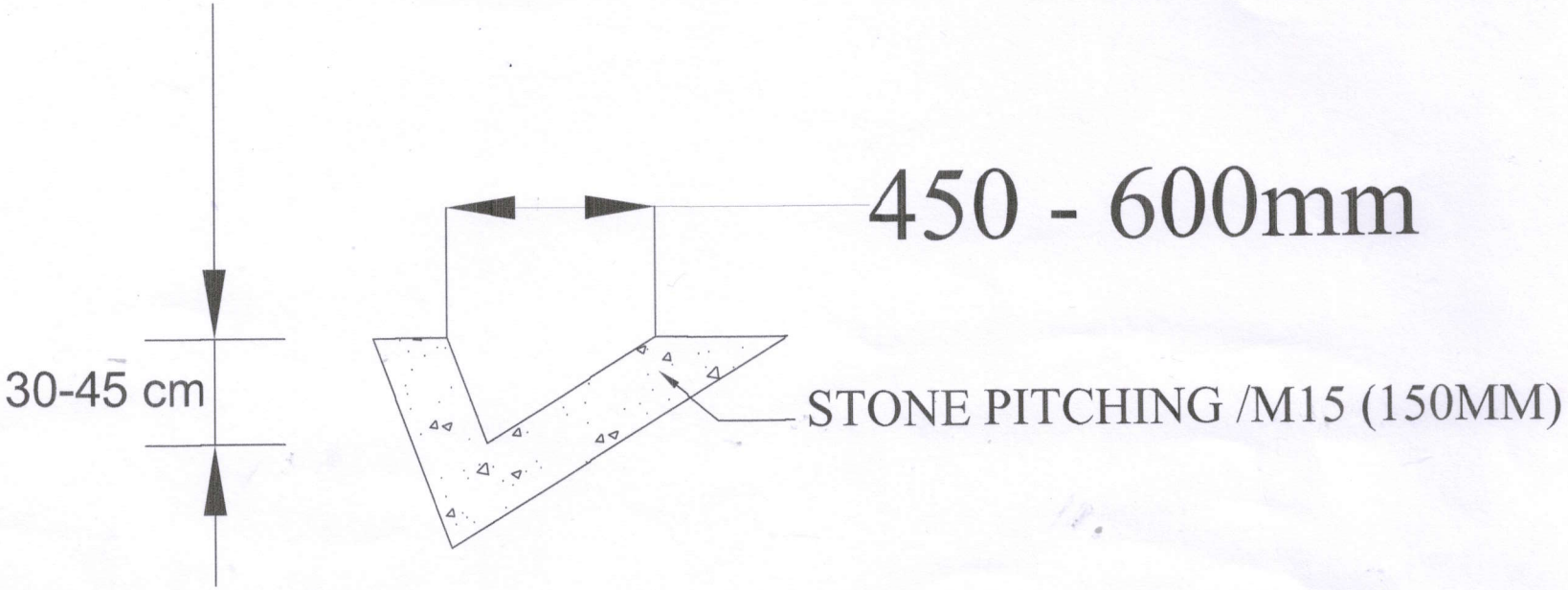
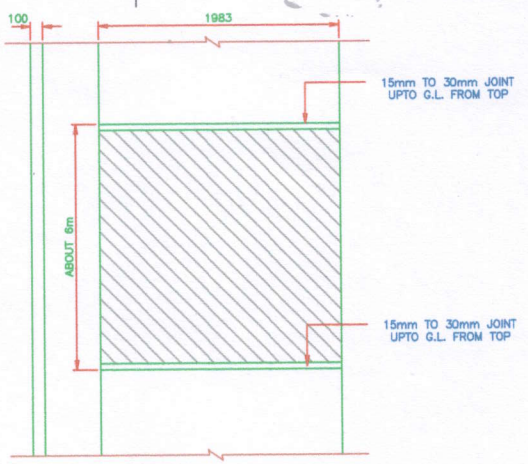


