STRUCTURAL DRAWING

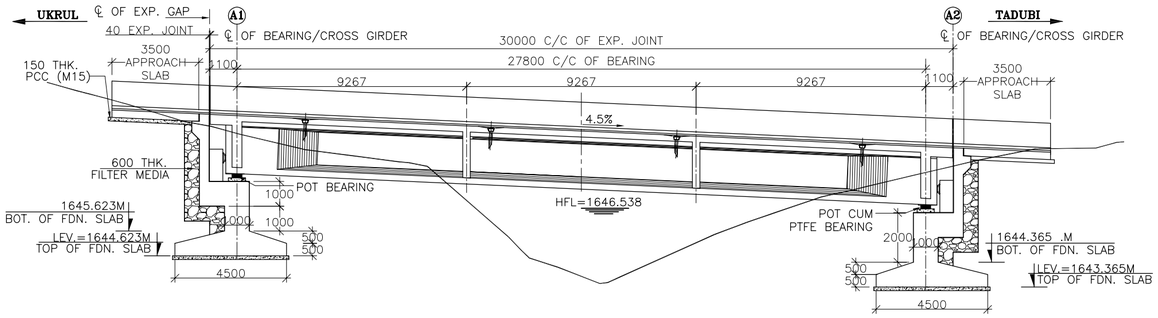
CONTENT

PROPOSED BRIDGE

ROAD NAME : UKHRUL - TOLOI - TADUBI

GENERAL ARRANGEMENT DRAWING

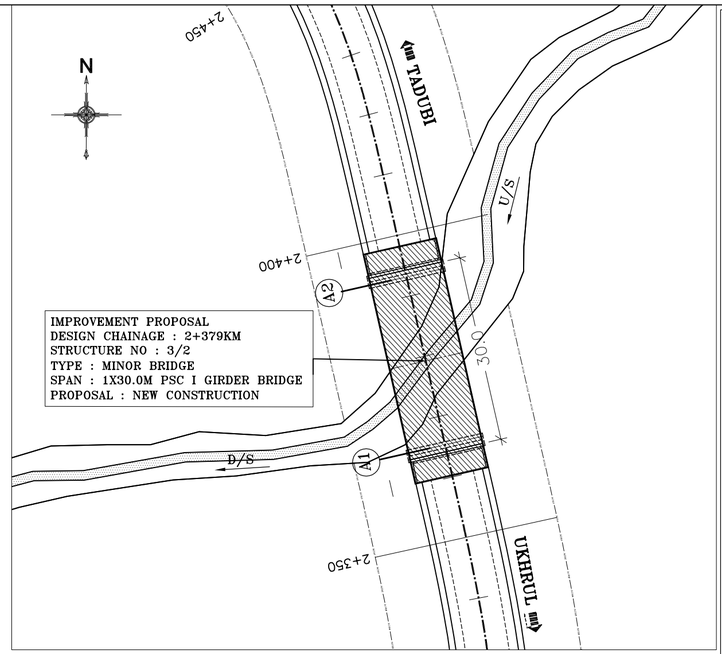
SL. NO.	DESIGN CHAINAGE	STR. NO.	IMPROVEMENT TYPE	DESCRIPTION	DRAWING NO.	NO. OF SHEETS
01.	2.379KM	3/2	NEW CONSTRUCTION	1X30.0M PSC-I GIRDER :-		
				GENERAL ARRANGEMENT	CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-3/2)/GAD	01
02.	3.624KM	4/3	NEW CONSTRUCTION	1X40.0M PSC-I GIRDER :-		
				GENERAL ARRANGEMENT	CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-4/3)/GAD	01
03.	4.109KM	5/1	NEW CONSTRUCTION	1X30.0M PSC-I GIRDER :-		
				GENERAL ARRANGEMENT	CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-5/1)/GAD	01
04.	4.375KM	5/2	NEW CONSTRUCTION	1X40.0M PSC-I GIRDER :-		
				GENERAL ARRANGEMENT	CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-5/2)/GAD	01
05.	4.906 KM	5/4	NEW CONSTRUCTION	1 X 90.0M STEEL TRUSS BRIDGE :-		
				GENERAL ARRANGEMENT	CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MJ/(STR-5/4)/GAD	01



FRL (RL IN METRE)	1650.686	1650.457	1650.236	1649.786	1649.336	1649.206	1648.886
EGL (RL IN METRE)	1650.924	1649.560	1648.628	1643.533	1647.290	1647.983	1649.034
CHAINAGE(KM)	2+360	2+365.098	2+370	2+380	2+390	2+392.898	2+400

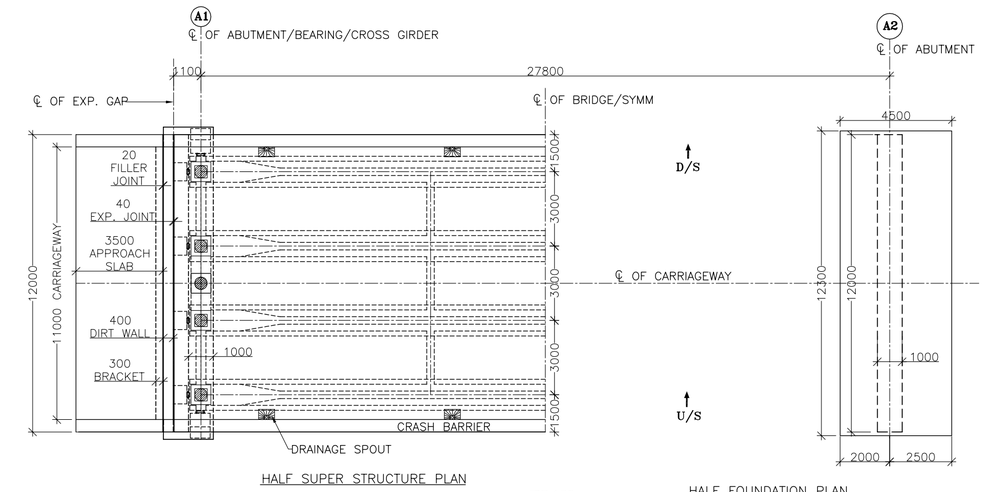
SECTIONAL ELEVATION

SCALE–1:175



LOCATION PLAN

SCALE : NTS



HALF SUPER STRUCTURE PLAN

HALF FOUNDATION PLAN

PLAN

SCALE–1:175

GENERAL NOTES :

A. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M . UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.

B. MATERIALS SPECIFICATIONS :

(I) CONCRETE :

1. GRADE OF CONCRETE USED :–
   a) DECK SLAB=M40,
   b) GIRDER=M45,
   c) SUB STRUCTURE=M30,
   d) DIRT WALL=M30,
   e) APPROACH SLAB = M30,
   f) P.C.C. BELOW APPROACH SLAB = M15,
   g) CRASH BARRIER = M40,
   h) PEDESTAL = M35
   i) REACTION BLOCK = M40.
2. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
3. 33/43/53 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 269, IS : 8112, IS : 12269 OR PORTLAND SLAG CEMENT CONFORMING TO IS : 455 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
4. TO IMPROVE WORKABILITY OF CONCRETE, ADMIXTURES CONFORMING TO IS:9103 MAY BE USED SUBJECT TO SATISFACTORY PROVEN USE.
5. THE MINIMUM CEMENT CONTENT IN CONCRETE SHALL BE AS PER TABLE 14.2, IRC –112–2020
6. MAX. WATER CEMENT RATIO SHALL BE AS PER TABLE–14.2, IRC:112–2020.

(II) REINFORCEMENT :

ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe 500D) 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)

(III) WATER :

WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO IRC : 112 – 2020.

(IV) EXPANSION JOINTS :

THE EXPANSION JOINTS SHOULD BE STRIP SEAL TYPE.

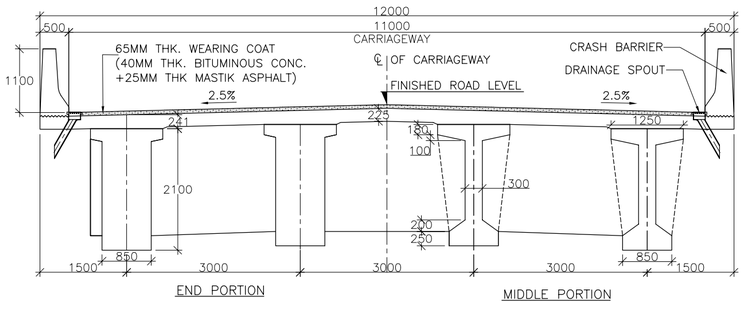
(V) BEARING SHALL BE OF POT & POT CUM PTFE TYPE. THE SIZE & DIMENSIONS OF THE BEARINGS SHALL BE FINALIZED AS PER THE DETAILS PROVIDED BY THE APPROVED VENDOR.

(VI) FILTER MATERIAL BEHIND ABUTMENT SHALL CONFORM TO CLAUSE 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.

(VII) PROPERTIES OF BACKFILL SOIL γ=2.0t/m³ , ϕ=30°.

C. WORKMANSHIP/DETAILING :

1. MINIMUM CLEAR COVER :
   a) SUPERSTRUCTURE = 40MM
   b) SUBSTRUCTURE : ABUTMENT, ABUTMENT CAP = 75MM
      FIN WALL = 50MM
   c) FOUNDATION SLAB = 75MM
2. DESIGN LOAD :
   a) 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.
   b) THE BRIDGE IS IN SEISMIC ZONE–V.
   c) SEISMIC LOADING :– AS PER CL. NO. 219 OF IRC:6–2017.
3. FOR ENSURING PROPER COVER OF CONCRETE TO REINFORCEMENT SPECIALLY MADE POLYMER COVER BLOCKS SHALL ONLY BE USED.
4. BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502.
5. 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.
6. SHUTTERING PLATES SHALL SUITABLY BE STIFFENED TO ENABLE THE COMPACTION BY FORM VIBRATORS.
7. SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
8. THE WEEP HOLES SHALL BE WITH 100MM DIA AC PIPE IN 1:20 SLOPE @ 1M C/C STAGGERED HORIZONTALLY & VERTICALLY AT ABUTMENT & FIN WALL.
9. THE SUB STRUCTURE & FOUNDATION DIMENSIONS MAY VARY ON THE BASIS OF DETAILED GEOTECHNICAL INVESTIGATION & STRUCTURAL DESIGN.



