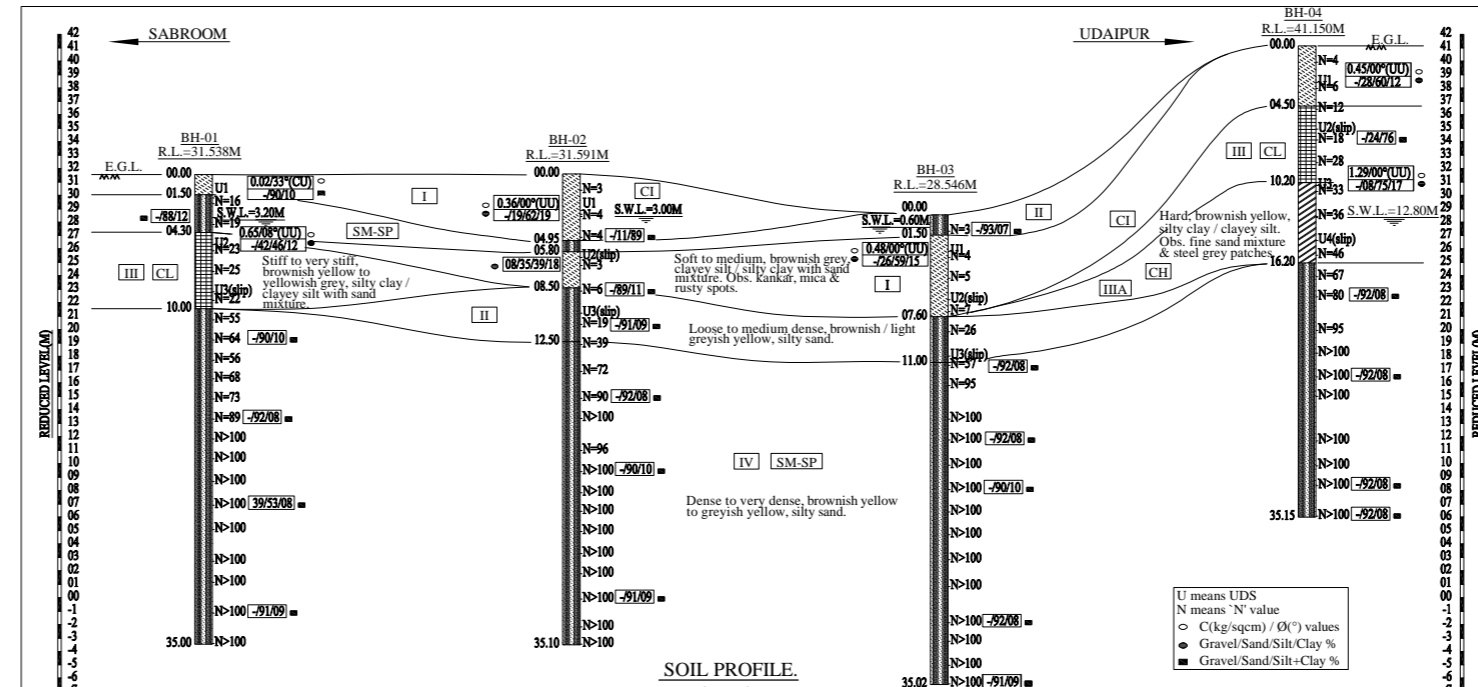
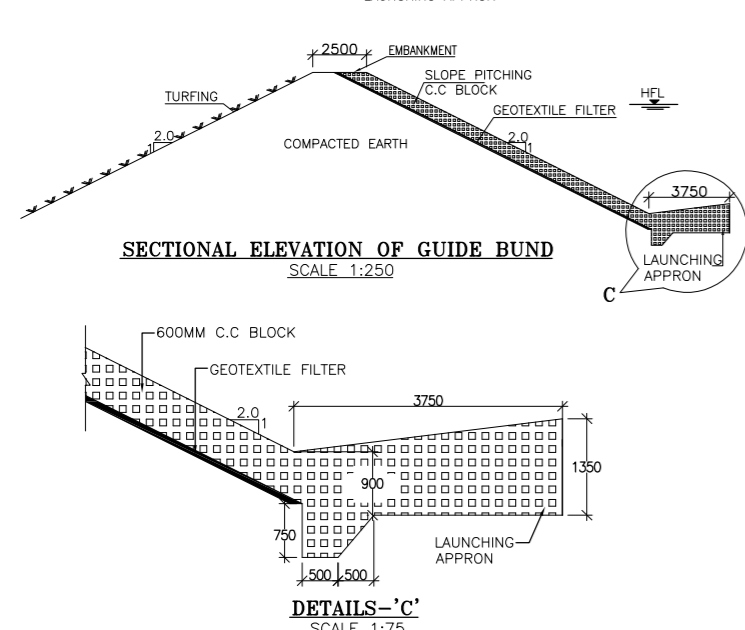
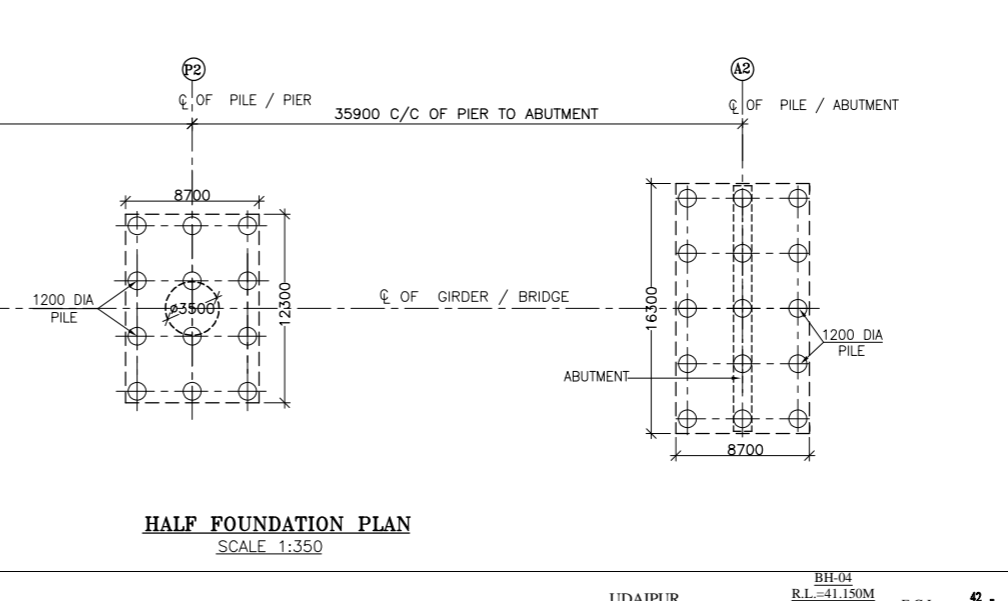
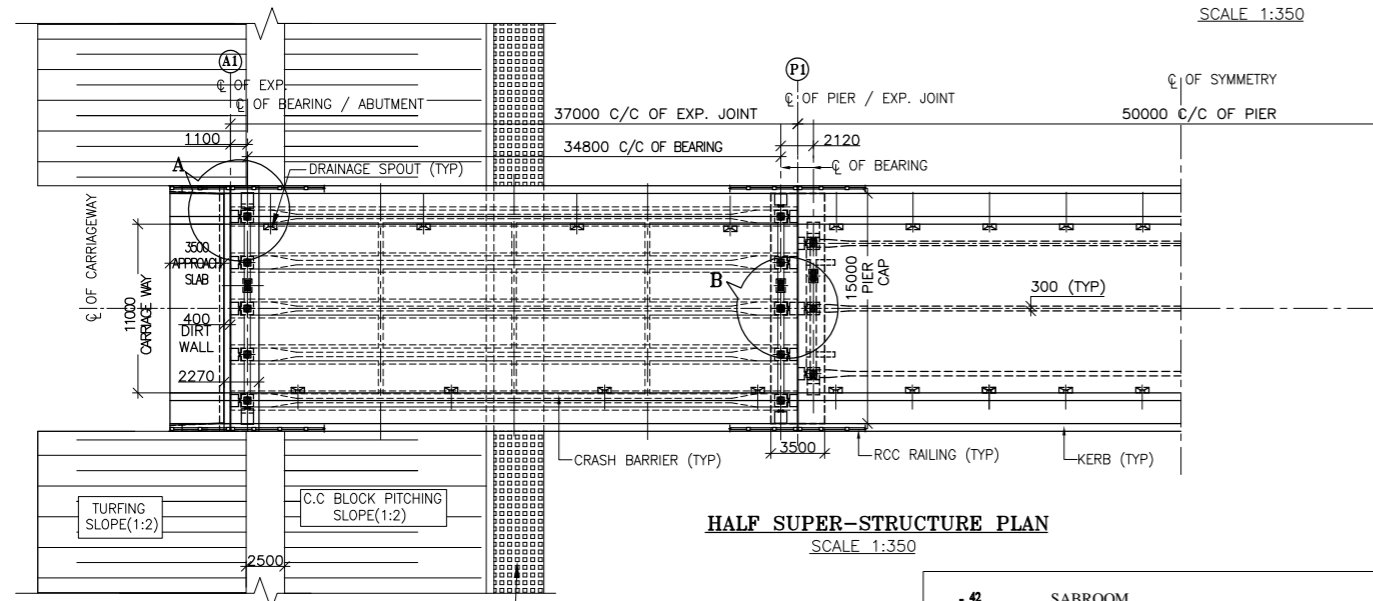
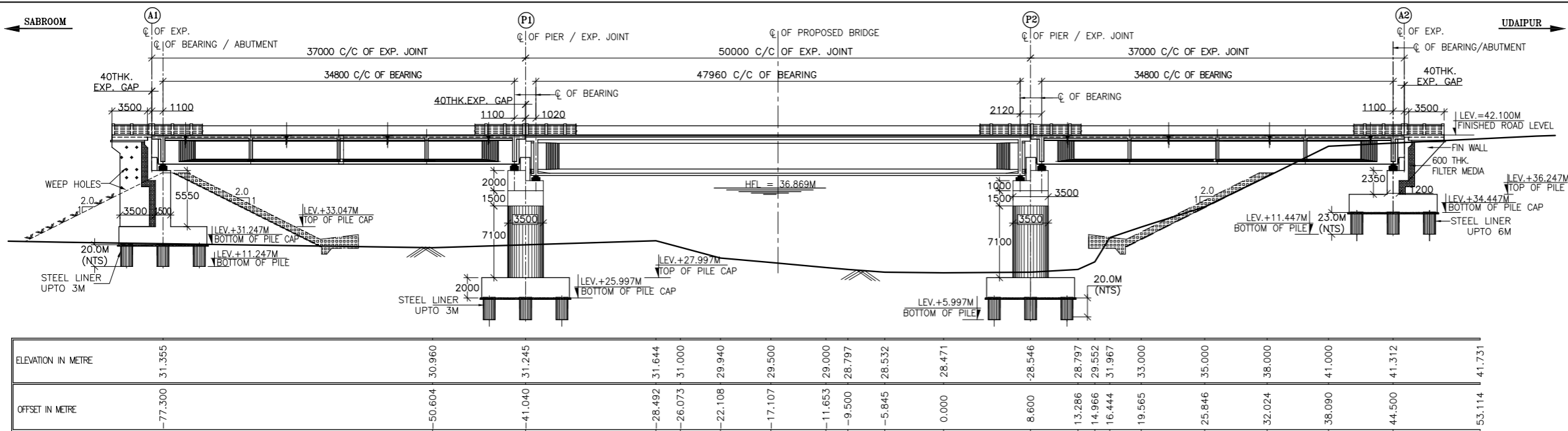


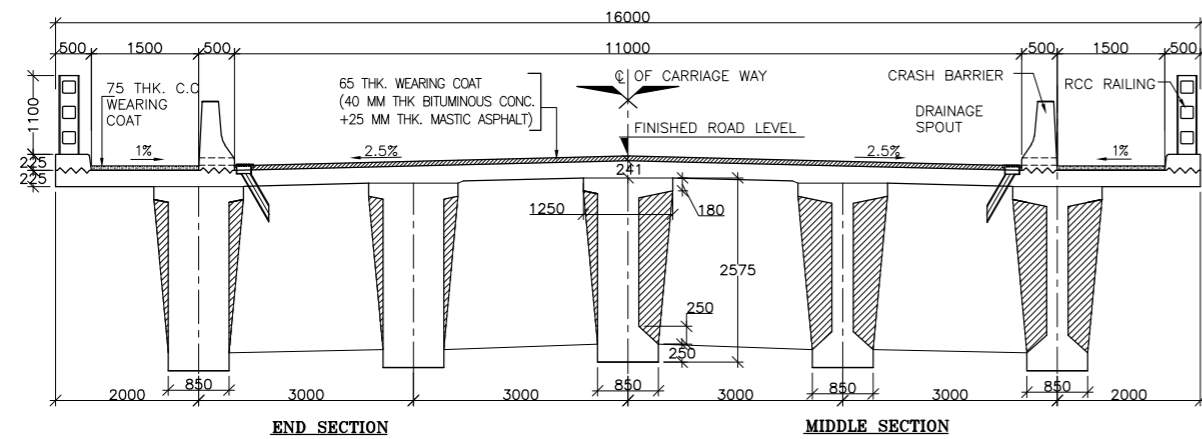


# **STRUCTURAL DRAWING**

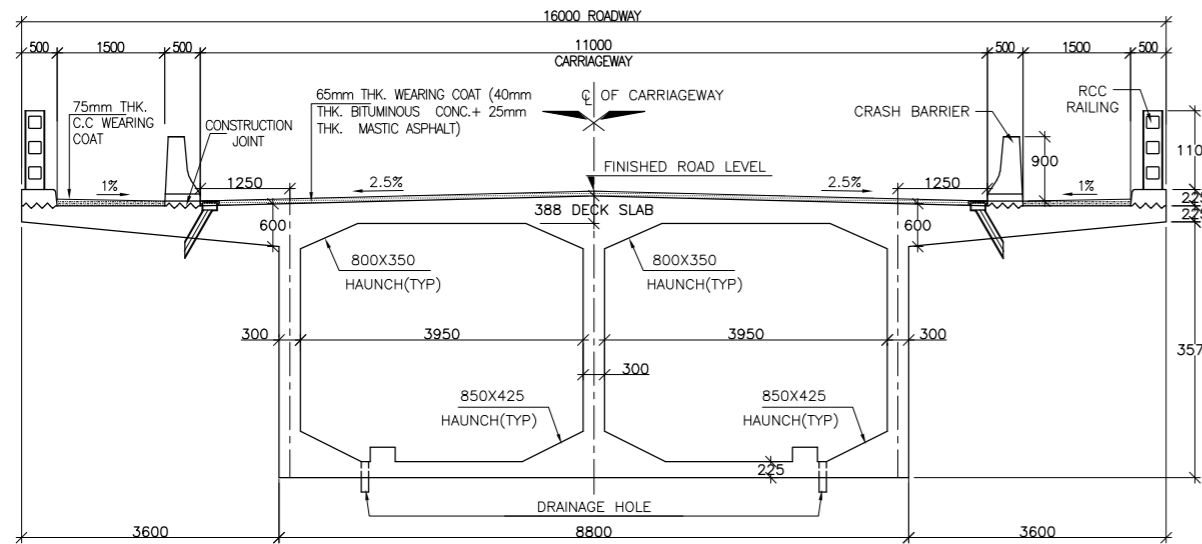


- GENERAL NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M. UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  - MATERIALS SPECIFICATIONS :**
    - CONCRETE :**
      - GRADE OF CONCRETE USED :-
        - SUPERSTRUCTURE (DECK)=M40
        - APPROACH SLAB = M30,
        - SUPERSTRUCTURE(GIRDER)=M45,
        - P.C.C BELOW APPROACH SLAB=M15,
        - SUBSTRUCTURE = M30,
        - R.C.C. RAILING & KERB = M30,
        - RETURN WALL = M30,
        - CRASH BARRIER = M40,
        - PILE CAP = M30,
        - PEDESTAL = M35,
        - PILE = M35,
        - REACTION BLOCK = M35.
        - DIRT WALL = M30,
    - CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
    - 43/53 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 8112 OR 33 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 269 OR PORTLAND SLAG CEMENT CONFORMING TO IS. 455 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
    - TO IMPROVE WORKABILITY OF CONCRETE, ADMIXTURES CONFORMING TO IS:9103 MAY BE USED SUBJECT TO SATISFACTORY PROVEN USE.
    - THE MINIMUM CEMENT CONTENT IN CONCRETE SHALL BE AS PER TABLE 14.2, IRC -112-2011
    - MAX. WATER CEMENT RATIO SHALL BE AS PER TABLE-14.2, IRC:112-2011.
  - REINFORCEMENT :**
    - ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe 500) CONFORMING TO IS : 1786 (EXCEPT FOR MESH REINFORCEMENT WHICH SHALL BE MS BARS GRADE, DESIGNATION Fe 250 CONFORMING TO IS:432 PART-I MILD STEEL)
  - WATER :**
    - WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO IRC : 112 - 2011.
  - EXPANSION JOINTS :**
    - THE EXPANSION JOINTS SHOULD BE STRIP SEAL TYPE.
  - BEARING :**
    - BEARING SHALL BE OF POT & POT CUM PTFE TYPE. THE SIZE & DIMENSIONS OF THE BEARINGS SHALL BE FINALIZED AS PER THE DETAILS PROVIDED BY THE APPROVED VENDOR.
  - FILTER MATERIAL :**
    - FILTER MATERIAL BEHIND ABUTMENT AND RETURN WALL SHALL CONFORM TO CLAUSE 2504.2.2 OF MoRTH SPECIFICATIONS TO A THICKNESS OF NOT LESS THAN 600mm. WITH SMALLER SIZE TOWARDS THE SOIL AND BIGGER SIZE TOWARDS THE WALL TO THE FULL HEIGHT.
  - PROPERTIES OF BACKFILL SOIL :**  $\gamma = 2.0 \text{ t/m}^3$ ,  $\phi = 30^\circ$ .
- WORKMANSHIP/DETAILING :**
    - MINIMUM CLEAR COVER :
      - SUPERSTRUCTURE = 40MM
      - SUBSTRUCTURE : ABUTMENT=75MM, RETURN WALL & PIER=50MM
      - FOUNDATION = 75MM
    - DESIGN LOAD :
      - CLASS A THREE LANES OR CLASS A ONE LANE + CLASS 70R TRACKED/WHEELED OR IRC CLASS SV LOADING WHICHEVER PRODUCES WORST EFFECT IS CONSIDERED FOR DESIGN.
      - THE BRIDGE IS IN SEISMIC ZONE-V.
      - SEISMIC LOADING :- AS PER CL. NO. 219 OF IRC:6-2017.
      - FOOTPATH :- AS PER CL. NO. 206.1 OF IRC:6-2017.
    - FOR ENSURING PROPER COVER OF CONCRETE TO REINFORCEMENT SPECIALLY MADE POLYMER COVER BLOCKS SHALL ONLY BE USED.
    - BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502.
    - LAP LENGTH & DEVELOPMENT LENGTH ( $L_d$ ) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH RELEVANT CLAUSE 15.2.5.1 & 15.2.3.3 OF IRC : 112-2011.
    - PROPER COMPACTION OF CONCRETE SHALL BE ENSURED BY USE OF FORM VIBRATOR OR NEEDLE VIBRATORS. USE OF FULL WIDTH SCREED VIBRATORS FOR COMPACTION OF CONCRETE IN DECK SLAB SHALL BE ENSURED.
    - SHUTTERING PLATES SHALL SUITABLY BE STIFFENED TO ENABLE THE COMPACTION BY FORM VIBRATORS.
    - SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
    - THE WEEP HOLES SHALL BE WITH 100MM DIA AC PIPE IN 1:20 SLOPE @ 1M C/C STAGGERED HORIZONTALLY & VERTICALLY AT ABUTMENT & RETURN WALLS.
    - THE LOCATION OF JACKS FOR LIFTING UP THE SUPERSTRUCTURE TO REPLACE BEARINGS ETC. IS SHOWN THUS THIS SHALL BE DISTINCTLY ETCHED ON END CROSS GIRDERS AND PIER / ABUTMENT CAPS.
    - MAXIMUM SCOUR LEVEL :-
      - AT ABUTMENT = 28.471M
      - AT PIER = 23.644M
    - PILE CAPACITY :
      - AT ABUTMENT : VERTICAL = 325 TON  
HORIZONTAL = 40 TON(A1), 28 TON(A2)
      - AT PIER : VERTICAL = 270 TON  
HORIZONTAL = 30 TON
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO.:
    - CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 02 TO 09)
    - CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)
    - CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

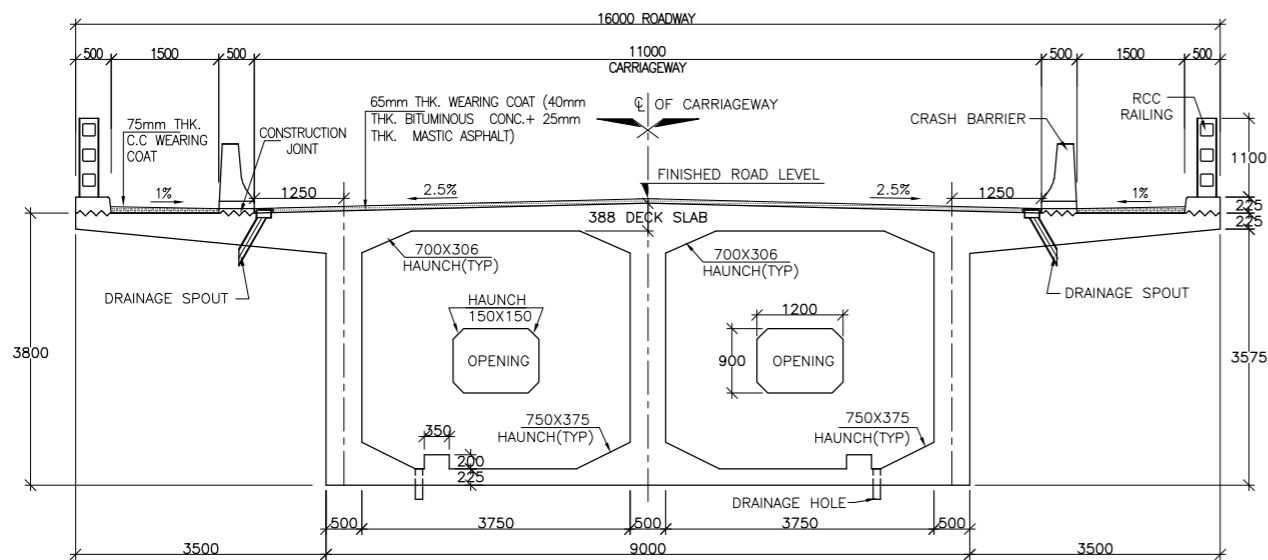
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DATE: AUGUST, 2019				PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA		SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT		C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.		REVISION MKD. - R0		SHEET NO. - 01 OF 10	
REVISIONS										DRAWN BY		DESIGN BY	
										SN.D		S.D	
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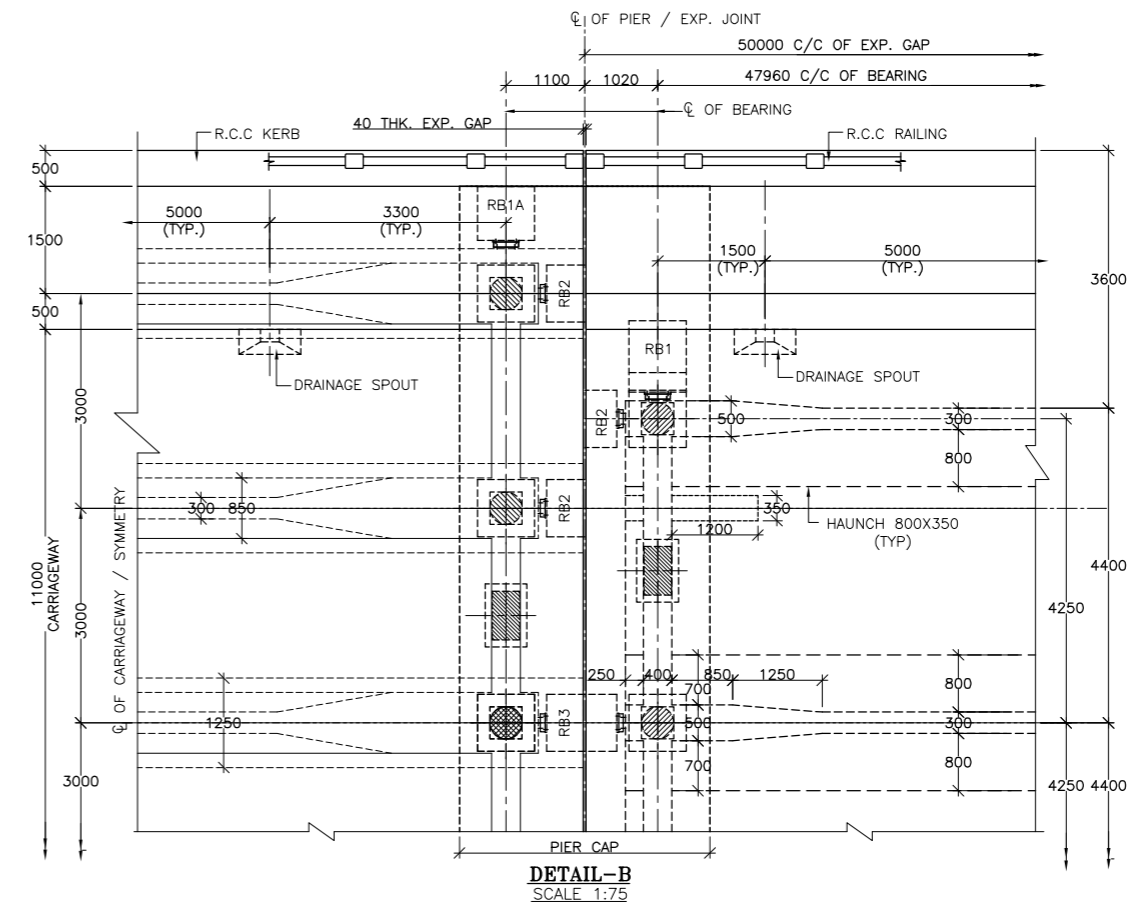
**CROSS SECTION OF SUPER STRUCTURE**  
SCALE-1:75



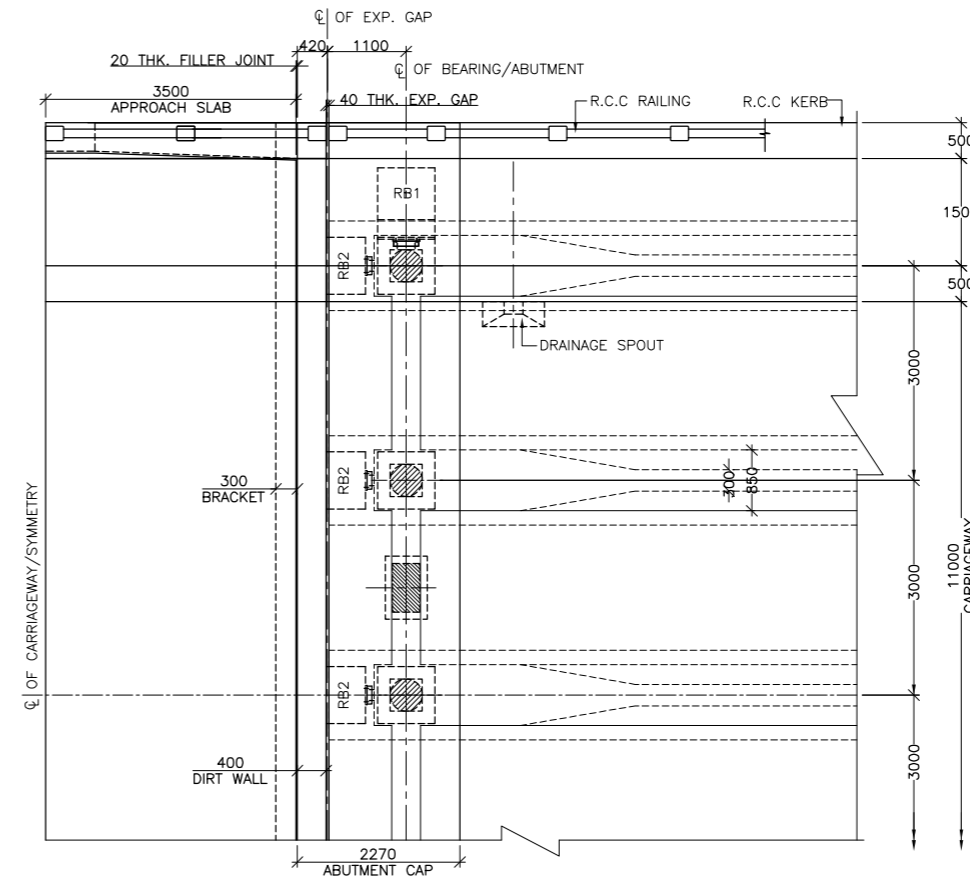
**CROSS SECTION OF MIDDLE PORTION OF PSC BOX GIRDER**  
SCALE 1:75



**CROSS SECTION OF END PORTION OF PSC BOX GIRDER**  
SCALE 1:75



**DETAIL-B**  
SCALE 1:75



**DETAIL-A**  
SCALE 1:75

**NOTES:-**  
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN M. UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.  
2. THIS DRAWING IS PREPARED IN CONNECTION WITH :  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 & 03 TO 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

SCALE:	AS SHOWN
DATE:	AUGUST, 2019
MKD.	DATE
DESCRIPTION	CHKD.
REVISIONS	APPRD.

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001

PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

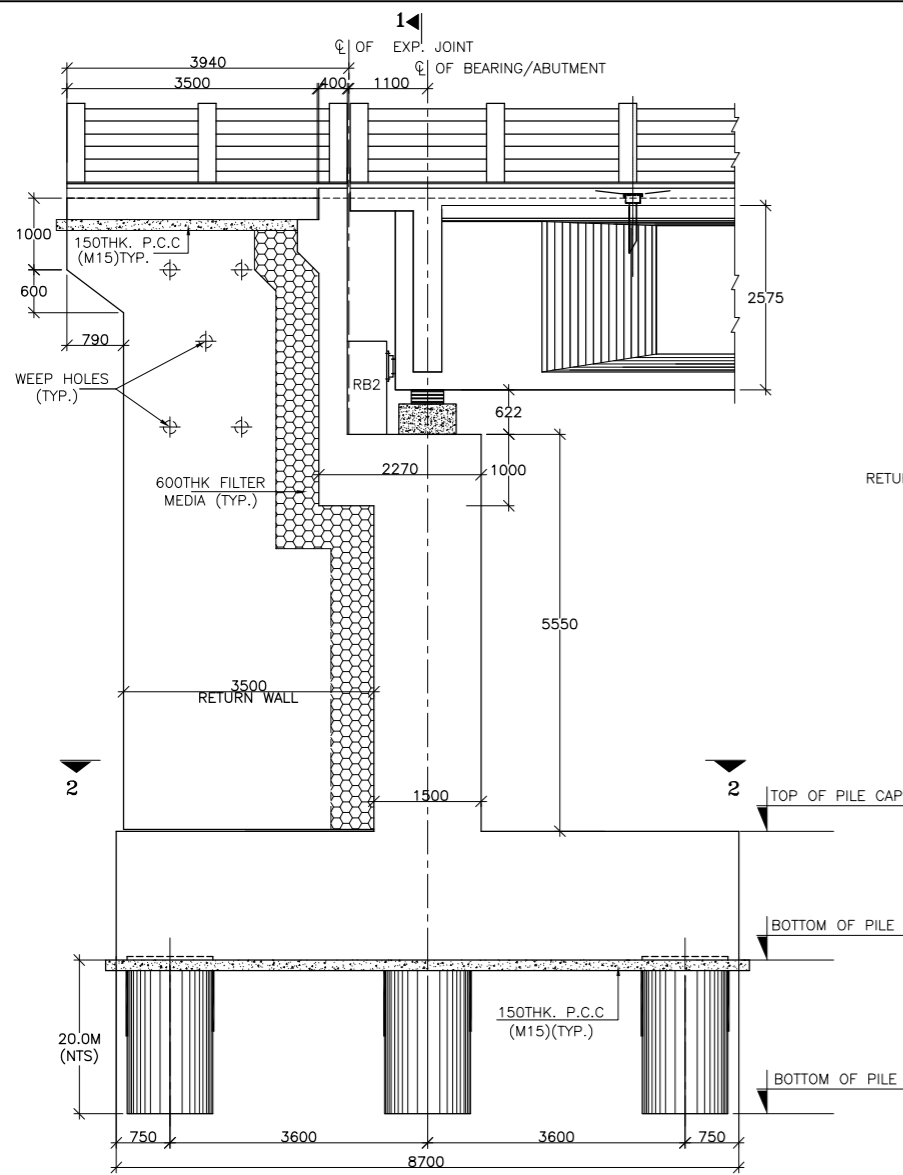
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SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT

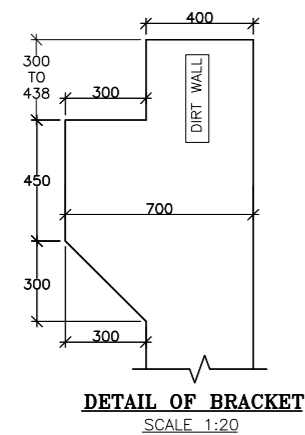
CONSULTANT: **CETEST** Engineering Consultants  
An ISO 9001, ISO 9001 & OHSAS 18001 Certified Company

**C.E. TESTING COMPANY PVT. LTD.**  
124-A, N.S.C. BOSE ROAD  
KOLKATA - 700092.

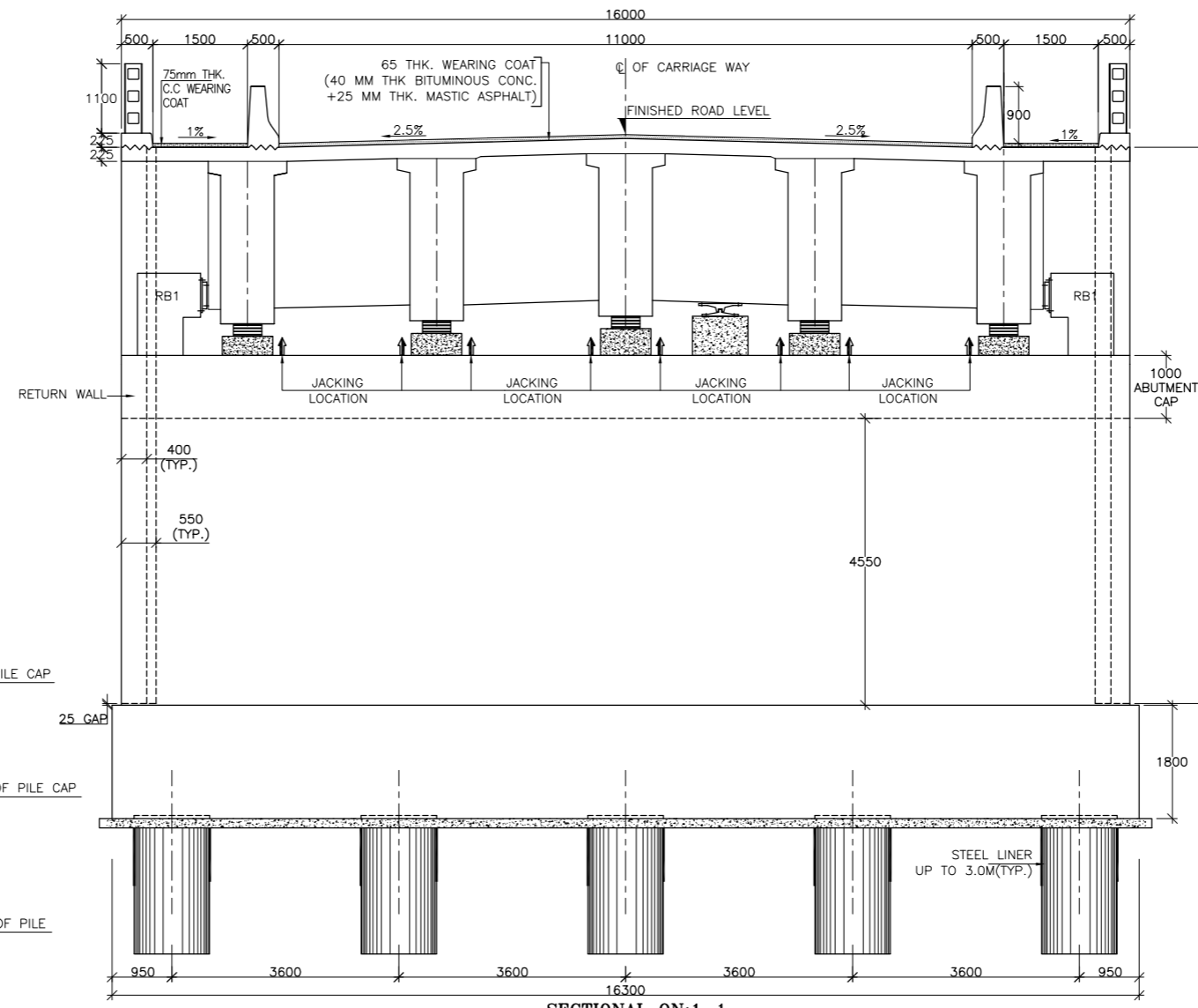
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REVISION MKD. -	R0	SHEET NO. - 02 OF 10		
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SN.D	S.D	S.D	S.D	



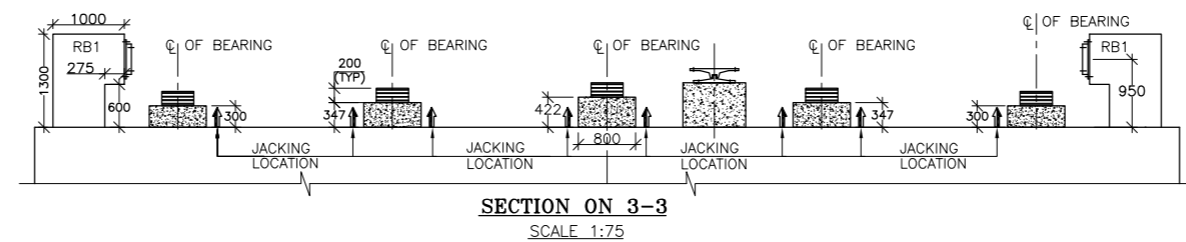
**SECTIONAL ELEVATION OF ABUTMENT (A1)**  
SCALE 1:75