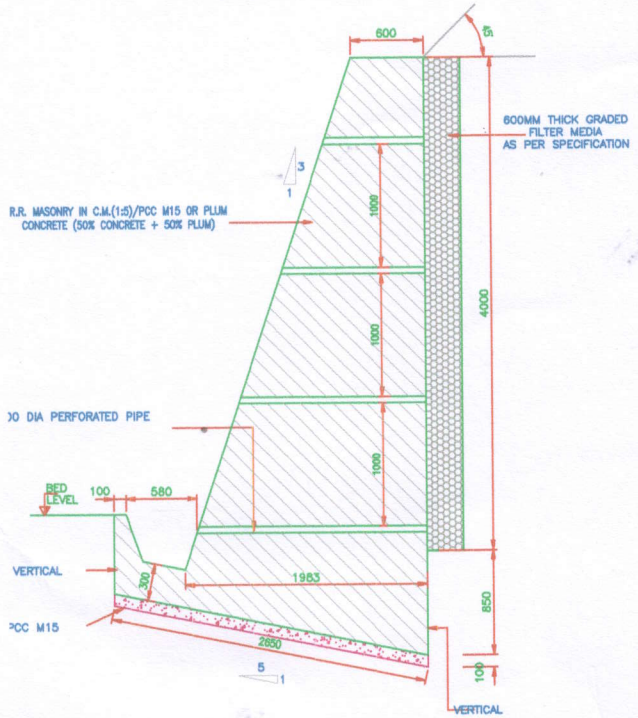
Typical Section : Triangular Drain

As per clause 8.4 of IRC:SP:48-1998

Authority's Engineer Oodlabari



PLAN GROUND LEVEL
SCALE 1:100



STANDARD 4.0m HIGH BREAST WALL
SCALE 1:30

PLUM CONCRETE SPECIFICATIONS

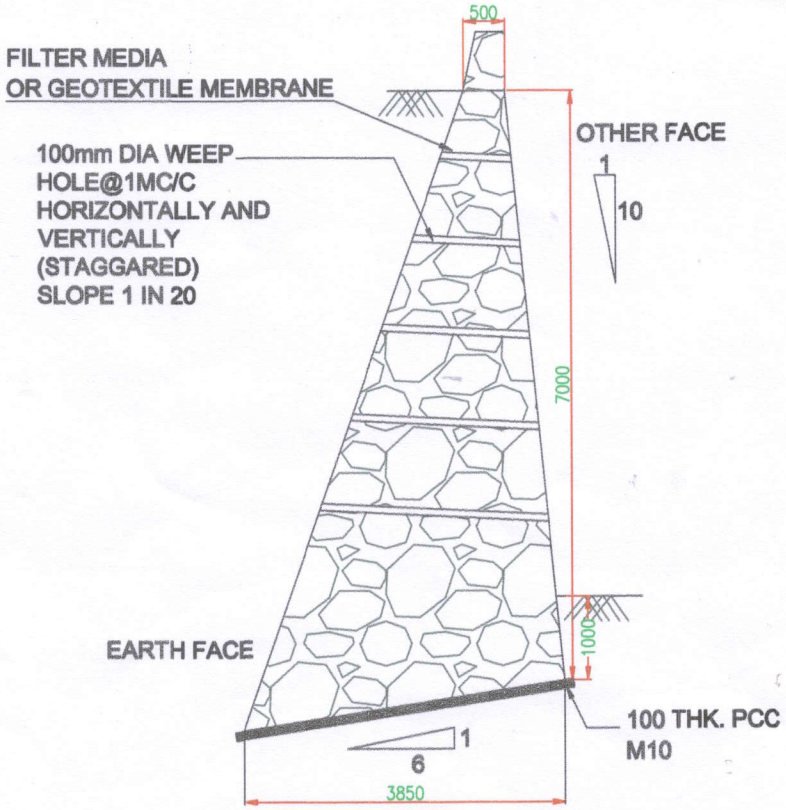
1. SIZE: THE SIZE OF STONE PLUM MAY BE FROM 150–300MM. THE MAXIMUM DIMENSION OF THESE STONES OR PLUMS SHALL NOT EXCEED 1/3 RD THE LEAST DIMENSION OF THE MEMBER.
2. MATERIAL:– ALL PLUMS SHALL BE HARD, DURABLE CLEN AND FREE FROM SOFT MATERIALS OR LOOSE PIECES OR DELETERIOUS SUBSTANCE IN THEM & SHALL NOT HAVE SHARP CORNERS.
3. CONSTRUCTION OPERATIONS: DURING CONCRETING THE FIRST LAYER OF CONCRETE OF THE SPECIFIED MIX SHALL BE LAID TO A THE PLUM SHALL THEN BE LAID WHILE THE TOP PORTION OF THIS CONCRETE IS STILL GREEN BUT SUFFICIENTLY STIFF TO PREVENT COMPLETE SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PLUMS SHALL BE ABOUT HALF EMBEDDED IN THE CONCRETE & THE REMAINING PART EXPOSED SO AS T FORM A KEA WITH THE NEXT LAYER OF THE CONCRETE NO PLUM SHALL BE USED FOR CONCRETE LAND UNDER WATER
4. WHILE PLACING THE PLUMS, CARE SHALL BE TAKEN TO SEE THAT THE CLEAR DISTANCE BETWEEN ANY TWO PLUMS IS NOT LESS THAN EITHER THE WIDTH OR THICKNESS OF EITHER OF THE PLUMS. THE DISTANCE FROM THE PLUMS TO THE OUTER SURFACE FROM ANY STEEL REINFORCEMENT SHALL BE EQUAL TO GREATEST WIDTH OF PLUMS. IF PLUMS OF STRATIFIED STONE ARE USED THEY SHALL BE LAID ON THEIR NATURAL BED. STONES WITH CONCAVE FACES SHALL AND SUCCESSIVE LAYERS OF CONCRETE SHALL BE AT LEAST TWICE THAT OF THE LARGEST PLUM.
5. QUANTITY OF PLUM: THE TOTAL VOLUME OF PLUMS SHALL BOT EXCEED 50% OF THE VOLUME OF THE FINISHED CONCRETE.
6. MIX OF PLUM: PLUM CONCRETE 1:2:4 (1 CEMENT:2 SAND: 4 GRADED STONE AGGREGATE 40MM NOMINAL SIZE) WITH 50 % PLUMS.

YONGMA ENGINEERING & CO. LTD. REDECON INDIA PVT. LTD. JV
Authority's Engineer
Oodlabari

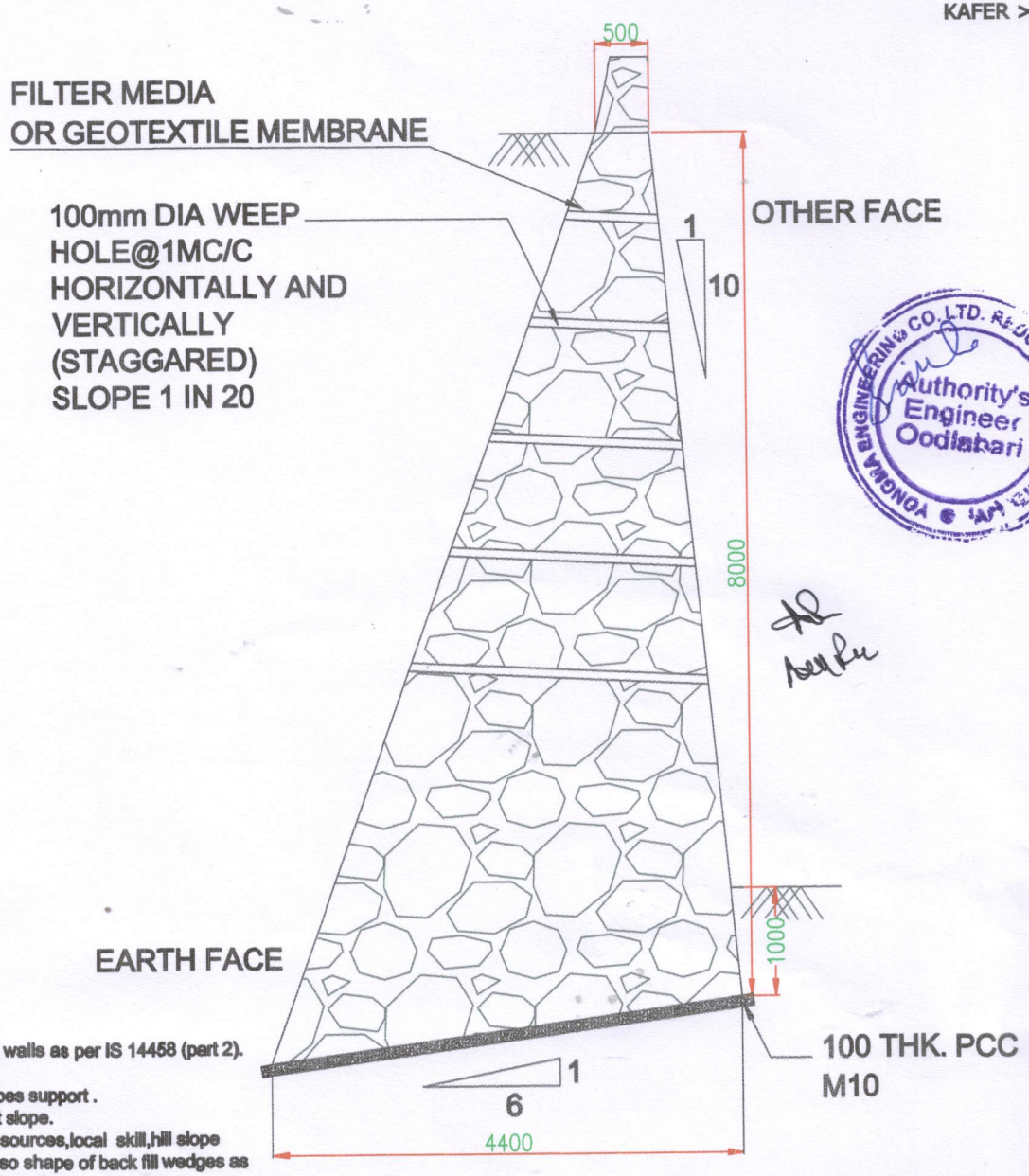
CLIENT:- NATIONAL HIGHWAY INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED	AUTHORITY'S ENGINEER:-	EPC CONTRACTOR :	DESIGN CONSULTANT :	PREPARED / DESIGNED / CHECKED / APPROVED	PROOF CONSULTANT :	SAFETY CONSULTANT :	PROJECT : CONSTRUCTION AND UPGRADATION OF EXISTING ROAD TO 2-LANE WITH PAVED SHOULDER OF BAGRAKOT-KAFER SECTION OF NH-717A FROM KM 28.000 TO KM 56.000 ON EPC BASIS UNDER BHARAT-NET PHASE-IV IN THE STATE OF WEST BENGAL (PACKAGE-V) ON ENGINEERING, PROCUREMENT & CONSTRUCTION (EPC) MODE	SCALE : AS SHOWN / REV. : R1 / PAPER : A-2 / DATE : MAY 202 / TITLE :