END PORTION

MIDDLE PORTION

TYPICAL CROSS SECTION OF SUPERSTRUCTURE

SCALE–1:75

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.

REVISIONS

SCALE : AS SHOWN

DATE : OCTOBER, 2023

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

PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF **UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM)** IN THE STATE OF MANIPUR ON EPC MODE.

TITLE : GENERAL ARRANGEMENT DRAWING OF 1X30.0M PSC-I GIRDER (AT CHAINAGE -2+379KM)

SUBMISSION TYPE : DRAFT DETAILED PROJECT REPORT

CONSULTANT : CETEST Engineering Consultants (An ISO 9001, 14001 & 45001 Certified Company)

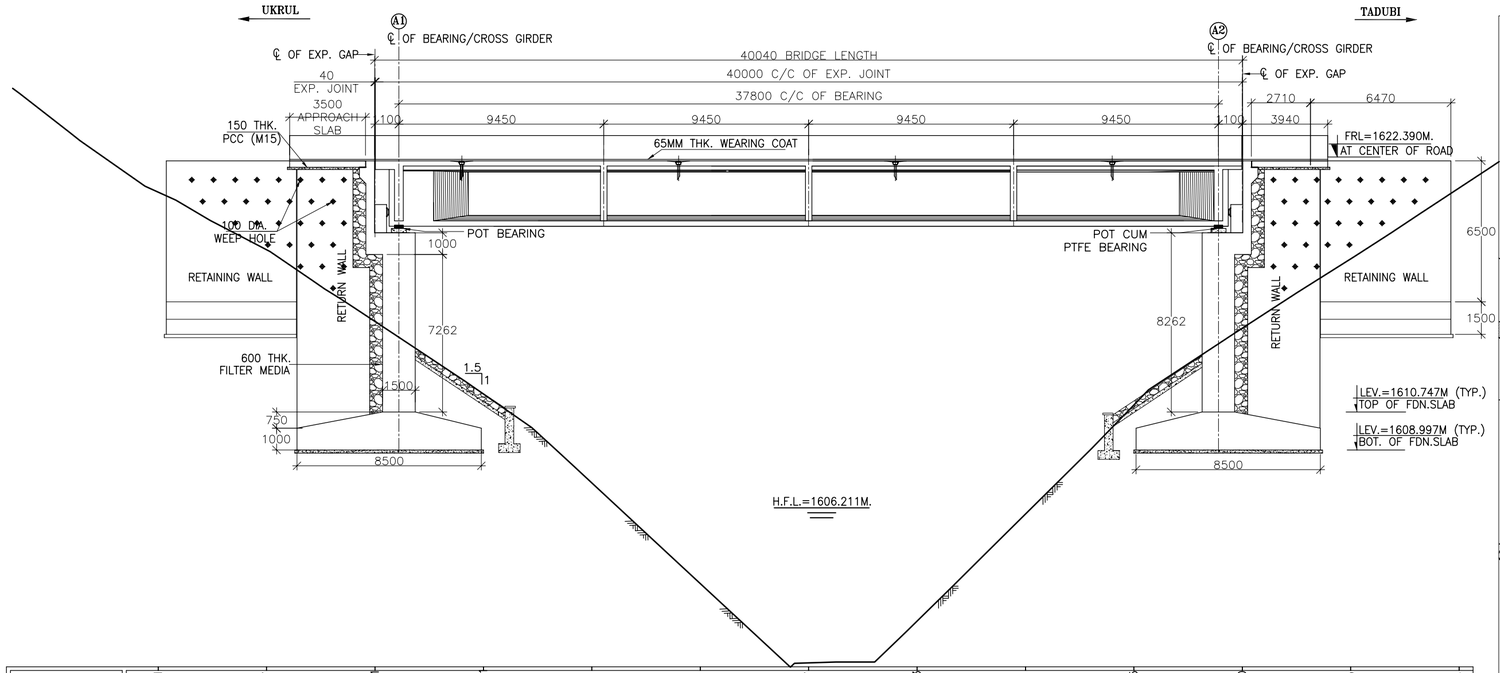
C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.

DWG NO :- CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-3/2)/GAD

REVISION MKD. - R0

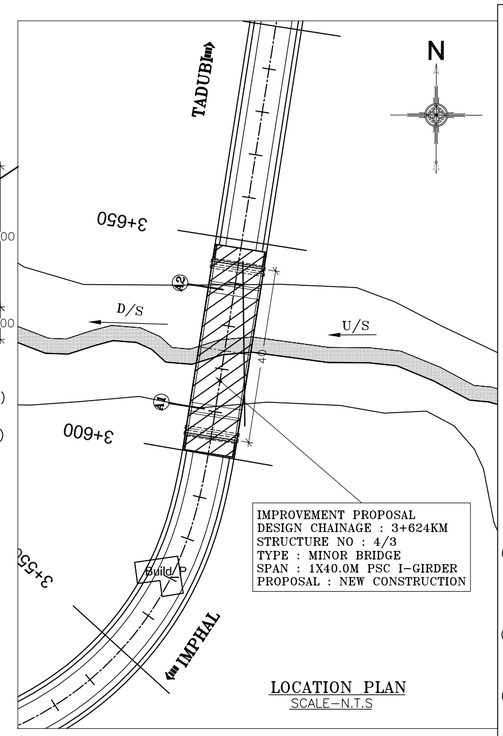
SHEET NO. - 01 OF 01

DRAWN BY	DESIGN BY	CHECKED BY	APPROVED BY
N.BHATTACHARJEE	-	P.SAHA	S.DEB

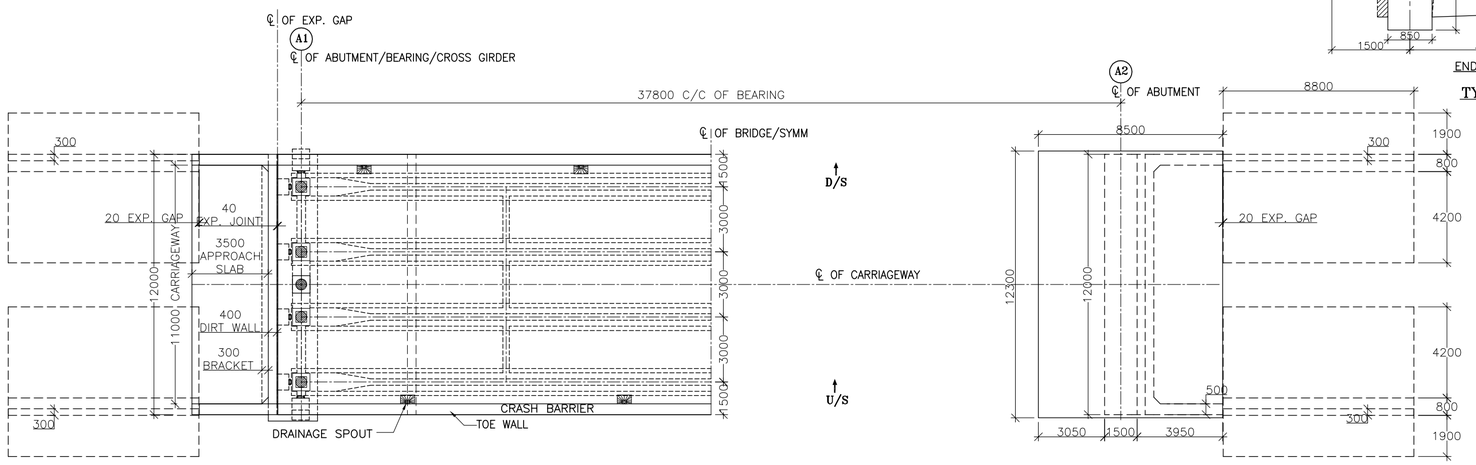


EGL (RL IN METRE)	1620.881	1618.227	1614.921	1611.581	1607.475	1602.830	1599.177	1601.103	1606.043	1611.065	1614.610	1617.805	1621.074
OFFSET (IN METRE)	3+594	3+599	3+604	3+609	3+614	3+619	3+624	3+629	3+634	3+639	3+644	3+649	3+654

SECTIONAL ELEVATION
SCALE–1:200



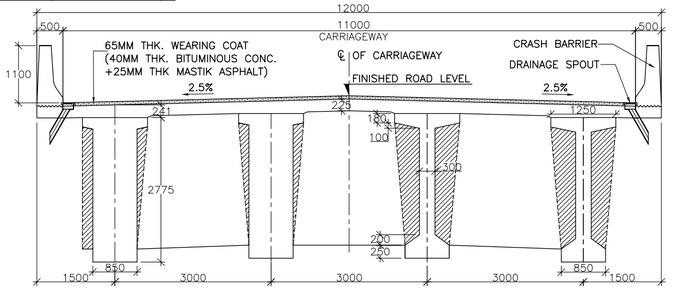
LOCATION PLAN
SCALE–N.T.S



HALF SUPER STRUCTURE PLAN

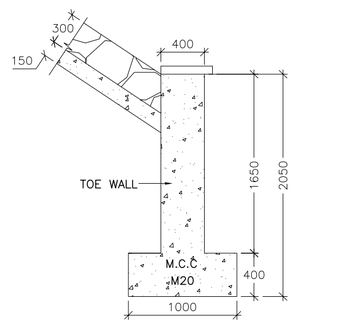
PLAN
SCALE–1:200

HALF FOUNDATION PLAN



END PORTION MIDDLE PORTION

TYPICAL CROSS SECTION OF SUPERSTRUCTURE
SCALE–1:75



DETAIL OF TOE WALL WITH PITCHING
SCALE–1:40

GENERAL NOTES :

A. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M . UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.

