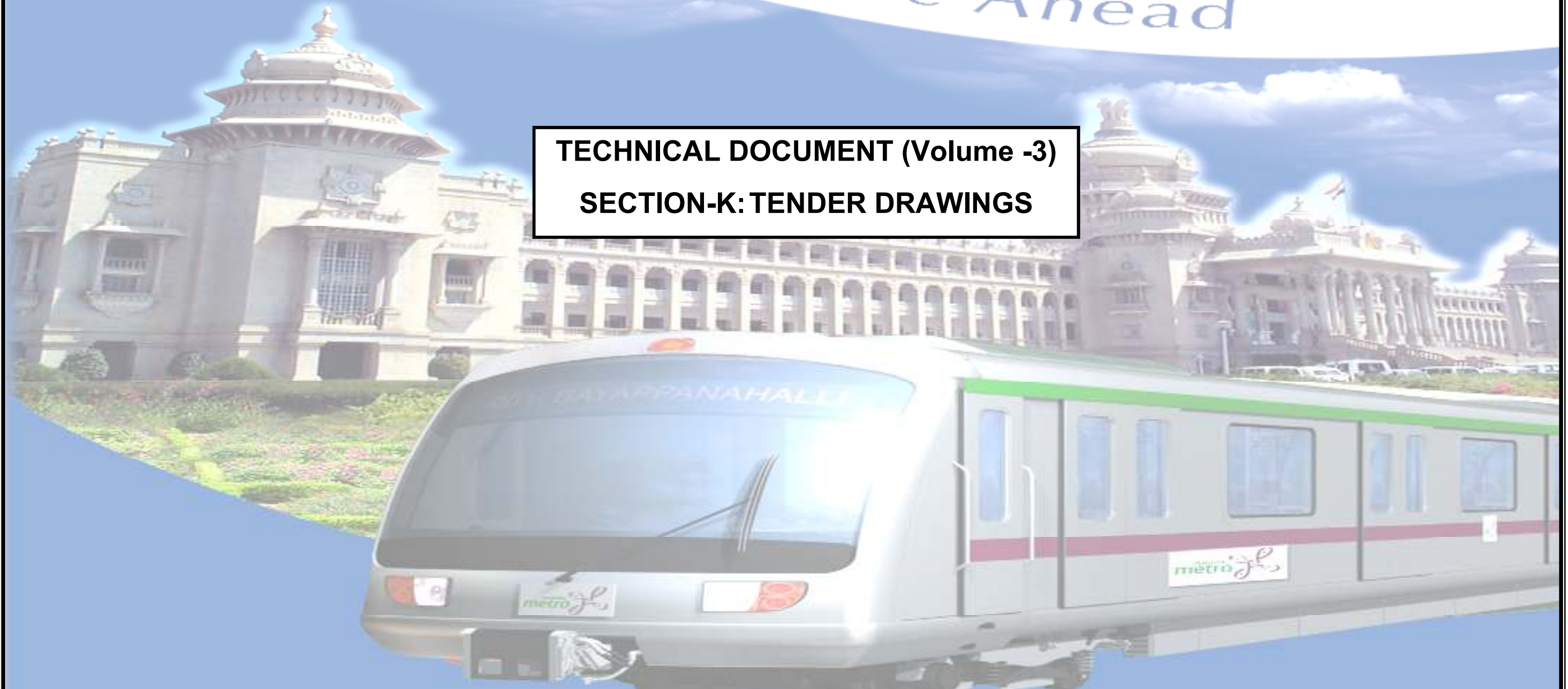


**TENDER No: BMRCL/Phase-2/Reach-1B Extn./Via/2026/150**



*Driving Bangalore Ahead*

**TECHNICAL DOCUMENT (Volume -3)  
SECTION-K: TENDER DRAWINGS**

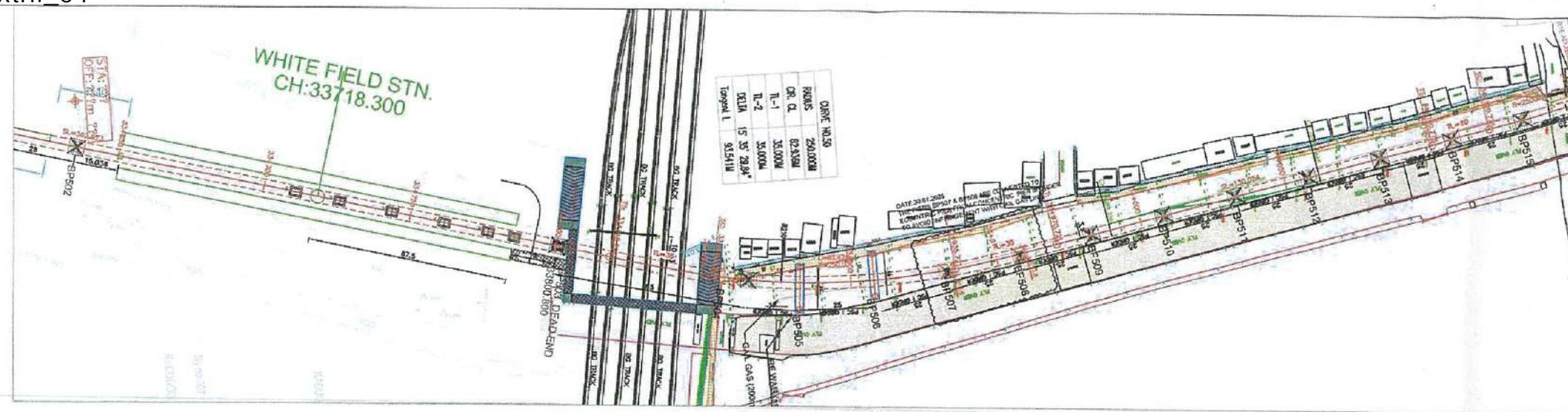


LIST OF DRAWING		
SL NO	DRAWING NO	DESCRIPTION OF DRAWING
	<b>A) PLAN &amp; PROFILE</b>	
<b>1</b>	BMRCL/PH-II/R1EXTN/VDT/PP/028	Plan and profile of viaduct beyond whiteflied station extension for pier BP503 TO BP516
<b>2</b>	BMRCL/PH-II/R1EXTN/VDT/PP/029	Plan and profile of viaduct beyond whiteflied station extension for pier BP515 TO BP521
<b>3</b>	BMRCL/PH-II/R1EXTN/SPAN ARRAGEMENT /001	Span arrangement drawing for thr piers(BP503-BP526) beyond whitefield station extension
	<b>B) SUB-STRUCTURES</b>	
<b>4</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/001 (Sheet 1 of 3)	Dimensional Details of Pier and Pier cap for concentric piers ( BP 514 & BP 515)
<b>5</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/001 (Sheet 2 of 3)	Reinforcement Details for Concentric Piers of Straight (BP 514 & BP 515)
<b>6</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/001 (Sheet 3 of 3)	Dimensional & Reinforcement Details of Pile cap & Pile for Concentric Piers of Straight BP 514 & BP 515)
<b>7</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/002 (Sheet 1 of 3)	Dimensional Details of Pier and Pier cap for concentric piers (BP-509 &BP 513 )
<b>8</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/002 (Sheet 2 of 3)	Reinforcement Details for Concentric Piers of Straight (BP 509 & BP 513)
<b>9</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/002 (Sheet 3 of 3)	Dimensional & Reinforcement Details of Pile cap & Pile for Concentric Piers of Straight ( BP 509)
<b>10</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/002 (Sheet 3A of 3)	Dimensional & Reinforcement Details of Pile cap & Pile for Concentric Piers of Straight ( BP 513)
<b>11</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/003 (Sheet 1 of 4)	Dimensional Details of Pier and Pier cap for concentric piers with radius 250 mtrs(BP-507 & BP 508)
<b>12</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/003 (Sheet 2 of 4)	Reinforcement Details for Concentric Piers with radius 250 mtrs (BP 507 & 508)
<b>13</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/003 (Sheet 3 of 4)	Dimensional & Reinforcement Details of Pile cap & Pile for Concentric Piers with radius 250 mtrs (BP 507 & 508)
<b>14</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/003 (Sheet 4 of 4)	Dimensional & Reinforcement Details of Pile cap & Pile for Concentric Piers with radius 250 mtrs ( BP 507 & 508)
<b>15</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/004 (Sheet 1 of 3)	Dimensional Details of Pier and Pier cap for concentric piers of straight (BP-510, BP 512)
<b>16</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/004 (Sheet 2 of 3)	Reinforcement Details for Concentric Piers of Straight (BP-510, BP 512)
<b>17</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/004 (Sheet 3 of 3)	Dimensional & Reinforcement Details of Pile cap & Pile for Concentric Piers of Straight (BP-510, BP 512)
<b>18</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/005 (Sheet 1 of 3)	Dimensional Details of Pier & Pier cap for concentric Fixed pier (BP-511 )
<b>19</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/005 (Sheet 2 of 3)	Reinforcement Details for Concentric Fixed Pier of Straight (BP 511)
<b>20</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/005 (Sheet 3 of 3)	Dimensional & Reinforcement Details of Pile cap & Pile for Concentric fixed Piers of Straight (BP 511)
<b>21</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/006 (Sheet 1 of 4)	Dimensional Details of Pier & Beam for Portal Pier (BP-505 & 506)
<b>22</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/006 (Sheet 2 of 4)	Reinforcement Details of Portal Pier (BP 505 & 506)
<b>23</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/006 (Sheet 3 of 4)	Dimensional & Reinforcement Details of Pile cap & Pile for Portal Pier A (BP 505 & 506)
<b>24</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/006 (Sheet 3A of 4)	Dimensional & Reinforcement Details of Pile cap & Pile for Portal Pier B (BP 505 & 506)
<b>25</b>	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/006 (Sheet 4 of 4)	Dimensional & Reinforcement Details of Beam for Portal Pier (BP 505 & 506)

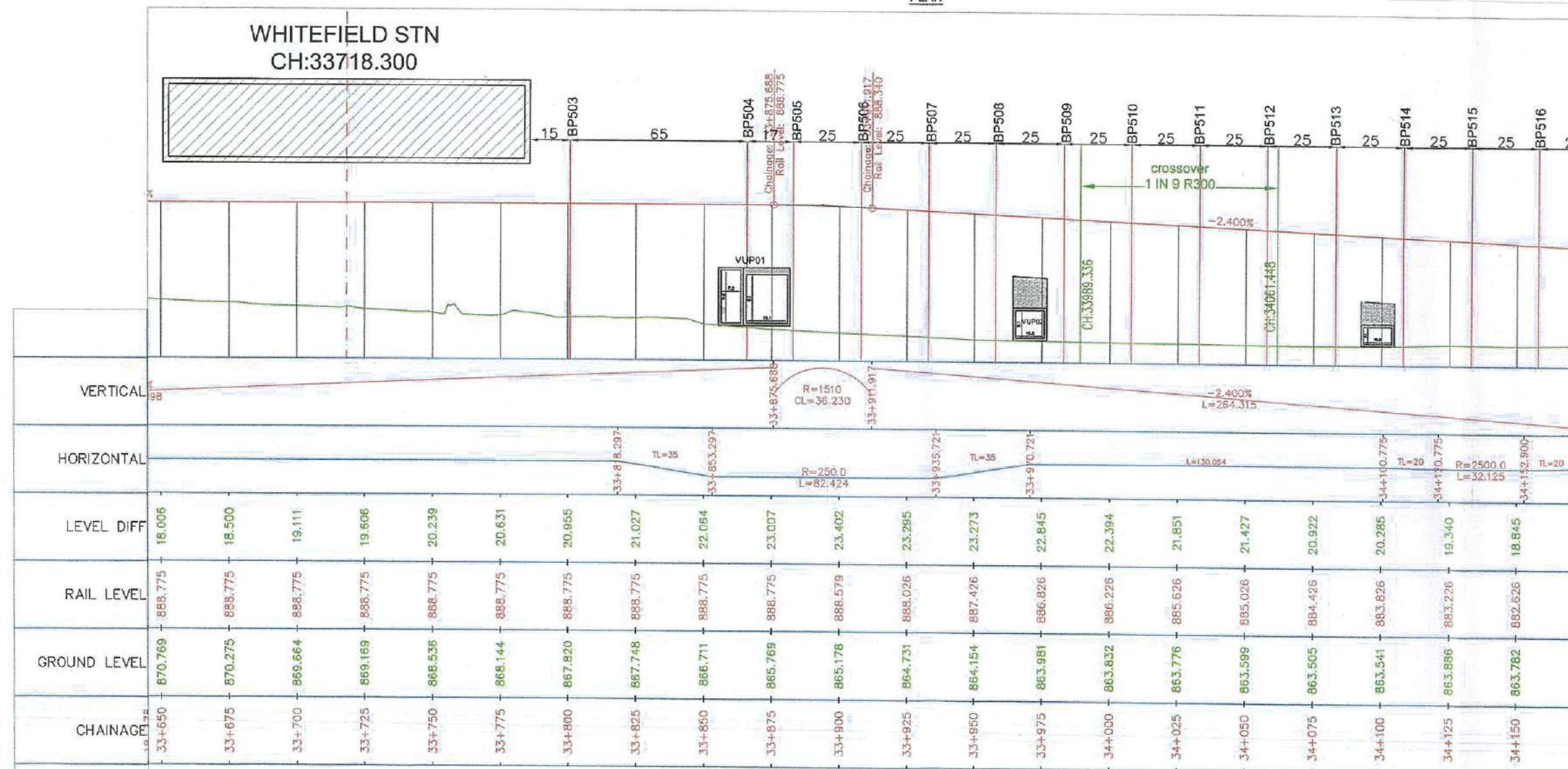
LIST OF DRAWING		
SL NO	DRAWING NO	DESCRIPTION OF DRAWING
26	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/007 (Sheet 1 of 4)	Dimensional Details of Pier & Beam for Portal Pier (BP-521)
27	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/007 (Sheet 2 of 4)	Reinforcement Details of Portal Pier (BP 521 )
28	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/007 (Sheet 3 of 4)	Dimensional & Reinforcement Details of Pile cap & Pile for Portal Pier A (BP 521 )
29	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/007 (Sheet 3A of 4)	Dimensional & Reinforcement Details of Pile cap & Pile for Portal Pier B (BP 521 )
30	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/007 (Sheet 4 of 4)	Dimensional & Reinforcement Details of Beam for Portal Pier (BP 521 )
31	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/008 (Sheet 1 of 4)	Dimensional Details of Pier & Pier cap for concentric piers (BP-516 to 520)
32	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/008 (Sheet 2 of 4)	Reinforcement Details for Eccentric pier (BP-516 to 520)
33	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/008 (Sheet 3 of 4)	Dimensional & Reinforcement Details of Pile cap & Pile for Concentric Piers (BP-516 to 517)
34	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/008 (Sheet 3A of 4)	Dimensional and reinforceement details of pile cap and pile for eccentric pier (518-520)
35	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/008 (Sheet 3B of 4)	Dimensional Details of Pile cap along with gail gas pipe line (plan view)
36	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/008 (Sheet 4 of 4)	Dimensional & Reinforcement Details of Pile cap & Pile for Eccentric Piers (BP-516 to 520)
37	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009 (Sheet 1 of 4)	Dimensional Details of Pier and Pier cap for concentric piers (BP-504)
38	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009 (Sheet 2 of 4)	Reinforcement Details for Concentric Fixed pier (BP504)
39	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009 (Sheet 3 of 4)	Dimensional & Reinforcement Details of Pile cap & Pile for Concentric Fixed pier (BP504)
40	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009 (Sheet 4 of 4)	Dimensional & Reinforcement Details of fixed piercap (BP-504)
41	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/010 (Sheet 1of 2)	Dimensional & Reinforcement detail of typical straight span pier cap
42	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTD-EXTN/0010 (Sheet 2 of 2)	Dimensional & Reinforcement detail of typical Concentric pier cap spans
	C) SUPER-STRUCTURES	
43	BMRCL/PH-II/R1EXTN/VDT/GL/001	Girder Layout of Viaduct Beyond Whitefield station Extension for BP503 to BP510
44	BMRCL/PH-II/R1EXTN/VDT/GL/002	Girder Layout of Viaduct Beyond Whitefield station Extension for BP510 to BP516
45	BMRCL/PH-II/R1EXTN/VDT/GL/003	Girder Layout of Viaduct Beyond Whitefield station Extension for BP517 to BP521
46	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/002 (Sheet 1 of 5)	GAD of PSC I Girder Superstructure for Straight Span 25m and radius 2500m
47	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/002 (Sheet 2 of 5)	GAD Profile of PSC I Girder Superstructure for Straight Span 25m and radius 2500m
48	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/002 (Sheet 3 of 5)	PSC I Girder Superstructure reinforcement detail for Straight Span 25m and radius 2500m
49	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/002 (Sheet 4 of 5)	Deck slab reinforcement detail for PSC I Girder superstructure for straight Span 17m and 25m and radius 2500m
50	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/002 (Sheet 5 of 5)	End and Intermediate Diaphragm reinforcement detail for Straight Span 25m and radius 2500m
51	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/003 Sheet 1	GAD of PSC I Girder Superstructure for Straight Span 17m at location BP504 to BP505

LIST OF DRAWING		
SL NO	DRAWING NO	DESCRIPTION OF DRAWING
52	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/003 Sheet 2	Cable profile of PSC I-Girder Superstructure for Straight Span 17m at location BP504 to BP505
53	BMRCL/PH-II/R1EXTN/MISC/SHEAR CONNECTOR/SHEET 1	Typical detail of shear connector for viaduct from BP503-BP521
	C) SPECIAL SPAN (Railway Composite Girder span)	
54	Railway Drawing No:-SWR/2025/GAD-30/Metro XING km.333/BP503-BP504/WFD/JTJ-SBC/BMRCL	Approved GAD drawing of Proposed BMRCL Metro Over Head Structure (Metro Viaduct )at Railway km.333/000-100 at Whitefield Station between WFD & KJM stations in SBC-JTJ section between metro piers BP-503 and BP-504 65m Composite Steel Girder
55	BMRCL/PHASE II/WHTD/EXT/VIA/DWG/001 (Sheet 1 of 6)	Numeration and Elevation details of steel Composite Girder 65.00m Span for BP-503 –BP504
56	BMRCL/PHASE II/WHTD/EXT/VIA/DWG/001 (Sheet 2 of 6)	Numeration and Elevation details of steel Composite Girder 65.00m Span for BP-503 –BP504
57	BMRCL/PHASE II/WHTD/EXT/VIA/DWG/001 (Sheet 3 of 6)	Splice and sectional details of steel Composite Girder 65.00m Span for BP-503 –BP504
58	BMRCL/PHASE II/WHTD/EXT/VIA/DWG/001 (Sheet 4 of 6)	Splice and Camber details of steel Composite Girder 65.00m Span for BP-503 –BP504
59	BMRCL/PHASE II/WHTD/EXT/VIA/DWG/001 (Sheet 5 of 6)	Transverse bearing and Connection details of steel Composite Girder 65.00m Span for BP-503 –BP504
60	BMRCL/PHASE II/WHTD/EXT/VIA/DWG/001 (Sheet 6 of 6)	RC Details of deck slab for steel Composite Girder 65.00m Span for BP-503 –BP504
	D) BEARINGS	
61	BMRCL/PHASE/WHTD/EXTN/VIA/DWG/001-A R1	Bearing force details of steel composite girder 65m span for BP503-504
62	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/MISC/002	Reinforced Elastomeric bearing details for I-Girder for span 25m & 17m (TYP)
63	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/MISC/004	Layout of cross over spans BP509 to BP513 for bearing details
	E) MISCELLANEOUS	
64	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/MISC/003 (Sheet 1 of 2)	Dimensional details of parapet wall and railing
65	BMRCL/PH-II R1Extn/VIA/SUP/WHTFD-EXTN/MISC/003 (Sheet 2 of 2)	Reinforcement details of parapet wall and railing
66	BMRCL/PH-II/GEN/RAINHAR/001	Rain water harvesting from viaduct (Typical drawing)
67	BMRCL/PH-II/R1Extn/VIA/MISC/005	Typical drainage details
68	BMRCL/PH-II/R1-Extn/GEN/MISC-PP/001	Details of pier protection
69	BMRCL/PH-II/R1/MISC/014	Typical section for drainage and road widening
70		Typical road cross section
71		Typical details and plan of footpath and chambers
72		Cross section of sewer water drain chamber, power line chamber and OFC line chamber
73	BMRCL/PH-II/R1Extn/VIA/MISC/14	Elevation of one unit temporary barricading





## PLAN



LEGEND

ALIGNMENT LINE

PORTAL PIER

NORMAL PIER

ECCENTRIC PIER

RAIL LEVEL

FLYOVER PROFILE

GROUND SURFACE

**NOTES:-**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
2. FOLLOW FIGURED DIMENSIONS ONLY.

LONGITUDINAL ELEVATION					GOOD FOR CONSTRUCTION	
ISSUE	DESCRIPTION	APPROVED	DATE	SCALE: AS SHOWN		
R0	THE HORIZONTAL AND VERTICAL ALIGNMENT IS EXTENDED BY 590M FROM PIER BP503 TO BP627 AS PER FILE:BMRC/94/BDM/2023/110TH BOARD MEETING DATED 27.06.2023.. ISSUED FOR CONSTRUCTION		03.01.2023	DATE (NO ISSUE)		
R1	THE HORIZONTAL AND VERTICAL ALIGNMENT FROM PIER BP503 TO BP521 IS REVISED AS PER SITE CONDITION. ISSUED FOR CONSTRUCTION.		24.05.2024	IF INCORPORATION OF ANY AMENDMENT IS REQUIRED, THE SAME SHALL BE SUBMITTED TO THE PROJECT MANAGER AT THE PROJECT OFFICE, BANGALORE METRO RAIL CORPORATION LTD. WITHIN 15 DAYS OF THE DATE OF ISSUANCE OF THIS DRAWING.		
R2	THE SPAN ARRANGEMENT FROM PIERS BP503 TO BP505 ARE REVISED AS PER THE APPROVED RAILWAY DRAWINGS. (REF: LETTER NO: S/W/R/W.352/RCR Km333/WFD/BMRC/ Dated:02.12.2024)		03.12.2024	IF INCORPORATION OF ANY AMENDMENT IS REQUIRED, THE SAME SHALL BE SUBMITTED TO THE PROJECT MANAGER AT THE PROJECT OFFICE, BANGALORE METRO RAIL CORPORATION LTD. WITHIN 15 DAYS OF THE DATE OF ISSUANCE OF THIS DRAWING.		
R3	THE PIERS BP506 & BP608 ARE REVISED TO ECENTRIC PIER FROM CONCENTRIC PIER IN ORDER TO AVOID INFRINGEMENT WITH C&L GAS LINE AS PER FILE NO:BMRC/CLD/C&LPH-10/18-EXTN/NGN/01115 Dtd:19.12.2024		29.01.2025	IF INCORPORATION OF ANY AMENDMENT IS REQUIRED, THE SAME SHALL BE SUBMITTED TO THE PROJECT MANAGER AT THE PROJECT OFFICE, BANGALORE METRO RAIL CORPORATION LTD. WITHIN 15 DAYS OF THE DATE OF ISSUANCE OF THIS DRAWING.		

**BANGALORE METRO RAIL CORPORATION LTD**

A-3rd Floor, BMTC Complex,  
K H Road, Shanthinagar,  
Bangalore-560027  
Tel:-080-32699300

PHASE II - RD EXTENSION

BANYAPPANAHALLI TO WHITEFIELD

PLAN AND PROFILE OF VIADUCT BEYOND WHITEFIELD STATION EXTENSION FOR PIER BP503 TO BP516

BMRC/PH-H/1 EXTN/VD/PP/028

DESIGN & DRAWN BY:

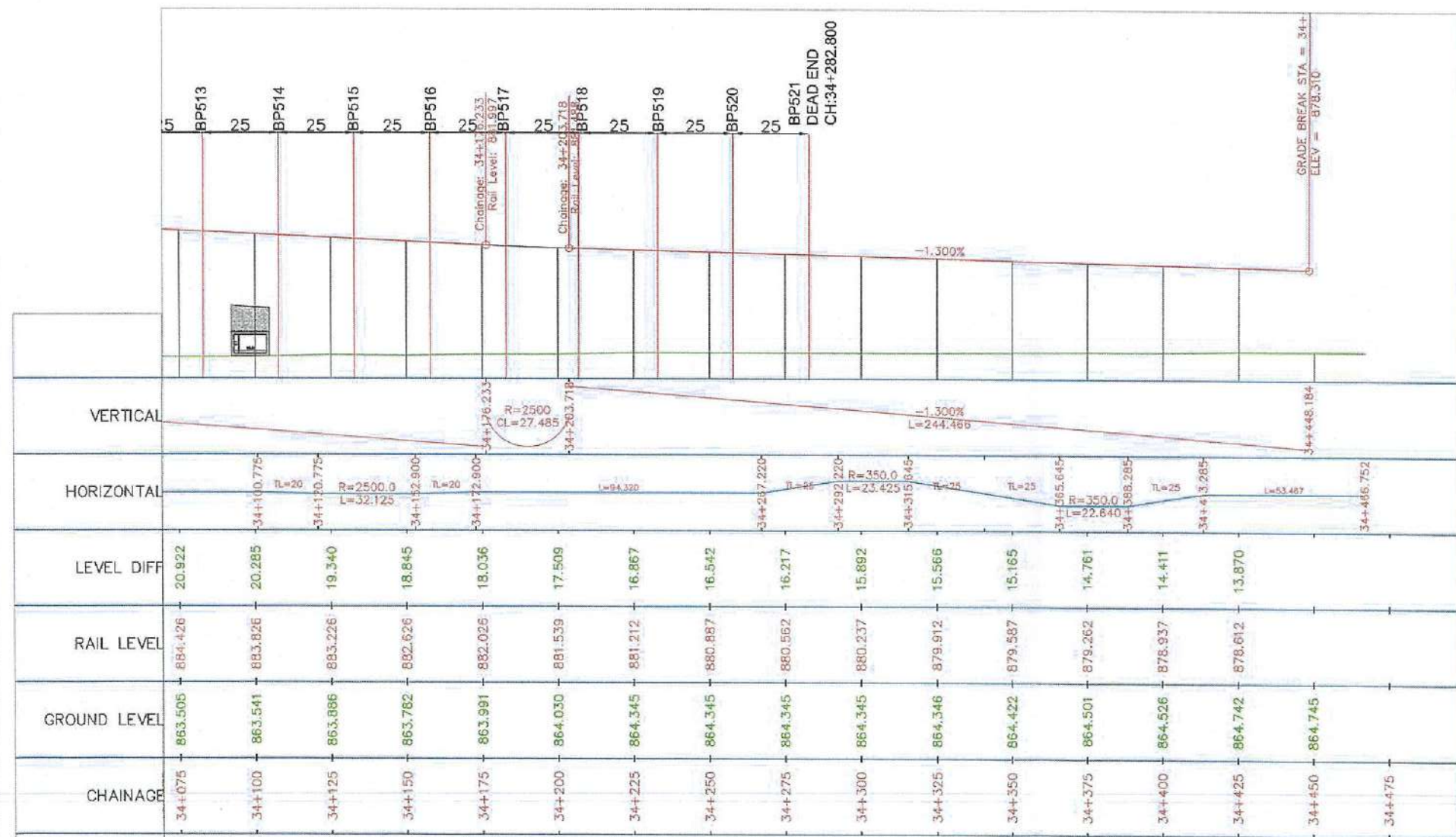
CHECKED BY:

APPROVED BY:

CE-(R&S)

DATE/(CURRENT ISSUE)  
29.01.2025





1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
2. FOLLOW FIGURED DIMENSIONS ONLY.

ISSUE		DESCRIPTION	APPROVED	DATE	SCALE: AS SHOWN	BANGALORE METRO RAIL CORPORATION LTD		PHASE II - R0 EXTENSION	
R0		THE HORIZONTAL AND VERTICAL ALIGNMENT IS EXTENDED BY 560M FROM PIER BP503 TO BP527 AS PER FILE NO.BMRC/49/BDM/2023/110TH BOARD MEETING DATED 27.06.2023.. ISSUED FOR CONSTRUCTION			DATE (R0 ISSUE)	03.01.2024			BAIYYAPPANAHALLI TO WHITEFIELD
R1		THE HORIZONTAL AND VERTICAL ALIGNMENT FROM PIER BP503 TO BP521 IS REVISED AS PER SITE CONDITION. ISSUED FOR CONSTRUCTION.		03.01.2023					
R2		THE SPAN ARRANGEMENT FROM PIERS BP503 TO BP505 ARE REVISED AS PER THE APPROVED RAILWAY DRAWINGS.(REF. LETTER NO:SWR/W.352/HOR Km333/WFD/BMRC/ Dated 02.12.2024)		24.05.2024					
R3		THE PIERS BP507 & BP508 ARE REVISED TO ECCENTRIC PIER FROM CONCENTRIC PIER IN ORDER TO AVOID INFRAINGEMENT WITH GAIL GAS LINE AS PER FILE NO.BMRC/DY.GE/PH-4/R18-EXTN/WD/2024/115 Dt:19.12.2024		03.12.2024					
				29.01.2025					

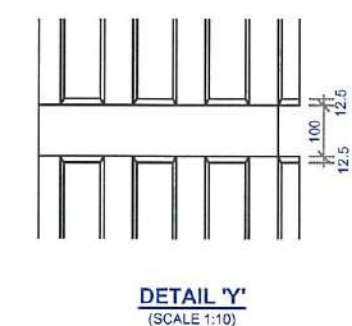


SPAN ARRANGEMENT DRAWING FOR THE PIERS (BP503-BP521)

PIER NO	SPAN	CHAINAGE	RAIL LEVEL(R.L)	GROUND LEVEL(G.L)	DIFFERENCE (R.L-G.L)	TYPE OF PIER	TYPE OF SUPERSTRUCTURE	PIER COORDINATES							
								VIADUCT CENTER /CONCENTRIC PIER		ECCENTRIC PIER COORDINATES		PORTAL PIER COORDINATES			
								EASTING	NORTHING	EASTING	NORTHING	A		B	
												EASTING	NORTHING	EASTING	NORTHING
BP503		33800.800	888.775	867.826	20.949	CONCENTRIC	I-GIRDER	799193.595	1438340.928						
BP504	65.000	33865.800	888.775	866.115	22.660	CONCENTRIC	COMPOSITE GIRDER	799209.117	1438404.002						
BP505	17.000	33882.800	888.758	865.584	23.174	2 LEGGED PORTAL	I-GIRDER	799211.12	1438420.88			799206.08	1438421.293	799220.034	1438420.159
BP506	25.000	33907.800	888.434	865.039	23.394	2 LEGGED PORTAL	I-GIRDER	799211.972	1438445.855			799203.174	1438445.684	799217.171	1438445.962
BP507	25.000	33932.800	887.839	864.551	23.289	ECCENTRIC	I-GIRDER	799210.327	1438470.791	799211.221	1438470.895				
BP508	25.000	33957.800	887.239	864.100	23.139	ECCENTRIC	I-GIRDER	799206.4021	1438495.475	799207.188	1438495.624				
BP509	25.000	33982.800	886.639	863.934	22.705	CONCENTRIC	I-GIRDER	799201.536	1438519.997						
BP510	25.000	34007.800	886.039	863.815	22.224	CONCENTRIC	I-GIRDER	799196.6281	1438544.51						
BP511	25.000	34032.800	885.439	863.720	21.719	CONCENTRIC	I-GIRDER	799191.721	1438569.024						
BP512	25.000	34057.800	884.839	863.569	21.270	CONCENTRIC	I-GIRDER	799186.8143	1438593.538						
BP513	25.000	34082.800	884.239	863.514	20.725	CONCENTRIC	I-GIRDER	799181.906	1438618.051						
BP514	25.000	34107.800	883.639	863.651	19.988	CONCENTRIC	I-GIRDER	799176.997	1438642.564						
BP515	25.000	34132.800	883.039	863.852	19.187	CONCENTRIC	I-GIRDER	799171.99	1438667.058						
BP516	25.000	34157.800	882.439	863.848	18.591	ECCENTRIC	I-GIRDER	799166.746	1438691.501	799167.6247	1438691.694				
BP517	25.000	34182.800	881.848	864.002	17.846	ECCENTRIC	I-GIRDER	799161.34	1438715.91	799162.219	1438716.103				
BP518	25.000	34207.800	881.435	864.130	17.305	ECCENTRIC	I-GIRDER	799155.922	1438740.316	799156.802	1438740.509				
BP519	25.000	34232.800	881.110	864.345	16.765	ECCENTRIC	I-GIRDER	799150.505	1438764.722	799151.384	1438764.915				
BP520	25.000	34257.800	880.785	864.345	16.440	ECCENTRIC	I-GIRDER	799145.088	1438789.128	799145.967	1438789.321				
BP521	25.000	34282.800	880.460	864.345	16.115	2 LEGGED PORTAL	I-GIRDER	799139.741	1438813.549			799132.158	1438811.995	799153.707	1438816.427

				(SCALE HOR 1:1000 VER 1:500)				GOOD FOR CONSTRUCTION	
ISSUE	DESCRIPTION	APPROVED	DATE	SCALE: AS SHOWN		BANGALORE METRO RAIL CORPORATION LTD  A. 3rd Floor, BMITC Complex, K H Road, Shanthinagar, Bangalore - 560027  Tel-080-22969300	PHASE II - R1 EXTENSION BAIYYAPPANAHALLI TO WHITEFIELD		
R0	AS PER R1 EXTENSION GAD DATED 06.01.2023	06.01.2023	DATE (R0 ISSUE) 03.01.2024				DWG. TITLE: SPAN ARRANGEMENT DRAWING FOR THE PIERS (BP503-BP526) BEYOND WHITEFIELD STATION EXTENSION		
R1	AS PER R1 EXTENSION GAD DATED 24.05.2024	24.05.2024					DWG NO: BMRCL/PH-IV/R1 EXTN/SPAN ARRANGEMENT/001	ISSUE R3	
R2	AS PER R1 EXTENSION GAD DATED 03.12.2024	03.12.2024					DESIGN & DRAWN BY: 	APPROVED BY: 	DATE (CURRENT ISSUE) 29.01.2025
R3	AS PER R1 EXTENSION GAD DATED 29.01.2025	29.01.2025							





**BANGALORE METRO RAIL  
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Tel:-080-22969300

### NOTES :-



1. ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
2. NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
3. MATERIALS :  
CONCRETE:  
a) PIER = M50  
b) PIER CAP = M50  
c) PEDESTAL = M50
4. FOR DETAILS OF PILE CAP & PILE REFER SEPARATE DRAWING.
5. THIS DRAWING MUST BE READ IN CONJUNCTION WITH GAD, GENERAL NOTES, SPAN ARRANGEMENT AND OTHER RELATED STRUCTURAL DRAWINGS.
6. CRASH BARRIER/PIER PROTECTION SHAPE & HEIGHT SHOWN IS TENTATIVE, REFER SEPARATE DRAWING FOR DETAIL.

REFERENCE DRAWING NO. :-	
1. GENERAL NOTES	-BMRC/L/PH-III/R1EXTN/VIAMISC/001
2. REINFORCEMENT DETAILS FOR CONCENTRIC PIERS	-BMRC/L/PH-III/R1EXTN/VIA/SUB/WHTFD-EXTN/001/SHT 2 OF 3
3. DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR CONCENTRIC PIERS	-BMRC/L/PH-III/R1EXTN/VIA/SUB/WHTFD-EXTN/001/SHT 3 OF 3

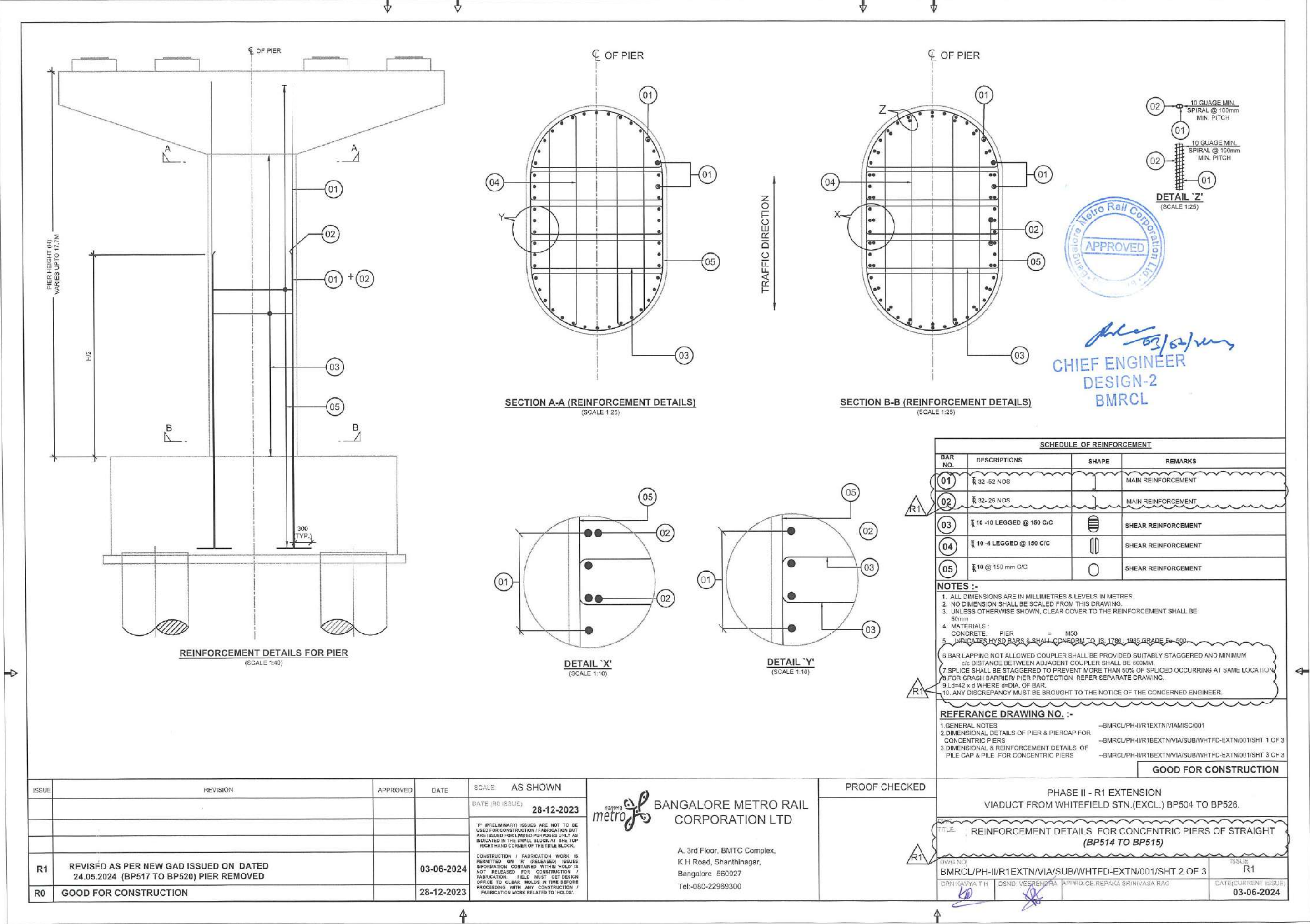
GOOD FOR CONSTRUCTION

PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.

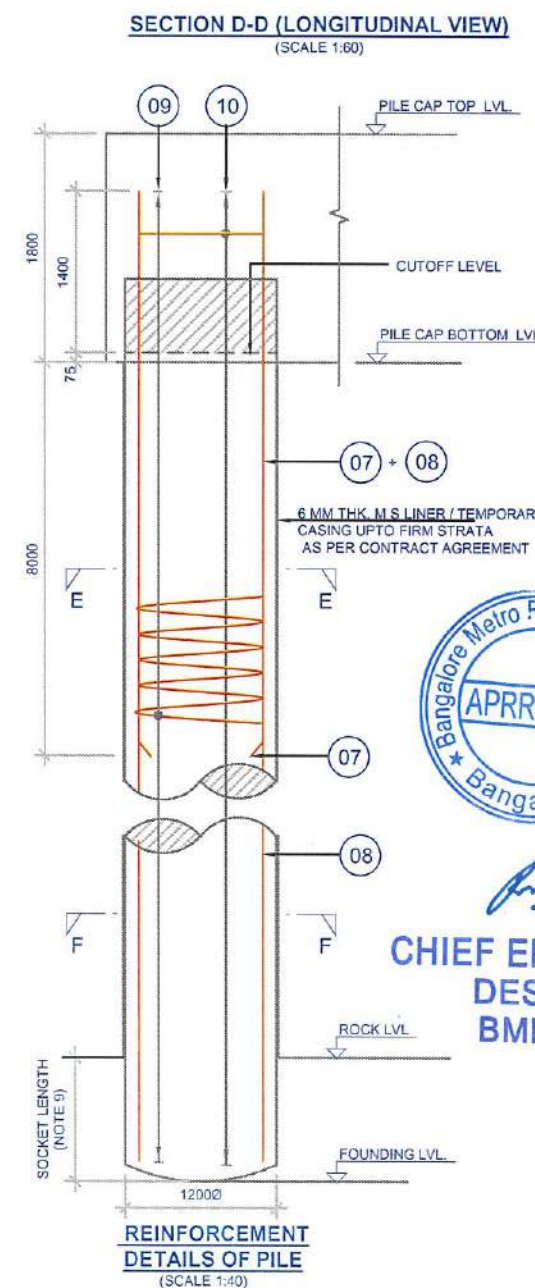
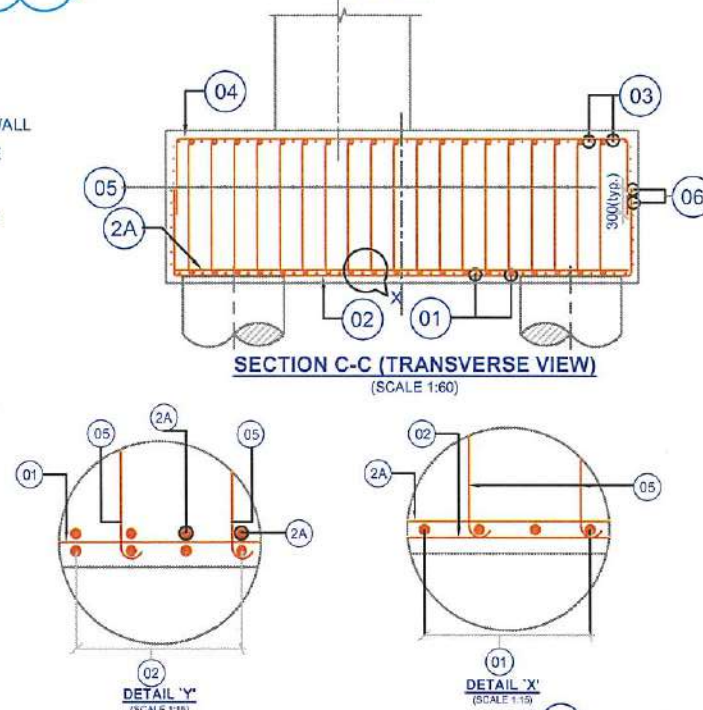
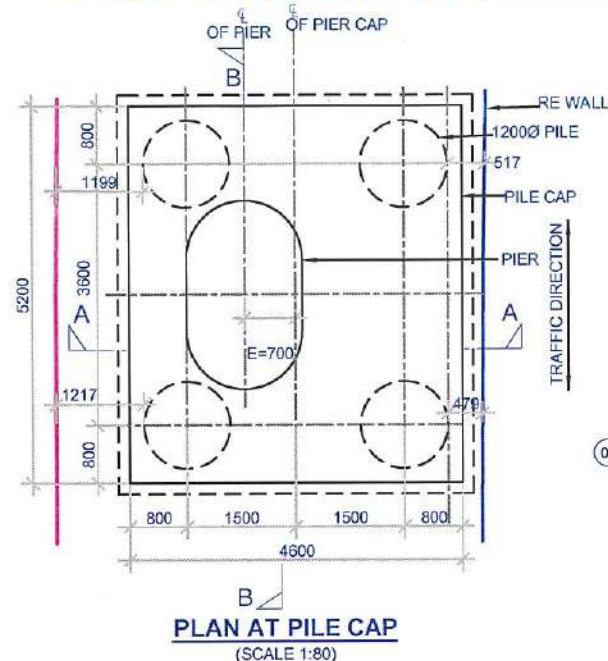
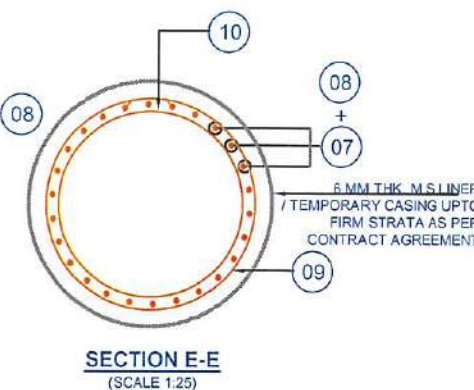
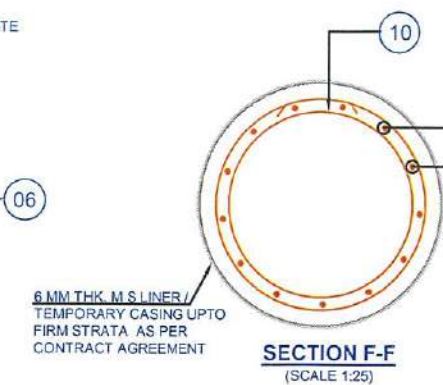
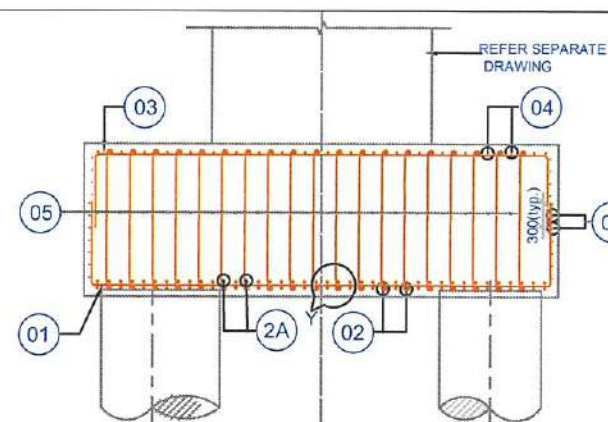
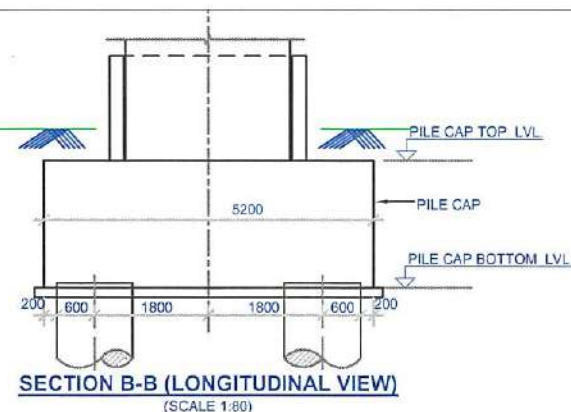
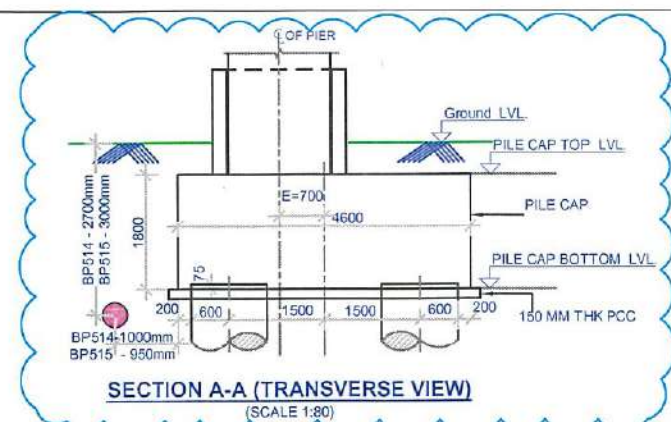
DWG.  
TITLE: DIMENSIONAL DETAILS OF PIER & PIER CAP FOR CONCENTRIC PIERS  
(BP514 & BP515)

DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/001/SHT 1 OF 3		ISSUE R2
DRN: 	DSND: 	APPRO: 
		DATE (CURRENT ISSUE) 12.02.2025









CHIEF ENGINEER  
DESIGN  
BMRCL

SCHEDULE OF REINFORCEMENT			
BAR NO.	DESCRIPTIONS	SHAPE	REMARKS
01	25 @ 125 C/C		MAIN REINFORCEMENT - LONGITUDINAL DIRECTION
02	25 @ 125 C/C		MAIN REINFORCEMENT - TRANSVERSE DIRECTION
2A	25 @ 125 C/C		MAIN REINFORCEMENT - TRANSVERSE DIRECTION
03	16 @ 125 C/C		TOP REINFORCEMENT - LONGITUDINAL DIRECTION
04	16 @ 125 C/C		TOP REINFORCEMENT - TRANSVERSE DIRECTION
05	16 @ 250 C/C IN BOTH DIRECTION		SHEAR REINFORCEMENT
06	12 @ 150 C/C		SIDE FACE REINFORCEMENT
07	25 - 13 NOS		MAIN REINFORCEMENT - PILE
08	25 - 13 NOS		MAIN REINFORCEMENT - PILE
09	10 @ 100 mm C/C		SPIRAL REINFORCEMENT
10	16 @ 1500 C/C STIFFENING RING SHOULD BE TACK WELDED TO MAIN REINF.		STIFFENING REINFORCEMENT - PILE

## NOTES :-

- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
- NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
- UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 75mm.
- MATERIALS:  
CONCRETE:  
a. PILE = M35  
b. PILECAP = M35  
c. PCC = M20
- INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 : 1985 GRADE Fe-500.
- CAPACITY OF PILE UNDER SERVICE CONDITION, SHALL BE 650T.
- FOR DETAILS OF PIER CAP & PIER, REFER SEPARATE DRAWING.
- THE LEVELS SHOWN ARE TENTATIVE. IF ACTUAL LEVELS VARY THE SAME SHALL BE INFORMED TO DESIGN SECTION BEFORE CONCRETING.
- ALL PILES SHALL BE SOCKETTED FOR A MINIMUM LENGTH OF 1200MM IN HARD ROCK OR 3000MM IN WEATHERED/ SOFT ROCK. TERMINATION OF PILES SHALL BE DECIDED AT SITE BASED ON PILE TERMINATION CRITERIA GIVEN IN CONTRACT AGREEMENT.
- BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 800MM.
- FOR CRASH BARRIER REFER SEPARATE DRAWING.
- Ld=42 x d WHERE d=DIA. OF BAR.
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

## REFERENCE DRAWING NO. :-

- GENERAL NOTES -BMRCL/PH-II/R1EXTN/VIA/MISC/001
- DIMENSIONAL DETAILS OF PIER & PIERCAP -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/001/SHT 1 OF 3
- REINFORCEMENT DETAILS FOR CONCENTRIC PIERS -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/001/SHT 2 OF 3

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
R2	AS PER SITE CONFIRMATION, DISTANCE FROM GAIL GAS LINE & PILE EDGE IS MAINTAINED 1.0mtr. ACCORDINGLY PILE CAP SIZE REVISED AS SHOWN.			DATE (R0 ISSUE) 28-12-2023
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024 (BP517 TO BP520) PIER REMOVED		12.02.2025	
R0	GOOD FOR CONSTRUCTION		03-06-2024	
			28-12-2023	



BANGALORE METRO RAIL  
CORPORATION LTD

A. 3rd Floor, BMTCL Complex,  
K H Road, Shanthinagar,  
Bangalore - 560027  
Tel:-080-22969300

PROOF CHECKED

PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.

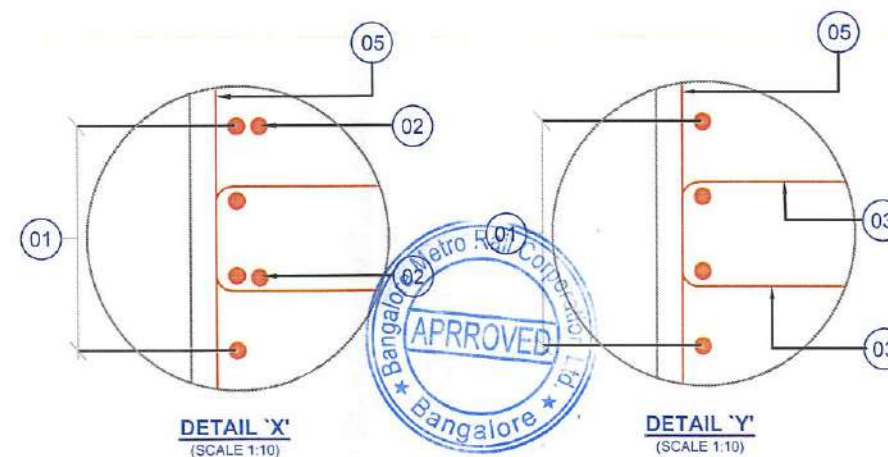
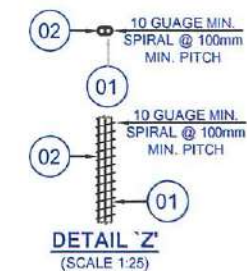
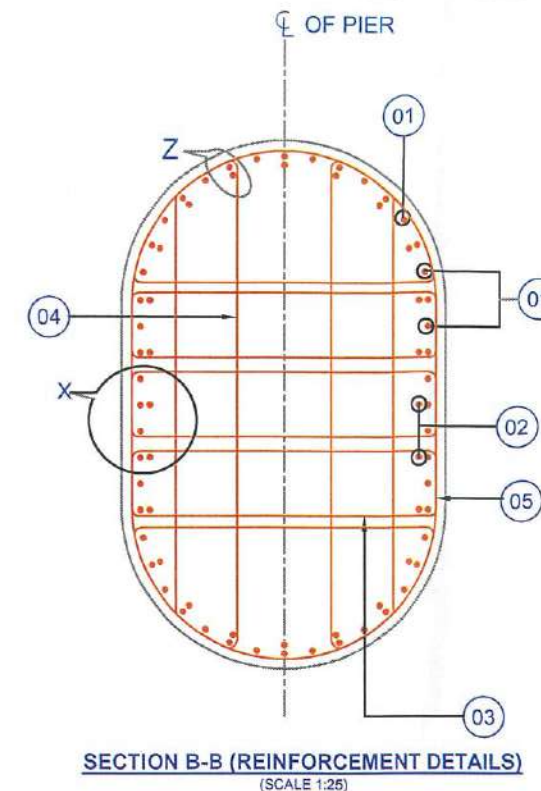
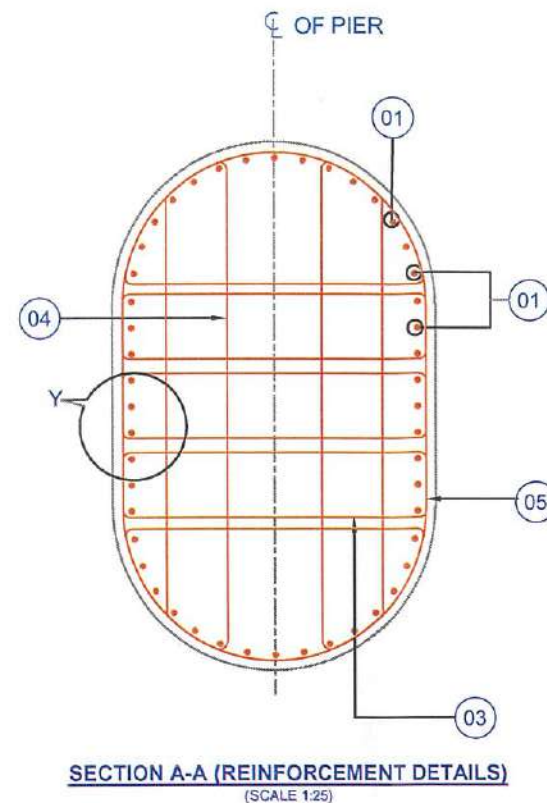
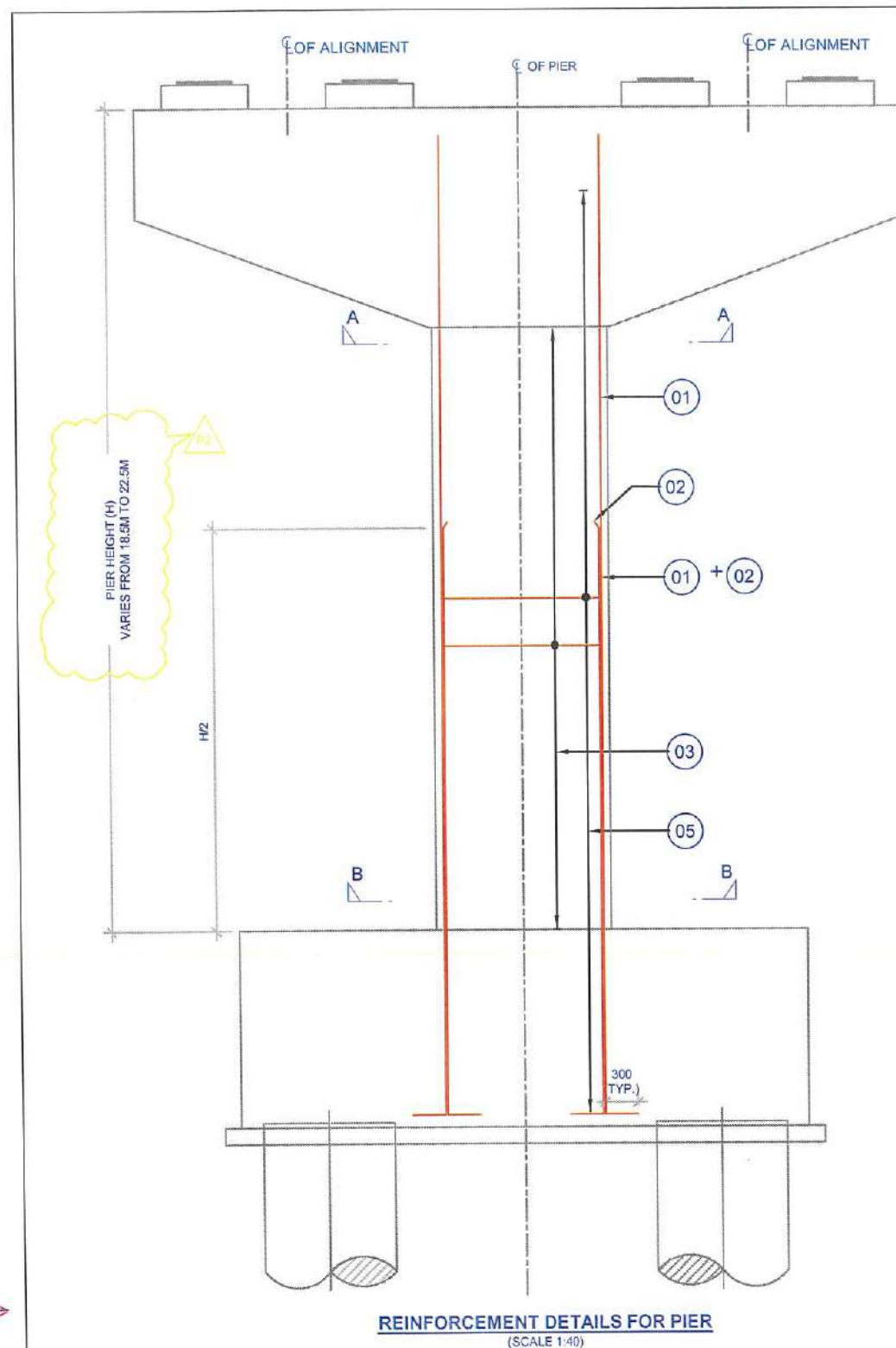
DWG. TITLE: DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR CONCENTRIC PIERS OF STRAIGHT (BP514 & BP515)

DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/001/SHT 3 OF 3	ISSUE R2
DRN: [Signature]	DATE (CURRENT ISSUE) 12.02.2025
DSND: [Signature]	
APPRD: [Signature]	



ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	<div>BANGALORE METRO RAIL CORPORATION LTD</div> <div>A. 3rd Floor, BMTC Complex, K H Road, Shanthinagar, Bangalore - 560027 Tel: 080-22969300</div>	PROOF CHECKED	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.		
				DATE (R0 ISSUE) 28-12-2023			DWG. TITLE: DIMENSIONAL DETAILS OF PIER & PIER CAP FOR CONCENTRIC PIERS (BP509 & BP513)		
R3	INDIVIDUAL DETAILS OF BP509 AND BP513 PILECAP INCORPORATED AND REVISED, AS PER LATEST GAD DATED 29.01.2025		30-01-2025	<div>"P" (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.</div> <div>CONSTRUCTION / FABRICATION WORK IS PERMITTED ON "P" (RELEASED) ISSUES INFORMATION CONTAINED WITHIN "HOLD" IS NOT RELEASED FOR CONSTRUCTION / FABRICATION FIELD MUST GET DESIGN OFFICE TO CLEAR "HOLD" IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO "HOLD".</div>			DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/002/SHT 1 OF 3		ISSUE R3
R2	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024 & REMOVED BP526.		03-06-2024				DRN:  DSND:  APPRD:		DATE(CURRENT ISSUE) 30-01-2025
R1	PIER CAP DEPTH CHANGED		01-02-2024						
R0	GOOD FOR CONSTRUCTION		28-12-2023						





## SCHEDULE OF REINFORCEMENT

BAR NO.	DESCRIPTIONS	SHAPE	REMARKS
01	32 - 56 NOS		MAIN REINFORCEMENT
02	32 - 28 NOS		MAIN REINFORCEMENT
03	10 - 10 LEGGED @ 150 C/C		SHEAR REINFORCEMENT
04	10 - 4 LEGGED @ 150 C/C		SHEAR REINFORCEMENT
05	10 @ 150 mm C/C		SHEAR REINFORCEMENT

## NOTES :-

- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
- NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
- UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 50mm.
- MATERIALS :  
CONCRETE : PIER = M50
- INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 : 2008 GRADE F<sub>y</sub> = 500.
- BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
- SPLICE SHALL BE STAGGERED TO PREVENT MORE THAN 50% OF SPLICES OCCURRING AT SAME LOCATION.
- FOR CRASH BARRIER/ PIER PROTECTION REFER SEPARATE DRAWING.
- L<sub>d</sub> = 42 x d WHERE d = DIA. OF BAR.
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

## REFERENCE DRAWING NO. :-

- GENERAL NOTES --BMRCL/PH-II/R1EXTN/VIA/MISC/001
- DIMENSIONAL DETAILS OF PIER & PIERCAP FOR CONCENTRIC PIERS --BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/002/SHT 1 OF 3
- DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR CONCENTRIC PIER(BP509) --BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/002/SHT 3 OF 3
- DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR CONCENTRIC PIER(BP513) --BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/002/SHT 3A OF 3

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 28-12-2023
R2	INDIVIDUAL PIER HEIGHT TO BE INCORPORATED AS PER LATEST GAD DATED 29.01.2025		30-01-2025	
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024 & REMOVED BP526.		03-06-2024	
R0	GOOD FOR CONSTRUCTION		28-12-2023	

'P' (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.

CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLD'S' IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'S'.