<<< BAGRAKOT

KAFER >>>



RETAINING WALL (7.0M)



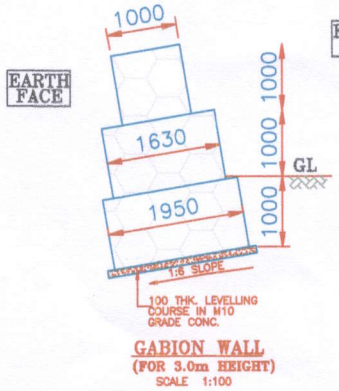
RETAINING WALL (8.0M)

NOTES:-

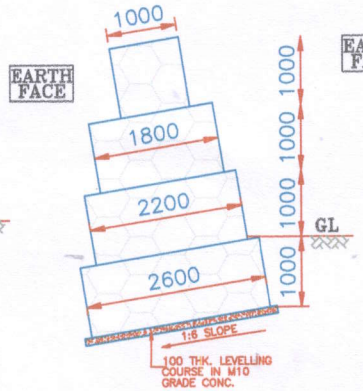
1. Design as Conventional retainning walls as per IS 14458 (part 2). Assume surcharge on road of 2T/m².
2. Used Both as cut slope and fill slopes support . Breast wall is more economical forcut slope.
3. Choice of wall depends on local resources,local skill,hill slope angle,foundation conditions and also shape of back fill wedges as illustrated in diagrams and compatibility of materials.
4. Foundations to be stepped up if rock encountered.
5. All walls require durable rock filling of small to medium size
6. Drainage of wall bases not shown. Provide 15 cm thick gravel layer in case of clayey foundation.

Authority's Engineer Oodlabari

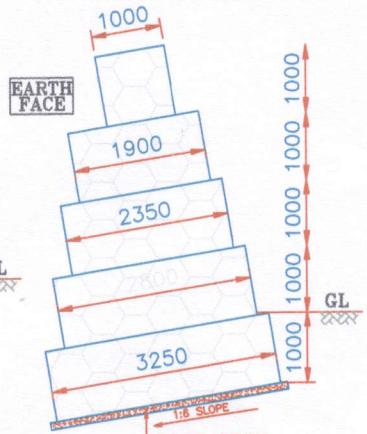
CLIENT:-	AUTHORITY'S ENGINEER:-	EPC CONTRACTOR :	DESIGN CONSULTANT :		PROOF CONSULTANT :	SAFETY CONSULTANT :	PROJECT :	SCALE :	REV.	PAPER	DWG No.
NATIONAL HIGHWAY INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED				PREPARED / DESIGNED / CHECKED / APPROVED	STRUCTURES / HIGHWAYS		CONSTRUCTION AND UPGRADATION OF EXISTING ROAD TO 2-LANE WITH PAVED SHOULDER OF BAGRAKOT-KAFER SECTION OF NH-717A FROM KM 25.000 TO KM. 39.300 ON EPC BASIS UNDER SARDP-NE PHASE 'A' IN THE STATE OF WEST BENGAL (PACKAGE-1) ON ENGINEERING, PROCUREMENT & CONSTRUCTION (EPC) MODE	AS SHOWN	R0	A-3	TITLE : DATE MAY 2023



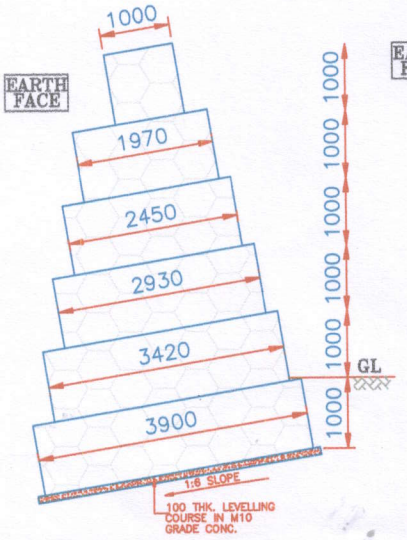
GABION WALL
(FOR 3.0m HEIGHT)
SCALE 1:100



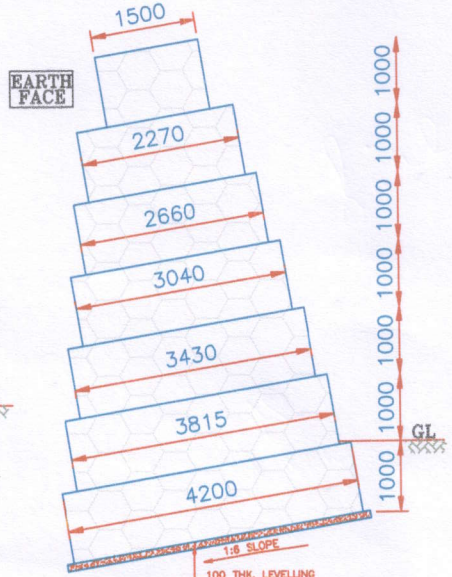
GABION WALL
(FOR 4.0m HEIGHT)
SCALE 1:100



GABION WALL
(FOR 5.0m HEIGHT)
SCALE 1:100



GABION WALL
(FOR 6.0m HEIGET)
SCALE 1:100



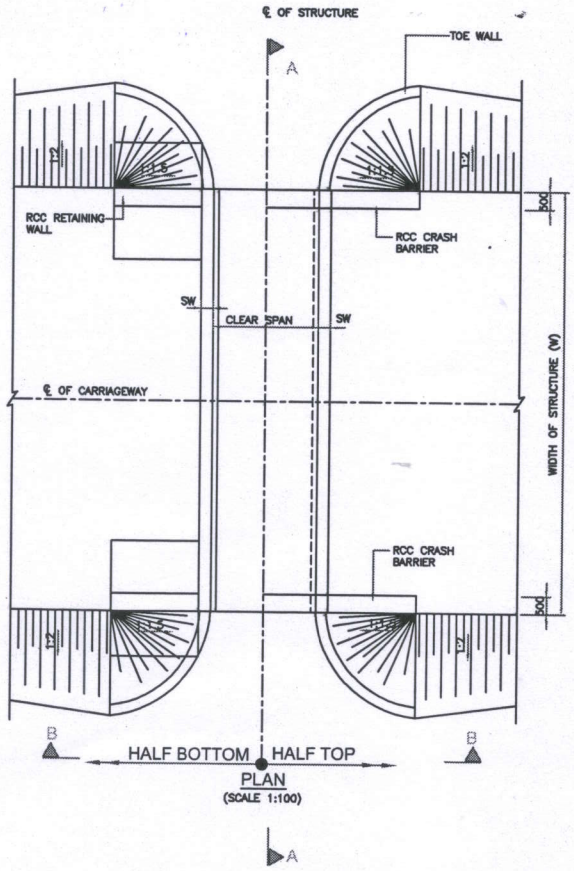
GABION WALL
(FOR 7.0m HEIGHT)
SCALE 1:100