B. MATERIALS SPECIFICATIONS :

(I) CONCRETE :

1. GRADE OF CONCRETE USED :–
   a) DECK SLAB=M40,
   b) GIRDER=M45,
   c) SUB STRUCTURE=M30,
   d) DIRT WALL=M30,
   e) APPROACH SLAB = M30,
   f) P.C.C. BELOW APPROACH SLAB = M15,
   g) CRASH BARRIER = M40,
   h) PEDESTAL = M35
   i) REACTION BLOCK = M40.
   j) FIN WALL = M30.
2. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
3. 33/43/53 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 269, IS : 8112, IS : 12269 OR PORTLAND SLAG CEMENT CONFORMING TO IS : 455 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
4. TO IMPROVE WORKABILITY OF CONCRETE, ADMIXTURES CONFORMING TO IS:9103 MAY BE USED SUBJECT TO SATISFACTORY PROVEN USE.
5. THE MINIMUM CEMENT CONTENT IN CONCRETE SHALL BE AS PER TABLE 14.2, IRC –112–2020
6. MAX. WATER CEMENT RATIO SHALL BE AS PER TABLE–14.2, IRC:112–2020.

(II) REINFORCEMENT :
ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe 500D) 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)

(III) WATER :
WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO IRC : 112 – 2020.

(IV) EXPANSION JOINTS :
THE EXPANSION JOINTS SHOULD BE STRIP SEAL TYPE.

(V) 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.

(VI) FILTER MATERIAL BEHIND ABUTMENT SHALL CONFORM TO CLAUSE 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.

(VII) PROPERTIES OF BACKFILL SOIL γ=2.0t/m³ , ϕ=30°.

C. WORKMANSHIP/DETAILING :

1. MINIMUM CLEAR COVER :
   a) SUPERSTRUCTURE = 40MM
   b) SUBSTRUCTURE : ABUTMENT, ABUTMENT CAP = 75MM
      FIN WALL = 50MM
   c) FOUNDATION SLAB = 75MM
2. DESIGN LOAD :
   a) 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.
   b) THE BRIDGE IS IN SEISMIC ZONE–V.
   c) SEISMIC LOADING :– AS PER CL. NO. 219 OF IRC:6–2017.
3. FOR ENSURING PROPER COVER OF CONCRETE TO REINFORCEMENT SPECIALLY MADE POLYMER COVER BLOCKS SHALL ONLY BE USED.
4. BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502.
5. 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.
6. SHUTTERING PLATES SHALL SUITABLY BE STIFFENED TO ENABLE THE COMPACTION BY FORM VIBRATORS.
7. SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
8. THE WEEP HOLES SHALL BE WITH 100MM DIA AC PIPE IN 1:20 SLOPE @ 1M C/C STAGGERED HORIZONTALLY & VERTICALLY AT ABUTMENT & FIN WALL.
9. THE SUB STRUCTURE & FOUNDATION DIMENSIONS MAY VARY ON THE BASIS OF DETAILED GEOTECHNICAL INVESTIGATION & STRUCTURAL DESIGN.

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.

REVISIONS

SCALE : AS SHOWN

DATE : OCTOBER, 2023

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

PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF **UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM)** IN THE STATE OF MANIPUR ON EPC MODE.

TITLE : GENERAL ARRANGEMENT DRAWING OF 1X40.0M PSC-I GIRDER (AT CHAINAGE - 3+624KM)

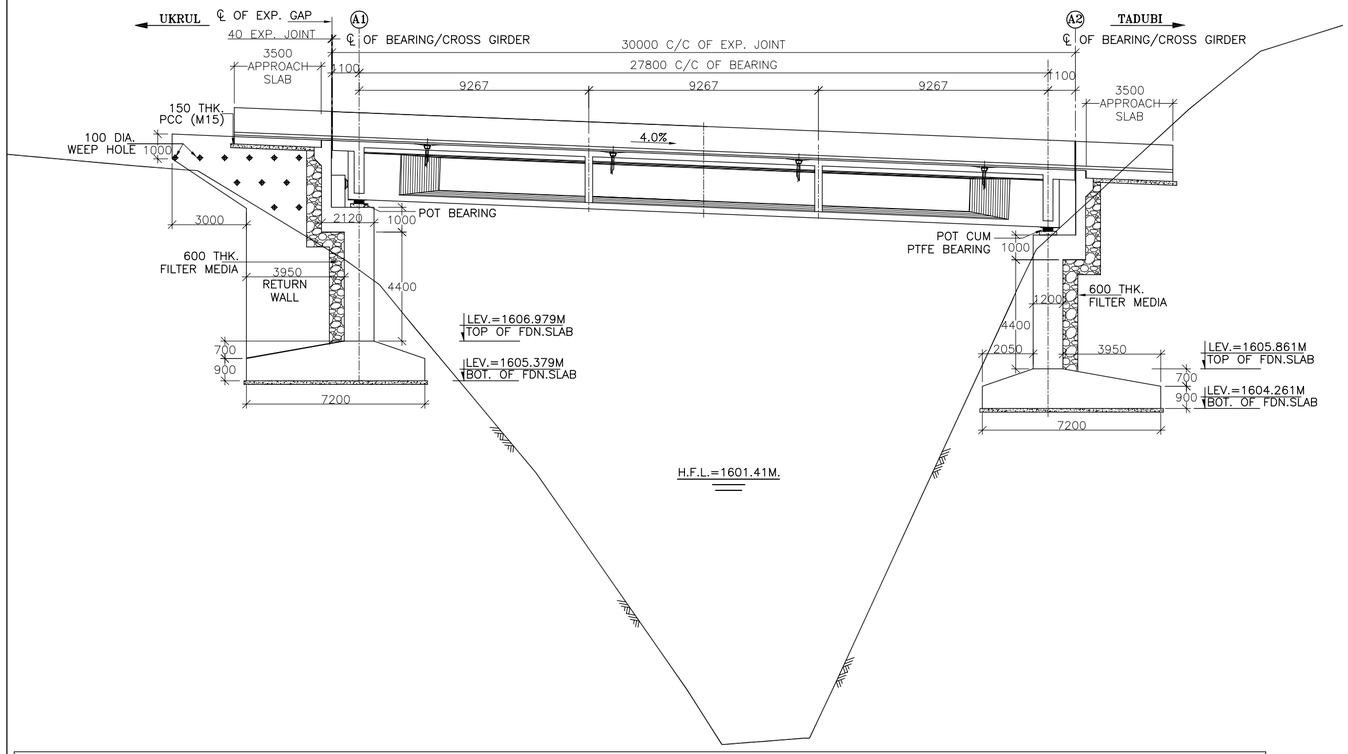
SUBMISSION TYPE : DRAFT DETAILED PROJECT REPORT

CONSULTANT : CETEST Engineering Consultants (An ISO 9001, 14001 & 45001 Certified Company)
C.E. TESTING COMPANY PVT. LTD.
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG NO :- CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-4/3)/GAD

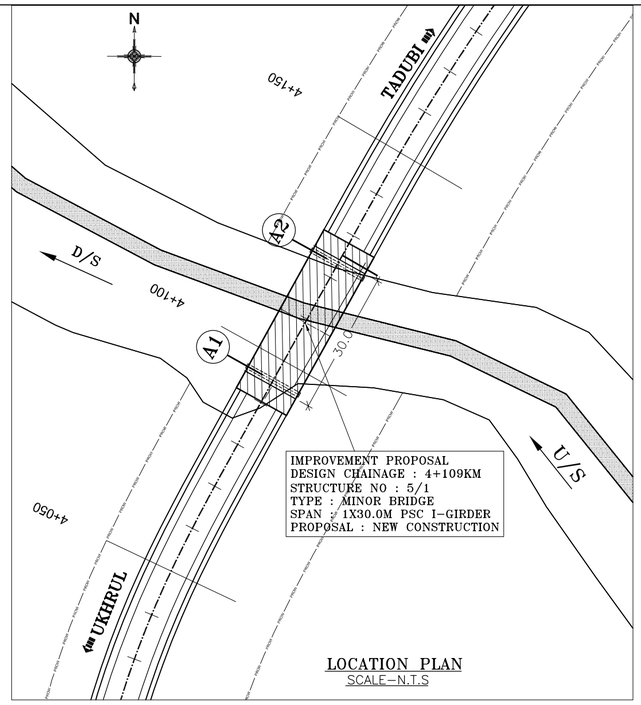
REVISION MKD. - R0 | SHEET NO. - 01 OF 01

DRAWN BY	DESIGN BY	CHECKED BY	APPROVED BY
N.BHATTACHARJEE	-	P.SAHA	S.DEB

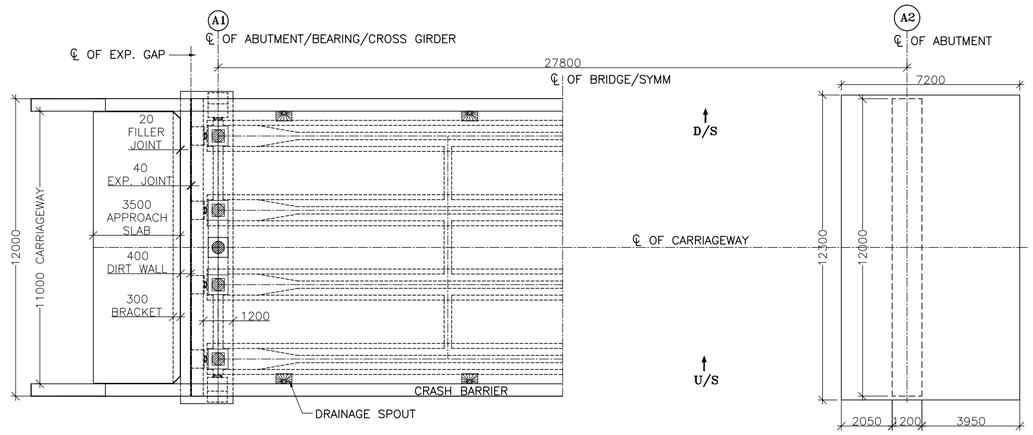


FRL (RL IN METRE)	1615.416	1615.212	1615.016	1614.616	1614.216	1614.100	1613.816
EGL (RL IN METRE)	1612.997	1609.849	1604.339	1590.721	1605.483	1611.115	1617.482
OFFSET (IN METRE)	4+090	4+095	4+100	4+110	4+120	4+123	4+130

