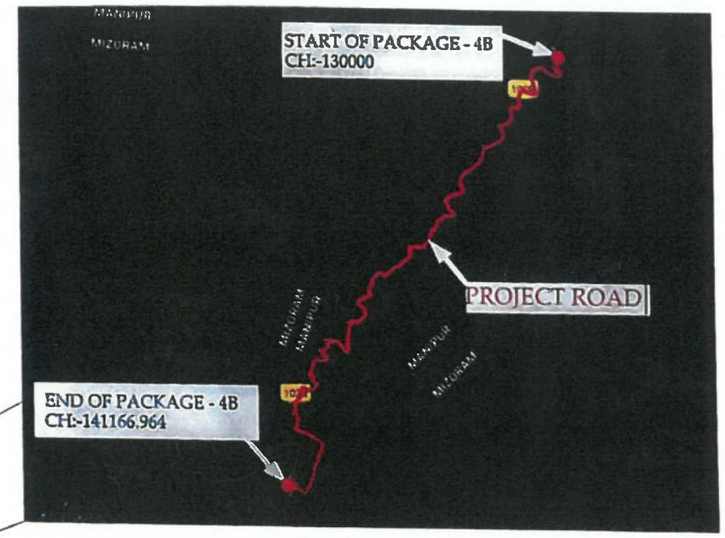
GPT. Infra/ RO. Imphal/ Design/ Pkg. 4B/ 20-21/61 (07.14.08.21, 14.08.21)

4B

BUILDING INFRASTRUCTURE - BUILDING THE NATION

National Highways & Infrastructure Development
राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction mode.



SUPER STRUCTURE - 43METER

PACKAGE - 4B

AT CH-141+016

APPROVED

AUGUST - 2021

GPT Infraprojects Limited Imphal Branch 795001 Imphal

EPC CONTRACTOR:

GPT GROUP

JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

DESIGN CONSULTANT:

SPS Technocrats Pvt. Ltd.

638 to 641, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

STRUCTURAL STEEL

1. MATERIALS

1.1 STEEL MEMBERS SHALL BE FREE FROM IMPERFECTIONS (i.e. MILL SCALE, SLAG INTRUSION, LAMINATION, PITTING, RUST ETC.) THAT MAY IMPAIR STRENGTH, DURABILITY AND APPEARANCE. ALL MATERIALS SHALL BE OF TESTED QUALITY.

1.2 STRUCTURAL STEEL SHALL CONFORM TO GRADE E410 (BO) OF IS: 2062-2011 UNLESS OTHERWISE SPECIFIED. SECONDARY MEMBERS LIKE INTERMEDIATE CROSS BRACINGS SHALL BE OF E250 GRADE.

1.3 HIGH STRENGTH BOLTS SHALL BE M-24 & M-20 FOR PROPOSED CLASS 10.9

1.4 ALL STRUCTURAL STEEL FABRICATION WORK SHALL BE CARRIED OUT AS PER RELEVANT INDIAN STANDARDS AND MORT&H SPECIFICATIONS.

1.5 HEADED STUDS SHALL BE OF FOLLOWING SPECIFICATIONS AS PER IRC : 22
CHARACTERISTIC TENSILE STRENGTH = 499MPa
CHARACTERISTIC YIELD STRENGTH = 355MPa
MINIMUM ELONGATION = 18%

2. FABRICATION

2.1 EDGE PREPARATION

2.1.1 EDGE PREPARATION FOR WELDING SHALL BE DONE BY MACHINE CONTROLLED FLAME CUTTING WITH EDGES FREE FROM BURRS, CLEAN AND STRAIGHT IN ACCORDANCE WITH IS:9595.

2.1.2 MATERIAL SHALL BE CUT TO SIZE BY OXY ACETYLENE FLAME CUTTING OR SAWING. ALL FLAME CUT EDGES SHALL BE GROUND/MACHINED TO CLEAN, SQUARE & TRUE EDGES. DRAG LINES OBTAINED SHALL BE REMOVED.

2.2 BOLTING

2.2.1 HOLES FOR BOLTS SHALL BE DRILLED CONFORMING TO CLAUSE 10 OF IS:7215. PUNCHING OF HOLES SHALL NOT BE PERMITTED. ALL HOLES EXCEPT AS STATED HEREUNDER SHALL BE DRILLED TO 3mm LESS THAN REQUIRED SIZE AND REAMED THEREAFTER TO THE REQUIRED SIZE. ALL MATCHING HOLES FOR BOLTS SHALL BE REGISTERED WITH EACH OTHER SO THAT A GAUGE OF 0.8mm LESS THAN HOLE DIA CAN PASS FREELY THROUGH THE MEMBERS ASSEMBLED FOR BOLTING IN THE DIRECTION AT RIGHT ANGLE TO SUCH MEMBERS.

2.2.2 ALL PERMANENT BOLTS SHALL BE HSFG M24, EXCEPT THOSE USED IN INTERMEDIATE CROSS GIRDER, WHERE HSFG M20 HAS BEEN USED.

2.2.3 HOLES FOR BOLTS SHALL BE AS FOLLOWS UNLESS OTHERWISE STATED:
i) FOR PERMANENT (HSFG) BOLTS & ERECTION BOLTS : DIAMETER + 1.5mm.

2.2.4 ALL PERMANENT BOLTS SHALL BE HIGH STRENGTH FRICTION GRIP TYPE. SURFACE PREPARATION FOR CONNECTIONS USING HSFG BOLT MUST CONFORM TO IS: 4000:1992 TO ATTAIN A SLIP FACTOR OF 0.30.

2.3 WELDING

2.3.1 SAMPLES OF WELDED COMPONENTS AND TESTS ON THEM SHALL BE GOT APPROVED BY THE INSPECTING AGENCY OR ITS NOMINATED AGENCY PRIOR TO COMMENCING FULL SCALE FABRICATION OF THE RELATED COMPONENTS.

2.3.2 BUTT WELDING OF THE COMPONENTS SHALL BE AVOIDED AS FAR AS POSSIBLE UNLESS SHOWN IN THE DRAWINGS. IF CARRIED OUT, SHALL BE OF MINIMUM NUMBER WITH THE APPROVAL OF THE ENGINEER-IN-CHARGE.

2.3.3 WELDING OF STRUCTURES SHALL BE DONE BY MEANS OF METAL ARC WELDING.

2.3.4 ALL ACCESSIBLE EDGES IN CONTACT AT A JOINT SHALL BE WELDED UNLESS OTHERWISE SPECIFIED.

2.3.5 WELDING PROCEDURE SHALL CONFORM TO IS: 814, IS:818 AND IS:9595.

2.3.6 CRITERIA FOR WELD TEST AND ACCEPTANCE SHALL BE STRICTLY FOLLOWED AS PER MORT&H SPECIFICATIONS.

2.3.7 THE CONTINUOUS WELDING FOR FABRICATING I-SECTIONS SHALL BE SUBMERGED ARC WELDING OR GAS METAL ARC WELDING (MIG) AND NECESSARY TESTS SHALL BE DONE AND REPORTS PREPARED & SCRUTINIZED BY COMPETENT AUTHORITY.

2.3.8 THE ELECTRODES USED FOR WELDING SHALL CONFORM TO IS:814.

2.4 FABRICATION AND ERECTION

2.4.1 FABRICATION, ERECTION, INSPECTION OF STEEL STRUCTURE SHALL BE DONE AS PER RELEVANT INDIAN SPECIFICATION, UNLESS OTHERWISE SPECIFIED IN MORT&H SPECIFICATIONS WHICH SHALL OVERRIDE CORRESPONDING PROVISIONS IN INDIAN SPECIFICATION.

2.4.2 ALL HOLES NECESSARY FOR ERECTION BOLTS SHALL BE PLUGGED FULLY AFTER SUCCESSFUL COMPLETION OF ERECTION WORK.

2.5 ASSEMBLY AT WORKSHOP

2.5.1 THE STEEL WORK SHALL BE TEMPORARILY SHOP ASSEMBLED AS INSTRUCTED BY THE ENGINEER-IN-CHARGE SO THAT THE ACCURACY OF THE FITTINGS ARE CHECKED BEFORE DESPATCH FROM FABRICATION SHOP. SHOP ASSEMBLY SHALL BE EFFECTED WITH SUFFICIENT NUMBER OF PARALLEL DRIFTS TO BRING AND KEEP THE PARTS IN PLACE.

2.5.2 MATCH DRILLING SHALL BE DONE, WHEREVER POSSIBLE. ALL MEMBERS, GUSSET PLATES ETC. SHALL BE CUT AFTER FULL SCALE SHOP LAYOUT.

3. TOLERANCE

3.1 FABRICATION OF STEEL WORKS SHALL BE DONE WITHIN THE SPECIFIED TOLERANCE LIMIT OF IS:7215 AND AS PER CLAUSE 1904.11 OF MORT&H SPECIFICATIONS.

4. INSPECTION & TESTING

4.1 FOR DETAILED INSPECTION AND TESTING OF STEEL WORKS, REFER IRC:24 AND MORT&H SPECIFICATIONS. ALL STEEL STRUCTURE SHALL BE INSPECTED IN THE FABRICATION SHOP, PRIOR TO DISPATCH FROM FABRICATION SHOP. NECESSARY TEST CERTIFICATES SHALL BE SUPPLIED DURING INSPECTION OR AS DIRECTED BY ENGINEER-IN-CHARGE.

5. PAINTING

5.1 ALL STRUCTURAL STEEL WORK SHALL BE CLEANED AND PAINTED AS PER PAINTING SPECIFICATION, CONFORMING TO IRC:24-2010 ANNEXURE-D WITH COATING SYSTEM '4' AND CLAUSE 1906 OF MORT&H SPECIFICATIONS.

5.2 PAINT DELIVERED TO THE FABRICATION SHOP/SITE SHALL BE READY MIXED IN ORIGINAL SEALED CONTAINER AS PACKED BY THE APPROVED PAINT MANUFACTURE. NO THINNER SHALL BE ADDED. PAINT SHALL BE STIRRED FREQUENTLY TO KEEP THE PIGMENT IN SUSPENSION.

5.3 SURFACES TO BE EMBEDDED IN CONCRETE SHALL HAVE NO PAINT APPLIED.

5.4 HOT-DIP GALVANIZED COATINGS FOR SECTIONS NOT LESS THAN 5mm THICKNESS SHALL HAVE A MINIMUM MEAN ZINC COATING WEIGHT OF 610mg/m² EQUIVALENT TO A COATING THICKNESS OF 85 MICRONS.

6. TRANSPORT TO SITE & STORAGE

6.1 STORAGE AT SITE SHOULD BE DONE ON A RAISED PLATFORM TO AVOID RUSTING/DAMAGE.

6.2 TRANSPORTATION OF ALL FABRICATED STRUCTURAL STEEL MATERIALS FROM SITE STORAGE YARD, HANDLING, ASSEMBLING, BOLTING, WELDING AND INSTALLATION AT APPROPRIATE LOCATION SHALL BE DONE ACCORDING TO APPROVED ERECTION DRAWING.

7. ERECTION

7.1 EACH FABRICATED MEMBER, WHETHER ASSEMBLED PRIOR TO DISPATCH FROM FABRICATION SHOP OR NOT, SHALL BEAR AN ERECTION MARK, WHICH WILL HELP TO IDENTIFY THE MEMBER AND ITS POSITION WITH RESPECT OF THE WHOLE STRUCTURE TO FACILITATE RE-ERECTION AT SITE.

7.2 NO REAMING SHALL BE CARRIED OUT WITHOUT PRIOR PERMISSION OF THE ENGINEER-IN-CHARGE.

7.3 THE CONTRACTOR SHALL SUBMIT THE QUALITY ASSURANCE PLAN, WELDING SEQUENCE AND WELDING PROCEDURE FOR FABRICATION AND ERECTION.

8. SYMBOLS AND ABBREVIATIONS

8.1 WELDING SYMBOL ARE AS PER IS: 813.

8.2 PERMANENT BOLT SHOWN THUS ------ ⊕

APPROVED

9. TESTING NOTES FOR STUD SHEAR CONNECTOR

(A) APPEARANCE TEST

1. THE WELD TO A STUD SHEAR CONNECTOR SHOULD FORM A COMPLETE COLLAR AROUND THE SHANK AND FREE FROM CRACKS, EXCESSIVE SPLASHES OF WELD MATERIAL, FREE FROM INJURIOUS LAPS, FINE, SEAMS, TWIST, BENDS OR OTHER INJURIOUS DEFECTS.
2. WELD MATERIAL SHOULD HAVE A 'STEEL BLUE' APPEARANCE.

(B) TEST TO CHECK THE FIXING OF SHEAR STUDS

ALL STUDS NEED TO BE CHECKED BY A RING TEST.

1. RING TEST:- INVOLVES STRIKING THE SIDE OF THE HEAD OF THE STUD WITH A 2 KG HAMMER. A RINGING TONE ACHIEVED AFTER STRIKING INDICATED GOOD FUSION WHEREAS DULL TONE INDICATES A LACK OF FUSION (BS 5400-6).
2. BEND TEST:- TEST REQUIRED THE HEAD OFF A STUD TO BE DISPLACED LATEALLY BY APPROXIMATE 25% OF ITS HEIGHT USING 6 KG HAMMER
   - THE WELD SHOULD THEN BE CHECKED FOR SIGNS OF CRACKING OR LACK FUSION.
   - STUD SHOULD NOT BE BENT BACK AS THIS IS LIKELY TO DAMAGE THE WELD
   - THE TESTING RATE SHOULD BE 1 IN 50 (BS 5400-6).

(C) GENERAL NOTES

1. THE STUD SHEAR CONNECTOR DESIGN IS BASED ON IRC: 22-2015.
2. THE WELDING OF STUD SHEAR CONNECTORS SHALL BE DONE BY "DRAWN ARC STUD WELDING WITH CERAMIC FERRULE" TECHNIQUE.
3. THE STUD SHEAR CONNECTOR AND CERAMIC FERRULES SHALL CONFORM TO TYPE SD1/UF AS PER BS EN ISO: 13918-2008.
4. MECHANICAL PROPERTIES OF STUD SHEAR CONNECTORS SHALL BE AS PER ISO 6892/BS EN ISO: 13918-2008.
5. SHAPE OF TIP OF STUD SHEAR CONNECTORS MAY BE CHOSEN BY MANUFACTURER. THE STUD TIP SHALL BE SUPPLIED WITH FLUX IN THE FROM OF PRESS FITTED ALUMINUM BALL OR ALUMINUM SPRAY COATING.
6. THE DIAMETER OF CERAMIC FERRULE D7 AD PER FIGURE 13/TABLE 18 OF BS EN ISO: 13918. SHALL BE $26mm^{+0.5mm}_{-0.5mm}$.

10. NOTES FOR INTERMEDIATE CROSS GIRDER

10.1 ALL HOLES ARE 21.5 DIA. FOR 20 DIA. HSFG BOLTS.

10.2 CO2 WELDING SHALL BE PREFERRED OVER MANUAL METAL ARC WELDING FOR DIAPHRAGM FABRICATION.

10.3 ALL WELDS SHALL BE MADE BY USING APPROVED WELDING PROCEDURE ONLY. WELDER QUALIFIED FOR A PARTICULAR WELD POSITION, WELDING TECHNIQUE AND SIZE ONLY SHALL MAKE THE WELD.

10.4 MINIMUM CLEARANCE AT JACKING POINT FROM TOP OF PIER SHALL BE 400mm.

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES

GPT Infraprojects Limited Imphal Branch 795001 Imphal

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

Rev.	Date	Description
R1	AUG-21	REVISED AS PER AS COMMENTS
R0	JUNE-21	FOR APPROVAL

CLIENT: WAIDCL

EPC CONTRACTOR: GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH M/SPARK FUTURISTICS AND ASSOCIATES C-6,2ND FLOOR, RJI TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. 6-52, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 519 & 511, JMD Megapolis, Sector-48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

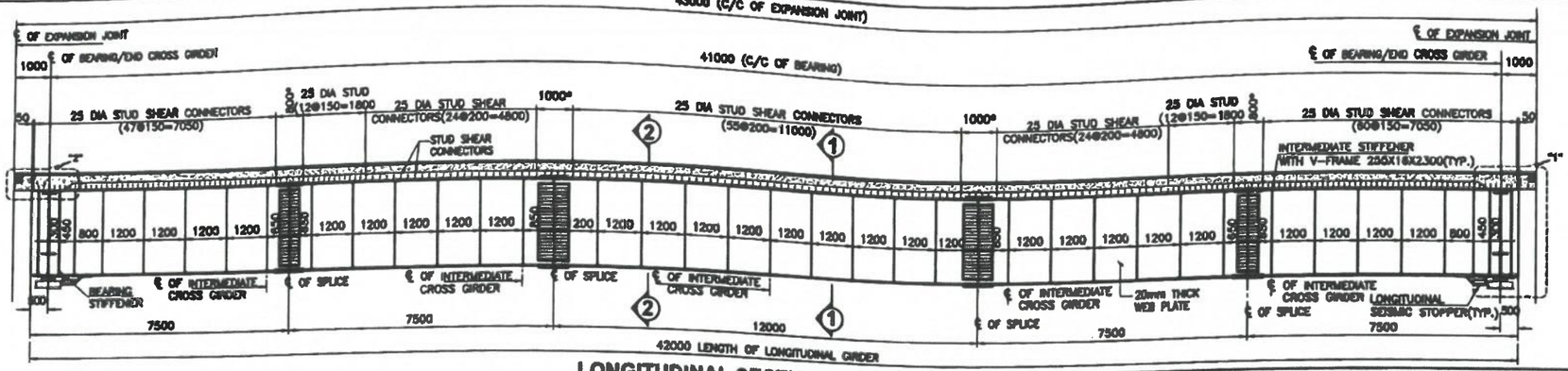
DRAWN	NB
DESIGNED	S.S
CHECKED	AS.K
DATE: JUNE - 2021	

TITLE: GENERAL NOTES FOR SUPERSTRUCTURE

SCALE: AS SHOWN (01 OF 01)

DRG.NO: GPT/CCT/4B/STR/NJB/SUPP/201

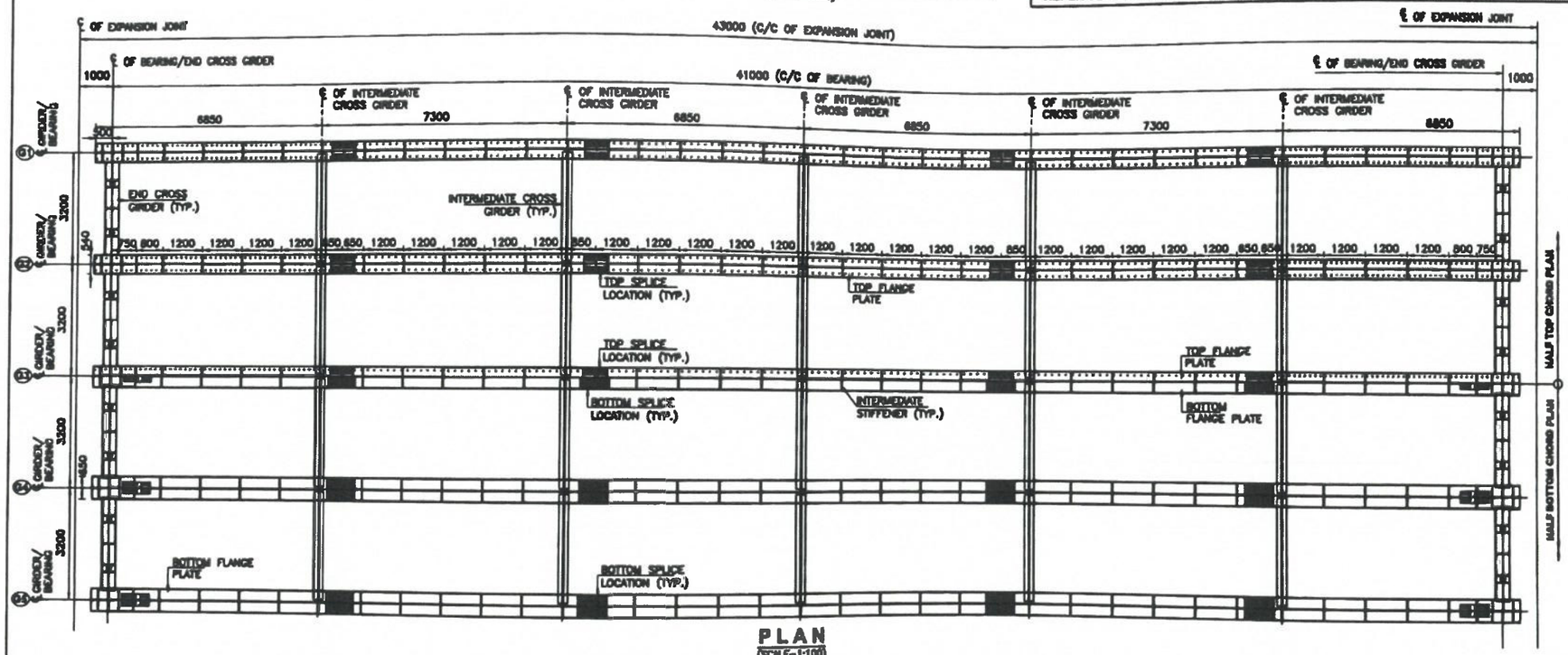
REV: R1



LONGITUDINAL SECTIONAL ELEVATION

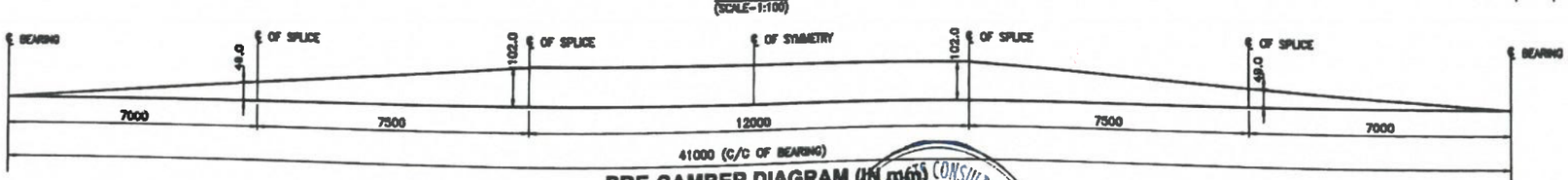
(SCALE-1:100)

* SPACING OF STUD SHEAR CONNECTORS ABOVE TOP FLANGE SPLICE PLATE PLEASE REFER SEPARATE DRAWING, DETAILS OF SPLICE JOINT AND STUD SHEAR CONNECTOR



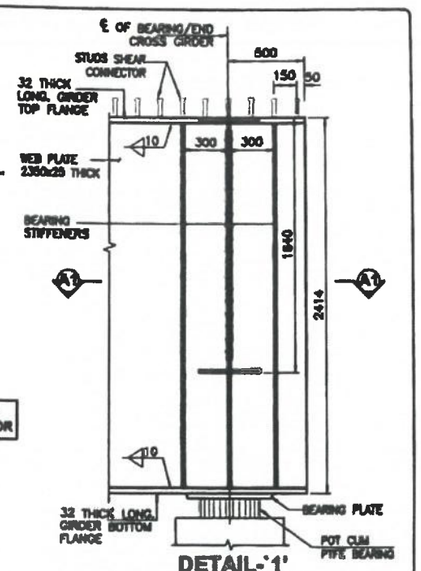
PLAN

(SCALE-1:100)



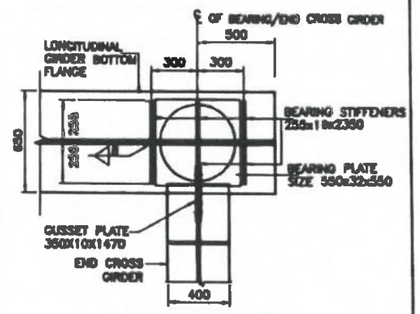
PRE-CAMBER DIAGRAM (IN mm)

(N.T.S.)



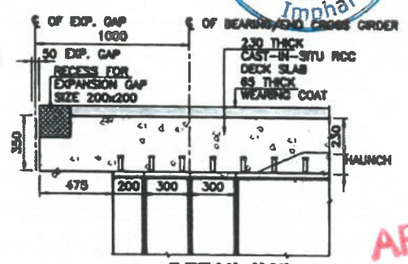
DETAIL-'1'

(STUD ON END CROSS GIRDER NOT SHOWN FOR CLARITY)
(SCALE-1:25)



SECTION A1-A1

(SCALE-1:25)



DETAIL-"2"

(STUD ON END CROSS GIRDER NOT SHOWN FOR CLARITY)
(SCALE 1:25)

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102 (CPPL) In association with MSPARK FUTURISTICS & ASSOCIATES

GPT Infraprojects Limited Imphal Branch 795001 Imphal

APPROVED

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.
3. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. GPT/CCT/4A/STR/MJB/SUP/301

Rev.	Date	Description
R1	AUG-21	REVISED AS PER AE COMMENTS
R0	JUNE-21	FOR APPROVAL

CLIENT: NAIDCL

EPC CONTRACTOR: GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-4,2ND FLOOR, R.K TOWER, SECTOR-4,VASUNDHARA, GHAZIABAD-201012

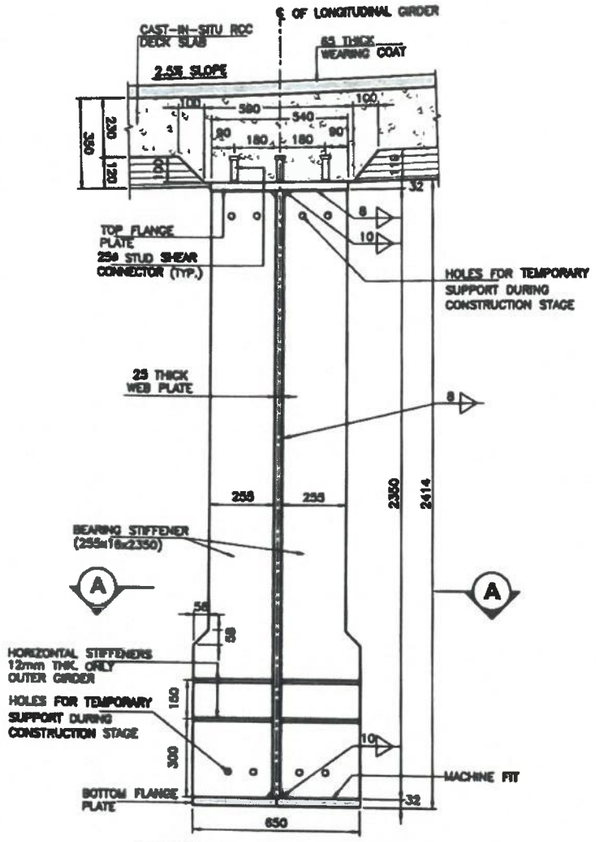
SAFETY CONSULTANT: SUVADRA CONSULTANTS PP-97, Tankapani Road, BBSR-18, Odisha

PMC & CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-62, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

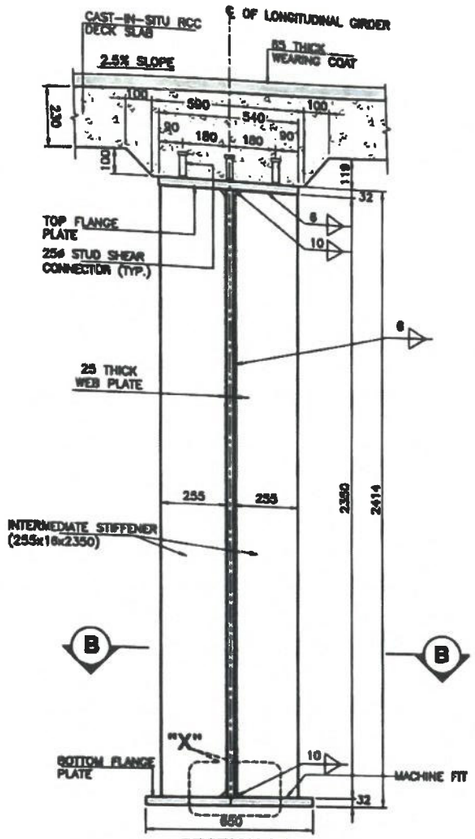
DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 139.000 to Km 141.020 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

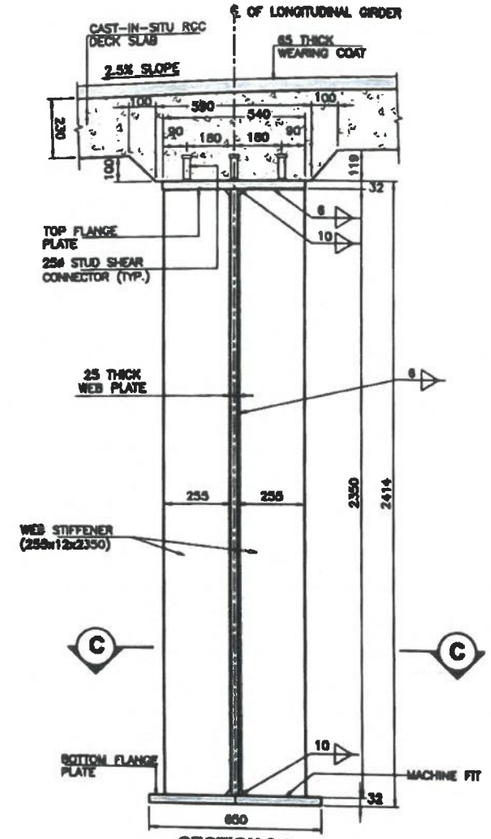
DRAWN	HP	TITLE: DETAILS OF LONGITUDINAL GIRDER SPAN 17X43 BJ TO BJ	
DESIGNED	S.R		
CHECKED	AB.K	SCALE: AS SHOWN (01 OF 02)	REV: R1
DATE: JUNE - 2021		DRG.NO: GPT/CCT/4B/STR/MJB/SUP/302	



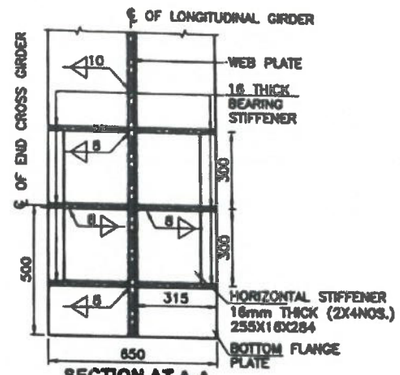
TYPICAL SECTION OF GIRDER AT BEARING STIFFENER LOCATION
(SCALE 1:15)



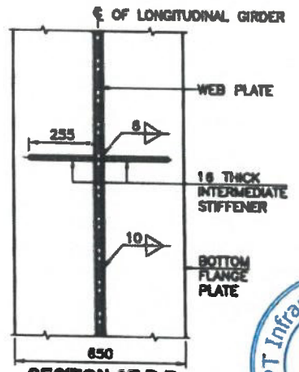
SECTION 1-1
(TYPICAL SECTION OF GIRDER AT INTERMEDIATE STIFFENER LOCATION)
(SCALE 1:15)



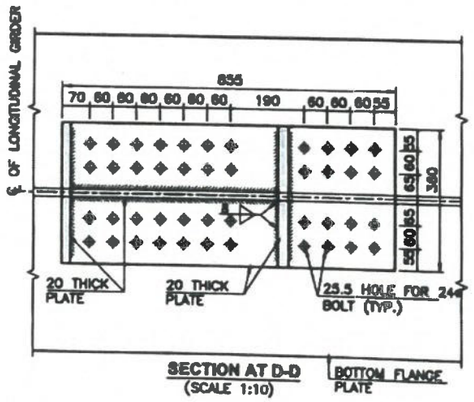
SECTION 2-2
(TYPICAL SECTION OF GIRDER AT OTHER LOCATION)
(SCALE 1:15)



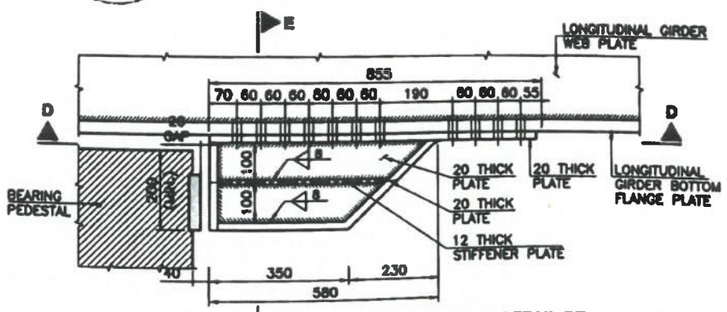
SECTION AT A-A
(SCALE 1:15)



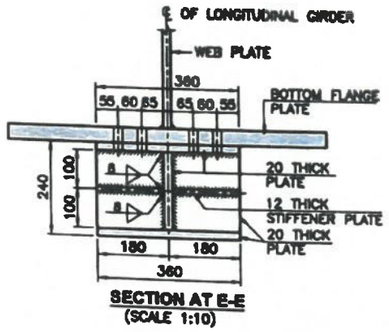
SECTION AT B-B
(SCALE 1:15)



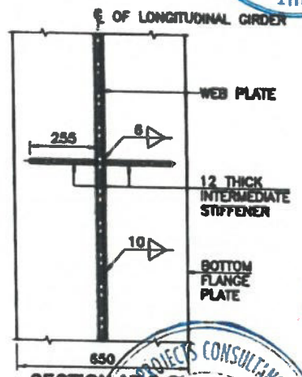
SECTION AT D-D
(SCALE 1:10)



DETAIL-"X" SHOWING DETAIL OF LONGITUDINAL SEISMIC STOPPER
(SCALE 1:10)



SECTION AT E-E
(SCALE 1:10)



SECTION AT C-C
(SCALE 1:15)

DETAILS 'X'
(SCALE 1:10)

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

GPT Infraprojects Limited Imphal Branch 795001 Imphal

APPROVED

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES NH-102-B

Rev.	Date	Description
R1	AUG-21	REVISED AS PER AE COMMENTS
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-6,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS PP-07, Tankapani Road, BBSR-14, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. 6 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 138.000 to Km 141.029 (Package-48) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

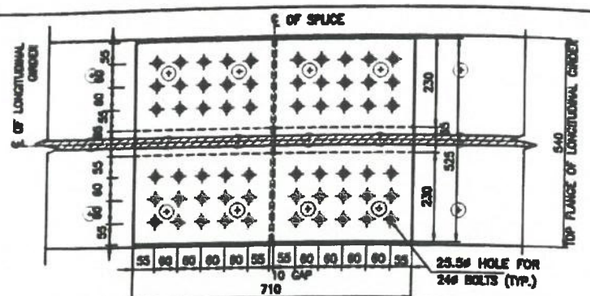
DRAWN	MP
DESIGNED	S.S
CHECKED	A.S.K
DATE: JUNE - 2021	

TITLE: DETAILS OF LONGITUDINAL GIRDER FOR SPAN 12X43 EJ TO BJ

SCALE: AS SHOWN (02 OF 02)

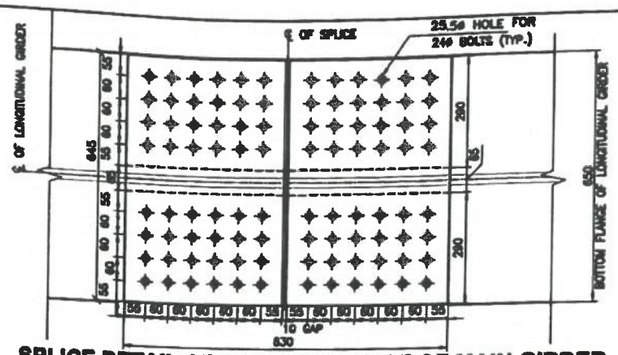
DRG. NO: GPT/CCT/NB/STR/MJR/SUP/202

REV: R1



SPLICE DETAIL OF TOP FLANGE OF MAIN GIRDER

(SCALE-1:10)

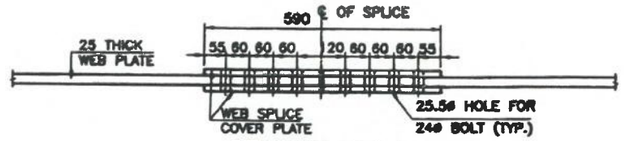


SPLICE DETAIL OF BOTTOM FLANGE OF MAIN GIRDER

(SCALE-1:10)