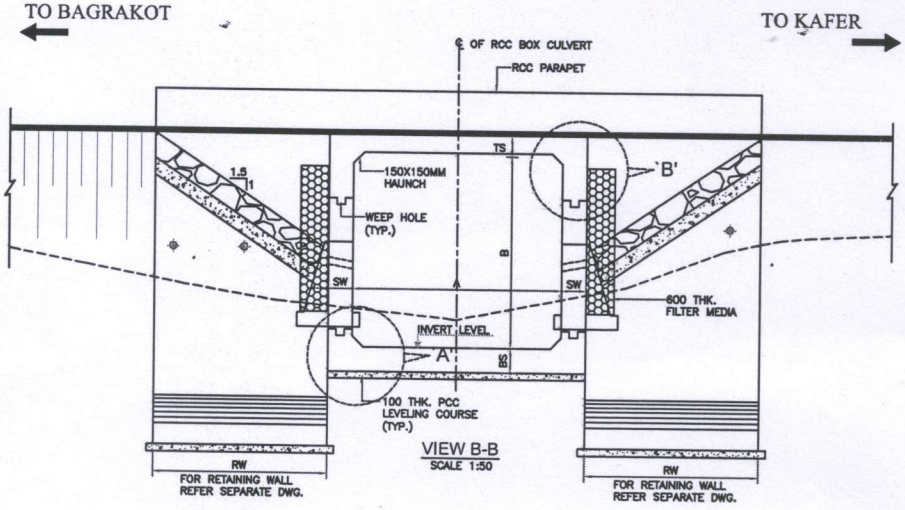
NOTES:–

1. ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES UNLESS OTHERWISE MENTIONED, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. GABION WALL DIMENSION DETAILS ARE PROVIDED IS:14458 (PART1): 1998
3. STONE TO BE HAND PACKED. STONE SHAPE IMPORTANT, BLOCKY PREFERABLE TO TABULAR. NO WEATHERED STONE TO BE USED.
4. COMPACT GRANULAR BACK FILL IN LAYERS (<15CM)
5. HILL SLOPE ANGLE SHOULD BE 35°–60°

YOGNIRA ENGINEERING & CO. LTD. REDECON INDIA PVT. LTD. Authority's Engineer Oodlabari

CLIENT:- NATIONAL HIGHWAY INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED	AUTHORITY'S ENGINEER:-	EPC CONTRACTOR :	DESIGN CONSULTANT :	PREPARED / DESIGNED / CHECKED / APPROVED	PROOF CONSULTANT : (Highway) (Structure)	SAFETY CONSULTANT : Safety Consultant	PROJECT : CONSTRUCTION AND UPGRADATION OF EXISTING ROAD TO 2-LANE WITH PAVED SHOULDER OF BAGRAKOT-KAFER SECTION OF NH-717A FROM KM 35.000 TO KM 39.500 ON EPC MODE UNDER SARDP-NE PHASE 'A' IN THE STATE OF WEST BENGAL (PACKAGE-IV C) ON DESIGNING, PROCUREMENT & CONSTRUCTION (EPC) MODE	SCALE: AS SHOWN	REV.: R0	PAPER: A-3	DRAWING NO.
								TITLE: GABION WALL DETAILS			DATE : MAY, 2023





NOTES:-

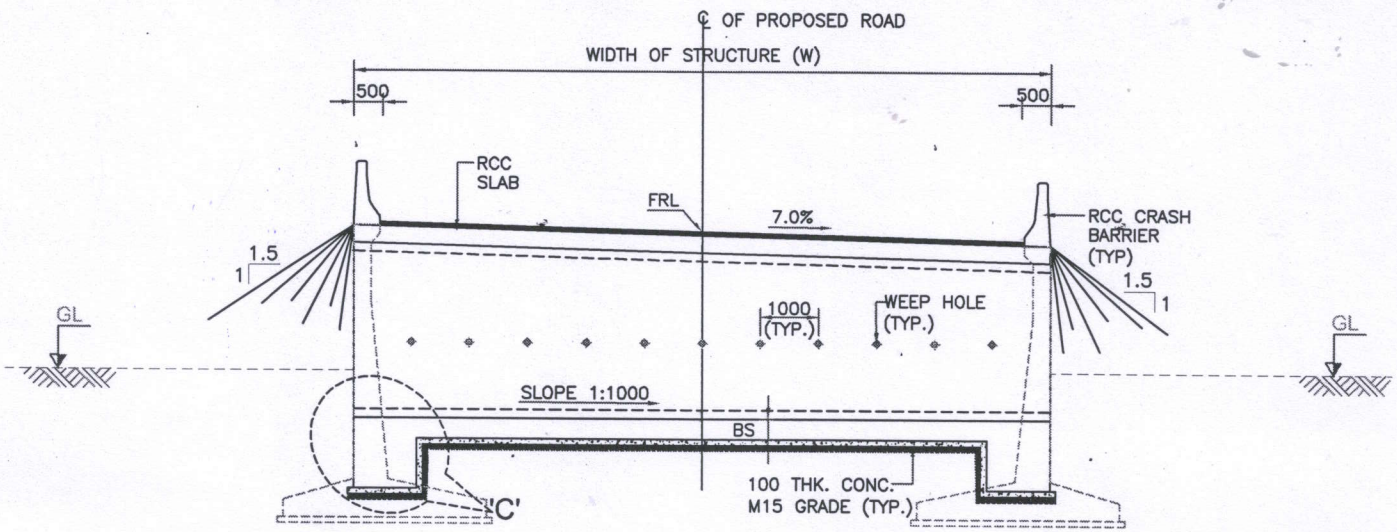
1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
2. NO DIMENSION SHALL BE MEASURED FROM THE DRAWINGS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS. FRL, BED LEVEL, CAMBER/SUPERELEVATION AND LAYOUT SHALL ALSO BE VERIFIED AT SITE BEFORE EXECUTION. DISCEPANCIES SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR REVISION IN DRAWINGS, IF ANY.
4. CHAINAGE OF THE STRUCTURE IS AT THE CENTER LINE OF THE PROPOSED STRUCTURE.
5. THE REINFORCEMENT SHALL BE HYSD BARS OF GRADE DESIGNATION Fe 5000 CONFORMING TO IS 1786–2008.
6. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH FOR DIFFERENT ELEMENTS AS FOLLOWS:
   - a. RCC BOX TYPE STRUCTURE – M30
   - b. RCC EARTH RETAINER – M30
   - c. RCC CRASH BARRIER – M40
   - d. PCC LEVELING COURSE – M15
   - e. RCC RETAINING WALL – M30
   - f. PCC TOE WALL – M20
7. CLEAR COVER TO OUTER STEEL SHALL BE AS FOLLOWS:–
   - a. TOP SLAB – 40MM
   - b. VERTICAL FACE IN CONTACT WITH EARTH – 75MM
   - c. VERTICAL FACE NOT IN CONTACT WITH EARTH – 40MM
   - d. BOTTOM SLAB – 75MM
8. BACK FILLING BEHIND WALLS/ABUTMENT SHALL CONSISTS OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC:78–2014 HAVING PROPERTIES C=0, ϕ>=30°, γ=2.0t/cu.m.
9. 65mm THICK WEARING COURSE COMPRISING OF 40mm THICK ASPHALTIC CONCRETE OVER LAID WITH 25MM THICK MASTIC ASPHALT SHALL BE PROVIDED AS PER SECTION 500 OF MORTH.
10. ALL SOLID WALLS RETAINING THE EARTH SHALL BE PROVIDED WITH WEEP HOLES (100MM DIA AND SLOPE 1V:20H) STARTING 150MM ABOVE THE GROUND LEVEL AND SPACED 1000MM C/C BOTH HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER.
11. 600THK FILTER MEDIA SHALL BE PROVIDED BEHIND RCC BOX WALL & RCC RETURN WALL (REFER APPENDIX–6 OF IRC:78–2014).
12. CONDITION OF EXPOSURE IS MODERATE. CONFIRMING TO IRC:112–2011.
13. FORMATION LEVEL SHOWN IS AT CENTER LINE OF CARRIAGEWAY.
14. THE STRUCTURE HAS BE DESIGNED FOR LIVE LOAD COMBINATIONS CONFORMING TO IRC: 6–2016.
15. THE INVERT LEVEL SHALL BE KEPT MIN. 500mm BELOW LOWEST BED LEVEL.
16. SBC AT FOUNDING LEVEL CONSIDERED IN DESIGN IS 10t/m² AND SAME SHALL BE VERIFIED/ENSURED BEFORE EXECUTION AT SITE.
17. CONDITION OF EXPOSURE IS MODERATE.
18. FLOOR APRON & PITCHING SHALL BE PROVIDED ACCORDING TO SITE CONDITION AND AS PER IRC SP 13 :2004.