BANGALORE METRO RAIL CORPORATION LTD

A. 3rd Floor, BMTCL Complex,  
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PROOF CHECKED

PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE: REINFORCEMENT DETAILS FOR CONCENTRIC PIERS OF STRAIGHT (BP509 & BP513)

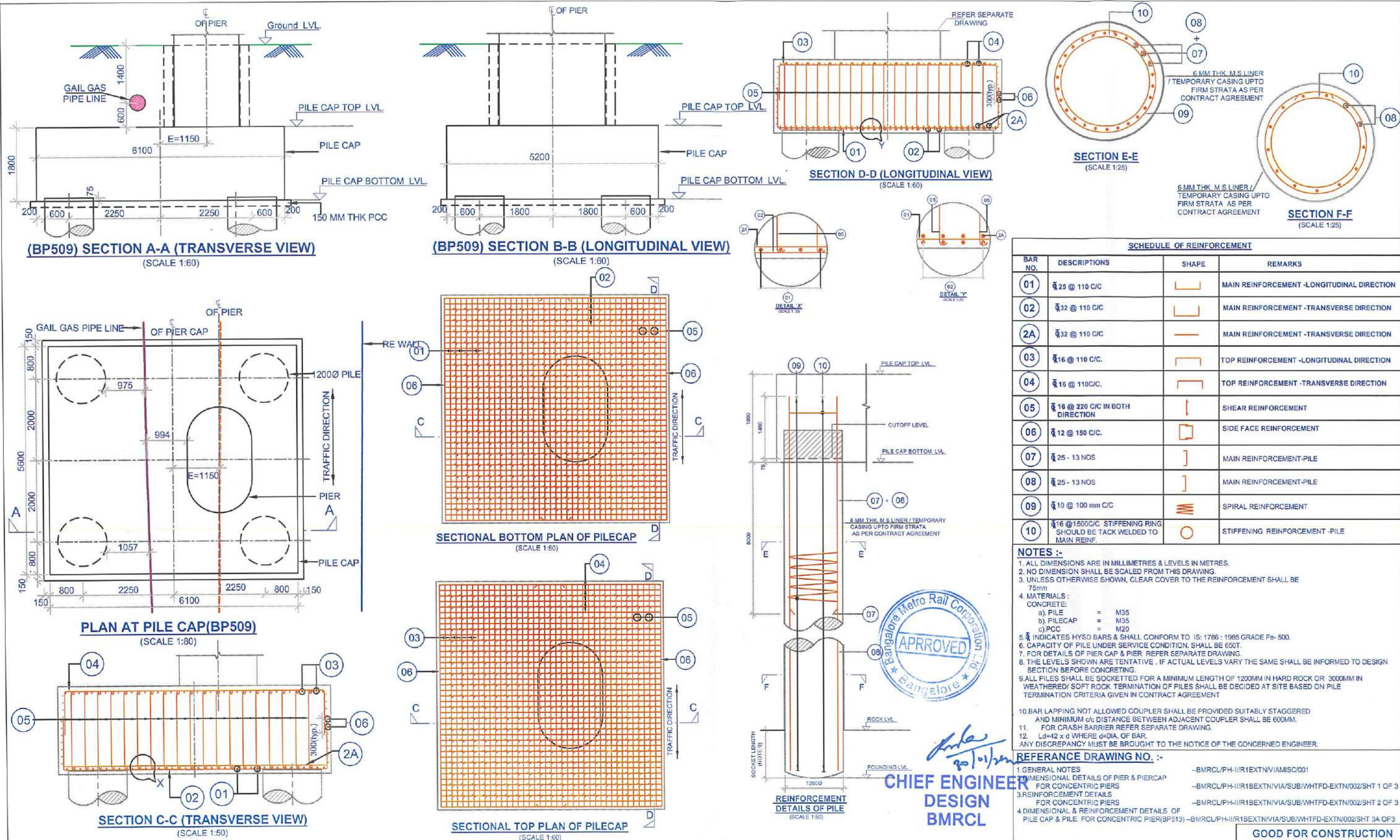
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DRN: DSD: APPR:

ISSUE R2

DATE(CURRENT ISSUE)  
30-01-2025





ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 28-12-2023
R2	INDIVIDUAL DETAILS OF BP509 SHOWN. REFER SEPARATE DRAWING FOR BP513 (BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/002/SHT 3A OF 3)		30-01-2025	
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024 & REMOVED BP526.		03-06-2024	
R0	GOOD FOR CONSTRUCTION		28-12-2023	

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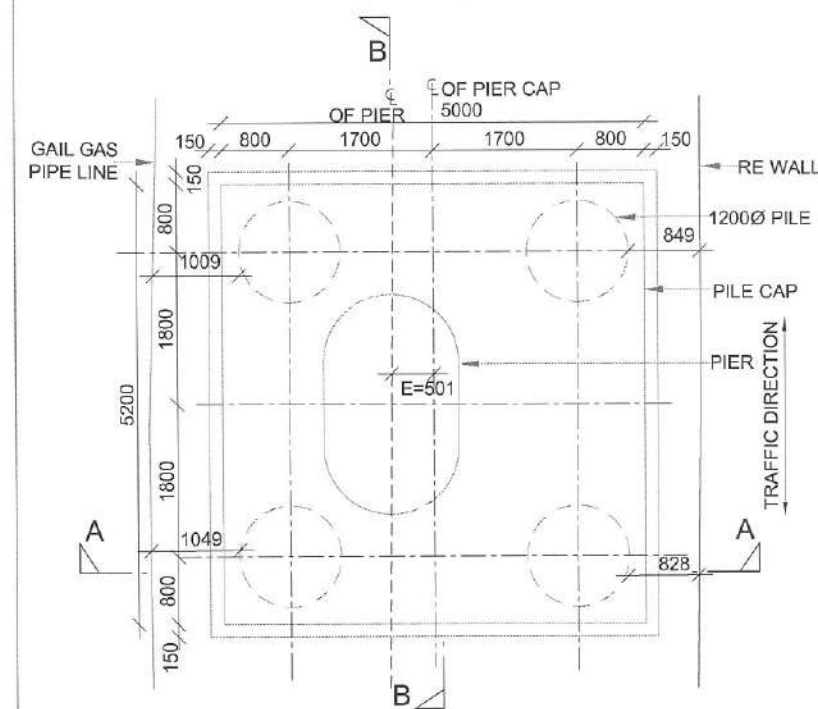
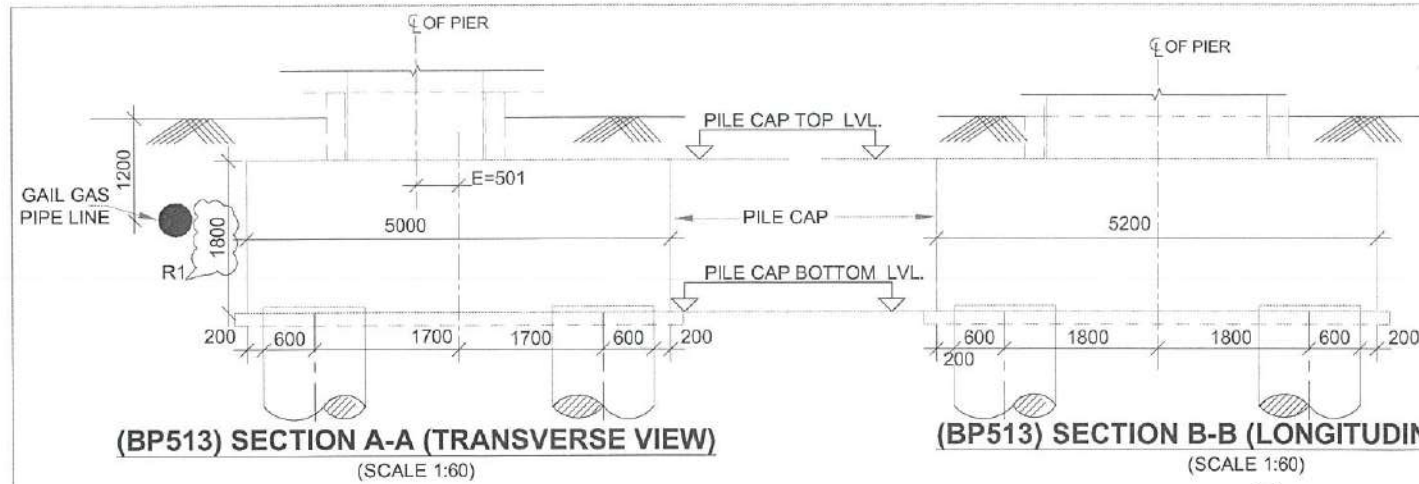
PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE: DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR CONCENTRIC PIERS OF STRAIGHT (BP509)

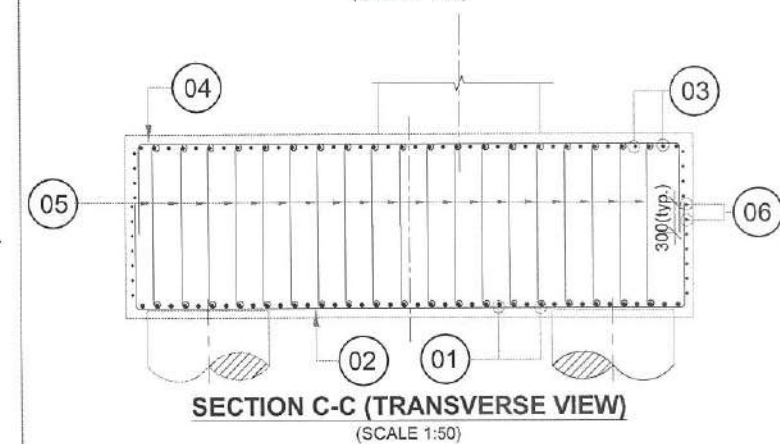
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ISSUE R2  
DATE (CURRENT ISSUE) 30-01-2025

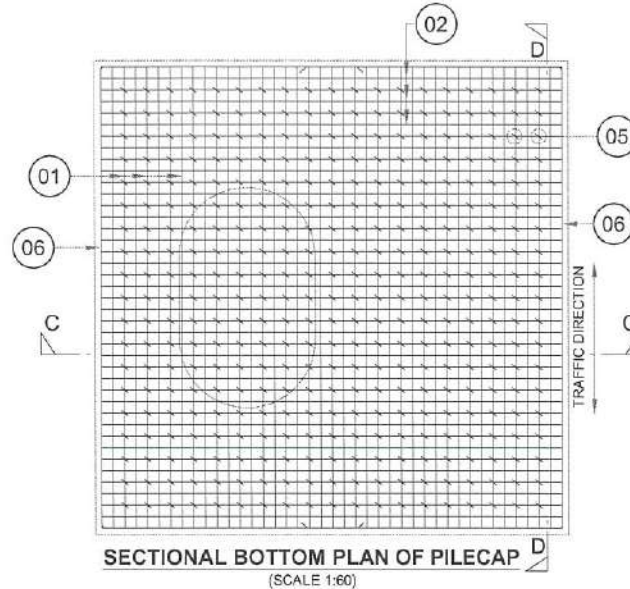
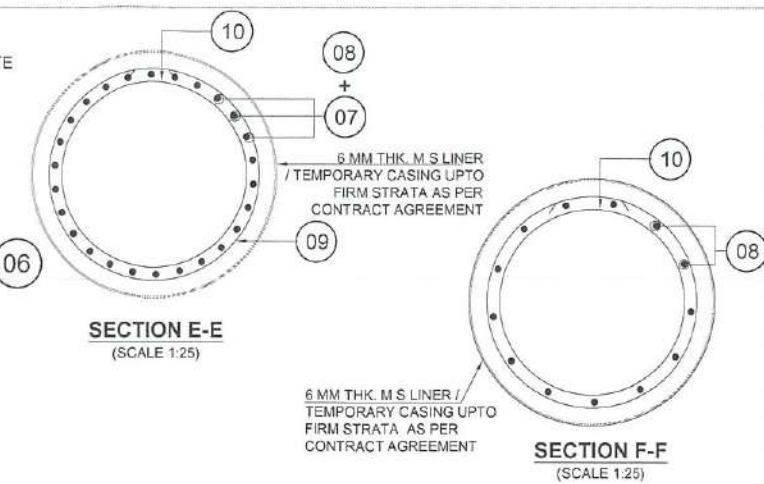
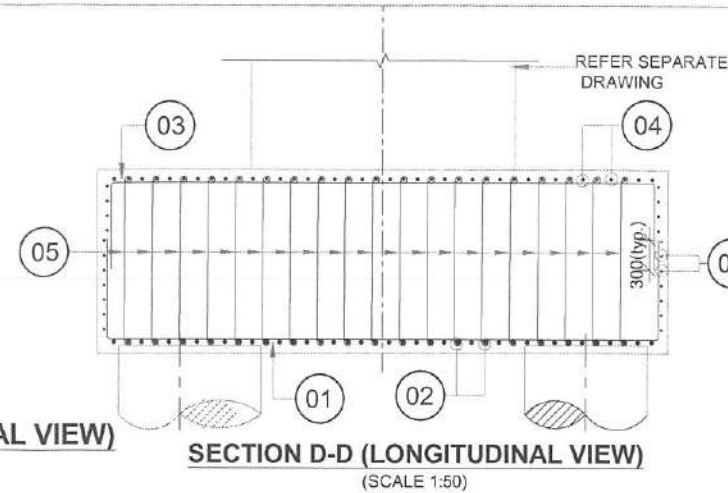
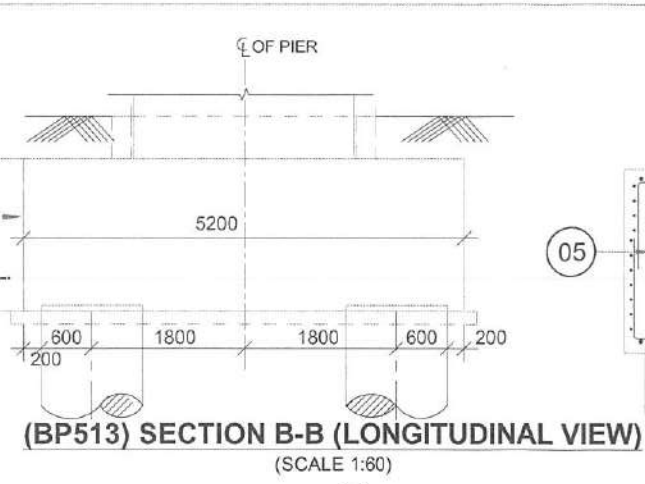




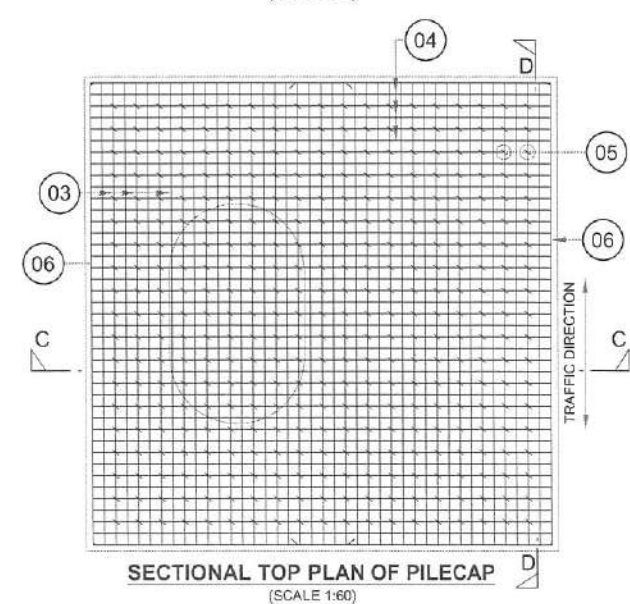
**PLAN AT PILE CAP(BP513)**  
(SCALE 1:80)



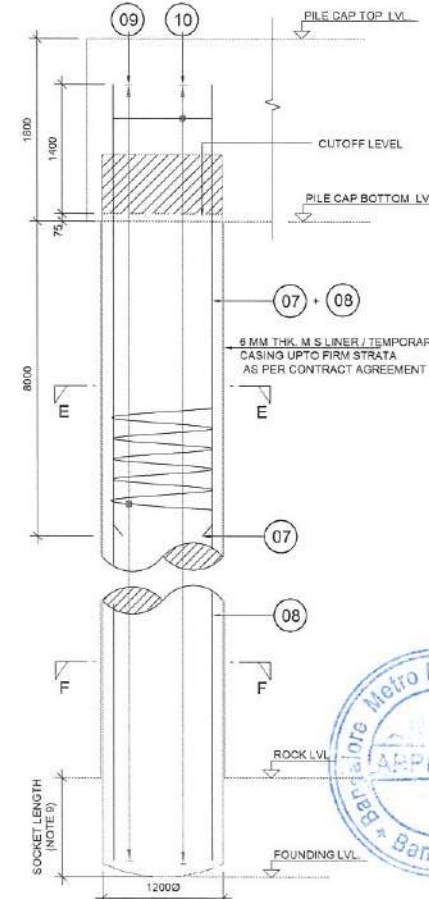
**SECTION C-C (TRANSVERSE VIEW)**  
(SCALE 1:50)



**SECTIONAL BOTTOM PLAN OF PILECAP**  
(SCALE 1:60)













**SECTIONAL TOP PLAN OF PILECAP**  
(SCALE 1:60)



**REINFORCEMENT  
DETAILS OF PILE**  
(SCALE 1:50)

Deputy Chief Engineer  
(Planning & Design)  
BMRCL

SCHEDULE OF REINFORCEMENT			
BAR NO.	DESCRIPTIONS	SHAPE	REMARKS
01	Q̄ 25 @ 110 C/C		MAIN REINFORCEMENT -LONGITUDINAL DIRECTION
02	Q̄ 32 @ 110 C/C		MAIN REINFORCEMENT -TRANSVERSE DIRECTION
03	Q̄ 16 @ 110 C/C.		TOP REINFORCEMENT -LONGITUDINAL DIRECTION
04	Q̄ 16 @ 110C/C.		TOP REINFORCEMENT -TRANSVERSE DIRECTION
05	Q̄ 16 @ 220 C/C IN BOTH DIRECTION		SHEAR REINFORCEMENT
06	Q̄ 12 @ 150 C/C.		SIDE FACE REINFORCEMENT
07	Q̄ 25 - 13 NOS		MAIN REINFORCEMENT-PILE
08	Q̄ 25 - 13 NOS		MAIN REINFORCEMENT-PILE
09	Q̄ 10 @ 100 mm C/C		SPIRAL REINFORCEMENT
10	Q̄ 16 @1500C/C STIFFENING RING SHOULD BE TACK WELDED TO MAIN REINF.		STIFFENING REINFORCEMENT -PILE

**NOTES :-**

1. ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
2. NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
3. UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 75mm
4. MATERIALS :  
CONCRETE:
  - a). PILE = M35
  - b). PILECAP = M35
  - c). PCC = M20
5. 6. INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 : 1985 GRADE Fe-500.
6. CAPACITY OF PILE UNDER SERVICE CONDITION, SHALL BE 650T.
7. FOR DETAILS OF PIER CAP & PIER REFER SEPARATE DRAWING.
8. THE LEVELS SHOWN ARE TENTATIVE . IF ACTUAL LEVELS VARY THE SAME SHALL BE INFORMED TO DESIGN SECTION BEFORE CONCRETING
9. ALL PILES SHALL BE SOCKETTED FOR A MINIMUM LENGTH OF 1200MM IN HARD ROCK OR 3000MM IN WEATHERED/ SOFT ROCK. TERMINATION OF PILES SHALL BE DECIDED AT SITE BASED ON PILE TERMINATION CRITERIA GIVEN IN CONTRACT AGREEMENT
10. BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
11. FOR CRASH BARRIER REFER SEPARATE DRAWING.
12.  $L_d = 42 \times d$  WHERE  $d = \text{dia. OF BAR}$ .
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

REFERENCE DRAWING NO. :-

- |   |   |
|---|---|
| 1. GENERAL NOTES  | --BMRCL/PH-I/R1/EXTN/VIA/MISC/001                       |
| 2. DIMENSIONAL DETAILS OF PIER & PIERCAP<br>FOR CONCENTRIC PIERS                        | --BMRCL/PH-I/R1/BEXTN/VIA/SUB/WHTFD-EXTN/002/SHT 1 OF 3 |
| 3. REINFORCEMENT DETAILS<br>FOR CONCENTRIC PIERS  | --BMRCL/PH-I/R1/BEXTN/VIA/SUB/WHTFD-EXTN/002/SHT 2 OF 3 |
| 4. DIMENSIONAL & REINFORCEMENT DETAILS OF<br>PILE CAP & PILE FOR CONCENTRIC PIER(BP509) | --BMRCL/PH-I/R1/BEXTN/VIA/SUB/WHTFD-EXTN/002/SHT 3 OF 3 |

## GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE	AS SHOWN
				DATE (R0 ISSUE)	30-01-2025
R1	DEPTH OF PILECAP IS SHOWN IN SECTION A-A ALSO.		02.09.2025		'P' (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.
R0	INDIVIDUAL DETAILS OF BP513 SHOWN. REFER SEPARATE DRAWING FOR BP509 (BMRLC/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/002/SHT 3 OF 3)		30-01-2025		CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLDS' IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLDS'.

namma  
metro

BANGALORE METRO RAIL  
CORPORATION LTD

A. 3rd Floor, BMTC Complex,  
K H Road, Shanthinagar,  
Bangalore -560027  
Tel:-080-22969300

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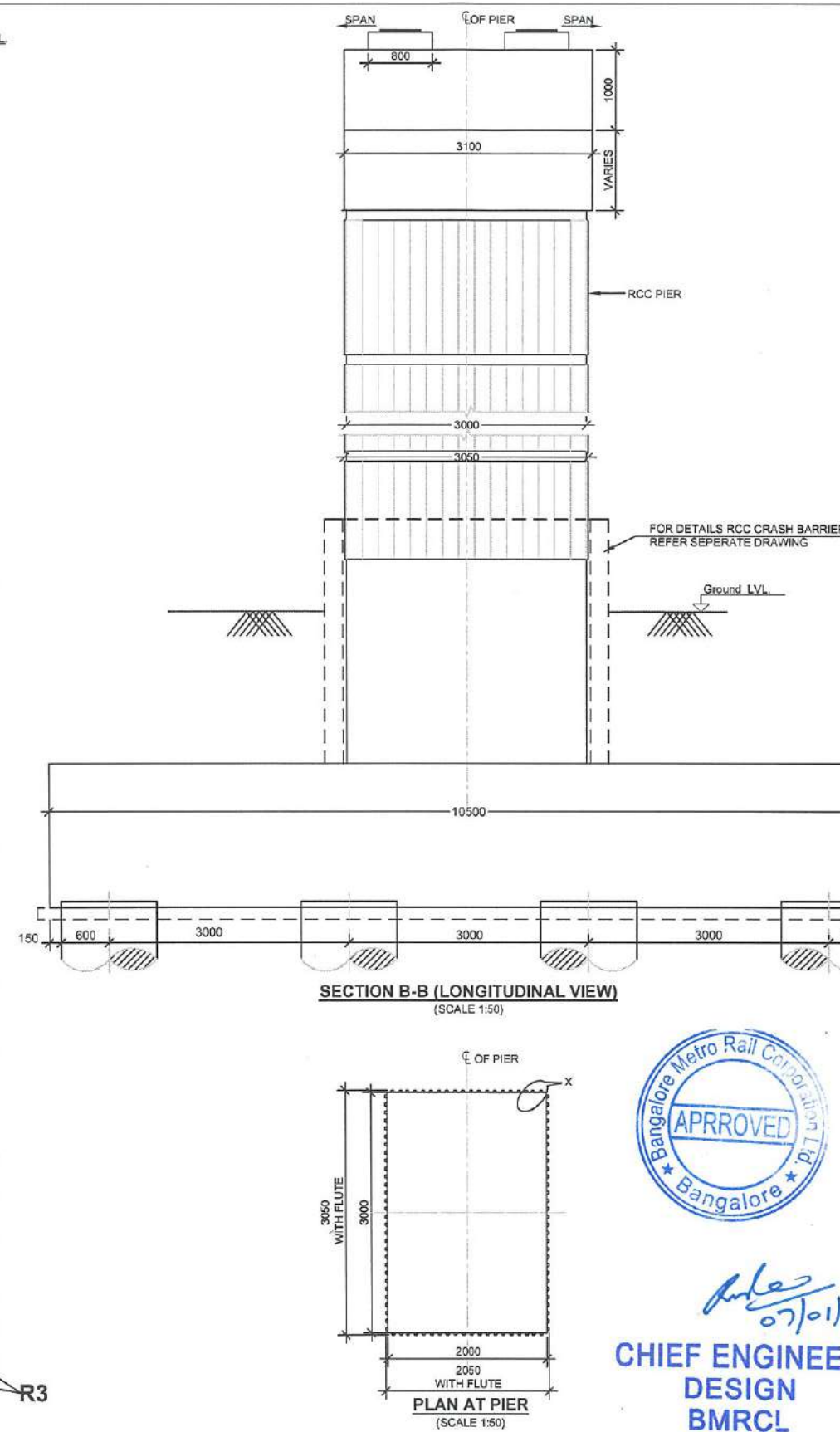
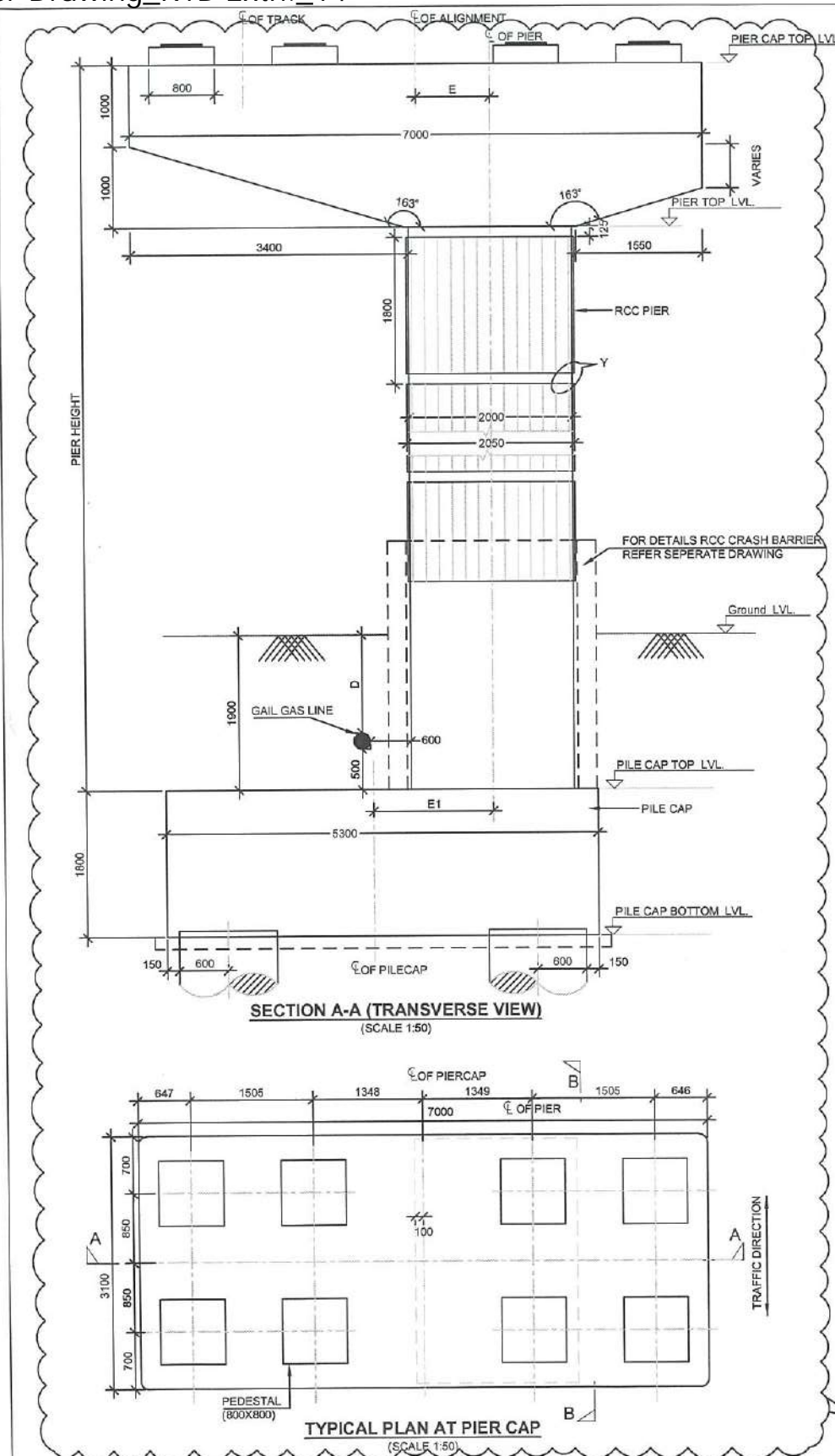
PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE: DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR CONCENTRIC PIERS OF STRAIGHT  
(BP513)

DWG NO:  
BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/002/SHT 3AOF3

DRN: 	DSND: 	APPRD: 	DATE(CURRENT ISSUE) <b>02.09.2025</b>
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SL.NO	PIER NO	ALIGNMENT LINE TO PIER CENTRE (E)	PILECAP CENTRE TO PIER CENTRE (E1)	DEPTH OF GAIL GAS PIPE TOP FROM GROUND (D)	GROUND LEVEL AS PER GAD	RAIL LEVEL AS PER GAD
1	BP507	900mm	1487mm	1.3m	864.551	887.839
2	BP508	800mm	1495mm	1.5m	864.100	887.239

1. ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.  
2. NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.

- CONCRETE:
- |             |       |
|-------------|-------|
| a) PIER     | = M50 |
| b) PIER CAP | = M50 |
| c) PEDESTAL | = M50 |

4. FOR DETAILS OF PILE CAP & PILE REFER SEPARATE DRAWING.

6. CRASH BARRIER/PIER PROTECTION SHAPE & HEIGHT SHOWN IS TENTATIVE, REFER SEPARATE DRAWING FOR DETAIL.

REFERENCE DRAWING NO. :-

### 1. GENERAL NOTES

2. REINFORCEMENT DETAILS FOR  
CONCRETE SLAB

### CONCENTRIC PIERS

#### 3 DIMENSIONAL & REINFORCEMENT DETAILS OF

### 3. DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR CONCENTRIC PIERS

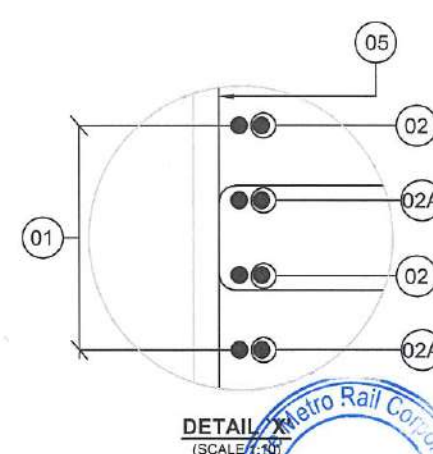
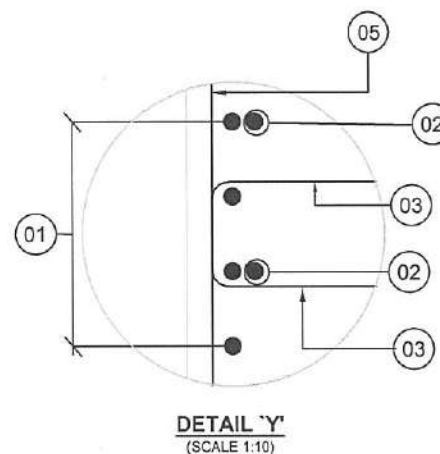
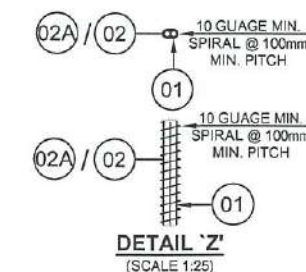
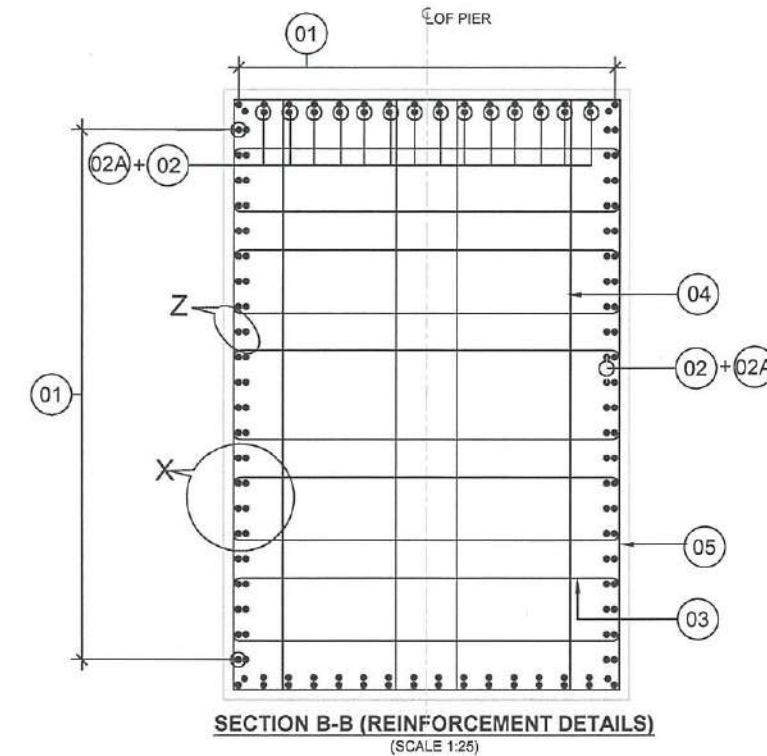
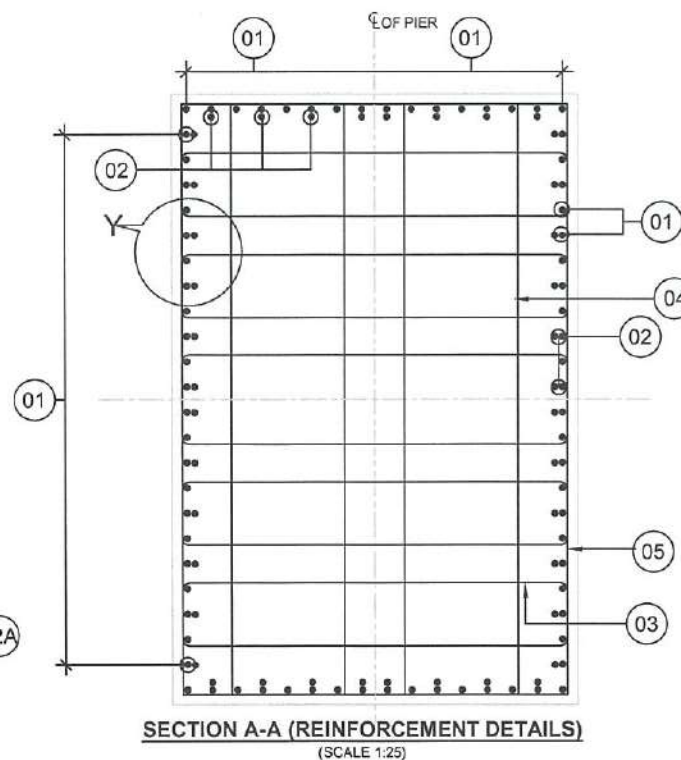
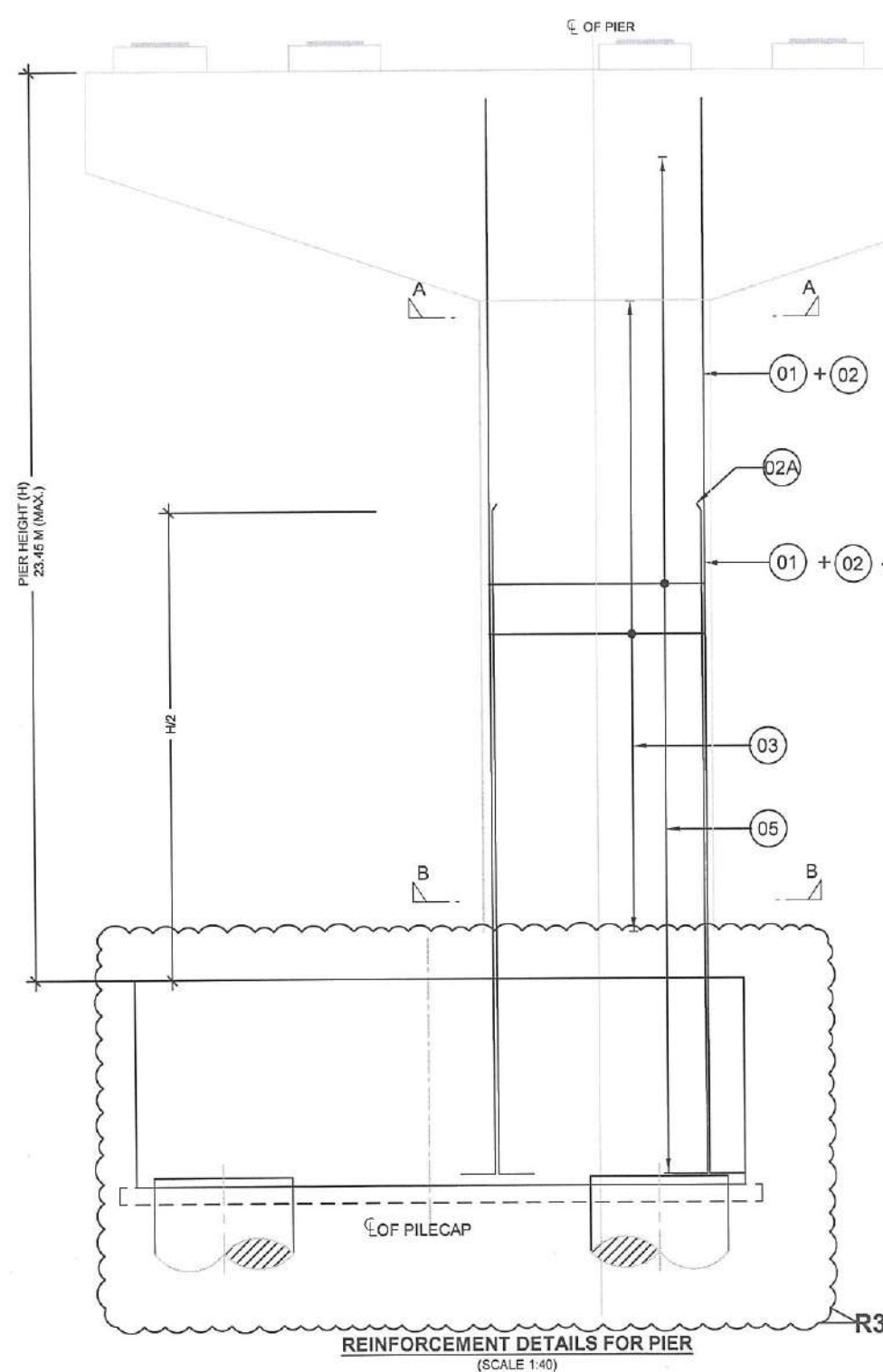
4. DIMENSIONAL &amp; REINFORCEMENT DETAILS OF

#### ADMINISTRATIVE & RENT ENFORCEMENT DETAILS OF PIER CAP FOR CONCENTRIC PIERS WITH RADIUS 250 MTRS (BP507 & BP508)

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	<div>BANGALORE METRO RAIL CORPORATION LTD</div> <div>A. 3rd Floor, BMTC Complex, K H Road, Shanthinagar, Bangalore -560027 Tel:-080-22969300</div>	PROOF CHECKED	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.			
R3	AS PER SITE CONFIRMATION ,DISTANCE FROM GAIL GAS LINE & PILE EDGE IS MAINTAINED 1.0mtr. ACCORDINGLY PILE CAP & PIERCAP SIZE REVISED AS SHOWN.			DATE (R0 ISSUE) 29-12-2023		DWG. TITLE:	DIMENSIONAL DETAILS OF PIER & PIER CAP FOR CONCENTRIC PIERS WITH RADIUS 250 MTRS (BP507 & BP508 )			
R2	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024		29-05-2024	<small>'P' (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.</small>		DWG NO:	BMRCL/PH-II/R1EXT/VIA/SUB/WHTFD-EXTN/003/SHT 1 OF 4		ISSUE R3	
R1	PIER CAP DEPTH CHANGED		01-02-2024			<small>CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLD'S IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'S.</small>	DRN: KAVYATH	DSND: VEERENDRA	APPRD: CE:REPAKA SRINIVASA RAO	DATE(CURRENT ISSUE) 07-01-2025
R0	GOOD FOR CONSTRUCTION		29-12-2023							





R3

## SCHEDULE OF REINFORCEMENT

BAR NO.	DESCRIPTIONS	SHAPE	REMARKS
01	32 - 92 NOS		MAIN REINFORCEMENT
02	32 - 46 NOS		MAIN REINFORCEMENT
02A	32 - 46 NOS		MAIN REINFORCEMENT
03	10 - 10 LEGGED @ 120 C/C		SHEAR REINFORCEMENT
04	10 - 4 LEGGED @ 120 C/C		SHEAR REINFORCEMENT
05	10 @ 120 mm C/C		SHEAR REINFORCEMENT

## NOTES :-

- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
- NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
- UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 50mm
- MATERIALS:  
CONCRETE: PIER = M50
- INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 GRADE Fe-500.
- BAR LAPPING NOT ALLOWED COUPLER, SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
- SPLICE SHALL BE STAGGERED TO PREVENT MORE THAN 50% OF SPLICED OCCURRING AT SAME LOCATION.
- FOR CRASH BARRIER/ PIER PROTECTION REFER SEPARATE DRAWING.
- Ld=42 x d WHERE d=DIA. OF BAR.
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

## REFERENCE DRAWING NO. :-

- GENERAL NOTES -BMRCL/PH-II/R1EXTN/VIA/SC/001
- DIMENSIONAL DETAILS OF PIER & PIERCAP FOR CONCENTRIC PIERS -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/003/ SHT 1 OF 4
- DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR CONCENTRIC PIERS -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/003/ SHT 3 OF 4
- DIMENSIONAL & REINFORCEMENT DETAILS OF PIER CAP FOR CONCENTRIC PIERS WITH RADIUS 250 MTRS (BP507 & BP508) -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/003/ SHT 4 OF 4

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
R3	PIER AND PILECAP ECCENTRICITY GRAPHICAL NOTATION SHOWN.NO CHANGE IN REINFORCEMENT.		07-01-2025	DATE (R0 ISSUE) 29-12-2023
R2	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024		29-05-2024	
R1	PIER CAP DEPTH CHANGED		01-02-2024	
R0	GOOD FOR CONSTRUCTION		29-12-2023	



BANGALORE METRO RAIL CORPORATION LTD

A. 3rd Floor, BMTCL Complex,  
K H Road, Shanthinagar,  
Bangalore - 560027  
Tel:-080-22969300

CHIEF ENGINEER  
DESIGN  
BMRCL

PROOF CHECKED

PHASE II - R1 EXTENSION

VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.

DWG. TITLE: REINFORCEMENT DETAILS FOR CONCENTRIC PIERS  
WITH RADIUS 250 MTRS  
(BP507 & BP508)

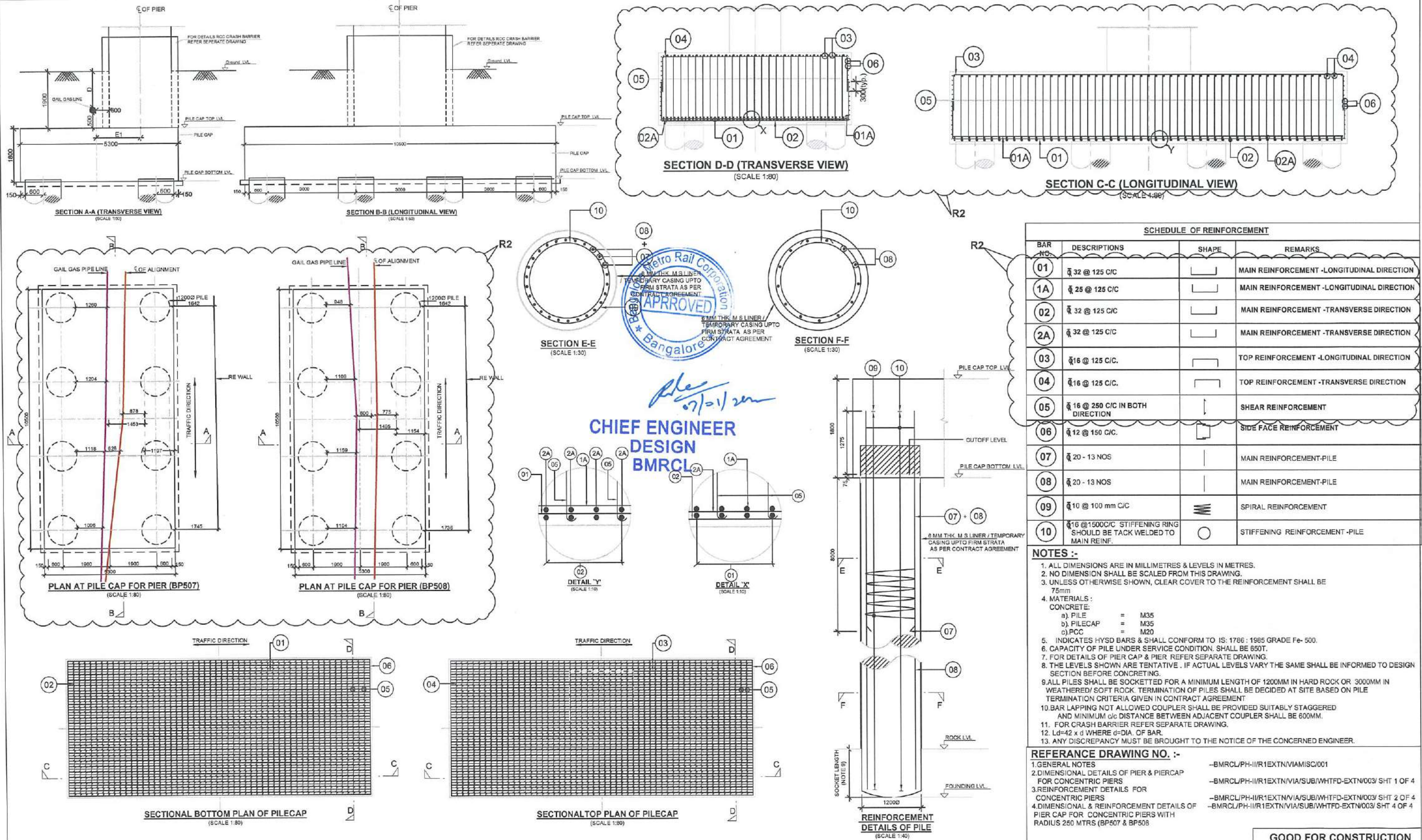
DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/003/SHT 2 OF 4

ISSUE R3

DRN: KAVYA T H DSND:VEERENDRA APPRD: CE:REPAKA SRINIVASA RAO

DATE(CURRENT ISSUE)  
07-01-2025





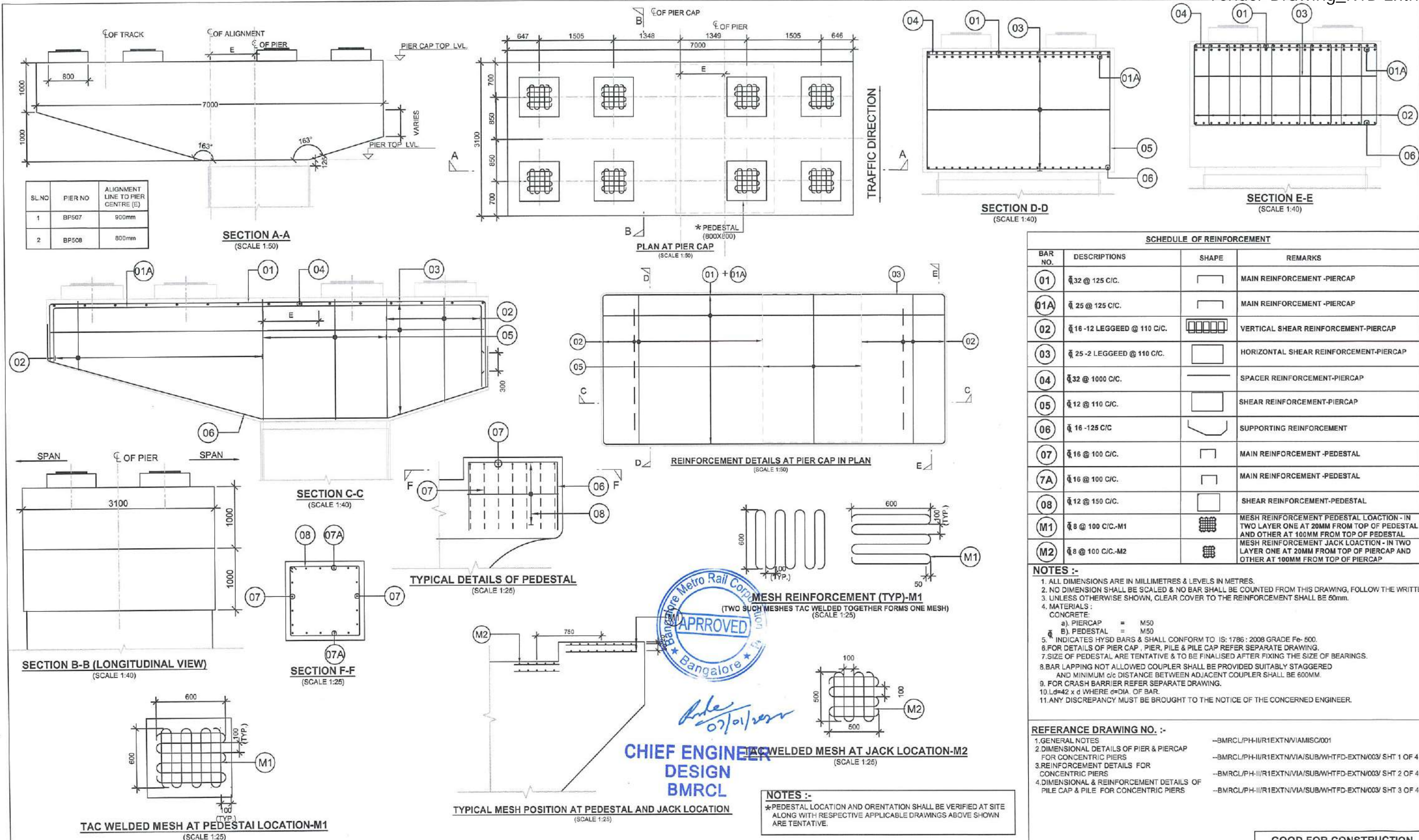
ISSUE		REVISION	APPROVED	DATE	SCALE: AS SHOWN	PROOF CHECKED	GOOD FOR CONSTRUCTION	
					DATE (R0 ISSUE)		PHASE II - R1 EXTENSION	
					29-12-2023		VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.	
R2	AS PER SITE CONFIRMATION ,DISTANCE FROM GAIL GAS LINE & PILE EDGE IS MAINTAINED 1.0mtr. ACCORDINGLY PILE CAP & PIERCAP SIZE REVISED AS SHOWN.		07-01-2025	DWG. TITLE:			DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR CONCENTRIC PIERS WITH RADIUS 250 MTRS (BP507 & BP508 )	
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024		29-05-2024	DWG NO:			BMRCL/PH-II/R1EXT/VIA/SUB/WHITFD-EXTN/003/SHT 3 OF 4	
R0	GOOD FOR CONSTRUCTION		29-12-2023	DRN: KAVYA T H			ISSUE R2	
				DATE (CURRENT ISSUE)			07-01-2025	

1. ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.  
2. NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.  
3. UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 75mm.  
4. MATERIALS:  
CONCRETE:  
a) PILE = M35  
b) PILECAP = M35  
c) PCC = M20  
5. INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 : 1985 GRADE Fe- 500.  
6. CAPACITY OF PILE UNDER SERVICE CONDITION, SHALL BE 650T.  
7. FOR DETAILS OF PIER CAP & PIER, REFER SEPARATE DRAWING.  
8. THE LEVELS SHOWN ARE TENTATIVE. IF ACTUAL LEVELS VARY THE SAME SHALL BE INFORMED TO DESIGN SECTION BEFORE CONCRETING.  
9. ALL PILES SHALL BE SOCKETTED FOR A MINIMUM LENGTH OF 1200MM IN HARD ROCK OR 3000MM IN WEATHERED/ SOFT ROCK. TERMINATION OF PILES SHALL BE DECIDED AT SITE BASED ON PILE TERMINATION CRITERIA GIVEN IN CONTRACT AGREEMENT.  
10. BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM  $\phi/6$  DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.  
11. FOR CRASH BARRIER REFER SEPARATE DRAWING.  
12.  $L_d = 42 \times d$  WHERE  $d = \text{DIA. OF BAR}$ .  
13. ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

REFERENCE DRAWING NO. :-  
1. GENERAL NOTES  
2. DIMENSIONAL DETAILS OF PIER & PIERCAP FOR CONCENTRIC PIERS  
3. REINFORCEMENT DETAILS FOR CONCENTRIC PIERS  
4. DIMENSIONAL & REINFORCEMENT DETAILS OF PIER CAP FOR CONCENTRIC PIERS WITH RADIUS 250 MTRS (BP507 & BP508 )  
-BMRCL/PH-II/R1EXTN/VIA/MISC/001  
-BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/003/ SHT 1 OF 4  
-BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/003/ SHT 2 OF 4  
-BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/003/ SHT 4 OF 4

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Bangalore -560027  
Tel:-080-22969300



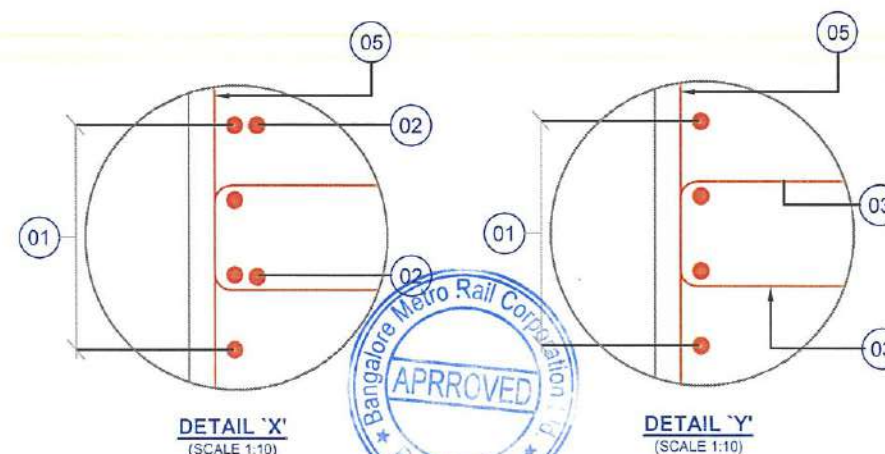
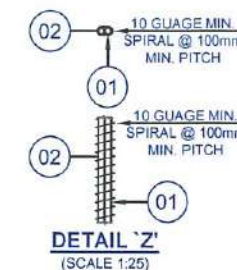
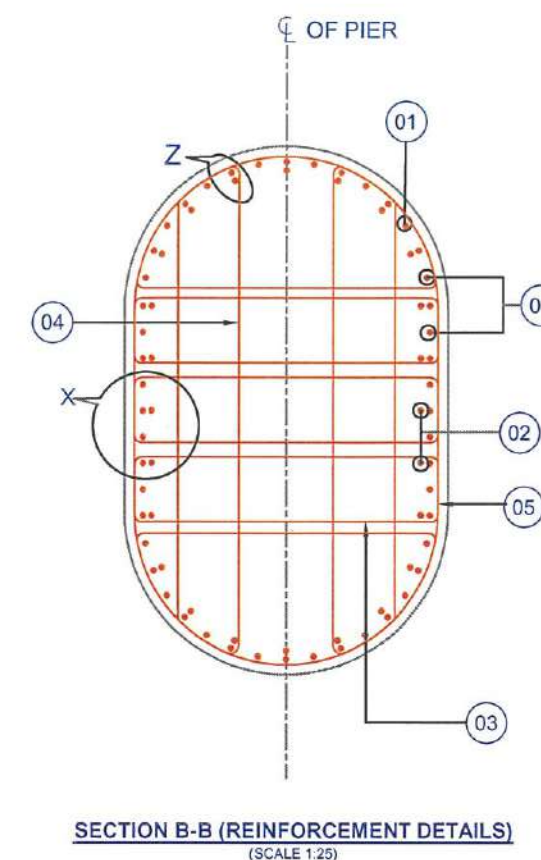
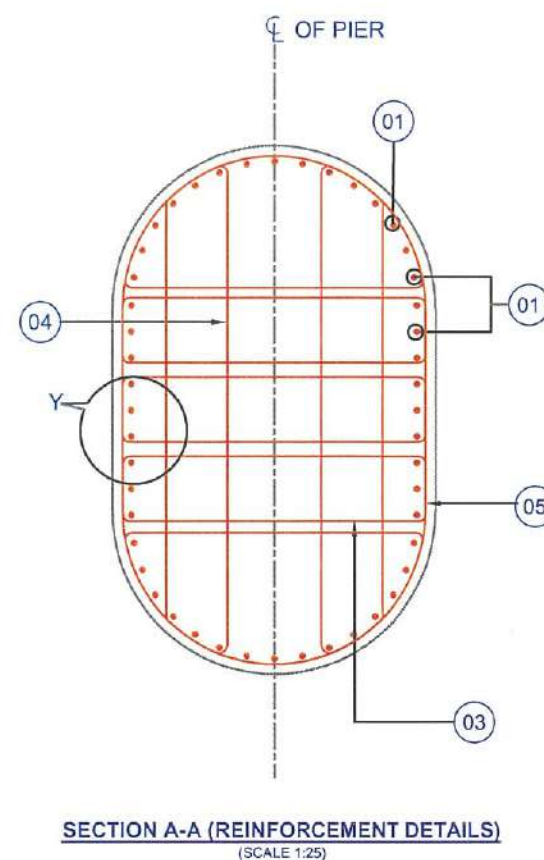
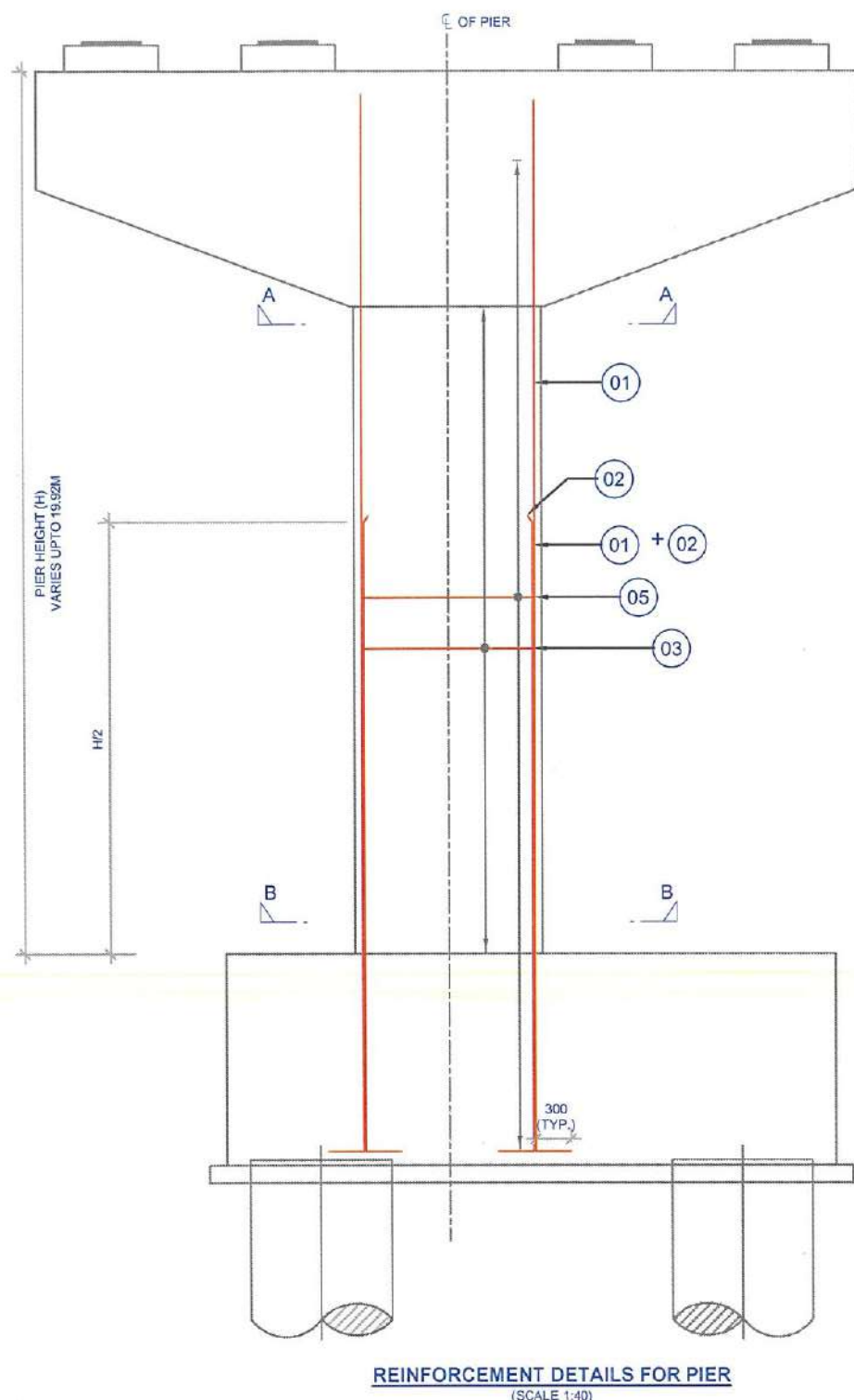


ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	PROOF CHECKED	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.
				DATE (R0 ISSUE) 07-01-2025		DWG. TITLE: DIMENSIONAL & REINFORCEMENT DETAILS OF PIER CAP FOR CONCENTRIC PIERS WITH RADIUS 250 MTRS (BP507 & BP508)
				CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLD' IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'.		DWG NO: BMRCL/PH-II/R1EXTN/IA/SUB/WHTFD-EXTN/003/SHT 4 OF 4
R0	GOOD FOR CONSTRUCTION		07-01-2025			ISSUE R0
				BANGALORE METRO RAIL CORPORATION LTD		DATE/CURRENT ISSUE) 07-01-2025
				A. 3rd Floor, BMTC Complex, K H Road, Shanthinagar, Bangalore -560027 Tel:-080-22969300		









## SCHEDULE OF REINFORCEMENT

BAR NO.	DESCRIPTIONS	SHAPE	REMARKS
01	32 - 44 NOS	]	MAIN REINFORCEMENT
02	32 - 22 NOS	]	MAIN REINFORCEMENT
03	10 - 10 LEGGED @ 150 C/C	⊗	SHEAR REINFORCEMENT
04	10 - 4 LEGGED @ 150 C/C	⊗	SHEAR REINFORCEMENT
05	10 @ 150 mm C/C	○	SHEAR REINFORCEMENT

## NOTES :-

- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
- NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
- UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 50mm
- MATERIALS:  
CONCRETE: PIER = M50
- INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 : 1985 GRADE Fe-500.
- BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
- SPLICE SHALL BE STAGGERED TO PREVENT MORE THAN 50% OF SPLICED OCCURRING AT SAME LOCATION.
- FOR CRASH BARRIER/ PIER PROTECTION REFER SEPARATE DRAWING.
- Ld=42 x d WHERE d=DIA. OF BAR.
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

## REFERENCE DRAWING NO. :-

- GENERAL NOTES --BMRCL/PH-I/R1EXTN/VIA/SC/001
- DIMENSIONAL DETAILS OF PIER & PIERCAP FOR CONCENTRIC PIERS --BMRCL/PH-I/R1EXTN/VIA/SUB/WHTFD-EXTN/004/SHT 1 OF 3
- DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR CONCENTRIC PIERS --BMRCL/PH-I/R1EXTN/VIA/SUB/WHTFD-EXTN/004/SHT 3 OF 3

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 01-02-2024
R2	ECCENTRIC PILECAP IS SHOWN AS INDICATIVE		05.02.2025	
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024 & REMOVED BP514 & BP516.		03.06.2024	
R0	GOOD FOR CONSTRUCTION		01-02-2024	



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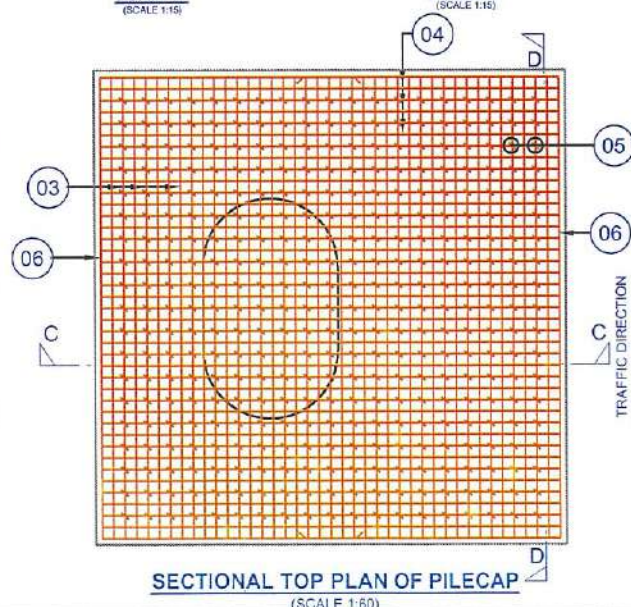
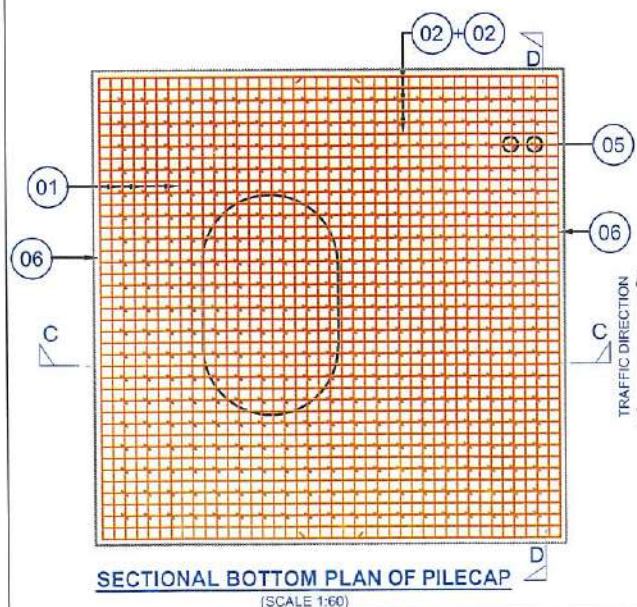
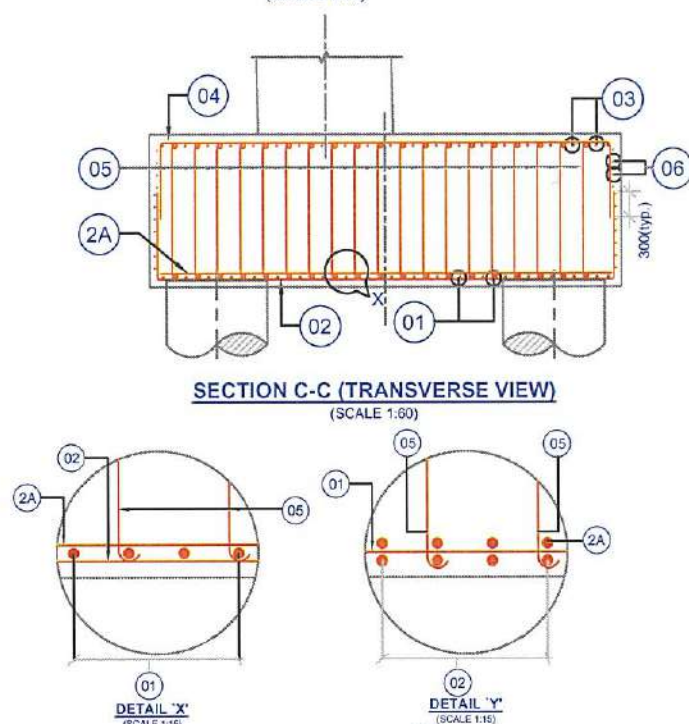
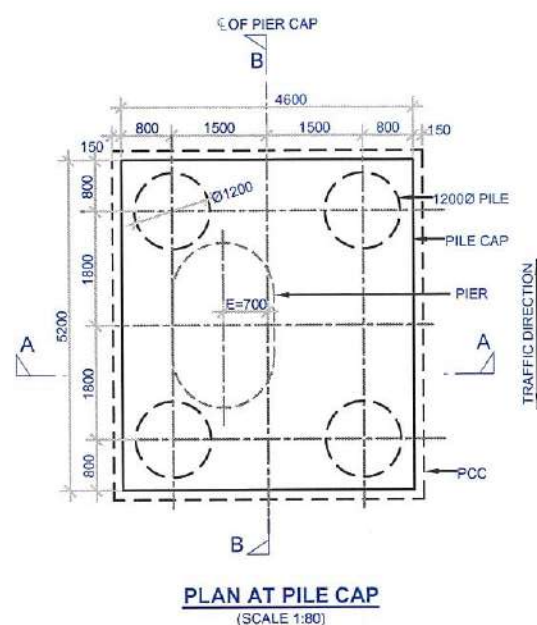
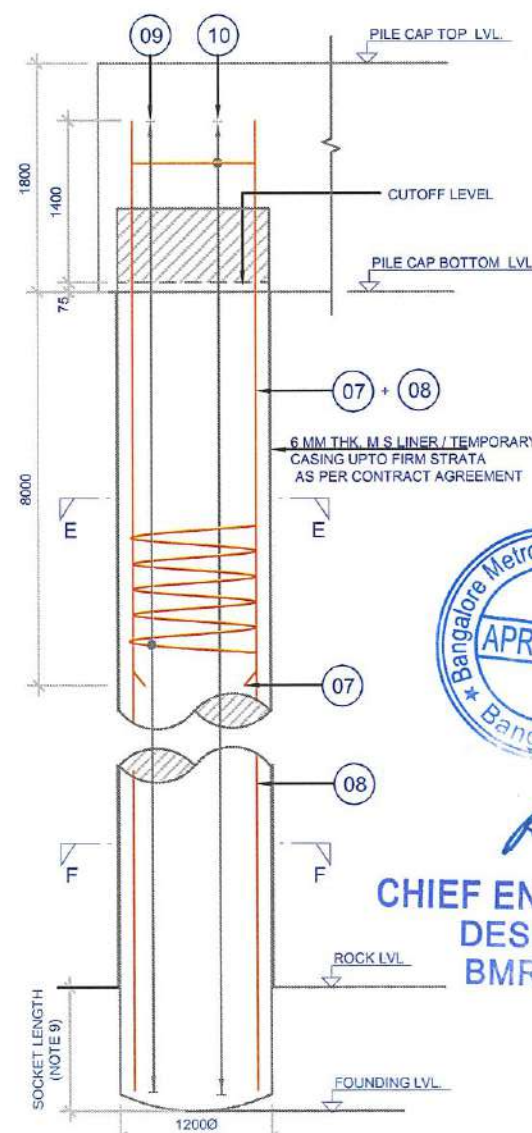
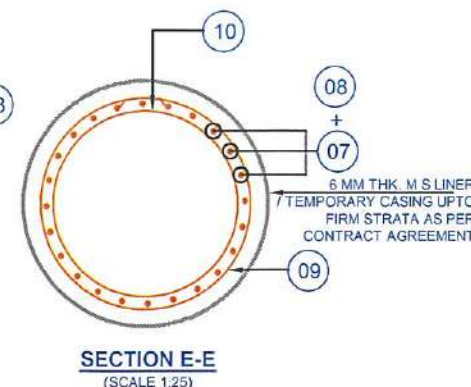
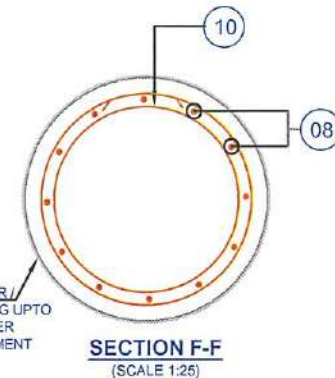
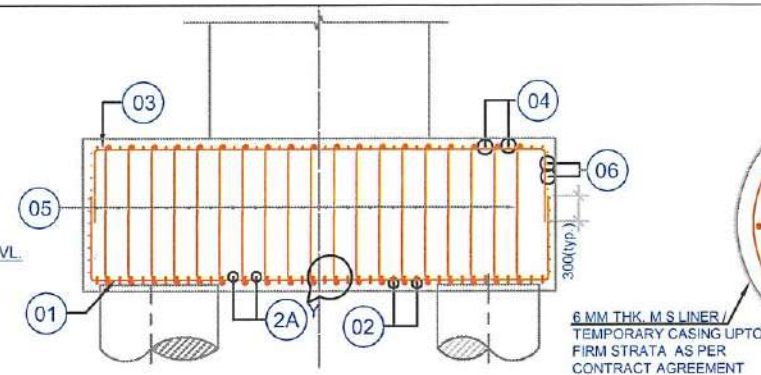
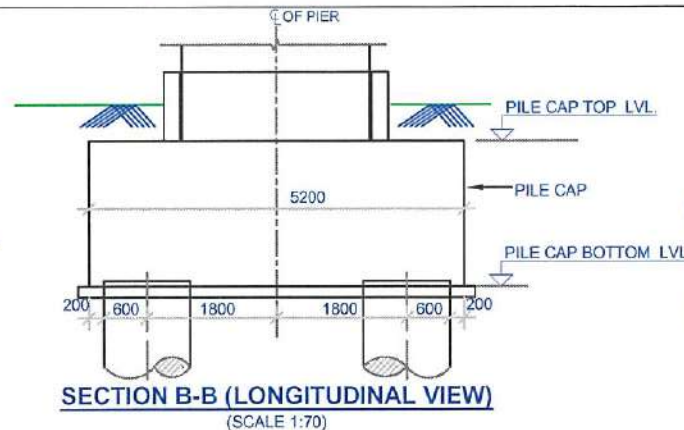
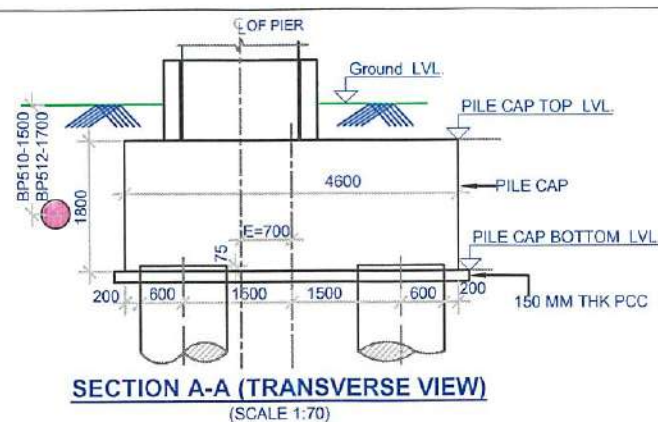
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PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.