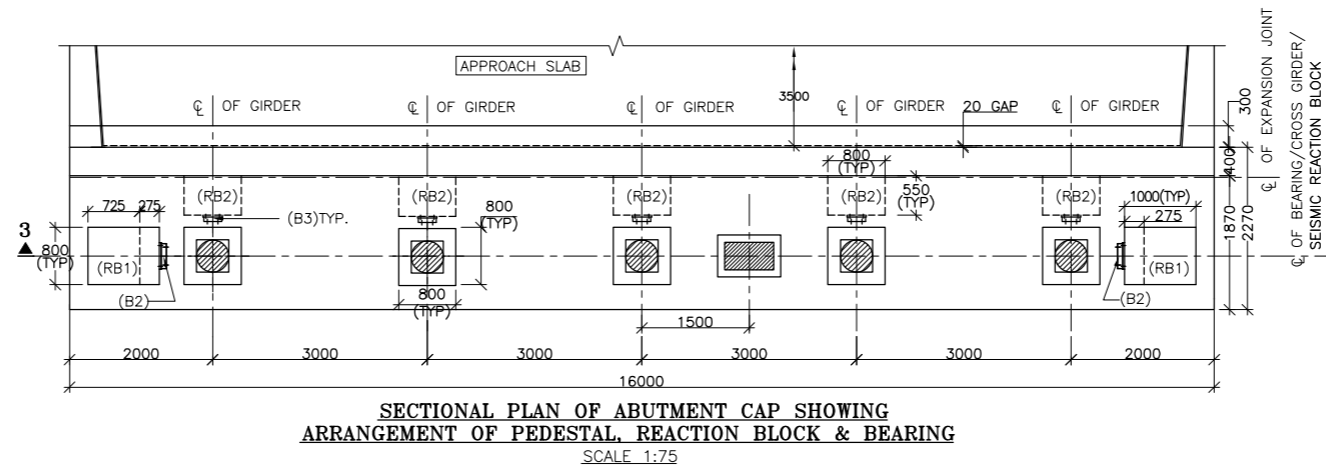
**DETAIL OF BRACKET**  
SCALE 1:20



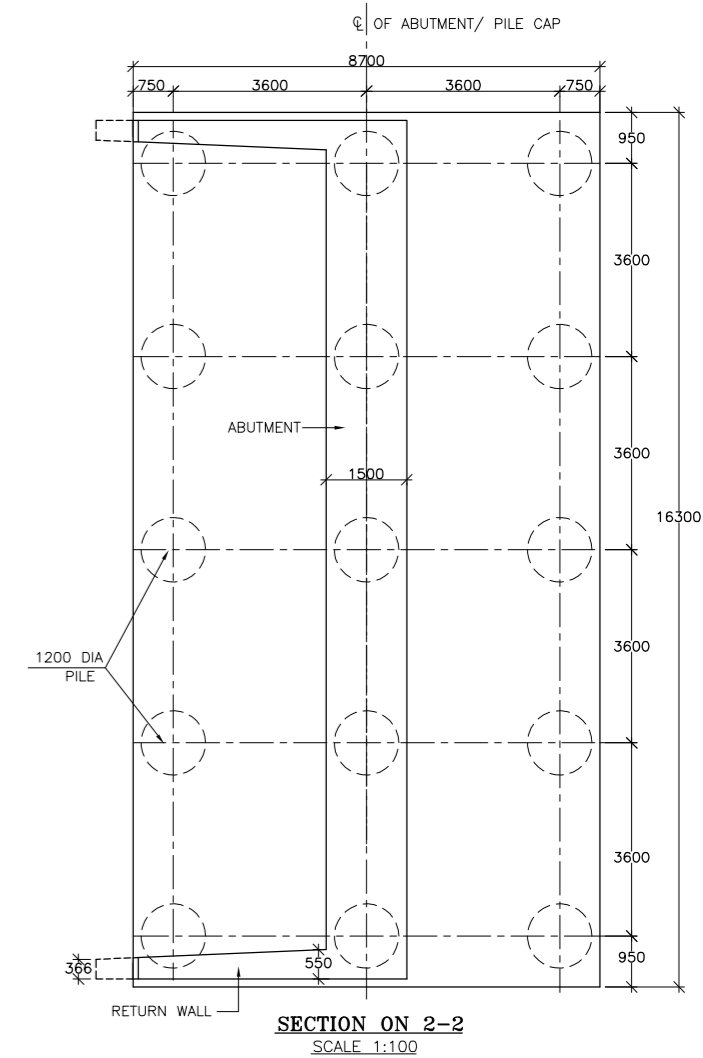
**SECTION ON 1-1**  
SCALE 1:75



**SECTION ON 3-3**  
SCALE 1:75



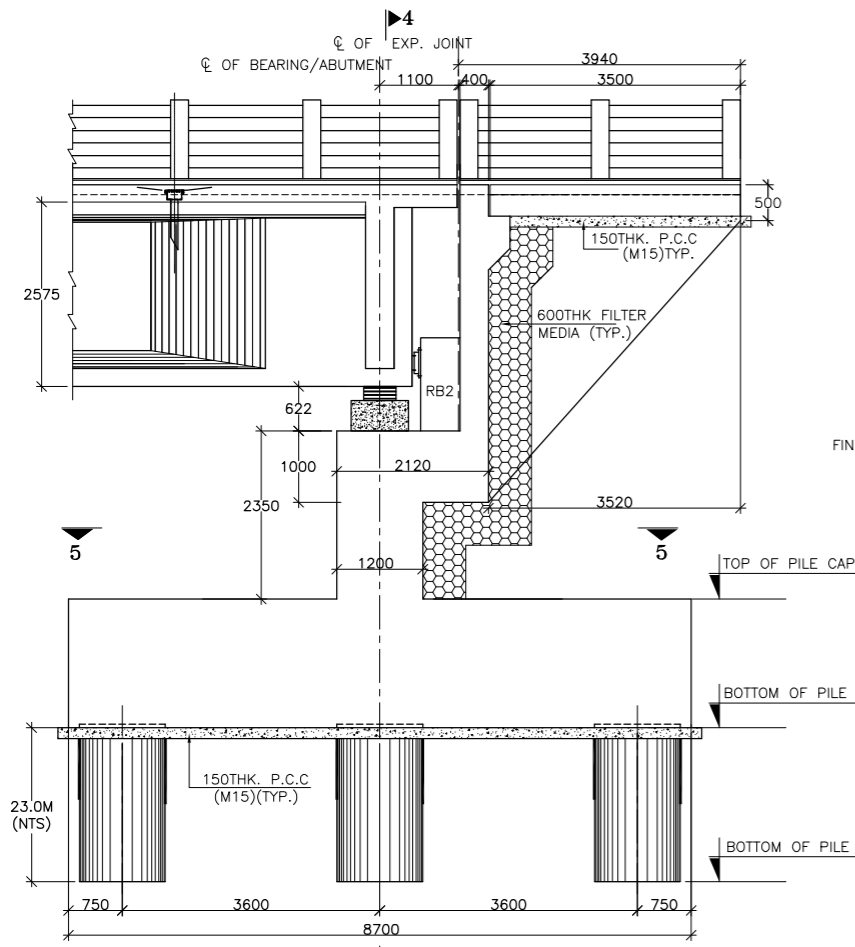
**SECTIONAL PLAN OF ABUTMENT CAP SHOWING ARRANGEMENT OF PEDESTAL, REACTION BLOCK & BEARING**  
SCALE 1:75



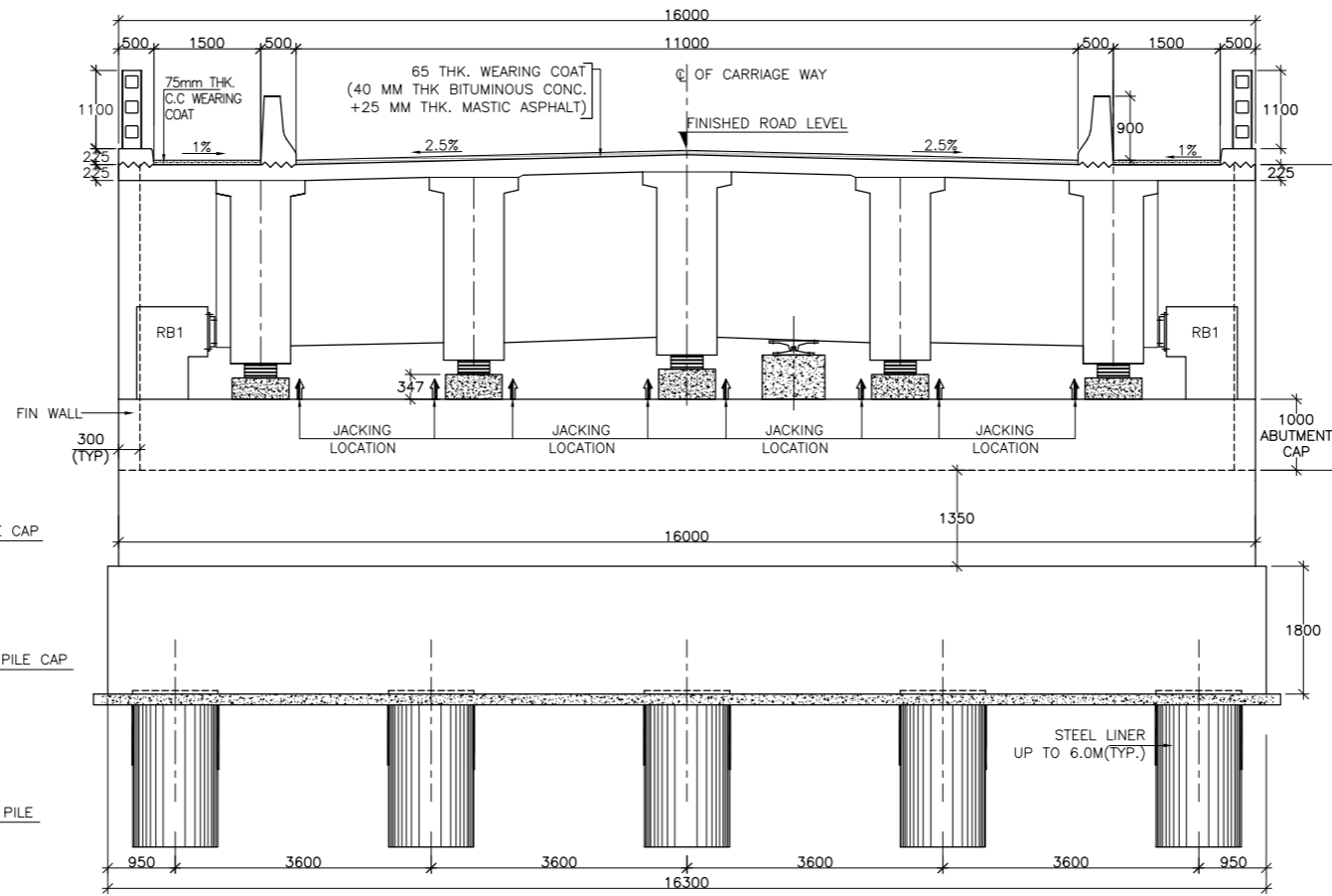
**SECTION ON 2-2**  
SCALE 1:100

**NOTES:-**  
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN M. UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.  
2. THIS DRAWING IS PREPARED IN CONNECTION WITH :  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01, 02 & 04 TO 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

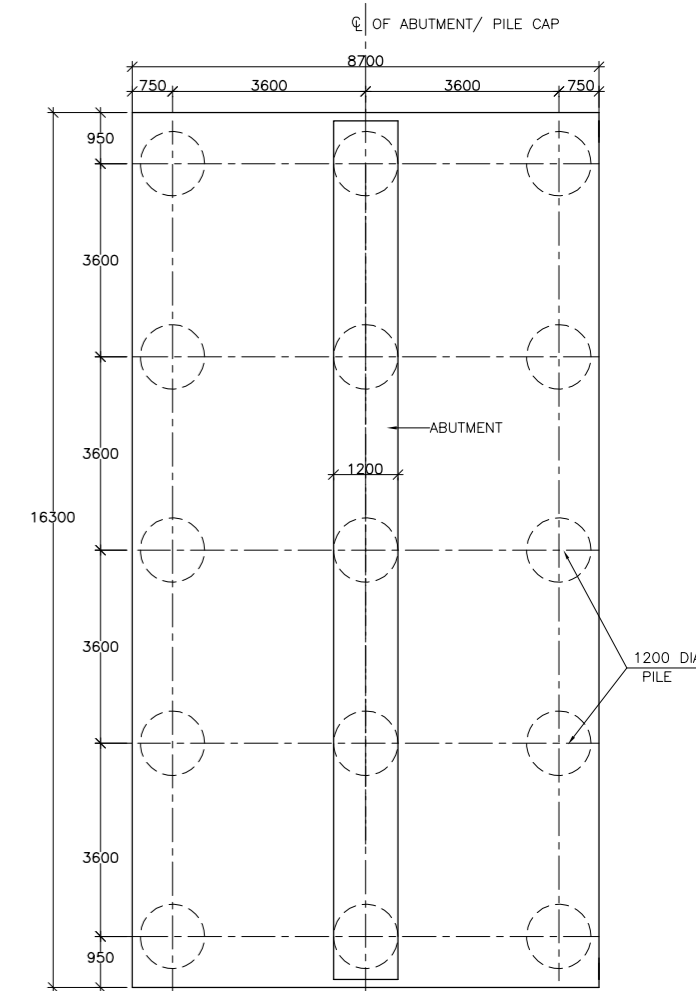
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DATE: AUGUST, 2019				PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA		SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT		C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.		REVISION MKD. - R0		SHEET NO. - 03 OF 10	
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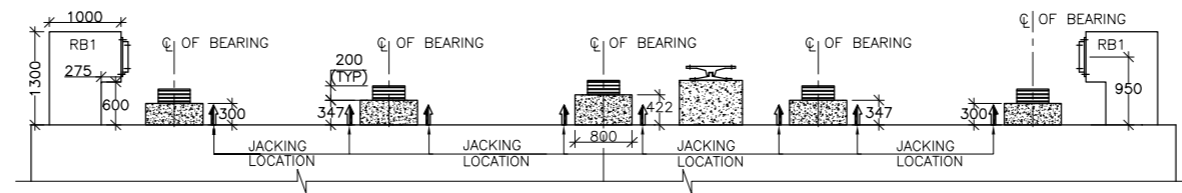
SECTIONAL ELEVATION OF ABUTMENT (A2)  
SCALE 1:75



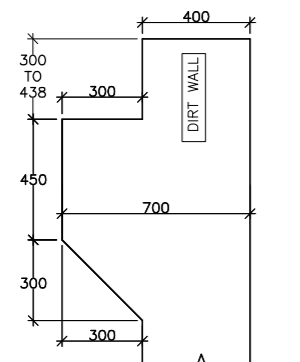
SECTIONAL ON:4-4  
SCALE 1:75



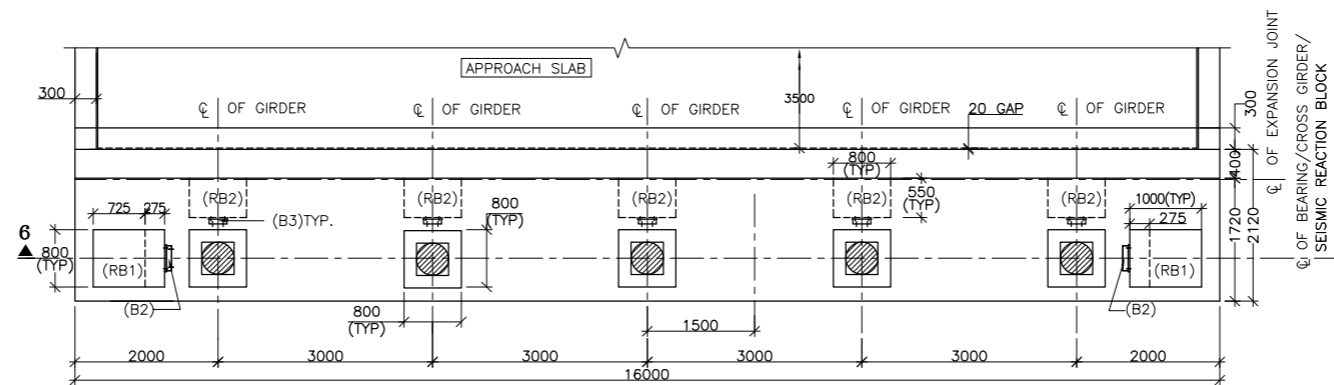
SECTION ON 5-5  
SCALE 1:100



SECTION ON 6-6  
SCALE 1:75



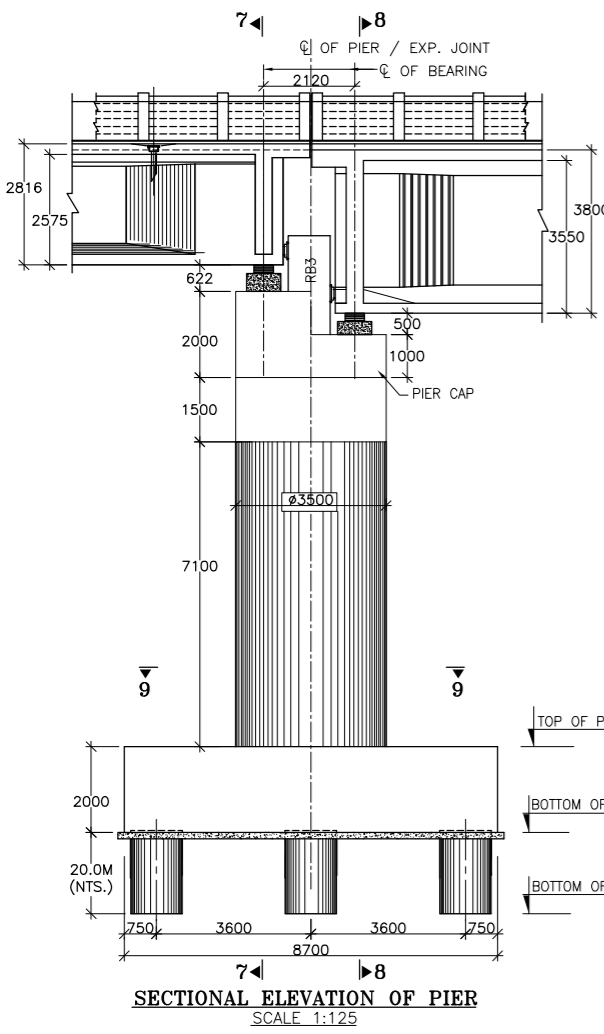
DETAIL OF BRACKET  
SCALE 1:20



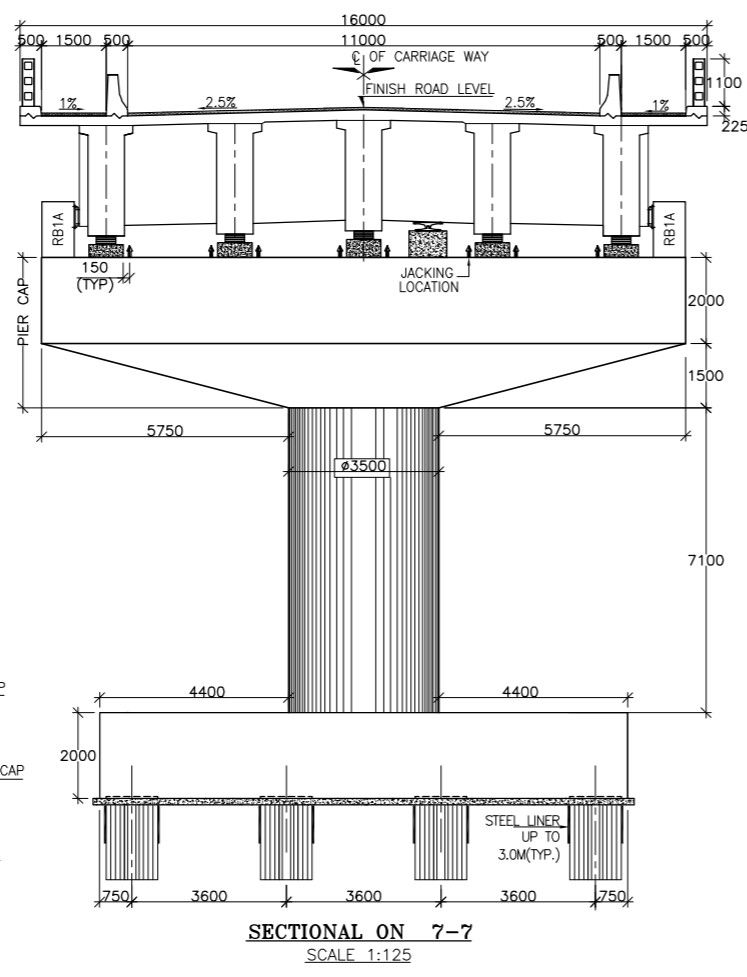
SECTIONAL PLAN OF ABUTMENT CAP SHOWING  
ARRANGEMENT OF PEDESTAL, REACTION BLOCK & BEARING  
SCALE 1:75

- NOTES:-**
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  2. THIS DRAWING IS PREPARED IN CONNECTION WITH :  
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 CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

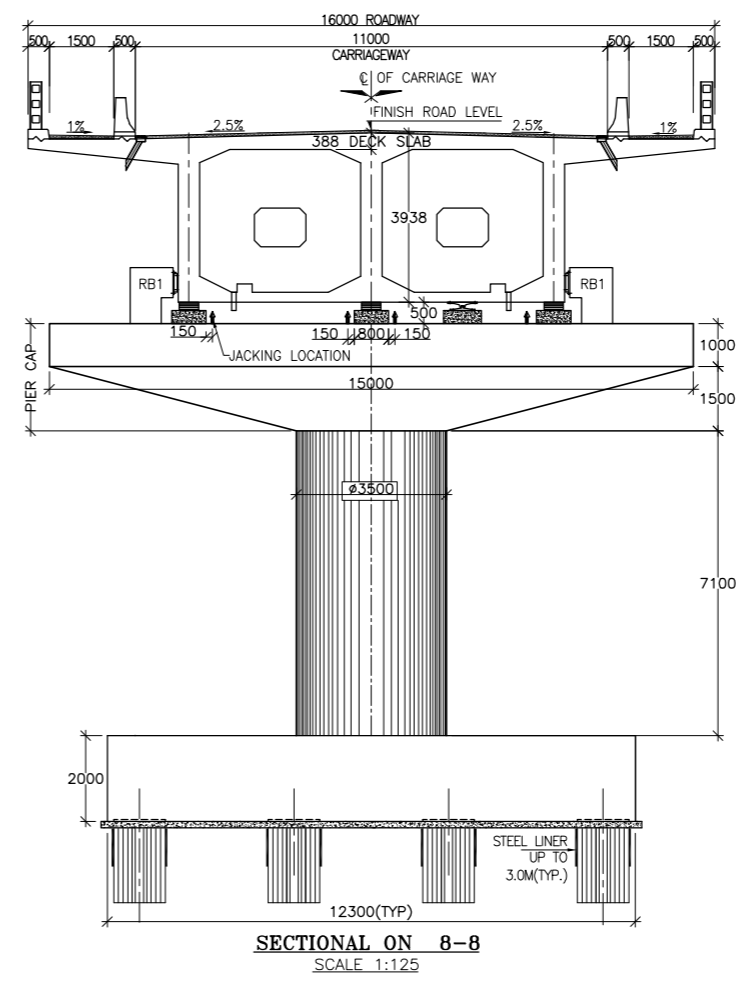
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DATE: AUGUST, 2019				PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA		SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT		C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.		REVISION MKD. - R0		SHEET NO. - 04 OF 10	
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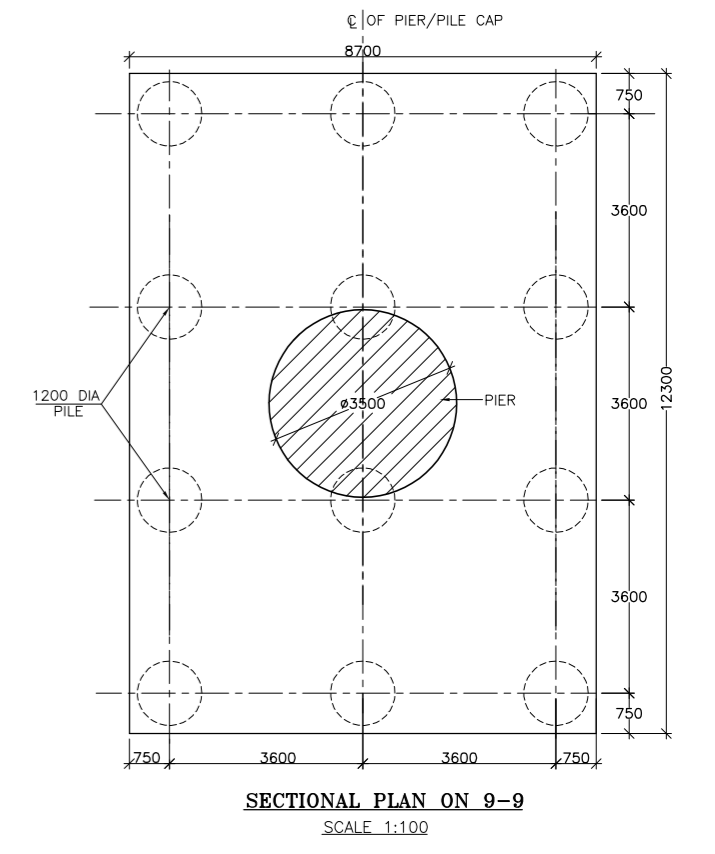
**SECTIONAL ELEVATION OF PIER**  
SCALE 1:125



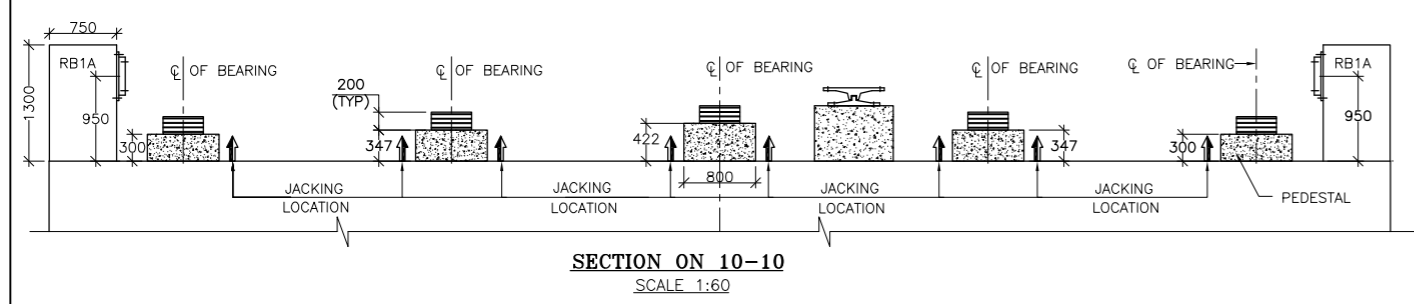
**SECTIONAL ON 7-7**  
SCALE 1:125



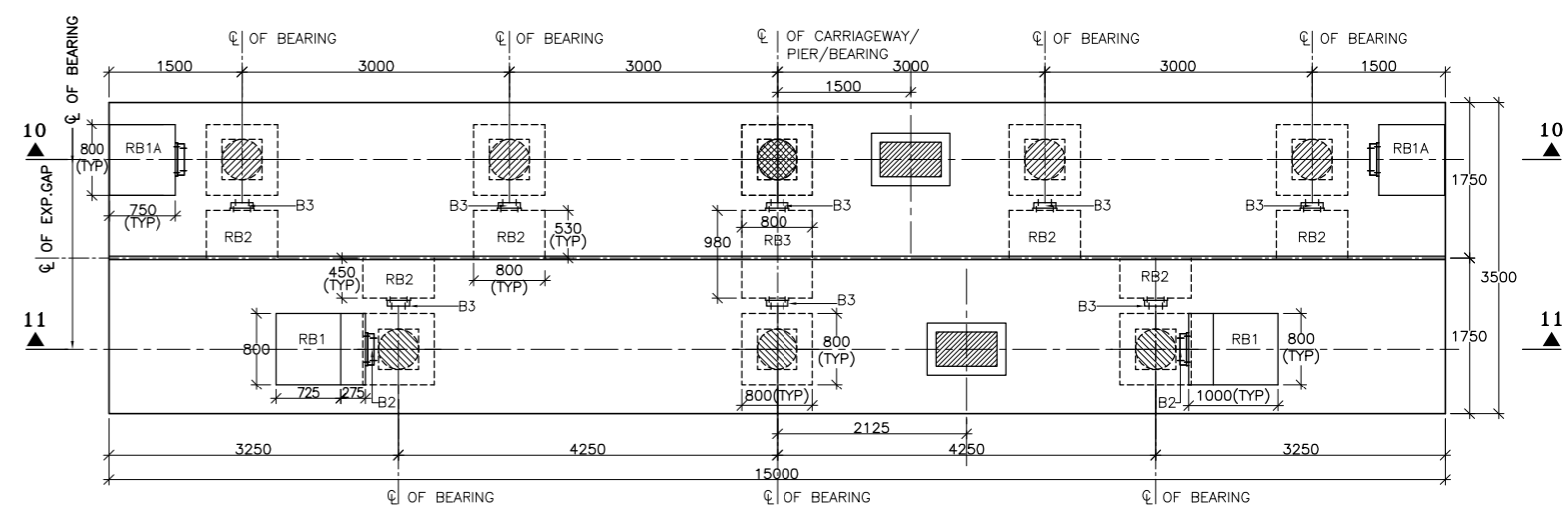
**SECTIONAL ON 8-8**  
SCALE 1:125



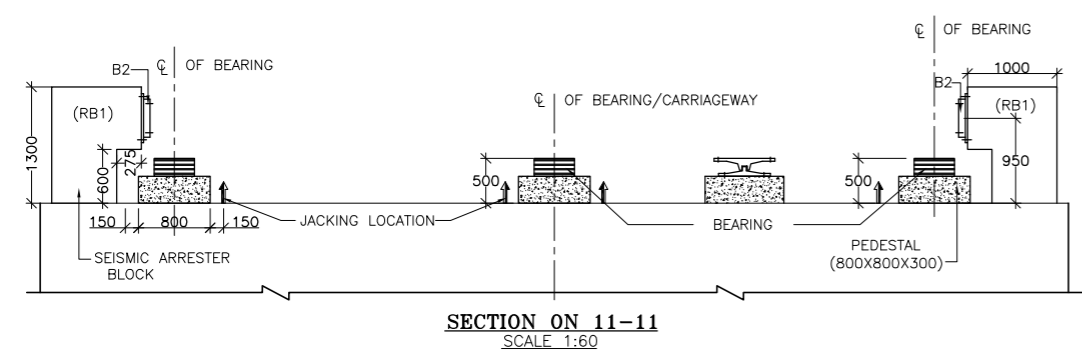
**SECTIONAL PLAN ON 9-9**  
SCALE 1:100



**SECTION ON 10-10**  
SCALE 1:60



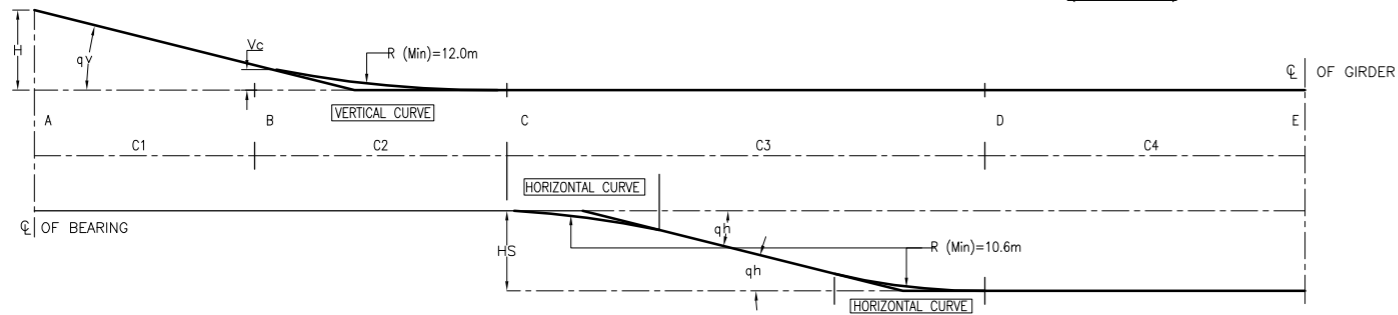
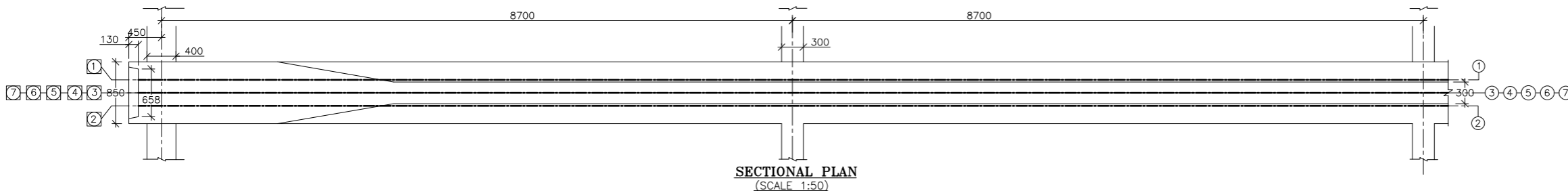
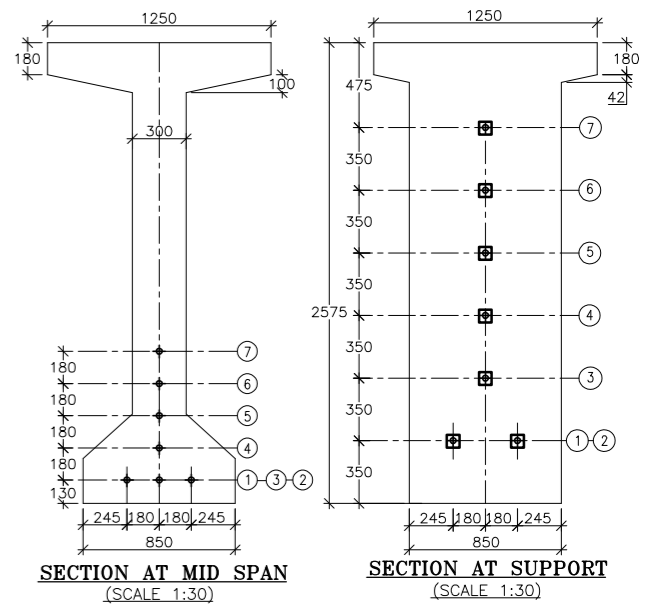
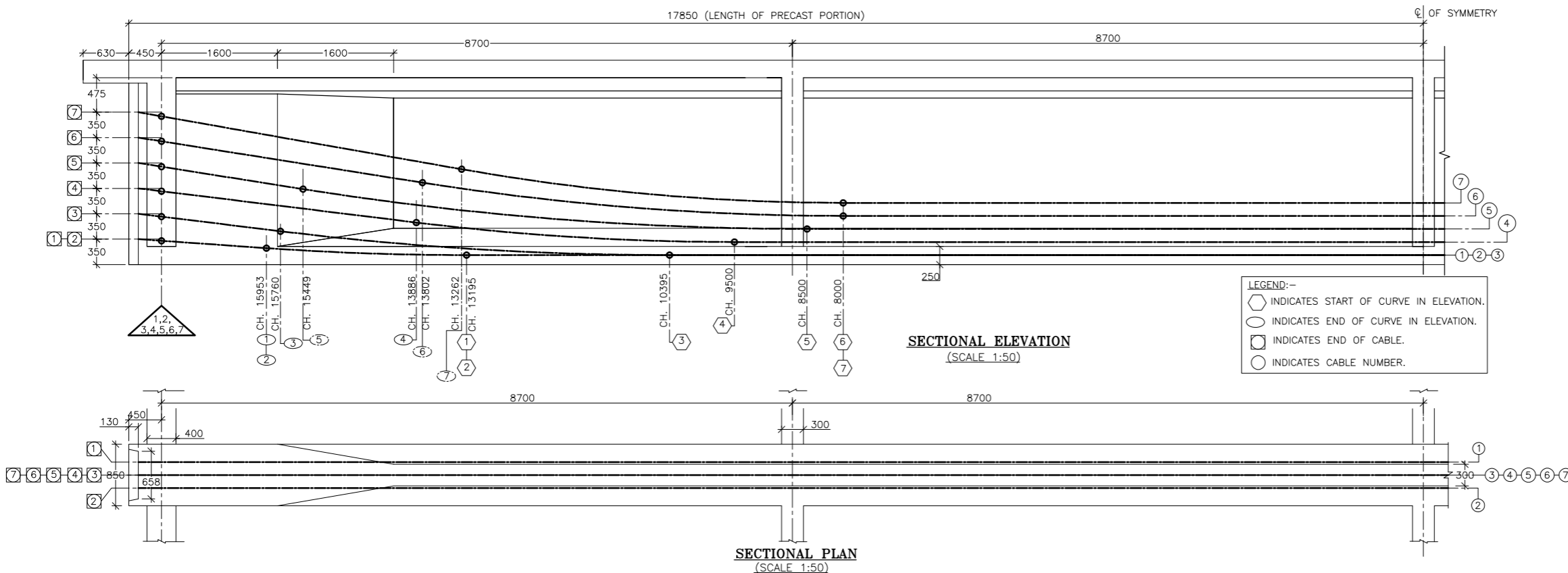
**SECTIONAL PLAN OF PIER CAP SHOWING  
ARRANGEMENT OF SEISMIC ARRESTER BLOCK & BEARING**  
SCALE 1:75



