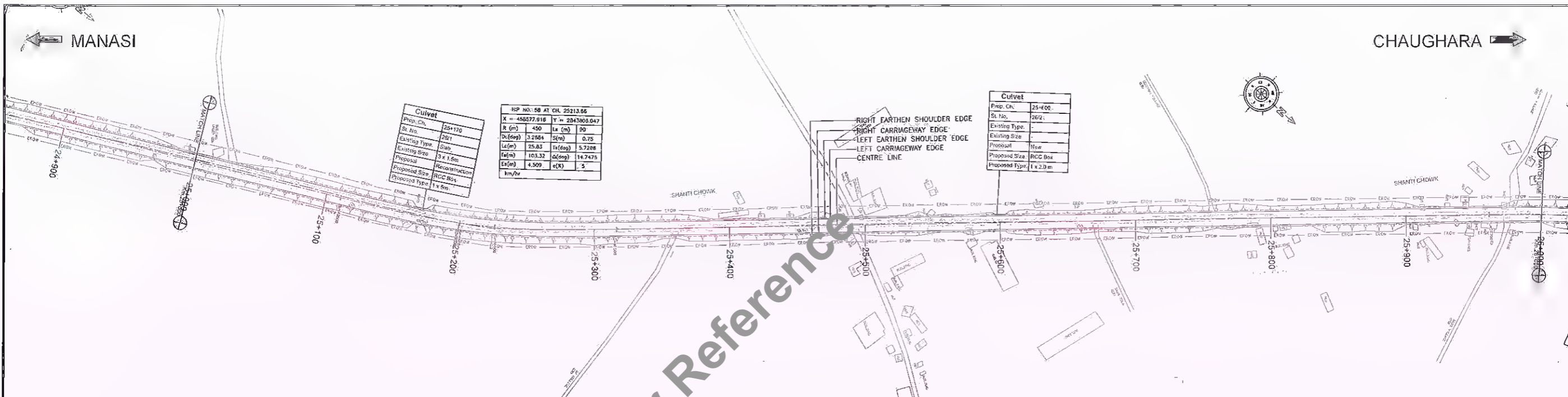
Station (m)	Proposed Road Level at Design Centreline (m)	Existing Ground/Road Level at Design Centreline (m)	Ground Level at 15m Left of Design Centreline (m)	Ground Level at 15m to Right of Design Centreline (m)	Proposed Vertical Alignment at Design Centreline	Proposed Horizontal Alignment at Design Centreline	Superelevation/Crossfall (%)	CBR	Pavement	Chainage (m)
24+000	38.205	37.527	37.567	38.189	G = -0.088% L = 259.486m	Lc = 61.921m R = 5000.0m	e = 2.5%	Subgrade strength	Overlay (BC=40mm, DBM=95mm, WMM=250mm, GSB=230mm) BC=40mm, DBM=95mm, WMM=250mm, GSB=230mm, SUBGRADE=500mm	24+000
24+020	38.169	37.497	38.146	38.579						24+020
24+040	38.131	37.534	38.131	38.540	R = 30426.170m Lv = 60.0m	D = 239.871m	e = 5.0%	New construction	24+040	
24+060	38.113	37.534	38.113	38.506					24+060	
24+080	38.095	37.534	38.113	38.477	G = 0.109%	Lc = 84.022m R = 200.0m	e = 5.0%		24+080	
24+100	38.078	37.534	38.113	38.448					24+100	
24+120	38.061	37.534	38.113	38.419	L = 225.104m G = 0.109%	Lc = 84.022m R = 200.0m	e = 5.0%		24+120	
24+140	38.044	37.534	38.113	38.390					24+140	
24+160	38.027	37.534	38.113	38.361	L = 119.676m G = 0.180%	D = 611.442m	e = 2.5%		24+160	
24+180	38.010	37.534	38.113	38.332					24+180	
24+200	37.993	37.534	38.113	38.303	L = 60.0m R = -13280.309m	Lc = 84.022m R = 200.0m	e = 2.5%		24+200	
24+220	37.976	37.534	38.113	38.274					24+220	
24+240	37.959	37.534	38.113	38.245	G = -0.343% L = 47.167m	Lc = 84.022m R = 200.0m	e = 2.5%		24+240	
24+260	37.942	37.534	38.113	38.216					24+260	
24+280	37.925	37.534	38.113	38.187	L = 60.0m R = -13280.309m	Lc = 84.022m R = 200.0m	e = 2.5%		24+280	
24+300	37.908	37.534	38.113	38.158					24+300	
24+320	37.891	37.534	38.113	38.129	G = 0.180% L = 119.676m	D = 611.442m	e = 2.5%		24+320	
24+340	37.874	37.534	38.113	38.100					24+340	
24+360	37.857	37.534	38.113	38.071	L = 60.0m R = -13280.309m	Lc = 84.022m R = 200.0m	e = 2.5%		24+360	
24+380	37.840	37.534	38.113	38.042					24+380	
24+400	37.823	37.534	38.113	38.013	G = 0.180% L = 119.676m	D = 611.442m	e = 2.5%		24+400	
24+420	37.806	37.534	38.113	37.984					24+420	
24+440	37.789	37.534	38.113	37.955	L = 60.0m R = -13280.309m	Lc = 84.022m R = 200.0m	e = 2.5%		24+440	
24+460	37.772	37.534	38.113	37.926					24+460	
24+480	37.755	37.534	38.113	37.897	G = -0.343% L = 47.167m	Lc = 84.022m R = 200.0m	e = 2.5%		24+480	
24+500	37.738	37.534	38.113	37.868					24+500	
24+520	37.721	37.534	38.113	37.839	L = 60.0m R = -13280.309m	Lc = 84.022m R = 200.0m	e = 2.5%		24+520	
24+540	37.704	37.534	38.113	37.810					24+540	
24+560	37.687	37.534	38.113	37.781	G = 0.180% L = 119.676m	D = 611.442m	e = 2.5%		24+560	
24+580	37.670	37.534	38.113	37.752					24+580	
24+600	37.653	37.534	38.113	37.723	L = 60.0m R = -13280.309m	Lc = 84.022m R = 200.0m	e = 2.5%		24+600	
24+620	37.636	37.534	38.113	37.694					24+620	
24+640	37.619	37.534	38.113	37.665	G = 0.180% L = 119.676m	D = 611.442m	e = 2.5%		24+640	
24+660	37.602	37.534	38.113	37.636					24+660	
24+680	37.585	37.534	38.113	37.607	L = 60.0m R = -13280.309m	Lc = 84.022m R = 200.0m	e = 2.5%		24+680	
24+700	37.568	37.534	38.113	37.578					24+700	
24+720	37.551	37.534	38.113	37.549	G = 0.180% L = 119.676m	D = 611.442m	e = 2.5%		24+720	
24+740	37.534	37.534	38.113	37.520					24+740	
24+760	37.517	37.534	38.113	37.491	L = 60.0m R = -13280.309m	Lc = 84.022m R = 200.0m	e = 2.5%		24+760	
24+780	37.500	37.534	38.113	37.462					24+780	
24+800	37.483	37.534	38.113	37.433	G = 0.180% L = 119.676m	D = 611.442m	e = 2.5%		24+800	
24+820	37.466	37.534	38.113	37.404					24+820	
24+840	37.449	37.534	38.113	37.375	L = 60.0m R = -13280.309m	Lc = 84.022m R = 200.0m	e = 2.5%		24+840	
24+860	37.432	37.534	38.113	37.346					24+860	
24+880	37.415	37.534	38.113	37.317	G = 0.180% L = 119.676m	D = 611.442m	e = 2.5%		24+880	
24+900	37.398	37.534	38.113	37.288					24+900	
24+920	37.381	37.534	38.113	37.259	L = 60.0m R = -13280.309m	Lc = 84.022m R = 200.0m	e = 2.5%		24+920	
24+940	37.364	37.534	38.113	37.230					24+940	
24+960	37.347	37.534	38.113	37.201	G = 0.180% L = 119.676m	D = 611.442m	e = 2.5%		24+960	
24+980	37.330	37.534	38.113	37.172					24+980	
25+000	37.313	37.534	38.113	37.143					25+000	

<p>Bihar State Road Development Corporation Ltd.</p>	<p>SCALE: HORIZONTAL = 1:2000, VERTICAL = 1:200</p>	<p>Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V</p>	<p>Design Consultants: HaskoningDHV Nederland B.V.</p>	<p>Title: PLAN & PROFILE (Ch. 24+000 to 25+000)</p>	<p>DRAWING NO: R11DHV/64801/DPR/P&P/25 DATE: December 2021 SHEET: 26 of 79</p>	<p>R3</p>

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Station (m)	Proposed Road Level at Design Centreline (m)	Existing Ground/Road Level at Design Centreline (m)	Ground Level at 15m Left of Design Centreline (m)	Ground Level at 15m to Right of Design Centreline (m)
25+000	38.208	37.852	38.297	40.197
25+020	38.210	37.814	38.006	37.898
25+040	38.214	37.839	37.884	36.050
25+060	38.218	37.908	36.307	36.223
25+080	38.222	37.952	36.275	36.116
25+100	38.226	37.960	36.595	36.18
25+120	38.230	37.970	36.268	36.287
25+140	38.234	37.939	36.075	35.705
25+160	38.238	38.025	36.140	36.143
25+180	38.242	38.081	36.215	36.166
25+200	38.246	38.041	36.146	36.250
25+220	38.250	37.991	36.205	36.155
25+240	38.254	38.001	36.205	36.444
25+260	38.258	38.029	36.336	36.390
25+280	38.262	38.041	36.429	36.285
25+300	38.266	38.044	36.351	36.219
25+320	38.270	38.081	36.189	36.166
25+340	38.274	38.181	36.611	36.152
25+360	38.278	38.530	37.028	36.437
25+380	38.282	38.572	37.860	37.576
25+400	38.286	38.613	38.128	39.821
25+420	38.290	38.655	37.121	38.868
25+440	38.294	38.697	36.832	36.762
25+460	38.298	38.739	36.858	36.689
25+480	38.302	38.781	39.222	38.314
25+500	38.306	38.823	37.954	41.493
25+520	38.310	38.865	37.985	38.772
25+540	38.314	38.907	38.714	39.216
25+560	38.318	38.949	39.087	37.257
25+580	38.322	38.991	37.120	36.665
25+600	38.326	39.033	37.243	36.746
25+620	38.330	39.075	37.295	37.170
25+640	38.334	39.117	38.356	37.574
25+660	38.338	39.159	38.694	37.498
25+680	38.342	39.201	39.627	37.550
25+700	38.346	39.243	38.594	38.562
25+720	38.350	39.285	36.932	37.235
25+740	38.354	39.327	36.557	36.998
25+760	38.358	39.369	36.941	37.278
25+780	38.362	39.411	37.759	37.933
25+800	38.366	39.453	39.909	38.315
25+820	38.370	39.495	39.794	38.742
25+840	38.374	39.537	39.084	37.638
25+860	38.378	39.579	37.899	37.412
25+880	38.382	39.621	37.070	36.881
25+900	38.386	39.663		
25+920	38.390	39.705		
25+940	38.394	39.747		
25+960	38.398	39.789		
25+980	38.402	39.831		
26+000	38.406	39.873		

<p>Bihar State Road Development Corporation Ltd.</p>	<p>SCALE</p> <p>HORIZONTAL = 1:2000</p> <p>VERTICAL = 1:200</p>	<p>Project :</p> <p>Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V</p>	<p>Design Consultants :</p> <p>Royal HaskoningDHV HaskoningDHV Nederland B.V.</p>	<p>Title :</p> <p>PLAN & PROFILE</p> <p>(Ch. 25+000 to 26+000)</p>	<p>DRAWING NO. RHDHV/64801/DPR/P&P/26</p>	<p>SHEET: 27 of 79</p>
					<p>DATE: December 2021</p>	<p>DESIGNED: R Singh</p> <p>DRAWN: J P Dobhal</p> <p>CHECKED: R Singh</p> <p>APPROVED: S Pathuri</p>

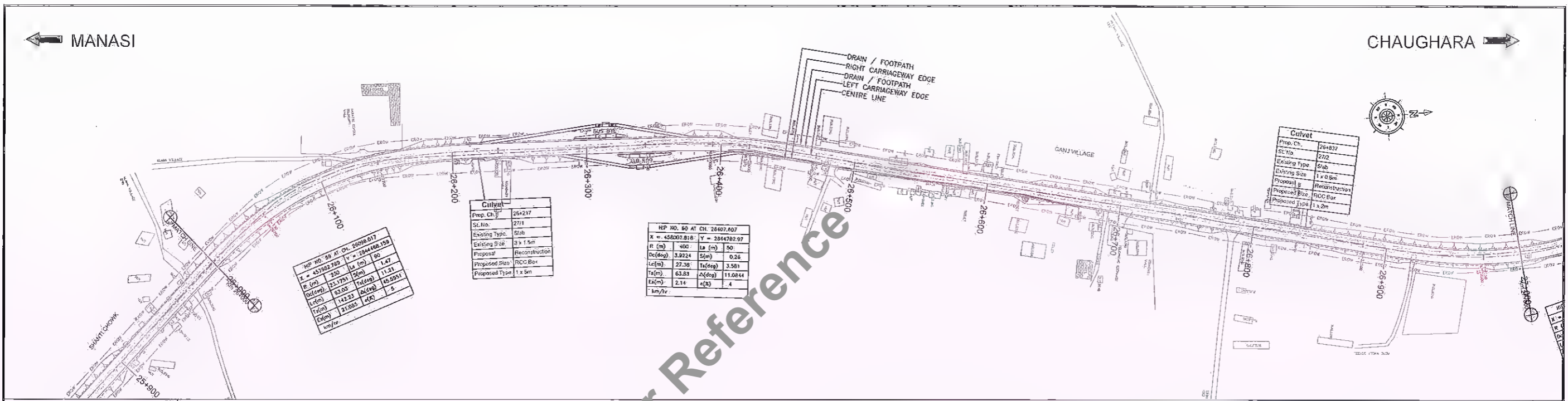
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← MANASI

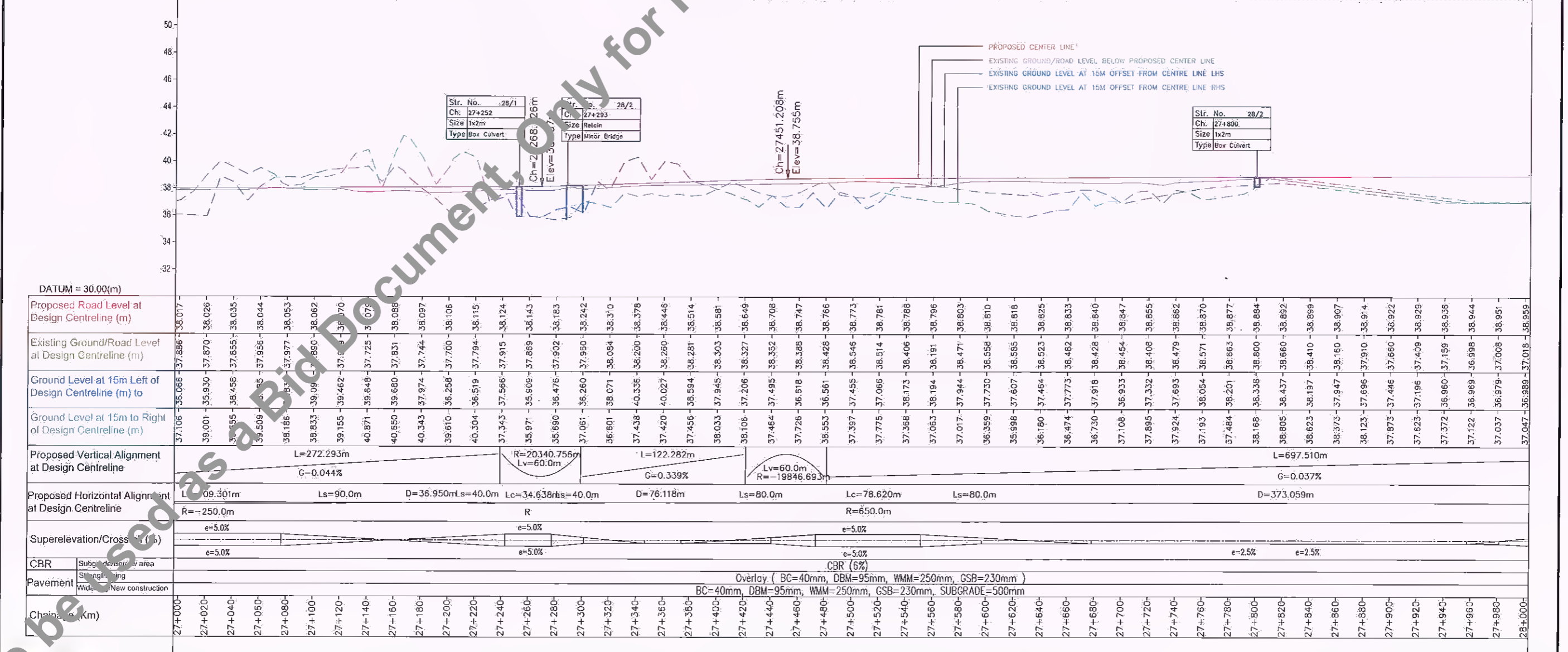
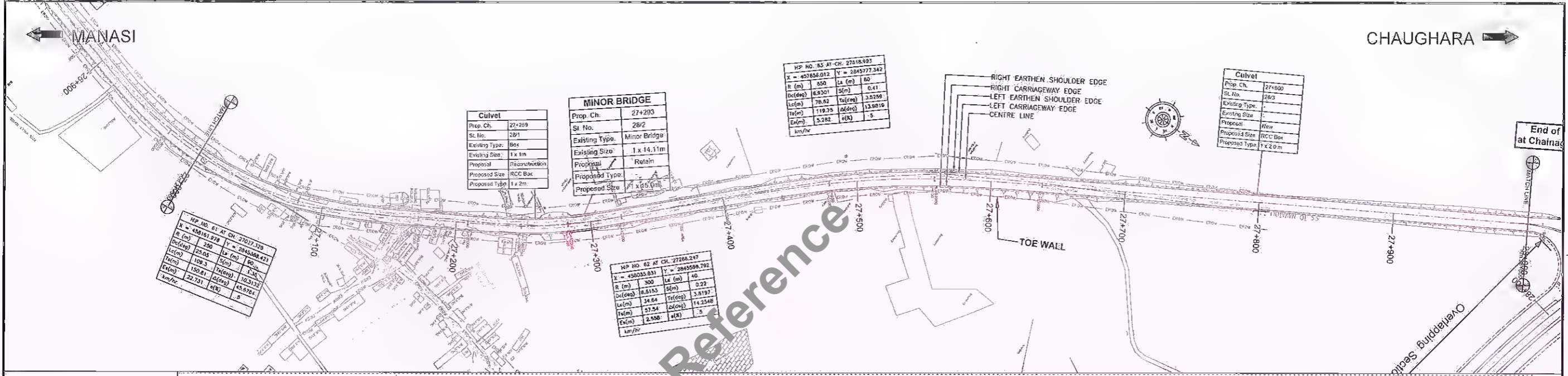
CHAUGHARA →



Client: Bihar State Road Development Corporation Ltd.
SCALE: HORIZONTAL = 1:2000, VERTICAL = 1:200
Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V
Design Consultants: HaskoningDHV Nederland B.V.
Title: PLAN & PROFILE (Ch. 26+000 to 27+000)
DRAWING NO.: RHDHV/64801/DPR/P&P/27
DATE: December 2021
DESIGNED: R Singh, **DRAWN:** J.P. Dabhi, **CHECKED:** R Singh, **APPROVED:** S Pathari
SHEET: 28 of 79

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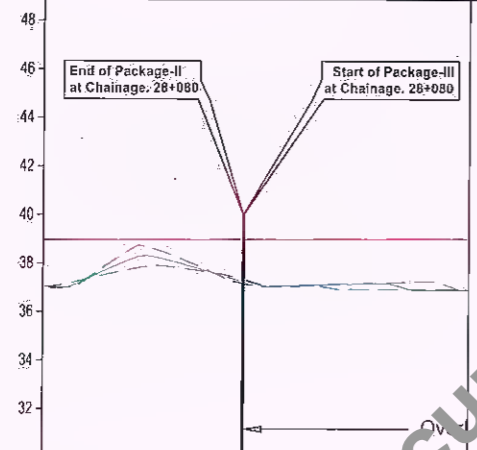
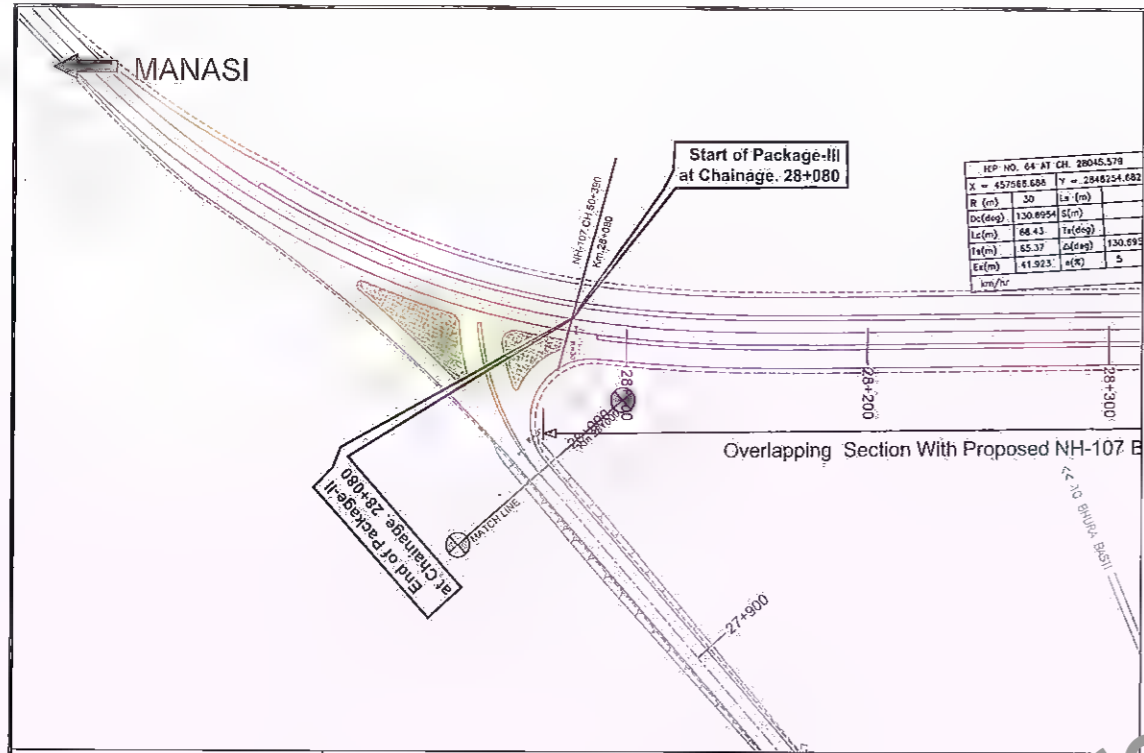
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Client Bihar State Road Development Corporation Ltd.	Scale HORIZONTAL = 1:2000 VERTICAL = 1:200	Project Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants Royal HaskoningDHV HaskoningDHV Nederland B.V.	Revision Table REV DATE DESCRIPTION OF REVISIONS R3 25 th Nov 2021 Alignment Modified at Kajayasi Temple R2 16 th Jun 2021 Alignment Modified at Manasi R1 20 th Nov 2019 Alignment Modified at Saharsabad Bypass R0 24 th April 2017 Plan & Profile	Title PLAN & PROFILE (Ch. 27+000 to 28+000)	DRAWING NO. RHDHV/64801/DPR/P&P/28 DATE December 2021 DESIGNED R Singh DRAWN J P Dabhal CHECKED R Singh APPROVED S Pathan	SHEET 29 of 79
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Chainage (m)	28+000	28+020	28+040	28+060	28+080	28+100	28+120	28+140	28+160
Proposed Road Level at Design Centreline (m)	38.959	38.966	38.973	38.981	38.988				
Existing Ground/Road Level at Design Centreline (m)	37.018	37.591	38.327	37.840	37.251	37.087	37.198	37.198	36.918
Ground Level at 15m Left of Design Centreline (m)	36.989	37.711	38.684	37.553	37.166	37.108	37.166	37.224	36.929
Ground Level at 15m to Right of Design Centreline (m)	37.047	37.471	37.876	37.728	37.338	37.108	37.166	37.224	36.929
Proposed Vertical Alignment at Design Centreline	Match Profile Levels With								
Proposed Horizontal Alignment at Design Centreline	Lc=68.432m R=30.0m								
Superelevation/Crossfall (%)	e=5.0%								
CBR	Subgrade area								
Pavement	Strengthening								
Width of New construction									

Client: Bihar State Road Development Corporation Ltd.	SCALE: HORIZONTAL = 1:2000, VERTICAL = 1:200	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 the State of Bihar, Package V	Design Consultants: HaskoningDHV Nederland B.V.	Title: PLAN & PROFILE (Ch. 28+000 to 28+080)	DRAWING NO. RHDHV/64801/DPR/P&P/29 DATE: December 2021 DESIGNED: R Singh DRAWN: J P Dabhi CHECKED: R Singh APPROVED: S Patil	R3 SHEET: 31 of 79
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VOLUME: VI-B
STRUCTURE DRAWINGS

TABLE OF CONTENTS

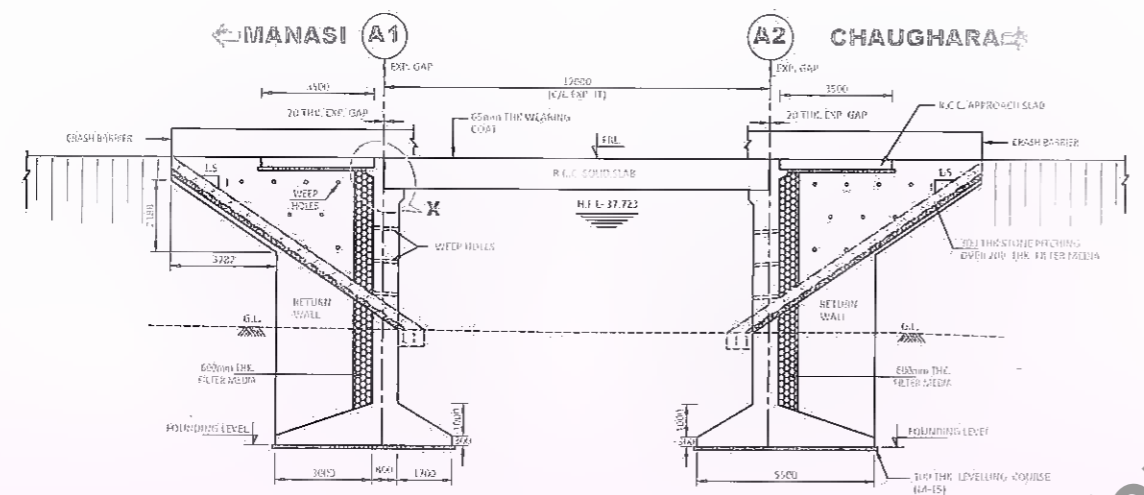
VOLUME-VIB (STRUCTURE DRAWINGS)

SR. NO.	TITLE OF DRAWINGS	DRAWING NO	SHEETS
A	MINOR BRIDGE'S		
1	GENERAL ARRANGEMENT DRAWING FOR MINOR BRIDGE AT CH. 21+925 (SPAN ARRANGEMENT 1x12.0m)	RHDHV/64801/DPR/MNB-001	1
2	GENERAL ARRANGEMENT DRAWING FOR MINOR BRIDGE AT CH. 22+392 (SPAN ARRANGEMENT 1x20.0m)	RHDHV/64801/DPR/MNB-002	1
3	GENERAL ARRANGEMENT DRAWING FOR MINOR BRIDGE AT CH. 22+818 (SPAN ARRANGEMENT 1x11.0m)	RHDHV/64801/DPR/MNB-003	1
B	CROSS DRAINAGE WORKS		
4	GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT	RHDHV/64801/DPR/CUL-001	1
5	GENERAL ARRANGEMENT DRAWING FOR RECONSTRUCTION PIPE CULVERT	RHDHV/64801/DPR/CUL-002	1
C	R.O.B.		
6	GENERAL ARRANGEMENT DRAWING FOR ROB AT CH. 23+448 (SPAN ARRANGEMENT 3x36.0m)	RHDHV/64801/DPR/ROB-001	1