DWG. TITLE: REINFORCEMENT DETAILS FOR CONCENTRIC PIERS OF STRAIGHT (BP510 & BP512)

DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/004/SHT 2 OF 3	ISSUE R2
DRN: [Signature]	DATE (CURRENT ISSUE) 05-02-2025





SCHEDULE OF REINFORCEMENT			
BAR NO.	DESCRIPTIONS	SHAPE	REMARKS
01	ϕ25 @ 125 C/C		MAIN REINFORCEMENT -LONGITUDINAL DIRECTION
02	ϕ25 @ 125 C/C		MAIN REINFORCEMENT -TRANSVERSE DIRECTION
2A	ϕ25 @ 125 C/C		MAIN REINFORCEMENT -TRANSVERSE DIRECTION
03	ϕ16 @ 125 C/C.		TOP REINFORCEMENT -LONGITUDINAL DIRECTION
04	ϕ16 @ 125 C/C.		TOP REINFORCEMENT -TRANSVERSE DIRECTION
05	ϕ16 @ 250 C/C IN BOTH DIRECTION		SHEAR REINFORCEMENT
06	ϕ12 @ 150 C/C.		SIDE FACE REINFORCEMENT
07	ϕ25 - 13 NOS		MAIN REINFORCEMENT-PILE
08	ϕ25 - 13 NOS		MAIN REINFORCEMENT-PILE
09	ϕ10 @ 100 mm C/C		SPIRAL REINFORCEMENT
10	ϕ16 @ 1500C/C STIFFENING RING SHOULD BE TACK WELDED TO MAIN REIN		STIFFENING REINFORCEMENT -PILE

NOTES :-

1. ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
2. NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
3. UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 75mm
4. MATERIALS :  
CONCRETE:
  - a) PILE = M35
  - b) PILECAP = M35
  - c) PCC = M20
5. ~~ALL~~ INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 : 1985 GRADE Fe- 500.
6. CAPACITY OF PILE UNDER SERVICE CONDITION, SHALL BE 650T.
7. FOR DETAILS OF PIER CAP & PIER REFER SEPARATE DRAWING.
8. THE LEVELS SHOWN ARE TENTATIVE . IF ACTUAL LEVELS VARY THE SAME SHALL BE INFORMED TO DESIGN SECTION BEFORE CONCRETING.
9. ALL PILES SHALL BE SOCKETTED FOR A MINIMUM LENGTH OF 1200MM IN HARD ROCK OR 3000MM IN WEATHERED/ SOFT ROCK. TERMINATION OF PILES SHALL BE DECIDED AT SITE BASED ON PILE TERMINATION CRITERIA GIVEN IN CONTRACT AGREEMENT
10. BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
11. FOR CRASH BARRIER REFER SEPARATE DRAWING.
12.  $L_d = 42 \times d$  WHERE  $d = \text{dia. OF BAR}$ .
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

REFERENCE DRAWING NO. :-

- |  |  |
|--|--|
| 1. GENERAL NOTES   | --BMRC/L/PH-I/R1EXTN/VIA/MISC/001                      |
| 2. DIMENSIONAL DETAILS OF PIER & PIERCAP<br>FOR CONCENTRIC PIERS | --BMRC/L/PH-I/R1EXTN/VIA/SUB/WHTFD-EXTN/004/SHT 1 OF 3 |
| 3. REINFORCEMENT DETAILS<br>FOR CONCENTRIC PIERS                 | --BMRC/L/PH-I/R1EXTN/VIA/SUB/WHTFD-EXTN/004/SHT 2 OF 3 |

GOOD FOR CONSTRUCTION

(SCALE 1:60)		(SCALE 1:60)	
ISSUE	REVISION	APPROVED	DATE
R3	PILE REINFORCEMENT REVISED.		12.02.2025
R2	PILECAP REVISED AS SHOWN TO AVOID GAIL GAS PIPE LINE INFRINGEMENT.		05.02.2025
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024 & REMOVED BP514 & BP516.		03.06.2024
R0	GOOD FOR CONSTRUCTION		01-02-2024



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K H Road, Shanthinagar,  
Bangalore -560027  
Tel:-080-22969300

PROOF CHECKED

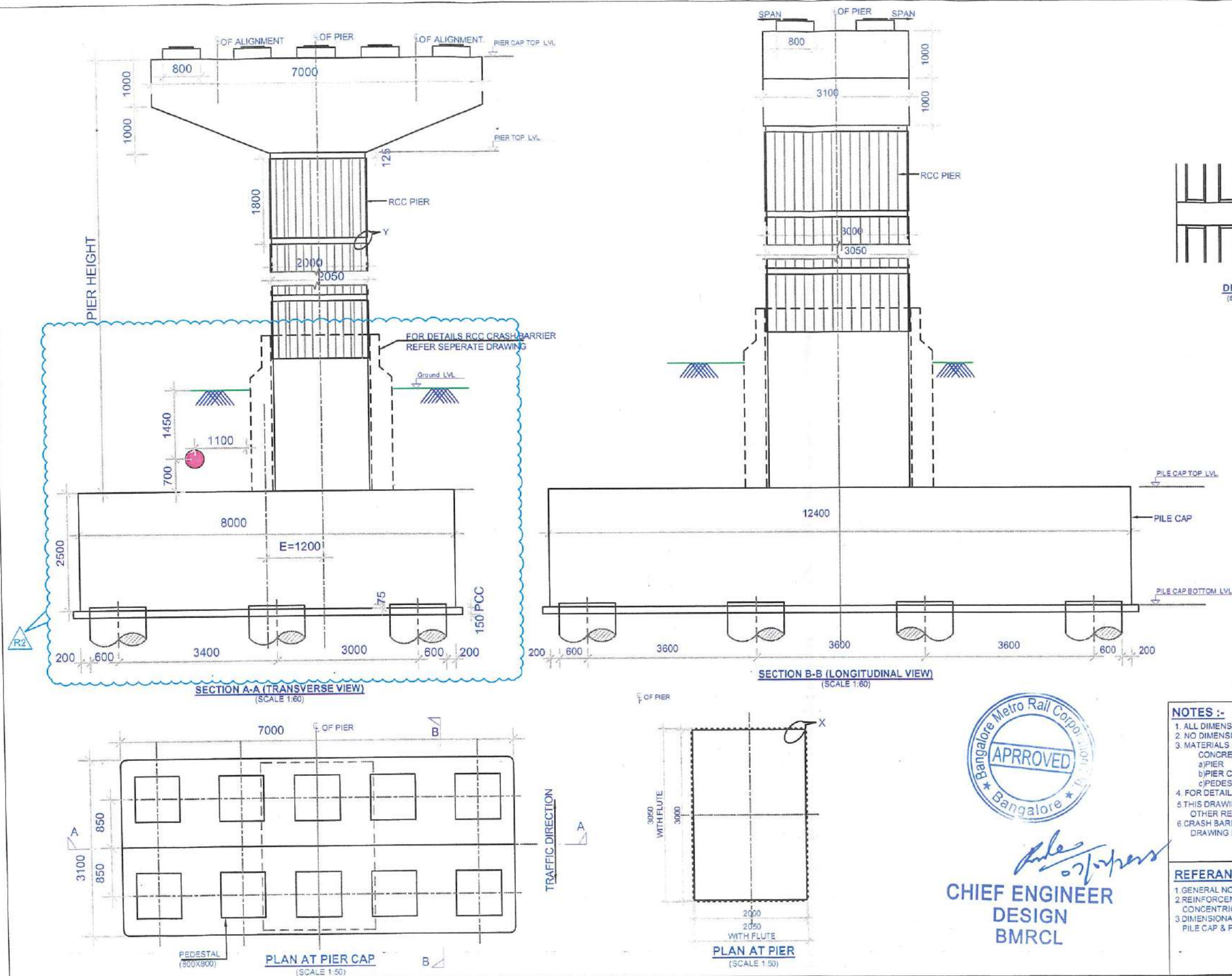
PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.

DWG. TITLE: DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR CONCENTRIC PIERS OF STRAIGHT  
(BP510 & BP512)

DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/004/SHT 3 OF 3

DRN: 	DSND: 	APPRD:	DATE(CURRENT ISSUE) 12-02-2025
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**NOTES :-**

1. ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
2. NO DIMENSION SHALL BE SCALED FROM THIS DRAWING
3. MATERIALS :  
CONCRETE = M50  
a) PIER = M50  
b) PIER CAP = M50  
c) PEDESTAL = M50
4. FOR DETAILS OF PILE CAP & PILE REFER SEPARATE DRAWING
5. THIS DRAWING MUST BE READ IN CONJUNCTION WITH GAD, GENERAL NOTES, SPAN ARRANGEMENT AND OTHER RELATED STRUCTURAL DRAWINGS
6. CRASH BARRIER/PIER PROTECTION SHAPE & HEIGHT SHOWN IS TENTATIVE, REFER SEPARATE DRAWING FOR DETAIL

**REFERENCE DRAWING NO. :-**

1. GENERAL NOTES - BMRC/PH-II/R1EXTN/VIA/ISC/001
2. REINFORCEMENT DETAILS FOR CONCENTRIC FIXED PIERS - BMRC/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/005/SHT 2 OF 3
3. DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR CONCENTRIC FIXED PIERS - BMRC/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/005/SHT 3 OF 3

**GOOD FOR CONSTRUCTION**

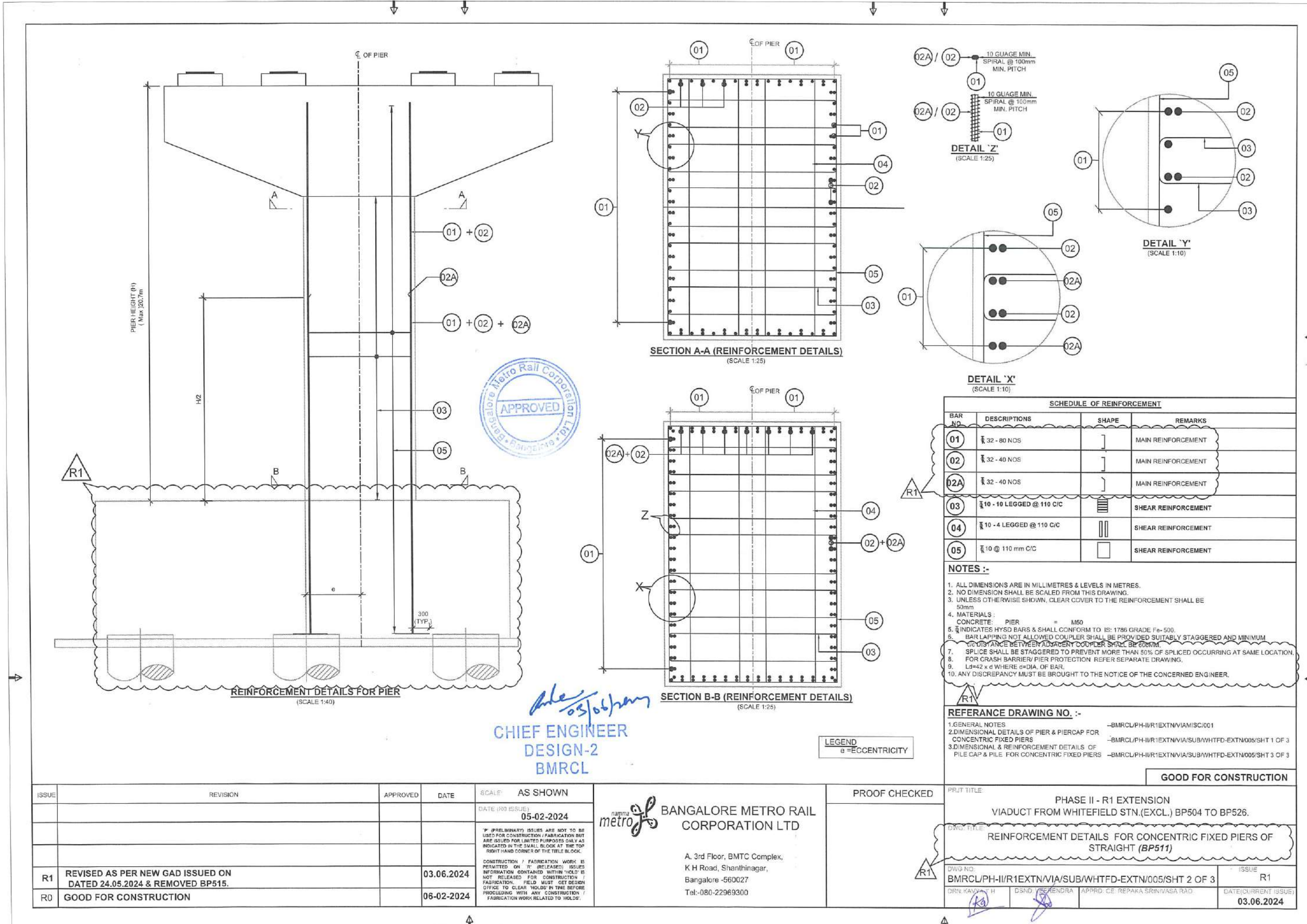
ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	PROOF CHECKED	PRJT TITLE:	DWG. TITLE:	DWG NO:	DRN:	DSND:	APPRD:	ISSUE	DATE (CURRENT ISSUE)
R2	AS PER SITE CONFIRMATION, DISTANCE FROM GAIL GAS LINE & PILE EDGE IS MAINTAINED 1.0mtr. ACCORDINGLY PILE CAP SIZE REVISED AS SHOWN.		07.02.2025	DATE (R0 ISSUE) 05-02-2024		PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.	DIMENSIONAL DETAILS OF PIER & PIER CAP FOR CONCENTRIC FIXED PIERS (BP511)	BMRC/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/005/SHT 1 OF 3				R2	07.02.2025
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024 & REMOVED BP515.		03.06.2024										
R0	GOOD FOR CONSTRUCTION		06-02-2024										

**BANGALORE METRO RAIL CORPORATION LTD**

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Bangalore - 560027  
Tel:-080-22969300

**CHIEF ENGINEER  
DESIGN  
BMRCL**





*05/06/2024*

CHIEF ENGINEER  
DESIGN-2  
BMRC

LEGEND  
e = ECCENTRICITY

SCHEDULE OF REINFORCEMENT			
BAR NO.	DESCRIPTIONS	SHAPE	REMARKS
01	32 - 80 NOS		MAIN REINFORCEMENT
02	32 - 40 NOS		MAIN REINFORCEMENT
02A	32 - 40 NOS		MAIN REINFORCEMENT
03	10 - 10 LEGGED @ 110 C/C		SHEAR REINFORCEMENT
04	10 - 4 LEGGED @ 110 C/C		SHEAR REINFORCEMENT
05	10 @ 110 mm C/C		SHEAR REINFORCEMENT

- NOTES :-
- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
  - NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
  - UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 50mm
  - MATERIALS:  
CONCRETE: PIER = M50
  - INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 GRADE Fe- 500.
  - BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
  - SPLICE SHALL BE STAGGERED TO PREVENT MORE THAN 50% OF SPLICED OCCURRING AT SAME LOCATION.
  - FOR CRASH BARRIER/ PIER PROTECTION REFER SEPARATE DRAWING.
  - Ld=42 x d WHERE d=DIA. OF BAR.
  - ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

- REFERENCE DRAWING NO. :-
- GENERAL NOTES -BMRC/PH-II/R1EXTN/VIA/SC/001
  - DIMENSIONAL DETAILS OF PIER & PIERCAP FOR CONCENTRIC FIXED PIERS -BMRC/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/005/SHT 1 OF 3
  - DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR CONCENTRIC FIXED PIERS -BMRC/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/005/SHT 3 OF 3

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE	AS SHOWN
				DATE (R0 ISSUE)	05-02-2024
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024 & REMOVED BP515.		03.06.2024		
R0	GOOD FOR CONSTRUCTION		06-02-2024		

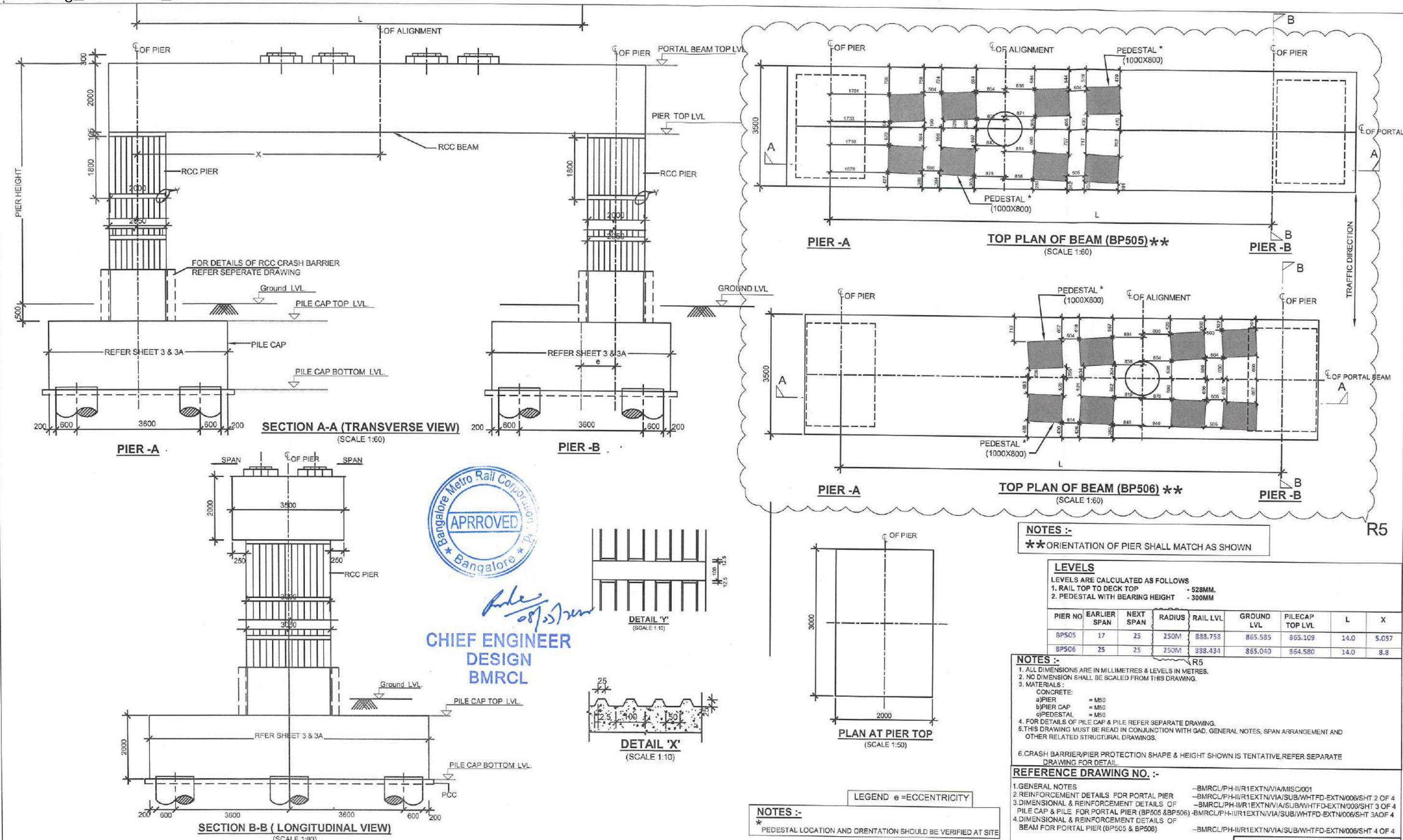
 BANGALORE METRO RAIL CORPORATION LTD  
A. 3rd Floor, BMTC Complex,  
K H Road, Shanthinagar,  
Bangalore -560027  
Tel:-080-22969300

PRJT TITLE: PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.	
DWG. TITLE: REINFORCEMENT DETAILS FOR CONCENTRIC FIXED PIERS OF STRAIGHT (BP511)	
DWG NO: BMRC/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/005/SHT 2 OF 3	ISSUE R1
DRN: KAVYASH H	DSND: VEERENDRA
APPRD: CE: REPAKA SRINIVASA RAO	DATE (CURRENT ISSUE) 03.06.2024









ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	DATE (R0) ISSUE
R5	PEDESTAL ORIENTATION REVISED AS PER LATEST ALIGNMENT DATED 29.01.2025.		08.05.2025		13.02.2024
R4	PILECAP REVISED AS PER LATEST ALIGNMENT GAD 29.01.2025		30.01.2025		
R3	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024.		29.05.2024		
R2	PORTAL SPAN REVISED AS PER LATEST GAD		03.05.2024		
R1	PEDESTAL POSITION AND ORIENTATION REVISED TO MATCH SUPERSTRUCTURE.		12.04.2024		

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PRJT. TITLE:  
PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE:  
DIMENSIONAL DETAILS OF PIER & BEAM FOR PORTAL PIER (BP505 & 506)

DWG NO:  
BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/006/SHT 1 OF 4

DRN:

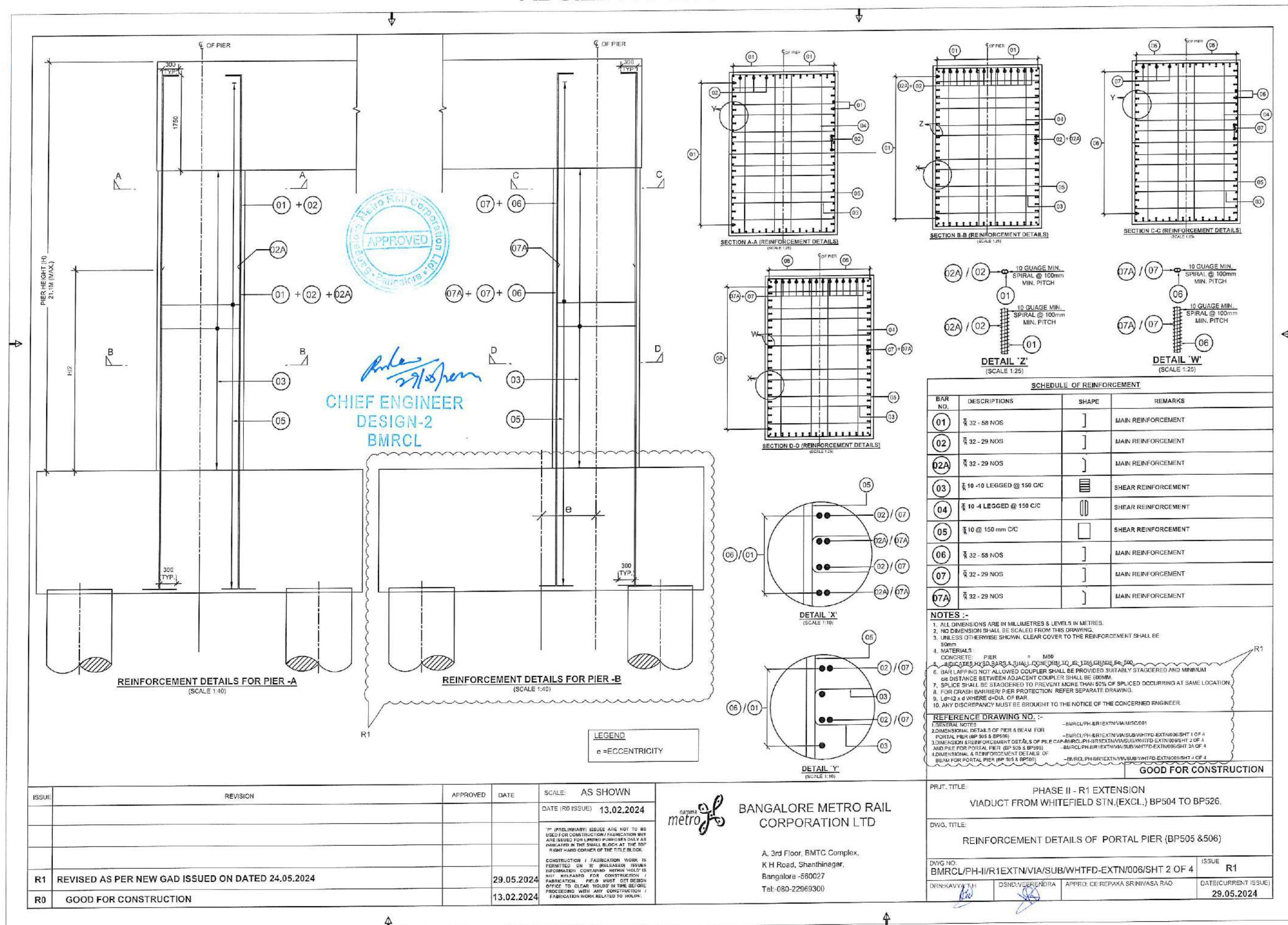
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APPRO:

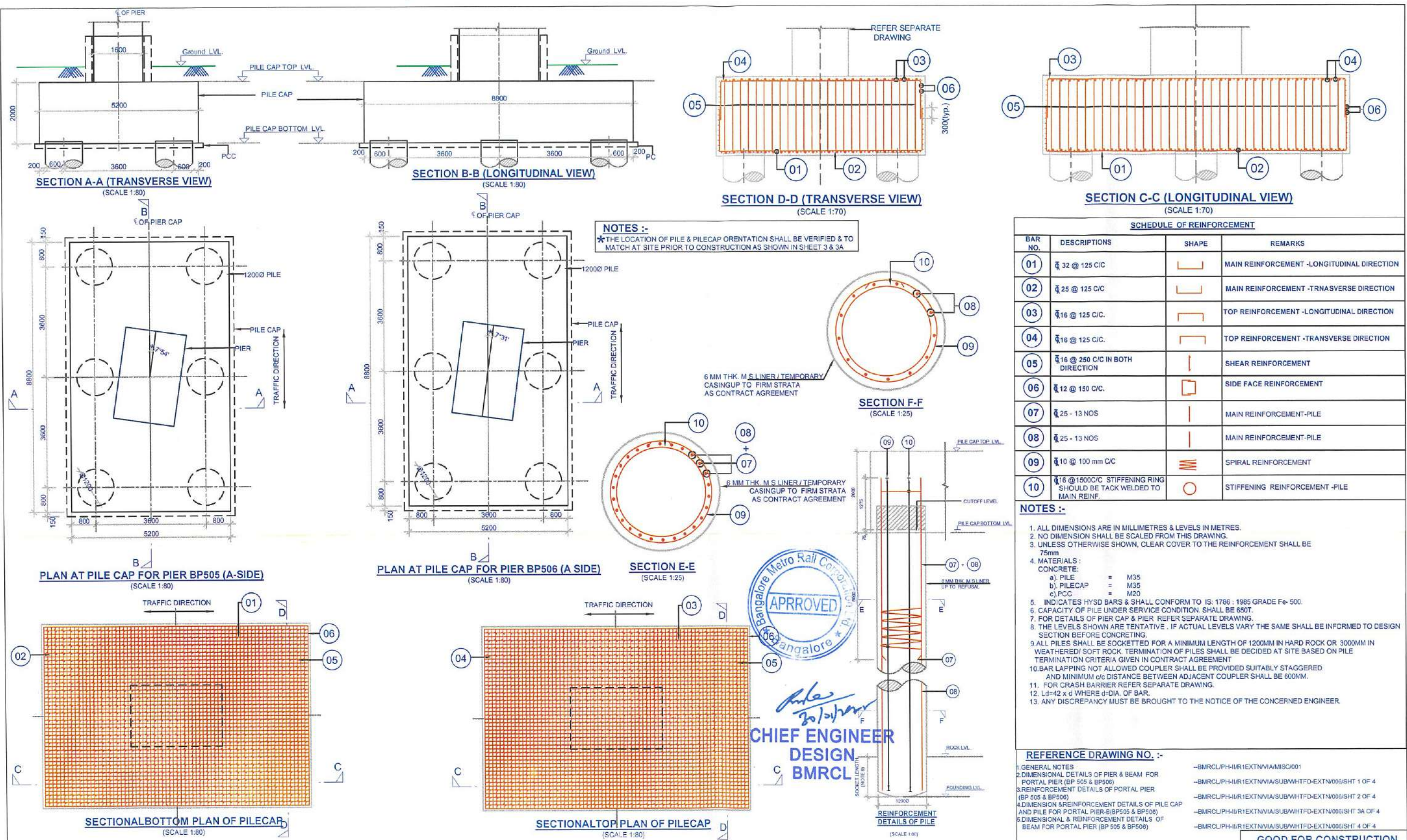
ISSUE  
R5

DATE(CURRENT ISSUE)  
08.05.2025









ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 13.02.2024
R2	PILECAP REVISED AS PER LATEST ALIGNMENT GAD 29.01.2025		30.01.2025	
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024. FOUNDATION DETAIL FOR PIER B SHOWN SEPARATE SHEET.		29.05.2024	
R0	GOOD FOR CONSTRUCTION		13.02.2024	

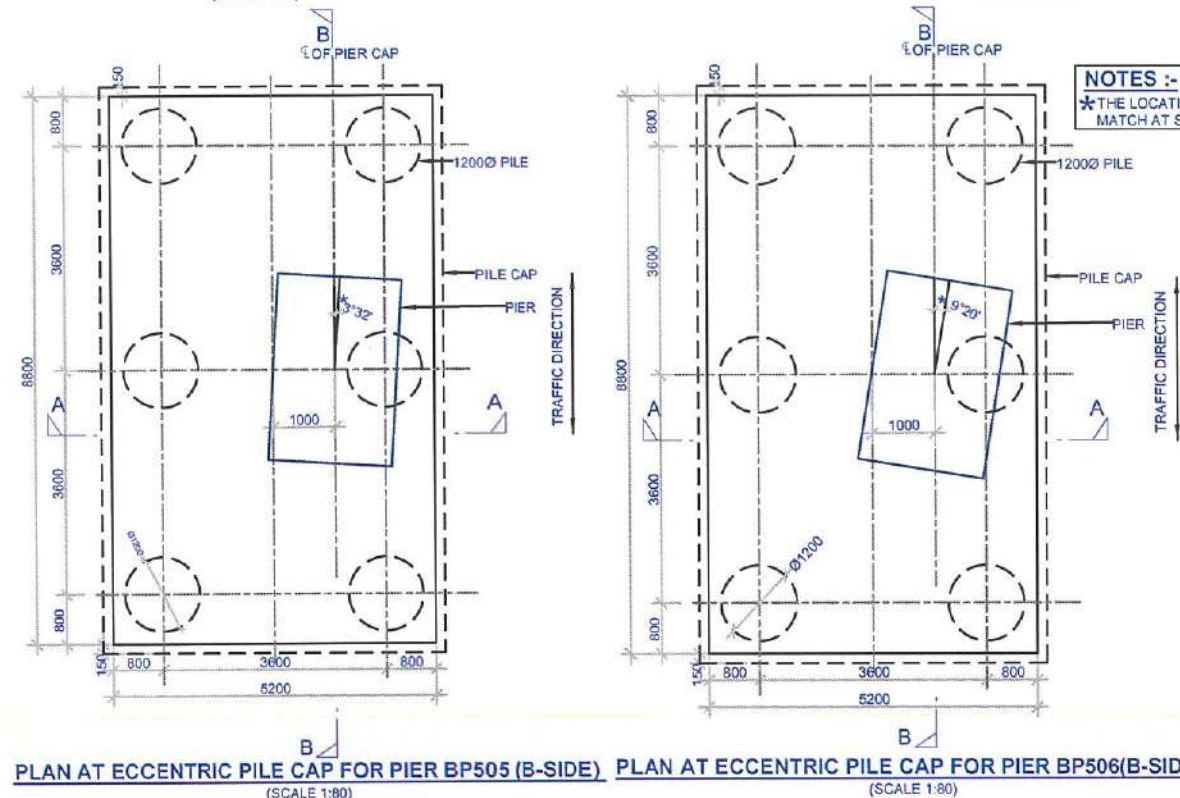
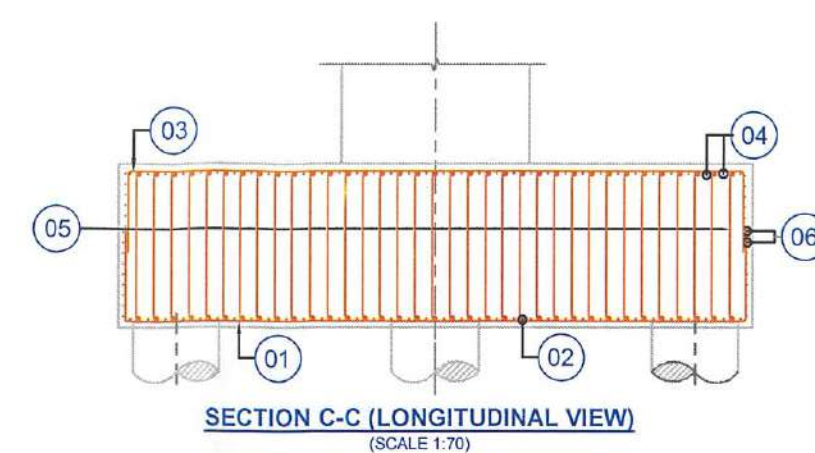
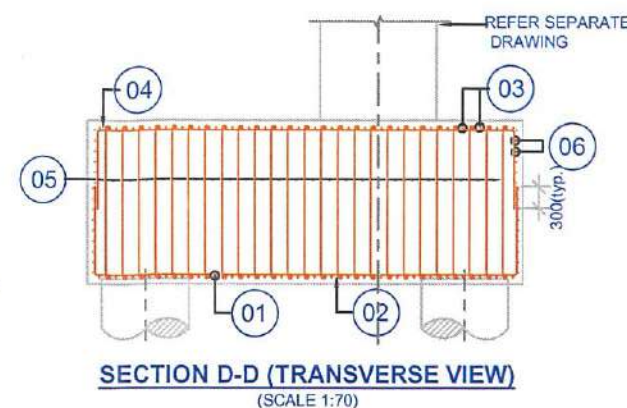
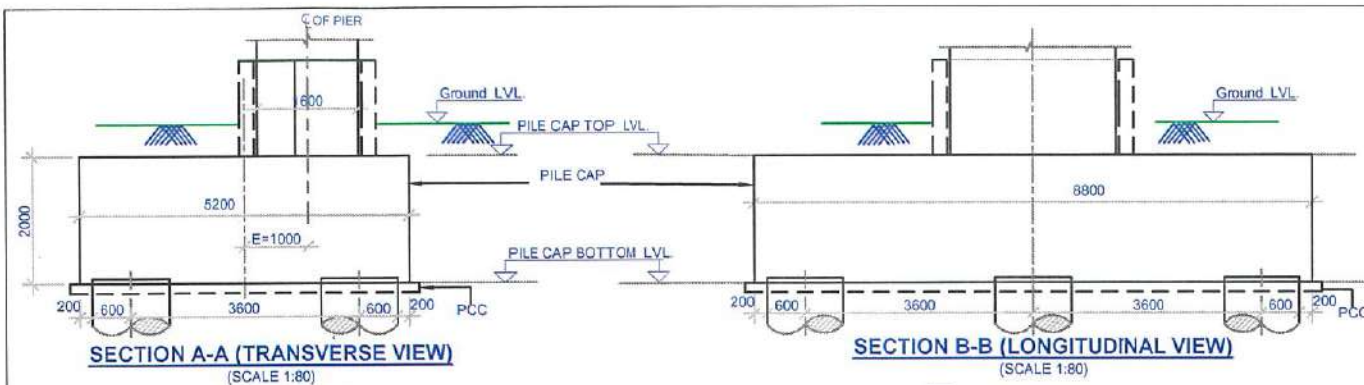


**BANGALORE METRO RAIL CORPORATION LTD**

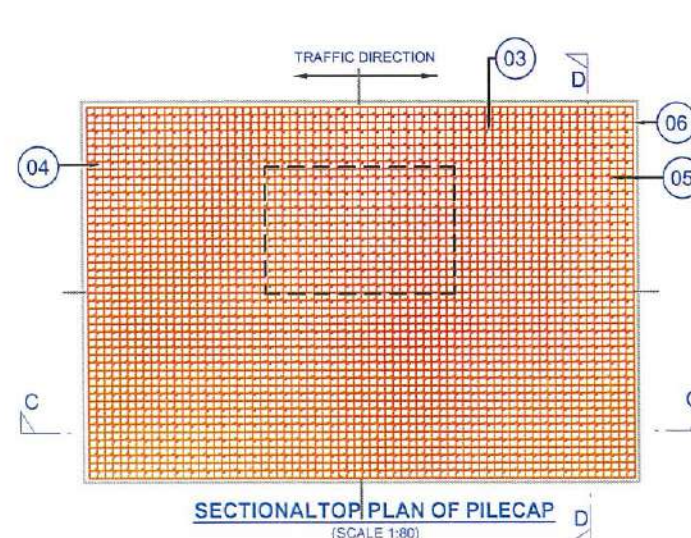
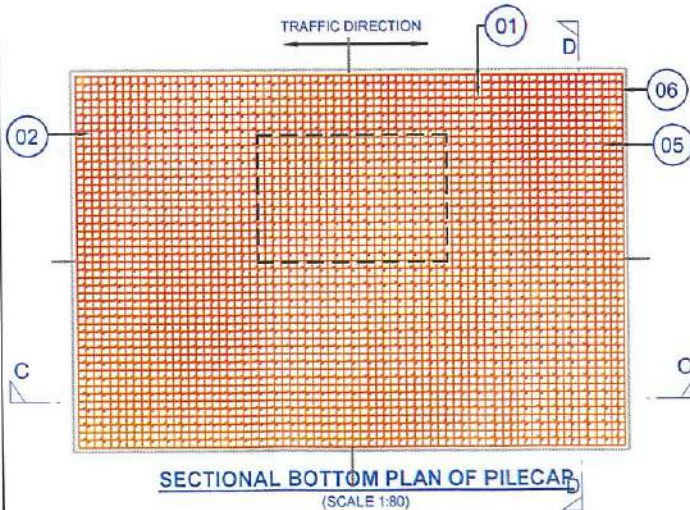
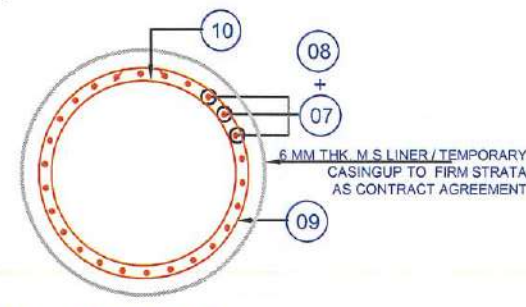
A. 3rd Floor, BMTC Complex,  
K H Road, Shanthinagar,  
Bangalore - 560027  
Tel:-080-22969300

PRJ.T. TITLE:	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.
DWG. TITLE:	DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR PORTAL PIER A (BP505 & 506)
DWG NO:	BMRC/PH-II/R1/EXTN/VIA/SUB/WHITFD-EXTN/006/SHT 3 OF 4
DRN:	DSND:
APPRO:	ISSUE R2
	DATE (CURRENT ISSUE) 30.01.2025

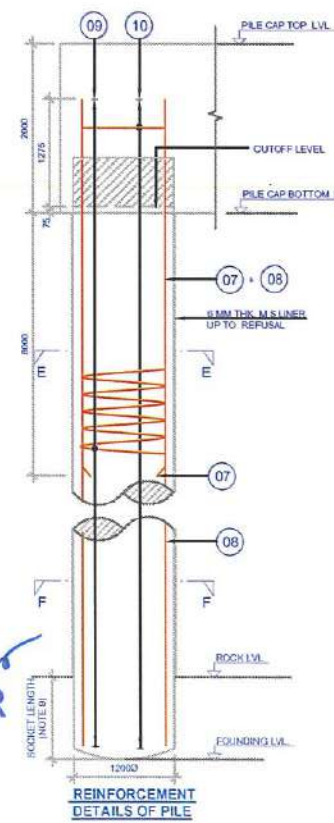




**SECTION E-E**  
(SCALE 1:25)



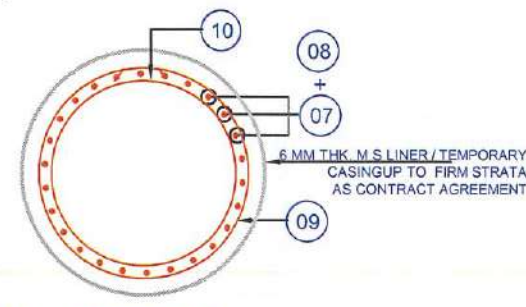
CHIEF ENGINEER  
DESIGN  
BMRCL



**NOTES :-**  
★ THE LOCATION OF PILE & PILECAP ORIENTATION SHALL BE VERIFIED & TO MATCH AT SITE PRIOR TO CONSTRUCTION AS SHOWN IN SHEET 3 & 3A

6 MM THK. M.S LINER / TEMPORARY CASING UP TO FIRM STRATA AS CONTRACT AGREEMENT

**SECTION F-F**  
(SCALE 1:25)



**SCHEDULE OF REINFORCEMENT**

BAR NO.	DESCRIPTIONS	SHAPE	REMARKS
01	32 @ 125 C/C		MAIN REINFORCEMENT - LONGITUDINAL DIRECTION
02	32 @ 125 C/C		MAIN REINFORCEMENT - TRANSVERSE DIRECTION
03	16 @ 125 C/C		TOP REINFORCEMENT - LONGITUDINAL DIRECTION
04	16 @ 125 C/C		TOP REINFORCEMENT - TRANSVERSE DIRECTION
05	16 @ 250 C/C IN BOTH DIRECTION		SHEAR REINFORCEMENT
06	12 @ 150 C/C		SIDE FACE REINFORCEMENT
07	25 - 13 NOS		MAIN REINFORCEMENT - PILE
08	25 - 13 NOS		MAIN REINFORCEMENT - PILE
09	10 @ 100 mm C/C		SPIRAL REINFORCEMENT
10	16 @ 1500 C/C STIFFENING RING SHOULD BE TACK WELDED TO MAIN REIN.		STIFFENING REINFORCEMENT - PILE

**NOTES :-**

- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
- NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
- UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 75mm.
- MATERIALS:  
CONCRETE:  
a) PILE = M35  
b) PILECAP = M35  
c) PCC = M20
- INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 : 1985 GRADE Fe-500.
- CAPACITY OF PILE UNDER SERVICE CONDITION, SHALL BE 650T.
- FOR DETAILS OF PIER CAP & PIER, REFER SEPARATE DRAWING.
- THE LEVELS SHOWN ARE TENTATIVE. IF ACTUAL LEVELS VARY THE SAME SHALL BE INFORMED TO DESIGN SECTION BEFORE CONCRETING.
- ALL PILES SHALL BE SOCKETTED FOR A MINIMUM LENGTH OF 1200MM IN HARD ROCK OR 3000MM IN WEATHERED / SOFT ROCK. TERMINATION OF PILES SHALL BE DECIDED AT SITE BASED ON PILE TERMINATION CRITERIA GIVEN IN CONTRACT AGREEMENT.
- BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
- FOR CRASH BARRIER REFER SEPARATE DRAWING.
- Ld = 42 x d WHERE d = DIA. OF BAR.
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

**REFERENCE DRAWING NO. :-**

- GENERAL NOTES --BMRCL/PH-II/R1/EXTN/VIA/MISC/001
- DIMENSIONAL DETAILS OF PIER & BEAM FOR PORTAL PIER (BP 505 & BP506) --BMRCL/PH-II/R1/EXTN/VIA/SUB/WHTFD-EXTN/006/SHT 1 OF 4
- REINFORCEMENT DETAILS OF PORTAL PIER (BP 505 & BP506) --BMRCL/PH-II/R1/EXTN/VIA/SUB/WHTFD-EXTN/006/SHT 2 OF 4
- DIMENSION & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR PORTAL PIER-A (BP505 & BP506) --BMRCL/PH-II/R1/EXTN/VIA/SUB/WHTFD-EXTN/006/SHT 3 OF 4
- DIMENSIONAL & REINFORCEMENT DETAILS OF BEAM FOR PORTAL PIER (BP 505 & BP506) --BMRCL/PH-II/R1/EXTN/VIA/SUB/WHTFD-EXTN/006/SHT 4 OF 4

**GOOD FOR CONSTRUCTION**

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 13.02.2024
R1	PILECAP REVISED AS PER LATEST ALIGNMENT GAD 29.01.2025		30.01.2025	
R0	ISSUED AS PER NEW GAD ISSUED ON DATED 24.05.2024		29.05.2024	

IF (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.

CONSTRUCTION / FABRICATION WORK IS PERMITTED ON "P" (RELEASED) ISSUES INFORMATION CONTAINED WITHIN "HOLD" IS NOT RELEASED FOR CONSTRUCTION / FABRICATION FIELD MUST GET DESIGN OFFICE TO CLEAR "HOLD" IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO "HOLD".

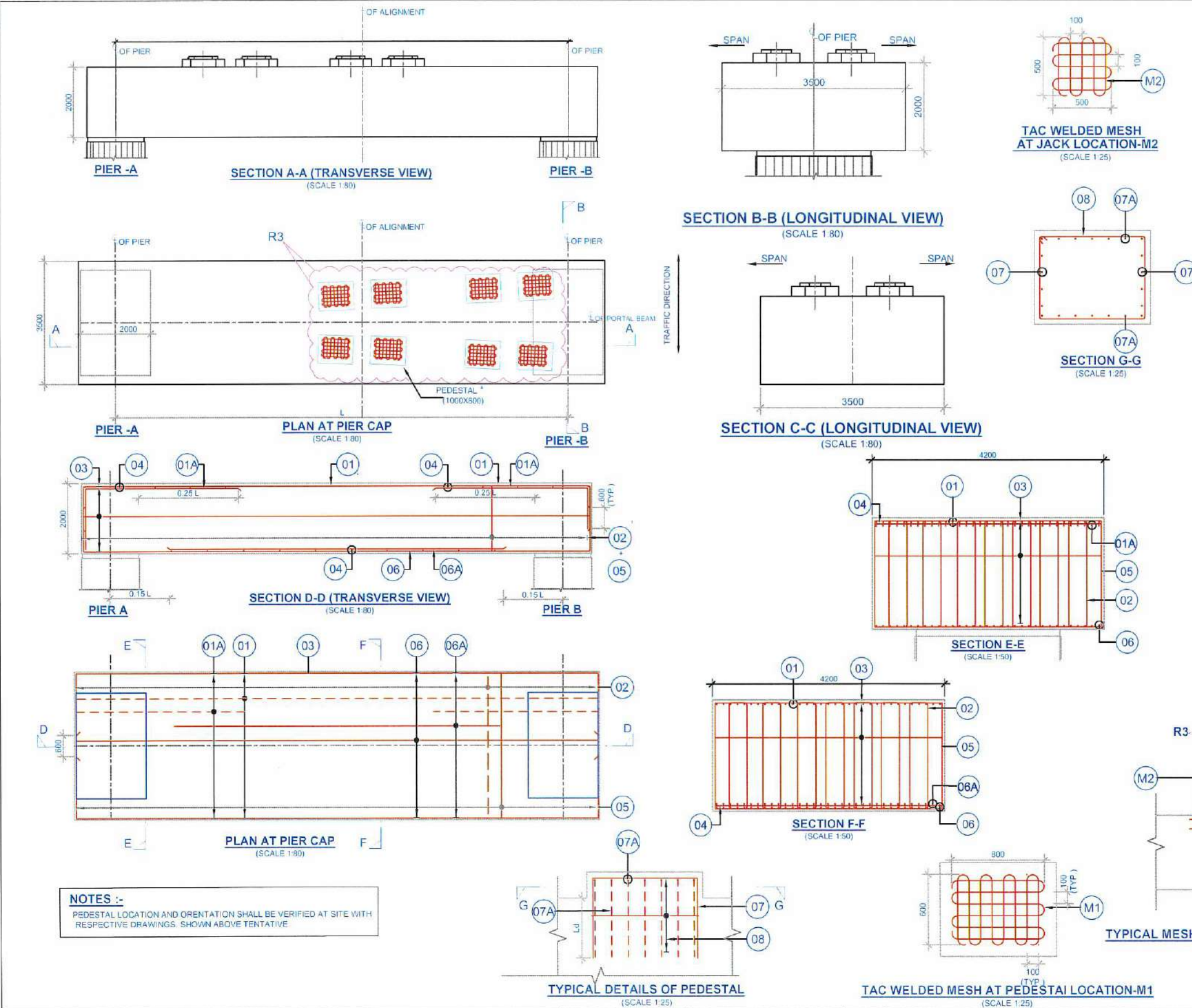


**BANGALORE METRO RAIL CORPORATION LTD**

A. 3rd Floor, BMTCL Complex,  
K H Road, Shanthinagar,  
Bangalore - 560027  
Tel:-080-22969300

PRJT. TITLE:	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.
DWG. TITLE:	DIMENSIONAL & REINFORCEMENT DETAILS OF ECCENTRIC PILE CAP AND PILE FOR PORTAL PIER-B (BP505 & 506)
DWG NO:	BMRCL/PH-II/R1/EXTN/VIA/SUB/WHTFD-EXTN/006/SHT3A OF 4
DRN:	DSND:
APPRO:	ISSUE R1
DATE (CURRENT ISSUE)	30.01.2025





SCHEDULE OF REINFORCEMENT			
BAR NO	DESCRIPTIONS	SHAPE	REMARKS
01	32 - 39Nos.		TOP MAIN REINFORCEMENT-BEAM
01A	32 - 39Nos.		TOP MAIN REINFORCEMENT-BEAM
02	16-14 LEGGEED @ 110 C/C.		VERTICAL SHEAR REINFORCEMENT-BEAM
03	32 @ 125 C/C.		HORIZONTAL SHEAR REINFORCEMENT-BEAM
04	32 @ 1000 C/C.		SPACER REINFORCEMENT-BEAM
05	16 - 2 LEGGEED @ 110 C/C.		SHEAR REINFORCEMENT-BEAM
06	32 - 39Nos.		BOTTOM MAIN REINFORCEMENT - BEAM
06A	32 - 39Nos.		BOTTOM MAIN REINFORCEMENT - BEAM
07	16 @ 100 C/C.		MAIN REINFORCEMENT-PEDESTAL
07A	16 @ 100 C/C.		MAIN REINFORCEMENT-PEDESTAL
08	12 @ 150 C/C.		SHEAR REINFORCEMENT-PEDESTAL
M1	8 @ 100 C/C.-M1		MESH REINFORCEMENT PEDESTAL LOCATION - IN TWO LAYER ONE AT 20MM FROM TOP OF PEDESTAL AND OTHER AT 100MM FROM TOP OF PEDESTAL
M2	8 @ 100 C/C.-M2		MESH REINFORCEMENT JACK LOCATION - IN TWO LAYER ONE AT 20MM FROM TOP OF PIERCAP AND OTHER AT 100MM FROM TOP OF PIERCAP

- NOTES :-**
- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
  - NO DIMENSION SHALL BE SCALED & NO BAR SHALL BE COUNTED FROM THIS DRAWING. FOLLOW THE WRITTEN.
  - UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 50mm.
  - MATERIALS  
CONCRETE  
a) PORTAL BEAM = M50  
b) PEDESTAL = M50
  - INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 : 2008 GRADE Fe- 500
  - FOR DETAILS OF PIER CAP, PIER, PILE & PILE CAP REFER SEPARATE DRAWING.
  - SIZE OF PEDESTAL ARE TENTATIVE & TO BE FINALISED AFTER FIXING THE SIZE OF BEARINGS.
  - THE LEVELS SHOWN ARE TENTATIVE. IF ACTUAL LEVELS VARY THE SAME SHALL BE INFORMED TO DESIGN SECTION BEFORE CONCRETING.
  - BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
  - SPLICE SHALL BE STAGGERED TO PREVENT MORE THAN 50% OF SPLICED OCCURRING AT SAME LOCATION.
  - Ld=42 x d WHERE d=DIA. OF BAR.
  - ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

**REFERENCE DRAWING NO. :-**

1. GENERAL NOTES	-BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/006/SHT 1 OF 4
2. DIMENSIONAL DETAILS OF PIER & BEAM FOR PORTAL PIER (BP 505 & BP506)	-BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/006/SHT 1 OF 4
3. REINFORCEMENT DETAILS OF PORTAL PIER (BP 505 & BP506)	-BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/006/SHT 3 OF 4
4. DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR PORTAL PIER (BP505 & BP506)	-BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/006/SHT 3A OF 4
5. GIRDER LAYOUT OF VIADUCT SUPERSTRUCTURE BEYOND WHITEFIELD STATION EXTENSION FOR PIER BP503 TO BP521	-BMRCL/PH-II/R1EXTN/VDI/GL/001



**CHIEF ENGINEER  
DESIGN  
BMRCL**

**LEGEND :-** TOP REINFORCEMENT  
BOTTOM REINFORCEMENT

**GOOD FOR CONSTRUCTION**

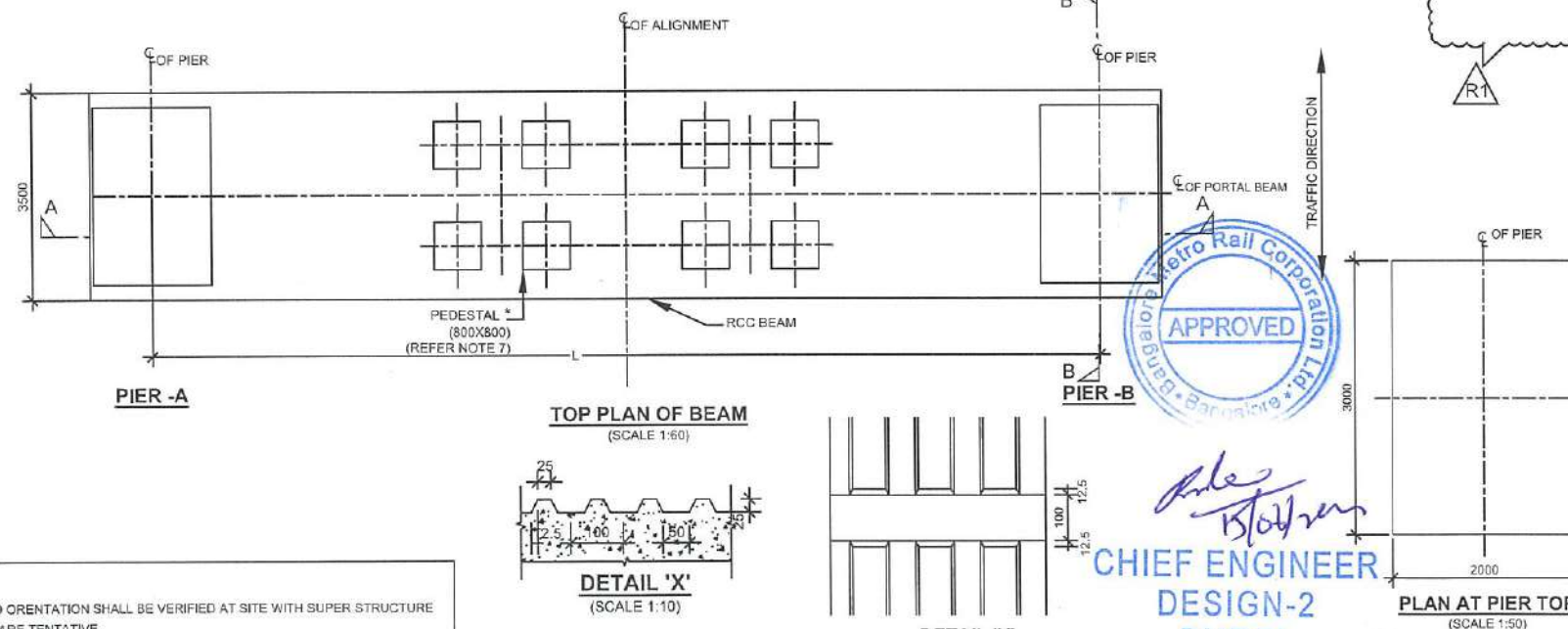
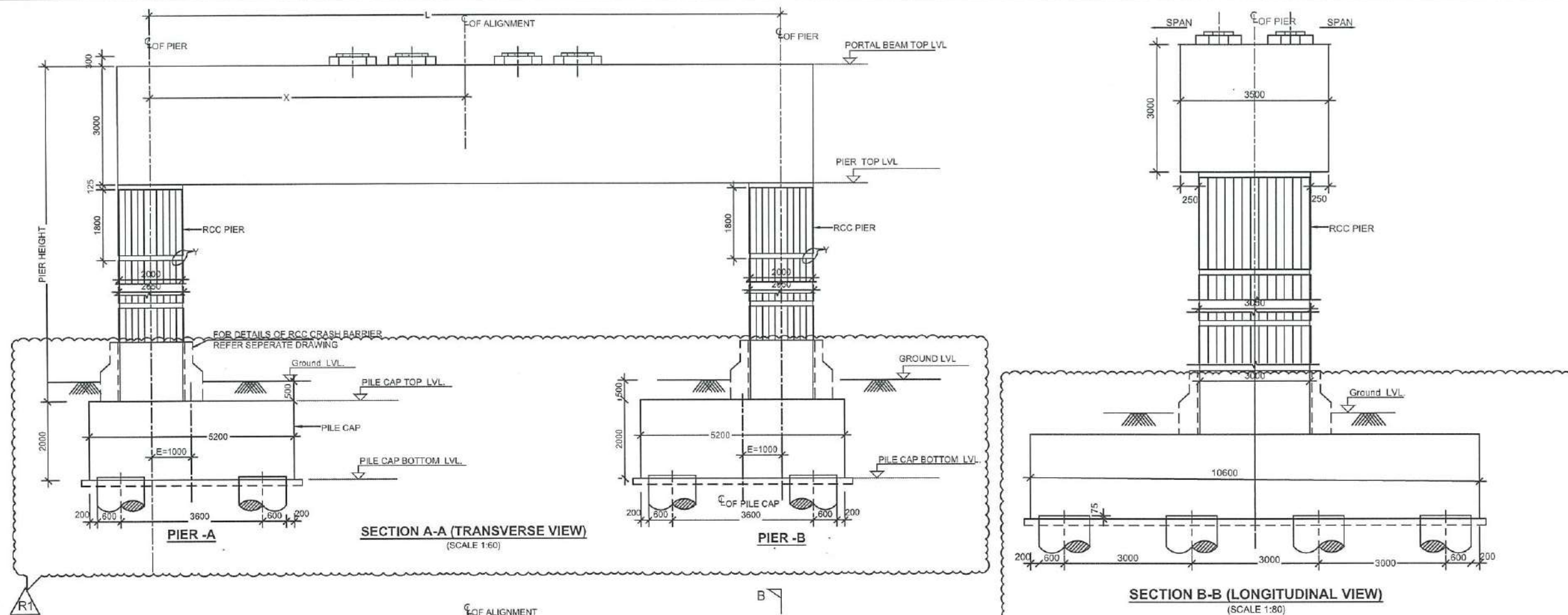
ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
R3	PEDESTAL ORIENTATION REVISED AS PER LATEST ALIGNMENT DATED 29.01.2025.ALSO REVISION UPDATED.		27.05.2025	DATE (R0 ISSUE) 13.02.2024
R2	NOTES ARE REVISED AS MARKED.		16.01.2025	
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024		29.05.2024	
R0	GOOD FOR CONSTRUCTION		13.02.2024	

**BANGALORE METRO RAIL CORPORATION LTD**

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Bangalore -560027  
Tel:-080-22969300

PRJT. TITLE:	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.
DWG. TITLE:	DIMENSIONAL & REINFORCEMENT DETAILS OF BEAM FOR PORTAL PIER (BP505 & 506)
DWG NO:	BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/006/SHT 4 OF 4
DRN:	DSND:
APPRO:	DATE(CURRENT ISSUE) 27.05.2025



**NOTES :-**

\* PEDESTAL LOCATION AND ORIENTATION SHALL BE VERIFIED AT SITE WITH SUPER STRUCTURE DRAWINGS, ABOVE SHOWN ARE TENTATIVE.

**LEVELS**

LEVELS ARE CALCULATED AS FOLLOWS  
1. RAIL TOP TO DECK TOP = 528MM.  
2. PEDESTAL WITH BEARING HEIGHT = 300MM.

PIER NO	EARLIER SPAN	NEXT SPAN	RADIUS	RAIL LVL	PORTAL BEAM TOP LVL	GROUND LVL	PILE CAP TOP LVL	L	X
BP521	25	25	350M	880.460	* 877.460	864.345	863.845	22	7.74

**NOTES :-**

- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
- NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
- MATERIALS : CONCRETE.  
a) PIER = M50  
b) PIER CAP/PORTAL BEAM = M50  
c) PEDESTAL = M50
- FOR DETAILS OF PILE CAP & PILE REFER SEPARATE DRAWING.
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH GAD, GENERAL NOTES, SPAN ARRANGEMENT AND OTHER RELATED STRUCTURAL DRAWINGS.
- CRASH BARRIER/PIER PROTECTION SHAPE & HEIGHT SHOWN IS TENTATIVE, REFER SEPARATE DRAWING FOR DETAIL.

\* LEVELS TO BE VERIFIED AT SITE WITH RESPECTIVE SUPER STRUCTURE DRAWINGS.

**REFERENCE DRAWING NO. :-**

- GENERAL NOTES
- REINFORCEMENT DETAILS FOR PORTAL PIER
- DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR PORTAL PIER A (BP521)
- DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR PORTAL PIER B (BP521)
- DIMENSIONAL & REINFORCEMENT DETAILS OF BEAM FOR PORTAL PIER (BP521)

**GOOD FOR CONSTRUCTION**

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024 . (BP522 TO BP524) PIER REMOVED		15.06.2024	
R0	GOOD FOR CONSTRUCTION		15.02.2024	

DATE (R0 ISSUE) 15.02.2024

P (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.

CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLD' IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'.



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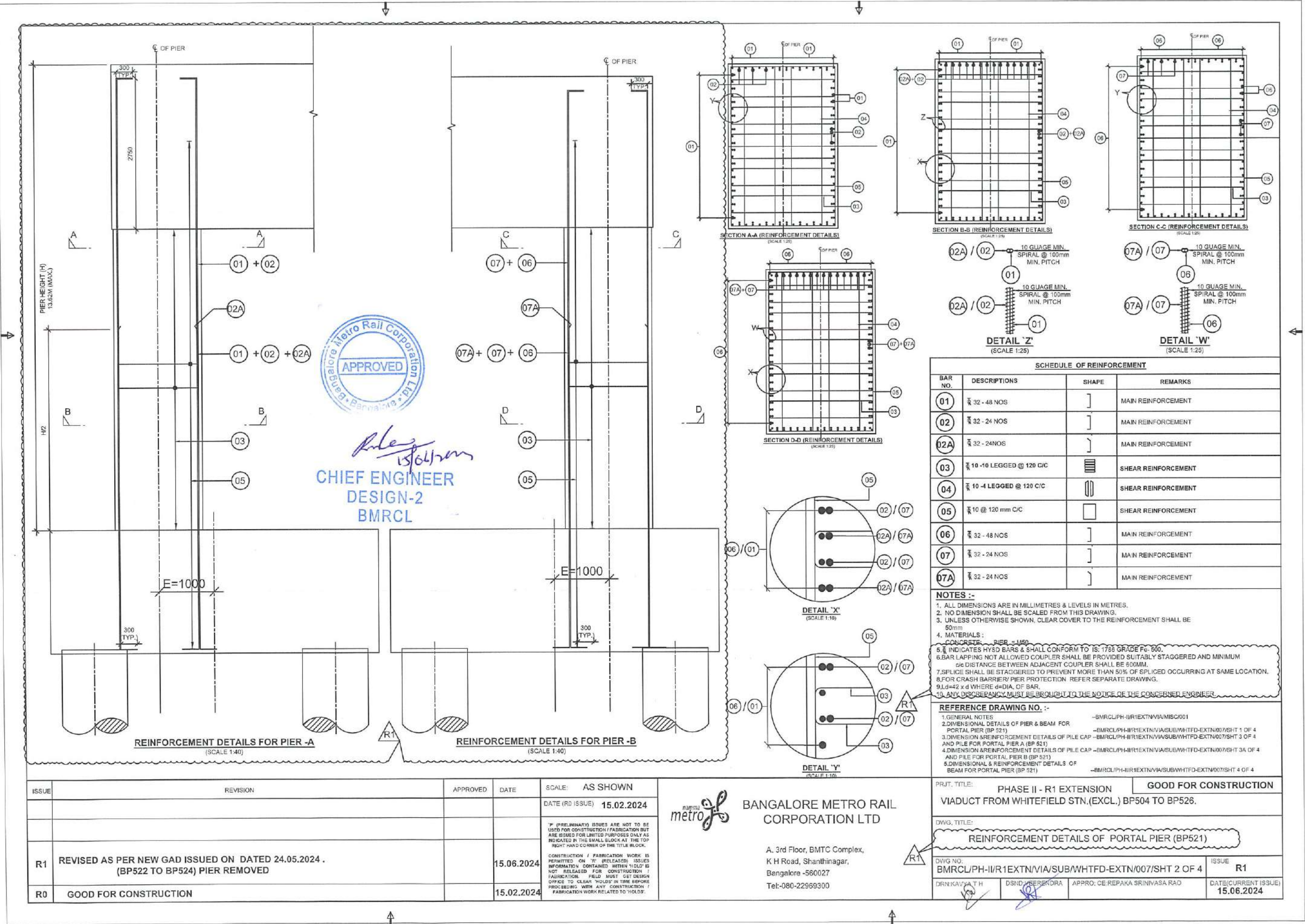
PRJ.T. TITLE: PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.