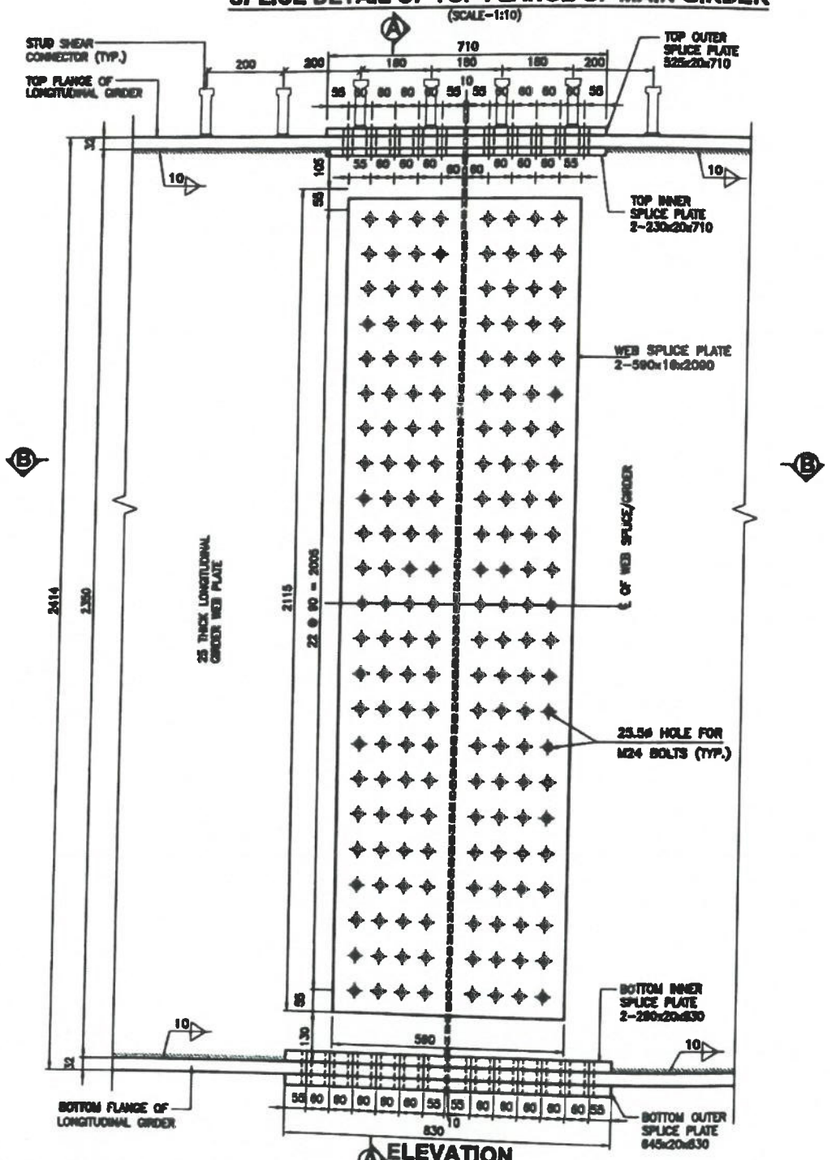
NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE MENTIONED.
2. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
3. BOLTS USED IS M-24 (GRADE 10.9HSGF).
4. ALL STRUCTURAL STEEL SHALL CONFORM TO HIGH STRENGTH STEEL E-410(Fe-540) AS PER IS: 2062-2011.
5. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. GPT/CCT/4A/STR/MJB/SUP/301



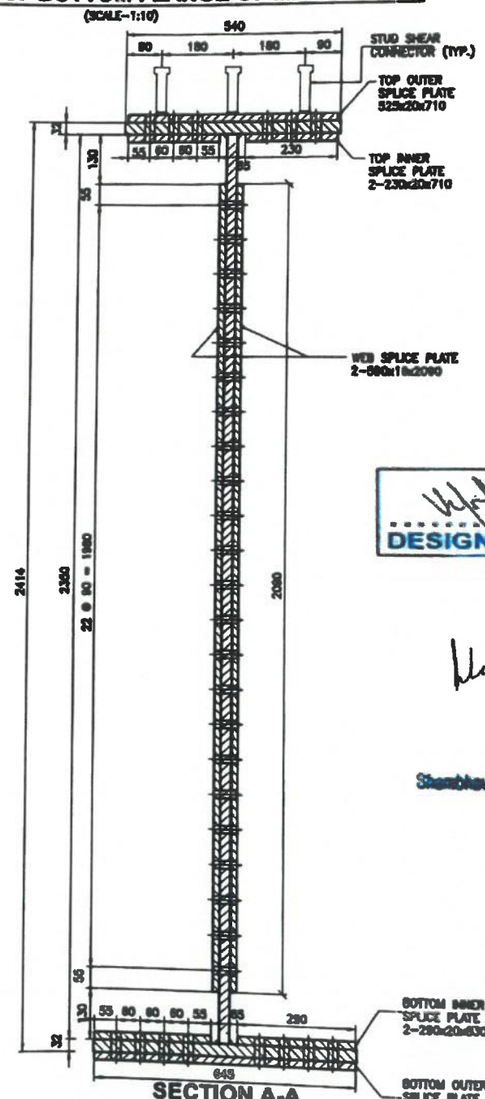
SECTION AT B-B

(SCALE 1:10)



ELEVATION

(SCALE-1:10)



SECTION A-A

(SCALE-1:10)

APPROVED

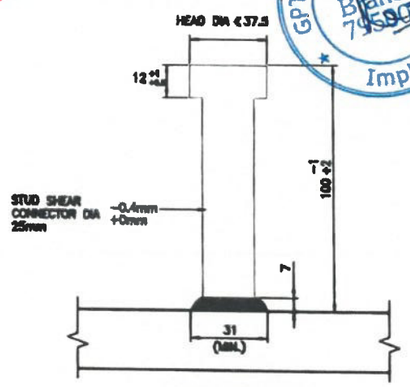
DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS BHUBANESWAR Regd. No- 11/2004-05

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MISPARK FUTURISTICS & ASSOCIATES

GPT Infraprojects Limited Imphal Branch Imphal



DETAIL OF STUD SHEAR CONNECTOR

(SCALE 1:2)

1. THE WELDING OF STUD SHEAR CONNECTORS SHALL BE DONE BY "DRAWN ARC STUD WELDING WITH CERAMIC FERRULE" TECHNIQUE.
2. THE STUD SHEAR CONNECTOR AND CERAMIC FERRULES SHALL CONFORM TO TYPE SD3/LF AS PER BS EN ISO 13918-2008.
3. MECHANICAL PROPERTIES OF STUD SHEAR CONNECTORS SHALL BE AS PER ISO 6982/BS EN ISO 13918-2008.
4. SHAPE OF TIP OF STUD SHEAR CONNECTORS MAY BE CHOSEN BY MANUFACTURER. THE STUD TIP SHALL BE SUPPLIED WITH FLUX IN THE FORM OF PRESS-FITTED ALUMINUM BALL OR ALUMINUM SPRAY COATING.
5. THE DIAMETER OF CERAMIC FERRULE 07 AS PER FIGURE 13/TABLE 18 OF BS EN ISO 13918 SHALL BE 28 +0.5 -0.

Rev.	Date	Description
R1	AUG-21	REVISED AS PER AS COMMENTS
R0	JUNE-21	FOR APPROVAL

CLIENT: NAIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MISPARK FUTURISTICS AND ASSOCIATES — C-6,IND FLOOR, ILH TOWER, SECTOR-4, VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tamapani Road, BBSR-16, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — S 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 139.000 to Km 141.229 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	HP
DESIGNED	S.S
CHECKED	AS.K
DATE: JUNE - 2021	

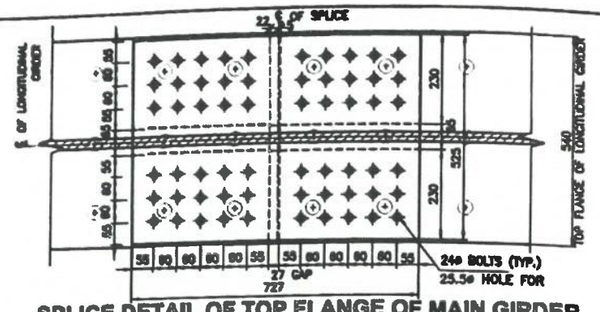
TITLE: DETAILS OF SPLICE JOINT AND STUD SHEAR CONNECTOR AT OUTER GIRDER FOR SPAN EXC 24 TO 25

SCALE: AS SHOWN — 1 OF 2

ORG. NO: GPT/CCT/4B/STR/MJB/SUP/303

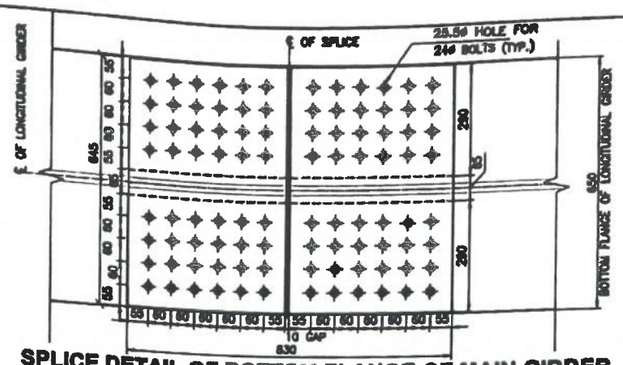
REV: R1

Z:\01_SPS PROJECTS_MANIPUR\PACKAGE-4B\01_Drawings\01_Major Bridge\Cha SPAN 8 PER STRUCTURE\MJ.dwg 13-Aug-21



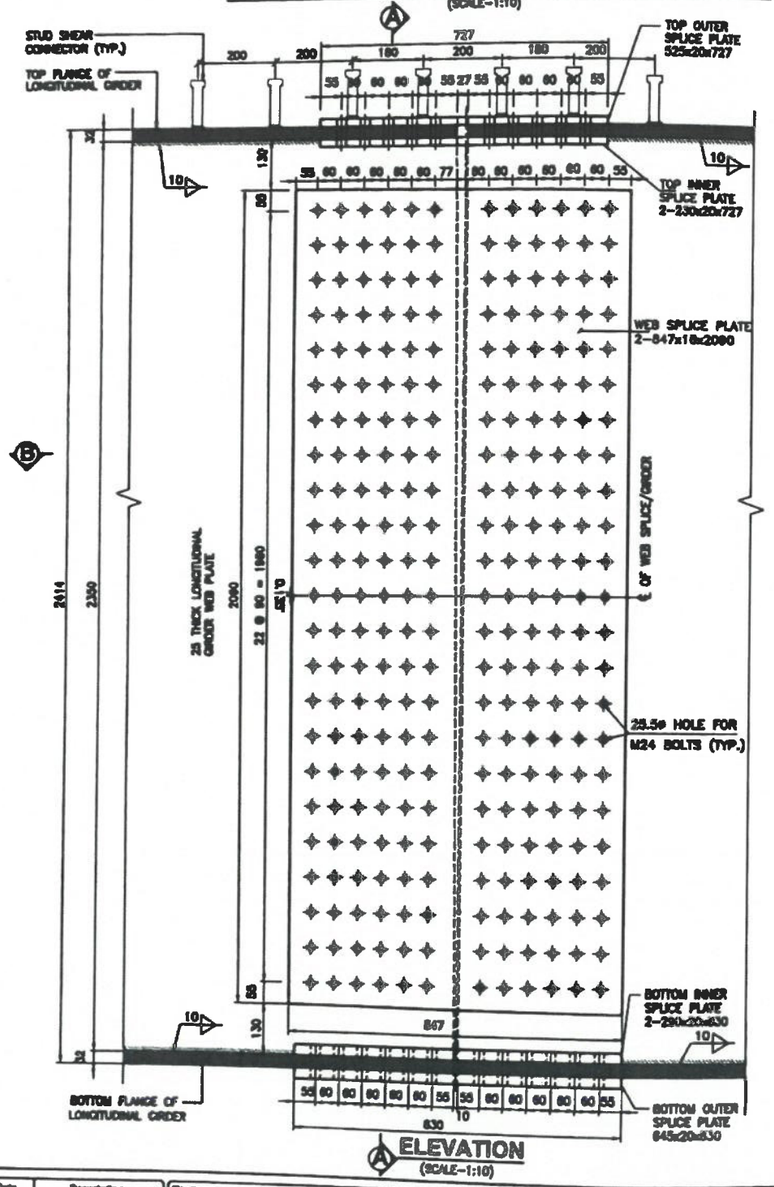
SPLICE DETAIL OF TOP FLANGE OF MAIN GIRDER

(SCALE-1:10)



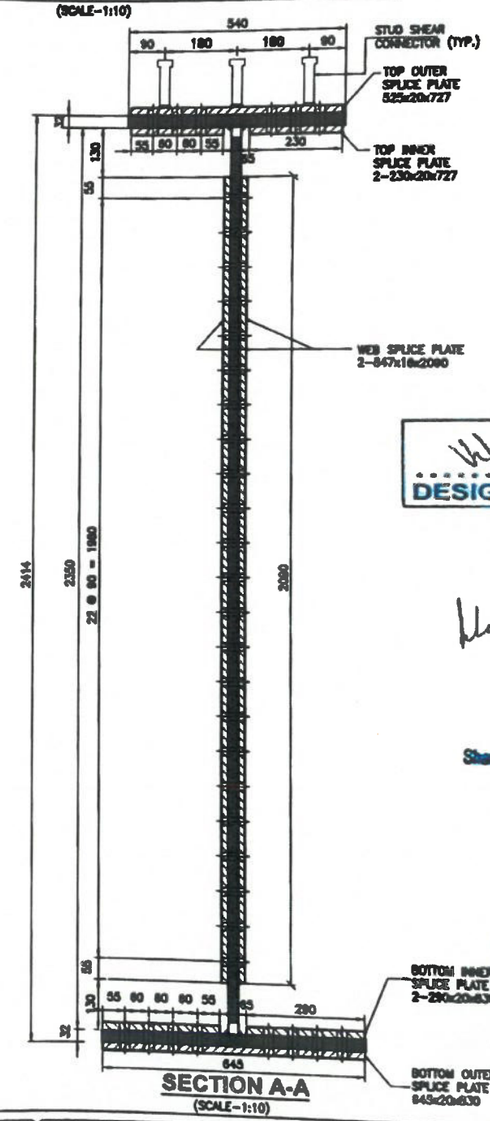
SPLICE DETAIL OF BOTTOM FLANGE OF MAIN GIRDER

(SCALE-1:10)



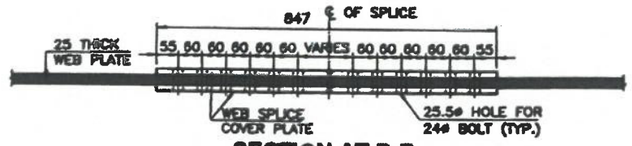
ELEVATION

(SCALE-1:10)



SECTION A-A

(SCALE-1:10)



SECTION AT B-B

(SCALE 1:10)

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE MENTIONED.
2. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
3. BOLTS USED IS M-24 (GRADE 10.9HSGF).
4. ALL STRUCTURAL STEEL SHALL CONFORM TO HIGH STRENGTH STEEL E-410(Fe-540) AS PER IS: 2062-2011.
5. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. GPT/CCT/4A/STR/MJB/SUP/301

DESIGN DIRECTOR

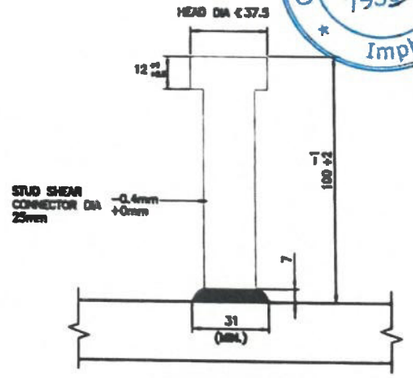
SUVADRA CONSULTANTS BHUBANESWAR Regd. No- 11/2004-05

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NS-102-E CEPU In association with MSPARK FUTURISTICS & ASSOCIATES

APPROVED

GPT Infraprojects Limited Imphal Branch 799001 Imphal



DETAIL OF STUD SHEAR CONNECTOR

(SCALE 1:2)

1. THE WELDING OF STUD SHEAR CONNECTORS SHALL BE DONE BY "DRAWN ARC STUD WELDING WITH CERAMIC FERRULE" TECHNIQUE.
2. THE STUD SHEAR CONNECTOR AND CERAMIC FERRULES SHALL CONFORM TO TYPE SD3/UF AS PER BS EN ISO 13918-2008.
3. MECHANICAL PROPERTIES OF STUD SHEAR CONNECTORS SHALL BE AS PER ISO 6982/BS EN ISO 13918-2008.
4. SHAPE OF TIP OF STUD SHEAR CONNECTORS MAY BE CHOSEN BY MANUFACTURER. THE STUD TIP SHALL BE SUPPLIED WITH FLUX IN THE FORM OF PRESS-FITTED ALUMINUM BALL OR ALUMINUM SPRAY COATING.
5. THE DIAMETER OF CERAMIC FERRULE 07 AS PER FIGURE 13/TABLE 18 OF BS EN ISO 13918 SHALL BE 28 +0.5 -0.

Rev.	Date	Description
R1	AUG-21	REVISED AS PER AE COMMENTS
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, G-8,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS, PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., E-23, Rajesh Kumar Path, B.N.Port, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd., # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 136.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	MP
DESIGNED	S.B
CHECKED	A.B.K
DATE: JUNE - 2021	

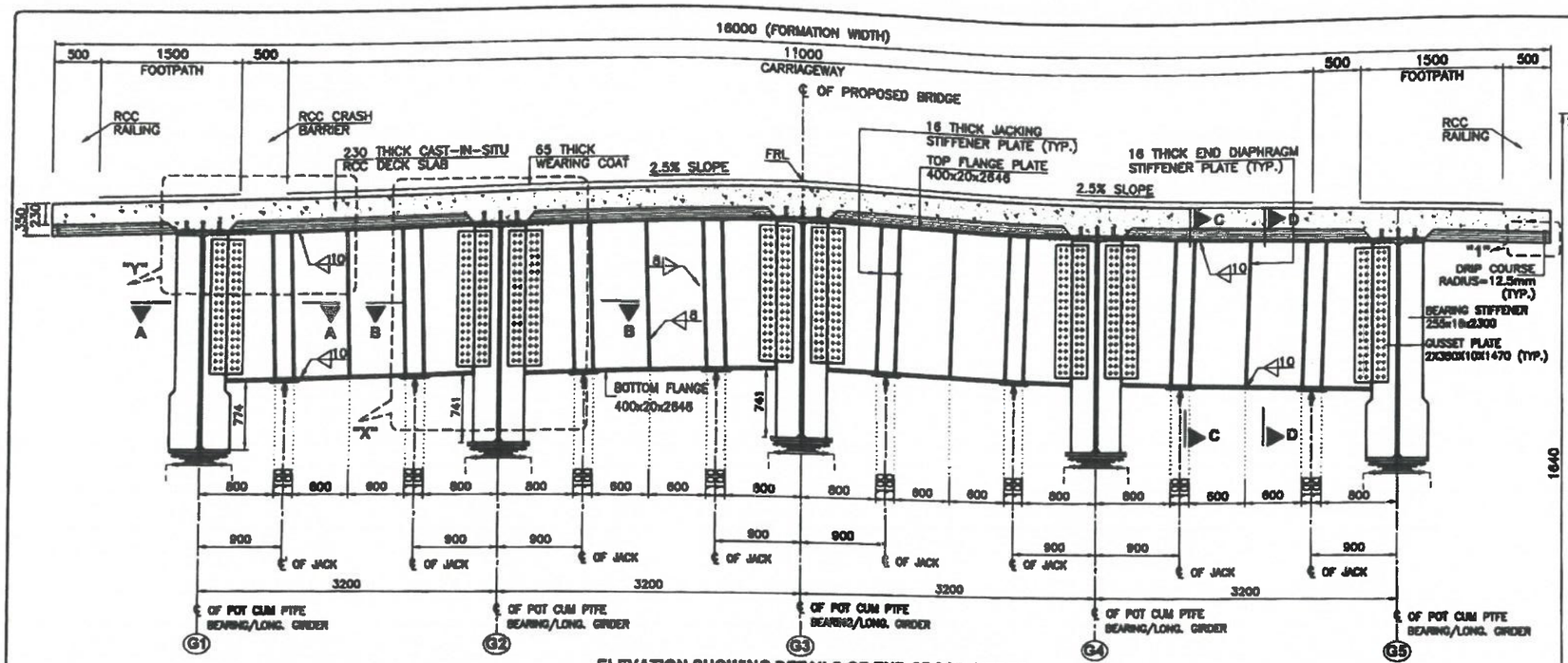
TITLE: DETAILS OF SPLICE JOINT AND STUD SHEAR CONNECTOR AT SIMPLE SPANS FOR SPAN 12X43 SJ TO SJ

SCALE: AS SHOWN 2 OF 2

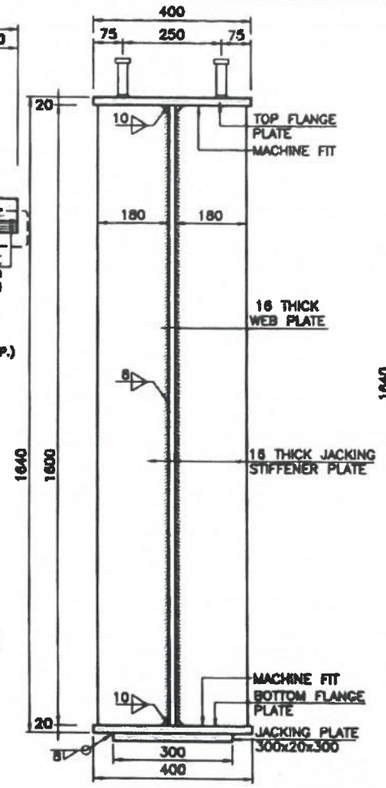
ORG.NO: GPT/CCT/4B/STR/MJB/SUP/303

REV: R1

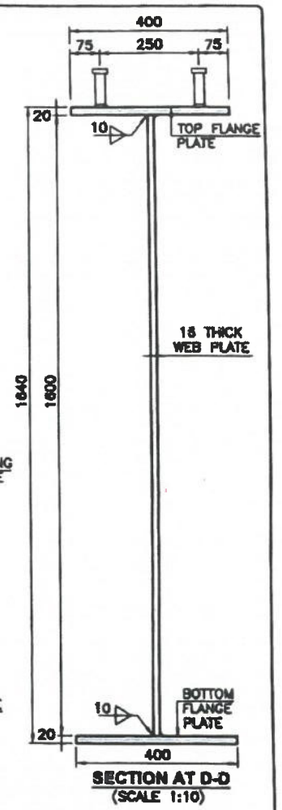
Z:\01_SPS PROJECT\0_MANIPUR PACKAGE-4B\01_Drawings\01_Major Bridge\Cas SPAN 12 PER STM CTUB2003 - 1.dwg 13-Aug-21



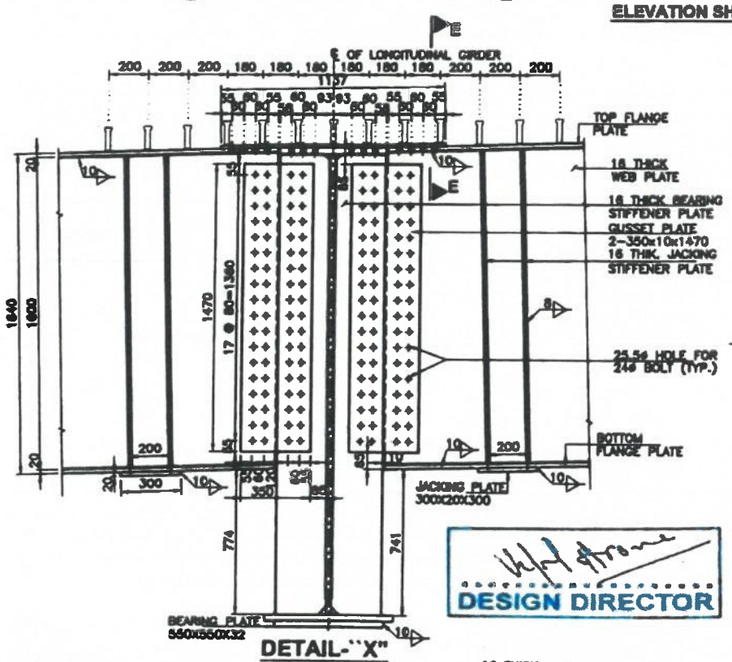
ELEVATION SHOWING DETAILS OF END CROSS GIRDER
(SCALE 1:40)



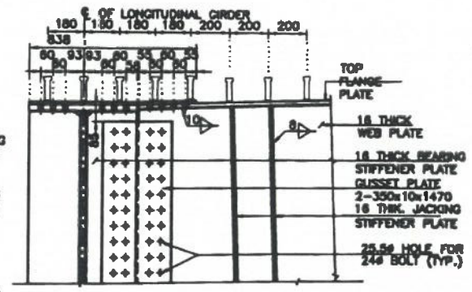
SECTION AT C-C
(SCALE 1:10)



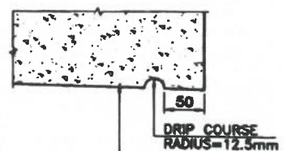
SECTION AT D-D
(SCALE 1:10)



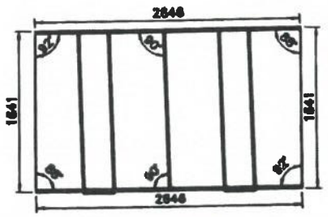
DETAIL-"X"
(SCALE 1:20)



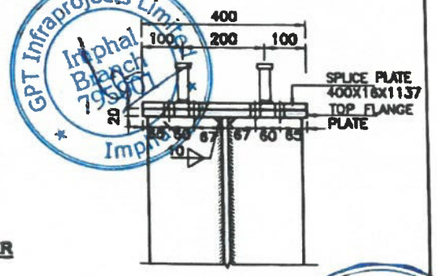
DETAIL-"Y"
(SCALE 1:20)



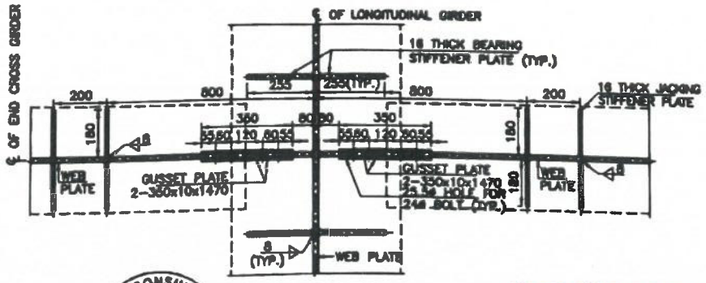
DETAIL -1
DRIP COURSE
(SCALE 1:5)



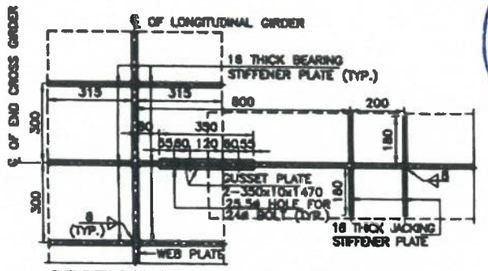
TYPICAL DETAILS OF END CROSS GIRDER
(SCALE 1:40)



SECTION AT E-E
(SCALE 1:10)



SECTION AT B-B
(SCALE 1:15)



SECTION AT A-A
(SCALE 1:15)

TYP. OPENING DETAILS
(SCALE 1:10)

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

GPT Infraprojects Limited Imphal Branch 795001 Imphal

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES

NH-102-B

APPROVED

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.
3. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. GPT/CCT/4A/STR/MJB/SUP/301

Rev.	Date	Description
R1	AUG-21	REVISED AS PER AS COMMENTS
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES
C-4,2ND FLOOR, RK TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA
PP-97, Tantapani Road, BBSR-16, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

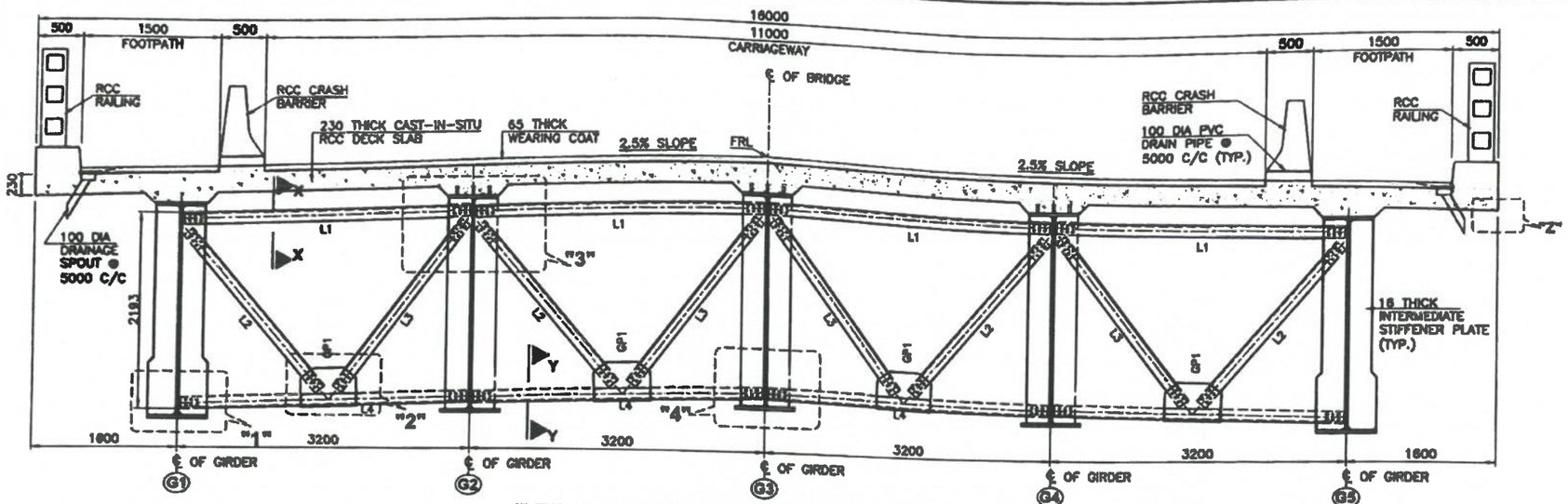
DRAWN	MP
DESIGNED	S.S
CHECKED	A.P.K
DATE: JUNE - 2021	

TITLE: DETAILS OF END CROSS GIRDER FOR SPAN 1X43 EJ TO EJ

SCALE: AS SHOWN (01 OF 01)

DRG.NO: GPT/CCT/4A/STR/MJB/SUP/304

Rev: R1



ELEVATION SHOWING DETAILS OF INTERMEDIATE CROSS GIRDER
(SCALE 1:40)

SECTION AT X-X
(SCALE 1:5)

SECTION AT Y-Y
(SCALE 1:5)

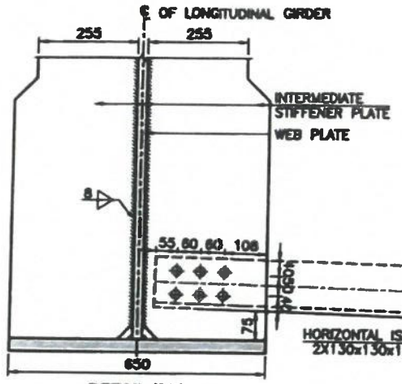
DESIGN DIRECTOR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MISPARK FUTURISTICS & ASSOCIATES
APPROVED

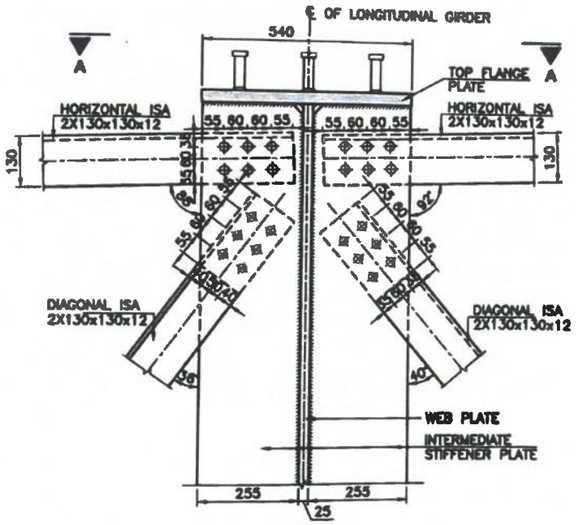
GPT Infraprojects Limited Imphal Branch 795001 Imphal

SUVADRA CONSULTANTS BHUBANESWAR Regd. No- 117/2004-05

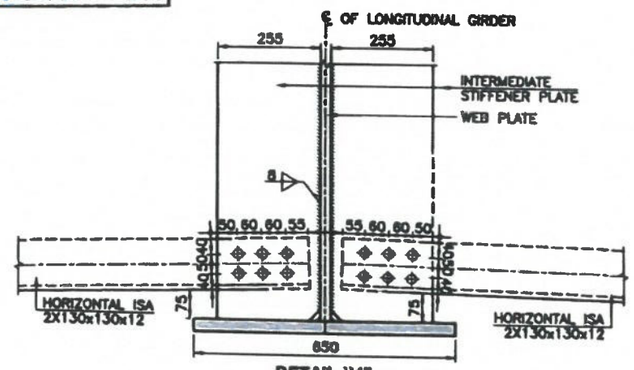
Shambhavi Techno Solutions Pvt. Ltd
Managing Director



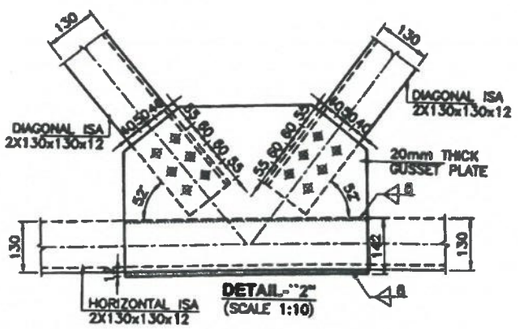
DETAIL-"1"
(SCALE 1:10)



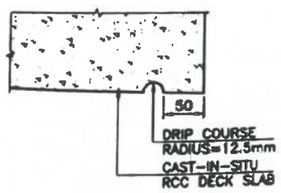
DETAIL-"3"
(SCALE 1:10)



DETAIL-"4"
(SCALE 1:10)

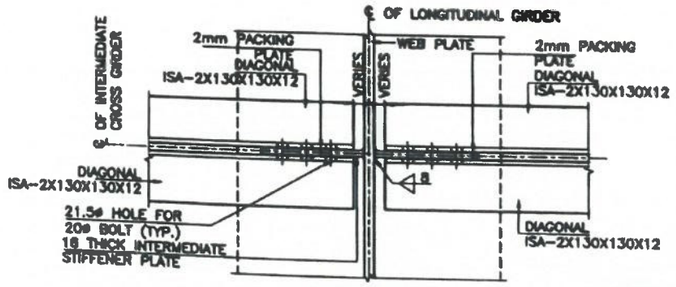


DETAIL-"2"
(SCALE 1:10)

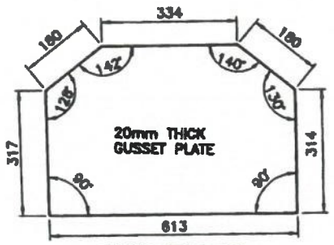


DETAIL 'Z' OF DRIP COURSE
(SCALE 1:5)

ANGLE MARKING	LENGTH (IN MM)
L1	3124
L2	2296
L3	2308
L4	3124



SECTION AT A-A
(SCALE 1:10)



GUSSET PLATE-GP1
(SCALE 1:10)

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.
3. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. GPT/CCT/4A/STR/MJB/SUP/301

Rev.	Date	Description
R1	AUG-21	REVISED AS PER AS COMMENTS
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH M/SPARK FUTURISTICS AND ASSOCIATES C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS PP-97, Tankaperi Road, BBSR-15, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-52, Rajesh Kumar Path, S.L.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. 610 & 611, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 138.000 to Km 141.029 (Package-48) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

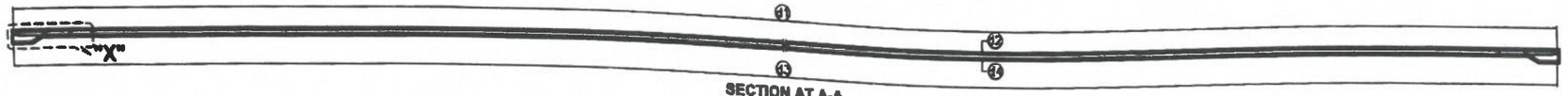
DRAWN	MP
DESIGNED	S.S
CHECKED	A.B.K
DATE: JUNE - 2021	

