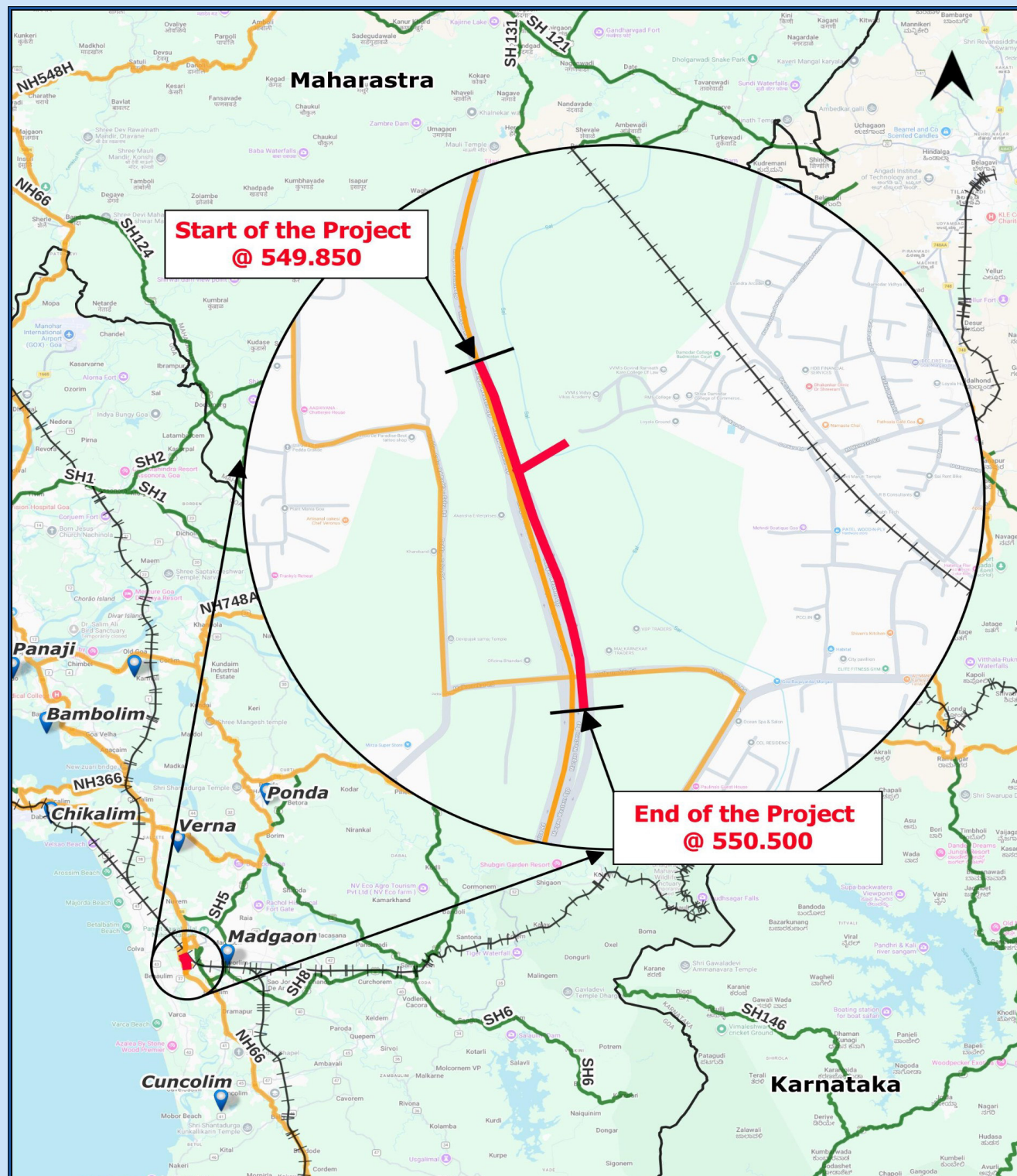


GOVERNMENT OF GOA

PUBLIC WORKS DEPARTMENT (NATIONAL HIGHWAYS)

Construction of service road and improvement of Khareband junction with road safety measures from Km 550.020 to Km 550.530 on Margao bypass section of NH-66.



STRUCTURAL DRAWINGS

Consultant



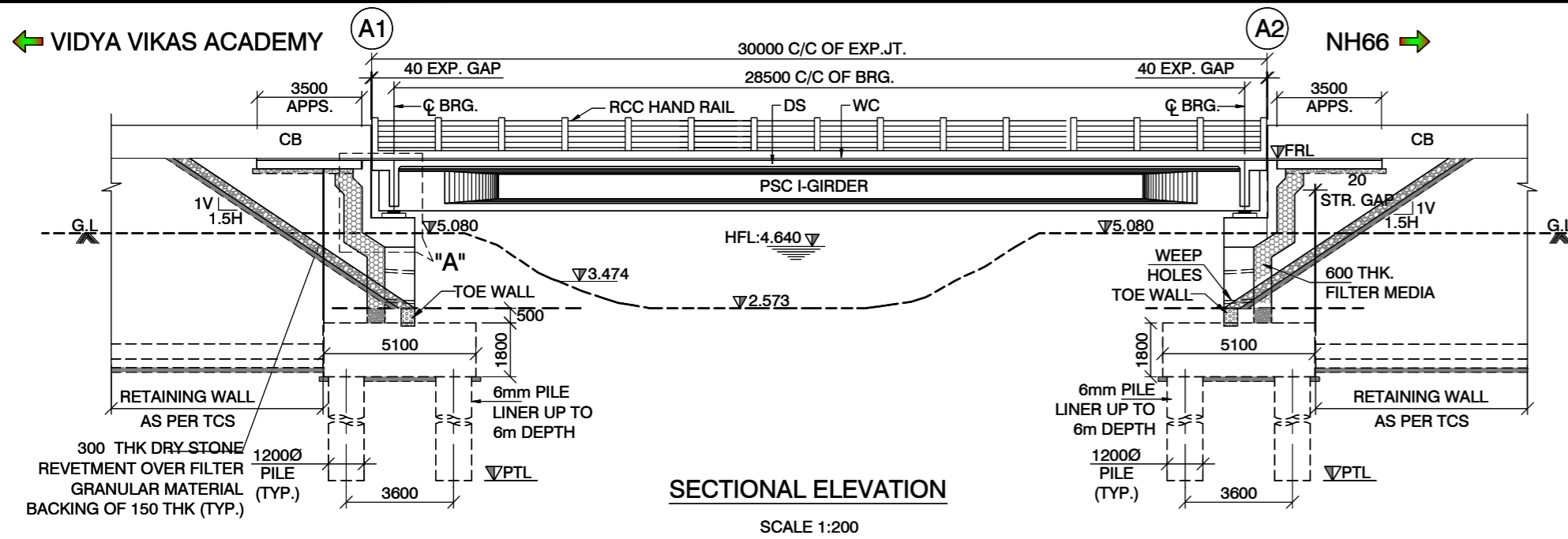
aarvee engineering consultants limited

8-2-5, Ravula Residency, Srinagar Colony Main Road, Hyderabad-82, Telangana, India.