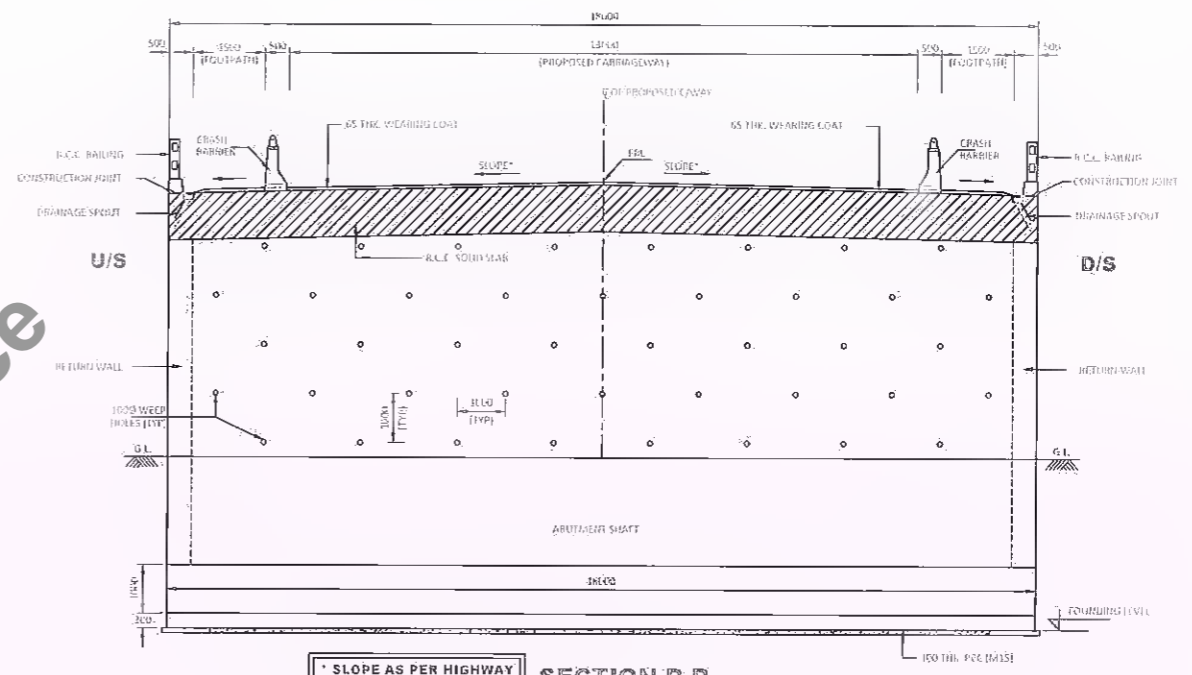
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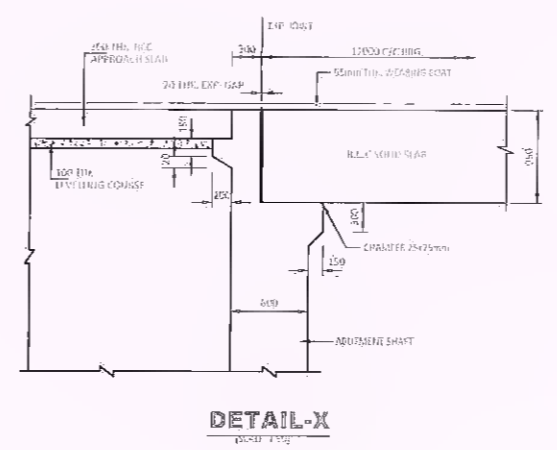
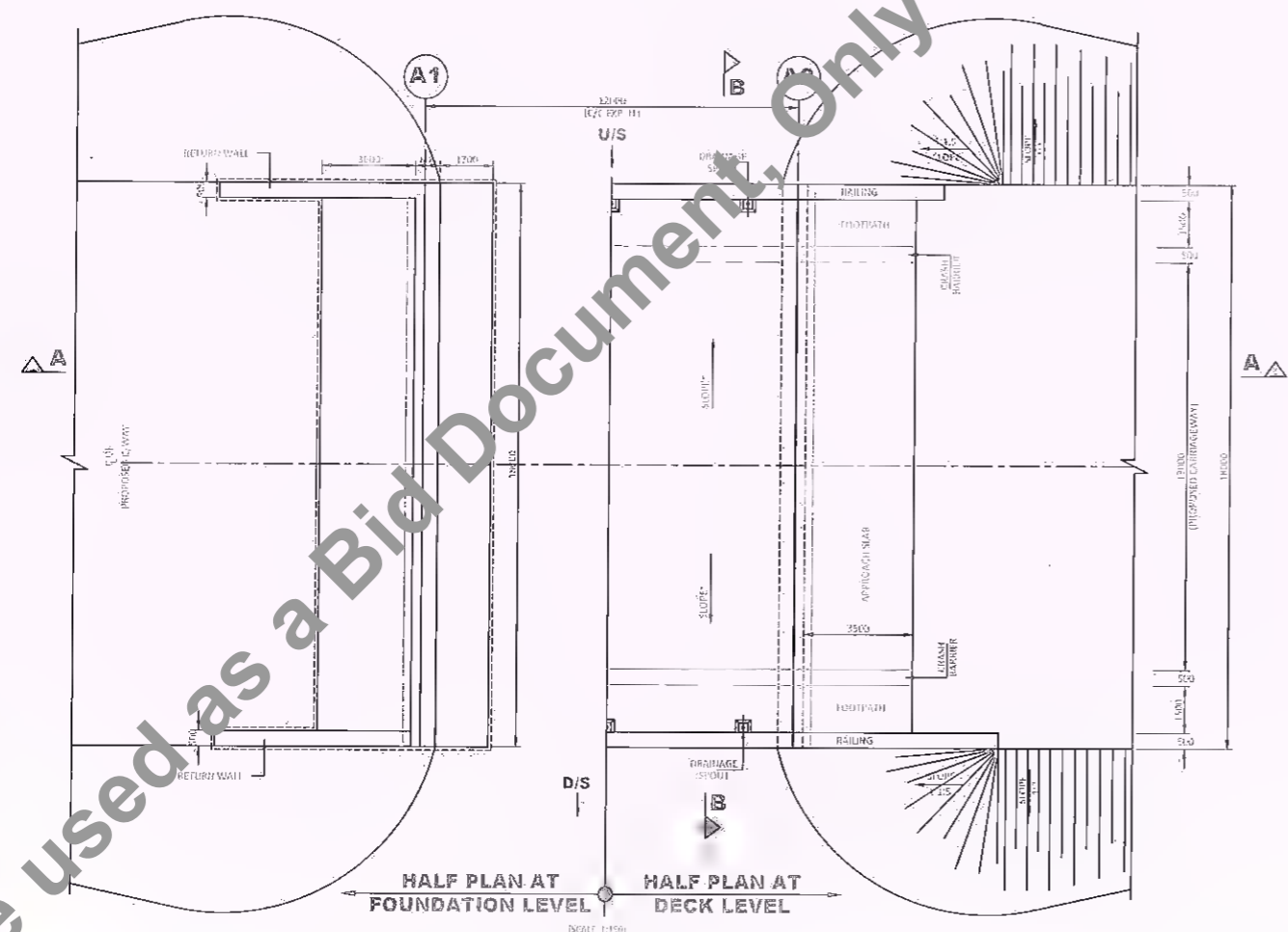
MINOR BRIDGE'S



SECTIONAL ELEVATION A-A
(SCALE: 1:150)



SECTION B-B
(SCALE: 1:200)



DETAIL-X
(SCALE: 1:50)

NOTES:-

01. ALL DIMENSIONS ARE TO BE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
02. DRAWING SHALL NOT BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
03. GRADE OF CONCRETE SHALL BE:-
 (a) ABUTMENT, ABUTMENT CHAM AND DECK WALL - M35
 (b) OPEN FOUNDATION - M25
 (c) R.C.C. - M25
 (d) R.C.C. ROAD SLAB SUPER STRUCTURE - M25
 (e) APPROACH SLAB - M20
 (f) CRASH BARRIER - M25
 (g) RETURN WALL - M25
04. REINFORCING STEEL SHALL BE THE DEFORMED BARS 6mm DIA. SPECIFICATION Fe-415/Fe-500 CONFORMING TO IS-1786.
05. BACKFILLING BEHIND ABUTMENT AND DECK WALL SHALL BE PROVIDED WITH SET TOP EARTH CONCRETE TO APPROXIMATELY REC-2000 (AS PER IS: 4962) (CH-10) (S-20) (R-10) (IS: 4962).
06. WEARING COAT SHALL CONSIST OF 40mm THICK BITUMINOUS CONCRETE OVERLAY WITH 25mm THICK BITUMINOUS TACKLE LAYER.
07. WEEP HOLES SPACED AT 1000 C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED BY A SLIGHTLY INCLINED TO ABUTMENTS, RETURN WALLS, JUNCTION WALL AND INDEPENDENT RETURN WALL. AS PER SECTION 2.6.6 OF IS: 4962 SPECIFICATIONS.
08. THE DIMENSION OF STRUCTURAL COMPONENTS SHOWN IN THIS DRAWING ARE TENTATIVE AND MAY CHANGE DURING DETAILED DESIGN.
09. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN DURING CONSTRUCTION SO THAT, 10. FILLER TYPE EXPANSION JOINTS SHALL BE PROVIDED.
11. THE SPECIFICATIONS SHALL CONFORM TO INDIA SPECIFICATIONS FOR ROAD AND BRIDGES.
12. ALL DIMENSIONS ARE TENTATIVE IF CAN BE CHANGED AS PER DESIGN.

LEGENDS:-

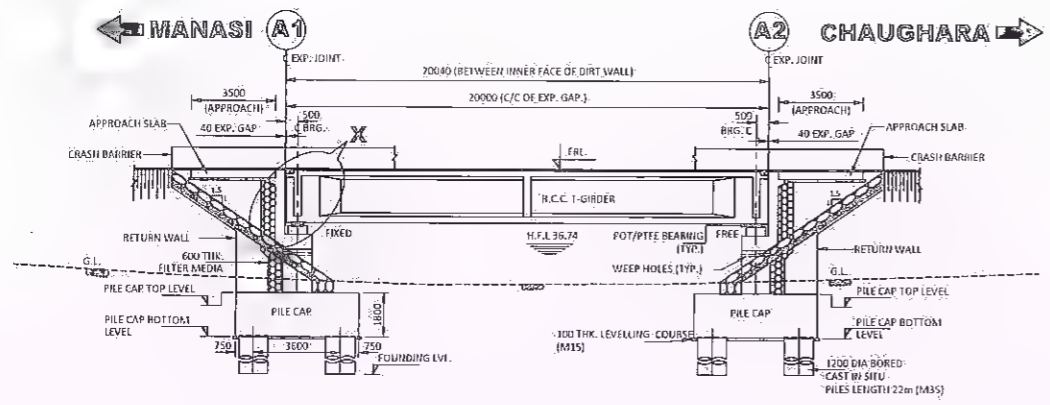
- U/S = UP STREAM
- D/S = DOWN STREAM
- [SYMBOL] = FINISH
- - - - = CENTER LINE

Client: Bihar State Road Development Corporation Ltd.	Scale: AS SHOWN	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: HaskoningDHV Nederland B.V.	Title: GENERAL ARRANGEMENT DRAWING FOR MINOR BRIDGE AT CH. 21+925 (Span Arrangement 1x12m)	DRAWING NO: RHDW/S4801/DDP/1410-001 DATE: DECEMBER 2021 DESIGNED BY: [] DRAWN BY: [] CHECKED BY: [] APPROVED BY: []							
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REV	DATE	DESCRIPTION OF REVISIONS										

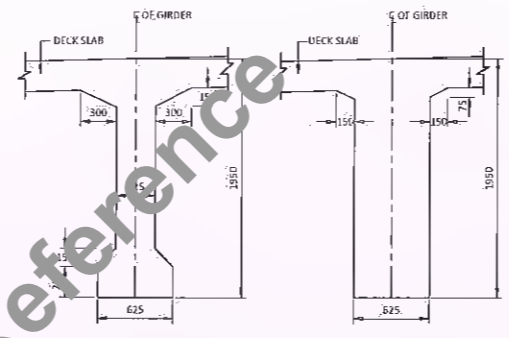
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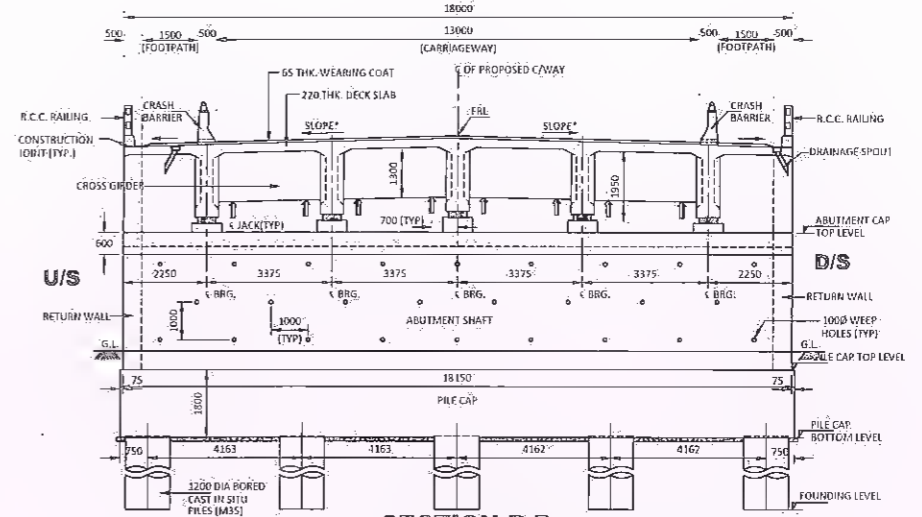
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SECTIONAL ELEVATION A-A
(SCALE 1:200)

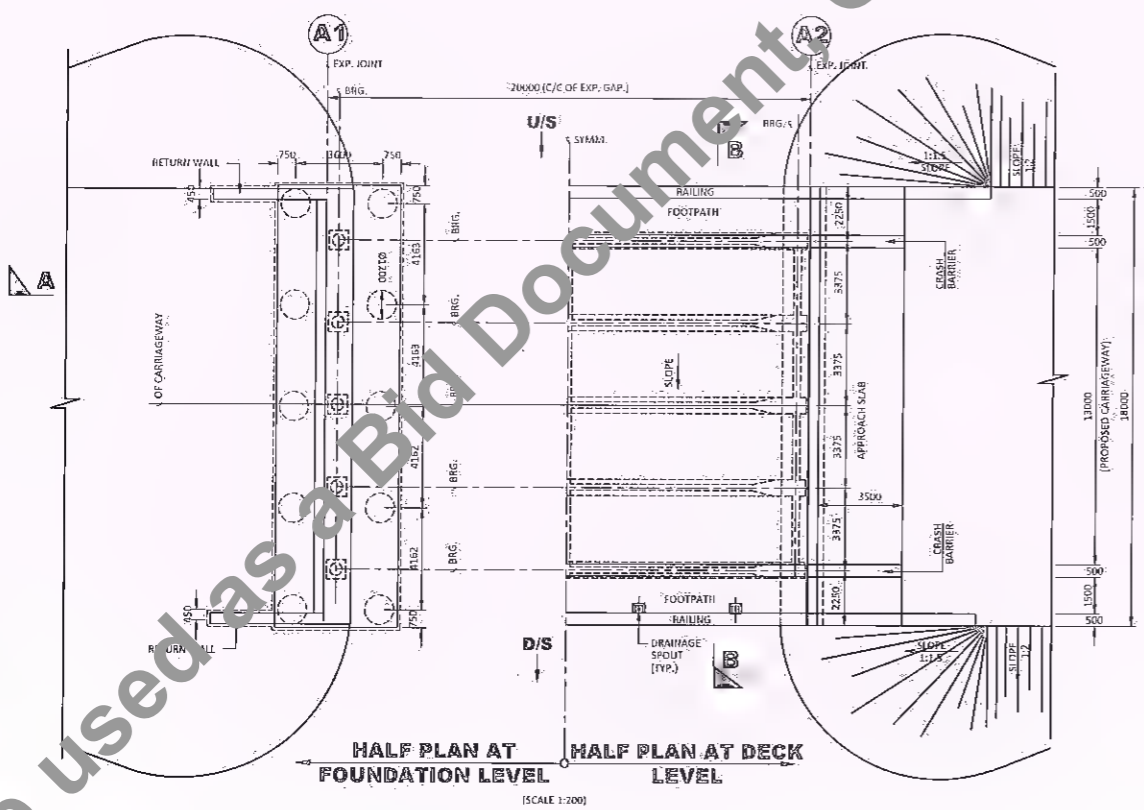


DETAILS OF R.C.C. GIRDER
(SCALE 1:40)



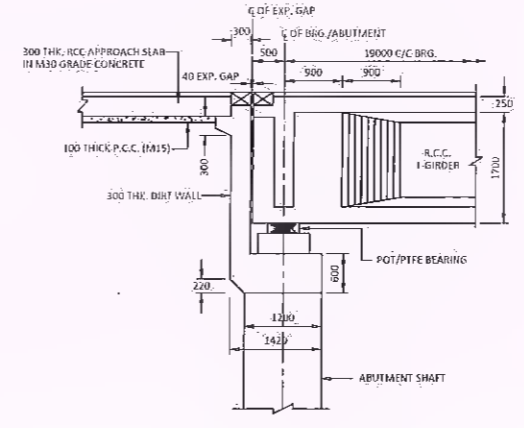
SECTION B-B
(SCALE 1:100)

* SLOPE AS PER HIGHWAY PLAN AND PROFILE



HALF PLAN AT FOUNDATION LEVEL
(SCALE 1:200)

HALF PLAN AT DECK LEVEL
(SCALE 1:200)



DETAIL-X
(SCALE 1:75)

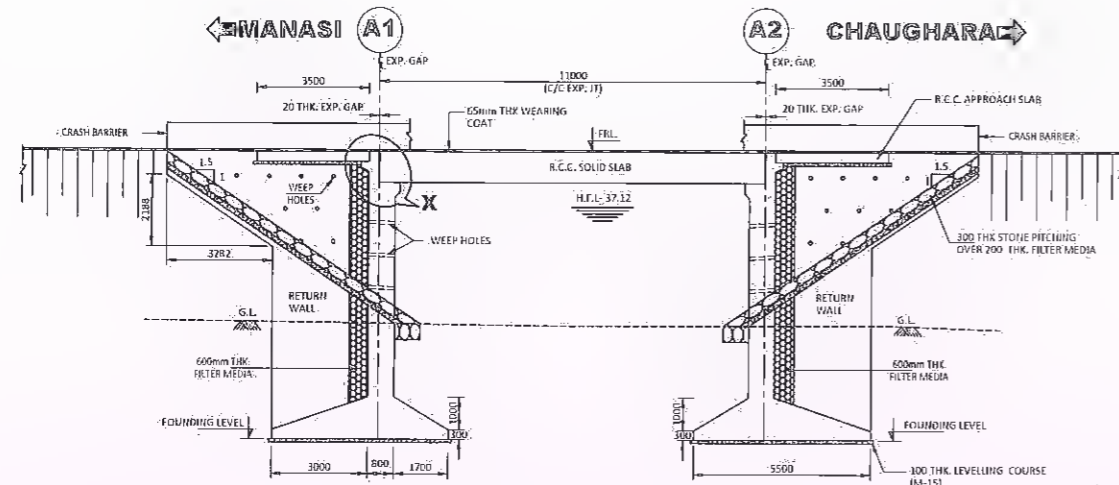
NOTES:-

- 01 ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED.
- 02 DRAWING SHALL NOT BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- 03 GRADE OF CONCRETE SHALL BE:-
 (i) ABUTMENT, ABUTMENT CAP AND DIRT WALL - M35
 (ii) PILE FOUNDATION - M35
 (iii) P.C.C. - M15
 (iv) R.C.C. I-GIRDER - M40
 (v) APPROACH SLAB - M30
 (vi) CRASH BARRIER - M40
 (vii) RETAINING WALL & MEDIAN WALL - M35
- 04 REINFORCING STEEL SHALL BE TMT DEFORMED BARS GRADE DESIGNATION Fe-500, CONFORMING TO IS-1786.
- 05 BACKFILLING BEHIND ABUTMENT AND WING WALL SHALL BE PROVIDED WITH SELECTED EARTH CONFORMING TO APPENDIX OF IRC:78-2014 HAVING PROPERTIES $e < 0.9$, $I_{p0.075} > 10$ AND $v_d = 18$ KMN³.
- 06 WEARING COAT SHALL COMPRISE 40mm THICK BITUMINOUS CONCRETE OVERLAIN WITH 25mm THICK BITUMINOUS MASTIC LAYER.
- 07 WEEP HOLES, SPACED AT 1000 C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN A STAGGERED MANNER IN ABUTMENTS, RETURN WALLS, MEDIAN WALL AND INDEPENDENT RETURN WALL ABOVE GROUND AS PER SECTION 2706 OF MORTH SPECIFICATIONS.
- 08 THE DIMENSION OF STRUCTURAL COMPONENTS SHOWN IN THIS DRAWING ARE TENTATIVE AND MAY CHANGE DURING DETAILED DESIGN.
- 09 ALL NECESSARY PRECAUTIONS SHALL BE TAKEN DURING CONSTRUCTION SO THAT.
- 10 FILLER TYPE EXPANSION JOINTS SHALL BE PROVIDED.
- 11 THE SPECIFICATIONS SHALL CONFIRM TO MOST SPECIFICATIONS FOR ROAD AND BRIDGES.
- 12 ALL DIMENSIONS ARE TENTATIVE IT CAN BE CHANGE AS PER DESIGN.

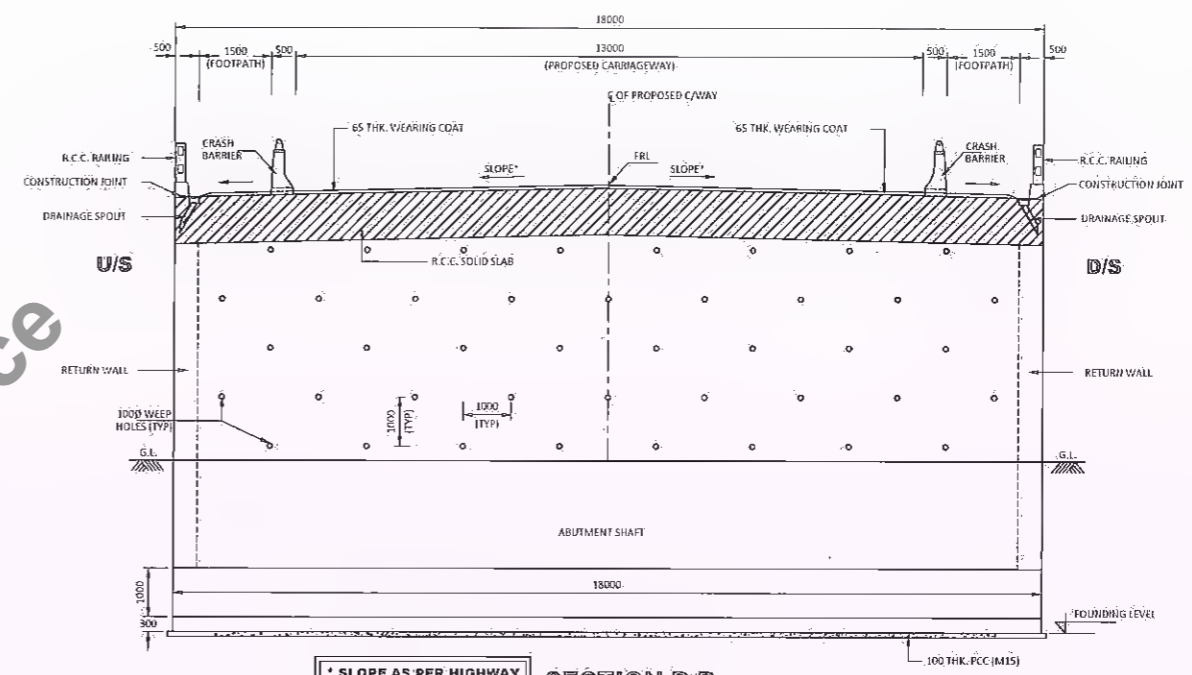
LEGENDS:-

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- D/S = DOWN STREAM
- (TYP) = TYPICAL
- S = CENTER LINE

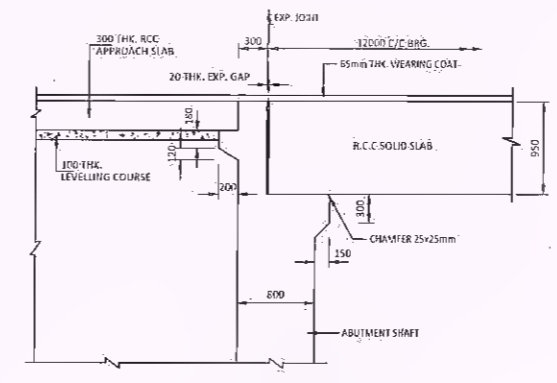
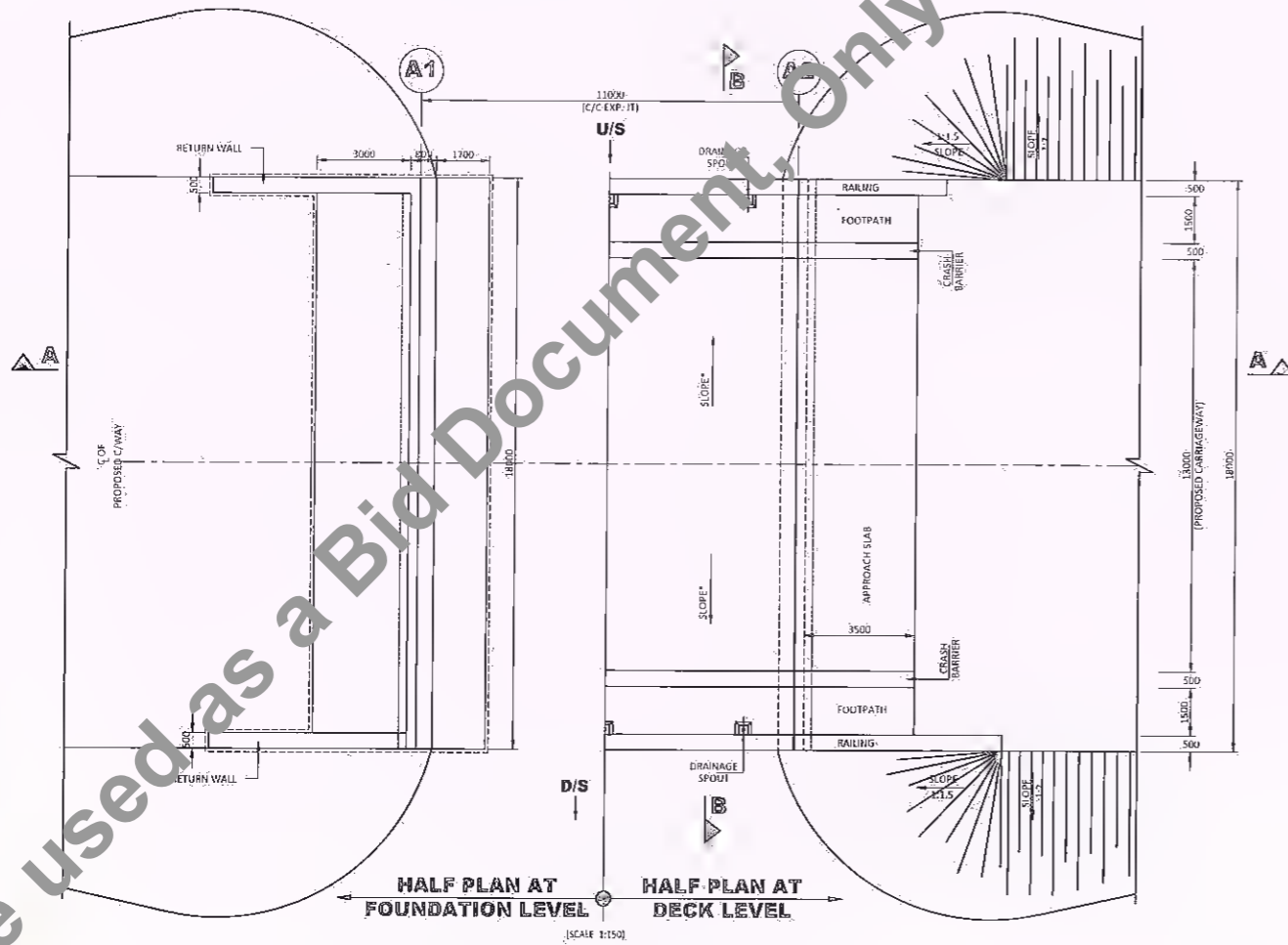
Client: Bihar State Road Development Corporation Ltd.	Scale: AS SHOWN	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title: GENERAL ARRANGEMENT DRAWING FOR MINOR BRIDGE AT CH. 22+392 (Span Arrangement 1x20.0m)	DRAWING NO. RHDHV/64801/DDP/MNB-002 DATE: DECEMBER 2021 DESIGNED BY: DRAWN BY: CHECKED BY: APPROVED BY:
Manager (Tech.) BSRDCL PIU-Khagaria				D.G.M. (Tech.) BSRDCL PIU-Khagaria	
REV		DATE		DESCRIPTION OF REVISIONS	



SECTIONAL ELEVATION A-A
(SCALE 1:150)



SLOPE AS PER HIGHWAY PLAN AND PROFILE
SECTION B-B
(SCALE 1:100)



DETAIL-X
(SCALE 1:25)

- NOTES:-**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED.
 - DRAWING SHALL NOT BE SCALED; ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - GRADE OF CONCRETE SHALL BE:-
 (i) ABUTMENT, ABUTMENT CAP AND DIRT WALL - M35
 (ii) OPEN FOUNDATION - M35
 (iii) R.C.C. - M35
 (iv) R.C.C. SOLID SLAB SUPER-STRUCTURE - M35
 (v) APPROACH SLAB - M30
 (vi) CRASH BARRIER - M30
 (vii) RETURN WALL - M35
 - REINFORCING STEEL SHALL BE TMT DEFORMED BARS GRADE DESIGNATION Fe-500 CONFORMING TO IS:1786.
 - BACKFILLING BEHIND ABUTMENT AND WING WALL SHALL BE PROVIDED WITH SELECTED EARTH CONFORMING TO APPENDIX S OF IRC78-2000 HAVING PROPERTIES $C_u=0.30$, $I_p=20$ & $\gamma=18kN/m^3$.
 - WEARING COAT SHALL COMPRISE 65mm THICK BITUMINOUS CONCRETE OVERLAIN WITH 25mm THICK BITUMINOUS MASTIC LAYER.
 - WEEP HOLES, SPACED AT 1000 C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN A STAGGERED MANNER IN ABUTMENTS, RETURN WALLS, MEDIAN WALL AND INDEPENDENT RETURN WALL ABOVE GROUND AS PER SECTION 2706 OF NORTH SPECIFICATIONS.
 - THE DIMENSION OF STRUCTURAL COMPONENTS SHOWN IN THIS DRAWING ARE TENTATIVE AND MAY CHANGE DURING DETAILED DESIGN.
 - ALL NECESSARY PRECAUTIONS SHALL BE TAKEN DURING CONSTRUCTION SO THAT.
 - FILLER TYPE EXPANSION JOINTS SHALL BE PROVIDED.
 - THE SPECIFICATIONS SHALL CONFIRM TO MOST SPECIFICATIONS FOR ROAD AND BRIDGES.
 - ALL DIMENSION ARE TENTATIVE IT CAN BE CHANGED AS PER DESIGN.