SECTIONAL ELEVATION
SCALE–1:175



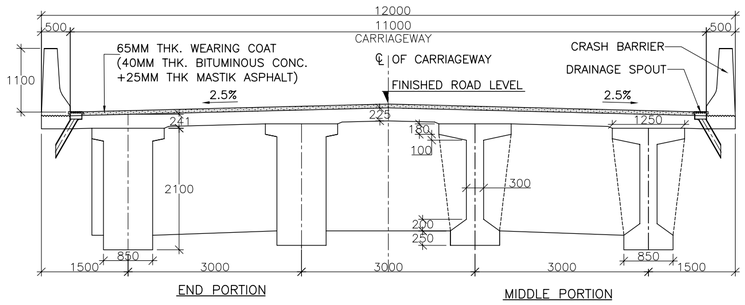
LOCATION PLAN
SCALE–N.T.S



HALF SUPER STRUCTURE PLAN

HALF FOUNDATION PLAN

PLAN
SCALE–1:175



END PORTION

MIDDLE PORTION

TYPICAL CROSS SECTION OF SUPERSTRUCTURE
SCALE–1:75

GENERAL NOTES :

A. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M . UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.

B. MATERIALS SPECIFICATIONS :

(I) CONCRETE :

1. GRADE OF CONCRETE USED :–
   a) DECK SLAB=M40,
   b) GIRDER=M45,
   c) SUB STRUCTURE=M30,
   d) DIRT WALL=M30,
   e) APPROACH SLAB = M30,
   f) P.C.C. BELOW APPROACH SLAB = M15,
   g) CRASH BARRIER = M40,
   h) PEDESTAL = M35
   i) REACTION BLOCK = M40.
   j) FIN WALL = M30.
2. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
3. 33/43/53 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 269, IS : 8112, IS : 12269 OR PORTLAND SLAG CEMENT CONFORMING TO IS : 455 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
4. TO IMPROVE WORKABILITY OF CONCRETE, ADMIXTURES CONFORMING TO IS:9103 MAY BE USED SUBJECT TO SATISFACTORY PROVEN USE.
5. THE MINIMUM CEMENT CONTENT IN CONCRETE SHALL BE AS PER TABLE 14.2, IRC –112–2020
6. MAX. WATER CEMENT RATIO SHALL BE AS PER TABLE–14.2, IRC:112–2020.

(II) REINFORCEMENT :
ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe 500D) 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)

(III) WATER :
WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO IRC : 112 – 2020.

(IV) EXPANSION JOINTS :
THE EXPANSION JOINTS SHOULD BE STRIP SEAL TYPE.

(V) 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.

(VI) FILTER MATERIAL BEHIND ABUTMENT SHALL CONFORM TO CLAUSE 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.

(VII) PROPERTIES OF BACKFILL SOIL γ=2.0t/m³ , ϕ=30°.

C. WORKMANSHIP/DETAILING :

1. MINIMUM CLEAR COVER :
   a) SUPERSTRUCTURE = 40MM
   b) SUBSTRUCTURE : ABUTMENT, ABUTMENT CAP = 75MM
      FIN WALL = 50MM
   c) FOUNDATION SLAB = 75MM
2. DESIGN LOAD :
   a) 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.
   b) THE BRIDGE IS IN SEISMIC ZONE–V.
   c) SEISMIC LOADING :– AS PER CL. NO. 219 OF IRC:6–2017.
3. FOR ENSURING PROPER COVER OF CONCRETE TO REINFORCEMENT SPECIALLY MADE POLYMER COVER BLOCKS SHALL ONLY BE USED.
4. BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502.
5. 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.
6. SHUTTERING PLATES SHALL SUITABLY BE STIFFENED TO ENABLE THE COMPACTION BY FORM VIBRATORS.
7. SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
8. THE WEEP HOLES SHALL BE WITH 100MM DIA AC PIPE IN 1:20 SLOPE @ 1M C/C STAGGERED HORIZONTALLY & VERTICALLY AT ABUTMENT & FIN WALL.
9. THE SUB STRUCTURE & FOUNDATION DIMENSIONS MAY VARY ON THE BASIS OF DETAILED GEOTECHNICAL INVESTIGATION & STRUCTURAL DESIGN.

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.

REVISIONS

SCALE : AS SHOWN

DATE : OCTOBER, 2023

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

PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF **UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM)** IN THE STATE OF MANIPUR ON EPC MODE.

TITLE : GENERAL ARRANGEMENT DRAWING OF 1X30.0M PSC-I GIRDER (AT CHAINAGE - 4+109KM)

SUBMISSION TYPE : DRAFT DETAILED PROJECT REPORT

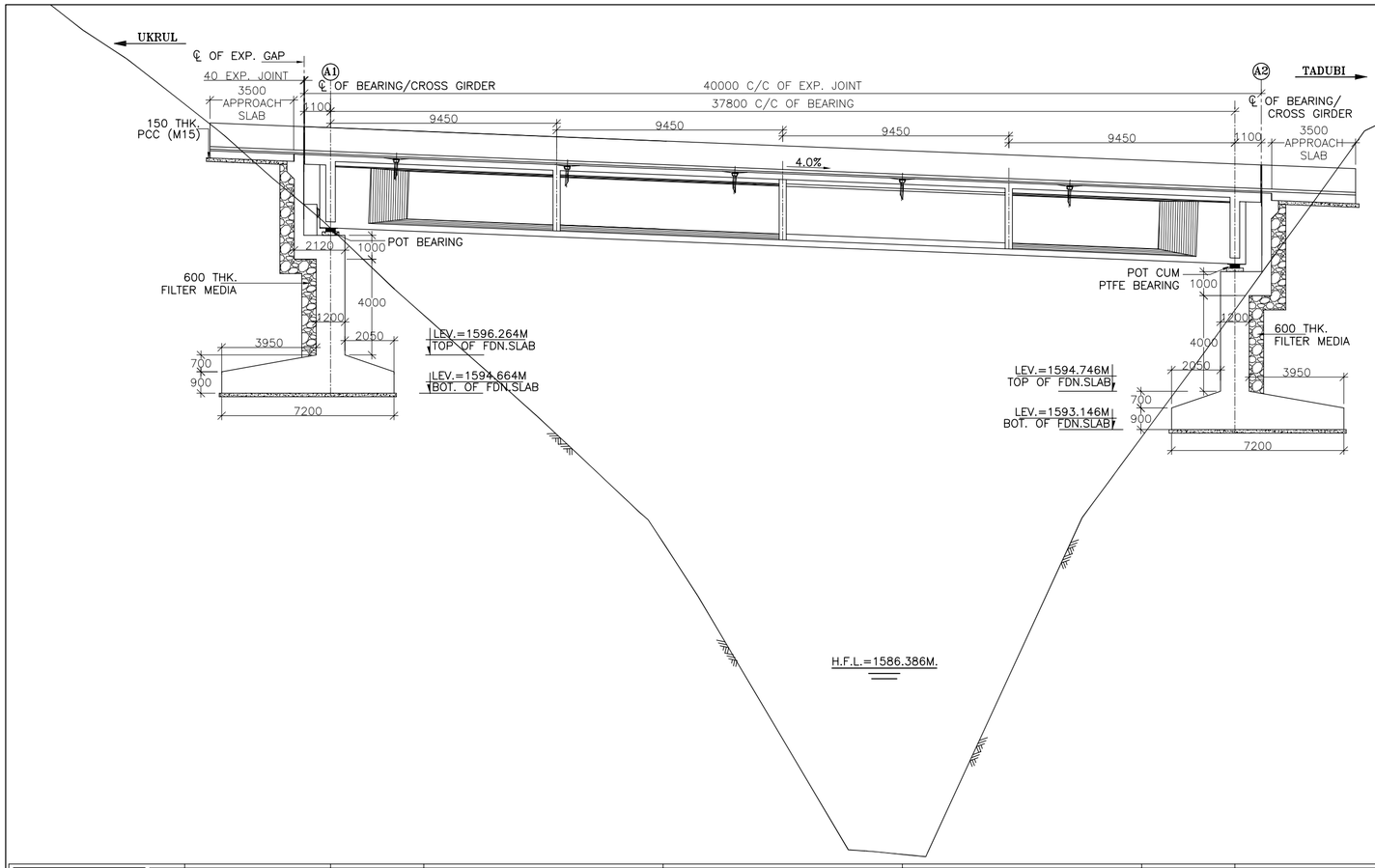
CONSULTANT : CETEST Engineering Consultants (An ISO 9001, 14001 & 45001 Certified Company)

C.E. TESTING COMPANY PVT. LTD.
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG NO :- CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-5/1)/GAD

