

TENDER NO: WAP/NK/JHK/RMC-PKG-1/BALANCE/2026

TENDER DOCUMENT

FOR

**Lining, Repair and Construction of Balance Works of Right Main Canal
& its Structures of Package-1 (RD 0 to 17.16 km) under North Koel
Reservoir Project, Jharkhand**

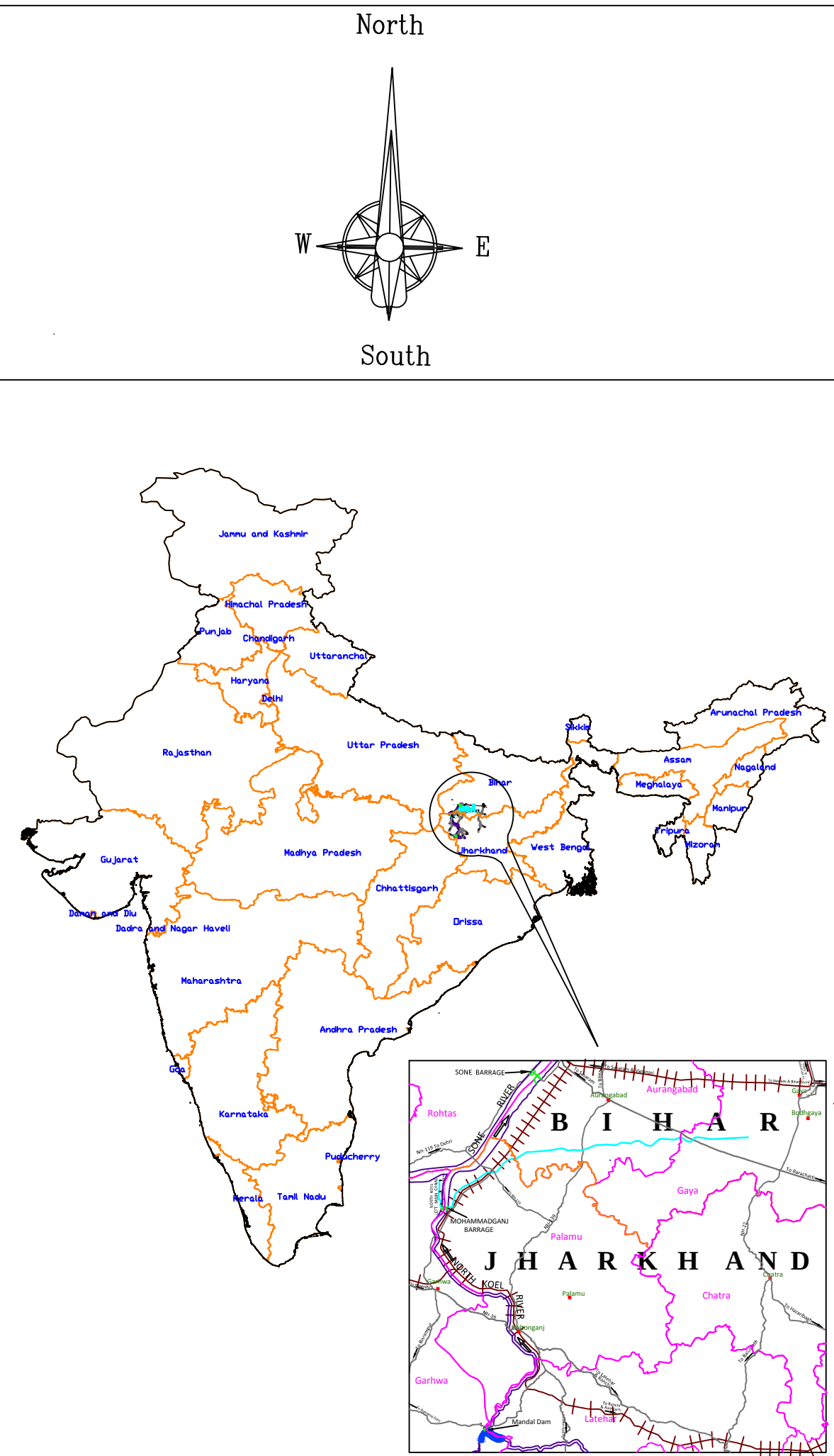
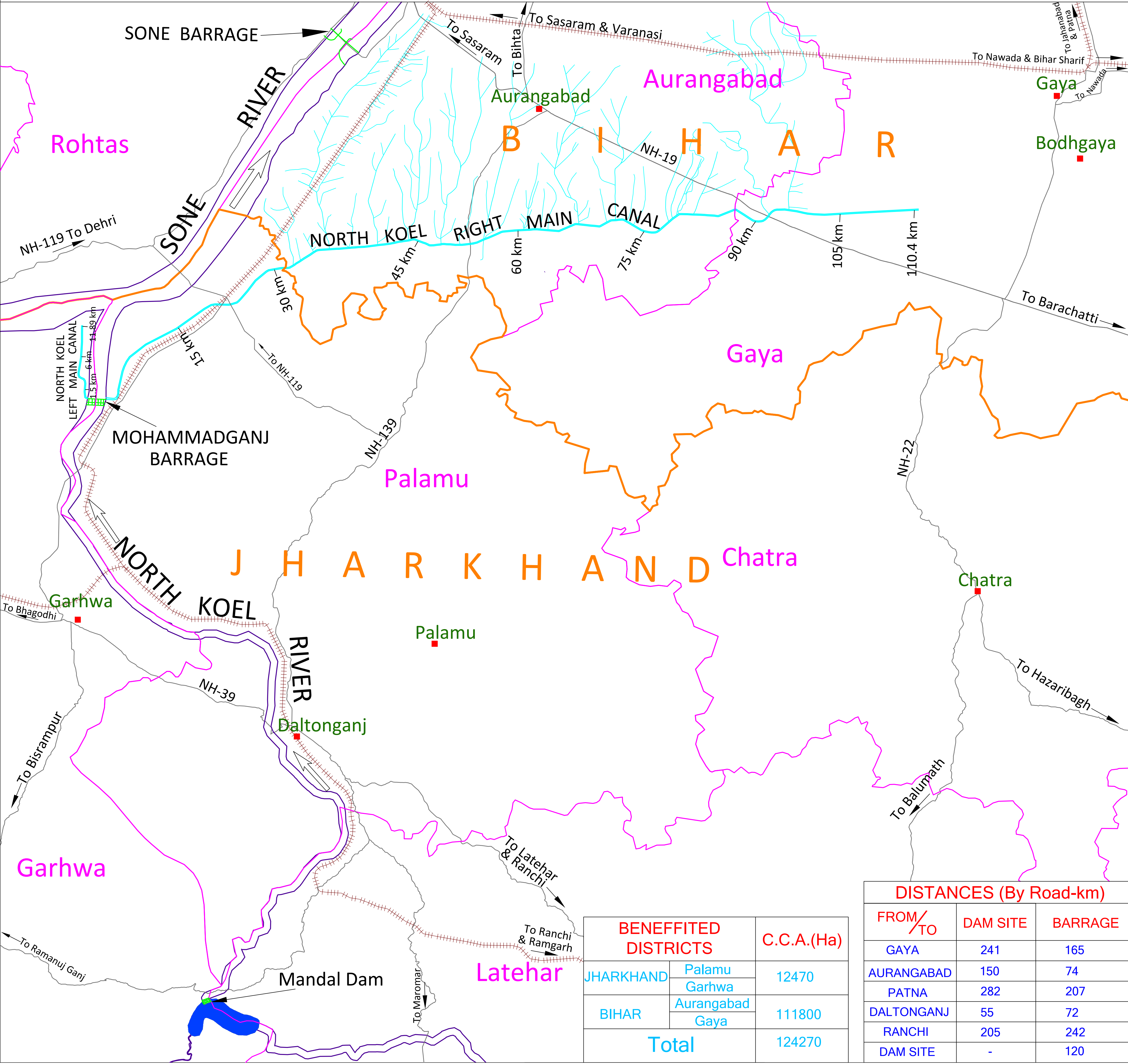
Estimated Cost (Rs. 50.40 Crores)

TENDER NO: WAP/NK/JHK/RMC-PKG-1/BALANCE/2026

TENDER DRAWINGS



INDEX MAP OF NORTH KOEL RESERVOIR PROJECT, JHARKHAND & BIHAR



LEGEND

	Road
	Railway
	Dam/Barrage
	Important Cities/Towns
	State Boundary
	District Boundary
	River
	Canal

Implementing Agency :-



वाष्कोस लिमिटेड
WAPCOS LIMITED
(भारत सरकार का उद्यम - जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय)
(A Government of India Undertaking - Ministry of Water Resources, River Development & Ganga Rejuvenation)

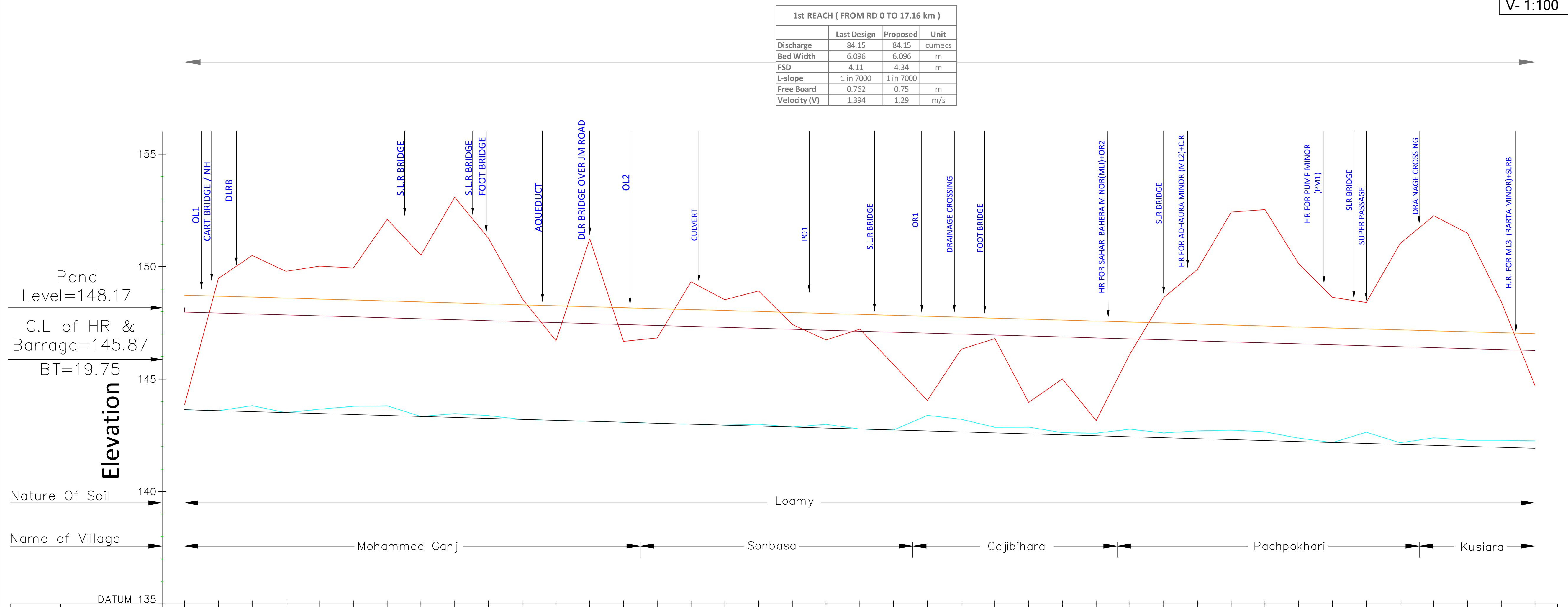
Project Title :-	NORTH KOEL RESERVOIR PROJECT, BIHAR & JHARKHAND	
Drawing Title :-	INDEX MAP	
Drawing No :-	WAP/INFRA/NORTH KOEL/RMC-01	

Drawn By :-	Checked By :-	Approved By :-
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BENEFFITED DISTRICTS		C.C.A.(Ha)
JHARKHAND	Palamu	12470
	Garhwa	
BIHAR	Aurangabad	111800
	Gaya	
Total		124270