TITLE: DETAILS OF INTERMEDIATE CROSS GIRDER FOR SPAN 1X43 EJ TO EJ

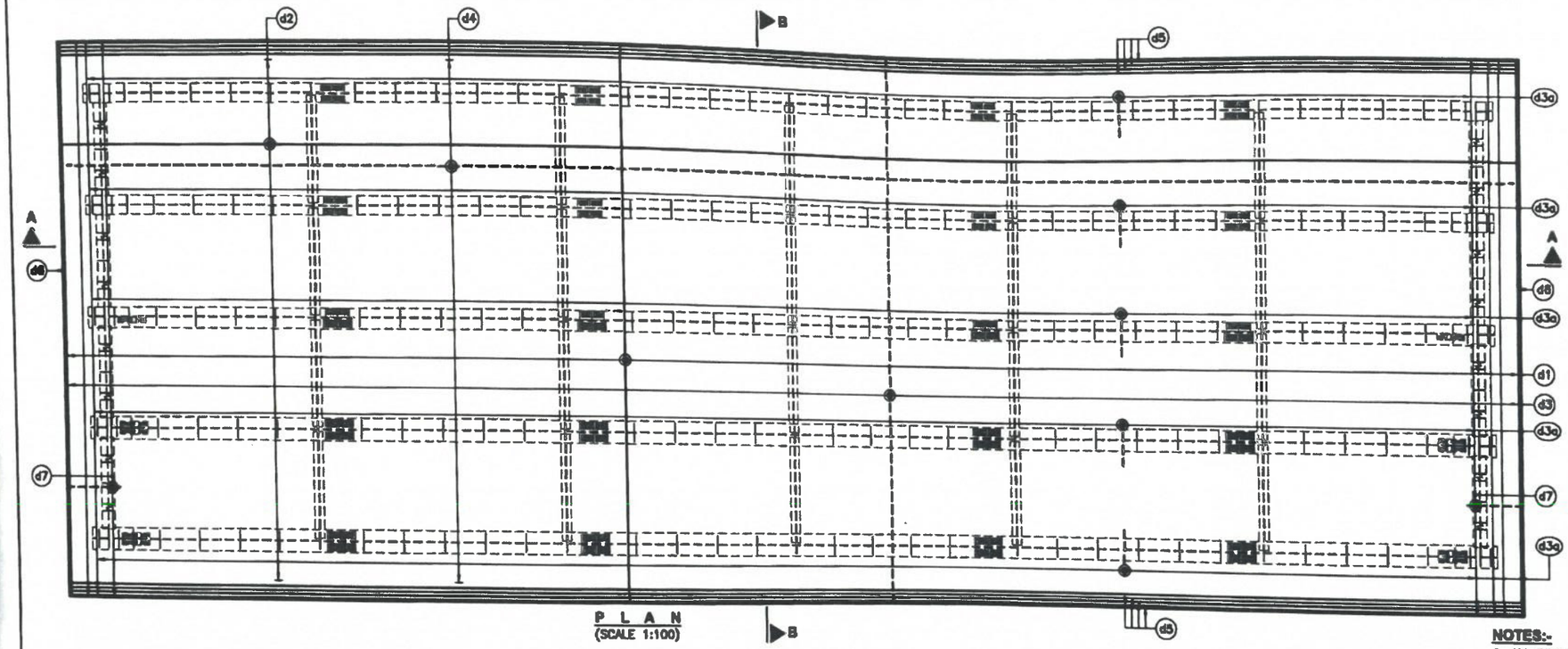
SCALE: AS SHOWN (01 OF 01)

REV: R1

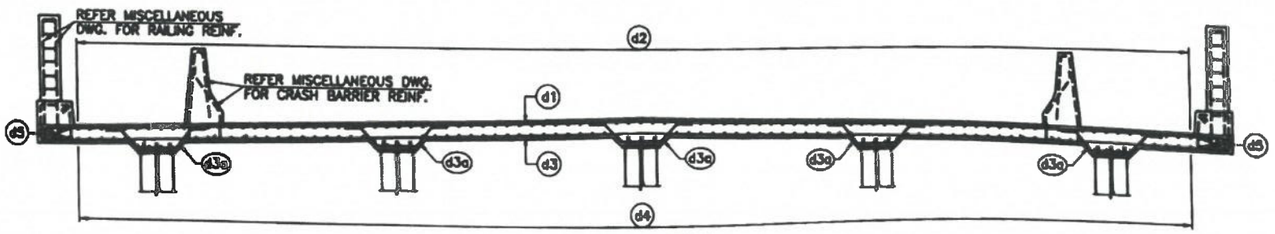
DRG.NO: GPT/CCT/4B/STR/MJB/SUP/306



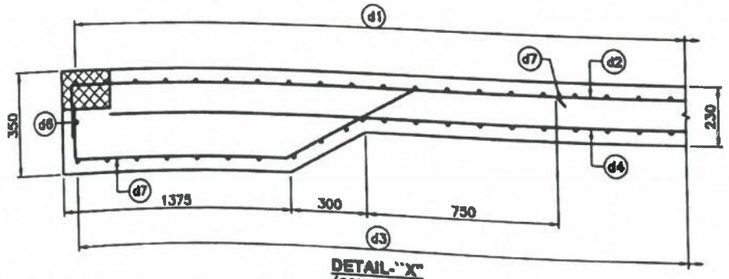
SECTION AT A-A
(SCALE 1:100)



PLAN
(SCALE 1:100)



SECTION AT B-B
(SCALE 1:50)



DETAIL-"X"
(SCALE 1:15)

SCHEDULE OF REINFORCEMENT		
BAR MKD.	BAR DIA & SPACING/NOS.	BAR SHAPE
d1	16 ϕ @ 100 C/C	150 150
d2	10 ϕ @ 180 C/C	200 200
d3	16 ϕ @ 100 C/C	150 150
d3a	12 ϕ @ 100 C/C	200 200
d4	10 ϕ @ 180 C/C	—
d5	12 ϕ 2x2x4 NOS.	100 100
d6	12 ϕ 2x1 NOS.	—
d7	10 ϕ @ 100 C/C	200

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THE REINFORCEMENT SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe-5000) CONFORMING TO IS: 1786.
3. GRADE OF CONCRETE SHALL BE AS BELOW:-
   RCC DECK SLAB M35
4. CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:-
   RCC DECK SLAB 40mm
5. SPLICING OF REINFORCEMENT SHALL BE DONE EITHER BY OVERLAPPING OR BY USING MECHANICAL COUPLER.
6. LAPPING SHALL BE STAGGERED, BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH SHALL BE PROVIDED AS "X*D" MENTIONED IN THE TABLE BELOW, WHERE 'D' IS THE DIA OF THE SMALLER BAR UNLESS OTHERWISE SPECIFIED.

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M35	X	36	41	50	54

UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M35	X	53	61	74	80

FAVOURABLE ZONE:-
a. RAFT/SLAB BOTTOM MAIN BAR.
UNFAVOURABLE ZONE:-
a. RAFT/SLAB TOP MAIN BAR.
b. WALL/COLUMN MAIN BAR.

7. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NW-102-B CCPL In association with MSPARK FUTURISTICS & ASSOCIATES

APPROVED

GPT Infraprojects Limited Imphal Branch 795001 Imphal

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No: 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

LEGEND:-	
TOP BAR	———
BOTTOM BAR OTHERWISE MENTIONED	- - - - - -

Rev.	Date	Description
R1	AUG-21	REVISED AS PER AE COMMENTS
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT, JC - 28, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-4,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS, PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. 0 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 139.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

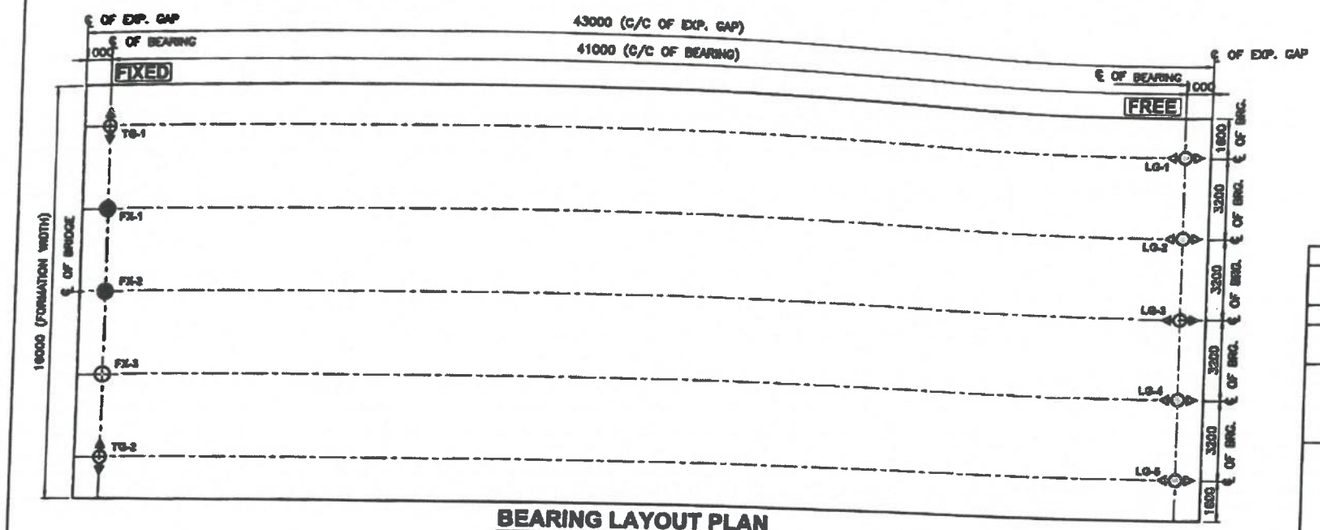
DRAWN	MP
DESIGNED	S.S
CHECKED	A.B.K
DATE: JUNE - 2021	

TITLE: REINFORCEMENT DETAILS OF DECK SLAB FOR SPAN 1X43 EJ TO EJ

SCALE: AS SHOWN (01 OF 01)

REV: R1

DRG.NO: GPT/CCT/4B/STR/R.B/SUP/306



BEARING LAYOUT PLAN

(SCALE 1:150)

A.1 Typical Load Data Format

1.	Bearing Identification mark			●	◇	◇
	Type of Bearing			Fixed Bearing	Long Guided	Trans Guided
2.	Number Off			3	5	2
3.	Seating Material and Character Strength	Upper Surface		Structural steel	Structural steel	Structural steel
		Lower Surface		Concrete	Concrete	Concrete
4.	Allowable contact Pressure (N/mm²)	Upper Surface	Serviceability	324	324	324
			Ultimate	419	419	419
		Lower Surface	Serviceability	28.1	28.1	28.1
			Ultimate	45	45	45
5.	Design Load (kN)	Serviceability Limit State (SLS)	Vertical (EXCL. SV loading)	Max	2031	2031	2031
				Permanent	1118	1118	1118
				Min	746	746	746
			Horizontal (EXCL. SV loading)	Longitudinal	109	0	109
				Transverse	0	0	0
			Vertical (SV loading)	Max	2380	2380	2380
				Permanent	1118	1118	1118
				Min	770	770	770
			Horizontal (SV loading)	Longitudinal	0	0	0
				Transverse	0	0	0
		Ultimate Limit State (ULS)	Vertical (EXCL. SV loading)	Max	3067	3067	3067
				Permanent	1526	1526	1526
				Min	81	81	81
			Horizontal (EXCL. SV loading)	Longitudinal	1439	0	1439
				Transverse	1311	1311	0
			Vertical (SV loading)	Max	2980	2980	2980
				Permanent	1526	1526	1526
				Min	1081	1081	1081
			Horizontal (SV loading)	Longitudinal	0	0	0
				Transverse	0	0	0
6.	Displacement (mm)	Serviceability Limit State (SLS)	Irreversible	Longitudinal	-	12.8	-
				Transverse	-	-	2.5
			Reversible	Longitudinal	-	14.5	-
				Transverse	-	-	2.9
		Ultimate Limit State (ULS)	Irreversible	Longitudinal	-	17.3	-
				Transverse	-	-	3.4
			Reversible	Longitudinal	-	18.5	-
				Transverse	-	-	3.8
7.	Rotation (Radians)	Serviceability Limit State (SLS)	Irreversible	Longitudinal	0.0006	0.0006	0.0006
				Transverse	0.0001	0.0001	0.0001
			Reversible	Longitudinal	0.0025	0.0025	0.0025
				Transverse	0.0000	0.0000	0.0000
8.	Maximum Bearing Dimensions (mm), if restricted	Upper Surface		Longitudinal	650	650	650
				Transverse	650	650	650
		Lower Surface		Longitudinal	750	750	750
				Transverse	750	750	750
		Overall Height (Bearing + Pedestal) (mm)			350	350	350
9.	Maximum acceptable rotation to rotation under Serviceability Limit State (kN x m), if restricted			Longitudinal	NA	NA	NA
				Transverse	NA	NA	NA
10.	Type of Plating Required			Upper Surface	BEARING PLATE DOWELS/STUB	BEARING PLATE DOWELS/STUB	BEARING PLATE DOWELS/STUB
				Lower Surface			

NOTES:-

1. MATERIAL MODIFICATIONS IN THE STRUCTURE DETAIL e.g. PEDESTAL ETC. FOR COMPATIBILITY WITH THE BEARING DETAIL AS PER MANUFACTURER'S REQUIREMENT SHALL BE PERMITTED SUBJECTED TO APPROVAL OF THE ENGINEER.
2. SPECIFICATION FOR BEARINGS SHALL BE AS PER LATEST TECHNICAL SPECIFICATIONS AND IRC: 83 PART–III.
3. THE TESTING OF RAW MATERIALS, METALLIC COMPONENTS, ELASTOMER, PTFE AND ACCEPTANCE TEST ON BEARING SHALL CONFORM TO MORTH SPECIFICATIONS.
4. MANUFACTURER SHALL SUBMIT THE CERTIFICATE FOR LOAD TESTING AND DIMENSIONS OF BEARINGS.
5. THE GROUT BEDDING MORTAR SHALL BE OF HIGH STRENGTH FREE FLOWING NON SHRINK TYPE.
6. BEARING PLANES SHALL BE MADE TRULY HORIZONTAL ALONG WITH PEDESTAL BY PROPER MECHANISM TO TAKE CARE OF GRADIENT EFFECT.
7. GRADE OF CONCRETE :–
   a. BEARING PEDESTAL M45
8. STRUCTURE IS LOCATED IN SEISMIC ZONE–V.
9. PRECAUTIONS TO BE TAKEN BY THE SITE ENGINEER DURING CONSTRUCTION OF STRUCTURES TILL THE GIRDER ARE BRACED BY DIAPHRAGMS/SLAB.
10. COMPREHENSIVE DATA IN TABLE, COMPRISING OF MAXIMUM/MINIMUM AND CORRESPONDING COEXISTING LOADS, FORCES, MOVEMENT AND ROTATION SHALL BE PROVIDED FOR EACH LOAD CONDITION AND CASE.
11. LEGEND :–
    MOVEMENT + EXPANSION
    – CONTRACTION

LEGEND

SYMBOL	DESCRIPTION
○	FIXED BEARING (FX)
◇	TRANS GUIDED (TG)
◇	LONG GUIDED (LG)
◇	FREE BEARING (FB)

TYPE OF BEARING –POT PTFE BEARING

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

GPT Infraprojects Limited Imphal Branch 795001 Imphal

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. MS-102-B CCPur In association with MSPARK FUTURISTICS & ASSOCIATES

APPROVED

Rev.	Date	Description
R1	AUG-21	REVISED AS PER AE COMMENTS
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT Infra — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-4,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD 201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-87, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — 9519 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN: MP
DESIGNED: S.S
CHECKED: AB.K
DATE: JUNE - 2021

TITLE: DETAIL OF POT CUM PTFE BEARING LAYOUT FOR SPAN 13X43 ELI TO EJ

SCALE: AS SHOWN (01 OF 01)

ORG.NO: GPT/ECT/4B/STR/BJ/SUP/307

REV: R1

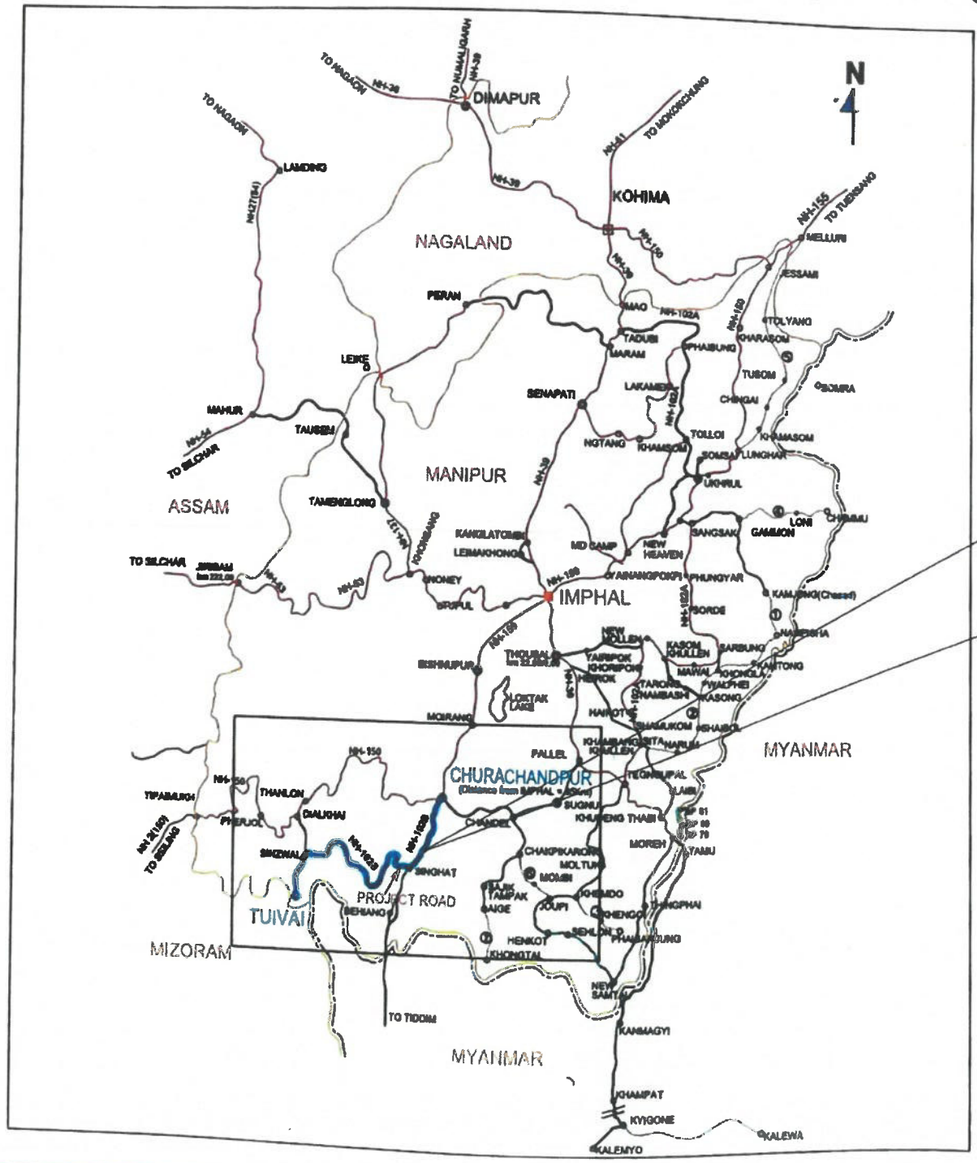
GPT-Infra/DO. Imphal/Design/Pkg 4B/20-21/ 61 (Rec. 14.08.21) 14.08.21.

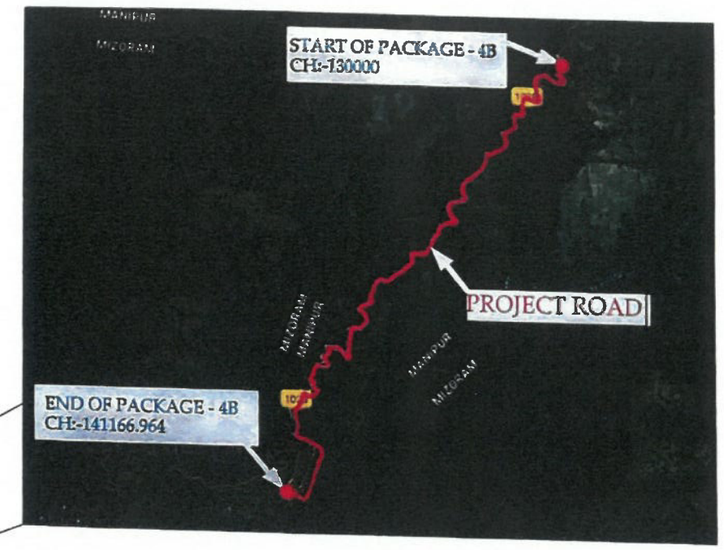
4B

BUILDING INFRASTRUCTURE - BUILDING THE NATION

National Highways & Infrastructure Development
राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction mode.





APPROVED

SUB STRUCTURE

PACKAGE - 4B

AT CH-141+016

AUGUST - 2021

GPT Infraprojects Limited Imphal Branch 795001 Imphal

CHAITANYA CONSULTANCY PVT. LTD. NH-102-B CCPur In association with ASPARK FUTURISTICS & ASSOCIATES

EPC CONTRACTOR:

GPT Group

JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

DESIGN CONSULTANT:

SPS Technocrats Pvt. Ltd.

638 to 641, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

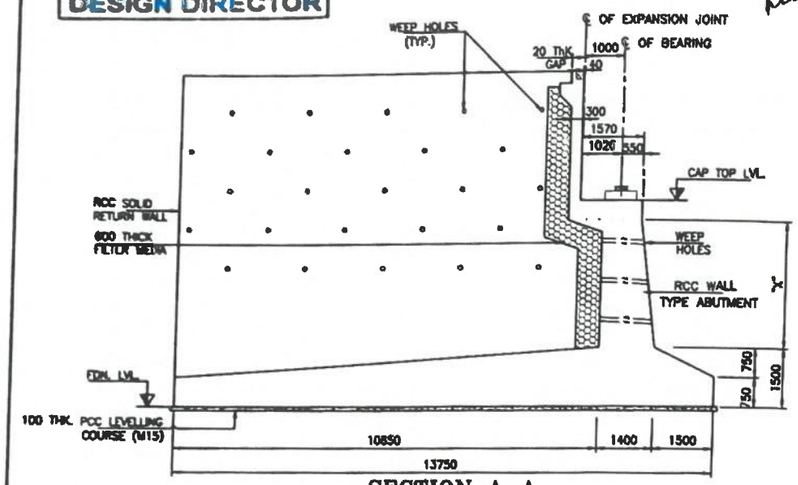
ABUTMENT-A1

APPROVED

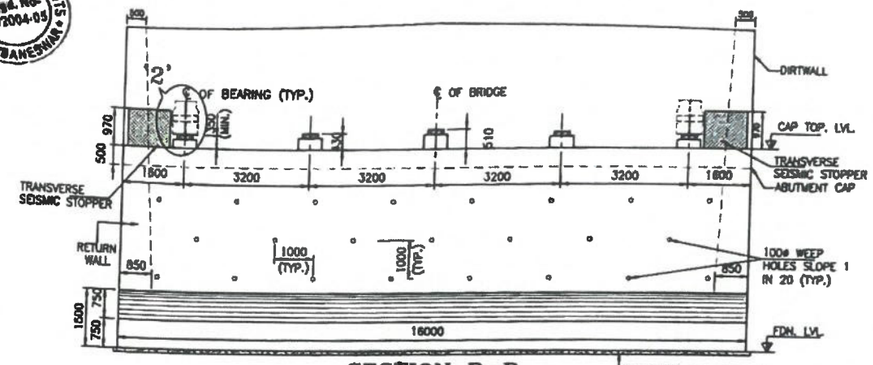
GPT Infraprojects Limited
Imphal Branch
795001
Imphal

DESIGN DIRECTOR

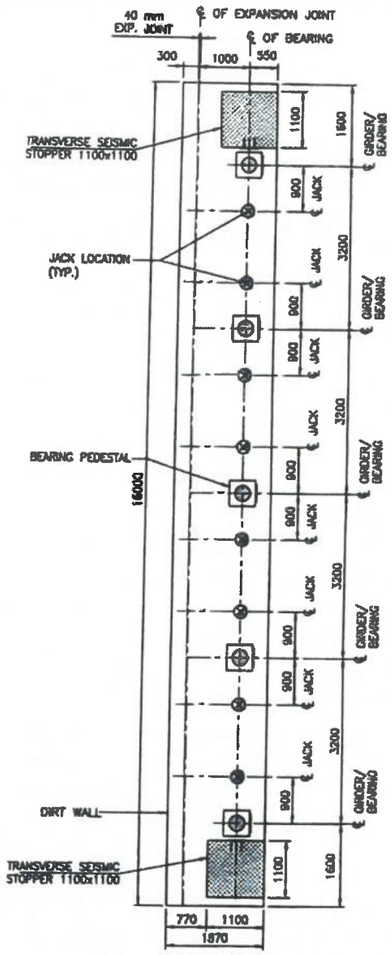
SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR



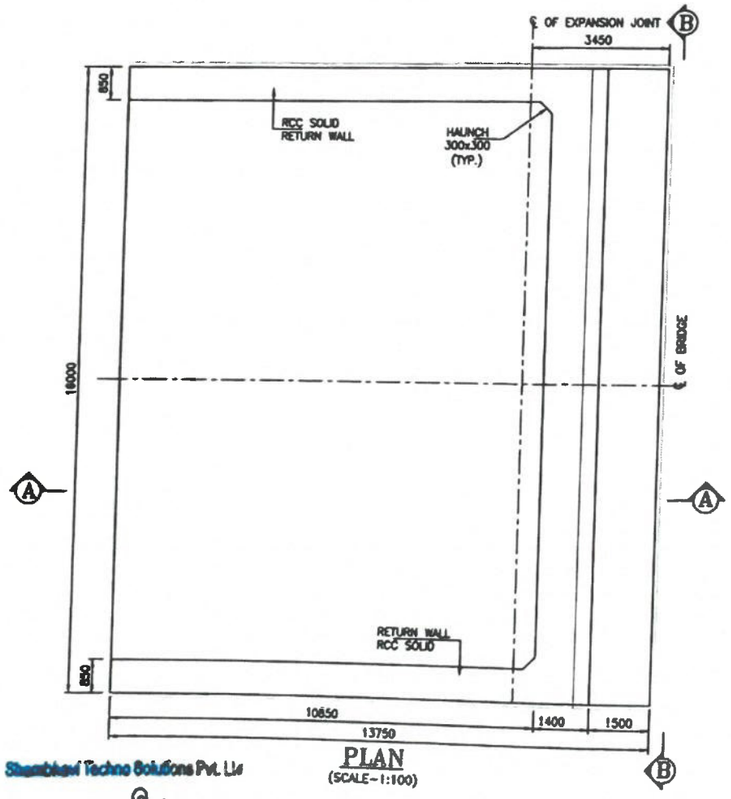
SECTION A-A
(SCALE-1:100)



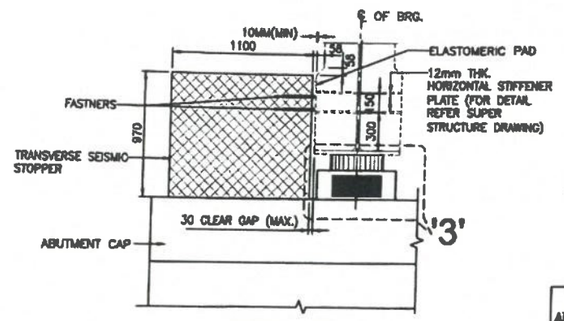
SECTION B-B
(SCALE-1:100)



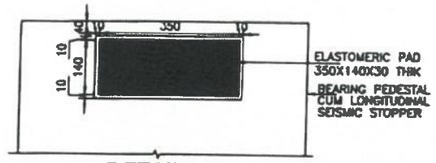
PLAN OF ABUTMENT CAP
(SCALE 1:75)



PLAN
(SCALE-1:100)

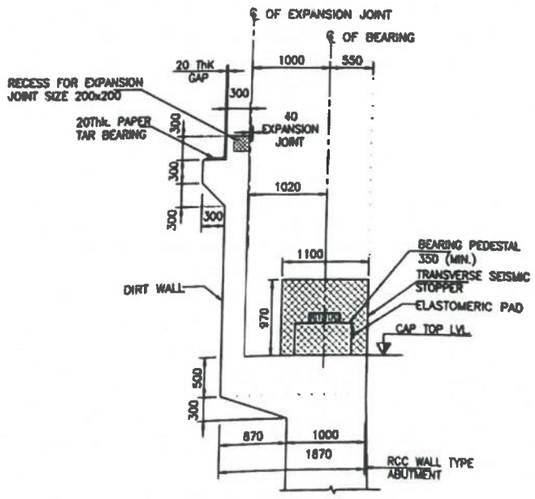


DETAIL -'2'
(SCALE-1:30)



DETAIL - '3'
(SCALE-1:10)

ABUTMENT A1	CAP TOP LVL	FOUNDING LVL	HEIGHT OF SHAFT "X"
	479.976	474.800	3.176m



DETAIL-'1'
(SCALE-1:50)

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. CONCRETE SHALL BE DESIGN MIX UNLESS OTHERWISE SPECIFIED IN DETAILED DRAWINGS, AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES FOR ALL ELEMENTS OF STRUCTURES AS INDICATED BELOW:
   a) SUBSTRUCTURE M35
   b) OPEN FOUNDATION M35
   c) PCC LEVELING COURSE M15
   d) BEARING PEDESTAL M45
   e) SEISMIC STOPPER M45
3. REINFORCEMENT BAR SHALL BE CONFORMING TO IS:1786-1985 OF GRADE Fe-5000.
4. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
   a) FOUNDATION 75mm
   b) ABUTMENT CAP & SEISMIC STOPPER.....50mm
   C) SUB STRUCTURE:-
      i) EARTH FACE 75mm
      ii) OTHER FACE 50mm
5. 100ø WEEP HOLES SPACED AT 1000 C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN A STAGGERED MANNER IN ABUTMENT WALLS AND RETURN WALLS, ABOVE GROUND LEVEL.
6. 600 THICK FILTER MEDIA SHALL BE PROVIDED AS PER "MORTH" SPECIFICATION.
7. @SHOWN JACK LOCATION IN PLAN AND SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.
8. SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 60T/Sqm.

* PEDESTAL DIMENSIONS SHALL BE CHANGED AS PER BEARING DETAILS.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/100(SH-01 OF 01)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-01 OF 02)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-02 OF 02)
2. REINF. DETAILS OF ABUTMENT FOOTING & SHAFT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/202.(SH-01 OF 01)
3. REINF. DETAILS OF RETURN WALL, ABUT. CAP AND DIRT WALL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/203.(SH-01 OF 01)
4. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/204.(SH-01 OF 01)

GPT Infraprojects Limited Imphal Branch 795001 Imphal

SUVADRA PROJECTS CONSULTANCY PVT. LTD. BHUBANESWAR

APPROVED

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MBPARK FUTURISTICS AND ASSOCIATES
C-2,3rD FLOOR, ILE TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-97, Tankagard Road, BBSR-16, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
5-B3, Rajeen Kumar Pain, S.I.Pull, Boring Road, Patna-800001

DESIGN CONSULTANT: SPB Technocrats Pvt. Ltd.
910 & 911, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) code.

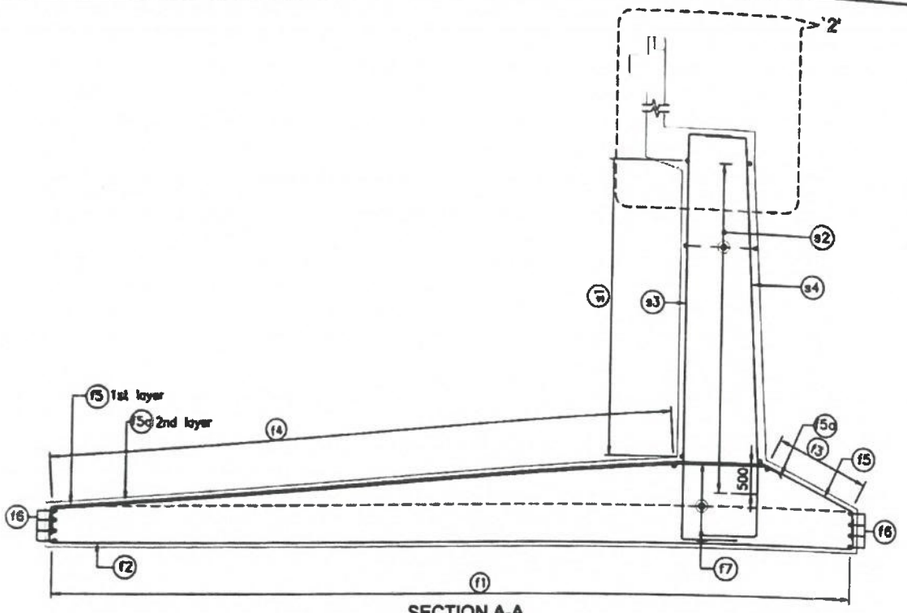
DRAWN	HP
DESIGNED	S.B
CHECKED	AS.K
DATE: JUNE - 2021	

TITLE: DIMENSION DETAILS OF ABUTMENT (A1) FOR MINOR BRIDGE AT CH-141+016

SCALE: AS SHOWN 1 OF 1

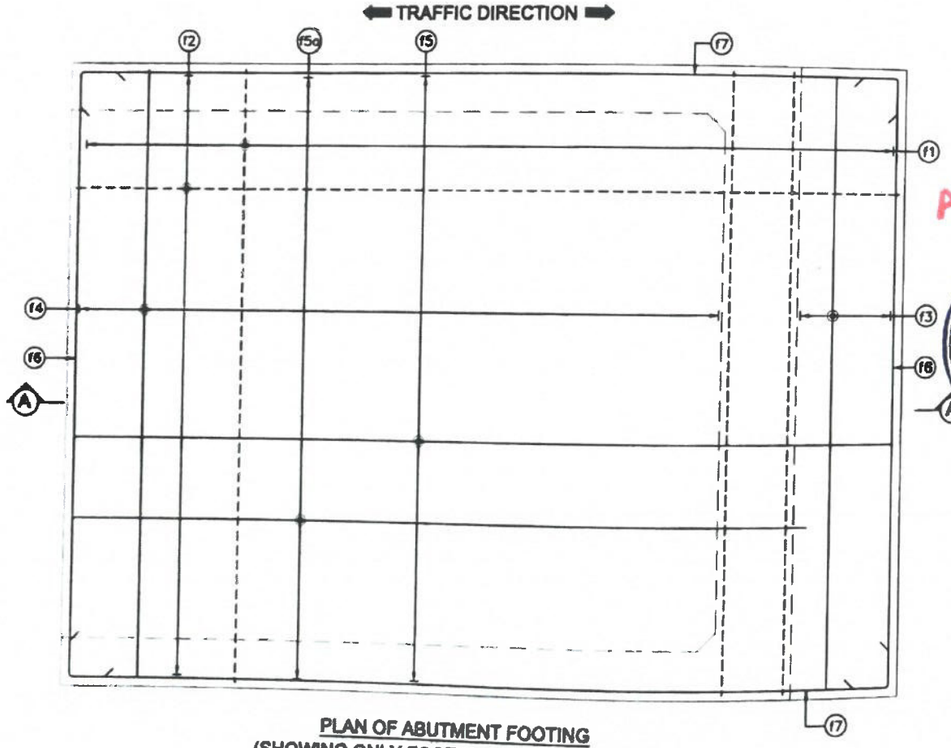
REV: R0

DRG. NO: GPT/CCT/4B/STR/MJB/ 141+016/ABT/201

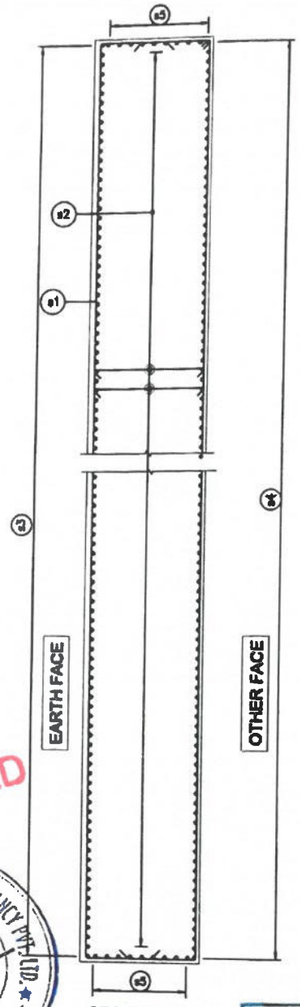


SECTION A-A
(SCALE-1:75)

TRAFFIC DIRECTION



PLAN OF ABUTMENT FOOTING
(SHOWING ONLY FOOTING REINFORCEMENT)
(SCALE-1:75)



SECTION C-C
(SCALE-1:50)

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. WH-102-B CCPPL In association with MISPARK FUTURISTICS & ASSOCIATES

DESIGN DIRECTOR

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
ABUTMENT FOOTING:-			
f1	12	150 C/C	
f2	16	80 C/C	
f3	20	100 C/C	
f4	20	100 C/C	
f5	25	80 C/C LAYER-1	
f5a	20	80 C/C LAYER-2	
f6	12	4 NOS.	
f7	12	100 C/C	VARIES
ABUTMENT SHAFT:-			
s1	12	100 C/C	
s2	8	LINKS TIED TO ALTERNATE VERTICAL BARS 200 C/C VERTICALLY & 160 C/C TRANSVERSELY	
s3	25	80 C/C	
s4	16	80 C/C	
s5	16	100 C/C	

SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR

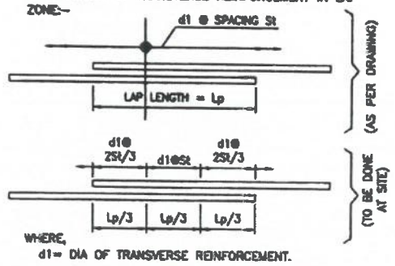
GPT Infraprojects Limited Imphal 795001

Shubhasal Techno Solutions Pvt. Ltd.
Managing Director

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786.
3. LAP/SPLICES SHALL BE PROVIDED AS PER CLAUSE NO. 15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 72ø.