- LEGENDS:-**
- U/S = UP STREAM
 - D/S = DOWN STREAM
 - (TYP) = TYPICAL
 - C/L = CENTER LINE

Client: Bihar State Road Development Corporation Ltd.	Scale: AS SHOWN	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title: GENERAL ARRANGEMENT DRAWING FOR MINOR BRIDGE AT CH. 22+818 (Span Arrangement 1x11m)	DRAWING NO.: RHDHV/64801/DDPR/MNB-003 DATE: DECEMBER 2021 DESIGNED BY: [] DRAWN BY: [] CHECKED BY: [] APPROVED BY: []	RO SHEET: 01 OF 01
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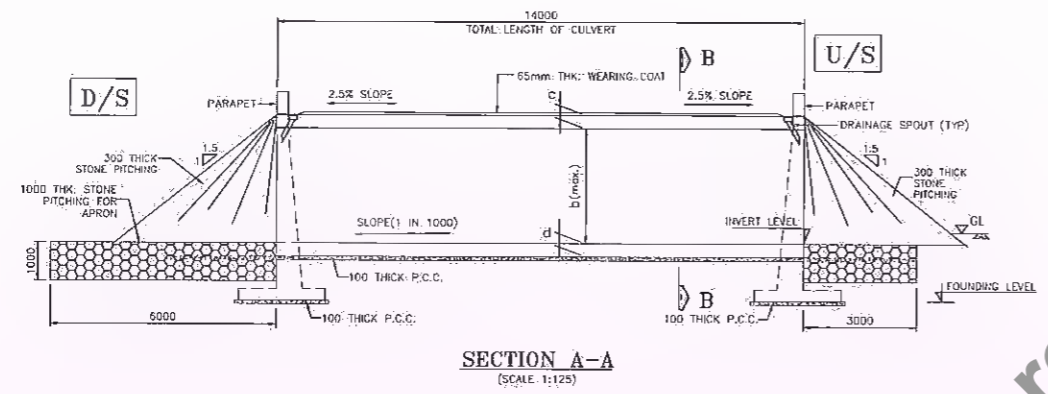
Manager (Tech.)
BSRDCL
PIU-Khagaria

D.G.M. (Tech.)
BSRDCL
PIU-Khagaria

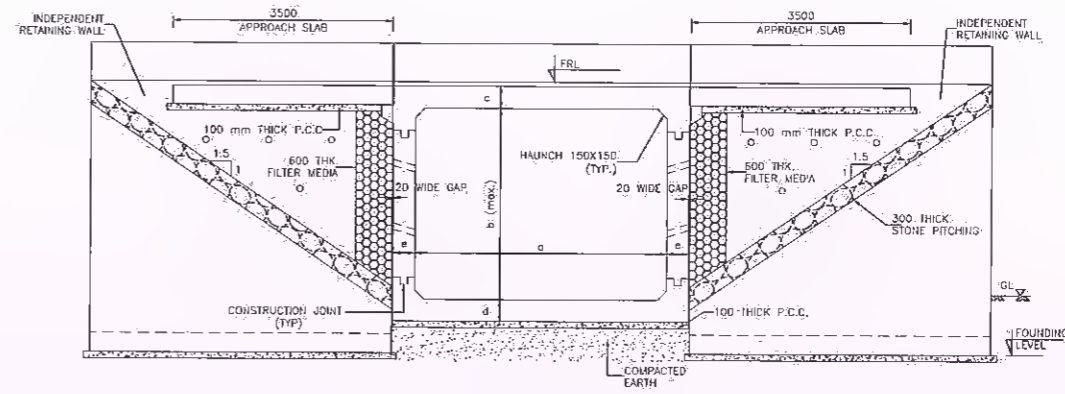
Not to be used as a Bid Document. Only for Reference

CROSS DRAINAGE WORKS

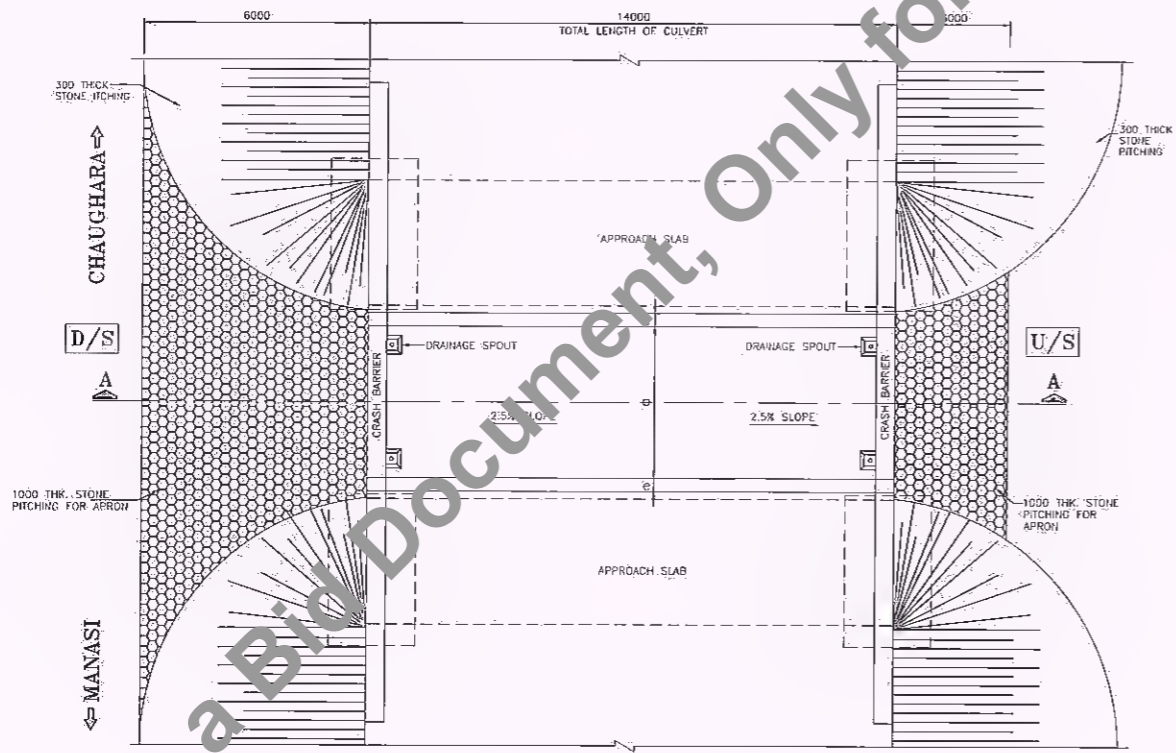
Not to be used as a Bid Document Only for Reference



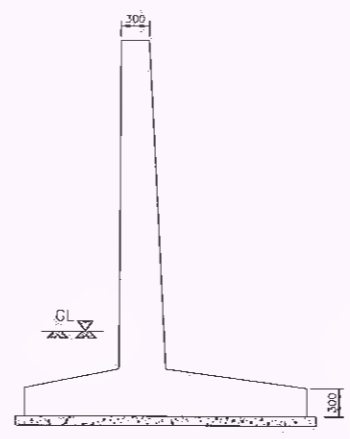
SECTION A-A
(SCALE 1:125)



SECTION B-B
(SCALE 1:75)



PLAN
(SCALE 1:125)



RETAINING WALL (CROSS-SECTION)
(SCALE 1:50)

NOTES:

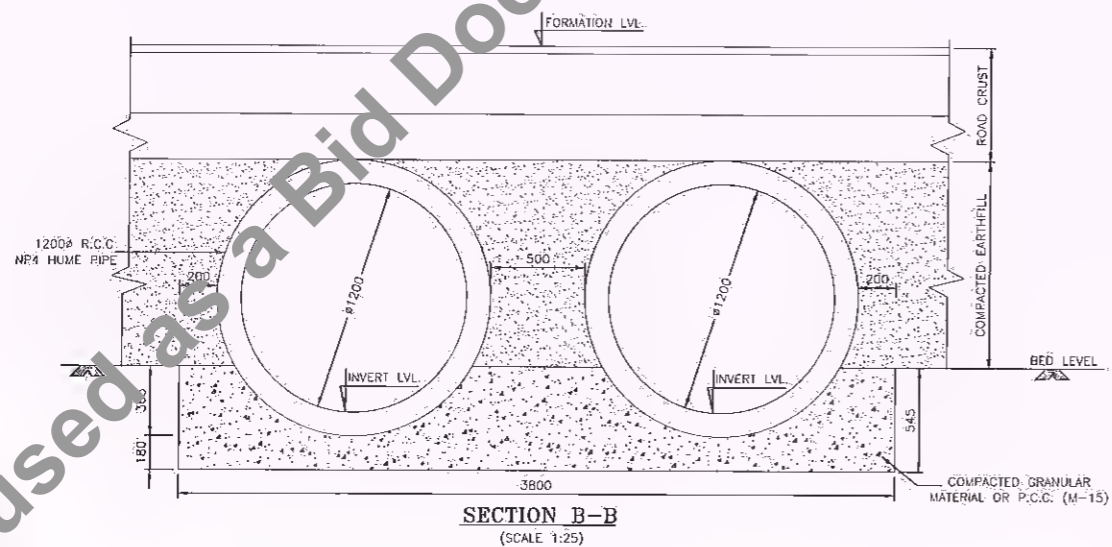
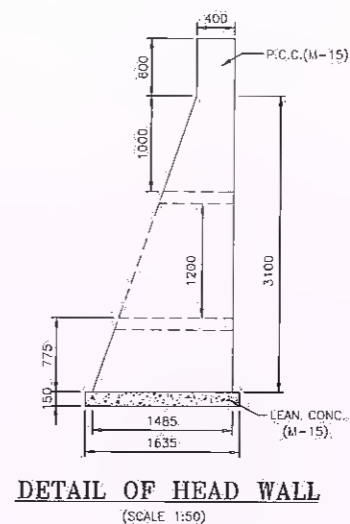
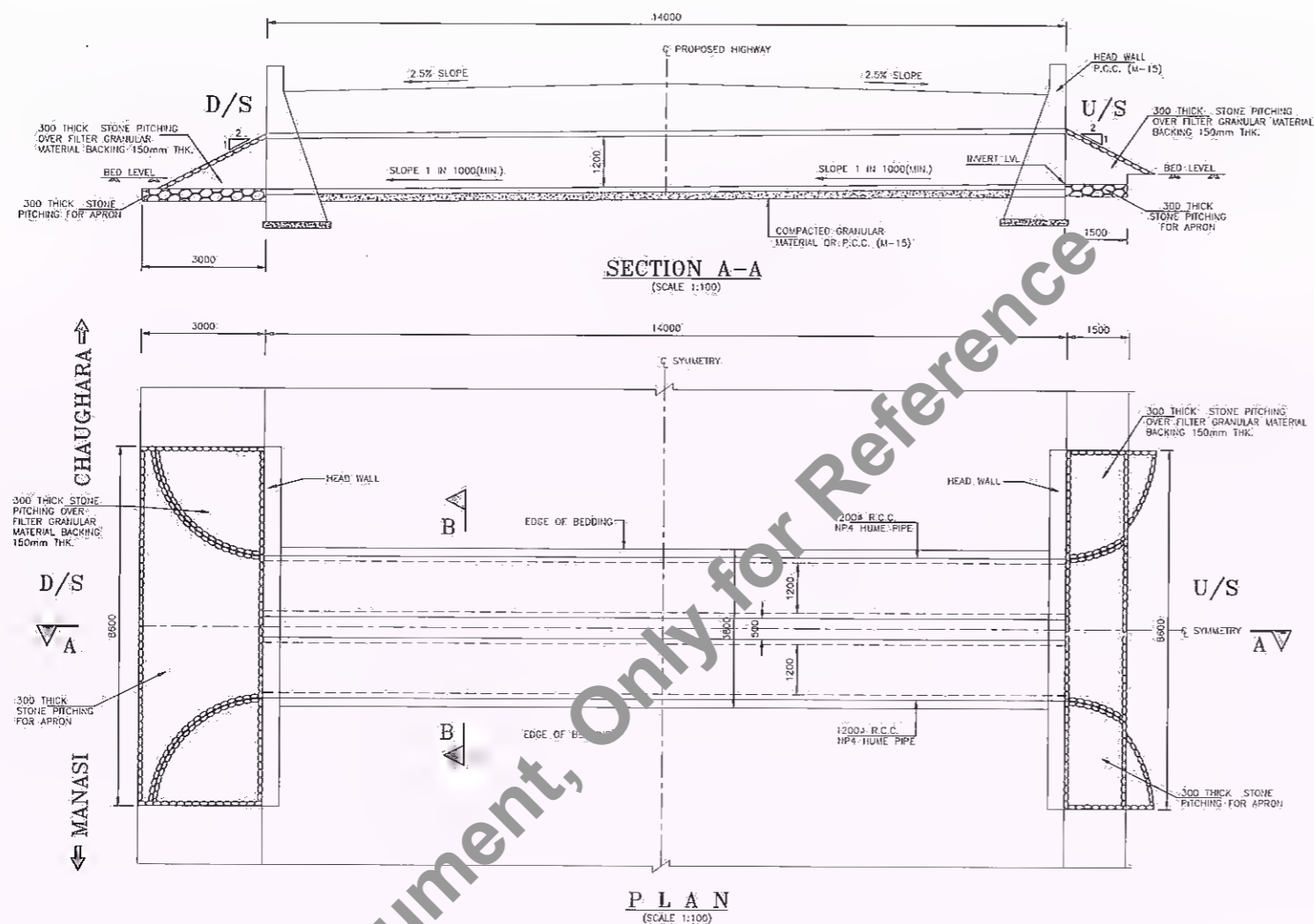
1. ALL DIMENSIONS ARE IN MM & LEVEL ARE IN METER.
2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED, DO NOT SCALE THE DIMENSIONS.
3. LOOSE / UNSUITABLE SOIL BELOW BOX CULVERTS TO BE REPLACED WITH SUITABLE GRANULAR MATERIAL.
4. PROPOSED CHANGING / FOUNDATION LEVEL SHALL BE PROVIDED AS PER PLAN & PROFILE DRAWING.
5. IN CASES WHERE INVERT LEVEL IS HIGHER THAN GROUND LEVEL AT ENDS OF CULVERT OR WHERE UNSUITABLE SOIL IS TO BE REPLACED BY GRANULAR MATERIAL PROVIDE ADEQUATE CUT OFF WALLS AT ENDS OF CULVERT TO PREVENT SCOUR/EROSION.
6. GRADE OF CONC. FOLLOWS:
P.C.C. LEAN CONC. ----- M-15
BOX STRUCTURE ----- M-30
RETAINING WALL ----- M-30
7. WEEP HOLES SPACED AT 1000mm C/C BOTH HORIZONTALLY & VERTICALLY SHALL BE PROVIDED IN A STAGGERED MANNER IN VERTICAL WALLS AND WING WALLS FROM GROUND LEVEL TO WALL TOP LEVEL.
8. AS PER CLAUSE 2508 OF MORTH SPECIFICATION DRY RUBBLE FLOORING 1m THICK COMPOSED OF LOOSE STONES LAID CLOSELY ON PREPARED BED IN REQUIRED NUMBERS OF LAYERS BONDED PROPERLY. THIS SHOULD BE PROVIDED MINIMUM 3.0m ON UPSTREAM SIDE AND MINIMUM 6.0m ON DOWNSTREAM SIDE BEYOND CUTOFF WALL OR AS THE CASE MAY BE.
9. 800mm THK. FILTER MATERIAL BEHIND BOX STRUCTURE, INDEPENDENT RETURN WALL/RETAINING WALL & WING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC:76-2014.
10. CUSHION AS PER SITE CONDITION.

	Scale:	Project:	Design Consultants:	Title: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT	DRAWING NO. RHDW/64001/06PR/CUL-001 RO DATE: DECEMBER 2021 SHEET: DESIGNED BY: DRAWN BY: CHECKED BY: APPROVED BY:
	AS SHOWN	Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Royal HaskoningDHV HaskoningDHV Nederland B.V.		

Manager (Tech.)
BSRDCL
PIU-Khagaria

D.G.M. (Tech.)
BSRDCL
PIU-Khagaria

Not to be used as a Bid Document, Only for Reference



NOTES:

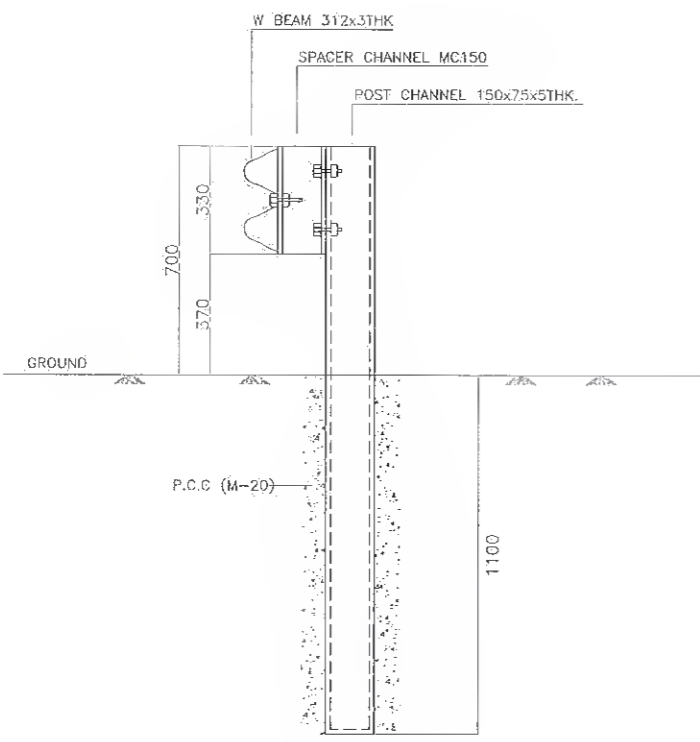
1. ALL DIMENSIONS ARE IN MM & LEVEL ARE IN METER.
2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED; DO NOT SCALE THE DIMENSIONS.
3. LOOSE / UNSUITABLE SOIL BELOW CULVERTS TO BE REPLACED WITH SUITABLE GRANULAR MATERIAL.
4. PROPOSED CHANGE / FORMATION LEVEL SHOULD BE VERIFIED AS PER APPROVED PLAN & PROFILE.
5. FOR CULVERTS SKEW TO THE TRAFFIC DIRECTION LENGTH OF CULVERT SHALL BE ADJUSTED AS PER SITE CONDITION.
6. IN CASE OF ANY DISCREPANCY INFORM TO THE CONSULTANT.
7. LONGITUDINAL SLOPE OF PIPE SHOULD BE MINIMUM 1 IN 1000.
8. FIRST CLASS BEDDING CAN BE USED FOR MAXIMUM HEIGHT OF FILL OF 4.0m.
9. THE DRAWING WAS MADE FOR THE MINIMUM CUSHION OF 1000mm (INCLUDING ROAD CRUST) IN CASE OF NEW/RECONSTRUCTION OF CULVERTS. IN CASE THE CUSHION IS INSUFFICIENT ENCASING OF PIPE IN CONCRETE SHALL BE ENSURED.
10. THE DRAWING IS APPLICABLE FOR THE MAXIMUM 4.0m DEPTH OF CUSHION. IF THE CUSHION ABOVE THE PIPE IS MORE THAN 4.0m, DRAWING REFERRING PLATE NO.-23 & 25 OF IRC SP-13, 2004 SHOULD BE ADOPTED.
11. IF THE BLACK COTTON SOILS AND POOR BEARING CAPACITY OF SOILS IS MET AT SITE, SUITABLE IMPROVEMENTS ACCORDING TO ARTICLE 22, OF IRC SP-13, 2004 SHOULD BE ADOPTED.
12. KERB DETAILS ARE INDICATIVE, FOR DETAILS REFER HIGHWAY DRAWING.

	Scale: AS SHOWN	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: HaskoningDHV Nederland B.V.	Title: GENERAL ARRANGEMENT DRAWING FOR PROPOSED NEW PIPE CULVERT	DRAWING NO.: RHDH/64801/DDPR/CUL-005 DATE: DECEMBER 2021 DESIGNED BY: [Signature] DRAWN BY: [Signature] CHECKED BY: [Signature] APPROVED BY: [Signature]	SHEETS: [Blank]	R.O.

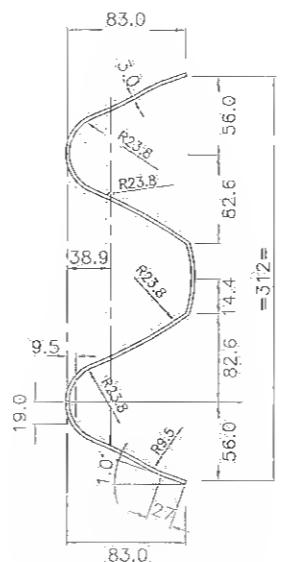
Not to be used as a Bid Document, Only for Reference

Not to be used as a Bid Document, Only for Reference

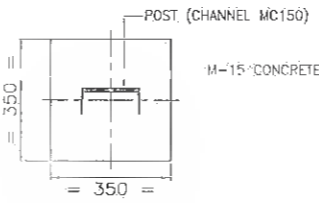
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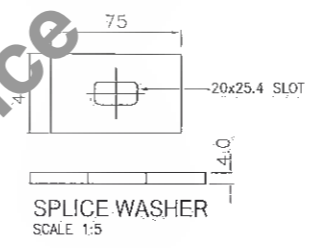
CROSS SECTION A-A
SCALE 1:15



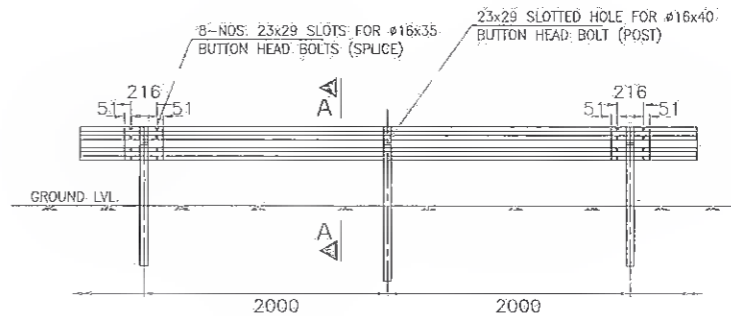
TYPICAL CROSS SECTION OF W BEAM
SCALE 1:5



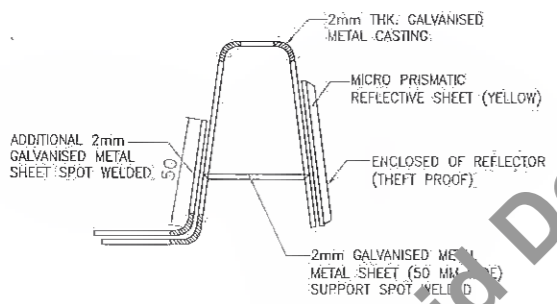
SECTION B-B
SCALE 1:5



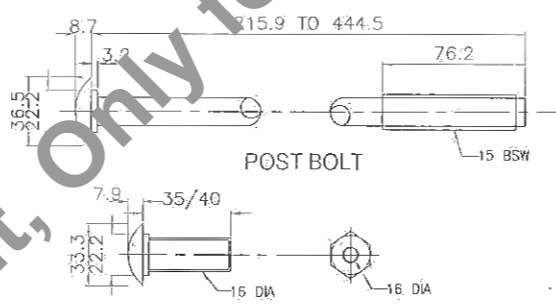
SPLICE WASHER
SCALE 1:5



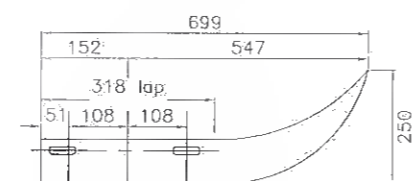
ELEVATION OF SINGLE SIDED CRASH BARRIER
SCALE 1:5



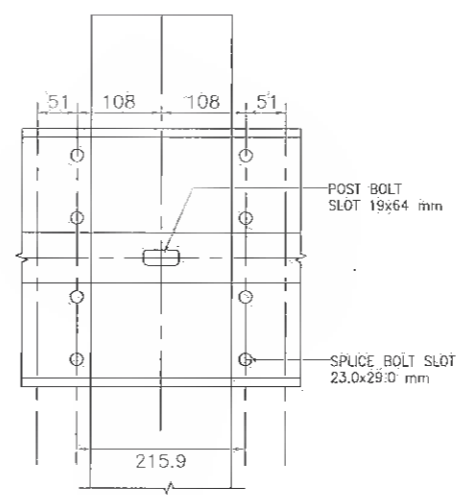
GUARD RAIL REFLECTOR
SCALE 1:5



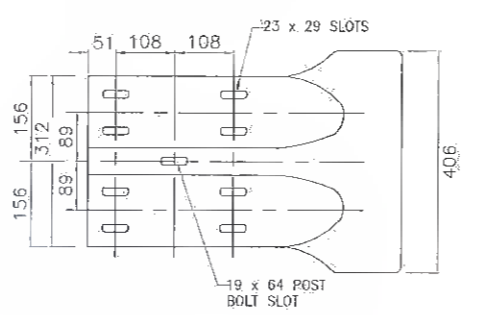
POST BOLT
SCALE 1:5



PLAN
SCALE 1:5



BEAM SPLICE
SCALE 1:5



ELEVATION OF W BEAM END SECTION (FLARED)
SCALE 1:5

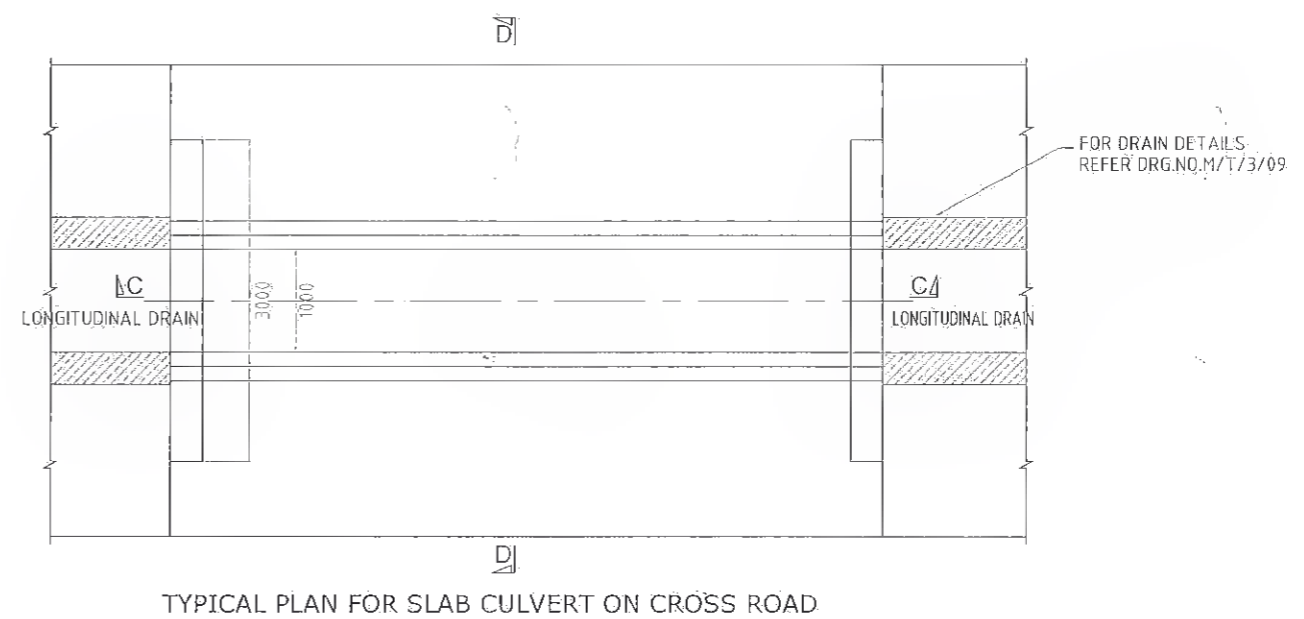
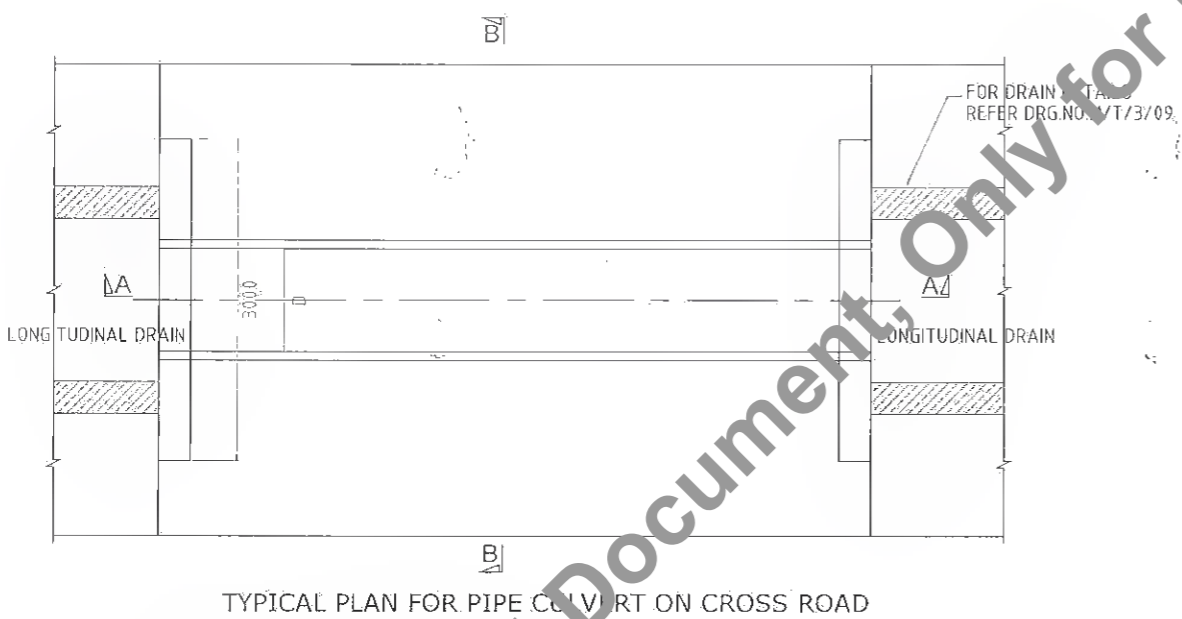
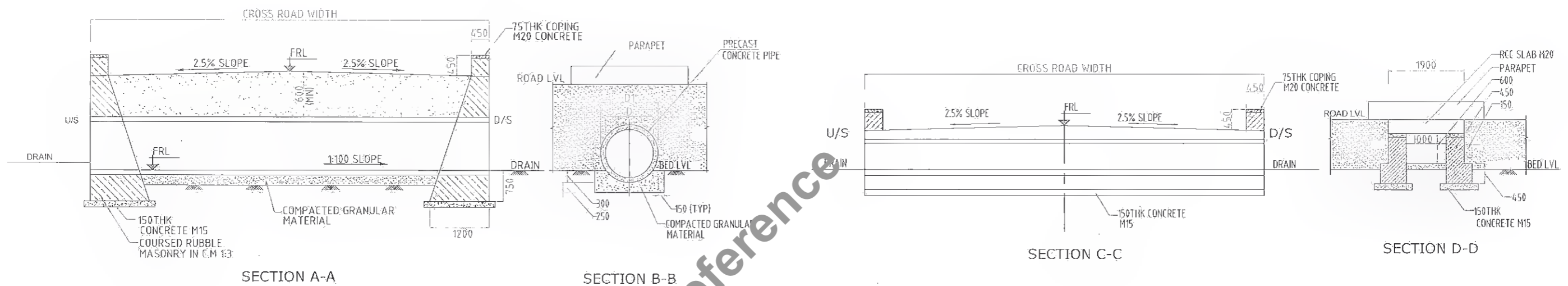
SHAPE : Equilateral Trapezium
DIMENSIONS :
FRONT CASTING
Top: 95mm
Bottom: 70mm
Height: 80mm
REFLECTIVE PORTION
Top: 70mm
Bottom: 50mm
Height: 50mm