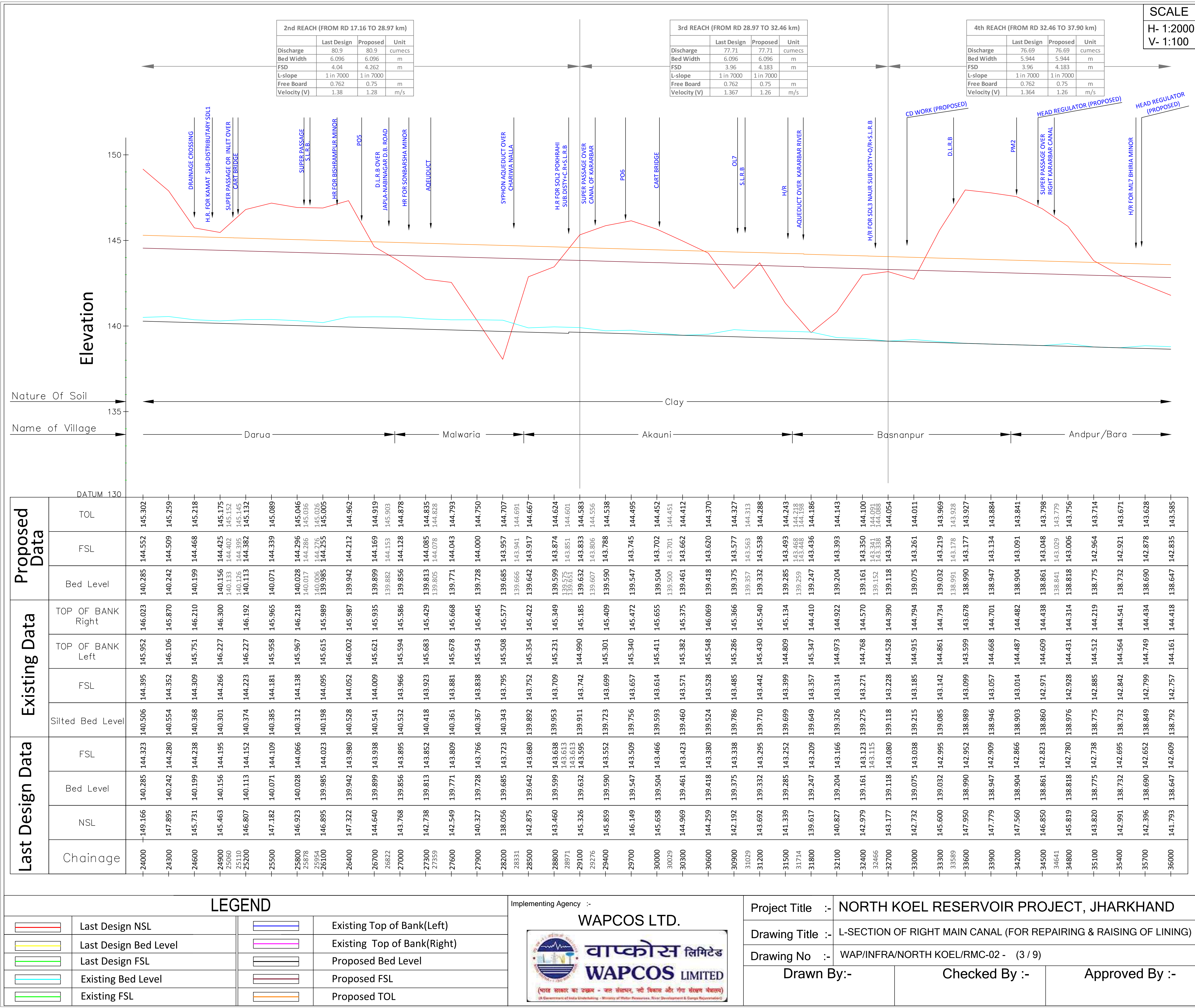
DISTANCES (By Road-km)		
FROM/TO	DAM SITE	BARRAGE
GAYA	241	165
AURANGABAD	150	74
PATNA	282	207
DALTONGANJ	55	72
RANCHI	205	242
DAM SITE	-	120

SCALE
H- 1:2000
V- 1:100

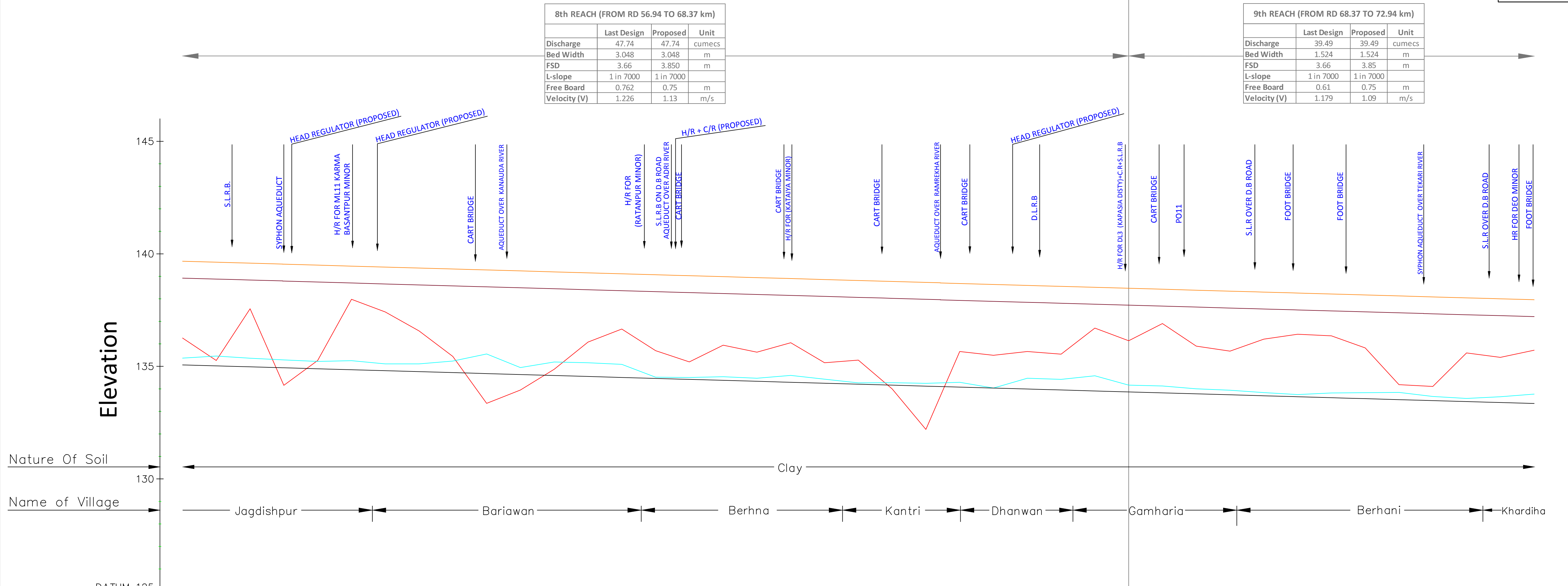


Last Design Data				Existing Data				Proposed Data			
Chainage	NSL	Bed Level	FSL	Silted Bed Level	FSL	TOP OF BANK Left	TOP OF BANK Right	Bed Level	FSL	TOL	
-0000 0155	143.866	143.637	147.752	143.640	147.750	148.300	148.500	143.637 143.615	147.979 147.957	148.729 148.707	
-0300	149.474	143.594	147.709	143.594	147.704	148.328	148.515	143.594	147.936	148.686	
-0600	150.495	143.551	147.666	143.821	147.661	148.155	148.326	143.551	147.893	148.643	
-0900	149.791	143.508	147.623	143.508	147.618	148.350	147.678	143.508	147.850	148.600	
-1200	150.020	143.466	147.580	143.666	147.576	149.011	149.804	143.466	147.808	148.558	
-1433								143.432	147.775	148.525	
-1500	149.940	143.423	147.538	143.789	147.533	148.336	147.843	143.423	147.766	148.516	
-1800	152.101	143.379	147.495	143.817	147.490	148.921	148.229	143.379	147.722	148.472	
-1807								143.379	147.722	148.472	
-2100	150.513	143.337	147.452	143.337	147.581	47.3321	149.682	143.337	147.680	148.430	
-2400	153.083	143.294	147.409	143.469	147.404	47.7141	147.824	143.294	147.637	148.387	
-2560								143.271	147.615	148.365	
-2682								143.234	147.597	148.347	
-2700	151.257	143.254	147.366	143.374	147.361	148.465	148.317	143.254	147.597	148.347	
-3000	148.578	143.208	147.323	143.208	147.318	147.773	148.227	143.208	147.552	148.302	
-3179								143.183	147.527	148.277	
-3300	146.703	143.166	147.280	143.166	147.276	147.834	148.295	143.166	147.510	148.260	
-3597								143.123	147.468	148.218	
-3600	151.233	143.123	147.238	143.123	147.233	148.043	148.777	143.123	147.468	148.218	
-3900	146.676	143.080	147.195	143.080	147.190	146.435	148.104	143.080	147.424	148.174	
-4200	146.828	143.037	147.152	143.037	147.147	148.742	148.258	143.037	147.382	148.132	
-4500	149.325	142.994	147.109	142.994	147.104	148.779	148.114	142.994	147.339	148.089	
-4570								142.984	147.330	148.080	
-4800	148.526	142.951	147.066	142.951	147.061	148.442	148.581	142.951	147.297	148.047	
-5100	148.916	142.908	147.023	142.997	147.018	148.556	147.744	142.908	147.255	148.005	
-5400	147.429	142.866	146.980	142.866	146.976	149.156	148.473	142.866	147.212	147.962	
-5700	146.740	142.823	146.938	142.990	146.933	148.074	147.878	142.823	147.169	147.919	
-6000	147.218	142.780	146.895	142.780	146.890	148.124	148.156	142.780	147.126	147.876	
-6126								142.762	147.110	147.860	
-6300	145.643	142.737	146.852	142.737	146.847	147.662	147.338	142.737	147.086	147.836	
-6600	144.048	142.694	146.809	143.387	146.804	147.357	147.387	142.694	147.043	147.793	
-6840								142.660	147.010	147.760	
-6900	146.325	142.651	146.766	143.215	146.761	147.604	147.462	142.651	147.009	147.759	
-7108								142.622	146.971	147.721	
-7200	146.798	142.608	146.723	142.858	146.718	147.253	147.739	142.608	146.958	147.708	
-7500	143.963	142.566	146.680	142.866	146.676	147.182	148.363	142.566	146.915	147.665	
-7800	145.009	142.523	146.638	142.618	146.633	147.102	147.529	142.523	146.872	147.622	
-8100	143.152	142.480	146.595	142.597	146.590	147.109	147.056	142.480	146.830	147.580	
-8400	146.106	142.437	146.552	142.776	146.547	146.882	147.077	142.437	146.787	147.537	
-8700	148.620	142.394	146.509	142.609	146.504	147.026	147.283	142.394	146.747	147.497	
-8702								142.394	146.747	147.497	
-8990	149.873	142.353	146.466	142.701	146.461	147.887	147.387	142.353	146.707	147.457	
-9000								142.353	146.696	147.446	
-9300	152.421	142.308	146.423	142.739	146.418	147.281	147.004	142.308	146.651	147.401	
-9600	152.534	142.266	146.380	142.658	146.376	147.250	147.213	142.266	146.608	147.358	
-9900	150.129	142.223	146.338	142.378	146.333	147.274	149.322	142.223	146.566	147.316	
-10200	148.633	142.180	146.295	142.180	146.518	146.898	146.743	142.180	146.523	147.273	
10394								142.152	146.496	147.246	
-10500	148.407	142.137	146.252	142.639	146.247	146.804	146.574	142.137	146.481	147.231	
								147.231		147.231	
-10800	151.013	142.094	146.209	142.172	146.204	147.099	147.089	142.094	146.438	147.188	
10970								142.070	146.415	147.165	
-11100	152.263	142.051	146.166	142.390	146.161	146.590	147.147	142.051	146.397	147.147	
-11400	151.486	142.008	146.123	142.288	146.118	146.779	146.931	142.008	146.354	147.104	
-11700	148.438	141.966	146.080	142.286	146.076	146.465	146.757	141.966	146.311	147.061	
-12000	144.704	141.923	146.038	142.254	146.033	146.648	146.650	141.923	146.268	147.018	