   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



   WHERE,
   d1= DIA OF TRANSVERSE REINFORCEMENT.
   St= SPACING OF TRANSVERSE REINFORCEMENT.
4. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.

LEGENDS

REINF.TOP FACE	————
REINF. BOTTOM FACE	- - - - - -
B/F	BOTH FACE
STP.	STIRRUP

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+015/100(SH-01 OF 01)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-01 OF 02)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-02 OF 02)
2. DIMENSION DETAILS OF ABUTMENT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/201.(SH-01 OF 01)
3. REINF. DETAILS OF RETURN WALL, ABUT. CAP AND DIRT WALL. (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/203.(SH-01 OF 01)
4. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/204.(SH-01 OF 01)

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: MADCL

EPC CONTRACTOR: GPT
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MISPARK FUTURISTICS AND ASSOCIATES
G-4,3RD FLOOR, RJK TOWER, SECTOR-4,VAISHALI GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
S-62, Rajesh Kumar Path, S.L.Pur, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
S 519 & 511, 2ND Magnolia, Sector 45, Gurugram, Haryana - 122012.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	NP
DESIGNED	S.S
CHECKED	A.S.K
DATE: JUNE - 2021	

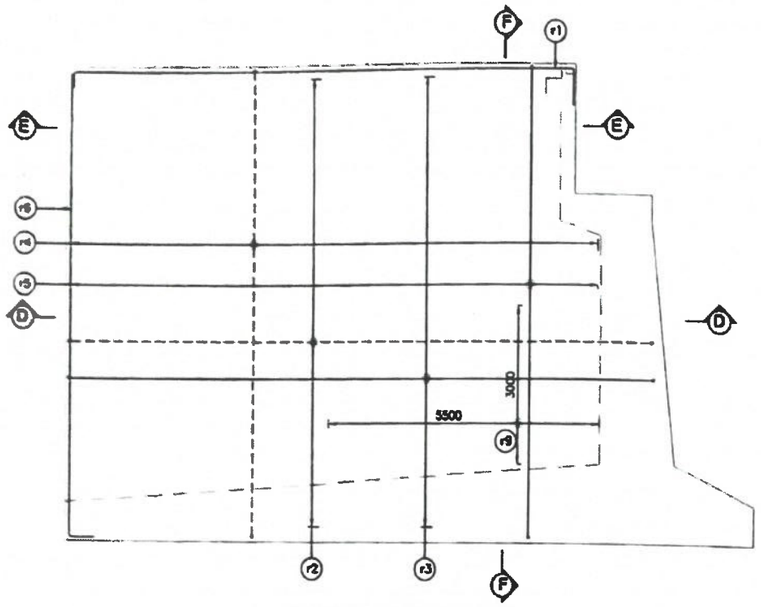
TITLE: REINFORCEMENT DETAILS OF ABUTMENT (A1) FOOTING & SHAFT DRAWING OF MINOR BRIDGE AT CH-141+016

SCALE: AS SHOWN

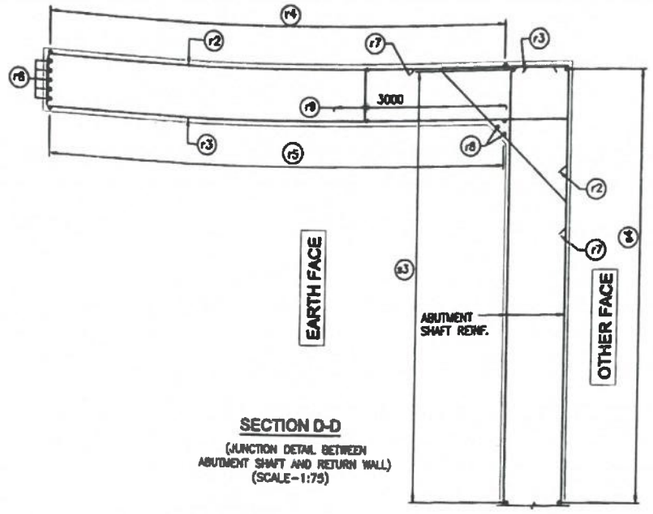
1 OF 1

REV: R0

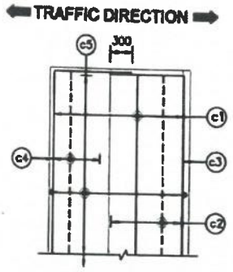
DRG.NO: GPT/CCT/4B/STR/MJB/141+016/ABT/203



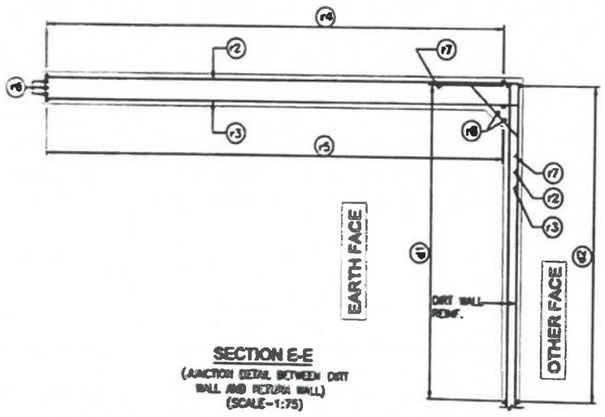
ELEVATION SHOWING REINF. DETAILS OF RETURN WALL
(SCALE-1:75)



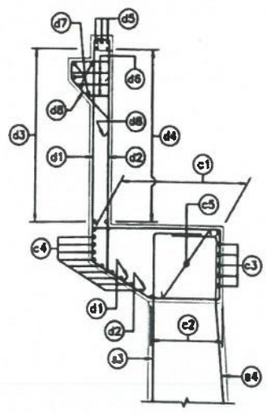
SECTION D-D
(JUNCTION DETAIL BETWEEN ABUTMENT SHAFT AND RETURN WALL)
(SCALE-1:75)



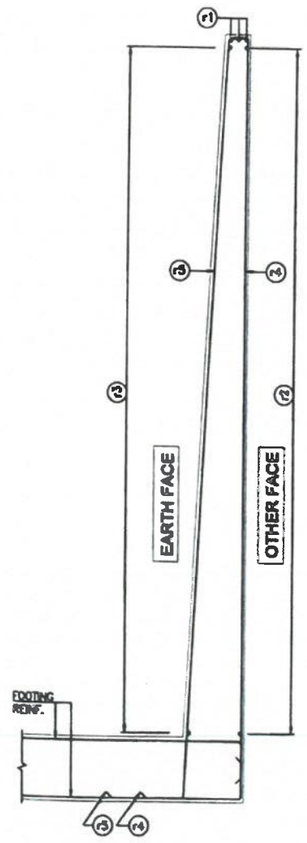
PLAN SHOWING REINFORCEMENT ARRANGEMENT IN ABUTMENT CAP
(SCALE-1:50)



SECTION E-E
(JUNCTION DETAIL BETWEEN DIRT WALL AND RETURN WALL)
(SCALE-1:75)



DETAIL-'2'
SHOWING REINF. DETAILS OF ABUTMENT CAP AND DIRT WALL
(SCALE-1:50)



SECTION F-F
(SCALE-1:75)

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
DIRT WALL:-			
d1	16	125 C/C	
d2	16	125 C/C	
d3	10	100 C/C	
d4	10	100 C/C	
d5	10	3 NOS.	
d6	12@ 2 LEGGED STIRRUPS @ 400 C/C TRANS. (3 LAYERS IN VERTICALLY IN STAGGERED MANNER		400 200
d7	12	5 NOS.	
d8	16	100 C/C	
RETURN WALL:-			
r1	12	3 NOS.	
r2	12	100 C/C	
r3	16	100 C/C	
r4	16	100 C/C	
r5	20	100 C/C	
r6	12	5 NOS.	
r7	16	100 C/C	
r8	12	2 NOS.	
r9	12	LINKS 100 C/C VERTICALLY & 300 C/C HORIZONTALLY	
ABUTMENT CAP:-			
c1	16	13 NOS.	
c2	16	6 NOS.	
c3	16	4 NOS.	
c4	16	3 NOS.	
c5	12	4 LEGGED STIRRUPS @ 150 C/C	

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. FOR OTHER NOTES REFER SHEET NO. 1 OF 3 OF THIS DRAWING.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/100(SH-01 OF 01)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-01 OF 02)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-02 OF 02)
2. DIMENSION DETAILS OF ABUTMENT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/201.(SH-01 OF 01)
3. REINF. DETAILS OF ABUTMENT FOOTING & SHAFT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/202.(SH-01 OF 01)
4. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/204.(SH-01 OF 01)

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MISPARK FUTURISTICS & ASSOCIATES NH-102 CPur

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No. 11/2004-05 BHUBANESWAR

GPT Infraprojects Limited Imphal Branch 795001 Imphal

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MISPARK FUTURISTICS AND ASSOCIATES
C-4,2nd FLOOR, R.K TOWER, SECTOR-4, VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-67, Tankagarai Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-62, Rajesh Kumar Path, S.R.Pur, Saing Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
0 EIB & 311, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Chumchanpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

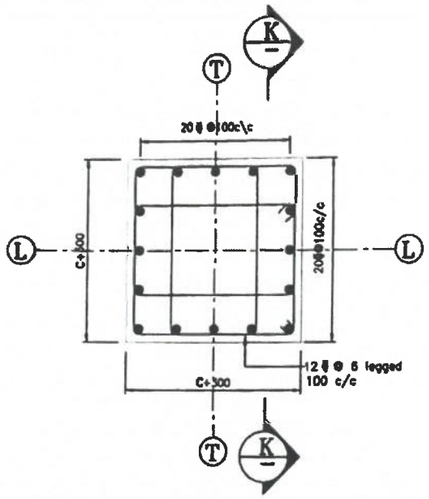
DRAWN	MP
DESIGNED	S.B
CHECKED	A.B.K
DATE: JUNE - 2021	

TITLE: REINFORCEMENT DETAILS OF RETURN WALL, ABUTMENT (A1) CAP & DIRT WALL DRAWING OF MINOR BRIDGE AT CH-141+016

SCALE: AS SHOWN 1 OF 1

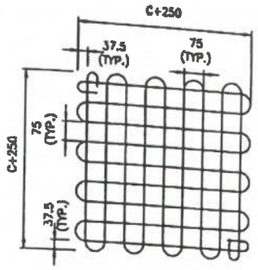
REV: R0

DRG. NO: GPT/CCT/4B/STR/MJB/ 141+016/ABT/203



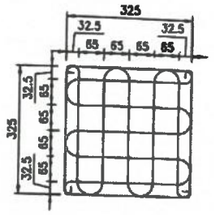
PLAN SHOWING TYPICAL REINF. DETAILS OF BEARING PEDESTAL

(SCALE 1:15)



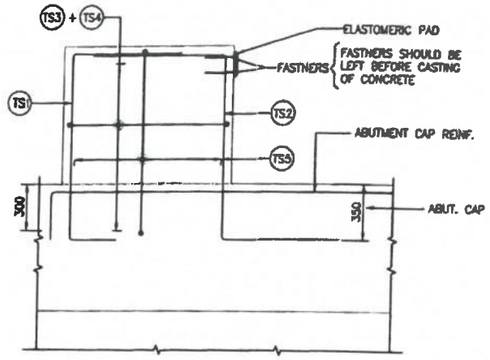
8 ϕ MESH m1

(AT EACH PEDESTAL LOCATION)
(SCALE 1:15)



DETAIL OF 8 ϕ MESH TYPE "m2"

(IN TWO LAYERS AT JACK LOCATION)
(SCALE 1:10)



SECTION J-J

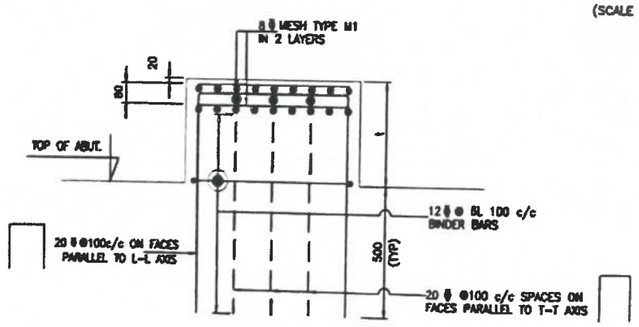
(SCALE-1:25)

PLAN SIZE OF PEDESTAL SHALL BE (C+300) X (C+300)
WHERE "C" IS THE DIA OF BEARING (MAX 700MM)

t = HEIGHT OF PEDESTAL (MAX 500MM)
= H-BEARING HEIGHT
H = HEIGHT BEARING+PEDESTAL

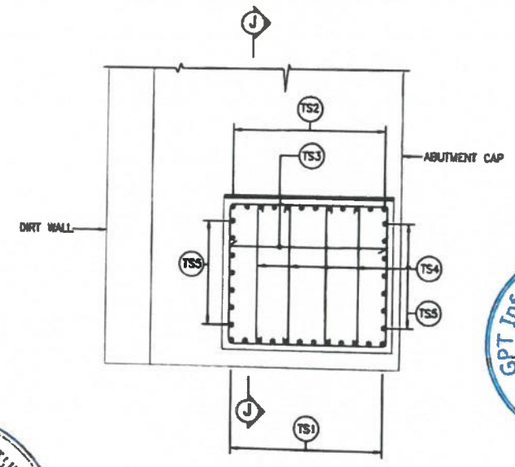
REINFORCEMENT DETAILS:-

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
TRANSVERSE SEISMIC STOPPER:-			
TS1	20	12 NOS.	200
TS2	32	12 NOS.	1500
TS3	2 LEGGED 16ϕ STIRRUPS TIED TO VERTICALLY BARS @ 100 C/C VERTICALLY		
TS4	2 LEGGED 3 NOS. 12 DIA STIRRUPS 4 LAYERS.		
TS5	12	3 NOS.	



SECTION K-K (C+300)X(C+300) PEDESTAL

(SCALE 1:15)



TRAFFIC DIRECTION

PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER ON ABUTMENT CAP

(SCALE-1:25)

GPT Infraprojects Limited
Imphal Branch
Imphal

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

CHAITANYA PROJECTS CONSULTANCY PVT. LTD.
In association with MSPARK FUTURISTICS & ASSOCIATES
NH-102-B
CCKur

APPROVED

DESIGN DIRECTOR

SUVADRA CONSULTANTS
Regd. No- 11/2004-05
BHUBANESWAR

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. MESH TYPE M1' SHALL BE PROVIDED IN ABUTMENT CAP AT BEARING LOCATIONS AND MESH TYPE 'M2' SHALL BE PROVIDED AT JACK LOCATION IN TWO LAYER AT 20mm AND AT 100mm FROM TOP OF CONCRETE.
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:5000) CONFORMING TO IS:1786
4. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
5. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/100(SH-01 OF 01)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-01 OF 02)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-02 OF 02)
2. DIMENSION DETAILS OF ABUTMENT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/201(SH-01 OF 01)
3. REINF. DETAILS OF ABUTMENT FOOTING & SHAFT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/202(SH-01 OF 01)
4. REINF. DETAILS OF RETURN WALL, ABUT. CAP AND DIRT WALL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/203(SH-01 OF 01)

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES
C-4,3RD FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-87, Tankagarh Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachanpur to Tuivai section of NH 102B from Km 130.000 to Km 141.028 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	RP
DESIGNED	S.S
CHECKED	A.S.K
DATE: JUNE - 2021	

TITLE: DIM.& REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL FOR MINOR BRIDGE AT CH-141+016 (A1)

SCALE: AS SHOWN 1 OF 1

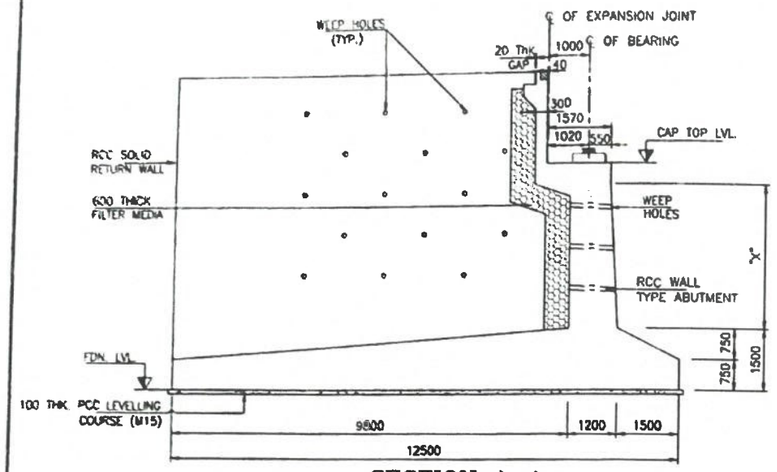
REV: R0

DRG. NO: GPT/CCT/4B/STR/MJB/ 141+016/ABT/204

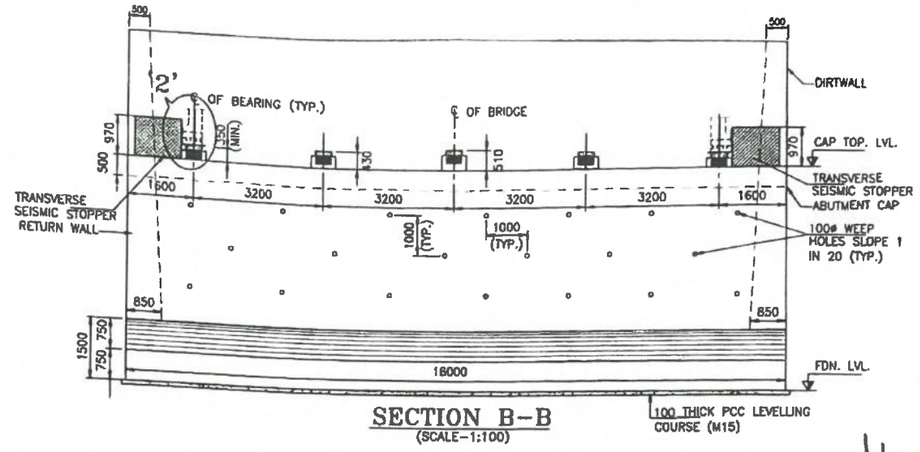
ABUTMENT-A2

GPT Infraprojects Limited
Imphal Branch 795001
Imphal

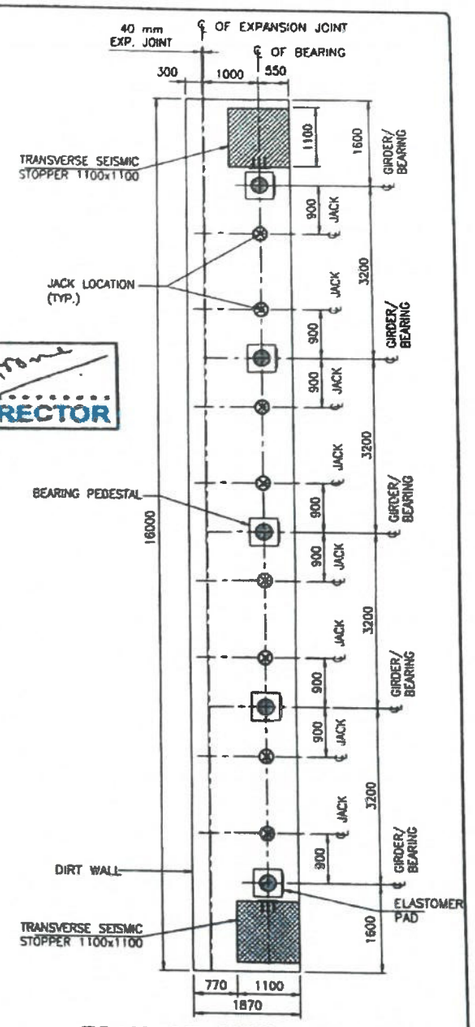
APPROVED



SECTION A–A
(SCALE–1:100)



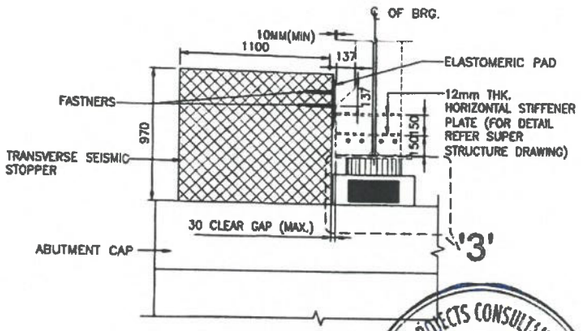
SECTION B–B
(SCALE–1:100)



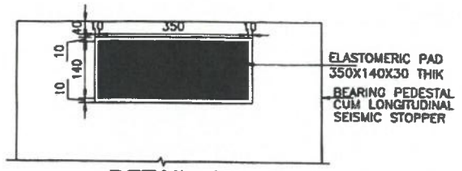
PLAN OF ABUTMENT CAP
(SCALE 1:75)

DESIGN DIRECTOR

SUVADRA CONSULTANTS BHUBANESWAR Regd. No- 11/2004-05



DETAIL -'2'
(SCALE–1:30)



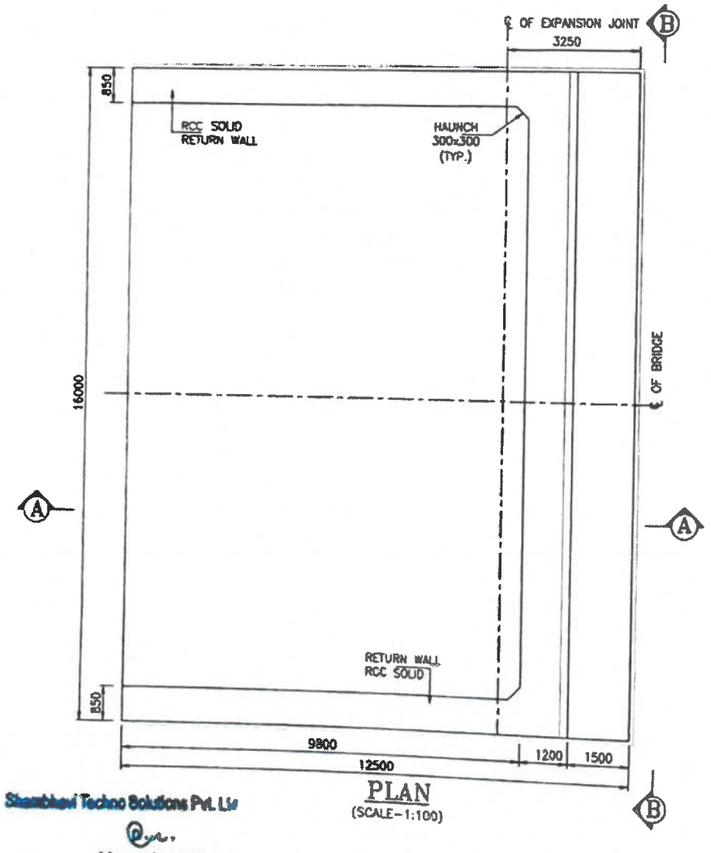
DETAIL - '3'
(SCALE–1:10)

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102-B CAPUR In association with MSPARK FUTURISTICS & ASSOCIATES

APPROVED

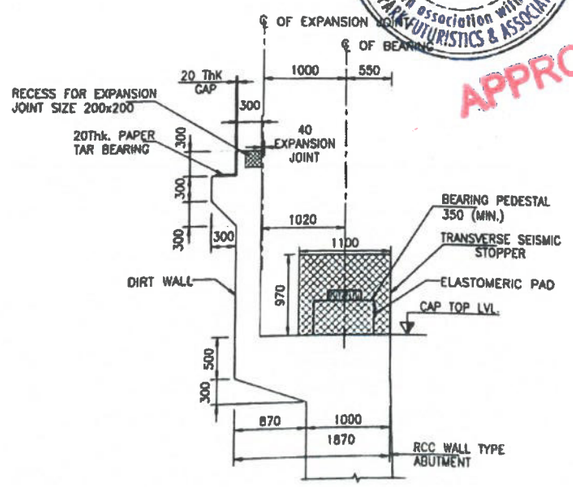
ABUTMENT A2	CAP TOP LVL	FOUNDING LVL	HEIGHT OF SHAFT "X"
	481.000	474.800	4.200m

* PEDESTAL DIMENSIONS SHALL BE CHANGED AS PER BEARING DETAILS.



PLAN
(SCALE–1:100)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director



DETAIL–'1'
(SCALE–1:50)

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. CONCRETE SHALL BE DESIGN MIX UNLESS OTHERWISE SPECIFIED IN DETAILED DRAWINGS, AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES FOR ALL ELEMENTS OF STRUCTURES AS INDICATED BELOW:
   - a) SUBSTRUCTURE M35
   - b) OPEN FOUNDATION M35
   - c) PCC LEVELING COURSE M15
   - d) BEARING PEDESTAL M45
   - e) SEISMIC STOPPER M45
3. REINFORCEMENT BAR SHALL BE CONFORMING TO IS:1786-1985 OF GRADE Fe-500D.
4. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
   - a) FOUNDATION 75mm
   - b) ABUTMENT CAP & SEISMIC STOPPER.....50mm
   - C) SUB STRUCTURE:-
     - I) EARTH FACE 75mm
     - II) OTHER FACE 50mm
5. 100ø WEEP HOLES SPACED AT 1000 C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN A STAGGERED MANNER IN ABUTMENT WALLS AND RETURN WALLS, ABOVE GROUND LEVEL.
6. 600 THICK FILTER MEDIA SHALL BE PROVIDED AS PER "MORTH" SPECIFICATION.
7. SHOWN JACK LOCATION IN PLAN AND ⊗ SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.
8. SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 60T/Sqm.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/100(SH-01 OF 01)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-01 OF 02)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-02 OF 02)
2. REINF. DETAILS OF ABUTMENT FOOTING & SHAFT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/206.(SH-01 OF 01)
3. REINF. DETAILS OF RETURN WALL, ABUT. CAP AND DIRT WALL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/207.(SH-01 OF 01)
4. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/208.(SH-01 OF 01)

GPT Infrastructure Limited Imphal Branch 795001 Imphal

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NAIDCL

EPC CONTRACTOR: GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES G-8,3RD FLOOR, R.K TOWER, SECTOR-4,VASUNDHARA, GHAZIABAD-201012

SAFETY CONSULTANT: SUVADRA CONSULTANTS PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 610 & 611, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

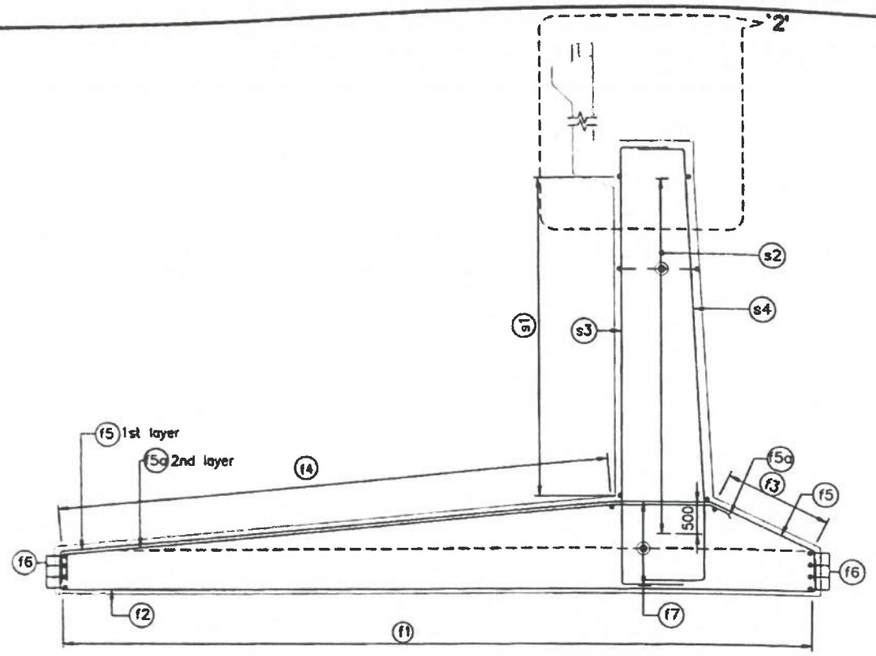
DRAWN	NP
DESIGNED	S.S
CHECKED	A.B.K
DATE: JUNE - 2021	

TITLE: DIMENSION DETAILS OF ABUTMENT (A2) FOR MINOR BRIDGE AT CH-141+016

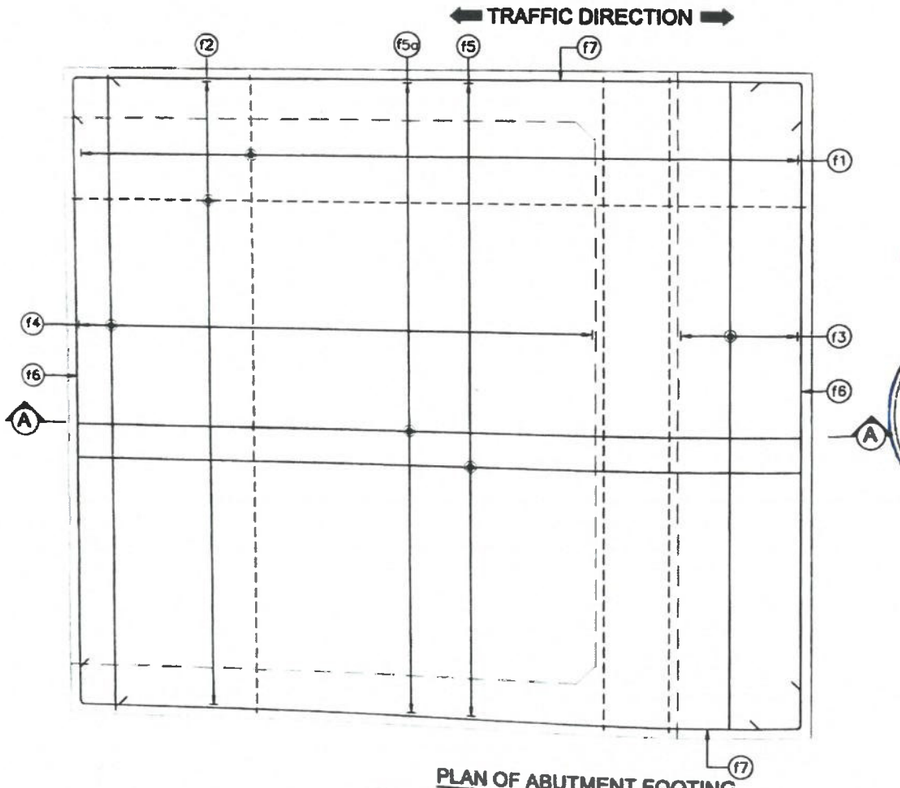
SCALE: AS SHOWN 1 OF 1

REV: R0

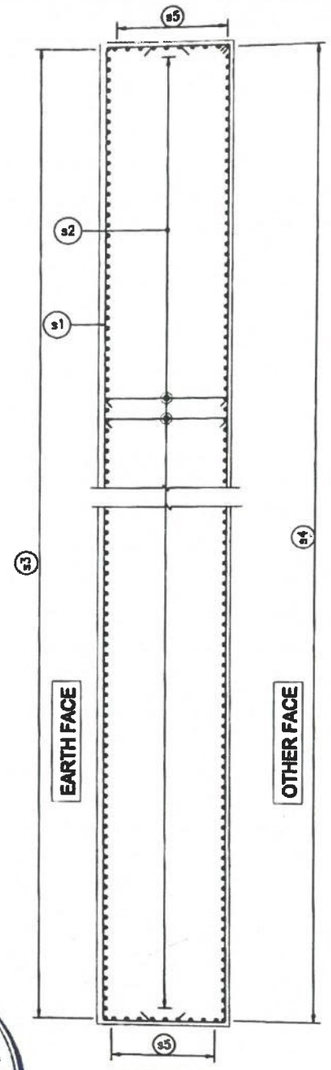
DRG. NO: GPT/CCT/4B/STR/MJB/ABT/206



SECTION A-A
(SCALE-1:75)



PLAN OF ABUTMENT FOOTING
(SHOWING ONLY FOOTING REINFORCEMENT)
(SCALE-1:75)



SECTION C-C
(SCALE-1:50)

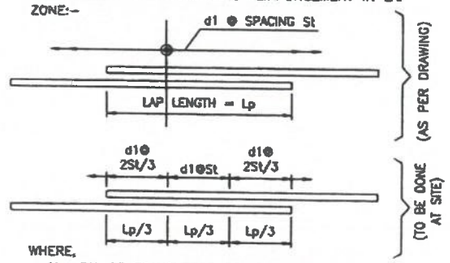
REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
ABUTMENT FOOTING:-			
f1	10	100 C/C	
f2	16	80 C/C	
f3	16	80 C/C	
f4	16	80 C/C	
f5	25	80 C/C	
f5a	16	80 C/C	
f6	12	4 NOS.	
f7	12	100 C/C	VARIES
ABUTMENT SHAFT:-			
s1	12	100 C/C	
s2	8	LINKS TIED TO ALTERNATE VERTICAL BARS 200 C/C VERTICALLY & 160 C/C TRANSVERSELY	
s3	25	80 C/C	
s4	12	80 C/C	
s5	16	100 C/C	

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:5000) CONFORMING TO IS:1786.
3. LAP/SPLICES SHALL BE PROVIDED AS PER CLAUSE NO. 15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 72ø.

   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



   WHERE,
   d1= DIA OF TRANSVERSE REINFORCEMENT.
   St= SPACING OF TRANSVERSE REINFORCEMENT.
4. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED. ONLY WRITTEN DATA SHALL BE FOLLOWED.