DWG. TITLE:

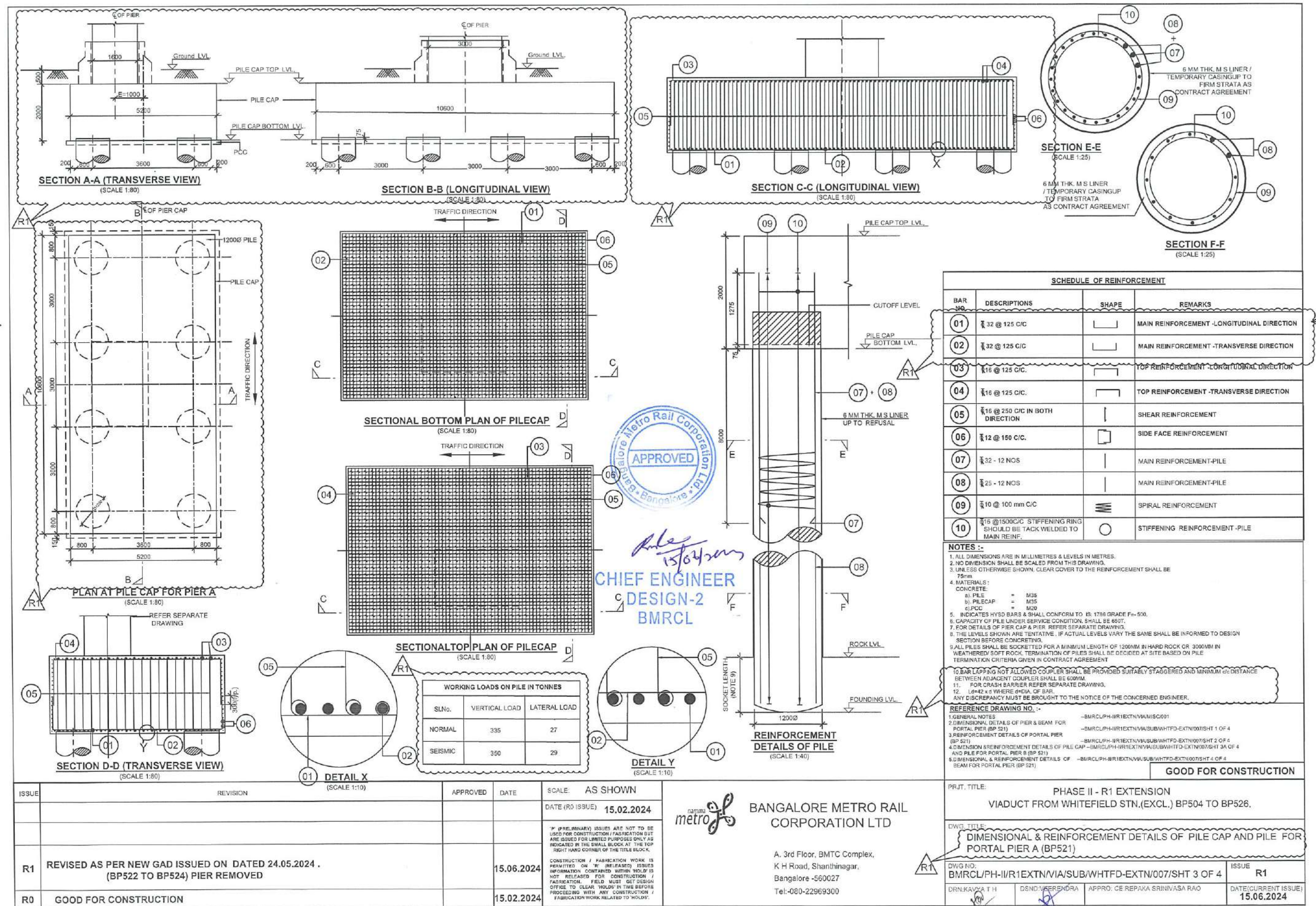
**DIMENSIONAL DETAILS OF PIER & BEAM FOR PORTAL PIER (BP521)**

DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/007/SHT 1 OF 4	ISSUE R1
DRN: KAVYA T H	DSND: VIRENDRA
APPRO: CE:REPAKA SRINIVASA RAO	DATE(CURRENT ISSUE) 15.06.2024

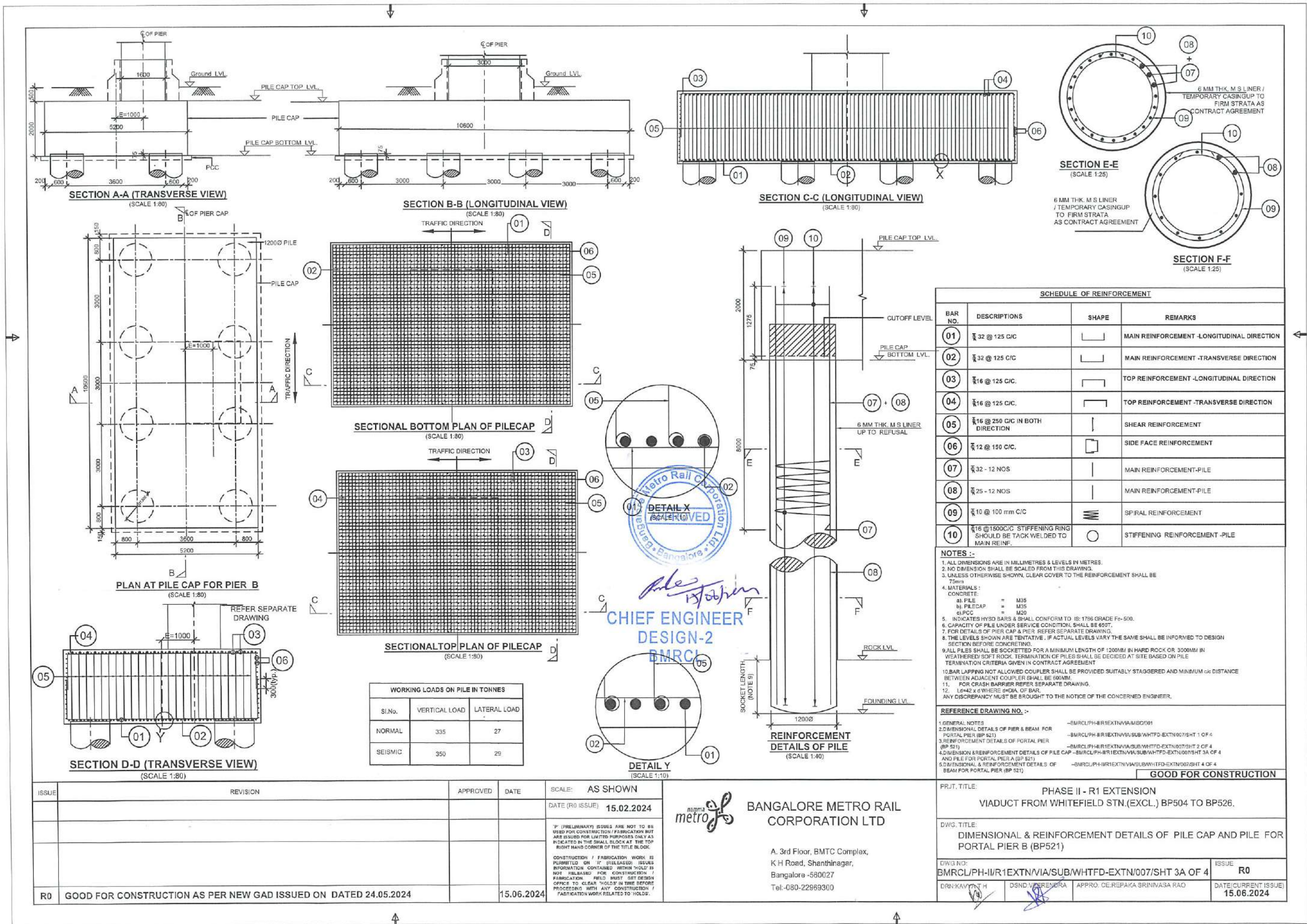




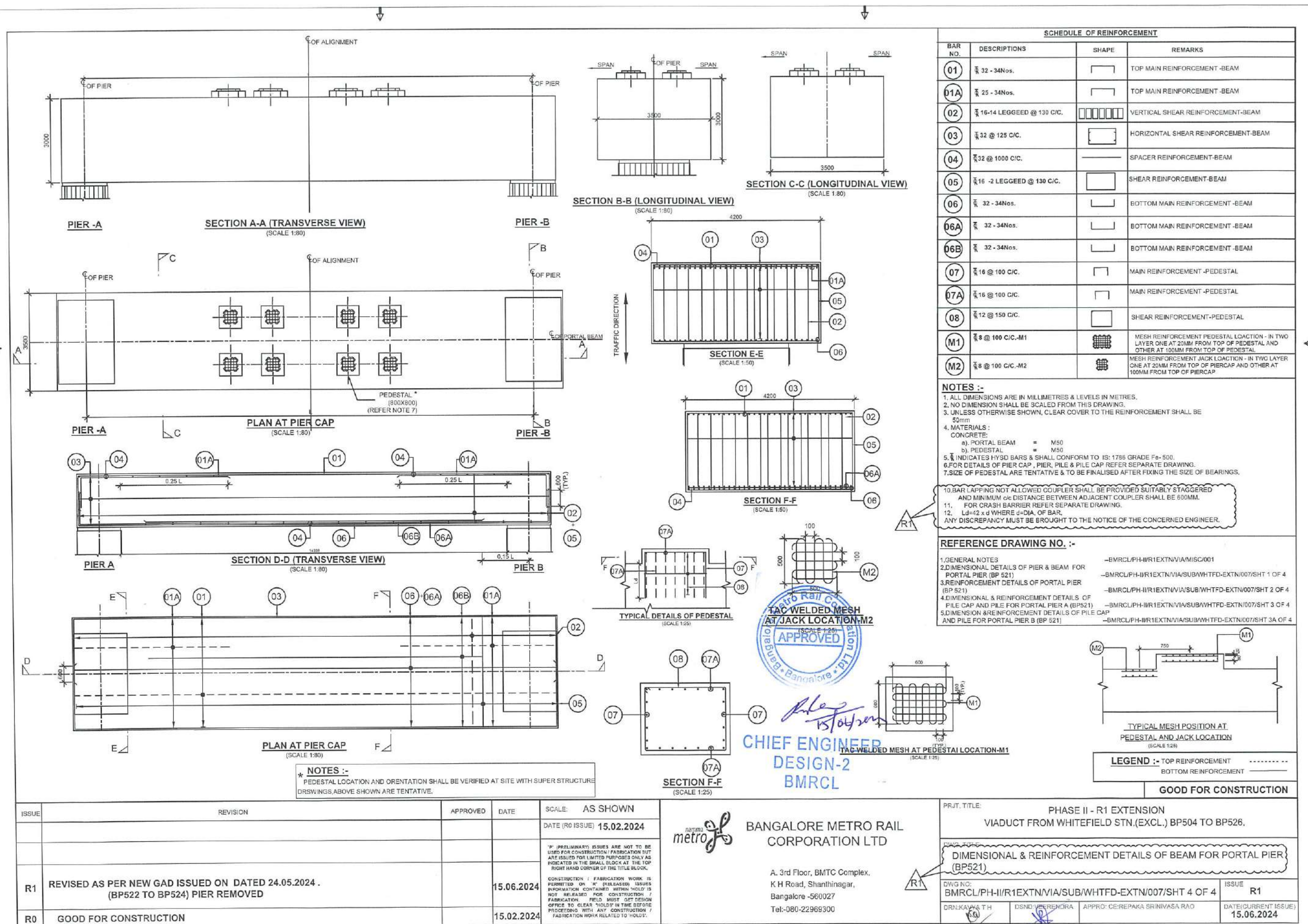




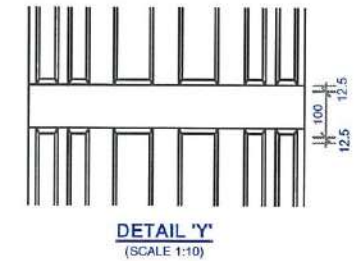
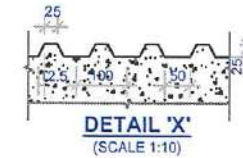
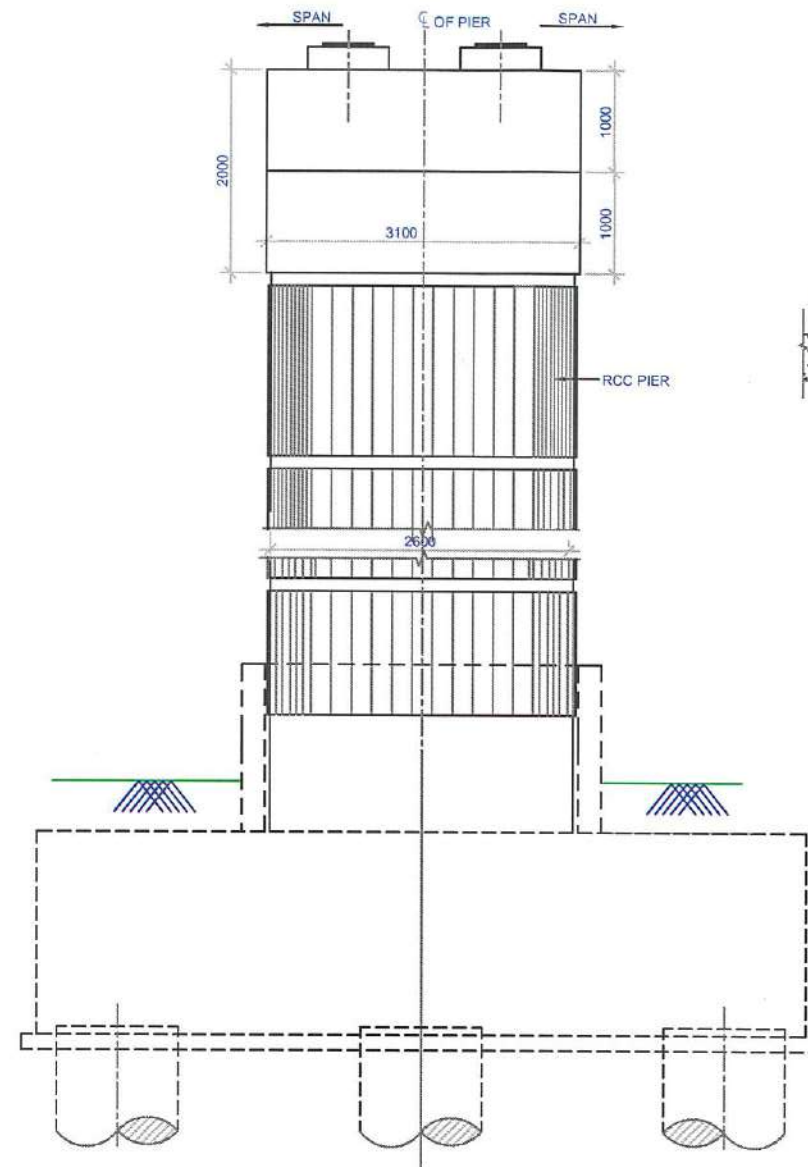
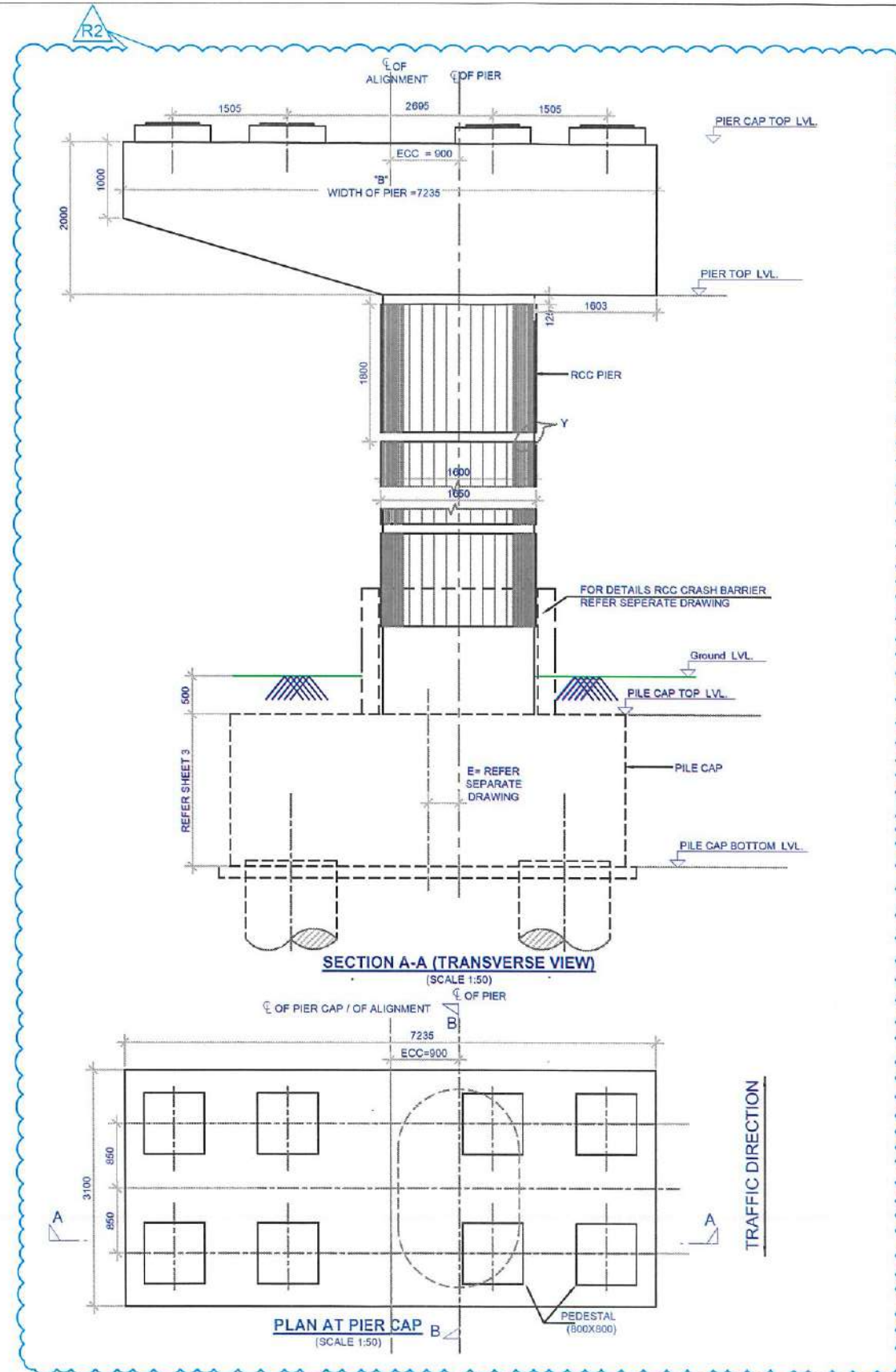












PIER NO.	EARLIER SPAN	NEXT SPAN	RADIUS	ECCENTRICITY 'ECC' IN (mm)	WIDTH 'B' IN (mm)	APPROVED EGL (m)	RAIL TOP LVL (m)
BP516	25	25	2500	900	7235	863.848	882.439
BP517	25	25	STRAIGHT	900	7235	863.002	881.848
BP518	25	25	STRAIGHT	900	7235	864.130	881.435
BP519	25	25	STRAIGHT	900	7235	864.345	881.110
BP520	25	25	STRAIGHT	900	7235	864.345	880.785

**NOTES :-**

- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
- NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
- MATERIALS :  
CONCRETE :  
a) PIER = M60  
b) PIER CAP = M60  
c) PEDESTAL = M60
- FOR DETAILS OF PILE CAP & PILE REFER SEPARATE DRAWING.
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH GAD, GENERAL NOTES, SPAN ARRANGEMENT AND OTHER RELATED STRUCTURAL DRAWINGS.
- CRASH BARRIER/PIER PROTECTION SHAPE & HEIGHT SHOWN IS TENTATIVE, REFER SEPARATE DRAWING FOR DETAIL.

**REFERENCE DRAWING NO. :-**

- GENERAL NOTES --BMRCL/PH-II/R1B/VIA/MISC/001
- REINFORCEMENT DETAILS FOR ECCENTRIC PIER --BMRCL/PH-II/R1B/VIA/SUB/B008/SHEET 02 OF 4
- DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR ECCENTRIC PIER --BMRCL/PH-II/R1B/VIA/SUB/B008/SHEET 03 OF 4
- DIMENSIONAL & REINFORCEMENT DETAILS OF PIER CAP FOR ECCENTRIC PIER --BMRCL/PH-II/R1B/VIA/SUB/B008/SHEET 04 OF 4

**GOOD FOR CONSTRUCTION**

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
R2	DIMENSIONS OF PILECAP REMOVED, FOR DETAILS REFER SHEET 3, 3A & 3B RESPECTIVELY.		24.02.2025	DATE (R0 ISSUE) 28-02-2024
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024. (BP525) PIER REMOVED AND (BP516 TO BP520) ADDED WITH 0.9M ECCENTRIC.		06.06.2024	
R0	GOOD FOR CONSTRUCTION		28-02-2024	

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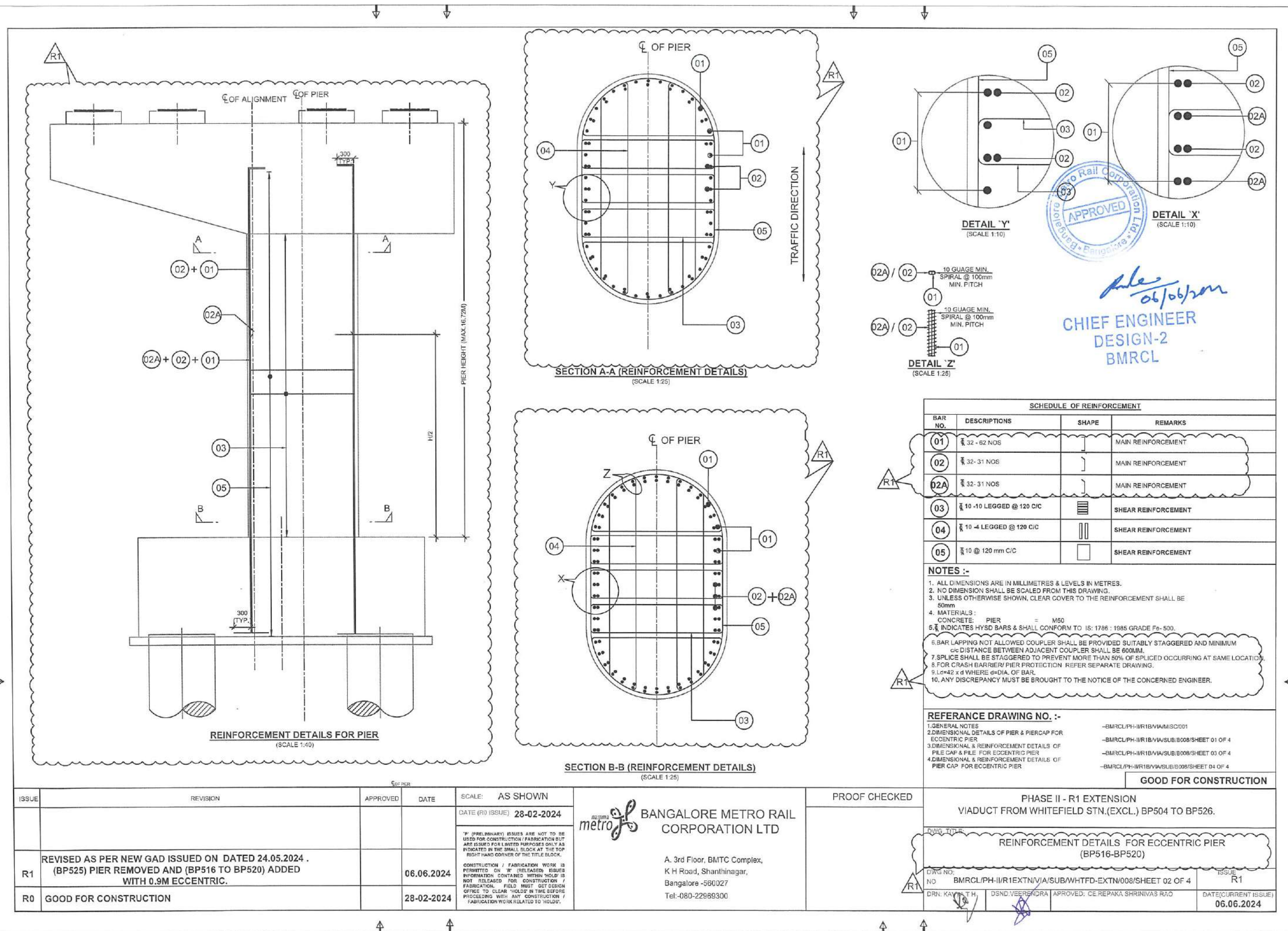
**CHIEF ENGINEER  
DESIGN  
BMRCL**

PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

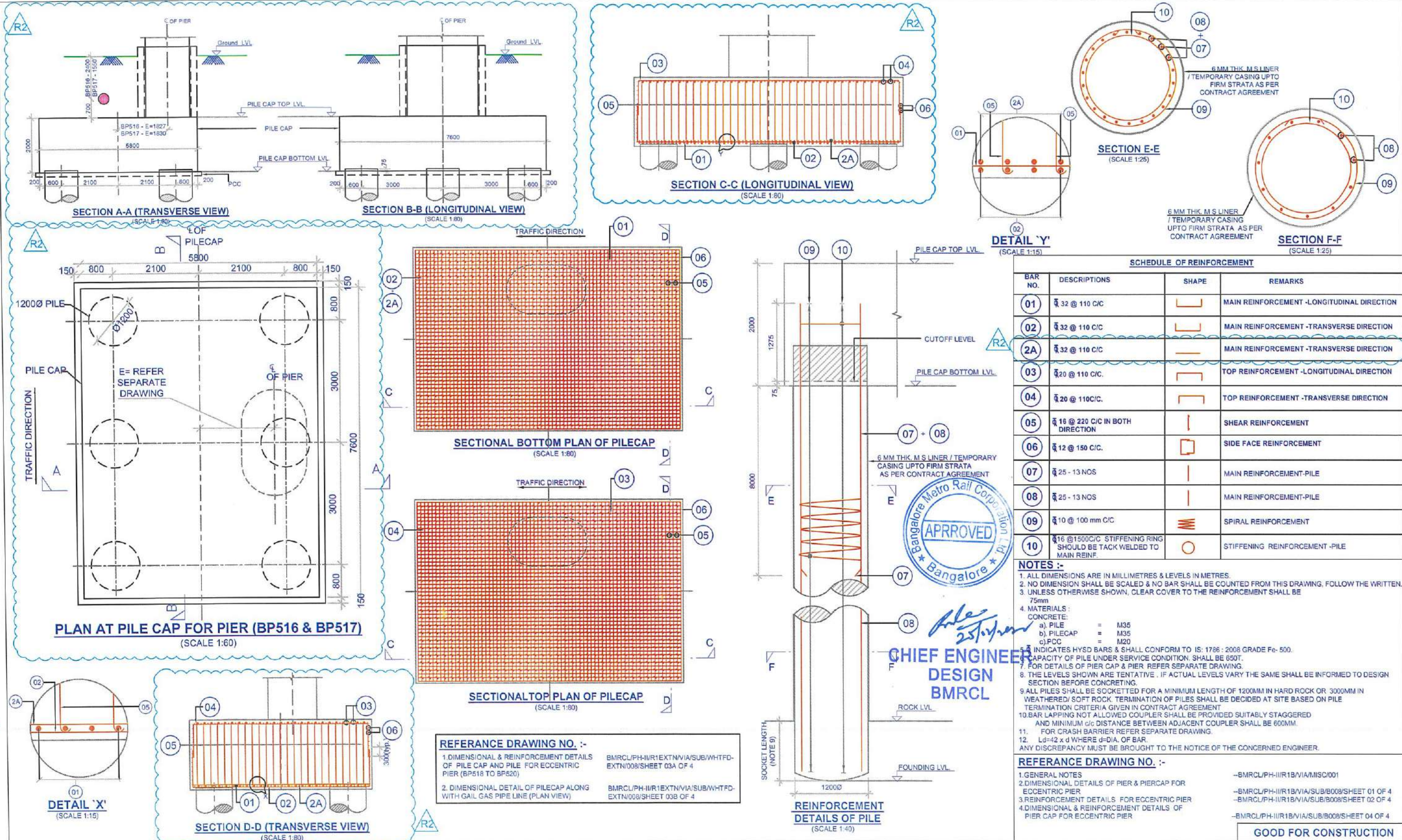
DWG. TITLE:  
**DIMENSIONAL DETAILS OF PIER & PIER CAP FOR ECCENTRIC PIER (BP516 TO BP520)**

DWG NO: NO	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/008/SHEET 01 OF 4	ISSUE R2
DRN:	DSND:	APPROVED:
		DATE (CURRENT ISSUE) 24.02.2025









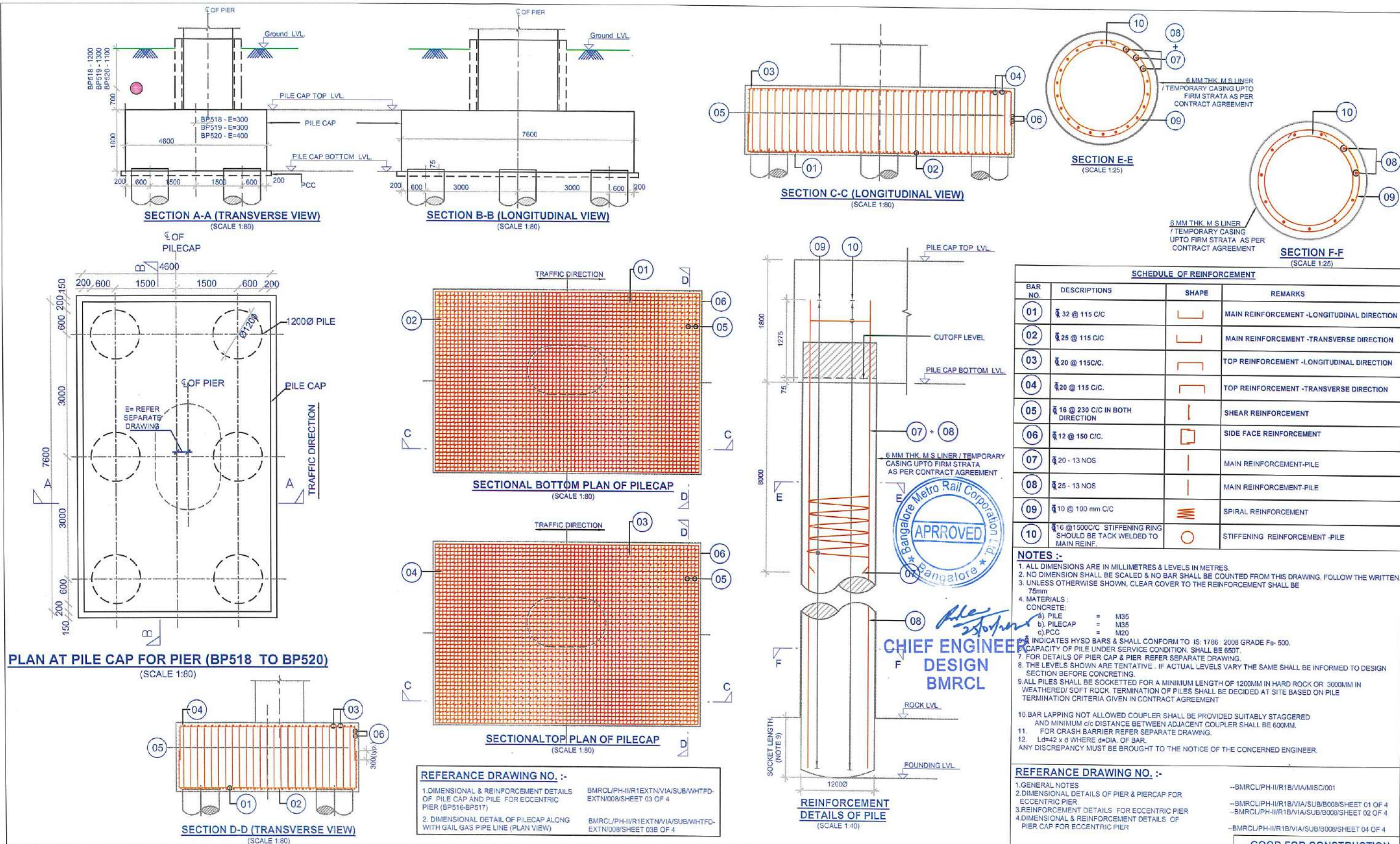
ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	PROOF CHECKED	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.
R2	SEPARATE DRAWING IS REPRESENTED FOR BP518 TO BP520 AND PILECAP REINFORCEMENT REVISED.		24.02.2025	DATE (R0 ISSUE) 28-02-2024		DWG. TITLE: DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR ECCENTRIC PIER (BP516-BP517)
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024 . (BP525) PIER REMOVED AND (BP516 TO BP520) ADDED WITH 0.9M ECCENTRIC.		06.06.2024	CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN HOLD IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR HOLD IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'S'		DWG NO: BMRCL/PH-I/IR1EXTN/VA/SUB/WHTFD-EXTN/008/SHEET 03 OF 4
R0	GOOD FOR CONSTRUCTION		28-02-2024			ISSUE/ISSUE R2
						DATE(CURRENT ISSUE) 24.02.2025

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**GOOD FOR CONSTRUCTION**



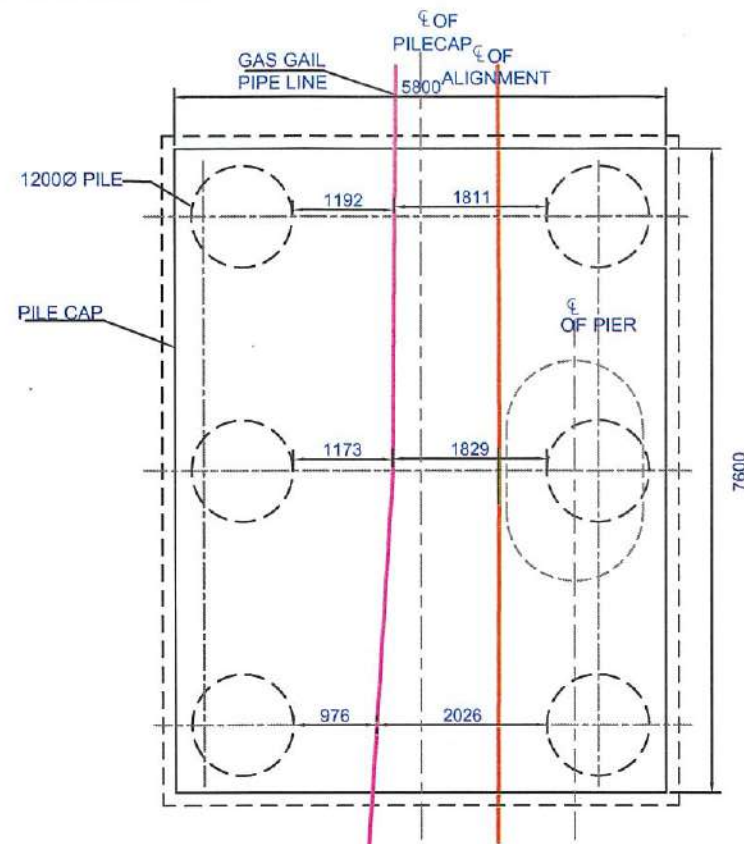


ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	PROOF CHECKED	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.
R0	SEPARATE DRAWING IS REPRESENTED FOR BP516 TO BP517 - PILECAP REINFORCEMENT REVISED.		24.02.2025	DATE (R0 ISSUE) 24.02.2025		DWG. TITLE: DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR ECCENTRIC PIER (BP518 TO BP520)
				DATE (R0 ISSUE) 24.02.2025		DWG NO: NO BMRC/PH-II/R1EXTN/VI/SUB/WHITFD-EXTN/008/SHEET 03A OF 4
						ISSUE/ISSUE R0
						DATE(CURRENT ISSUE) 24.02.2025

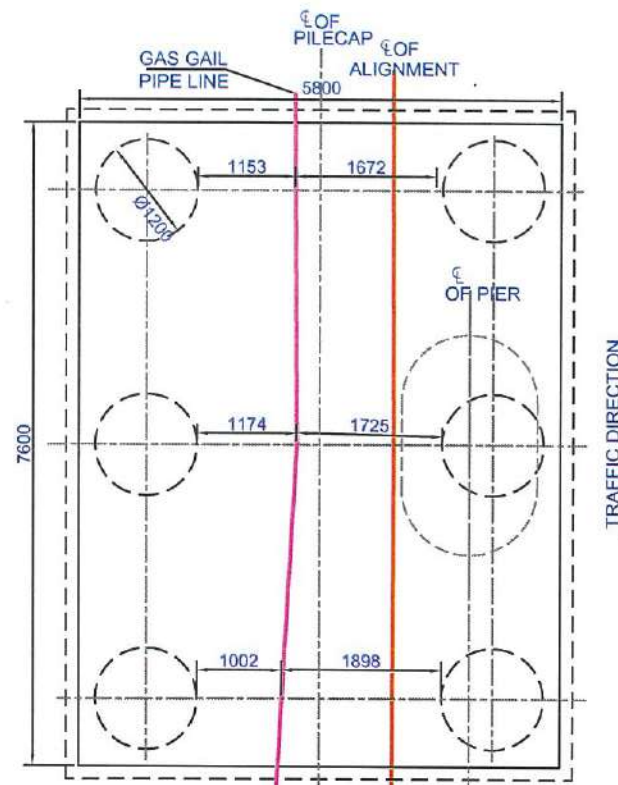
**BANGALORE METRO RAIL CORPORATION LTD**

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Bangalore - 560027  
Tel:-080-22969300

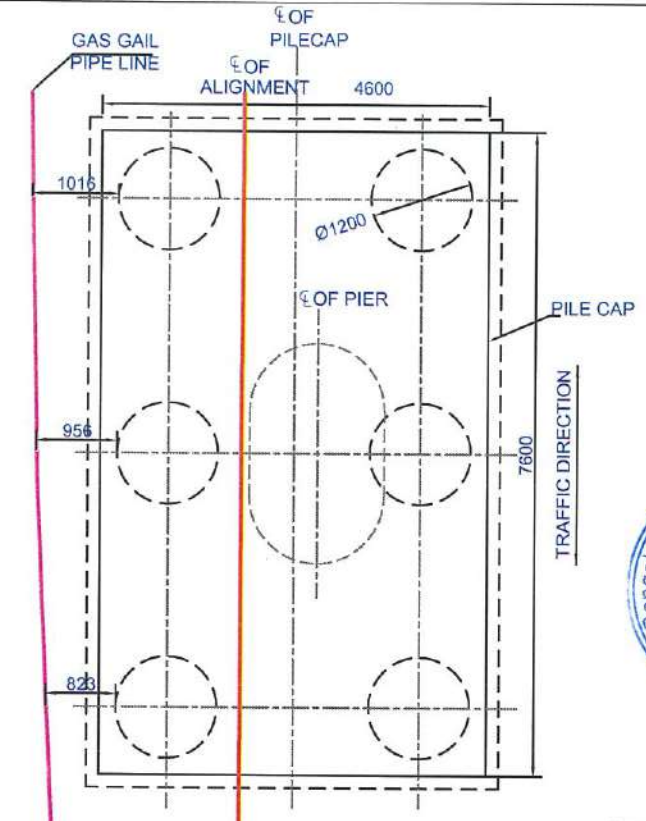




**PLAN AT PILE CAP FOR PIER (BP516)**  
(SCALE 1:80)



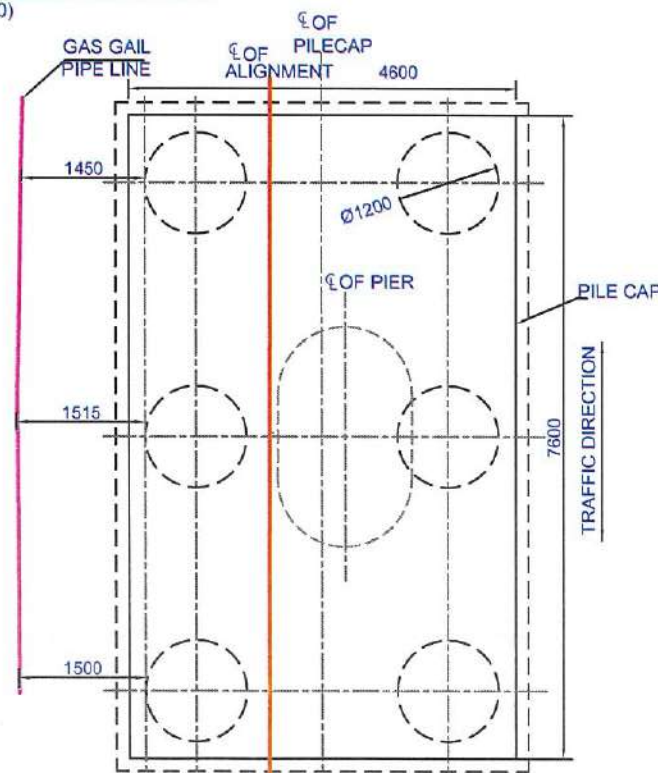
**PLAN AT PILE CAP FOR PIER (BP517)**  
(SCALE 1:80)



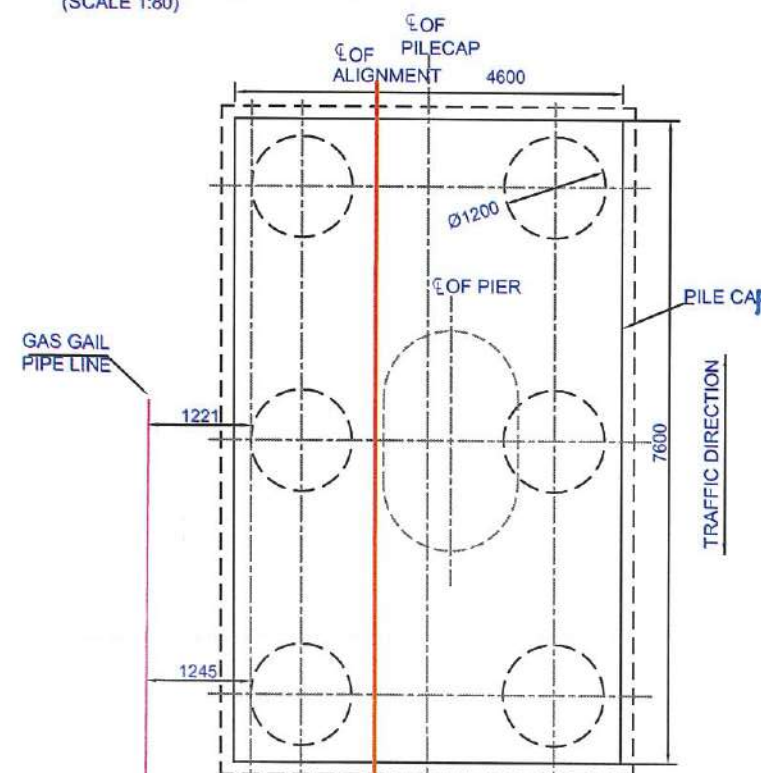
**PLAN AT PILE CAP FOR PIER (BP518)**  
(SCALE 1:80)



*[Signature]*  
**CHIEF ENGINEER  
DESIGN  
BMRCL**



**PLAN AT PILE CAP FOR PIER (BP519)**  
(SCALE 1:80)



**PLAN AT PILE CAP FOR PIER (BP520)**  
(SCALE 1:80)

**REFERENCE DRAWING NO. :-**

- |   |   |
|---|---|
| 1. DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR ECCENTRIC PIER (BP516-BP517)    | BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/008/SHEET 03 OF 4  |
| 2. DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR ECCENTRIC PIER (BP518 TO BP520) | BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/008/SHEET 03A OF 4 |

**NOTES :-**

- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
- NO DIMENSION SHALL BE SCALED & NO BAR SHALL BE COUNTED FROM THIS DRAWING, FOLLOW THE WRITTEN.
- UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 75mm
- MATERIALS :  
CONCRETE:  
a). PILE = M35  
b). PILECAP = M35  
c). PCC = M20
- INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 : 2008 GRADE Fe- 500.
- CAPACITY OF PILE UNDER SERVICE CONDITION, SHALL BE 650T.
- FOR DETAILS OF PIER CAP & PIER, REFER SEPARATE DRAWING.
- THE LEVELS SHOWN ARE TENTATIVE. IF ACTUAL LEVELS VARY THE SAME SHALL BE INFORMED TO DESIGN SECTION BEFORE CONCRETING.
- ALL PILES SHALL BE SOCKETTED FOR A MINIMUM LENGTH OF 1200MM IN HARD ROCK OR 3000MM IN WEATHERED/ SOFT ROCK. TERMINATION OF PILES SHALL BE DECIDED AT SITE BASED ON PILE TERMINATION CRITERIA GIVEN IN CONTRACT AGREEMENT
- BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
- FOR CRASH BARRIER REFER SEPARATE DRAWING.
- Ld=42 x d WHERE d=DIA. OF BAR.
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

**REFERENCE DRAWING NO. :-**

- |   |   |
|---|---|
| 1. GENERAL NOTES  | -BMRCL/PH-II/R1B/VIA/MISC/001               |
| 2. DIMENSIONAL DETAILS OF PIER & PIERCAP FOR ECCENTRIC PIER           | -BMRCL/PH-II/R1B/VIA/SUB/B008/SHEET 01 OF 4 |
| 3. REINFORCEMENT DETAILS FOR ECCENTRIC PIER                           | -BMRCL/PH-II/R1B/VIA/SUB/B008/SHEET 02 OF 4 |
| 4. DIMENSIONAL & REINFORCEMENT DETAILS OF PIER CAP FOR ECCENTRIC PIER | -BMRCL/PH-II/R1B/VIA/SUB/B008/SHEET 04 OF 4 |

**GOOD FOR CONSTRUCTION**

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 24.02.2025
R0	GOOD FOR CONSTRUCTION		24.02.2025	<p>"P" (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.</p> <p>CONSTRUCTION / FABRICATION WORK IS PERMITTED ON "P" (RELEASED) ISSUES INFORMATION CONTAINED WITHIN "HOLD" IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR "HOLD" IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO "HOLD".</p>



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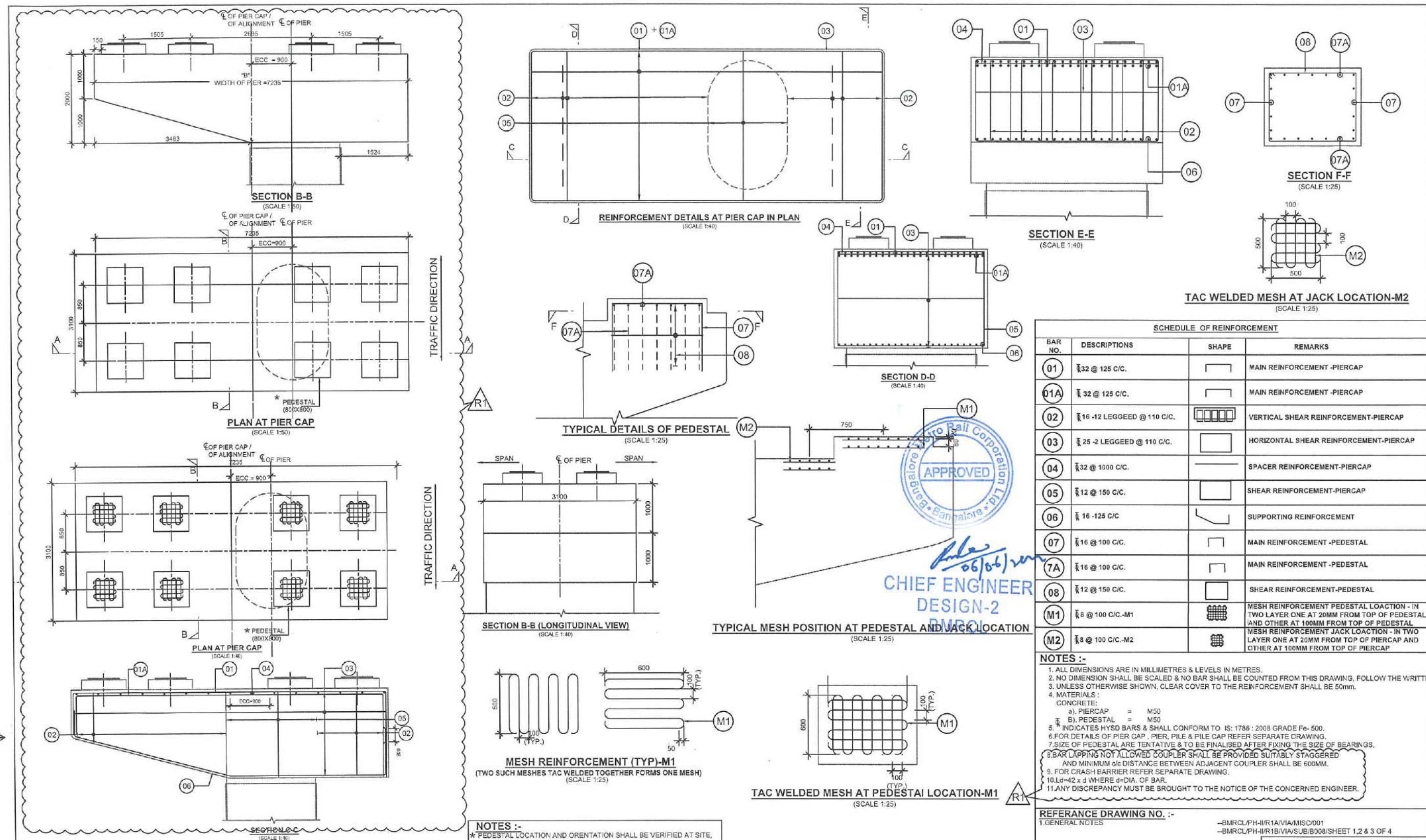
PROOF CHECKED

PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE:  
DIMENSIONAL DETAIL OF PILECAP ALONG WITH GAIL GAS PIPE LINE  
(PLAN VIEW)

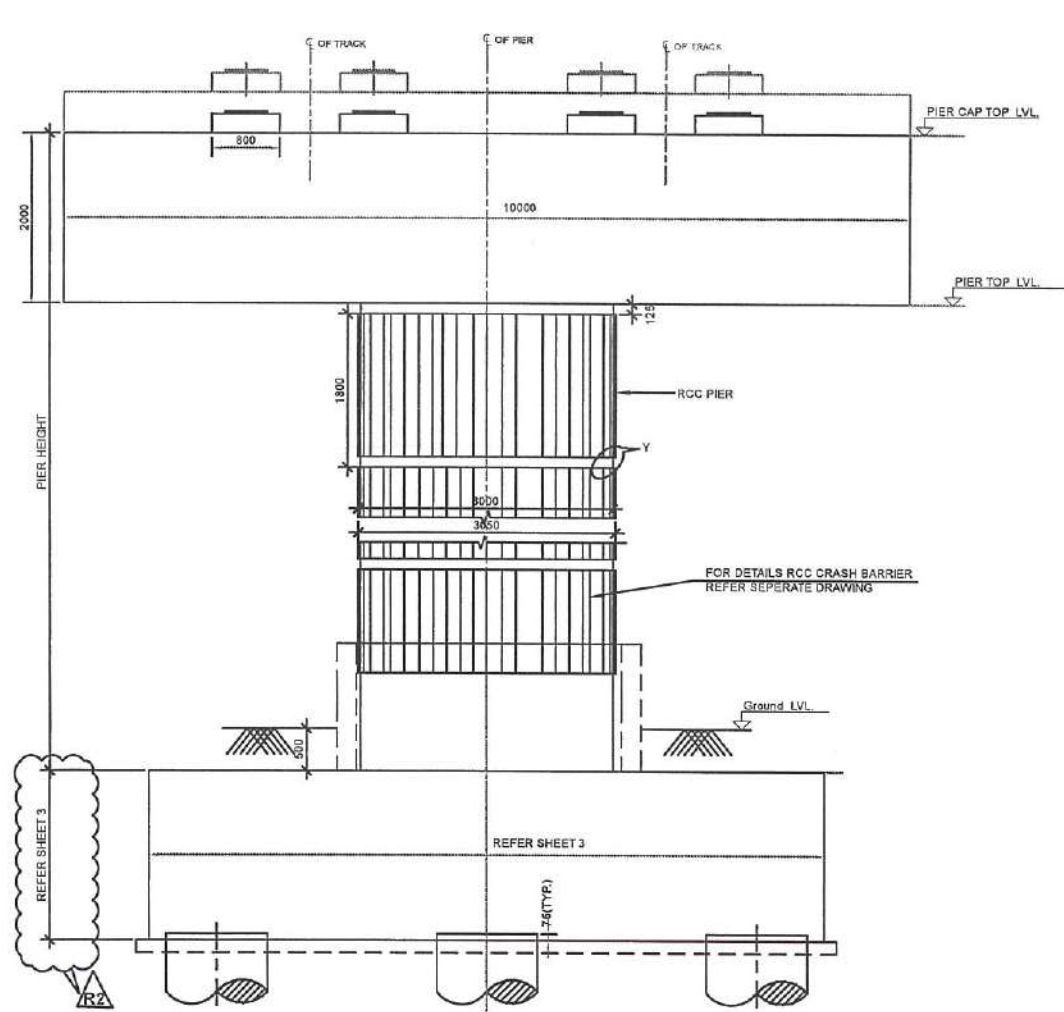
DWG NO: NO BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/008/SHEET 03B OF 4	ISSUE/ISSUE R0
DRN: <i>[Signature]</i> DSND: <i>[Signature]</i> APPROVED: <i>[Signature]</i>	DATE(CURRENT ISSUE) 24.02.2025



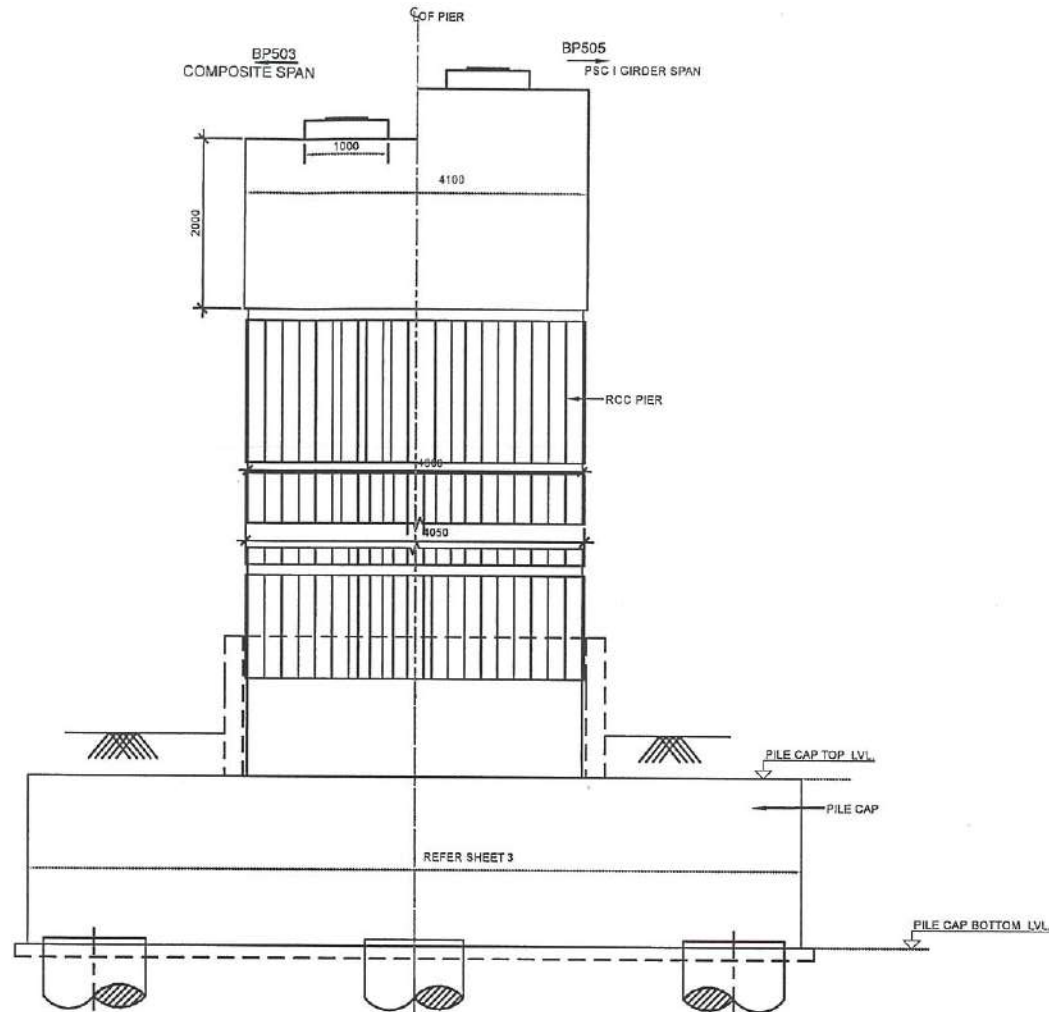


ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	PROOF CHECKED	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.
R1	REVISED AS PER NEW GAD ISSUED ON DATED 24.05.2024. (BP525) PIER REMOVED AND (BP516 TO BP520) ADDED WITH 0.9M ECCENTRIC.		06.06.2024	DATE (R0 ISSUE) 28-02-2024		DWG. TITLE: DIMENSIONAL & REINFORCEMENT DETAILS OF PIER CAP FOR ECCENTRIC PIER (BP516-BP520)
R0	GOOD FOR CONSTRUCTION		28-02-2024	<p>CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLD' IN TIME BEFORE PROCESSING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'.</p> <p>BANGALORE METRO RAIL CORPORATION LTD</p> <p>A. 3rd Floor, BMTCL Complex, K H Road, Shanthinagar, Bangalore - 560027</p> <p>Tel:-080-22969300</p>		<p>DRN: KAVYA T H</p> <p>DSND: VEEBENDRA</p> <p>APPROVED: CE REPAKA SHRINIVAS RAO</p> <p>DATE (CURRENT ISSUE): 06.06.2024</p>

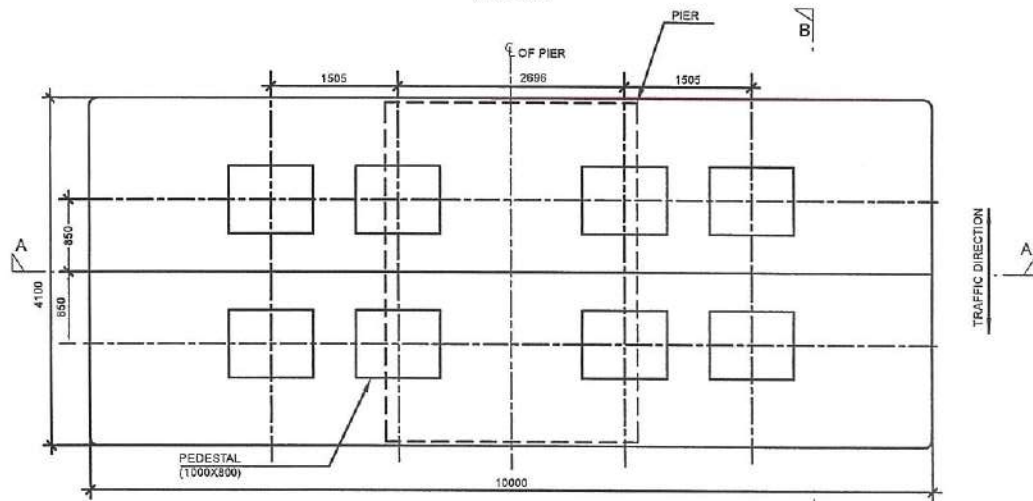




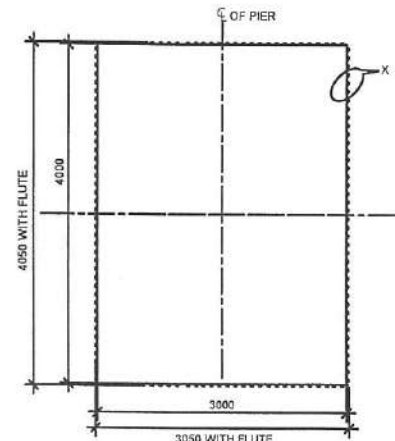
SECTION A-A (TRANSVERSE VIEW)  
(SCALE 1:50)



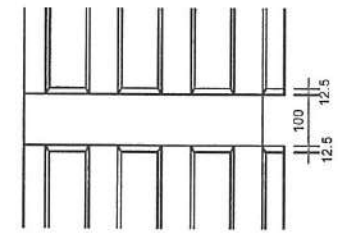
SECTION B-B (LONGITUDINAL VIEW)  
(SCALE 1:50)



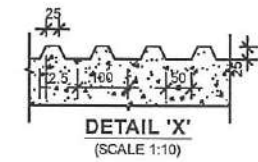
PLAN AT PIER CAP  
(SCALE 1:50)



PLAN AT PIER  
(SCALE 1:50)



DETAIL 'Y'  
(SCALE 1:10)



DETAIL 'X'  
(SCALE 1:10)



*12/04/2024*  
**CHIEF ENGINEER**  
**PLANNING & DESIGN**  
BMRCL

**NOTES :-**

1. ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
2. NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
3. MATERIALS :  
CONCRETE:  
a) PIER = M50  
b) PIER CAP = M50  
c) PEDESTAL = M50
4. FOR DETAILS OF PILE CAP & PILE REFER SEPARATE DRAWING.
5. THIS DRAWING MUST BE READ IN CONJUNCTION WITH GAD, GENERAL NOTES, SPAN ARRANGEMENT AND OTHER RELATED STRUCTURAL DRAWINGS.

**REFERENCE DRAWING NO. :-**

1. GENERAL NOTES - BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/009/SHT 2 OF 4
2. REINFORCEMENT DETAILS FOR CONCENTRIC FIXED PIERS - BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/009/SHT 3 OF 4
3. DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR CONCENTRIC FIXED PIERS - BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/009/SHT 4 OF 4
4. DIMENSIONAL & REINFORCEMENT DETAILS OF FIXED PIER CAP - BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/009/SHT 4 OF 4

**GOOD FOR CONSTRUCTION**

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 20.05.2024
R2	PIERCAP DEPTH REVISED AS SHOWN		17.04.2025	
R1	PIERCAP AND PILE CAP SIZE REVISED AS SHOWN		27.03.2025	
R0	GOOD FOR CONSTRUCTION		20.05.2024	



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PRJT TITLE:

PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE:

DIMENSIONAL DETAILS OF PIER & PIER CAP FOR CONCENTRIC FIXED PIER (BP504)

DWG NO:

BMRCL/PH-II/R1EXTN/VIA/SUB/WHITFD-EXTN/009/SHT 1 OF 4

ISSUE

R2

DRN:

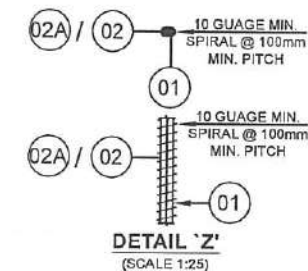
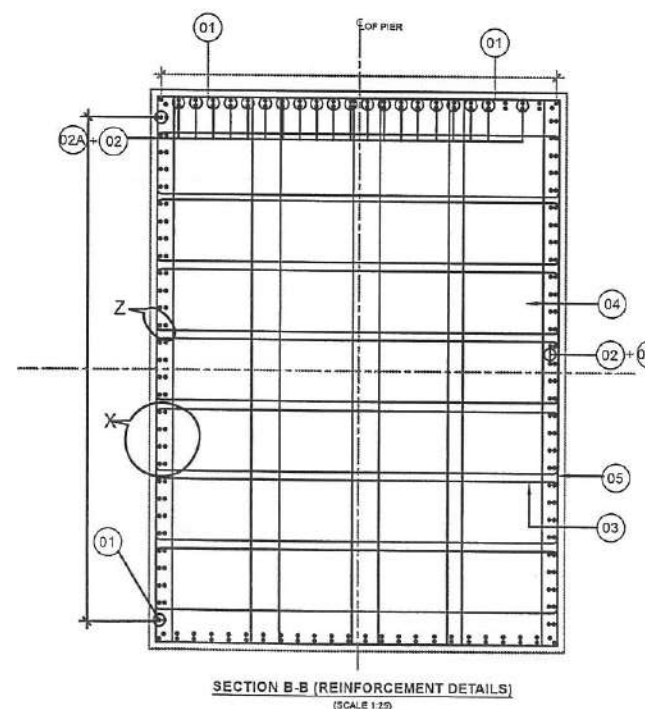
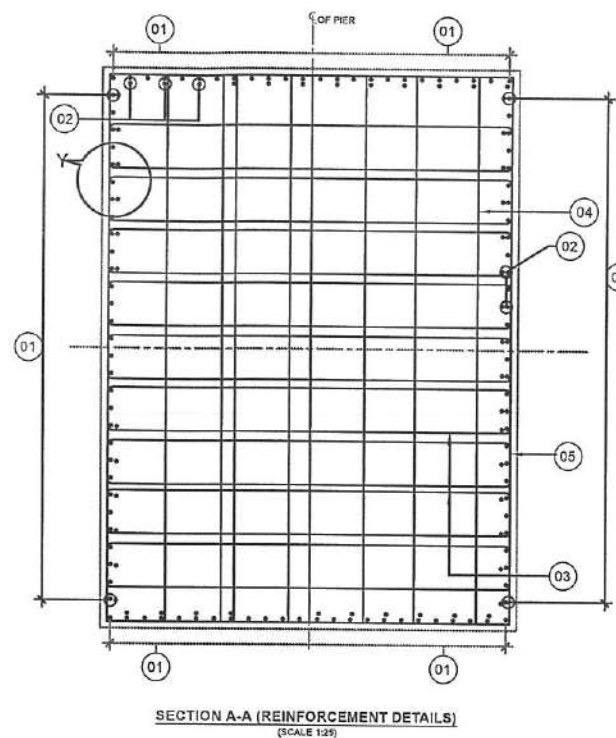
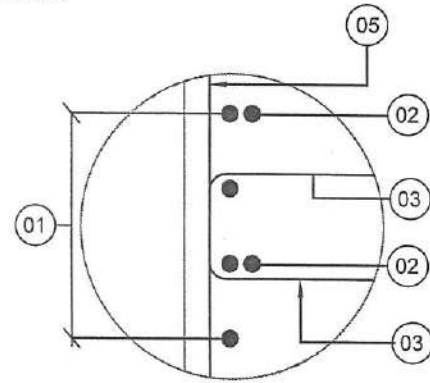
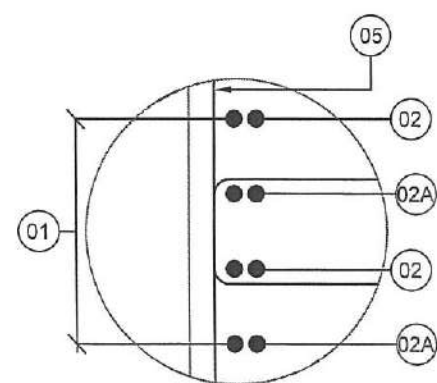
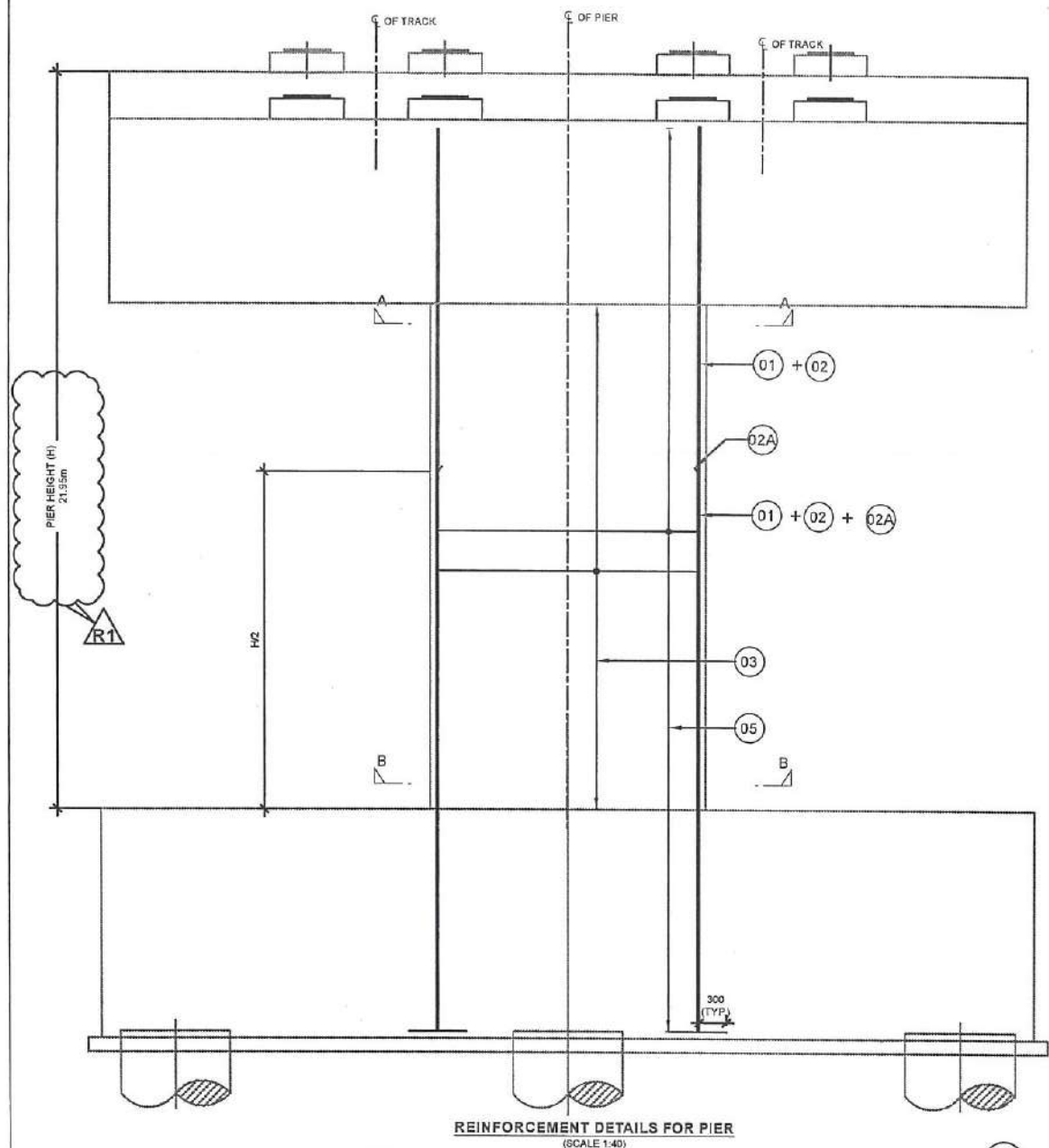
DSND:

APPROD:

DATE(CURRENT ISSUE)

17.04.2025





*17/04/2025*

**CHIEF ENGINEER**  
PLANNING & DESIGN  
BMRCL

#### SCHEDULE OF REINFORCEMENT

BAR NO.	DESCRIPTIONS	SHAPE	REMARKS
01	32 - 88 NOS	]	MAIN REINFORCEMENT
02	32 - 44 NOS	]	MAIN REINFORCEMENT
02A	32 - 44 NOS	]	MAIN REINFORCEMENT
03	10 - 14 LEGGED @ 110 C/C	≡	SHEAR REINFORCEMENT
04	10 - 8 LEGGED @ 110 C/C	≡	SHEAR REINFORCEMENT
05	10 @ 110 mm C/C	□	SHEAR REINFORCEMENT

#### NOTES :-

- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
- NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
- UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 50mm
- MATERIALS:  
CONCRETE: PIER = M50
- INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 GRADE Fe-500.
- BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
- SPLICE SHALL BE STAGGERED TO PREVENT MORE THAN 50% OF SPLICED OCCURRING AT SAME LOCATION.
- FOR CRASH BARRIER/PIER PROTECTION REFER SEPARATE DRAWING.
- Ld=42 x d WHERE d=DIA. OF BAR.
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

#### REFERENCE DRAWING NO. :-

- GENERAL NOTES -BMRCL/PH-II/R1EXTN/VIA/ISC/001
- DIMENSIONAL DETAILS OF PIER & PIERCAP FOR CONCENTRIC FIXED PIERS -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009/SHT 1 OF 4
- DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP & PILE FOR CONCENTRIC FIXED PIERS -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009/SHT 3 OF 4
- DIMENSIONAL & REINFORCEMENT DETAILS OF FIXED PIERCAP -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009/SHT 4 OF 4

**GOOD FOR CONSTRUCTION**

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 20.05.2024
R1	PIER HEIGHT REVISED AS SHOWN		17.04.2025	
R0	GOOD FOR CONSTRUCTION		20.05.2024	



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PRJT TITLE:

PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE:

REINFORCEMENT DETAILS FOR CONCENTRIC FIXED PIER (BP504)

DWG NO:

BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009/SHT 2 OF 4

ISSUE

R1

DRN:

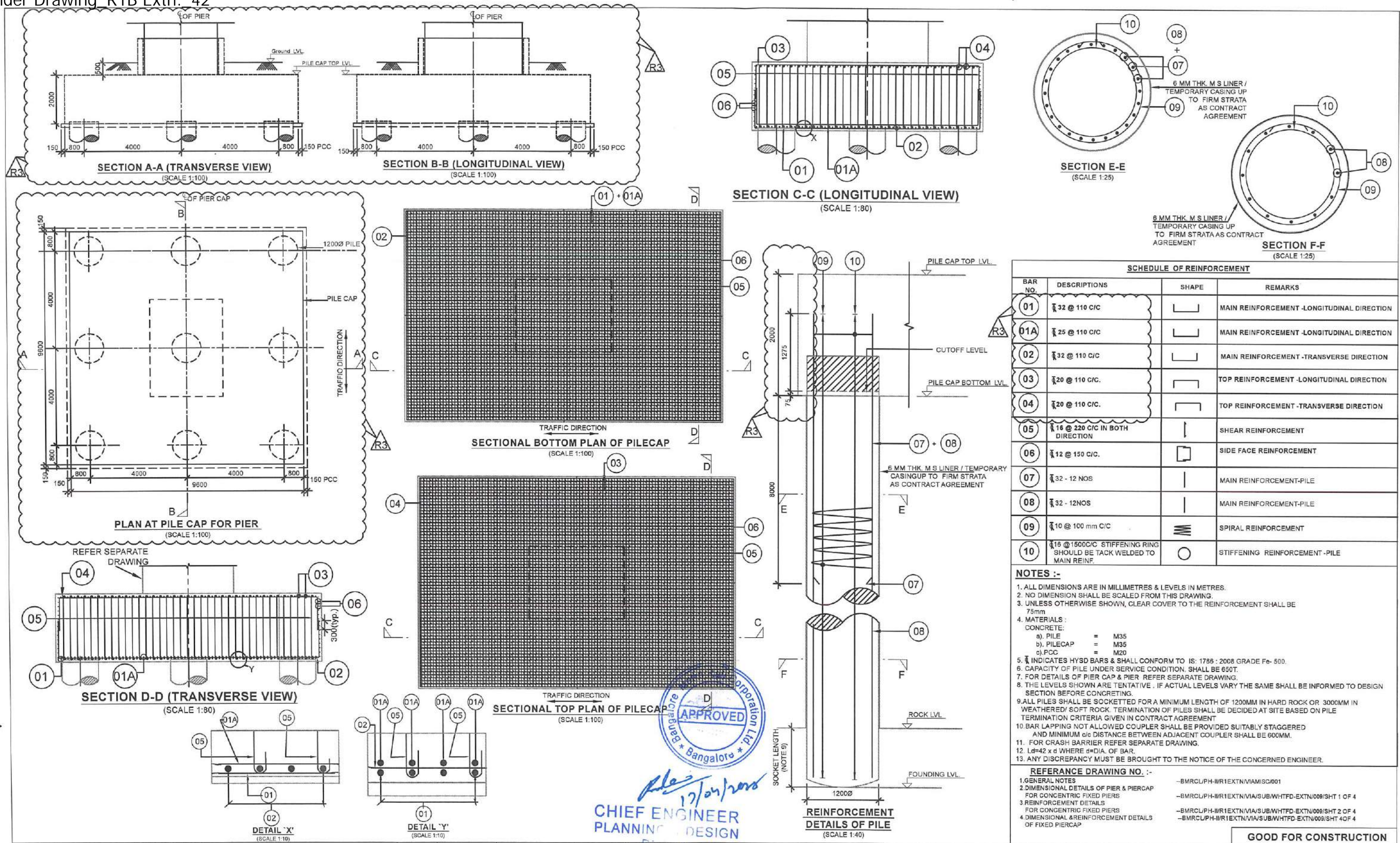
DSND:

APPROD:

DATE(CURRENT ISSUE)

17.04.2025





ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	PROOF CHECKED
R3	PILE CAP TOP LOWERED AND PILECAP DEPTH REVISED TO 2M TO AVOID BWSSB WATER PIPE LINE AS PER CONTRACTOR REQUEST LETTER -MVR/BMRC/BANG/50/103 DATED 25.03.2025 AND E-OFFICE -198286-BMRC/C129/A001/14/2025-BMRC/CIV		17.04.2025	DATE (R0 ISSUE) 20.05.2024	
R2	PILE CAP SIZE REVISED AS SHOWN		27.03.2025		
R1	PILECAP SIZE REVISED, AS SUPER STRUCTURE SPAN OF COMPOSITE GIRDER CHANGED FROM 57M TO 65M.		20.02.2025		
R0	GOOD FOR CONSTRUCTION		20.05.2024		

**BANGALORE METRO RAIL CORPORATION LTD**

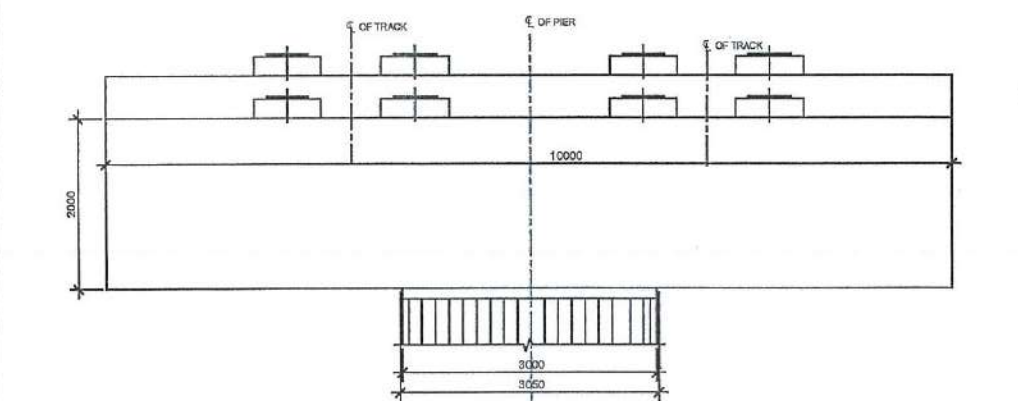
A. 3rd Floor, BMTC Complex,  
K H Road, Shanthinagar,  
Bangalore -560027  
Tel:-080-22959300

**PHASE II - R1 EXTENSION**  
**VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.**

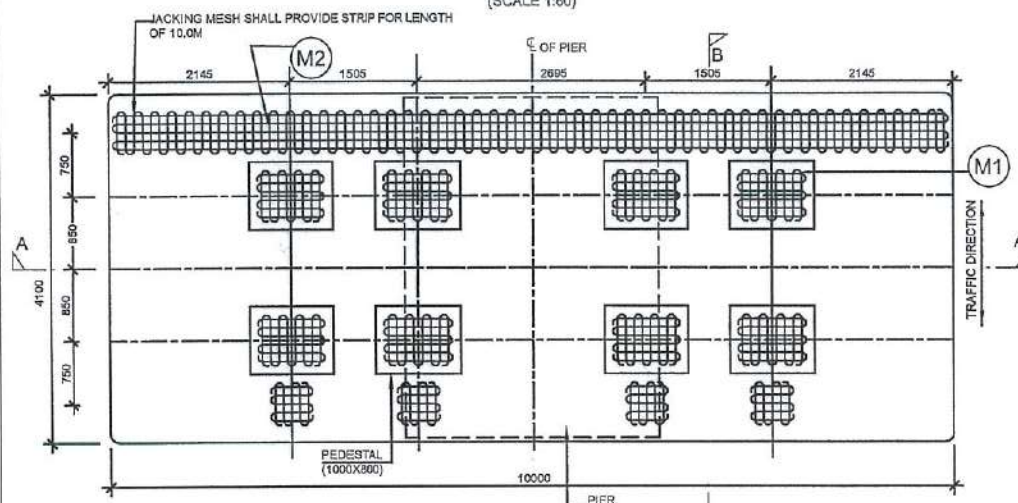
**DIMENSIONAL & REINFORCEMENT DETAILS OF PILE CAP AND PILE FOR CONCENTRIC FIXED PIER (BP504)**

DWG NO: BMRCL/PH-II/R1EXTN/VA/SUB/WHTFD-EXTN/009/SHT 3 OF 4  
DSND:   
APPROD:   
DATE (CURRENT ISSUE) 17.04.2025

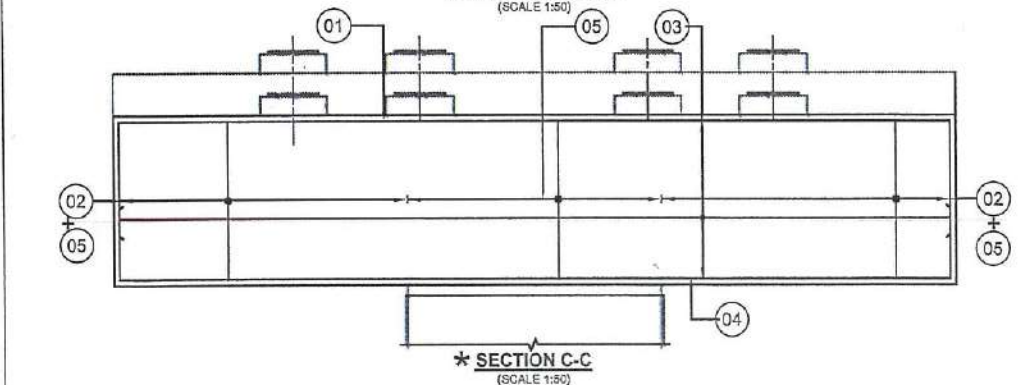




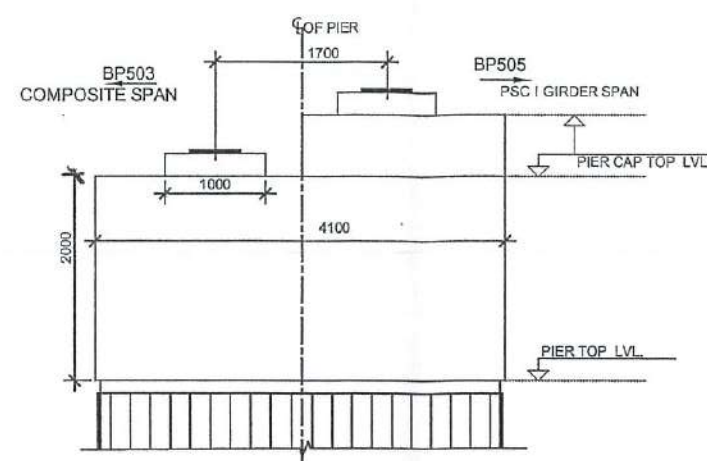
\* SECTION A-A (TRANSVERSE VIEW)  
(SCALE 1:60)



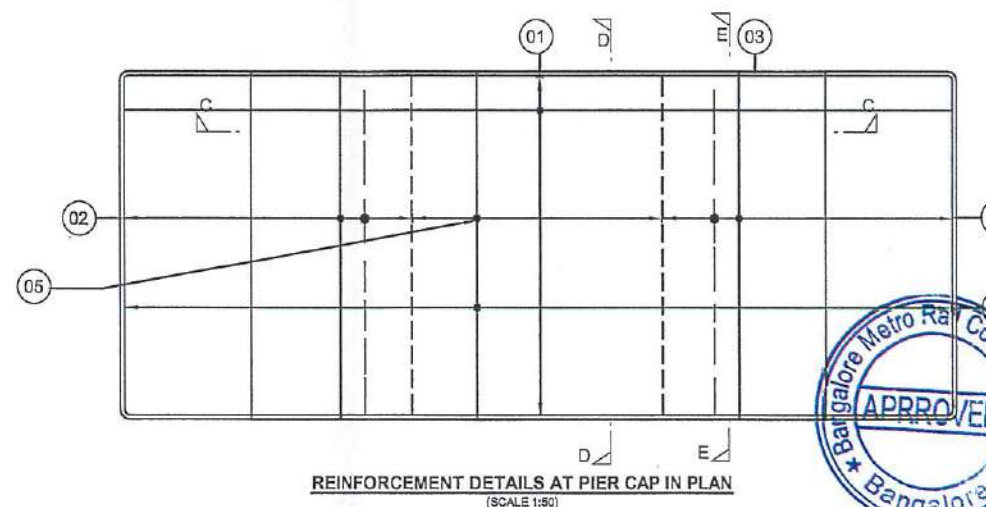
PLAN AT PIER CAP  
(SCALE 1:50)



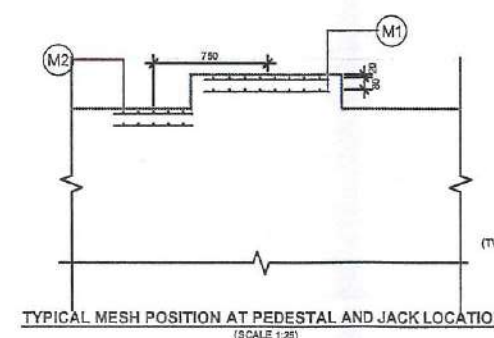
\* SECTION C-C  
(SCALE 1:50)



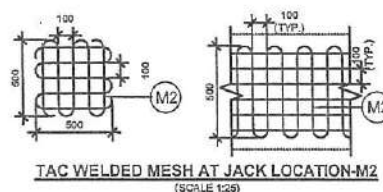
\*SECTION B-B (LONGITUDINAL VIEW)  
(SCALE 1:50)



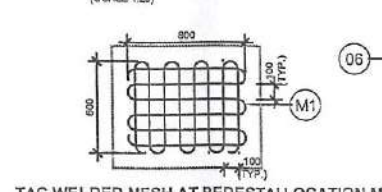
REINFORCEMENT DETAILS AT PIER CAP IN PLAN  
(SCALE 1:50)



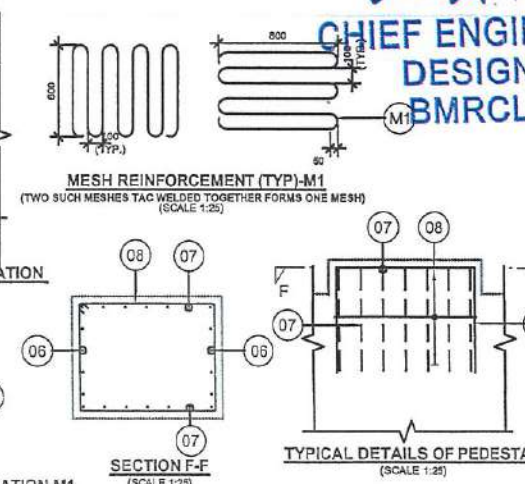
TYPICAL MESH POSITION AT PEDESTAL AND JACK LOCATION  
(SCALE 1:25)



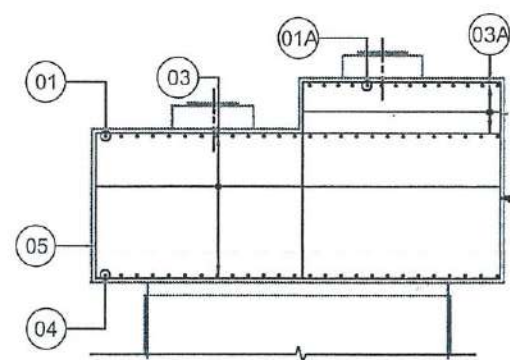
TAC WELDED MESH AT JACK LOCATION-M2  
(SCALE 1:25)



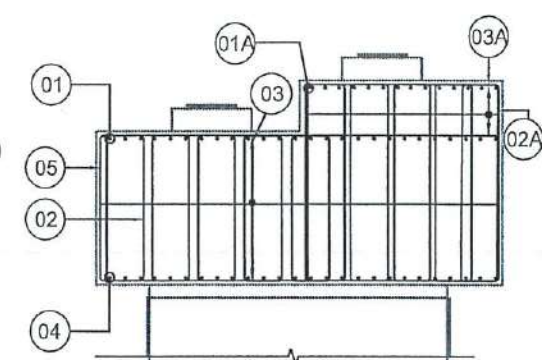
TAC WELDED MESH AT PEDESTAL LOCATION-M1  
(SCALE 1:25)



SECTION F-F  
(SCALE 1:25)



\* SECTION D-D  
(SCALE 1:50)



\* SECTION E-E  
(SCALE 1:50)

SCHEDULE OF REINFORCEMENT

BAR NO.	DESCRIPTIONS	SHAPE	REMARKS
01	32 @ 125 C/C.		MAIN REINFORCEMENT -PIERCAP
01A	32 @ 125 C/C.		MAIN REINFORCEMENT -STEP-PIERCAP
02	16-18 LEGGED @ 110 C/C.		VERTICAL SHEAR REINFORCEMENT
02A	16-2 LEGGED @ 110 C/C.		VERTICAL MAIN REINFORCEMENT-STEP
03	20-2 LEGGED @ 150 C/C.		HORIZONTAL SHEAR REINFORCEMENT
03A	32 @ 150 C/C.		SIDE FACE REINFORCEMENT-STEP
04	20 @ 125 C/C.		SUPPORTING REINFORCEMENT
05	16-2 LEGGED @ 120 C/C.		VERTICAL SHEAR REINFORCEMENT
06	16 @ 100 C/C.		MAIN REINFORCEMENT -PEDESTAL
07	16 @ 100 C/C.		MAIN REINFORCEMENT -PEDESTAL
08	12 @ 150 C/C.		SHEAR REINFORCEMENT
M1	8 @ 100 C/C-M1		MESH REINFORCEMENT PEDESTAL LOCATION - IN TWO LAYER ONE AT 20MM FROM TOP OF PEDESTAL AND OTHER AT 100MM FROM TOP OF PEDESTAL
M2	8 @ 100 C/C-M2		MESH REINFORCEMENT JACK LOCATION - IN TWO LAYER ONE AT 20MM FROM TOP OF PIERCAP AND OTHER AT 100MM FROM TOP OF PIERCAP

NOTES :-

- ALL DIMENSIONS ARE IN MILLIMETRES & LEVELS IN METRES.
- NO DIMENSION SHALL BE SCALED FROM THIS DRAWING.
- UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 50mm.
- MATERIALS : CONCRETE:
  - PILE = M35
  - PIERCAP = M35
  - PCC = M20
- INDICATES HYSD BARS & SHALL CONFORM TO IS: 1786 : 1985 GRADE Fe-500.
- CAPACITY OF PILE UNDER SERVICE CONDITION, SHALL BE 650T.
- FOR DETAILS OF PIER CAP & PIER, REFER SEPARATE DRAWING.
- THE LEVELS SHOWN ARE TENTATIVE. IF ACTUAL LEVELS VARY THE SAME SHALL BE INFORMED TO DESIGN SECTION BEFORE CONCRETING.
- BAR LAPPING NOT ALLOWED COUPLER SHALL BE PROVIDED SUITABLY STAGGERED AND MINIMUM c/c DISTANCE BETWEEN ADJACENT COUPLER SHALL BE 600MM.
- SPLICE SHALL BE STAGGERED TO PREVENT MORE THAN 50% OF SPLICED OCCURRING AT SAME LOCATION.
- $L_d = 42 \times d$  WHERE  $d$  = DIA. OF BAR.
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.

REFERENCE DRAWING NO. :-

- GENERAL NOTES -BMRCL/PH-II/R1EXTN/VIA/MISC/001
- DIMENSIONAL DETAILS OF PIER & PIERCAP -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009/SHT 1 OF 4
- REINFORCEMENT DETAILS FOR CONCENTRIC FIXED PIERS -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009/SHT 2 OF 4
- DIMENSIONAL & REINFORCEMENT DETAILS OF PIER CAP & PILE FOR CONCENTRIC FIXED PIERS -BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009/SHT 3 OF 4

GOOD FOR CONSTRUCTION

NOTES :- \* STEPPED PIERCAP SHALL BE CAST MONOLITHICALLY

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 20.05.2024
R1	PIERCAP SIZE REVISED AS SHOWN		27.03.2025	
R0	GOOD FOR CONSTRUCTION		20.05.2024	

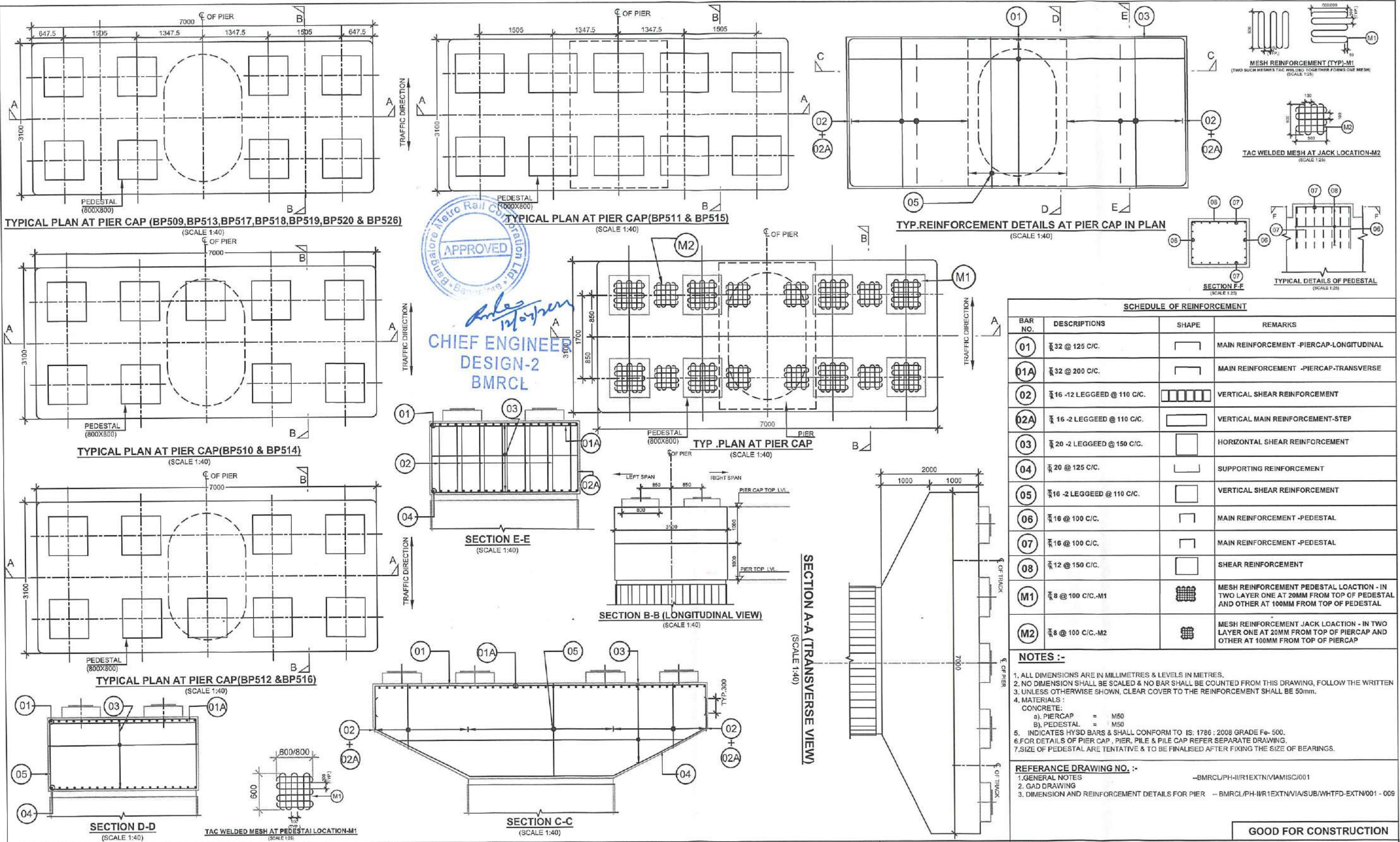
**BANGALORE METRO RAIL CORPORATION LTD**

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K H Road, Shanthinagar,  
Bangalore-560027  
Tel:-080-22969300

PROOF CHECKED

PRJT TITLE:	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.
DWG. TITLE:	DIMENSIONAL & REINFORCEMENT DETAILS OF FIXED PIERCAP (BP504)
DWG NO:	BMRCL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/009/SHT 4 OF 4
ISSUE	R1
DRN:	DATE (CURRENT ISSUE) 27.03.2025
DSND:	
APPROD:	





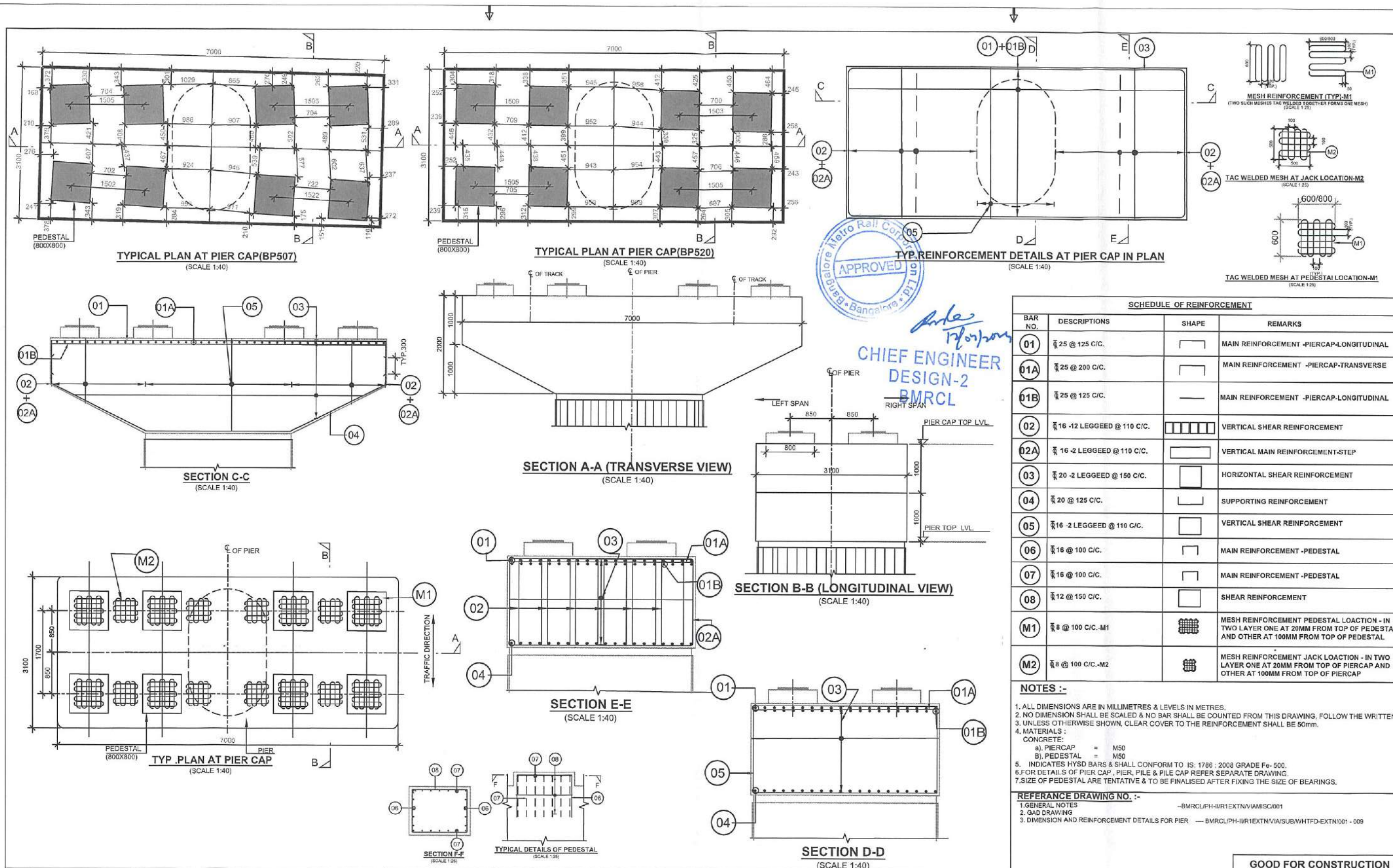
ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 12-04-2024
				IF (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.
				CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLD' IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'.
R0	GOOD FOR CONSTRUCTION		12-04-2024	

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Tel:-080-22969300

PROOF CHECKED	PRJT TITLE: PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.
	DWG. TITLE: DIMENSIONAL & REINFORCEMENT DETAILS OF TYPICAL STRAIGHT SPAN PIERCAP
	DWG NO: BMRL/PH-II/R1EXTN/VIA/SUB/WHTFD-EXTN/010/SHT 1 OF 2
	ISSUE R0
	DATE (CURRENT ISSUE) 12-04-2024





ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 12-04-2024
				"P" (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.
				CONSTRUCTION / FABRICATION WORK IS PERMITTED ON "R" (RELEASED) ISSUES INFORMATION CONTAINED WITHIN "HOLD" IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR "HOLD" IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO "HOLD".
R0	GOOD FOR CONSTRUCTION		12-04-2024	

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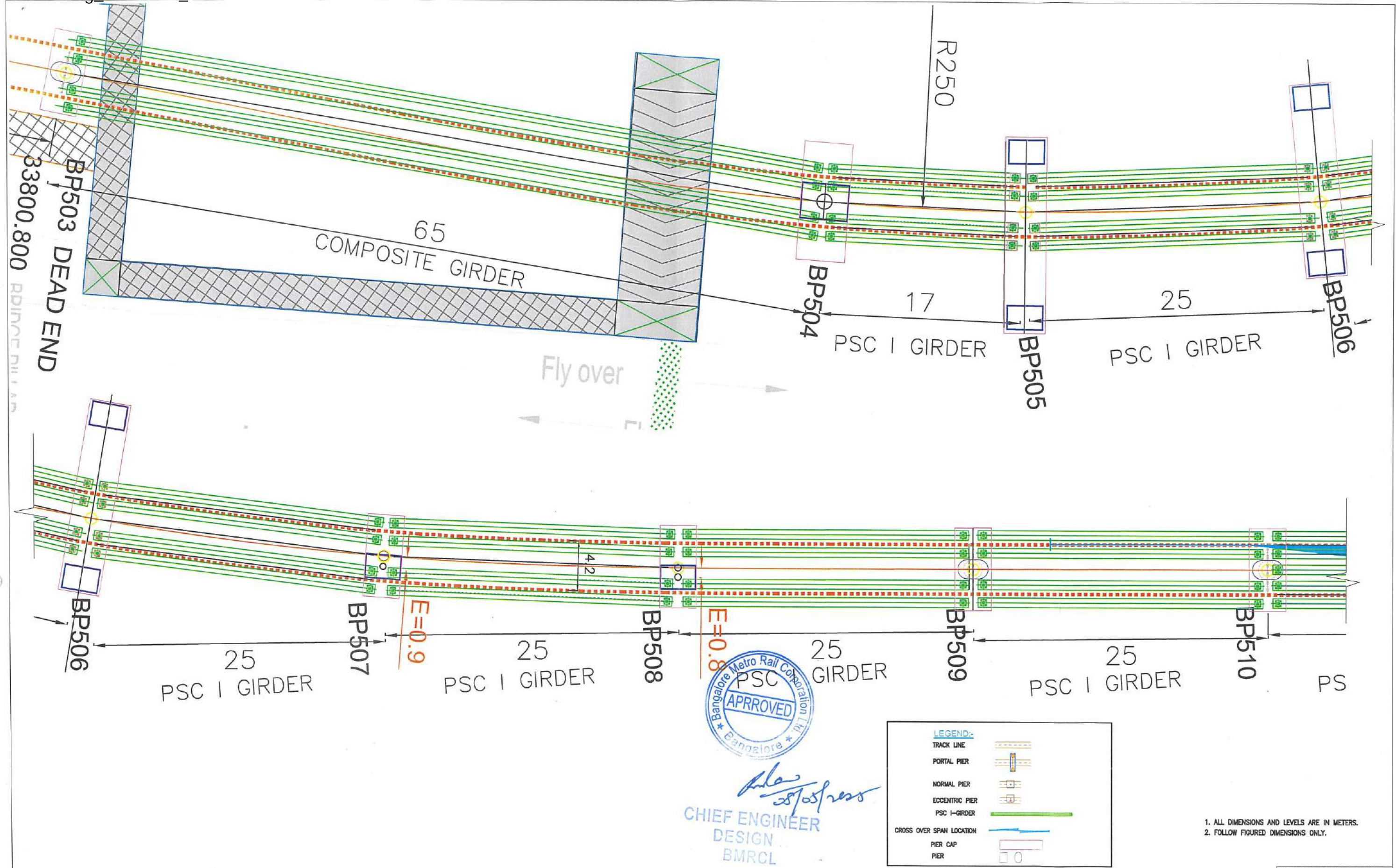
A. 3rd Floor, BMTCL Complex,  
K H Road, Shanthinagar,  
Bangalore -560027  
Tel:-080-22969300

PROOF CHECKED


PRJCT TITLE:	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP526.
DWG. TITLE:	DIMENSIONAL & REINFORCEMENT DETAILS OF TYPICAL CONCENTRIC PIERCAP WITH CURVE SPANS.
DWG NO:	BMRL/PH-I/R1/EXTN/VIA/SUB/WHITFD-EXTN/010/SHT 2 OF 2
DRN: KADYA T.H.	DSND: VIRENDRA
CHKD & APPRD: CE: REPAKA SRINIVASA RAO	DATE (CURRENT ISSUE): 12-04-2024

GOOD FOR CONSTRUCTION





ISSUE	DESCRIPTION	APPROVED	DATE	SCALE	AS SHOWN
				DATE (R0 ISSUE)	19.07.2024
R1	GIRDER LAYOUT REVISED AS PER LATEST ALIGNMENT DATED 29.01.2025.		08.05.2025		
R0	GOOD FOR CONSTRUCTION		19.07.2024		





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Bangalore-560027  
Tel:-080-22969000


PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE: GIRDER LAYOUT OF VIADUCT SUPERSTRUCTURE BEYOND WHITEFIELD STATION EXTENSION FOR PIER BP503 TO BP510

DWG NO: BMRCL/PH-II/R1 EXTN/VD/TL/001

DRAWN BY: 

CHECKED BY: 

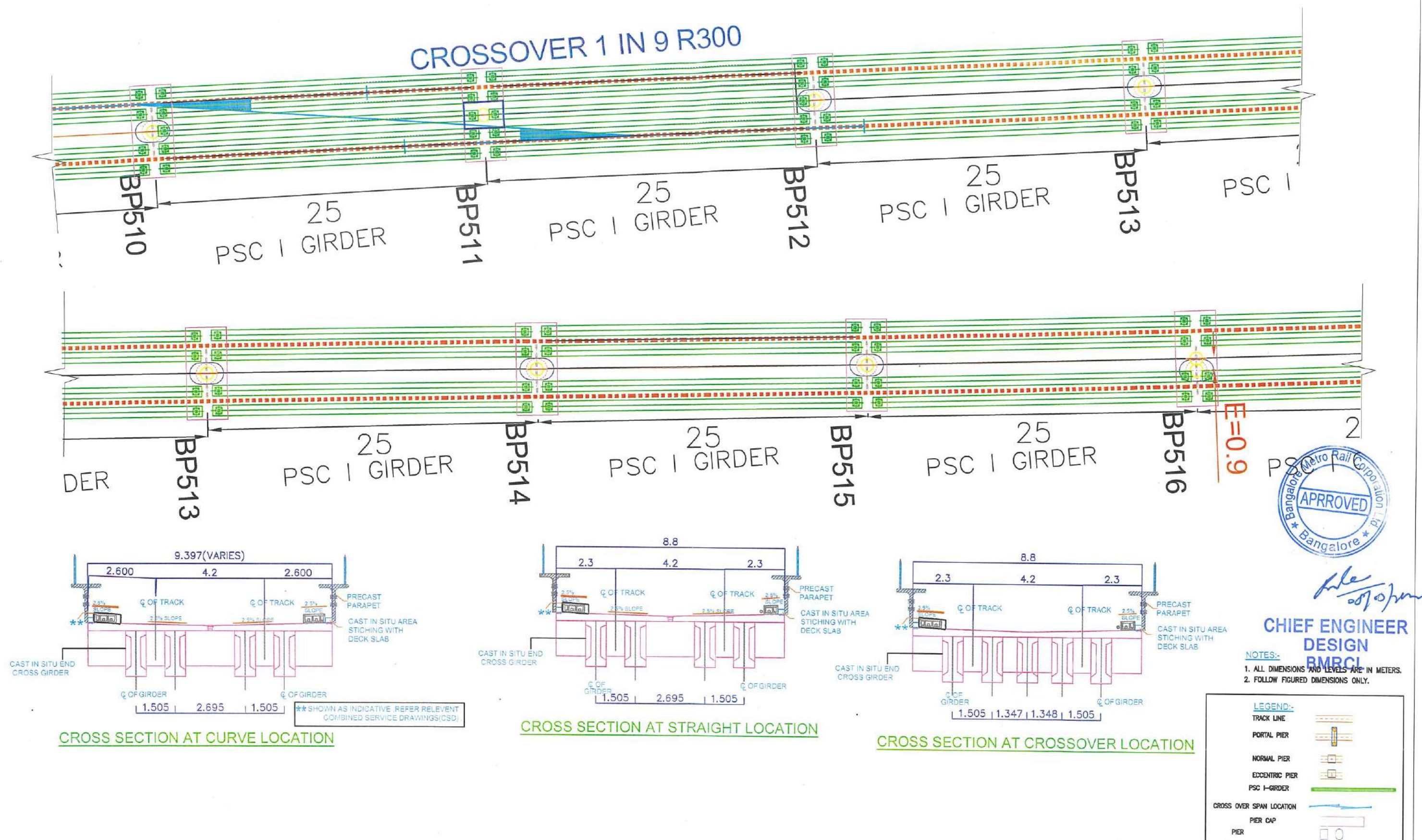
APPROVED BY: 

CE-(P&D)

ISSUE R1

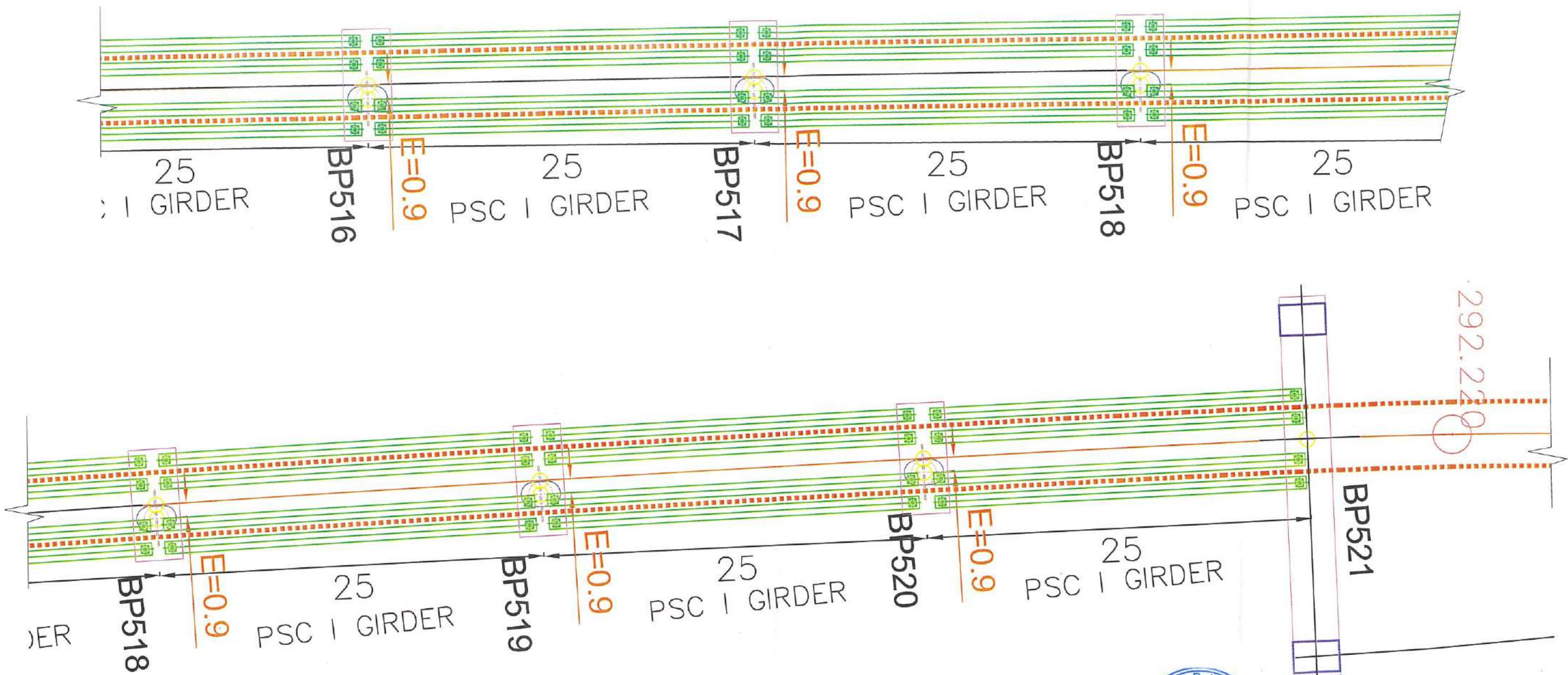
DATE(CURRENT ISSUE) 08.05.2025





ISSUE	DESCRIPTION	APPROVED	DATE	SCALE: AS SHOWN			
R1	GIRDER LAYOUT REVISED AS PER LATEST ALIGNMENT DATED 29.01.2025.		08.05.2025	DATE (NO ISSUE) 19.07.2024	<b>BANGALORE METRO RAIL CORPORATION LTD</b> A. 3rd Floor, BMTCL Complex K.H. Road, Shanthinagar, Bangalore - 560027 Tel: +91-80-22989300	<b>PHASE II - R1 EXTENSION</b> <b>VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.</b> <b>DWG. TITLE: GIRDER LAYOUT OF VIADUCT SUPERSTRUCTURE BEYOND WHITEFIELD STATION EXTENSION FOR PIER BP510 TO BP516</b>	
R0	GOOD FOR CONSTRUCTION		19.07.2024			DWG. NO: BMRCL/PH-II/R1 EXTN/VT/GL/002 DRAWN BY:	CHECKED BY: APPROVED BY: CE-(P&D)
						ISSUE R1	DATE(CURRENT ISSUE) 08.05.2025









**LEGEND:**

- TRACK LINE
- PORTAL PIER
- NORMAL PIER
- ECCENTRIC PIER
- PSC I-GIRDER
- CROSS OVER SPAN LOCATION
- PIER CAP
- PIER



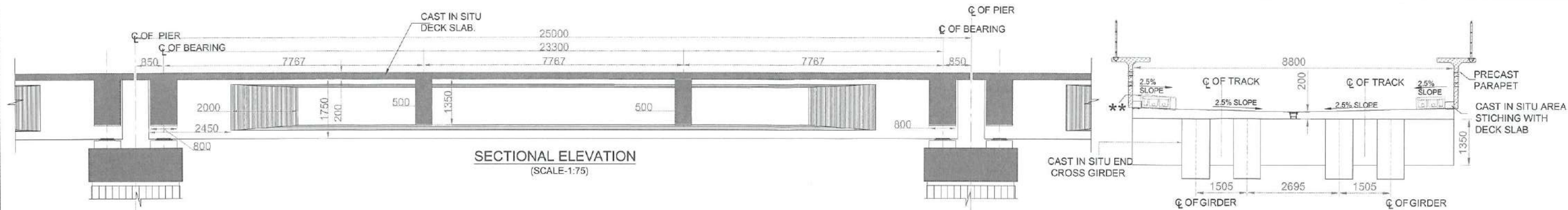
*[Signature]*  
**CHIEF ENGINEER  
 DESIGN  
 BMRCL**

- NOTES:**
1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
  2. FOLLOW FIGURED DIMENSIONS ONLY.

ISSUE	DESCRIPTION	APPROVED	DATE	SCALE: AS SHOWN	 <div>BANGALORE METRO RAIL CORPORATION LTD A-3rd Floor, BMRCL Complex, K.H. Road, Shanthinagar, Bangalore-560027 Tel:-080-23360000</div>	GOOD FOR CONSTRUCTION			
				DATE (FOR ISSUE) 19.07.2024		PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.			
				IF AMENDMENT/REVISION NOT TO BE MADE FOR CONSTRUCTION, FABRICATION AND Erection, THE DATED DRAWING IS TO BE INDICATED IN THE SCALE BLOCK AT THE END OF THE DRAWING.		DWG. TITLE: GIRDER LAYOUT OF VIADUCT SUPERSTRUCTURE BEYOND WHITEFIELD STATION EXTENSION FOR PIER BP517 TO BP521			
				CONSTRUCTION, FABRICATION, Erection, AND Erection, THE DATED DRAWING IS TO BE INDICATED IN THE SCALE BLOCK AT THE END OF THE DRAWING.		DWG NO: BMRCL/PH-II/R1 EXTN/VD/GL/003		ISSUE R1	
R1	GIRDER LAYOUT REVISED AS PER LATEST ALIGNMENT DATED 29.01.2025.		08.05.2025			DESIGN & DRAWN BY: 	CHECKED BY: 	APPROVED BY: 	DATE(CURRENT ISSUE)
R0	GOOD FOR CONSTRUCTION		19.07.2024					CE-(P&D)	08.05.2025

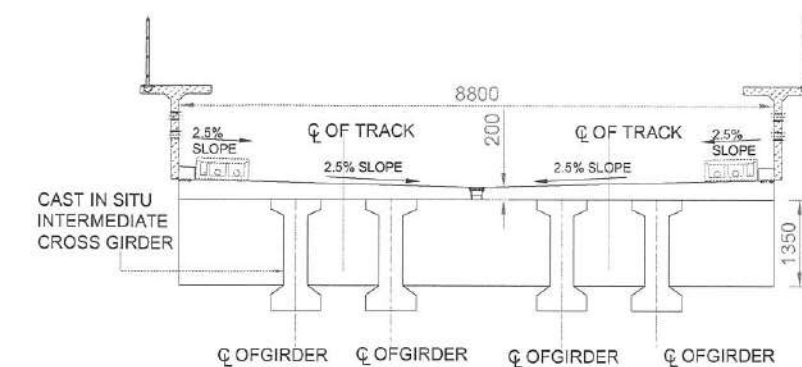
GOOD FOR CONSTRUCTION



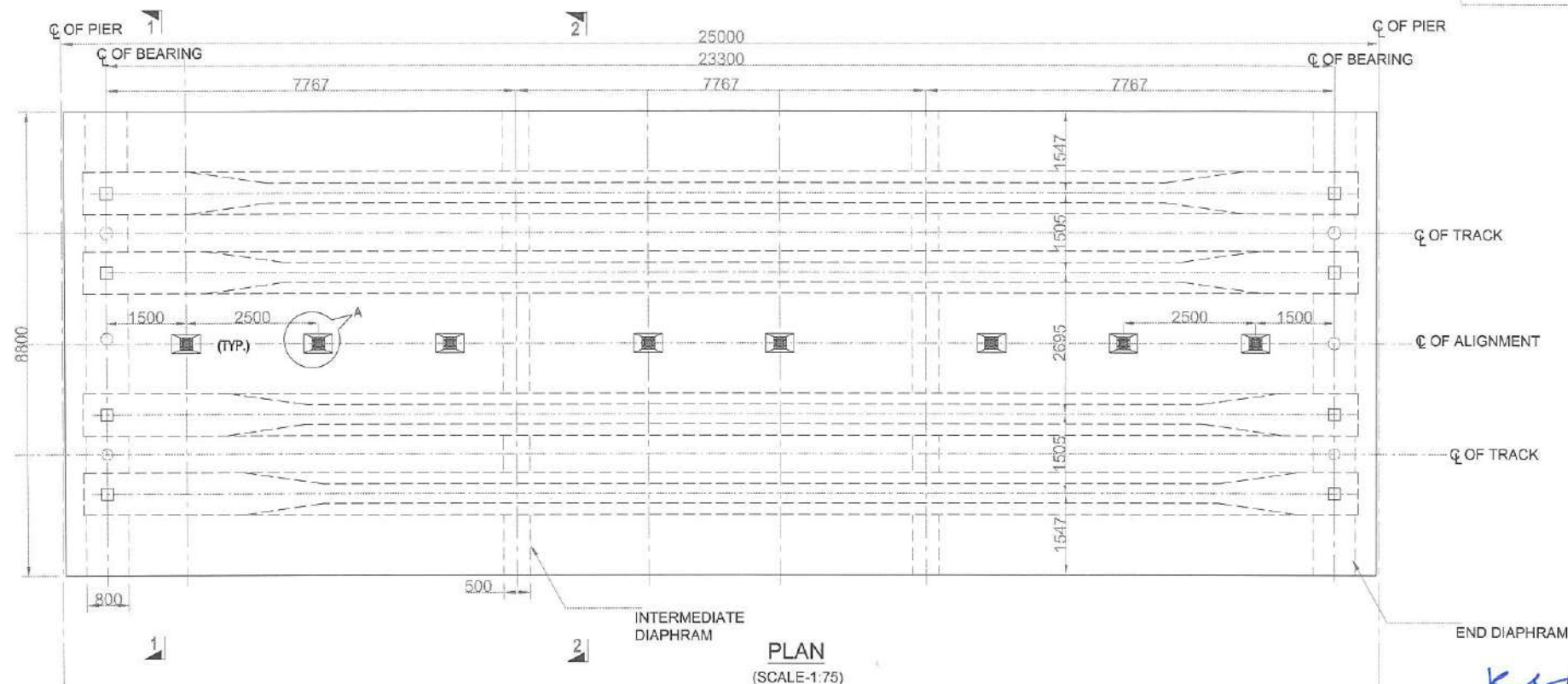


\*\* SHOWN AS INDICATIVE, REFER RELEVANT COMBINED SERVICE DRAWINGS(CSD).

SECTION 1-1  
(SCALE-1:75)

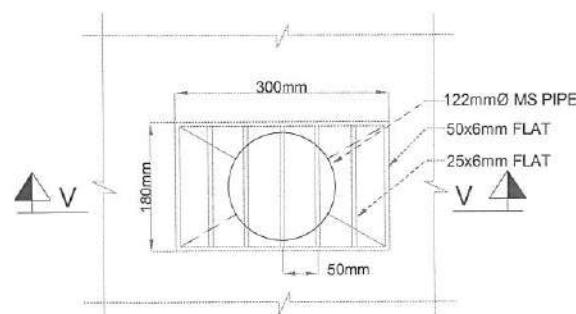


SECTION 2-2  
(SCALE-1:75)

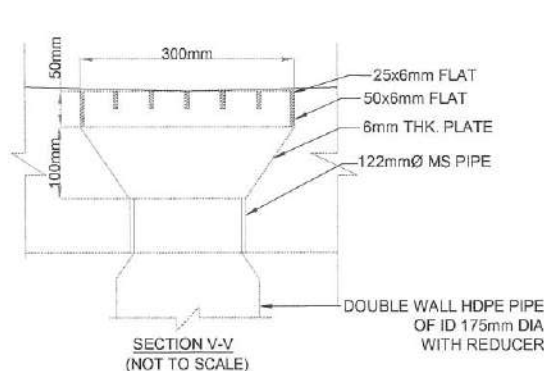


*K. K. Srinivasan*  
Deputy Chief Engineer  
(Planning & Design)  
BMRCL

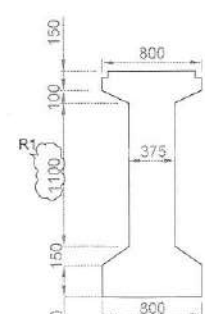
SL NO	PIER	SPAN	RADIUS
1	BP507 — BP508	25	STRAIGHT
2	BP508 — BP509	25	STRAIGHT
3	BP509 — BP510	25	CROSS OVER STRAIGHT SPAN
4	BP512 — BP513	25	CROSS OVER STRAIGHT SPAN
5	BP513 — BP514	25	STRAIGHT
6	BP514 — BP515	25	STRAIGHT
7	BP515 — BP516	25	STRAIGHT
8	BP516 — BP517	25	2500 M
9	BP517 — BP518	25	STRAIGHT
10	BP518 — BP519	25	STRAIGHT
11	BP519 — BP520	25	STRAIGHT
12	BP520 — BP521	25	STRAIGHT



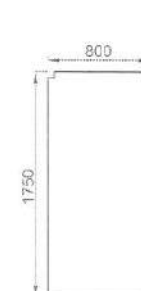
DETAIL 'A' DRAIN SPOUT  
(NOT TO SCALE)



SECTION V-V  
(NOT TO SCALE)



GIRDER SECTION AT CENTER  
(SCALE-1:40)



GIRDER SECTION AT END  
(SCALE-1:40)

#### NOTES :-

1. ALL DIMENSIONS ARE IN MILLIMETERS & LEVELS IN METERS.
2. PARAPET SHOWN ABOVE TENTATIVE FOLLOW RELEVANT DRAWINGS.
3. MATERIALS :  
a). GIRDER = M50  
b). DECK SLAB = M35  
c). CROSS & END GIRDER = M35
4. READ THIS DRAWING ALONG WITH SUBSTRUCTURE & OTHER RELEVANT DRAWINGS.
5. DIMENSIONS SHALL NOT BE SCALED FROM DRAWING FOLLOW ONLY WRITTEN DIMENSIONS AND IN CASE OF ANY DISCREPANCIES REFER TO THE ENGINEER-IN-CHARGE.

#### REFERENCE DRAWING NO. :-

1. GENERAL NOTES
  2. DIMENSIONAL & REINFORCEMENT DETAILS FOR SUBSTRUCTURE
  3. BEARING DRAWINGS
  4. PARAPET DRAWINGS
- BMRCL/PH-II/R1/EXTN/VIA/MISC/001  
—BMRCL/PH-II/R1/EXTN/VIA/SUB/WHTFD-EXTN/001 TO 010  
—BMRCL/PH-II/R1/EXTN/VIA/MISC/002  
—BMRCL/PH-II/R1/EXTN/VIA/MISC/003

GOOD FOR CONSTRUCTION

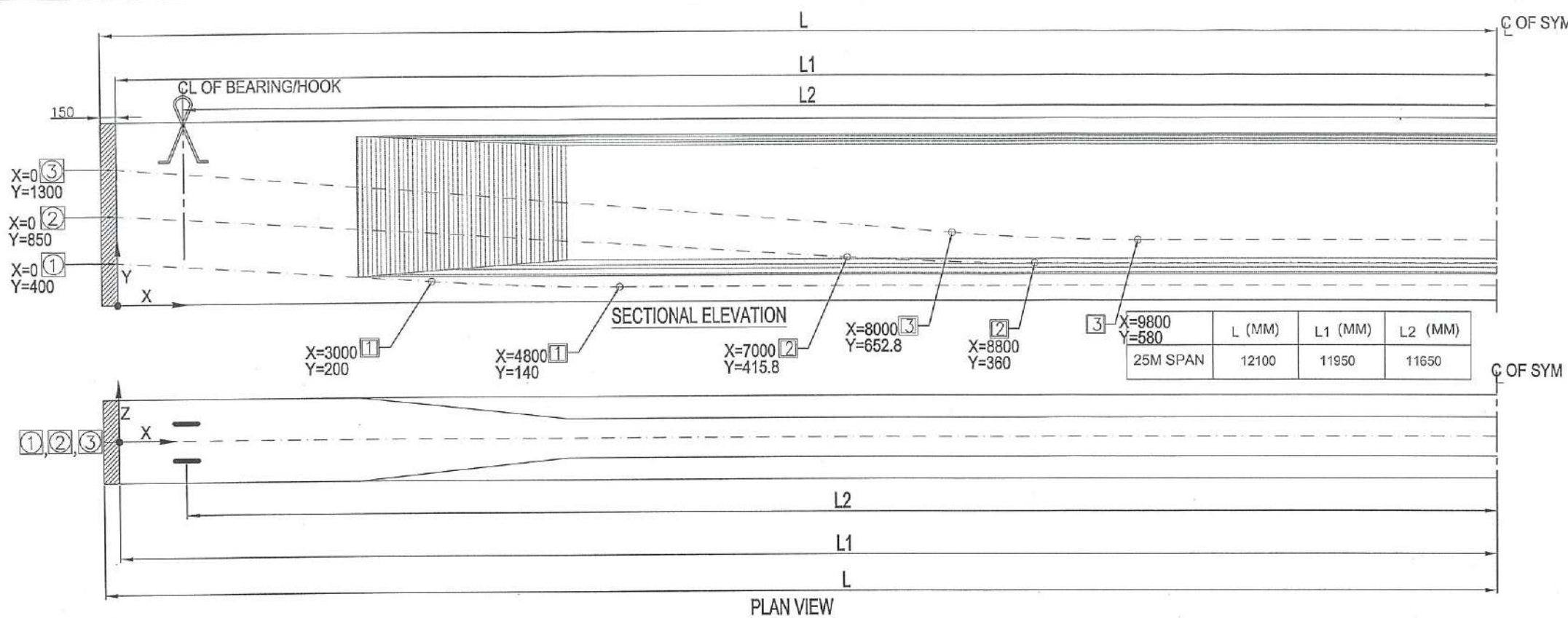
ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	PRJT. TITLE:
				DATE (R0 ISSUE) 11.07.2024	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.
R1	DEPTH OF WEB IS CORRECTED TO 1100mm (GIRDER SECTION AT CENTRE)		02.09.2025		DWG. TITLE:
R0	GOOD FOR CONSTRUCTION		11.07.2024		GAD OF PSC I-GIRDER SUPERSTRUCTURE FOR STRAIGHT SPAN 25M AND RADIUS 2500M
					DWG NO: BMRCL/PH-II/R1/EXTN/VIA/SUP/WHTFD-EXTN/002/SHT 1 OF 5
					ISSUE R1
					DRN: DSND: APPRO: DATE (CURRENT ISSUE) 02.09.2025



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	X-VALUE (mm)	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	10500	11000	11500	12000	12100
CABLE-1	Y	400	367	333	300	267	233	200	171	152	142	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CABLE-2	Y	850	819	788	757	726	695	664	633	602	571	540	509	478	447	416	389	371	362	360	360	360	360	360	360	360	360
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CABLE-3	Y	1300	1260	1219	1179	1138	1098	1057	1017	976	936	896	855	815	774	734	693	653	618	594	582	580	580	580	580	580	580
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Notes:-**

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- MATERIAL:-**
  - CONCRETE CONTROLLED DESIGN MIX AND HAVING 28 DAYS CHARACTERISTIC STRENGTH OF 50N/mm<sup>2</sup> (M50).
  - PRE STRESSING STEEL OF 15.2mm NOMINAL DIA. SEVEN PLY CLASS-2 STRANDS AS PER IS:14268-1995 LOW RELAXATION TYPE IS USED FOR PRE STRESSING.
  - HIGH YIELD STRENGTH DEFORMED BARS Fe500 CONFORMING TO IS:1786-1985.
- MINIMUM CLEAR COVER TO ORDINARY REINFORCEMENT- 40mm.
- LAP LENGTH OF DEFORMED BARS ARE AS PER GENERAL NOTES
- SHEATHING SHALL BE HDPE CORRUGATED PIPES DUCT DIA FOR 19T16 - 107mm
- STRAND PROPERTIES:-**
  - NOMINAL DIAMETER =15.20mm
  - AREA =140Sq.mm.
  - YIELD STRENGTH =1880 MPa (Min.)
  - UTS =260.73 KN/STRAND
  - MODULUS OF ELASTICITY (E) =195000 MPa
- PARAMETERS USED FOR DESIGN:-**
  - COEFFICIENT OF FRICTION = 0.17/radians
  - WOBLE COEFFICIENT = 0.002/meter
  - ANCHORAGE SLIP = 6mm
- ELONGATION'S ARE COMPUTED BASED ON ABOVE PARAMETERS.
- BEFORE TAKING UP STRESSING OPERATION, IT IS TO BE ENSURED THAT THE JACK AND PUMP ARE PROPERLY CALIBRATED.
- LAYING OF SHEATHING:-**
  - SHEATHING SHALL BE CLOSELY SUPPORTED IN CORRECT PROFILE TO THE LEVELS SO THAT THEY ARE NOT DISPLACED DURING CONCRETING.
  - ANY REINFORCEMENT FOULING WITH SHEATHING SHALL BE ADJUSTED LOCALLY.

**11. AGE OF STRESSING :**

- CABLES SHALL BE STRESSED WHEN CONCRETE ATTAINS THE CUBE STRENGTH OF 45 Mpa OR ON 14th DAY AFTER CASTING OF GIRDERS WHICHEVER IS LATER.
- ANY APPROVED SYSTEM OF PRE-STRESSING SHALL BE ADOPTED.
- THE CABLE IS IN TWO STRAIGHT LINE'S JOINED BY CIRCULAR CURVE IN ELEVATION.
- SPIRAL REINFORCEMENT AROUND ANCHORAGE SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.
- ALL THE CABLE ARE STRESSED FROM ONE END ONLY AS INDICATED.
- THE READINGS PERTAINING TO BOTH FORCE AND ELONGATION AT EVERY STAGE SHALL BE RECORDED AT REGULAR INTERVALS AS PER CODAL PROVISION.
- JACKING FORCE PER CABLE SHALL BE EQUAL TO 75% OF UTS. 260.73 KN x 0.75 = 195.55KN PER STRAND. FORCE PER CABLE = 195.55 x NO. OF STRANDS IN THE CABLE.
- NORMALLY STRESSING CAN PROCEED ON THE INDICATED ELONGATION
  - IN CASE ELONGATION IS REACHED AND CORRESPONDING JACK PRESSURE IS NOT REACHED, STRESSING SHALL BE CONTINUED UP TO 5% IN EXCESS OF PRESCRIBED ELONGATION.
  - IN CASE JACK PRESSURE IS REACHED AND ELONGATION IS NOT REACHED, STRESSING CAN BE CONTINUED UP TO A MAXIMUM JACK PRESSURE OF 1.05 TIMES THE CALCULATED PRESSURE.
  - IN CASE OF VARIATION MORE THAN THE PRESCRIBED LIMITS, THE MATTER SHALL BE REFERRED TO THE DESIGN OFFICE.
- EXTENSIONS SHALL BE RECHECKED AT 24 HOURS AFTER ANCHORING TO OBSERVE SLOW SLIPPAGE THE MATTER SHALL BE REPORTED FOR EXCESSIVE SLIPPAGE, IF ANY.
- INITIAL SLACKNESS IN PRE-STRESSING CABLES SHALL BE REMOVED BY APPLYING SMALL TENSION. THE INITIAL TENSION REQUIRED TO REMOVE SLACKNESS SHALL BE TAKEN AS THE STARTING POINT FOR MEASURING ELONGATION, AND CORRECTION SHALL BE APPLIED AS PER CLAUSE 12.2.1.3 OF IS 1343-1980.

- GROUTING SHALL BE DONE 24 HOURS AFTER STRESSING THE STRANDS AND AFTER THOROUGHLY FLUSHING THE SHEATHING WITH WATER JETTING AND IT SHALL BE DONE WITH PLAIN CEMENT GROUT WITH WATER CEMENT RATIO NOT EXCEEDING 0.4. A SUITABLE NON-ALUMINIUM BASED EXPANDING AGENT SHALL BE ADDED TO THE GROUT (0.4% WT OF CEMENT 'INTRAPLAST N200' MANUFACTURED BY SIKKA OR EQUIVALENT).
- EXTRA LENGTH OF STRANDS AT THE END SHALL BE CUT AFTER GROUT HAS SET. THE CUTTING HAS TO BE DONE USING A GRINDER AND NOT BY GAS CUTTING.
- CONCRETE FOR THE POCKET SHALL HAVE NON-SHINK ADDITIVES.
- THE ELONGATION GIVEN IN TABLE BELOW SHALL BE MODIFIED AT SITE INCASE ACTUAL VALUE OF AREA OF STRANDS 'A' AND MODULUS OF ELASTICITY 'E' VARY FROM THOSE ASSUMED IN DESIGN REVISED EXTENSIONS SHALL BE CALCULATED AS UNDER REVISED ELONGATION = (140 x 195000 / AREA x NEW MODULUS) x EXTENSION.
- THE PRE-STRESSING IS DONE USING THE FOLLOWING TYPES OF CABLES. VARIATIONS IN ELONGATION SHOULD NOT EXCEED 5% OVER THEORETICALLY CALCULATED ELONGATION THE CUT LENGTH OF STRANDS MENTIONED IN TABLE IS INCLUSIVE OF GRIP LENGTH.
- ALL ANCHORAGE PLATES ARE TO BE SET AT RIGHT ANGLE OF TENDON AXIS AT ANCHORAGE LOCATION.
- THE WORK OF PRESTRESSING SHALL BE CARRIED OUT BY ANY RECOGNIZED SYSTEM AFTER CARRYING OUT NECESSARY MODIFICATIONS IN THE DRAWING WITH THE APPROVAL OF ENGINEER-IN-CHARGE. ALL PRESTRESSING AND GROUTING WORK TO BE UNDERTAKEN BY TRAINED PERSONAL ONLY. A REPRESENTATIVE OF THE SUPPLIER OF THE PRESTRESSING SYSTEM SHALL BE PRESENT DURING ALL TENSIONING AND GROUTING OPERATIONS AND SHALL ENSURE, MONITOR AND THEIR CORRECTNESS OF THE SYSTEM AND METHODS.

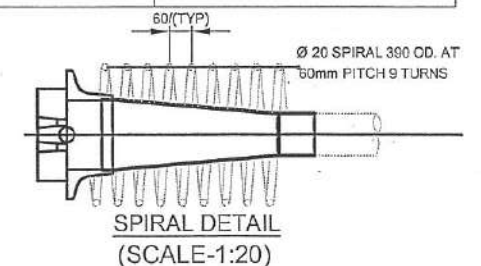
**PRE STRESSING DETAILS FOR 25M SPAN:**

CABLE NUMBER	TYPE OF CABLE	STRANDS NO. OF	JACKING FORCE(MN)/CABLE	CUT LENGTH (m)	ELONGATION TOTAL (MM)
CABLE-1	19T16	19	3715.5	25.50	188.22
CABLE-2	19T16	14	2737.8	25.50	188.28
CABLE-3	19T16	14	2737.8	25.50	188.01

A GRIP LENGTH OF 1000mm AT LIVE END AND 300mm AT DEAD END ARE INCLUDED IN THE CUT LENGTH.

**TABLE - II (PRESTRESSING SEQUENCE FOR GIRDER)**

SL.NO.	ITEM	DAY NO.
1	COMPLETION OF CASTING OF PSC GIRDER	0
2	PRESTRESSING OF TENDON FOR CABLE NO.3 2 & 1 FROM ONE END OF THE GIRDER.	14 DAYS CASTING OF GIRDER OR WHEN GIRDER CONCRETE ATTAINED A STRENGTH OF 45Mpa WHICHEVER IS LATER
3	CASTING OF DECK SLAB & DIAPHRAGM	20 DAYS AFTER CASTING OF GIRDER
4	APPLICATION OF SIDL etc....	45 DAYS AFTER CASTING OF GIRDER

**LEGEND :-**

- (N) JACKING END
- (N) CABLE NUMBER
- (N) START OF VERTICAL CURVE
- (N) END OF VERTICAL CURVE
- CABLE
- CL OF SYM - CENTER LINE OF SYMMETRY.



**CHIEF ENGINEER**  
**DESIGN-2**  
**BMRC**

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (RO ISSUE) 11.07.2024
				"P" (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.
				CONSTRUCTION / FABRICATION WORK IS PERMITTED ON "R" (RELEASED) ISSUES INFORMATION CONTAINED WITHIN "HOLD" IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR "HOLD" IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO "HOLD".
R0	GOOD FOR CONSTRUCTION		11.07.2024	



**BANGALORE METRO RAIL CORPORATION LTD**

A. 3rd Floor, BMTC Complex,  
K H Road, Shanthinagar,  
Bangalore - 560027  
Tel:-080-22969300

PRJT. TITLE: PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP524

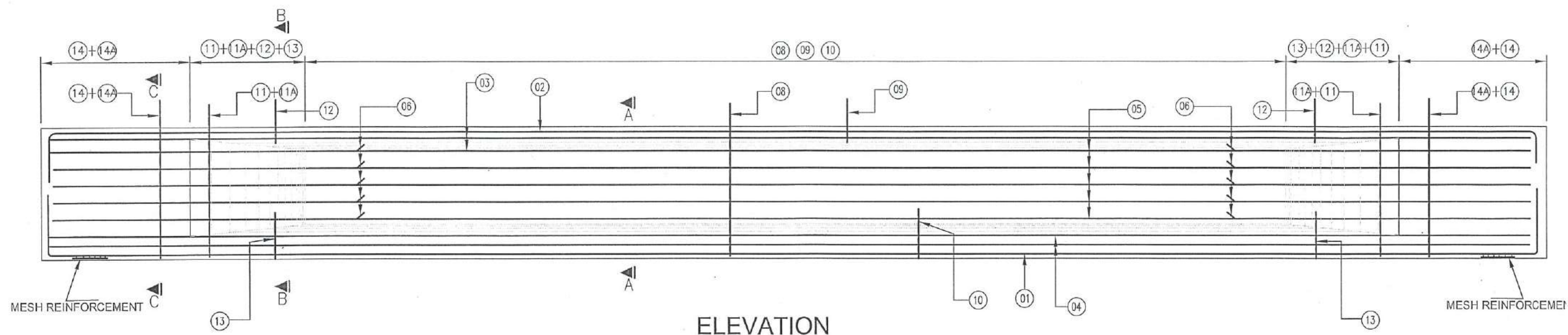
DWG. TITLE: CABLE PROFILE OF PSC I-GIRDER SUPER STRUCTURE FOR STRAIGHT SPAN 25M AND RADIUS 2500M

DWG NO: BMRC/PH-II/R1EXTN/VIA/SUP/WHITFD-EXTN/002/SHT 2 OF 5

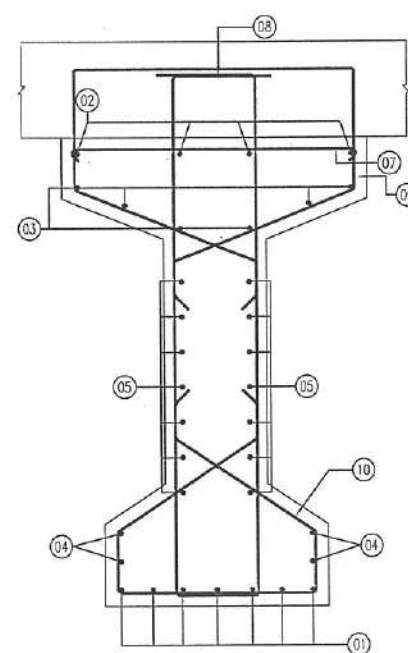
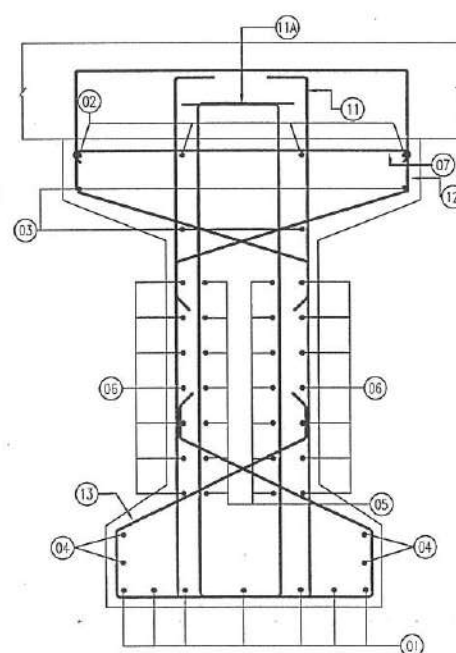
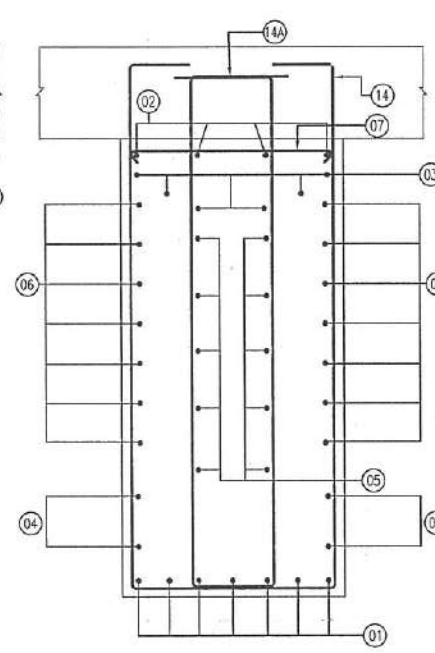
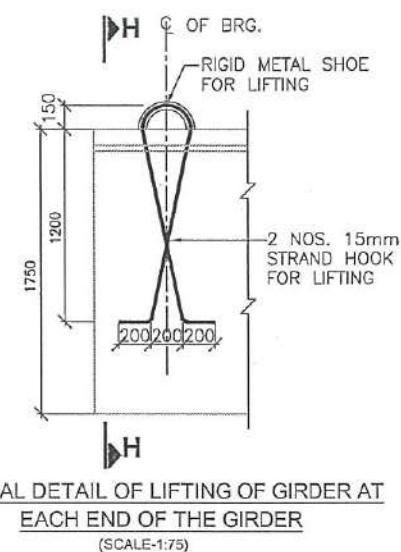
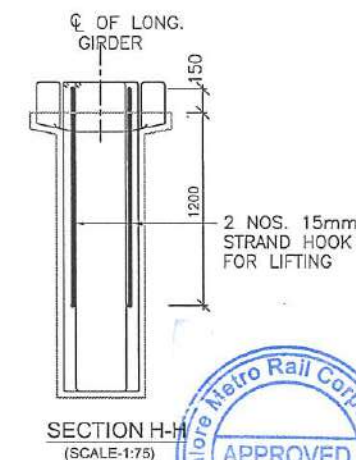
DRN: KANYA T H DSND: VEERENDRA APPRO: CE:REPAKA SRINIVASA RAO

ISSUE R0  
DATE (CURRENT ISSUE) 11.07.2024





ELEVATION

SECTION A-A  
(SCALE-1:50)SECTION B-B  
(SCALE-1:50)SECTION C-C  
(SCALE-1:50)TYPICAL DETAIL OF LIFTING OF GIRDER AT  
EACH END OF THE GIRDER  
(SCALE-1:75)SECTION H-H  
(SCALE-1:75)

*12/07/24*  
**CHIEF ENGINEER**  
**DESIGN-2**  
**BMRC**

REINFORCEMENT SCHEDULE

BAR MARK	DESCRIPTION	SHAPE	REMARKS
01	7Y12		
02	4Y12		
03	6Y12		
04	2Y12		2 SETS
05	7Y12		2 SETS
06	7Y12		EACH SIDE
07	Y10@150C/C		
08	2L;Y12@150c/c		
09	2L;Y12@150c/c		WIDTH VARIES
10	2L;Y12@150c/c		
11	2L;Y20@100c/c		WIDTH VARIES
11A	2L;Y18@100c/c		WIDTH VARIES
12	2L;Y12@150c/c		
13	2L;Y12@150c/c		HEIGHT VARIES
14	2L;Y25@100c/c		
14A	2L;Y18@100c/c		

## NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS & LEVELS IN METERS, UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THIS DRAWING IS APPLICABLE FOR BOTH INNER & OUTER GIRDER.
4. CLEAR COVER TO ANY REINFORCEMENT SHALL BE 40 MM.
5. ALL REINFORCEMENT BARS SHALL BE HIGH YIELD STRENGTH DEFORMED STEEL BAR OF GRADE Fe 500D CONFIRMING TO IS: 1786-2008.
6. BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH CAN BE KEPT AS 50 TIMES 'd' WHERE 'd' IS THE DIAMETER OF THE BAR. FOR BAR DIAMETER GREATER THAN 18MM COUPLERS SHALL BE USED.
7. READ THIS DRAWING ALONG WITH SUBSTRUCTURE & OTHER RELEVANT DRAWINGS.
8. LOCAL ADJUSTMENT OF REINFORCEMENT SHALL BE MADE IF NECESSARY WITHOUT CHANGING THE CABLE CO-ORDINATES. IF THERE IS ANY LARGE VARIATION IT SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE/DESIGN OFFICE.
9. DOWELS OF REQUIRED DIAMETER SHALL BE PROVIDED AT APPROPRIATE LOCATIONS WHEREVER REQUIRED.