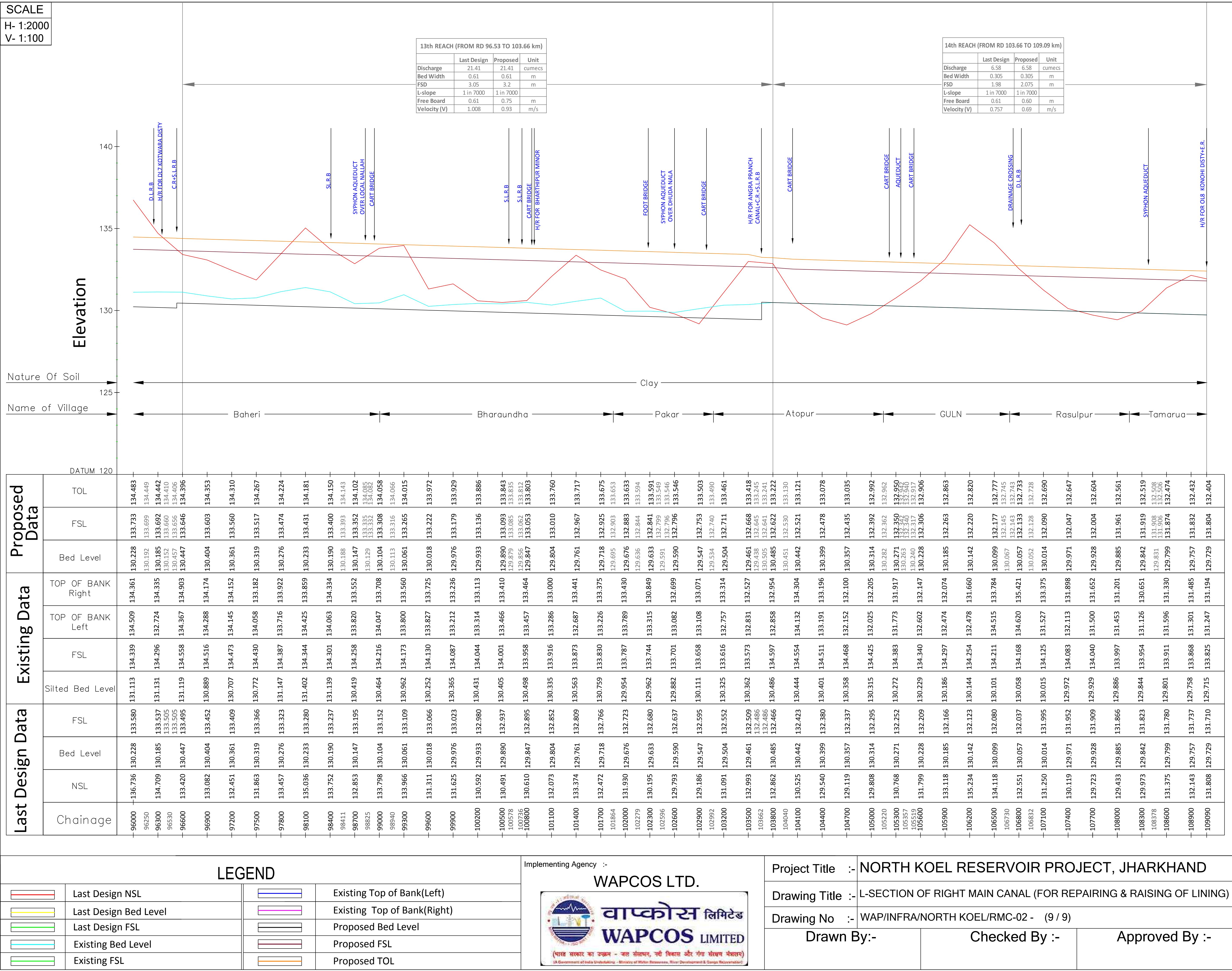
LEGEND				Implementing Agency :-	Project Title :-	NORTH KOEL RESERVOIR PROJECT, JHARKHAND			
	Last Design NSL		Existing Top of Bank(Left)	WAPCOS LTD. 	Drawing Title :-	L-SECTION OF RIGHT MAIN CANAL (FOR REPAIRING & RAISING OF LINING)			
	Last Design Bed Level		Existing Top of Bank(Right)		Drawing No :-	WAP/INFRA/NORTH KOEL/RMC-02 - (1 / 9)			
	Last Design FSL		Proposed Bed Level		Drawn By:-		Checked By :-		Approved By :-
	Existing Bed Level		Proposed FSL						
	Existing FSL		Proposed TOL						



SCALE
H- 1:2000
V- 1:100

[illegible]

LEGEND				Implementing Agency :- WAPCOS LTD.  वाष्कोस लिमिटेड WAPCOS LIMITED (भारत सरकार का उपक्रम - बल संवर्धन, नदी विकास और गंगा संरक्षण योजना) (A Government of India Undertaking - Ministry of Water Resources, River Development & Ganga Rejuvenation)	Project Title :- NORTH KOEL RESERVOIR PROJECT, JHARKHAND	
	Last Design NSL		Existing Top of Bank(Left)		Drawing Title :- L-SECTION OF RIGHT MAIN CANAL (FOR REPAIRING & RAISING OF LINING)	
	Last Design Bed Level		Existing Top of Bank(Right)		Drawing No :- WAP/INFRA/NORTH KOEL/RMC-02 - (6 / 9)	
	Last Design FSL		Proposed Bed Level		Drawn By:- Checked By :- Approved By :-	
	Existing Bed Level		Proposed FSL			
	Existing FSL		Proposed TOL			



In Full Cutting (Natural Ground Above Top of Lining)

The diagram illustrates a cross-section of a drainage ditch in full cutting, showing the ditch profile, lining, and surrounding ground. The ditch has a bottom width of 6096 mm and a depth of 4340 mm. The sides are sloped at 33°. The lining consists of a 750 mm thick CNS layer and a 100 mm thick cement concrete lining. The ditch is flanked by 2400 mm wide shoulders with a 1:1.5 slope. The ground surface is at a height of 1000 mm above the ditch bottom. The ditch is labeled "FREE BOARD".

Key dimensions and materials shown:

- Ditch bottom width: 6096 mm
- Ditch depth: 4340 mm
- Sideslope: 33°
- Top width of ditch: 1500 mm (each side)
- Shoulder width: 2400 mm (each side)
- Shoulder slope: 1:1.5
- Ground surface height: 1000 mm above ditch bottom
- Free board: 750 mm
- Lining materials:
 - 100 mm Thick Cement Concrete Lining of M-15
 - 750 mm Thick CNS Layer as per BIS Code
 - LDPE Sheet (50 micron)
 - Horizontal Cement Concrete Copping

POROUS CONCRETE SLEEPER
MIX(1:4 AGGREGATE
SIZE 4.75 TO 10mm
W/C RATIO 0.28 TO 0.34)

Prepared By:-

WAPCOS LTD.

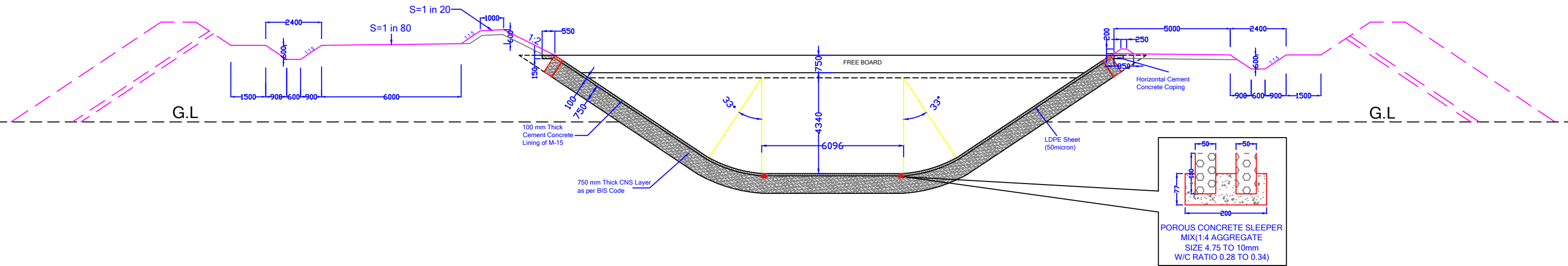


The logo of WAPCOS Limited is a circular emblem. It features a stylized sun or gear-like shape at the top, a wavy line representing water in the middle, and a stylized dam or bridge structure at the bottom. The text 'WAPCOS' is written in a bold, sans-serif font across the middle. Below the emblem, the text 'WAPCOS LIMITED' is written in a bold, sans-serif font. At the bottom of the logo, there is a line of text in Hindi: '(भारत सरकार का उपक्रम - जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय)' and below that, in English: '(A Government of India Undertaking - Ministry of Water Resources, River Development & Ganga Rejuvenation)'.

Project Title :-	NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND
Drawing Title :-	DESIGN SECTIONS (FROM RD -0.0 to 17.16) (FOR LINING & RAISING)
Drawing No :-	WAP/INFRA/NORTH KOEL/RMC-X-SECTION-03a (01 / 03)

In Partial Cutting & Filling

(Natural Ground Between Bed & F.S.L.)



Note :- All Dimensions in mm

Prepared By:-

WAPCOS LTD.



Project Title :-

NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND

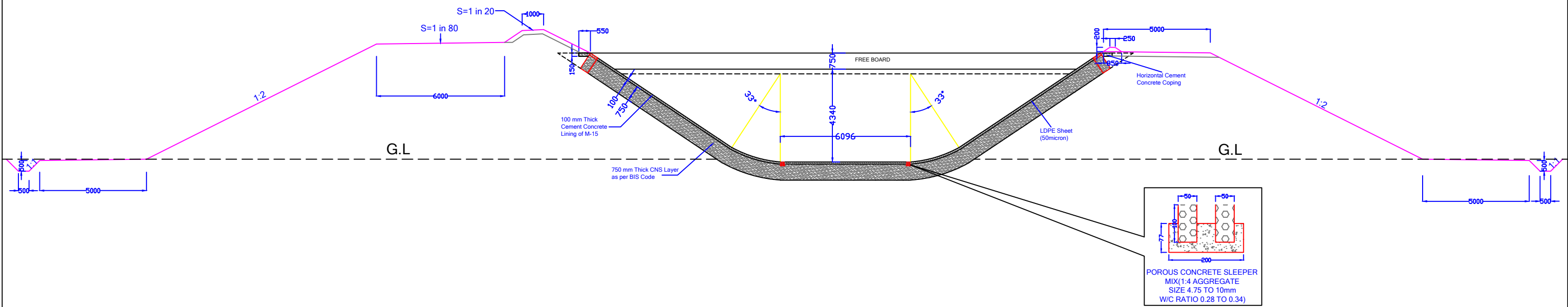
Drawing Title :-

DESIGN SECTIONS (FROM RD -0.0 to 17.16) (FOR LINING & RAISING)

Drawing No :-

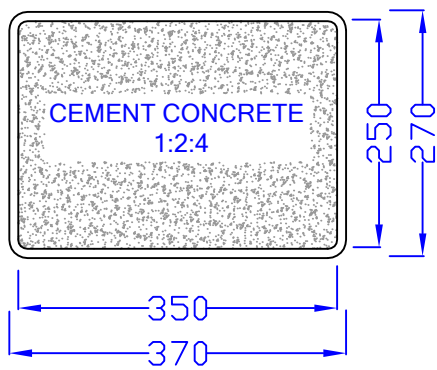
WAP/INFRA/NORTH KOEL/RMC-X-SECTION-03b (01 / 03)

In Full Filling
(Natural Ground Below Bed)

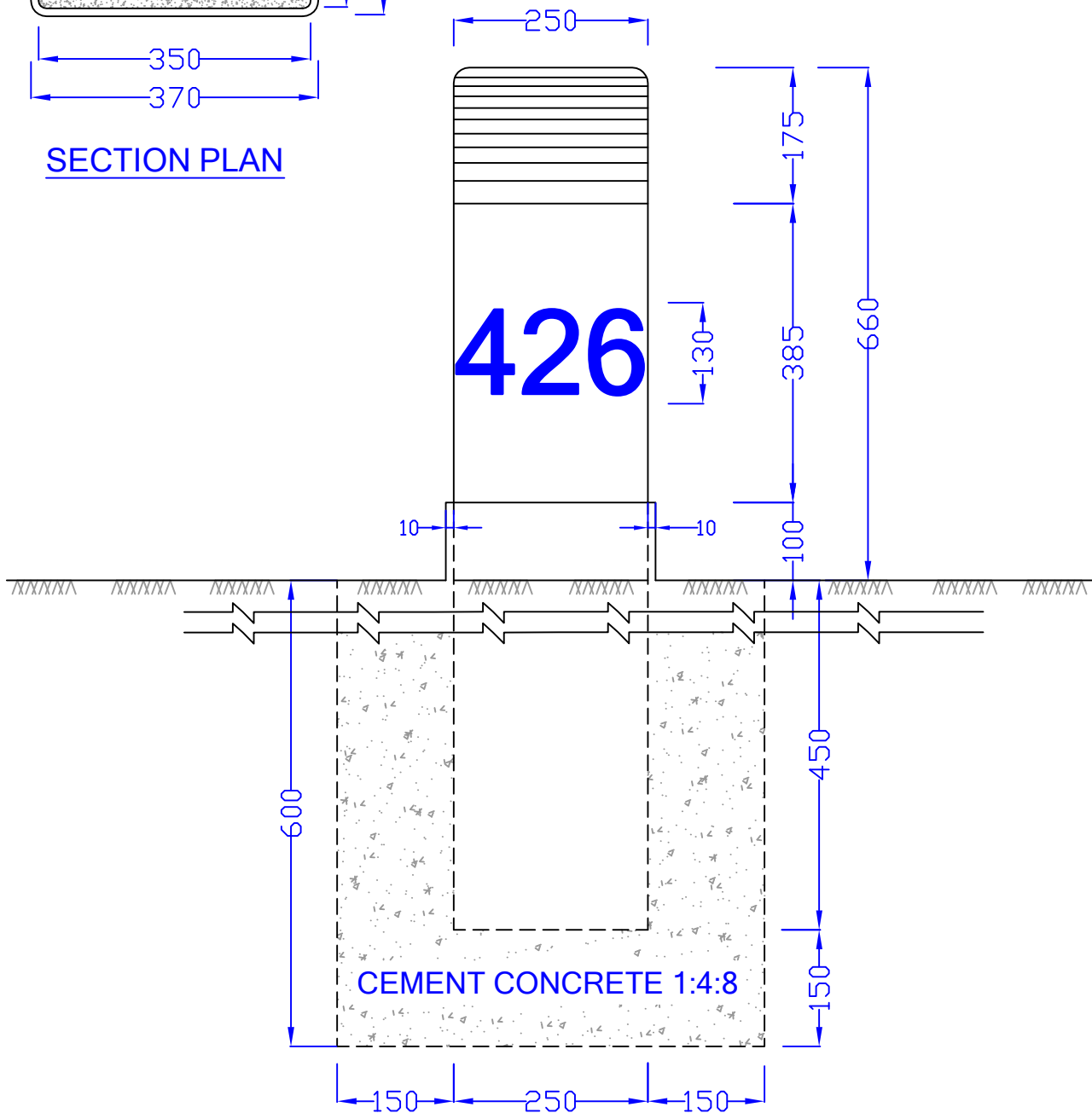


Note :- All Dimensions in mm

Prepared By:- WAPCOS LTD. 	Project Title :-	NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND
	Drawing Title :-	DESIGN SECTIONS (FROM RD -0.0 to 17.16) (FOR LINING & RAISING)
	Drawing No :-	WAP/INFRA/NORTH KOEL/RMC-X-SECTION-03c (01 / 03)



SECTION PLAN



SIDE ELEVATION

Prepared By:-

WAPCOS LTD.