Tel: +91-40-4848 3456, 2373 7633; Fax: +91-40-23736277

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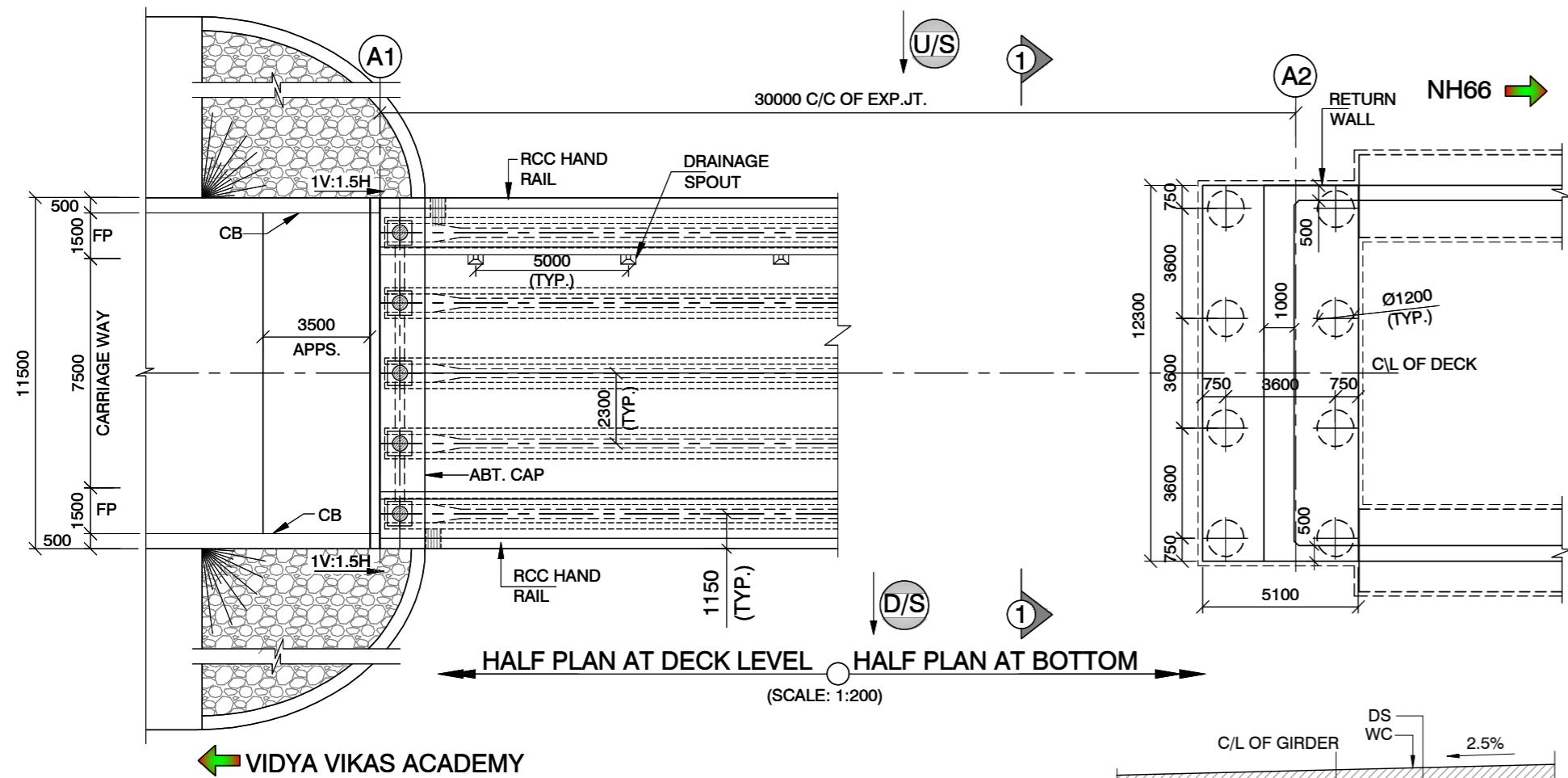
MINOR BRIDGES



SECTIONAL ELEVATION

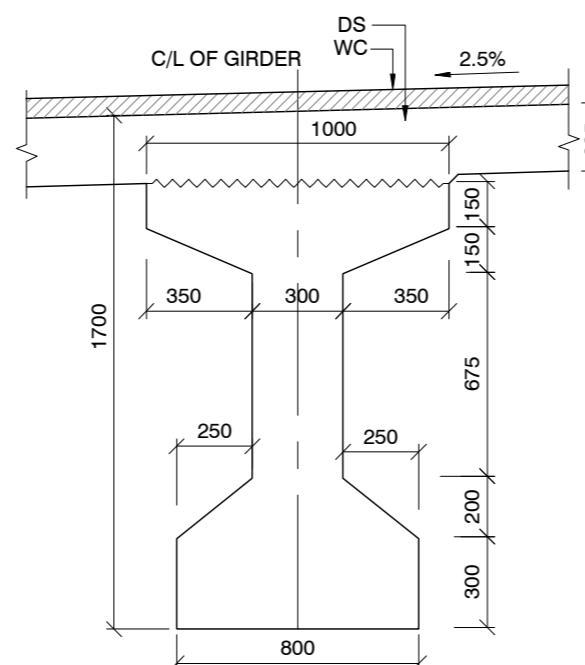
SCALE 1:200

FRL	7.604	7.680	7.681
GROUND LEVEL	2.573		2.573
PILE TIP LEVEL	-17.427		-17.427
CHAINAGE	0+031	0+046	0+061



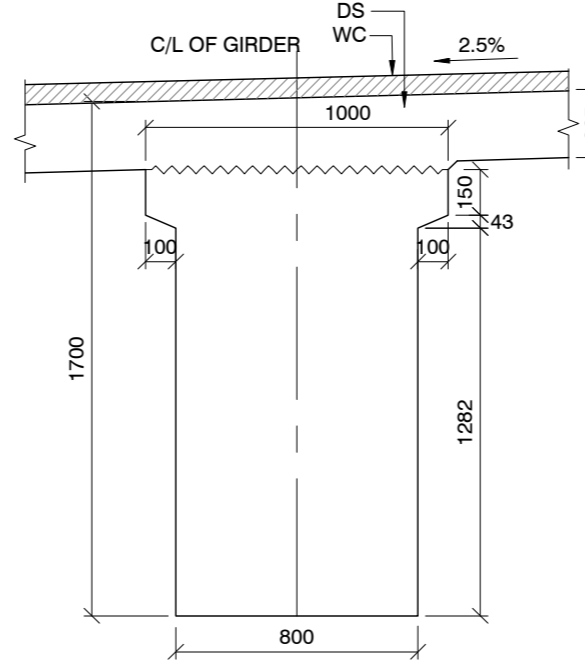
HALF PLAN AT DECK LEVEL HALF PLAN AT BOTTOM

(SCALE: 1:200)