REVISION MKD. - R0 | SHEET NO. - 01 OF 01

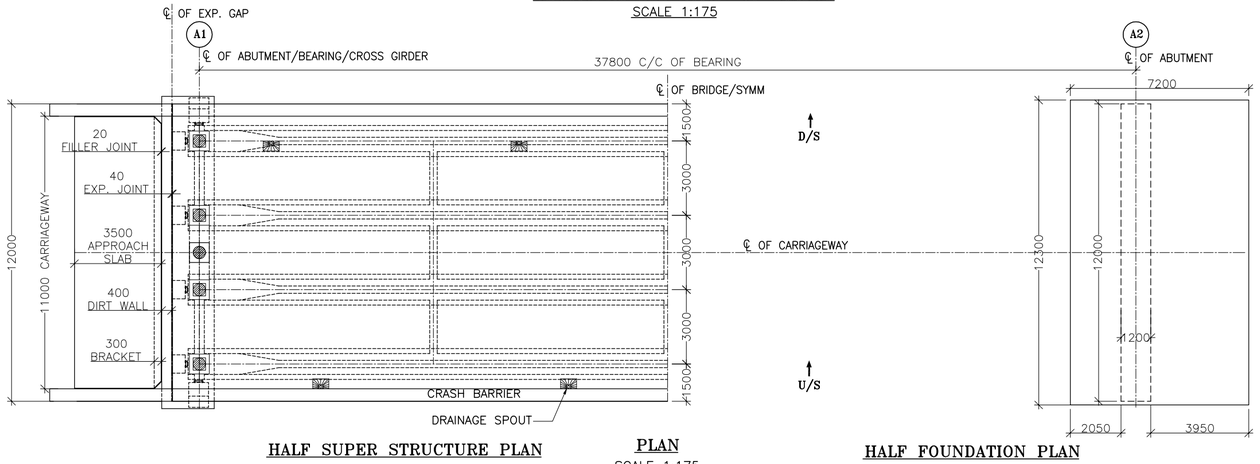
DRAWN BY	DESIGN BY	CHECKED BY	APPROVED BY
N.BHATTACHARJEE	-	P.SAHA	S.DEB



FRL (RL IN METRE)	1605.016	1604.772	1604.616	1604.216	1603.816	1603.416	1603.260	1603.016
EGL (RL IN METRE)	1606.767	1601.558	1597.934	1588.419	1575.389	1592.827	1598.140	1605.957
OFFSET (IN METRE)	4+350	4+356	4+360	4+370	4+380	4+390	4+394	4+400

SECTIONAL ELEVATION OF BRIDGE

SCALE 1:175

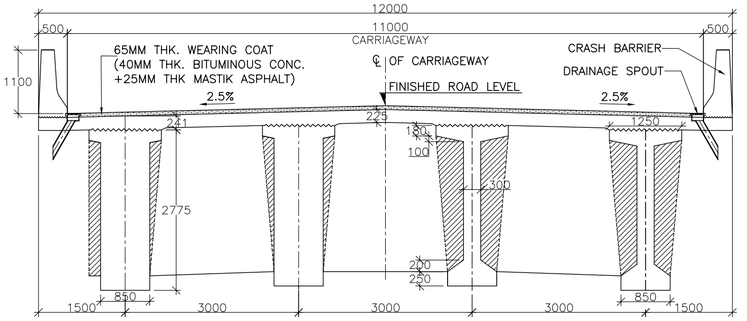


HALF SUPER STRUCTURE PLAN

PLAN

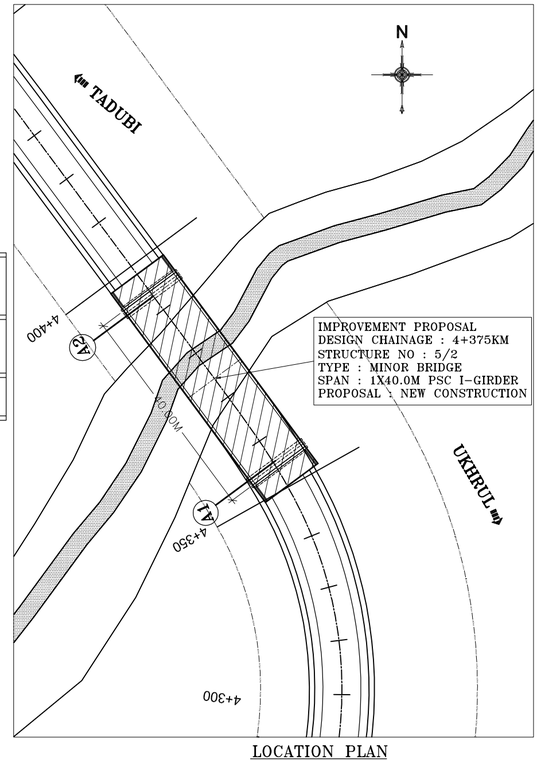
SCALE 1:175

HALF FOUNDATION PLAN



TYPICAL CROSS SECTION OF SUPER STRUCTURE

SCALE=1:75



LOCATION PLAN

SCALE-N.T.S

GENERAL NOTES :

A. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M . UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.

B. MATERIALS SPECIFICATIONS :

(I) CONCRETE :

1. GRADE OF CONCRETE USED :–
   a) DECK SLAB=M40,
   b) GIRDER=M45,
   c) SUB STRUCTURE=M30,
   d) DIRT WALL=M30,
   e) APPROACH SLAB = M30,
   f) P.C.C. BELOW APPROACH SLAB = M15,
   g) CRASH BARRIER = M40,
   h) PEDESTAL = M35
   i) REACTION BLOCK = M40.
   j) FIN WALL = M30.
2. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
3. 33/43/53 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS : 269, IS : 8112, IS : 12269 OR PORTLAND SLAG CEMENT CONFORMING TO IS : 455 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
4. TO IMPROVE WORKABILITY OF CONCRETE, ADMIXTURES CONFORMING TO IS:9103 MAY BE USED SUBJECT TO SATISFACTORY PROVEN USE.
5. THE MINIMUM CEMENT CONTENT IN CONCRETE SHALL BE AS PER TABLE 14.2, IRC –112–2020
6. MAX. WATER CEMENT RATIO SHALL BE AS PER TABLE–14.2, IRC:112–2020.

(II) REINFORCEMENT :

ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe 500D) 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)

(III) WATER :

WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO IRC : 112 – 2020.

(IV) EXPANSION JOINTS :

THE EXPANSION JOINTS SHOULD BE STRIP SEAL TYPE.

(V) 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.

(VI) FILTER MATERIAL BEHIND ABUTMENT SHALL CONFORM TO CLAUSE 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.

(VII) PROPERTIES OF BACKFILL SOIL γ=2.0t/m³ , ϕ=30°.

C. WORKMANSHIP/DETAILING :

1. MINIMUM CLEAR COVER :
   a) SUPERSTRUCTURE = 40MM
   b) SUBSTRUCTURE : ABUTMENT, ABUTMENT CAP = 75MM
      FIN WALL = 50MM
   c) FOUNDATION SLAB = 75MM
2. DESIGN LOAD :
   a) 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.
   b) THE BRIDGE IS IN SEISMIC ZONE–V.
   c) SEISMIC LOADING :– AS PER CL. NO. 219 OF IRC:6–2017.
3. FOR ENSURING PROPER COVER OF CONCRETE TO REINFORCEMENT SPECIALLY MADE POLYMER COVER BLOCKS SHALL ONLY BE USED.
4. BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502.
5. 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.
6. SHUTTERING PLATES SHALL SUITABLY BE STIFFENED TO ENABLE THE COMPACTION BY FORM VIBRATORS.
7. SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
8. THE WEEP HOLES SHALL BE WITH 100MM DIA AC PIPE IN 1:20 SLOPE @ 1M C/C STAGGERED HORIZONTALLY & VERTICALLY AT ABUTMENT & FIN WALL.
9. THE SUB STRUCTURE & FOUNDATION DIMENSIONS MAY VARY ON THE BASIS OF DETAILED GEOTECHNICAL INVESTIGATION & STRUCTURAL DESIGN.

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.

REVISIONS

SCALE : AS SHOWN

DATE : OCTOBER, 2023

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

PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF **UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM)** IN THE STATE OF MANIPUR ON EPC MODE.

TITLE : GENERAL ARRANGEMENT DRAWING OF 1X40.0M PSC-I GIRDER (AT CHAINAGE - 4+375KM)

SUBMISSION TYPE : DRAFT DETAILED PROJECT REPORT

CONSULTANT : CETEST Engineering Consultants, An ISO 9001, 14001 & 45001 Certified Company

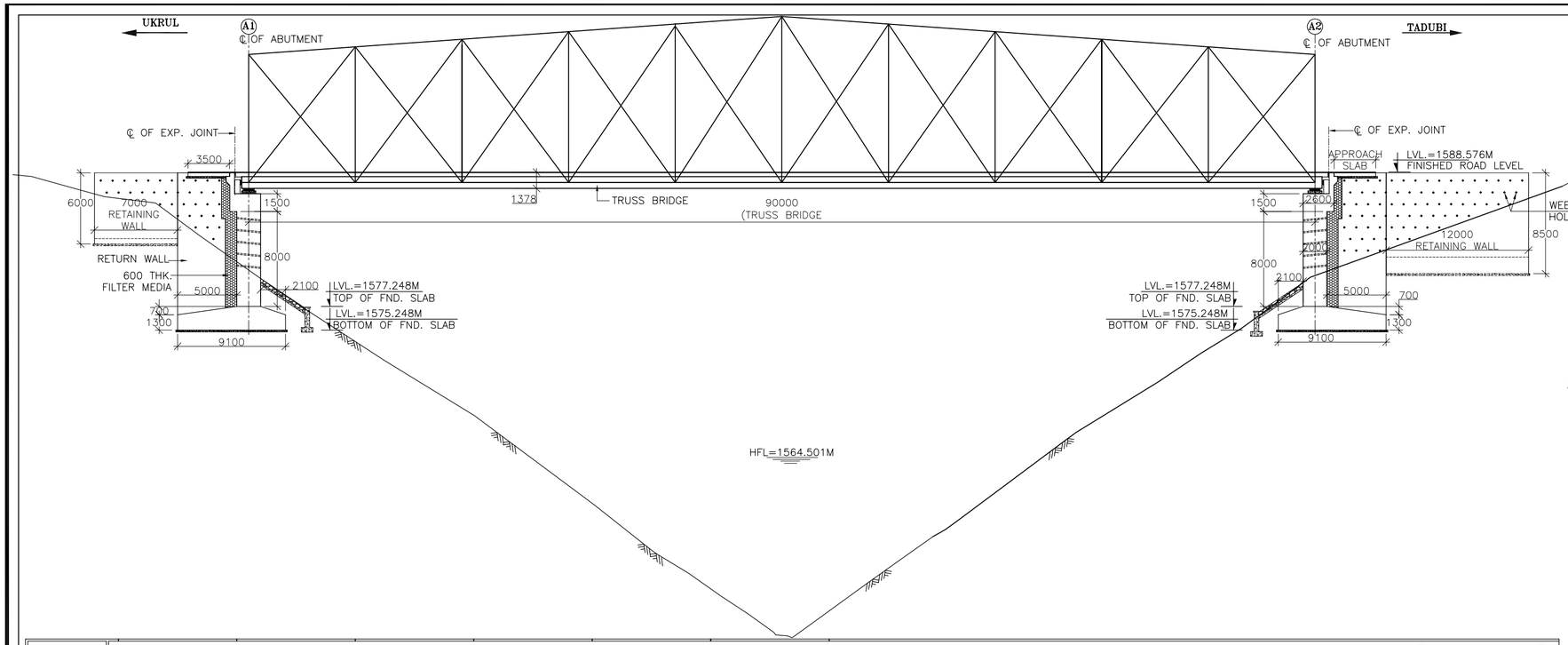
C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