Project Title :-

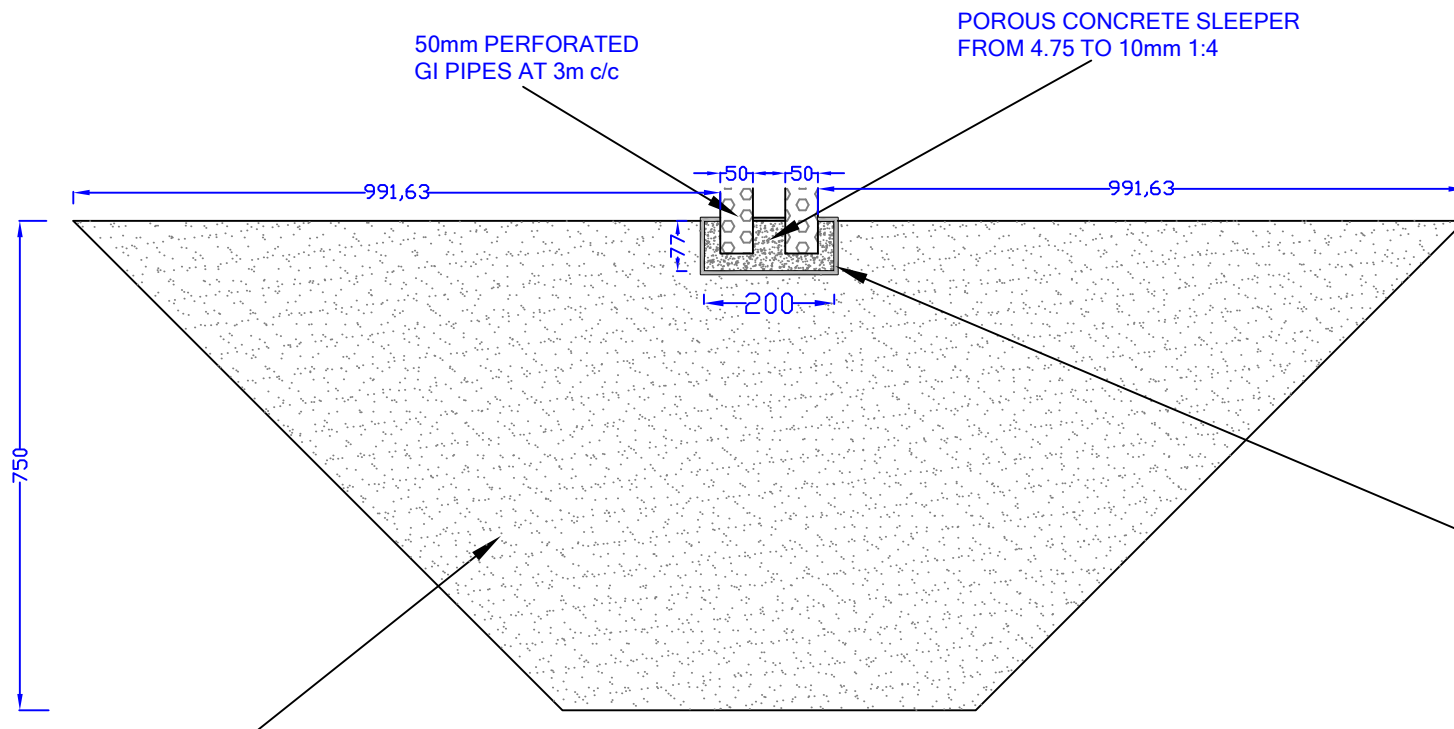
NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND

Drawing Title :-

DETAILS OF DISTANCE MARKS

Drawing No :-

WAP/INFRA/NORTH KOEL/RMC-05



CNS SOIL BROADLY CONFORM
 CLAY (LESS THAN 2 microns) : 15-20%
 SILT (0.06 mm - 0.002 mm) : 30-40%
 SAND (2 mm - 0.06mm) : 30-40%
 GRAVEL (SIZE GREATER THAN 2 mm) : 0-10%
 LIQUID LIMIT : MORE THAN 30 BUT LESS THAN 50%
 PLASTICITY INDEX : MORE THAN 15 BUT LESS THAN 30%

Design Specifications of Non-Woven Geo Textile Filter				
S.No.	Various Specifications	Unit	Test Standards	Value adopted
Physical Properties				
1	Mass per unit area	gm/m ²	ASTMD-5261	200
2	Thickness	Micron	ASTMD-5199	1800
3	Roll length	Meter	ASTMD-5261	100
4	Roll Width	Meter	ASTMD-5261	4.5
Hydraulic Properties				
1	Water Flow	Liter/m ² /min	ASTMD-4491	4480
2	Apparent Opening Size(AOS)	mm	ASTMD-4751	0.212
3	Permeability	s ⁻¹	ASTMD-4751	1.4
Mechanical Properties				
1	Tensile Strength	kN/m	ASTMD-4595	Not less than 9
2	Grab Tensile Strength	N	ASTMD-4632	Not less than 710
3	CBR Puncture Strength	N	ASTMD-6241	Not less than 1500
4	Grab Elongation	%	ASTMD-4632	Not less than 50
5	Trapezoidal Tear Strength	N	ASTMD-4533	250
6	Elongation at Maximum Load	%	ASTMD-4595	Not more than 50%
7	Survivability and Endurance Criteria		As per MoRTH Section 700, Table 701	

Prepared By:-

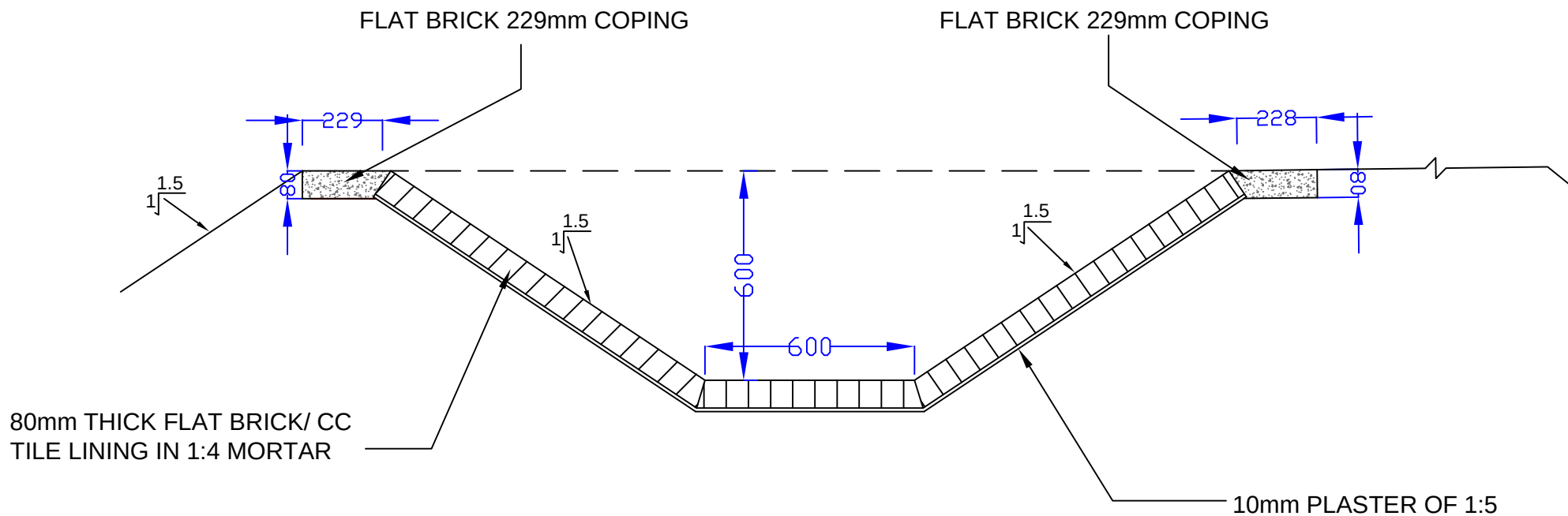
WAPCOS LTD.



Project Title :- NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND

Drawing Title :- ARRANGEMENT OF FILTER BEHIND LINING

Drawing No :- WAP/INFRA/NORTH KOEL/RMC-06



Note :- All Dimensions in mm

Prepared By:-

WAPCOS LTD.



Project Title :-

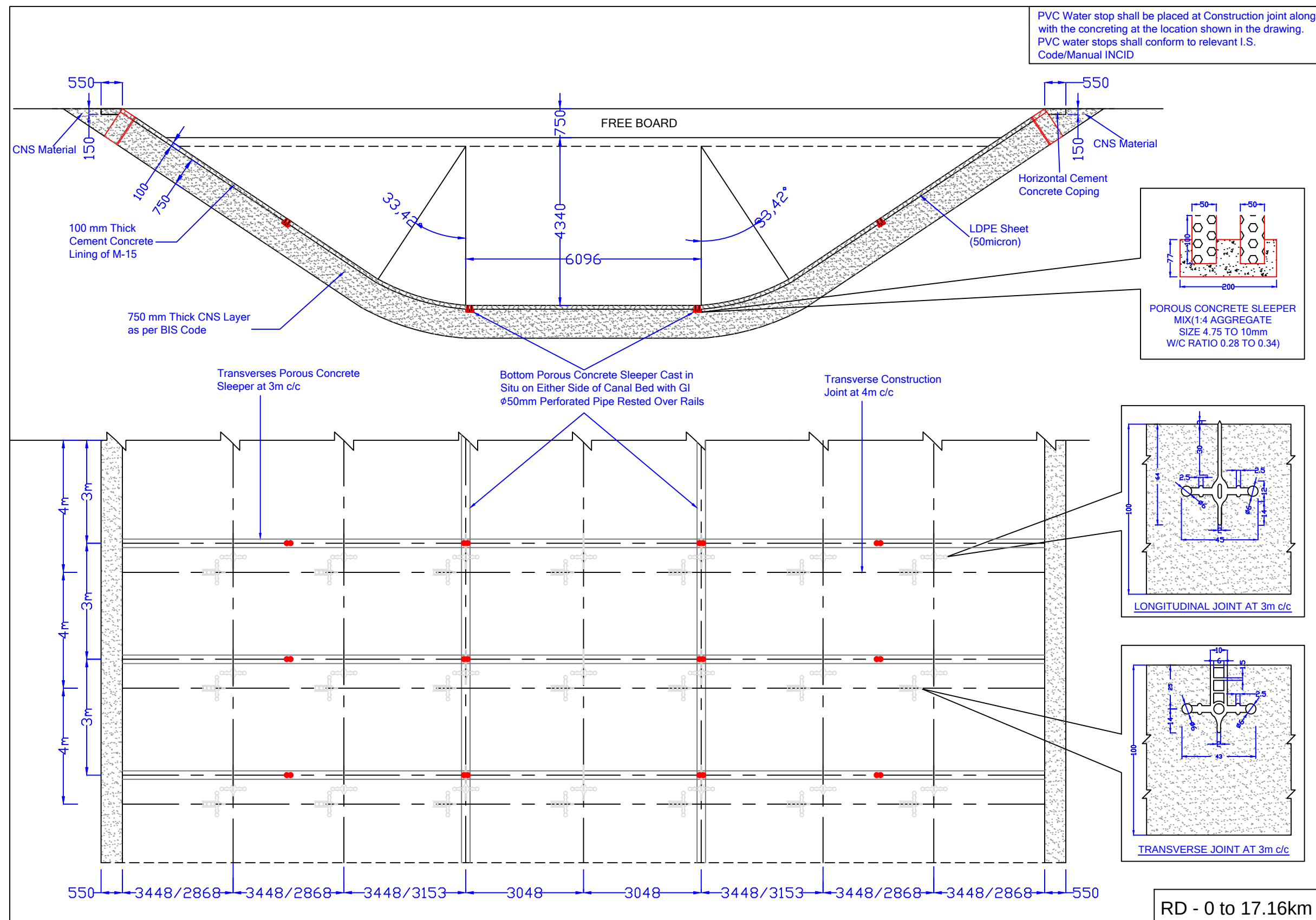
NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND