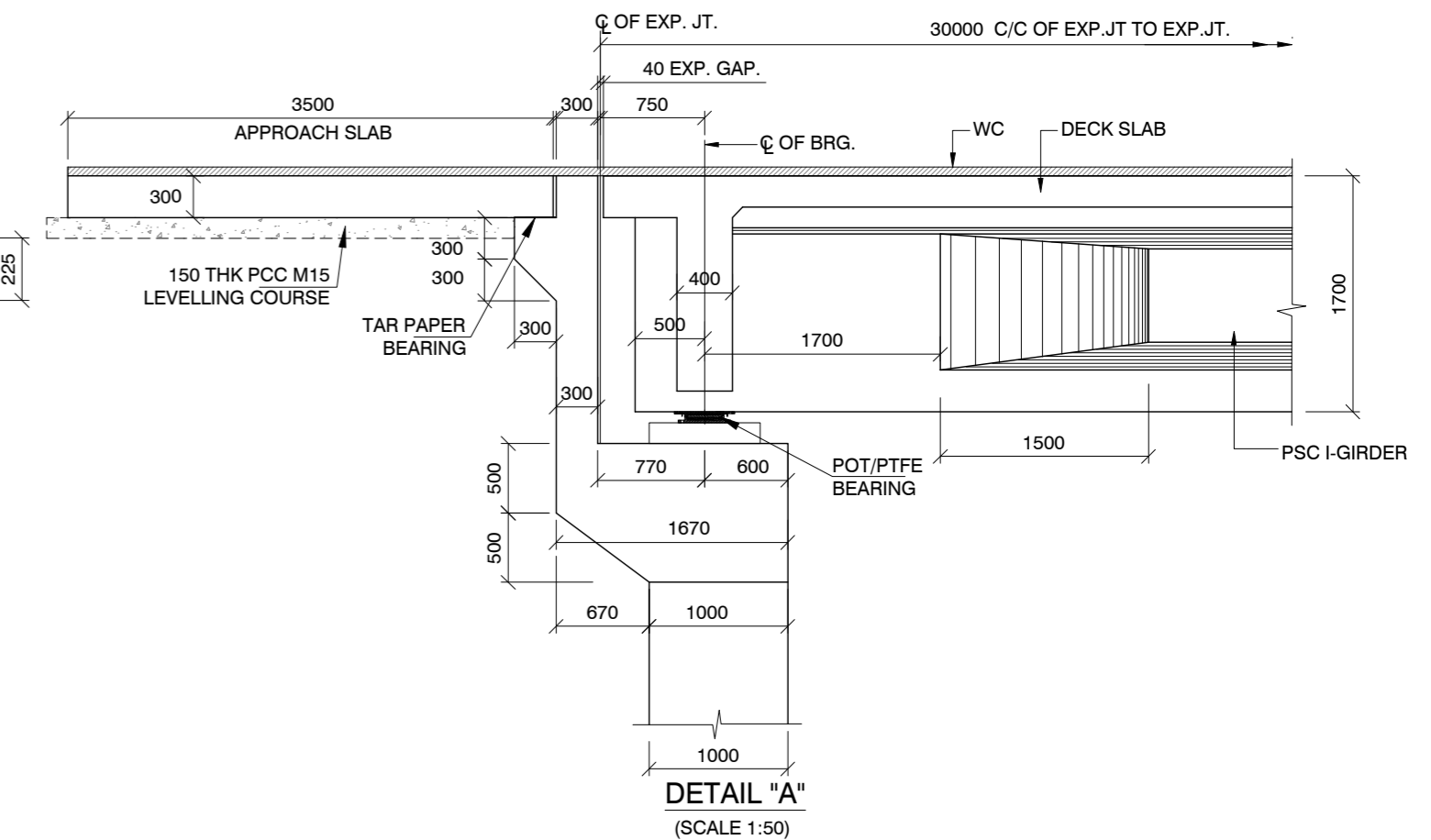
SECTION OF PSC GIRDER AT MID SPAN

SCALE 1:25



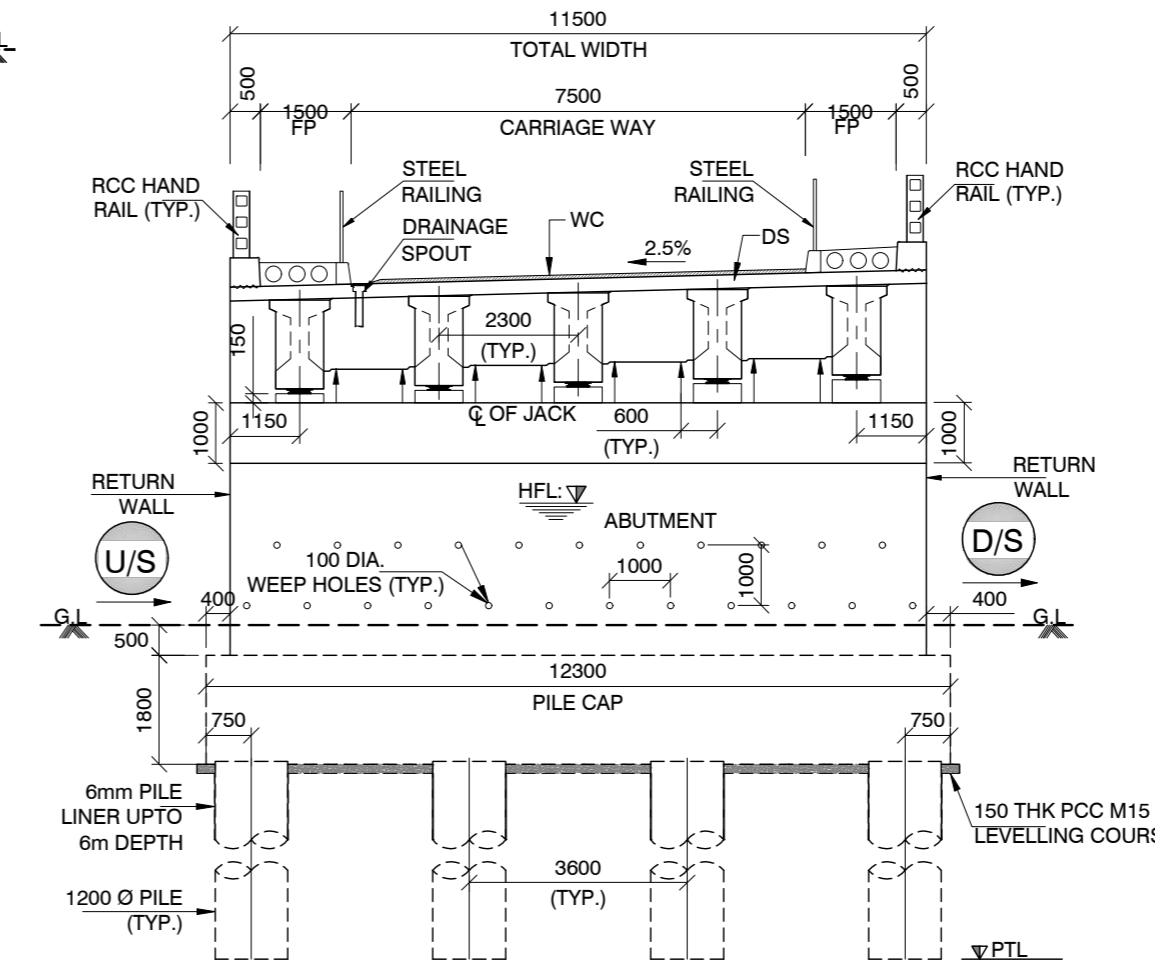
SECTION OF PSC GIRDER AT SUPPORT

SCALE 1:25



DETAIL "A"

(SCALE 1:50)



SECTION AT 1-1

SCALE 1:125

- TYP. : TYPICAL
 APPS. : APPROACH SLAB
 THK. : THICK
 LVL. : LEVEL
 WC : WEARING COAT
 DS : DECK SLAB
 BRG. : BEARING
 F.P. : FOOTPATH
- C.L. : CENTER LINE
 C/C : CENTER TO CENTER
 BRG. : BEARING
 GL : GROUND LEVEL
 PTL : PILE TIP LEVEL
 FRL : FINISHED ROAD LEVEL
 EXP. : EXPANSION
 JT. : JOINT