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

NOTES:-

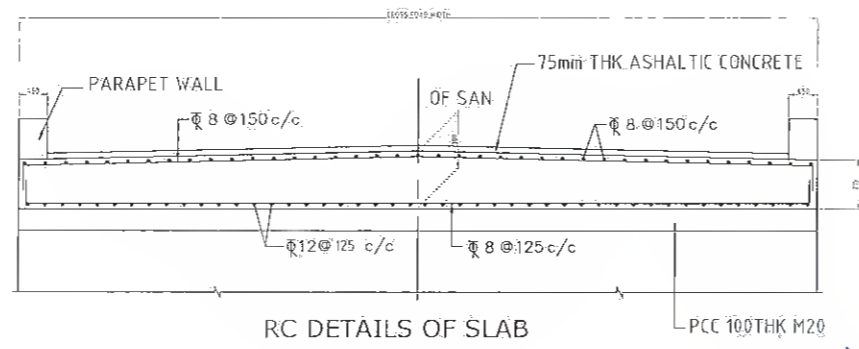
1. ALL DIMENSION ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. ALL PUNCHING DIMENSIONS UNLESS OTHERWISE STATED = ±1mm.
3. WELDING ELECTRODES SHALL CONFORM TO IS:319.
4. FOR GUARD RAIL BEAMS, POSTS & SPACER MATERIAL SHALL CONFORM TO IS:10748; GRADE-II, IS 808, IS 2052
5. BOLTS, NUTS & WASHERS SHALL BE ELECTRO GALVANISED.
6. GUARD RAIL, POSTS, SPACERS, FOUNDATION BOLTS SHALL BE HOT DIP GALVANISED.
7. THE OVER LAPPING OF THE GUARD RAIL BEAM BE ACHIEVED USING SUITABLE SIZE WASHERS.
8. END OF CONCRETE BRIDGE BARRIERS SHALL BE PROVIDED WITH HOLES AND SEAT FOR END SHOE CONNECTION AS SHOWN. THE END SHOE SHALL BE FURNISHED AND INSTALLED WITH ROADWAY APPROACH GUARD RAIL.
9. W-BEAM GUARDRAIL ARE TO BE FABRICATED AND INSTALLED AS PER SECTION 810 OF MOST SPECIFICATION FOR METAL BEAM CRASH BARRIER.

<p>Bihar State Road Development Corporation Ltd.</p>	SCALE	Project:	Design Consultants:	Title: STANDARD DRAWINGS STEEL W-BEAM CRASH BARRIER DETAILS	DRAWING NO.: RHDHV/64081/DDPR/CB/01 RO DATE: APRIL 2017 SHEET: 01 of 01 DESIGNED: R Singh DRAWN: J P Dohal CHECKED: R Singh APPROVED: S Puthuri
	NTS	Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Royal HaskoningDHV HaskoningDHV Nederland B.V.		
REV DATE DESCRIPTION OF REVISIONS					



SCHEDULE OF PRECAST CONCRETE PIPE

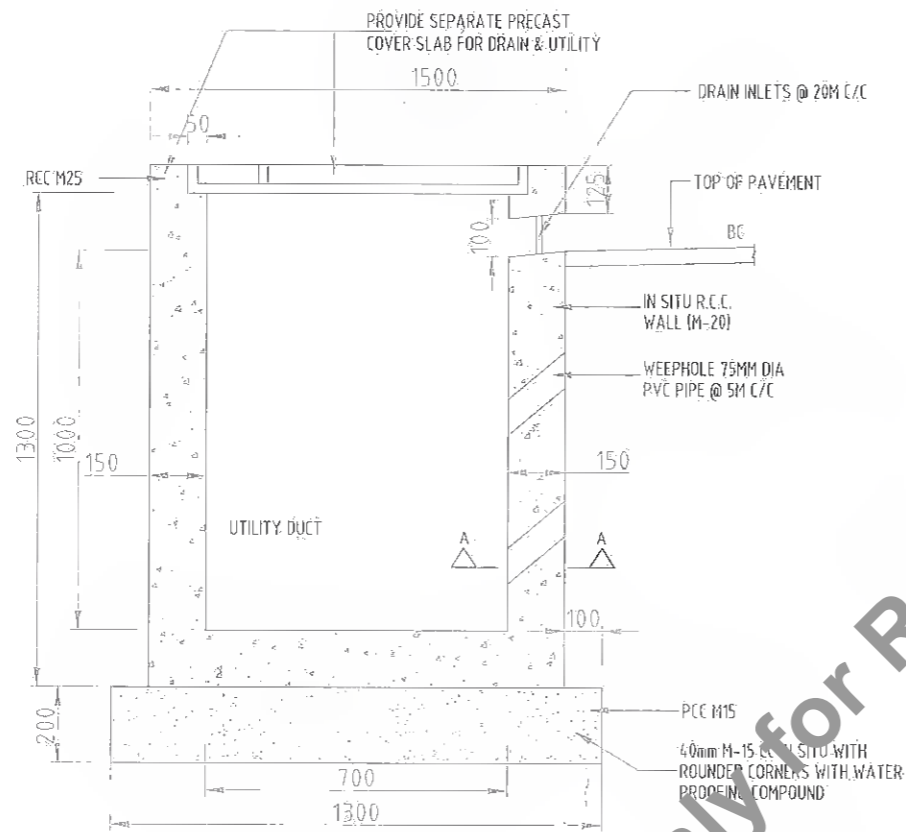
NOMINAL DIAMETER 'D'	450	600	750
EXTERNAL DIAMETER 'D1'	540	720	900



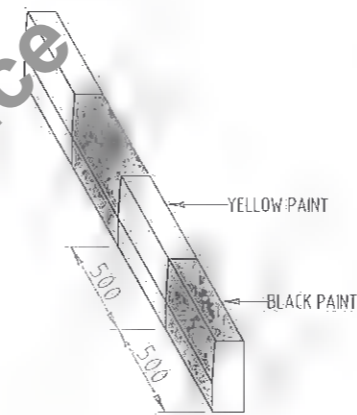
- NOTES
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
 2. ALL PRECAST CONCRETE PIPES TO BE OF GRADE NP3 CONFORMING TO IS 458.
 3. REINFORCEMENT BARS SHALL BE HIGH YIELD STRENGTH DEFORMED BARS (DENOTED AS) HAVING YIELD STRENGTH OF 415 MPa AND CONFORMING TO IS 1786
 4. CLEAR COVER TO ANY REINFORCEMENT SHALL BE 50mm. UNLESS OTHERWISE MENTIONED.
 5. THE SUITABILITY OF PIPE OR SLAB CULVERT FOR CROSS ROADS SHOULD BE DECIDED AT SITE BY ENGINEER-IN-CHARGE DEPENDING ON SITE CONDITIONS.

A
DBM (Tech)

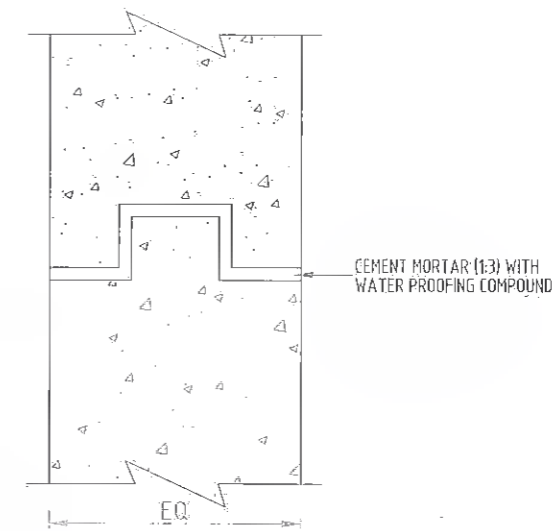
<p>Bihar State Road Development Corporation Ltd.</p>	<p>SCALE: NTS</p>	<p>Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V</p>	<p>Design Consultants: Royal HaskoningDHV HaskoningDHV Nederland B.V.</p>	<p>Title: TYPICAL - GROSS DRAIN SINGLE LANE BT ROAD/EARTHEN ROAD.</p>	<p>DRAWING NO.: RHDHV/64081/DDPR/CD/01 R0</p>
					<p>DATE: APRIL 2017</p> <table border="1"> <tr> <td>DESIGNED: R Singh</td> <td>DRAWN: J P Dabhi</td> <td>CHECKED: R Singh</td> <td>APPROVED: S Pathari</td> </tr> </table>
DESIGNED: R Singh	DRAWN: J P Dabhi	CHECKED: R Singh	APPROVED: S Pathari		



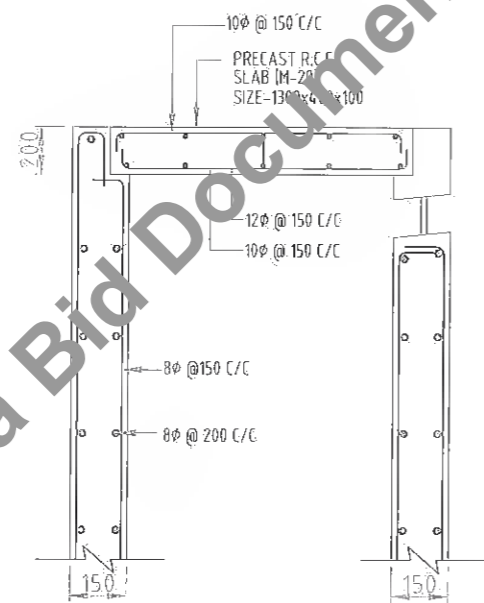
DETAIL OF SIDE DRAIN



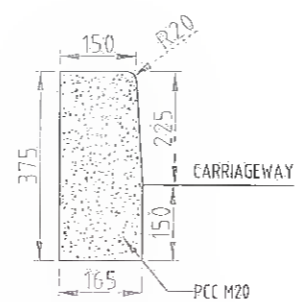
KERB MARKING



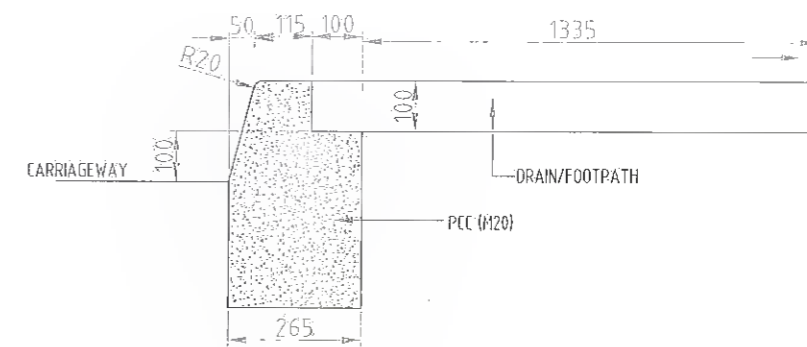
SECTION A-A
WATER PROOFING COMPOUND



DETAIL OF REINFORCEMENT



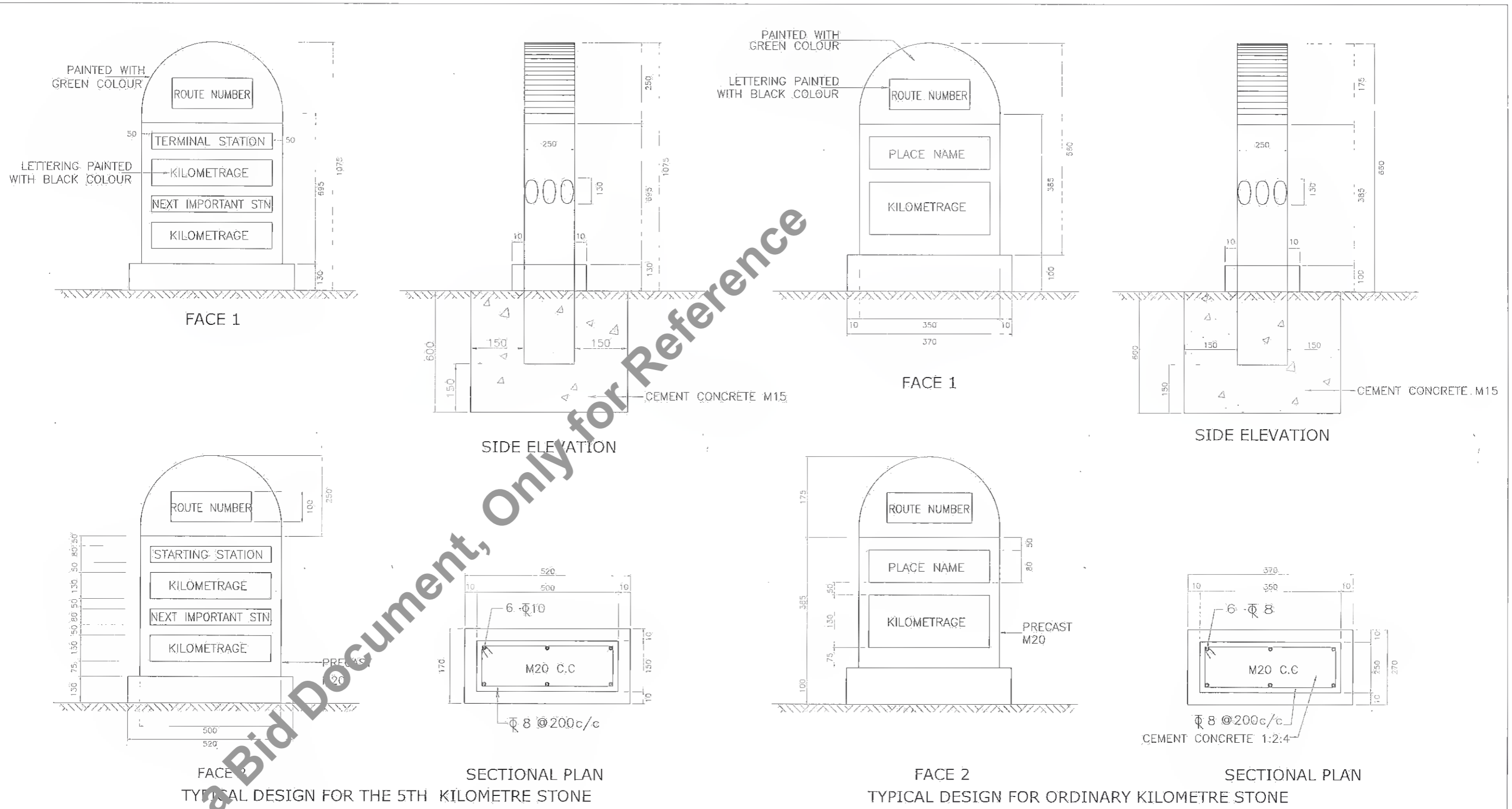
TYPE - I
KERB FOR CENTRAL
AND DIRECTIONAL ISLAND



TYPE - II
KERB FOR
COVERED DRAIN

A
DGM (RCA)

<p>Bihar State Road Development Corporation Ltd.</p>	<p>SCALE: NTS</p>	<p>Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V</p>	<p>Design Consultants: Royal HaskoningDHV HaskoningDHV Nedertand B.V.</p>	<p>Title: DETAILS OF COVER DRAIN AND KERB AT URBAN SECTION</p>	<p>DRAWING NO.: RHDHV/64081/DDPR/DR/01 R0</p>
					<p>DATE: APRIL 2017</p>
<p>REV DATE DESCRIPTION OF REVISIONS</p>					



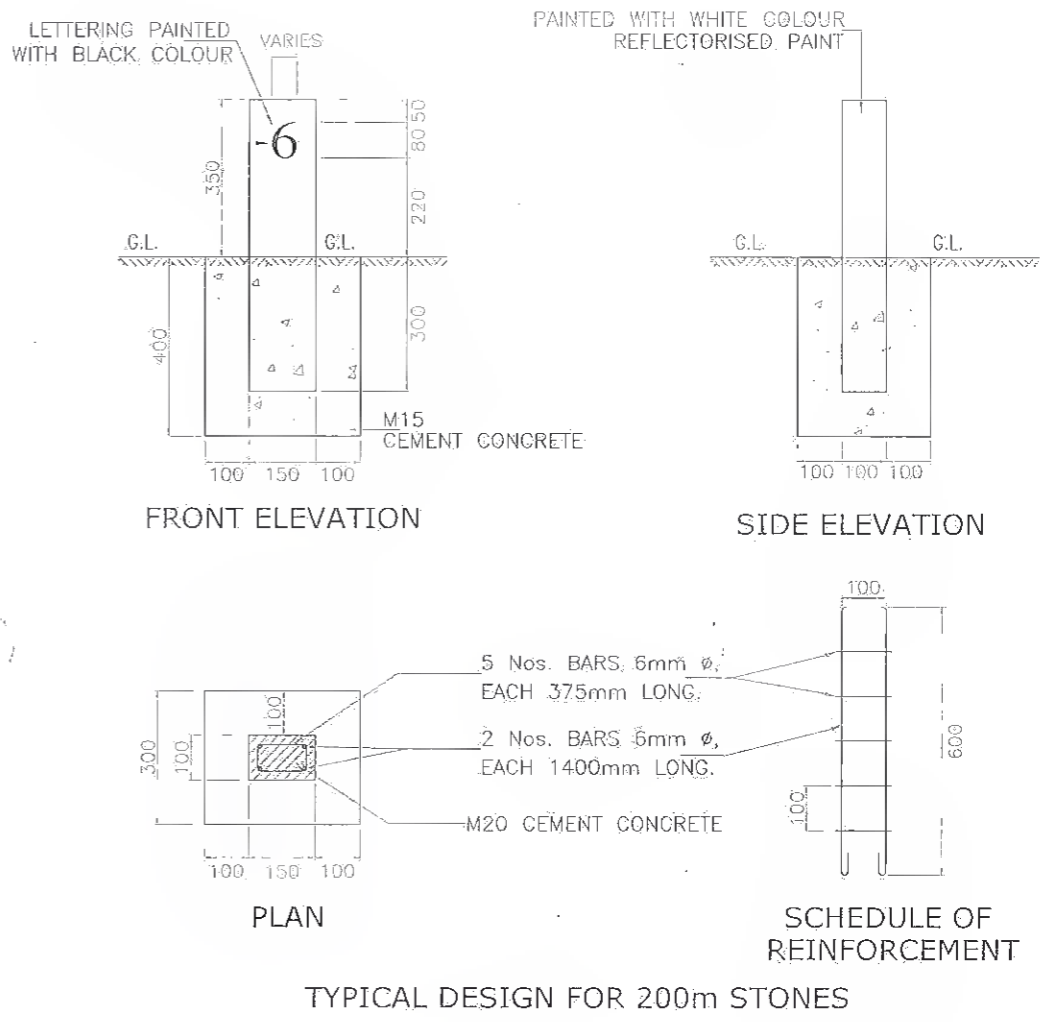
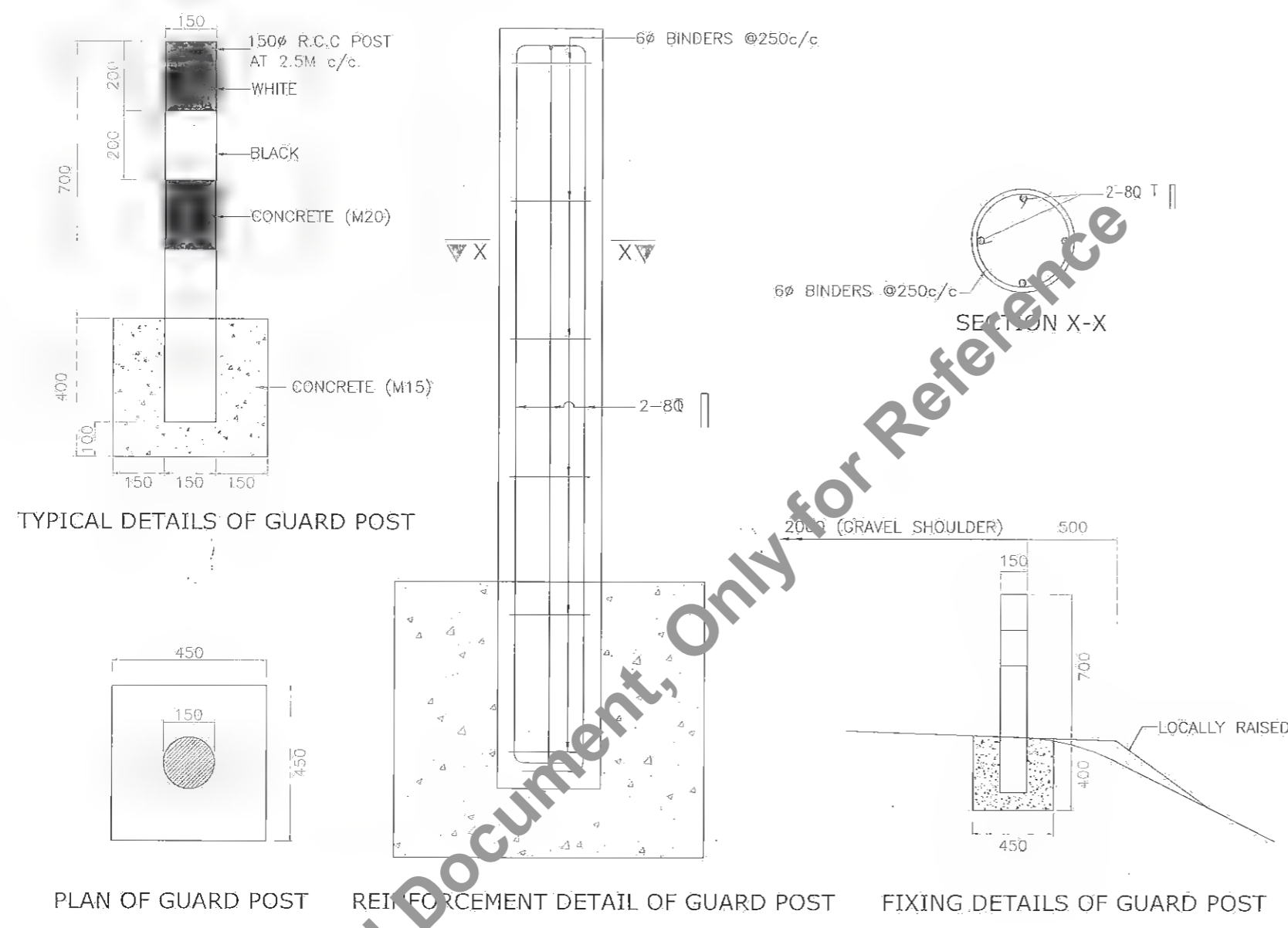
TYPICAL DESIGN FOR THE 5TH KILOMETRE STONE

TYPICAL DESIGN FOR ORDINARY KILOMETRE STONE

INDEX FOR KILOMETRE STONES		
Km. No	SCRIPT FOR PLACE NAMES	PLACE TO BE SHOWN
0	ROMANS	TERMINAL/STARTING STATION AND NEXT IMPORTANT TOWN
1	HINDI (DEVANAGARI SCRIPT)	TERMINAL / STARTING STATION
2	LOCAL LANGUAGE (HINDI)	NEXT IMPORTANT TOWN

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. REFLECTORISED PAINT SHALL BE IN ACCORDANCE WITH CL.803.5 OF M.O.R.T & H SPEC.
 3. FOR TYPE & STYLE SIZE OF LETTERING RELEVANT IRC CODE OF PRATICE SHALL BE REFERED.
 4. LETTERING IS DONE WITH APPROVED QUALITY BLACK ENAMEL PAINT USING STENCIL

Client: Bihar State Road Development Corporation Ltd.	SCALE: NTS	Project: Constancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title: TYPICAL KM STONE & 5TH KM STONE	DRAWING NO.: RHDHV/64081/DDPR/KM/01	RO	
					DATE: APRIL 2017	SHEET: 01 OF 02	
DESIGNED: R. Singh		DRAWN: J.P. Dobhal		CHECKED: R. Singh		APPROVED: S. Pathuri	
REV: 2 nd April 2017		Plan & Profile		REV: DATE DESCRIPTION OF REVISIONS			



NOTES:

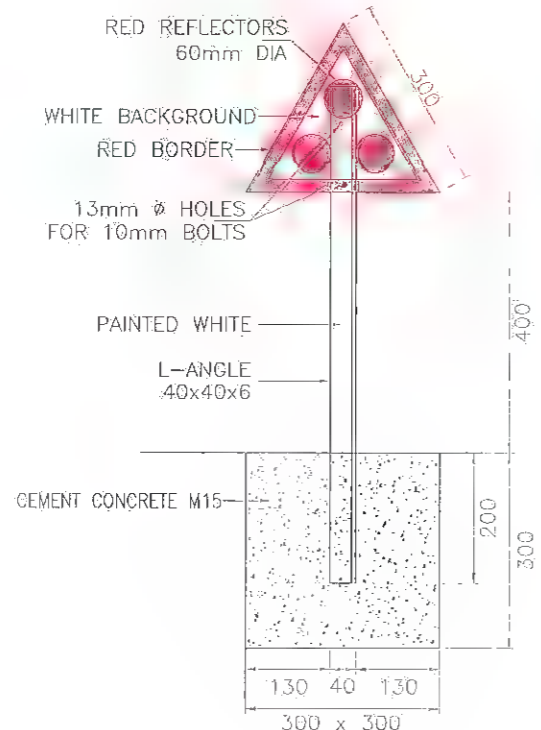
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED.
2. FOR EXACT DETAILS OF W-BEAM, REFER MANUFACTURER DRAWING.
3. W-BEAM BARRIER IS INSTALLED WHERE EMBANKMENT HEIGHT IS MORE THAN 6 METRES & AT IMMEDIATE BRIDGE APPROACHES.
4. R.C.C. GUARD POSTS IS INSTALLED WHERE EMBANKMENT HEIGHT IS BETWEEN 3M TO 6M & AT OTHER HAZARD LOCATIONS.