Drawing Title :-

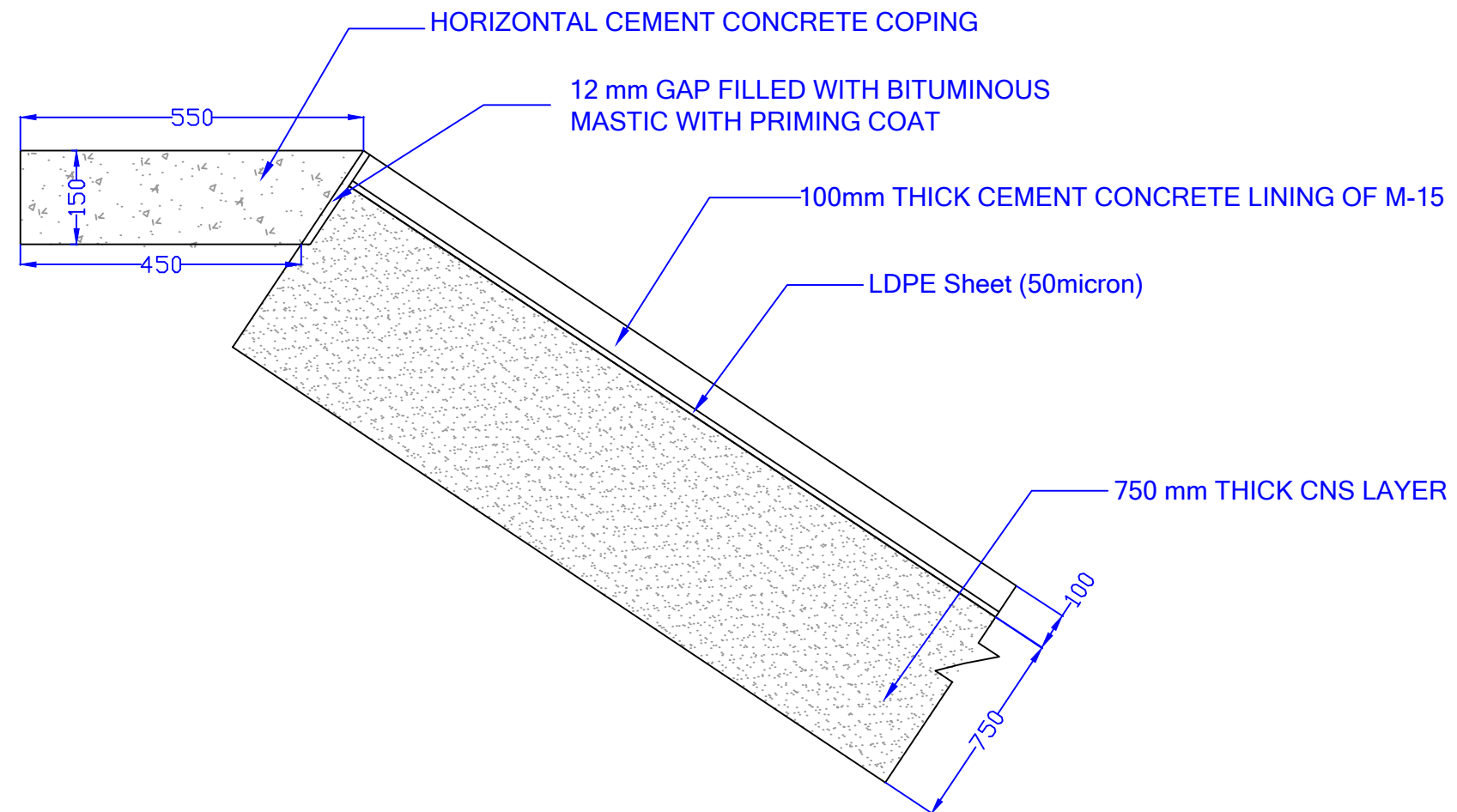
TYPICAL CROSS SECTION FOR CATCH WATER DRAIN

Drawing No :-

WAP/INFRA/NORTH KOEL/RMC-07



Prepared By:- WAPCOS LTD. 	Project Title :-	NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND
	Drawing Title :-	CROSS SECTION & PLAN SHOWING LINING SPECIFICATIONS AND CONSTRUCTION PVC JOINT& POROUS SLEEPER ARRANGEMENT FROM RD-00 to 17.16 km. FROM RD-17.16 to 32.46 THE ARRANGEMENT SHOULD BE ADJUSTED AS PER DESIGN
	Drawing No :-	WAP/INFRA/NORTH KOEL/RMC-08a



DETAIL OF COPING

Prepared By:-

WAPCOS LTD.



Project Title :-

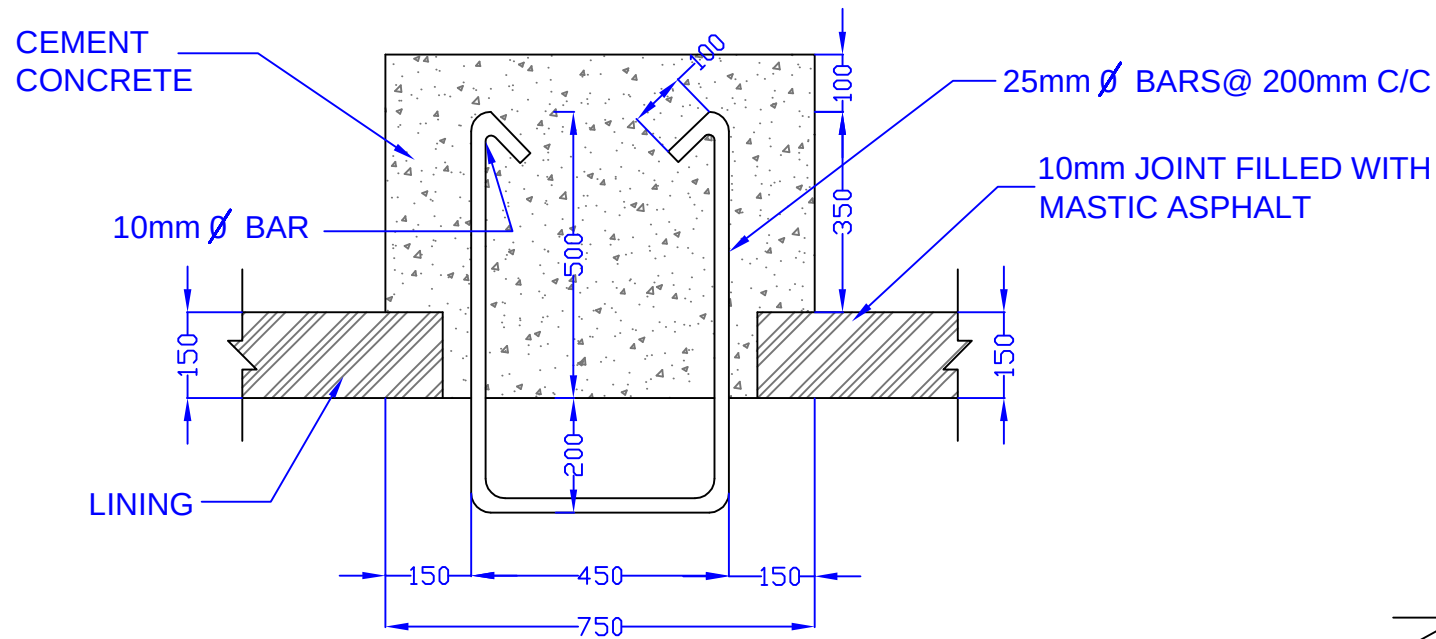
NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND

Drawing Title :-

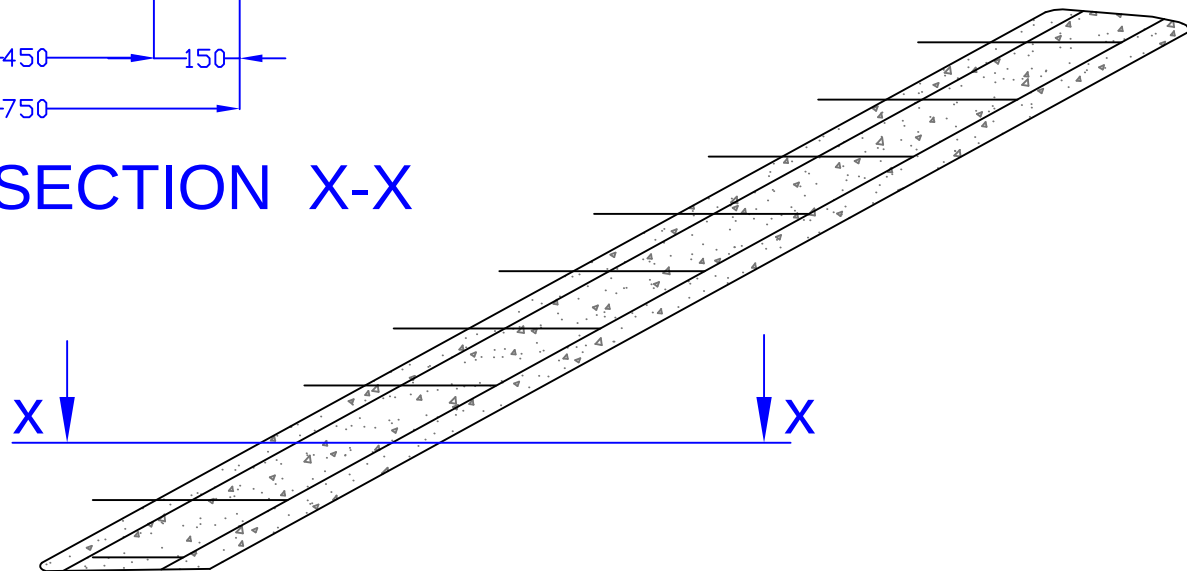
DETAILS OF COPING

Drawing No :-

WAP/INFRA/NORTH KOEL/RMC-08b



ENLARGED SECTION X-X



Prepared By:-

WAPCOS LTD.



Project Title :-

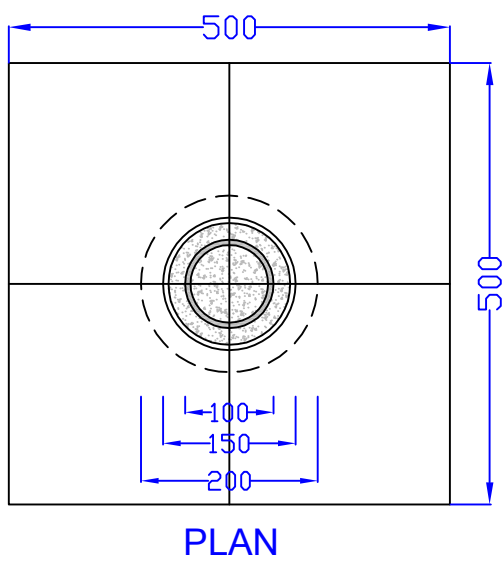
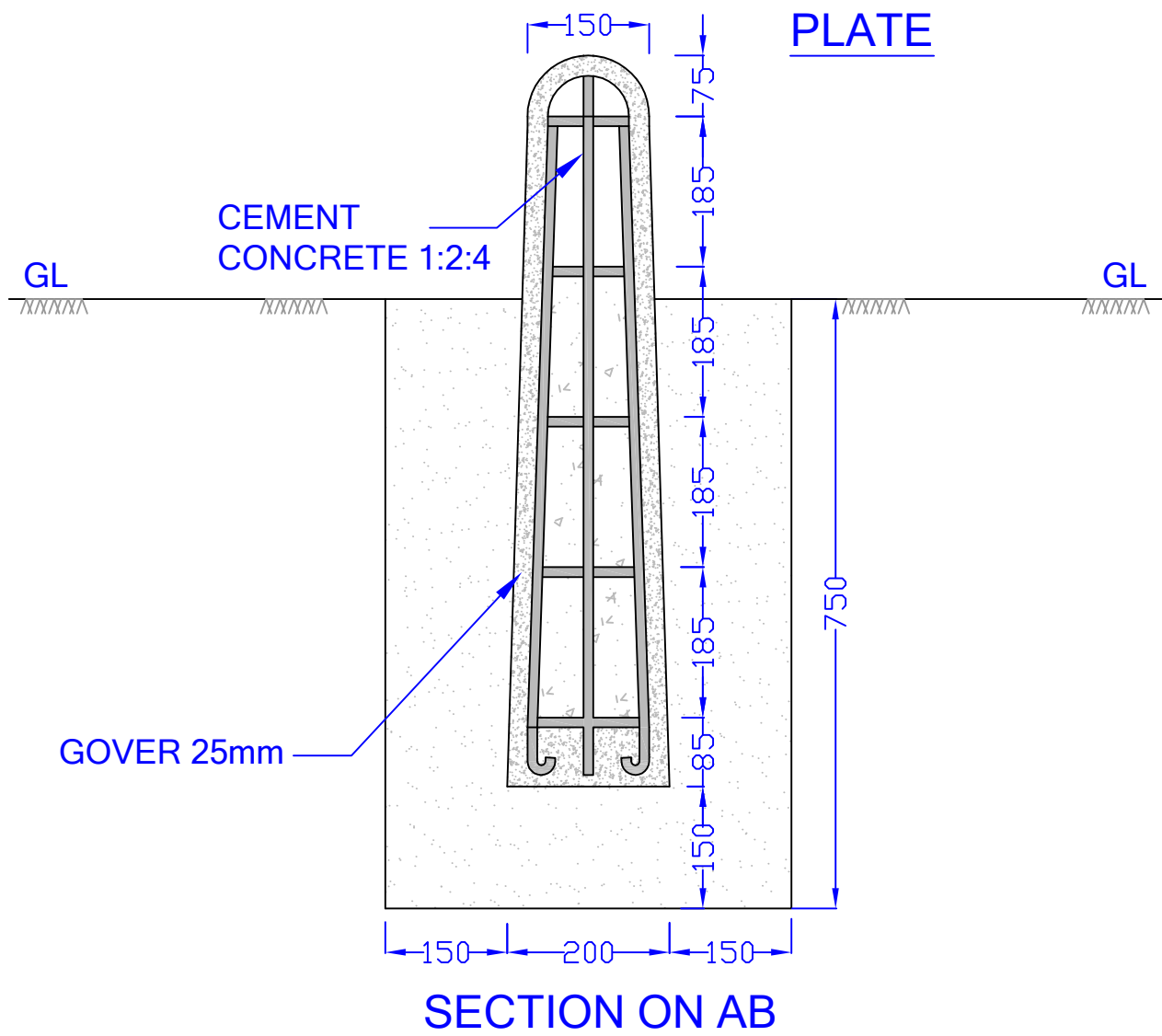
NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND