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102-B COPur In association with MSPARK FUTURISTICS & ASSOCIATES

DESIGN DIRECTOR

GPT Infraprojects Limited Imphal Branch 795001 Imphal

LEGENDS	
REINF.TOP FACE	————
REINF. BOTTOM FACE	- - - - - -
B/F	BOTH FACE
STP.	STIRRUP

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/100(SH-01 OF 01)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-01 OF 02)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-02 OF 02)
2. DIMENSION DETAILS OF ABUTMENT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/205.(SH-01 OF 01)
3. REINF. DETAILS OF RETURN WALL, ABUT. CAP AND DIRT WALL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/207.(SH-01 OF 01)
4. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/208.(SH-01 OF 01)

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-3,2ND FLOOR, R.K TOWER, SECTOR-4, VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-52, Rajesh Kumar Path, B.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — # 610 & 611, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Chumchandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

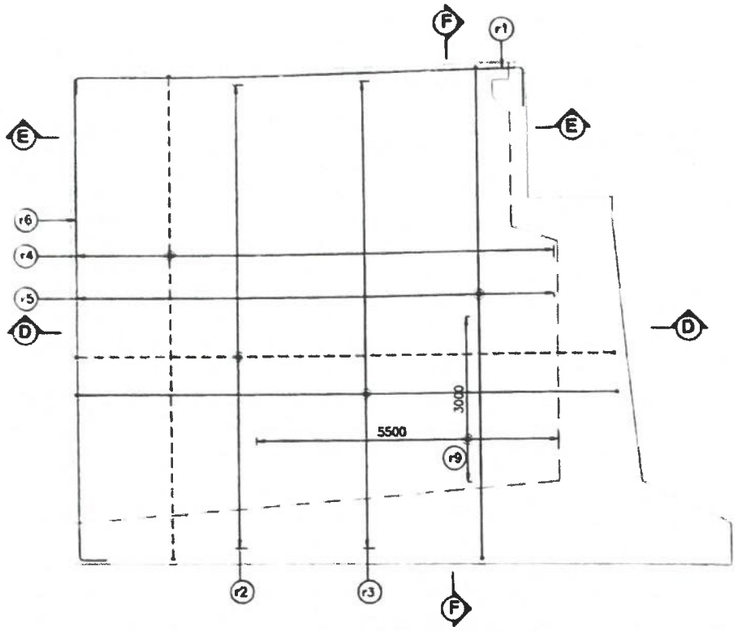
DRAWN	NP
DESIGNED	S.S
CHECKED	AB.K
DATE: JUNE - 2021	

TITLE: REINFORCEMENT DETAILS OF ABUTMENT (A2) FOOTING & SHAFT DRAWING OF MINOR BRIDGE AT CH-141+016

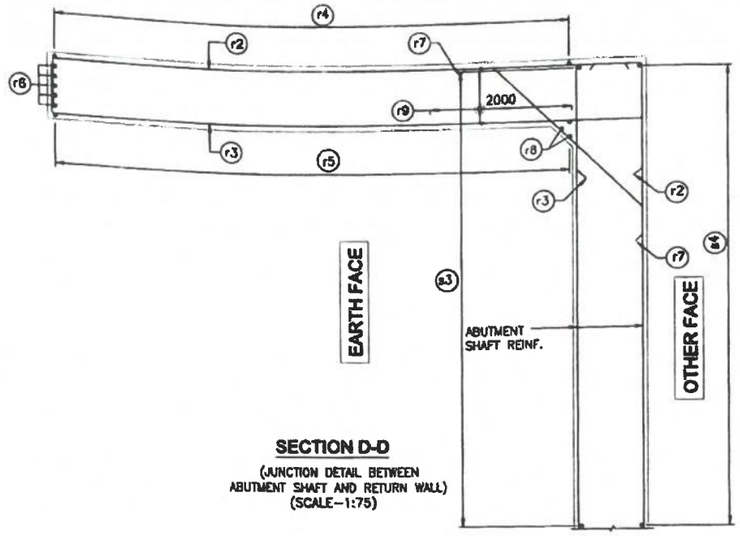
SCALE: AS SHOWN — 1 OF 1

DRG.NO: GPT/CCT/4B/STR/MJB/ ABT/206

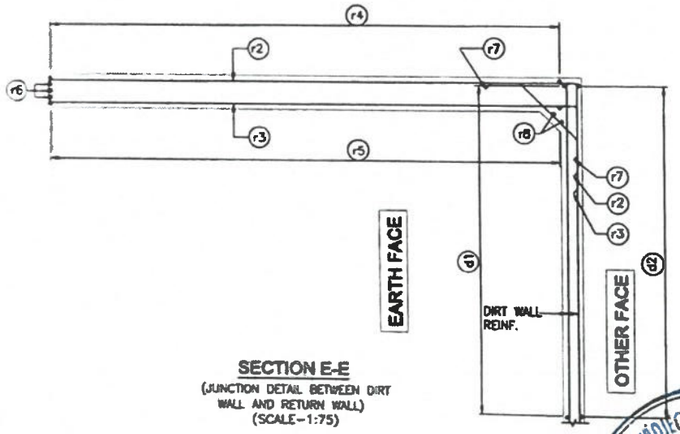
REV: R0



ELEVATION SHOWING REINF. DETAILS OF RETURN WALL
(SCALE–1:75)

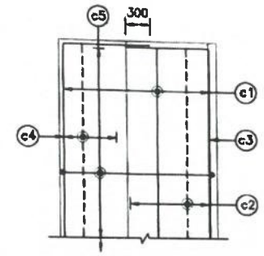


SECTION D-D
(JUNCTION DETAIL BETWEEN ABUTMENT SHAFT AND RETURN WALL)
(SCALE–1:75)

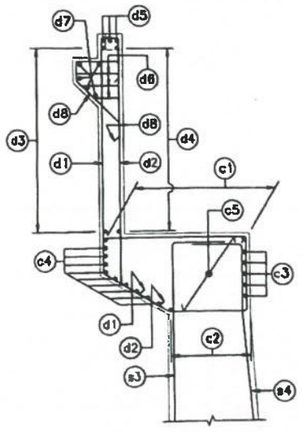


SECTION E-E
(JUNCTION DETAIL BETWEEN DIRT WALL AND RETURN WALL)
(SCALE–1:75)

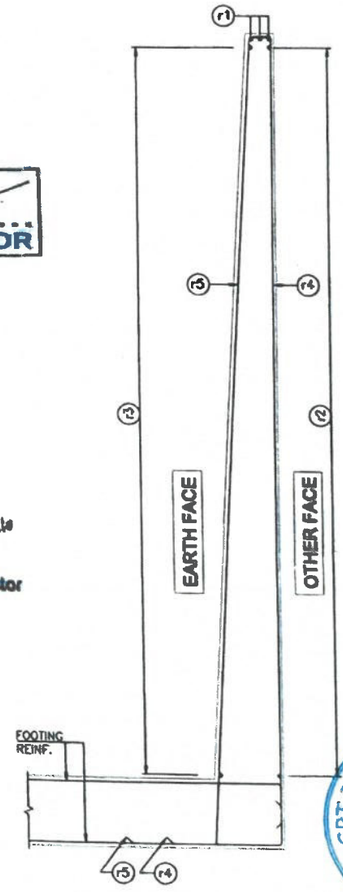
TRAFFIC DIRECTION



PLAN SHOWING REINFORCEMENT ARRANGEMENT IN ABUTMENT CAP
(SCALE–1:50)



DETAIL-'2'
SHOWING REINF. DETAILS OF ABUTMENT CAP AND DIRT WALL
(SCALE–1:50)



SECTION F-F
(SCALE–1:75)

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102-B IMPHAL In association with M/SPARK FUTURISTICS & ASSOCIATES

APPROVED

GPT Infraprojects Limited Imphal Branch 795001 Imphal

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
DIRT WALL:-			
d1	12	150 C/C	
d2	12	150 C/C	
d3	10	100 C/C	
d4	10	100 C/C	
d5	10	3 NOS.	
d6	12ø 2 LEGGED STIRRUPS @ 400 C/C TRANS. (3 LAYERS IN VERTICALLY IN STAGGERED MANNER		400 200
d7	12	5 NOS.	
d8	16	100 C/C	
RETURN WALL:-			
r1	12	3 NOS.	
r2	12	100 C/C	
r3	16	100 C/C	
r4	16	100 C/C	
r5	20	100 C/C	
r6	12	5 NOS.	
r7	12	150 C/C	
r8	12	2 NOS.	
r9	12	LINKS 100 C/C VERTICALLY & 300 C/C HORIZONTALLY	
ABUTMENT CAP:-			
c1	16	13 NOS.	
c2	16	6 NOS.	
c3	18	4 NOS.	
c4	16	3 NOS.	
c5	12	4 LEGGED STIRRUPS @ 150 C/C	

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. FOR OTHER NOTES REFER SHEET NO. 1 OF 3 OF THIS DRAWING.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/100(SH–01 OF 01)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH–01 OF 02)
   GPT/CCT/4B/STR/MJB/GAD/141+015/101(SH–02 OF 02)
2. DIMENSION DETAILS OF ABUTMENT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/205.(SH–01 OF 01)
3. REINF. DETAILS OF ABUTMENT FOOTING & SHAFT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/206.(SH–01 OF 01)
4. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/208 (SH–01 OF 01)

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH M/SPARK FUTURISTICS AND ASSOCIATES
C-6,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-97, Tankaperi Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.L.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
513 & 511, JMD Megapolis, Sector-48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

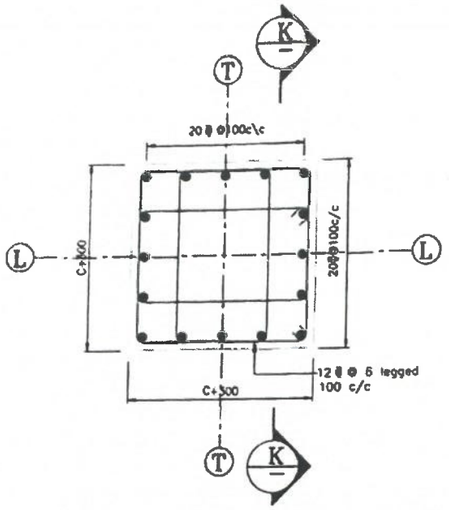
DRAWN	NP
DESIGNED	S.S
CHECKED	A.B.K
DATE: JUNE - 2021	

TITLE: REINFORCEMENT DETAILS OF RETURN WALL, ABUTMENT (A2) CAP & DIRT WALL DRAWING OF MINOR BRIDGE AT CH-141+016

SCALE: AS SHOWN 1 OF 1

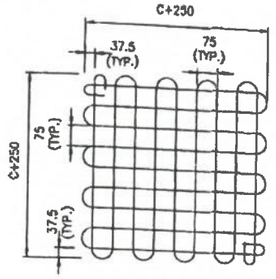
DRG. NO: GPT/CCT/4B/STR/MJB/ ABT/207

REV: R0



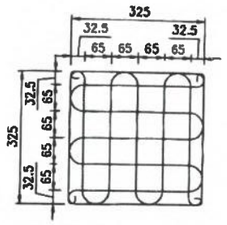
PLAN SHOWING TYPICAL REINF. DETAILS OF BEARING PEDESTAL

(SCALE 1:15)



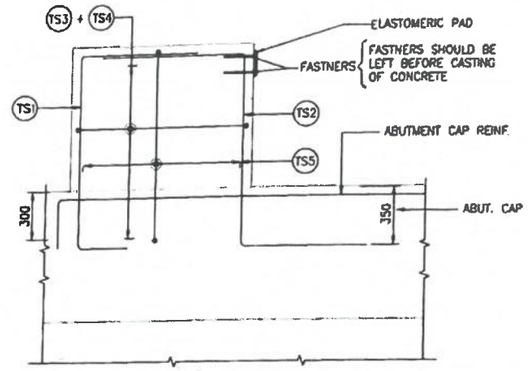
8 ϕ MESH m1

(AT EACH PEDESTAL LOCATION)
(SCALE 1:15)



DETAIL OF 8 ϕ MESH TYPE "m2"

(IN TWO LAYERS AT JACK LOCATION)
(SCALE 1:10)



SECTION J-J

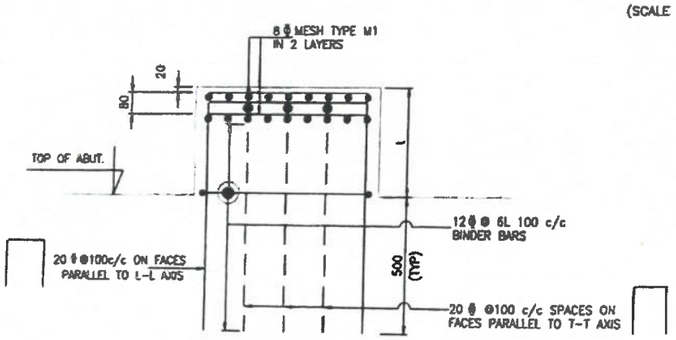
(SCALE-1:25)

PLAN SIZE OF PEDESTAL SHALL BE (C+300) X (C+300)
WHERE "C" IS THE DIA OF BEARING (MAX 700MM)

t = HEIGHT OF PEDESTAL (MAX 500MM)
= H-BEARING HEIGHT
H = HEIGHT BEARING+PEDESTAL

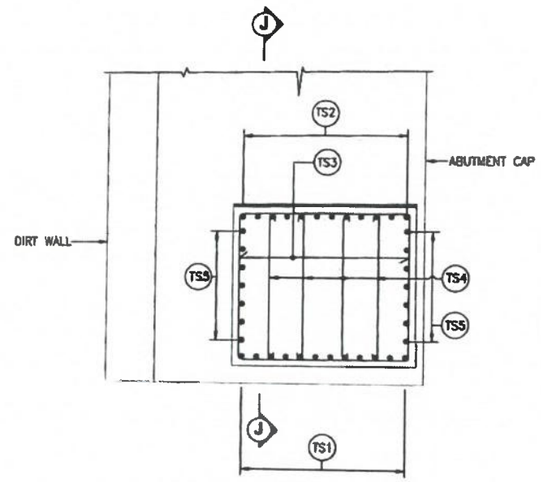
REINFORCEMENT DETAILS:-

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
TRANSVERSE SEISMIC STOPPER:-			
TS1	20	12 NOS.	200 / 1500
TS2	32	12 NOS.	
TS3	2 LEGGED 16ϕ STIRRUPS TIED TO VERTICALLY BARS @ 100 C/C VERTICALLY		
TS4	2 LEGGED 3 NOS. 12 DIA STIRRUPS 4 LAYERS.		
TS5	12	3 NOS.	



SECTION K-K (C+300)X(C+300) PEDESTAL

(SCALE 1:15)



TRAFFIC DIRECTION

PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER ON ABUTMENT CAP

(SCALE-1:25)

GPT Infraprojects Limited
Imphal Branch
795001
Imphal

APPROVED

DESIGN DIRECTOR

SUVADRA CONSULTANTS
Regd. No- 11/2004-05
BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. MESH TYPE M1' SHALL BE PROVIDED IN ABUTMENT CAP AT BEARING LOCATIONS AND MESH TYPE 'M2' SHALL BE PROVIDED AT JACK LOCATION IN TWO LAYER AT 20mm AND AT 100mm FROM TOP OF CONCRETE.
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786
4. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
5. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/100(SH-01 OF 01)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-01 OF 02)
   GPT/CCT/4B/STR/MJB/GAD/141+016/101(SH-02 OF 02)
2. DIMENSION DETAILS OF ABUTMENT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/205(SH-01 OF 01)
3. REINF. DETAILS OF ABUTMENT FOOTING & SHAFT.
   GPT/CCT/4B/STR/MJB/141+016/ABT/206(SH-01 OF 01)
4. REINF. DETAILS OF RETURN WALL, ABUT CAP AND DIRT WALL (ABT).
   GPT/CCT/4B/STR/MJB/141+016/ABT/207(SH-01 OF 01)

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NAIDCL

EPC CONTRACTOR: GPT
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES
C-8,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, B.I.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
D 518 & 611, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	HP
DESIGNED	S.B
CHECKED	AB.K

TITLE: DIMLA REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL FOR MINOR BRIDGE AT CH-141+016 (A2)

SCALE: AS SHOWN 1 OF 1

REV: R0

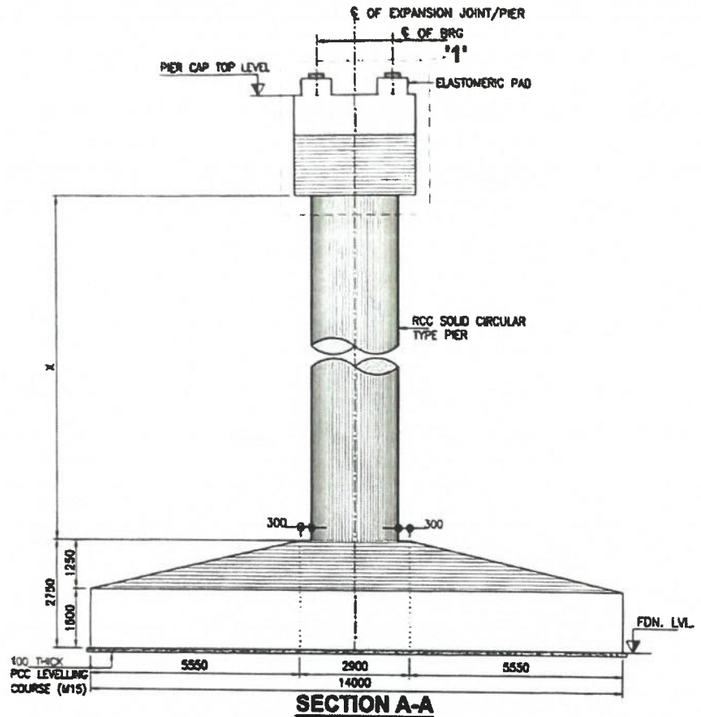
DATE: JUNE - 2021

DRG.NO: GPT/CCT/4B/STR/MJB/ABT/206

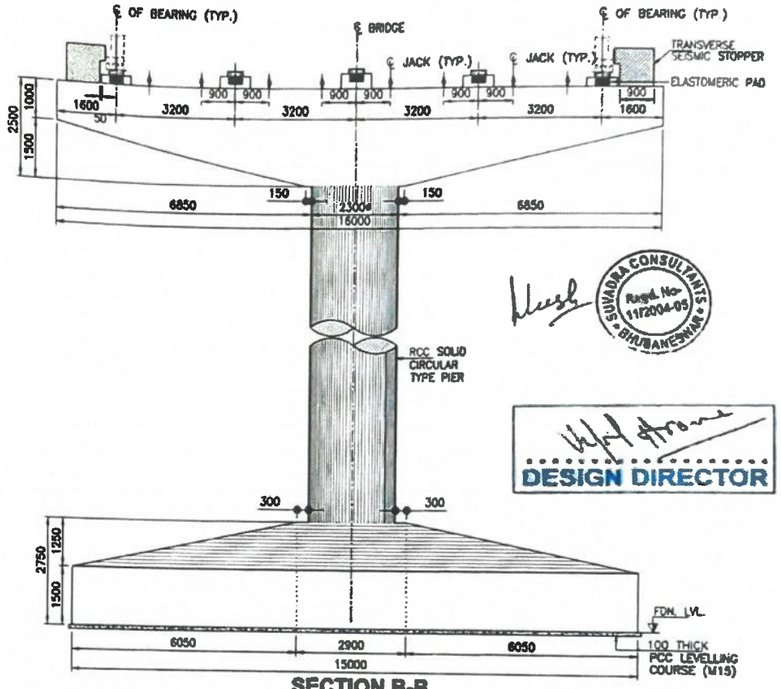
PIER-P1

APPROVED

GPT Infraprojects Limited
Imphal Branch
795001
Imphal



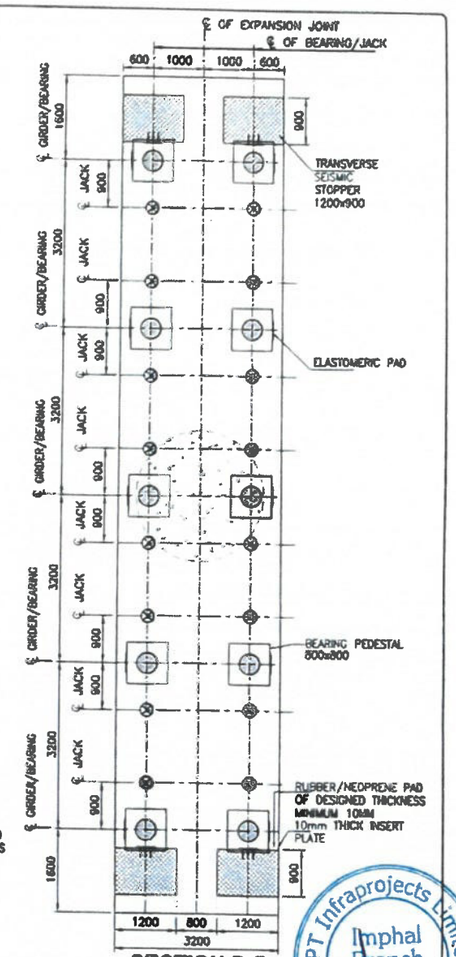
SECTION A-A
(SCALE-1:100)



SECTION B-B
(SCALE-1:100)

SUVADRA CONSULTANTS Regd. No: 11/2004-05 BHUBANESWAR

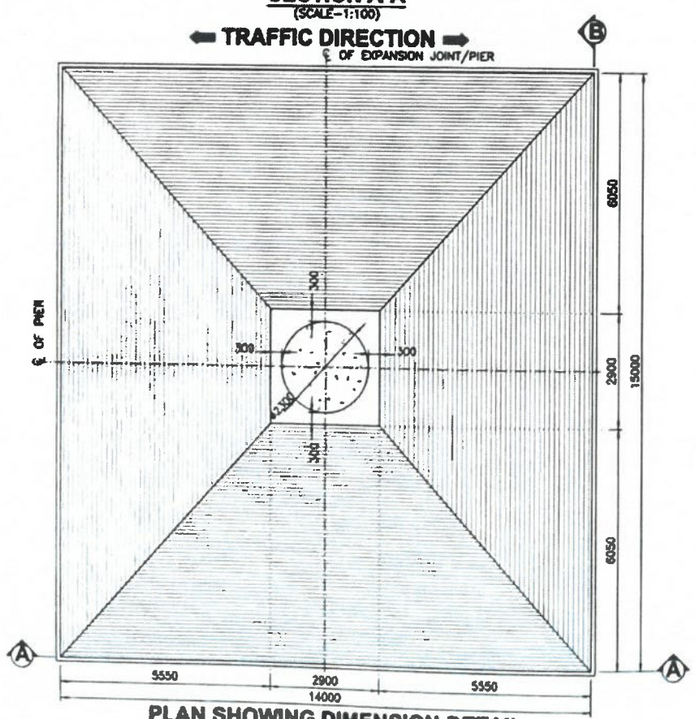
DESIGN DIRECTOR



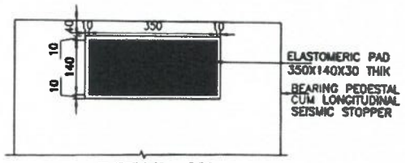
SECTION D-D
(SCALE-1:75)

GPT Infraprojects Limited Imphal Branch 795001 Imphal

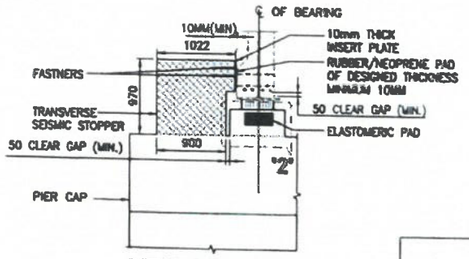
⬅ TRAFFIC DIRECTION ➡



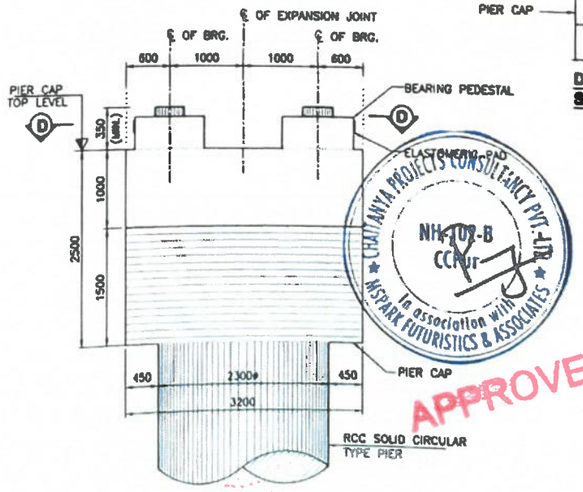
PLAN SHOWING DIMENSION DETAIL OF PIER FOOTING AND PIER SHAFT
(SCALE-1:100)



DETAIL - '2'
(SCALE-1:10)



DETAIL OF TRANSVERSE SEISMIC STOPPER
(SCALE-1:50)



DETAIL - '1'
(SCALE-1:50)

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102-B CCKur In association with MSPARK FUTURISTICS & ASSOCIATES

APPROVED

PIER P1	CAP TOP LVL.	FOUNDING LVL.	HEIGHT OF SHAFT
	479.976	463.500	11.754m

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
2. CONCRETE SHALL BE DESIGN MIX UNLESS OTHERWISE SPECIFIED IN DETAILED DRAWINGS, AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES FOR ALL ELEMENTS OF STRUCTURES AS INDICATED BELOW:
   a) PCC LEVELING COURSE M15
   b) FOUNDATION M35
   c) SUBSTRUCTURE M35
   d) BEARING PEDESTAL M45
   e) SEISMIC STOPPER M45
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
   a) FOUNDATION 75mm
   b) PIER CAP & SEISMIC STOPPER 50mm
   c) SUB STRUCTURE:- 50mm
5. ● SHOWN JACK LOCATION IN PLAN AND ⦶ SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.
6. SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 60T/Sqm. THE SAME SHALL BE VALIDATED AT SITE BEFORE EXECUTION OF WORK BY PLATE LOAD TEST AT DESIGN FOUNDING LEVEL.

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/101 (SH. 1 OF 1)
   GPT/CCT/4B/STR/MJB/GAD/141+016/102 (SH. 1 OF 3)
2. REINFORCEMENT DETAILS OF PIER P1.
   GPT/CCT/4B/STR/MJB/SUB/251
   GPT/CCT/4B/STR/MJB/SUB/252
   GPT/CCT/4B/STR/MJB/SUB/253

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NAIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-8,2ND FLOOR, R.K TOWER, SECTOR-6 VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-62, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	MP
DESIGNED	S.S
CHECKED	A.B.K
DATE: JUNE - 2021	

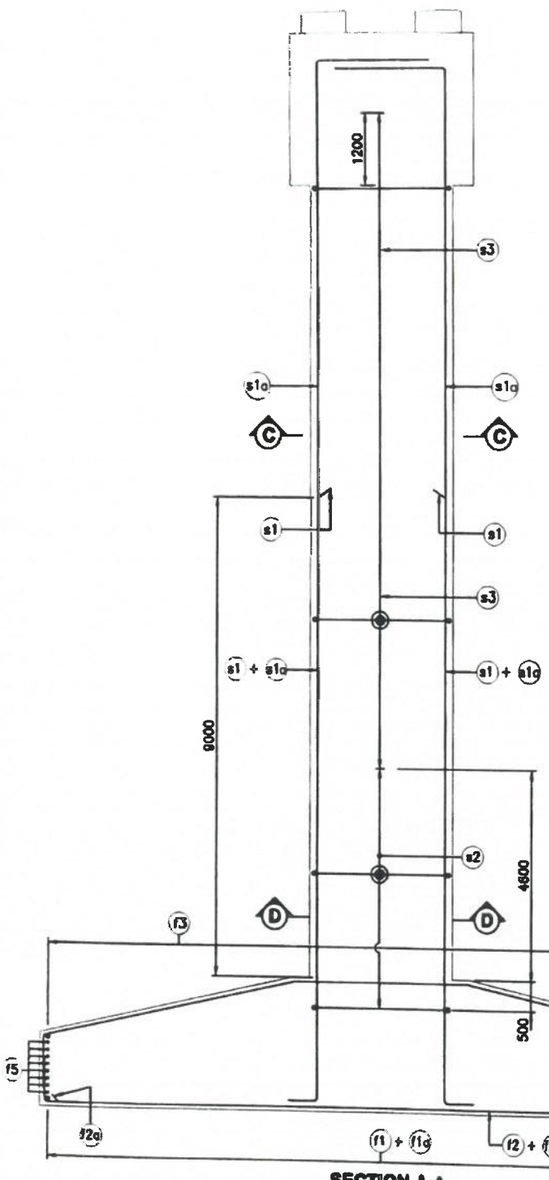
TITLE: DIMENSION DETAILS OF PIER (P1) FOR MAJOR BRIDGE AT CH-141+016.

SCALE: AS SHOWN — 1 OF 1

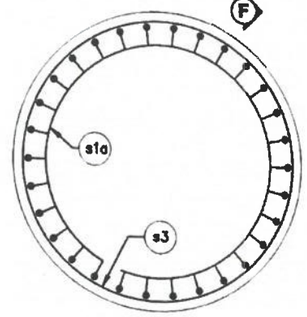
REV: R0

DRG.NO: GPT/CCT/4B/STR/MJB/SUB/250

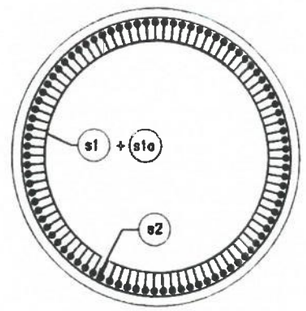
Z:\01_SPS PROJECT\06_MANIPUR\PACKAGE-4B\01_Drawings\01_Major Bridge\MJB STRUCTURE\KEY\GPT-CCT-4B-STR-MJB-SUB-141+016_250-P1.dwg 28-Jun-21



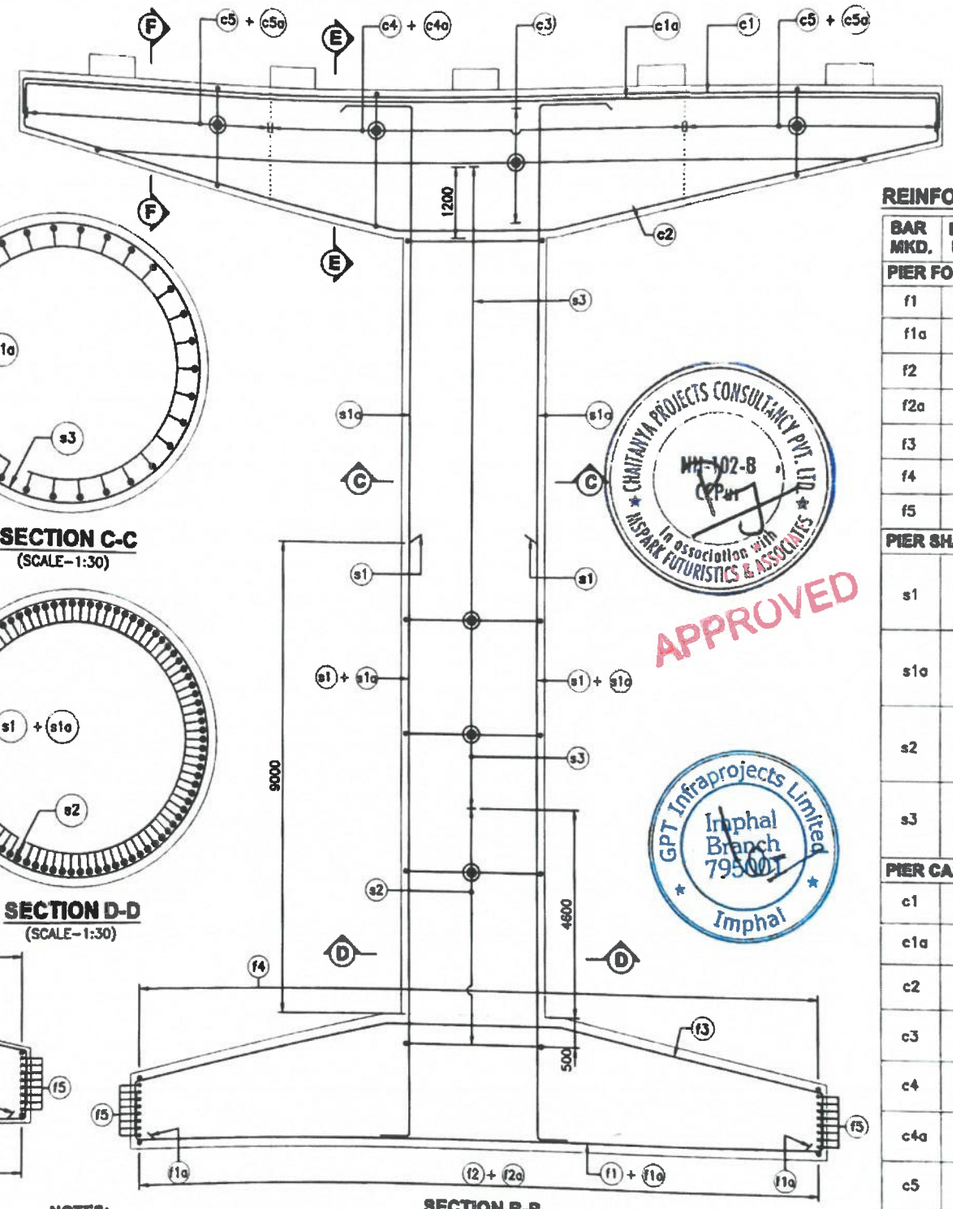
SECTION A-A
(SCALE-1:60)



SECTION C-C
(SCALE-1:30)



SECTION D-D
(SCALE-1:30)



SECTION B-B
(SCALE-1:60)

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
PIER FOOTING:-			
f1	25	180 C/C	800 800
f1a	25	180 C/C	
f2	25	180 C/C	800 800
f2a	25	180 C/C	
f3	16	90 C/C	800 800
f4	16	90 C/C	800 800
f5	16	4x8 NOS.	300 300
PIER SHAFT:-			
s1	32	28 NOS.(ALTERNATE WITH s1a)	500
s1a	32	56 NOS.	2000 500
s2	20	85 C/C	350 (MIN. LAP)
s3	16	85 C/C	350 (MIN. LAP)
PIER CAP:-			
c1	32	28 NOS. (IN FIRST LAYER)	800 800
c1a	32	28 NOS. (IN SECOND LAYER)	800 800
c2	20	28 NOS.	500 500
c3	20	100 C/C	1750 1750 LENGTH VARIES
c4	16 ϕ 2 LEGGED STIRRUP @ 100 C/C		
c4a	16 ϕ 8 LEGGED STIRRUPS @ 100 C/C		
c5	16 ϕ 2 LEGGED STIRRUP @ 100 C/C		
c5a	16 ϕ 8 LEGGED STIRRUPS @ 100 C/C		

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

LEGEND:-

REINFORCEMENT AT TOP FACE	————
REINFORCEMENT AT BOTTOM FACE	- - - - - - - -

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/101 (SH. 1 OF 1)
   GPT/CCT/4B/STR/MJB/GAD/141+016/102 (SH. 1 OF 3)
2. DIMENSIONS DETAILS OF PEIR.
   GPT/CCT/4A/STR/MJB/SUB/250 (SH. 1 OF 1)
3. REINFORCEMENT DETAILS OF PIER P1.
   GPT/CCT/4A/STR/MJB/SUB/252 (SH. 1 OF 1)
   GPT/CCT/4A/STR/MJB/SUB/253 (SH. 1 OF 1)

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with ASPARK FUTURISTICS & ASSOCIATES
MH-302-B
APPROVED

GPT Infraprojects Limited Imphal Branch 795001 Imphal

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH M/SPARK FUTURISTICS AND ASSOCIATES — C-8,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankagani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-62, Rajesh Kumar Path, S.I.Pud, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — S 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	KP
DESIGNED	S.S
CHECKED	A.S.K
DATE: JUNE - 2021	

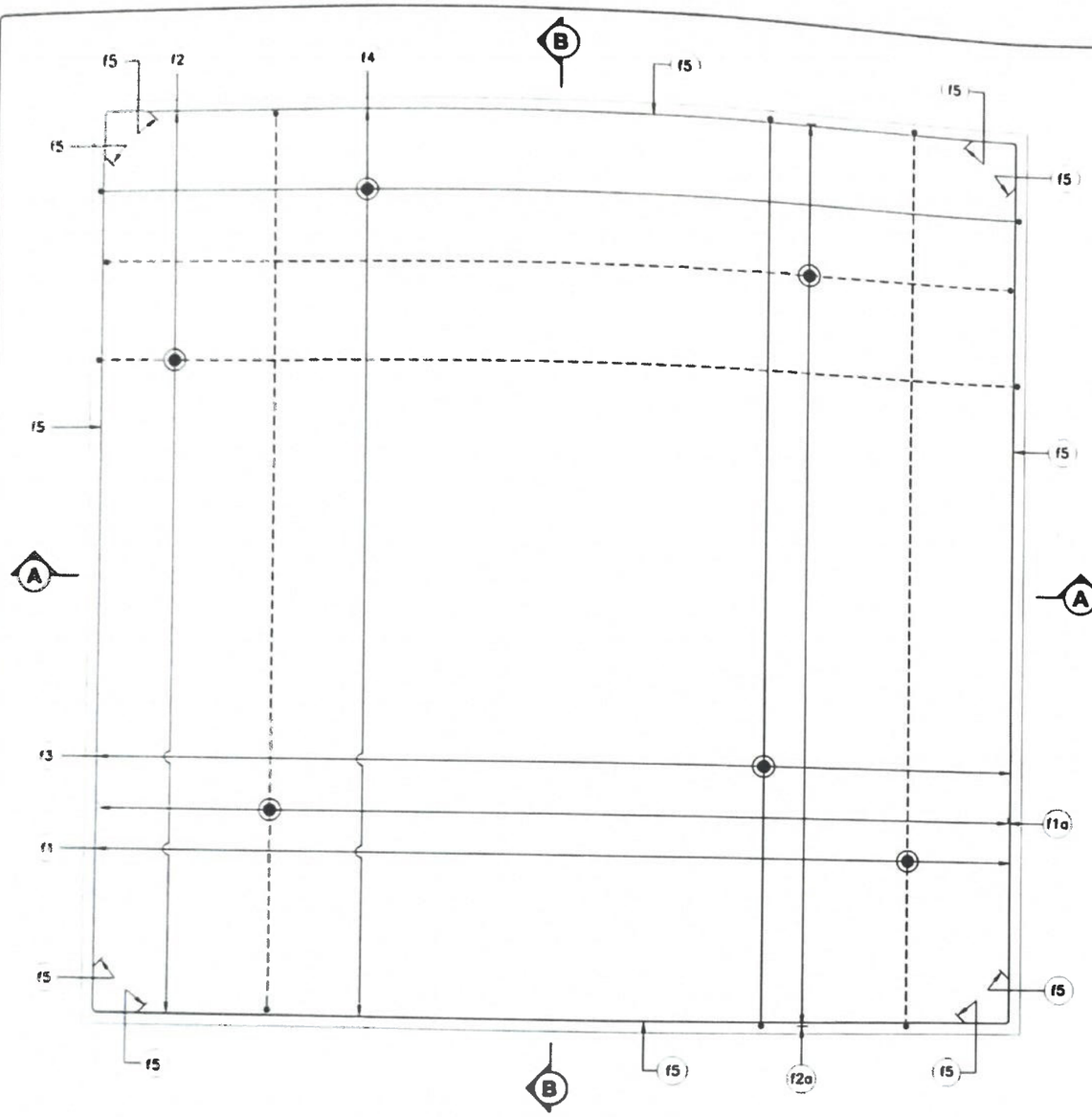
TITLE: REINFORCEMENT DETAILS OF PIER P1 MAJOR BRIDGE AT CH-141+016.