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (RO ISSUE) 11.07.2024
				CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN THIS IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE 'T' CLEAR 'HOLD' IN TIME BEFORE PROCEED. 1. WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'.
			11.07.2024	
GOOD FOR CONSTRUCTION				



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 Bangalore - 560027  
 Tel:-080-22969300

PRJT. TITLE: PHASE II - R1 EXTENSION  
 VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP524.

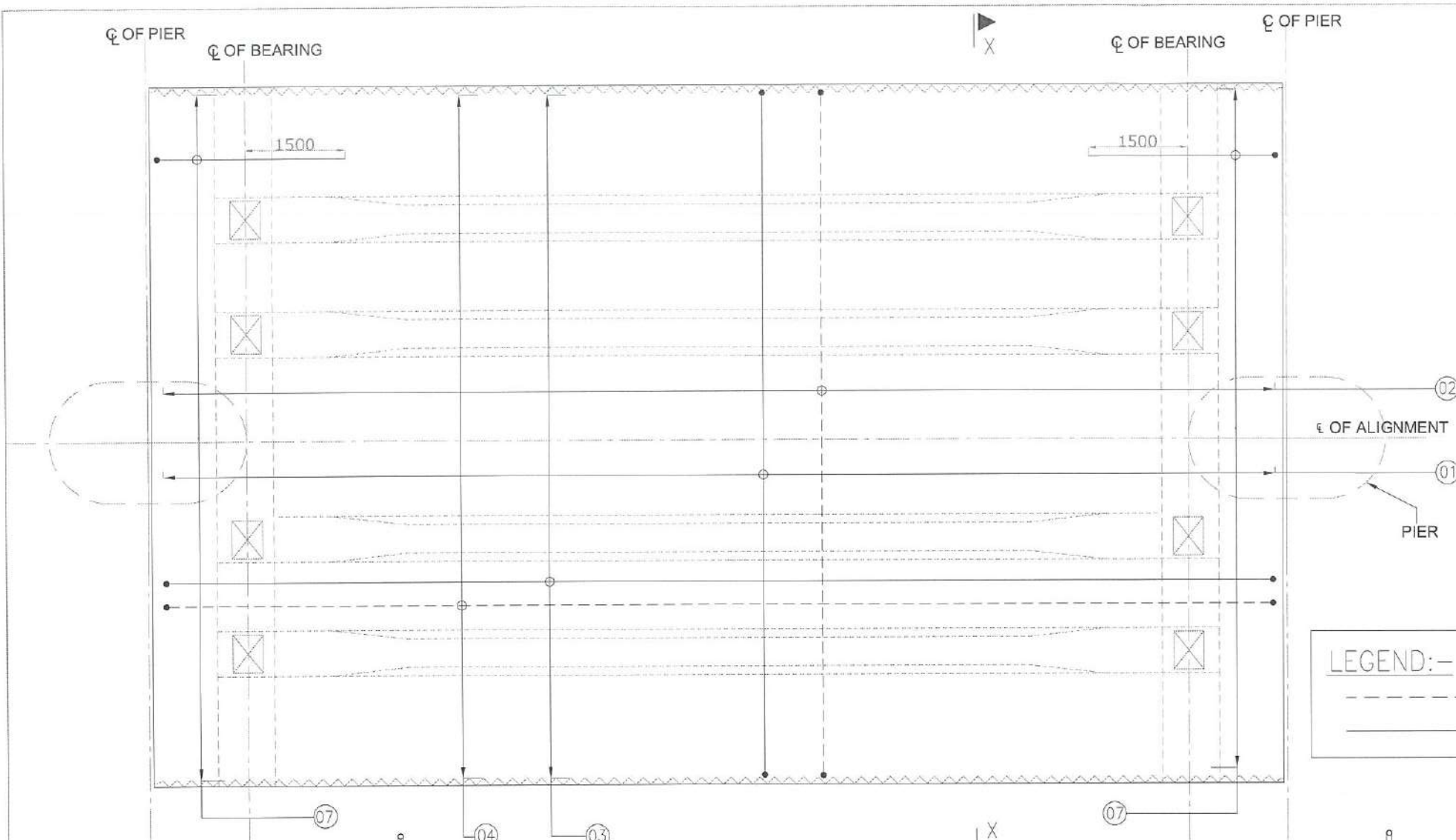
DWG. TITLE: PSC I-GIRDER SUPERSTRUCTURE REINFORCEMENT DETAIL  
 FOR STRAIGHT SPAN 25M AND RADIUS 2500M

DWG NO: BMRC/PH-II/R1EXTN/IA/SUP/WHTFD-EXTN/002/SHT 3 OF 5

ISSUE R0

DRN:KAWA T H DSND:VEERENDRA APPRO: CE:REPAKA SRINIVASA RAO DATE(CURRENT ISSUE) 11.07.2024





REINFORCEMENT SCHEDULE

BAR NOS.	DESCRIPTION	SHAPE	REMARK
01	Y16@100c/c		BOTTOM
02	Y16@100c/c		TOP
03	Y12@100c/c		BOTTOM
04	Y12@100c/c		TOP
05	4Y16 (TWO SET)		TOP & BOTTOM
06	Y10 @100 C/C		SLAB EDGE REIN
07	Y20 @125 C/C		

LEGEND:-

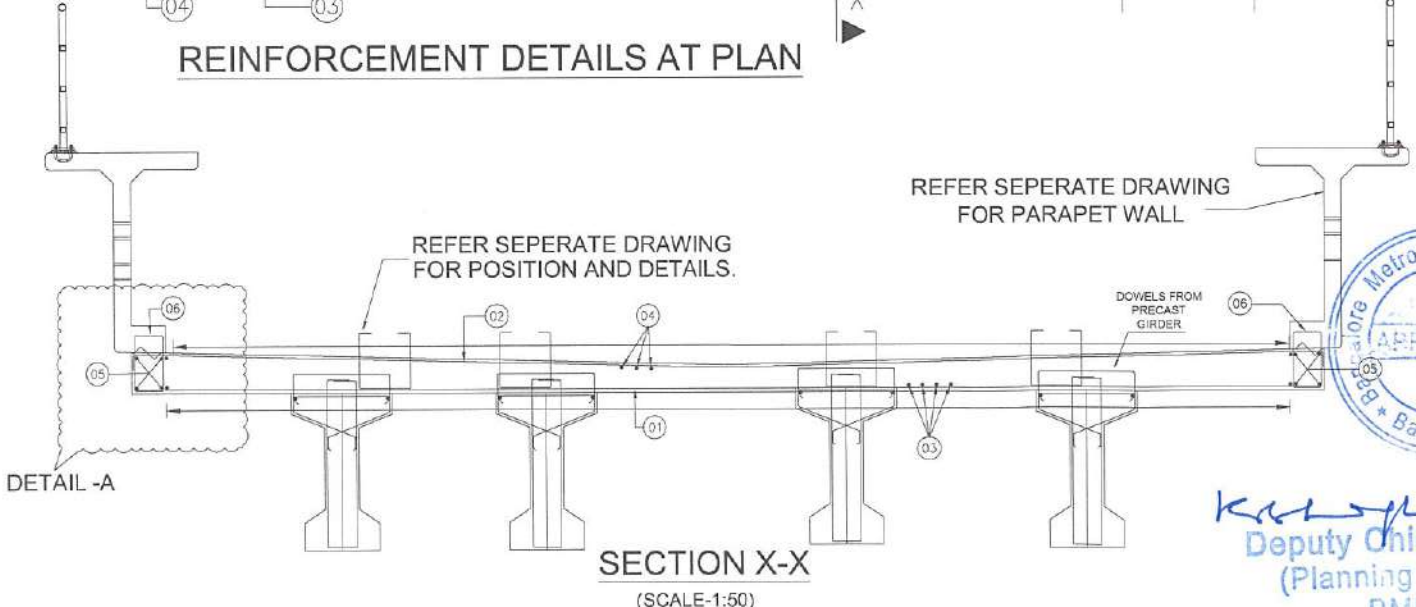
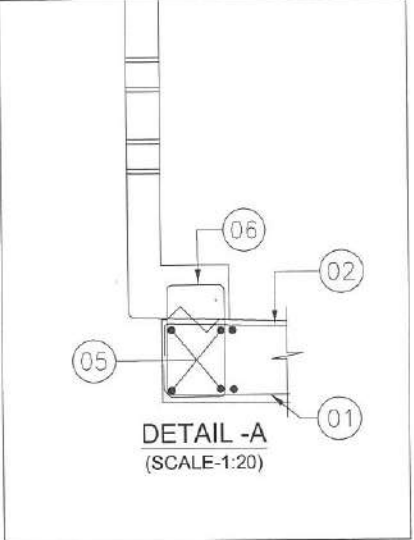
--- TOP REINFORCEMENT

— BOTTOM REINFORCEMENT

NOTES:

1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS SHALL NOT BE SCALED FROM DRAWING FOLLOW ONLY WRITTEN DIMENSIONS , IN CASE OF ANY DISCREPENCIES REFER TO THE ENGINEER- IN - CHARGE/DESIGN OFFICER .
3. CONCRETE GRADE SHALL BE M35 AND ALL REINFORCEMENT BARS SHALL BE HIGH YIELD STRENGTH DEFORMED STEEL BAR OF GRADE Fe 500D CONFIRMING TO IS: 1786-2008.
4. MINIMUM CLEAR COVER TO ANY REINFORCEMENT SHALL BE 40mm.
5. BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH CAN BE KEPT AS 50 TIMES 'd' WHERE 'd' IS THE DIAMETER OF THE BAR AND BAR DIAMETER GREATER THAN 16MM, COUPLERS SHALL BE USED.
6. LOCAL ADJUSTMENT OF REINFORCEMENT SHALL BE MADE IF NECESSARY, WITHOUT CHANGING THE CABLE COORDINATES . IF THERE IS ANY LARGE VARIATION, IT SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE / DESIGN OFFICE.
7. DOWELS OF REQUIRED DIAMETER SHALL BE PROVIDED AT APPROPRIATE LOCATIONS WHEREVER REQUIRED.

REINFORCEMENT DETAILS AT PLAN



Deputy Chief Engineer  
(Planning & Design)  
BMRCL

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (RC ISSUE) 11.07.2024
R1	DRAWING TITLE REVISED -17M SPAN INCORPORATED		02.09.2025	
R0	GOOD FOR CONSTRUCTION		11.07.2024	

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PRJT. TITLE: PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE: DECK SLAB REINFORCEMENT DETAILS FOR PSC I-GIRDER SUPERSTRUCTURE FOR STRAIGHT SPAN 17M AND 25M AND RADIUS 2500M

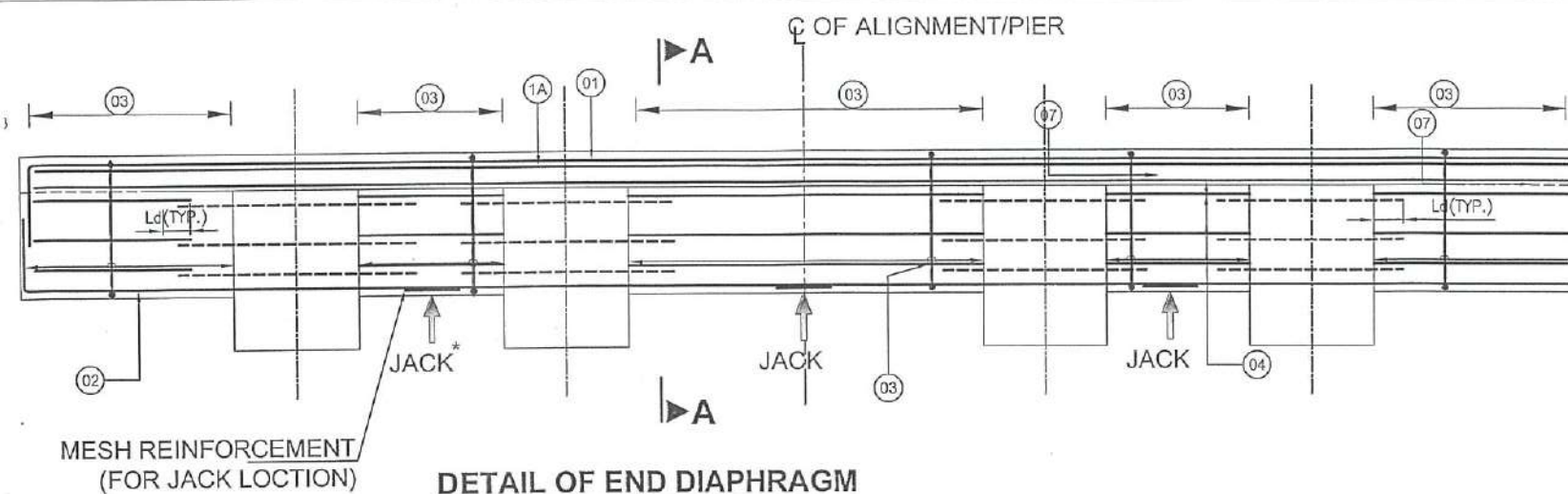
DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUP/WHTFD-EXTN/002/SHT 4 OF 5

DRN: OSND: APPRO:

ISSUE **R1**

DATE(CURRENT ISSUE) **02.09.2025**

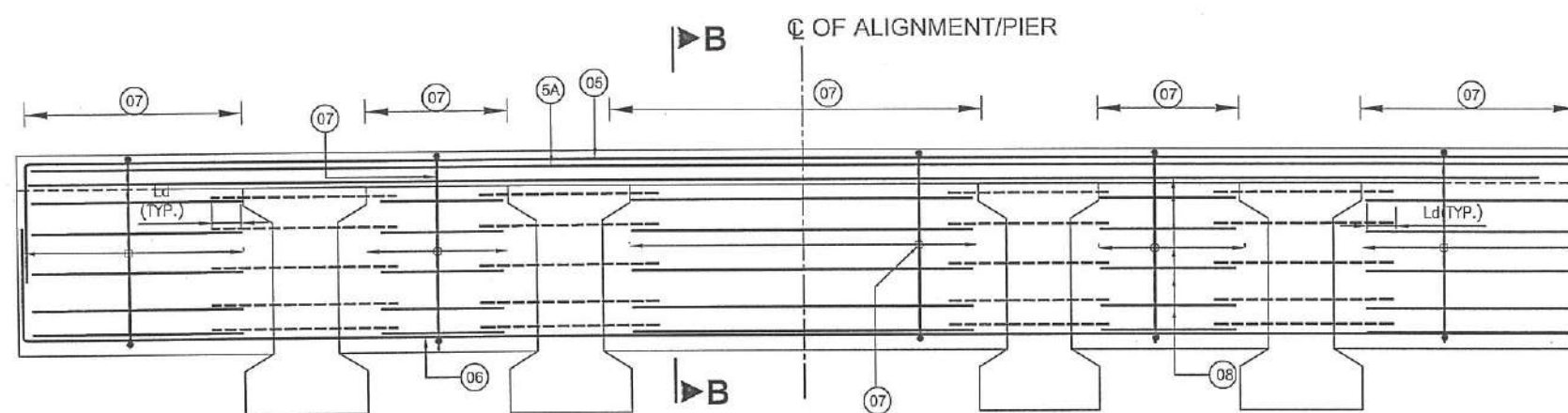




\* FOR JACK POSITION REFER CORRESPONDING GAD

### SCHEDULE OF REINFORCEMENT

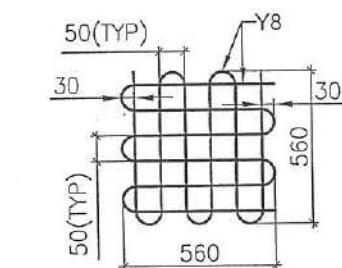
BAR NO.	DISCRIPTION	SHAPE	REMARK
01	6-Y32		
1A	6-Y20		
02	6-Y16		
03	4L-Y12@150C/C		
04	8-Y12		2 SETS
05	4-Y32		
5A	4-Y20		
06	4-Y16		
07	2L-Y12@150C/C		
08	8-Y12		2 SETS



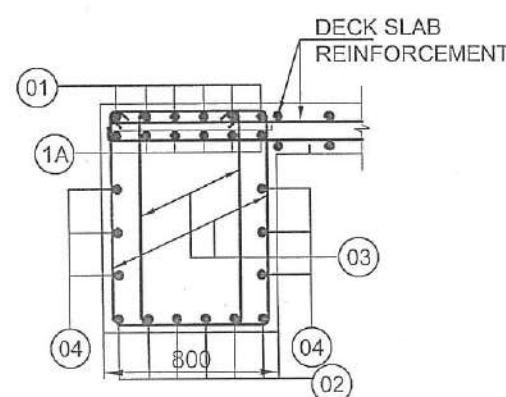
### DETAIL OF INTERMEDIATE DIAPHRAGM

### NOTES, :-

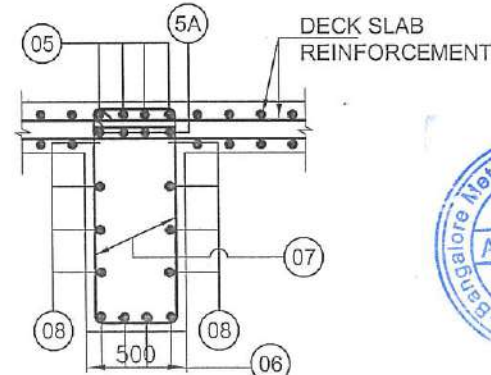
- ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS SHALL NOT BE SCALED FROM DRAWING ONLY WRITTEN DIMENSIONS TO BE FOLLOWED. IN CASE OF ANY DISCREPANCIES REFER TO THE ENGINEER-IN-CHARGE / DESIGN OFFICE.
- CONCRETE GRADE SHALL BE M35 AND ALL REINFORCEMENT BARS SHALL BE HIGH YIELD STRENGTH DEFORMED STEEL BAR OF GRADE Fe 500D CONFIRMING TO IS: 1786-2008.
- MINIMUM CLEAR COVER TO ANY REINFORCEMENT SHALL BE 40mm.
- JACK CAPACITY SHALL BE 210 TON.
- FORCE IN THE JACK SHALL BE MAINTAINED CONSTANT WHILE LIFTING.
- BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH CAN BE KEPT AS 50 TIMES 'd' WHERE 'd' IS THE DIAMETER OF THE BAR AND BAR DIAMETER GREATER THAN 16mm, COUPLERS SHALL BE USED.
- LOCAL ADJUSTMENT OF REINFORCEMENT SHALL BE MADE IF NECESSARY, WITHOUT CHANGING THE CABLE COORDINATES. IF THERE IS ANY LARGE VARIATION, IT SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE / DESIGN OFFICE.
- DOWELS OF REQUIRED DIAMETER SHALL BE PROVIDED AT APPROPRIATE LOCATIONS WHEREVER REQUIRED.



MESH REINFORCEMENT  
(FOR JACK LOCATION)



SECTION A-A



SECTION B-B



*[Signature]*  
CHIEF ENGINEER  
DESIGN-2  
BMRCL

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	PRJ. TITLE:
				DATE (R0 ISSUE) 11.07.2024	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP524
				7" (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.	DWG. TITLE:
				CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLD'S' IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'S'.	END AND INTERMEDIATE DIAPHRAM REINFORCEMENT DETAILS FOR STRAIGHT SPAN 25M AND RADIUS 2500M
R0	GOOD FOR CONSTRUCTION		11.07.2024		DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUP/WHTFD-EXTN/002/SHT 5 OF 5
					ISSUE R0
					DATE(CURRENT ISSUE) 11.07.2024

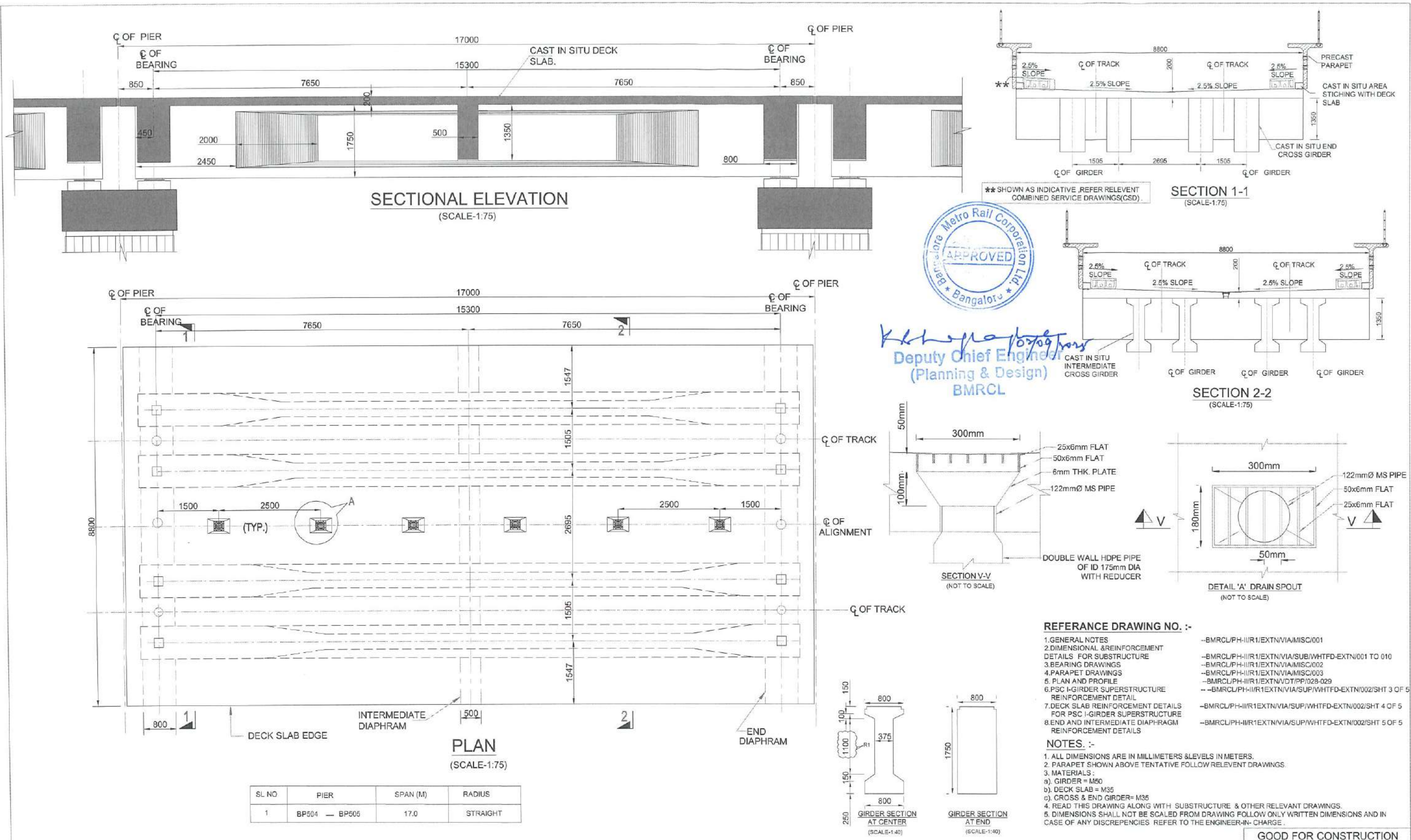


BANGALORE METRO RAIL  
CORPORATION LTD

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DRN: KAVYA T H	DSND: VEERENDRA	APPRO: CE: REPAKA SRINIVASA RAO	ISSUE R0
			DATE(CURRENT ISSUE) 11.07.2024





ISSUE	REVISION	APPROVED	DATE	SCALE	AS SHOWN
				DATE (RD ISSUE)	24.04.2025
R1	DEPTH OF WEB IS CORRECTED TO 1100mm (GIRDER SECTION AT CENTRE)		02.09.2025		
R0	GOOD FOR CONSTRUCTION		24.04.2025		

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Bangalore - 560027  
Tel:-080-22969300

PRJ.T. TITLE:  
PHASE II - R1 EXTENSION  
VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE:  
GAD OF PSC I-GIRDER SUPERSTRUCTURE  
FOR STRAIGHT SPAN 17M AT LOCATION BP504 TO BP505

DWG NO:  
BMRCL/PH-II/R1EXTN/VIA/SUP/WHTFD-EXTN/003/SHEET 1

ISSUE  
R1

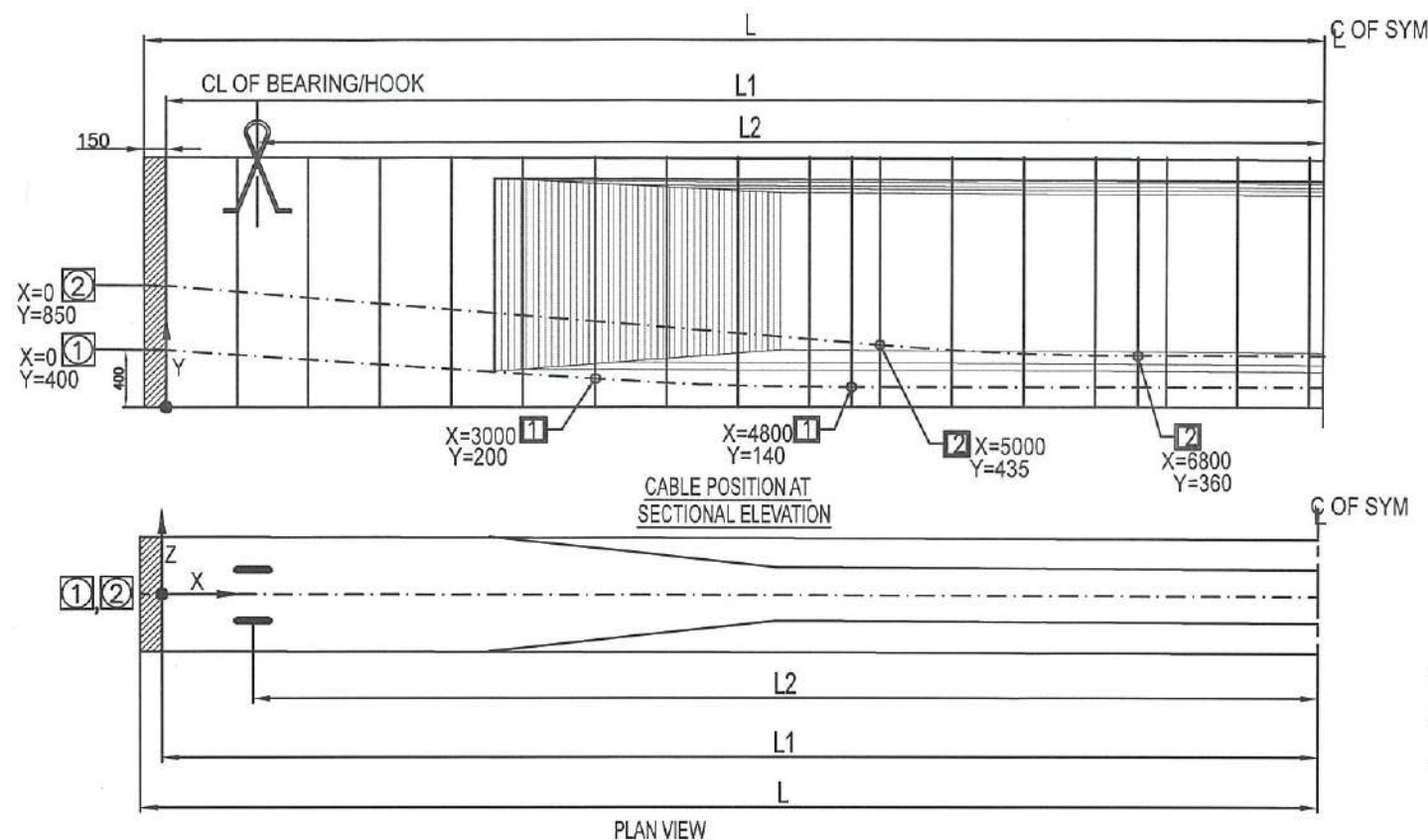
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APPRO:  
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DATE(CURRENT ISSUE)  
02.09.2025





	X=VALUE (mm)	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8100
CABLE-1	Y	400	367	333	300	267	233	200	171	152	142	140	140	140	140	140	140	140	140
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CABLE-2	Y	850	809	767	725	684	642	601	559	518	476	435	399	375	362	360	360	360	360
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Notes:-**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.

**2. MATERIAL:-**

- a) CONCRETE CONTROLLED DESIGN MIX AND HAVING 28 DAYS CHARACTERISTIC STRENGTH OF 50N/mm<sup>2</sup> (M50).
- b) PRE STRESSING STEEL OF 15.2mm NOMINAL DIA. SEVEN PLY CLASS-2 STRANDS AS PER IS:14258-1995 LOW RELAXATION TYPE IS USED FOR PRE STRESSING.
- c) HIGH YIELD STRENGTH DEFORMED BARS Fe500 CONFORMING TO IS:1786-1985.

3. MINIMUM CLEAR COVER TO ORDINARY REINFORCEMENT- 40mm.
4. LAP LENGTH OF DEFORMED BARS ARE AS PER GENERAL NOTES
5. SHEATHING SHALL BE HDPE CORRUGATED PIPES DUCT DIA. FOR 19T15 - 107mm

**6. STRAND PROPERTIES:-**

NOMINAL DIAMETER = 15.20mm

AREA = 140S<sub>q</sub> mm.

YIELD STRENGTH = 1860 MPa (Min.)

UTS = 260.73 kN/STRAND

MODULUS OF ELASTICITY (E) = 195000 MPa

**7. PARAMETERS USED FOR DESIGN:-**

COEFFICIENT OF FRICTION = 0.17/radians

WOBBLE COEFFICIENT = 0.002/meter

ANCHORAGE SLIP = 6mm

8. ELONGATIONS ARE COMPUTED BASED ON ABOVE PARAMETERS.
9. BEFORE TAKING UP STRESSING OPERATION, IT IS TO BE ENSURED THAT THE JACK AND PUMP ARE PROPERLY CALIBRATED.

**10. LAYING OF SHEATHING:-**

- a) SHEATHING SHALL BE CLOSELY SUPPORTED IN CORRECT PROFILE TO THE LEVELS SO THAT THEY ARE NOT DISPLACED DURING CONCRETING.

- b) ANY REINFORCEMENT FOULING WITH SHEATHING SHALL BE ADJUSTED LOCALLY.

**11. AGE OF STRESSING:-**

- a) CABLES SHALL BE STRESSED WHEN CONCRETE ATTAINS THE CUBE STRENGTH OF 45 Mpa OR ON 14th DAY AFTER CASTING OF GIRDERS WHICHEVER IS LATER.

12. ANY APPROVED SYSTEM OF PRE-STRESSING SHALL BE ADOPTED.

13. THE CABLE IS IN TWO STRAIGHT LINE'S JOINED BY CIRCULAR CURVE IN ELEVATION.

14. SPIRAL REINFORCEMENT AROUND ANCHORAGE SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.

15. ALL THE CABLE ARE STRESSED FROM ONE END ONLY AS INDICATED.

16. THE READINGS PERTAINING TO BOTH FORCE AND ELONGATION AT EVERY STAGE SHALL BE RECORDED AT REGULAR INTERVALS AS PER CODAL PROVISION.

17. JACKING FORCE PER CABLE SHALL BE EQUAL TO 75% OF UTS. 260.73 kN x 0.75 = 195.55kN PER STRAND. FORCE PER CABLE = 195.55 x NO. OF STRANDS IN THE CABLE.

18. NORMALLY STRESSING CAN PROCEED ON THE INDICATED ELONGATION

- a) IN CASE ELONGATION IS REACHED AND CORRESPONDING JACK PRESSURE IS NOT REACHED, STRESSING SHALL BE CONTINUED UP TO 5% IN EXCESS OF PRESCRIBED ELONGATION.

- b) IN CASE JACK PRESSURE IS REACHED AND ELONGATION IS NOT REACHED, STRESSING CAN BE CONTINUED UP TO A MAXIMUM JACK PRESSURE OF 1.05 TIMES THE CALCULATED PRESSURE.

- c) IN CASE OF VARIATION MORE THAN THE PRESCRIBED LIMITS, THE MATTER SHALL BE REFERRED TO THE DESIGN OFFICE.

19. EXTENSIONS SHALL BE RECHECKED AT 24 HOURS AFTER ANCHORING TO OBSERVE SLOW SLIPPAGE THE MATTER SHALL BE REPORTED FOR EXCESSIVE SLIPPAGE, IF ANY.

20. INITIAL SLACKNESS IN PRE-STRESSING CABLES SHALL BE REMOVED BY APPLYING SMALL TENSION. THE INITIAL TENSION REQUIRED TO REMOVE SLACKNESS SHALL BE TAKEN AS THE STARTING POINT FOR MEASURING ELONGATION. AND CORRECTION SHALL BE APPLIED AS PER CLAUSE 12.2.1.3 OF IS 1343-1980.

21. GROUTING SHALL BE DONE 24 HOURS AFTER STRESSING THE STRANDS AND AFTER THOROUGHLY FLUSHING THE SHEATHING WITH WATER JETTING AND IT SHALL BE DONE WITH PLAIN CEMENT GROUT WITH WATER CEMENT RATIO NOT EXCEEDING 0.4. A SUITABLE NON-ALUMINIUM BASED EXPANDING AGENT SHALL BE ADDED TO THE GROUT (0.4% WT OF CEMENT 'INTRAPLAST N200' MANUFACTURED BY Sika OR EQUIVALENT).

22. EXTRA LENGTH OF STRANDS AT THE END SHALL BE CUT AFTER GROUT HAS SET. THE CUTTING HAS TO BE DONE USING A GRINDER AND NOT BY GAS CUTTING.

23. CONCRETE FOR THE POCKET SHALL HAVE NON-SHRINK ADDITIVES.

24. THE ELONGATION GIVEN IN TABLE BELOW SHALL BE MODIFIED AT SITE IN CASE ACTUAL VALUE OF AREA OF STRANDS 'A' AND MODULUS OF ELASTICITY 'E' VARY FROM THOSE ASSUMED IN DESIGN REVISED EXTENSIONS SHALL BE CALCULATED AS UNDER REVISED ELONGATION = (140 x 195000 / AREA x NEW MODULUS) x EXTENSION.

25. THE PRE-STRESSING IS DONE USING THE FOLLOWING TYPES OF CABLES. VARIATIONS IN ELONGATION SHOULD NOT EXCEED 5% OVER THEORETICALLY CALCULATED ELONGATION THE CUT LENGTH OF STRANDS MENTIONED IN TABLE IS INCLUSIVE OF GRIP LENGTH.

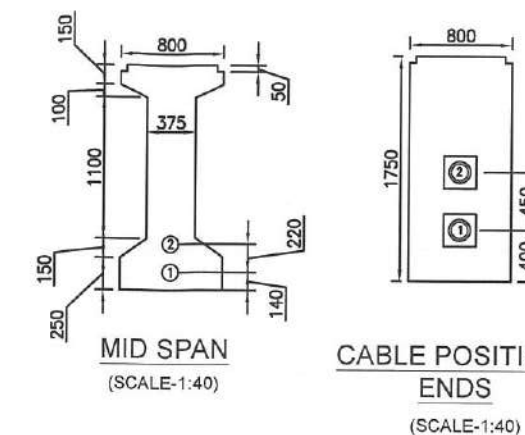
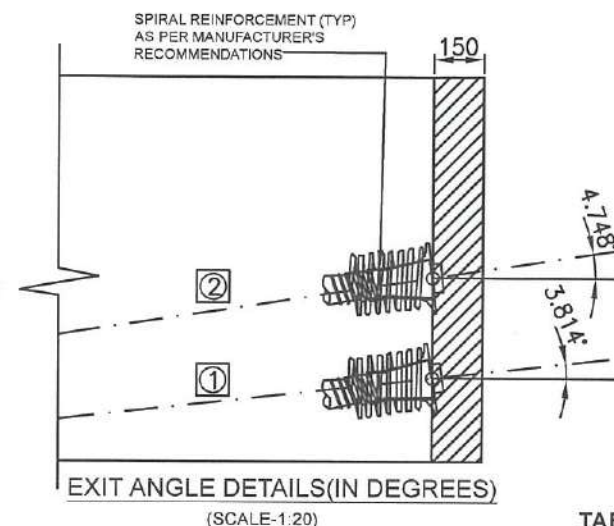
26. ALL ANCHORAGE PLATES ARE TO BE SET AT RIGHT ANGLE OF TENDON AXIS AT ANCHORAGE LOCATION.

27. THE WORK OF PRESTRESSING SHALL BE CARRIED OUT BY ANY RECOGNIZED SYSTEM AFTER CARRYING OUT NECESSARY MODIFICATIONS IN THE DRAWING WITH THE APPROVAL OF ENGINEER-IN-CHARGE. ALL PRESTRESSING AND GROUTING WORK TO BE UNDERTAKEN BY TRAINED PERSONAL ONLY A REPRESENTATIVE OF THE SUPPLIER OF THE PRESTRESSING SYSTEM SHALL BE PRESENT DURING ALL TENSIONING AND GROUTING OPERATIONS AND SHALL ENSURE, MONITOR AND THEIR CORRECTNESS OF THE SYSTEM AND METHODS.

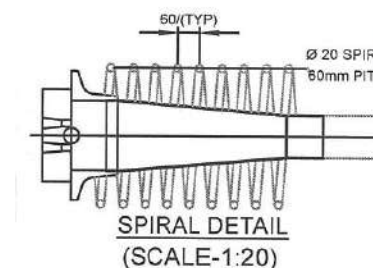
**PRE STRESSING DETAILS FOR 17M SPAN:**

CABLE NUMBER	TYPE OF CABLE	STRANDS NO. OF	JACKING FORCE (kN) / CABLE	CUT LENGTH (m)	ELONGATION TOTAL (mm)
CABLE-1	19T15	15	2932.88	17.216	119.77
CABLE-2	19T15	15	2932.88	17.239	119.58

A GRIP LENGTH OF 1000mm AT LIVE END AND 300mm AT DEAD END ARE INCLUDED IN THE CUT LENGTH.

**TABLE - II (PRESTRESSING SEQUENCE FOR GIRDER)**

SL.NO.	ITEM	DAY NO.
1	COMPLETION OF CASTING OF PSC GIRDER	0
2	PRESTRESSING OF TENDON FOR CABLE NO. 2 & 1 FROM ONE END OF THE GIRDER.	14 DAYS CASTING OF GIRDER OR WHEN GIRDER CONCRETE ATTAINED A STRENGTH OF 45Mpa WHICHEVER IS LATER
3	CASTING OF DECK SLAB & DIAPHRAGM	29 DAYS AFTER CASTING OF GIRDER
4	APPLICATION OF SIDL etc....	45 DAYS AFTER CASTING OF GIRDER



**CHIEF ENGINEER  
DESIGN  
BMRCL**

**LEGEND:-**

- Ⓝ JACKING END
- Ⓝ CABLE NUMBER
- Ⓝ START OF VERTICAL CURVE
- Ⓝ END OF VERTICAL CURVE
- CABLE
- CL OF SYM - CENTER LINE OF SYMMETRY.

GOOD FOR CONSTRUCTION

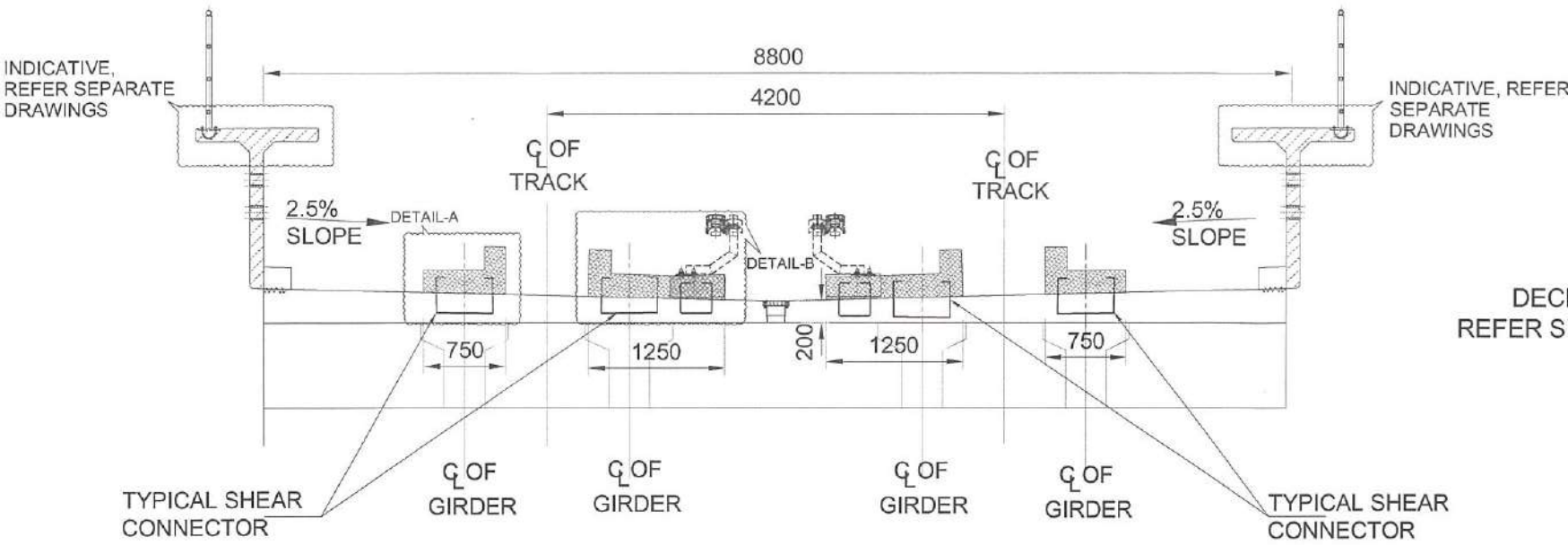
ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	PRJ.T. TITLE:
				DATE (RO ISSUE) 24.04.2025	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.
					DWG. TITLE: CABLE PROFILE OF PSC I-GIRDER SUPER STRUCTURE FOR STRAIGHT SPAN 17M AT LOCATION BP504 TO BP505
					DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUP/WHTFD-EXTN/003/SHEET 2
					ISSUE R0
R0	GOOD FOR CONSTRUCTION		24.04.2025		DATE (CURRENT ISSUE) 24.04.2025



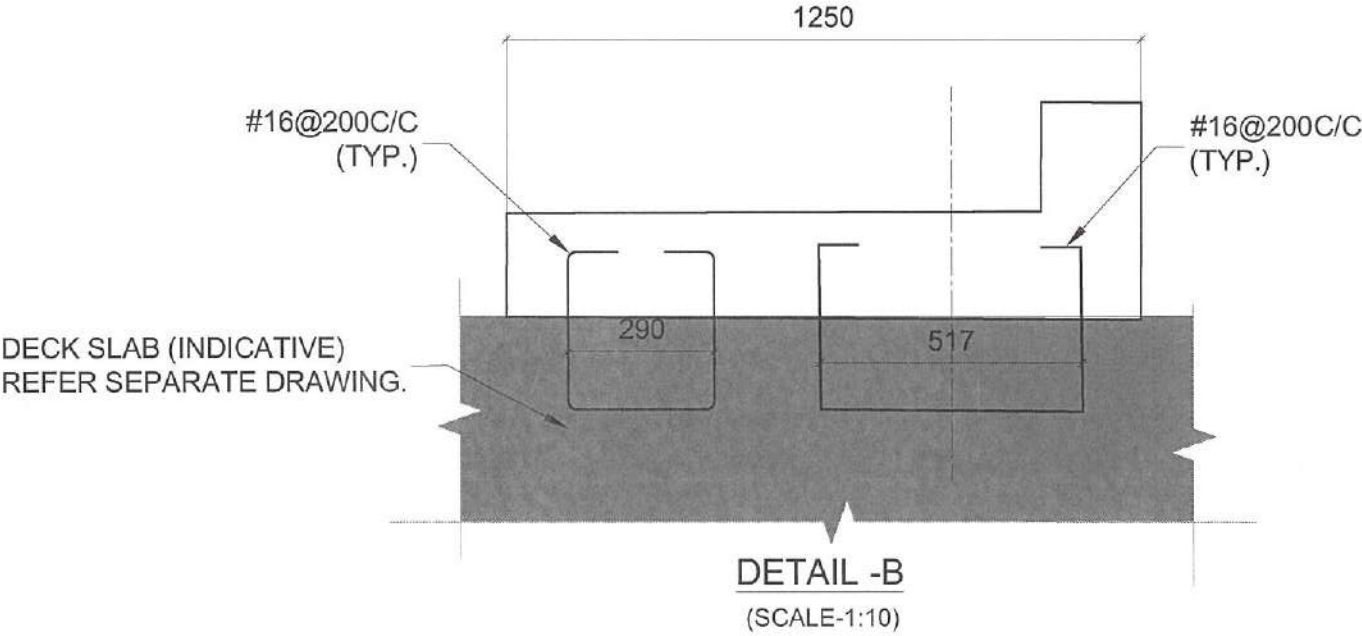
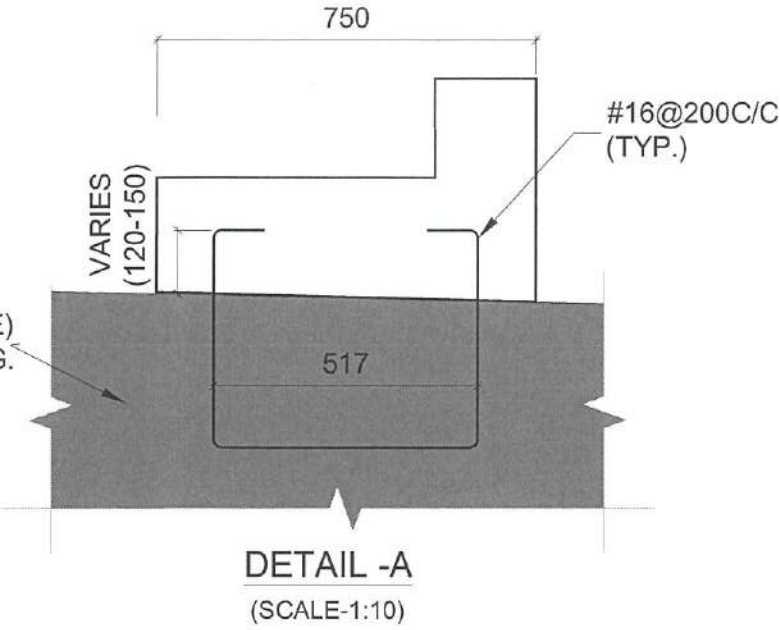
**BANGALORE METRO RAIL CORPORATION LTD**

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Bangalore - 560027  
Tel:-080-22969300





TYPICAL DETAIL OF SHEAR CONNECTOR  
(SCALE-1:40)



*K. K. S. S.*  
Deputy Chief Engineer  
(Planning & Design)  
BMRCL

- NOTES:-**
1. ALL DIMENSIONS ARE IN MILLIMETERS.
  2. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  3. REFER THIS DRAWING FOR SHEAR CONNECTOR DETAIL ONLY.
  4. MINIMUM CLEAR COVER TO THE REINFORCEMENT SHALL BE 40mm.
  5. ALL REINFORCEMENT ARE HYSD BARS & SHALL CONFORM TO IS: 1786: 2008 GRADE Fe-500D/550D.
  6. DISCREPANCY IF ANY SHALL BE BROUGHT TO THE NOTICE OF THE CONCERNED ENGINEER.
  7. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS.
  8. DIRECTION OF SLOPE SHOWN IS INDICATIVE, SHALL MATCH WITH DRAINAGE ARRANGEMENT.
  9. FOR LOCATION AND POSITION OF THIRD RAIL BRACKET, REFER RELEVANT DRAWINGS FROM TRACK /TRACTION CONTRACTOR.

ISSUE	APPROVED	DATE	SCALE	AS SHOWN
			DATE (R0 ISSUE)	02.09.2025
			P (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.	
			CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLD' IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'.	
R0	GOOD FOR CONSTRUCTION	02.09.2025		

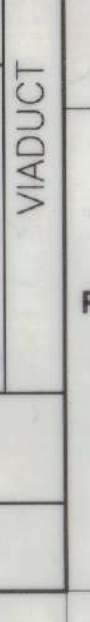


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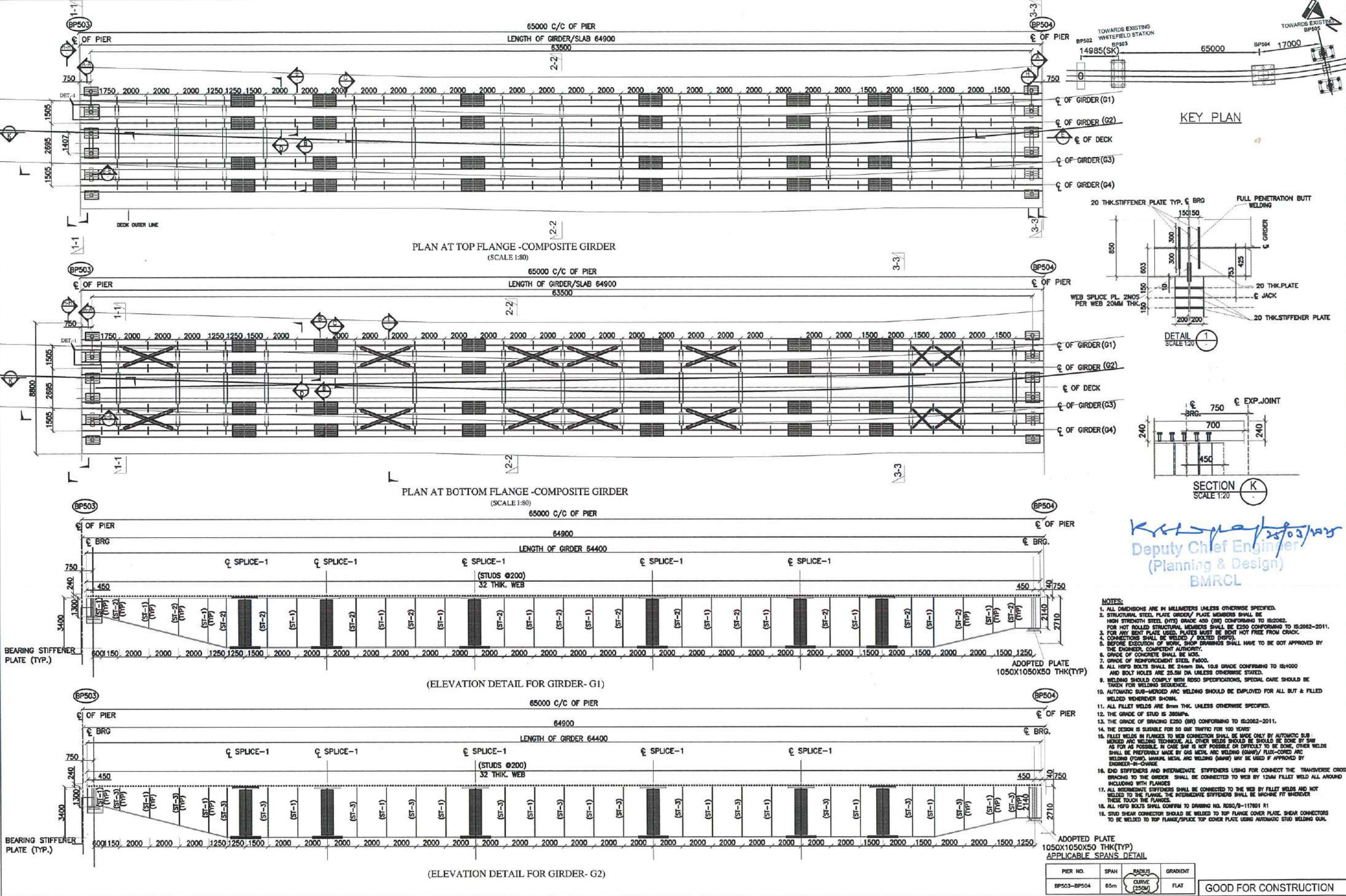
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K H Road, Shanthinagar,  
Bangalore -560027  
Tel:-080-22969300

PHASE II - R1 EXTENSION			
VIADUCT FROM VISVESHVARAYA INDUST.AREA STN (EXCL.) TO WHITEFIELD STN.(INCL.)			
DWG. TITLE: TYPICAL DETAIL OF SHEAR CONNECTOR FOR VIADUCT FROM BP503 TO BP521			
DWG NO: BMRCL/PH-II/R1EXTN/SUP/MISC/SHEARCONNECTOR/SHEET 1	ISSUE R0		
DRN: <i>K. K. S. S.</i>	DSND: <i>K. K. S. S.</i>	APPORD:	DATE(CURRENT ISSUE) 02.09.2025









- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
  2. STRUCTURAL STEEL PLATE OR GIRDERS SHALL BE HIGH STRENGTH STEEL (HSS) GRADE 450 (BR) CONFORMING TO IS 2062.
  3. FOR HOT ROLLED STRUCTURAL MEMBERS SHALL BE E250 CONFORMING TO IS 2062-2011.
  4. FOR ANY BENT PLATE USED, PLATES MUST BE BENT HOT FREE FROM CRACK.
  5. CONNECTIONS SHALL BE WELDED / BOLTED (BWP).
  6. BEFORE EXECUTION OF WORK, SHOP DRAWINGS SHALL HAVE TO BE GOT APPROVED BY THE ENGINEER, COMPETENT AUTHORITY.
  7. GRADE OF CONCRETE SHALL BE M35.
  8. GRADE OF REINFORCEMENT STEEL, F400.
  9. ALL HSS BOLTS SHALL BE 24mm DIA. 10.8 GRADE CONFORMING TO IS 4000 AND BOLT HOLES ARE 25.5mm DIA UNLESS OTHERWISE STATED.
  10. WELDING SHOULD COMPLY WITH WSDO SPECIFICATIONS, SPECIAL CARE SHOULD BE TAKEN FOR WELDING SEQUENCE.
  11. AUTOMATIC SUB-MERGED ARC WELDING SHOULD BE EMPLOYED FOR ALL BUTT & FILLET WELDED WHEREVER SHOWN.
  12. ALL FILLET WELDS ARE 8mm THK. UNLESS OTHERWISE SPECIFIED.
  13. THE GRADE OF STUD IS 300MPa.
  14. THE DESIGN IS SUITABLE FOR 50 YRS TRAFFIC FOR 100 YEARS.
  15. FILLET WELDS IN FLANGES TO WEB CONNECTION SHALL BE MADE ONLY BY AUTOMATIC SUB-MERGED ARC WELDING TECHNIQUE. ALL OTHER WELDS SHOULD BE DONE BY SHW AS FAR AS POSSIBLE. IN CASE SHW IS NOT POSSIBLE OR DIFFICULT TO BE DONE, OTHER WELDS SHALL BE PREFERABLY MADE BY GAS METAL ARC WELDING (GMAW) / PLASMA-CORDED ARC WELDING (CPAW), MANUAL METAL ARC WELDING (MMAW) MAY BE USED IF APPROVED BY ENGINEER-IN-CHARGE.
  16. END STIFFENERS AND INTERMEDIATE STIFFENERS USED FOR CONNECT THE TRANSVERSE CROSS BRACING TO THE GIRDER SHALL BE CONNECTED TO WEB BY 12MM FILLET WELD ALL AROUND INCLUDING WITH FLANGES.
  17. ALL INTERMEDIATE STIFFENERS SHALL BE CONNECTED TO THE WEB BY FILLET WELDS AND NOT WELDED TO THE FLANGE. THE INTERMEDIATE STIFFENERS SHALL BE MACHINE FIT WHEREVER THESE TOUCH THE FLANGES.
  18. ALL HSS BOLTS SHALL CONFORM TO DRAWING NO. R200/9-117001 R1.
  19. STUD SHEAR CONNECTOR SHOULD BE WELDED TO TOP FLANGE COVER PLATE. SHEAR CONNECTORS TO BE WELDED TO TOP FLANGE/SPICE TOP COVER PLATE USING AUTOMATIC STUD WELDING GUN.

ISSUE	DESCRIPTION	APPROVED	DATE	SCALE: AS SHOWN
R0	ISSUED FOR GOOD FOR CONSTRUCTION		18-07-2024	DATE (NO ISSUE): 18-7-2024
R1	SPAN IS REVISED TO 65M		01-02-2025	
R2	RADIUS OF CURVE CORRECTED AS PER ALIGNMENT.		25-03-2025	

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Tel: 080-22969300

OVER HEAD STRUCTURE OF METRO VIADUCT OF 65m (E) TO (E) COMPOSITE STEEL GIRDER SPAN (FOR REACH BB PHASE-2) CROSSING BETWEEN PIERS BP 503 AND BP 504 AT BMRCL CHAINAGE KM:33.8255 AND AT RAILWAY KM 335/000-335/100 BETWEEN KR PURAM - WHITEFIELD SECTION IN BANGALURU - CHENNAI DOUBLE LINE BG SECTION.