DWG NO :- CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MN/(STR-5/2)/GAD

REVISION MKD. - R0 | SHEET NO. - 01 OF 01

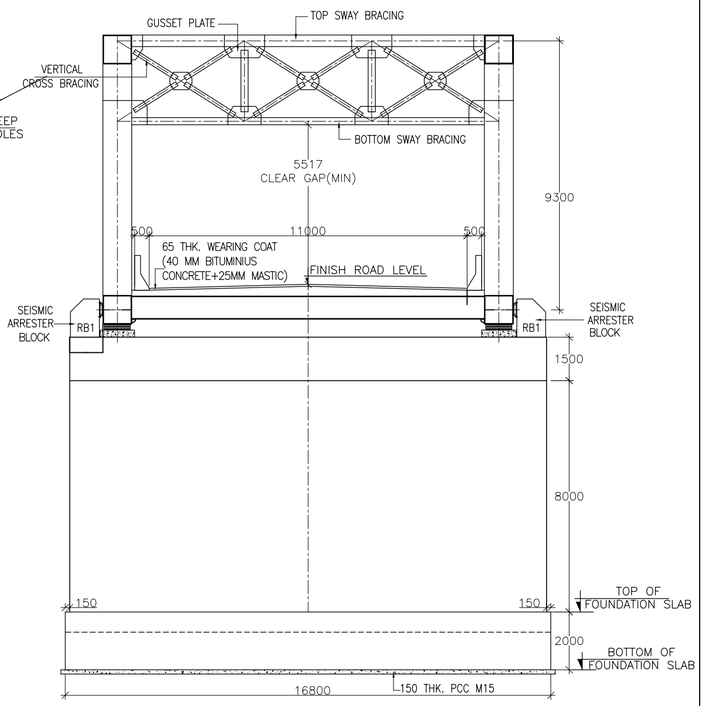
DRAWN BY	DESIGN BY	CHECKED BY	APPROVED BY
N.BHATTACHARJEE	-	P.SAHA	S.DEB



EGL (RL IN METRE)	1586.355	1581.016	1574.287	1568.065	1560.629	1553.414	1551.568	1558.562	1565.996	1572.373	1579.244	1583.091	1586.701
OFFSET (IN METRE)	4+850	4+860	4+870	4+880	4+890	4+900	4+910	4+920	4+930	4+940	4+950	4+960	4+970

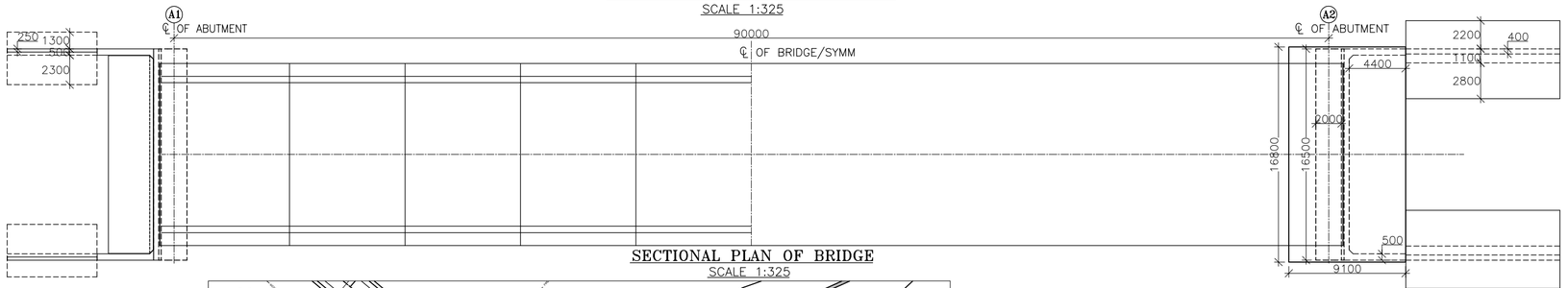
SECTIONAL ELEVATION OF BRIDGE

SCALE 1:325



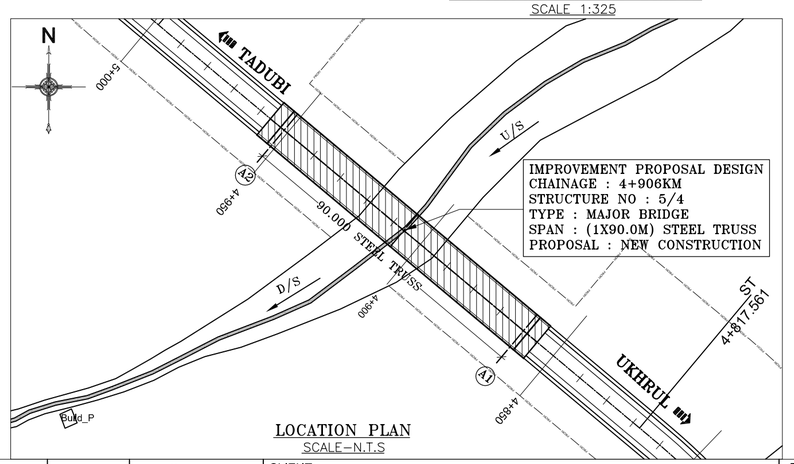
TYPICAL CROSS SECTIONAL AT ABUTMENT

SCALE 1:150



SECTIONAL PLAN OF BRIDGE

SCALE 1:325



LOCATION PLAN

SCALE–N.T.S

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS. UNLESS OTHERWISE MENTIONED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED
2. MATERIALS:
   STRUCTURAL STEEL: B_0 KILLED STEEL Fy ≤ 540 N/mm².(Fe 540)
   REINFORCING STEEL (R) : HYSD BARS CONFORM TO IS : 1786 GRADE Fe 500D.
3. ALL BEARING SHALL BE OF POT CUM PTFE TYPE. THE LONGITUDINAL GUIDED BEARING SHALL BE CAPABLE OF ACCOMMODATING A MOVEMENT OF 100mm.
4. THE SUB STRUCTURE & FOUNDATION DIMENSIONS MAY VARY ON THE BASIS OF DETAILED GEOTECHNICAL INVESTIGATION & STRUCTURAL DESIGN.

MATERIALS SPECIFICATIONS :–

CONCRETE :

A) GRADE OF CONCRETE USED :–
   (I) SUB STRUCTURE = M30,
   (II) FOUNDATION SLAB = M30,

B) CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.

C) 43 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.

D) TO IMPROVE WORKABILITY OF CONCRETE, ADMIXTURES CONFORMING TO IS : 9103 MAY BE USED SUBJECT TO SATISFACTORY PROVEN USE.

E) THE MINIMUM CEMENT CONTENT IN CONCRETE SHALL BE AS PER IRC–112 : 2020.

F) MAXIMUM WATER CEMENT RATIO SHALL BE AS PER IRC–112 : 2020.

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.

REVISIONS

SCALE : AS SHOWN

DATE : OCTOBER, 2023

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

PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF **UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM)** IN THE STATE OF MANIPUR ON EPC MODE.