SCALE: AS SHOWN — 1 OF 3

REV: R0

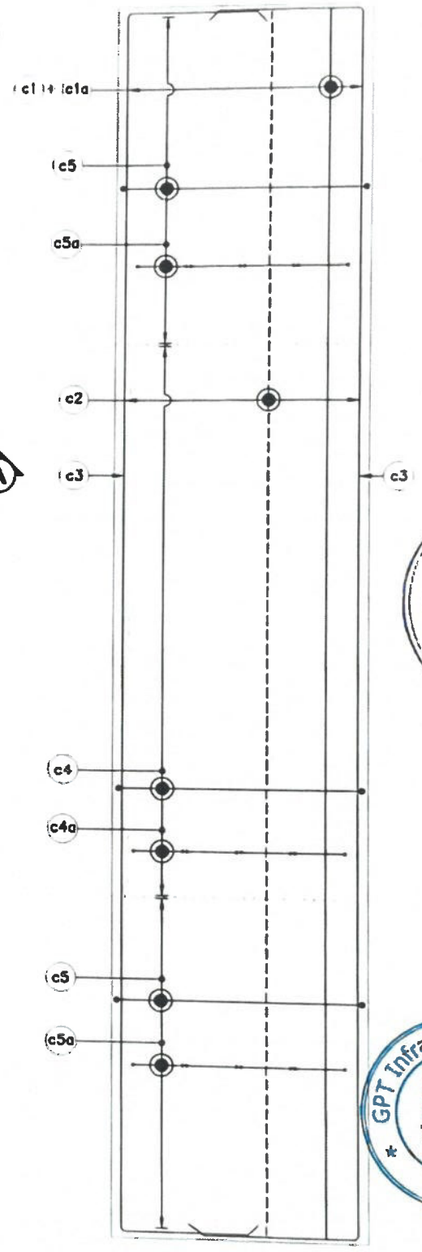
DRG. NO: GPT/CCT/4B/STR/MJB/SUB/251

Z:\01_SPS PROJECTS_MANIPUR\PACKAGE-4B\01_Drawings\01_Major Bridge\SUB STRUCTURE\R0\GPT-CCT-4B-STR-MJB-SUB-141+016_251-P1.dwg 29-Jun-21



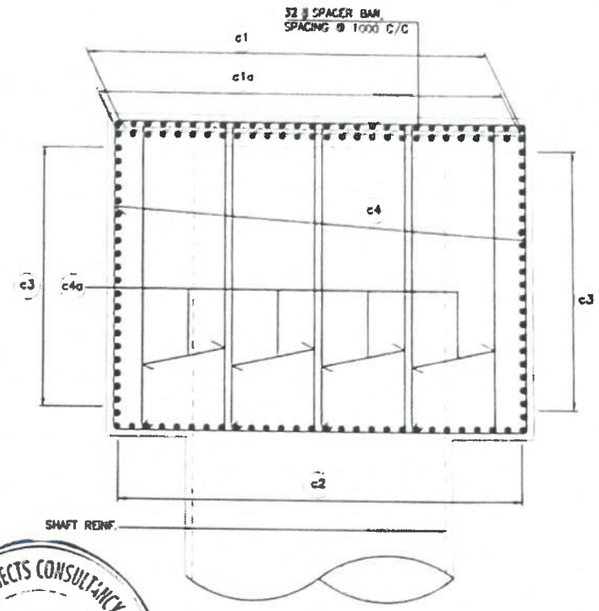
PLAN SHOWING REINFORCEMENT DETAIL OF PIER FOOTING

(SCALE-1:50)



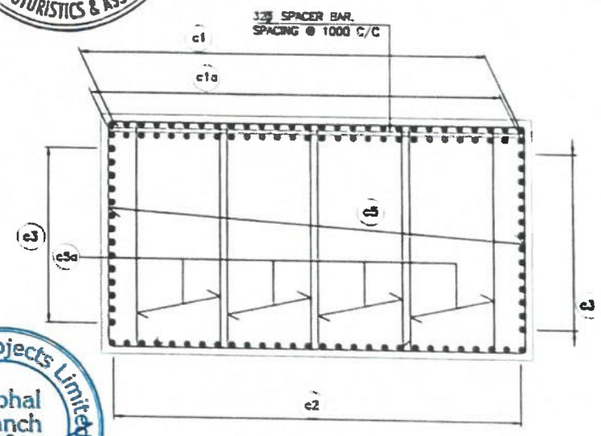
PLAN SHOWING REINFORCEMENT DETAIL OF PIER CAP

(SCALE-1:50)



SECTION E-E

(SCALE-1:30)



SECTION F-F

(SCALE-1:30)

DESIGN DIRECTOR

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/101 (SH. 1 OF 1)
   GPT/CCT/4B/STR/MJB/GAD/141+016/102 (SH. 1 OF 3)
2. DIMENSIONS DETAILS OF PEIR.
   GPT/CCT/4A/STR/MJB/SUB/250 (SH 1 OF 1)
3. REINFORCEMENT DETAILS OF PIER P1.
   GPT/CCT/4A/STR/MJB/SUB/251 (SH. 1 OF 1)
   GPT/CCT/4A/STR/MJB/SUB/253 (SH 1 OF 1)

LEGEND:-

REINFORCEMENT AT TOP FACE	————
REINFORCEMENT AT BOTTOM FACE	- - - - - - - - - -

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with ASPARK FUTURISTICS & ASSOCIATES — WH-102-B CCPG

APPROVED

GPT Infraprojects Limited Imphal Branch 795001 Imphal

SUVADRA CONSULTANTS BHUBANESWAR Regd. No 117/2004-05

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

Rev	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH M/SPARK FUTURISTICS AND ASSOCIATES, C-4 3rd FLOOR, R.K TOWER, SECTOR-4 VAISHALI GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-07, Tankapani Road, BBSR-14, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-52, Rajesh Kumar Path, 3 b Pat. Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd., 8 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN: NB
DESIGNED: S.S
CHECKED: A.S.K
DATE: JUNE - 2021

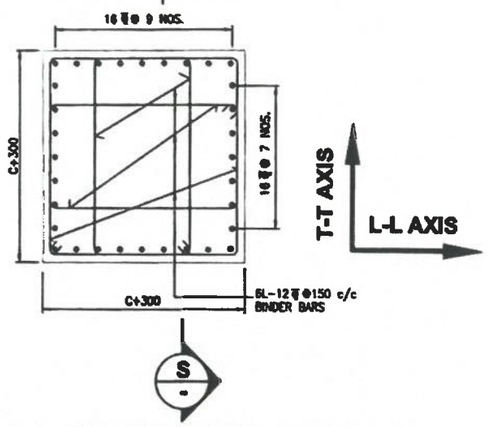
TITLE: REINFORCEMENT DETAILS OF PIER P1 MAJOR BRIDGE AT CH-141+016.

SCALE: AS SHOWN — 2 OF 3

REV: R0

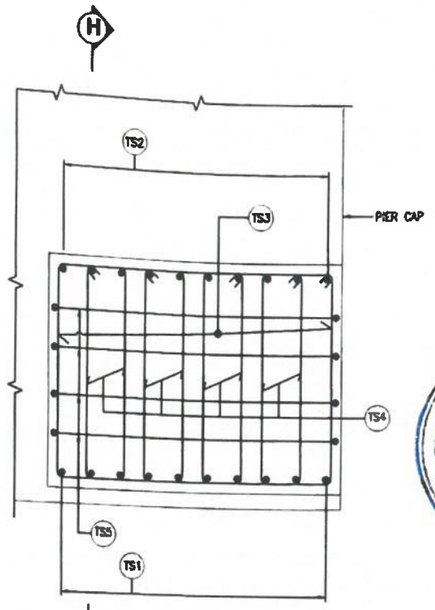
DRG. NO: GPT/CCT/4B/STR/MJB/SUB/252

Z:\01_SPS PROJECTS\8_MANIPUR\PACKAGE-4B\P1_ Drawings\01_Major Bridge\SUB STRUCTURE\PIER\GPT-CCT-4B-STR-MJB-SUB-141+016_251-P1.dwg 29-Jun-21



PLAN SHOWING TYPICAL REINF. DETAILS OF BEARING PEDESTAL

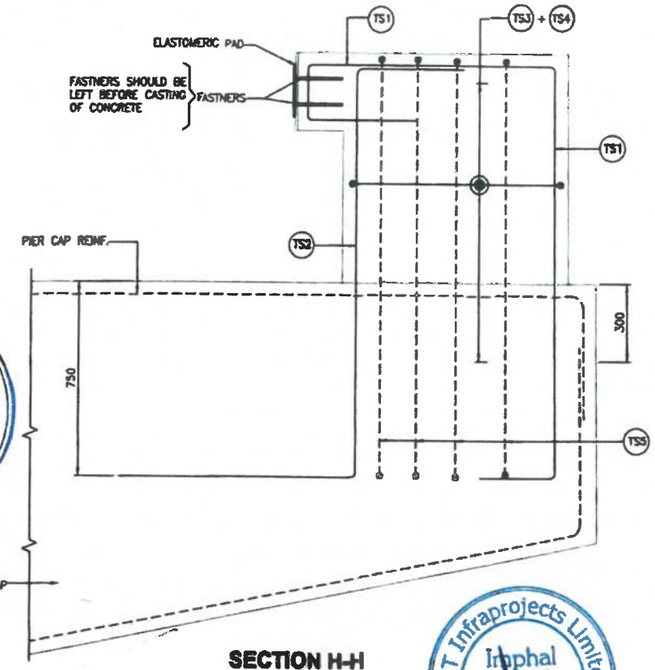
(SCALE 1:15)



⬅ TRAFFIC DIRECTION ➡

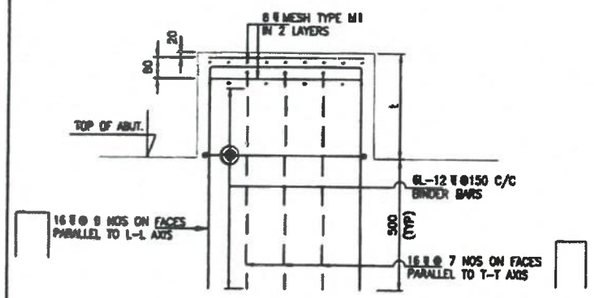
PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER

(SCALE-1:15)



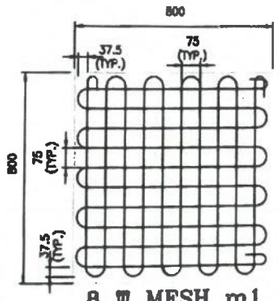
SECTION H-H

(SCALE-1:15)



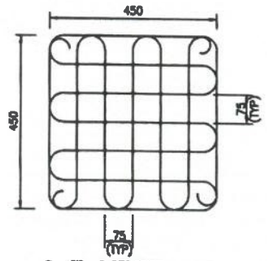
SECTION S-S

(SCALE 1:15)



8 ⌀ MESH m1

(AT EACH PEDESTAL LOCATION)
(SCALE-1:15)



8 ⌀ MESH m2

(AT EACH JACK LOCATION AND TEMPORARY SUPPORT)
(SCALE-1:10)

TRANSVERSE SEISMIC STOPPER

TS1	16	10 NOS.	200
TS2	25	10 NOS.	1500
TS3	2 LEGGED 12 ⌀ STIRRUPS TIED TO VERTICALLY BARS @ 100 C/C VERTICALLY		
TS4	8 LEGGED NO. 12 ⌀ STIRRUPS @100 C/C VERTICALLY		
TS5	2 LEGGED 12 ⌀ @100 C/C		

APPROVED

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

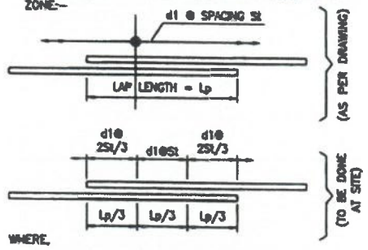
SIZE OF BEARING PEDESTAL SHALL BE (C+300) x (C+300) WHERE "C" IS THE DIA OF BEARING

t = HEIGHT OF PEDESTAL
= H-BEARING HEIGHT
H = HEIGHT OF BEARING+PEDESTAL

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. MESH TYPE M1' SHALL BE PROVIDED IN PIER CAP AT BEARING LOCATIONS AND MESH TYPE 'M2' SHALL BE PROVIDED AT JACK LOCATION IN TWO LAYER AT 20mm AND AT 100mm FROM TOP OF CONCRETE.
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. LAP/SPLICES SHALL BE PROVIDED AS PER CLAUSE NO. 15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 72⌀.

   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



   WHERE,

   d1= DIA OF TRANSVERSE REINFORCEMENT.

   St= SPACING OF TRANSVERSE REINFORCEMENT.

5. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
6. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/101 (SH. 1 OF 1)
   GPT/CCT/4B/STR/MJB/GAD/141+016/102 (SH. 1 OF 3)
2. DIMENSIONS DETAILS OF PIER.
   GPT/CCT/4A/STR/MJB/SUB/250 (SH. 1 OF 1)
3. REINFORCEMENT DETAILS OF PIER P1.
   GPT/CCT/4A/STR/MJB/SUB/251 (SH. 1 OF 1)
   GPT/CCT/4A/STR/MJB/SUB/252 (SH. 1 OF 1)

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT JC - 26, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD, IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-8,2ND FLOOR, R.K TOWER, SECTOR-4 VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA Consultants PP-87, Tankapani Road, BBSR-15, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. S-52, Rajesh Kumar Path, S.I.P.cut, Beltrg Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. S 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 135.000 to Km 141.020 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	NP
DESIGNED	S.G
CHECKED	A.B.K
DATE: JUNE - 2021	

TITLE: REINFORCEMENT DETAILS OF PIER P1 MAJOR BRIDGE AT CH-141+016.

SCALE: AS SHOWN 3 OF 3

REV: R0

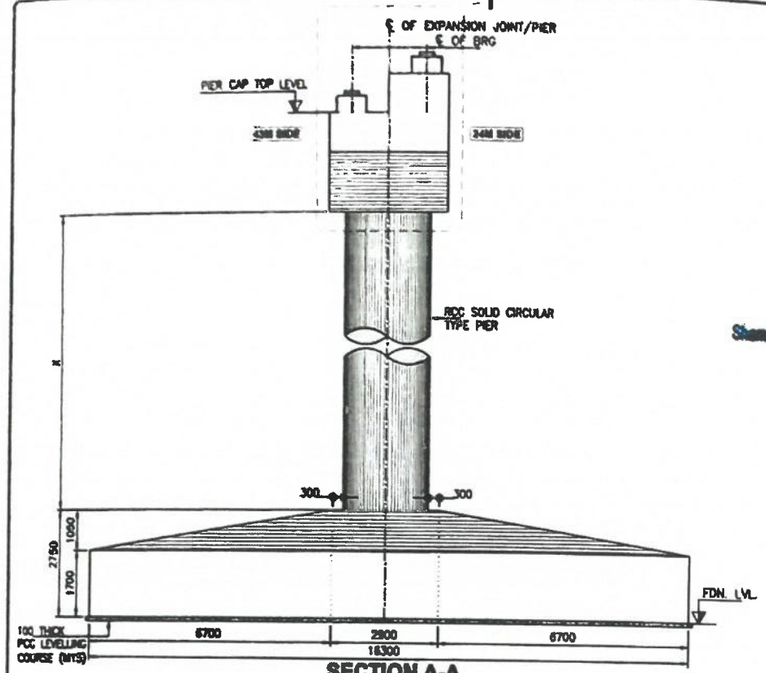
DRG.NO: GPT/CCT/4B/STR/MJB/SUB/250

2021_SPS PROJECTS_SHARE\PACKAGE-4B_Structural\1_Major Bridge\MJB STRUCTURE\PIER\GPT-CCT-4B-STR-MJB-SUB-141+016_101-P1.dwg 28-Jun-21

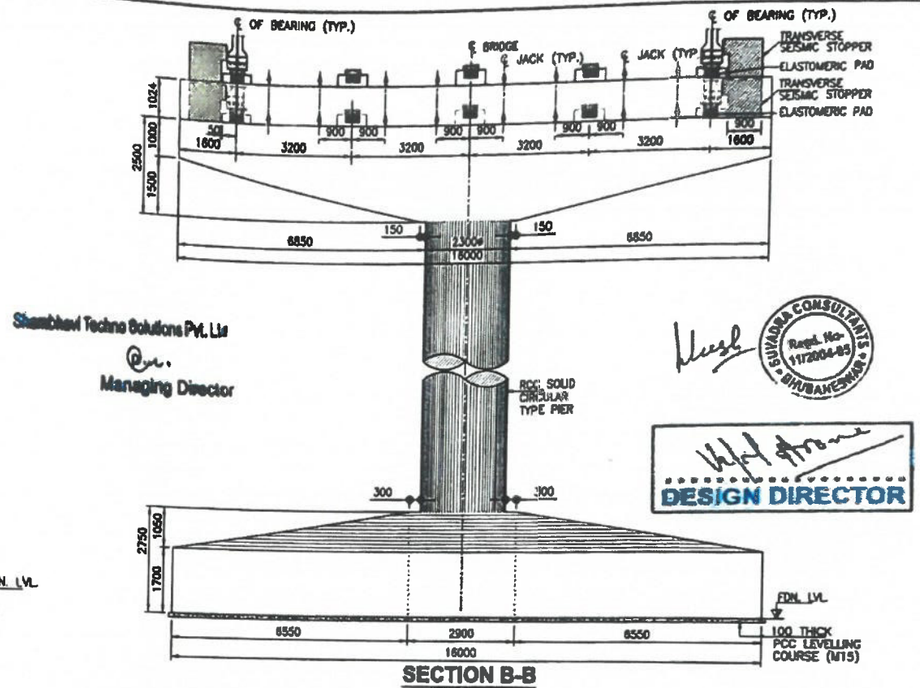
PIER-P2

GPT Infraprojects Limited
Imphal Branch
795001
Imphal

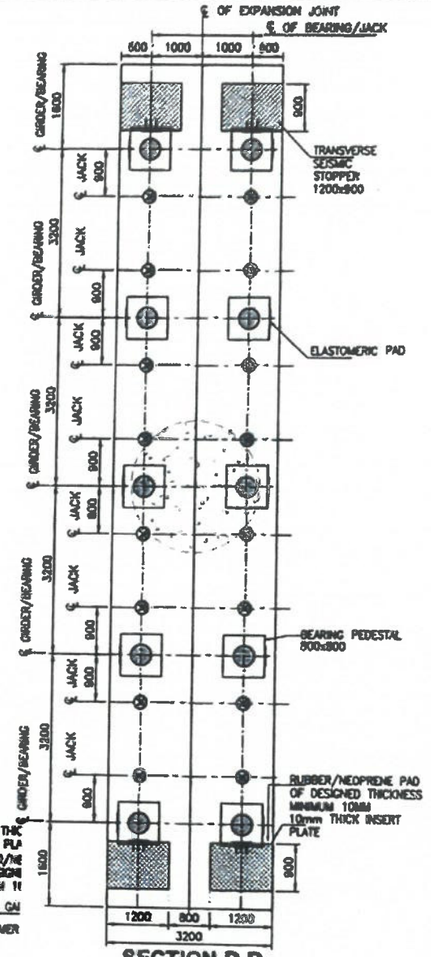
APPROVED



SECTION A-A
(SCALE-1:100)



SECTION B-B
(SCALE-1:100)



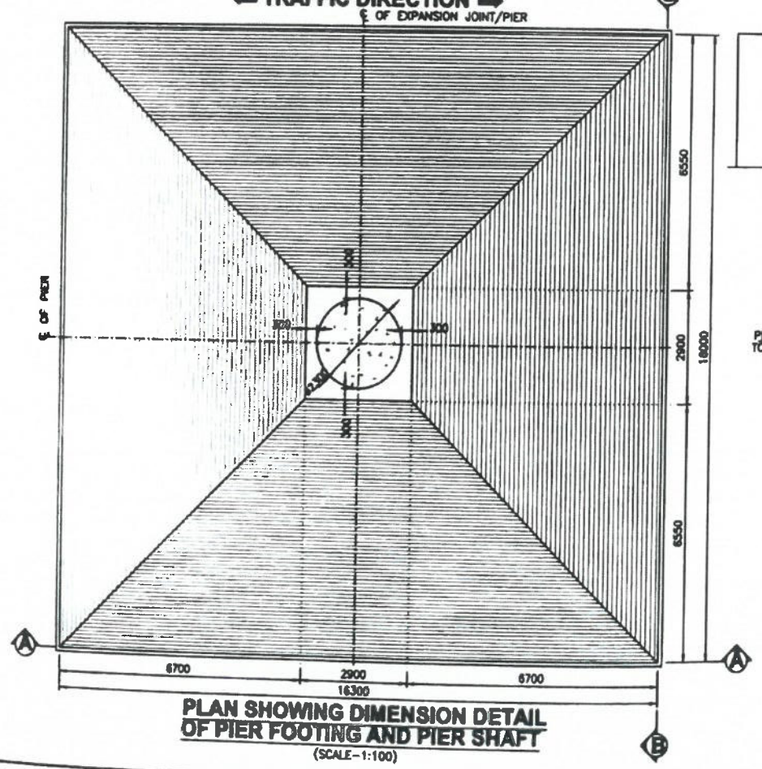
SECTION D-D
(SCALE-1:75)

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

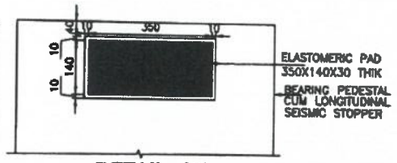
SUVADRA CONSULTANTS Regd. No- 1172004-05 BHUBANESWAR

DESIGN DIRECTOR

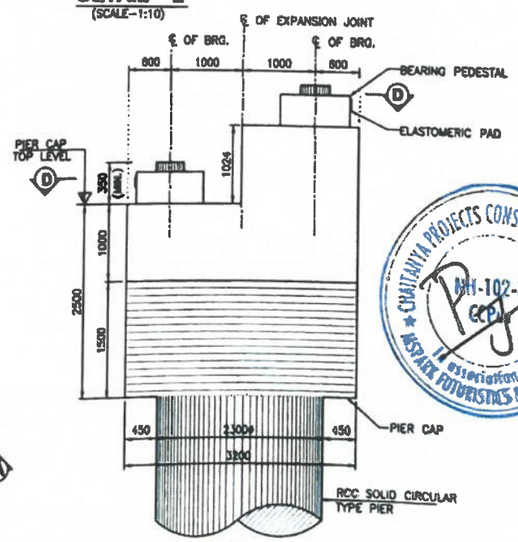
⬅ TRAFFIC DIRECTION ➡



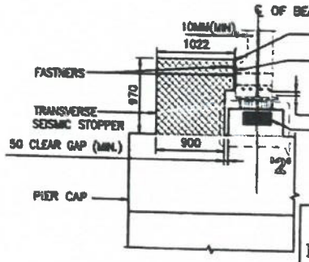
PLAN SHOWING DIMENSION DETAIL OF PIER FOOTING AND PIER SHAFT
(SCALE-1:100)



DETAIL - '2'
(SCALE-1:10)



DETAIL - '1'
(SCALE-1:50)



PIER P1	CAP TOP LVL.	FOUNDING LVL.	HEIGHT OF SHAFT "X"
	479.976	463.500	11.754m

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. MH-102-B association with MSPARK FUTURISTICS & ASSOCIATES

GPT Infraprojects Limited Imphal Branch 795001 Imphal

APPROVED

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
2. CONCRETE SHALL BE DESIGN MIX UNLESS OTHERWISE SPECIFIED IN DETAILED DRAWINGS, AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES FOR ALL ELEMENTS OF STRUCTURES AS INDICATED BELOW:
   a) PCC LEVELING COURSE M15
   b) FOUNDATION M35
   c) SUBSTRUCTURE M35
   d) BEARING PEDESTAL M45
   e) SEISMIC STOPPER M45
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe5000) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
   a) FOUNDATION 75mm
   b) PIER CAP & SEISMIC STOPPER 50mm
   c) SUB STRUCTURE:- 50mm
5. ● SHOWN JACK LOCATION IN PLAN AND ▮ SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.
6. SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 60T/Sqm. THE SAME SHALL BE VALIDATED AT SITE BEFORE EXECUTION OF WORK BY PLATE LOAD TEST AT DESIGN FOUNDING LEVEL.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/101 (SH. 1 OF 1)
   GPT/CCT/4B/STR/MJB/GAD/141+016/102 (SH. 1 OF 3)
2. REINFORCEMENT DETAILS OF PIER P1.
   GPT/CCT/4B/STR/MJB/SUB/255
   GPT/CCT/4B/STR/MJB/SUB/256
   GPT/CCT/4B/STR/MJB/SUB/257

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C.A.2ND FLOOR, S.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-37, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-52, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — 3518 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

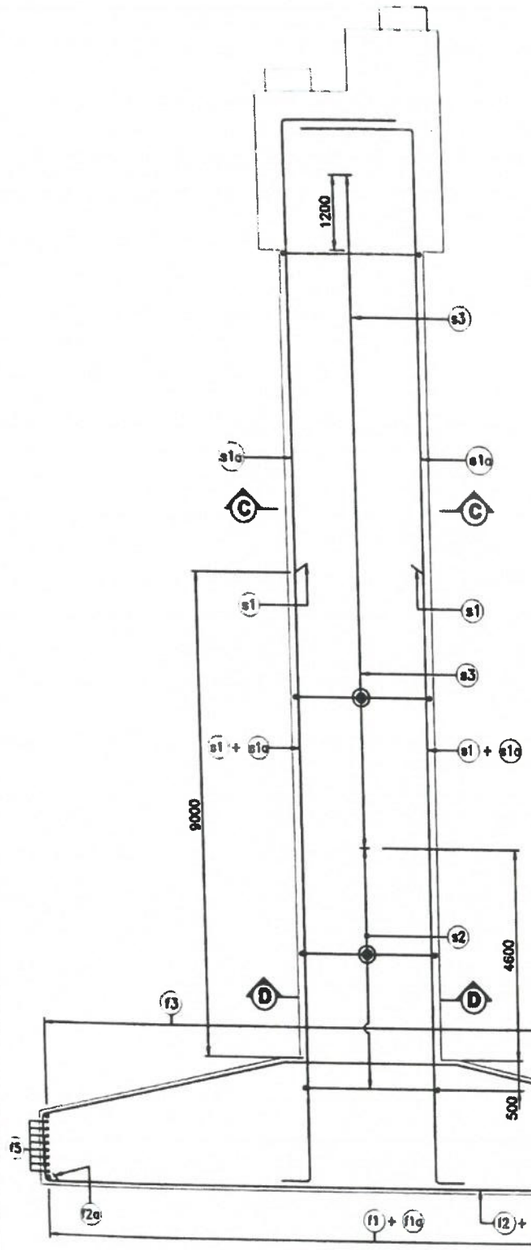
DRAWN	HP
DESIGNED	S.S
CHECKED	A.S.K
DATE: JUNE - 2021	

TITLE: DIMENSION DETAILS OF PIER (P2) FOR MAJOR BRIDGE AT CH-141+016.

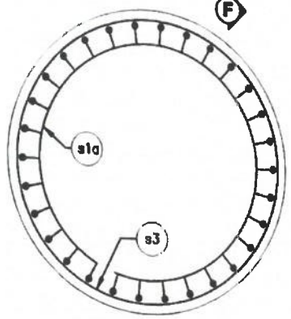
SCALE: AS SHOWN — 1 OF 1

DRG.NO: GPT/CCT/4B/STR/MJB/SUB/254

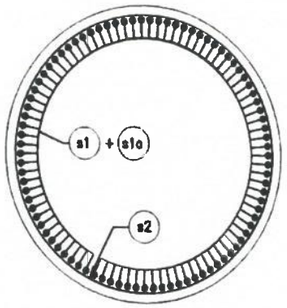
REV: R0



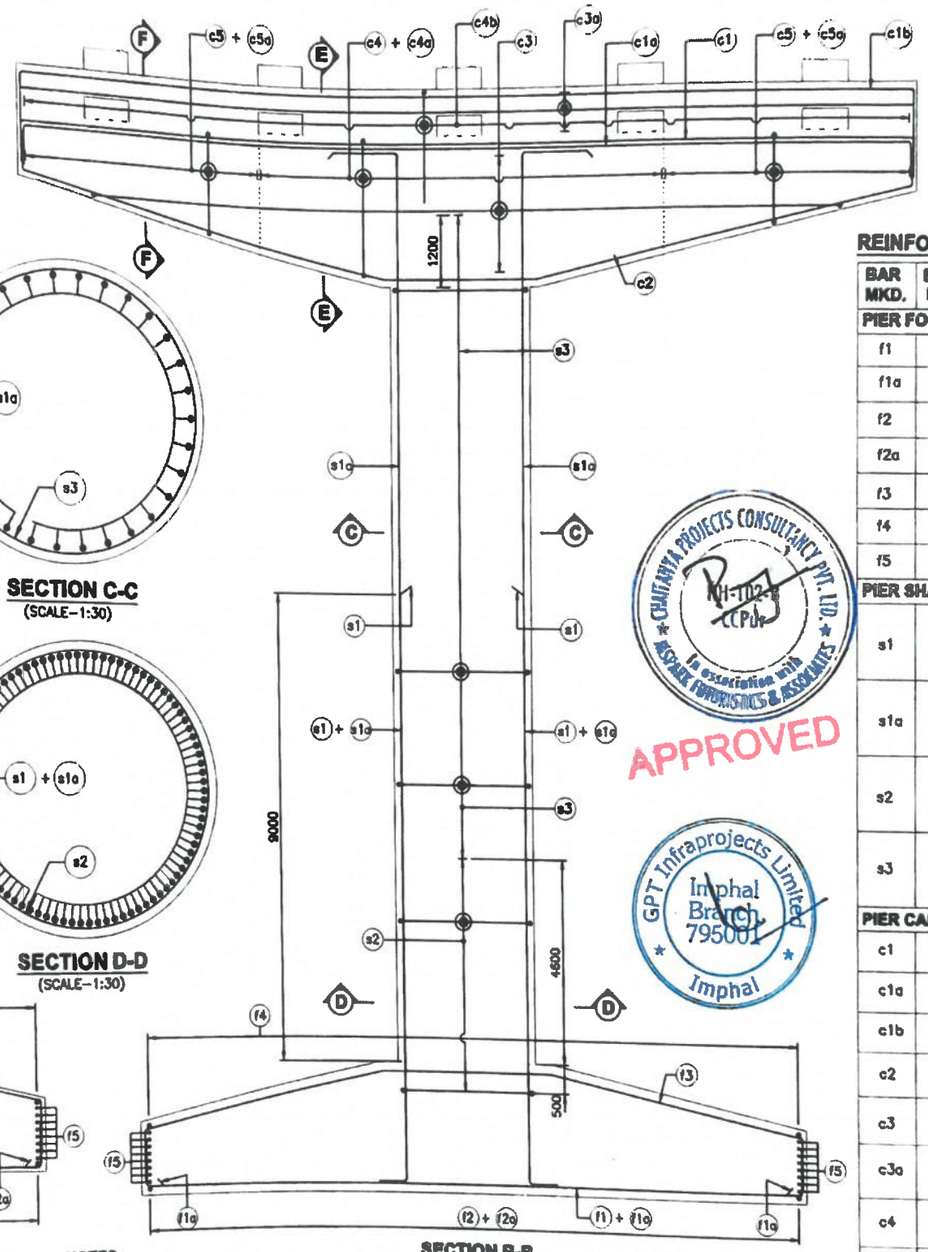
SECTION A-A
(SCALE-1:60)



SECTION C-C
(SCALE-1:30)



SECTION D-D
(SCALE-1:30)



SECTION B-B
(SCALE-1:60)

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

CHAITANYA PROJECTS CONSULTANCY PVT. LTD.
In association with
MISPARK FUTURISTICS & ASSOCIATES

APPROVED

GPT Infraprojects Limited
Imphal Branch
795001
Imphal

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
PIER FOOTING:-			
f1	25	160 C/C	800 800
f1a	25	160 C/C	
f2	25	160 C/C	800 800
f2a	25	160 C/C	
f3	12	80 C/C	800 800
f4	12	80 C/C	800 800
f5	16	4x8 NOS.	300 300
PIER SHAFT:-			
s1	32	28 NOS.(ALTERNATE WITH s1a)	500
s1a	32	56 NOS.	500 2000
s2	20	85 C/C	350 (MIN. LAP)
s3	16	85 C/C	350 (MIN. LAP)
PIER CAP:-			
c1	32	28 NOS. (IN FIRST LAYER)	800 800
c1a	32	28 NOS. (IN SECOND LAYER)	800 800
c1b	20	14 NOS.	
c2	20	28 NOS.	500 500
c3	20	100 C/C	1750 1750 LENGTH VARIES
c3a	16	100 C/C	
c4	16	2 LEGGED STIRRUP @ 100 C/C	
c4a	16	8 LEGGED STIRRUPS @ 100 C/C	
c4b	16	100 C/C	
c5	16	2 LEGGED STIRRUP @ 100 C/C	
c5a	16	8 LEGGED STIRRUPS @ 100 C/C	

SUVADRA CONSULTANTS
Regd. No- 11/2004-05
BHUBANESWAR

LEGEND:-

REINFORCEMENT AT TOP FACE	————
REINFORCEMENT AT BOTTOM FACE	- - - - - -

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

DESIGN DIRECTOR

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/101 (SH. 1 OF 1)
   GPT/CCT/4B/STR/MJB/GAD/141+016/102 (SH. 1 OF 3)
2. DIMENSIONS DETAILS OF PIER.
   GPT/CCT/4A/STR/MJB/SUB/250 (SH. 1 OF 1)
3. REINFORCEMENT DETAILS OF PIER P1.
   GPT/CCT/4A/STR/MJB/SUB/252 (SH. 1 OF 1)
   GPT/CCT/4A/STR/MJB/SUB/253 (SH. 1 OF 1)

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MISPARK FUTURISTICS AND ASSOCIATES
C-4,2ND FLOOR, RJK TOWER, SECTOR-4, VAISHALI GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
S-62, Rajesh Kumar Path, S.L.Pur, Baring Road, Patna-800001

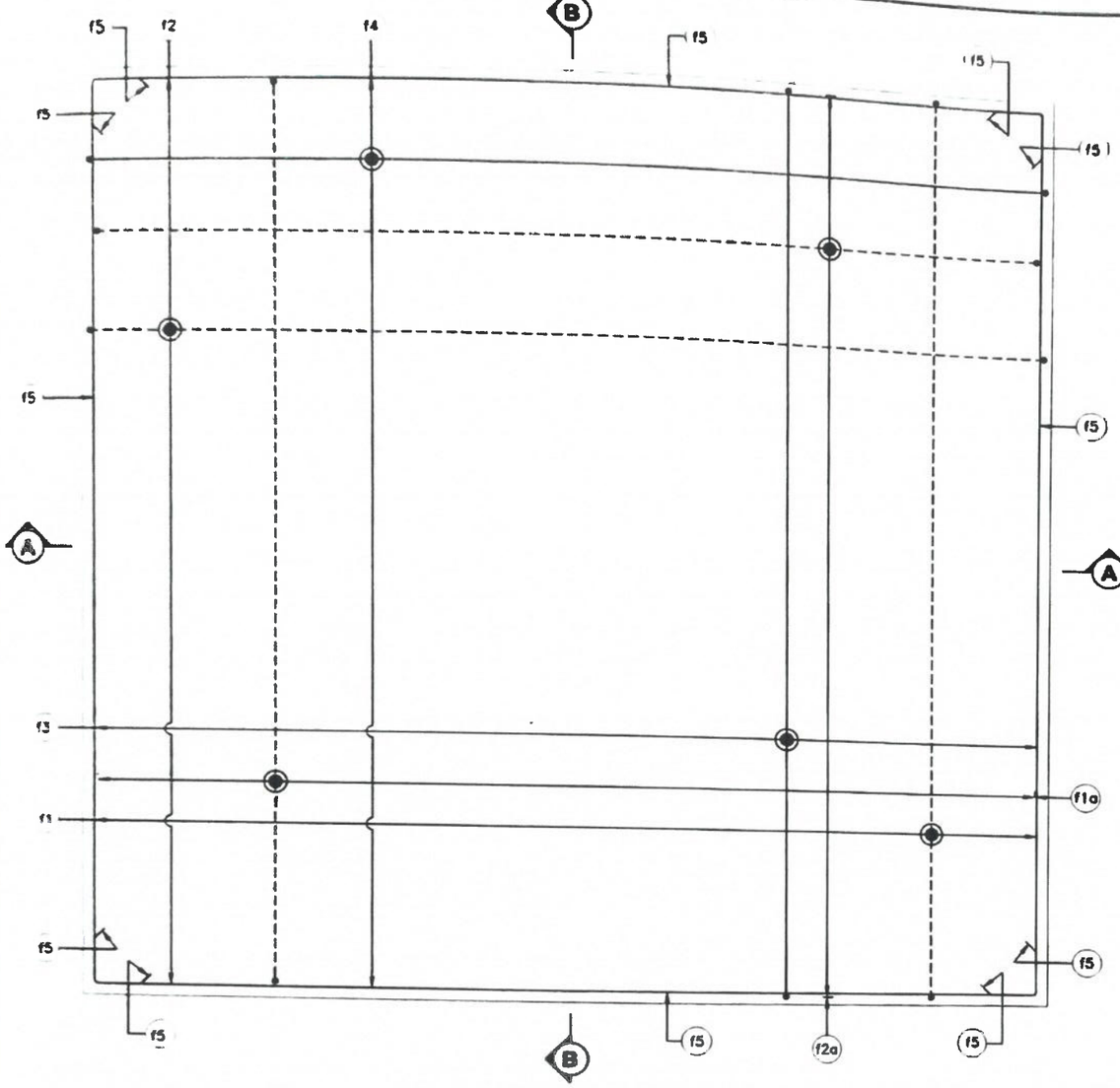
DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
S 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.026 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