Drawing Title :-

DETAILS OF SAFETY LADDERS

Drawing No :-

WAP/INFRA/NORTH KOEL/RMC-09



TYPE DESIGN WITH R.C.C AS MATERIAL

Prepared By:-

WAPCOS LTD.



Project Title :-

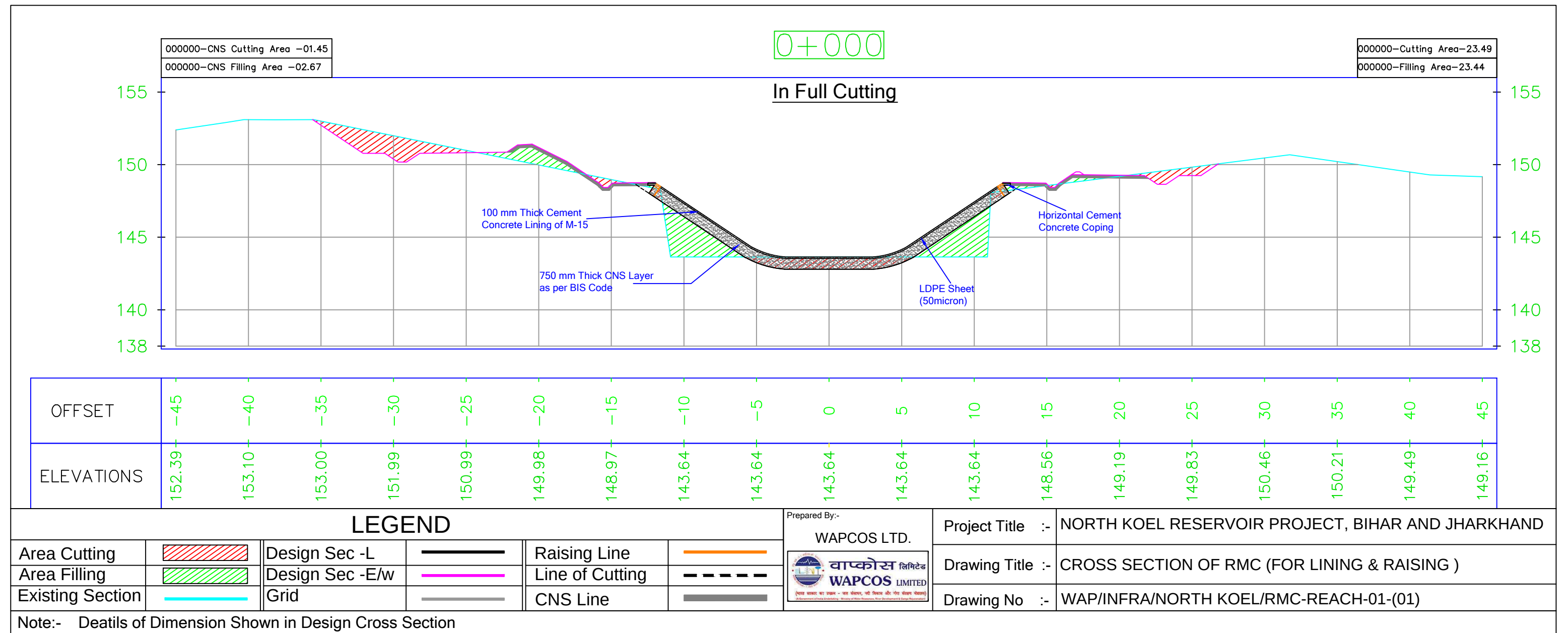
NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND

Drawing Title :-

DETAILS OF BOUNDARY PILLAR

Drawing No :-

WAP/INFRA/NORTH KOEL/RMC-10



000600—CNS Cutting Area —01.10
000600—CNS Filling Area —02.23

0+600

000600—Cutting Area—31.37
000600—Filling Area—04.26

In Partial Cutting & Filling

OFFSET	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45
ELEVATIONS	147.15	146.96	146.91	148.21	150.05	149.91	150.11	147.72	144.48	143.82	144.37	147.12	149.54	150.87	150.96	150.79	150.50	150.14	149.98

LEGEND

Area Cutting		Design Sec -L		Raising Line	
Area Filling		Design Sec -E/w		Line of Cutting	
Existing Section		Grid		CNS Line	

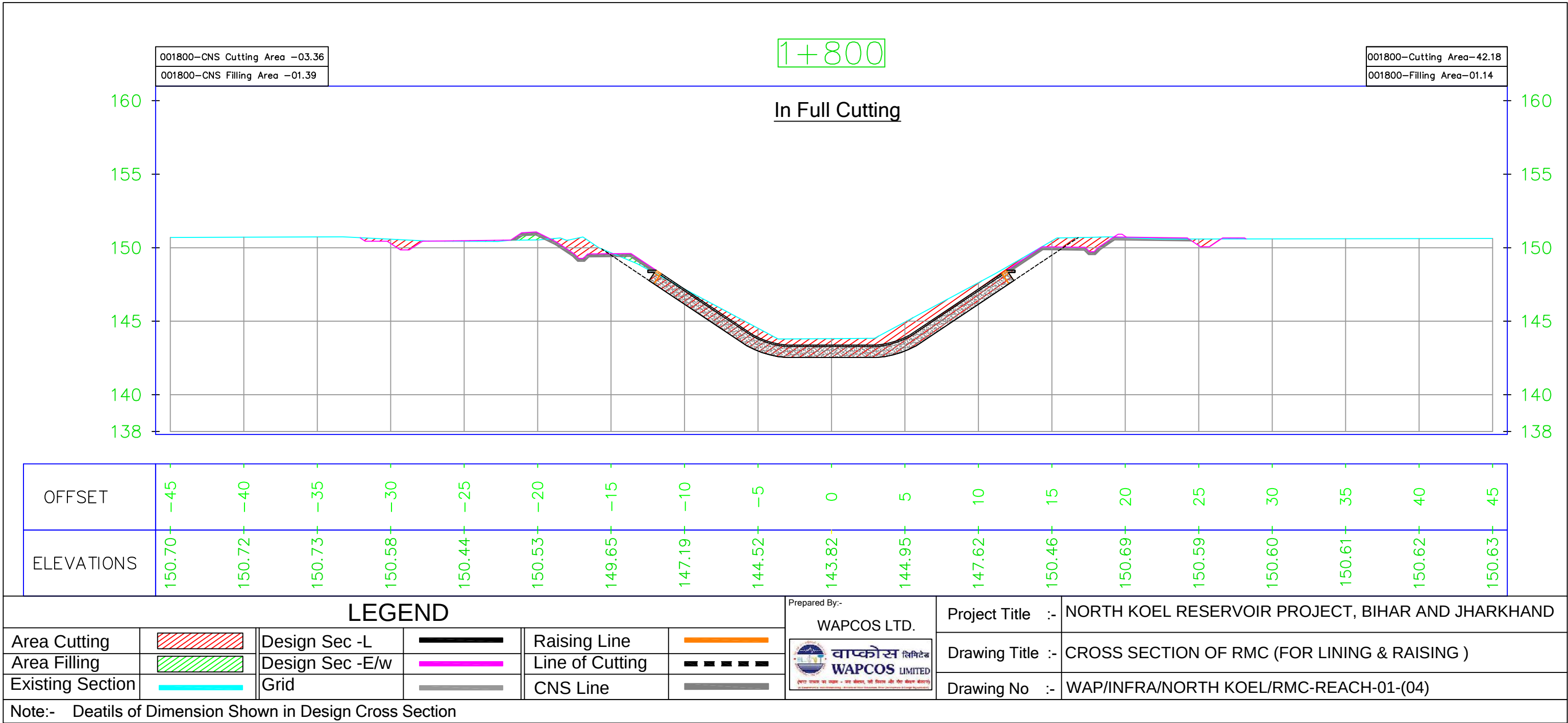
Prepared By:-

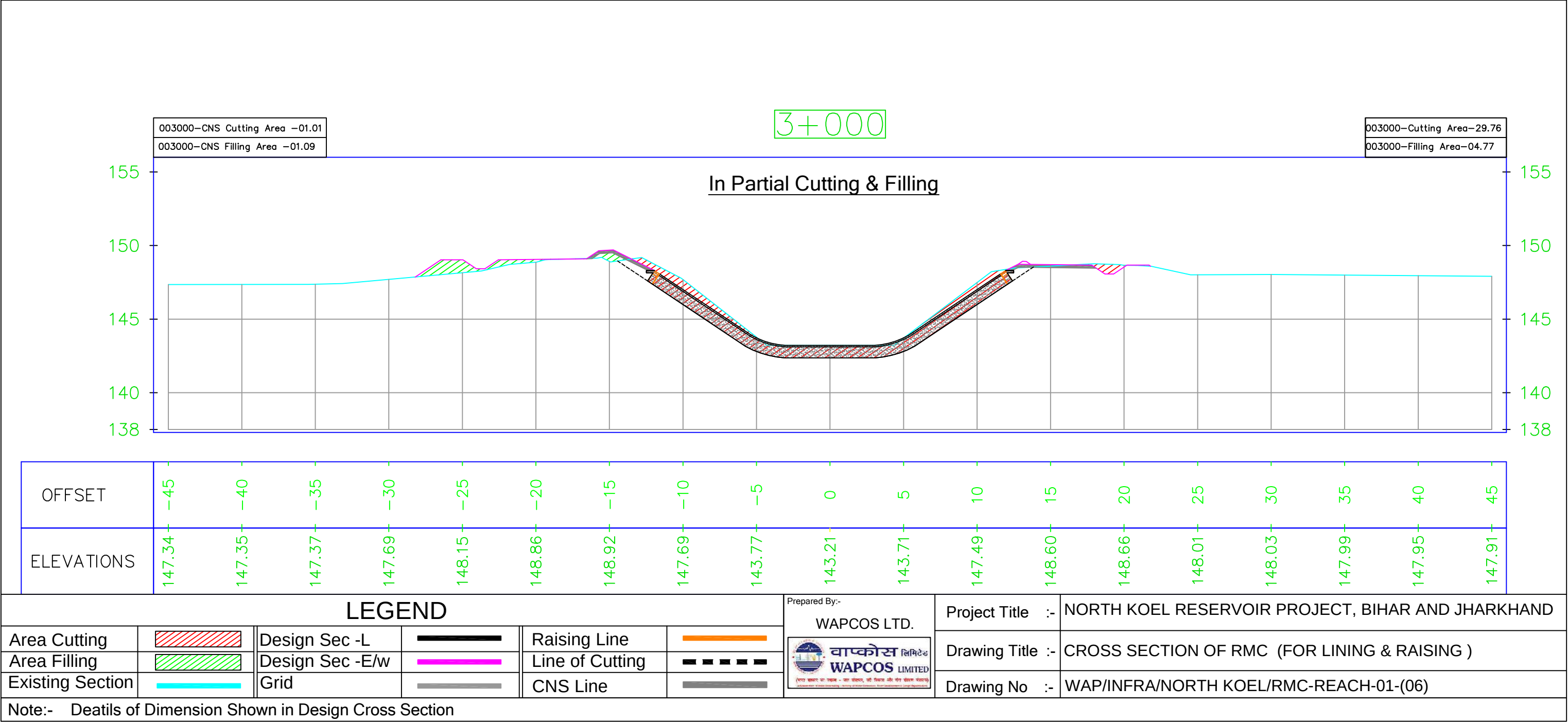
WAPCOS LTD.