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES, UNLESS OTHERWISE SPECIFIED.
- DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE BRIDGE IS DESIGNED FOR 2 LANE OF 1 LANE OF 70R OR 2 LANE OF CLASS A LOADING WHICHEVER GOVERNS.
- DESIGN CRITERIA HAS BEEN FROM THE FOLLOWING CODES:
 a) IRC 5 :2015 b) IRC 6: 2017
 c) IRC: 112 - 2020 d) IRC: 78 - 2022
- THE REINFORCEMENT SHALL BE BARS OF GRADE DESIGNATION Fe 500 CONFORMING TO LATEST IRC CODES / MORTH CIRCULARS.
- GRADE OF CONCRETE MIX SHALL BE AS FOLLOWS :-
 a) PCC M15 e) PSC GIRDER M45
 b) PILE & PILE CAP M35 f) DECK SLAB M35
 c) SUBSTRUCTURE M35 g) CRASH BARRIER M40
 d) APPROACH SLAB M30
- MINIMUM CLEAR COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOWS :-
 SUPER STRUCTURE - 45
 SUBSTRUCTURE - 75 (EARTH FACE)
 - 50 (NON- EARTH FACE)
- THE BRIDGE LIES IN SEISMIC ZONE - III.
- STRIP SEAL TYPE EXPANSION JOINT SHALL BE PROVIDED.
- COMPRESSIBLE FILLER BOARD SHALL BE PROVIDED IN ALL STRUCTURE GAPS PROVIDED BETWEEN ELEMENTS AND SHALL BE SEALED WITH POLYSULPHIDE SEALANT.
- BACK FILL FOR RE WALLS SHALL CONFORM TO SPECIFICATIONS GIVEN IN APPENDIX-6 OF IRC : 78.
- POT/PTFE BEARINGS SHALL BE USED.
- THE REINFORCEMENT OF CRASH BARRIER & RAILING SHALL BE ANCHORED INTO SLAB BEFORE CASTING THE DECK SLAB.
- THE BRIDGE IS DESIGNED FOR PILE CARRYING CAPACITY OF 400 t VERTICAL AND 30 t HORIZONTAL RESPECTIVELY. THE SAME SHALL BE ENSURED BEFORE EXECUTION.
- FOR MISCELLANEOUS DETAILS LIKE CRASH BARRIER, EXPANSION JOINTS, APPROACH SLAB, HAND RAILS, DRAINAGE SPOUTS ETC., REFER MISCELLANEOUS DRAWINGS.
- THE FRL, CROSS SLOPE AND LONGITUDINAL GRADIENT SHALL BE VERIFIED WITH CORRESPONDING PLAN OF PROFILE.
- THE FOUNDATION RECOMMENDATION IS AS PER THE GEO TECHNICAL INVESTIGATION DONE DURING FEASIBILITY STAGE. THE SAME TO BE ASCERTAINED AT SITE BY CONDUCTING SUITABLE INVESTIGATION.
- THE PILE LINER SHALL BE PLACED FOR PILE OF THE SPT 'N' VALUE <9 AS PER IRC 78- 2022 OR UP TO 6.0m MINIMUM DEPTH.

REV	DESCRIPTION	DATE
R0	INITIAL SUBMISSION	JAN - 2026
R1	REVISED AS PER MODIFIED TCS	FEB - 2026

SCALES: AS MENTIONED

SCALES SHOWN ARE FOR AN A2 SIZE ORIGINAL DRAWING

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CLIENT:

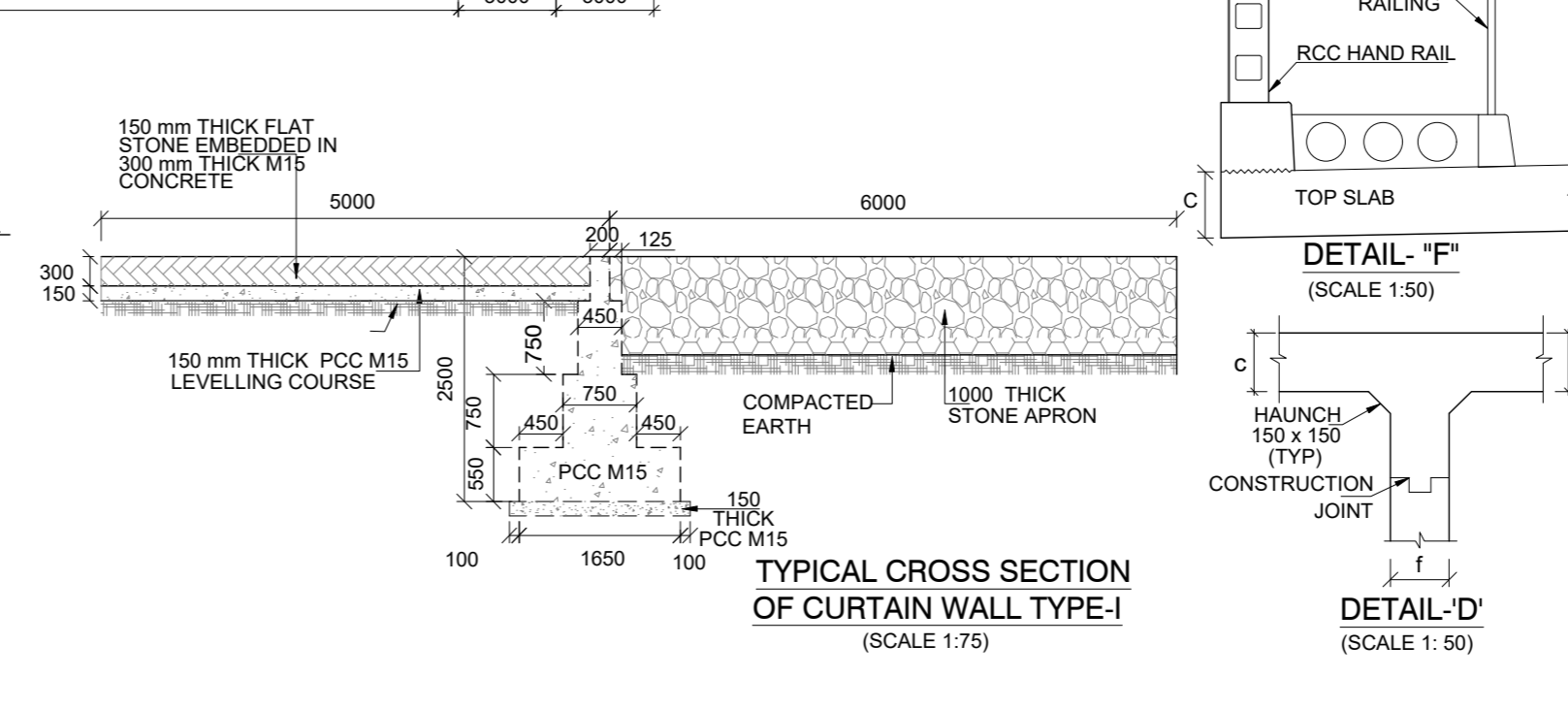
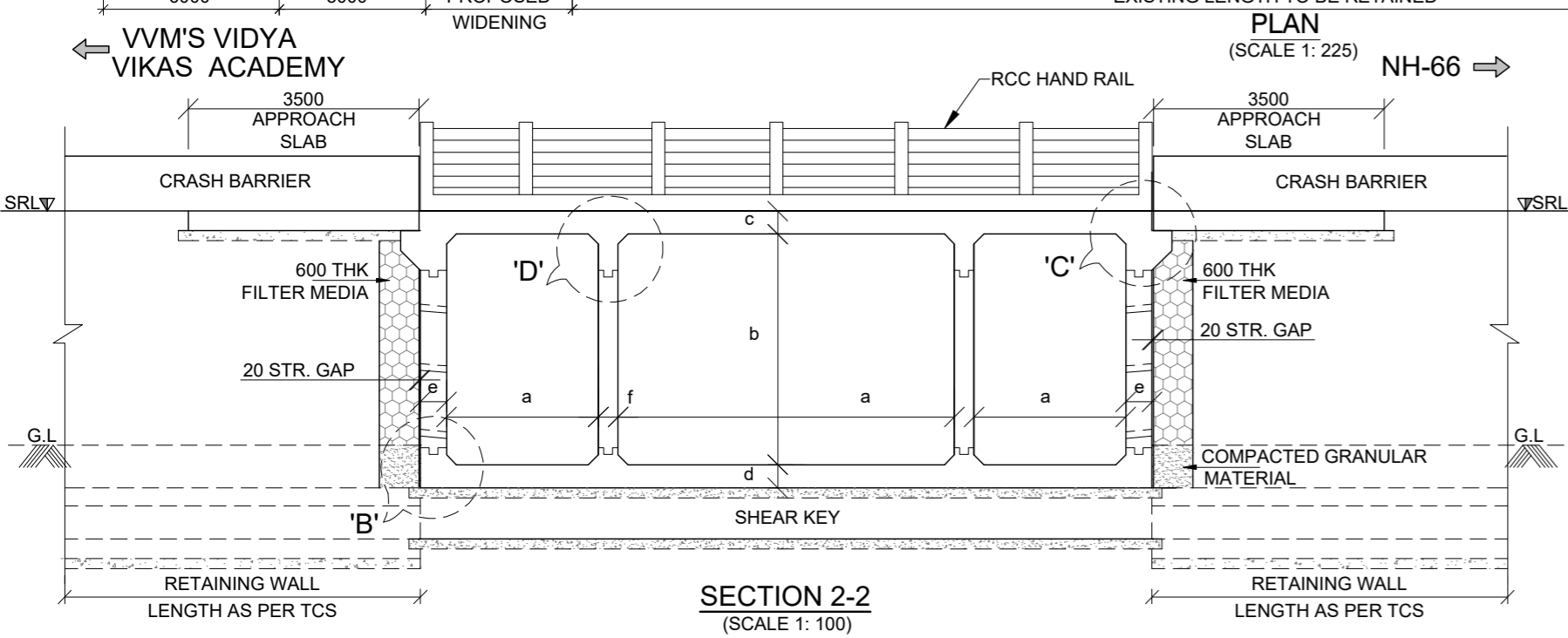
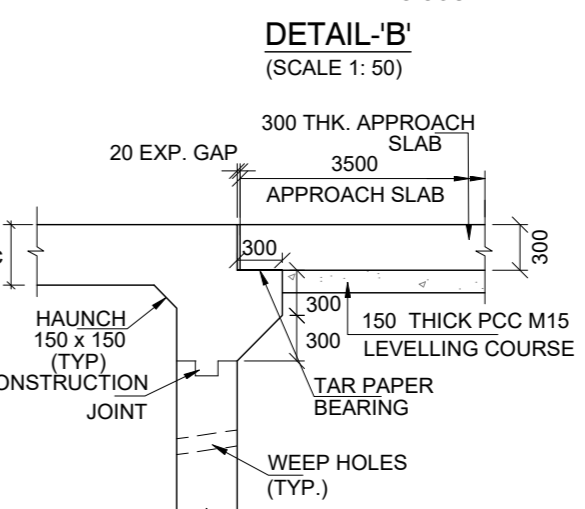
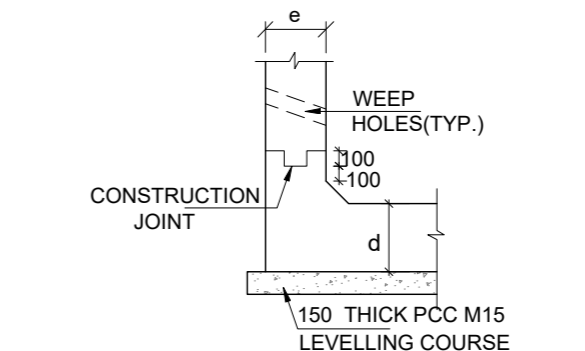
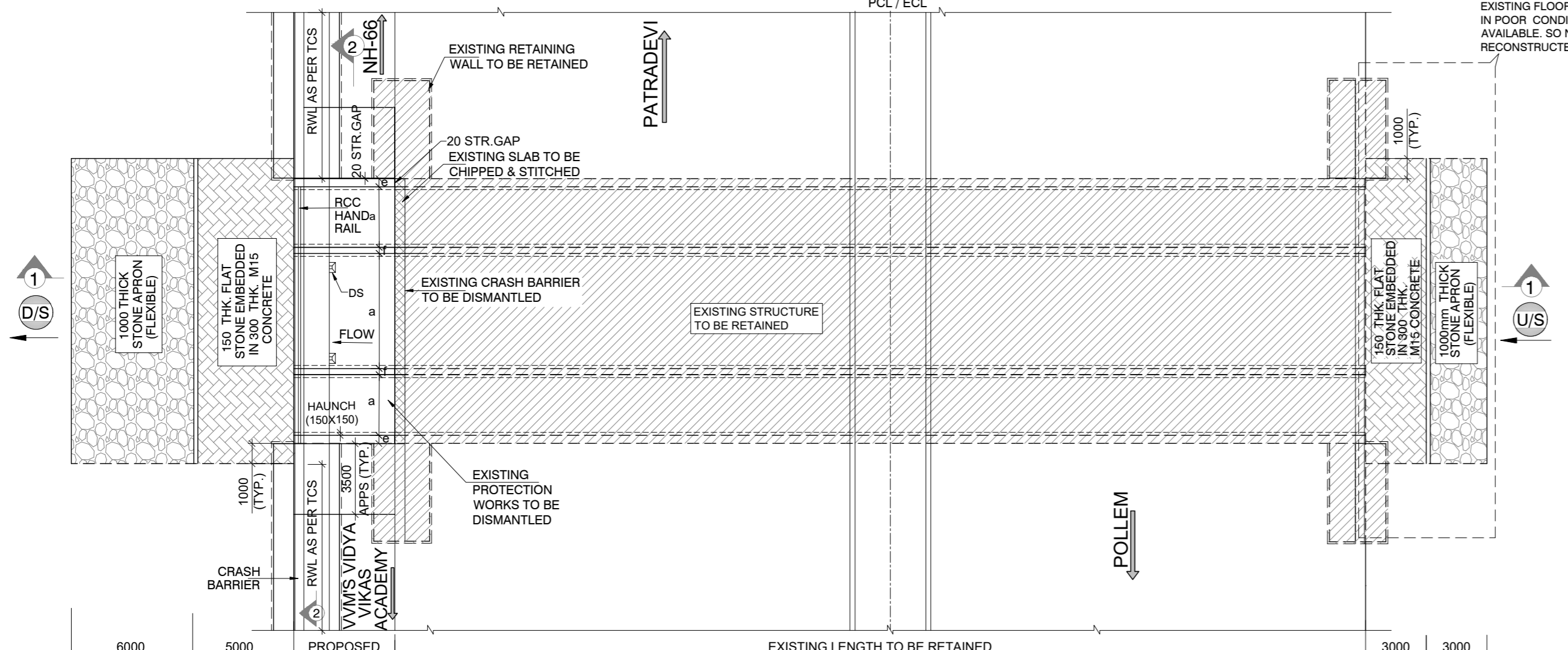
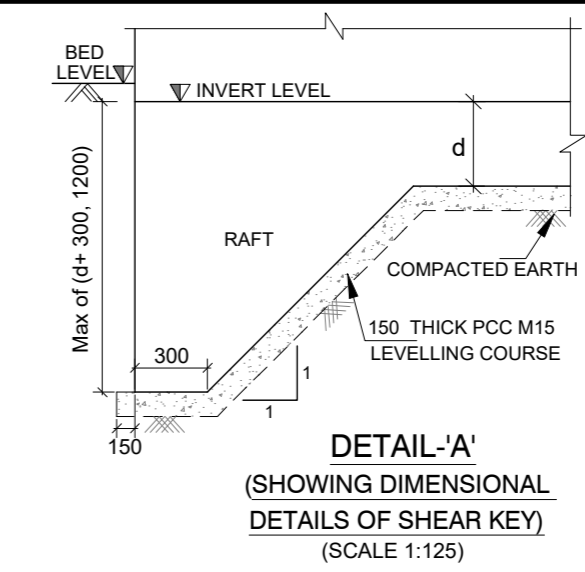
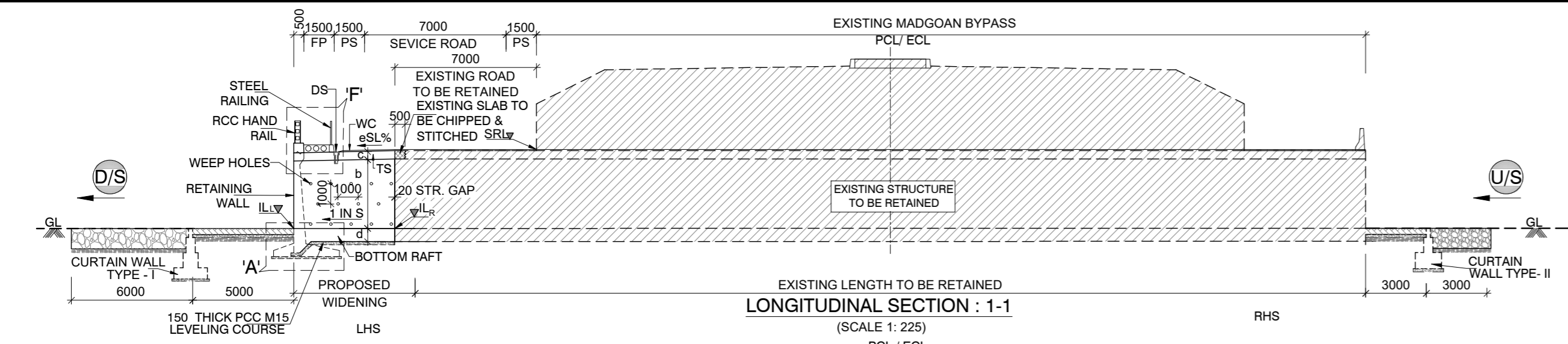
DRAWN: M.NARESH
 DESIGNED: SIBHI CHELVAN
 CHECKED: Y. PRAVEEN
 APPROVED: G. PRAVEEN