**SECTION ON 11-11**  
SCALE 1:60

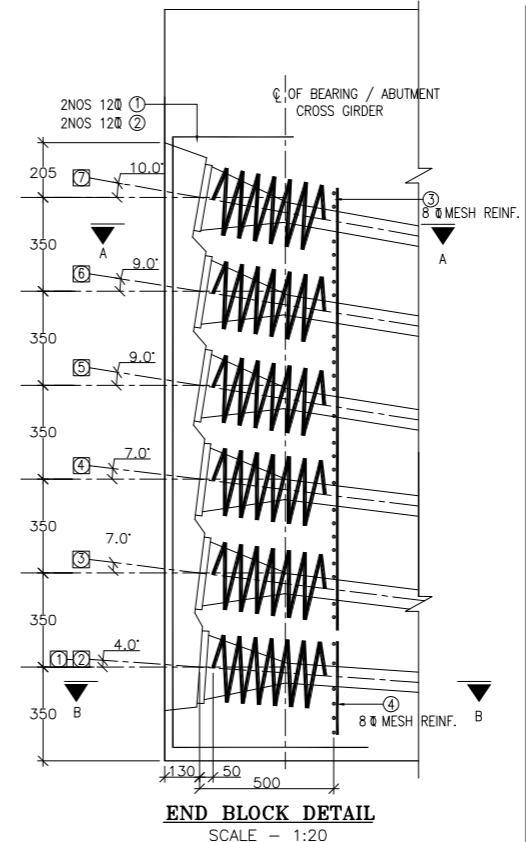
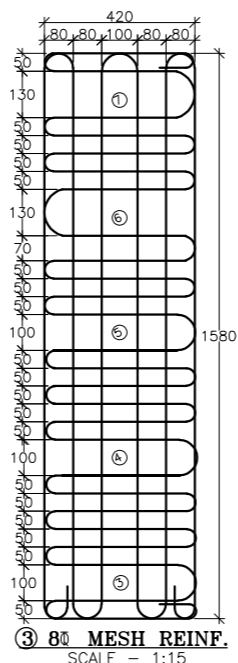
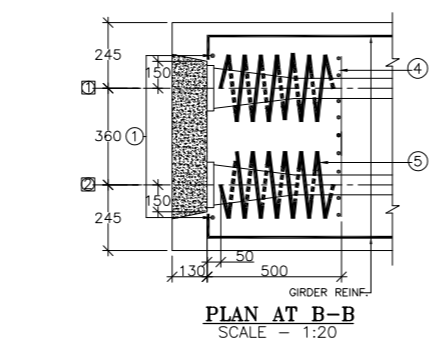
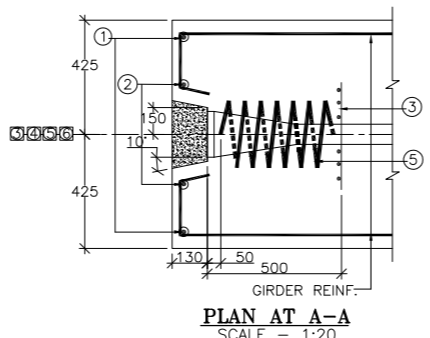
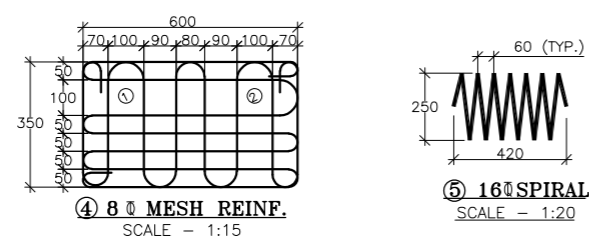
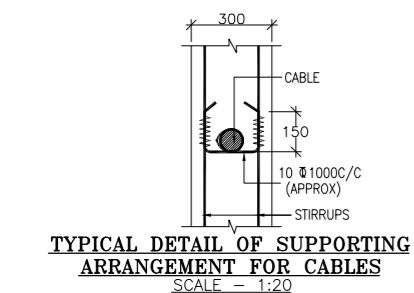
**NOTES:-**  
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2. THIS DRAWING IS PREPARED IN CONNECTION WITH :  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 04 & 06 TO 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

SCALE: AS SHOWN				CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001		TITLE: DETAILS OF PIER		CONSULTANT: <b>CETEST</b> Engineering Consultants An ISO 9001, 14001 & OHSAS 18001 Certified Company		DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA			
DATE: AUGUST, 2019				PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA		SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT		C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.		REVISION MKD. - R0		SHEET NO. - 05 OF 10	
REVISIONS										DRAWN BY		DESIGN BY	
										SN.D		S.D	
										CHECKED BY		ISSUED BY	
										S.D		S.D	



**TABLE NO A**

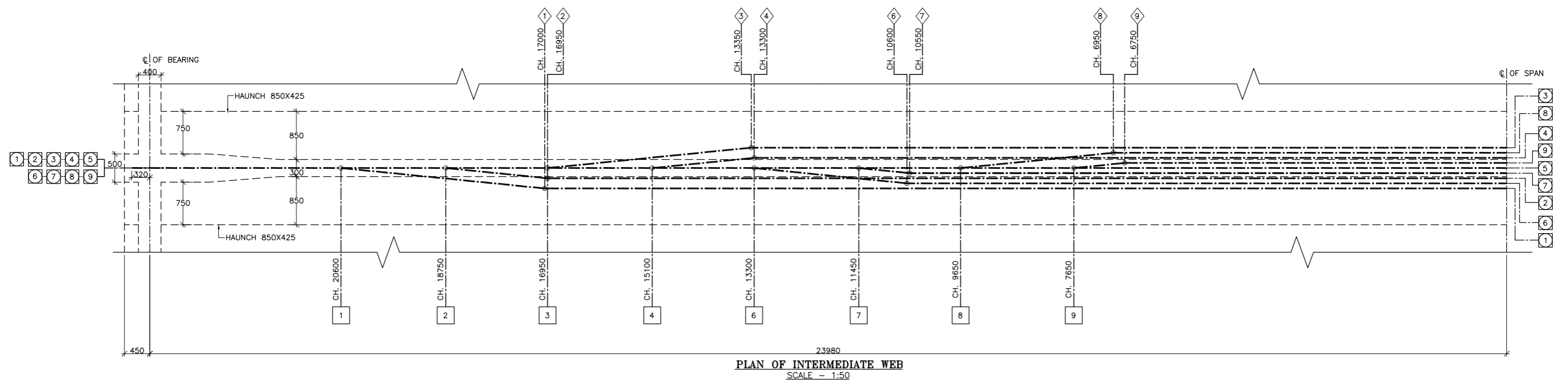
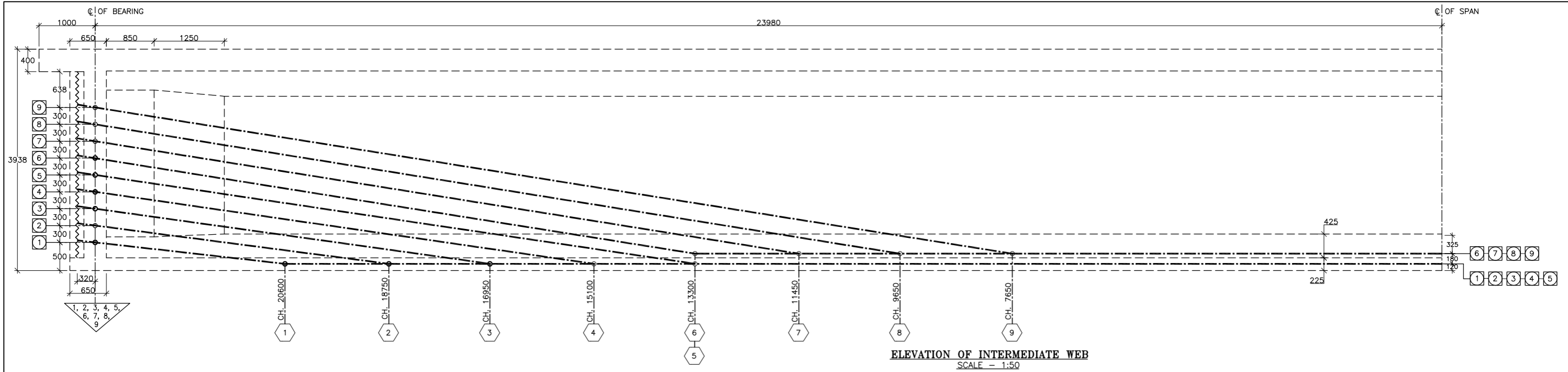
CABLE NO.	LENGTH (C1) IN (M)	LENGTH (C2) IN (M)	LENGTH (C3) IN (M)	LENGTH (C4) IN (M)	LIFT HEIGHT (H) IN (M)	HEIGHT OF VERTICAL CURVE (Vc) IN (M)	VERTICAL ANGLE (θv) IN (DEG.)	LENGTH OF VERTICAL CURVE (LVc) IN (M)	HORIZONTAL SWAY (Hs) IN (M)	HORIZONTAL ANGLE (θh) IN (DEG.)	LENGTH OF HORIZONTAL CURVE (LHc) IN (M)	LENGTH 'AB' IN (M)
1	1.767	2.758	0.000	13.195	0.220	0.096	4.000	2.764	0.000	0.000	0.000	1.771
2	1.767	2.758	0.000	13.195	0.220	0.096	4.000	2.764	0.000	0.000	0.000	1.771
3	1.960	5.365	0.000	10.395	0.570	0.329	7.000	5.399	0.000	0.000	0.000	1.975
4	3.834	4.386	0.000	9.500	0.740	0.269	7.000	4.413	0.000	0.000	0.000	3.863
5	2.271	6.949	0.000	8.500	0.910	0.550	9.000	7.021	0.000	0.000	0.000	2.299
6	3.918	5.802	0.000	8.000	1.080	0.459	9.000	5.862	0.000	0.000	0.000	3.967
7	4.458	5.262	0.000	8.000	1.250	0.464	10.000	5.330	0.000	0.000	0.000	4.527



**NOTES :**

- ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METER UNLESS OTHERWISE SPECIFIED.
- CONC. GRADE SHALL BE M40 FOR SUPER STRUCTURE.
- ALL REINFORCING STEEL SHALL BE OF HYSD BARS (GRADE DESIGNATION FE-500) CONFORMING TO IS: 1786.
- CLEAR COVER = 40 MM.
- PRESTRESSING SYSTEM
  - ALL PRESTRESSING CABLES SHALL HAVE 19 NOS. 7 PLY UNCOATED STRESS RELIEVED LOW RELAXATION STRANDS OF 12.7 mm DIA. CONFORMING TO CLASS II OF IS 14268-1995.
  - JACKS USED FOR TENSIONING SHALL BE FREYSNETT TYPE OR EQUIVALENT & JACK LOAD = 159.288 TON.
  - BRIGHT METAL SHALL BE USED FOR CABLE SHEATHING.
  - THE PARAMETERS ADOPTED FOR DESIGN ARE AS FOLLOWS:-
    - ANCHORAGE TYPE ---- 19113 (DYNAMIC OR EQUIVALENT).
    - SLIP AT EACH END ---- 6 mm.
    - MINIMUM SHEATHING DIAMETER ---- 90 mm FOR 19113.
    - SHEATHING THICKNESS ---- AS PER IRC:112-2011
    - CO-EFFICIENT OF FRICTION ----  $\mu = 0.25/\text{Radian}$ .
    - WOBBLE CO-EFFICIENT ----  $k = 0.0046/\text{Metre}$ .
    - NOMINAL AREA OF EACH STRAND ---- 98.8 sq. mm.
    - ULTIMATE BREAKING LOAD OF EACH STRAND ---- 183.71 K N.
    - MODULUS OF ELASTICITY OF HIGH TENSILE STEEL ----  $195 \times 10^9$  Mpa.
    - THOUSAND HOURS RELAXATION LOSS AS PER TABLE 6.2 IRC-112, 2011.
  - ALL THE DESIGN PARAMETERS ADOPTED SHALL BE VERIFIED AT SITE BEFORE USE.
- PRESTRESSING OPERATION
  - ALL CABLES SHALL BE PASSING THROUGH THE GIVEN ORINATES AND SHALL BE SUPPORTED AT A SPACING NOT EXCEEDING 1000 mm BY A 16 mm DIA. CROSS BARS TACK WELDED/ SECURELY HELD IN POSITION WITH VERTICAL WEB REINFORCEMENT.
  - CABLE LENGTH MENTIONED IN THE DRAWING IS EXCLUSIVE OF 1000 mm EXTRA LENGTH AT EACH END. THE TOTAL LENGTH OF CABLE SHALL BE VERIFIED AT SITE.
  - SEQUENCE OF CONSTRUCTION AND PRESTRESSING SHALL BE AS FOLLOWS:
    - GIRDERS ARE CASTED AT CASTING YARD.
    - 1st. STAGE OF PRESTRESSING IS DONE AFTER CONCRETE ATTAINS A STRENGTH OF 40.5 MPa.(14 DAYS). AFTER 1st. STAGE PRESTRESSING PRECAST GIRDERS MAY BE LAUNCHED OVER PIER TOP.
    - SHUTTERING FOR DECK SLAB AND CROSS GIRDERS ARE ERECTED FROM I-GIRDERS AND CASTING IS DONE AFTER CONCRETE ATTAINS 38 MPa.(21 DAYS)
    - 2nd. STAGE OF PRESTRESSING IS DONE AFTER ATTAINING OF FULL STRENGTH OF DECK CONCRETE i.e 40 MPa. (28 DAYS AFTER CASTING OF DECK SLAB i.e 49 DAYS).
    - CRASH BARRIER & KERB IS TO BE CASTED & WEARING COURSE TO BE LAID AFTER REMOVAL OF SHUTTERING OF DECK SLAB.
  - STRESSING OF CABLES SHALL BE CARRIED OUT SIMULTANEOUSLY FROM BOTH ENDS, JACKING FORCES, SHALL BE INCREASED BY APPROPRIATE PERCENTAGE TO ACCOUNT FOR ANCHORAGE AND JACK FRICTION AND EFFICIENCY AS PER THE MANUFACTURER'S INSTRUCTIONS.
  - GROUTING OF CABLES SHALL BE DONE IN SAME SEQUENCE AS STRESSING AND SHALL CONFORM TO IRC 112-2011.
    - EXTENSION ARE GIVEN FOR CABLE LENGTHS (EXCLUDING 1.0M GRIP LENGTH) INCLUSIVE OF 6mm GRIP LENGTH AT EACH END. LOSS UP TO 6 mm DUE TO SLIP OF ANCHORAGES ARE NOT TO BE COMPENSATED DURING SITE OPERATION. JACK PRESSURE AND EXTENSION OF CABLES AT EACH END GIVEN IN THE DRAWING SHALL BE VERIFIED AT SITE.
    - INITIAL SLACKNESS IN PRESTRESSING TENDONS SHALL BE REMOVED BY APPLYING SMALL INITIAL 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.
    - THE EXTENSION GIVEN IN TABLE NO. A SHALL BE MODIFIED AT SITE IN CASE ACTUAL VALUE OF AREA OF STRAND 'A' AND MODULES OF ELASTICITY 'E' VARIES FROM THE VALUES CONSIDERED IN DESIGN. REVISED EXTENSION = EXTENSION AS PER DESIGN (98.7 mm x 195 x 10 m pa) / (NEW AREA x NEW MODULES).
    - EXTENSION OF CABLE SHALL BE VERIFIED FOR A FEW CABLES AT SITE. IN CASE THE VALUE OF  $\mu$  AND  $k$  ARE FOUND TO BE MORE THAN HAVE BEEN CONSIDERED, EXTENSION SHALL BE SUITABLY MODIFIED AFTER APPROVAL OF THE ENGINEER.
    - THE GRIP LENGTH FROM ANCHORAGE FACE UP TO GRIPPING POINT IN JACK ASSUMED IN EXTENSION CALCULATION IS 600 mm AND THE ADDITIONAL LENGTH TAKEN FOR CUTTING IS 400 mm IF GRIP LENGTH VARIES FROM THE ABOVE VALUES THAN THE CORRESPONDING NEW EXTENSION =  $EX + EX (\text{GRIP}-600)/(\text{LENGTH OF CABLE}-800)$  WHERE 'EX' IS EXTENSION SHOWN IN THIS DRAWING. S. SEQUENCE OF STRESSING: -
      - 1st. STAGE: 1 → 2 → 3 → 6
      - 2nd. STAGE: 4 → 5
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO.
  - CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 05 & 07 TO 10)
  - CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)
  - CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

SCALE: AS SHOWN				CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001				TITLE: DETAILS OF PRESTRESSING CABLES ARRANGEMENT AND ANCHORAGE DETAILS OF LONGITUDINAL GIRDER				CONSULTANT: CETEST Engineering Consultants				DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA			
DATE: AUGUST, 2019				PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA				SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT				C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.				REVISION MKD. - R0 SHEET NO. - 06 OF 10			
REVISIONS												DRAWN BY: SN.D DESIGN BY: S.D CHECKED BY: S.D ISSUED BY: S.D							

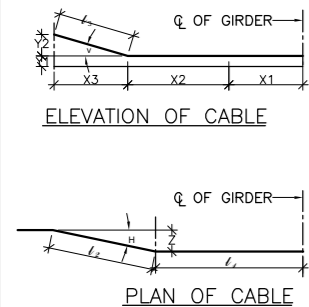


**TABLE-1**

CABLE NO.	Y1 (mm)	Y2 (mm)	v (rad)	H (rad)	Z (mm)	X1=f <sub>1</sub> (mm)	X2 (mm)	X3 (mm)	l <sub>2</sub> (mm)	l <sub>3</sub> (mm)
1	120	380	0.102	0.100	360	17000	3600	3700	3618	3719
2	120	680	0.122	0.100	180	16950	1800	5550	1809	5592
3	120	980	0.133	0.100	360	13350	3600	7350	3618	7415
4	120	1280	0.138	0.100	180	13300	1800	9200	1809	9289
5	120	1580	0.143	0.100	-	13300	-	11000	-	11113
6	300	1700	0.153	0.100	270	10600	2700	11000	2713	11131
7	300	2000	0.154	0.100	90	10550	900	12850	904	13005
8	300	2300	0.156	0.100	270	6950	2700	14650	2713	14829
9	300	2600	0.156	0.100	90	6750	900	16650	904	16852

**TABLE-2**

CABLE NO.	TYPE OF CABLE	ELONGATION AT EACH SIDE (mm)	CABLE LENGTH INCLUDING EXTRA 1.0M AT EACH END (m)
1	19T13	145	50.675
2	19T13	145	50.701
3	19T13	146	50.766
4	19T13	147	50.795
5	19T13	147	50.826
6	19T13	146	50.888
7	19T13	149	50.918
8	19T13	150	50.986
9	19T13	151	51.013



**LEGEND :**

- INDICATES START OF INCLINATION IN ELEVATION
- ▽ INDICATES END OF INCLINATION IN ELEVATION
- INDICATES START OF INCLINATION IN PLAN
- ◇ INDICATES END OF INCLINATION IN PLAN
- ⊠ INDICATES END OF CABLE
- INDICATES CABLE NUMBER

**NOTES:-**

- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN M. UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING IS PREPARED IN CONNECTION WITH :  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 06 & 08 TO 10)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

SCALE: AS SHOWN	CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001	TITLE: SHEATHING PROFILE AND ANCHORAGE DETAILS OF PSC BOX GIRDER 50.0M. SPAN (INTERMEDIATE WEB)	CONSULTANT: CETEST Engineering Consultants	DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA
DATE: AUGUST, 2019	PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA	SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT	C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.	REVISION MKD. - R0 SHEET NO. - 07 OF 10
REVISIONS				DRAWN BY: SN.D DESIGN BY: S.D CHECKED BY: S.D ISSUED BY: S.D

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
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CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001

PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

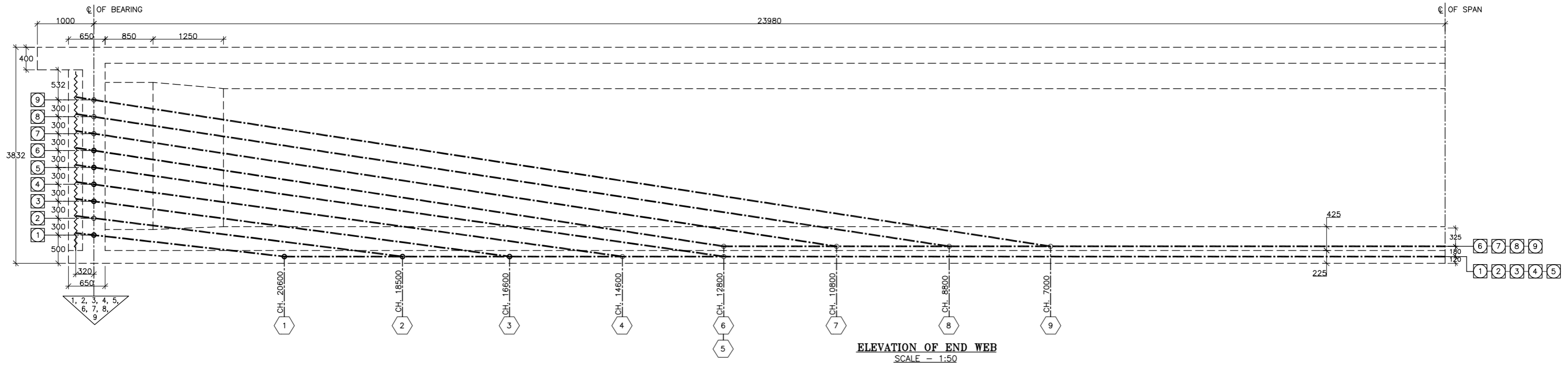
TITLE: SHEATHING PROFILE AND ANCHORAGE DETAILS OF PSC BOX GIRDER 50.0M. SPAN (INTERMEDIATE WEB)

SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT

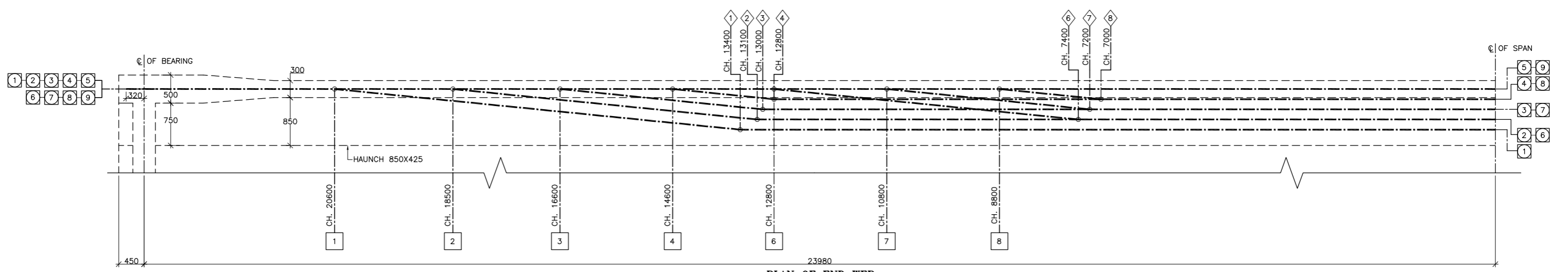
CONSULTANT: **CETEST** Engineering Consultants  
 An ISO 9001, ISO 14001 & OHSAS 18001 Certified Company

**C.E. TESTING COMPANY PVT. LTD.**  
 124-A, N.S.C. BOSE ROAD  
 KOLKATA - 700092.

DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA	REVISION MKD. - R0	SHEET NO. - 07 OF 10
DRAWN BY: SN.D	DESIGN BY: S.D	CHECKED BY: S.D
ISSUED BY: S.D		



**ELEVATION OF END WEB**  
SCALE - 1:50



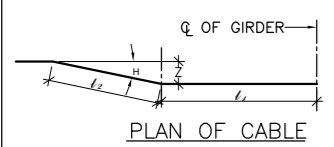
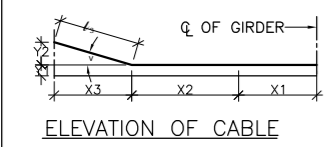
**PLAN OF END WEB**  
SCALE - 1:50

**TABLE-1**

CABLE NO.	Y1 (mm)	Y2 (mm)	v (rad)	H (rad)	Z (mm)	X1=l <sub>1</sub> (mm)	X2 (mm)	X3 (mm)	l <sub>2</sub> (mm)	l <sub>3</sub> (mm)
1	120	380	0.102	0.100	720	13400	7200	3700	7236	3719
2	120	680	0.117	0.100	540	13100	5400	5800	5427	5840
3	120	980	0.127	0.100	360	13000	3600	7700	3618	7762
4	120	1280	0.131	0.100	180	12800	1800	9700	1809	9784
5	120	1580	0.137	0.100	-	12800	-	11500	-	11608
6	300	1700	0.147	0.100	540	7400	5400	11500	5427	11625
7	300	2000	0.147	0.100	360	7200	3600	13500	3618	13647
8	300	2300	0.147	0.100	180	7000	1800	15500	1809	15670
9	300	2600	0.149	0.100	-	7000	-	17300	-	17494

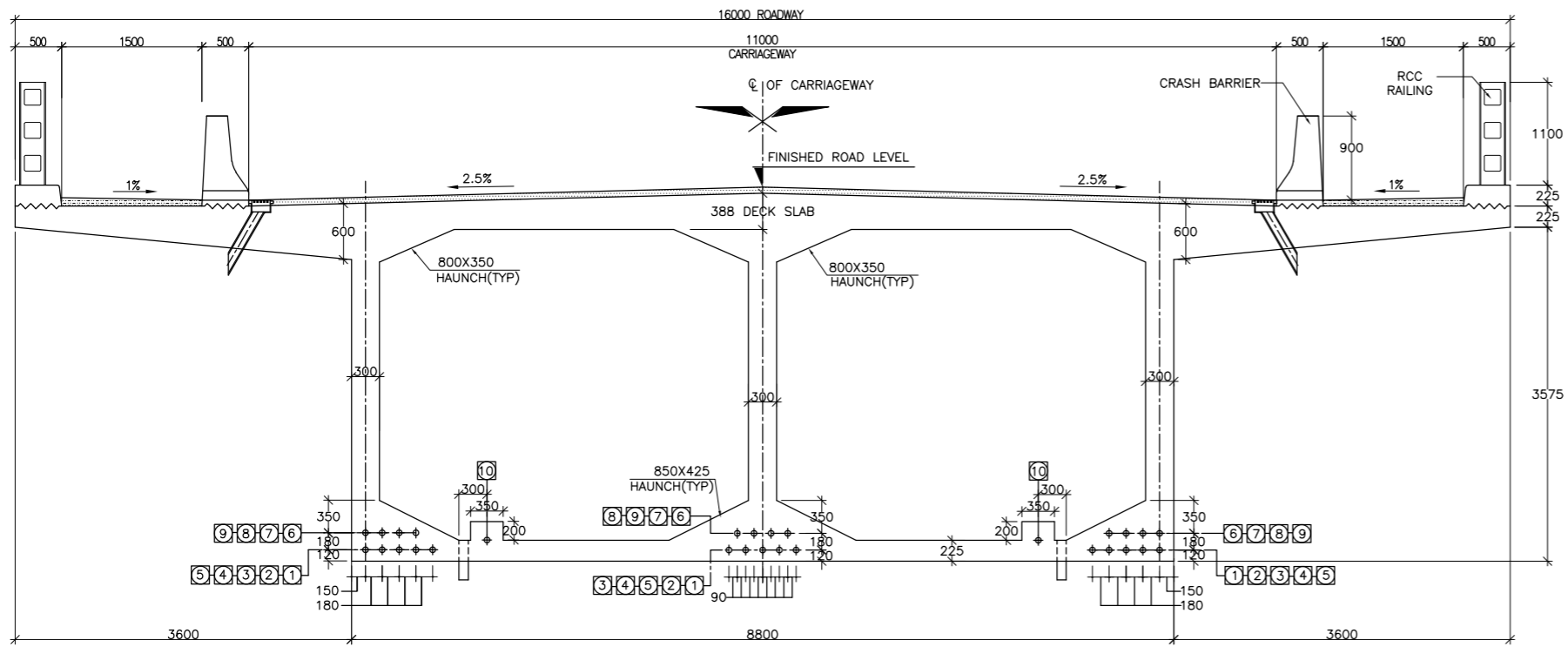
**TABLE-2**

CABLE NO.	TYPE OF CABLE	ELONGATION AT EACH SIDE(mm)	CABLE LENGTH INCLUDING EXTRA 1.0M AT EACH END (m)
1	19T13	146	50.711
2	19T13	146	50.733
3	19T13	146	50.760
4	19T13	147	50.786
5	19T13	148	50.816
6	19T13	148	50.904
7	19T13	150	50.931
8	19T13	150	50.957
9	19T13	151	50.989



**NOTES:-**  
 1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN M. UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.  
 2. THIS DRAWING IS PREPARED IN CONNECTION WITH :  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 07 & 10)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

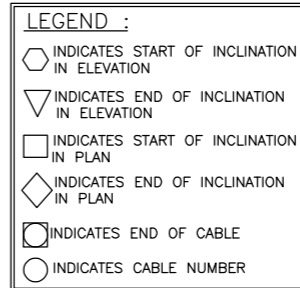
SCALE: AS SHOWN DATE: AUGUST, 2019				<b>CLIENT:</b> NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001				<b>TITLE:</b> SHEATHING PROFILE AND ANCHORAGE DETAILS OF PSC BOX GIRDER 50.0M. SPAN (END WEB)				<b>CONSULTANT:</b> <b>CETEST</b> Engineering Consultants An ISO 9001, 14001 & OHSAS 18001 Certified Company				<b>DRG. NO.:</b> CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA <b>REVISION MKD. - R0</b> SHEET NO. - 08 OF 10							
<b>PROJECT:</b> CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA				<b>SUBMISSION TYPE:</b> FINAL DETAILED PROJECT REPORT				<b>C.E. TESTING COMPANY PVT. LTD.</b> 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.				<table border="1"> <tr> <th>DRAWN BY</th> <th>DESIGN BY</th> <th>CHECKED BY</th> <th>ISSUED BY</th> </tr> <tr> <td>SN.D</td> <td>S.D</td> <td>S.D</td> <td>S.D</td> </tr> </table>				DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY	SN.D	S.D	S.D	S.D
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MKD.	DATE	DESCRIPTION	CHKD.	APPRD.																			



**CROSS SECTION OF MIDDLE PORTION  
OF PSC BOX GIRDER**  
SCALE 1:50



**CROSS SECTION OF END PORTION  
OF PSC BOX GIRDER**  
SCALE 1:50



**NOTES :**

1. PRESTRESSING CABLES SHALL BE 19T13 STRAND CABLES CONFORMING TO IS:14268-1995 (LOW RELAXATION STEEL) CLASS II WITH MINIMUM BREAKING LOAD OF 18.737 TON FOR 12.7 MM DIA. 7 PLY STAND NOMINAL STEEL AREA OF EACH PRESTRESSING CABLES SHALL BE 98.7 SQ.MM AND TOTAL AREA OF EACH CABLE 18.772 SQ.CM. ULTIMATE FORCE IN ONE CABLE = 349.049 TON. JACKING FORCE = 244.334 TON. WOBBLE CO-EFFICIENT = 0.0046 CO-EFFICIENT OF FRICTION = 0.25 MODULUS OF ELASTICITY OF STEEL IN STRAND =  $1.95 \times 10^6$  MPA AVERAGE SLIP = 6MM GROUTING SHALL BE CARRIED AS PER IRC 112 : 2011 MINIMUM STRESS OF CONCRETE AT THE TIMES OF 1ST STAGE PRESTRESSING IS 0.85 TIMES THE 28 DAYS OF CUBE CRUSHING STRENGTH. GRADE OF CONCRETE = M50
2. a) 1ST STAGE CABLES ARE STRESSED 1,2,3,4,5 & 6 AT 10 DAYS AFTER CASTING OF BOX. b) CRASH BARRIER & KERB IS CAST. c) 2ND STAGE PRESTRESSING CABLES ARE 7,8 & 9 NO. CABLE AFTER 28 DAYS AFTER CASTING OF BOX. CABLE NO. 10 IS DUMMY CABLE. d) RAILING, CRASH BARRIER & WEARING COURSE ARE CONSTRUCTED AFTER WITHIN 21 DAYS OF 2ND STAGE PRESTRESSING I.E. ON 49 DAYS.
3. THE LENGTH OF CABLES INDICATED ARE MEASURED ALONG PROFILE BETWEEN MID SPAN AND END FACES OF BOX GIRDER ONLY. ADDITIONAL LENGTH REQUIRED FOR ATTACHING JACK IS TO BE ADDED IN CONSULTATION WITH SYSTEM MANUFACTURER.
4. THE EXTENSIONS INDICATED ARE FOR PORTION OF CABLES LYING BETWEEN MIDSPAN AND END FACES OF PRECAST GIRDER ONLY. ADDITIONAL EXTENSION FOR PORTION LYING BETWEEN END FACE AND GRIPPING POINT OF JACK IS TO BE ADDED (APPROXIMATE 7MM/M)
5. ALL CABLES ARE TO HAVE SMOOTH PROFILE (WITHOUT KINKS) PASSING THROUGH GIVEN ORDINATES AND FIRMLY SUPPORTED AT EVERY 1.0M INTERVAL.
6. **SPECIAL NOTE FOR PRESTRESSING**  
IF CALCULATED ELONGATION IS REACHED BEFORE THE CALCULATED GAUGE PRESSURE IS OBTAINED, CONTINUE TENSIONING TILL ATTAINING THE CALCULATED GAUGE PRESSURE, PROVIDED THE ELONGATION DOES NOT EXCEED 1.05 TIMES THE CALCULATED ELONGATION. IF THIS ELONGATION IS ACHIEVED BEFORE THE CALCULATED GAUGE PRESSURE IS ATTAINED, STOP STRESSING AND INFORM THE ENGINEER.  
IF THE CALCULATED ELONGATION HAS NOT BEEN REACHED CONTINUE TENSIONING BY INTERVALS OF 5KG/SQ CM UNIT THE CALCULATED ELONGATION IS REACHED PROVIDED THE GAUGE PRESSURE DOES NOT EXCEED 1.05 TIMES THE CALCULATED GAUGE PRESSURE.  
IF THE ELONGATION AT 1.05 TIMES THE CALCULATED GAUGE PRESSURE IS LESS THAN 0.95 TIMES THE CALCULATED ELONGATION, THE FOLLOWING MEASURES MUST BE TAKEN, IN SUCCESSION, TO DEFINE THE CAUSE OF THIS TO DEFINE THE CAUSE OF THIS LACK OF ELONGATION.  
A) RECALIBRATE THE PRESSURE GAUGE.  
B) CHECK THE CORRECT FUNCTIONING OF THE JACK, PUMP AND LEADS.  
C) DE-TENSION THE CABLE, SLIDE IT IN ITS TO CHECK THAT IT IS NOT BLOCKED BY MORTAR WHICH HAS ENTERED THROUGH HOLES IN THE SHEATH. RE-TENSION CABLE, IF FREE.  
IF THE REQUIRED ELONGATION IS NOT OBTAINED, FURTHER FINISHING OPERATION SUCH AS CUTTING OR SEALING, SHOULD NOT BE UNDERTAKEN WITHOUT THE APPROVAL OF THE ENGINEER.
7. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH :-  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 08 & 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

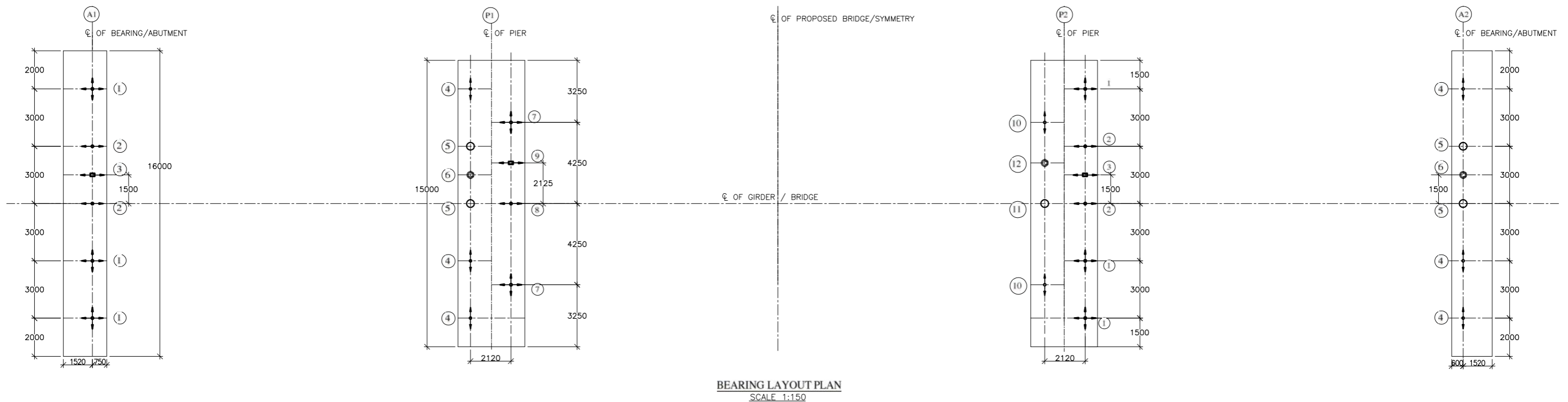
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DATE:	AUGUST, 2019			
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

CLIENT:	NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001
PROJECT:	CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

TITLE:	SHEATHING PROFILE AND ANCHORAGE DETAILS OF PSC BOX GIRDER 50.0M. SPAN
SUBMISSION TYPE:	FINAL DETAILED PROJECT REPORT

CONSULTANT:	<b>CETEST</b> Engineering Consultants An ISO 9001, ISO 14001 & OHSAS 18001 Certified Company
C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.	