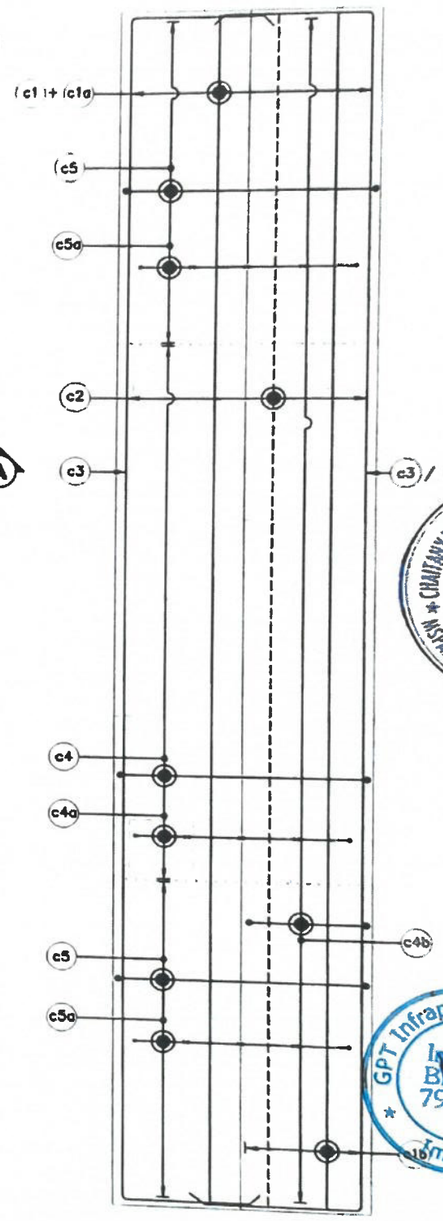
DRAWN	HP
DESIGNED	S.S
CHECKED	A.S.K
DATE: JUNE - 2021	

TITLE: REINFORCEMENT DETAILS OF PIER P2 MAJOR BRIDGE AT CH-141+016.
SCALE: AS SHOWN
1 OF 3
DRG.NO: GPT/CCT/4B/STR/MJB/SUB/253
REV: R0

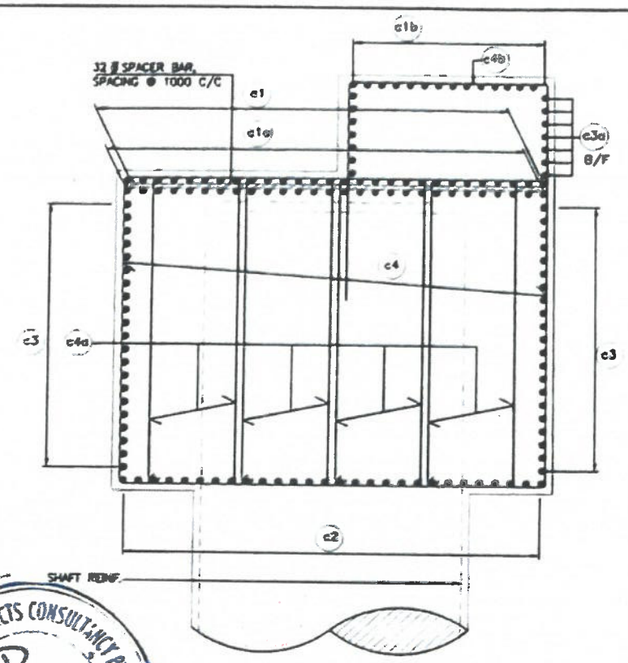
2251_GPS PROJECTS_MANIPUR\DOCUMENT_Drawings\01_Major Bridge\SUB STRUCTURE\PIER\GPT-CCT-4B-STR-MJB-SUB-141+016_101-P2.dwg 29-Jun-21



PLAN SHOWING REINFORCEMENT
DETAIL OF PIER FOOTING
(SCALE–1:50)

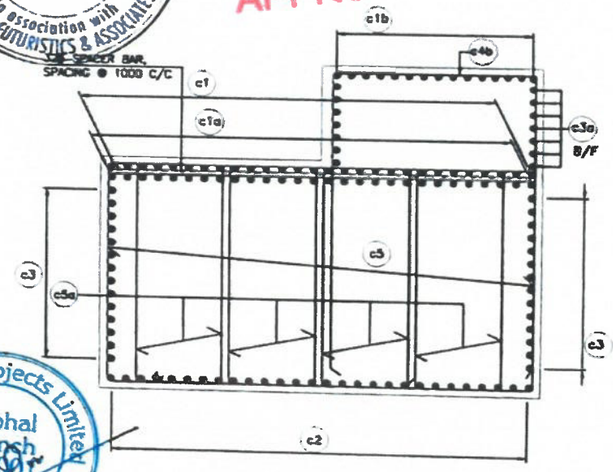


PLAN SHOWING REINFORCEMENT
DETAIL OF PIER CAP
(SCALE–1:50)



SECTION E-E
(SCALE–1:30)

APPROVED



SECTION F-F
(SCALE–1:30)

DESIGN DIRECTOR

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/101 (SH. 1 OF 1)
   GPT/CCT/4B/STR/MJB/GAD/141+016/102 (SH. 1 OF 3)
2. DIMENSIONS DETAILS OF PEIR.
   GPT/CCT/4A/STR/MJB/SUB/250 (SH. 1 OF 1)
3. REINFORCEMENT DETAILS OF PIER P1.
   GPT/CCT/4A/STR/MJB/SUB/251 (SH. 1 OF 1)
   GPT/CCT/4A/STR/MJB/SUB/253 (SH. 1 OF 1)

LEGEND:-

REINFORCEMENT AT TOP FACE	————
REINFORCEMENT AT BOTTOM FACE	- - - - - -

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES

GPT Infraprojects Limited Imphal Branch 795001 Imphal

SUVADRA CONSULTANTS BHUBANESWAR Regd. No 11/2004-05

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

Client: NHIDCL

EPC Contractor: GPT, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

Authority Engineer: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES

Safety Consultant: SUVADRA CONSULTANTS, PP-87, Tankapani Road, BBSR-18, Odisha

Proof Consultant: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, B.k.Pur, Boring Road, Patna-800001

Design Consultant: SPS Technocrats Pvt. Ltd.

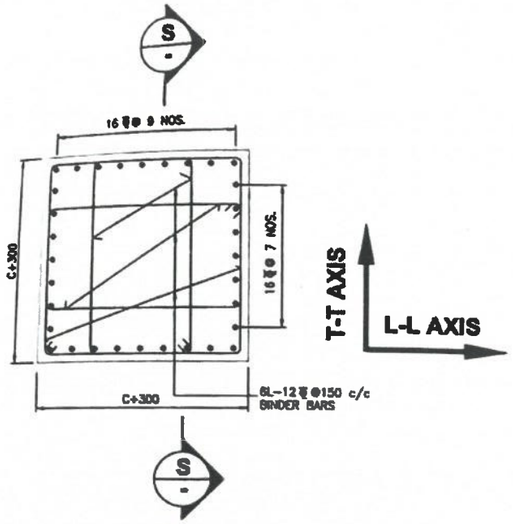
Project: Widening to 2 (Two) Lane with Hard shoulder of Chumthangjur to Tuker section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

Drawn: NP; Designed: S.S; Checked: A.B.K; Date: JUNE - 2021

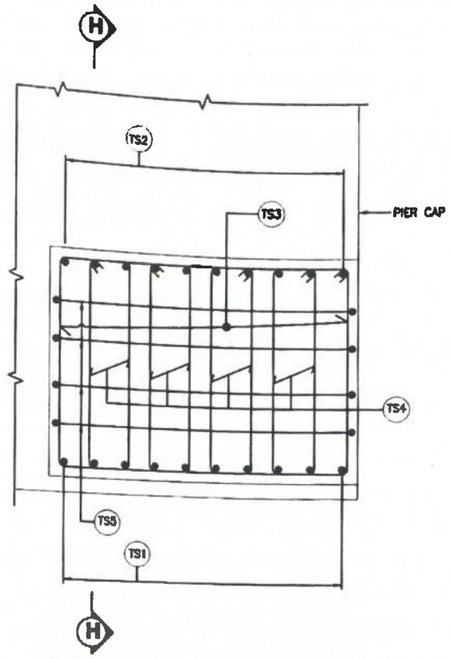
Title: REINFORCEMENT DETAILS OF PIER P2 MAJOR BRIDGE AT CH-141+016.

Scale: AS SHOWN; 2 OF 3; Rev: R0

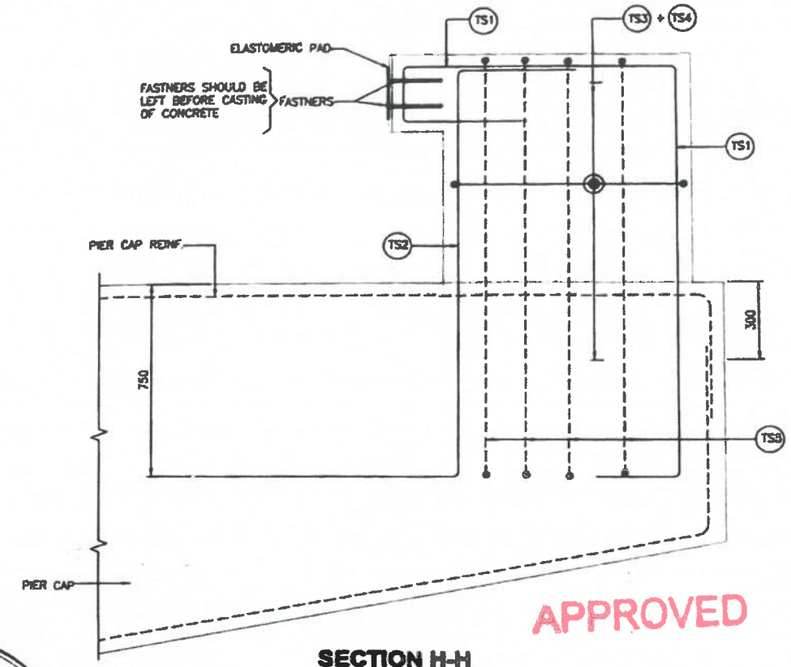
Dwg. No: GPT/CCT/4B/STR/MJB/SUB/250



PLAN SHOWING TYPICAL REINF. DETAILS OF BEARING PEDESTAL
(SCALE 1:15)

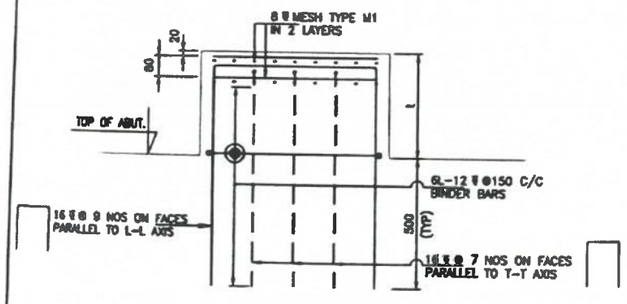


PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER
(SCALE–1:15)

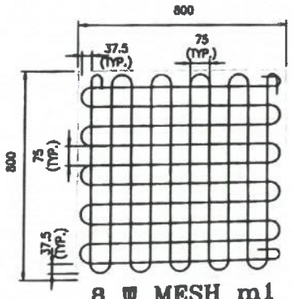


APPROVED

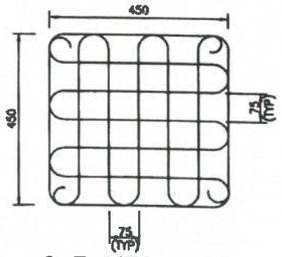
SECTION H-H
(SCALE–1:15)



SECTION S-S
(SCALE 1:15)



8 ⌀ MESH m1
(AT EACH PEDESTAL LOCATION)
(SCALE–1:15)



8 ⌀ MESH m2
(AT EACH JACK LOCATION AND TEMPORARY SUPPORT)
(SCALE–1:10)

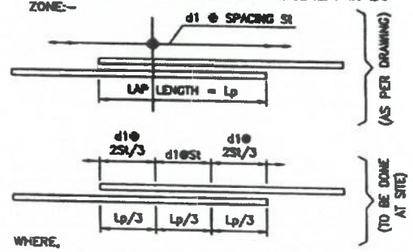
TRANSVERSE SEISMIC STOPPER

TS1	16	10 NOS.	200
TS2	25	10 NOS.	1500
TS3	2 LEGGED 12 ⌀ STIRRUPS TIED TO VERTICALLY BARS @ 100 C/C VERTICALLY		
TS4	8 LEGGED NO. 12 ⌀ STIRRUPS @100 C/C VERTICALLY		
TS5	2 LEGGED 12 ⌀ @100 C/C		

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. MESH TYPE M1' SHALL BE PROVIDED IN PIER CAP AT BEARING LOCATIONS AND MESH TYPE 'M2' SHALL BE PROVIDED AT JACK LOCATION IN TWO LAYER AT 20mm AND AT 100mm FROM TOP OF CONCRETE.
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. LAP/SPLICES SHALL BE PROVIDED AS PER CLAUSE NO. 15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 72⌀.

   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:–



WHERE,
d1= DIA OF TRANSVERSE REINFORCEMENT.
St= SPACING OF TRANSVERSE REINFORCEMENT.

5. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
6. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   GPT/CCT/4B/STR/MJB/KEY/141+016/101 (SH. 1 OF 1)
   GPT/CCT/4B/STR/MJB/GAD/141+016/102 (SH. 1 OF 3)
2. DIMENSIONS DETAILS OF PEIR.
   GPT/CCT/4A/STR/MJB/SUB/250 (SH. 1 OF 1)
3. REINFORCEMENT DETAILS OF PIER P1.
   GPT/CCT/4A/STR/MJB/SUB/251 (SH. 1 OF 1)
   GPT/CCT/4A/STR/MJB/SUB/252 (SH. 1 OF 1)

SIZE OF BEARING PEDESTAL SHALL BE (C+300) x (C+300) WHERE "C" IS THE DIA OF BEARING

t = HEIGHT OF PEDESTAL
= H-BEARING HEIGHT
H = HEIGHT OF BEARING+PEDESTAL

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES

GPT Infraprojects Limited Imphal Branch 795001 Imphal

SUVADRA CONSULTANTS Regd. No: 11/2004-05 BHUBANESWAR

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-8,3RD FLOOR, RJK TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS, FP-67, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd., # 310 & 311, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN: MP	TITLE: REINFORCEMENT DETAILS OF PIER P2 MAJOR BRIDGE AT CH-141+016.		
DESIGNED: S.G	SCALE: AS SHOWN	3 OF 3	REV: R0
CHECKED: AS.K	DATE: JUNE - 2021	DRG.NO: GPT/CCT/4B/STR/MJB/SUB/257	

2391_SPS PROJECTS_MANIPUR PACKAGE-4B\01_Drawings\01_Major Bridge\SUB STRUCTURE\DGN\GPT-CCT-4B-STR-MJB-SUB-141+016_251-P2.dwg 28-Jun-21

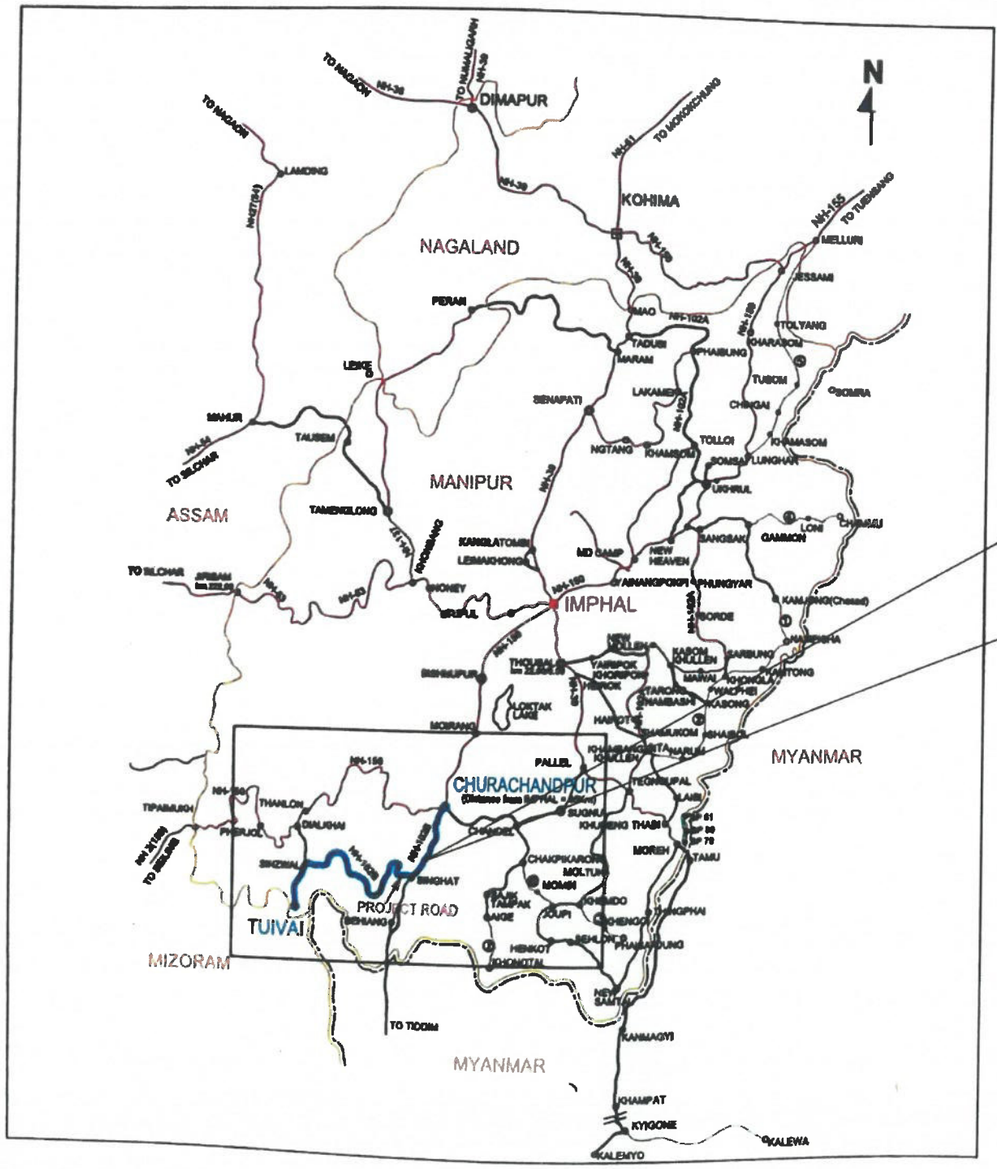
GPT. Infra/G.O Imphal/Design/Pkg-4B/20-21/61 (Dt. 14.08.21 Rec. 14.08.21)

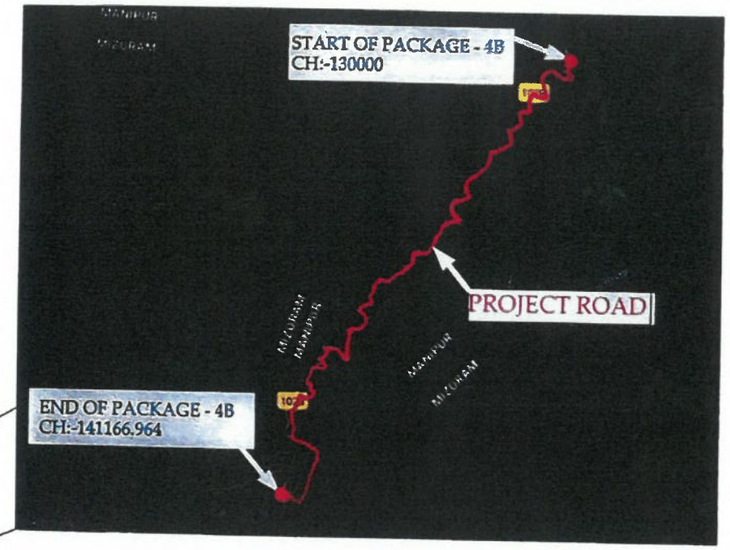
4B

BUILDING INFRASTRUCTURE - BUILDING THE NATION

National Highways & Infrastructure Development
राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction mode.





GENERAL ARRANGEMENT DRAWING

PACKAGE - 4B

AT CH-141+016

AUGUST - 2021

APPROVED

GPT Infraprojects Limited Imphal Branch 795001 Imphal

EPC CONTRACTOR:

GPT Group

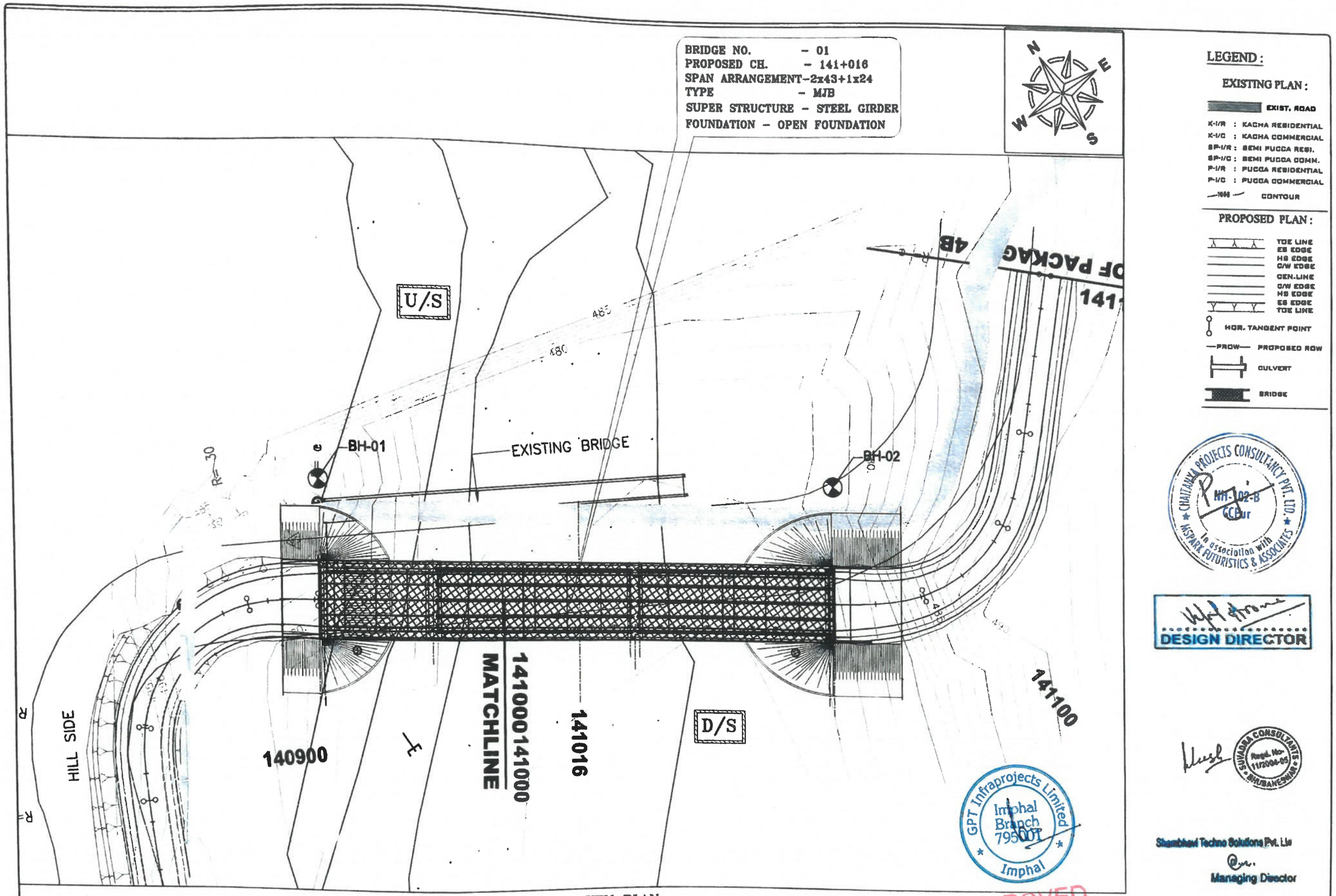
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

DESIGN CONSULTANT:

SPS Technocrats Pvt. Ltd.

638 to 641, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

BRIDGE NO. - 01
PROPOSED CH. - 141+016
SPAN ARRANGEMENT-2x43+1x24
TYPE - MJB
SUPER STRUCTURE - STEEL GIRDER
FOUNDATION - OPEN FOUNDATION



KEY PLAN
(SCALE - 2:1)

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NAIDCL

EPC CONTRACTOR: GPT
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES
D-6,3rd FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, B.L.Pur, Baing Road, Patna-800001

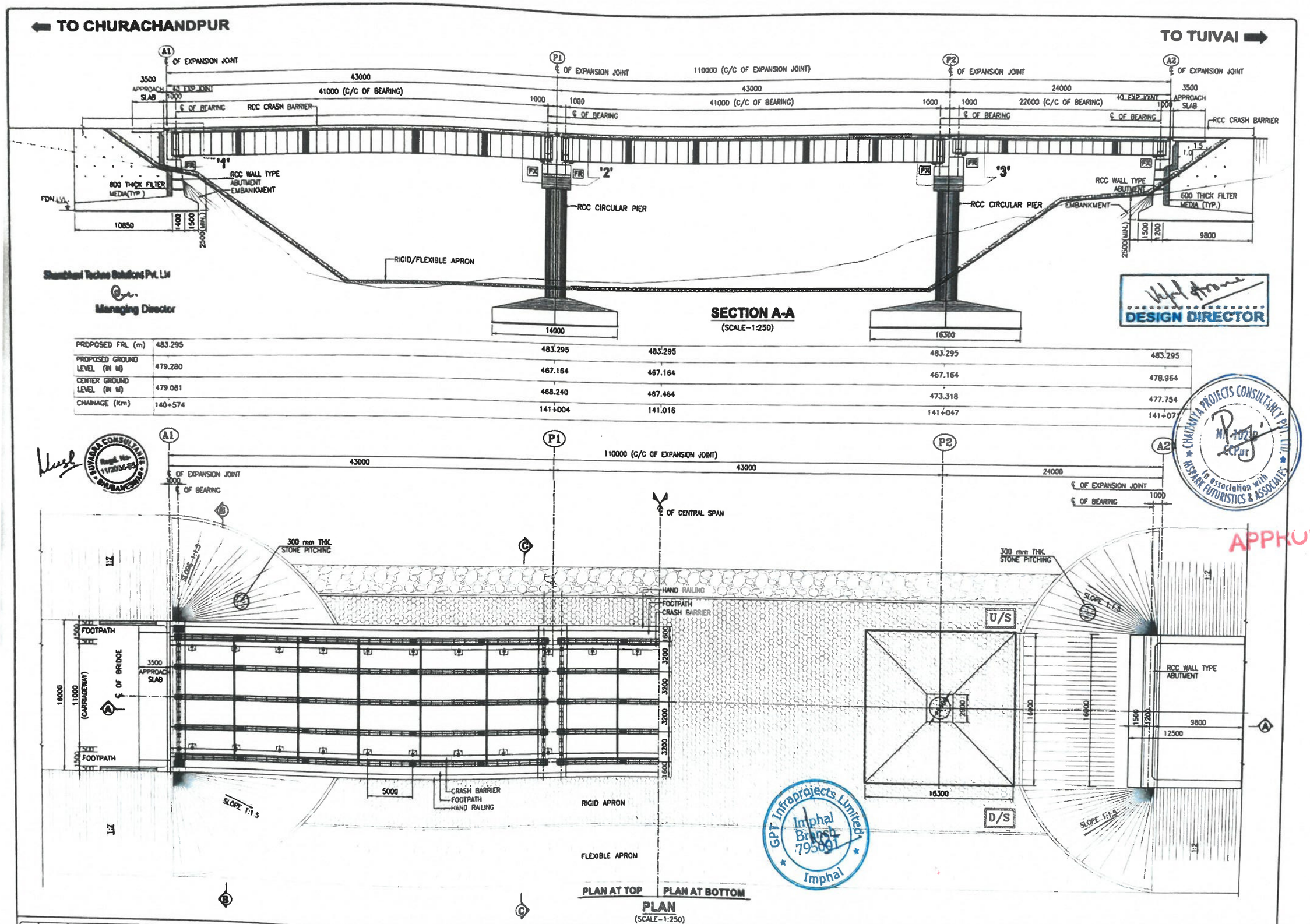
DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.000 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	MP
DESIGNED	S.S
CHECKED	A.S.K
DATE: JUNE - 2021	

TITLE: KEY PLAN FOR MAJOR BRIDGE AT CH:141+016.
SCALE: AS SHOWN 1 OF 1
REV: R0
DRG. NO: GPT/CCT/4B/STRUC/BRIDGE/141+016/100

Z:\01_SPS PROJECTS\B_MANIPUR\PACKAGE-4B\01_Drawings\01_Major Bridge\MAJOR\GPT-CCT-4B-M-B-MAJ-141+016_101.dwg 13-Aug-21



Shambhavi Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with M/SPARK FUTURISTICS & ASSOCIATES NI-1028 ECPur

APPROVED

GPT Infraprojects Limited Imphal Branch 795001 Imphal

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

Client: NHIDCL

EPC Contractor: GPT, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

Authority Engineer: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH M/SPARK FUTURISTICS AND ASSOCIATES, C-6,2ND FLOOR, R.K TOWER, SECTOR-I,VAISHALI, GHAZIABAD-201010.

Safety Consultant: SUVADRA, PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., E-82, Rajesh Kumar Path, B.K.Puri, Boring Road, Patna-800001

Design Consultant: SPS Technocrats Pvt. Ltd., # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

Project: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

Drawn: HP
Designed: S.S
Checked: A.S.K
Date: JUNE - 2021

Title: GENERAL ARRANGEMENT DRAWING FOR MAJOR BRIDGE AT CH. 141+016 (2x43+1x24m) SPAN

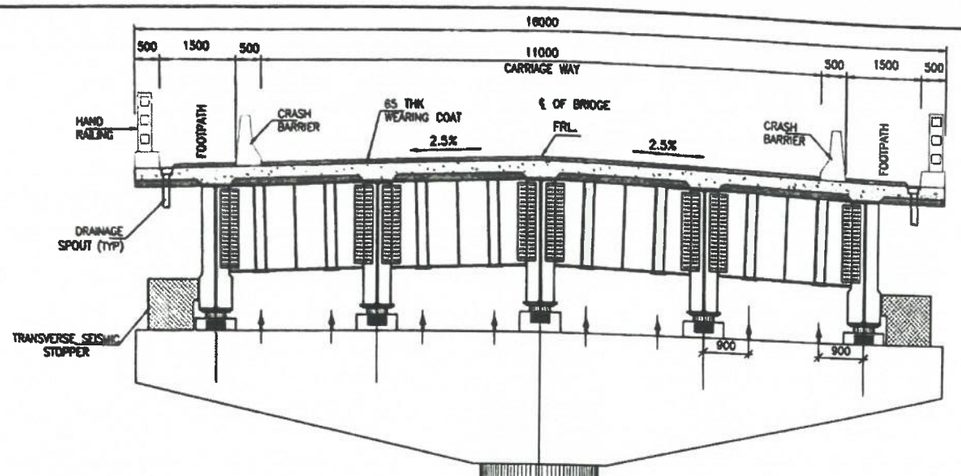
Scale: AS SHOWN

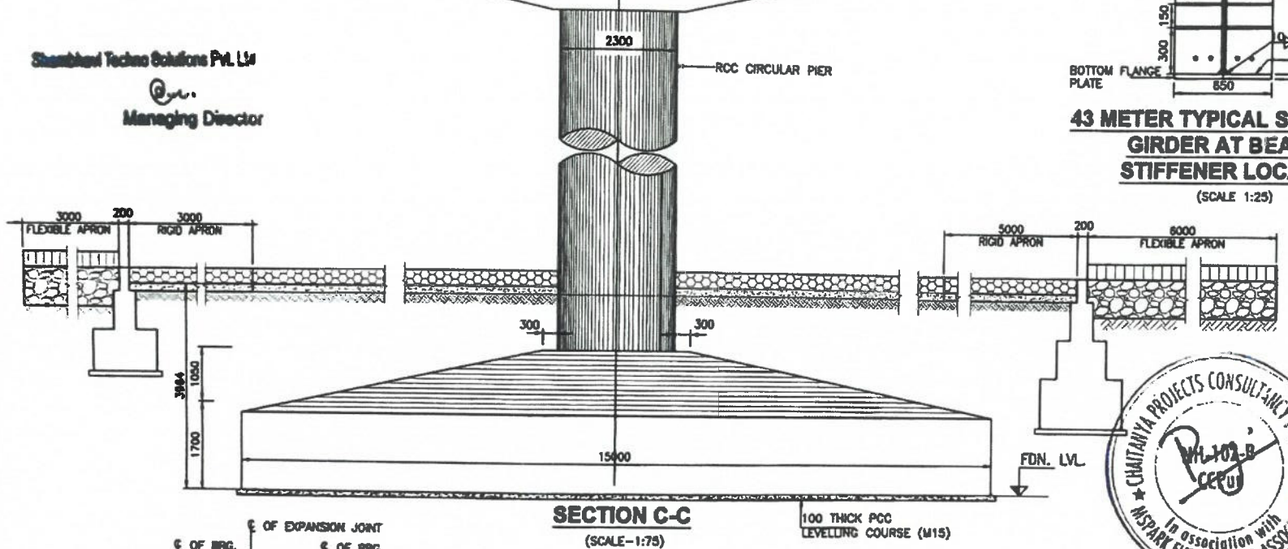
1 OF 3

Rev: R0

Drg. No: GPT/OCT/4B/STRM/GAD/141+016/101

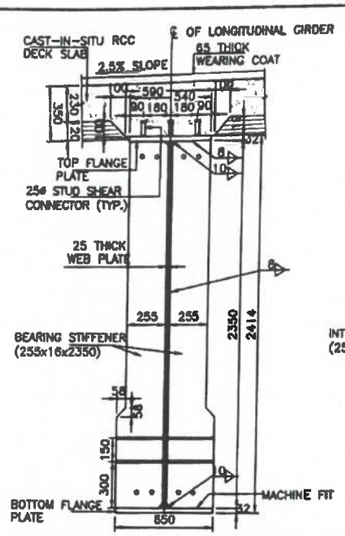
Y:\NI_SPS PROJECTS_MANIPUR\PACKAGE-4B\41_Drawings\41_Major Bridge\MAJ\GPT-CCT-4B-MJB-GAD-141+016_101 .dwg 13-Aug-21





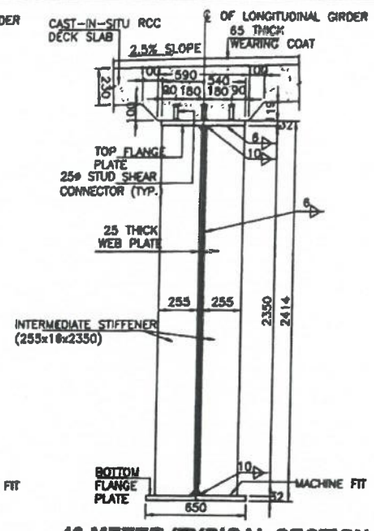
SECTION C-C

(SCALE-1:75)