DWG. TITLE: NUMERATION AND ELEVATION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP503-BP504

DWG. NO: BMRCL/PHASEIII/WHTE/EXTN/VIADWG/001 (SHEET 1 OF 6)

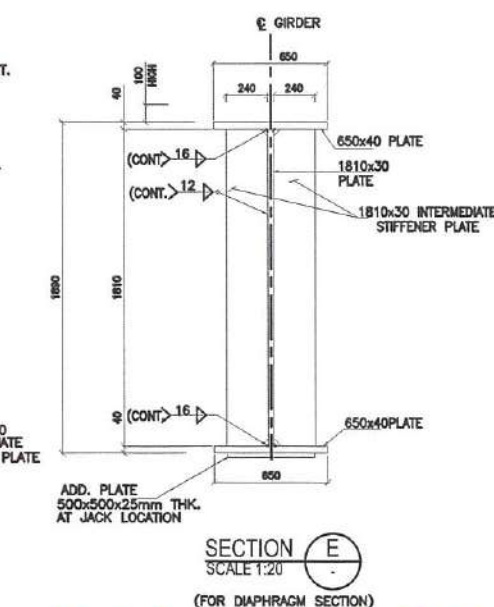
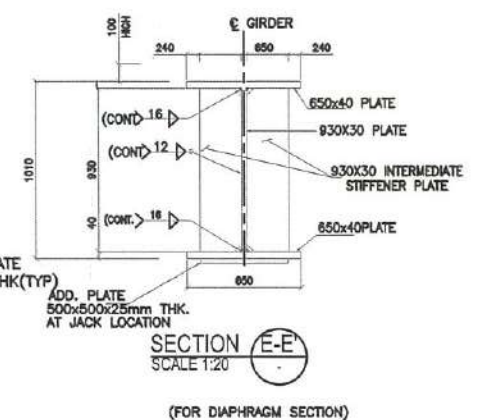
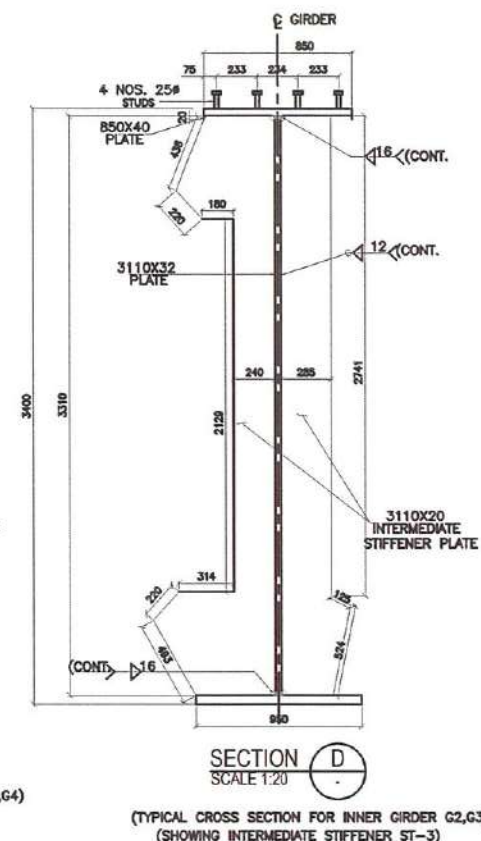
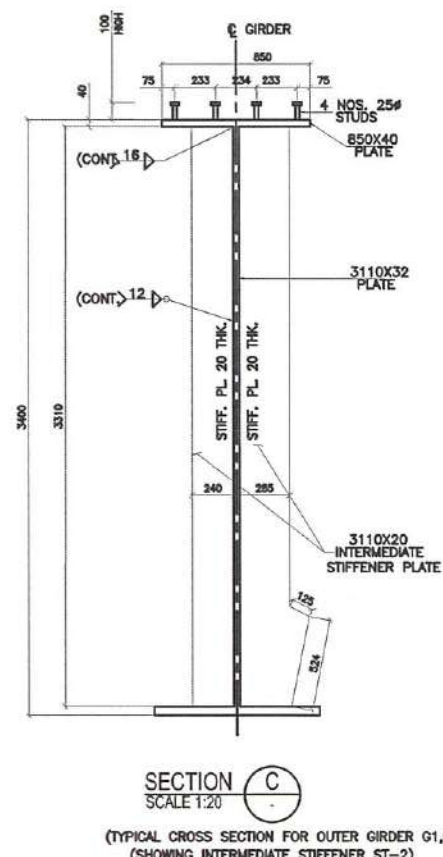
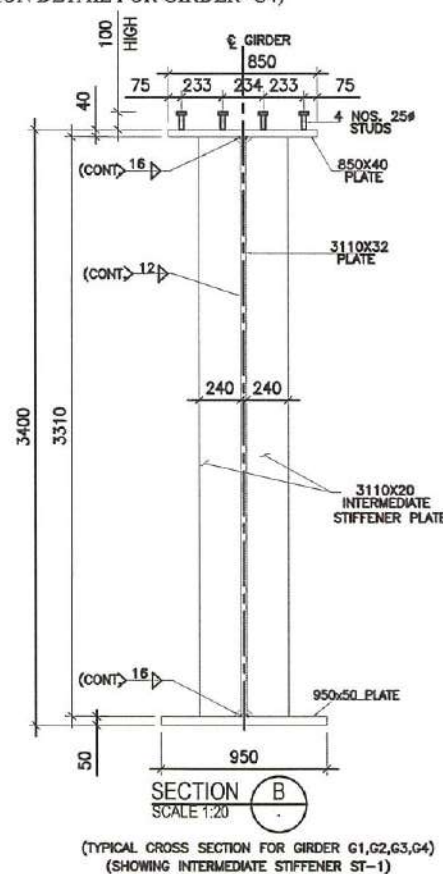
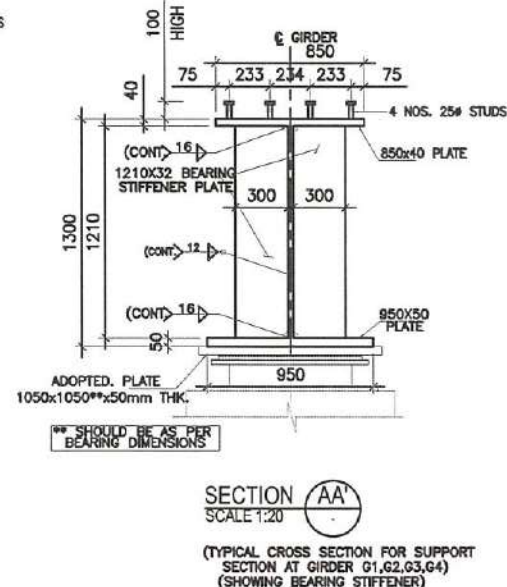
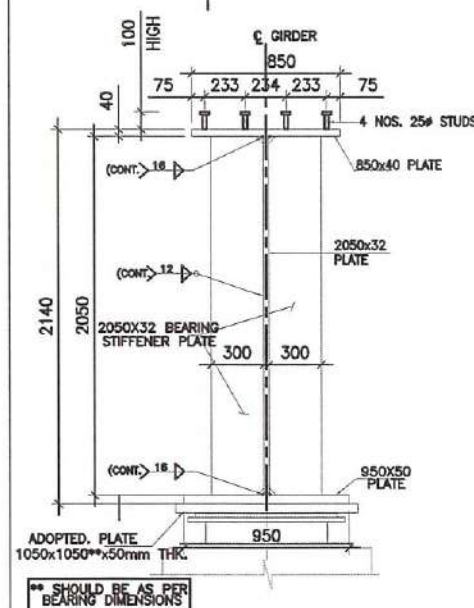
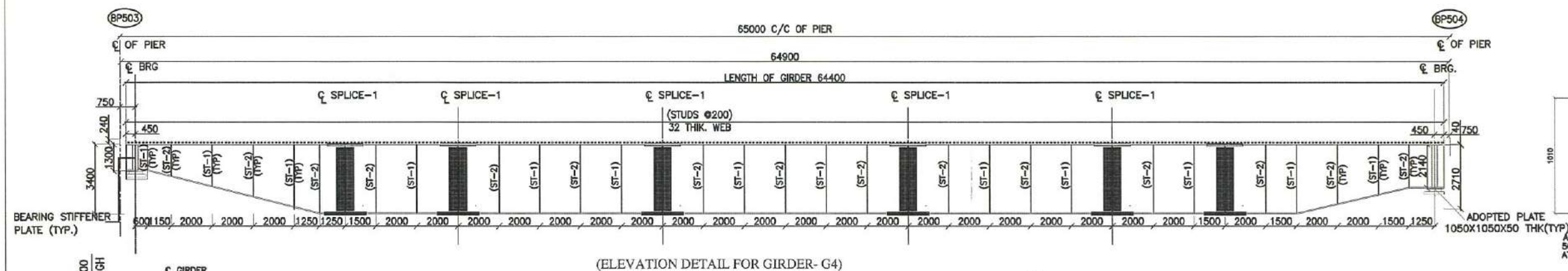
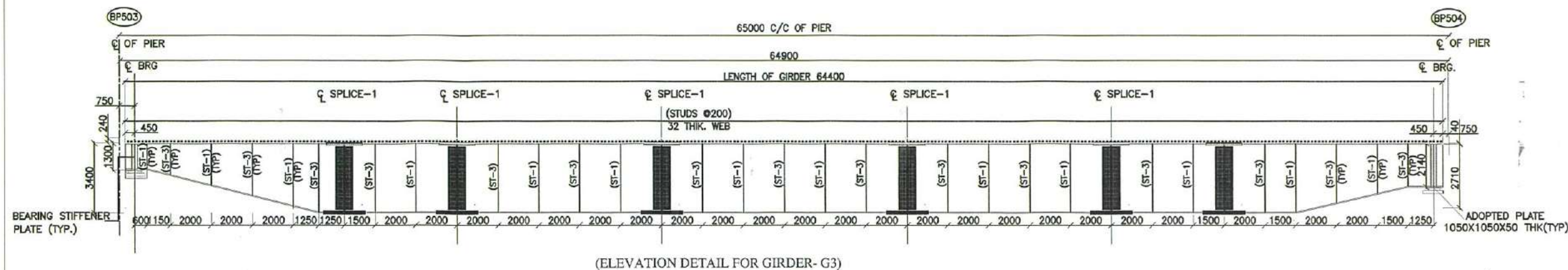
DRN: HARISH N

DESIGNED: K S SOORIYANARAYANAN

ISSUE R2

DATE (CURRENT ISSUE) 25-03-2025





## REFERENCE DRAWINGS:

1. NUMERATION AND ELEVATION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 REFER BMRL/PHASEII/HTD/EXT/VIADWG/001 (SHEET 1 OF 6)
2. SPLICE AND SECTIONAL DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 REFER BMRL/PHASEII/HTD/EXT/VIADWG/001 (SHEET 3 OF 6)
3. SPLICE AND CAMBER DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 REFER BMRL/PHASEII/HTD/EXT/VIADWG/001 (SHEET 4 OF 6)
4. TRANSVERSE BRACING AND CONNECTION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR REFER BMRL/PHASEII/HTD/EXT/VIADWG/001 (SHEET 5 OF 6)
5. RC DETAILS OF DECK SLAB FOR STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 REFER BMRL/PHASEII/HTD/EXT/VIADWG/001 (SHEET 6 OF 6)

ISSUE	DESCRIPTION	APPROVED	DATE	SCALE: AS SHOWN
R0	ISSUED FOR GOOD FOR CONSTRUCTION		18-07-2024	DATE (RD ISSUE): 18-7-2024
R1	SPAN IS REVISED TO 65M		01-02-2025	



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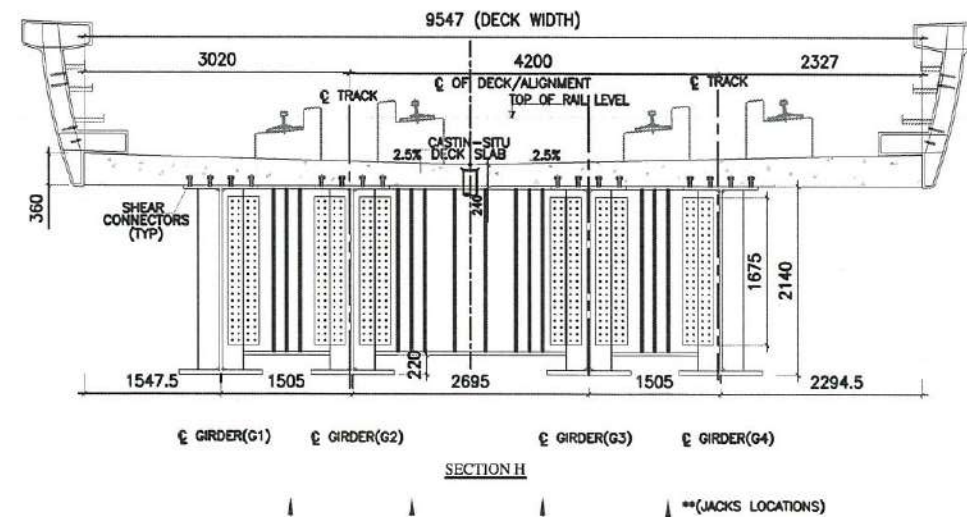
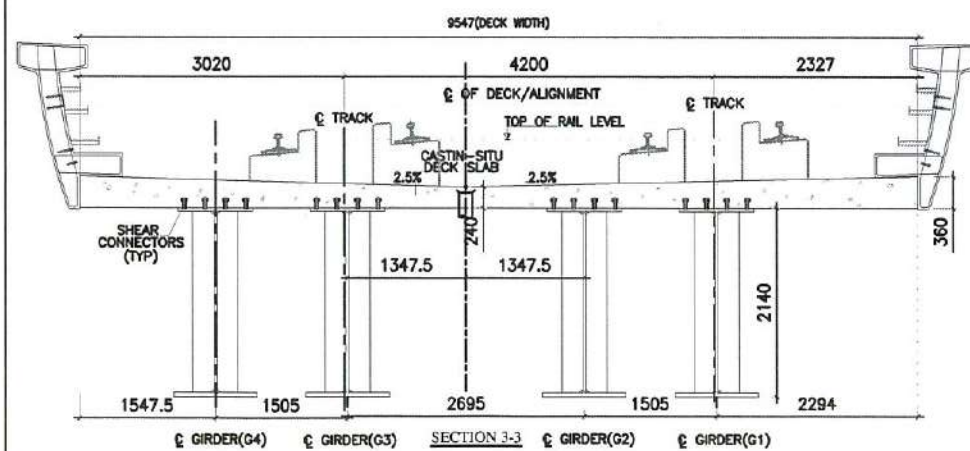
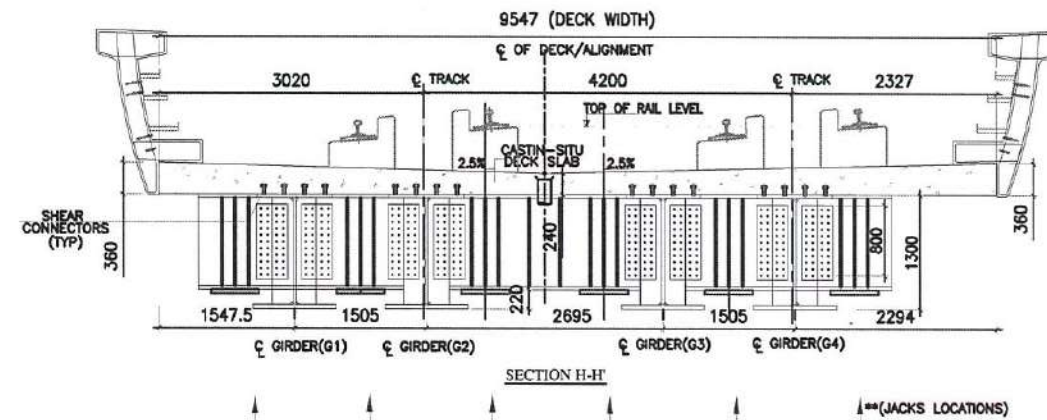
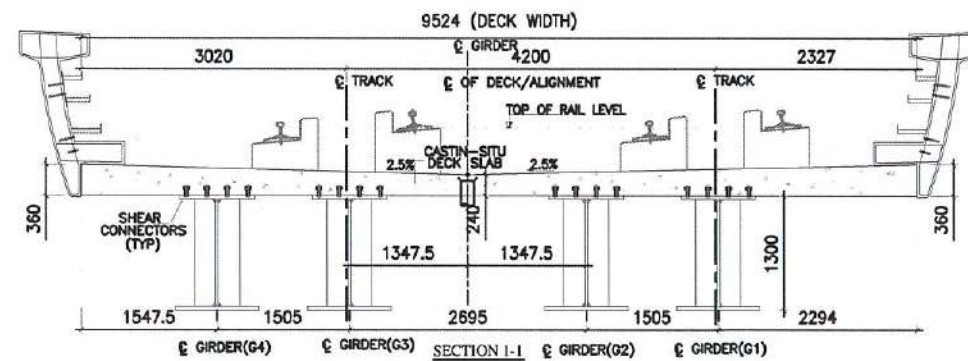
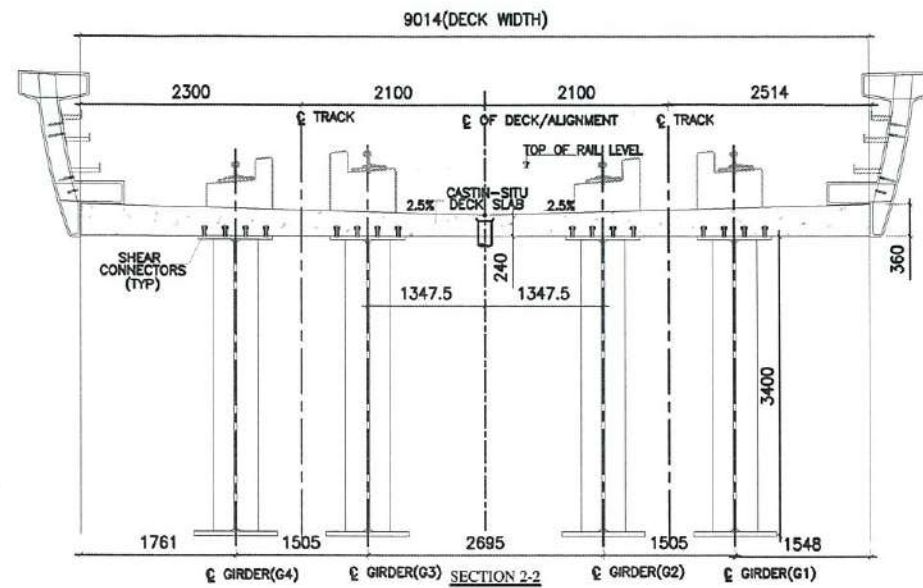
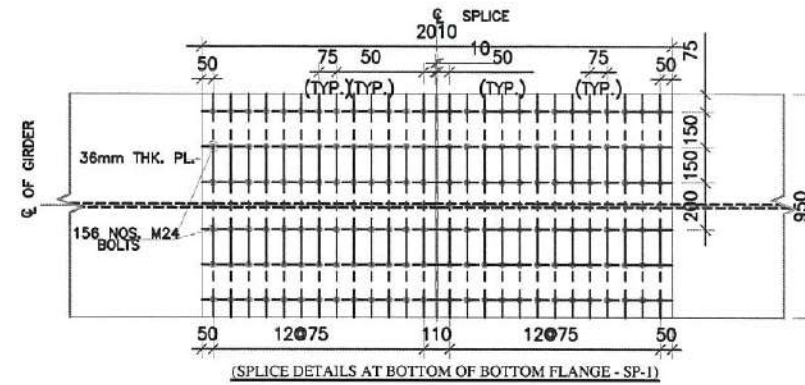
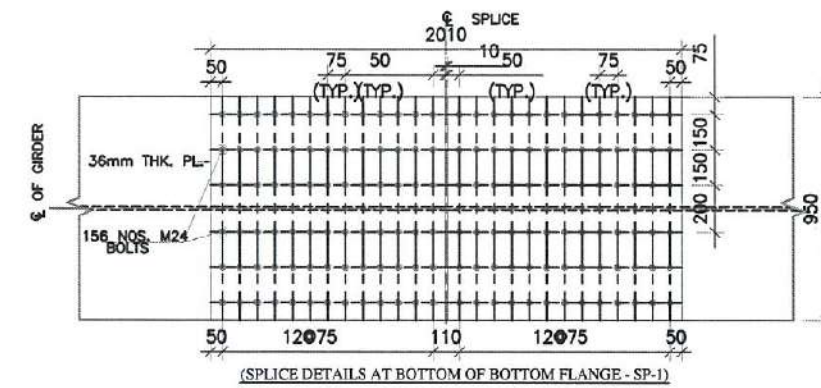
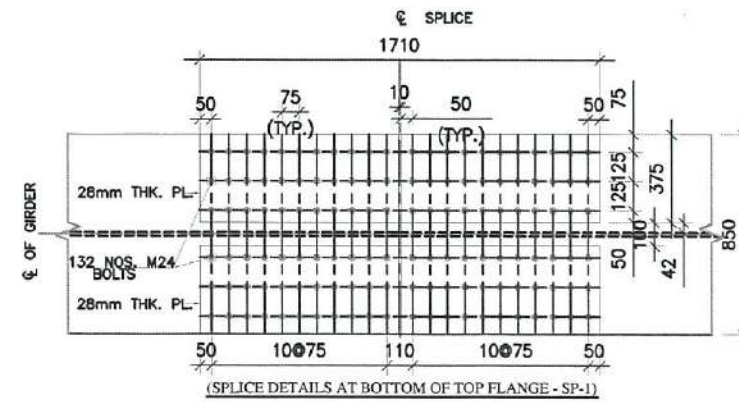
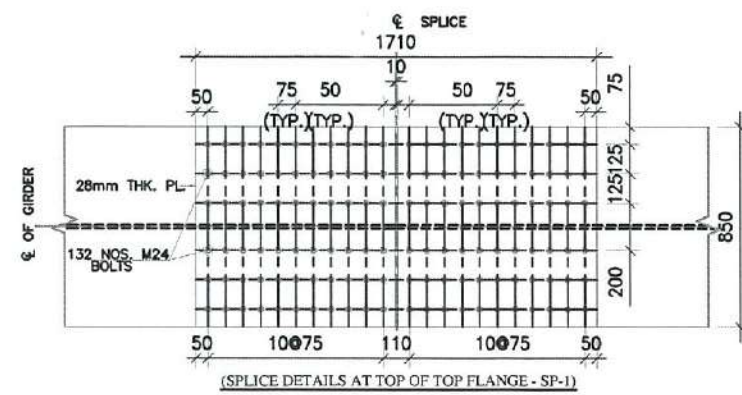
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Bangalore - 560027  
Tel: 080-22969300

OVER HEAD STRUCTURE OF METRO VIADUCT OF 65m (EI TO EIJ) COMPOSITE STEEL GIRDER SPAN (FOR REACH 1B PHASE-2) CROSSING BETWEEN PIERS BP 503 AND BP 504 AT BMRL CHAINAGE KM:33.8255 AND AT RAILWAY KM:333/006-333/100 BETWEEN KR PURAM - WHITEFIELD SECTION IN BANGALURU-CHENNAI DOUBLE LINE BG SECTION.	
DWG. TITLE:	NUMERATION AND ELEVATION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP503-BP504
DWG NO:	BMRL/PHASEII/HTD/EXT/VIADWG/001 (SHEET 2 OF 6)
DATE:	HARISH N
DESIGNED:	K S SOORIYANARAYANAN
DATE (CURRENT ISSUE):	01-02-2025

GOOD FOR CONSTRUCTION

*K. S. Sooriyanarayanan*  
Deputy Chief Engineer  
(Planning & Design)  
BMRL





"DUE TO REDUCTION IN DEPTHS OF GIRDERS AT END DIAPHRAGAMS 6 JACKS AT BP' 503 END AND 4 JACKS AT BP' 504 END TO BE USED FOR LOWERING AND LIFTING OF GIRDERS WHILE LAUNCHING// REPLACING OF BEARINGS.

REFERENCE DRAWINGS:

1. NUMERATION AND ELEVATION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504  
REFER BM/CL/PHASE/II/WH/D/EXT/VI/DWG/001 (SHEET : 1 OF 6)
2. SPLICE AND SECTIONAL DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504  
REFER BM/CL/PHASE/II/WH/D/EXT/VI/DWG/001. (SHEET : 2 OF 6)
3. SPLICE AND CAMBER DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504  
REFER BM/CL/PHASE/II/WH/D/EXT/VI/DWG/001. (SHEET : 4 OF 6)
4. TRANSVERSE BRACING AND CONNECTION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504  
REFER BM/CL/PHASE/II/WH/D/EXT/VI/DWG/001. (SHEET : 5 OF 6)
5. RC DETAILS OF DECK SLAB FOR STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504  
REFER BM/CL/PHASE/II/WH/D/EXT/VI/DWG/001. (SHEET : 6 OF 6)

GOOD FOR CONSTRUCTION

ISSUE		APPROVED	DATE	SCALE: AS SHOWN
R0	ISSUED FOR GOOD FOR CONSTRUCTION		18-07-2024	DATE (R0 ISSUE): 18-7-2024
R1	SPAN IS REVISED TO 65M		01-02-2025	IF PRELIMINARY BEINGS ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BEINGS ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK OF THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK
R2	SECTION H-H CROSS DIAPHRAGM SPLICE DETAILS MODIFIED. JACKS LOCATIONS IN SECTION H & H-H AND SPECIAL NOTE ADDED.		25-03-2025	CONSTRUCTION / FABRICATION BEINGS FORWARDED OR "B" RELEASED BEING INFORMATION CONTAINED HEREIN HOLDS NOT BE RELEASED FOR CONSTRUCTION FABRICATION BEINGS MUST GET DETENTION OFFICE TO CLEAR HOLD IN THIS MATTER PROCEEDING WITH ANY CONSTRUCTION FABRICATION WORK RELATED TO THIS ISSUE

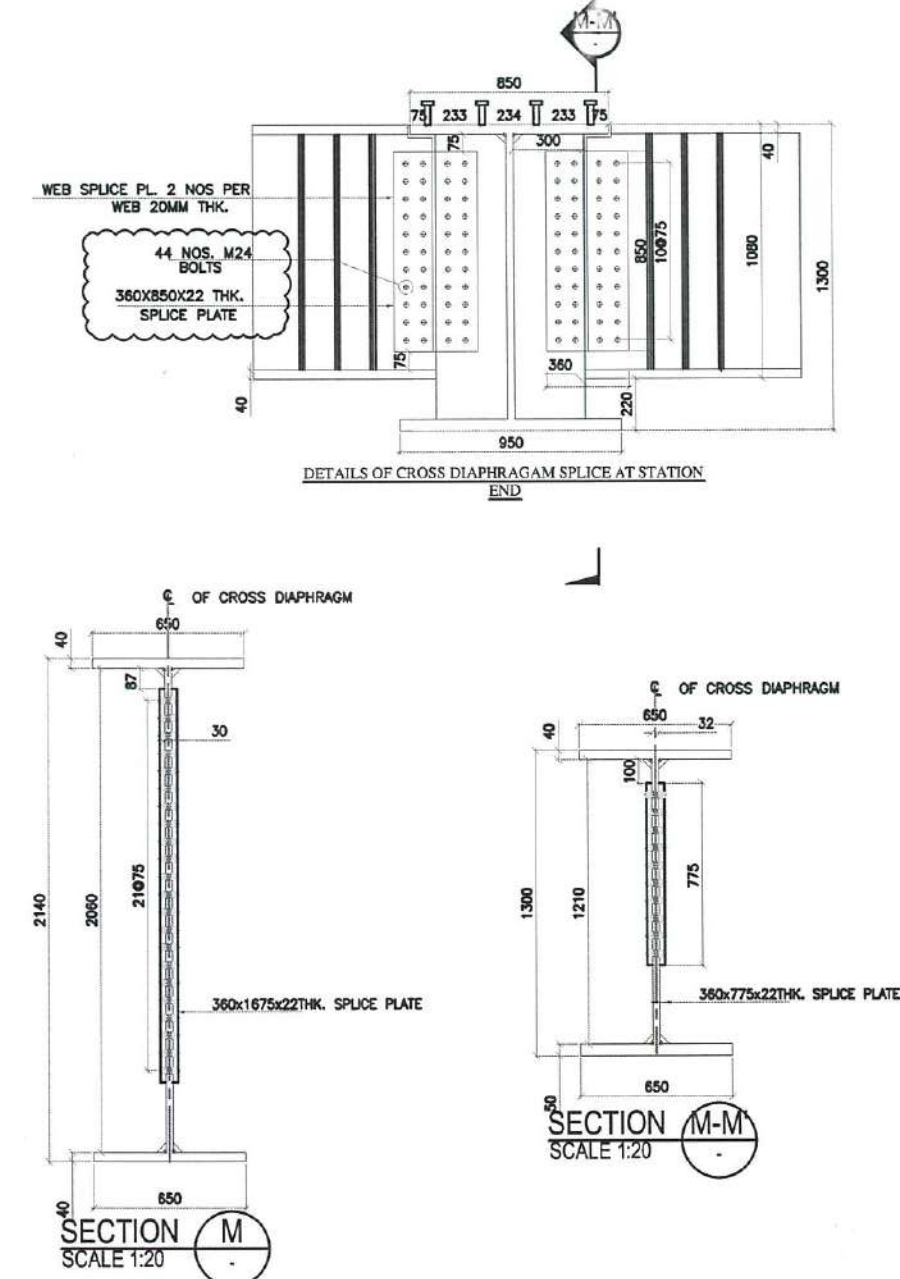
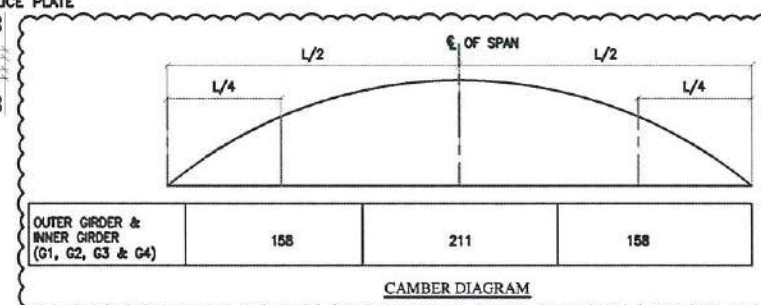
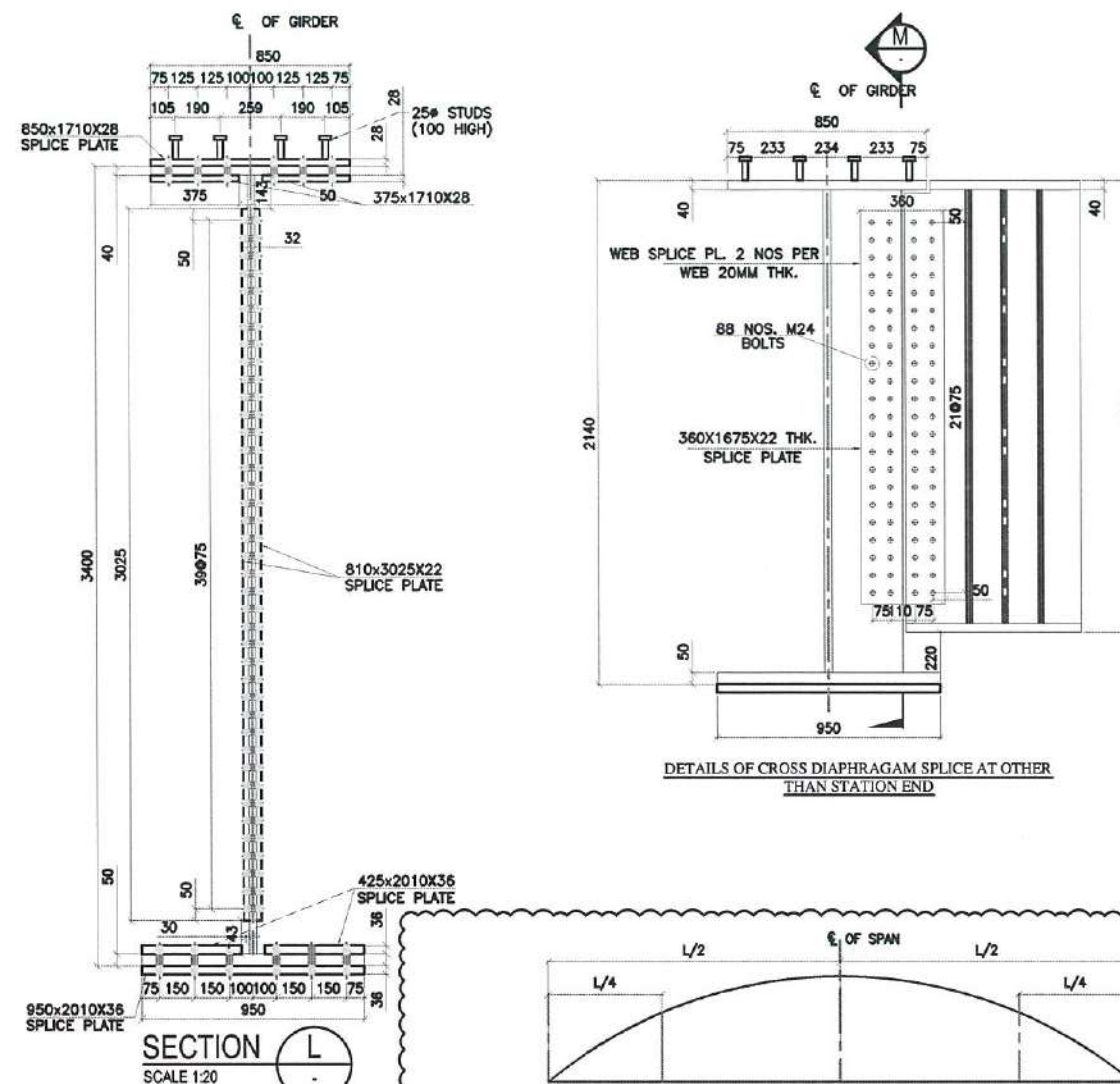
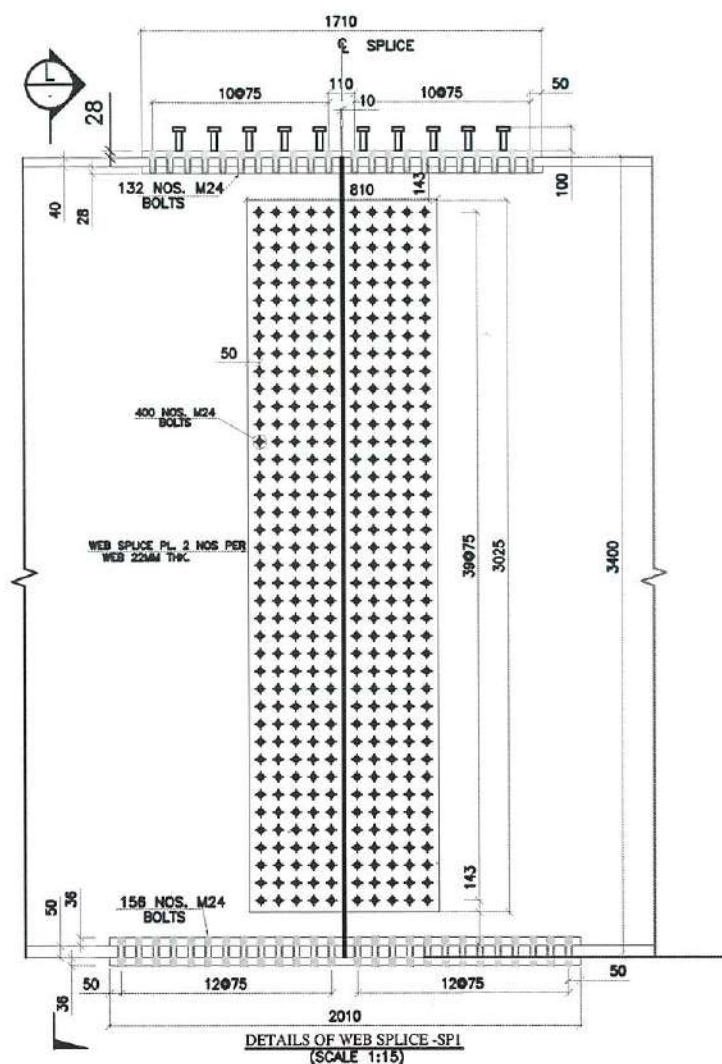


BANGALORE METRO RAIL  
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Tel:-080-22969300

OVER HEAD STRUCTURE OF METRO VIADUCT OF 6/m (E) TO E1) COMPOSITE STEEL GIRDER SPAN (FOR REACH 1B PHASE-2) CROSSING BETWEEN PIERS BP 504 AND BP 584 AT BMRC/ CHAINAGE KM 33.829* AND AT RAILWAY KM 333/600-333/704 BETWEEN KB PURAM - WHITEFIELD SECTION IN BENGALURU- CHENNAI DOUBLE LINE BG SECTION.			
DWG. TITLE:		<u>SPLICE AND SECTIONAL DETAILS OF STEEL COMPOSITE GIRDER</u> <u>55M SPAN FOR BPSG-BPS04</u>	
DWG. NO:		BMRC/LPHASEII/WHDT/EXT/VIA/DWG/001 (SHEET 3 OF 6)	ISSUE R2
DRN:	HARISH N	DESIGNED:	K S SOORIYANARAYANAN DATE/CURRENT ISSUE 03-01-2025



**NOTES:-**

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
- DO NOT SCALE THE DRAWING. FOLLOW THE FIGURED DIMENSIONS ONLY.
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH GAD, GENERAL NOTES, ELECTRICAL & OTHER RELATED STRUCTURAL DRAWINGS.
- GRADE OF CONCRETE: CAST-IN-SITU DECK SLAB-M35
- STRUCTURE STEEL PLATE GIRDER SHALL BE HIGH STRENGTH STEEL (HTS) - GRADE E450BR CONFORMING TO IS:2062-2011
- REINFORCEMENT (HYSD TMT REINFORCEMENT) GRADE FE 500 :IS 1786.
- THE DESIGN IS IN ACCORDANCE WITH THE IRS BRIDGE RULES, STEEL BRIDGE CODE, WELDED BRIDGE CODE, CONCRETE BRIDGE CODE, SHEAR CONNECTOR DESIGN CODE IS: 3935 AND UIC BEARING DESIGN CODE-772-2R.
- AUTOMATIC SUBMERGED ARC WELDING SHOULD BE EMPLOYED FOR FILLET WELDS IN FLANGES TO WEB. OTHER WELDS SHOULD ALSO BE DONE BY SUBMERGED ARC WELDING TO THE MAXIMUM EXTENT POSSIBLE.
- ALL WELDS TO BE MADE BY USING APPROVED WELDING PROCEDURES AND BY QUALIFIED WELDERS ONLY. (IS-9595).
- ALL STIFFENERS SHALL BE CONNECTED WITH WEB BY 8mm FILLET WELD ALL AROUND, UNLESS OTHERWISE STATED.
- WELDING CONSUMABLES (IF ANY) THE WELDING CONSUMABLES TO CONFORM TO IS:814-1991 AND OF STRENGTH REQUIREMENTS APPROPRIATE FOR PREHEATED HT STEEL OR UN-HEATED MILD STEEL.
- THE GRADE OF STUD IS 385MPa.

**A) GENERAL NOTES FOR STRUCTURAL STEEL:**

- ALL STRUCTURAL STEEL PLATES SHALL BE OF E450 (BR) GRADE CONFORMING TO IS:2062-2011.
- ALL MATERIALS SHOULD HAVE TEST CERTIFICATES (TC) OF THE MAIN PRODUCER. IF REQUIRED ALL THE STRUCTURAL STEEL SHALL BE TESTED FOR MECHANICAL AND CHEMICAL PROPERTIES AS PER VARIOUS IS CODES AS MAY BE APPLICABLE AND SHALL CONFIRM TO THE REQUIREMENTS SPECIFIED IN IS:2062-2011.
- ROLLING AND CUTTING TOLERANCES SHALL BE AS PER IS:1852. THE THICKNESS TOLERANCES CHECK MEASUREMENTS FOR THE PLATES AND ROLLED SECTIONS SHALL BE TAKEN AT NOT LESS THAN 15mm FROM EDGE.
- LAMINATION CHECK IN PLATES SHALL BE CARRIED OUT BY ULTRASONIC TESTING OR ANY OTHER APPROVED METHODS OR SHOULD HAVE THE MILL TEST CERTIFICATE FOR THE TESTING.
- CAMBER IS TO BE PROVIDED BY CUTTING WEB PLATE IN PROFILE AS PER DIMENSIONS INDICATED ABOVE.
- FLANGE SPLICE PLATES ARE TO BE BENT TO SUIT THE CAMBER PROFILE OF GIRDER. IF IT IS EXPECTED THAT THE PLATES WILL BEND DURING BOLT TIGHTENING. HOWEVER, IF ANY PROBLEM EXPERIENCED, THE FLANGE SPLICE PLATES MAY PRE-BEND HYDRAULICALLY.
- CAMBER TO BE PROVIDED BY CUTTING WEB PLATE IN PROFILE AS PER DIMENSION INDICATED IN CAMBER DIAGRAM. THE HEIGHT OF WEB PLATE SHOULD BE MAINTAINED AS 3310MM.

**B) FABRICATION:**

- FABRICATION SHALL BE DONE AS PER STIPULATIONS OF IRSB1. ALL WELDS SHALL BE MADE BY USING APPROVED WELDING PROCEDURES AND BY QUALIFIED WELDERS.
- DIMENSIONS FOR CHANNELS, ANGLES ETC.,  
DIMENSIONS FOR STEEL PLATES, SHEETS, FLATS ETC.,  
ROLLING & CUTTING TOLERANCES FOR HOT ROLLED STEEL PRODUCTS  
STEEL FOR GENERAL STRUCTURAL PURPOSES  
HSFG BOLTS  
ELECTRODES FOR MANUAL METAL ARC WELDING  
GLOSSARY OF TERMS OF WELDING & CUTTING OF METAL  
CODE OF PRACTICE FOR METAL ARC WELDING  
CODE OF PRACTICE FOR INSPECTION OF WELDS  
CODE OF PRACTICE FOR USE OF WELDING IN BRIDGES

- IS:808-1989  
IS:1730-1989  
IS:1852-1973  
IS:2062-2011  
IS:3757-1985  
IS:814-1991  
IS:812-1957  
IS:816-1969  
IS:822-1970  
IS:1024-1979

**REFERENCE DRAWINGS:**

- NUMERATION AND ELEVATION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRL/PHASEII/WHTD/EXT/MA/DWG/001 (SHEET 1 OF 6)
- NUMERATION AND ELEVATION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRL/PHASEII/WHTD/EXT/MA/DWG/001 (SHEET 2 OF 6)
- SPLICE AND SECTIONAL DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRL/PHASEII/WHTD/EXT/MA/DWG/001 (SHEET 3 OF 6)
- TRANSVERSE BRACING AND CONNECTION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRL/PHASEII/WHTD/EXT/MA/DWG/001 (SHEET 5 OF 6)
- RC DETAILS OF DECK SLAB FOR STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRL/PHASEII/WHTD/EXT/MA/DWG/001 (SHEET 6 OF 6)

*K. S. Sooriyanarayanan*  
Deputy Chief Engineer  
(Planning & Design)  
BMRL

ISSUE	APPROVED	DATE	SCALE: AS SHOWN
R0 ISSUED FOR GOOD FOR CONSTRUCTION		18-07-2024	DATE (R0 ISSUE): 18-7-2024
R1 SPAN IS REVISED TO 65M		01-02-2025	IF (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION OF ARE REVISED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.
R2 CROSS DIAPHRAGM SPLICE PLATE SIZE INCREASED WITH EXTRA 4 BOLTS ON EACH SIDE AND CAMBER DIAGRAM MODIFIED.		25-03-2025	CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'P' RELEASED. REVISED INFORMATION CONTAINED WITHIN THIS IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'YIELD' IN THE BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'YIELD'.



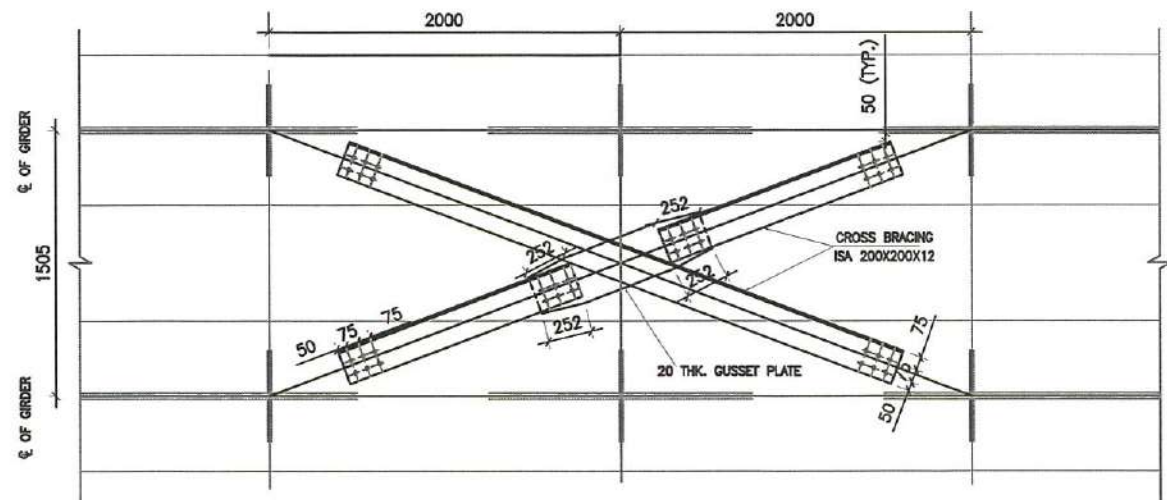
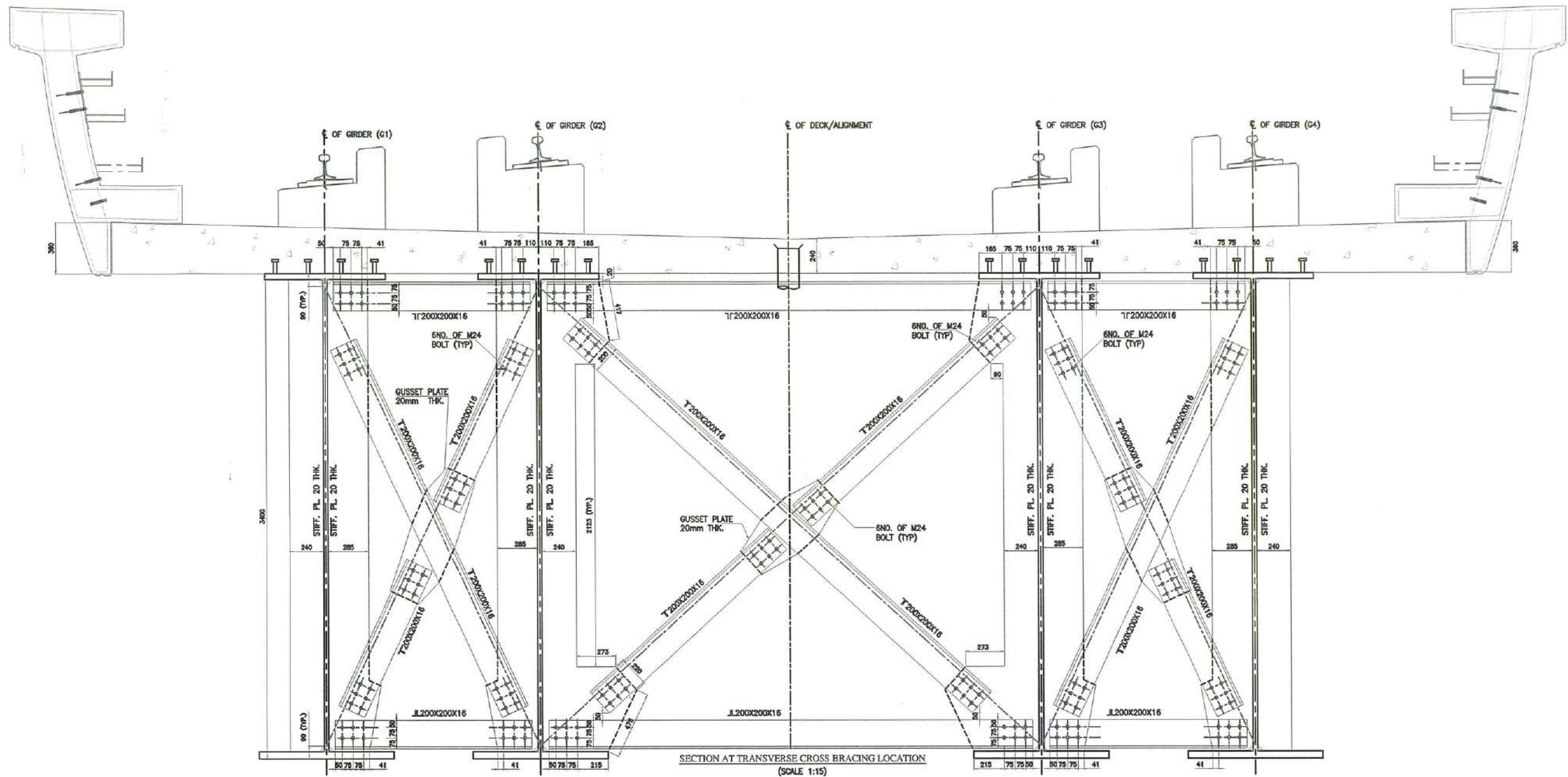
BANGALORE METRO RAIL  
CORPORATION LTD

A. 3rd Floor, BMTCL Complex,  
K.H. Road, Shanthinagar,  
Bangalore - 560027  
Tel: 080-22969300

OVER HEAD STRUCTURE OF METRO VIADUCT OF 65M SPAN TO STEEL COMPOSITE GIRDER SPAN (FOR REACH 18 PHASE-2) CROSSING BETWEEN PIERS BP 503 AND BP 504 AT BMRL CHAINAGE KM.33.825 AND AT RAILWAY KM.333/865-333/186 BETWEEN KR PURAM - WHITEFIELD SECTION IN BANGALORE - CHENNAI DOUBLE LINE BC SECTION.			
DWG. TITLE:	SPLICE AND CAMBER DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP503-BP504		
DWG. NO:	BMRL/PHASEII/WHTD/EXT/MA/DWG/001 (SHEET 4 OF 6)		
DRN:	HARISH N	DESIGNED:	K S SOORIYANARAYANAN
DATE (CURRENT ISSUE): 25-03-2025			ISSUE R2

GOOD FOR CONSTRUCTION





*K. S. Sooriyanarayanan*  
Deputy Chief Engineer  
(Planning & Design)  
BMRCL

- REFERENCE DRAWINGS:
- 1. NUMERATION AND ELEVATION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRCL/PHASEII/WHITD/EXT/VA/DWG/001 (SHEET 1 OF 6)
  - 2. NUMERATION AND ELEVATION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRCL/PHASEII/WHITD/EXT/VA/DWG/001 (SHEET 2 OF 6)
  - 3. SPLICE AND SECTIONAL DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRCL/PHASEII/WHITD/EXT/VA/DWG/001(SHEET 3 OF 6)
  - 4. SPLICE AND CAMBER DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRCL/PHASEII/WHITD/EXT/VA/DWG/001(SHEET 4 OF 6)
  - 5. RC DETAILS OF DECK SLAB FOR STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504: BMRCL/PHASEII/WHITD/EXT/VA/DWG/001(SHEET 6 OF 6)

GOOD FOR CONSTRUCTION

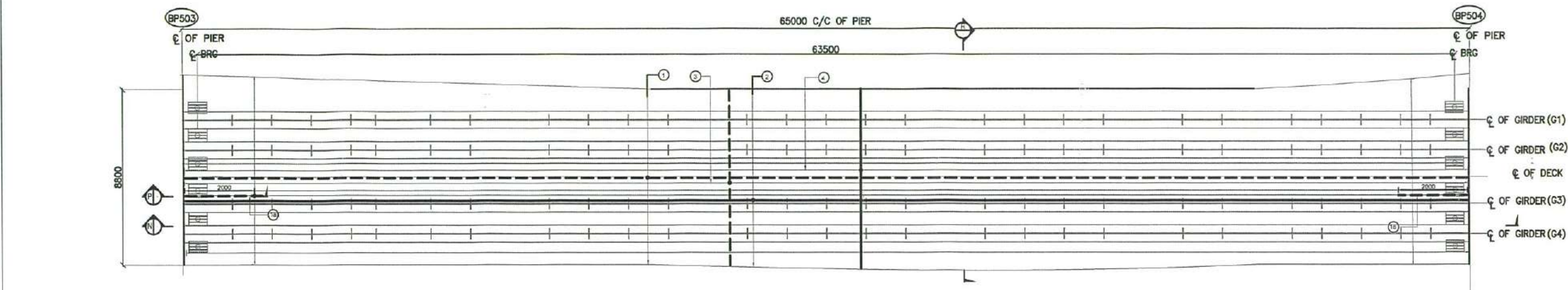
ISSUE	APPROVED	DATE	SCALE	AS SHOWN
R0	ISSUED FOR GOOD FOR CONSTRUCTION	18-07-2024	DATE (R0 ISSUE): 18-7-2024	
R1	SPAN IS REVISED TO 65M	01-02-2025		



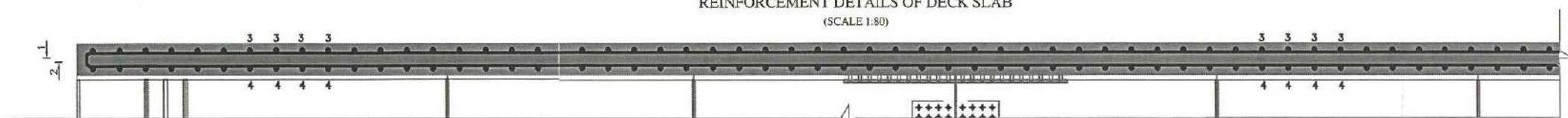
BANGALORE METRO RAIL CORPORATION LTD  
A. 3rd Floor, BMTC Complex,  
K H Road, Shanthinagar,  
Bangalore - 560027  
Tel: 080-22969300

OVER HEAD STRUCTURE OF METRO VIADUCT OF 61m (E) TO (F) COMPOSITE STEEL GIRDER SPAN (FOR REACH 1B PHASE-2) CROSSING BETWEEN PIERS BP 503 AND BP 504 AT BMRCL CHAINAGE KM:33.625 AND AT RAILWAY KM 333/000-333/104 BETWEEN KR PURAM - WHITEFIELD SECTION IN BANGALURU- CHENNAI DOUBLE LINE BG SECTION.			
DWG. TITLE:	TRANSVERSE BRACING AND CONNECTION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP503-BP504		
DWG NO.	BMRCL/PHASEII/WHITD/EXT/VA/DWG/001 (SHEET 5 OF 6)		
DRN:	HARISH N	DESIGNED:	K S SOORIYANARAYANAN
			DATE(CURRENT ISSUE) 01-02-2025

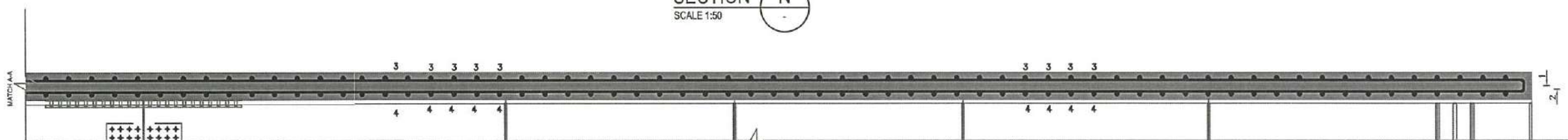




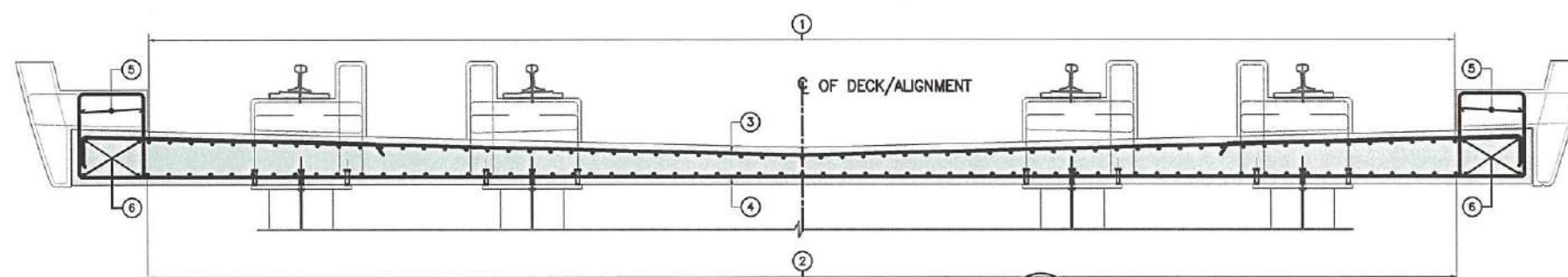
REINFORCEMENT DETAILS OF DECK SLAB  
(SCALE 1:80)



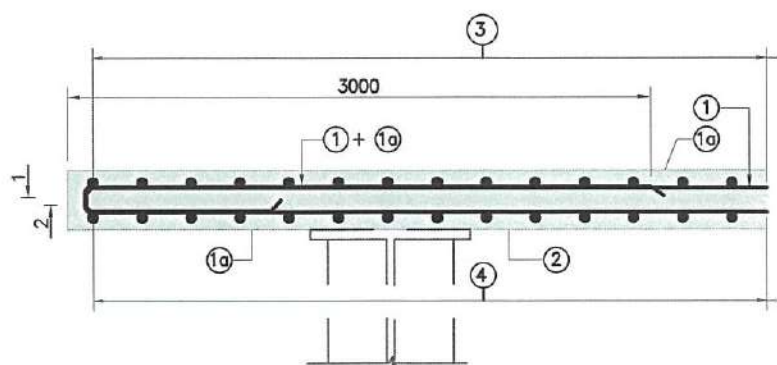
SECTION N  
SCALE 1:50



SECTION R  
SCALE 1:50



SECTION P  
SCALE 1:50



SECTION Q  
SCALE 1:50

SCHEDULE OF REINFORCEMENT  
FOR DECK SLAB

BAR MARK	DESCRIPTION	SHAPE
①	Y12 AT 200	U
②	Y12 AT 200	U
③	Y20 AT 100	U
④	Y20 AT 100	U
⑤	Y12 AT 100	U
⑥	Y12 AT 100 (STIRRUPS)	U
⑦	Y16 AT 4 NOS.	—

#### REFERENCE DRAWINGS:

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- SPLICE AND CAMBER DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRCL/PHASEII/WHITD/EXT/VA/DWG/001 (SHEET 4 OF 6)
- TRANSVERSE BRACING AND CONNECTION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504 BMRCL/PHASEII/WHITD/EXT/VA/DWG/001 (SHEET 5 OF 6)

#### NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DIMENSION ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- GRADE OF CONCRETE FOR DECK SLAB SHALL BE M35.
- GRADE OF ALL REINFORCING BARS SHALL BE HYSD-FE 500D CONFORMING TO IS:1786 STANDARDS.
- CLEAR COVER TO ANY REINFORCEMENT SHALL BE 35mm.
- MINIMUM DEVELOPMENT LENGTH SHALL BE 41 TIMES DIA OF BAR.
- NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED AT ANY SECTION. MINIMUM LAP LENGTH SHALL BE 58 TIMES DIAMETER OF BARS.

#### LEGEND:

BOTTOM R/F BARS  
TOP R/F BARS

\*PLCD. ALT. = PLACED ALTERNATELY

GOOD FOR CONSTRUCTION

ISSUE	APPROVED	DATE	SCALE	AS SHOWN
R0 ISSUED FOR GOOD FOR CONSTRUCTION		18-07-2024	DATE (NO ISSUE):	18-7-2024
R1 SPAN IS REVISED TO 65M		01-02-2025		

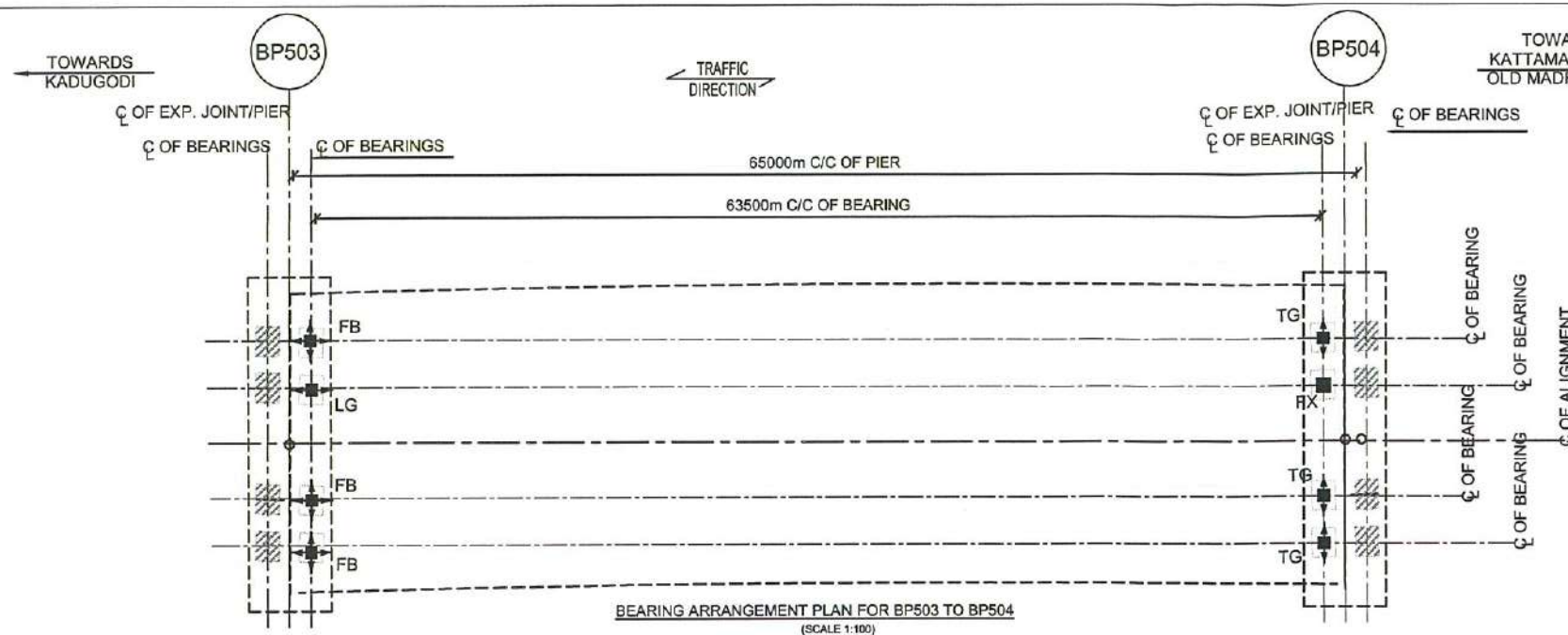






BANGALORE METRO RAIL  
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OVER HEAD STRUCTURE OF METRO VIADUCT OF 65M (E) TO E1/COMP3 SITE STEEL GIRDER SPAN (FOR BEACH 1B PHASE-2) CROSSING BETWEEN PIERS BP 503 AND BP 504 AT BMRCL CHAINAGE KM:33.825 AND AT RAILWAY KM 333/000-333/104 BETWEEN KR PURAM - WHITEFIELD SECTION IN BANGALURU - CHENNAI DOUBLE LINE BG SECTION.	
DWG. TITLE:	RC DETAILS OF DECK SLAB FOR STEEL COMPOSITE GIRDER 65M SPAN FOR BP503-BP504
DWG. NO.	BMRCL/PHASEII/WHITD/EXT/VA/DWG/001 (SHEET 6 OF 6)
DRN:	HARISH N
DESIGNED:	K S SOORIYANARAYANAN
DATE (CURRENT ISSUE)	01-02-2025









BP 503 - BP 504				BEARING 1	BEARING 2	BEARING 3	BEARING 4
							
				TG	FX	FB	LG
SEATING MATERIAL	UPPER SURFACE			STEEL	STEEL	STEEL	STEEL
	LOWER SURFACE			CONCRETE - M50	CONCRETE - M50	CONCRETE - M50	CONCRETE - M50
ALLOWABLE CONTACT PRESSURE (N/MM <sup>2</sup> )	UPPER SURFACE	SERVICEABILITY		-	-	-	-
		ULTIMATE		-	-	-	-
	LOWER SURFACE	SERVICEABILITY		-	-	-	-
		ULTIMATE		22.33	22.33	22.33	22.33
DESIGN LOAD (KN)	SERVICEABILITY LIMIT STATE	NORMAL	VERTICAL MAX	3479	2425	3321	2447
			VERTICAL PERM	2637	1755	2650	1770
			VERTICAL MIN	2130	1755	2108	1770
			LONGITUDINAL	335	269	332	245
			TRANSVERSE	348	1494	332	1494
DESIGN LOAD (KN)	ULTIMATE LIMIT STATE	NORMAL	VERTICAL MAX	5203	3525	4950	3557
			VERTICAL MIN	3045	2458	3014	2481
			LONGITUDINAL	533	429	495	356
			TRANSVERSE	520	2376	495	2376
		WIND	VERTICAL MAX	4935	3311	4737	3342
			VERTICAL MIN	3045	2458	3014	2481
			LONGITUDINAL	426	343	474	334
			TRANSVERSE	493	2108	474	2108
		SEISMIC	VERTICAL MAX	4751	3131	4509	3344
			VERTICAL MIN	3045	2458	3014	2481
			LONGITUDINAL	731	542	451	334
			TRANSVERSE	475	1893	451	1893
TRANSLATION (MM)	SERVICEABILITY LIMIT STATE	IRREVERSIBLE	LONGITUDINAL	-	-	25	25
			TRANSVERSE	4	-	4	-
		REVERSIBLE	LONGITUDINAL	-	-	30	30
	TRANSVERSE		5	-	5	-	
	ULTIMATE LIMIT STATE	IRREVERSIBLE	LONGITUDINAL	-	-	30	30
			TRANSVERSE	6	-	6	-
		REVERSIBLE	LONGITUDINAL	-	-	35	35
			TRANSVERSE	6	-	6	-
WHETHER PRE-SETTING ALLOWED (A)/NOT-ALLOWED (NA)				A	A	A	A
ROTATION (RAD)	SERVICEABILITY LIMIT STATE	IRREVERSIBLE	LONGITUDINAL	0.01	0.01	0.01	0.01
			TRANSVERSE	0.01	0.01	0.01	0.01
		REVERSIBLE	LONGITUDINAL	0.01	0.01	0.01	0.01
			TRANSVERSE	0.01	0.01	0.01	0.01

NOTES :

1. AS PER CL. 4.1 OF IRC 83, CORROSION PROTECTION OF THE EXPOSED STEEL SURFACES INCLUDING BACKING, INTERMEDIATE PLATES AND WELDING ZONE ETC. SHALL BE ACHIEVED BY A PROTECTIVE COATING SYSTEM IN ACCORDANCE WITH THE ESTABLISHED SPECIFICATIONS e.g. ISO 12544.
2. ALL BEARINGS SHALL BE LOAD TESTED IN THE FACTORY AS PER IRC.83 & MORTH SPECIFICATIONS.
3. CERTIFICATE FOR ACCEPTANCE TEST ON BEARINGS SHALL BE FURNISHED.
4. SUITABLE ERECTION CLAMPS FOR SAFE TRANSPORTATION AND HANDLING ALONG WITH TEMPLATE
5. MATERIAL SPECIFICATION :
  - a) STAINLESS STEEL : STAINLESS STEEL BE AS PER CL. 4.4 OF IRC 83 STAINLESS STEEL. FOR THE SLIDING INTERFACE SHALL BE IN ACCORDANCE WITH AISI 316L OR  $O_2$ ,  $Cr_{17}$ ,  $Ni_2$ ,  $Mo_2$  OF IS:6911
  - b) MILD STEEL - CONFORMING TO IS: 2062
  - c) PTFE (THERMO-PLASTIC SLIDING MATERIAL) SHALL BE AS PER CL.4.2 OF IRC 83 PART IV.
  - d) ANCHOR BOLT: ANCHORING ARRANGEMENT SHALL BE AS PER CL.4.9 OR IRC 83 PART IV ANCHORING ARRANGEMENT.
6. WELDING : WELDING SHALL CONFORM TO IS:9595 USING ELECTRODES OF SUITABLE GRADE AS PER IS:814 PRE HEATING & POST WELD STRESS RELIEVING TO BE DONE AS PER IS:9595.
7. DIMENSIONAL TOLERANCE OF STEEL COMPONENTS AND BEARINGS SHALL BE AS PER CL. 6.1 OF IRC 83 PART -IV(TABLE-5)
8. CAST STEEL SHALL AS PER CL.4.1 OF IRC 83 PART IV AND IN ACCORDANCE WITH IS: 1030 GRADE 340-570W.
  - a) THE SURFACE HARDNESS SHALL NOT BE LESS THAN 300 BHN.
  - b) CASTING TAPER FILLETS ROUNDOFF OFF OF EDGES TO MATCHING ALLOWANCE TO BE AS PER STANDARD PRACTICE.
  - c) TENSILE TEST, IMPACT TEST AND BOND TEST SHALL BE CONDUCTED AS PER IS:1030.
  - d) CASTING SHALL BE ULTRASONICALLY TESTED AND CERTIFICATES SHALL BE SUBMITTED.
  - e) QUALITY LEVEL OF CASTING AS PER IS:9585 SHALL BE LEVEL 3.
  - f) RECTIFICATION OF CASTING SHALL BE DONE AS PER IS:1030 AND IS:5530.
9. DIMPLES SHALL BE PROVIDED AS PER CLAUSE 4.2 AND ANNEXURE A OF IRC 83 PART IV. IN CASE OF SUPERSTRUCTURE IN CURVE, BEARING LAYOUT SHALL BE AS PER IRC : SP : 66-2005, FIG-4.
11. BEARING SHALL BE INSTALLED AT A TEMPERATURE BETWEEN 15°C AND 35°C. IF THERE IS ANY VARIATION, TOP PLATE OF SLIDING BEARING SHALL BE PRESET AS REQUIRED. THE BEARING AND THEIR CONNECTIONS TO THE STRUCTURE SHALL BE DESIGNED FOR THE FORCES STATED ON THE DRAWINGS.
13. ALL BEARING SHALL BE REPLACEABLE AND POSITIVELY LOCATED TO PREVENT THEM FROM SHIFTING DURING BRIDGE MOVEMENT.
14. EACH BEARING SHALL BE INDIVIDUALLY MARKED WITH THE BEARING IDENTIFICATION MARK. THE TOP FACE OF THE DIRECTION OF MOVEMENT OF EACH BEARING SHALL BE IDENTIFIABLE.
15. TESTING SHALL BE DONE AS PER MANUFACTURER & MORTH SPECIFICATIONS.
16. PROPRIETARY BEARINGS SHALL BE DESIGNED TO THE PERFORMANCE REQUIREMENTS GIVEN ON THE DRAWINGS AND SHALL SATISFY THE REQUIREMENTS OF IRC 83.
17. MANUFACTURING SHALL SPECIFY THE PRE-SETTING DETAILS & INCLUDING SETTING TOLERANCE RANGE IN THE SHOP DRAWING OF BEARINGS.

Deputy Chief Engineer  
(Planning & Design)  
BMRCL

BEARING TYPE	SYMBOL
FIXED	
FREE	
LONGITUDINAL GUIDED	
TRANSVERSE GUIDED	

### LEGEND

FX	-	FIXED BEARING
LG	-	LONGITUDINAL GUIDED BEARING
TG	-	TRANVERSE GUIDED BEARING
FB	-	FREE BEARING

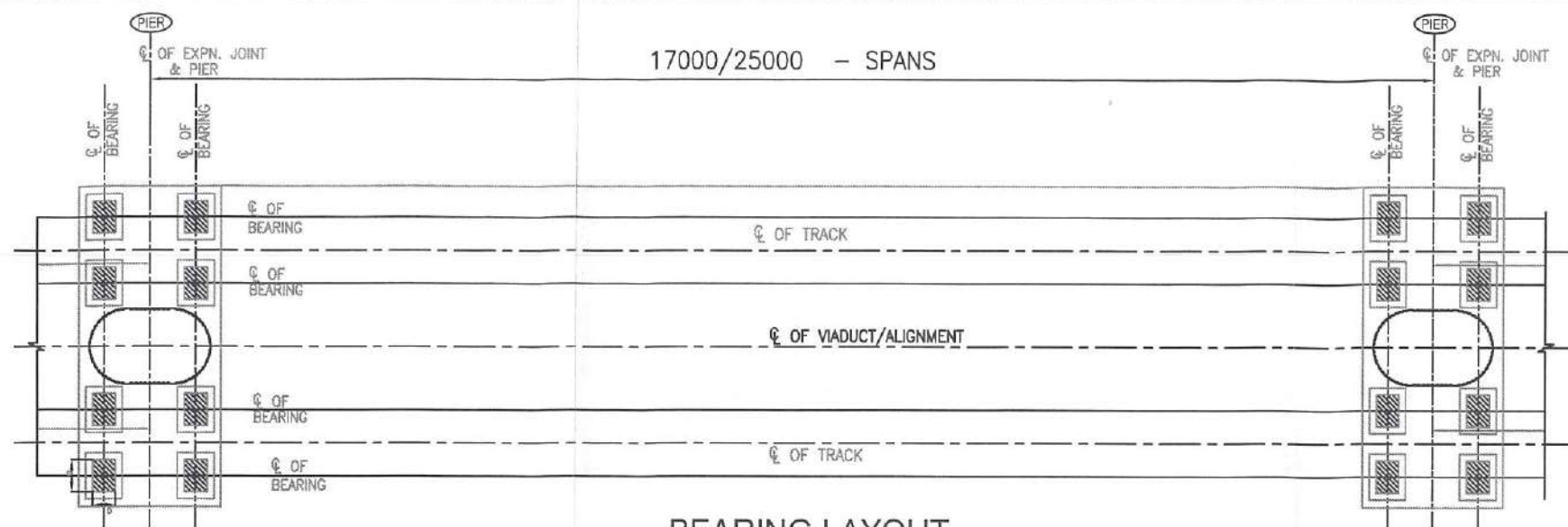
### REFERENCE DRAWINGS

1. NUMERATION AND ELEVATION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504  
BMRLC/PHASEIII/WHTD/EXT/VA/DWG/001 (SHEET 1 OF 6)
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BMRLC/PHASEIII/WHTD/EXT/VA/DWG/001 (SHEET 2 OF 6)
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BMRLC/PHASEIII/WHTD/EXT/VA/DWG/001(SHEET 3 OF 6)
4. SPLICE AND CAMBER DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504  
REFER BMRLC/PHASEIII/WHTD/EXT/VA/DWG/001.(SHEET : 4OF 6)
5. TRANSVERSE BRACING AND CONNECTION DETAILS OF STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504  
BMRLC/PHASEIII/WHTD/EXT/VA/DWG/001(SHEET 5 OF 6)
6. RC DETAILS OF DECK SLAB FOR STEEL COMPOSITE GIRDER 65M SPAN FOR BP 503 & BP 504  
BMRLC/PHASEIII/WHTD/EXT/VA/DWG/001(SHEET 6 OF 6)

GOOD FOR CONSTRUCTION

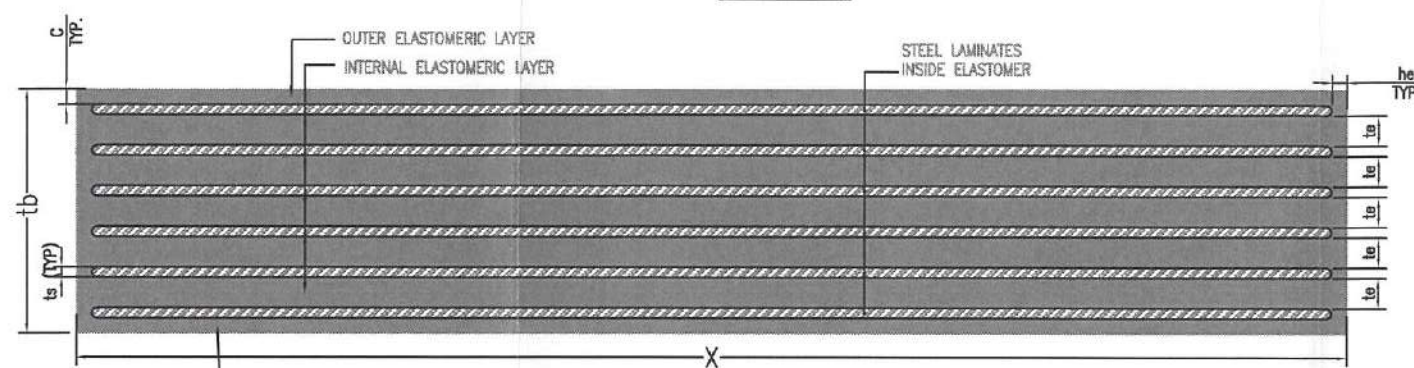
ISSUE		APPROVED	DATE	SCALE: AS SHOWN	<div><div><div>BEARING</div><div>metro</div></div><div><div>BANGALORE METRO RAIL CORPORATION LTD</div><div>A. 3rd Floor, BMTCL Complex, KH Road, Shanthinagar, Bangalore - 560027 Tel: 080-22965300</div></div></div>	OVER HEAD STRUCTURE OF METRO VIADUCT OF 65m (E1 TO E1) COMPOSITE STEEL GIRDER SPAN (FOR EACH IS PHASE-2) CROSSING BETWEEN PIERS R7 R8 AND R7 R9 AT BMRCL CHAINAGE KM 13+870 AND AT RAILWAY KM 33+00-33+100 BETWEEN KR PURAM - WHITEFIELD SECTION IN BANGALORE - CHENNAI DOUBLE LINE BG SECTION.		
R0	GOOD FOR CONSTRUCTION		20-07-2024	DATE (R0 ISSUE): 20-7-2024				
R1	SPAN IS REVISED TO 65M		09-04-2025	(P) PRELIMINARY ISSUE AND NOT TO BE USED FOR POINT LOCATION / FABRICATION AND INDICATED IN THE EMAIL SUBJECT THAT TOP RIGHT HAND CORNER OF THE EARTHWORK.  CONSTRUCTION / FABRICATION WORK IS PERMITTED ON RELEASED ISSUE INFORMATION CONTAINS WITHIN SCOPE OF NOT PERMITTED FOR FABRICATION FIELD MUST USE DESIGN GIVEN TO CLEAR WORK IN THE BEARING PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATE TO "ISSUE"			DETAILS OF BEARING LOADS FOR 65.0M SPAN STEEL COMPOSITE GIRDER BETWEEN R203 TO R204 (FOR SPHERICAL BEARING)	
							BMRL/PHASEII/WHTD/EXT/VI/A/DWG/001-A	ISSUE R1
							DWG NO:  Dwg No:  Dwg No:	DESIGNED: RAMESH V  DATE (CURRENT ISSUE) 09-04-2025
						DWG NO:  Dwg No:  Dwg No:	DESIGNED: RAMESH V  DATE (CURRENT ISSUE) 09-04-2025	





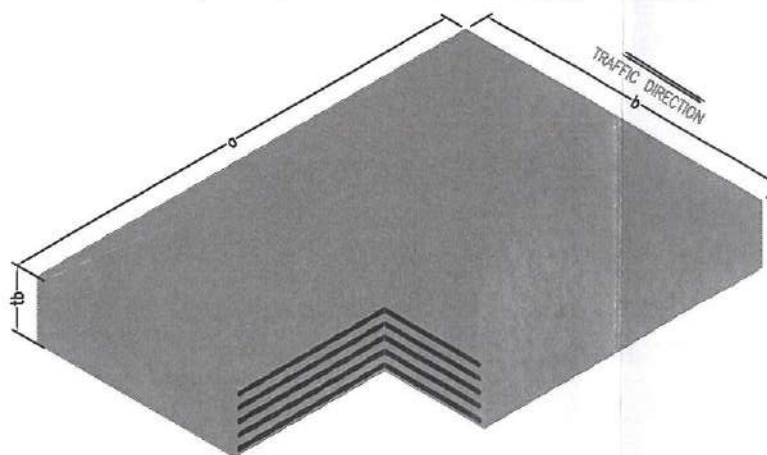
BEARING LAYOUT

(SCALE 1:50)



SECTION THROUGH BEARING

(SCALE 1:50)



ISOMETRIC VIEW OF ELASTOMERIC BEARING

(SCALE 1:25)

SPAN L (m)	PLAN SIZE		SIDE COVER he (mm)	TOP AND BOTTOM COVER c (mm)	INTERMEDIATE ELASTOMER LAYERS		STEEL LAMINATES		TOTAL THICKNESS OF BEARINGS tb (mm)
	a (mm)	b (mm)			te (mm)	n (No.s)	ts (mm)	ns (No.s)	
25	400	400	6	6	12	5	3	6	90
17	375	375	6	6	12	5	3	6	90

R1



CHIEF ENGINEER  
DESIGN  
BMRCL

## NOTES:

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED.
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED.
- ALL BEARINGS SHALL BE NEOPRENE TYPE.
- CENTRE LINE OF BEARINGS SHALL MATCH WITH CENTRE LINE OF DIAPHRAGM.
- ALL BEARINGS SHALL BE TEST CERTIFIED BY MANUFACTURER.
- MATERIAL, FABRICATION AND TESTING OF ELASTOMERIC BEARING SHALL CONFIRM TO RELEVANT CLAUSES OF BS EN 1337, PART 3 - 2005.
- SHEAR MODULUS OF THE ELASTOMERIC BEARING SHALL BE 1.0 MPA.
- ELASTOMERIC BEARING SHALL SATISFY THE ACCEPTANCE SPECIFICATIONS OF BS EN 1337, PART 3 - 2005.
- BEARING SHALL SATISFY THE REQUIREMENTS OF CODE BS EN 1337, PART 3 - 2005.
- BEARING SHALL BE INSTALLED AS PER MANUFACTURE'S SPECIFICATIONS HOWEVER THE FOLLOWING PRECAUTIONS SHALL BE TAKEN DURING INSTALLATION.
  - THE TOLERANCE OF THE TOTAL MEAN THICKNESS (T<sub>bo</sub>) ACCORDING TO THE NOMINAL THICKNESS IS :- T<sub>bo</sub> ≤ 100 ± 2 MM.
  - THE ACCEPTED VARIATION OF THICKNESS BETWEEN TWO CONSECUTIVE CORNERS IS 0.2% OF THE DISTANCE BETWEEN THESE TWO POINTS OR 1MM WHICHEVER IS LARGER FOR BEARING PLAN DIMENSIONS UNDER 700 X 700 MM.
  - CONCRETE SURFACE SHALL BE FREE FROM LOCAL IRREGULARITIES (MAXIMUM TOLERANCE ±1mm IN HEIGHT)
  - EASY REMOVING SOFT FORMS SHALL BE USED AROUND THE BEARINGS DURING CONCRETING OF THE CAST-IN-SITU SUPERSTRUCTURE. FORMS SHALL SNUGLY FIT THE BEARINGS TO PREVENT LEAKAGE OF MORTAR GROUT. HOWEVER, ANY MORTAR GROUT CONTAMINATING THE BEARINGS DURING CONCRETING SHALL BE COMPLETELY REMOVED BEFORE IT SETS.
- SURFACE FLATNESS :- STRAIGHT EDGE PLACED ALONG A DIAGONAL OF PROPOSED CONTACT AREA SHALL NOT REVEAL HOLLOW IN EXCESS OF 2 MM OR 0.3% OF CONSIDERED LENGTH WHICHEVER IS GREATER.
- THE INNER REINFORCING PLATES SHALL BE OF STEEL GRADE S 235 ACCORDING TO EN 10025 OR STEEL WITH A MINIMUM EQUIVALENT ELONGATION AT BREAK. THEIR MINIMUM THICKNESS SHALL BE 2 MM.
- BEARINGS SHALL BE HANDLED CAREFULLY. THESE SHALL BE PROTECTED FROM BRIGHT SUN LIGHT AND EXTREME COLD. THESE SHALL BE STORED NEATLY UNDER COVER TILL INSTALLATION.