DRG. NO.:	CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA			
REVISION MKD. -	R0	SHEET NO. - 09 OF 10		
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY	
SN.D	S.D	S.D	S.D	



BEARING MARK	NO.	BEARING TYPE	DL(KN)			SIDL(KN)			LL(KN)			SEISMIC(KN)		
			Longitudinal Direction	Transverse Direction	Vertical Direction	Longitudinal Direction	Transverse Direction	Vertical Direction	Longitudinal Direction	Transverse Direction	Vertical Direction	Longitudinal Direction	Transverse Direction	Vertical Direction
1	6	FREE SLIDING POT CUM PTFE	-	-	1050	-	-	227	-	-	561	-	-	513
2	4	LONGITUDINAL GUIDED SLIDE POT CUM PTFE	-	-	1050	-	-	227	-	55	561	-	766	513
3	2	METALLIC GUIDE	-	-	-	-	-	-	-	-	-	-	766	-
4	6	TRANSVERSE GUIDED SLIDE POT CUM PTFE	-	-	1050	-	-	227	173	-	561	621	-	513
5	4	FIXED POT	-	-	1050	-	-	227	173	55	561	621	766	513
6	2	PIN	-	-	-	-	-	-	-	-	-	-	766	-
7	2	FREE SLIDING POT CUM PTFE	-	-	2621	-	-	511	-	-	1109	-	-	1259
8	1	LONGITUDINAL GUIDED SLIDE POT CUM PTFE	-	-	2621	-	-	511	-	127	1109	-	1691	1259
9	1	METALLIC GUIDE	-	-	-	-	-	-	-	-	-	-	1691	-
10	2	TRANSVERSE GUIDED SLIDE POT CUM PTFE	-	-	2621	-	-	511	282	-	1109	1522	-	1259
11	1	FIXED POT	-	-	2621	-	-	511	282	127	1109	1522	1691	1259
12	1	PIN	-	-	-	-	-	-	-	-	-	-	1691	-

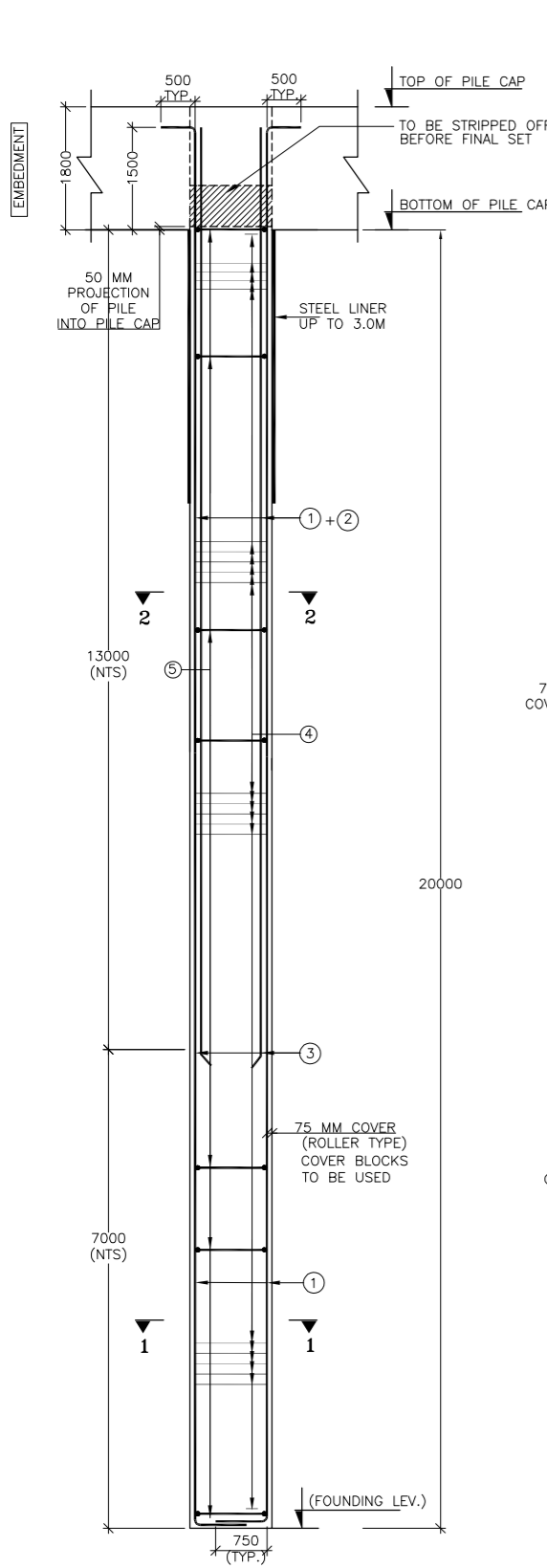
SYMBOL	LEGEND
	FIXED POT BEARING
	FREE SLIDING POT-CUM-PTFE
	LONGITUDINAL GUIDED SLIDE POT CUM PTFE BEARING
	TRANSVERSE GUIDED SLIDE POT CUM PTFE BEARING
	PIN
	METALLIC GUIDE

ALL BEARINGS EXCEPT PIN AND MATALLIC GUIDE SHALL BE PROVIDED UNDER GIRDER LEAVES, PIN AND MATALLIC GUIDE SHALL BE PROVIDED IN THE END DIAPHRAM AS PER DRAWING.

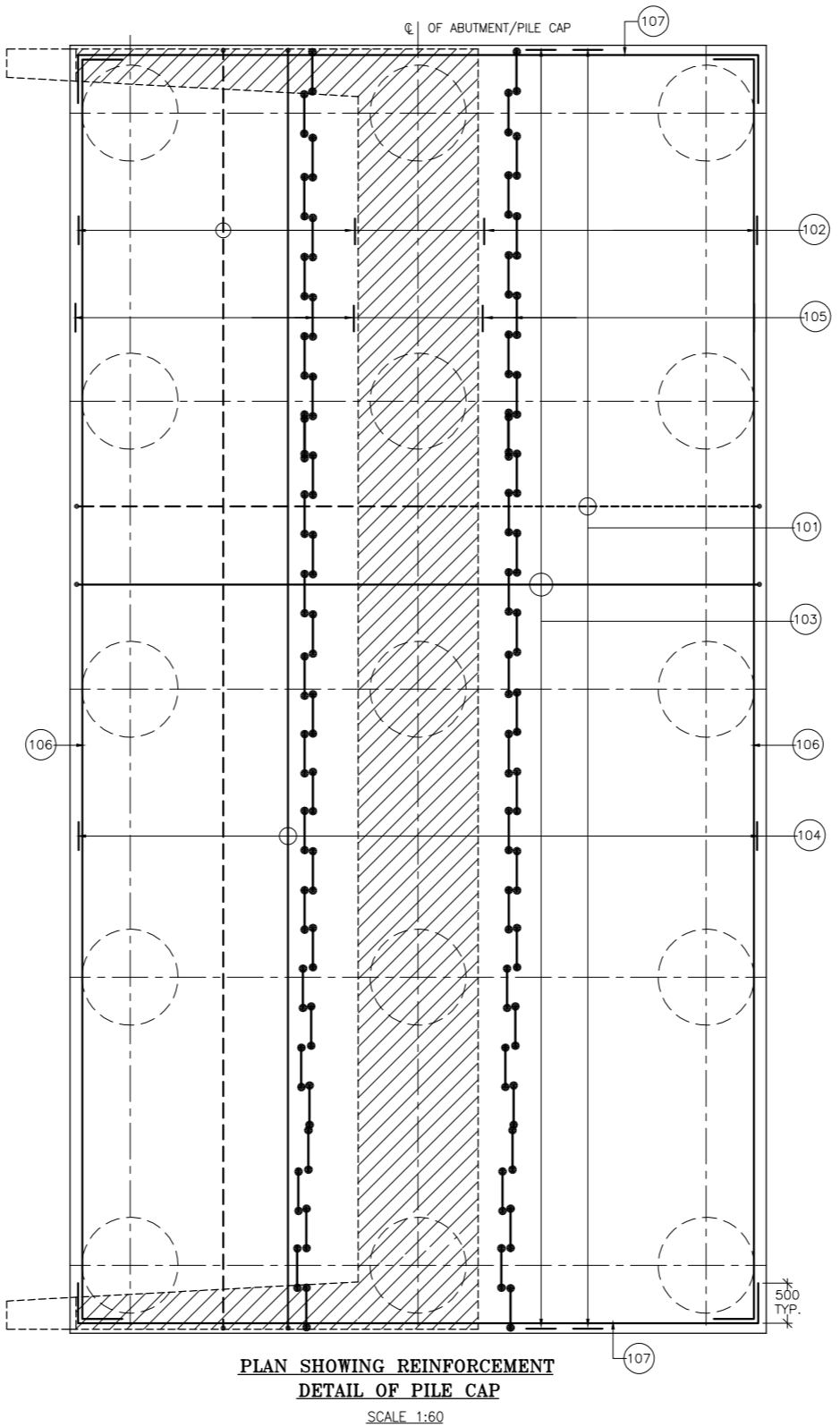
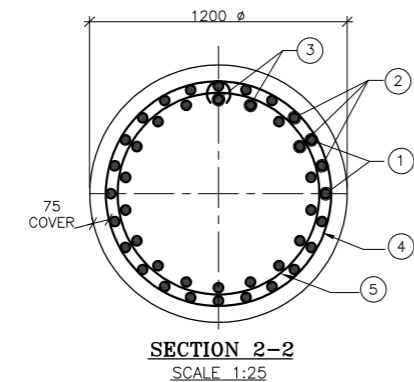
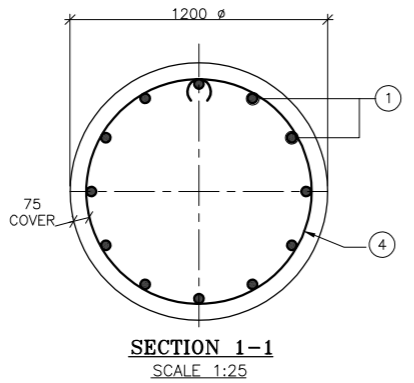
**NOTES:-**  
 1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN M. UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.  
 2. THIS DRAWING IS PREPARED IN CONNECTION WITH :  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 09)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

X → LONGITUDINAL DIRECTION ALONG CENTRE LINE OF GIRDER.  
 Y → TRANSVERSE DIRECTION ACROSS ROAD WIDTH.  
 Z → VERTICAL DIRECTION DIRECTION ALONG CENTRE LINE OF CROSS SECTION.

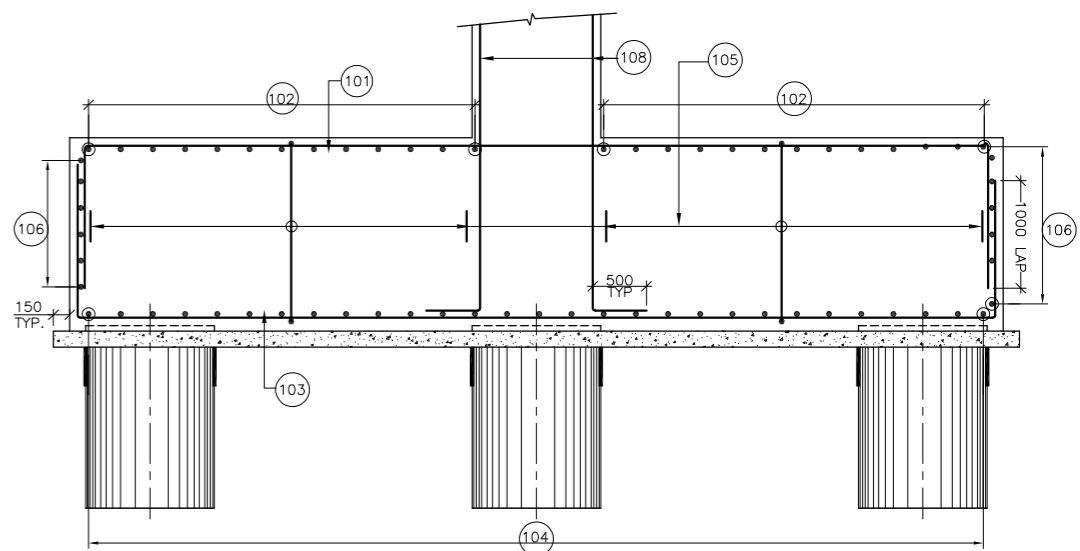
SCALE: AS SHOWN				CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001		TITLE: GENERAL ARRANGEMENT DRAWING OF BEARING LAYOUT PLAN		CONSULTANT:  Engineering Consultants An ISO 9001, ISO 9001 & OHSAS 18001 Certified Company		DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA			
R0		DATE: AUGUST, 2019		PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA		SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT		C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.		REVISION MKD. - R0		SHEET NO. - 10 OF 010	
REVISIONS										DRAWN BY: SN.D		DESIGN BY: S.D	
										CHECKED BY: S.D		ISSUED BY: S.D	



**REINFORCEMENT DETAIL OF PILE ABUTMENT(A1)**  
(SCALE 1:75)



**PLAN SHOWING REINFORCEMENT DETAIL OF PILE CAP**  
(SCALE 1:60)



**SECTIONAL ELEVATION SHOWING REINFORCEMENT DETAIL OF ABUTMENT PILE CAP**  
(SCALE 1:50)

BAR MKD.	DIA OF BARS (mm)	SPACING (mm)	REMARKS
1.	32	12 NOS.	FULL LENGTH
2.	32	12 NOS.	UPTO 13M
3.	25	18 NOS.	UPTO 13M
4.	8	150 C/C	LATERAL TIE
5.	16	2000 C/C	INTERNAL RING

BAR MKD.	DIA.OF BARS (mm)	SPACING (mm)
101.	16	150 C/C
102.	16	150 C/C
103.	25	125 C/C
104.	16	125 C/C
105.	16	150 C/C (2 LEGGED)
106.	16	6 NOS.
107.	16	6 NOS.

- NOTES :**
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.
  - CONCRETE GRADE SHALL BE M30 FOR PILE CAP, M35 FOR PILE.
  - ALL REINFORCING STEEL SHALL BE OF HYSD BARS (GRADE DESIGNATION FE-500) CONFORMING TO IS: 1786.
  - CLEAR COVER = 50MM. FOR SUBSTRUCTURE & 75MM FOR PILE & PILE CAP.
  - LAP LENGTH & DEVELOPMENT LENGTH (L<sub>d</sub>) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH RELEVANT CLAUSE OF IRC:112-2011.
  - WELDING OF BARS SHALL NOT BE PERMITTED.
  - SHARP EDGES OF CONCRETE WILL NOT BE PERMITTED.
  - LOAD TESTING OF PILES SHOULD BE DONE IN ACCORDING WITH IS 2911 PART IV.
  - LAPPING OF BARS SHOULD BE STAGGERED AS FAR AS PRACTICABLE.
  - PILE CAPACITY : VERTICAL = 325 TON  
HORIZONTAL = 40 TON
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH :  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 02 TO 12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

**LEGEND:-**  
 REAR FACE / TOP BAR -----  
 FRONT FACE / BOTTOM BAR \_\_\_\_\_

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
RO				

SCALE: AS SHOWN  
 DATE: AUGUST, 2019

**CLIENT:**  
 NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.  
 4, PARLIAMENT STREET, NEW DELHI - 110001

**PROJECT:**  
 CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

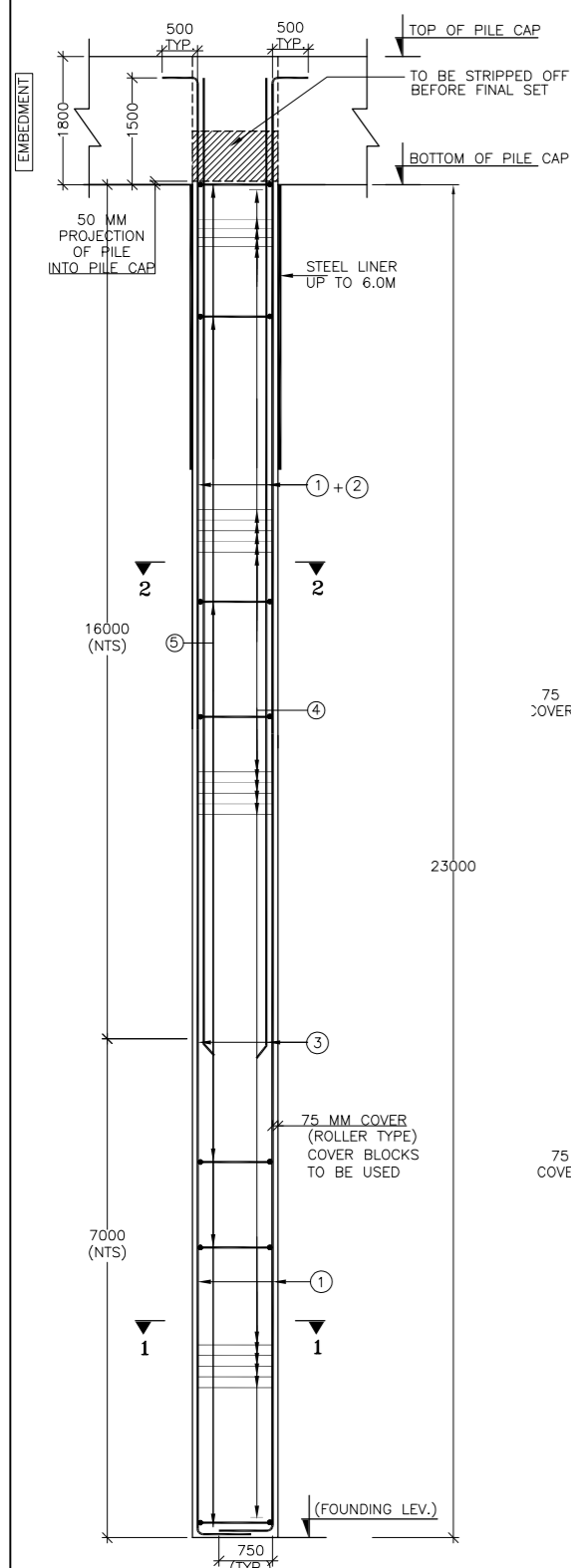
**TITLE:**  
 REINFORCEMENT DETAILS OF PILE AND PILE CAP (ABUTMENT-A1)

**SUBMISSION TYPE:**  
 FINAL DETAILED PROJECT REPORT

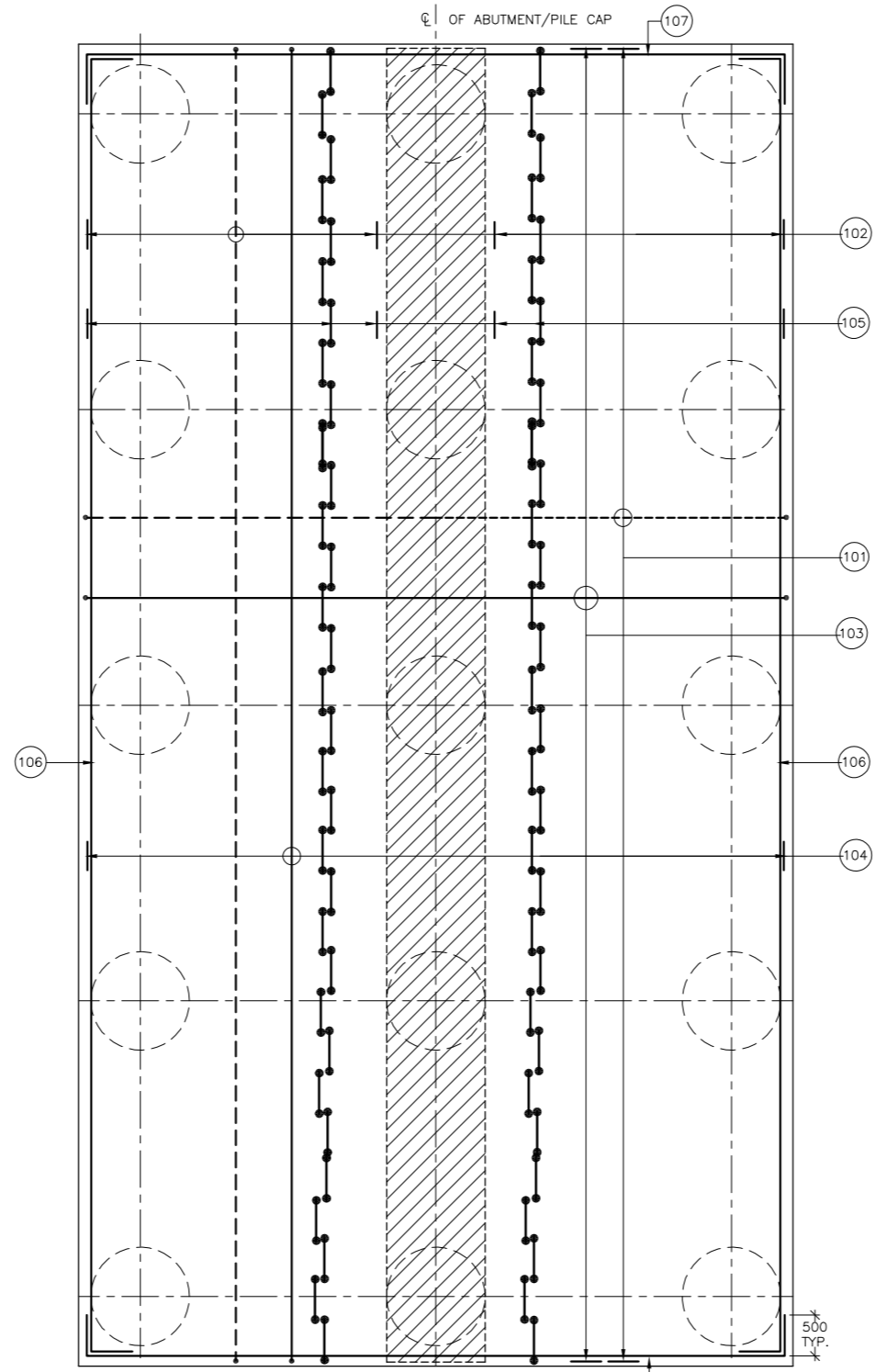
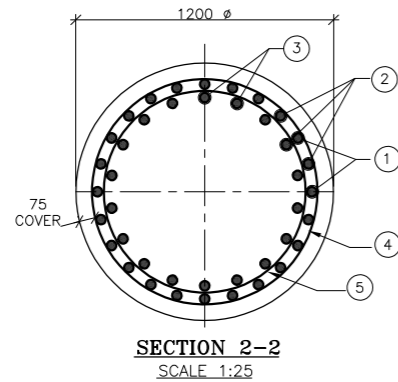
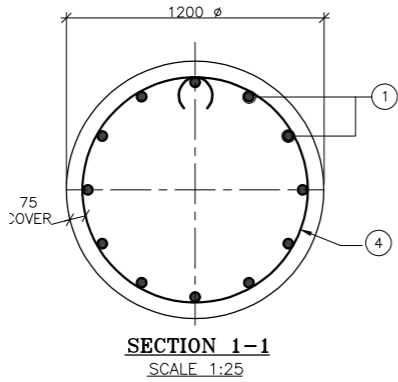
**CONSULTANT:**  
**CETEST**  
 Engineering Consultants  
 An ISO 9001, ISO 14001 & OHSAS 18001 Certified Company

**C.E. TESTING COMPANY PVT. LTD.**  
 124-A, N.S.C. BOSE ROAD  
 KOLKATA - 700092.

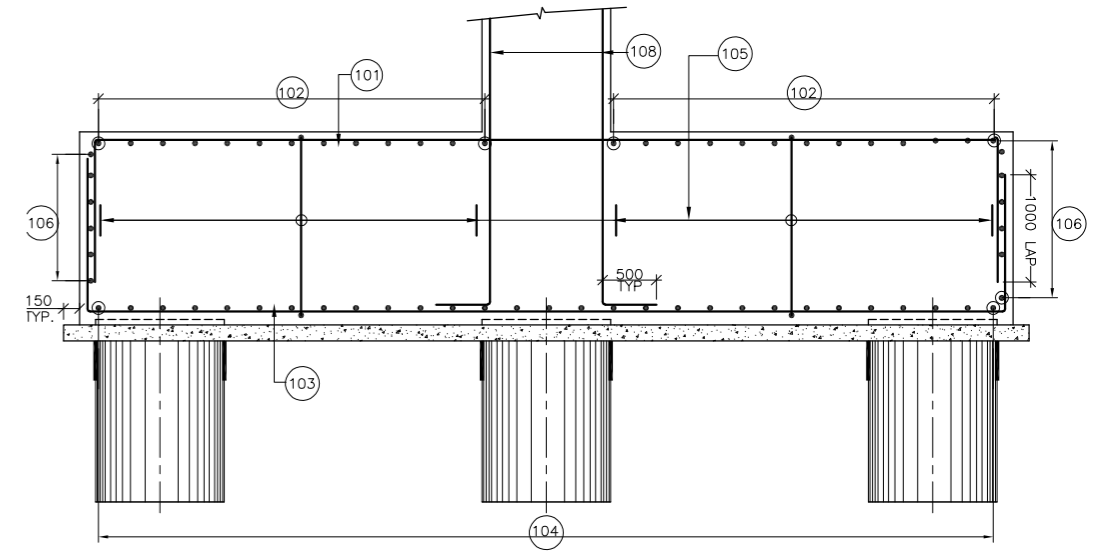
DRG. NO. : CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC			
REVISION MKD. - RO		SHEET NO. - 01 TO 12	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
SN.D	S.D	S.D	S.D



**REINFORCEMENT DETAIL OF PILE ABUTMENT(A2)**  
(SCALE 1:75)



**PLAN SHOWING REINFORCEMENT DETAIL OF PILE CAP**  
(SCALE 1:60)



**SECTIONAL ELEVATION SHOWING REINFORCEMENT DETAIL OF ABUTMENT PILE CAP**  
(SCALE 1:50)

BAR MKD.	DIA OF BARS (mm)	SPACING (mm)	REMARKS
1.	32	12 NOS.	FULL LENGTH
2.	32	12 NOS.	UPTO 16M
3.	25	18 NOS.	UPTO 16M
4.	8	150 C/C	LATERAL TIE
5.	16	2000 C/C	INTERNAL RING


BAR MKD.	DIA. OF BARS (mm)	SPACING (mm)
101.	16	150 C/C
102.	16	150 C/C
103.	25	125 C/C
104.	16	125 C/C
105.	16	150 C/C (2 LEGGED)
106.	16	6 NOS.
107.	16	6 NOS.

- NOTES :**
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.
  - CONCRETE GRADE SHALL BE M30 FOR PILE CAP, M35 FOR PILE.
  - ALL REINFORCING STEEL SHALL BE OF HYSD BARS (GRADE DESIGNATION FE-500) CONFORMING TO IS: 1786.
  - CLEAR COVER = 50MM. FOR SUBSTRUCTURE & 75MM FOR PILE & PILE CAP.
  - LAP LENGTH & DEVELOPMENT LENGTH (L<sub>d</sub>) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH RELEVANT CLAUSE OF IRC:112-2011.
  - WELDING OF BARS SHALL NOT BE PERMITTED.
  - SHARP EDGES OF CONCRETE WILL NOT BE PERMITTED.
  - LOAD TESTING OF PILES SHOULD BE DONE IN ACCORDING WITH IS 2911 PART IV.
  - LAPPING OF BARS SHOULD BE STAGGERED AS FAR AS PRACTICABLE.
  - PILE CAPACITY : VERTICAL = 325 TON  
HORIZONTAL = 40 TON
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH :  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 & 03 TO 12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

**LEGEND:-**  
 REAR FACE / TOP BAR -----  
 FRONT FACE / BOTTOM BAR \_\_\_\_\_

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
R0				


SCALE: AS SHOWN  
 DATE: AUGUST, 2019

**CLIENT:**  
  
 NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.  
 4, PARLIAMENT STREET, NEW DELHI - 110001

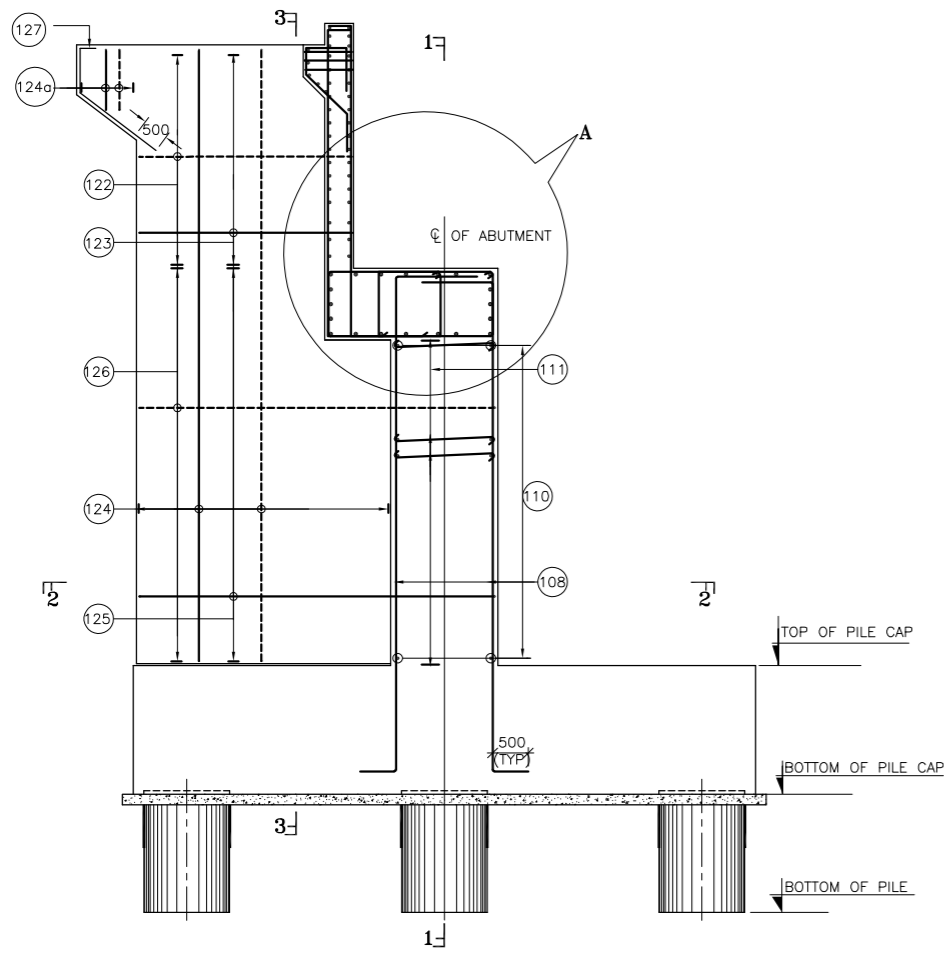
**PROJECT:** CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

**TITLE:** REINFORCEMENT DETAILS OF PILE AND PILE CAP (ABUTMENT-A2)

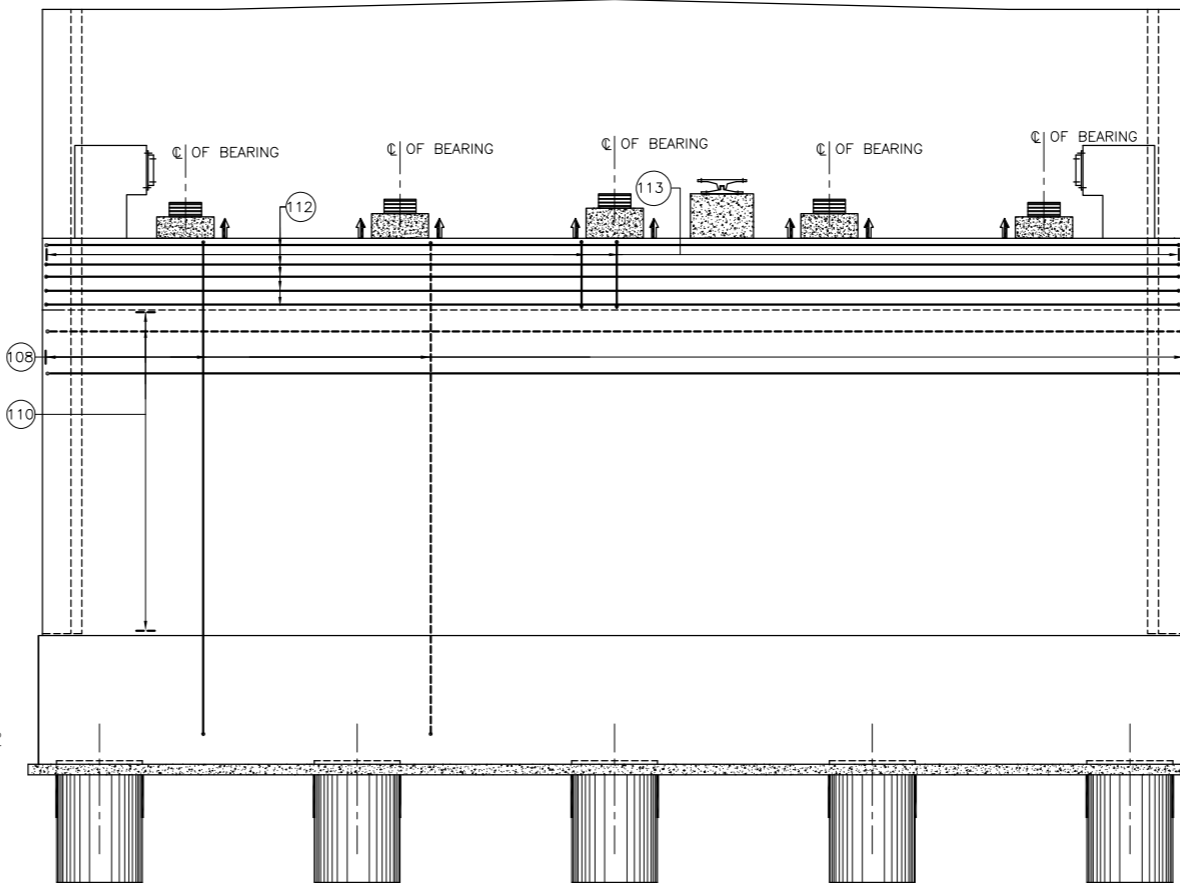
**SUBMISSION TYPE:** FINAL DETAILED PROJECT REPORT

**CONSULTANT:**  
  
**C.E. TESTING COMPANY PVT. LTD.**  
 124-A, N.S.C. BOSE ROAD  
 KOLKATA - 700092.

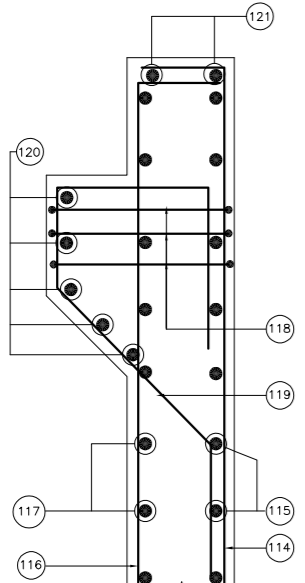
DRG. NO. : CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC			
REVISION MKD. - R0		SHEET NO. - 02 TO 12	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
SN.D	S.D	S.D	S.D



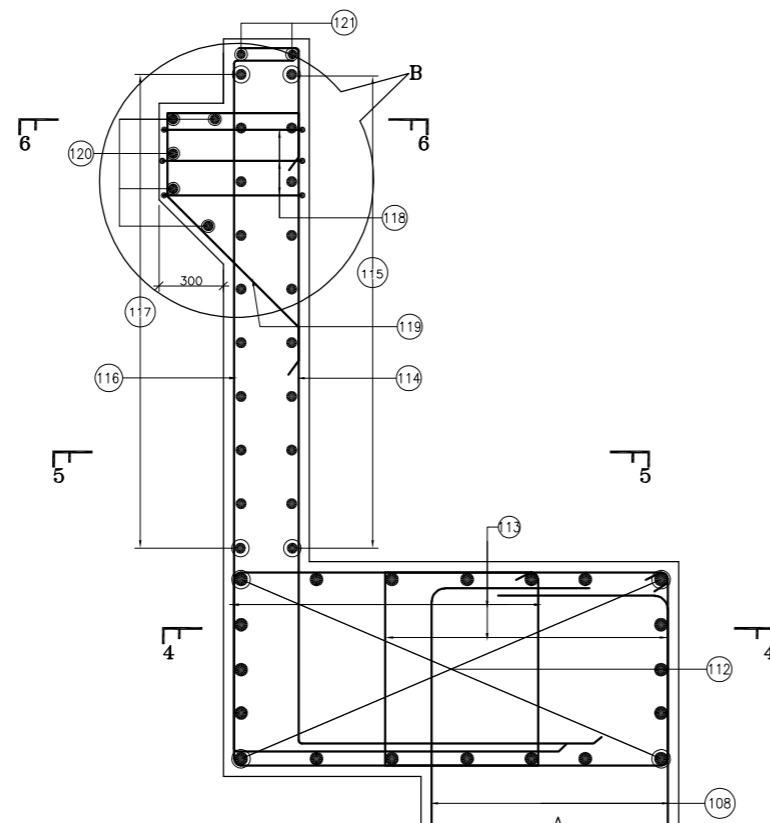
**REINFORCEMENT DETAILS OF ABUTMENT(A1)**  
SCALE 1:75



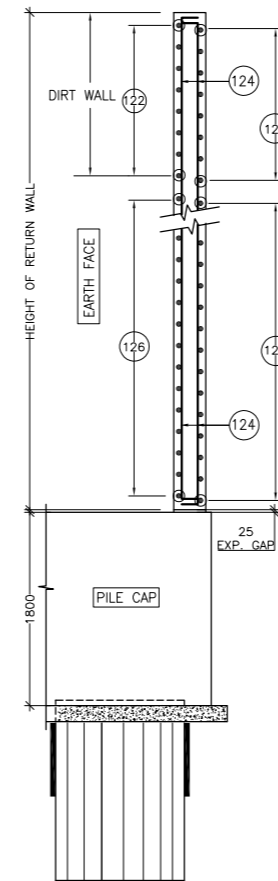
**SECTIONAL ON 1-1**  
SCALE 1:75



**DETAIL - B**  
SCALE 1:20



**DETAIL - A**  
SCALE 1:25



**SECTION OF 3-3**  
SCALE 1:50

**LEGEND:-**  
 REAR FACE/TOP BAR -----  
 /EARTH FACE BAR -----  
 FRONT FACE/BOTTOM BAR -----  
 /OPP.TO EARTH FACE BAR -----

REINFORCEMENT SCHEDULE OF ABUTMENT(A1)			
BAR MKD.	DIA. OF BARS (mm)	SPACING (mm)	REMARKS
108	25	150 C/C	
109	25	200 C/C	
110	20	150 C/C	
111	10	4 NOS.	PER SQM.
112	20	20 NOS.	
113	16	150 C/C	4 LEGGED
114	16	150 C/C	
115	10	150 C/C	
116	16	150 C/C	
117	10	150 C/C	
118	12	300 C/C	3 LAYERS 2 LEGGED
119	12	100 C/C	
120	12	5 NOS.	
121	16	2 NOS.	
122	25	100 C/C	
123	16	150 C/C	
124	16	150 C/C	
124a	16	150 C/C	
125	16	150 C/C	
126	25	100 C/C	
127	16	4 NOS	
128	16	4 NOS	
M1	16	150 C/C	
M2	16	150 C/C	
M3	8	50 C/C	
M4	32	8 NOS.	
M5	25	8 NOS.	
M6	12	9 NOS.	4 LEGGED
M7	12	5 NOS.	4 LEGGED
M8	12	4 NOS.	4 LEGGED
M9	8	50 C/C	
M11	32	8 NOS.	
M12	25	8 NOS.	
M13	12	8 NOS.	4 LEGGED
M14	12	10 NOS.	4 LEGGED
M15	8	50 C/C	

- NOTES :**
- ALL DIMENSIONS IN MM UNLESS OTHERWISE NOTED.
  - GRADE OF CONCRETE USED :-  
(i) SUBSTRUCTURE = M30,  
(ii) RETURN WALL = M30
  - ALL REINFORCING STEEL SHALL BE OF HYSD BARS (GRADE DESIGNATION FE-500) CONFORMING TO IS: 1786.
  - CLEAR COVER = 75MM. FOR SUBSTRUCTURE.
  - MINIMUM LAP LENGTH FOR REINFORCEMENT BARS SHALL BE AS PER SECTION 15, IRC:112-2011. LAP SHALL BE STAGGERED AND NOT MORE THAN 50% BARS SHALL BE LAPPED AT ANY SECTION.
  - LAP SPLICES SHALL BE PROVIDED ONLY IN THE CENTRAL HALF OF THE MAIN BAR LENGTH. NOT MORE THAN 50% OF THE BARS SHALL BE SPLICED AT ONE SECTION.
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH :  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01, 02 & 04 TO 12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
R0				
REVISIONS				