NOTES:

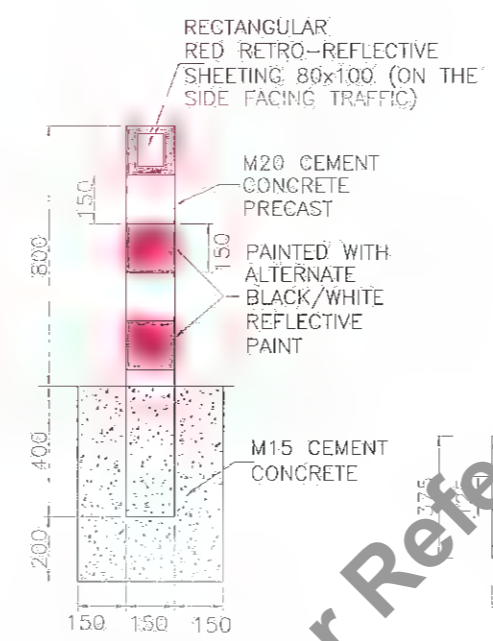
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFLECTORISED PAINT SHALL BE IN ACCORDANCE WITH CL.803.5 OF M.O.R.T & H SPEC.
3. FOR TYPE & STYLE SIZE OF LETTERING RELEVANT IRC CODE OF PRACTICE SHALL BE REFERRED.
4. LETTERING IS DONE WITH APPROVED QUALITY BLACK ENAMEL PAINT USING STENCIL

A

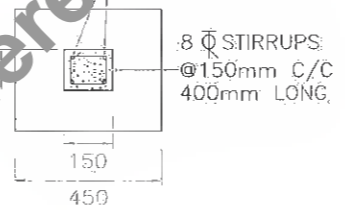
<p>Bihar State Road Development Corporation Ltd.</p>	SCALE	Project	Design Consultants	Title TYPICAL DETAILS OF 200M STONE & GUARD POST	DRAWING NO. RHDHV/64081/DDPR/KM/01 RO DATE: APRIL 2017 SHEET: 02 OF 02 DESIGNED: R Singh DRAWN: J P Dobhal CHECKED: R Singh APPROVED: S Pathuri
	NTS	Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Royal HaskoningDHV HaskoningDHV Nederland B.V.		
REV. DATE DESCRIPTION OF REVISIONS					



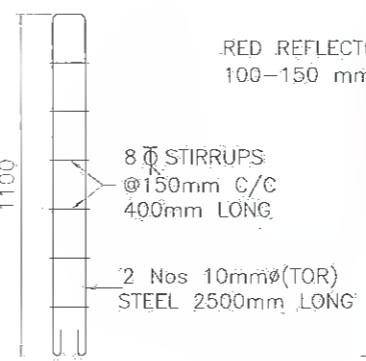
TYPICAL OBJECT MARKERS



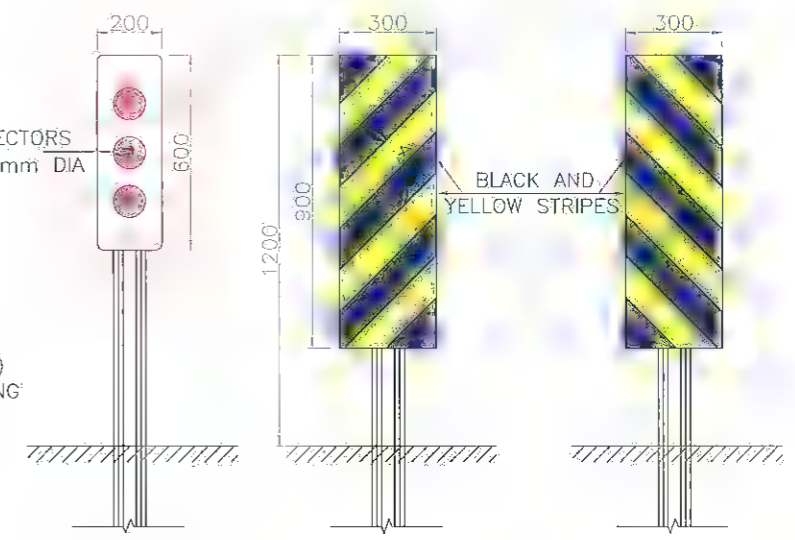
DELINEATORS WITH RECTANGULAR REFLECTION



PLAN



SCHEDULE OF REINFORCEMENT

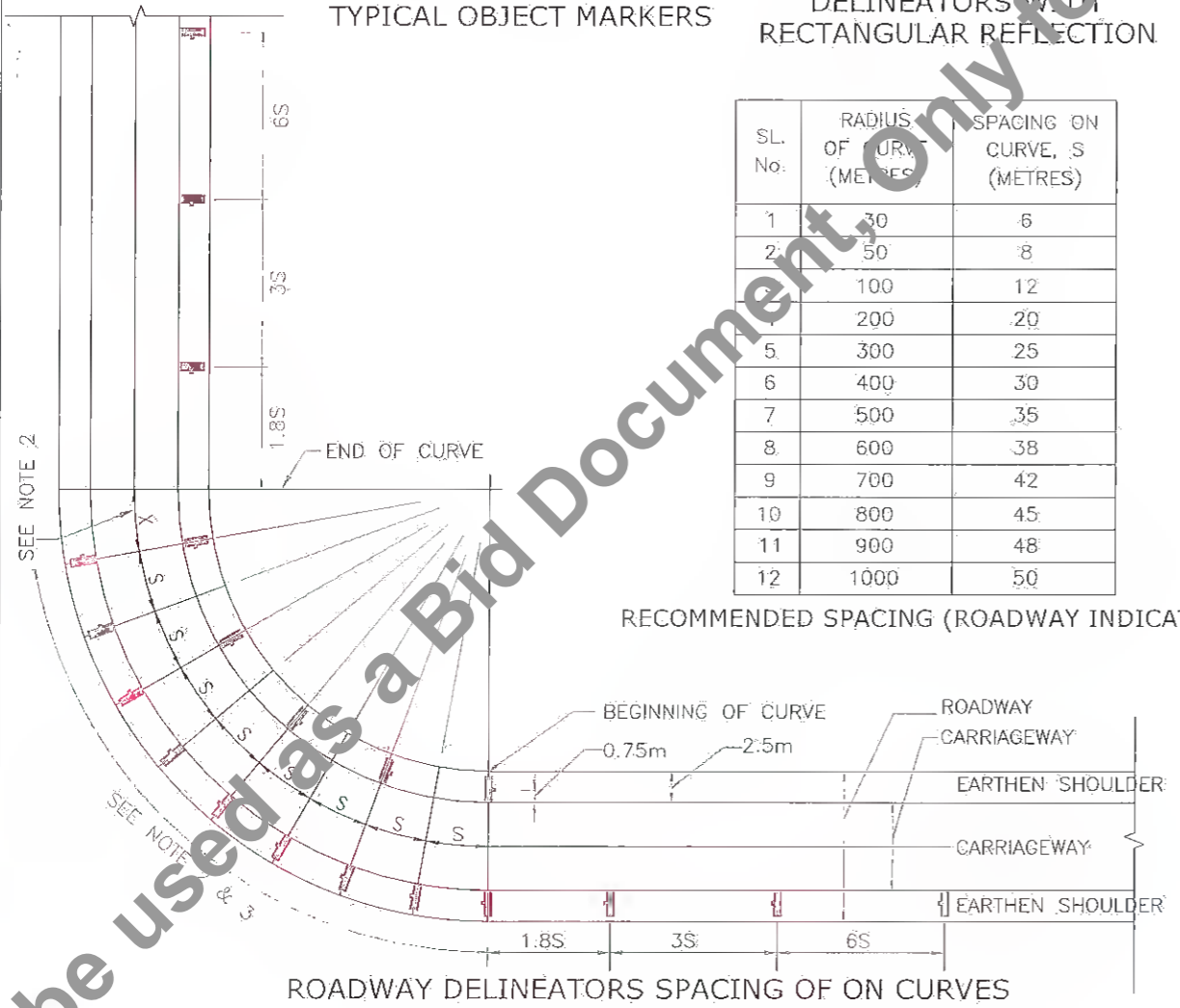


HAZARD MARKERS (SAME DESIGN TO BE USED BOTH ON LEFT AND RIGHT SIDE OF THE ROAD)

HAZARD MARKERS

SL. No.	RADIUS OF CURVE (METRES)	SPACING ON CURVE, S (METRES)
1	30	6
2	50	8
3	100	12
4	200	20
5	300	25
6	400	30
7	500	35
8	600	38
9	700	42
10	800	45
11	900	48
12	1000	50

RECOMMENDED SPACING (ROADWAY INDICATOR)

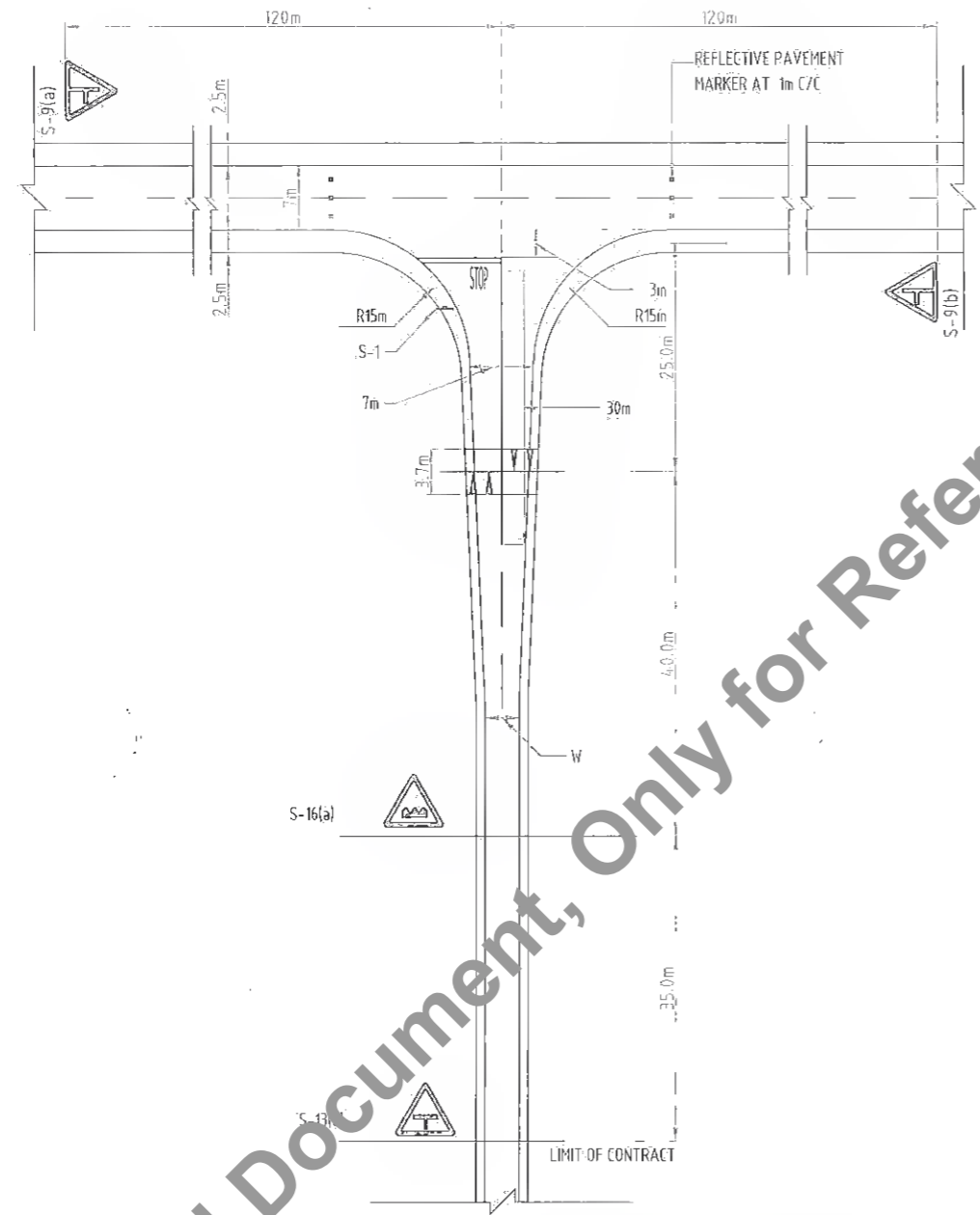


ROADWAY DELINEATORS SPACING OF ON CURVES

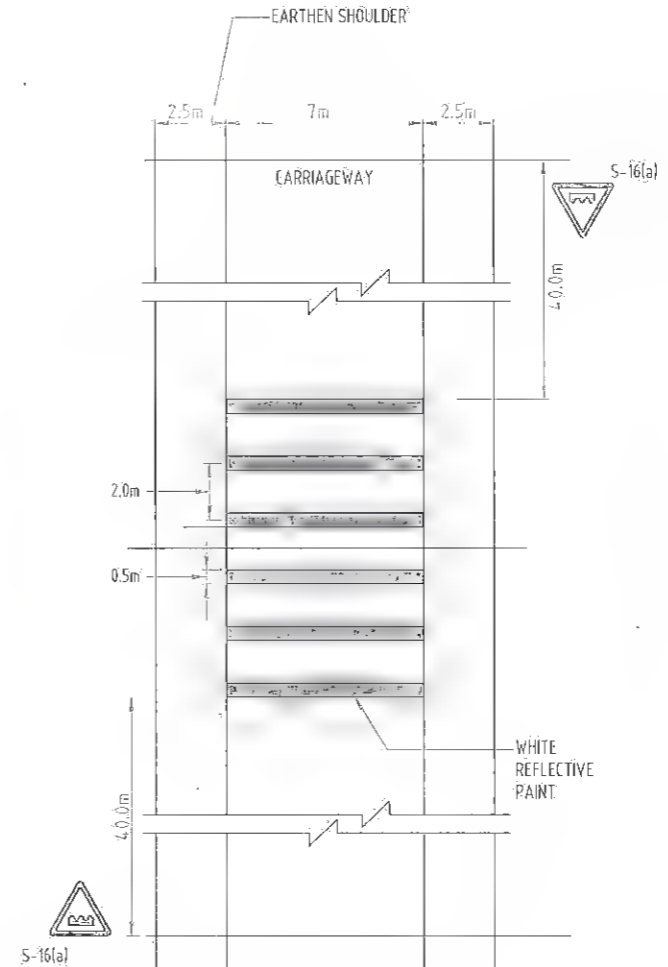
NOTES:

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
- ADJUST DISTANCE 'X' SUITABLY SO THAT THE LAST ROADWAY DELINEATOR IS AT THE END OF THE CURVE.
- INSTALL ALL DELINEATORS AT EDGE AS SHOWN IN THE DRAWING PERPENDICULAR TO THE ONCOMING TRAFFIC.
- SEE TABLE FOR VALUE OF 'S' i.e. SPACING OF DELINEATORS ON THE CURVE.
- ON STRAIGHT SECTIONS DELINEATORS SHOULD BE SPACED UNIFORMLY 50m FROM EACH OTHER, THE POSTS BEING IN PAIRS, ONE ON EACH SIDE OF THE ROADWAY.
- LOCATIONS OF OBJECT MARKERS
 - TRAFFIC ISLANDS AT APPROACHES TO INTERSECTIONS
 - MEDIAN OPENINGS
 - ON MEDIANS & ISLANDS ON FAR SIDE OF THE INTERSECTIONS
 - FACING APPROACHING TRAFFIC AT ISLANDS FORMING LEFT INFILTRATION LANES
- OBJECT MARKERS SHOULD BE SET BACK FROM THE FACE OF THE KERB A DISTANCE OF ATLEAST 500mm
- REQUIREMENT OF REFLECTORS SHALL BE IN ACCORDANCE WITH IRC:79-1981 CODE OF PRACTICE.
- ON EMBANKMENTS WITH HEIGHT MORE THAN 2m CLEAR SPACING OF DELINEATORS SHALL BE 25m.
- DELINEATORS ARE NOT PROVIDED AT LOCATIONS WHERE CHEVRON SIGN BOARDS ARE PROPOSED
- GAURD POSTS ARE PROVIDED ON EMBANKMENTS OF HEIGHT >2m AND <3m AT 5m INTERVAL
- DELINEATORS ARE PROVIDED BEFORE AND AFTER PARAPET WALL ON BOTH SIDES AT ALL BRIDGE LOCATIONS AND ALSO AT CULVERT LOCATIONS WHOSE WIDTH IS LESS THAN 12m AND MORE THAN 10m.
- REFLECTIVE PAINT SHALL BE IN ACCORDANCE WITH CL803.5 OF M.O.R.T & H SPEC.

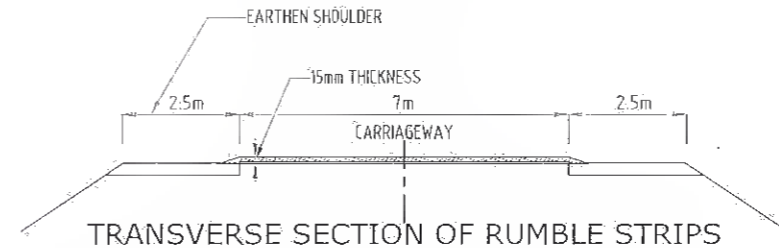
Client: Bihar State Road Development Corporation Ltd.	SCALE: NTS	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: HaskoningDHV Nederland B.V.	Title: DETAILS OF ROAD DELINEATORS.	DRAWING NO.: RHDIV/64081/DDPR/RD/01 DATE: APRIL 2017 SHEET: 01 OF 01 DESIGNED: R Singh DRAWN: J P Dohal CHECKED: R Singh APPROVED: S Pathari
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LOCATION OF ROADHUMP AT MINORROAD INTERSECTIONS



DETAILS OF RUMBLE STRIPS



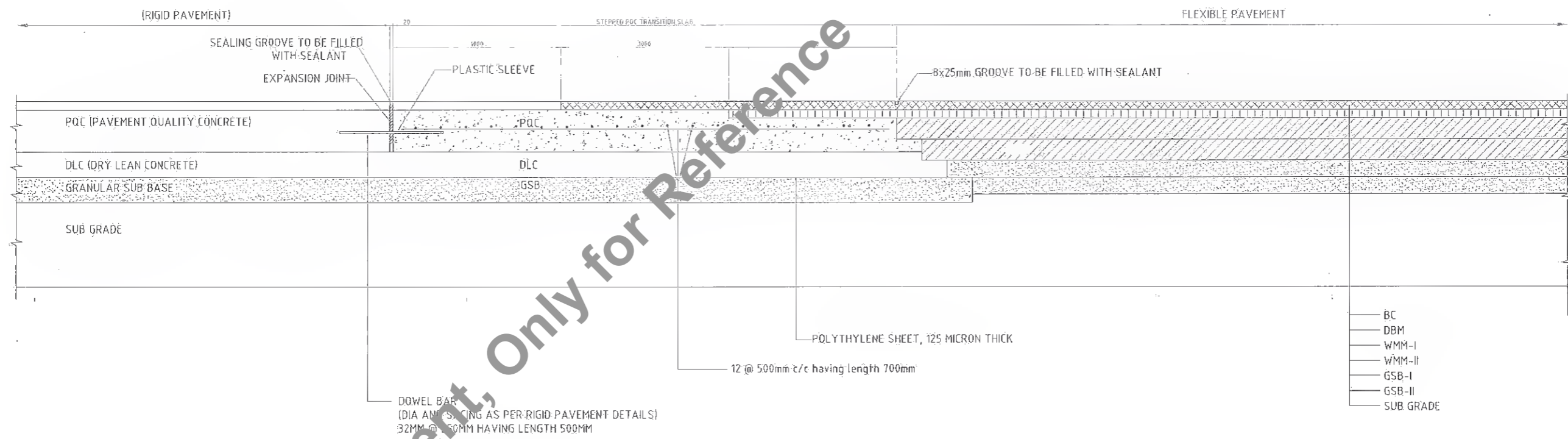
TRANSVERSE SECTION OF RUMBLE STRIPS

NOTES:-

1. THE DESIGN OF ROAD HUMP IS IN ACCORDANCE WITH IRC: 99-1988 GUIDE LINES.
2. ROAD HUMP IS PROPOSED AT UNCONTROLLED INTERSECTIONS OF MINOR ROADS WITH MAJOR ROADS ON THE MINOR ARMS.
3. THE WARNING SIGNS SHOULD BE OF THE DESIGN 'HUMP OR ROUGH ROAD' DETAILED IN IRC: 67-2001 SHOULD BE INSTALLED AT SPECIFIED DISTANCE AHEAD OF RUMBLE STRIP ROAD HUMP AS GIVEN IN DWG No. RHDHV\64801\SH-95\RS-001, RS-002 & RS-003
4. REFLECTIVE PAINT SHALL BE HOT APPLIED THERMOPLASTIC MATERIAL CONFORMING TO M.O.R.T & H SEC. CL.803.4
5. RUMBLE STRIPS ARE PROVIDED ON ALL SHARP CURVES WITH RADIUS LESS THAN 170m AND AT VILLAGE AND URBAN APPROACHES.
6. HEIGHT OF RUMBLE STRIP IS 15mm
7. MATERIAL OF CONSTRUCTION FOR RUMBLE STRIP IS OPEN GRADED PREMIX BITUMINOUS SURFACING (TYPE-B) AS PER TECH.SEC. CL:512
8. MATERIAL OF CONSTRUCTION FOR ROAD HUMP IS BITUMINOUS CONCRETE AS PER TECH.SEC. CL 509
9. REFLECTIVE PAVEMENT MARKERS ARE PROVIDED AS SHOWN IN DRAWING No. RHDHV\64801\SH-95\RPN-001 BEFORE AND AFTER RUMBLE STRIPS/ROAD HUMP.

Client : Bihar State Road Development Corporation Ltd.	SCALE : N:1'S	Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants : HaskoningDHV Nederland B.V.	Title : DETAILS OF ROAD HUMP AND RUMBLE STRIPS	DRAWING NO. RHDHV/64081/DDPR/RH&RS/01
					DATE : APRIL 2017
DESIGNED : R Singh		DRAWN : J P Dobia		CHECKED : R Singh	
REV' :		DATE :		DESCRIPTION OF REVISIONS :	
APPROVED : S. Pathari		APPROVED :		APPROVED :	

Not to be used as a Bid Document, Only for Reference



TYPICAL DETAILS OF TRANSITION SLAB BETWEEN RIGID & FLEXIBLE PAVEMENT

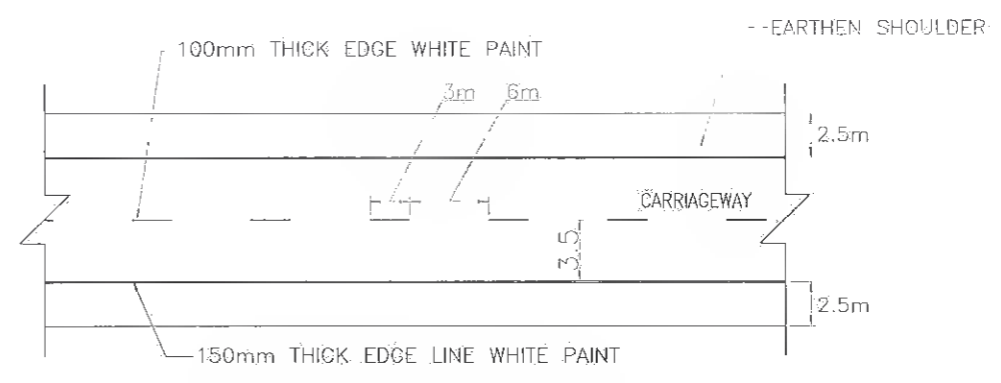
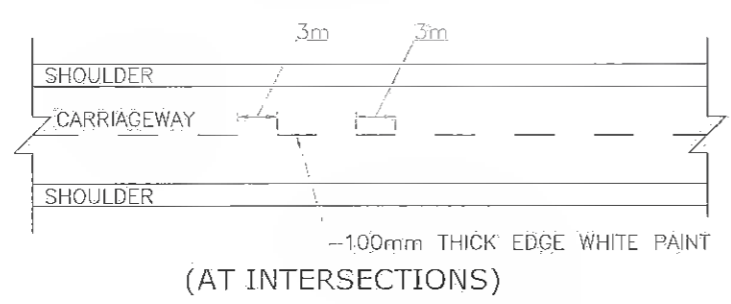
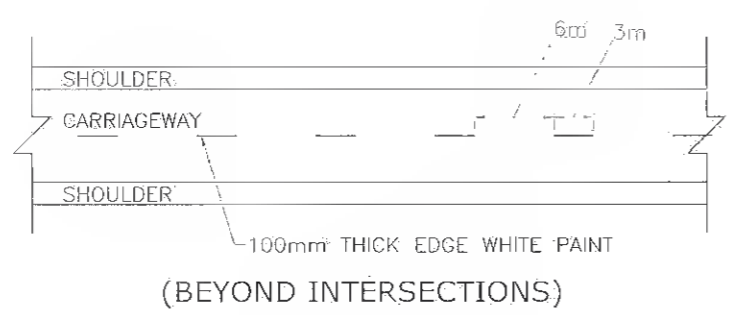
NOTES:
 1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED.
 2. THIS DRAWING IS TO BE READ ALONG WITH OTHER TYPICAL ROAD X-SECTION DRAWINGS.

Client : Bihar State Road Development Corporation Ltd.	SCALE : NTS	Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi-Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants : Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title : TYPICAL DETAILS OF TRANSITION SLAB BETWEEN RIGID AND FLEXIBLE PAVEMENT	DRAWING NO. : RHDIV/64081/DDPR/RIGID/01 DATE : APRIL 2017 DESIGNED : R. Singh DRAWN : J.P. Dobhal CHECKED : R. Singh APPROVED : S. Pathari
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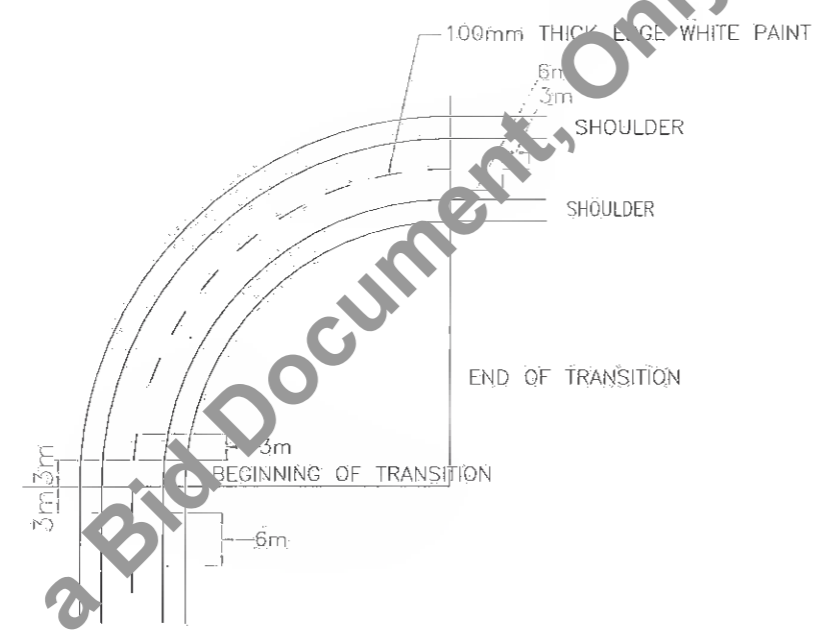
Not to be used as a Bid Document, Only for Reference