## INSTALLATION INSTRUCTIONS:

- CARE SHALL BE TAKEN IN PACKING, TRANSPORTATION, STORAGE AND HANDLING TO AVOID ANY MECHANICAL DAMAGE. CONTAMINATION WITH OIL, GREASE AND DIRT, UNDUE EXPOSURE TO SUNLIGHT AND WEATHER.
- THE POSITION OF THE BEARINGS SHALL BE ACCURATELY MARKED ON PIER CAP AND THE AREA WHERE THE BEARINGS WILL BE SEATED ACCURATELY LEVELED.
- THE CONCRETE SURFACE SHALL BE FREE FROM ANY LOOSE MATERIAL AND CLEANED OF ANY GREASE, OIL, PAINT ETC., AND IT SHALL BE DRY AT THE TIME OF FIXING OF BEARING. THE SURFACES SHALL BE SAND BLASTED, CLEAN OF ALL LAITANCE AND LEVELLED TRUE.
- GIRDERS SHOULD BE LOWERED ON BEARING ONLY AFTER THE COMPLETION OF STRESSING AND GROUTING OPERATION AT THE TIME OF STRESSING OPERATION, END OF GIRDER SHALL BE SEATED OVER TEMPORARY BEARINGS.
- WHERE BEARINGS ARE INSTALLED PRIOR TO ITS CONCRETING, THE FORMS AROUND THE BEARINGS SHALL BE SOFT ENOUGH FOR EASY REMOVAL. FORMS SHALL BE ALSO FIT THE BEARINGS SNUGLY AND PREVENT ANY LEAKAGE OF MORTAR GROUT. ANY MORTAR CONTAMINATING THE BEARINGS DURING CONCRETING SHALL BE COMPLETELY REMOVED BEFORE SETTING.
- THE TEMPORARY FORMS SHALL BE REMOVED AFTER THE SUPERSTRUCTURE CONCRETE HAS SET. THE SIDES OF BEARINGS SHALL BE CLEANED OF ANY DEPOSIT OF CEMENT SLURRY/CONCRETE.

## MAINTENANCE:

- THE BEARING SHALL BE SUBJECTED TO PLANNED MAINTENANCE CARE.
- THE EXPOSED BEARING SURFACE SHALL BE MAINTAINED CLEAN AND FREE FROM CONTAMINATION WITH GREASE OR OIL, ETC..
- ANNUAL ROUTINE MAINTENANCE INSPECTION OR SPECIAL MAINTENANCE INSPECTION OF ALL BEARINGS SHALL BE MADE TO CHECK FOR ANY SURFACE CRACKING OR SIGNS OF DAMAGE, DETERIORATION OR DISTRESS.
- DAMAGED BEARINGS SHALL BE REPLACED IMMEDIATELY TO AVOID DIFFERENCES IN STIFFNESS. ALL ADJACENT BEARINGS ON THE SAME LINE OF SUPPORT SHALL ALSO BE REPLACED AND UNIFORM SEATING OF THE MAIN GIRDER OVER ALL THE NEW BEARINGS SHALL BE ENSURED

GOOD FOR CONSTRUCTION

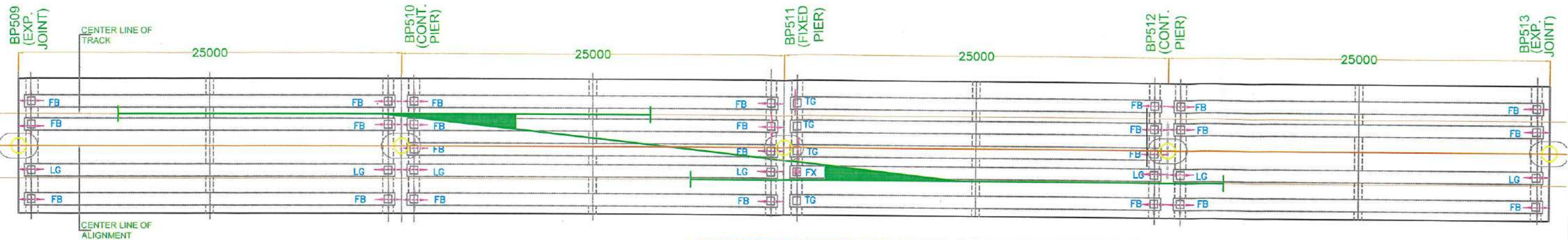
ISSUE	REVISION	APPROVED	DATE	SCALE	AS SHOWN	PRJT. TITLE
				DATE (R0 ISSUE)	11.07.2024	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.
						DWG. TITLE
						R1 REINFORCED ELASTOMERIC BEARING DETAILS FOR I GIRDER FOR SPAN 17M AND 25M.
						DWG. NO.
						BMRCL/PH-II/R1EXTN/VIASUP/WHITFD-EXTN/MISC-002
						DRN
						DSND
						APPRO
						DATE (CURRENT ISSUE)
						10.06.2025
R1	DETAILS OF 17M BEARING INCORPORATED AND 25M BEARING DETAILS REVISED		10.06.2025			
R0	GOOD FOR CONSTRUCTION		11.07.2024			



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LAYOUT OF BEARINGS FOR CROSS OVER SPANS BP509 TO BP513

Bearing Schedule as per IRC:83 Part 3-				BEARING FORCE FOR CROSS OVER SPAN BP509 TO BP513			
				BEARING 1	BEARING 2	BEARING 3	BEARING 4
BEARING IDENTIFICATION MARK/NUMBER							
				IG1	FX1	FR1	LG1
QTY. REQUIRED FOR EACH TYPE				4	1	24	7
SEATING MATERIAL	LOWER SURFACE			CONCRET E - M50	CONCRET E - M50	CONCRETE - M50	CONCRETE - M50
ALLOWABLE CONTACT PRESSURE (N/MM2)	UPPER SURFACE	SERVICEABILITY		-	-	-	-
		ULTIMATE		-	-	-	-
	LOWER SURFACE	SERVICEABILITY		-	-	-	-
		ULTIMATE		22.33	22.33	22.33	22.33
DESIGN LOAD (kN)	SERVICEABILITY LIMIT STATE	NORMAL	VERTICAL MAX	1750	1750	1750	1750
			VERTICAL PERM	1300	1300	1300	1300
			VERTICAL MIN	1288	1288	1288	1288
			LONGITUDINAL	800	800	100	100
			TRANSVERSE	0	0	0	0
			VERTICAL MAX	2600	2600	2600	2600
DESIGN LOAD (kN)	ULTIMATE LIMIT STATE	NORMAL	VERTICAL MIN	1918	1918	1918	1918
			LONGITUDINAL	1200	1200	150	150
			TRANSVERSE	0	0	0	0
			VERTICAL MAX	2450	2450	2450	2450
		WIND	VERTICAL MIN	1918	1918	1918	1918
			LONGITUDINAL	1000	1000	150	150
			TRANSVERSE	0	50	0	50
			VERTICAL MAX	2350	2500	2450	2450
		SEISMIC	VERTICAL MIN	1918	1918	1918	1918
			LONGITUDINAL	800	950	150	150
			TRANSVERSE	0	650	0	550
			LONGITUDINAL	-	-	36	36
TRANSLATION (mm)	SERVICEABILITY LIMIT STATE	Irreversible	TRANSVERSE	4	-	4	-
			LONGITUDINAL	-	-	44	44
		Reversible	TRANSVERSE	4	-	5	-
			LONGITUDINAL	-	-	42	42
	Ultimate Limit State	Irreversible	TRANSVERSE	6	-	6	-
			LONGITUDINAL	-	-	52	52
		Reversible	TRANSVERSE	6	-	6	-
			LONGITUDINAL	-	-	-	-
WHETHER PRE-SETTING ALLOWED (A)/NOT-ALLOWED (NA)				A	A	A	A
ROTATION (RAD)	SERVICEABILITY LIMIT STATE	Irreversible	LONGITUDINAL	0.01	0.01	0.01	0.01
			TRANSVERSE	0.01	0.01	0.01	0.01
		Reversible	LONGITUDINAL	0.01	0.01	0.01	0.01
			TRANSVERSE	0.01	0.01	0.01	0.01



25/04/2025  
**CHIEF ENGINEER  
 DESIGN  
 BMRCL**

**LEGEND:**

- FIXED BEARING -FX
- LONGITUDINAL GUIDED -LG
- ↑ TRANSVERSE GUIDED -TG
- + FREE BEARING -FB

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN	PRJT. TITLE:
				DATE (RO ISSUE) 25.04.2025	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.
					DWG. TITLE: LAYOUT OF CROSS OVER SPANS BP509 TO BP513 FOR BEARING DETAILS.
					DWG NO: BMRCL/PH-II/R1/EXTN/VIA/MISC/004
					ISSUE R0
R0	GOOD FOR CONSTRUCTION		25.04.2025		DATE(CURRENT ISSUE) 25.04.2025

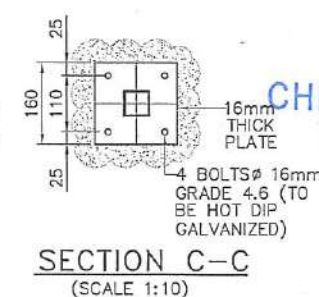
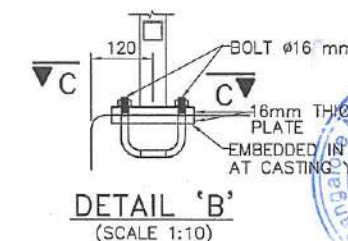
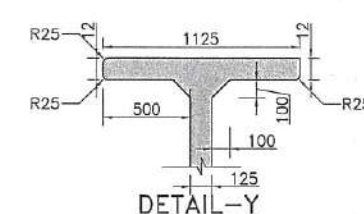
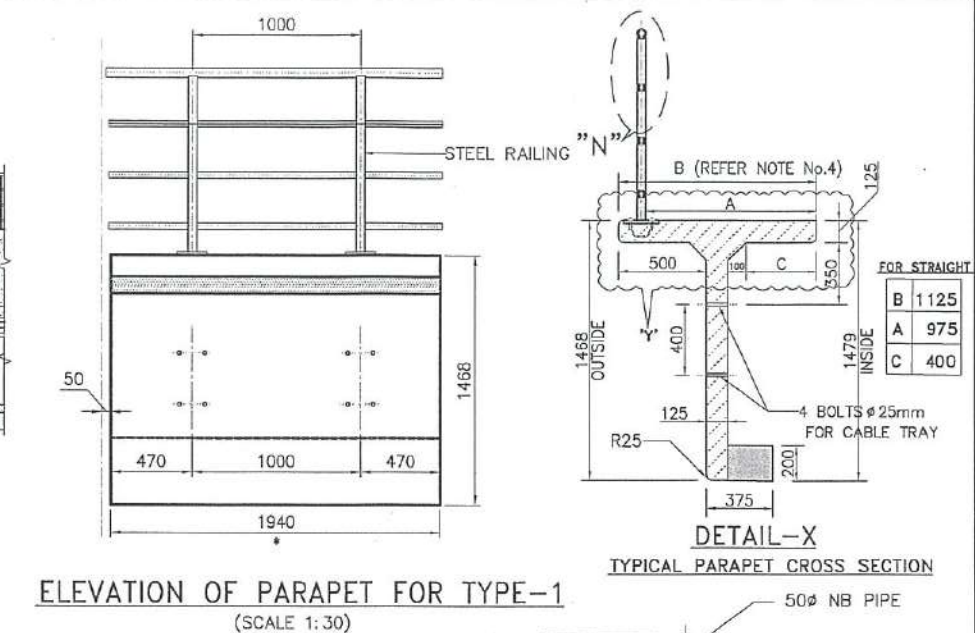
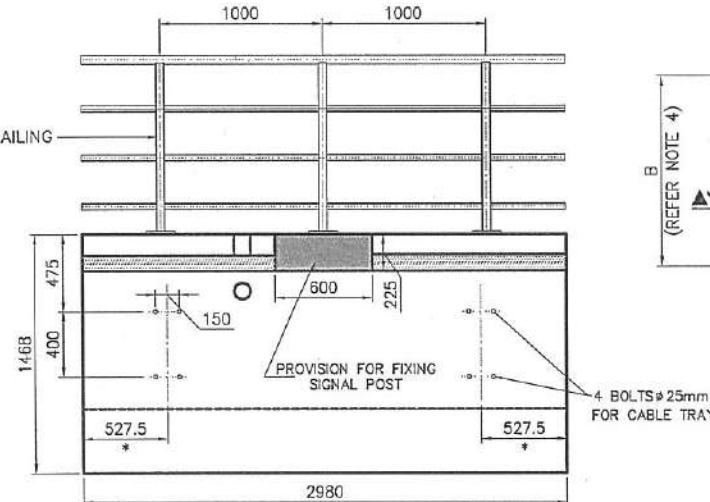
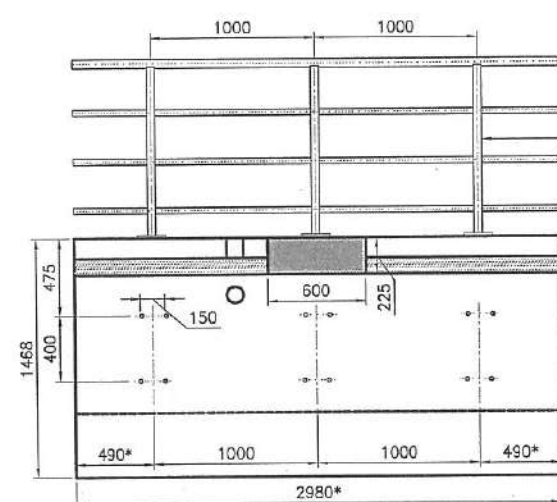
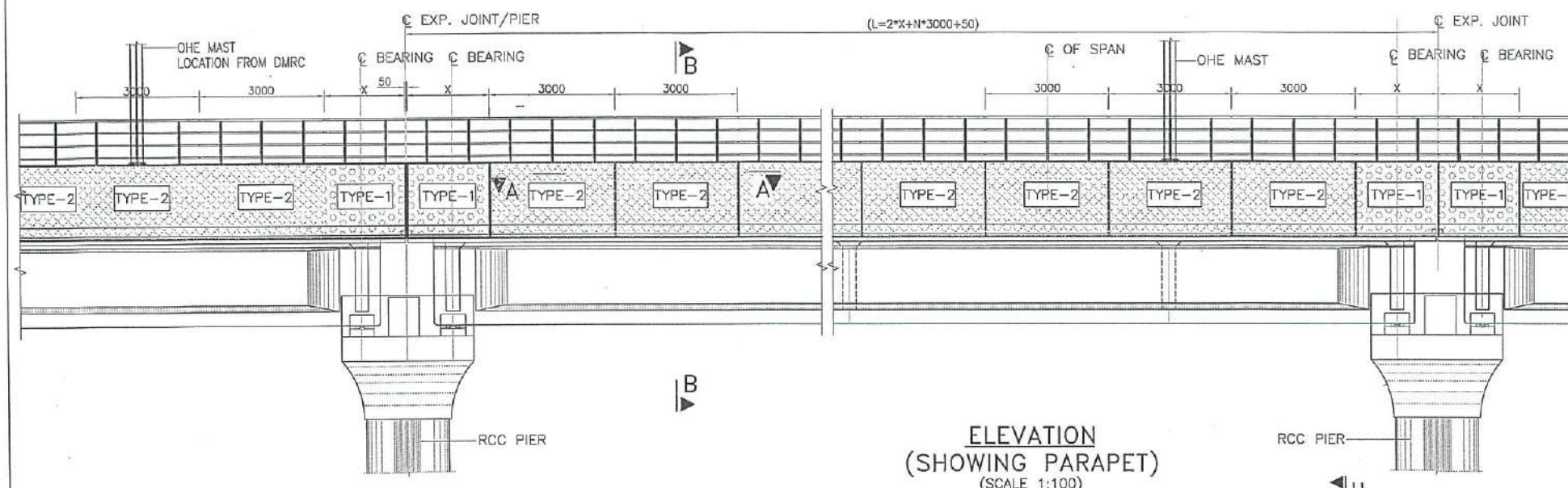


**BANGALORE METRO RAIL  
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 Bangalore - 560027  
 Tel:-080-22969300

IF (PRELIMINARY) ISSUES ARE NOT TO BE  
 USED FOR CONSTRUCTION / FABRICATION BUT  
 ARE ISSUED FOR LIMITED PURPOSES ONLY AS  
 INDICATED IN THE SMALL BLOCK AT THE TOP  
 RIGHT HAND CORNER OF THE TITLE BLOCK.  
 CONSTRUCTION / FABRICATION WORK IS  
 PERMITTED ON (R) (RELEASED) ISSUES  
 INFORMATION CONTAINED WITHIN HOLD IS  
 NOT RELEASED FOR CONSTRUCTION /  
 FABRICATION. FIELD MUST OBTAIN DESIGN  
 OFFICE TO CLEAR HOLD IN TIME BEFORE  
 PROCEEDING WITH ANY CONSTRUCTION /  
 FABRICATION WORK RELATED TO HOLD.





**CHIEF ENGINEER**  
**DESIGN-2**  
**BMRCL**

- NOTES:-**
1. ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE MENTIONED.
  2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH SHEET 2 AND 3 OF THIS DRAWING.
  4. DIMENSION 'A,B,C' SHALL VARY ACCORDING TO RADIUS OF CURVE.

FOR 'I' GIRDER SPANS, LENGTH OF PARAPET NEEDS TO BE MODIFIED BASED ON SPECIFIC SPANS.

GOOD FOR CONSTRUCTION

ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 11.07.2024
				"P" (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.
				CONSTRUCTION / FABRICATION WORK IS PERMITTED ON "P" (RELEASED) ISSUES INFORMATION CONTAINED WITHIN "HOLD" IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR "HOLD" IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO "HOLD".
R0	GOOD FOR CONSTRUCTION		11.07.2024	

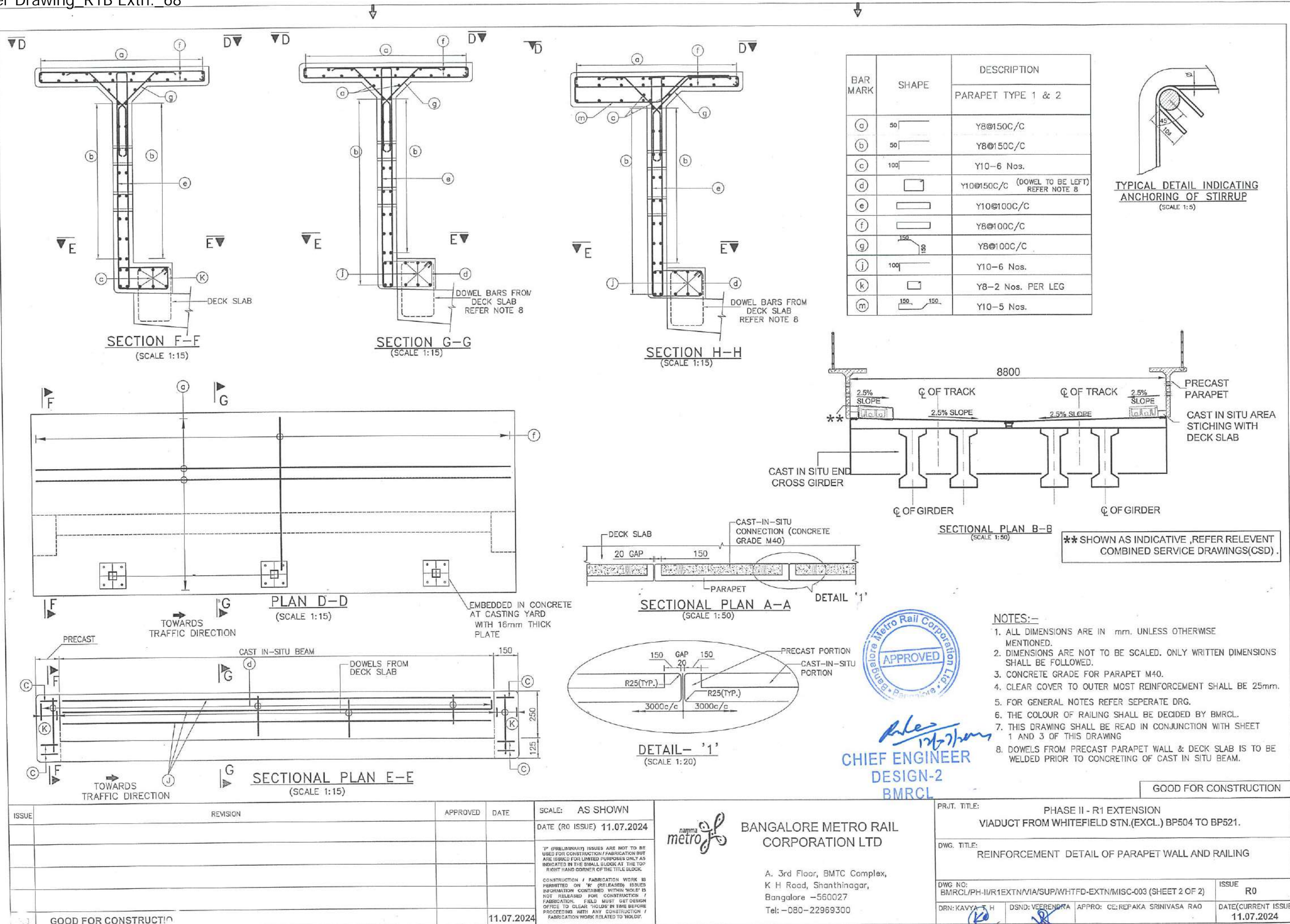


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Bangalore - 560027  
Tel: -080-22969300

PRJT. TITLE:	PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.
DWG. TITLE:	DIMENSIONAL DETAIL OF PARAPET WALL AND RAILING
DWG NO:	BMRCL/PH-II/R1EXTN/VIA/SUP/WHITFD-EXTN/MISC-003(SHEET 1 OF 2)
DRN: KAVYA T H	DSND: VEERENDRA
APPRO: CE:REPAKA SRINIVASA RAO	ISSUE R0
	DATE(CURRENT ISSUE) 11.07.2024





ISSUE	REVISION	APPROVED	DATE	SCALE: AS SHOWN
				DATE (R0 ISSUE) 11.07.2024
<div>1P (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.</div> <div>CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLDS' IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLDS'.</div>				
GOOD FOR CONSTRUCTION				11.07.2024



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Bangalore -560027  
Tel: -080-22969300

PRJ.T. TITLE: PHASE II - R1 EXTENSION VIADUCT FROM WHITEFIELD STN.(EXCL.) BP504 TO BP521.

DWG. TITLE: REINFORCEMENT DETAIL OF PARAPET WALL AND RAILING

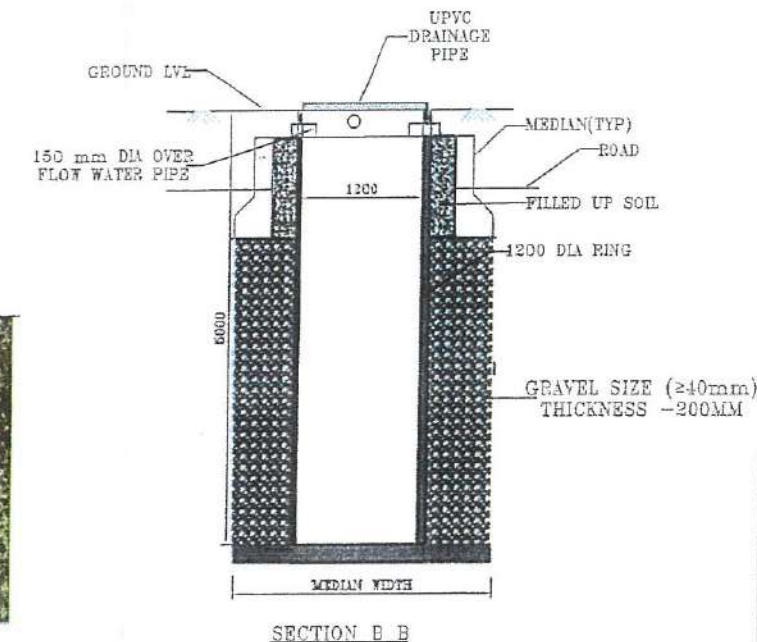
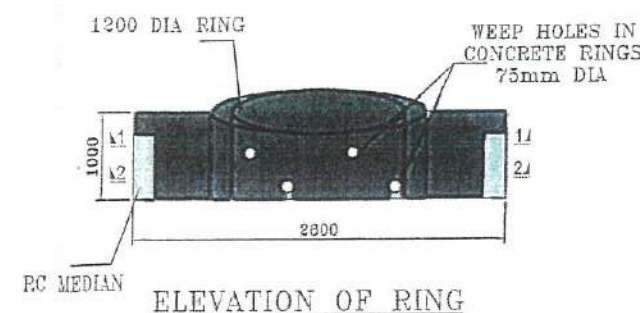
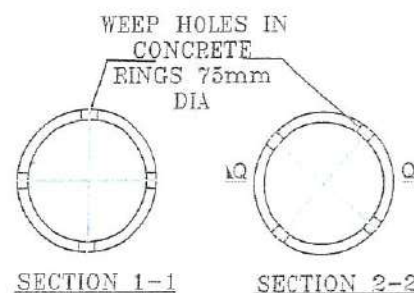
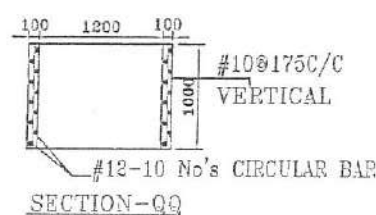
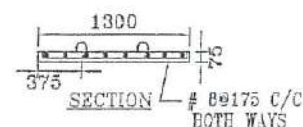
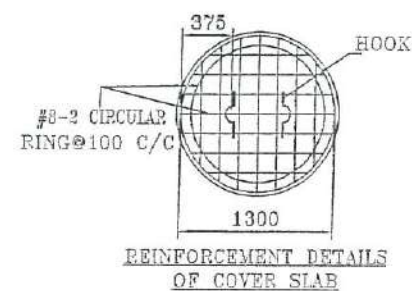
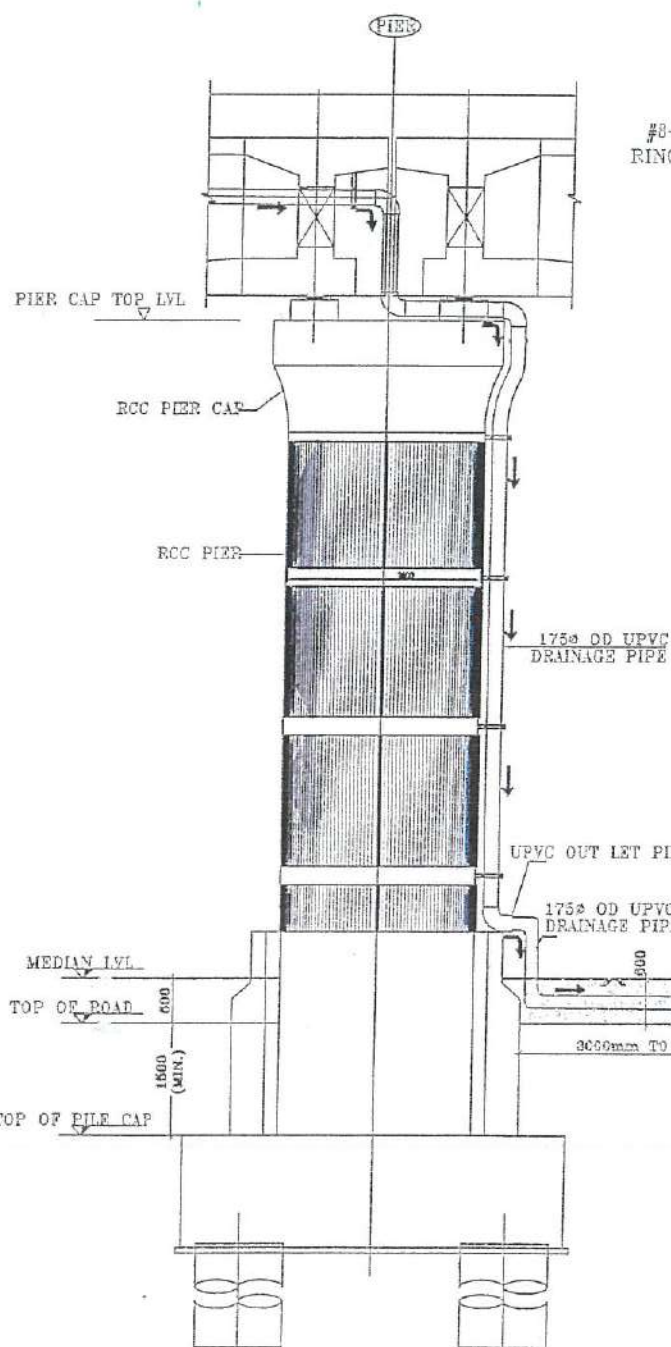
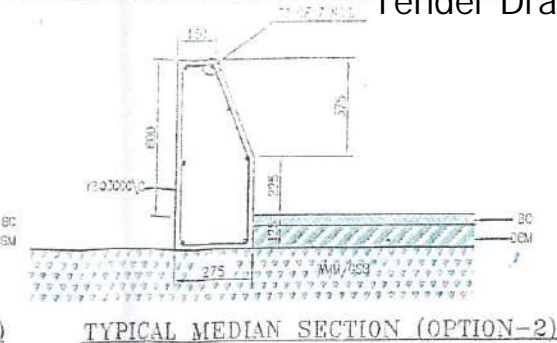
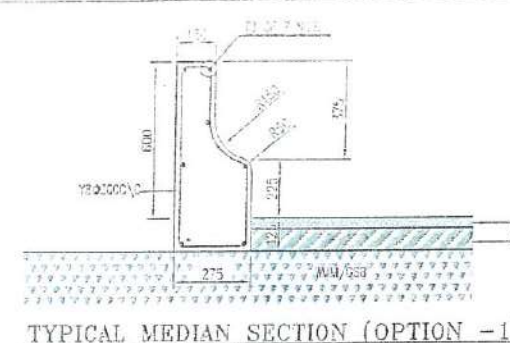
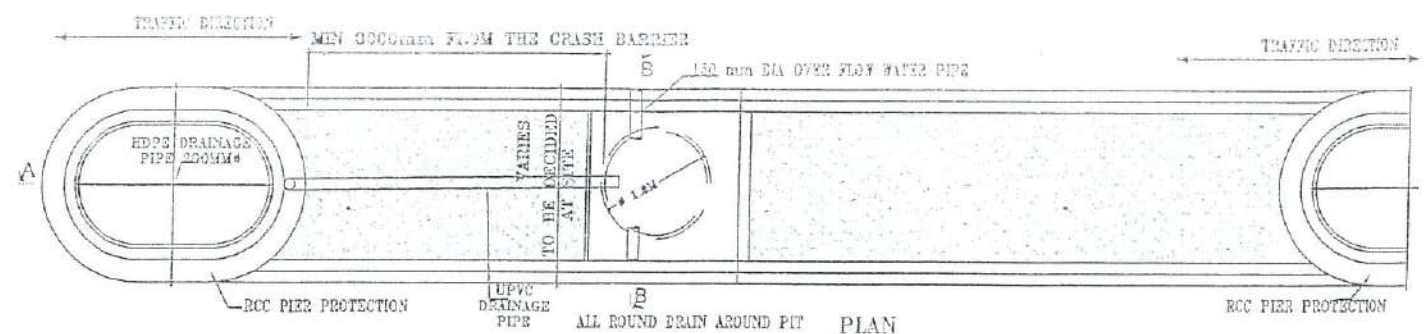
DWG NO: BMRCL/PH-II/R1EXTN/VIA/SUP/WHTFD-EXTN/MISC-003 (SHEET 2 OF 2)

ISSUE R0

DRN: KAVYA T H DSND: VEERENDRA APPRO: CE:REPAKA SRINIVASA RAO

DATE(CURRENT ISSUE) 11.07.2024





NOTE: IF HARD ROCK IS ENCOUNTERED WITHIN 3m THE PIT IS TO BE CLOSED AS RWH IS NOT FEASIBLE.

- GENERAL NOTES:
1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
  2. ALL DIMENSIONS ARE TO BE READ AND NOT MEASURED.
  3. ANY DISCREPANCIES MUST BE BROUGHT TO THE NOTICE OF BMRL BEFORE EXECUTION OF WORK AT SITE.
  4. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT GAD, STRUCTURAL, PLUMBING, TRAFFIC MANAGEMENT PLAN AND ELECTRICAL DRAWINGS.
  5. THIS DRAWING IS THE SOLE PROPERTY OF BMRL. IT SHOULD NOT BE USED/COPIED/REPRODUCED IN ANY FORMAT.
  6. DO NOT SCALE THE DRAWING, FOLLOW FIGURED DIMENSIONS ONLY.
  7. GRADE OF CONCRETE SHALL BE M25 & CLEAR COVER 20MM.

REV. No.	DESCRIPTION	DATE	SIGN	AS SHOWN
R1	GOOD FOR CONSTRUCTION	18.02.2015		



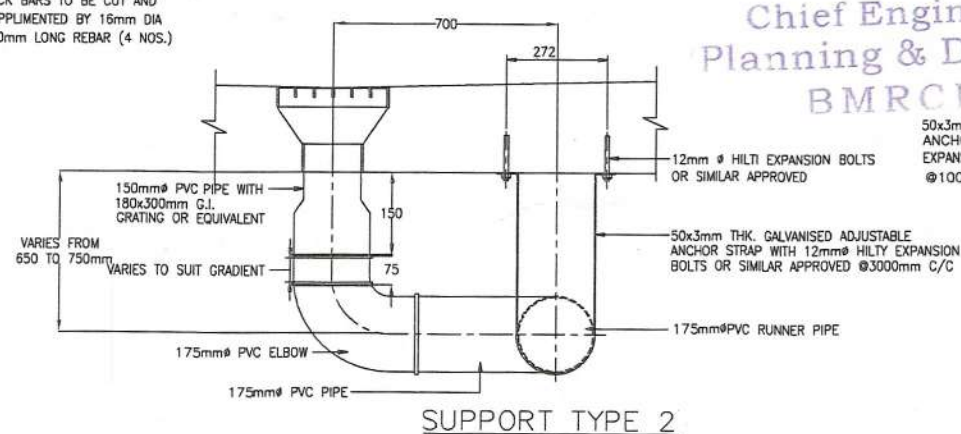
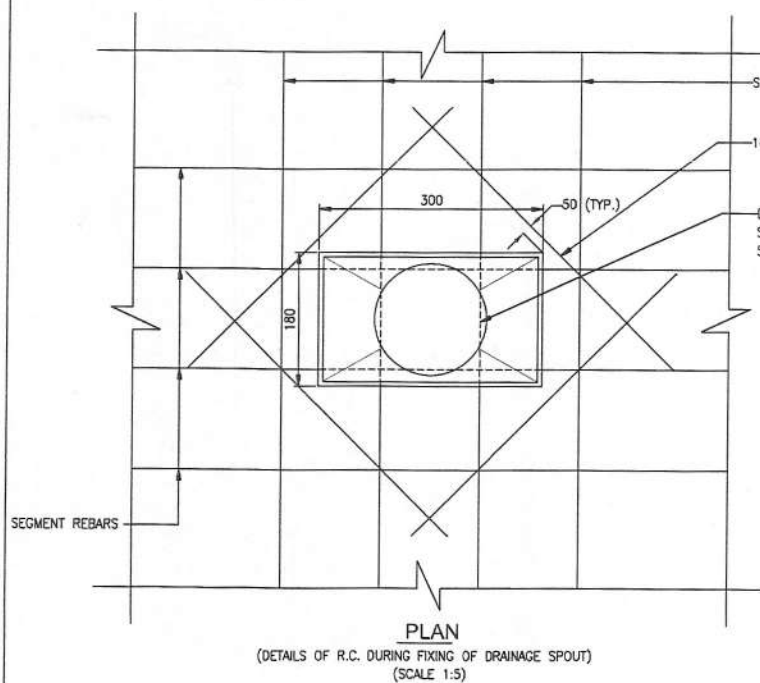
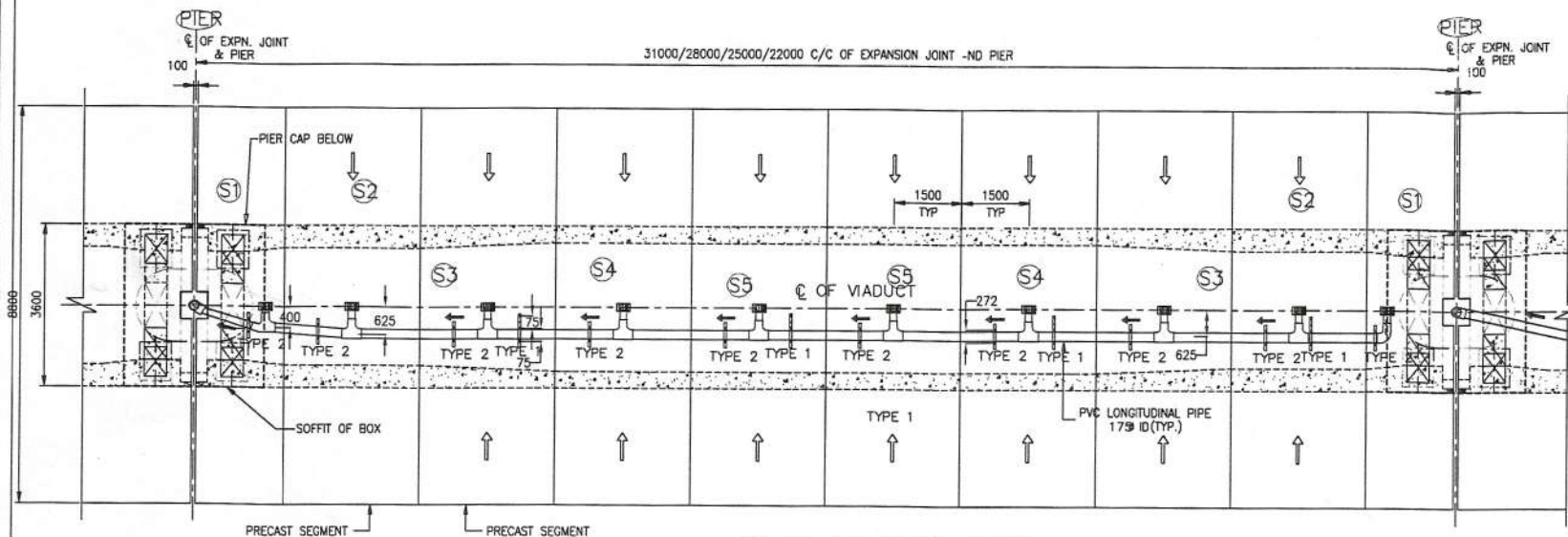
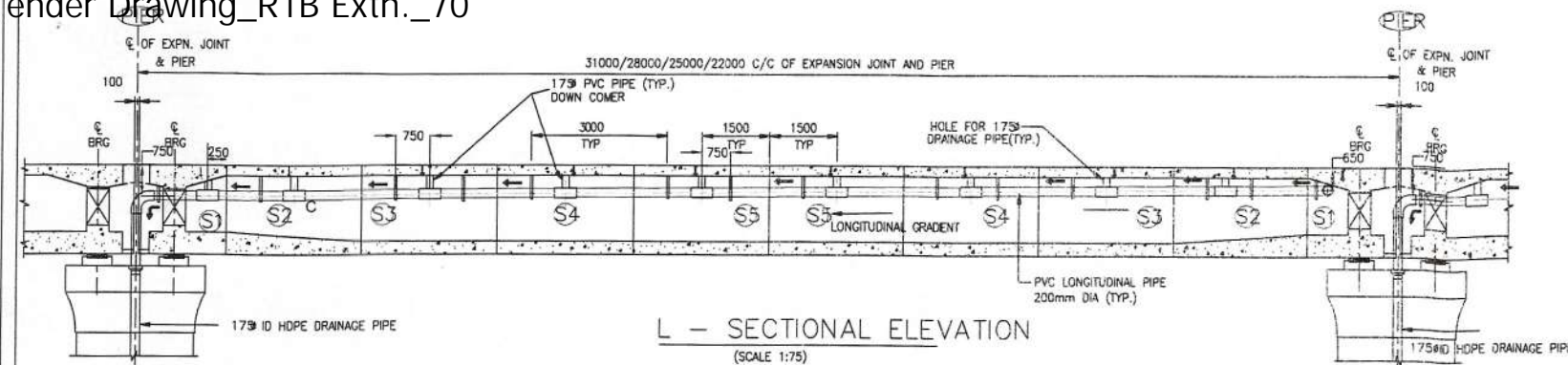
BANGALORE METRO RAIL CORPORATION LTD

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-560027 Tel:-081-22983300

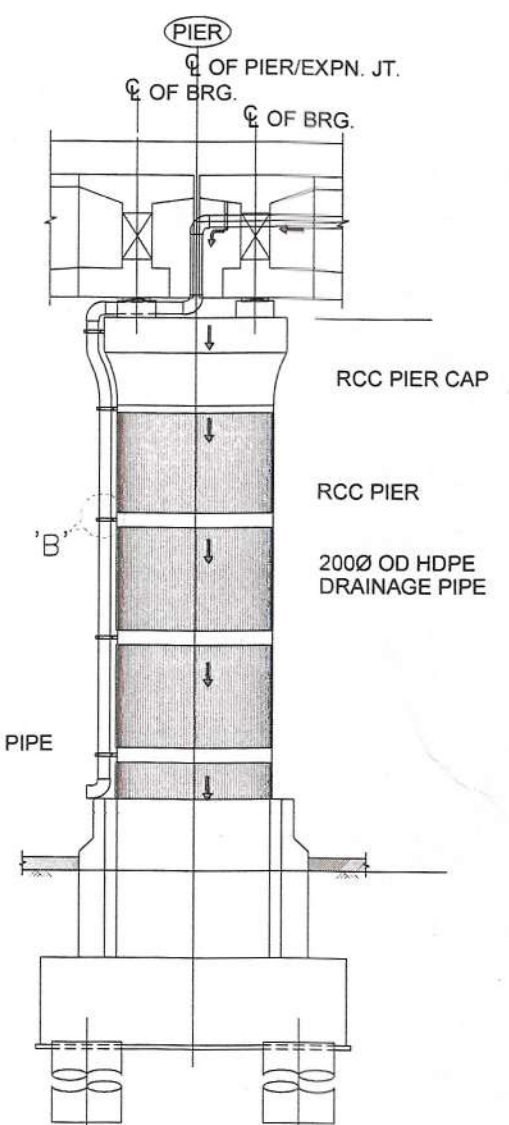
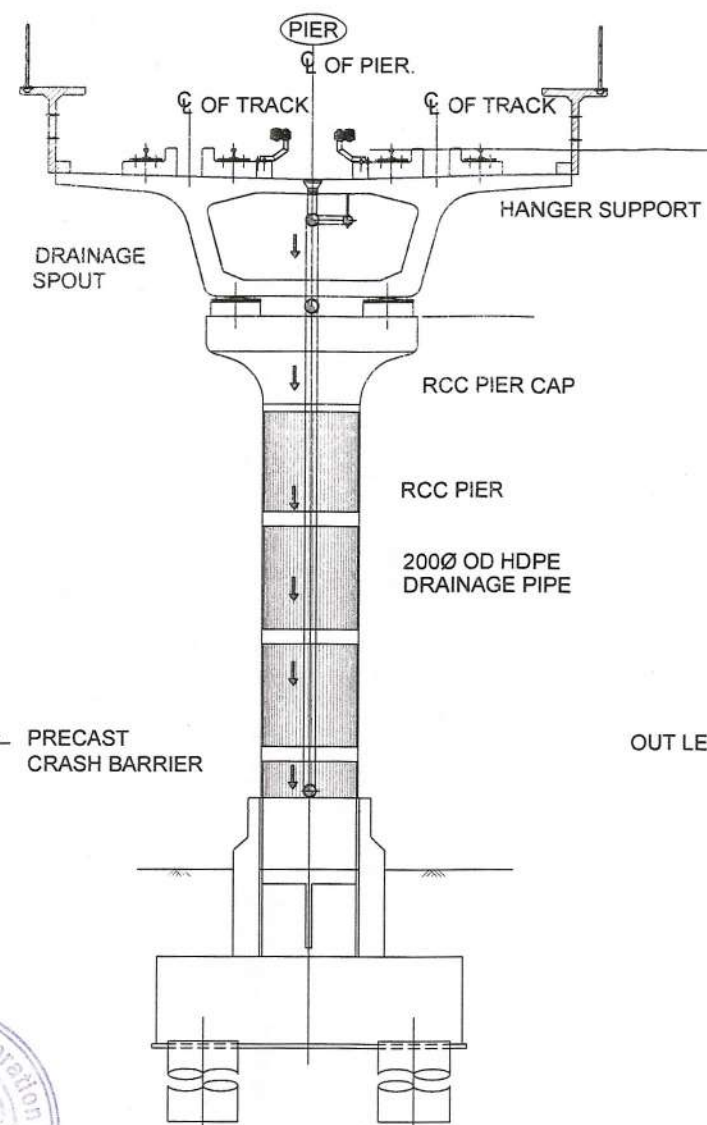
STATUS:	GOOD FOR CONSTRUCTION
DWG. TITLE:	RAIN WATER HARVESTING FROM VIADUCT (TYPICAL DRAWING)
DWG No:	BMRL/PH/GEN.RAIN/HAR/001
ISSUE No:	01
DESIGNED BY:	CHANDRASEKHAR NARAYAN
CHECKED BY:	18.02.2015

STRUCTURAL





NOTE : DIRECTION OF FLOW OF WATER SHOULD BE ALONG THE GRADIENT.



NOTE: -

1. ALL DIMENSION ARE IN MILLIMETERS.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.

GOOD FOR CONSTRUCTION

ISSUE	REVISIONS	APPROVED	DATE
R1	CONNECTION DETAILS OF DRAINAGE PIPE TO PIER ADDED		25-04-18



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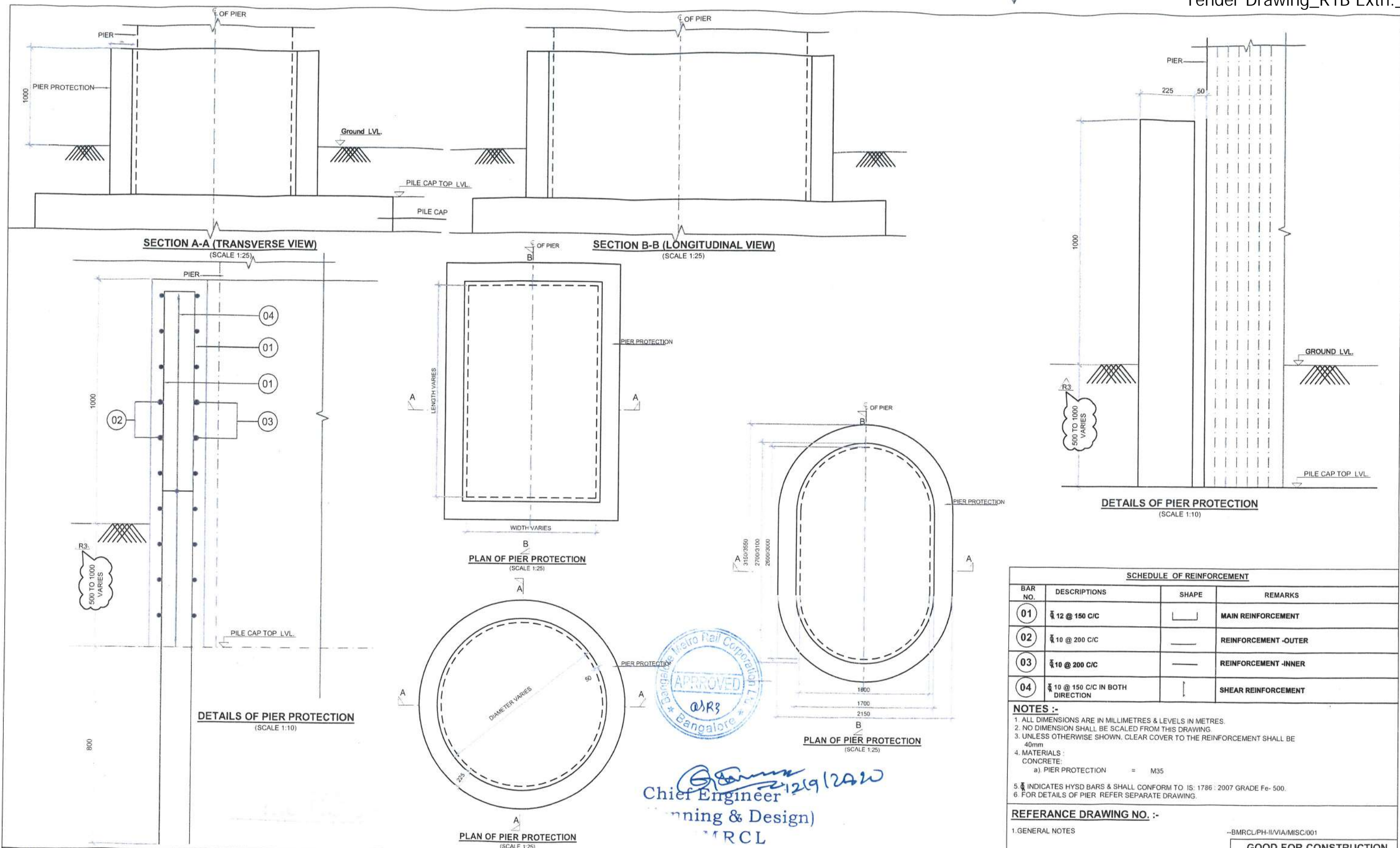
PHASE II - R1 EXTENSION  
BAIYAPPANAHALLI STATION(EXC.) TO WHITEFIELD STATION(INCL.)

DWG. TITLE:  
TYPICAL DRAINAGE DETAILS

DWG. NO: BMRL/PH-II/R1EXTN/VIA/MISC/005

ISSUE: R1  
DATE(CURRENT): 25-04-2018





ISSUE	REVISION	APPROVED	DATE	SCALE	AS SHOWN
R1	REVISED CLEAR COVER		30.05.2018	DATE (R1 ISSUE)	17.04.2018
R2	LENGTH AND WIDTH IN RECTANGULAR SECTION REVISED AND CIRCULAR PIER PROTECTION DETAIL ADDED		26.11.2019		
R3	REVISED AS SHOWN		12-09-2020		

CONSTRUCTION / FABRICATION WORK IS PERMITTED ON 'R' (RELEASED) ISSUES INFORMATION CONTAINED WITHIN 'HOLD' IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST GET DESIGN OFFICE TO CLEAR 'HOLD' IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO 'HOLD'.

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PROOF CHECKED

PHASE II - REACH 1 EXTN.

DETAILS OF PIER PROTECTION

BMRCL/PH-II/R1-EXTN/GEN/MISC-PP/001

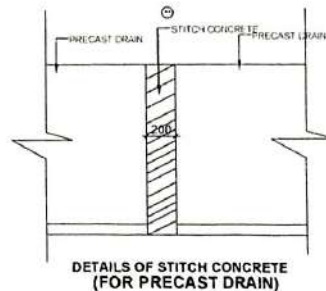
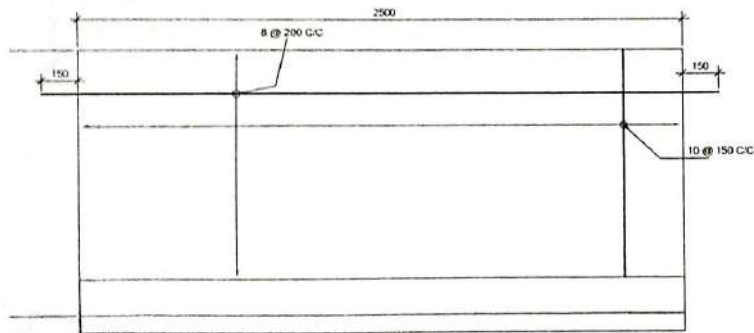
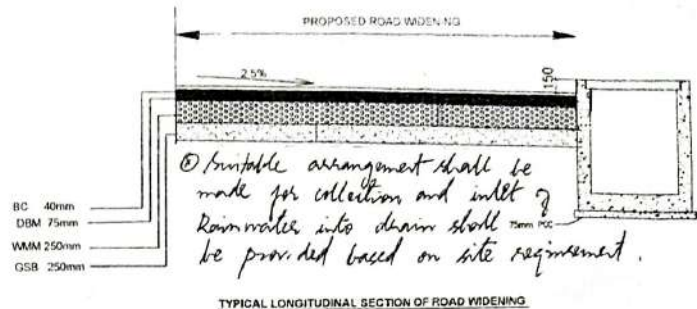
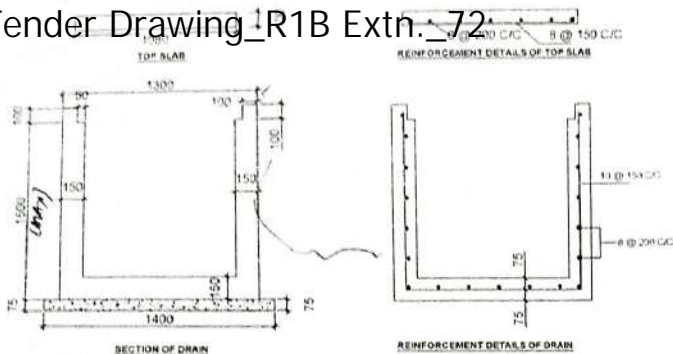
R3

12-09-2020



# Tender Drawing\_R1B Extn. 72

12



**\*\*EPOXY BASED BONDING AGENT TO BE APPLIED BETWEEN STITCH CONCRETE AND PRECAST UNITS.**

## NOTES :-

1. ALL DIMENSIONS ARE IN MILLIMETRES
2. NO DIMENSION SHALL BE SCALED FROM THIS DRAWING
3. UNLESS OTHERWISE SHOWN, CLEAR COVER TO THE REINFORCEMENT SHALL BE 50MM FOR DRAIN & 40MM FOR TOP SLAB
4. MATERIALS  
 CONCRETE  
 a) DRAIN & STITCH CONCRETE - M35/50  
 b) PCC - M20
5.  $\Phi$  INDICATES HYSD BARS & SHALL CONFORM TO IS 1786 1925 GRADE Fe 500

**TYPICAL LONGITUDINAL SECTION OF PRECAST DRAIN (FOR PRECAST DRAIN)**



**T. R. Ramesh Chandra**  
 09/06/17  
 Chief Engineer  
 (Planning & Design)  
 BMRCL

*Received*  
*09/06/17*

NO.	REVISION	APPROVED	DATE	SCALE	AS ABOVE
				DATE: (DD/M/YY)	

IF PRELIMINARY ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE REQUIRED FOR LIMITED PURPOSES ONLY, AS INDICATED BY THE SMALL BLOCK AT THE TOP RIGHT CORNER OF THE TITLE BLOCK, CONSTRUCTION / FABRICATION SHALL BE PREVENTED OR IF RELEASED, READER INFORMATION CONTAINED HEREIN SHALL BE NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST BE REVISION, OFFICE TO CLEAR, VALID IN THIS BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO THIS.



**BANGALORE METRO RAIL CORPORATION LTD**

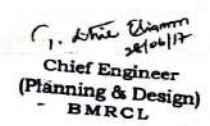
A. 3rd Floor, BMTCL Complex,  
 K H Road, Shanthinagar,  
 Bangalore - 560027  
 Tel:-080-22969300

PHASE-II REACH 1 EXT

**TYPICAL SECTION FOR DRAIN AND ROAD WIDENING**

NO.	DMRCL/PH-I/R1/MISC/014	ISSUE	01
DATE	09/06/17	BY	09/06/17





Note: Asst. Exec. Eng. Asst. Executive Engineer  
Traffic Engineering Cell

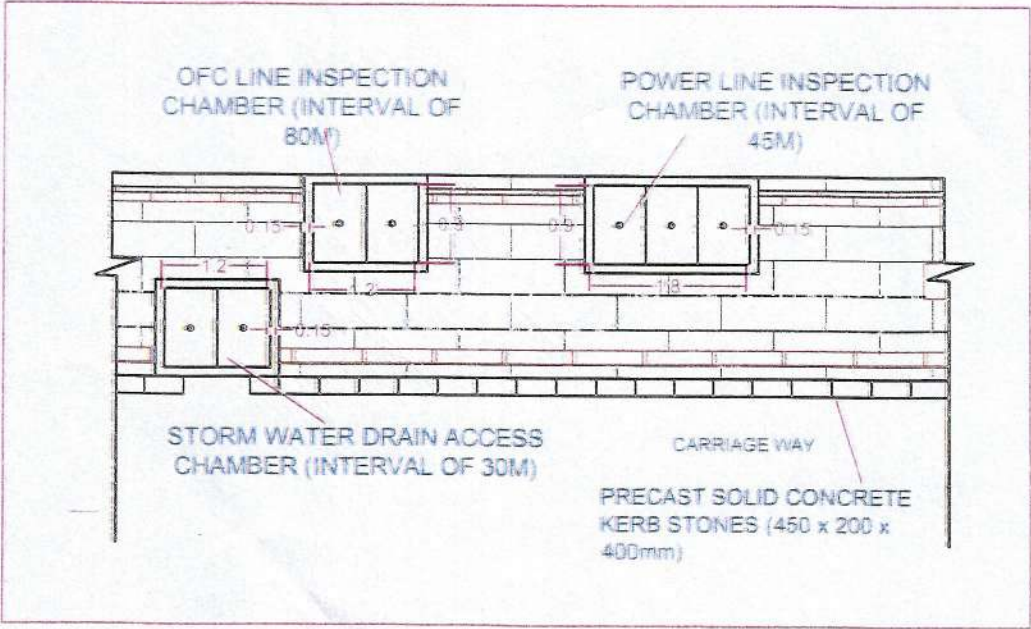
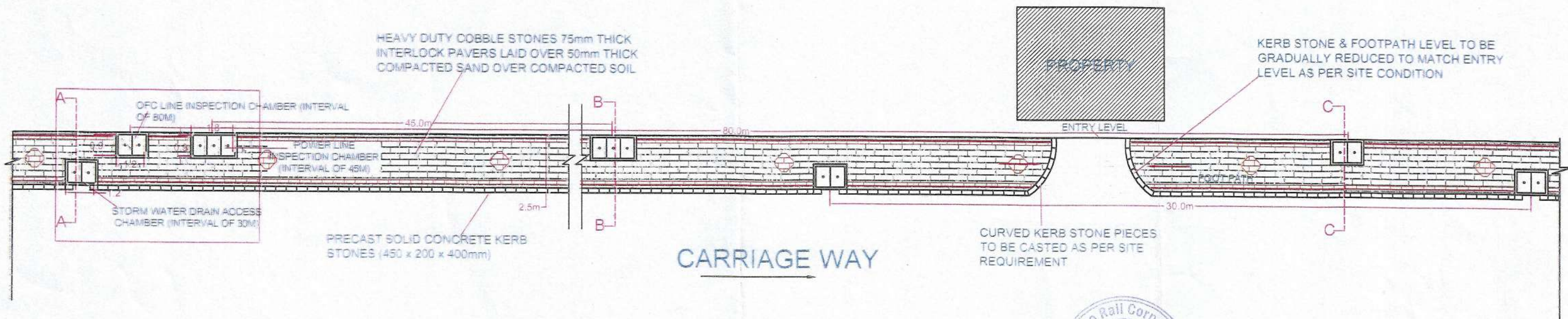
Executive Engineer:  
Traffic Engineering C-117

- iv. Access chamber for storm water drain shall be of size 900x1200x1050 at 30mtrs interval.
- v. Inspection chamber for Power line shall be of size 600x1800x900 at 45mtrs interval.
- vi. Inspection chamber for O/C line shall be of size 900x1200x600 at 80mtrs interval.
- vii. Street light pole shall be 9mtrs height with LED fixtures.
- viii. Inlet chamber for rain water collection shall be provided at 30mtrs interval.

Traffic Engineering Cell  
Bruhat Bangalore Mahanagara Palike  
N.R.square, Bangalore - 560 052

Proposed Signal Free Corridor along  
Identified Stretches of Road from Mekhri Circle  
to NH-64B (NH-207) (Near Thirumalashettyhalli)  
via Old Madras Road, Hope Farm Junction and  
Channasandra Main Road.





T. L. S. Chiamm  
17/11/18  
Chief Engineer  
(Planning & Design)  
BMRCL

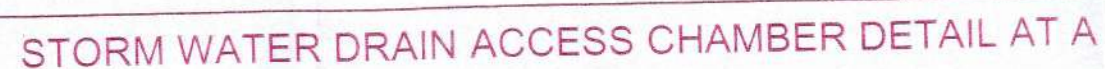
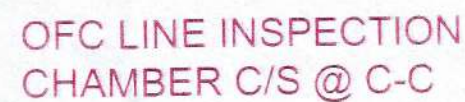
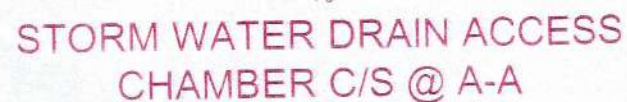


BANGALORE METRO RAIL CORPORATION LTD.

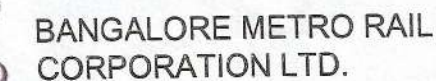
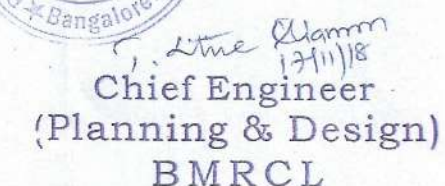
DRAWING TITLE:  
  
TYPICAL DETAILS & PLAN OF FOOTPATH AND CHAMBERS

DATE: 14-11-2018  
SCALE: NA





Note: Slab thickness shall be 300mm at cross road locations



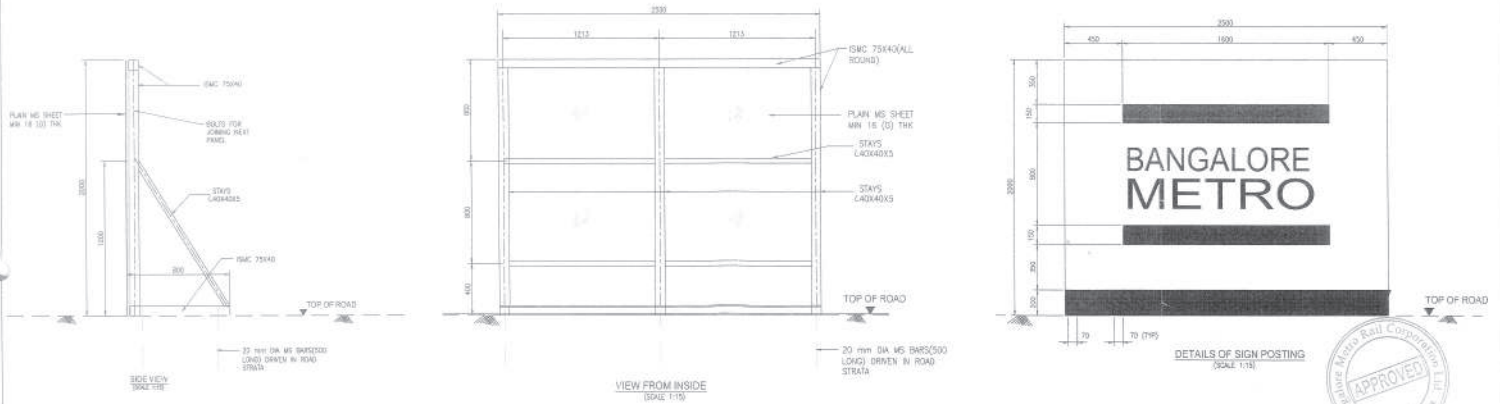
CROSS SECTION OF SEWER WATER DRAIN CHAMBER,  
POWER LINE CHAMBER & OFC LINE CHAMBER

SCALE: NA



Under Drawing\_R1B Extn.\_76

(SCALE 7-15)



DETAILS OF SIGN POSTING  
(SCALE 1/15)



Chief Engineer  
(Planning & Design)  
BMRCL

GOOD FOR CONSTRUCTION

PHASE II - R1 EXTENSION  
BAYAPPANAHALLI STATION (EXCL.) TO WHITEFIELD STATION (INCL.)

ELEVATION OF ONE UNIT OF TEMPORARY BARRICADING

INC. HQ: 3400 CLYDE RD. - (1/11) EXTN/YW/MISC/14

TABLE 1

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0400

STAGE	NO
DATE/COMMENTS	



BANGALORE METRO RAIL

CORPORATION LTD

A. 3rd Floor, BMTC Complex.

Tel: 0800-22969300