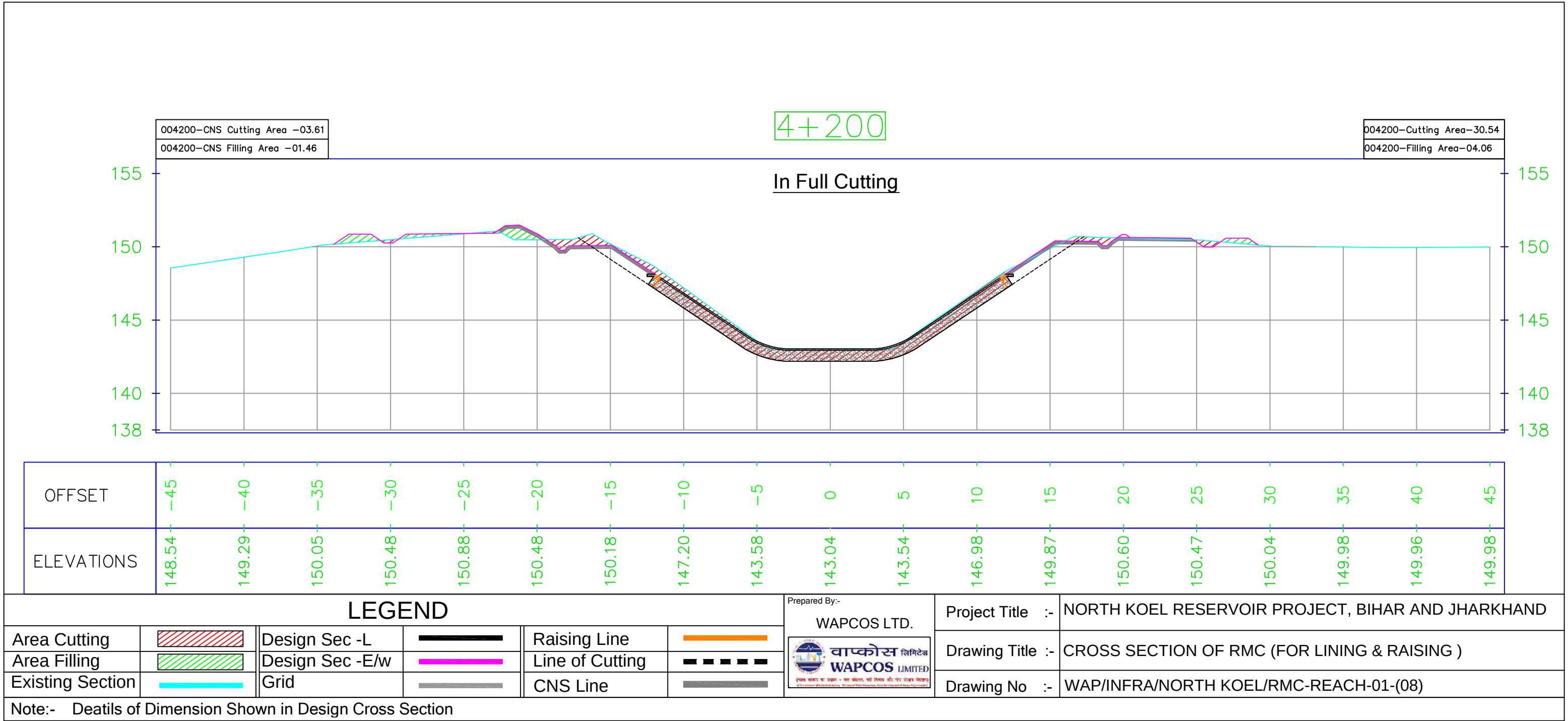


Project Title :-	NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND
Drawing Title :-	CROSS SECTION OF RMC (FOR LINING & RAISING)
Drawing No :-	WAP/INFRA/NORTH KOEL/RMC-REACH-01-(02)

Note:- Deatils of Dimension Shown in Design Cross Section



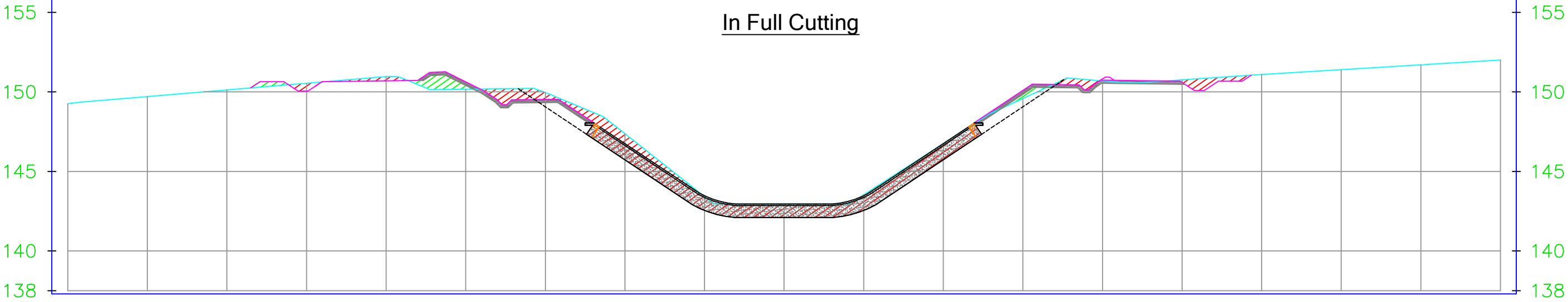




004800-CNS Cutting Area -03.14
004800-CNS Filling Area -02.04

4+800

004800-Cutting Area-33.86
004800-Filling Area-03.20



LEGEND

Area Cutting		Design Sec -L		Raising Line	
Area Filling		Design Sec -E/w		Line of Cutting	
Existing Section		Grid		CNS Line	

Prepared By:-

WAPCOS LTD.

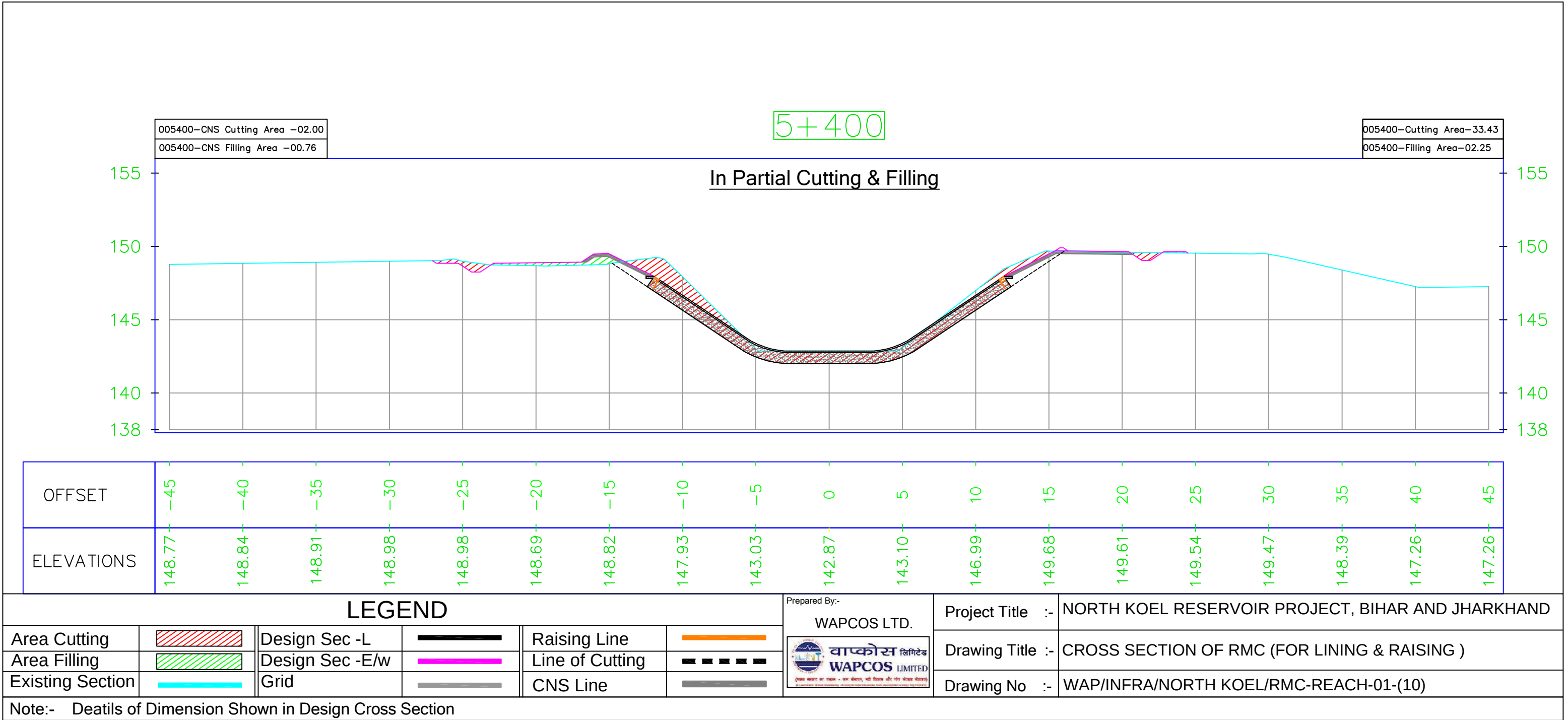


Project Title :- NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND

Drawing Title :- CROSS SECTION OF RMC (FOR LINING & RAISING)

Drawing No :- WAP/INFRA/NORTH KOEL/RMC-REACH-01-(09)

Note:- Deatils of Dimension Shown in Design Cross Section

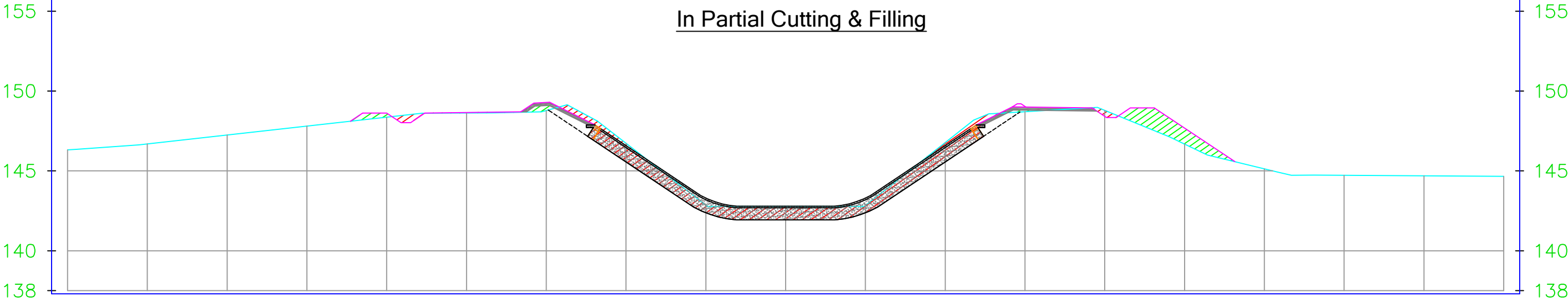


006000-CNS Cutting Area -01.16
006000-CNS Filling Area -01.26

006000-Cutting Area-24.56
006000-Filling Area-07.66

6+000

In Partial Cutting & Filling



OFFSET	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45
ELEVATIONS	146.32	146.69	147.25	147.81	148.36	148.63	148.78	146.72	142.86	142.78	142.84	146.77	148.71	148.79	146.67	145.13	144.73	144.69	144.65

LEGEND

Area Cutting		Design Sec -L		Raising Line	
Area Filling		Design Sec -E/w		Line of Cutting	
Existing Section		Grid		CNS Line	