TITLE : GENERAL ARRANGEMENT DRAWING OF (90.0M) STEEL TRUSS (AT CHAINAGE -4+906KM)

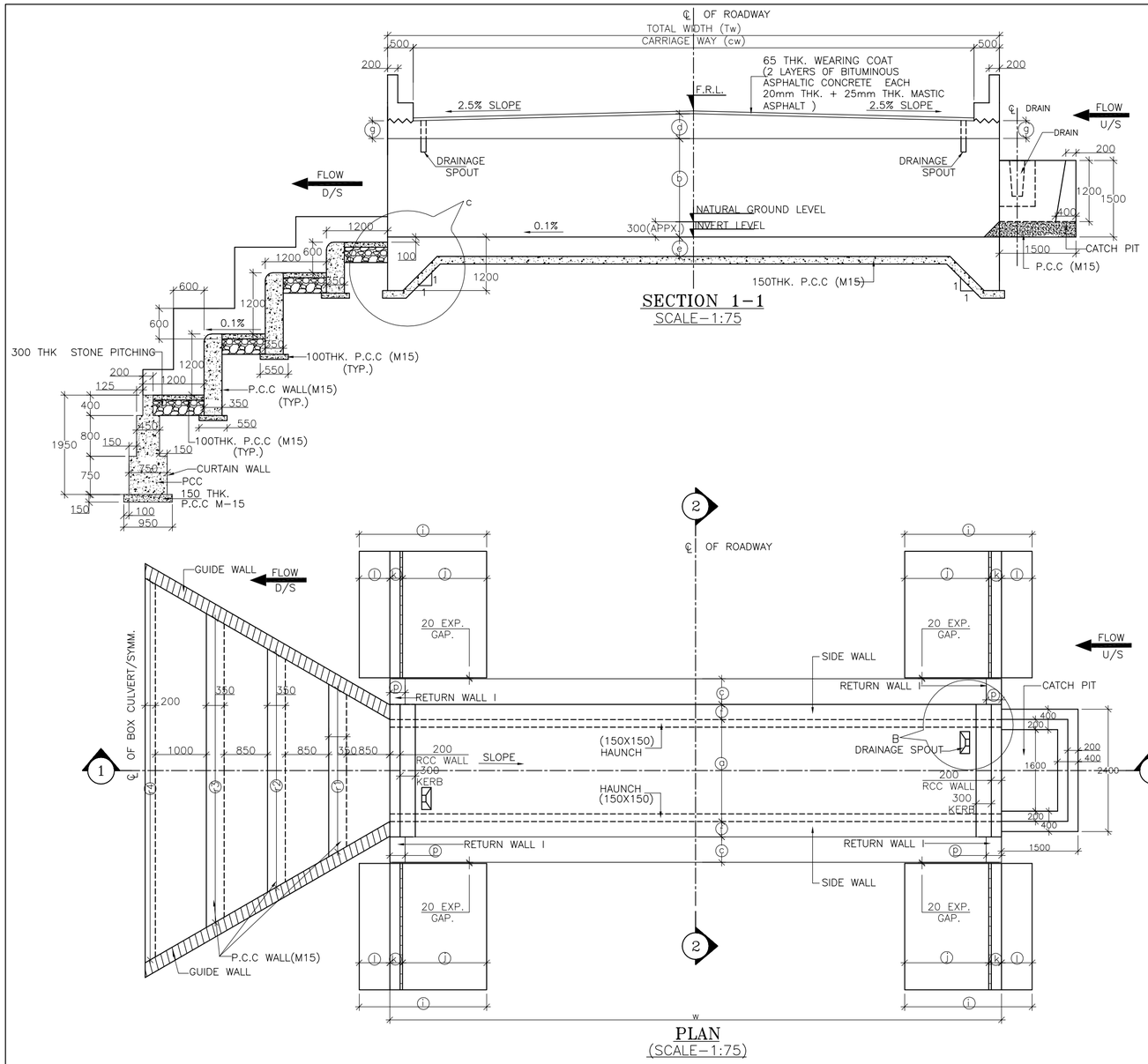
SUBMISSION TYPE : DRAFT DETAILED PROJECT REPORT

CONSULTANT : CETEST Engineering Consultants (An ISO 9001, 14001 & 45001 Certified Company) C.E. TESTING COMPANY PVT. LTD. 124-A, N.S.C. Bose Road Kolkata - 700092.

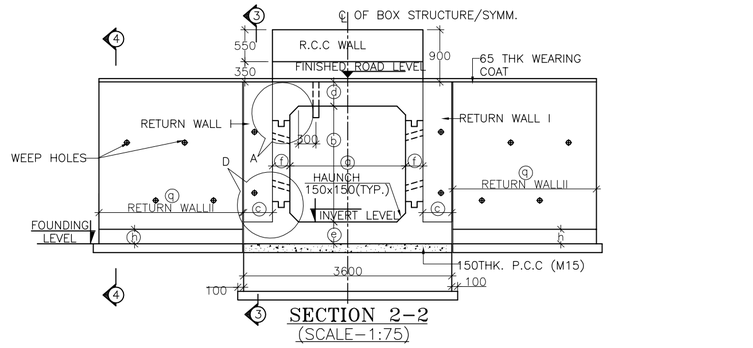
DWG NO :- CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/MJ/(STR-5/4)/GAD

REVISION MKD. - R0		SHEET NO. - 01 OF 01	
DRAWN BY	DESIGN BY	CHECKED BY	APPROVED BY
N.BHATTACHARJEE	-	P.SAHA	S.DEB

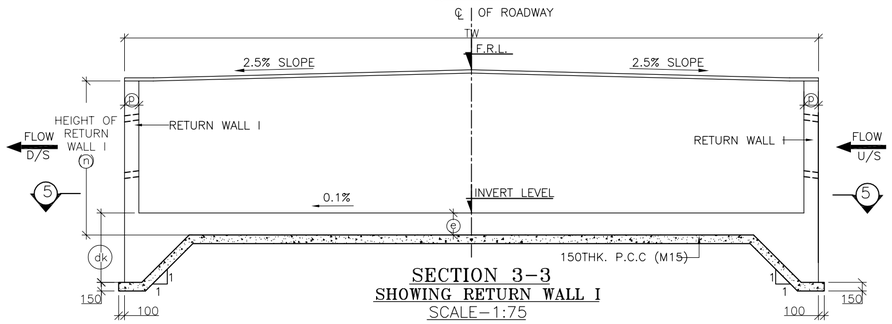
CULVERT



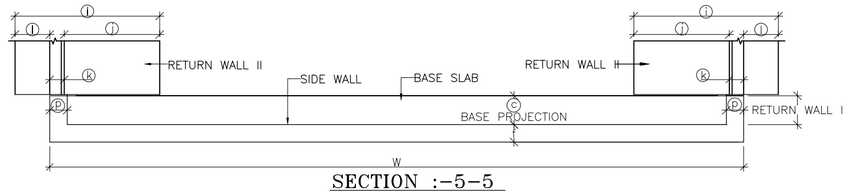
SECTION 1-1
SCALE-1:75



SECTION 2-2
(SCALE-1:75)

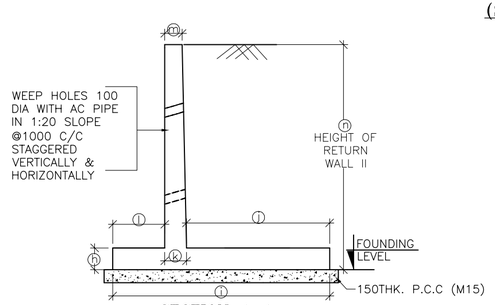


SECTION 3-3
SHOWING RETURN WALL I
SCALE-1:75



SECTION :-5-5
(SHOWING RETURN WALL I)
SCALE-1:75

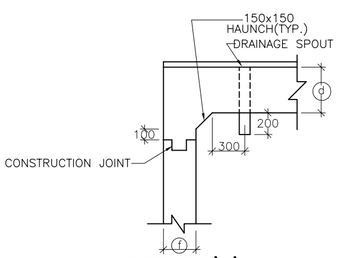
PLAN
(SCALE-1:75)



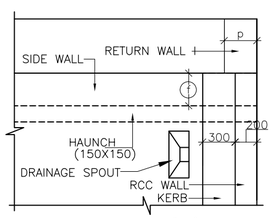
SECTION 4-4
(SHOWING RETURN WALL- II)
(SCALE-1:50)

NOTES :

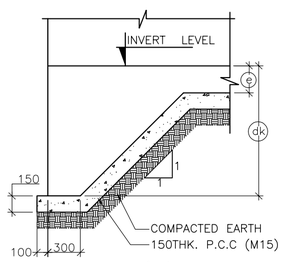
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN M. UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
2. FOR LOCATION OF CULVERT REFER PLAN & PROFILE DRAWINGS.
3. GRADE OF CONCRETE :
   BOX CELL STRUCTURE = M25
   CURTAIN WALL = M25
   LEVELLING COURSE (P.C.C.)= M15
   RETURN WALL = M25
   RCC WALL & KERB = M25
4. ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe 500) CONFORMING TO IS : 1786
5. MINIMUM CLEAR COVER : 50MM
6. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE TO ACHIEVE MINIMUM 28 DAYS CHARACTERISTICS STRENGTH ON 150MM CUBES FOR MODERATE EXPOSURE.
7. PROPERTIES OF BACKFILL SOIL $\gamma=2.0t/m^3$, $\phi=30^\circ$.
8. FILTER MATERIAL BEHIND SIDE WALL AND RCC 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.
9. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
10. FLOW DIRECTION SHOWN IN THE DRAWING IS INDICATIVE ONLY. BED PROTECTION FOR UP & DOWN STREAM SHALL BE BASED ON THE FLOW DIRECTION IN SITE.
11. DISCREPANCY IF ANY IS TO BE IMMEDIATELY BROUGHT INTO THE NOTICE OF ENGINEER FOR NECESSARY MODIFICATION IN THE DRAWINGS.
12. EARTH BELLOW BOX SHALL BE WELL COMPACTED TO ACHIEVE MINIMUM BEARING CAPACITY MENTIONED IN TABLE.
13. THIS DRAWING HAS BEEN PREPARED BASED ON STANDARD DRAWINGS FOR BOX CULVERT PUBLISHED BY MoRTH.



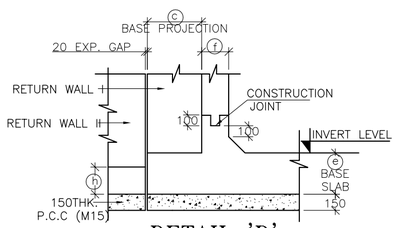
DETAIL 'A'
(SCALE-1:40)



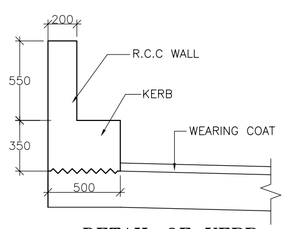
DETAIL 'B'
(SCALE-1:40)



DETAIL 'C'
(SCALE-1:40)



DETAIL 'D'
(SCALE-1:40)



DETAIL OF KERB
(FOR GENERAL ARRANGEMENT
(SCALE-1:30)

MKD.	DATE	DESCRIPTION	CHKD.	APPRD.