PROJECT: CONSTRUCTION OF SERVICE ROAD AND IMPROVEMENT OF KHAREBAND JUNCTION WITH ROAD SAFETY MEASURES FROM Km 549.850 TO Km 550.450 ON MARGAO WESTERN BYPASS SECTION OF NH-66 IN THE STATE OF GOA

DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR PROPOSED MINOR BRIDGE AT Km : 0+046

DRG. NO.: AA/2667/STR/MNB/0046/001

SHEET NO: 1 OF 1



- NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES, UNLESS OTHERWISE SPECIFIED.
 - DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - GRADE OF CONCRETE SHALL BE AS FOLLOWS :-
 LEVELLING COURSE M15
 BOX CELL M30
 CRASH BARRIER M40
 - MINIMUM CLEAR COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOWS :-
 NON EARTH FACE 45
 EARTH FACE 75
 CRASH BARRIER 45
 - DESIGN CRITERIA HAS BEEN FROM THE FOLLOWING CODES:
 a) IRC: SP: 13-2022 c) IRC: 112-2020
 b) IRC: 6-2017 d) IRC: 78-2014
 - THE REINFORCEMENT SHALL BE BARS OF GRADE DESIGNATION Fe 500 CONFORMING TO LATEST IRC CODES / MORTH CIRCULARS
 - BACK FILLING FOR SIDE WALL AND RETAINING WALLS SHALL CONFORM TO SPECIFICATION GIVEN AT APPENDIX-6 OF IRC : 78.
 - THE PROPERTIES OF THE MATERIALS USED FOR BACK FILLING BEHIND SIDE WALL AND RETAINING WALLS SHALL CONFORM TO THE FOLLOWING $\phi \leq 30^\circ$ & $r_d = 20.0 \text{ kN/m}^3$
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300 mm.
 - COMPRESSIBLE FILLER BOARD SHALL BE PROVIDED IN EXPANSION GAP BETWEEN SIDE WALLS AND RETAINING WALL & APPROACH SLAB AND SIDE WALL.
 - ANY DISCREPANCY NOTED SHOULD BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY.
 - ALL THE LEVELS AND CAMBERS TO BE VERIFIED WITH RESPECT TO PLAN AND PROFILE DRAWINGS BEFORE STARTING UP OF EXECUTION.
 - BACK FILLING BEHIND WALLS SHALL BE DONE SIMULTANEOUSLY ON EITHER SIDE OF THE STRUCTURE WITH HEIGHT DIFFERENCE NOT MORE THAN 1.0 m.
 - WEEP HOLES OF 100 mm DIA SHALL BE PROVIDED AT 1000 mm C/C BOTH HORIZONTALLY AND VERTICALLY IN A STAGGERED MANNER IN SIDE WALLS OF BOX CELL AND RETAINING WALLS ABOVE 150 mm FROM GL OR LWL WHICHEVER IS HIGHER.
 - 600 mm THICK FILTER MEDIA SHALL BE PROVIDED BEHIND SIDE WALLS AND RETAINING WALLS AS PER IRC : 78.
 - FOR DETAILS OF RETAINING WALL REFER SEPARATE DRAWING.
 - FOR MISCELLANEOUS DETAILS OF HAND RAILS, FOOTPATH, KERB AND DRAINAGE SPOUT REFER MISCELLANEOUS DRAWINGS.

- LEGENDS:**
- | | |
|-------------------------------------|----------------------|
| SRL = FINISHED ROAD LEVEL | TS = TOP SLAB |
| PCL = PROPOSED CENTER LINE | APPS = APPROACH SLAB |
| IL = INVERT LEVEL | S = SLOPE |
| EXP. = EXPANSION | THK. = THICK |
| JT. = JOINT | TYP. = TYPICAL |
| FP = FOOTPATH | STR. = STRUCTURE |
| PS = PAVED SHOULDER | U/S = UP STREAM |
| C.B. = CRASH BARRIER | D/S = DOWN STREAM |
| WC = WEARING COAT | |
| DS = DRAINAGE SPOUT | |
| RWL = RETAINING WALL LENGTH | |
| = EXISTING STRUCTURE TO BE RETAINED | |

SCHEDULE OF BOX MINOR BRIDGES

S. no.	Proposed Chainage (km)	Existing structure type	Existing span arrangement (m)	Existing structure length (m)	TCS	Proposal Type	Proposed structure Type	No of cells	Span Length [a] (m)			Min Vent Height (b) (m)	Top Slab [c] (m)	Bottom Slab [d] (m)	Side Wall [e] (m)	Intermediate Wall [f] (m)	Skew / Normal	Service road FRL (m)	Top slab Left edge level (m)	Service road Camber (e _s)	Flow's direction	Slope of flow	Invert Level (IL _s) (m)	Invert Level (IL _u) (m)	Total widening Length (L) (m)	Required SBC (t/m ²)
									1 st cell	2 nd cell	3 rd cell															
1	550+174	Box-MNB	1x3+1x6+1x3	7.0	IIC	Retained & Widening	Box-MNB	3.0	3.00	6.00	3.00	3.8	0.400	0.450	0.400	0.300	Normal	8.068	7.723	-2.50%	R to L	1 in 1000	3.409	3.414	5.00	12.0
2	550+369	Box-MNB	1x3+1x6+1x3	7.0	IIC	Retained & Widening	Box-MNB	3.0	3.00	6.00	3.00	3.7	0.400	0.450	0.400	0.300	Normal	6.972	6.561	-2.50%	R to L	1 in 1000	2.426	2.431	5.00	12.0