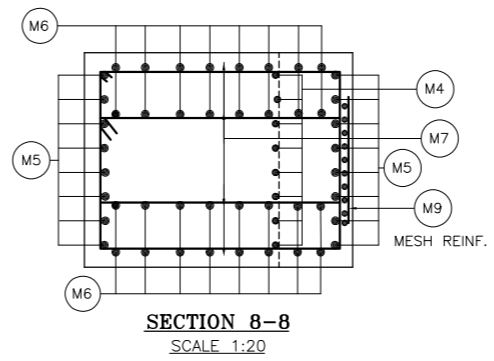
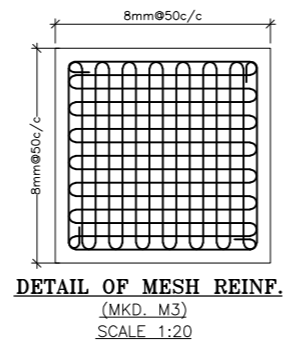
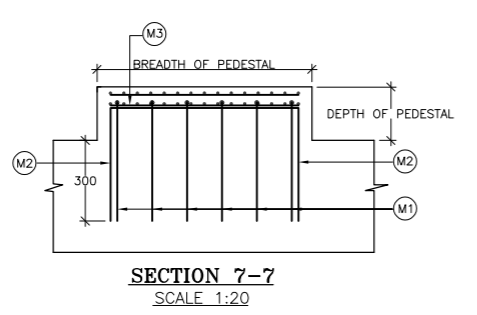
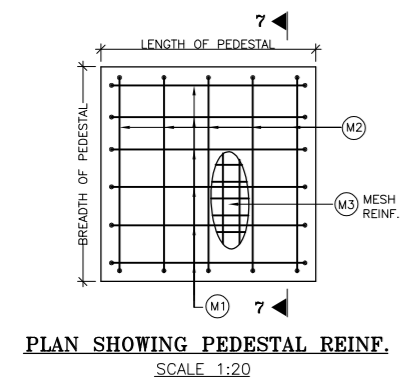
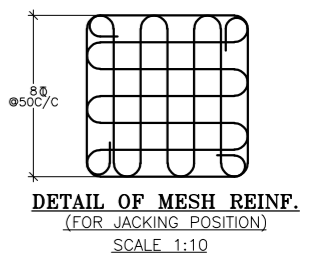
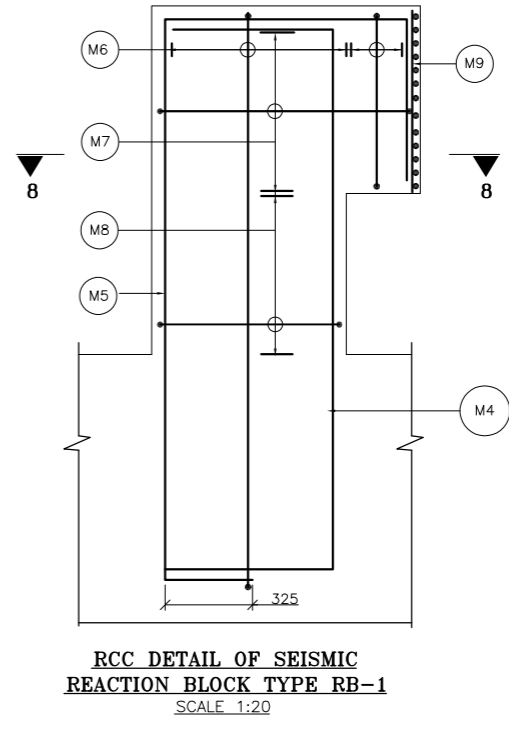
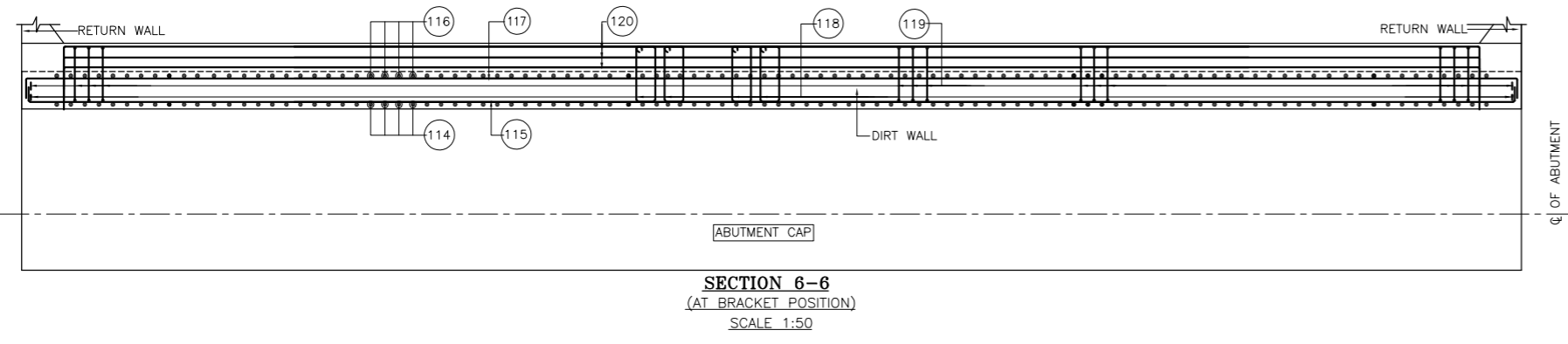
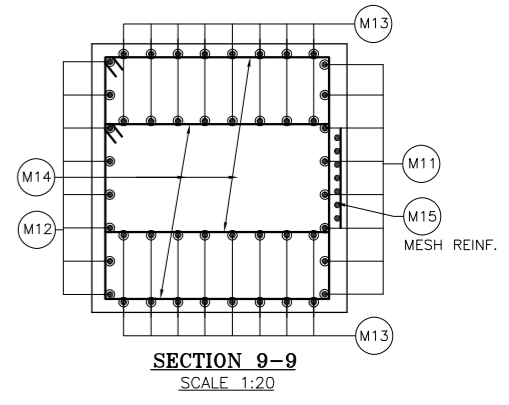
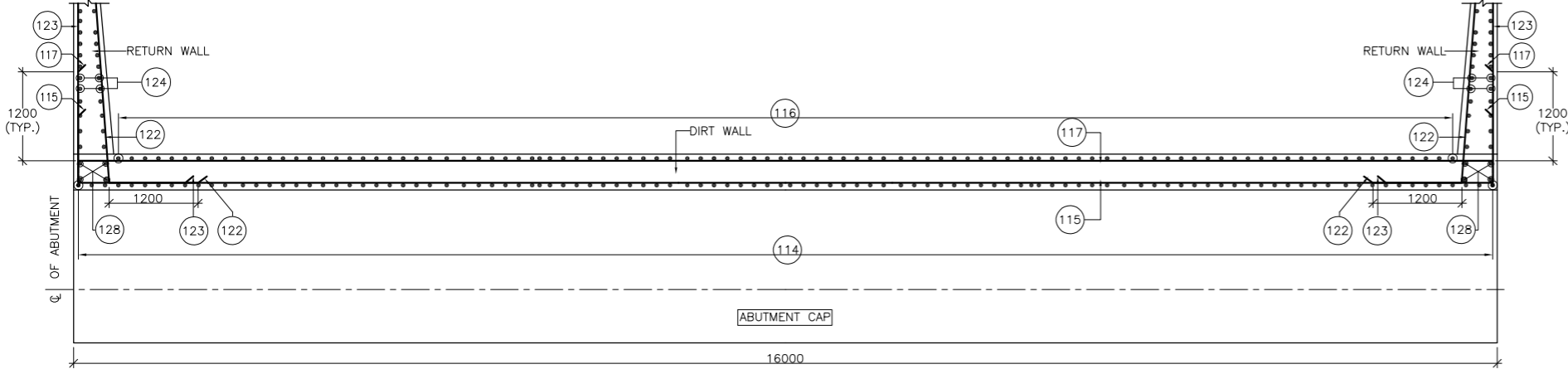
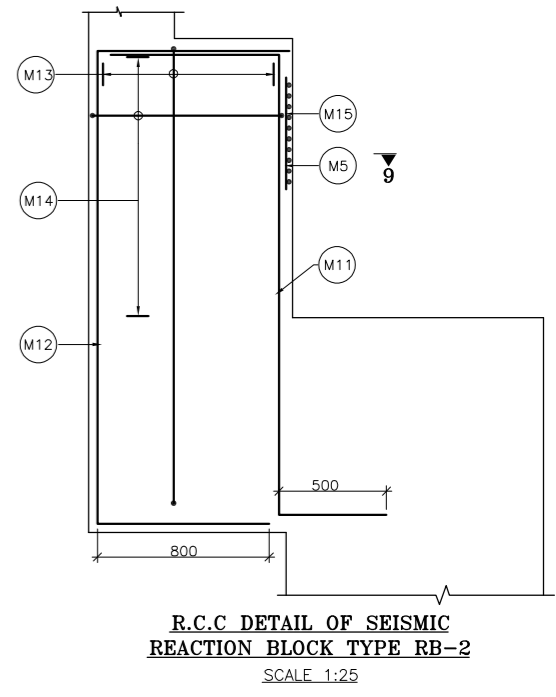
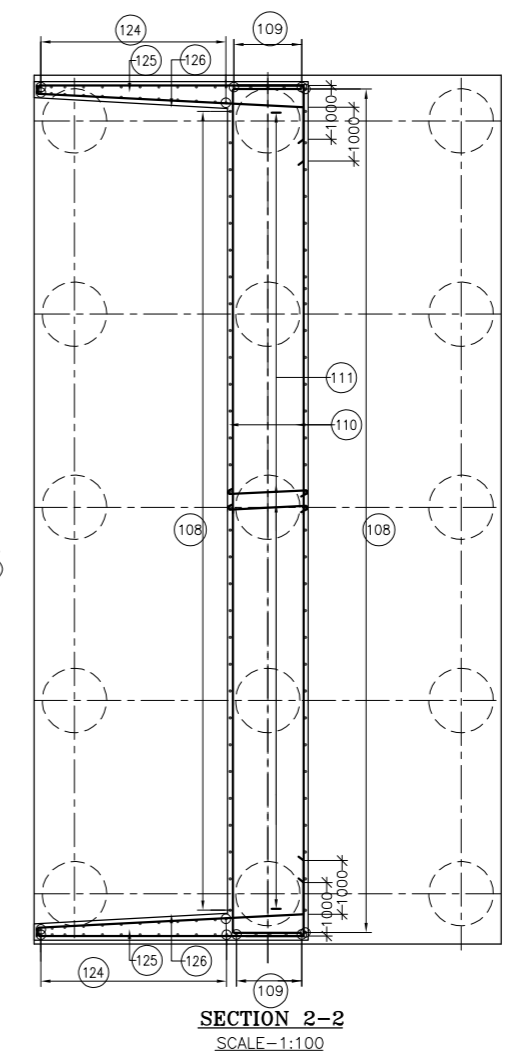
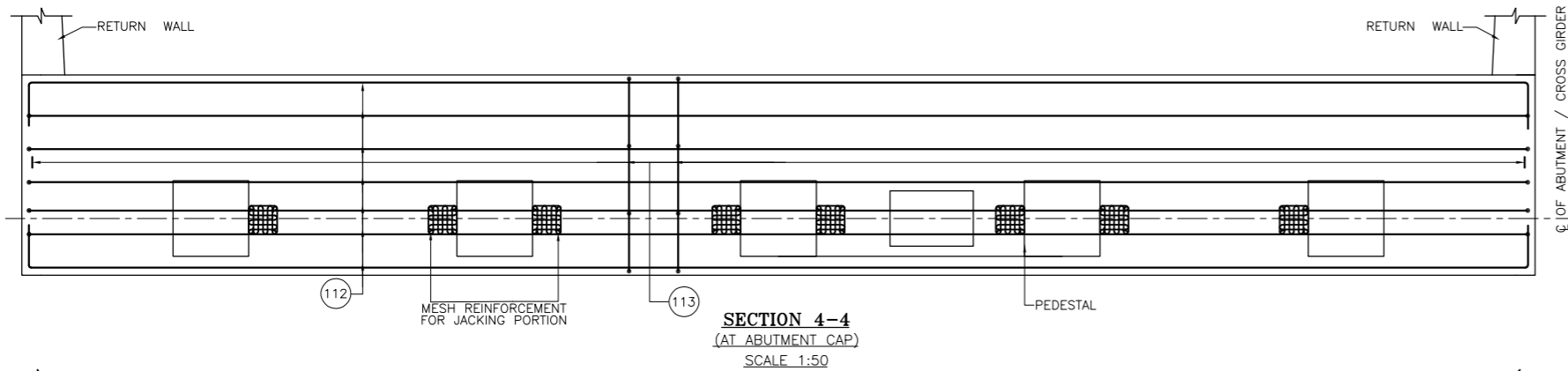
SCALE: AS SHOWN  
DATE: AUGUST, 2019

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001  
PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

TITLE: REINFORCEMENT DETAILS OF ABUTMENT(A1) & RETURN WALL  
SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT

CONSULTANT: CETEST Engineering Consultants  
C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.

DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC			
REVISION MKD. - R0		SHEET NO. - 03 TO 12	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
SN.D	S.D	S.D	S.D



**LEGEND:-**  
 REAR FACE/TOP BAR -----  
 /EARTH FACE BAR - - - - -  
 FRONT FACE/BOTTOM BAR \_\_\_\_\_  
 /OPP. TO EARTH FACE BAR - - - - -

**NOTES :**  
 1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.  
 2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH :  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 03 & 05 TO 12)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

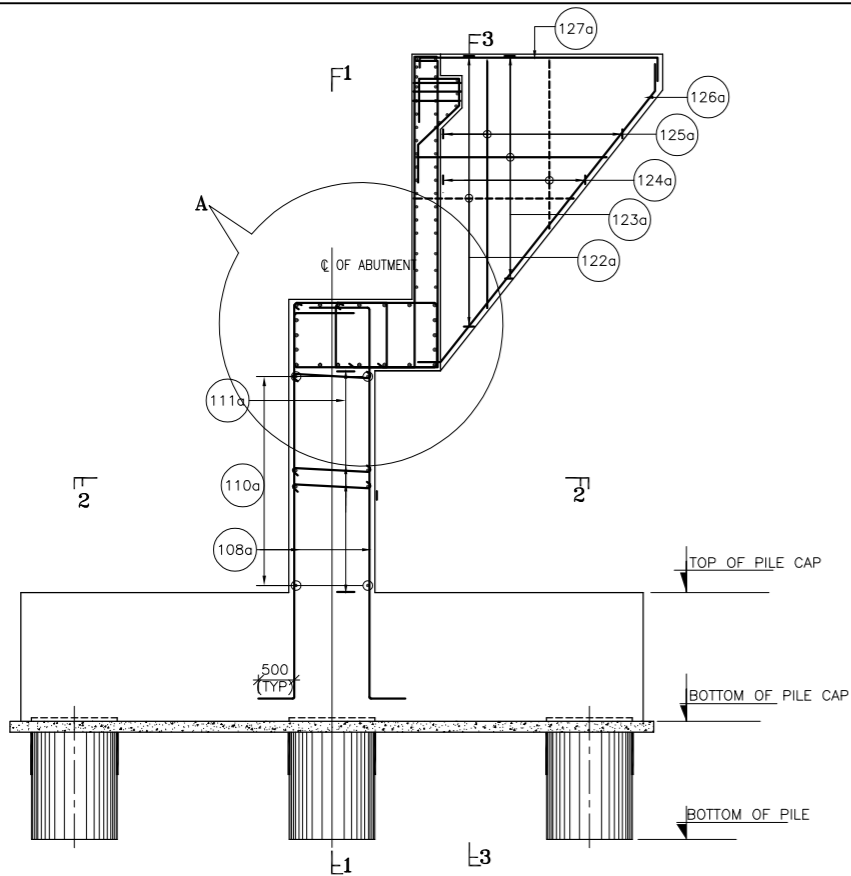
SCALE: AS SHOWN  
 DATE: AUGUST, 2019

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001  
 PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

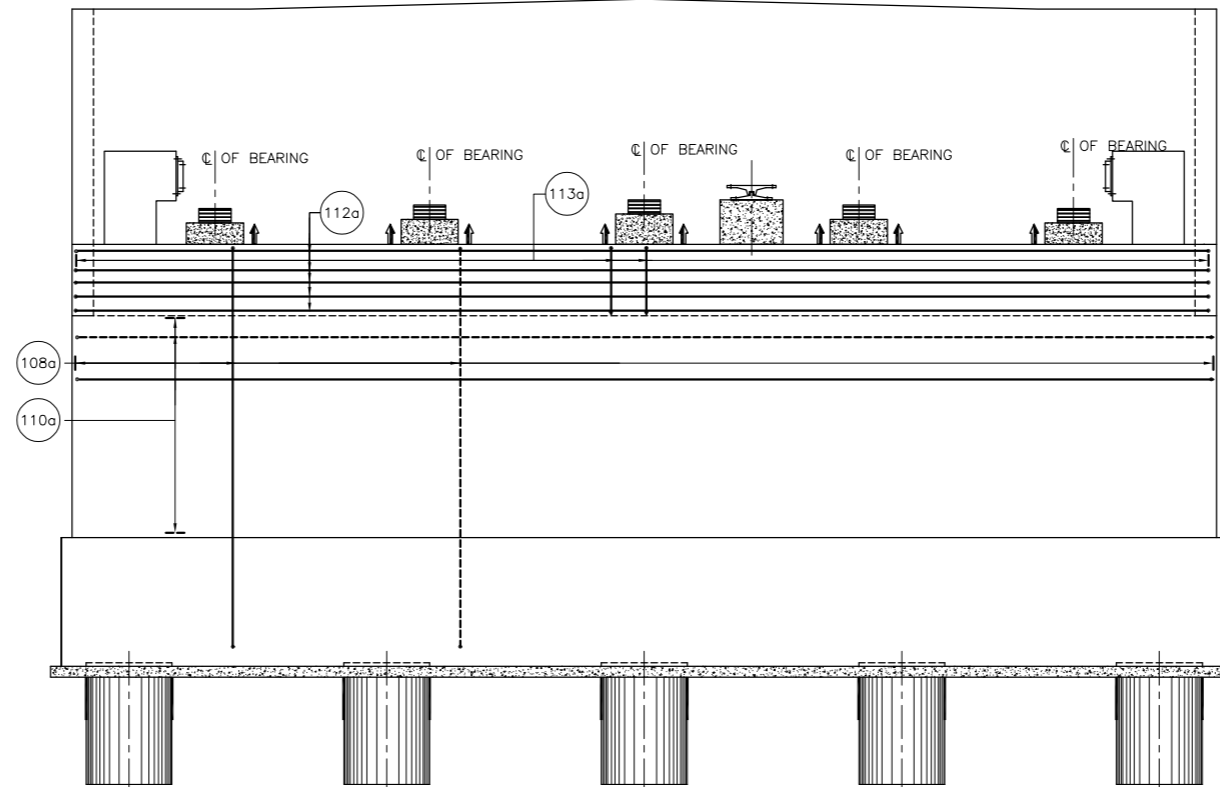
TITLE: REINFORCEMENT DETAILS OF ABUTMENT CAP, PEDESTAL & SEISMIC REACTION BLOCK  
 SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT

CONSULTANT: **CETEST** Engineering Consultants  
 C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.

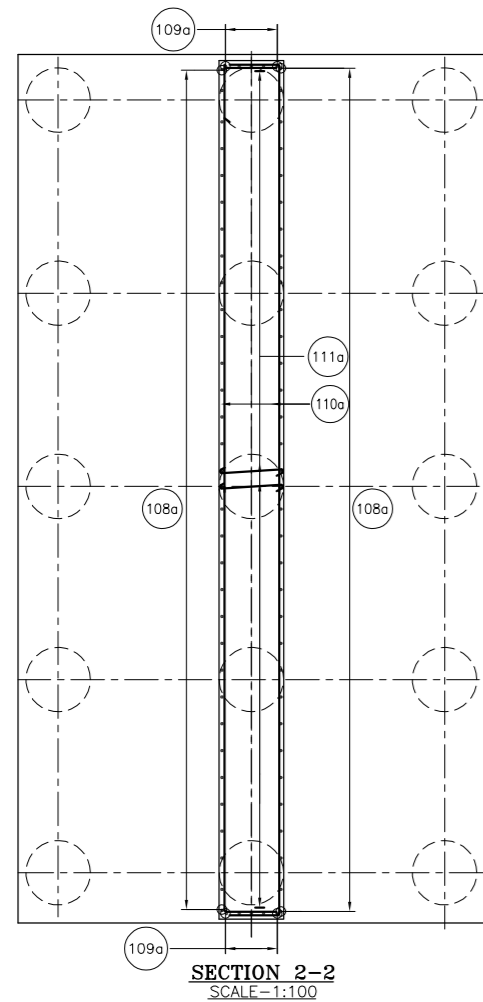
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REVISION MKD. - R0		SHEET NO. - 04 TO 12	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
SN.D	S.D	S.D	S.D



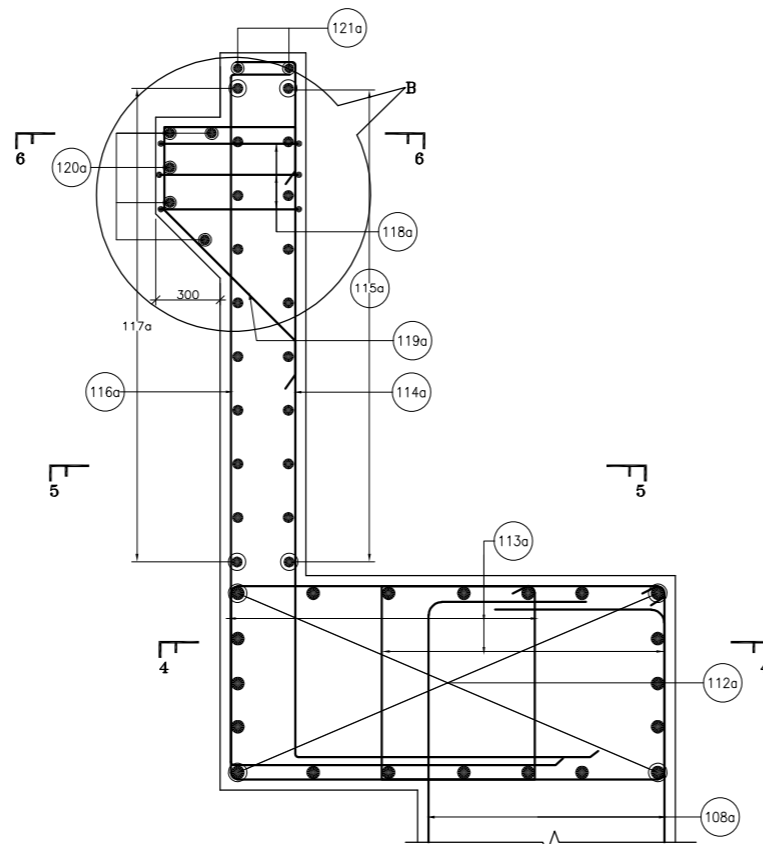
**REINFORCEMENT DETAILS OF ABUTMENT**  
SCALE 1:75



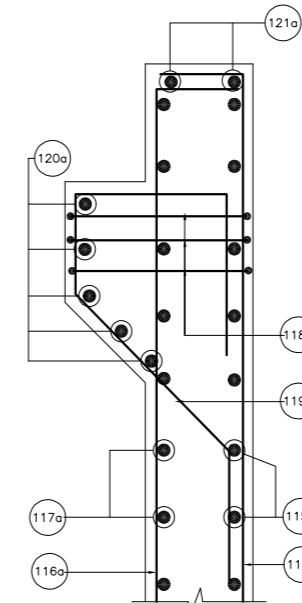
**SECTIONAL ON 1-1**  
SCALE 1:75



**SECTION 2-2**  
SCALE 1:100



**DETAIL-A**  
SCALE 1:25





**DETAIL - B**  
SCALE 1:20

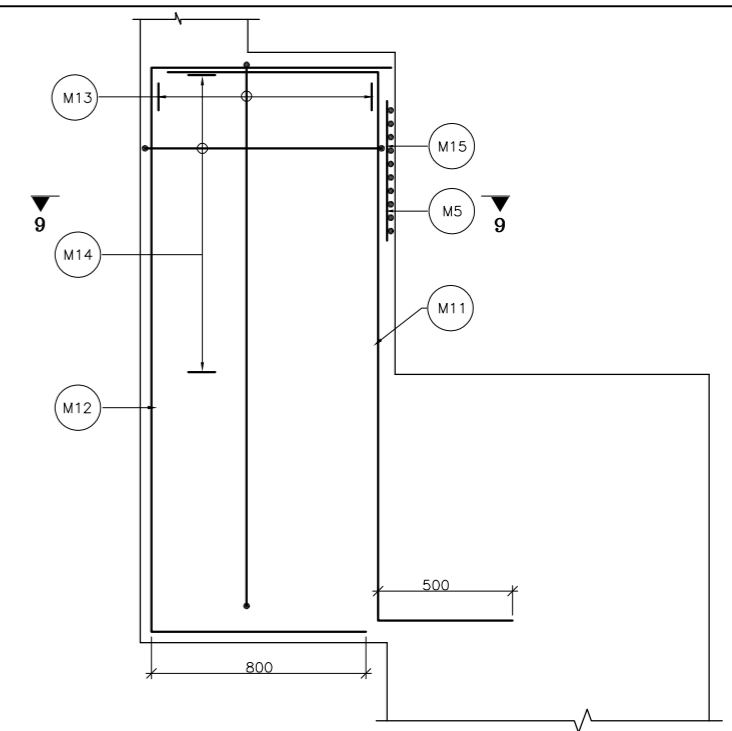
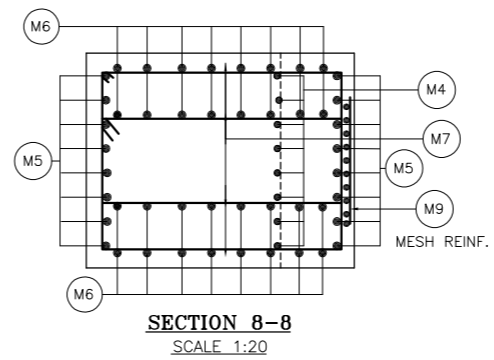
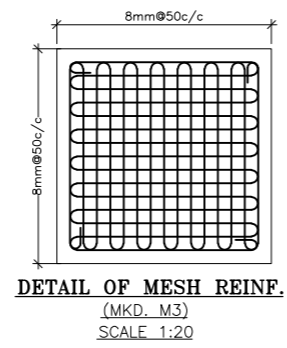
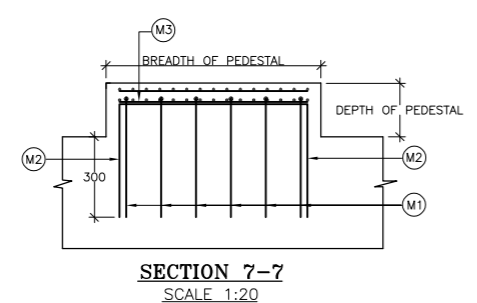
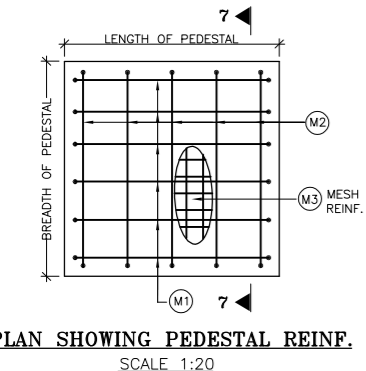
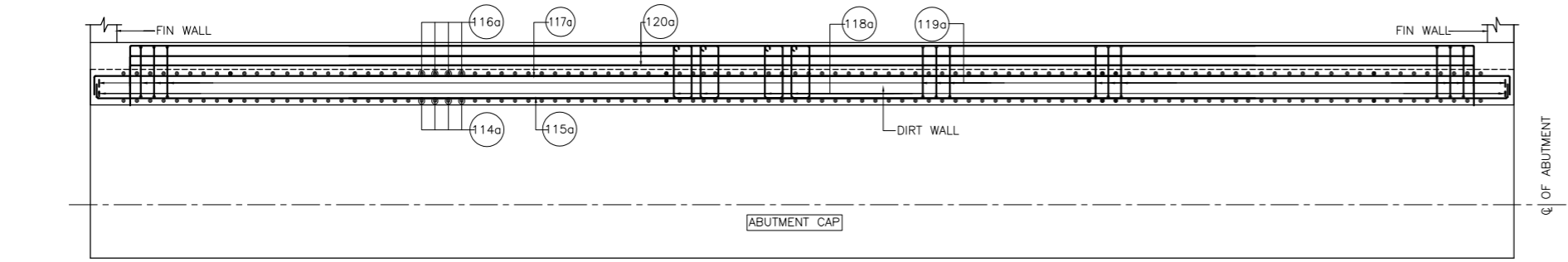
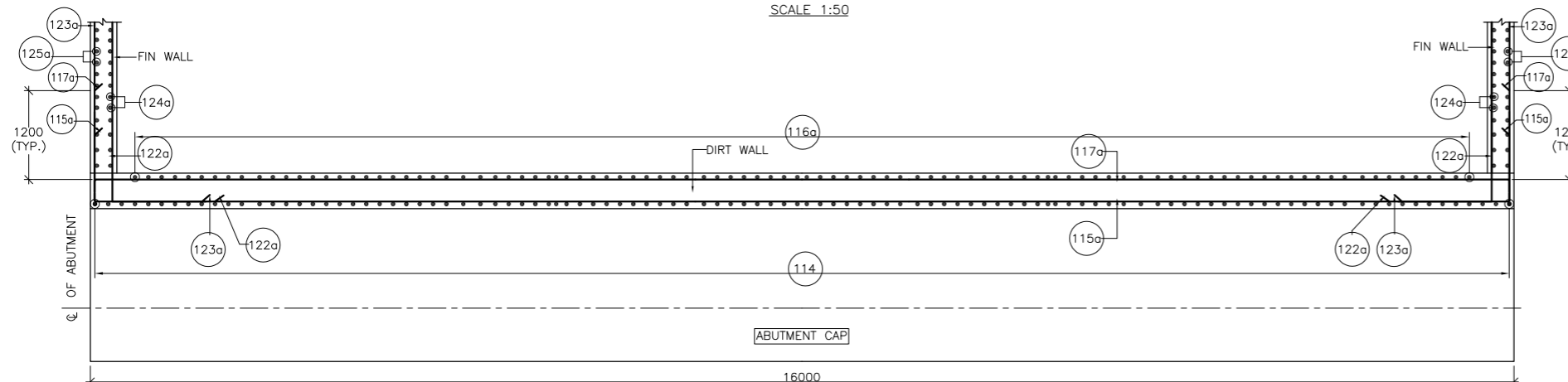
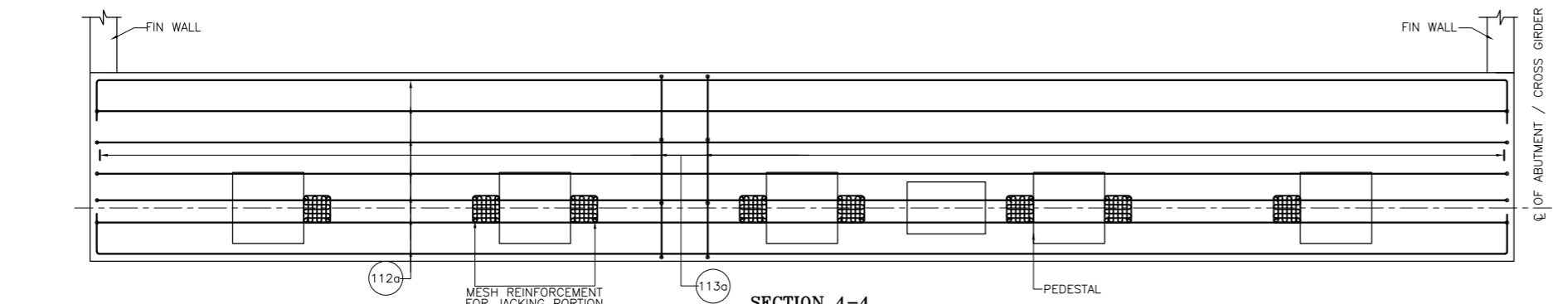
REINFORCEMENT SCHEDULE OF ABUTMENT(A2)			
BAR MKD.	DIA. OF BARS (mm)	SPACING (mm)	REMARKS
108a	20	150 C/C	
109a	20	200 C/C	
110a	16	150 C/C	
111a	10	4 NOS.	PER SQM.
112a	20	20 NOS.	
113a	16	150 C/C	4 LEGGED
114a	16	150 C/C.	
115a	10	150 C/C	
116a	16	150 C/C	
117a	10	150 C/C	
118a	12	300 C/C	3 LAYERS 2 LEGGED
119a	12	100 C/C	
120a	12	5 NOS.	
121a	16	2 NOS.	
122a	16	150 C/C	LENGTH VARIES
123a	12	150 C/C	LENGTH VARIES
124a	10	150 C/C	LENGTH VARIES
125a	10	150 C/C	LENGTH VARIES
126a	10	3 NOS.	
127a	10	3 NOS.	
M1	16	150 C/C	
M2	16	150 C/C	
M3	8	50 C/C	
M4	32	8 NOS.	
M5	25	8 NOS.	
M6	12	9 NOS.	4 LEGGED
M7	12	5 NOS.	4 LEGGED
M8	12	4 NOS.	4 LEGGED
M9	8	50 C/C	
M11	32	8 NOS.	
M12	25	8 NOS.	
M13	12	8 NOS.	4 LEGGED
M14	12	10 NOS.	4 LEGGED
M15	8	50 C/C	

**LEGEND:-**

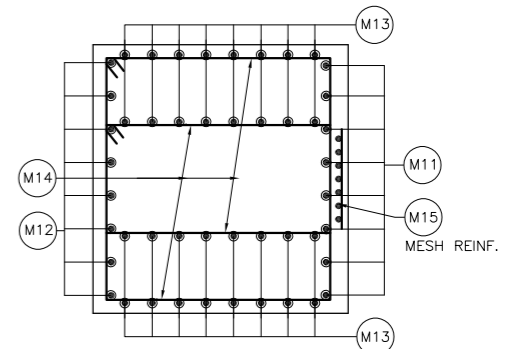
REAR FACE/TOP BAR	-----
/EARTH FACE BAR	-----
FRONT FACE/BOTTOM BAR	-----
/OPP.TO EARTH FACE BAR	-----

- NOTES :**
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH :  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 04 & 06 TO 12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

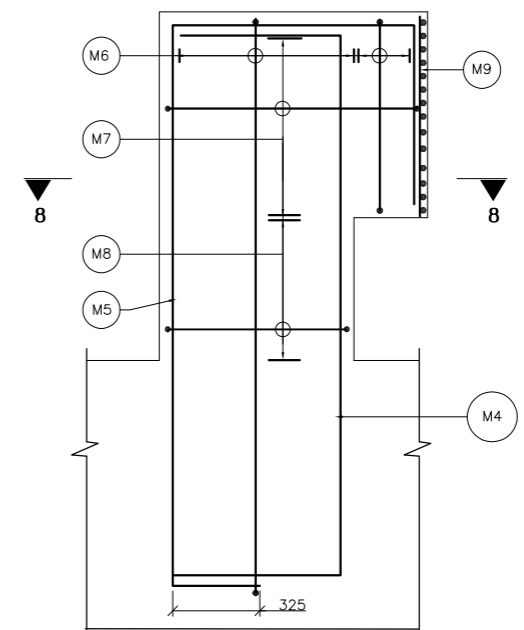
SCALE: AS SHOWN				<b>CLIENT:</b>  NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001				<b>TITLE :</b> REINFORCEMENT DETAILS OF ABUTMENT (A2)				<b>CONSULTANT :</b>  <b>C.E. TESTING COMPANY PVT. LTD.</b> 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.				<b>DRG. NO. :</b> CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC							
R0				<b>PROJECT:</b> CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA				<b>SUBMISSION TYPE :</b> FINAL DETAILED PROJECT REPORT				<b>REVISION MKD. - R0</b> SHEET NO. - 05 TO 12											
<b>DATE:</b> AUGUST, 2019								<b>DRAWN BY</b> SN.D				<b>DESIGN BY</b> S.D				<b>CHECKED BY</b> S.D				<b>ISSUED BY</b> S.D			
<b>REVISIONS</b>																							



**R.C.C DETAIL OF SEISMIC REACTION BLOCK TYPE RB-2**  
SCALE 1:20



**SECTION 9-9**  
SCALE 1:20




**RCC DETAIL OF SEISMIC REACTION BLOCK TYPE RB-1**  
SCALE 1:20

**LEGEND:-**  
 REAR FACE/TOP BAR /EARTH FACE BAR (dashed line)  
 FRONT FACE/BOTTOM BAR /OPP.TO EARTH FACE BAR (solid line)

**NOTES :**  
 1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.  
 2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH :  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 05 & 07 TO 12)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
R0				
REVISIONS				


SCALE: AS SHOWN  
 DATE: AUGUST, 2019

**CLIENT:**  
  
 NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.  
 4, PARLIAMENT STREET, NEW DELHI - 110001