LEGEND:-

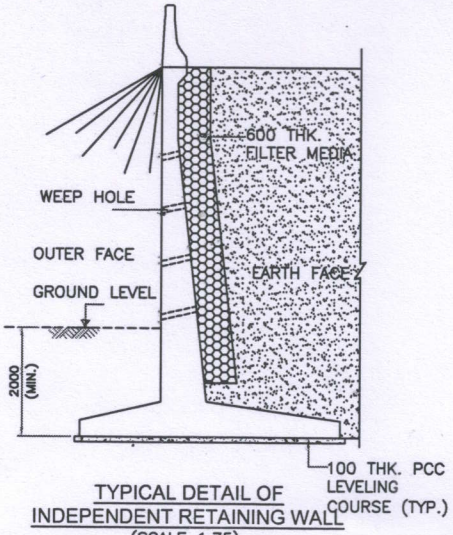
FRL	–	FINISHED ROAD LEVEL
LHS	–	LEFT HAND SIDE
RHS	–	RIGHT HAND SIDE
GL	–	GROUND LEVEL
FDN	–	FOUNDATION
LVL	–	LEVEL
EG	–	EXPANSION GAP

REFERENCE DRAWINGS:

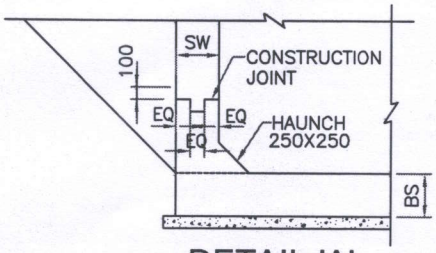
1.) RETAINING WALL:–
NH–717A–STR–RW–TYP–01



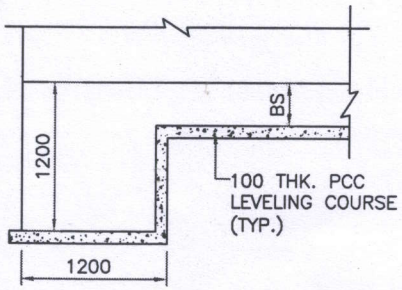
SECTION A-A
(SCALE 1:100)



TYPICAL DETAIL OF INDEPENDENT RETAINING WALL
(SCALE 1:75)

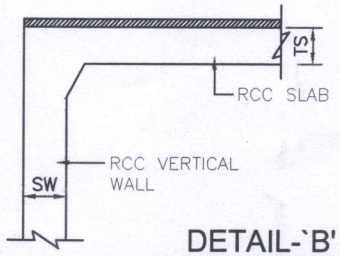


DETAIL-'A'
(SCALE 1:50)

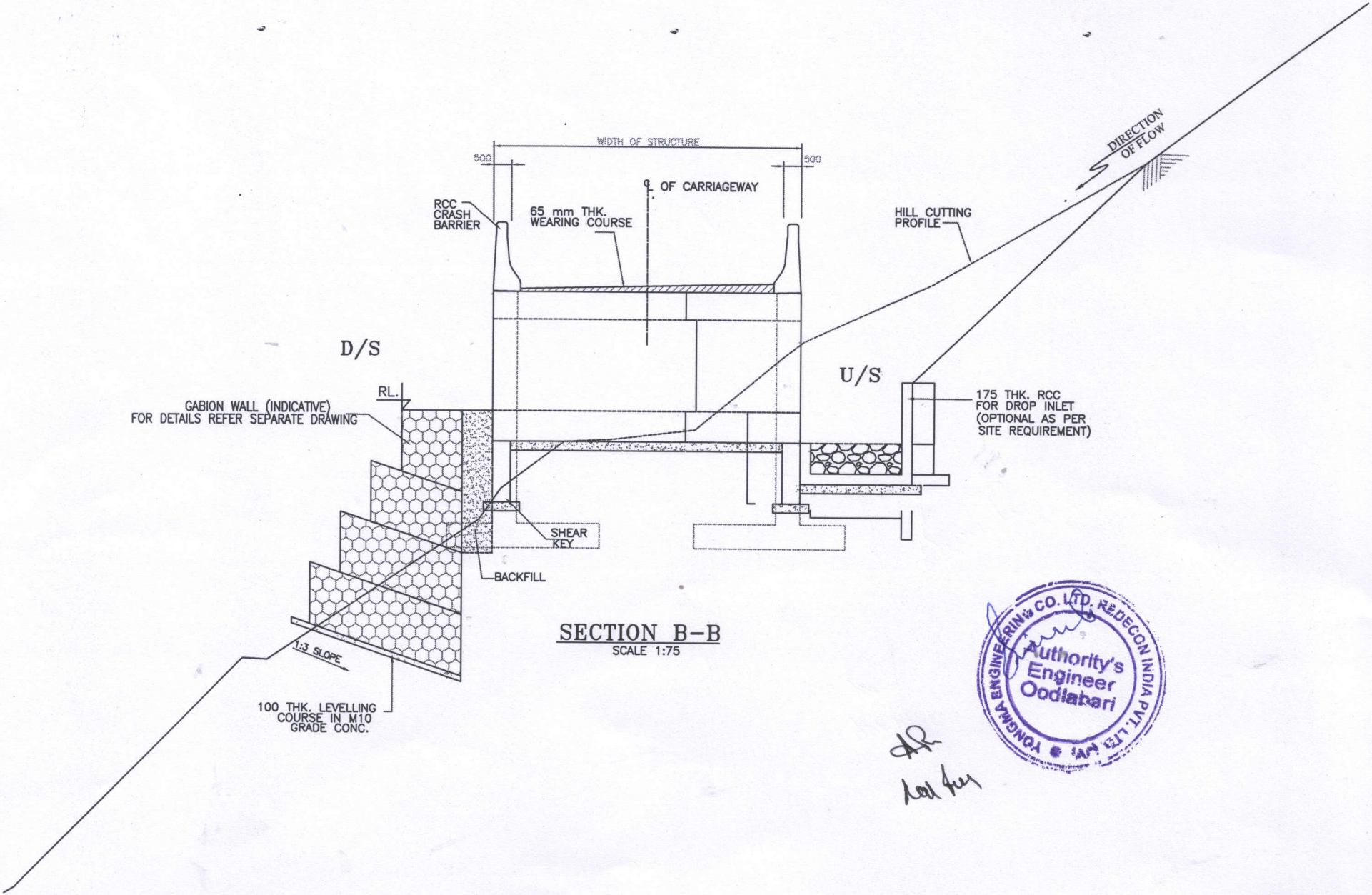


DETAIL-'C'
(SCALE 1:50)