REV	DESCRIPTION	DATE
R0	INITIAL SUBMISSION	JAN - 2026
R1	REVISED AS PER MODIFIED TCS	FEB - 2026


SCALES: AS MENTIONED

SCALES SHOWN ARE FOR AN A2 SIZE ORIGINAL DRAWING

CONSULTANTS:

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CLIENT:



DRAWN: D.GOPAL RAO
 DESIGNED: SIBHI CHELVAN
 CHECKED: Y. PRAVEEN
 APPROVED: G. PRAVEEN

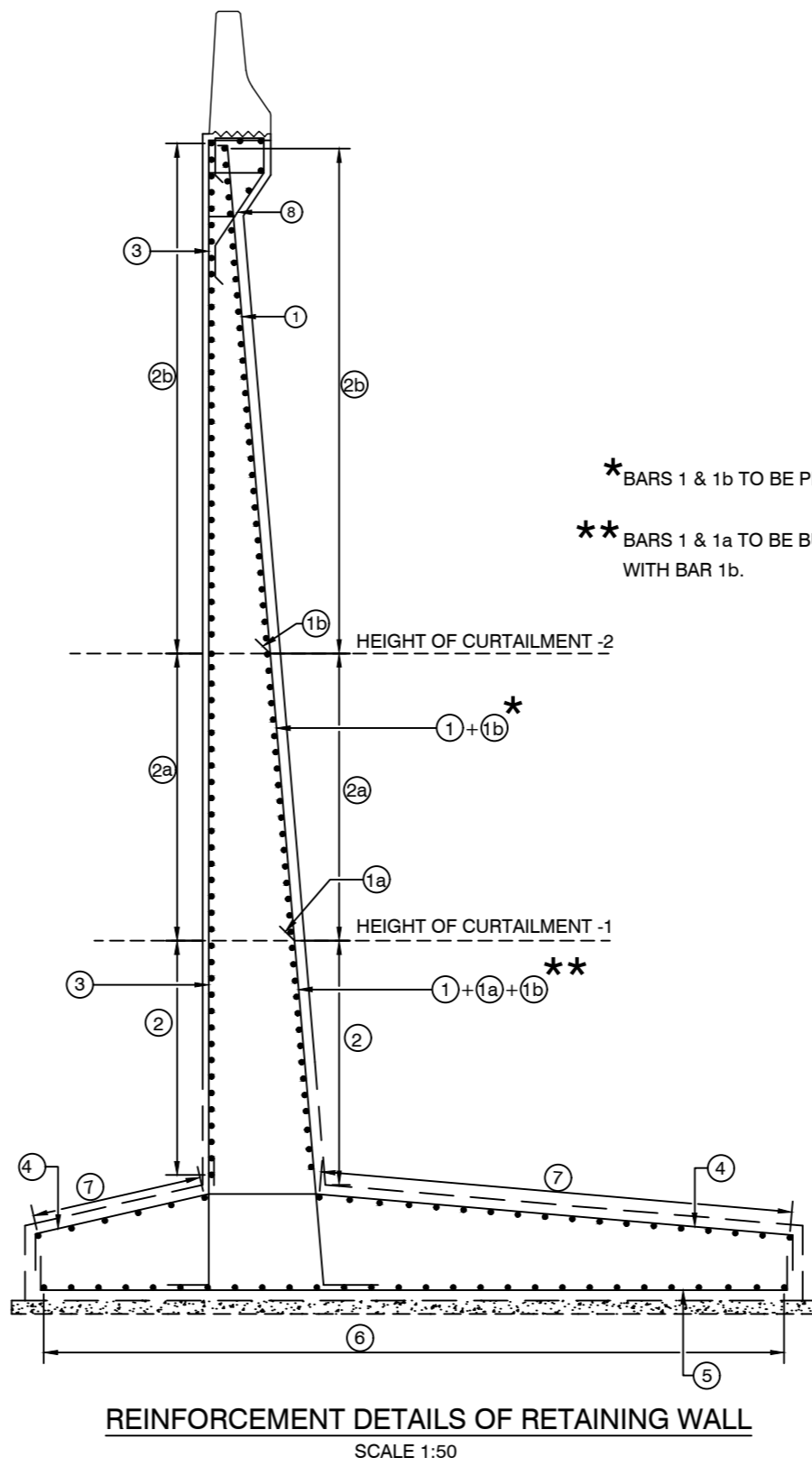
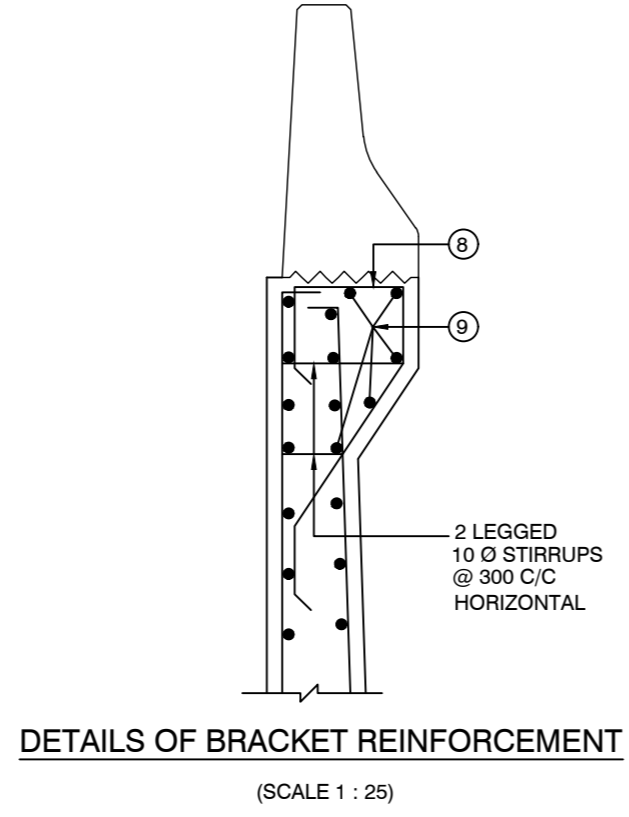
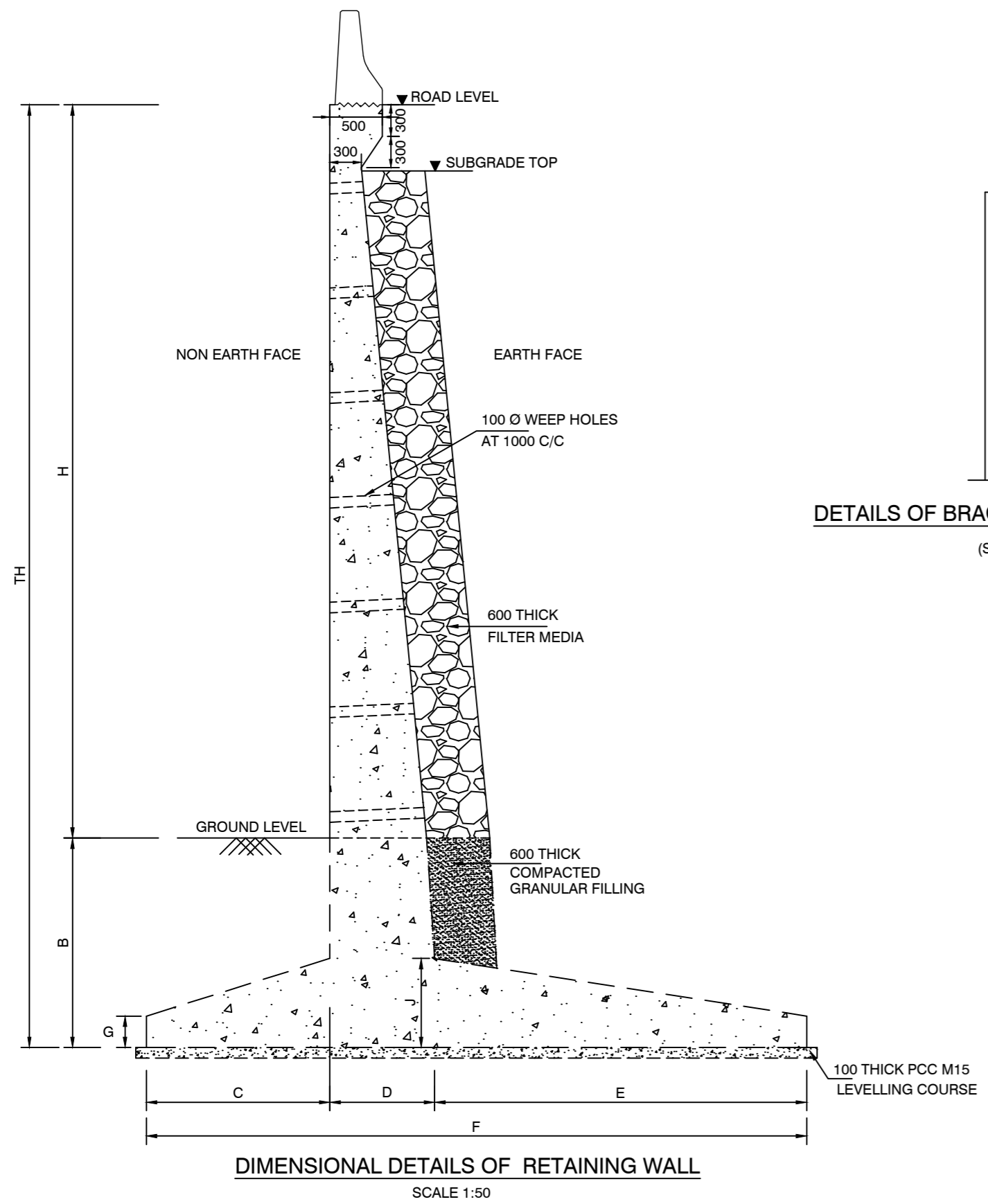
PROJECT: CONSTRUCTION OF SERVICE ROAD AND IMPROVEMENT OF KHAREBAND JUNCTION WITH ROAD SAFETY MEASURES FROM Km 549.850 TO Km 550.450 ON MARGAO WESTERN BYPASS SECTION OF NH-66 IN THE STATE OF GOA