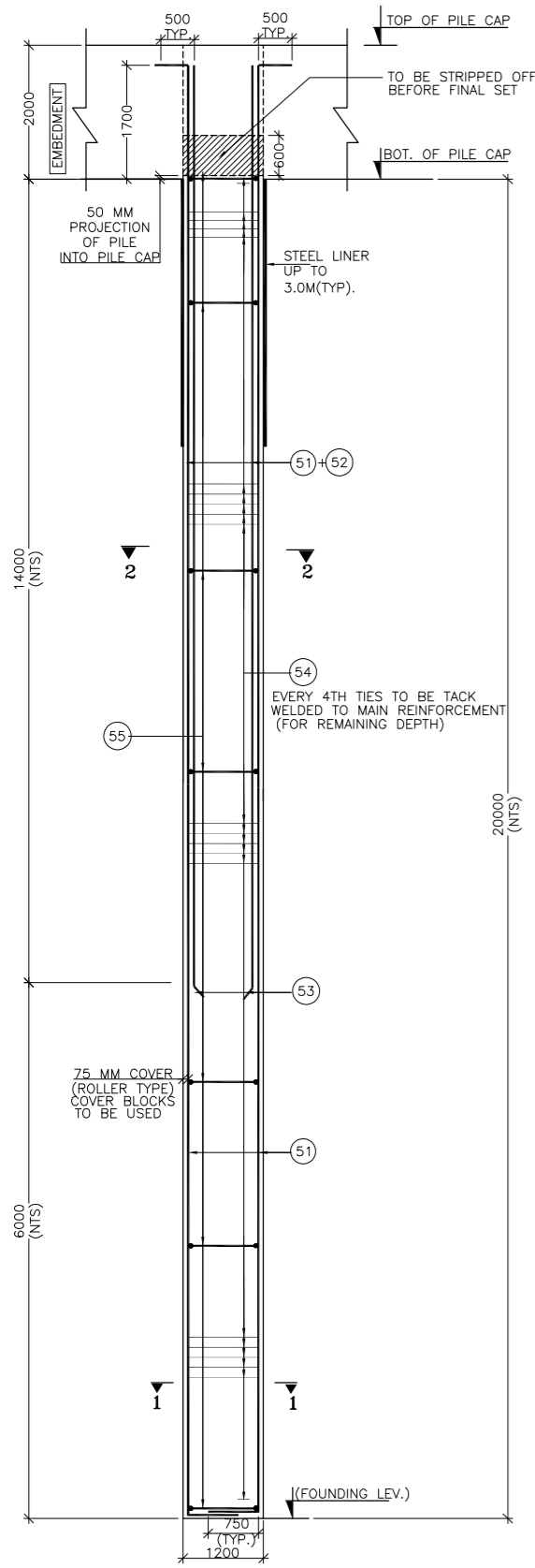
**PROJECT:** CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

**TITLE:** REINFORCEMENT DETAILS OF ABUTMENT CAP, PEDESTAL & SEISMIC REACTION BLOCK

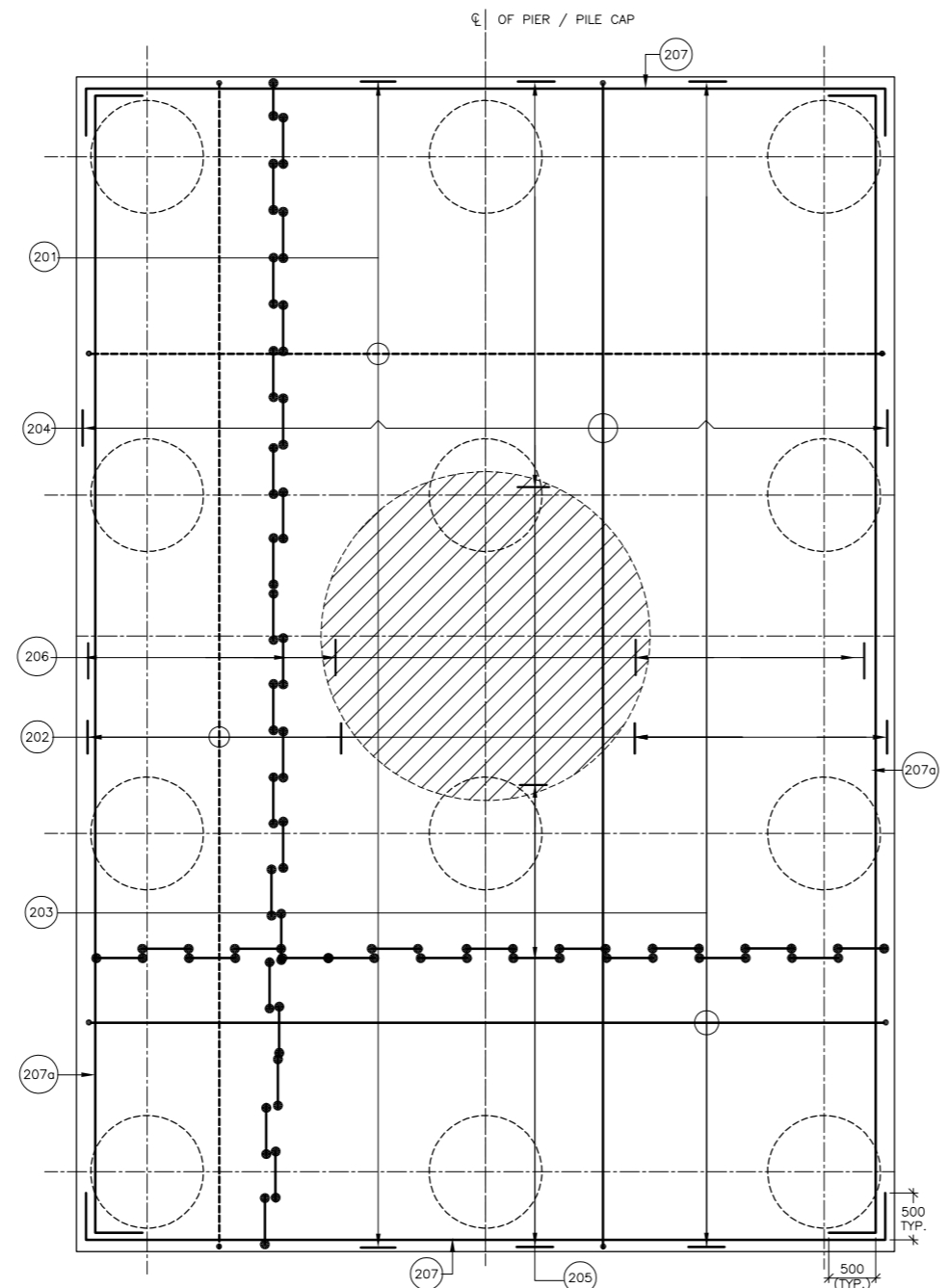
**SUBMISSION TYPE:** FINAL DETAILED PROJECT REPORT

**CONSULTANT:**  
  
**C.E. TESTING COMPANY PVT. LTD.**  
 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.

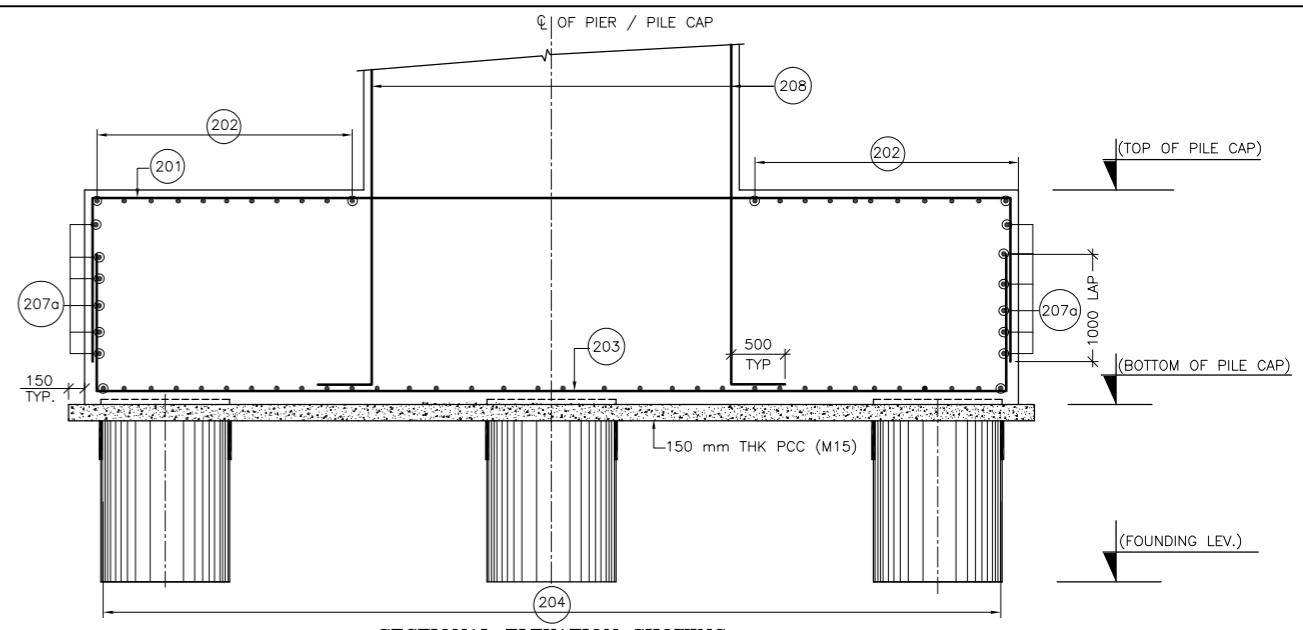
DRG. NO. : CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC			
REVISION MKD. - R0		SHEET NO. - 06 TO 12	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
SN.D	S.D	S.D	S.D



**REINFORCEMENT DETAIL OF PILE FOR PIER**  
(SCALE 1:75)



**PLAN SHOWING REINFORCEMENT DETAIL OF PIER PILE CAP**  
SCALE 1:50

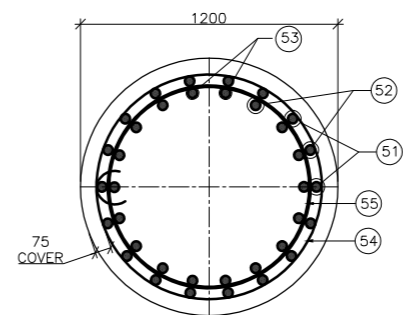


**SECTIONAL ELEVATION SHOWING REINFORCEMENT DETAIL OF PILE CAP OF PIER**  
(205 & 206 BARS ARE NOT SHOWN)  
(SCALE 1:50)

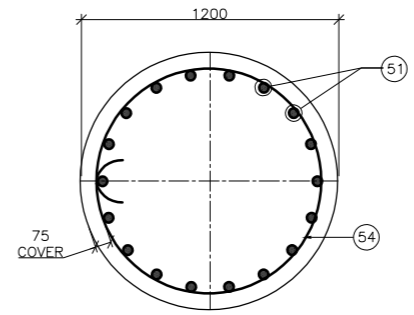
BAR MKD.	DIA OF BARS (mm)	SPACING (mm)	REMARKS
51.	32	12 NOS.	FULL LENGTH
52.	32	12 NOS.	UPTO 14M
53.	25	18 NOS.	UPTO 14M
54.	8	150 C/C	LATERAL TIE
55.	16	2000 C/C	INTERNAL RING

BAR MKD.	DIA. OF BARS (mm)	SPACING (mm)
201.	20	150 C/C
202.	20	150 C/C
203.	32	150 C/C
204.	32	100 C/C
205.	16	150 C/C (2 LEGGED)
206.	16	150 C/C (2 LEGGED)
207.	16	7 NOS.
207a.	16	7 NOS.

**LEGEND:-**  
 REAR FACE / TOP BAR -----  
 FRONT FACE / BOTTOM BAR \_\_\_\_\_



**SECTION 2-2**  
SCALE 1:25



**SECTION 1-1**  
SCALE 1:25

- NOTES :**
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.
  - CONC. GRADE SHALL BE M30 FOR PILE CAP, M35 FOR PILE & REST M30
  - ALL REINFORCING STEEL SHALL BE OF HYSD BARS (GRADE DESIGNATION FE-500) CONFORMING TO IS: 1786.
  - CLEAR COVER = 50MM. FOR SUBSTRUCTURE & 75MM FOR PILE & PILE CAP.
  - LAP LENGTH & DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH RELEVANT CLAUSE OF IRC:112-2011.
  - WELDING OF BARS SHALL NOT BE PERMITTED.
  - SHARP EDGES OF CONCRETE WILL NOT BE PERMITTED.
  - LOAD TESTING OF PILES SHOULD BE DONE IN ACCORDING WITH IS 2911 PART IV.
  - LAPPING OF BARS SHOULD BE STAGGERED AS FAR AS PRACTICABLE.
  - PILE CAPACITY (PIER); VERTICAL = 270 TON  
HORIZONTAL = 30 TON
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH :  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 06 & 08 TO 12)  
 CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.

REVISIONS

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.  
 4, PARLIAMENT STREET, NEW DELHI - 110001

PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

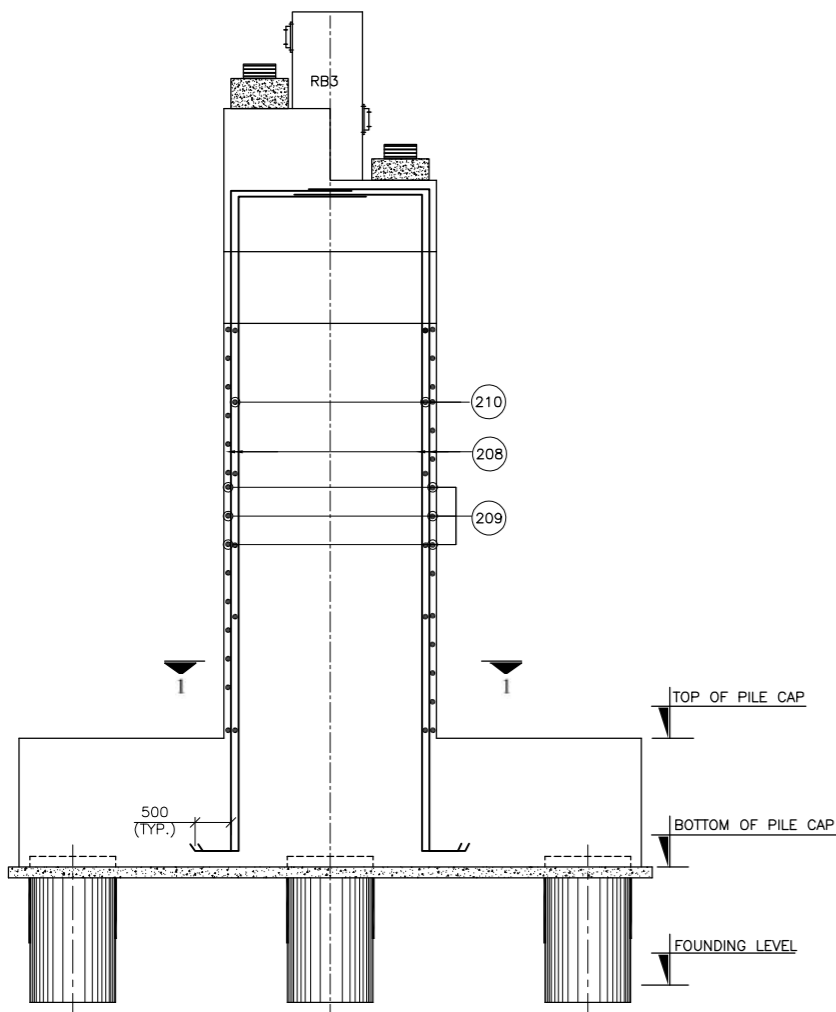
TITLE: REINFORCEMENT DETAILS OF PILE AND PILE CAP (PIER)

SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT

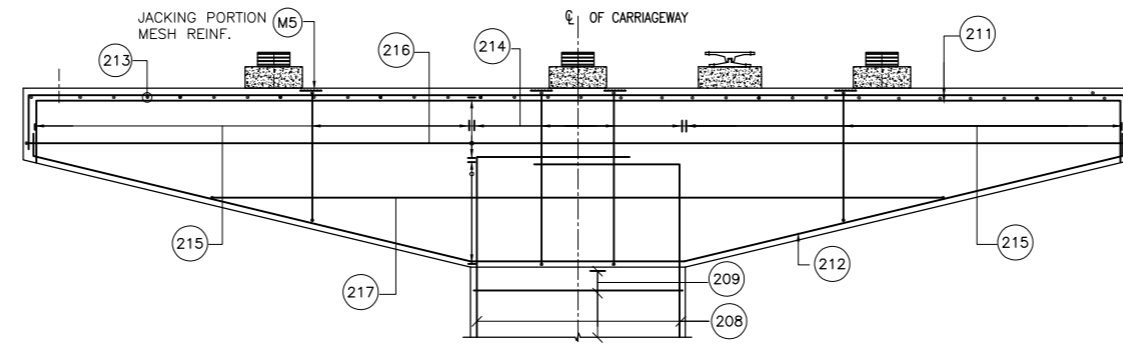
CONSULTANT: **CETEST** Engineering Consultants  
 An ISO 9001, 14001 & OHSAS 18001 Certified Company

**C.E. TESTING COMPANY PVT. LTD.**  
 124-A, N.S.C. BOSE ROAD  
 KOLKATA - 700092.

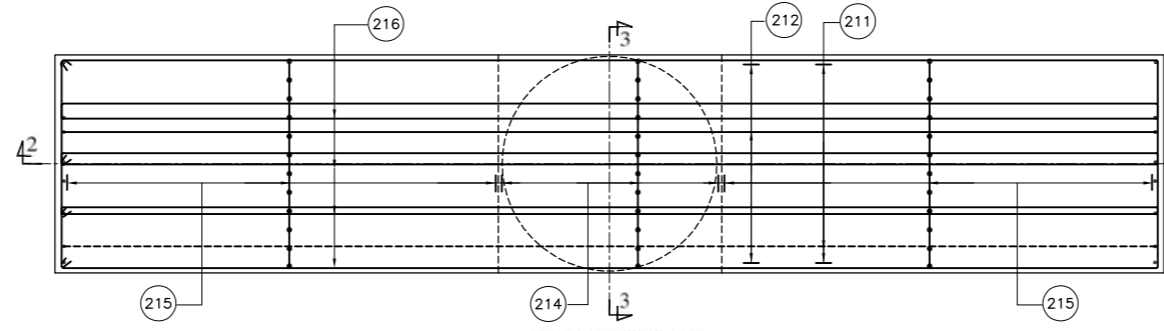
DRG. NO.:	CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC			
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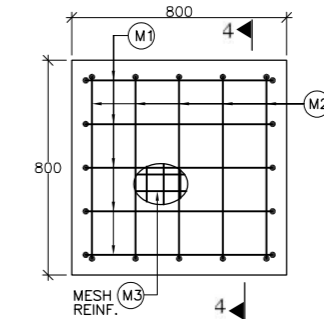
SECTION ELEVATION OF PIER  
(PIER CAP BARS ARE NOT SHOWN)  
SCALE 1:75



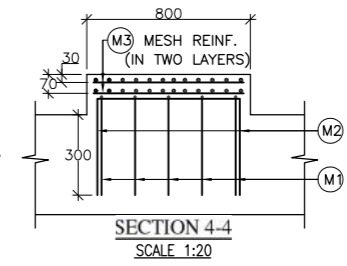
SECTION 2-2  
SCALE 1:75



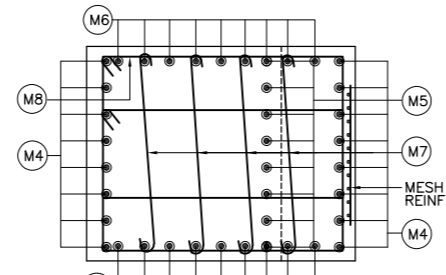
PLAN OF PIER CAP  
SCALE 1:75



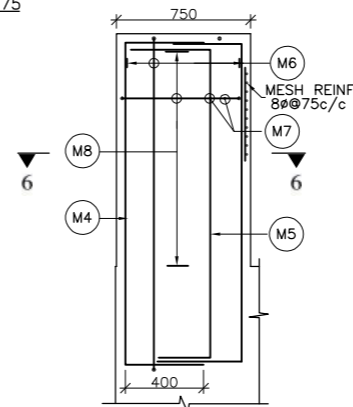
PLAN SHOWING PEDESTAL REINF.  
SCALE 1:20



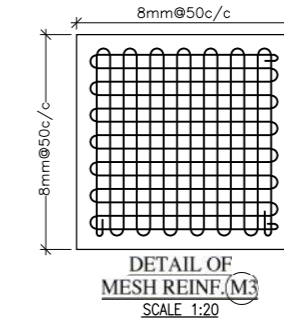
SECTION 4-4  
SCALE 1:20



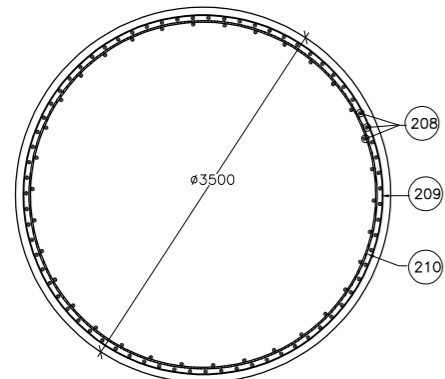
SECTION 6-6  
SCALE 1:20



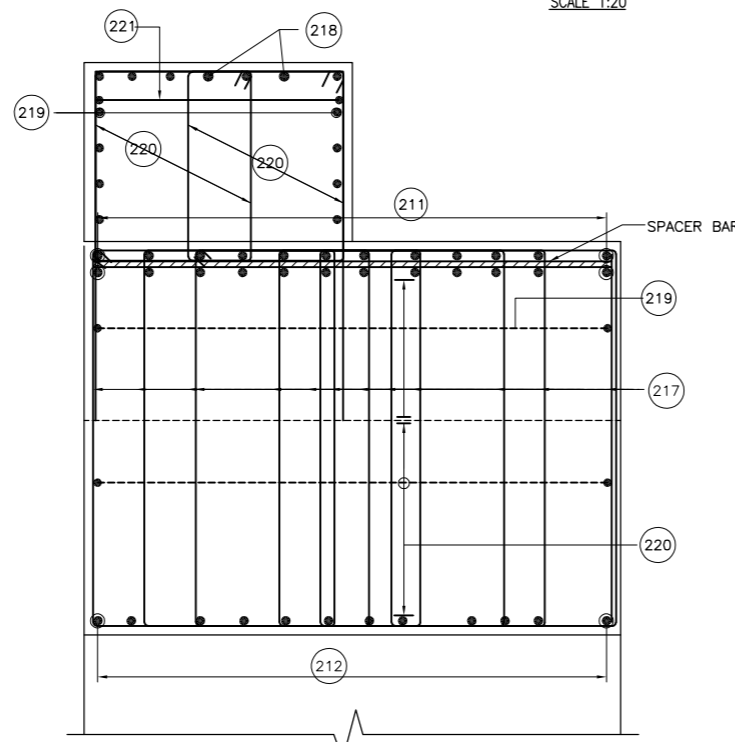
R.C.C DETAIL OF SEISMIC  
REACTION BLOCK TYPE RB-1A  
SCALE 1:30



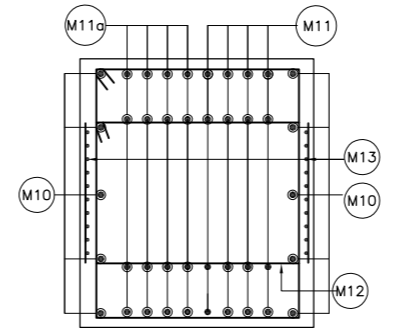
DETAIL OF  
MESH REINF. (M3)  
SCALE 1:20



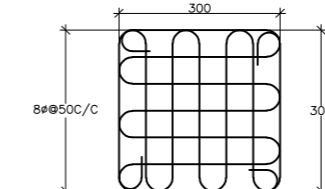
SECTION 1-1  
SCALE 1:50



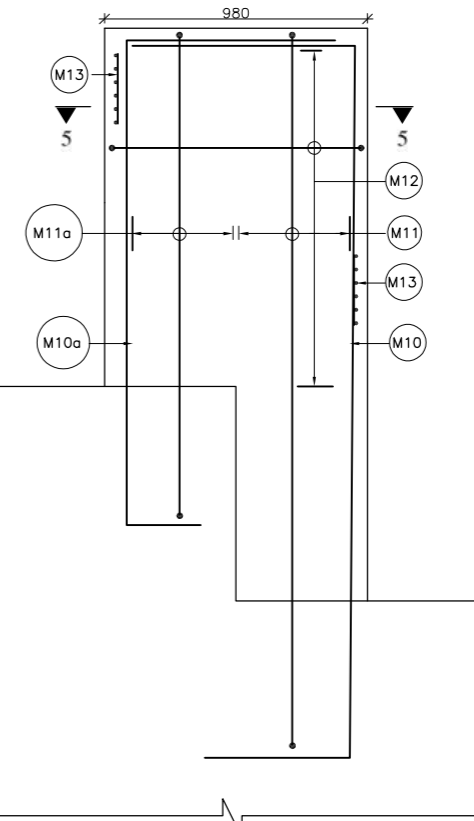
DETAIL 3-3  
(SCALE 1:30)



SECTION 5-5  
SCALE 1:20



DETAIL OF MESH REINF.  
(FOR JACKING POSITION)  
SCALE 1:10



R.C.C DETAIL OF SEISMIC  
REACTION BLOCK TYPE RB-3  
SCALE 1:20

REINFORCEMENT SCHEDULE OF PIER			
BAR MKD.	DIA. OF BARS (mm)	SPACING (mm)	REMARKS
208	32	150 C/C	2 LAYERS
209	16	125 C/C	
210	25	1000 C\C	SPACER BAR
211	32	150 C/C	2 LAYERS
212	25	150 C/C	
213	25	1000 C/C	SPACER BAR
214	16	150 C/C	12 LEGGED STP
215	16	150 C/C	12 LEGGED STP(LV.)
216	16	200 C/C	8 LEGGED STP.
217	16	200 C/C	8 LEGGED STP.(LV.)
218	32	150 C/C	
219	25	150 C/C	SIDE FACE BAR
220	16	150 C/C	4 LEGGED STP.
221	16	200 C/C	4 LEGGED STP.
M1	16	150 C/C	
M2	16	150 C/C	
M3	8	50 C/C	2 LAYERS
M4	32	8 NOS.	
M5	25	8 NOS.	
M6	12	9 NOS.	4 LEGGED
M7	12	5 NOS.	4 LEGGED
M8	12	4 NOS.	4 LEGGED
M9	8	50 C/C	
M10	32	5 NOS.	
M10a	32	5 NOS.	
M11	12	8 NOS.	4 LEGGED
M11a	12	8 NOS.	4 LEGGED
M12	12	18 NOS.	4 LEGGED
M13	8	50 C/C	

(208 TO 212) MKD. BARS ARE NOT USED

LEGEND:-  
REAR FACE / TOP BAR -----  
FRONT FACE / BOTTOM BAR \_\_\_\_\_

NOTES:

- ALL DIMENSIONS IN MM UNLESS OTHERWISE NOTED.
- GRADE OF CONCRETE USED :-  
(i) PIER & PIER CAP = M30.
- ALL REINFORCING STEEL SHALL BE OF HYSD BARS (GRADE DESIGNATION FE-500) CONFORMING TO IS: 1786.
- CLEAR COVER = 50MM. FOR SUBSTRUCTURE.
- MINIMUM LAP LENGTH FOR REINFORCEMENT BARS SHALL BE AS PER SECTION 15, IRC:112-2011. LAP SHALL BE STAGGERED AND NOT MORE THAN 50% BARS SHALL BE LAPPED AT ANY SECTION.
- LAP SPLICES SHALL BE PROVIDED ONLY IN THE CENTRAL HALF OF THE MAIN BAR LENGTH. NOT MORE THAN 50% OF THE BARS SHALL BE SPLICED AT ONE SECTION.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH :  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 07 & 09 TO 12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
RO				
REVISIONS				

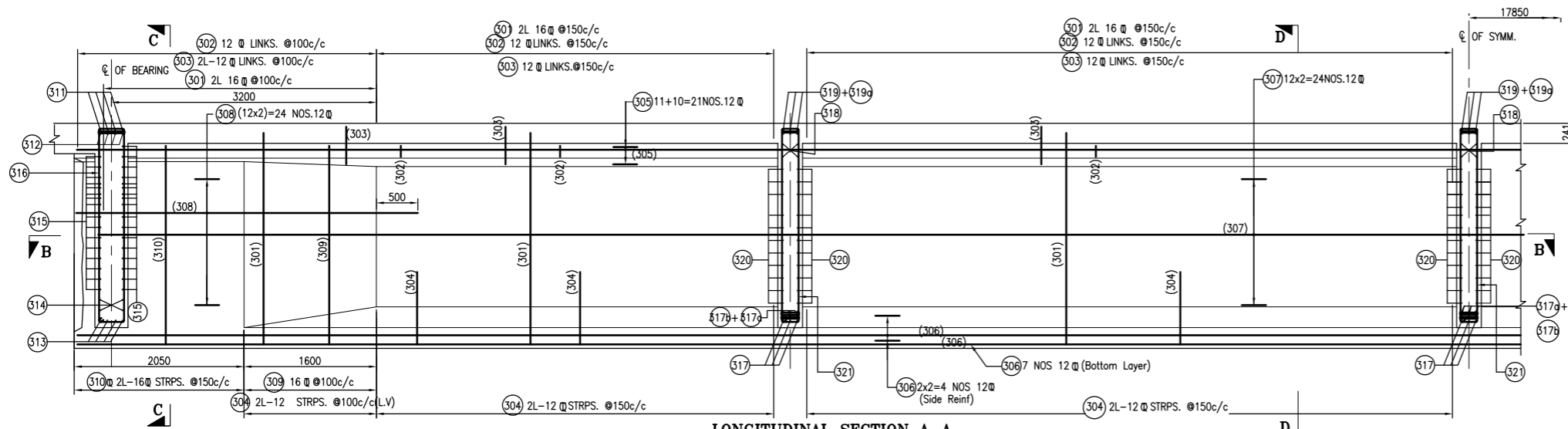
SCALE: AS SHOWN  
DATE: AUGUST, 2019

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001  
PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

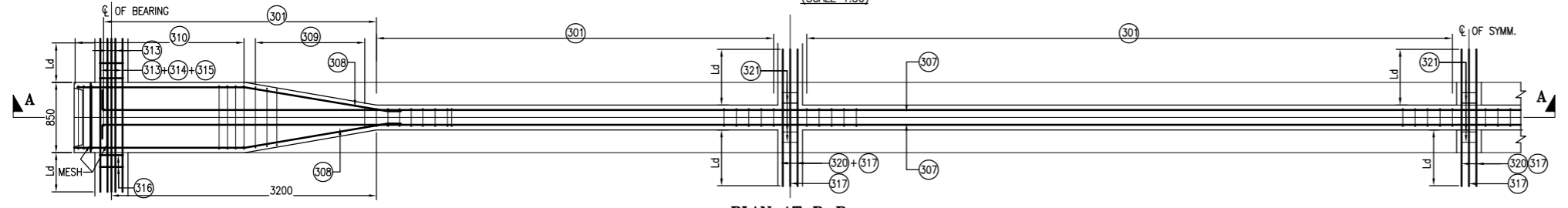
TITLE: REINFORCEMENT DETAILS OF PIER, PIER CAP AND REACTION BLOCK  
SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT

CONSULTANT: CETEST Engineering Consultants  
C.E. TESTING COMPANY PVT. LTD.  
124-A, N.S.C. BOSE ROAD  
KOLKATA - 700092.

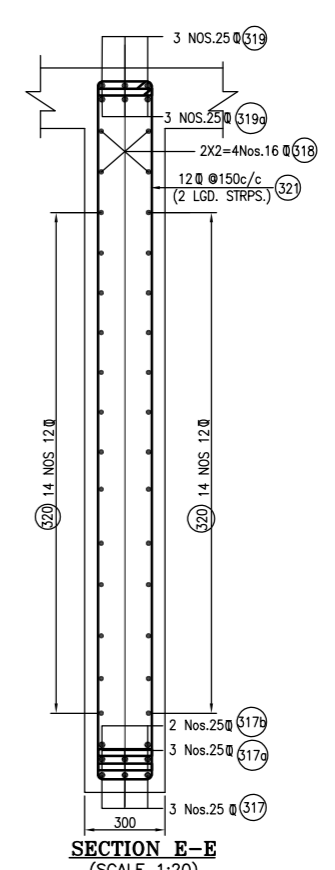
DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC			
REVISION MKD. -	RO	SHEET NO. - 08 OF 12	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
SN.D	S.D	S.D	S.D



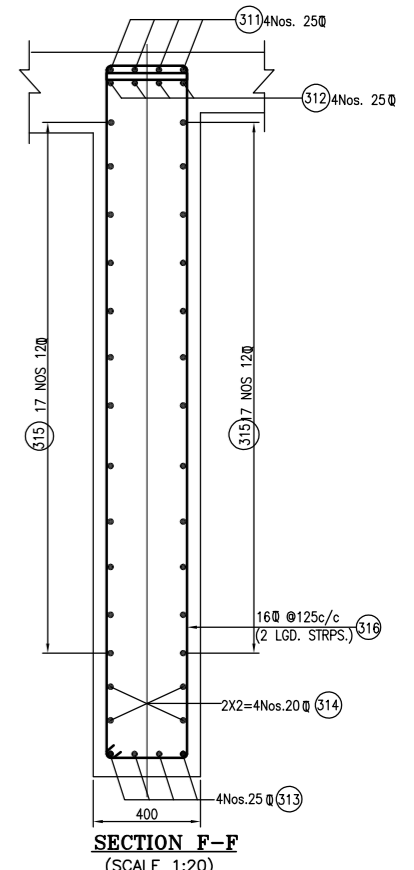
**LONGITUDINAL SECTION A-A**  
(DECK SLAB REINFORCEMENT NOT SHOWN FOR CLARITY)  
(SCALE 1:50)



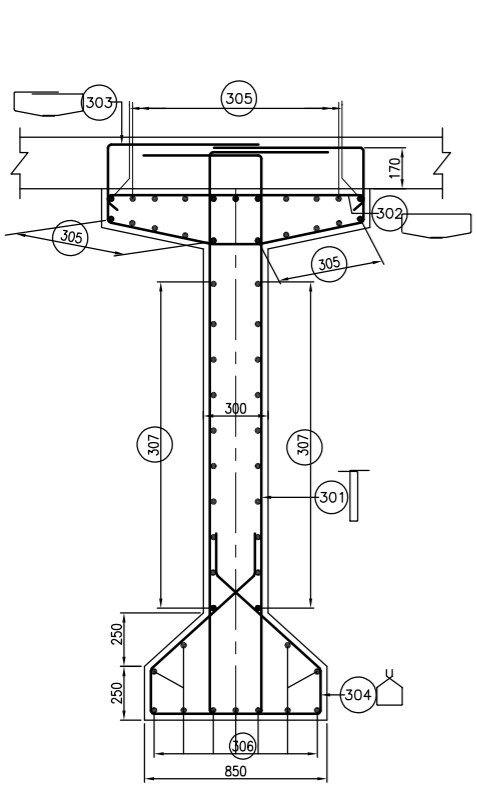
**PLAN AT B-B**  
(SCALE 1:50)



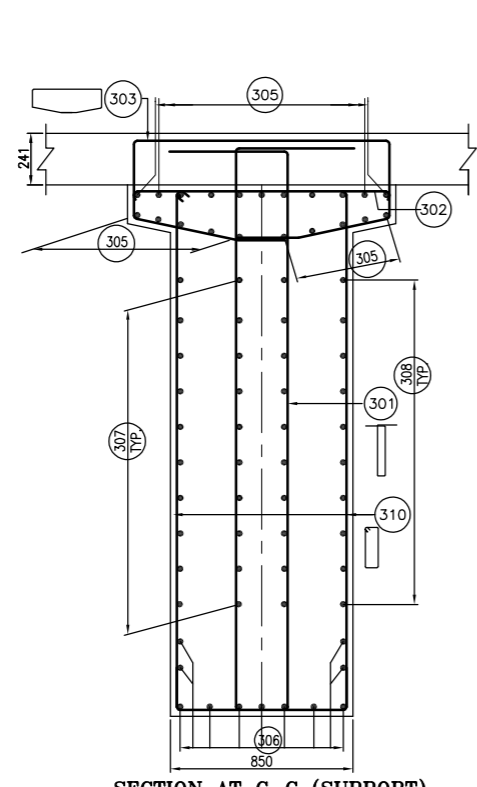
**SECTION E-E**  
(SCALE 1:20)



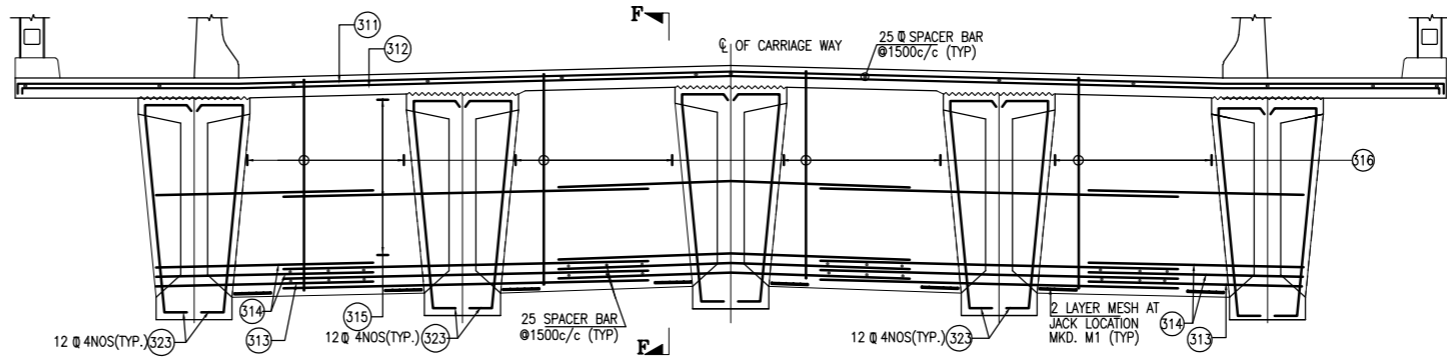
**SECTION F-F**  
(SCALE 1:20)



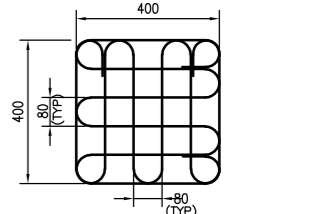
**SECTION AT D-D (MID SPAN)**  
(SCALE 1:25)



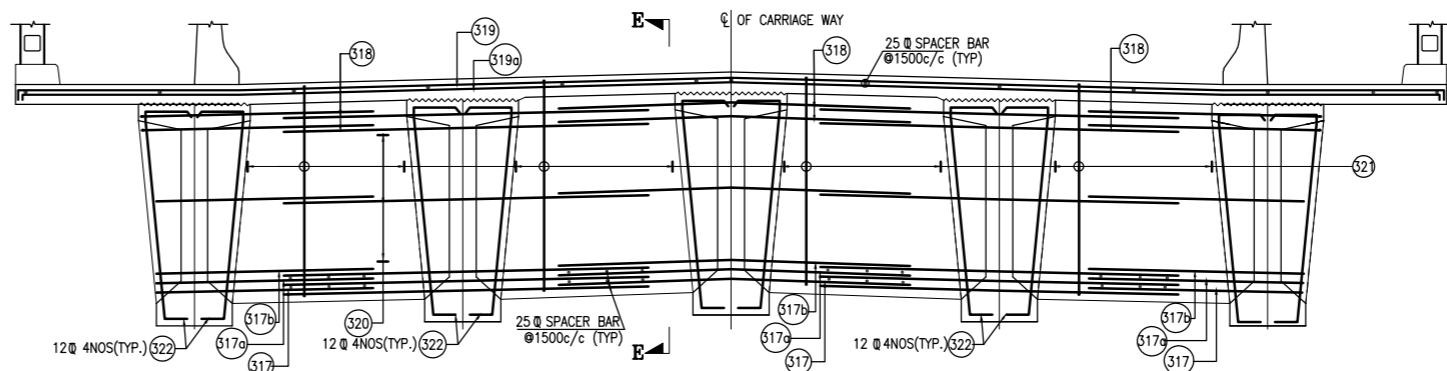
**SECTION AT C-C (SUPPORT)**  
(SCALE 1:25)