SHEAR KEY



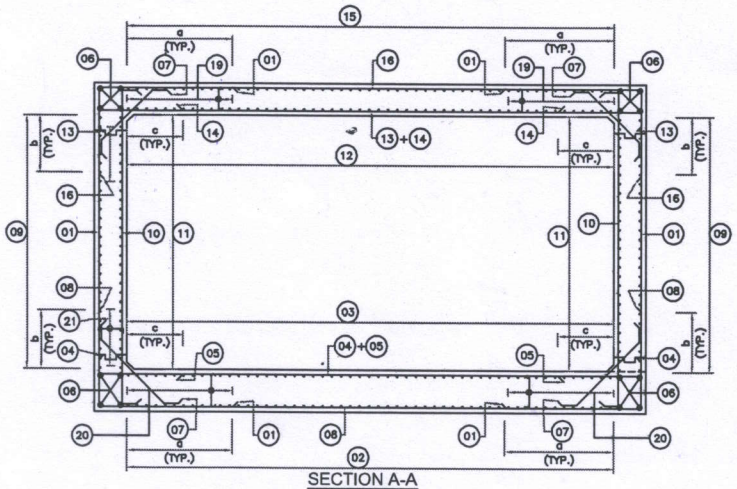
DETAIL-`B'
(SCALE 1:50)



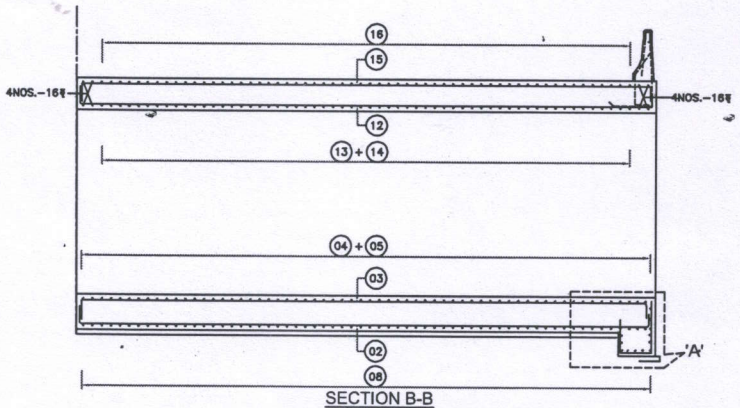
SECTION B–B

SCALE 1:75

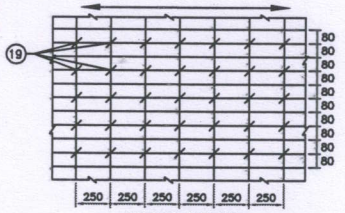
YONGMA ENGINEERING & CO. LTD. REDECON INDIA PVT. LTD. JV
Authority's Engineer Oodlabari



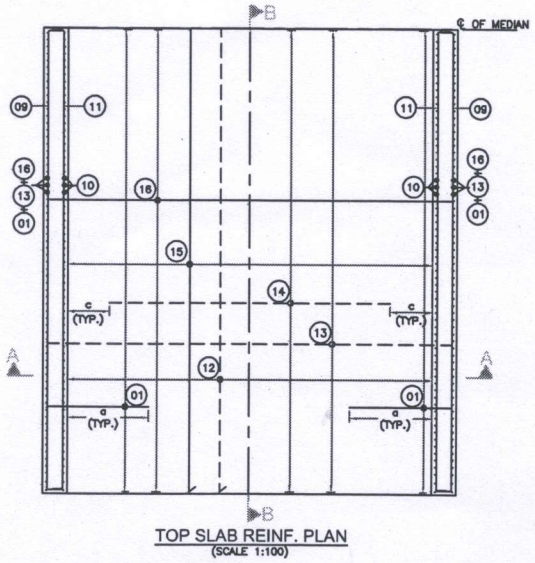
SECTION A-A
(SCALE 1:75)



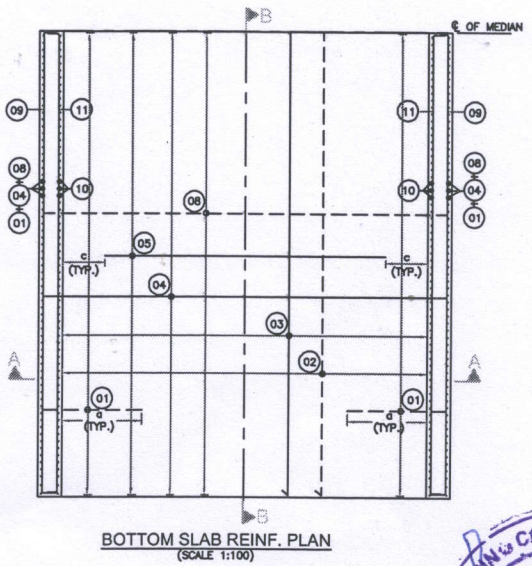
SECTION B-B
(SCALE 1:75)
(REINF. DETAILS OF LHS CARRIAGEWAY
SAME TO ADOPTED FOR RHS CARRIAGEWAY)



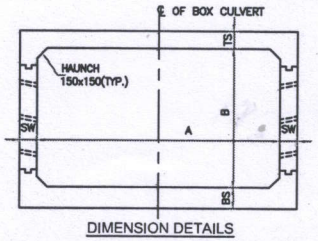
FOR TOP SLAB
DETAILS SHOWING LINK CONFIGURATION



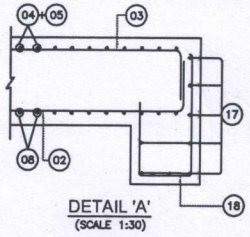
TOP SLAB REINF. PLAN
(SCALE 1:100)



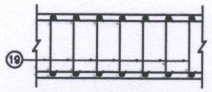
BOTTOM SLAB REINF. PLAN
(SCALE 1:100)



DIMENSION DETAILS



DETAIL 'A'
(SCALE 1:30)



DETAIL OF LINKS TYP.
(SCALE 1:30)

LEGEND:-

REINF. ON OUTER/BOTTOM FACE ---------
REINF. ON EARTH/TOP FACE ———

TS – TOP SLAB THICKNESS
BS – BOTTOM SLAB THICKNESS
SW – SIDE WALL THICKNESS
WW – WIDTH OF WING WALL
A – CLEAR SPAN SQUARE
B – CLEAR HEIGHT

a = 0.3A
b = 0.3B
c = 0.15A
d = 0.15B
A = CLEAR SPAN (MIN.)
B = CLEAR HEIGHT

YONGMA ENGINEERING & CO. LTD. & YONGMA CONSTRUCTION INDIA PVT. LTD.
Authority's Engineer
Oodlabari