REVISIONS

SCALE : AS SHOWN

DATE : OCTOBER, 2023

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

PROJECT: CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY STUDY AND DETAILED PROJECT REPORT FOR TWO LANING WITH PAVED SHOULDER OF **UKHRUL - TOLOI - TADUBI SECTION OF NH-102A (115 KM)** IN THE STATE OF MANIPUR ON EPC MODE.

TITLE : GENERAL ARRANGEMENT DRAWING OF BOX CULVERT (TYPICAL)

SUBMISSION TYPE : DRAFT DETAILED PROJECT REPORT

CONSULTANT : CETEST Engineering Consultants, An ISO 9001, 14001 & 45001 Certified Company

C.E. TESTING COMPANY PVT. LTD.
124-A, N.S.C. Bose Road
Kolkata - 700092.

DWG NO :- CET/BDG/2016/3640/NHIDCL/NH-102A/DDPR/CULVERT/GAD

REVISION MKD. - R0 | SHEET NO. - 01 OF 01

DRAWN BY	DESIGN BY	CHECKED BY	APPROVED BY
N.BHATTACHARJEE	-	P.SAHA	S.DEB

Sl No.	Design Chainage (Km)	No of Cell (Clr Span X Clr Height) (M X M)	Nc/ab/EC	Height of Earth Cushion (s) (M)	Total Width (T_W) (M)	Proposed Carriageway (C_W) (M)	Clear Span of Proposed Box (a)(M)	Vent Height of Proposed Box (b)(M)	Vent Height (b1) (M)	Vent Height (b2) (M)	Top Slab Thickness at Edge (g) (M)	Top Slab Thickness at Centre (d) (M)	Bottom Slab Thickness (e) (M)	Side Wall Thickness (f) (M)	Projection of Slab (c) (M)	Total Length of Box Culvert (M)	Barrel length of Box Culvert (r) (M)
1	0.066	2.0 X 2.0	01/22/0		11	10	2	2			0.350	0.475	0.380	0.300	0.500	2.600	11.000
2	0.190	3.0 X 4.0	01/34/3	1.630	11	10	3	4			0.390	0.390	0.470	0.480	1.400	3.960	17.521
3	0.451	3.0 X 4.0	01/34/3	1.846	11	10	3	4			0.390	0.390	0.470	0.480	1.400	3.960	18.384
4	0.579	2.0 X 3.0	01/23/3	0.588	11	10	2	3			0.294	0.294	0.300	0.350	1.100	2.700	13.354
5	0.714	2.0 X 2.0	01/22/3	0.340	11	10	2	2			0.263	0.263	0.300	0.250	0.600	2.500	12.362
6	1.207	3.0 X 4.0	01/34/3	2.939	11	10	3	4			0.390	0.390	0.470	0.480	1.400	3.960	22.755
7	1.549	5.0 X 4.0	01/54/3	3.840	11	10	5	4			0.580	0.580	0.700	0.530	0.800	6.060	26.359
8	1.878	2.0 X 2.0	01/22/0		11	10	2	2	2	2.700	0.350	0.350	0.380	0.300	0.500	2.600	11.000
9	2.107	2.0 X 2.0	01/22/3	0.866	11	10	2	2			0.263	0.263	0.300	0.250	0.600	2.500	14.464
10	2.549	2.0 X 2.0	01/22/0		11	10	2	2			0.350	0.475	0.380	0.300	0.500	2.600	11.000
11	2.838	5.0 X 4.0	01/54/3	6.066	11	10	5	4			0.580	0.580	0.700	0.530	0.800	6.060	35.262
12	2.954	2.0 X 3.0	01/23/3	1.021	11	10	2	3			0.294	0.294	0.300	0.350	1.100	2.700	15.084
13	3.254	2.0 X 2.0	01/22/0		11	10	2	2	2	2.700	0.350	0.350	0.380	0.300	0.500	2.600	11.000
14	3.874	2.0 X 2.0	01/22/0		11	10	2	2	2	2.560	0.350	0.350	0.380	0.300	0.500	2.600	11.000
15	5.100	2.0 X 2.0	01/22/0		12	11	2	2	2	2.770	0.350	0.350	0.380	0.300	0.500	2.600	12.000
16	5.300	3.0 X 4.0	01/34/3	2.079	11	10	3	4			0.390	0.390	0.470	0.480	1.400	3.960	19.317
17	5.604	2.0 X 2.0	01/22/0		11	10	2	2			0.350	0.475	0.380	0.300	0.500	2.600	11.000
18	5.843	2.0 X 2.0	01/22/0		11	10	2	2			0.350	0.475	0.380	0.300	0.500	2.600	11.000
19	5.954	2.0 X 2.0	01/22/0		11	10	2	2	2	2.570	0.350	0.350	0.380	0.300	0.500	2.600	11.000
20	6.529	2.0 X 2.0	01/22/0		11	10	2	2	2	2.560	0.350	0.350	0.380	0.300	0.500	2.600	11.000

Sl No.	Design Chainage (Km)	Length of Return Wall -I (M)	Height of Return Wall-I (o) (M)	Height of Return Wall-I Inner Side of Curve (o1) (M)	Height of Return Wall-I (outer side of curve) (o2) (M)	Thickness of Return Wall-I (p) (M)	Length of Return Wall -II (q) (M)	Total Height of Return Wall-II (n) (M)	Return Wall ht Inner Side of curve (n1) (M)	Return Wall ht Outer Side of curve (n2) (M)	Retaining wall height for adopting section	h	i	j	k	l	m	Finished Road Level (M)
1	0.066	0.500	2.350			0.250	3.010	2.730	-	-	3.0	0.250	2.500	1.650	0.250	0.600	0.200	1689.374
2	0.190	1.400	4.390			0.300	8.130		6.140	6.840	7.0	0.650	5.300	2.800	0.650	1.850	0.250	1693.877
3	0.451	1.400	4.390			0.300	8.360		6.426	6.986	7.0	0.650	5.300	2.800	0.650	1.850	0.250	1689.782
4	0.579	1.100	3.294			0.300	5.130		3.902	4.462	5.0	0.400	4.150	2.200	0.450	1.500	0.200	1688.94
5	0.714	0.600	2.263			0.250	2.590	2.437	-	-	3.0	0.250	2.500	1.650	0.250	0.600	0.200	1687.095
6	1.207	1.400	4.390			0.300	4.980	4.735	-	-	5.0	0.400	4.150	2.200	0.450	1.500	0.200	1662.692
7	1.549	0.800	4.580			0.250	5.870	5.155	-	-	6.0	0.450	4.300	2.300	0.500	1.500	0.250	1660.28
8	1.878	0.500		2.350	3.050	0.250	4.060		2.730	3.430	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1669.7
9	2.107	0.600	2.263			0.250	4.410		3.208	3.648	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1658.998
10	2.549	0.500	2.350			0.250	3.010	2.730	-	-	3.0	0.250	2.500	1.650	0.250	0.600	0.200	1642.786
11	2.838	0.800	4.580			0.250	15.680		10.996	11.696	12.0	1.350	8.000	3.500	1.350	3.150	0.400	1628.597
12	2.954	1.100	3.294			0.300	3.640	3.468	-	-	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1625.395
13	3.254	0.500		2.350	3.050	0.250	4.060		2.730	3.430	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1632.146
14	3.874	0.500		2.350	2.910	0.250	3.850		2.730	3.290	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1619.884
15	5.100	0.500		2.350	3.120	0.250	4.160		2.730	3.500	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1587.152
16	5.300	1.400	4.390			0.300	4.980	4.735	-	-	5.0	0.400	4.150	2.200	0.450	1.500	0.200	1573.933
17	5.604	0.500	2.350			0.250	3.010	2.730	-	-	3.0	0.250	2.500	1.650	0.250	0.600	0.200	1565.629
18	5.843	0.500	2.350			0.250	3.010	2.730	-	-	3.0	0.250	2.500	1.650	0.250	0.600	0.200	1562.043
19	5.954	0.500		2.350	2.920	0.250	3.860		2.730	3.300	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1563.752
20	6.529	0.500		2.350	2.910	0.250	3.850		2.730	3.290	4.0	0.300	3.300	1.850	0.350	1.100	0.200	1585.706

Sl No.	Design Chainage (Km)	Proposed Invert Level (M)	Proposed Founding Level (M)	Protection Type	Cross Fall	SE (e%)	NC	SE (e%)
1	0.066	1686.834	1686.454	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
2	0.190	1687.792	1687.322	Catch Pit With Stepped Protection	SE	7.0		7.0%
3	0.451	1683.481	1683.011	Catch Pit With Stepped Protection	SE	5.6		5.6%
4	0.579	1684.993	1684.693	Catch Pit With Stepped Protection	SE	5.6		5.6%
5	0.714	1684.427	1684.127	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
6	1.207	1655.298	1654.828	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
7	1.549	1651.795	1651.095	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
8	1.878	1666.935	1666.555	Catch Pit With Stepped Protection	SE	7.0		7.0%
9	2.107	1655.805	1655.505	Catch Pit With Stepped Protection	SE	4.4		4.4%
10	2.549	1640.246	1639.866	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
11	2.838	1617.886	1617.186	Catch Pit With Stepped Protection	SE	7.0		7.0%
12	2.954	1621.016	1620.716	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
13	3.254	1629.381	1629.001	Catch Pit With Stepped Protection	SE	7.0		7.0%
14	3.874	1617.189	1616.809	Catch Pit With Stepped Protection	SE	5.6		5.6%
15	5.100	1584.352	1583.972	Catch Pit With Stepped Protection	SE	7.0		7.0%
16	5.300	1567.399	1566.929	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
17	5.604	1563.089	1562.709	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
18	5.843	1559.503	1559.123	Catch Pit With Stepped Protection	NC	0	0.025	2.5%
19	5.954	1561.052	1560.672	Catch Pit With Stepped Protection	SE	5.7		5.7%
20	6.529	1583.011	1582.631	Catch Pit With Stepped Protection	SE	5.6		5.6%