DETAILS OF CENTRE LINE

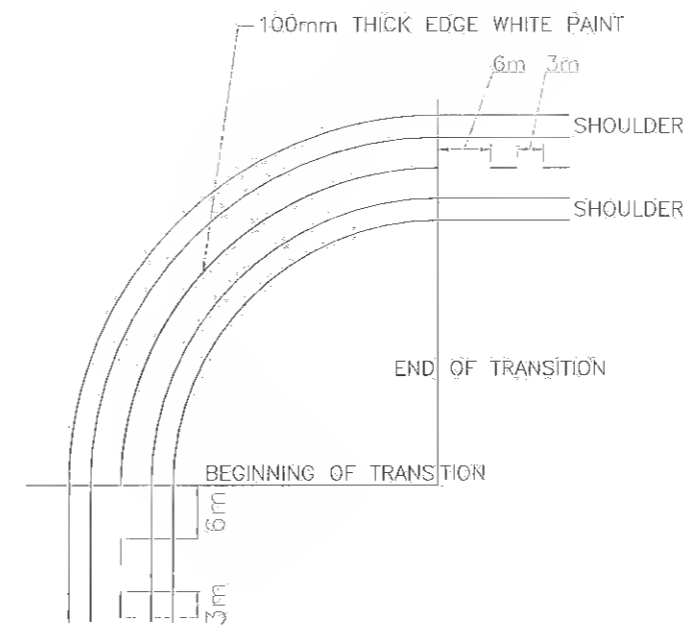
LONGITUDINAL MARKING



DETAILS OF EDGE LINE MARKING



DETAILS AT CURVES



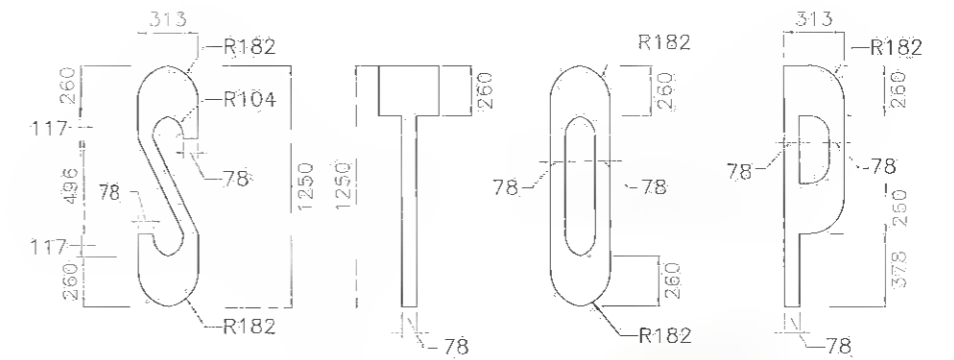
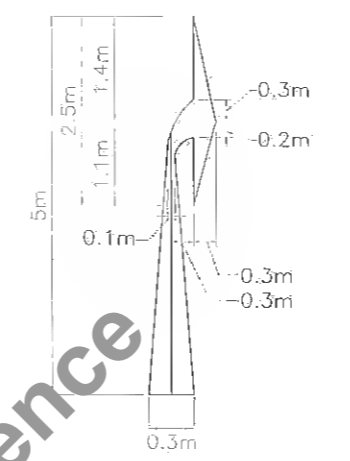
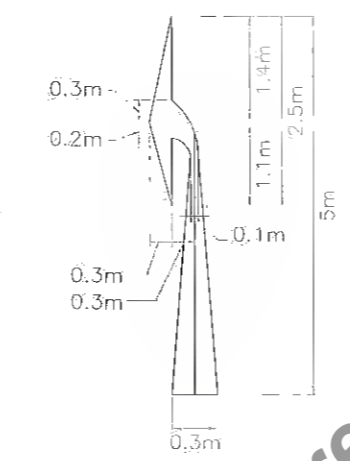
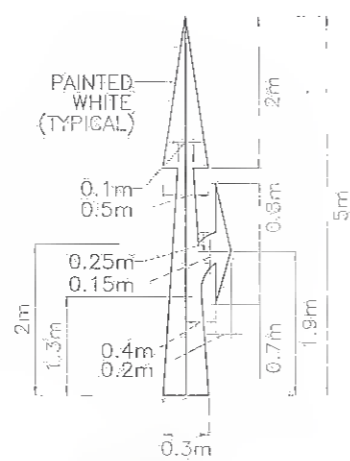
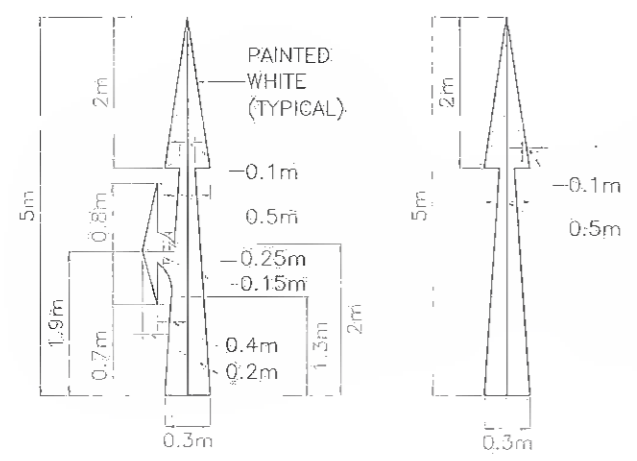
DETAILS AT SHARP CURVES
(NO-OVERTAKING ZONE)

NOTE:

1. EDGE LINE MARKINGS SHOULD NOT BE CARRIED ACROSS THE MOUTHS OF SIDE ROADS
2. CENTRE LINE & EDGE MARK SHALL END AT THE STOP LINE & SHALL NOT BE CONTINUED.
3. ROAD MARKING SHOULD BE DONE WITH THERMOPLASTIC PAINT CONFORMING TO CL. 803.4 OF M.O.R.T & H. SPECIFICATIONS
4. DETAILS OF ROAD MARKING ARE AS PER IRC: 35-1997, CODE OF PRACTICE FOR ROAD MARKINGS

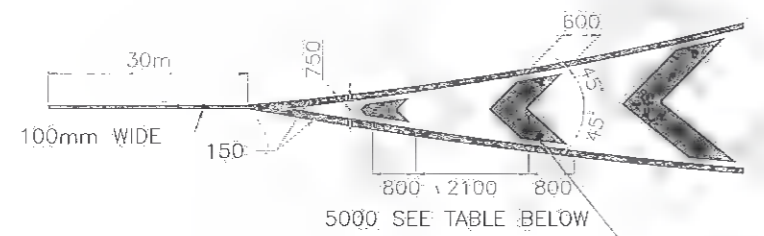
<p>Bihar State Road Development Corporation Ltd.</p>	SCALE:	Project:	Design Consultant:	<p>ROYAL HASKONINGDHV</p> <p>HaskoningDHV Nederland B.V.</p>	<p>DATE: APRIL 2017</p> <p>DESIGNED: R Singh</p> <p>DRAWN: J.P. Döbhal</p> <p>CHECKED: R Singh</p> <p>APPROVED: S Pathari</p>	<p>DRAWING NO.: RHDHV/64081/DDPR/RM/01</p> <p>DATE: APRIL 2017</p> <p>DESIGNED: R Singh</p> <p>DRAWN: J.P. Döbhal</p> <p>CHECKED: R Singh</p> <p>APPROVED: S Pathari</p>	<p>RD</p> <p>SHEET: 01 OF 02</p>
	NTS	<p>Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V</p>	<p>ROYAL HASKONINGDHV</p> <p>HaskoningDHV Nederland B.V.</p>				

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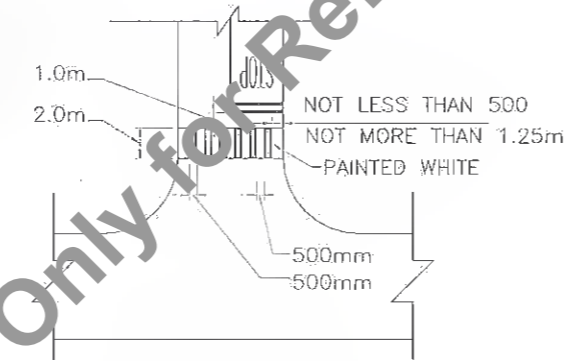


SIZE OF LETTERS

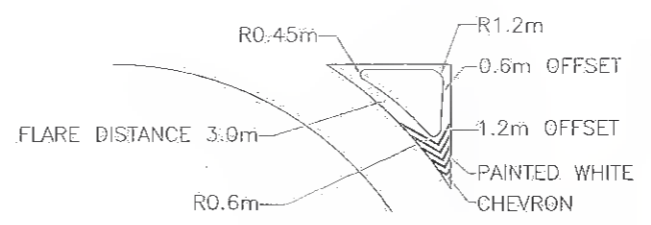
DIRECTIONAL ARROWS



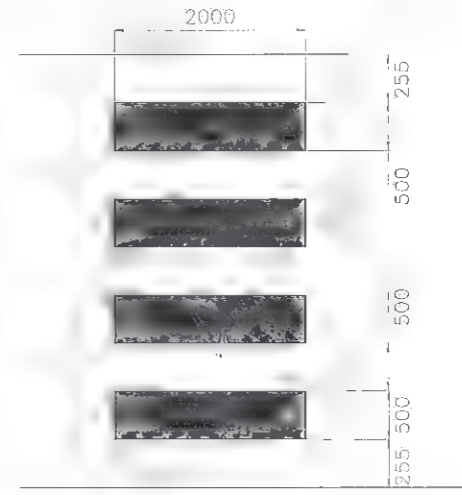
DIAGONAL MARKINGS



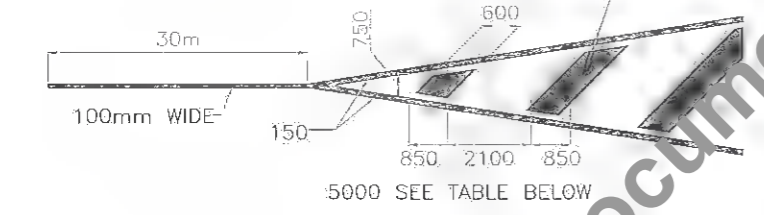
PEDESTRIAN CROSSING



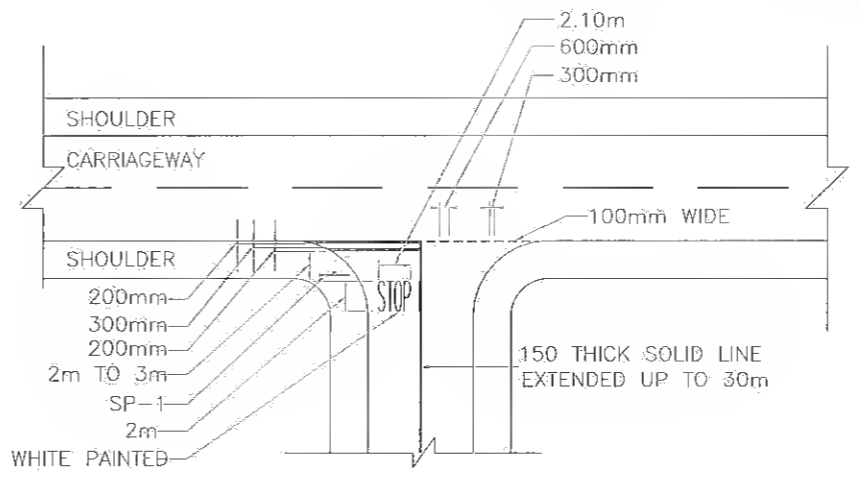
CHANELISING ISLAND



PEDESTRIAN CROSSING



CHEVRON MARKINGS



STOP LINE

TABLE : SPACING BETWEEN DIAGONALS/CHEVRONS

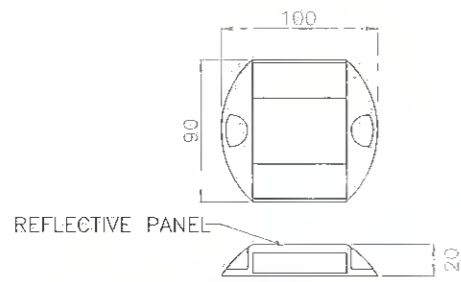
TOTAL LENGTH OF MARKING (m)	CLEAR SPACING BETWEEN DIAGONALS OR CHEVRONS (mm)	
	SPEED ≤ 75 km/h	SPEED (>75 km/h)
≤ 6	2100	-
6 TO 22	3500	-
> 22	5000	-
≤ 10	-	4000
> 10	-	6000

NOTE:

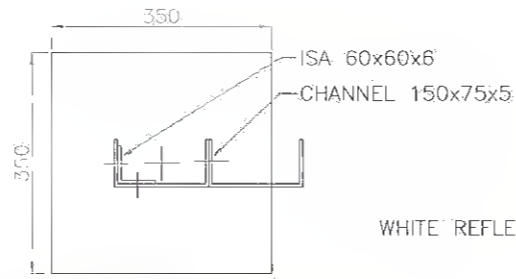
1. ALL LENGTHS AND SPACINGS IN THE TABLE ARE MEASURED PARALLEL TO ROAD CENTRE LANE.
2. FIRST DIAGONAL OR CHEVRON IS TO BE SO LOCATED THAT ITS LENGTH IS ATLEAST EQUAL TO ITS WIDTH
3. WIDTH OF ALL DIAGONALS/CHEVRONS MEASURED AT RIGHT ANGLES TO THE DIAGONALS OR CHEVRONS IS 600mm.
4. FOR CENTERLINE AND EDGELINE MARKING AT BUS BAY LOCATION REFER DRAWING NO. RHDHV\64801\SH-95\BB-001
5. ROAD MARKING SHOULD BE DONE WITH THERMOPLASTIC PAINT CONFORMING TO CL. 803.4 OF M.O.R.T & H SPECIFICATIONS
6. DETAILS OF MARKING AT INTERSECTIONS ARE AS PER M.O.R.T & H TYPE DESIGNS FOR INTERSECTIONS ON NATIONAL HIGHWAYS

A

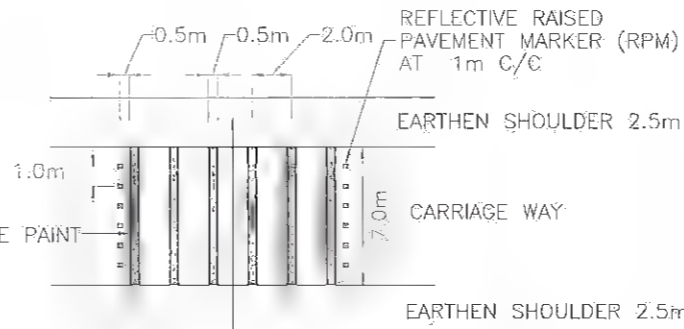
Client: Bihar State Road Development Corporation Ltd.	Scale: NTS	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultant: HaskoningDHV Nederland B.V.	Title: TYPICAL ROAD MARKING DETAILS	Drawing No.: RHDJV/64081/DDPR/RM/01	RO
DATE: 20 April 2017				DATE: APRIL 2017		SHEET: 02 OF 02
DESIGNED: R. Singh		DRAWN: J.P. Dobhal		CHECKED: R. Singh		APPROVED: S. Pathari



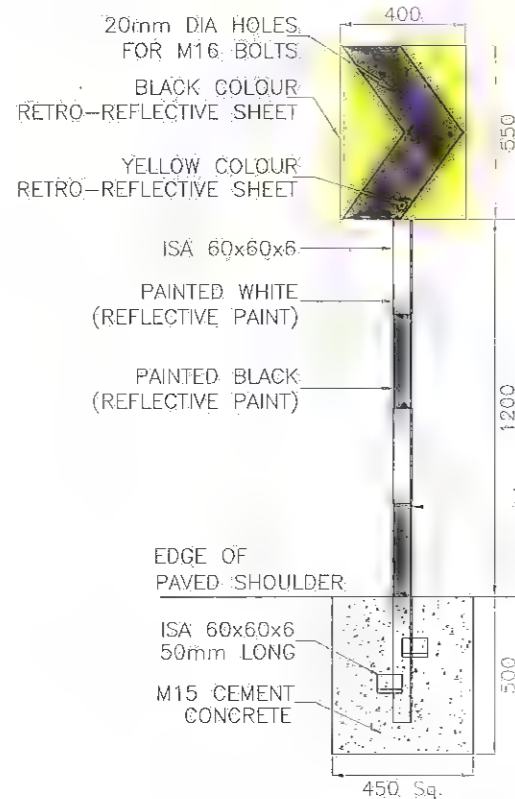
REFLECTIVE PAVEMENT MARKERS (RPM)



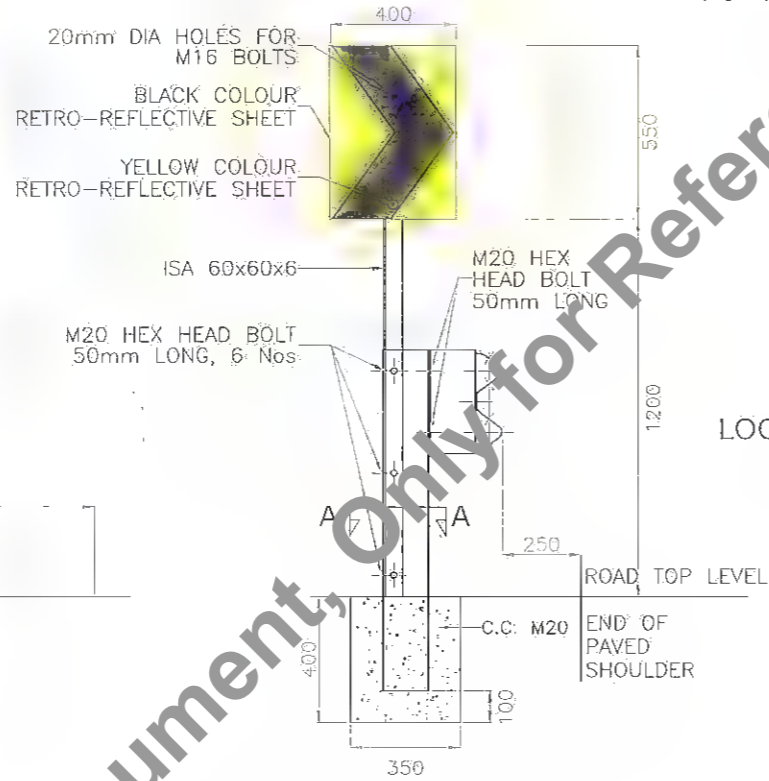
SECTION 'A-A'



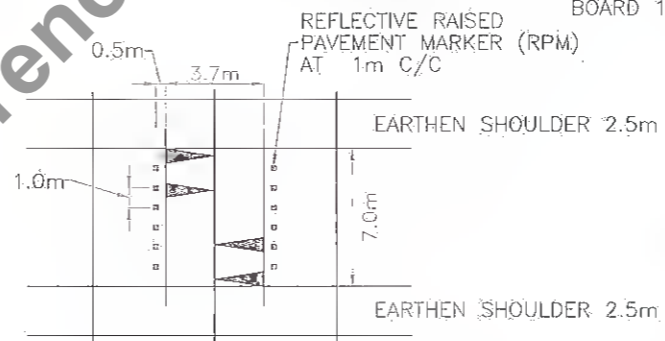
LOCATION OF RPM BEFORE RUMBLE STRIPS



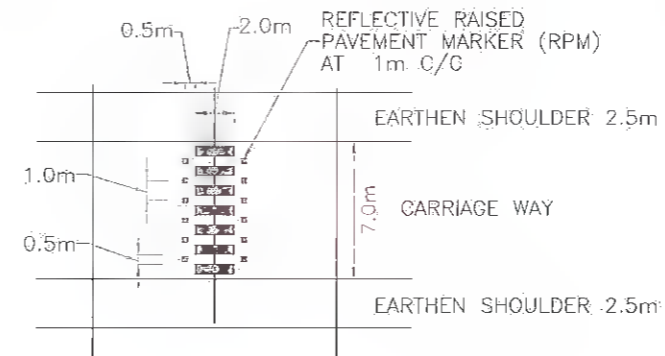
CHEVRON DIRECTION SIGN BOARD



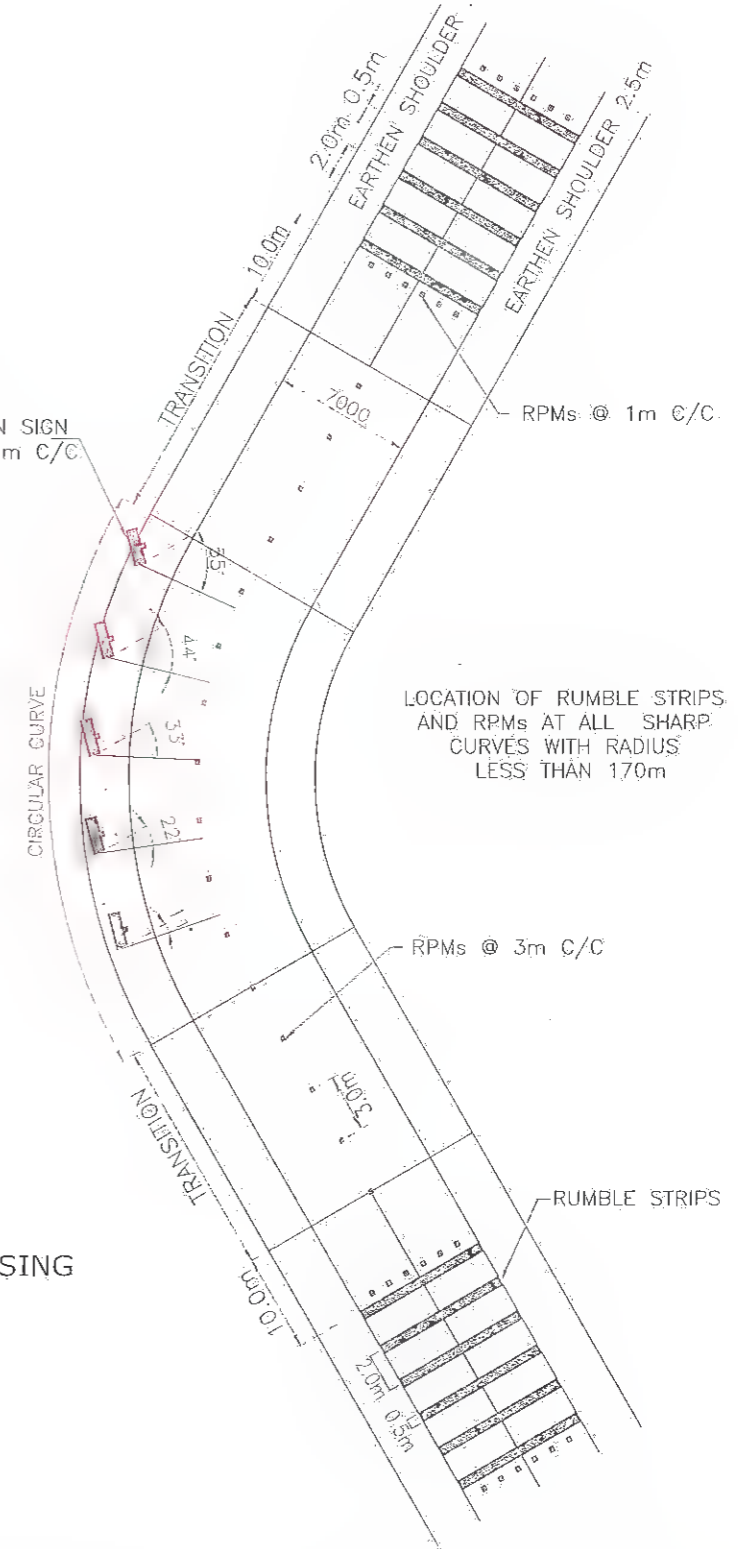
CHEVRON DIRECTION SIGN BOARD WITH CRASH BARRIER



LOCATION OF RPM BEFORE ROAD HUMPS



LOCATION OF RPM BEFORE PEDESTRIAN CROSSING



LOCATION OF RUMBLE STRIPS AND RPMs AT ALL SHARP CURVES WITH RADIUS LESS THAN 170m

REFLECTIVE PAVEMENT MARKERS

- SPECIFICATION OF MATERIAL, DESIGN, OPTICAL PERFORMANCE, TESTS AND FIXING OF RPM SHALL BE IN ACCORDANCE WITH TECH.SPEC. CL.812.
- LOCATIONS OF RPM

COLOUR OF RPM	LOCATION	SPACING
WHITE	RUMBLE STRIP & ROAD HUMPS AS SHOWN IN DRG.	1m C/C
AMBER	CURVES < 600m RADIUS ALONG CENTERLINE	3m C/C
RED	BEFORE AND AFTER PEDESTRIAN CROSSING AS SHOWN IN DRG. AND AT APPROACHES TO ROAD INTERSECTION	1m C/C

- RPM SHOULD MEET MINIMUM CIL VALUES EQUIVALENT TO CATEGORY 'A' STUDS AS PER CLAUSE 812 OF TECH.SPEC.

CHEVRON SIGN BOARD

- THE SIZE OF 'CHEVRON' SIGNBOARD IS 400MM X 550MM.
- THE SIGN BOARD SHOULD BE WIDE-ANGLE MICRO-PRISMATIC LENS, CONFIRMING TO TECH.SPEC. CL.801.3.2.2
- THE RETRO-REFLECTIVE SURFACE AFTER CLEANING WITH SOAP AND WATER IN DRY CONDITION SHOULD HAVE THE MINIMUM CO-EFFICIENT OF RETRO-REFLECTION (MORT&H WIDE 801.3.2 CLAUSE & MINISTRY'S LETTER NO. RW/NH-33023/31/88-DQ III) AS INDICATED BELOW FOR ENCAPSULATED LENS.
- CHEVRON SIGN BOARDS SHALL BE INSTALLED AT 10M C/C AS SHOWN IN THE DRAWINGS AT ALL CURVES OF RADIUS LESS THAN 200M ALONG THE OUTER EDGE FACING THE TRAFFIC OF NEARBY LANE.

A

Client: Bihar State Road Development Corporation Ltd.	SCALE: NTS	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultant: Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title: DETAILS OF RPMs & CHEVRON MARKERS	DRAWING NO.: RHDHV/64081/DDPR/RPM/01 DATE: APRIL 2017 DESIGNED: Rishabh K Singh DRAWN: J.P. Dobhal CHECKED: Rishabh K Singh APPROVED: S. Pathuri
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S-1

STOP



S-2

COMPULSORY
KEEP LEFT



S-2(a)

RESTRICTION ENDS



S-3

GIVE WAY



S-4(a)

SPEED LIMIT



S-4(b)

SPEED LIMIT



S-4(c)

SPEED LIMIT



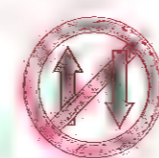
S-4(d)

SPEED LIMIT



SP-5(a)

OVERTAKING
PROHIBITED



SP-5(b)

ONE WAY



SP-5(c)

ONE WAY



SP-6

SCHOOL ZONE



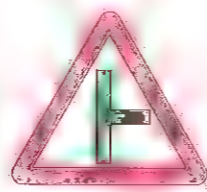
S-7

COMPULSORY
SOUND HORN



S-8

CROSS ROAD



S-9(a)

RIGHT SIDE ROAD



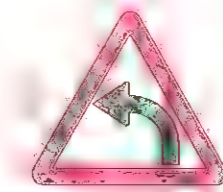
S-9(b)

LEFT SIDE ROAD



S-10(a)

RIGHT HAND
CURVE



S-10(b)

LEFT HAND
CURVE



S-10(c)

RIGHT HAIR PIN
BEND



S-10(d)

LEFT HAIR PIN
BEND



S-10(e)

RIGHT REVERSE
BEND



S-10(f)

LEFT REVERSE
BEND



S-11

T-INTERSECTION



S-12

PEDESTRIAN
CROSSING

A
DGM (Tech)

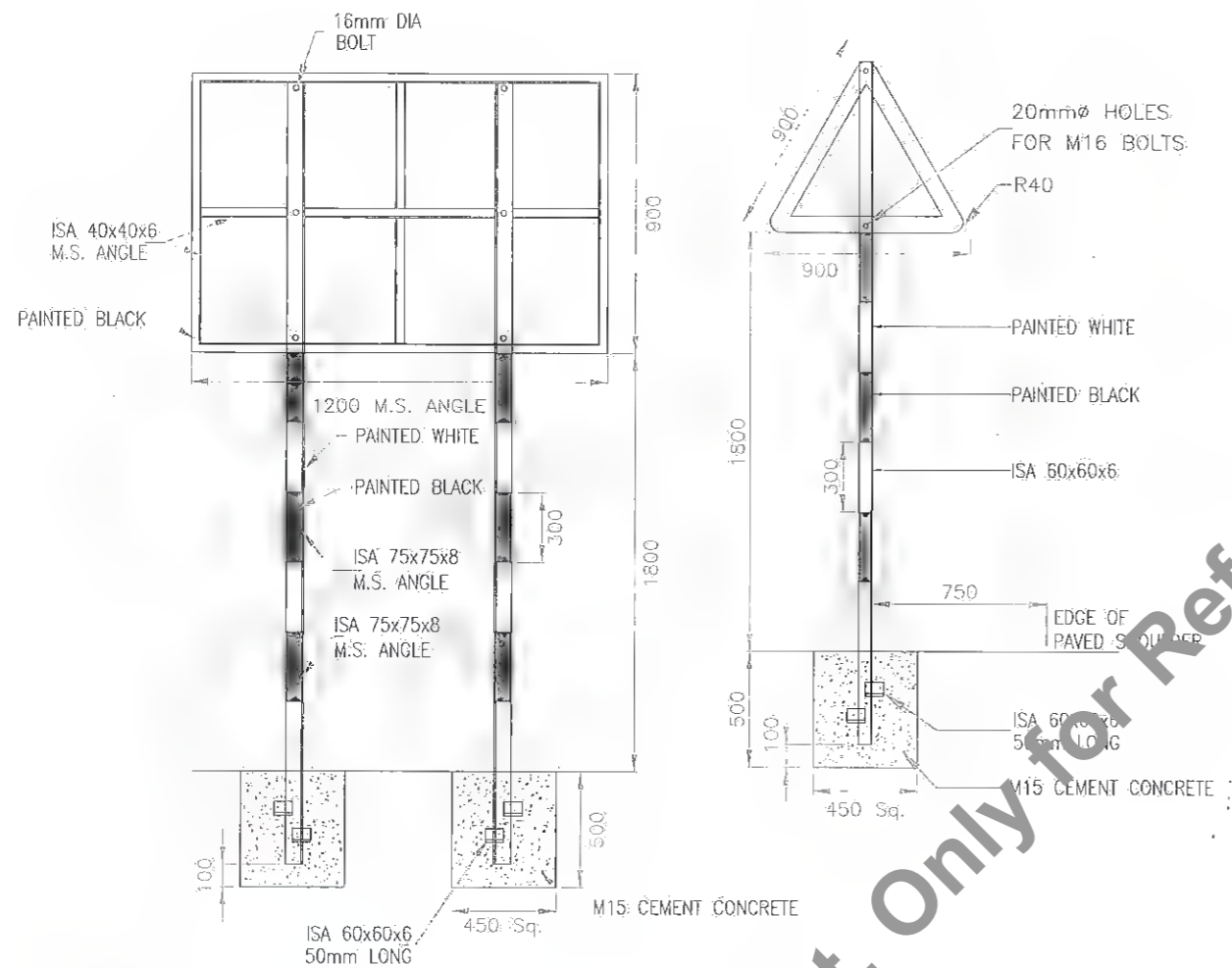
Client: Bihar State Road Development Corporation Ltd.	SCALE: N.T.S.	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultant: HaskoningDHV Nederland B.V.	Title: TYPICAL ROAD SIGNS	DRAWING NO.: RRDHV/64081/DDPR/RS/01 DATE: APRIL 2017 DESIGNED: R Singh DRAWN: J P Dobhal CHECKED: R Singh APPROVED: S Pathuri
				REVISIONS:	SHEET: 01 OF 03
				REV: 24 th Feb 2013	
				DATE: 24 th Feb 2013	
				DESCRIPTION OF REVISIONS:	