DIMENSION SCHEDULE

SIZE	RCC BOX DIMENSIONS					MAXIMUM BASE PRESSURE (t/m^2)
	A(mm)	B(mm) (MIN.)	TS(mm)	BS(mm)	SW(mm)	
1x3.0x2.0	3000	2000	250	300	300	7.00

NOTES:-

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED. NO DIMENSION SHALL BE SCALED.
2. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH FOR DIFFERENT ELEMENTS AS FOLLOWS:
   a.RCC BOX STRUCTURE – M30
3. CLEAR COVER TO OUTER STEEL SHALL BE AS FOLLOWS:–
   a.SUPERSTRUCTURE 45MM
   b.VERTICAL FACE IN CONTACT WITH EARTH 75MM
   c.VERTICAL FACE NOT IN CONTACT WITH EARTH 45MM
   d.FOUNDATION 75MM
4. THE REINFORCEMENT SHALL BE HYSD BARS OF GRADE DESIGNATION Fe 500D CONFORMING TO IS 1786–2008.
5. WATER STOPPER SHOULD BE PROVIDED AT CONSTRUCTION JOINT LOCATION.
6. LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOME UNAVOIDABLE, LAP LENGTH SHALL BE PROVIDED AS PER CLAUSE 15.2.5 IRC:112–2011:
   * $\alpha_1 x 40\phi$ (GRADE M30) FAVOURABLE CONDITION
   * $\alpha_1 x 1.43 x 40\phi$ (GRADE M30) UNFAVOURABLE CONDITION

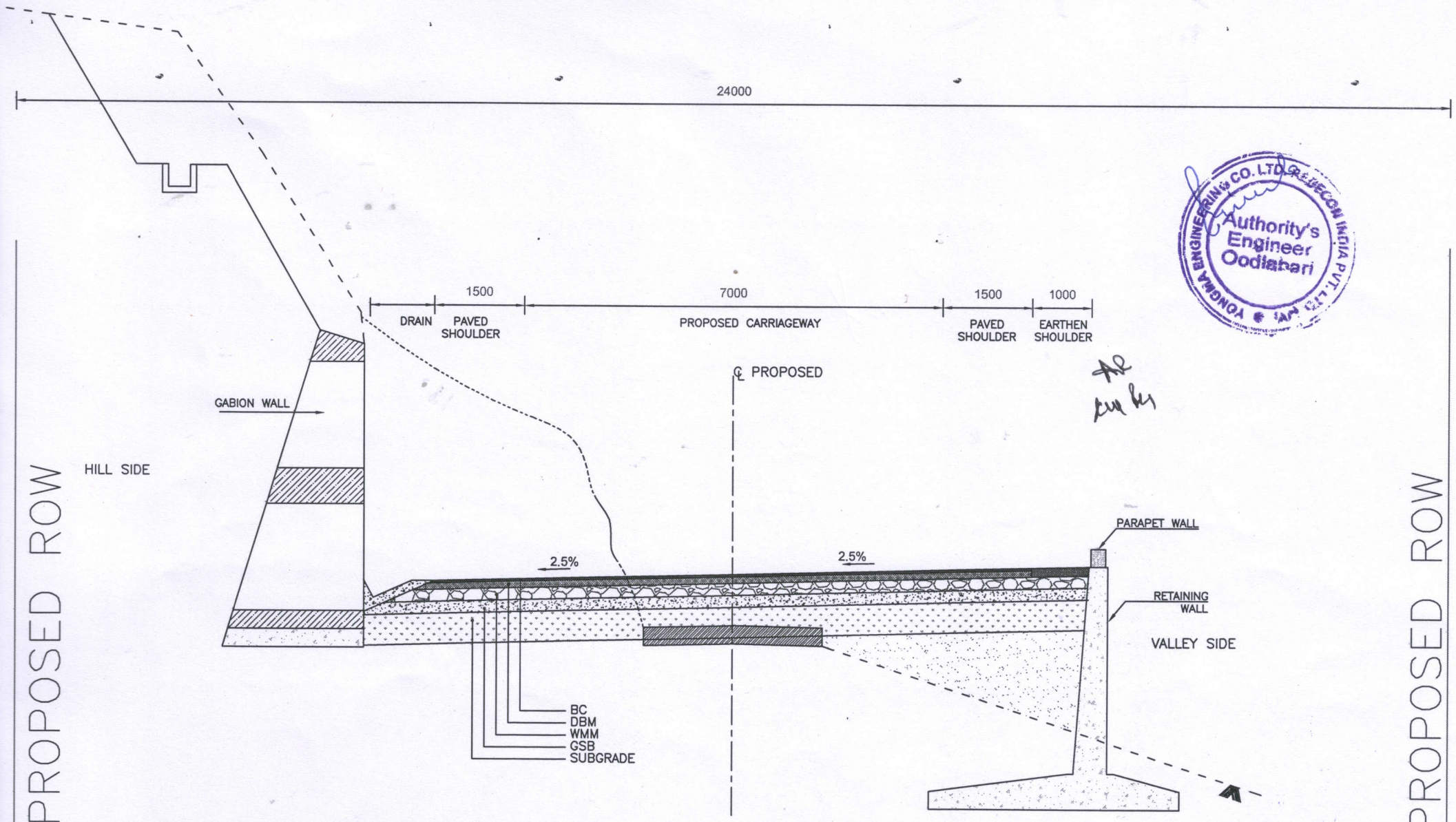
PERCENTAGE OF LAPPED BARS RELATIVE TO TOTAL CROSS–SECTIONAL AREA	<25%	33%	50%	>50%
α_1	1	1.15	1.4	1.5

7. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT GENERAL ARRANGEMENT DRAWING.

YONGMA ENGINEERING CO. LTD. REDECON INDIA PVT. LTD. Authority's Engineer Oodlabari