**LONGITUDINAL SECTION OF END CROSS GIRDER**  
SCALE 1:60



**DETAIL OF MESH MKD. M1 FOR JACK**  
(SCALE 1:15)



**LONGITUDINAL SECTION OF INTERMEDIATE CROSS GIRDER**  
SCALE 1:60

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
  - DIMENSIONS ARE NOT TO BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE READ.
  - SPLICING OF REINFORCEMENTS SHALL BE AVOIDED AS FAR AS PRACTICABLE. IN CASE SPLICING OF BARS BECOME UNAVOIDABLE THE ARRANGEMENT SHALL CONFORM TO IRC:2012-2011.
  - GRADE OF CONCRETE:-  
PSC I-GIRDER & CROSS GIRDER=M45.
  - CLEAR COVER:-  
PSC I-GIRDER & CROSS GIRDER -40mm.
  - STEEL USED SHALL BE H.Y.S.D. BARS CONFORMING TO IS:1786 OF GRADE Fe-500.
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO. CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10) CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 08 & 10 TO 12) CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN  
DATE: AUGUST, 2019

**CLIENT:**  
NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.  
4, PARLIAMENT STREET, NEW DELHI - 110001

**PROJECT:**  
CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

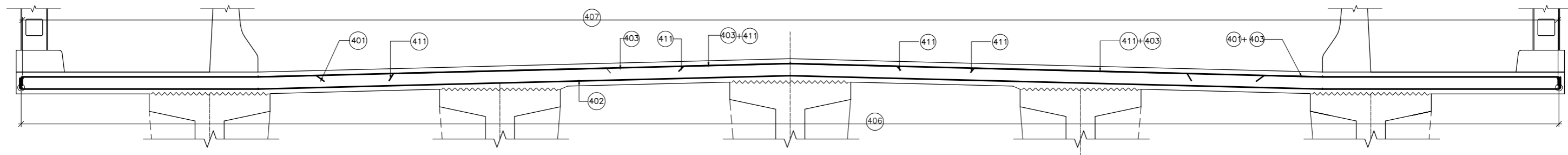
**TITLE:**  
GENERAL ARRANGEMENT DRAWING OF 1X37.0M PSC T-GIRDER+1X50.0M PSC BOX GIRDER +1X37.0M PSC T-GIRDER

**SUBMISSION TYPE:**  
FINAL DETAILED PROJECT REPORT

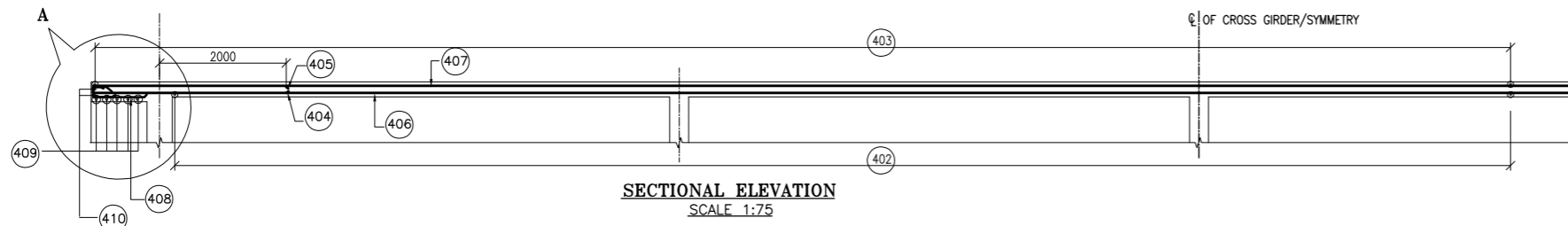
**CONSULTANT:**  
**CETEST**  
Engineering Consultants  
An ISO 9001, ISO 14001 & OHSAS 18001 Certified Company

**C.E. TESTING COMPANY PVT. LTD.**  
124-A, N.S.C. BOSE ROAD  
KOLKATA - 700092.

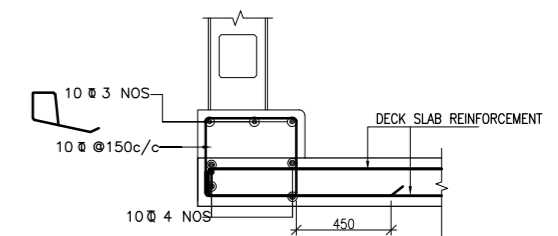
DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC			
REVISION MKD. - R0		SHEET NO. - 09 TO 12	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
SN.D	S.D	S.D	S.D



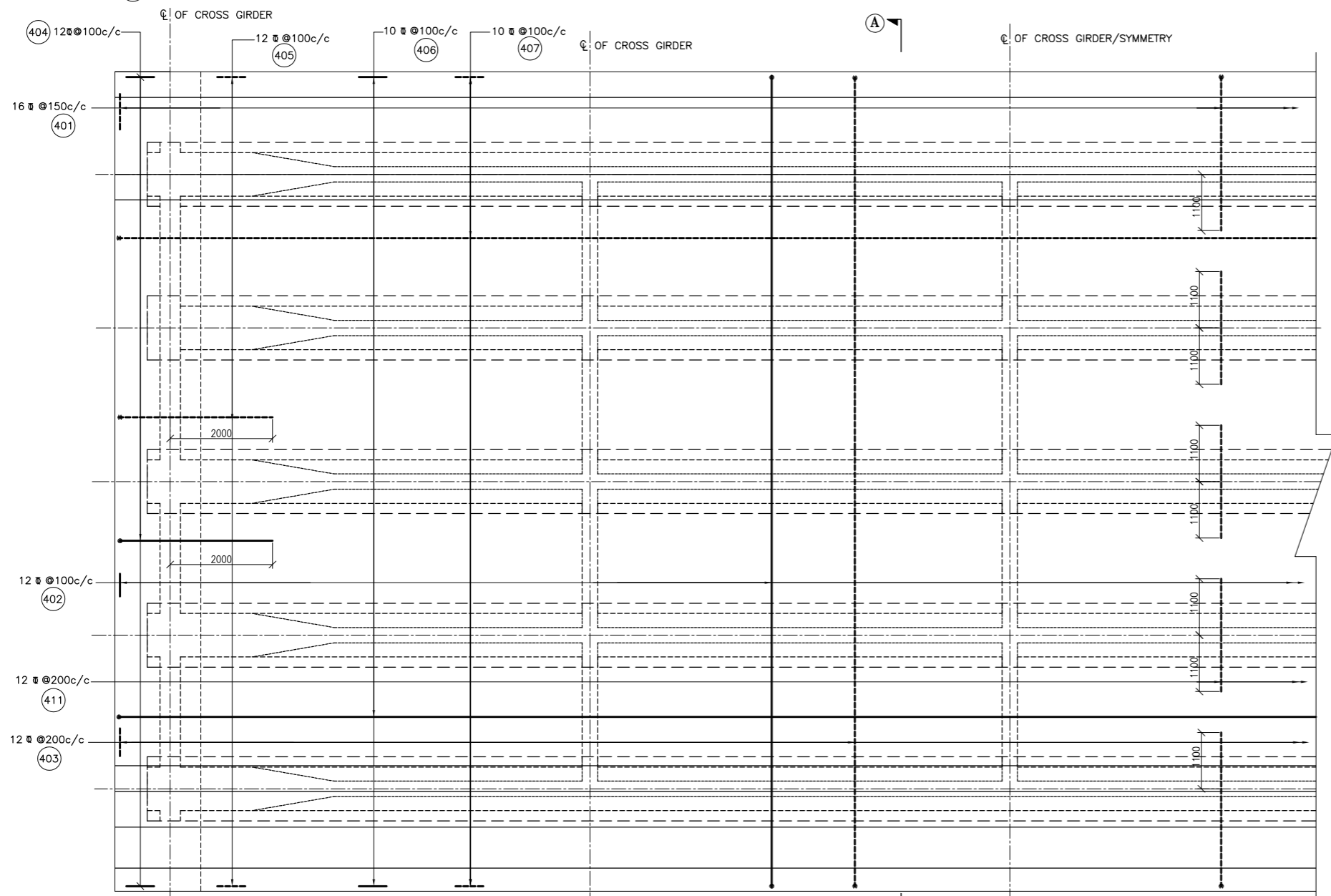
**SECTION A-A**  
SCALE 1:30



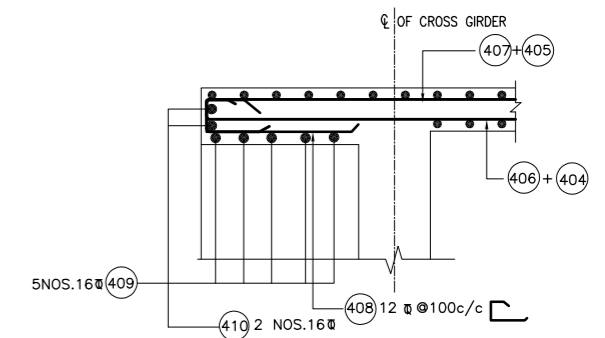
**SECTIONAL ELEVATION**  
SCALE 1:75



**REINFORCEMENT DETAILS OF KERB**  
SCALE : 1:25



**TOP PLAN OF DECK SLAB**  
(SCALE 1:75)



**DETAIL- A**  
SCALE 1:30

**LEGEND:-**

REAR FACE BAR/TOP BAR	-----
FRONT FACE BAR/BOTTOM BAR	—————

- NOTES :**
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH :  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 09)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 09 & 11,12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01 OF 01)

R0				
MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: AS SHOWN  
DATE: AUGUST, 2019

**CLIENT:**  
NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.  
4, PARLIAMENT STREET, NEW DELHI - 110001

**PROJECT:** CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

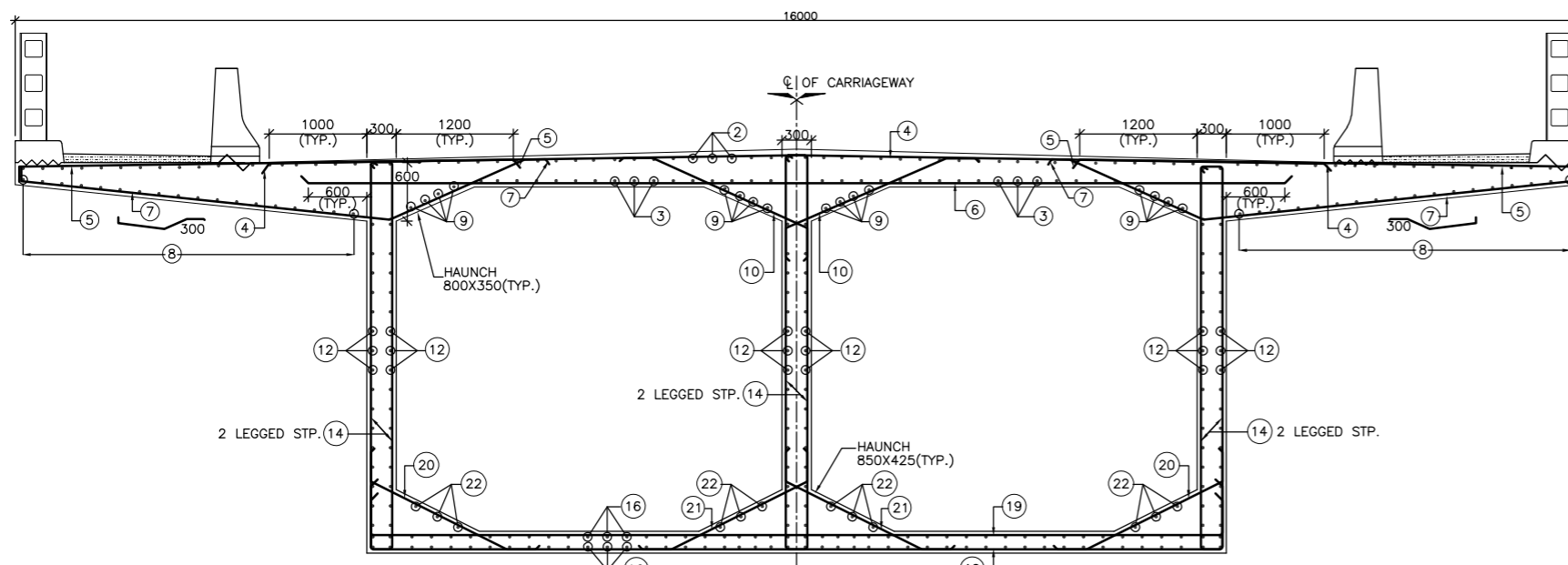
**TITLE :** REINFORCEMENT DETAILS OF DECK SLAB (PSC T-GIRDER)

**SUBMISSION TYPE :** FINAL DETAILED PROJECT REPORT

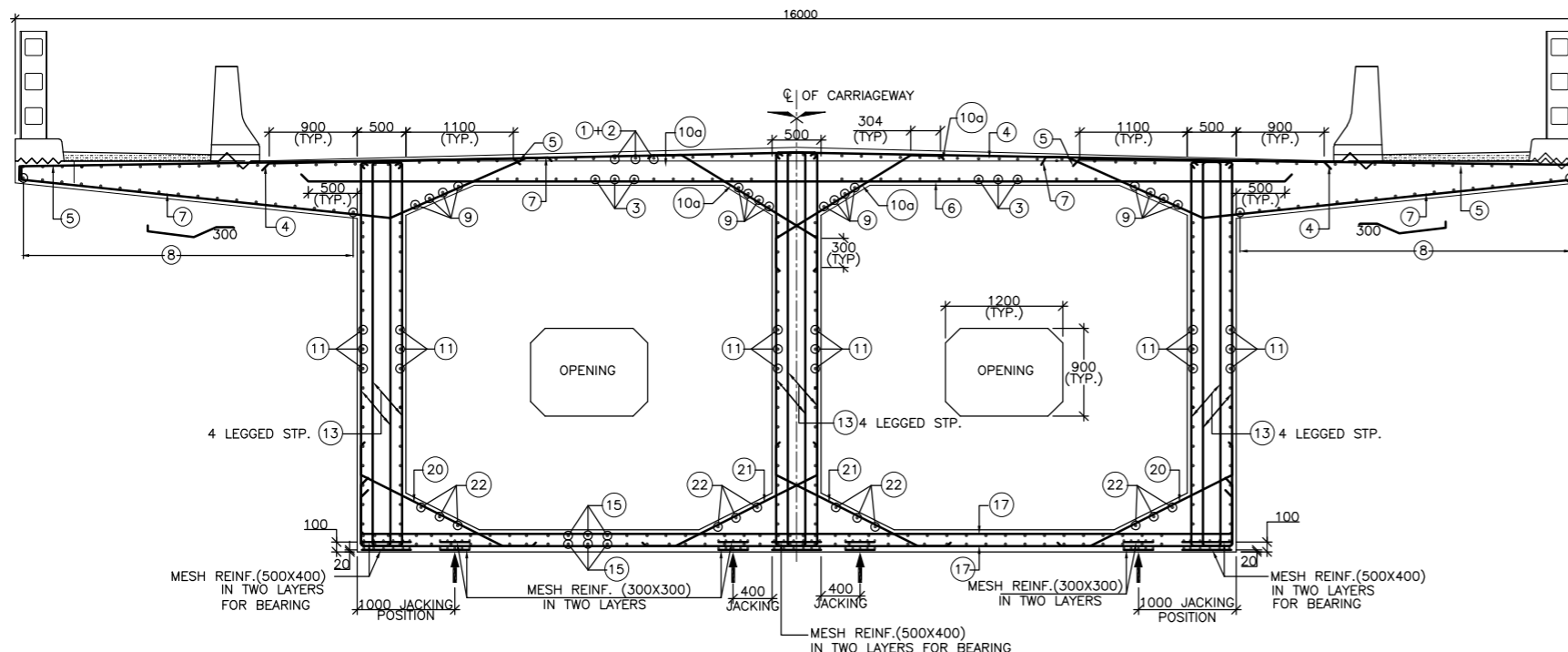
**CONSULTANT :**  
**CETEST**  
Engineering Consultants  
An ISO 9001, ISO 14001 & OHSAS 18001 Certified Company

**C.E. TESTING COMPANY PVT. LTD.**  
124-A, N.S.C. BOSE ROAD  
KOLKATA - 700092.

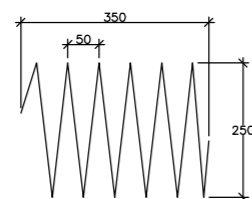
DRG. NO. : CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC			
REVISION MKD. - R0		SHEET NO. - 10 TO 12	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
SN.D	S.D	S.D	S.D



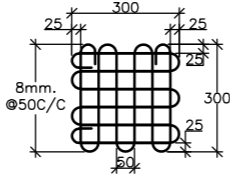
**REINFORCEMENT DETAILS OF SUPER STRUCTURE OF PSC BOX GIRDER AT MID SPAN**  
SCALE 1:50



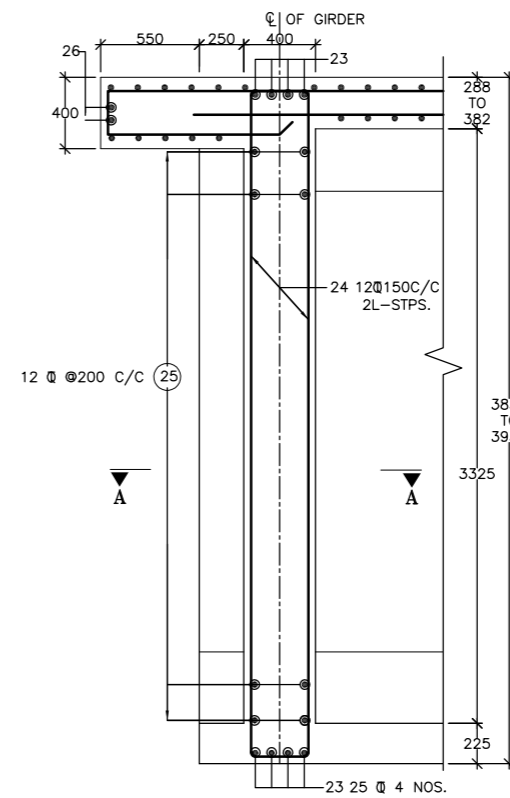
**REINFORCEMENT DETAILS OF SUPER STRUCTURE OF PSC BOX GIRDER AT END SPAN**  
SCALE 1:50



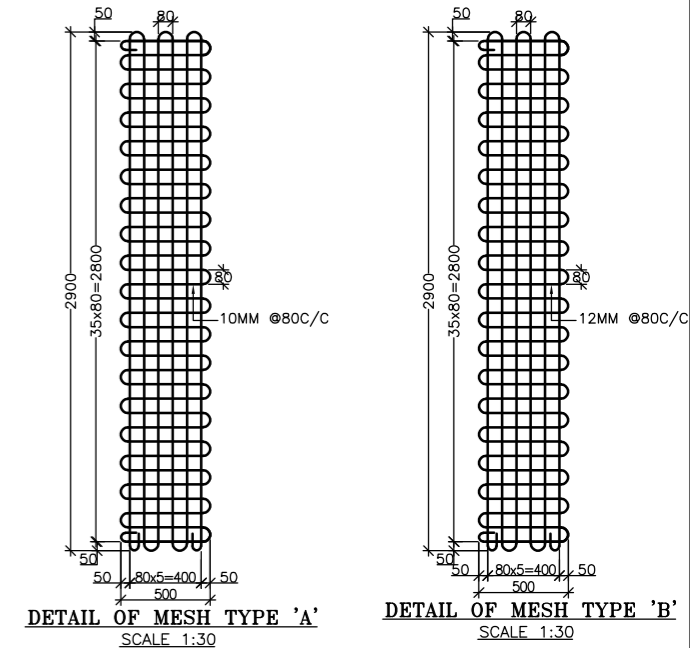
**DETAIL OF MESH REIN. (FOR JACKING PORTION)**  
SCALE 1:15



**DETAIL OF MESH REIN. (BELOW BEARING PORTION)**  
SCALE 1:15



**DETAIL OF DIAPHRAGM**  
SCALE 1:30

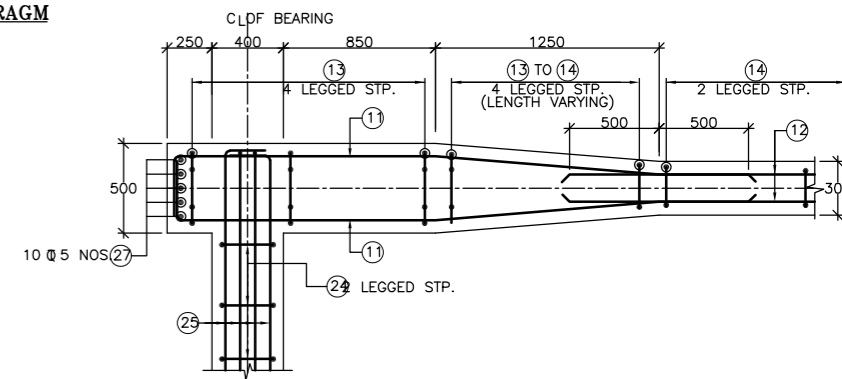


**DETAIL OF MESH TYPE 'A'**  
SCALE 1:30

**DETAIL OF MESH TYPE 'B'**  
SCALE 1:30

**RCC SCHEDULE PSC BOX & SLAB**

BAR MKD.	DIA. OF BARS (MM)	SPACING (MM)/NO	REMARKS
1	16	100	
2	12	100	
3	12	100	
4	16	100	
5	16	100	
6	16	100	
7	12	100	
8	12	100	
9	10	4 NOS.	AT EACH HAUNCH
10a	12	100	TOP HAUNCH BAR AT END
10	12	100	TOP HAUNCH BAR AT MIDDLE
11	10	125	
12	10	125	
13	16	150	4 LEGGED STP.
14	16	100	2 LEGGED STP.
15	12	220 NOS.	110 TOP + 110 BOTTOM
16	12	190 NOS.	95 TOP + 95 BOTTOM
17	12	100	
18	12	100	
19	12	100	
20	12	100	BOTTOM HAUNCH BAR AT EDGE
21	12	100	BOTTOM HAUNCH BAR AT CENTRE
22	10	5 NOS.	AT EACH HAUNCH
23	25	4 NOS.	AT EACH FACE
24	12	150	2 LEGGED STP.
25	12	200	
26	16	2 NOS.	SIDE BAR AT EACH FACE
27	10	5 NOS.	AT EACH FACE
28	12	6 NOS.	AT EACH FACE



**SECTION A-A (OF END GIRDER)**  
SCALE 1:30

**NOTES :**

- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.
- DIMENSION ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- CLEAR COVER TO OUTER MOST REINF. SHALL BE AS FOLLOWS:-  
PSC BOX GIRDER- 40MM.
- GRADE OF CONCRETE -  
i) SUPER STRUCTURE PSC BOX = M45  
ii) CRASH BARRIER = M40  
iii) R.C.C. RAILING = M30  
iv) KERB = M40
- ALL REINFORCING STEEL SHALL BE HIGH YIELD STRENGTH DEFORMED (TMT) BARS(GRADE-Fe 500), CONFORMING IS:1786.
- LAP LENGTH & DEVELOPMENT LENGTH(Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE IRC:112-2011.
- ALL LAPS SHALL BE SUITABLY STAGGERED AND MINIMUM DISTANCE BETWEEN THIS ADJACENT LAPS SHALL BE 1.3 TIMES LAP LENGTH.
- JACKING /ANCHORAGE DETAILS MUST BE SUIT WITH THE MANUFACTURE SUPPLIED DRAWING.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO. :-  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 10 & 12)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
RO				
REVISIONS				

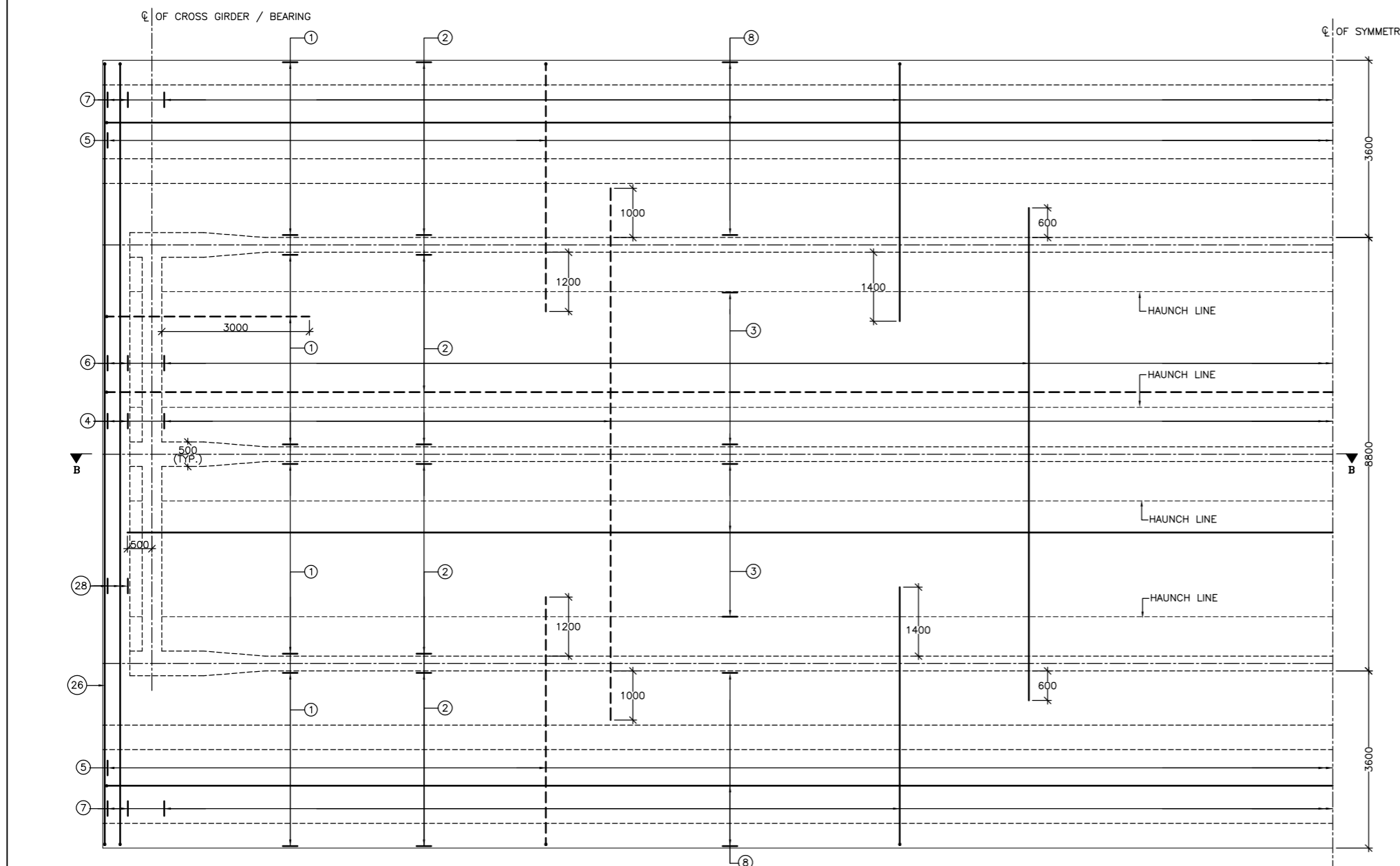
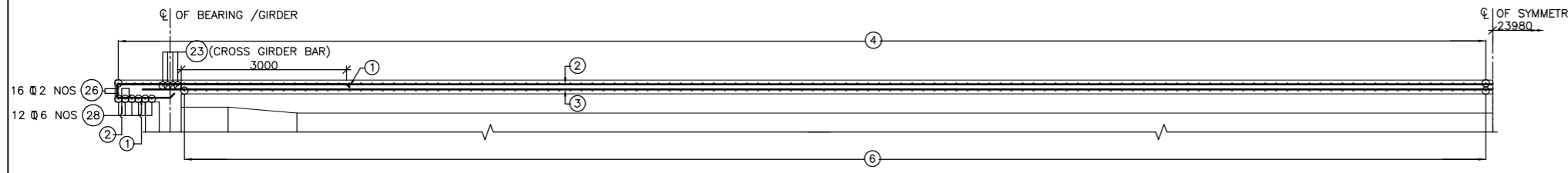
SCALE: AS SHOWN  
DATE: AUGUST, 2019

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001  
PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

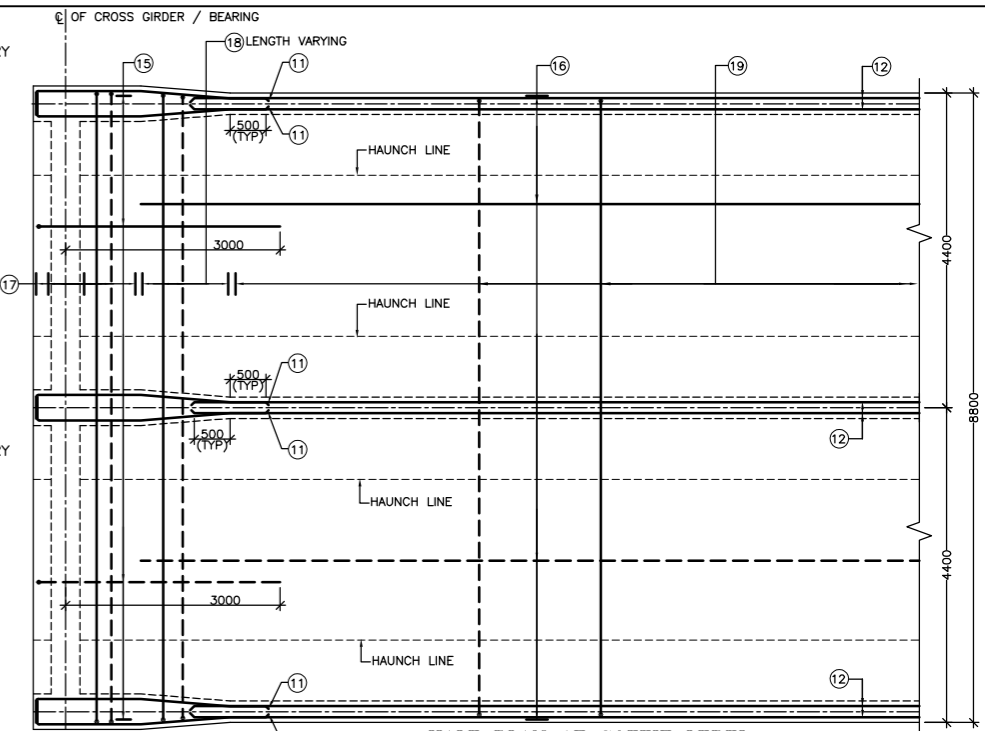
TITLE: REINFORCEMENT DETAILS OF PSC BOX GIRDER (FOR 50.00M. SPAN)  
SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT

CONSULTANT: **CETEST** Engineering Consultants  
C.E. TESTING COMPANY PVT. LTD.  
124-A, N.S.C. BOSE ROAD  
KOLKATA - 700092.

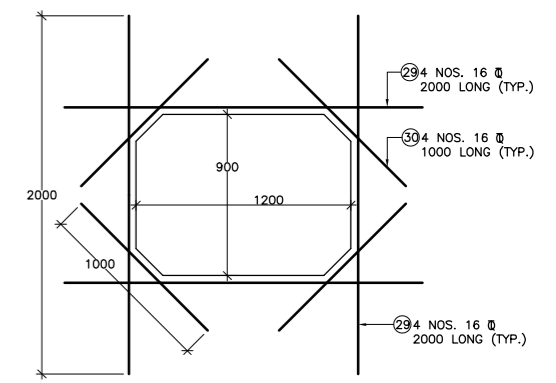
DRG. NO. : CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC			
REVISION MKD. - RO		SHEET NO. - 11 OF 012	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
SN.D	S.D	S.D	S.D



**HALF PLAN AT DECK LEVEL**  
(REINFORCEMENT OF HAUNCH, KERB & CRASH BARRIER ARE NOT SHOWN HERE)  
SCALE 1:75



**HALF PLAN AT SOFFIT LEVEL**  
(REINFORCEMENT OF HAUNCH & STIRRUPS ARE NOT SHOWN HERE)  
SCALE 1:75



**DETAIL OF EXTRA REINFORCEMENT AROUND OPENING**  
SCALE 1:30

**RCC SCHEDULE PSC BOX & SLAB**

BAR MKD.	DIA. OF BARS (MM)	SPACING (MM)/NO	REMARKS
1	16	100	
2	12	100	
3	12	100	
4	16	100	
5	16	100	
6	16	100	
7	12	100	
8	12	100	
9	10	4 NOS.	AT EACH HAUNCH
10	12	100	TOP HAUNCH BAR AT END
11	10	125	TOP HAUNCH BAR AT MIDDLE
12	10	125	
13	16	150	4 LEGGED STP.
14	16	100	2 LEGGED STP.
15	12	220 NOS.	110 TOP + 110 BOTTOM
16	12	190 NOS.	95 TOP + 95 BOTTOM
17	12	100	
18	12	100	
19	12	100	
20	12	100	BOTTOM HAUNCH BAR AT EDGE
21	12	100	BOTTOM HAUNCH BAR AT CENTRE
22	10	5 NOS.	AT EACH HAUNCH
23	25	4 NOS.	AT EACH FACE
24	12	150	2 LEGGED STP.
25	12	200	
26	16	2 NOS.	SIDE BAR AT EACH FACE
27	10	5 NOS.	AT EACH FACE
28	12	6 NOS.	AT EACH FACE

**LEGEND:-**  
TOP BAR - - - - -  
BOTTOM BAR ———

- NOTES :**
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M. UNLESS OTHERWISE NOTED.
  - DIMENSION ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  - CLEAR COVER TO OUTER MOST REINF. SHALL BE AS FOLLOWS:-  
PRECAST PSC BOX GIRDER- 40MM.
  - GRADE OF CONCRETE -  
i) SUPER STRUCTURE PSC BOX = M45  
ii) CRASH BARRIER = M40  
iii) R.C.C. RAILING = M30  
iv) KERB= M40
  - ALL REINFORCING STEEL SHALL BE HIGH YIELD STRENGTH DEFORMED (TMT) BARS(GRADE-Fe 500). CONFORMING IS:1786.
  - LAP LENGTH & DEVELOPMENT LENGTH(Ld) OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH CLAUSE 304.6 OF IRC:21-2000.
  - ALL LAPS SHALL BE SUITABLY STAGGERED AND MINIMUM DISTANCE BETWEEN THIS ADJACENT LAPS SHALL BE 1.3 TIMES LAP LENGTH.
  - JACKING /ANCHORAGE DETAILS MUST BE SUIT WITH THE MANUFACTURE SUPPLIED ITEM.
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO. :-  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 01 TO 10)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 11)  
CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC (SHEET NO. 01)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
RO				
REVISIONS				