Not to be used as a Bid Document, Only for Reference

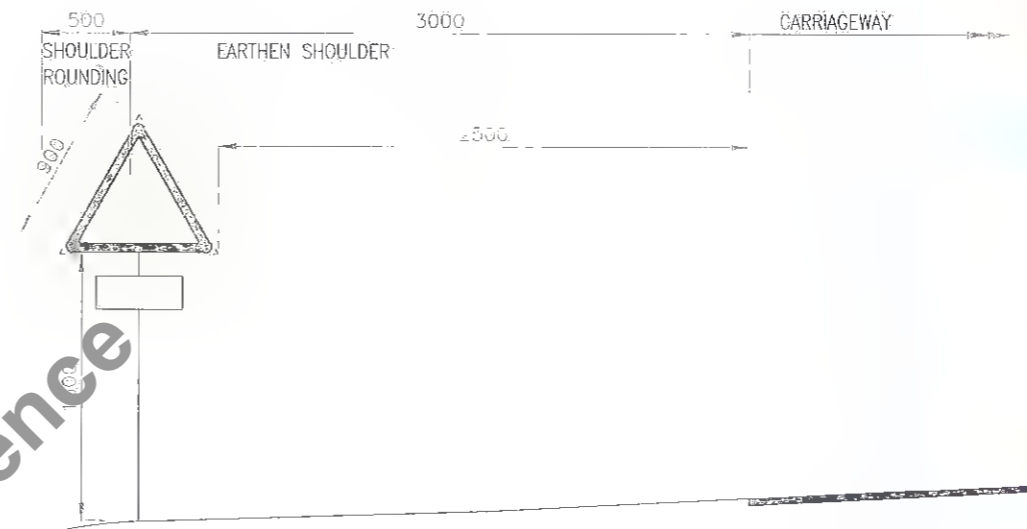
S-13(a)  STAGGERED INTERSECTION	S-13(b)  STAGGERED INTERSECTION	S-13(c)  MAJOR ROAD AHEAD	S-13(d)  MAJOR ROAD AHEAD	S-14(a)  Y-INTERSECTION	S-14(b)  Y-INTERSECTION
S-14(c)  Y-INTERSECTION	S-14(d)  GAP IN MEDIAN	S-14(e)  OVERHEAD CABLE	S-15(a)  NARROW BRIDGE	S-15(b)  DUAL C' WAY STARTS	S-15(c)  DUAL C' WAY ENDS
S-15(d)  SERIES OF BENDS	S-16(a)  HUMP OR ROUGH ROAD	S-16(b)  BARRIER AHEAD	S-17  STATE ROUTE MARKER SIGN	S-18 (a)  GUARDED RAILWAY CROSSING AT 200m	S-18 (b)  GUARDED RAILWAY CROSSING AT 50-100m
S-24  PUBLIC TELEPHONE	S-22  PETROL BUNK	S-23  HOSPITAL	<p>NOTE:</p> <ol style="list-style-type: none"> 1. DETAILS OF ROAD SIGNS ARE AS PER IRC: 67-2001. 2. DETAIL OF STATEROUTE MARKER SIGN IS AS PER IRC: 31-1969. 3. ALL MANDATORY AND CAUTIONARY SIGNS SHOULD BE HIGH INTENSITY WIDE ANGLE MICRO PRISMATIC SHEETING CONFORMING TO CL-801 OF TECH. SPECIFICATION 4. ALL INFORMATORY SIGNS SHOULD CONFIRM TO STANDARDS OF HIGH INTENSITY ENCAPSULATED TYPE RETRO REFLECTIVE SHEETING AS PER CL. 801 OF TECH. SPECIFICATION 		
S-25  DISPENSARY	S-26  EATING PLACE	<p>LEGEND</p> <ul style="list-style-type: none"> WHITE SHEET BLACK SHEET RED SHEET BLUE SHEET 			

Client:  Bihar State Road Development Corporation Ltd.	SCALE: NTS	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants:  Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title: TYPICAL ROAD SIGNS.	DRAWING NO.: RHDHV/64081/DDPR/RS/02 DATE: APRIL 2017 DESIGNED: R. Singh DRAWN: J.P. Dolhat CHECKED: R. Singh APPROVED: S. Pathuri	RO SHEET: 02 OF 03
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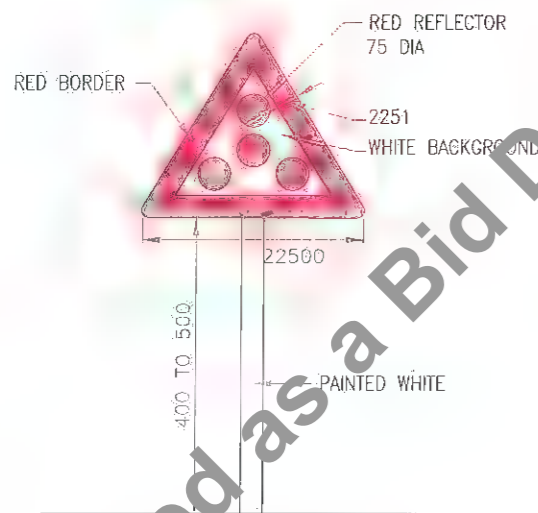
Not to be used as a Bid Document, Only for Reference



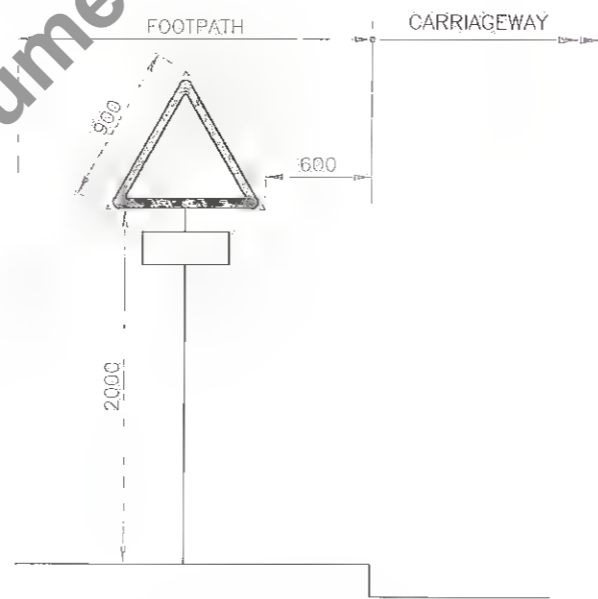
DETAIL OF TYPICAL POST



MINIMUM CLEARANCE OF SIGNS IN UNKERBED SECTIONS



CLUSTER OF RED REFLECTORS TA 1



MINIMUM CLEARANCE OF SIGNS IN KERBED SECTIONS

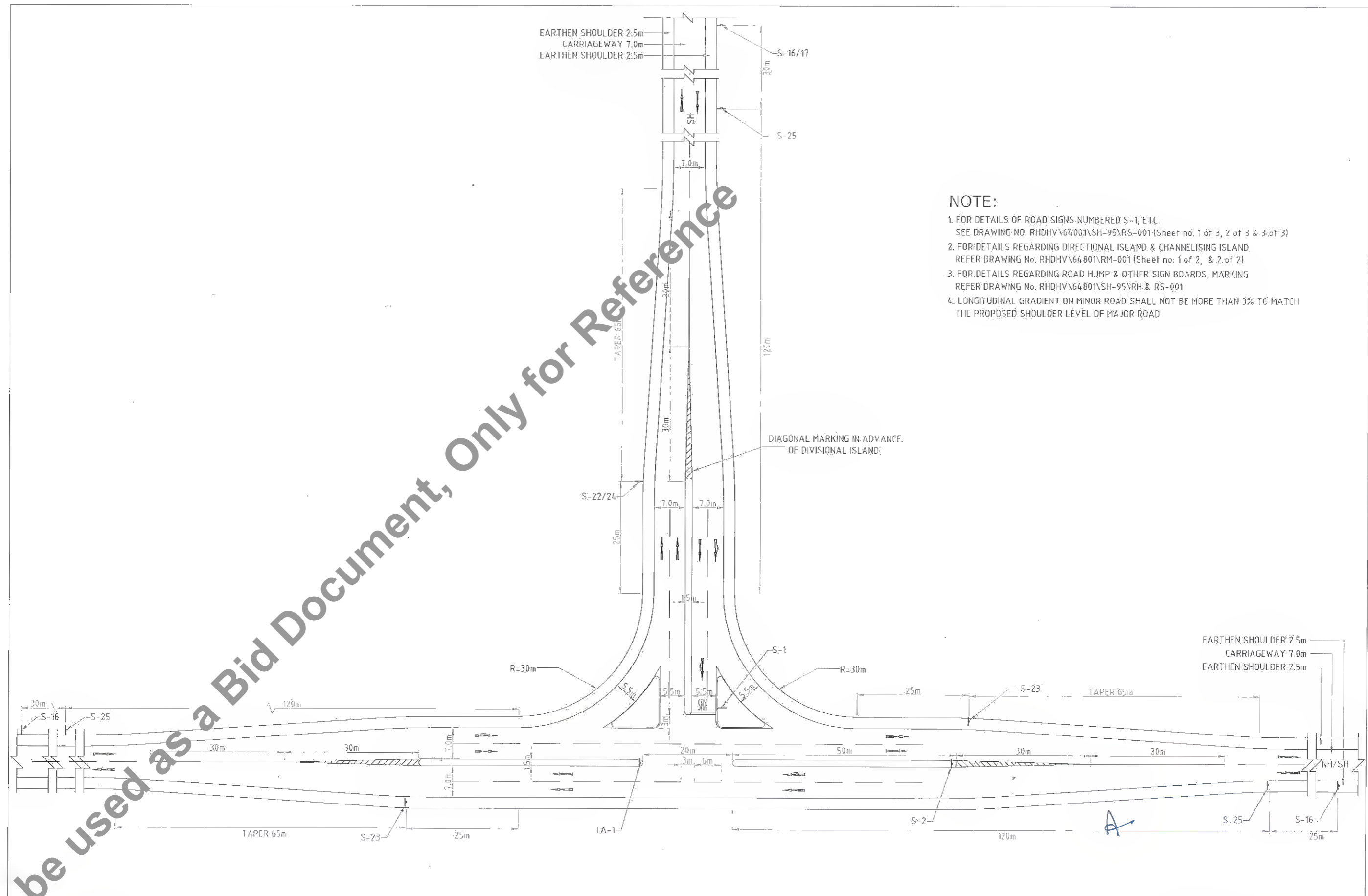


NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS INDICATED OTHERWISE.
2. ROAD SIGNS, SIZES OF ARROWS, LETTERS & NUMERALS IS AS PER IRC:67-2001.
3. ALL ROAD SIGNS ARE NORMALLY BE PLACED AT RIGHT ANGLES TO THE LINE OF TRAVEL OF THE APPROACHING TRAFFIC.
4. ALL WARNING SIGNS ARE NORMALLY BE LOCATED AT 120m IN ADVANCE OF THE HAZARD WARNED AGAINST IN NON-URBAN LOCATIONS. IN URBAN LOCATIONS, THE WARNING SIGNS ARE LOCATED AT ABOUT 50m AWAY FROM THE POINT OF HAZARD.
5. ALL ROAD SIGNS ARE RETRO-REFLECTIVE SHEET OF HIGH INTENSITY GRADE WITH ENCAPSULATED LENSE FIXED OVER ALUMINIUM SHEET AS PER MORT&H SPECIFICATIONS.
6. ROUTE MARKER SIGN FOR NH IS AS PER IRC :2-1968.
7. SIGNS WITH AN AREA UPTO 0.9sq. m. SHALL BE MOUNTED ON A SINGLE POST, AND FOR GREATER AREA TWO OR MORE SUPPORTS SHALL BE PROVIDED.
8. POST ANGLS USED TO SUPPORT THE SIGN BOARD SHALL BE PAINTED WITH (2-COATS) APPROVED QUALITY (ANTI-CORROSIVE) ENAMEL PAINT OVER TWO COATS OF GOOD QUALITY PRIMER


A

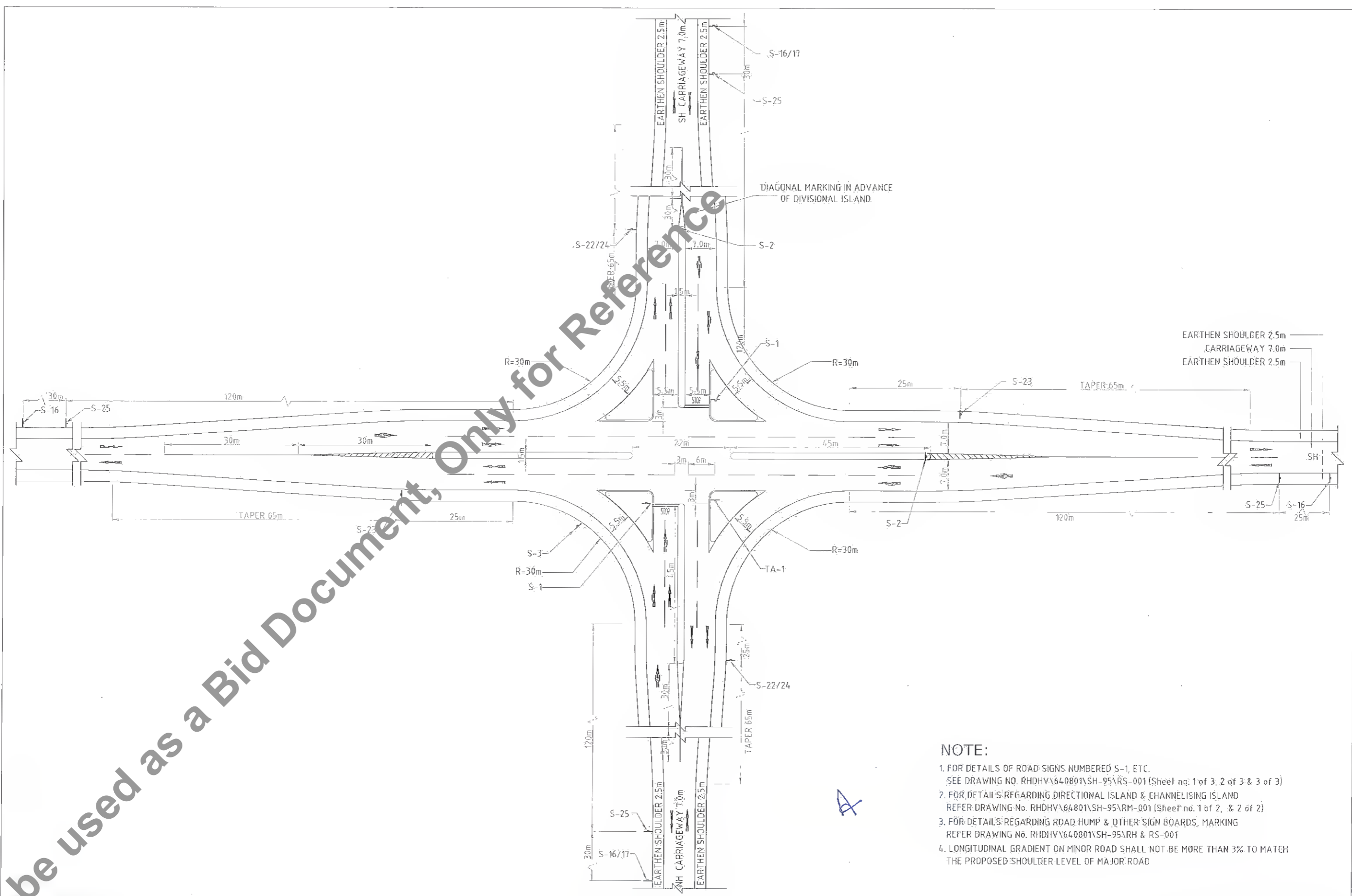
Client : Bihar State Road Development Corporation Ltd.	SCALE : NTS	Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants : Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title : TYPICAL ROAD SIGNS	DRAWING NO : RHDHV/64081/DDPR/RS/01 DATE : APRIL, 2017 DESIGNED : R Singh DRAWN : J P Dobhal CHECKED : R Singh APPROVED : S Pathari	RD REV DATE DESCRIPTION OF REVISIONS	SHEET: 03 OF 03
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NOTE:

1. FOR DETAILS OF ROAD SIGNS NUMBERED S-1, ETC. SEE DRAWING NO. RHDHV\64001\SH-95\RS-001 (Sheet no. 1 of 3, 2 of 3 & 3 of 3)
2. FOR DETAILS REGARDING DIRECTIONAL ISLAND & CHANNELISING ISLAND REFER DRAWING No. RHDHV\64801\RM-001 (Sheet no. 1 of 2, & 2 of 2)
3. FOR DETAILS REGARDING ROAD HUMP & OTHER SIGN BOARDS, MARKING REFER DRAWING No. RHDHV\64801\SH-95\RH & RS-001
4. LONGITUDINAL GRADIENT ON MINOR ROAD SHALL NOT BE MORE THAN 3% TO MATCH THE PROPOSED SHOULDER LEVEL OF MAJOR ROAD

Client:  Bihar State Road Development Corporation Ltd.	SCALE: N.T.S.	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants:  HaskoningDHV Nederland B.V.	Title: TYPICAL 4-LEGGED INTERSECTION WITH SINGLE LANE BT ROAD	DRAWING NO.: RHDHV/64081/DDPR/N/01	RO	
					DATE: APRIL 2017	SHEET: 6 OF 15	
REV. DATE DESCRIPTION OF REVISIONS				DESIGNED: R Singh	DRAWN: J P Dubial	CHECKED: R Singh	APPROVED: S Pathari

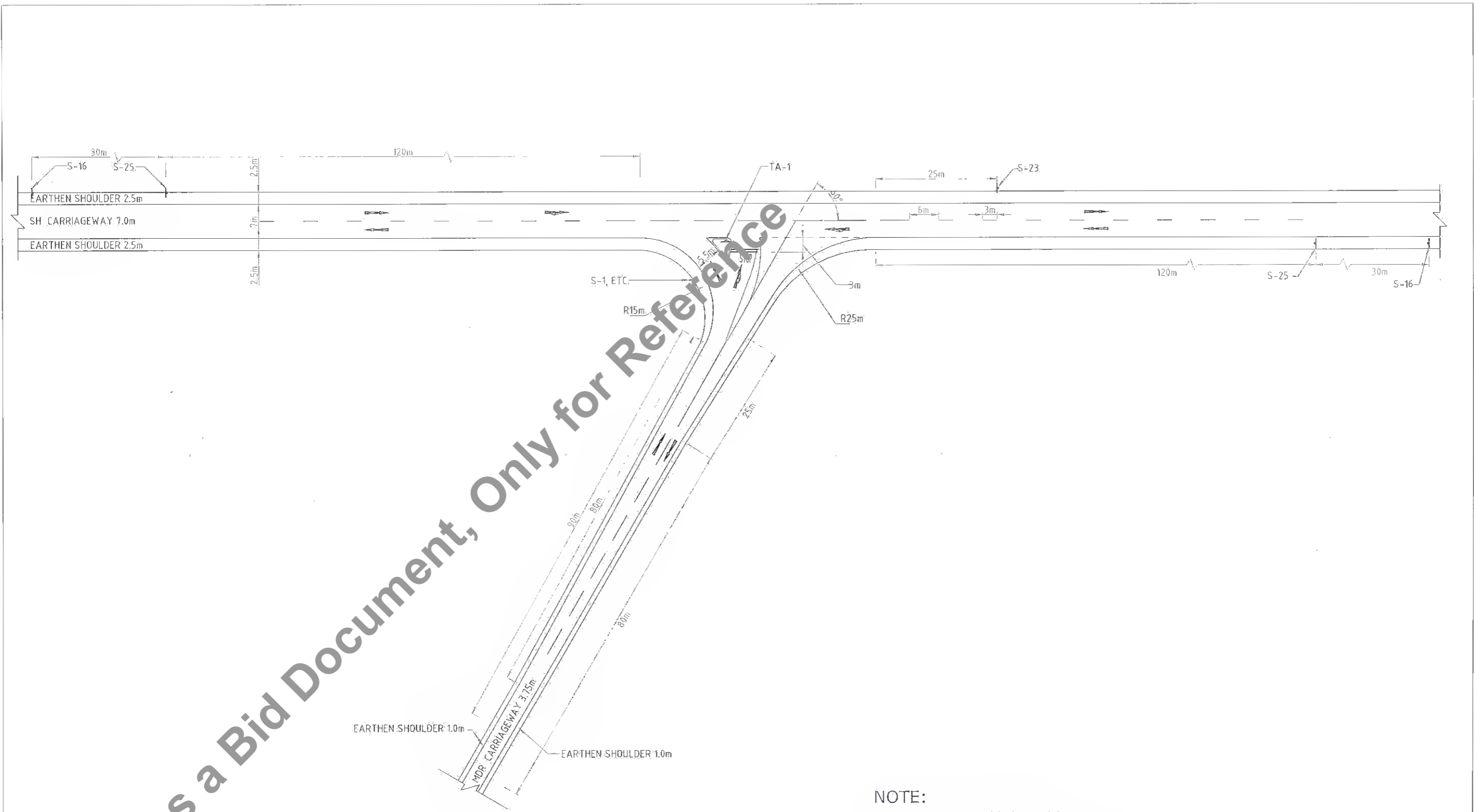


NOTE:

1. FOR DETAILS OF ROAD SIGNS NUMBERED S-1, ETC. SEE DRAWING NO. RHDHV\640801\SH-95\RS-001 (Sheet no. 1 of 3, 2 of 3 & 3 of 3)
2. FOR DETAILS REGARDING DIRECTIONAL ISLAND & CHANNELISING ISLAND REFER DRAWING No. RHDHV\640801\SH-95\RM-001 (Sheet no. 1 of 2, & 2 of 2)
3. FOR DETAILS REGARDING ROAD HUMP & OTHER SIGN BOARDS, MARKING REFER DRAWING No. RHDHV\640801\SH-95\RH & RS-001
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Client:  Bihar State Road Development Corporation Ltd.	SCALE: NTS	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants:  HaskoningDHV Nederland B.V.	<table border="1"> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION OF REVISIONS</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REV	DATE	DESCRIPTION OF REVISIONS							Title: TYPICAL 4-LEGGED INTERSECTION WITH SINGLE LANE BT ROAD	<table border="1"> <tr> <td colspan="2">DRAWING NO.: RHDHV/64081/DDPR/IN/01</td> <td colspan="2">RO</td> </tr> <tr> <td colspan="2">DATE: APRIL 2017</td> <td colspan="2">SHEET: 2 of 6</td> </tr> <tr> <td>DESIGNED</td> <td>DRAWN</td> <td>CHECKED</td> <td>APPROVED</td> </tr> <tr> <td><i>R Singh</i></td> <td><i>J P Dobhal</i></td> <td><i>R Singh</i></td> <td><i>S. Patiluri</i></td> </tr> <tr> <td>R Singh</td> <td>J P Dobhal</td> <td>R Singh</td> <td>S. Patiluri</td> </tr> </table>	DRAWING NO.: RHDHV/64081/DDPR/IN/01		RO		DATE: APRIL 2017		SHEET: 2 of 6		DESIGNED	DRAWN	CHECKED	APPROVED	<i>R Singh</i>	<i>J P Dobhal</i>	<i>R Singh</i>	<i>S. Patiluri</i>	R Singh	J P Dobhal	R Singh	S. Patiluri
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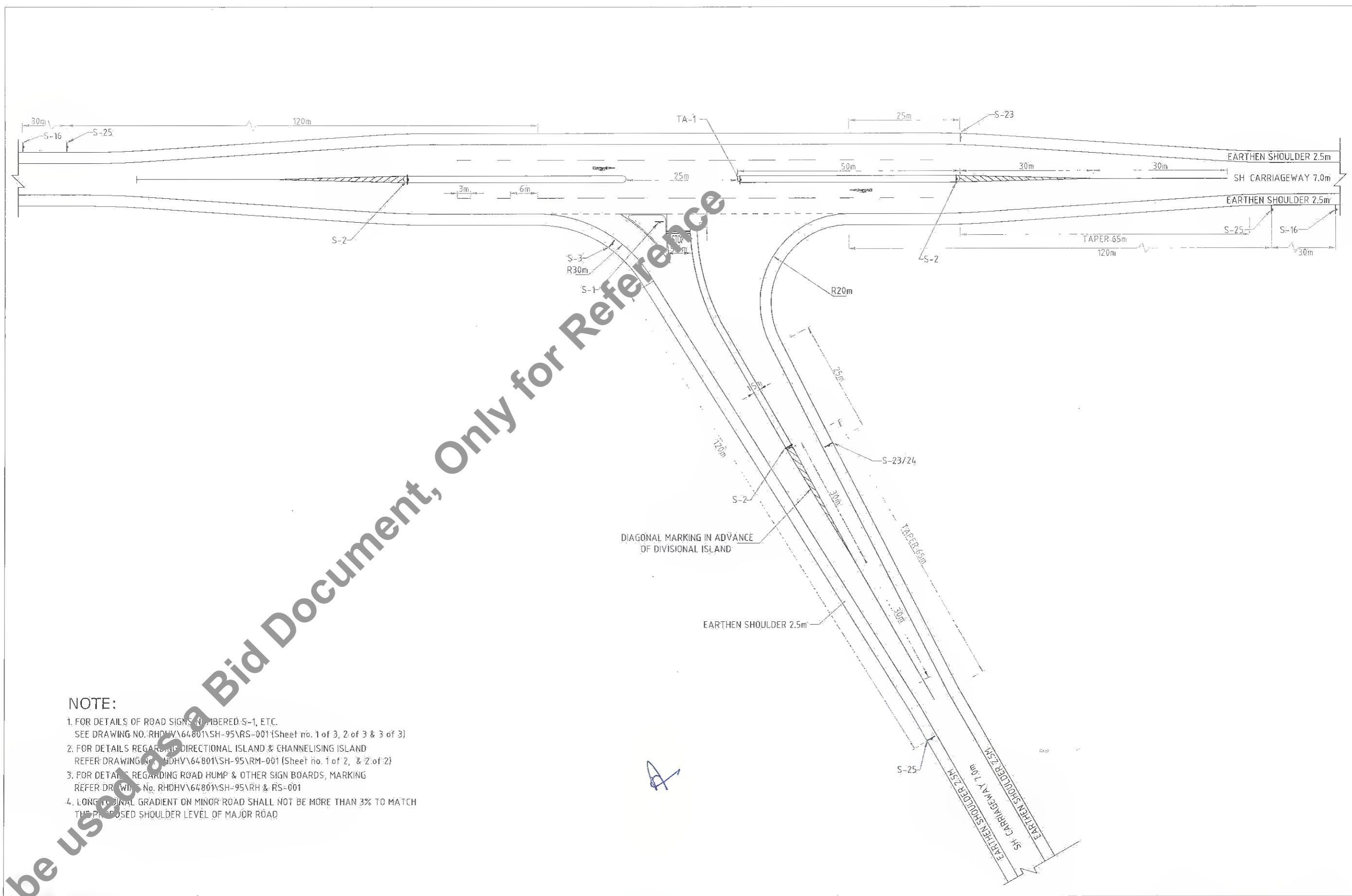


NOTE:

1. FOR DETAILS OF ROAD SIGNS NUMBERED S-1, ETC. SEE DRAWING NO. RHDHV\64801\SH-95\RS-001 (Sheet no. 1 of 3, 2 of 3 & 3 of 3)
2. FOR DETAILS REGARDING DIRECTIONAL ISLAND & CHANNELISING ISLAND REFER DRAWING No. RHDHV\64801\SH-95\RM-001 (Sheet no. 1 of 2, & 2 of 2)
3. FOR DETAILS REGARDING ROAD HUMP & OTHER SIGN BOARDS, MARKING REFER DRAWING No. RHDHV\64801\SH-95\Manasi (NH-31)-Saharsa-Hardi Chaughara\RH & RS-001
4. LONGITUDINAL GRADIENT ON MINOR ROAD SHALL NOT BE MORE THAN 3% TO MATCH THE PROPOSED SHOULDER LEVEL OF MAJOR ROAD

Client: Bihar State Road Development Corporation Ltd.	SCALE: NTS	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title: TYPICAL 4-LEGGED INTERSECTION WITH SINGLE LANE BT ROAD		DRAWING NO. RHDHV/64081/DDPR/JN/01		SHEETS: 01 of 01	
				DATE: APRIL 2017		DESIGNED: R Singh	DRAWN: J P Dobhal	CHECKED BY: R Singh	APPROVED: S Pathari
REV				NO	DATE	DESCRIPTION OF REVISIONS			