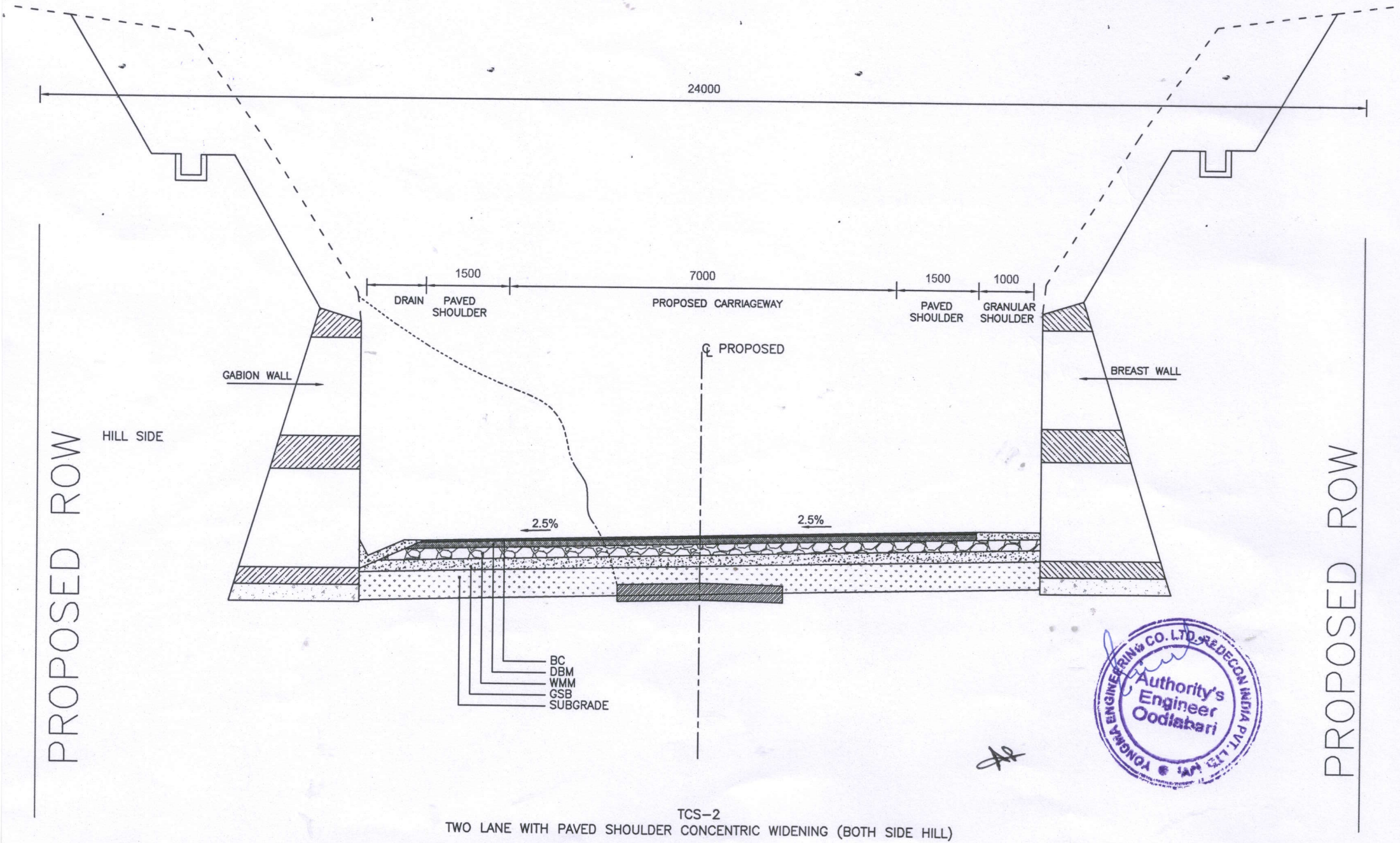
SCHEDULE OF REINFORCEMENT

	BAR NO.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
SIZE	BAR BEND LENGTH	M M	M M	M M	M M		M M	M M	M M	M M	M M	M M	M M	M M		M M	M M	M M	M m=1100		
1x3.0x2.0	M	1125	150	150	150	AS SHOWN	150	150	1125	125	150	125	150	175	AS SHOWN	150	1125	200	850		
0.0m CUSHION		10ϕ @160	8ϕ @250	8ϕ @250	10ϕ @160	10ϕ @160	10ϕ4x4NOS.	10ϕ @160	10ϕ @160	8ϕ @250	10ϕ @175	8ϕ @250	8ϕ @250	10ϕ @160	10ϕ @160	8ϕ @250	10ϕ @160	10ϕ –15NOS.	10ϕ @250	10ϕ @160 &250	10ϕ @160 &250

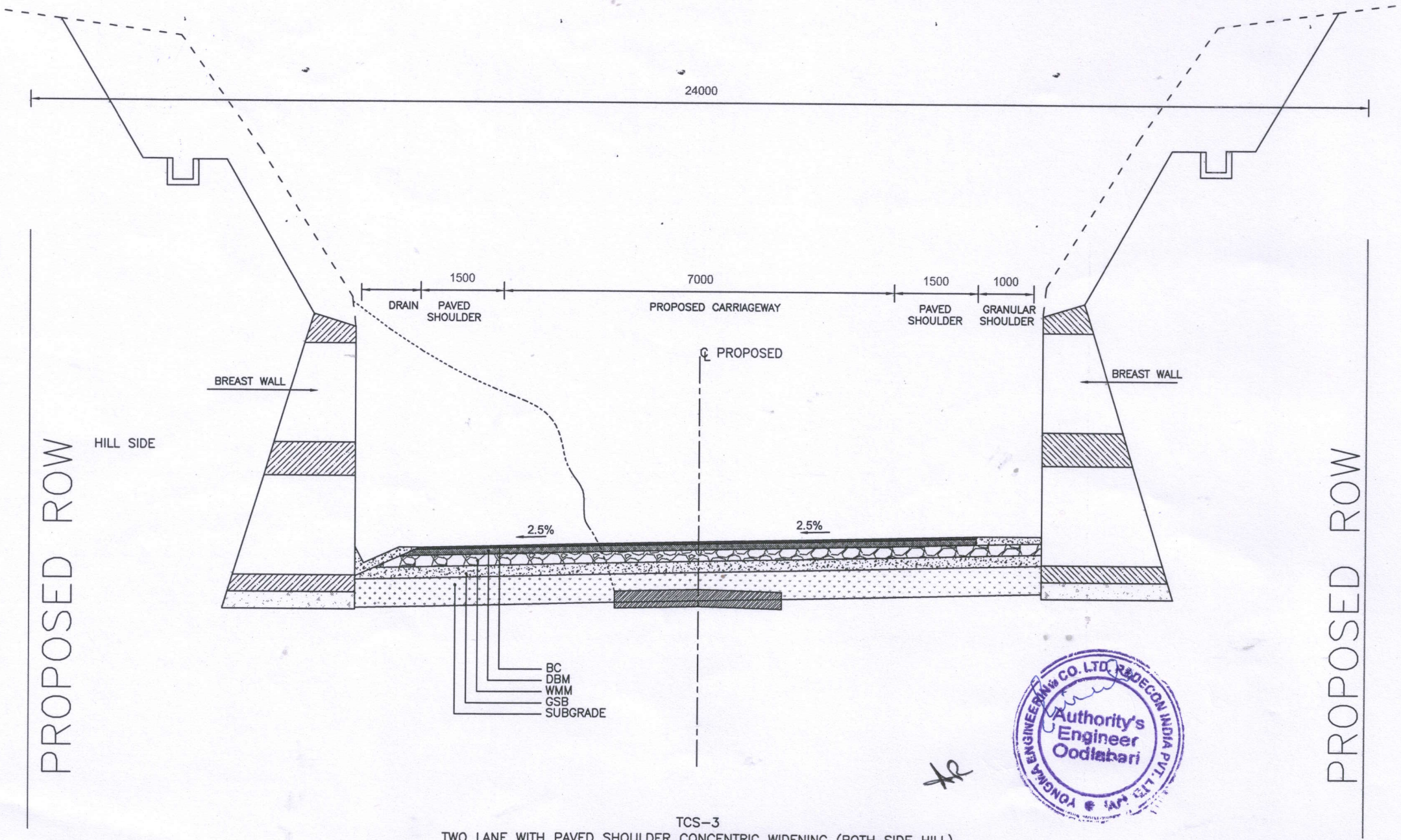


TCS–1

TWO LANE WITH PAVED SHOULDER CONCENTRIC WIDENING (ONE SIDE HILL ONE SIDE VALLEY SECTION)



TCS–2
TWO LANE WITH PAVED SHOULDER CONCENTRIC WIDENING (BOTH SIDE HILL)



TCS–3
TWO LANE WITH PAVED SHOULDER CONCENTRIC WIDENING (BOTH SIDE HILL)