DRAWING TITLE: TYPICAL GENERAL ARRANGEMENT DRAWING FOR BOX MINOR BRIDGE (RETAINED & WIDENING)

DRG. NO.: AA/2667/STR/MNB/TYP-1/001

SHEET NO: 1 OF 1

RETAINING WALLS



- NOTES:-**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES, UNLESS OTHERWISE SPECIFIED.
 - DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - GRADE OF CONCRETE SHALL BE AS FOLLOWS :-
 LEVELLING COURSE ----- M15
 RETAINING WALL ----- M30
 - THE REINFORCEMENT SHALL BE BARS OF GRADE DESIGNATION Fe 500 CONFORMING TO LATEST IRC CODES / MORTH CIRCULARS
 - MINIMUM CLEAR COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOWS :-
 EARTH FACE ----- 75 mm
 NON EARTH FACE ----- 45 mm
 - BACK FILLING FOR RETAINING WALLS SHALL CONFIRM TO SPECIFICATION APPENDIX-6 OF IRC : 78-2022.
 - WEEP HOLES OF 100 mm DIA SHALL BE PROVIDED AT 1000 mm C/C BOTH HORIZONTALLY & VERTICALLY IN A STAGGERED MANNER ABOVE 150mm FROM GL OR LWL WHICHEVER IS HIGHER.
 - 600mm THICK FILTER MEDIA SHALL BE PROVIDED BEHIND RETAINING WALL AS PER IRC: 78-2022.
 - SBC CONSIDERED IN DESIGN IS SHOWN IN TABLE FOR EACH HEIGHT. THE SAME SHALL BE ENSURED BEFORE EXECUTION.
 - 20mm EXPANSION GAP SHALL BE PROVIDED IN BETWEEN RETAINING WALL FOR EVERY 20m LENGTH COMPRESSIBLE FILLER BOARD (BITUMEN PAD OR SHELTEX BOARD) SHALL BE PROVIDED IN EXPANSION GAP.

IMPORTANT NOTE:
 # LENGTH AND HEIGHT ABOVE GROUND LEVEL SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK.

Schedule of Sectional Dimensions										Curtailment Height From bottom stem		Stem main reinforcement (Earth face)				Stem main reinforcement (Non Earth face)		Stem Distribution reinforcement				Raft Top		Raft Bottom		Raft Bottom Distribution		Raft Top Distribution				Bracket Reinforcement					
Height Above GL	Df Below GL	Total Height	SBC (kN/m ²)	Length of Toe	Stem Bottom Thick	Length of Heel	Total Width	Raft Thickness (end)	Bottom raft Thickness At stem	For Bar 1a	For Bar 1b	1	1a	1b	3	2	2a	2b	4	5	6	7	8	9													
H	B	TH		C	D	E	F	G	J			400	400	400	400						200	200															
				Dia	spacing	Dia	spacing	Dia	spacing	Dia	spacing	Dia	spacing	Dia	spacing	Dia	spacing	Dia	spacing	Dia	spacing	Dia	spacing	Dia	spacing	Dia	spacing	Dia	spacing	Dia	No's						
2.0	1.5	3.5	130	0.5	0.4	2.0	2.9	0.3	1.0	-	-	12	160	-	-	-	-	12	180	8	220	8	220	-	-	16	150	16	150	8	170	8	170	12	160	8	5
2.5		4.0		0.6	0.4	2.4	3.4	0.3	1.1	1.20	-	-	12	160	12	160	-	-	12	180	8	220	8	220	-	-	16	140	16	140	8	160	8	160	12	160	8
3.0	2.0	4.5	150	0.7	0.5	2.6	3.8	0.3	1.2	1.40	-	12	160	12	160	-	-	12	160	8	190	8	190	-	-	16	120	16	120	8	140	8	140	12	160	8	5
3.5		5.5		1.3	0.5	2.6	4.4	0.3	1.2	1.10	2.10	12	200	12	200	16	200	12	160	8	180	8	190	8	200	16	120	16	120	8	140	8	140	12	200	8	5
4.0		6.0		1.4	0.6	2.6	4.6	0.3	1.20	1.60	3.00	12	160	12	160	12	160	12	130	8	160	8	160	8	190	16	120	16	120	8	140	8	140	12	160	8	5

REV	DESCRIPTION	DATE
R0	INITIAL SUBMISSION	JAN - 2026

SCALES: AS MENTIONED

SCALES SHOWN ARE FOR AN A2 SIZE ORIGINAL DRAWING

CONSULTANTS:

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CLIENT:

DRAWN: D.GOPAL RAO

DESIGNED: SIBHI CHELVAN

CHECKED: Y. PRAVEEN

APPROVED: G. PRAVEEN

PROJECT: CONSTRUCTION OF SERVICE ROAD AND IMPROVEMENT OF KHAREBAND JUNCTION WITH ROAD SAFETY MEASURES FROM Km 549.850 TO Km 550.450 ON MARGAO WESTERN BYPASS SECTION OF NH-66 IN THE STATE OF GOA

DRAWING TITLE: DIMENSIONAL AND REINFORCEMENT DETAILS OF RETAINING WALL

DRG. NO.: AA/2667/STR/RW/001

SHEET NO: 1 OF 1