SCALE: AS SHOWN  
DATE: AUGUST, 2019

**CLIENT:**  
NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.  
4, PARLIAMENT STREET, NEW DELHI - 110001

**PROJECT:**  
CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

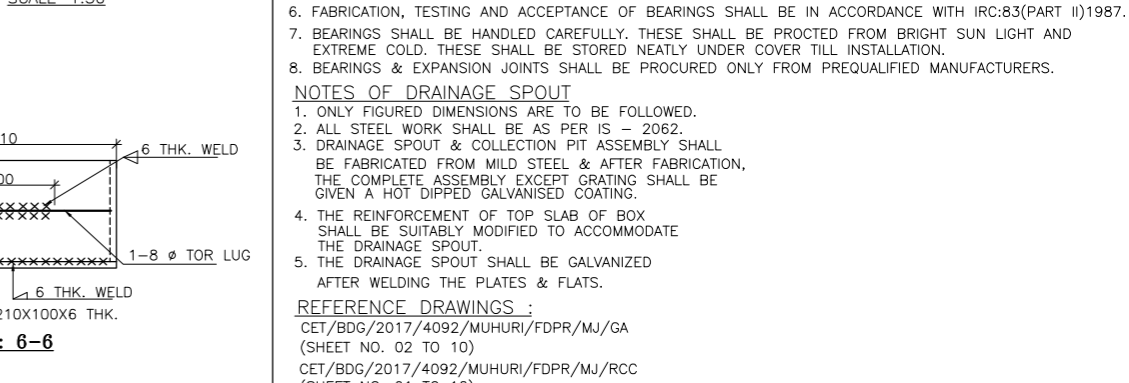
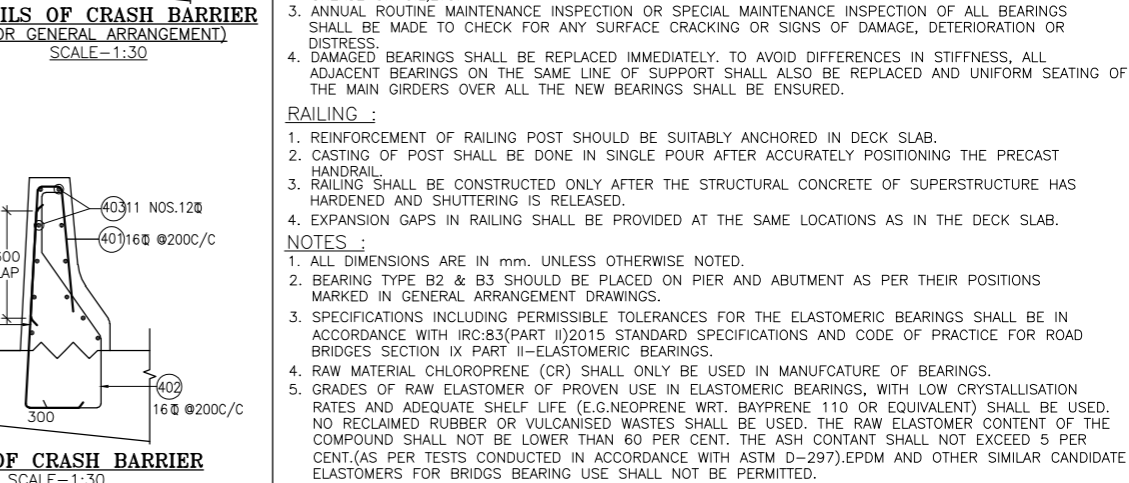
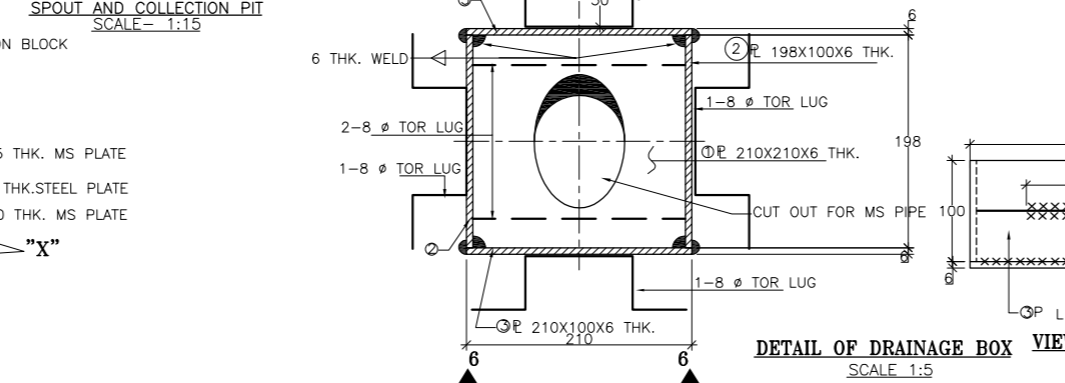
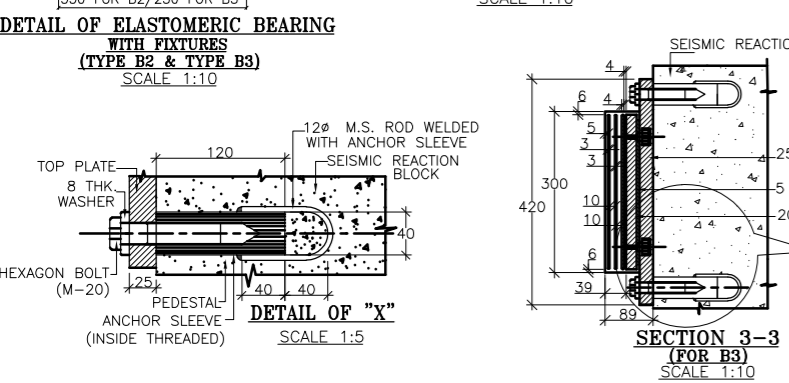
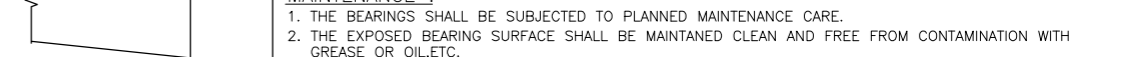
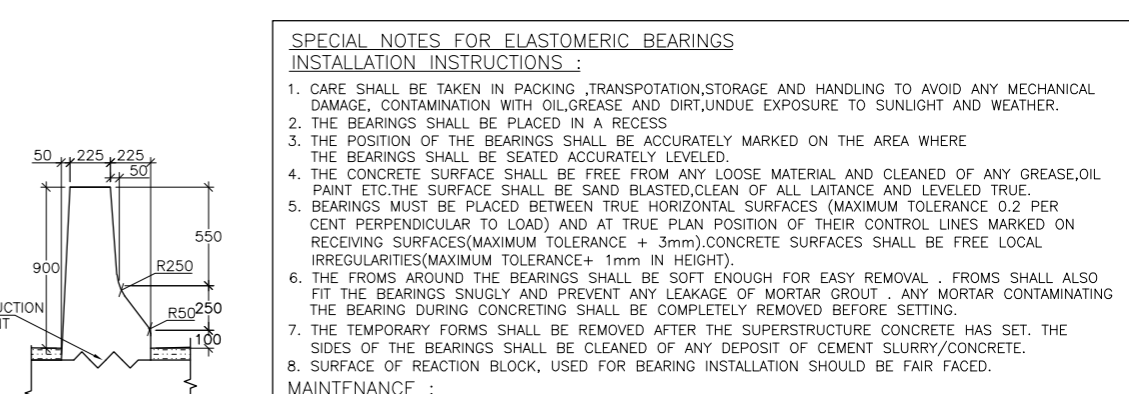
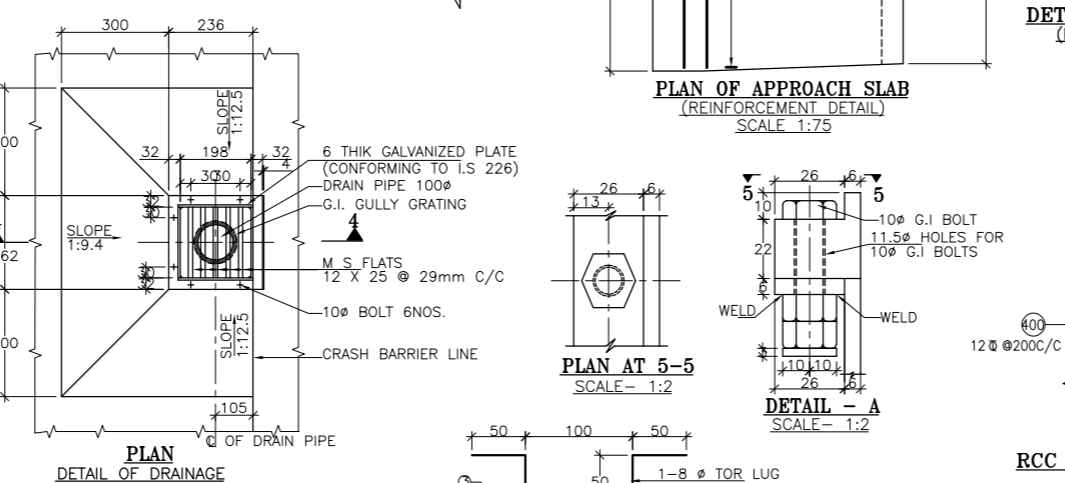
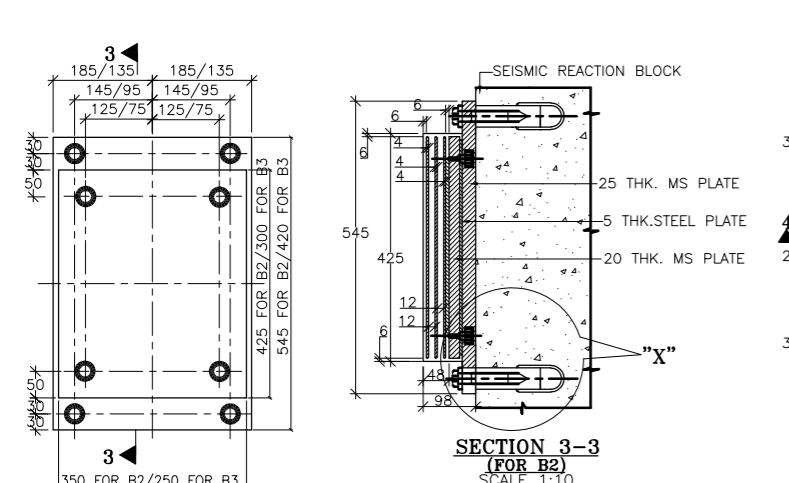
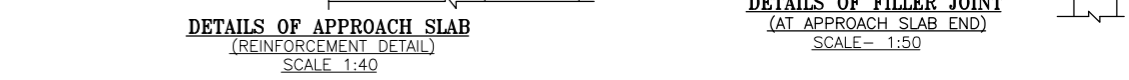
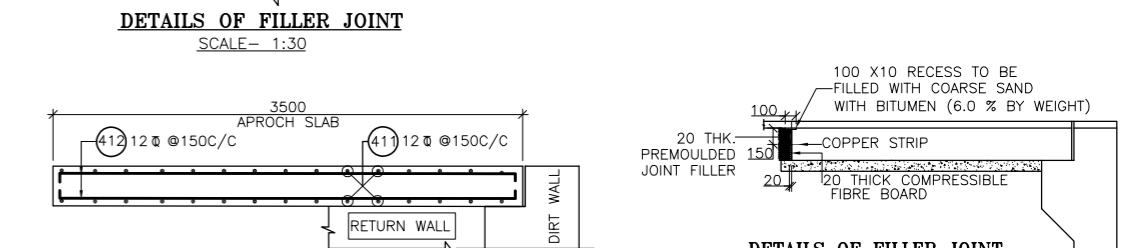
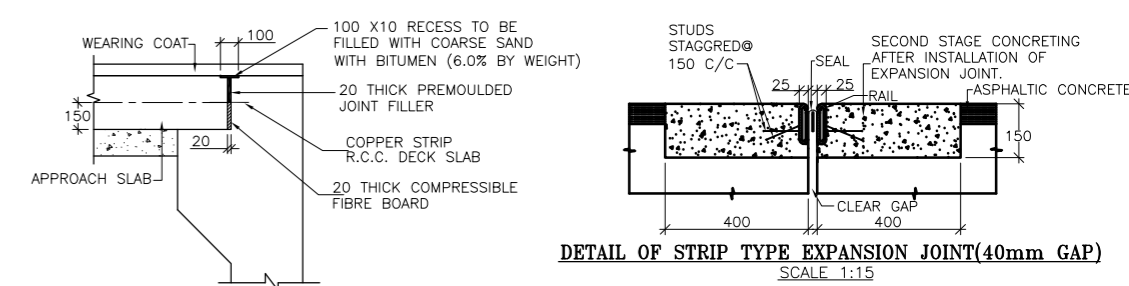
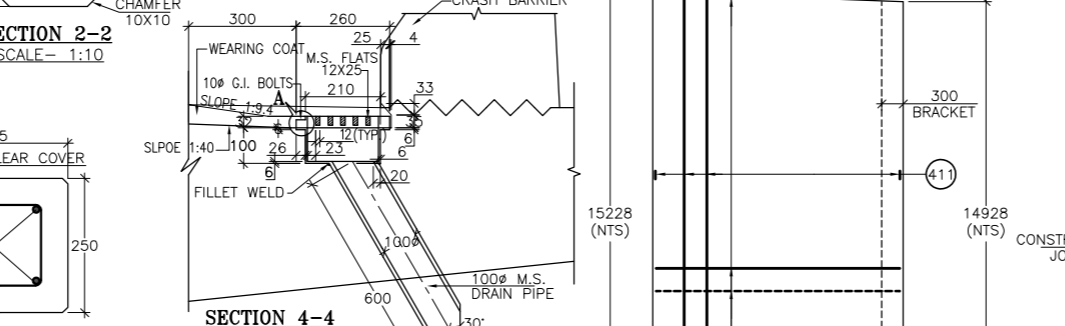
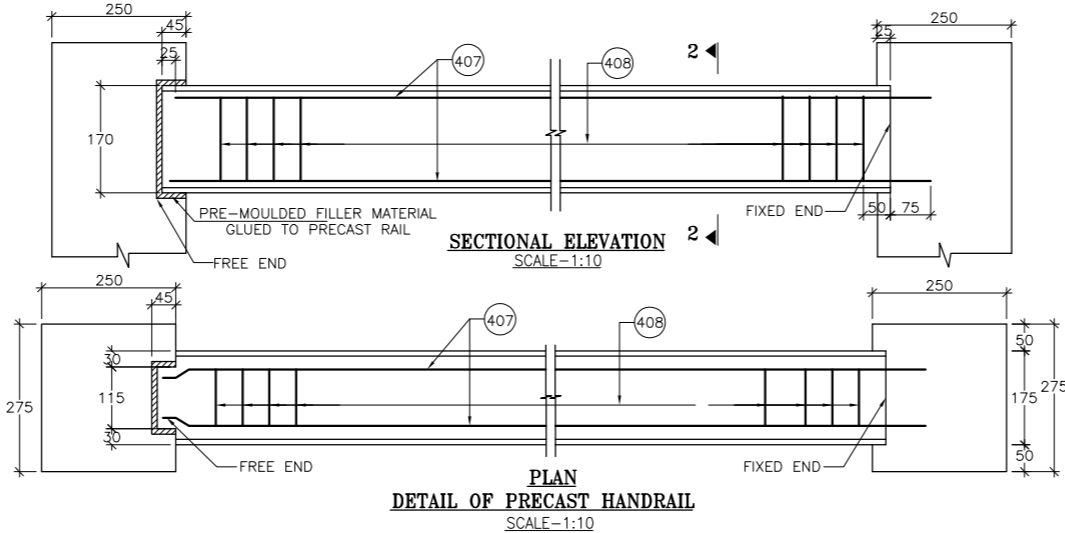
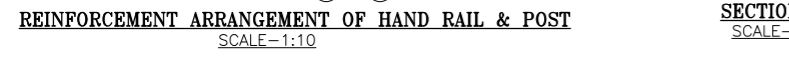
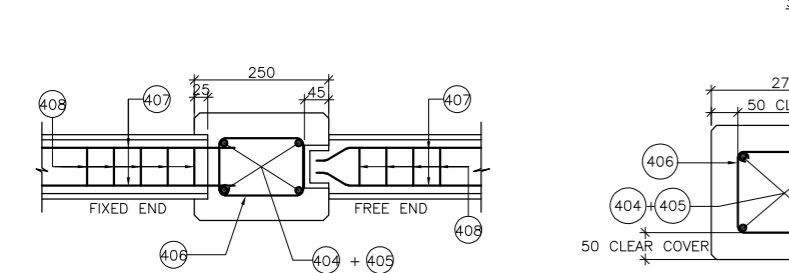
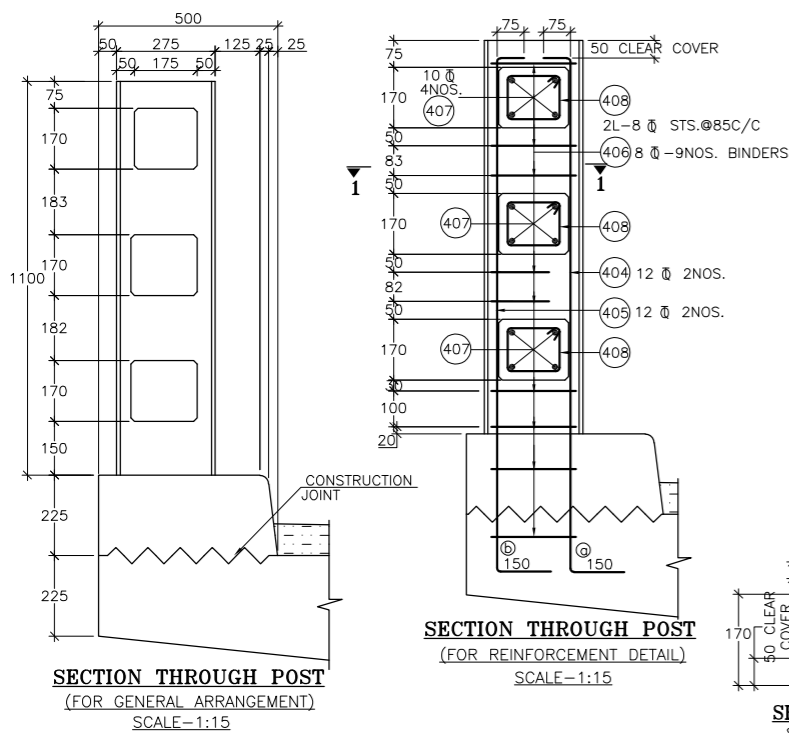
**TITLE:** REINFORCEMENT DETAILS OF DECK SLAB (PSC BOX-GIRDER)

**SUBMISSION TYPE:** FINAL DETAILED PROJECT REPORT

**CONSULTANT:**  
**CETEST**  
Engineering Consultants  
An ISO 9001, ISO 14001 & OHSAS 18001 Certified Company

**C.E. TESTING COMPANY PVT. LTD.**  
124-A, N.S.C. BOSE ROAD  
KOLKATA - 700092.

DRG. NO. : CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC			
REVISION MKD. - R0		SHEET NO. - 12 OF 12	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
SN.D	S.D	S.D	S.D



**SPECIAL NOTES FOR ELASTOMERIC BEARINGS 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 BEARINGS SHALL BE PLACED IN A RECESS.
- THE POSITION OF THE BEARINGS SHALL BE ACCURATELY MARKED ON THE AREA WHERE THE BEARINGS SHALL BE SEATED ACCURATELY LEVELED.
- THE CONCRETE SURFACE SHALL BE FREE FROM ANY LOOSE MATERIAL AND CLEANED OF ANY GREASE, OIL PAINT ETC. THE SURFACE SHALL BE SAND BLASTED, CLEAN OF ALL LAITANCE AND LEVELED TRUE.
- BEARINGS MUST BE PLACED BETWEEN TRUE HORIZONTAL SURFACES (MAXIMUM TOLERANCE 0.2 PER CENT PERPENDICULAR TO LOAD) AND AT TRUE PLAN POSITION OF THEIR CONTROL LINES MARKED ON RECEIVING SURFACES (MAXIMUM TOLERANCE + 3mm). CONCRETE SURFACES SHALL BE FREE LOCAL IRREGULARITIES (MAXIMUM TOLERANCE + 1mm IN HEIGHT).
- THE FORMS AROUND THE BEARINGS SHALL BE SOFT ENOUGH FOR EASY REMOVAL. FORMS SHALL ALSO FIT THE BEARINGS SNUGLY AND PREVENT ANY LEAKAGE OF MORTAR GROUT. ANY MORTAR CONTAMINATING THE BEARING DURING CONCRETING SHALL BE COMPLETELY REMOVED BEFORE SETTING.
- THE TEMPORARY FORMS SHALL BE REMOVED AFTER THE SUPERSTRUCTURE CONCRETE HAS SET. THE SIDES OF THE BEARINGS SHALL BE CLEANED OF ANY DEPOSIT OF CEMENT SLURRY/CONCRETE.
- SURFACE OF REACTION BLOCK, USED FOR BEARING INSTALLATION SHOULD BE FAIR FACED.

**MAINTENANCE :**

- THE BEARINGS 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 GIRDERS OVER ALL THE NEW BEARINGS SHALL BE ENSURED.

**RAILING :**

- REINFORCEMENT OF RAILING POST SHOULD BE SUITABLY ANCHORED IN DECK SLAB.
- CASTING OF POST SHALL BE DONE IN SINGLE POUR AFTER ACCURATELY POSITIONING THE PRECAST HANDRAIL.
- RAILINGS SHALL BE CONSTRUCTED ONLY AFTER THE STRUCTURAL CONCRETE OF SUPERSTRUCTURE HAS HARDENED AND SHUTTERING IS RELEASED.
- EXPANSION GAPS IN RAILING SHALL BE PROVIDED AT THE SAME LOCATIONS AS IN THE DECK SLAB.

**NOTES :**

- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE NOTED.
- BEARING TYPE B2 & B3 SHOULD BE PLACED ON PIER AND ABUTMENT AS PER THEIR POSITIONS MARKED IN GENERAL ARRANGEMENT DRAWINGS.
- SPECIFICATIONS INCLUDING PERMISSIBLE TOLERANCES FOR THE ELASTOMERIC BEARINGS SHALL BE IN ACCORDANCE WITH IRC:83(PART II) 2015 STANDARD SPECIFICATIONS AND CODE OF PRACTICE FOR ROAD BRIDGES SECTION IX PART II-ELASTOMERIC BEARINGS.
- RAW MATERIAL CHLOROPRENE (CR) SHALL ONLY BE USED IN MANUFACTURE OF BEARINGS.
- GRADES OF RAW ELASTOMER OF PROVEN USE IN ELASTOMERIC BEARINGS, WITH LOW CRYSTALLISATION RATES AND ADEQUATE SHELF LIFE (E.G. NEOPRENE WRT. BAYPRENE 110 OR EQUIVALENT) SHALL BE USED. NO RECLAIMED RUBBER OR VULCANISED WASTES SHALL BE USED. THE RAW ELASTOMER CONTENT OF THE COMPOUND SHALL NOT BE LOWER THAN 60 PER CENT. THE ASH CONTENT SHALL NOT EXCEED 5 PER CENT. (AS PER TESTS CONDUCTED IN ACCORDANCE WITH ASTM D-297). EPDM AND OTHER SIMILAR CANDIDATE ELASTOMERS FOR BRIDGE BEARING USE SHALL NOT BE PERMITTED.
- FABRICATION, TESTING AND ACCEPTANCE OF BEARINGS SHALL BE IN ACCORDANCE WITH IRC:83(PART II) 1987.
- 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.
- BEARINGS & EXPANSION JOINTS SHALL BE PROCURED ONLY FROM PREQUALIFIED MANUFACTURERS.

**NOTES OF DRAINAGE SPOUT**

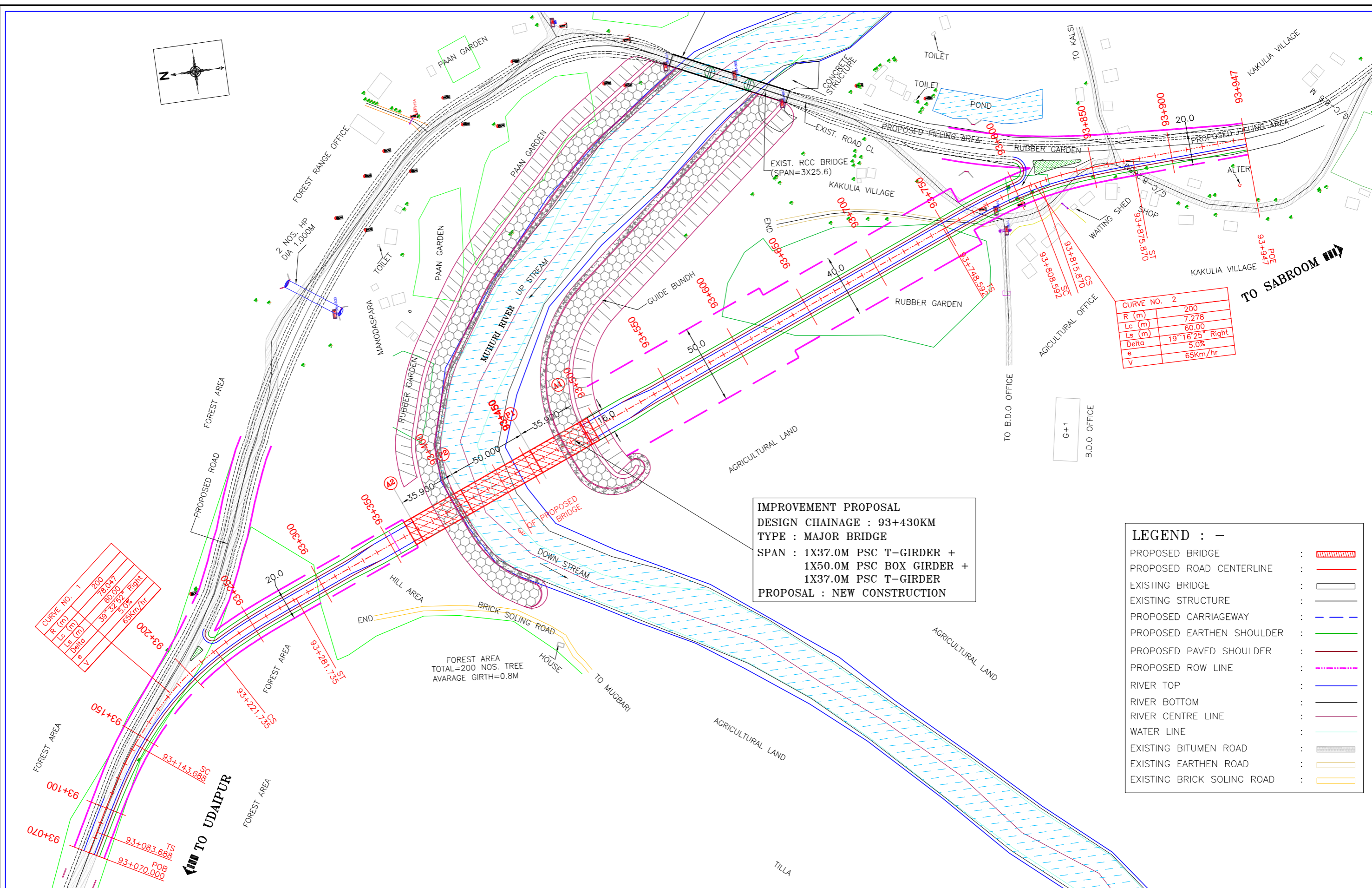
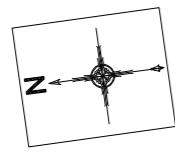
- ONLY FIGURED DIMENSIONS ARE TO BE FOLLOWED.
- ALL STEEL WORK SHALL BE AS PER IS - 2062.
- DRAINAGE SPOUT & COLLECTION PIT ASSEMBLY SHALL BE FABRICATED FROM MILD STEEL & AFTER FABRICATION, THE COMPLETE ASSEMBLY EXCEPT GRATING SHALL BE GIVEN A HOT DIPPED GALVANISED COATING.
- THE REINFORCEMENT OF TOP SLAB OF BOX SHALL BE SUITABLY MODIFIED TO ACCOMMODATE THE DRAINAGE SPOUT.
- THE DRAINAGE SPOUT SHALL BE GALVANIZED AFTER WELDING THE PLATES & FLATS.

**REFERENCE DRAWINGS :**

- CET/BDG/2017/4092/MUHURI/FDPR/MJ/GA (SHEET NO. 02 TO 10)
- CET/BDG/2017/4092/MUHURI/FDPR/MJ/RCC (SHEET NO. 01 TO 12)

SCALE: AS SHOWN				CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, PARLIAMENT STREET, NEW DELHI - 110001				TITLE: MISCELLANEOUS DETAILS				CONSULTANT: CETEST Engineering Consultants				DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/MJ/MISC.			
R0				PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA				SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT				C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.				REVISION MKD. - R0 SHEET NO. - 01 OF 01			
MKT. DATE DESCRIPTION CHKD. APPRD.				DATE: AUGUST, 2019								DRAWN BY DESIGN BY CHECKED BY ISSUED BY							
REVISIONS												SN.D - S.D							

## **PLAN & PROFILE OF APPROACH ROAD**



CURVE NO. 2	
R (m)	200
Lc (m)	7.278
Ls (m)	60.00
Delta	19° 16' 25" Right
e	5.0%
V	65Km/hr

**IMPROVEMENT PROPOSAL**  
**DESIGN CHAINAGE : 93+430KM**  
**TYPE : MAJOR BRIDGE**  
**SPAN : 1X37.0M PSC T-GIRDER +**  
**1X50.0M PSC BOX GIRDER +**  
**1X37.0M PSC T-GIRDER**  
**PROPOSAL : NEW CONSTRUCTION**

**LEGEND : -**

PROPOSED BRIDGE	: [Red hatched box]
PROPOSED ROAD CENTERLINE	: [Red dashed line]
EXISTING BRIDGE	: [Black outline box]
EXISTING STRUCTURE	: [Black outline box]
PROPOSED CARRIAGEWAY	: [Blue dashed line]
PROPOSED EARTHEN SHOULDER	: [Green dashed line]
PROPOSED PAVED SHOULDER	: [Red dashed line]
PROPOSED ROW LINE	: [Purple dashed line]
RIVER TOP	: [Blue solid line]
RIVER BOTTOM	: [Black solid line]
RIVER CENTRE LINE	: [Red solid line]
WATER LINE	: [Cyan solid line]
EXISTING BITUMEN ROAD	: [Grey solid line]
EXISTING EARTHEN ROAD	: [Yellow solid line]
EXISTING BRICK SOLING ROAD	: [Orange solid line]

CURVE NO. 1	
R (m)	200
Lc (m)	78.047
Ls (m)	39.3232 Right
Delta	5.0%
e	65Km/hr
V	

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.
REVISIONS				

SCALE: 1:2200  
 DATE: AUGUST, 2019

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.  
 4, Parliament Street, New Delhi - 110001  
 PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER GOMTI AT CH. 49.800KM AND OVER RIVER MUHURI AT CH. 93.775KM INCLUDING APPROACH ROADS TO THE BRIDGES ON AGARTALA TO SABROOM ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA

TITLE: PLAN OF APPROACH ROAD  
 SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT

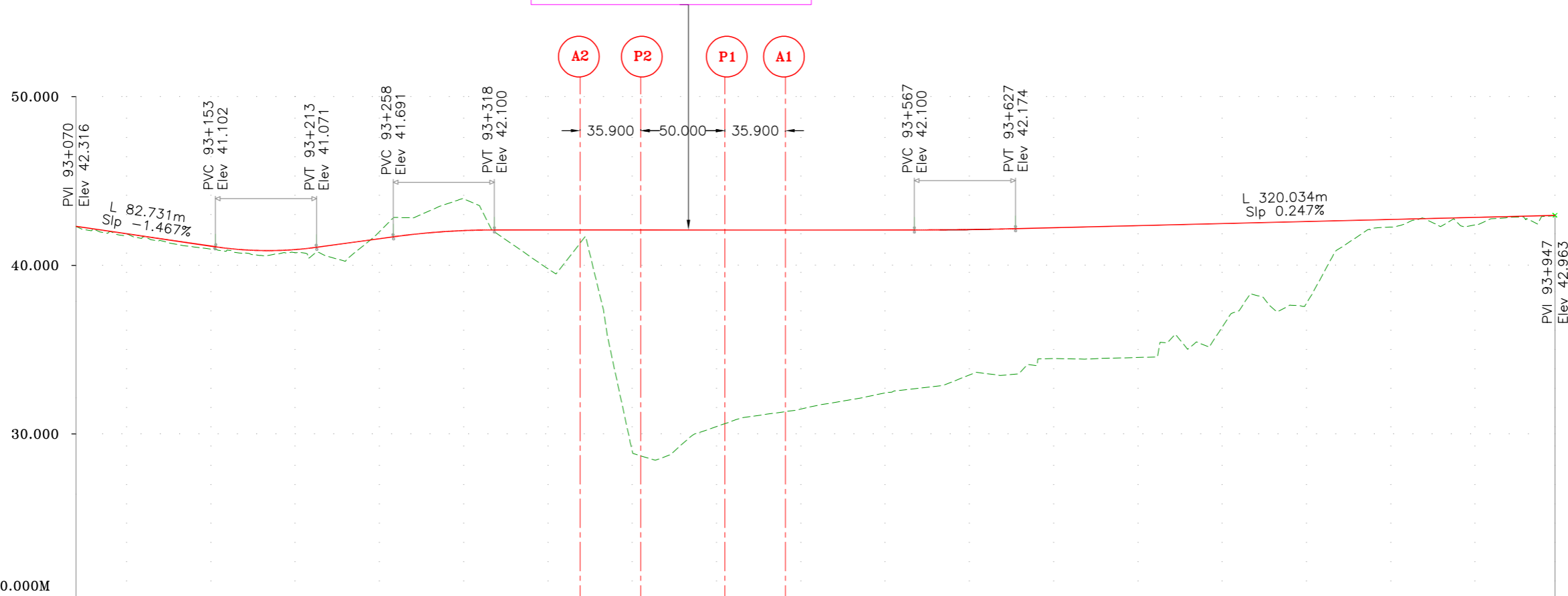
CONSULTANT: CETEST Engineering Consultants  
 C.E. TESTING COMPANY PVT. LTD.  
 124-A, N.S.C. BOSE ROAD  
 KOLKATA - 700092.

DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/PP			
REVISION MKD. - R0		SHEET NO. - 01 OF 02	
DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
S.C		S.D	

TO UDAIPUR ←

TO SABROOM →

PROPOSED MAJOR BRIDGE  
 DESIGN CHAINAGE : 93+430KM  
 SPAN= 1X37.0M PSC T-GIRDER +  
 1X50.0M PSC BOX GIRDER +  
 1X37.0M PSC T-GIRDER  
 FRL = 42.100M

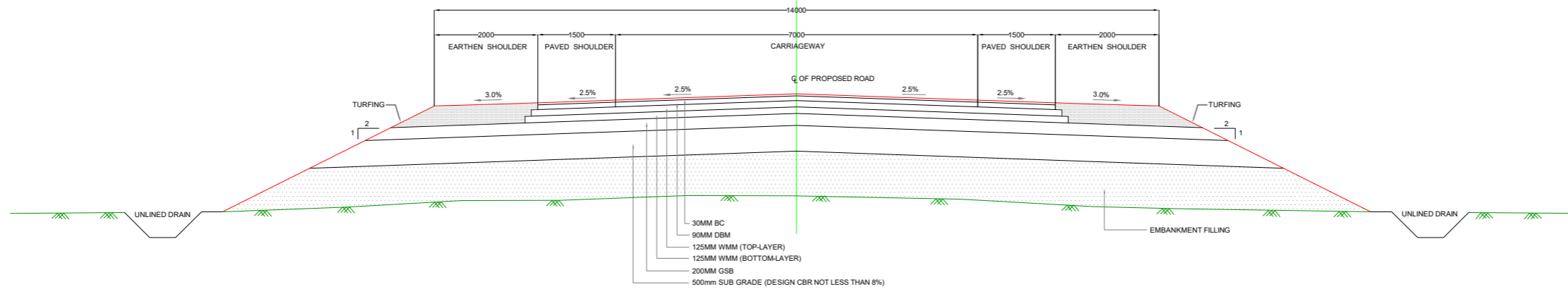


DATUM :- 20.000M

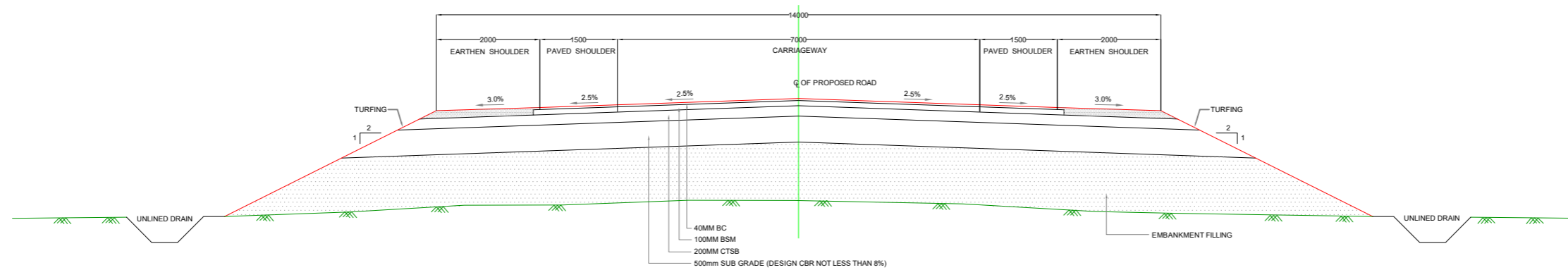
PROPOSED ROAD LEVELS (M)	42.316	41.876	41.509	41.142	40.892	40.936	41.238	41.579	41.888	42.062	42.100	42.100	42.100	42.100	42.100	42.100	42.101	42.122	42.168	42.230	42.291	42.353	42.415	42.476	42.538	42.600	42.661	42.723	42.785	42.846	42.908	42.963					
EXISTING GROUND LEVELS (M)	42.310	41.879	41.335	40.961	40.635	40.756	40.373	41.992	43.026	43.943	41.520	39.800	40.623	28.998	28.974	30.436	31.102	31.477	31.951	32.434	32.771	33.500	33.525	34.471	34.465	34.535	35.573	36.336	38.018	37.748	41.351	42.269	42.524	42.403	42.867	42.947	
HORIZONTAL ALIGNMENT	L 60.00 A 109.54			L 78.05 R 200.00		L 60.00 A 109.54			L 60.00 A 109.54																		L 7.28 R 200.00		L 60.00 A 109.54								
VERTICAL ALIGNMENT	L82.722 Slp -1.467%			L60.00 L1 30.000 L2 30.000		L45.517 Slp 1.363%		L60.00 L1 30.000 L2 30.000		L249.164 Slp 0.000%										L60.00 L1 30.000 L2 30.000		L320.033 Slp 0.247%															
SUPERELEVATION	e 1.141%	e 2.500%	e 5.000%	e 5.000%	e 5.000%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%	e 2.500%
CHAINAGE	93+070	93+100	93+125	93+150	93+175	93+200	93+225	93+250	93+275	93+300	93+325	93+350	93+375	93+400	93+425	93+450	93+475	93+500	93+525	93+550	93+575	93+600	93+625	93+650	93+675	93+700	93+725	93+750	93+775	93+800	93+825	93+850	93+875	93+900	93+925	93+947	

SCALE: 1:2200			CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001	TITLE: PROFILE OF APPROACH ROAD SUBMISSION TYPE: FINAL DETAILED PROJECT REPORT	CONSULTANT: C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.	DRG. NO.: CET/BDG/2017/4092/MUHURI/FDPR/PP			
DATE: AUGUST, 2019						REVISION MKD. - R0		SHEET NO. - 02 OF 02	
REVISIONS	MKD.	DATE	DESCRIPTION	CHKD.	APPRD.	DRAWN BY	DESIGN BY	CHECKED BY	ISSUED BY
						S.G		S.D	



**TYPICAL CROSS-SECTION  
OF APPROACH ROAD**



TCS : TYPICAL CROSS-SECTION OF 2-LANE CARRIAGEWAY WITH PAVED SHOULDER FOR BRIDGE APPROACHES WITH CONVENTIONAL PAVEMENT COMPOSITION



TCS : TYPICAL CROSS-SECTION OF 2-LANE CARRIAGEWAY WITH PAVED SHOULDER FOR BRIDGE APPROACHES WITH INNOVATIVE PAVEMENT COMPOSITION

SCALE: NTS					CLIENT:  NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 4, Parliament Street, New Delhi - 110001		TITLE : TYPICAL CROSS-SECTION		CONSULTANT :  C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. BOSE ROAD KOLKATA - 700092.		DRG. NO. : CET/BDG/2017/4092/FDPR/MUHURI/TCS			
DATE: AUGUST, 2019					PROJECT: CONSULTANCY SERVICES FOR CARRYING OUT FEASIBILITY STUDY, PREPARATION OF DETAILED PROJECT REPORT AND PROVIDING PRE CONSTRUCTION SERVICES IN RESPECT OF NEW RCC BRIDGE OVER RIVER <b>GOMTI AT CH. 49.800KM</b> AND OVER RIVER <b>MUHURI AT CH. 93.775KM</b> INCLUDING APPROACH ROADS TO THE BRIDGES ON <b>AGARTALA TO SABROOM</b> ROAD SECTION OF NH-44 IN THE STATE OF TRIPURA		SUBMISSION TYPE : FINAL DETAILED PROJECT REPORT				REVISION MKD. - R0		SHEET NO. - 01 OF 01	
REVISIONS											DRAWN BY		DESIGN BY	
											S.C		S.D	
											CHECKED BY		ISSUED BY	