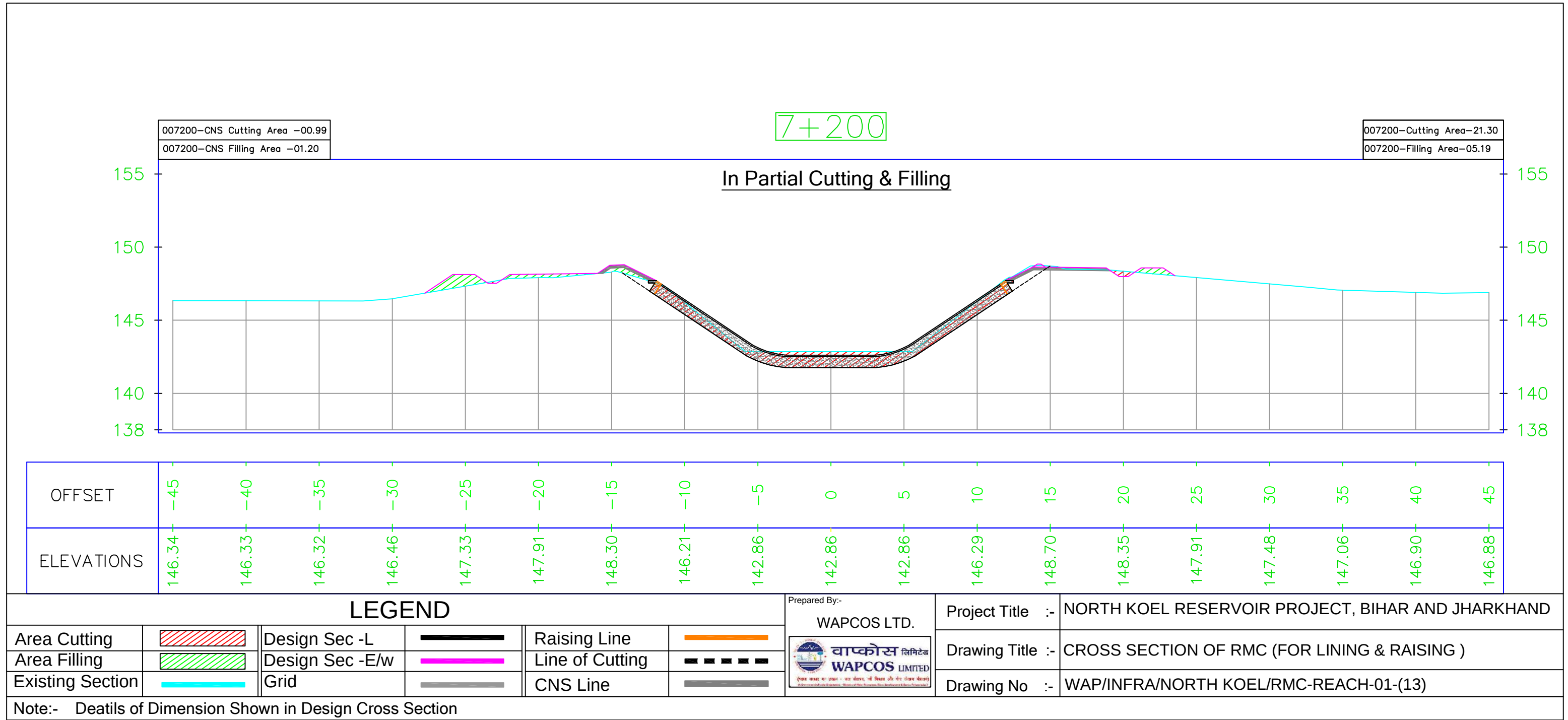
Prepared By:-

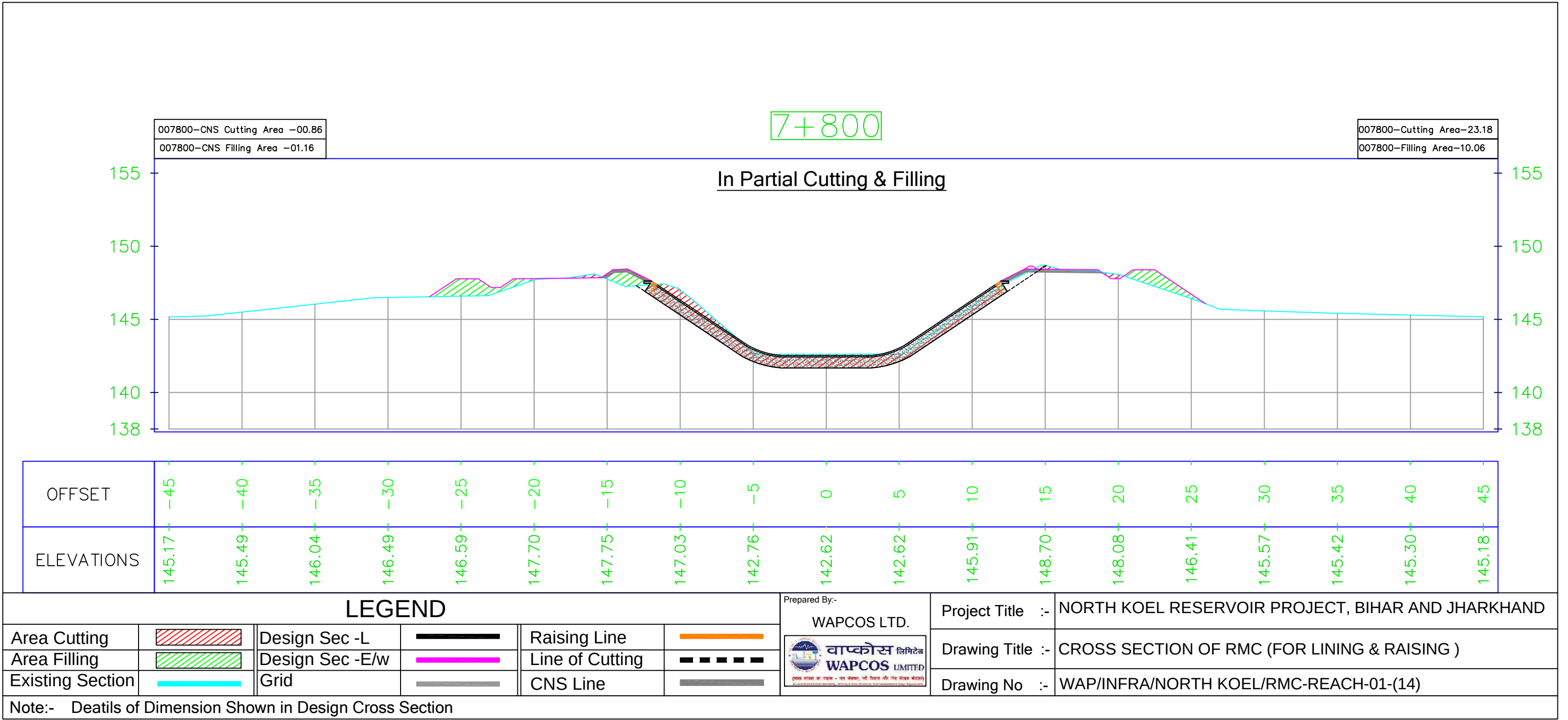
WAPCOS LTD.

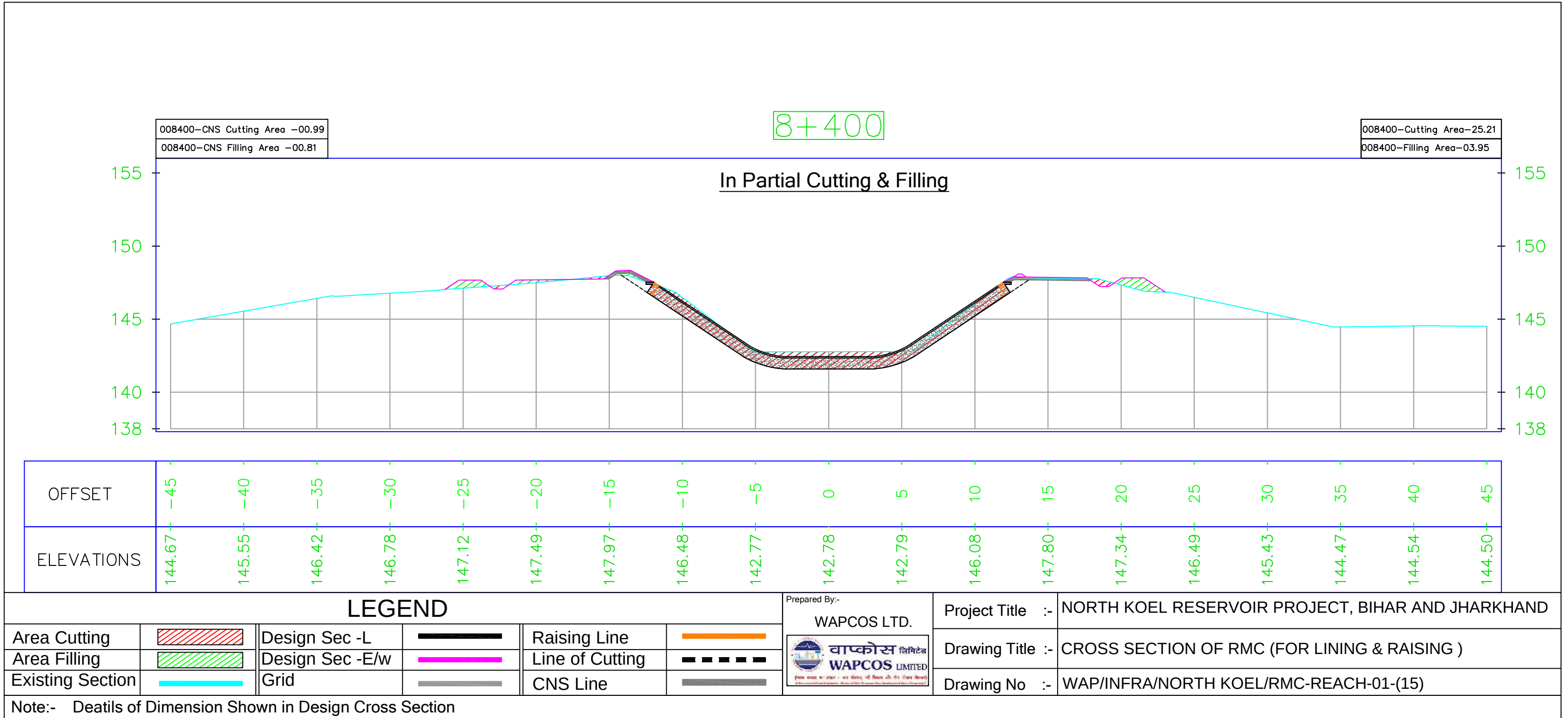


Project Title :-	NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND
Drawing Title :-	CROSS SECTION OF RMC (FOR LINING & RAISING)
Drawing No :-	WAP/INFRA/NORTH KOEL/RMC-REACH-01-(11)

Note:- Deatils of Dimension Shown in Design Cross Section



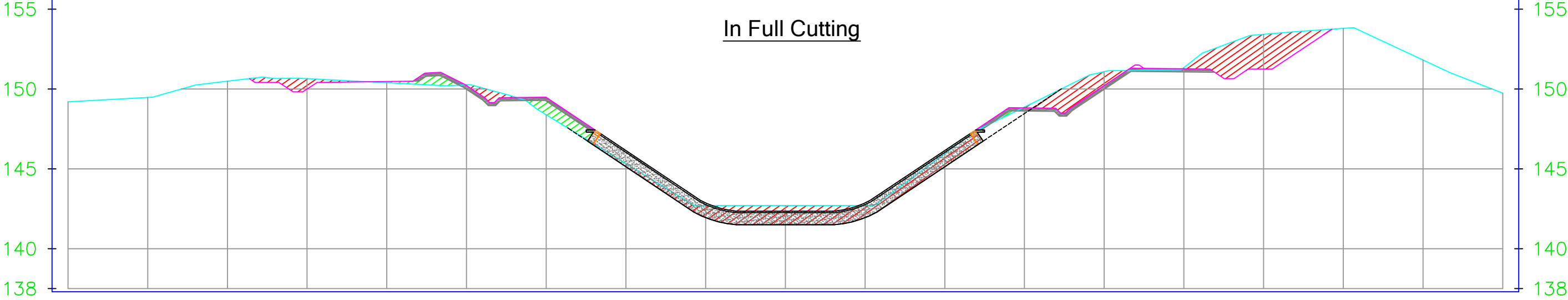




009000—CNS Cutting Area —03.13
009000—CNS Filling Area —02.56

9+000

009000—Cutting Area—41.27
009000—Filling Area—04.31



LEGEND

Area Cutting		Design Sec -L		Raising Line	
Area Filling		Design Sec -E/w		Line of Cutting	
Existing Section		Grid		CNS Line	

Prepared By:-

WAPCOS LTD.



Project Title :-	NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND
Drawing Title :-	CROSS SECTION OF RMC (FOR LINING & RAISING)
Drawing No :-	WAP/INFRA/NORTH KOEL/RMC-REACH-01-(16)

Note:- Deatils of Dimension Shown in Design Cross Section

009600—CNS Cutting Area —02.11
009600—CNS Filling Area —06.28

9+600

009600—Cutting Area—27.63
009600—Filling Area—30.14

In Full Cutting

OFFSET	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45
ELEVATIONS	155.99	154.65	154.19	154.01	152.04	149.92	147.70	145.35	142.66	142.66	142.66	146.15	148.92	151.33	153.86	154.91	154.61	155.44	156.69

LEGEND

Area Cutting		Design Sec -L		Raising Line	
Area Filling		Design Sec -E/w		Line of Cutting	
Existing Section		Grid		CNS Line	

Prepared By:-

WAPCOS LTD.



Project Title :-	NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND
Drawing Title :-	CROSS SECTION OF RMC (FOR LINING & RAISING)
Drawing No :-	WAP/INFRA/NORTH KOEL/RMC-REACH-01-(17)

Note:- Deatils of Dimension Shown in Design Cross Section