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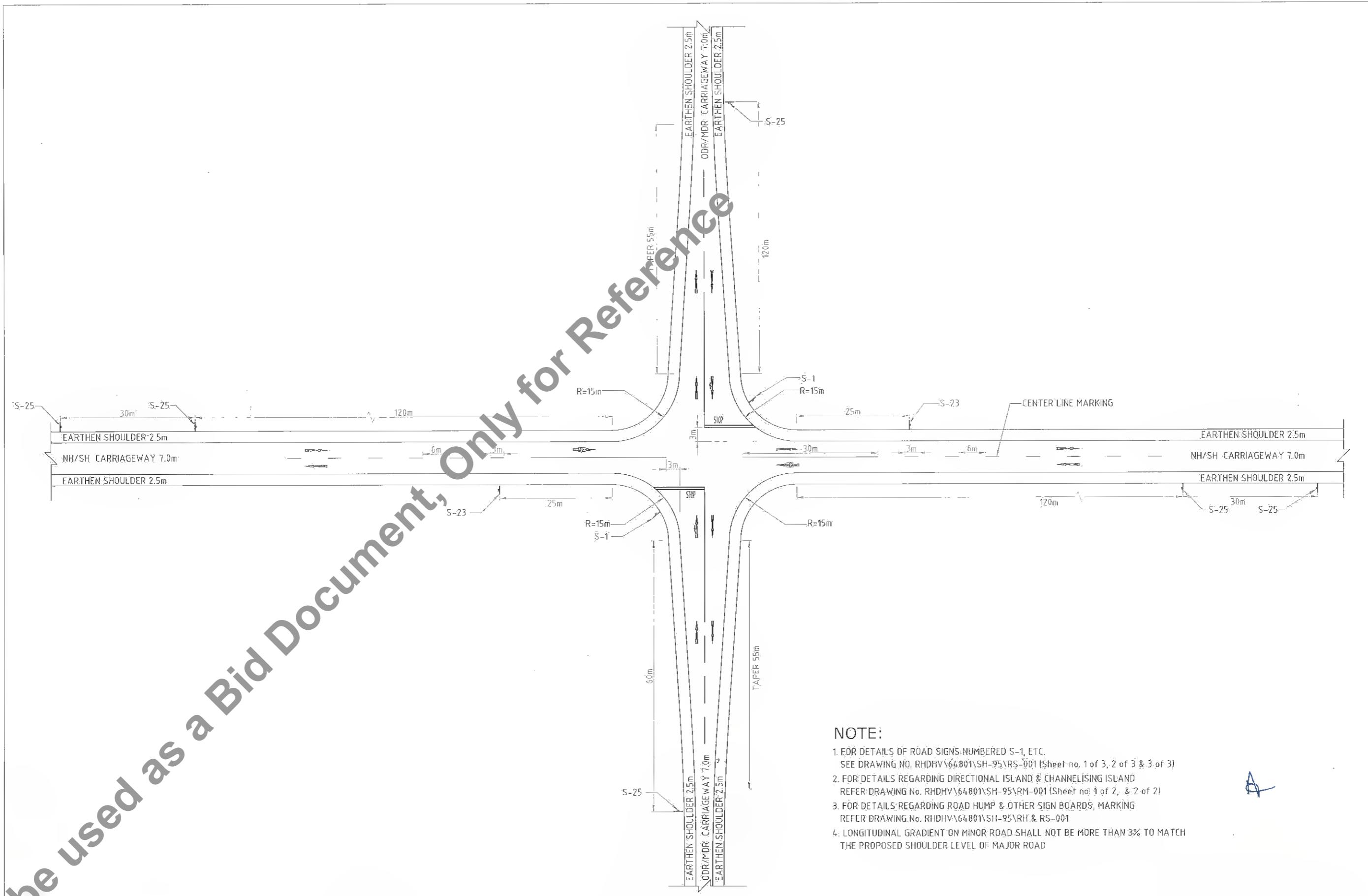


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Client Bihar State Road Development Corporation Ltd.	SCALE NTS	Project Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants Royal HaskoningDHV HaskoningDHV Nederland B.V.	Title TYPICAL 4-LEGGED INTERSECTION WITH SINGLE LANE BT ROAD		DRAWING No. : RHDHV/64801/DDPR/IN/01	RS						
				DATE : APRIL 2017	SHEET: 4 of 4	DESIGNED R Singh	DRAWN J P Dohal	CHECKED R Singh	APPROVED S Parburi				
<table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION OF REVISIONS</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>				REV	DATE	DESCRIPTION OF REVISIONS							
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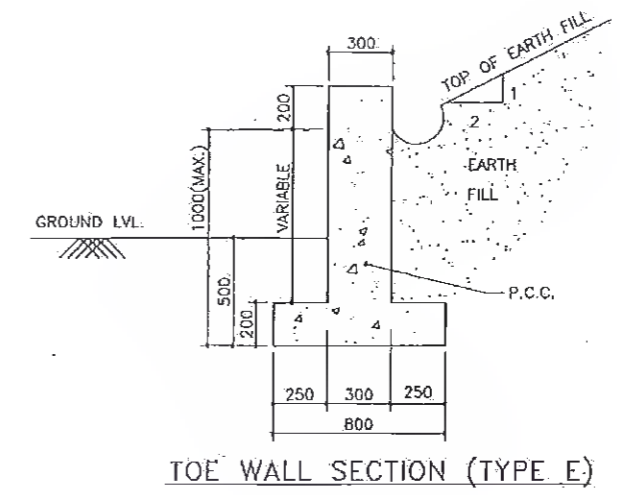
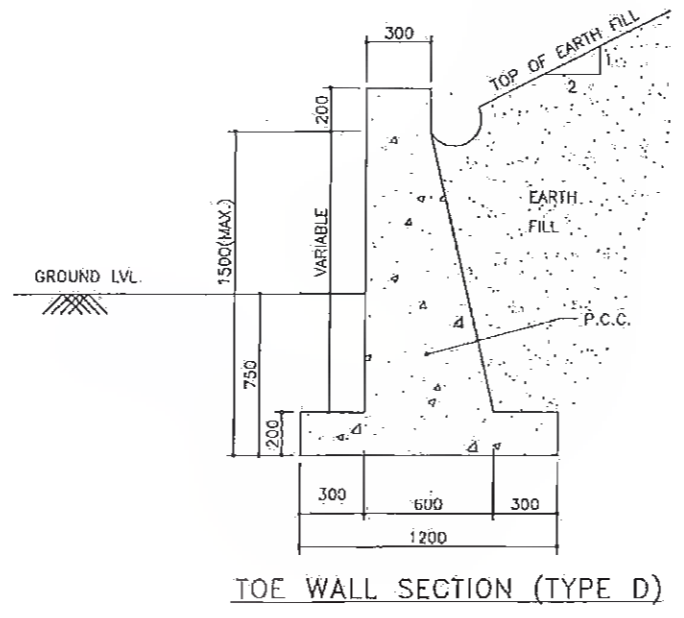
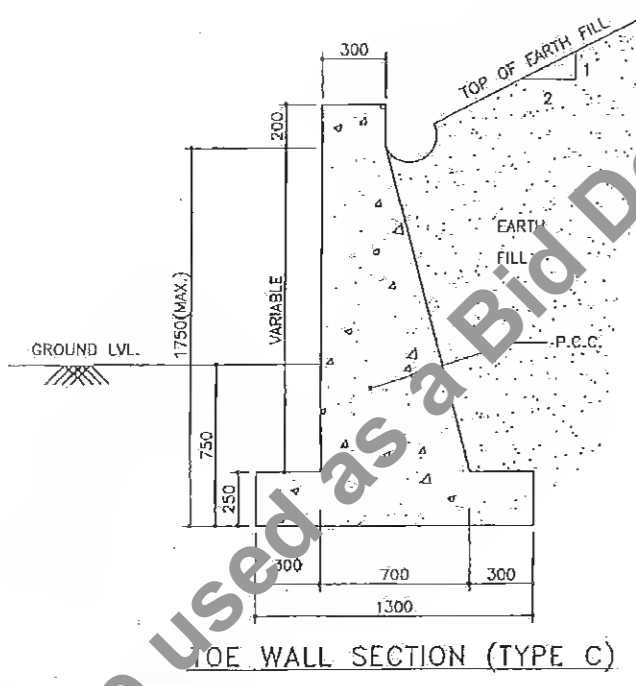
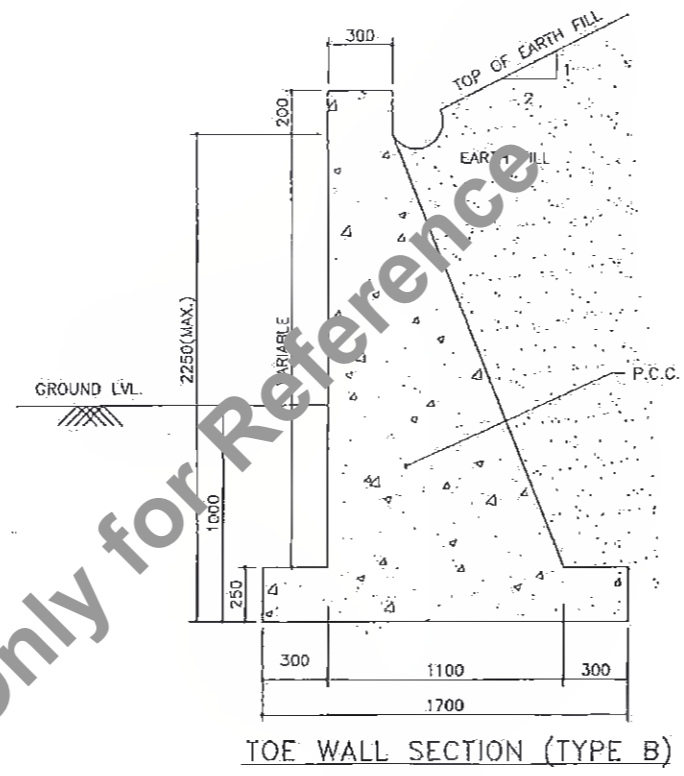
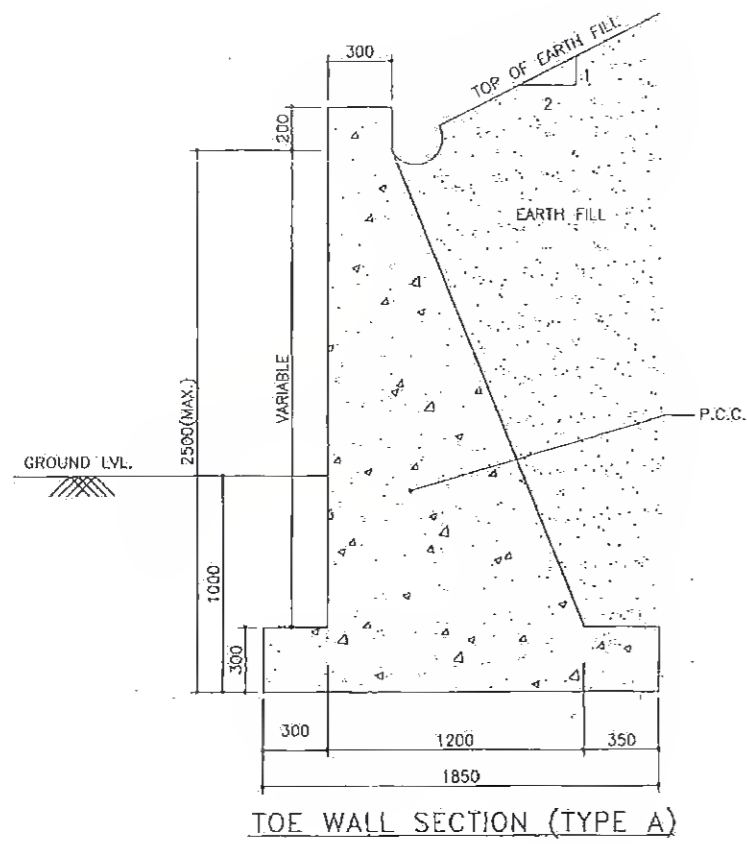
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Client Bihar State Road Development Corporation Ltd.	SCALE NTS.	Project: Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants: HaskoningDHV Nederland B.V.	Title: TYPICAL 4-LEGGED INTERSECTION WITH SINGLE LANE BT ROAD			DRAWING NO.: RHDHV/64081/DDPR/JN/01 DATE: APRIL, 2017 SHEET: 45 of 45	
				R0 REV DATE DESCRIPTION OF REVISIONS	DESIGNED R Singh	DRAWN J P Dohal	CHECKED R Singh	APPROVED S Palluri



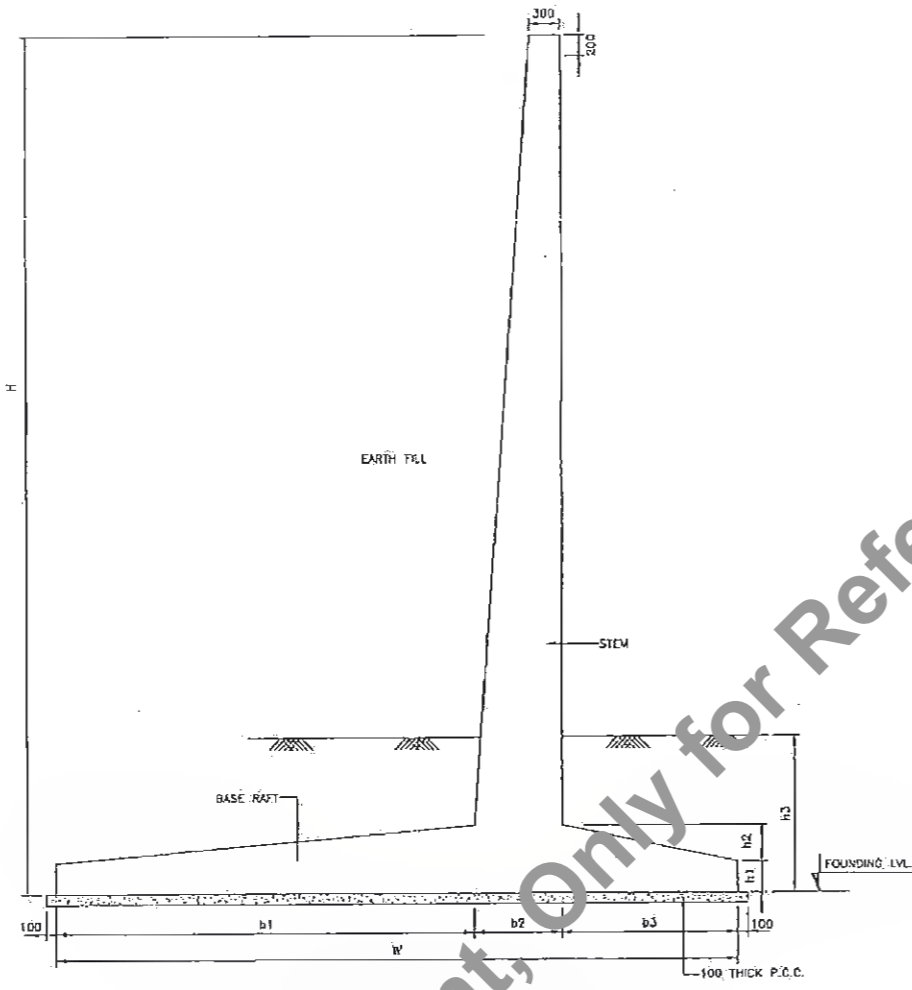
NOTES

1. ALL DIMENSIONS ARE IN mm.
2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DO NOT SCALE THE DIMENSIONS.
3. GRADE OF CONC. FOR P.C.C. WORKS ---- M-15.
4. SKIN REINFORCEMENT 8 @ 150 c/c BOTHWAYS IS PROVIDED ON ALL FACES OF P.C.C. MEMBERS.

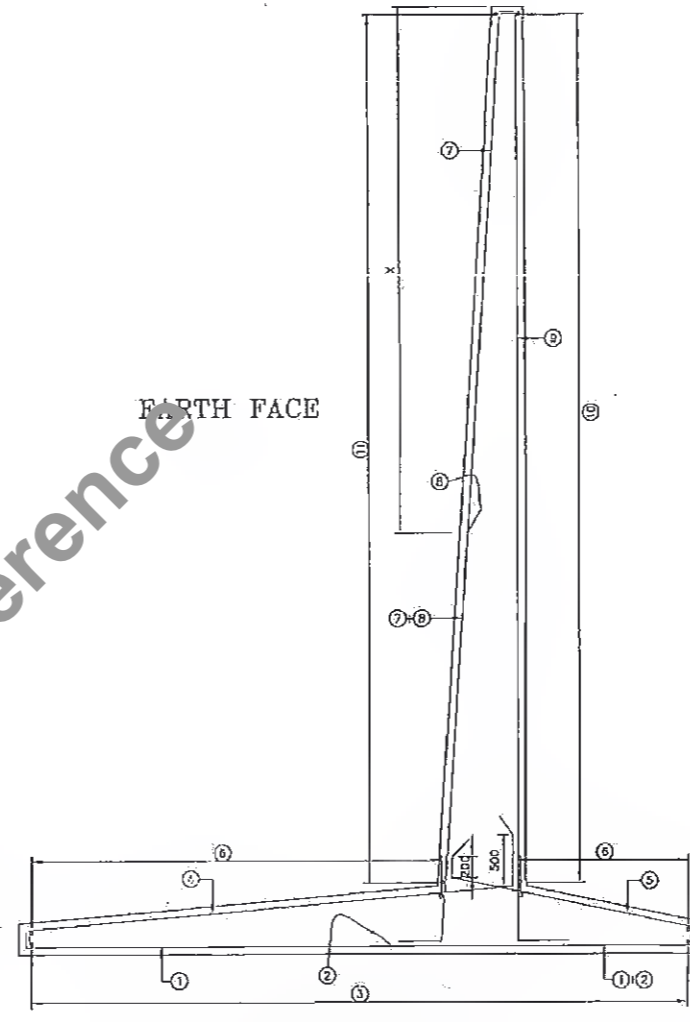
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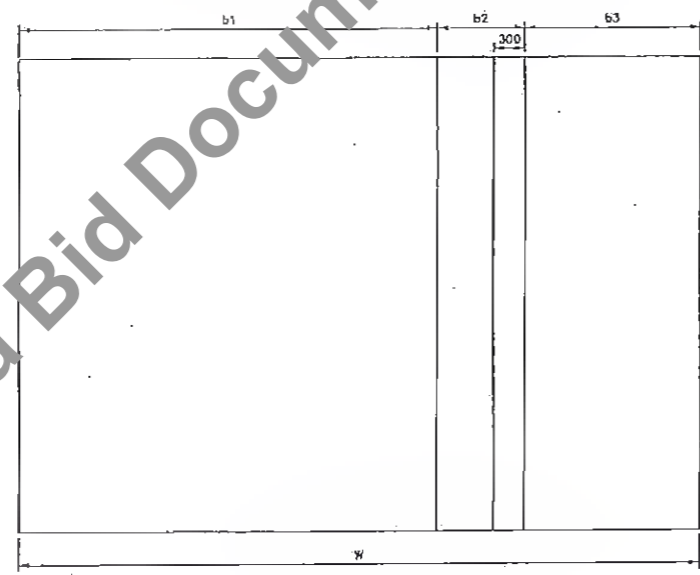
<p>Client : Bihar State Road Development Corporation Ltd.</p>	<p>SCALE NTS</p>	<p>Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V</p>	<p>Design Consultants : Royal HaskoningDHV HaskoningDHV Nederland B.V.</p>	<p>Title : TOE WALL</p>	<p>DRAWING NO.: RHDHV/1260/Ram-Arm/TWR0 DATE: APRIL 2017 DESIGNED: R Singh DRAWN: J P Dohal CHECKED: R Singh APPROVED: S Pathuri</p>									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO</th> <th>DATE</th> <th>DESCRIPTION OF REVISIONS</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>				NO	DATE	DESCRIPTION OF REVISIONS							<p>REV: 24 April 2017 Pls. & Prate</p>	
NO	DATE	DESCRIPTION OF REVISIONS												



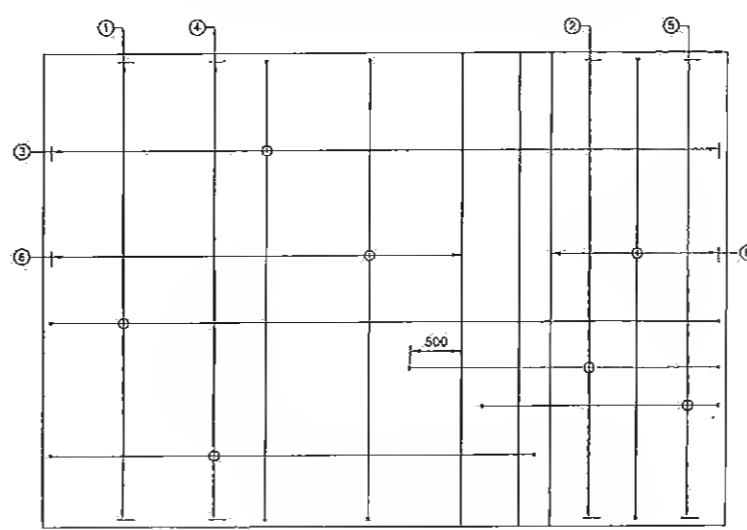
CROSS SECTION OF RETAINING WALL
(SHOWING DIMENSION)
(SCALE 1:50)



CROSS SECTION OF RETAINING WALL
(SHOWING REINFORCEMENT)
(SCALE 1:50)



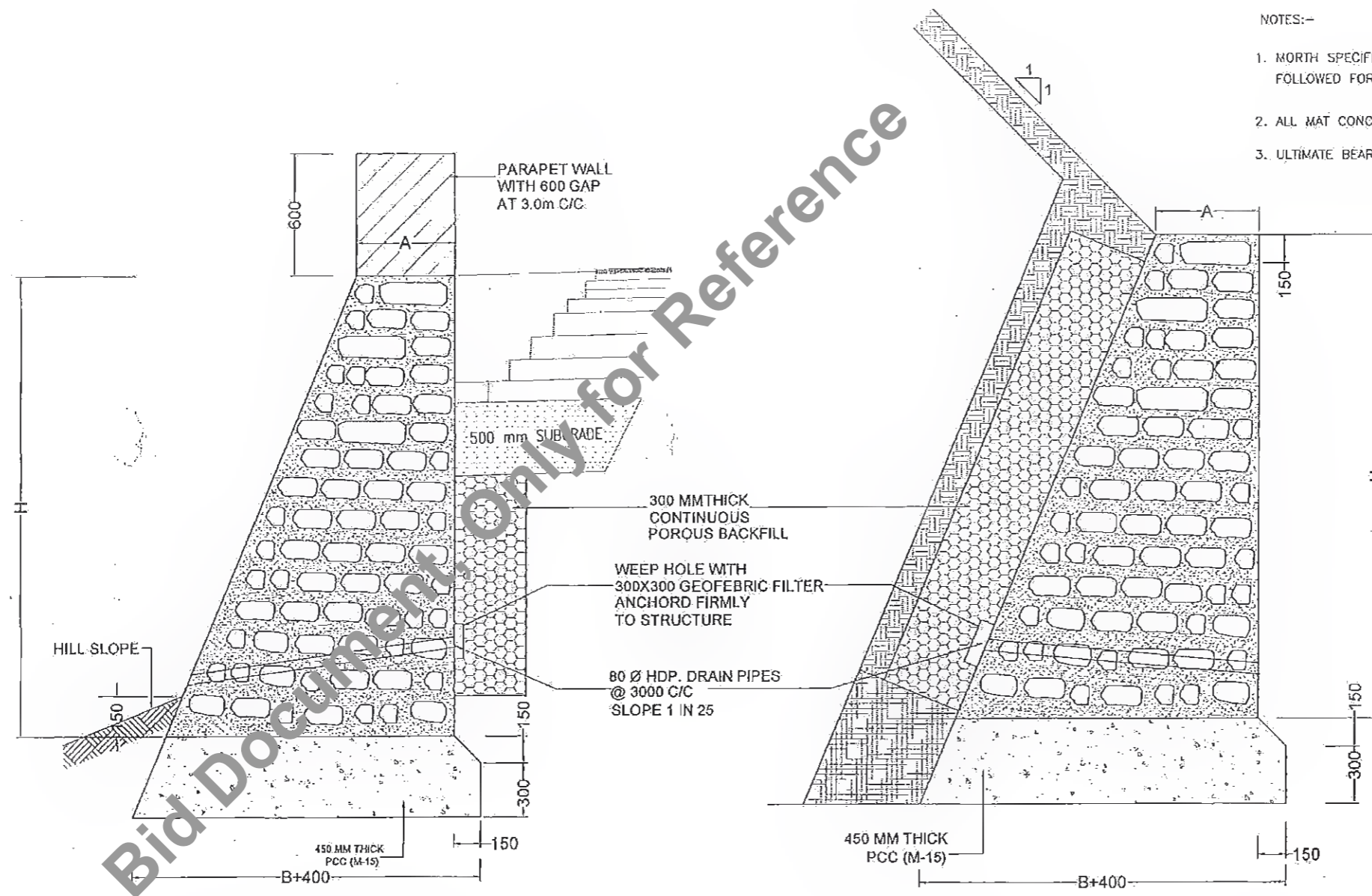
PLAN OF FOOTING
(SHOWING DIMENSION)
(SCALE 1:50)



PLAN OF FOOTING
(SHOWING REINFORCEMENT)
(SCALE 1:50)

A

<p>Client : Bihar State Road Development Corporation Ltd.</p>	<p>SCALE NTS</p>	<p>Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi Chaughara section of SH-95 in the State of Bihar, Package V</p>	<p>Design Consultants : Royal HaskoningDHV HaskoningDHV Nederland B.V.</p>	<p>REV. DATE DESCRIPTION OF REVISIONS</p>	<p>Title : RETAINING WALL</p>	<p>DRAWING NO. : RHDHV/I260/Ram-Ahm/RE/R0 DATE : APRIL 2017 DESIGNED : R Singh DRAWN : J P Dohral CHECKED : R Singh APPROVED : S Pathuri</p>
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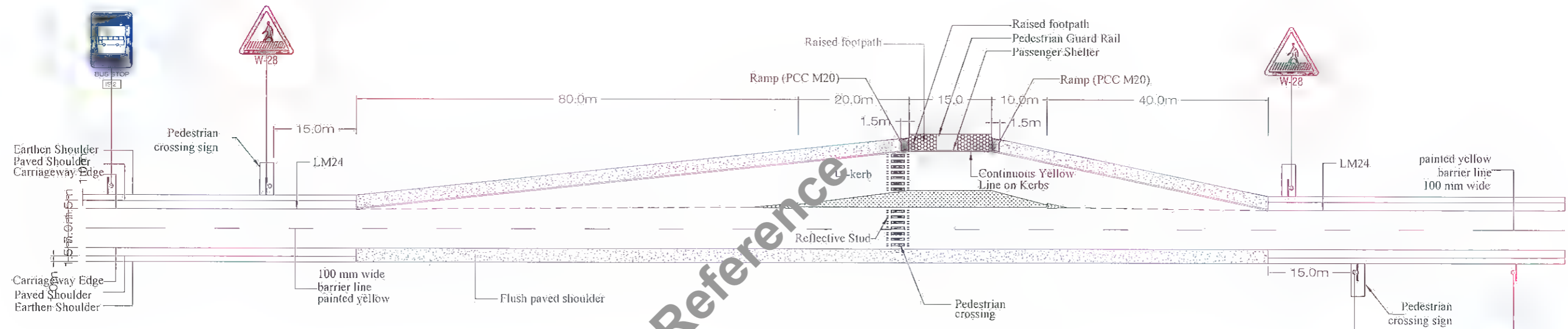
- NOTES:-
1. NORTH SPECIFICATIONS FOR ROAD AND BRIDGE WORKS TO BE FOLLOWED FOR CONSTRUCTION
 2. ALL MAT CONCRETE/LEVELLING COURSE : M15
 3. ULTIMATE BEARINGS CAPACITY OF SOIL 30t/Sqm.

DETAIL OF RETAINING WALL
RUBBLE MASONRY (1:3)

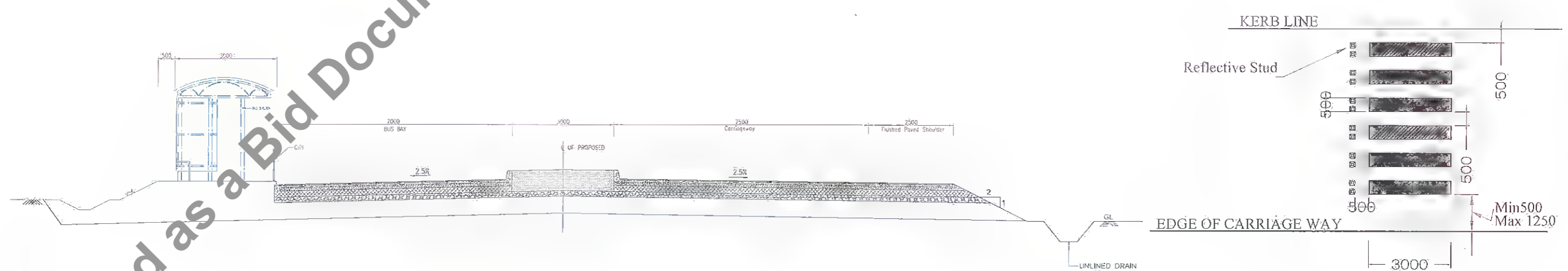
DETAIL OF RUBBLE MASONRY (1:3) BREAST WALL

DIMENSIONS		
"H" IN MM	"A" IN MM	"B" IN MM
900	450	541
1200	450	722
1500	450	900
1800	500	1081
2100	500	1259
2400	525	1441
2700	525	1622
3000	550	1800
3300	550	1981
3600	575	2159
3900	575	2341
4200	600	2522
4500	600	2700

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TYPICAL DRG. OF BUS STOP



TYPICAL CROSS SECTION

ZEBRA MARKING & STUD DETAILS SCALE 1:250

Client : Bihar State Road Development Corporation Ltd.	SCALE : NTS	Project : Consultancy Services for Preparation of Detailed Project Report for Manasi (NH-31)-Saharsa-Hardi'Chaughara section of SH-95 in the State of Bihar, Package V	Design Consultants : HaskoningDHV Nederland B.V.	Title : LAYOUT OF PICK-UP BUS-STOP	DRAWING NO. : RHDHV/64081/DDPR/BST/01 DATE : APRIL 2017 DESIGNED : R Singh DRAWN : J P Dobbie CHECKED : R Singh APPROVED : S. Palitani	SHEET : 1 of 1 R0
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