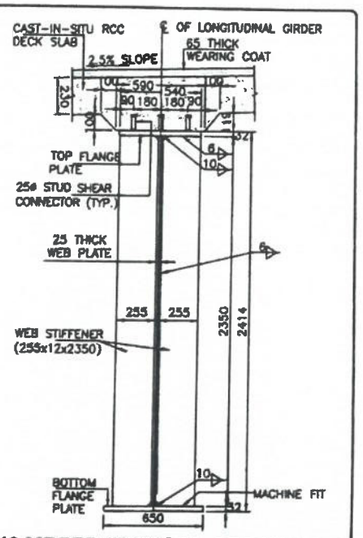
43 METER TYPICAL SECTION OF GIRDER AT BEARING STIFFENER LOCATION

(SCALE 1:25)



43 METER (TYPICAL SECTION OF GIRDER AT INTERMEDIATE STIFFENER LOCATION)

(SCALE 1:25)



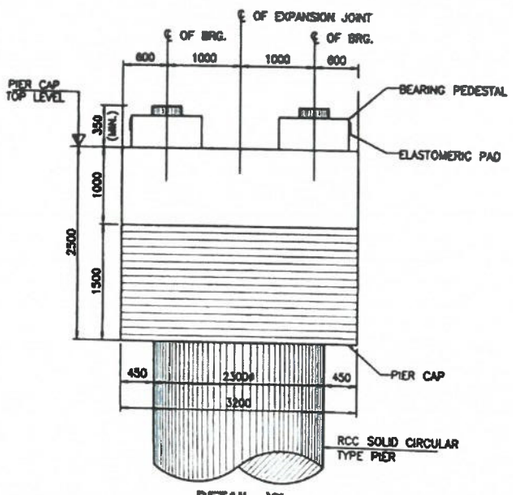
43 METER (TYPICAL SECTION OF GIRDER AT OTHER LOCATION)

(SCALE 1:25)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

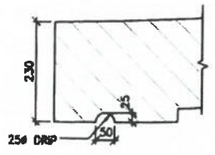
DESIGN DIRECTOR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES



DETAIL - '2'

(SCALE-1:50)



DETAIL-3

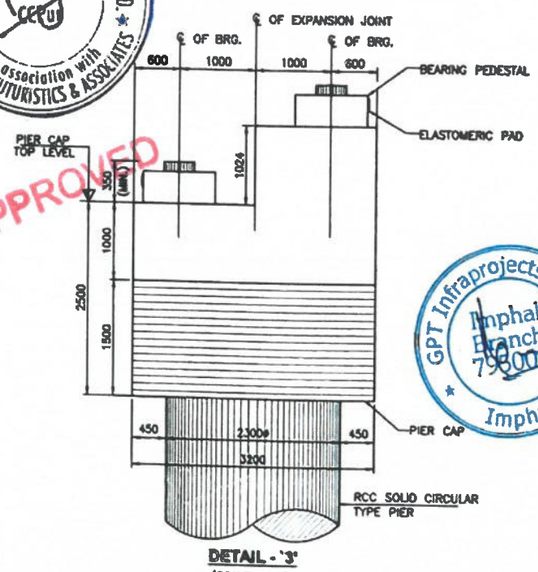
(SCALE-1:10)

HYDROLOGICAL DATA	
HFL	478.480m
DISCHARGE	3808.2cumecs
VELOCITY	4.61m/s

LEGENDS	
FRL	FINISHED ROAD LEVEL
G.L	GROUND LEVEL
B.L	BED LEVEL
F.D.N	FOUNDATION
H.F.L.	HIGHEST FLOOD LEVEL
F.L	FOUNDATION LEVEL

SUVADRA CONSULTANTS BHUBANESWAR Regd. No- 11/2004-05

APPROVED



DETAIL - '3'

(SCALE-1:50)

GPT Infraprojects Ltd. Imphal Branch 795001 Imphal

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS ARE IN METERS. UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT TO BE SCALED ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE BRIDGE HAS BEEN DESIGNED FOR LIVE LOAD COMBINATION OF CLASS A AND 70R AS PER IRC : 6-2017 FOR 4 LANES WITH FOOTPATH.
4. EXPOSURE CONDITION OF THE BRIDGE AND IT'S COMPONENTS SHOULD BE DECLARED AS PER IRC 112-2011 / IS:456. ALL SPECIFICATION LAID DOWN IN IRC CODE / IS :456 CODES FOR RELAVENT EXPOSURE CONDITION SHALL BE FOLLOWED.
5. DESIGN SHALL BE CARRIED OUT AS PER RELEVANT CODE OF IRC CODE OF PRACTICE AND OTHER CODE AS APPROVED BY NORTH.
6. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC ON 150MM CUBE AS FOLLOWS:
   - (a) LEVELLING COURSE (UNDER FOUNDATION) -M15.
   - (b) LEVELLING COURSE (UNDER APPROACH SLAB) -M15.
   - (c) SUPERSTRUCTURE RCC DECK SLAB -M35
   - (d) SUBSTRUCTURE -:
   - (e) ABUTMENT -M35
   - (f) PIER -M40
   - (g) CRASH BARRIER -M40
   - (h) APPROACH SLAB -M30
7. REINFORCING BAR SHALL BE CONFORMING TO IS:1786-1985 OF GRADE Fe-500 D.
8. ALL STRUCTURE STEEL SHALL CONFORM TO HIGH STRENGTH E-410 IS:2062:2011
9. 65mm THK. WEARING COURSE COMPRESSING OF 40mm SHALL THICK ASPHALTIC CONCRETE OVER LAID WITH 25mm THK. MASTIC ASPHALT SHALL BE PROVIDED AS PER SECTION 500 OF MORTH.
10. 100mm DIA WEEP HOLES AT 1000mm C/C HORIZONTALLY AND VERTICALLY SHALL BE IN PROVIDED IN TWO LAYERS ABOVE LOWEST WATER LEVEL IN VERTICAL WALL OF ABUTMENT AND RETAINING WALL.
11. WATER TO BE USED IN CONCRETING & CURING SHALL CONFORM TO CLAUSE 302.4 OF IRC : 112-2011.
12. LAYING COMPACTION AND EXTEND OF BACKFILL BEHIND ABUTMENT AND RETAINING WALL SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX-A OF IRC:78-2014 HAVING PROPERTIES C=0, ϕ=30°, δ =22.5° & γ=18 KN/m
13. MINIMUM CLEAR COVER TO OUTER MOST REINFORCEMENT FOR RCC MINOR BRIDGE SHALL BE AS UNDER:-
   - (a) SUPERSTRUCTURE - 40mm.
   - (b) SUBSTRUCTURE (EARTH FACE) - 75mm.
   - (c) SUBSTRUCTURE (NON EARTH FACE - 50mm.
   - (d) FOUNDATION - 75MM
14. POT-CUM-PTFE BEARINGS SHALL BE DESIGNED AS PER PROVISION OF IRC : 83 (PART 2-2015)
15. THE BRIDGE IS DESIGNED FOR PROVISION OF SEISMIC ZONE-V AS CLAUSE 218 OF IRC:6-2017.
16. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH RELEVANT PLAN AND PROFILE DRAWING.
17. ALL CHAINAGE, FRL, GL SHALL BE CONFIRMED AT SITE PRIOR TO EXECUTION.
18. FOR APPROACH SLAB, DRAINAGE SPOUT, CRASH BARRIER, PROTECTION WORK AND RETAINING WALL DETAILS FOR REFER SEPARATE DRAWINGS.
19. FOR FABRICATION, WORKMANSHIP, INSPECTION & TESTING, PROTECTION AGAINST CORROSION ETC. RELEVANT PROVISION OF IRC : 24-2010 SHALL BE FOLLOWED

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-6,2ND FLOOR, R.R TOWER, SECTOR-4,VASHALI, GHAZIABAD-201012.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-67, Tankasani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.I.Pull, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — #319 & 311, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

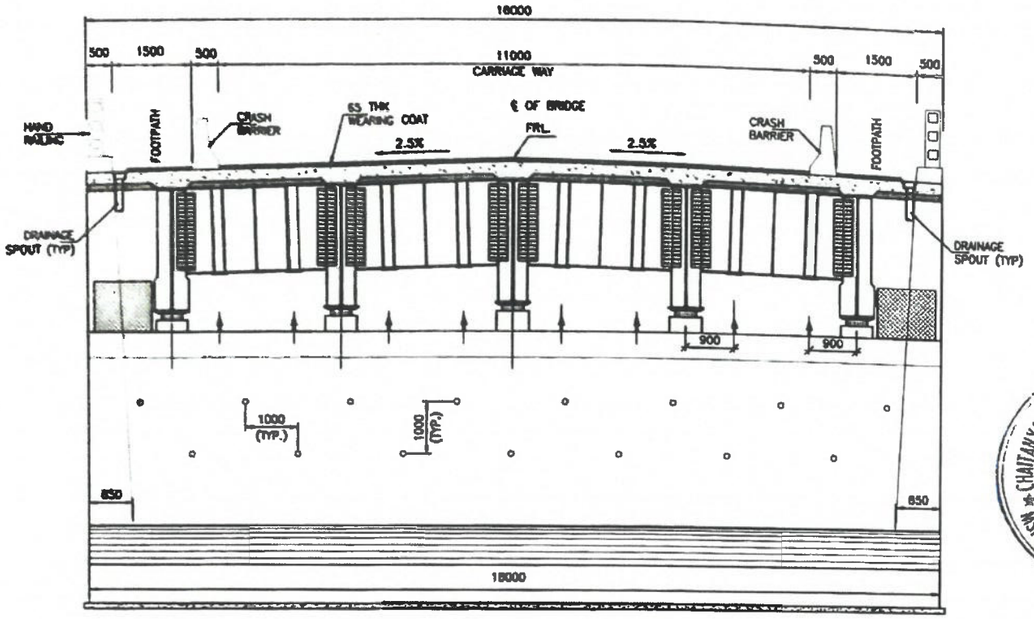
DRAWN	HP
DESIGNED	S.S
CHECKED	A.B.K
DATE: JUNE - 2021	

TITLE: GENERAL ARRANGEMENT DRAWING FOR MAJOR BRIDGE AT CH. 141+016 (2x43+1x24m) SPAN

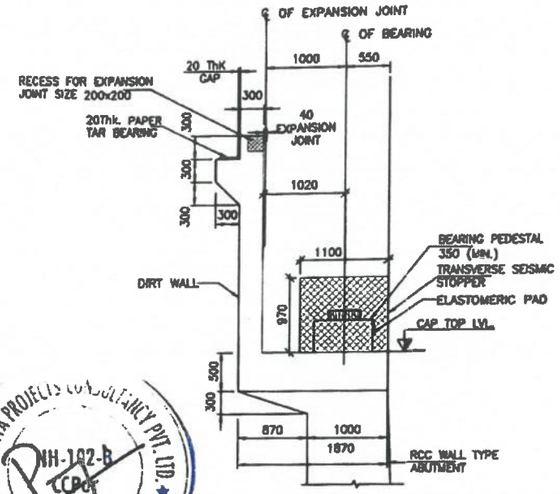
SCALE: AS SHOWN — 3 OF 3 — REV: R0

DRG.NO: GPT/CCT-4B/STR/MJB/GAD/141+016/101

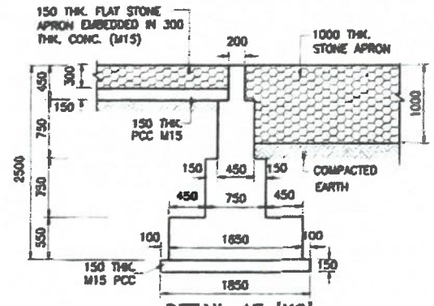
Z:\01_GPS PROJECT\30_MANIPUR\PACKAGE-4B\01_ Drawings\01_Major Bridge\GAD\GPT-CCT-4B-MJB-GAD-141+016_101 .dwg 13-Aug-21



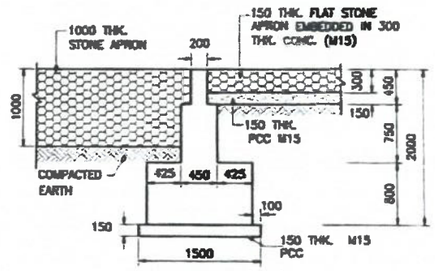
SECTION B–B
(SCALE–1:75)



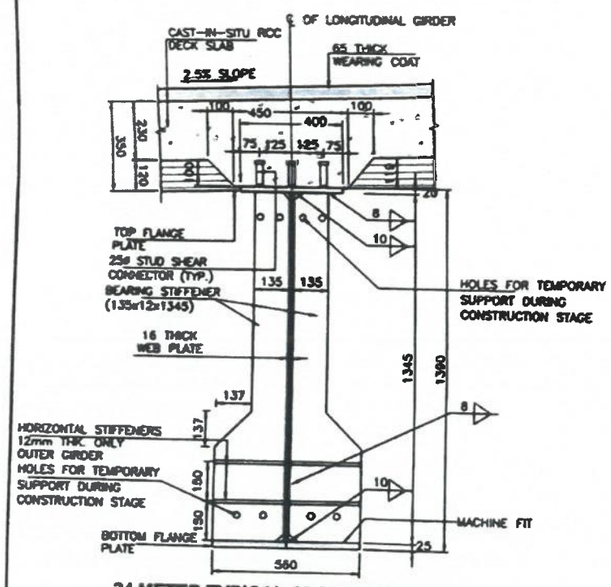
DETAIL–'1'
(SCALE–1:50)



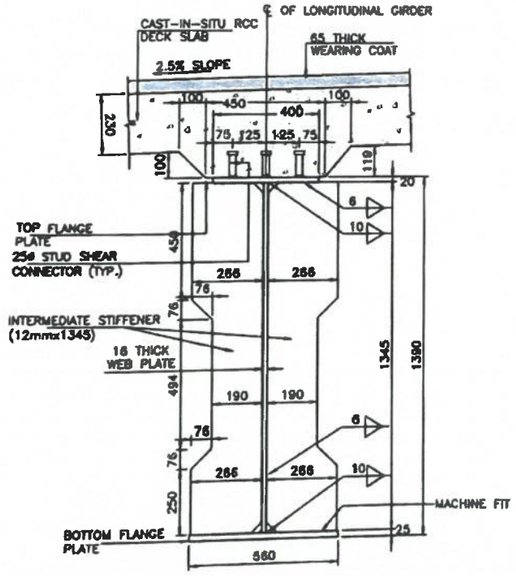
DETAIL AT 'X2'
CURTAIN WALL TYPE–I (DOWN STREAM SIDE)
SCALE 1:50



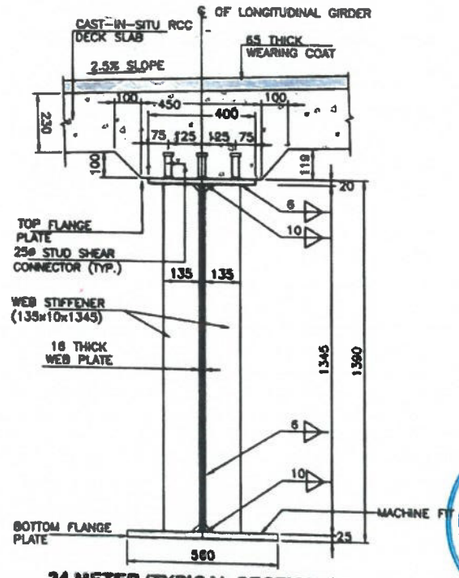
DETAIL AT 'X1'
CURTAIN WALL TYPE–II (UP STREAM SIDE)
SCALE 1:50



24 METER TYPICAL SECTION OF GIRDER AT BEARING STIFFENER LOCATION
(SCALE 1:15)

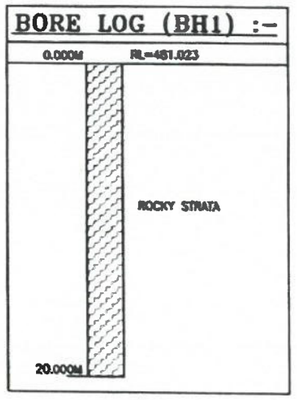


24 METER (TYPICAL SECTION OF GIRDER AT INTERMEDIATE STIFFENER LOCATION)
(SCALE 1:15)

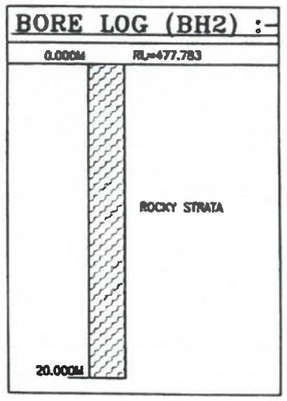


24 METER (TYPICAL SECTION OF GIRDER AT OTHER LOCATION)
(SCALE 1:15)

BORE LOG (BH1) :–



BORE LOG (BH2) :–



CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102-B CCPCPL In association with MSPARK FUTURISTICS & ASSOCIATES

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

GPT Infraprojects Limited Imphal Branch 795001 Imphal

APPROVED

DESIGN DIRECTOR

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NAIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-4,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97 Tankapani Road, Jaiswal-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — 5-62, Rajesh Kumar Path, S.B.Pur, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	HP
DESIGNED	S.S
CHECKED	AS.K
DATE: JUNE - 2021	

TITLE: GENERAL ARRANGEMENT DRAWING FOR MAJOR BRIDGE AT CH. 141+016 (2x43+1x24m) SPAN

SCALE: AS SHOWN — 3 OF 3

DWG. NO: GPT/CCT/4B/STM/BJB/GAB/141+016/101

REV: R0

Z:\01_GPS PROJECT\39_MANIPUR\PACKAGE-4B\01_ Drawings\01_Major bridge\GAD\GPT-CCT-4B-MJB-GAD-141+016_101 .dwg 13-Aug-21

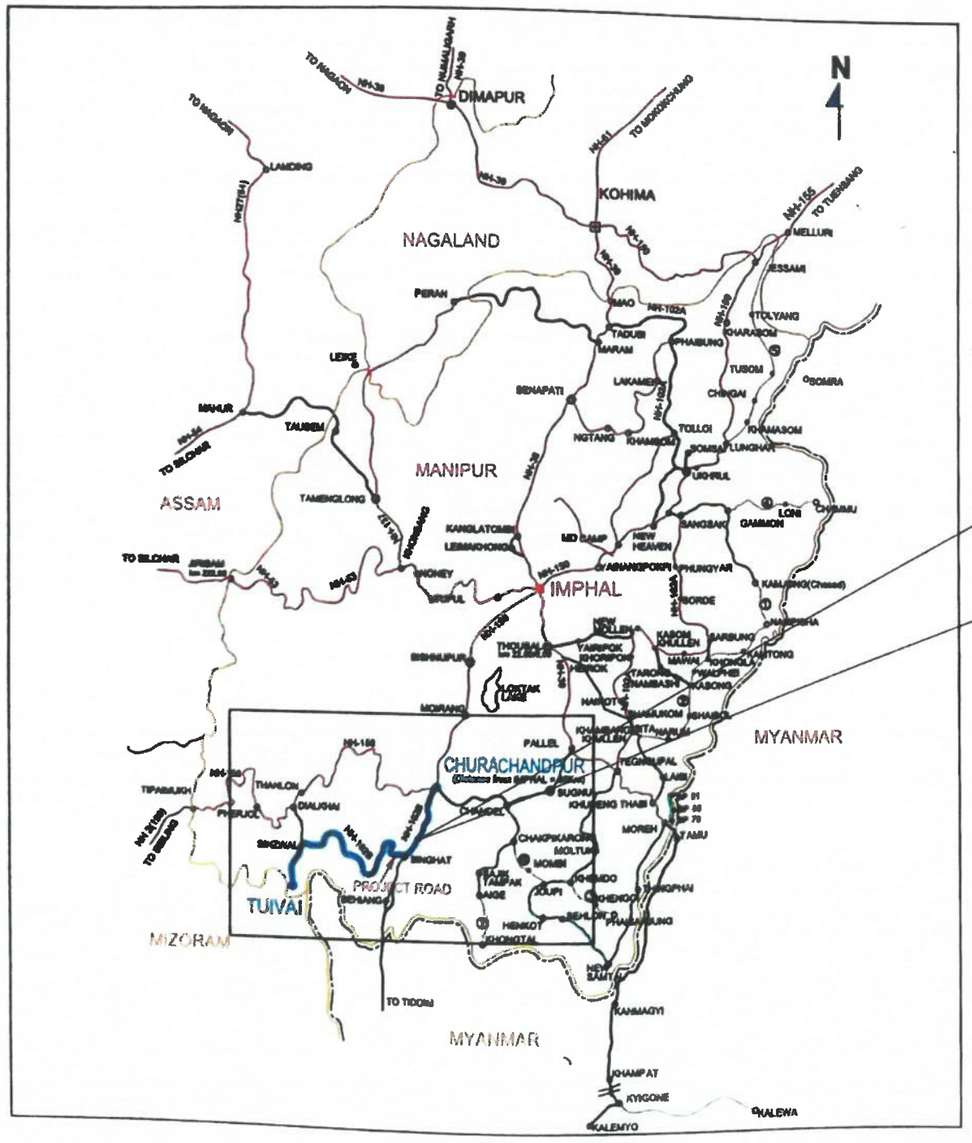
GPT. Infra/B.O Imphal/Design/Proj. 40/20-21/61 Dt. 14.08.21 (Rec. 14.08.21)

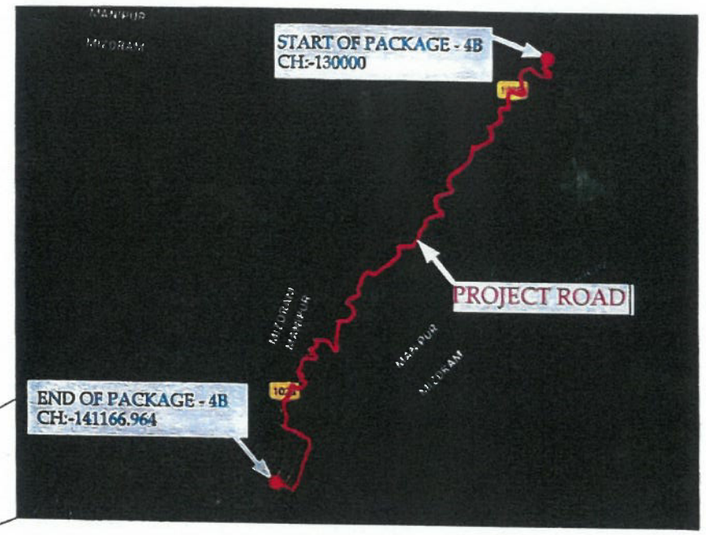
4B

BUILDING INFRASTRUCTURE - BUILDING THE NATION

National Highways & Infrastructure Development
राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction mode.





SUPER STRUCTURE - 24 METER

PACKAGE - 4B

AT CH-141+016

JULY - 2021

GPT Infraprojects Limited Imphal Branch 795001 Imphal

APPROVED

EPC CONTRACTOR:

GPT Group

JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

DESIGN CONSULTANT:

SPS Technocrats Pvt. Ltd.

638 to 641, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

STRUCTURAL STEEL

1. MATERIALS

1.1 STEEL MEMBERS SHALL BE FREE FROM IMPERFECTIONS (i.e. MILL SCALE, SLAG INTRUSION, LAMINATION, PITTING, RUST ETC.) THAT MAY IMPAIR STRENGTH, DURABILITY AND APPEARANCE. ALL MATERIALS SHALL BE OF TESTED QUALITY.

1.2 STRUCTURAL STEEL SHALL CONFORM TO GRADE E410 (80) OF IS: 2062-2011 UNLESS OTHERWISE SPECIFIED. SECONDARY MEMBERS LIKE INTERMEDIATE CROSS BRACINGS SHALL BE OF E250 GRADE.

1.3 HIGH STRENGTH BOLTS SHALL BE M-24 FOR PROPOSED CLASS 10.9

1.4 ALL STRUCTURAL STEEL FABRICATION WORK SHALL BE CARRIED OUT AS PER RELEVANT INDIAN STANDARDS AND MORT&H SPECIFICATIONS.

1.5 HEADED STUDS SHALL BE OF FOLLOWING SPECIFICATIONS AS PER IRC : 22
CHARACTERISTIC TENSILE STRENGTH = 495MPa
CHARACTERISTIC YIELD STRENGTH = 385MPa
MINIMUM ELONGATION = 18%

2. FABRICATION

2.1 EDGE PREPARATION

2.1.1 EDGE PREPARATION FOR WELDING SHALL BE DONE BY MACHINE CONTROLLED FLAME CUTTING WITH EDGES FREE FROM BURRS, CLEAN AND STRAIGHT IN ACCORDANCE WITH IS:9595.

2.1.2 MATERIAL SHALL BE CUT TO SIZE BY OXY ACETYLENE FLAME CUTTING OR SAWING. ALL FLAME CUT EDGES SHALL BE GROUND/MACHINED TO CLEAN, SQUARE & TRUE EDGES. DRAG LINES OBTAINED SHALL BE REMOVED.

2.2 BOLTING

2.2.1 HOLES FOR BOLTS SHALL BE DRILLED CONFORMING TO CLAUSE 10 OF IS:7215. PUNCHING OF HOLES SHALL NOT BE PERMITTED. ALL HOLES EXCEPT AS STATED HEREUNDER SHALL BE DRILLED TO 3mm LESS THAN REQUIRED SIZE AND REAMED THEREAFTER TO THE REQUIRED SIZE. ALL MATCHING HOLES FOR BOLTS SHALL BE REGISTERED WITH EACH OTHER SO THAT A GAUGE OF 0.8mm LESS THAN HOLE DIA CAN PASS FREELY THROUGH THE MEMBERS ASSEMBLED FOR BOLTING IN THE DIRECTION AT RIGHT ANGLE TO SUCH MEMBERS.

2.2.2 ALL PERMANENT BOLTS SHALL BE HSFG M24, EXCEPT THOSE USED IN INTERMEDIATE CROSS GIRDER, WHERE HSFG M20 HAS BEEN USED.

2.2.3 HOLES FOR BOLTS SHALL BE AS FOLLOWS UNLESS OTHERWISE STATED:
i) FOR PERMANENT (HSFG) BOLTS & ERECTION BOLTS : DIAMETER + 1.5mm.

2.2.4 ALL PERMANENT BOLTS SHALL BE HIGH STRENGTH FRICTION GRIP TYPE. SURFACE PREPARATION FOR CONNECTIONS USING HSFG BOLT MUST CONFORM TO IS: 4000:1992 TO ATTAIN A SLIP FACTOR OF 0.30.

2.3 WELDING

2.3.1 SAMPLES OF WELDED COMPONENTS AND TESTS ON THEM SHALL BE GOT APPROVED BY THE INSPECTING AGENCY OR ITS NOMINATED AGENCY PRIOR TO COMMENCING FULL SCALE FABRICATION OF THE RELATED COMPONENTS.

2.3.2 BUTT WELDING OF THE COMPONENTS SHALL BE AVOIDED AS FAR AS POSSIBLE UNLESS SHOWN IN THE DRAWINGS. IF CARRIED OUT, SHALL BE OF MINIMUM NUMBER WITH THE APPROVAL OF THE ENGINEER-IN-CHARGE.

2.3.3 WELDING OF STRUCTURES SHALL BE DONE BY MEANS OF METAL ARC WELDING.

2.3.4 ALL ACCESSIBLE EDGES IN CONTACT AT A JOINT SHALL BE WELDED UNLESS OTHERWISE SPECIFIED.

2.3.5 WELDING PROCEDURE SHALL CONFORM TO IS: 814, IS:816 AND IS:9595.

2.3.6 CRITERIA FOR WELD TEST AND ACCEPTANCE SHALL BE STRICTLY FOLLOWED AS PER MORT&H SPECIFICATIONS.

2.3.7 THE CONTINUOUS WELDING FOR FABRICATING I-SECTIONS SHALL BE SUBMERGED ARC WELDING OR GAS METAL ARC WELDING (MIG) AND NECESSARY TESTS SHALL BE DONE AND REPORTS PREPARED & SCRUTINIZED BY COMPETENT AUTHORITY.

2.3.8 THE ELECTRODES USED FOR WELDING SHALL CONFORM TO IS:814.

2.4 FABRICATION AND ERECTION

2.4.1 FABRICATION, ERECTION, INSPECTION OF STEEL STRUCTURE SHALL BE DONE AS PER RELEVANT INDIAN SPECIFICATION, UNLESS OTHERWISE SPECIFIED IN MORT&H SPECIFICATIONS WHICH SHALL OVERRIDE CORRESPONDING PROVISIONS IN INDIAN SPECIFICATION.

2.4.2 ALL HOLES NECESSARY FOR ERECTION BOLTS SHALL BE PLUGGED FULLY AFTER SUCCESSFUL COMPLETION OF ERECTION WORK.

2.5 ASSEMBLY AT WORKSHOP

2.5.1 THE STEEL WORK SHALL BE TEMPORARILY SHOP ASSEMBLED AS INSTRUCTED BY THE ENGINEER-IN-CHARGE SO THAT THE ACCURACY OF THE FITTINGS ARE CHECKED BEFORE DESPATCH FROM FABRICATION SHOP. SHOP ASSEMBLY SHALL BE EFFECTED WITH SUFFICIENT NUMBER OF PARALLEL DRIFTS TO BRING AND KEEP THE PARTS IN PLACE.

2.5.2 MATCH DRILLING SHALL BE DONE, WHEREVER POSSIBLE. ALL MEMBERS, GUSSET PLATES ETC. SHALL BE CUT AFTER FULL SCALE SHOP LAYOUT.

3. TOLERANCE

3.1 FABRICATION OF STEEL WORKS SHALL BE DONE WITHIN THE SPECIFIED TOLERANCE LIMIT OF IS:7215 AND AS PER CLAUSE 1904.11 OF MORT&H SPECIFICATIONS.

4. INSPECTION & TESTING

4.1 FOR DETAILED INSPECTION AND TESTING OF STEEL WORKS, REFER IRC:24 AND MORT&H SPECIFICATIONS. ALL STEEL STRUCTURE SHALL BE INSPECTED IN THE FABRICATION SHOP, PRIOR TO DISPATCH FROM FABRICATION SHOP. NECESSARY TEST CERTIFICATES SHALL BE SUPPLIED DURING INSPECTION OR AS DIRECTED BY ENGINEER-IN-CHARGE.

5. PAINTING

5.1 ALL STRUCTURAL STEEL WORK SHALL BE CLEANED AND PAINTED AS PER PAINTING SPECIFICATION, CONFORMING TO IRC:24-2010 ANNEXURE-D WITH COATING SYSTEM '4' AND CLAUSE 1906 OF MORT&H SPECIFICATIONS.

5.2 PAINT DELIVERED TO THE FABRICATION SHOP/SITE SHALL BE READY MIXED IN ORIGINAL SEALED CONTAINER AS PACKED BY THE APPROVED PAINT MANUFACTURE. NO THINNER SHALL BE ADDED. PAINT SHALL BE STIRRED FREQUENTLY TO KEEP THE PIGMENT IN SUSPENSION.

5.3 SURFACES TO BE EMBEDDED IN CONCRETE SHALL HAVE NO PAINT APPLIED.

5.4 HOT-DIP GALVANIZED COATINGS FOR SECTIONS NOT LESS THAN 5mm THICKNESS SHALL HAVE A MINIMUM MEAN ZINC COATING WEIGHT OF 610mg/m² EQUIVALENT TO A COATING THICKNESS OF 85 MICRONS.

6. TRANSPORT TO SITE & STORAGE

6.1 STORAGE AT SITE SHOULD BE DONE ON A RAISED PLATFORM TO AVOID RUSTING/DAMAGE.

6.2 TRANSPORTATION OF ALL FABRICATED STRUCTURAL STEEL MATERIALS FROM SITE STORAGE YARD, HANDLING, ASSEMBLING, BOLTING, WELDING AND INSTALLATION AT APPROPRIATE LOCATION SHALL BE DONE ACCORDING TO APPROVED ERECTION DRAWING.

7. ERECTION

7.1 EACH FABRICATED MEMBER, WHETHER ASSEMBLED PRIOR TO DISPATCH FROM FABRICATION SHOP OR NOT, SHALL BEAR AN ERECTION MARK, WHICH WILL HELP TO IDENTIFY THE MEMBER AND ITS POSITION WITH RESPECT OF THE WHOLE STRUCTURE TO FACILITATE RE-ERECTION AT SITE.

7.2 NO REAMING SHALL BE CARRIED OUT WITHOUT PRIOR PERMISSION OF THE ENGINEER-IN-CHARGE.

7.3 THE CONTRACTOR SHALL SUBMIT THE QUALITY ASSURANCE PLAN, WELDING SEQUENCE AND WELDING PROCEDURE FOR FABRICATION AND ERECTION.

8. SYMBOLS AND ABBREVIATIONS

8.1 WELDING SYMBOL ARE AS PER IS: 813.

8.2 PERMANENT BOLT SHOWN THUS ----- ⊕

9. TESTING NOTES FOR STUD SHEAR CONNECTOR

(A) APPEARANCE TEST

1. THE WELD TO A STUD SHEAR CONNECTOR SHOULD FORM A COMPLETE COLLAR AROUND THE SHANK AND FREE FROM CRACKS, EXCESSIVE SPLASHES OF WELD MATERIAL, FREE FROM INJURIOUS LAPS, FINE, SEAMS, TWIST, BENDS OR OTHER INJURIOUS DEFECTS.
2. WELD MATERIAL SHOULD HAVE A 'STEEL BLUE' APPEARANCE.

(B) TEST TO CHECK THE FIXING OF SHEAR STUDS

ALL STUDS NEED TO BE CHECKED BY A RING TEST.

1. RING TEST:- INVOLVES STRIKING THE SIDE OF THE HEAD OF THE STUD WITH A 2 KG HAMMER. A RINGING TONE ACHIEVED AFTER STRIKING INDICATED GOOD FUSION WHEREAS DULL TONE INDICATES A LACK OF FUSION (BS 5400-6).
2. BEND TEST:- TEST REQUIRED THE HEAD OF A STUD TO BE DISPLACED LATEALLY BY APPROXIMATE 25% OF ITS HEIGHT USING 6 KG HAMMER
   - THE WELD SHOULD THEN BE CHECKED FOR SIGNS OF CRACKING OR LACK FUSION.
   - STUD SHOULD NOT BE BENT BACK AS THIS IS LIKELY TO DAMAGE THE WELD
   - THE TESTING RATE SHOULD BE 1 IN 50 (BS 5400-6).

(C) GENERAL NOTES

1. THE STUD SHEAR CONNECTOR DESIGN IS BASED ON IRC: 22-2015.
2. THE WELDING OF STUD SHEAR CONNECTORS SHALL BE DONE BY "DRAWN ARC STUD WELDING WITH CERAMIC FERRULE" TECHNIQUE.
3. THE STUD SHEAR CONNECTOR AND CERAMIC FERRULES SHALL CONFORM TO TYPE SD1/UF AS PER BS EN ISO: 13918-2008.
4. MECHANICAL PROPERTIES OF STUD SHEAR CONNECTORS SHALL BE AS PER ISO 6892/BS EN ISO: 13918-2008.
5. SHAPE OF TIP OF STUD SHEAR CONNECTORS MAY BE CHOSEN BY MANUFACTURER. THE STUD TIP SHALL BE SUPPLIED WITH FLUX IN THE FROM OF PRESS FITTED ALUMINUM BALL OR ALUMINUM SPRAY COATING.
6. THE DIAMETER OF CERAMIC FERRULE D7 AD PER FIGURE 13/TABLE 18 OF BS EN ISO: 13918. SHALL BE $26mm^{+0.5mm}_{-0.5mm}$.

10. NOTES FOR INTERMEDIATE CROSS GIRDER

10.1 ALL HOLES ARE 25.5 DIA. FOR 24 DIA. HSFG BOLTS.

10.2 CO2 WELDING SHALL BE PREFERRED OVER MANUAL METAL ARC WELDING FOR DIAPHRAGM FABRICATION.

10.3 ALL WELDS SHALL BE MADE BY USING APPROVED WELDING PROCEDURE ONLY. WELDER QUALIFIED FOR A PARTICULAR WELD POSITION, WELDING TECHNIQUE AND SIZE ONLY SHALL MAKE THE WELD.

10.4 MINIMUM CLEARANCE AT JACKING POINT FROM TOP OF PIER SHALL BE 400mm.

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

GPT Infraprojects Limited Imphal Branch 795001 Imphal

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

NH 102 B EPC Pur
In association with FUTURISTICS & ASSOCIATES

APPROVED

DESIGN DIRECTOR

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT Infra — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-A,3RD FLOOR, RX TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.I.P.urI, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — 6510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018,

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.028 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

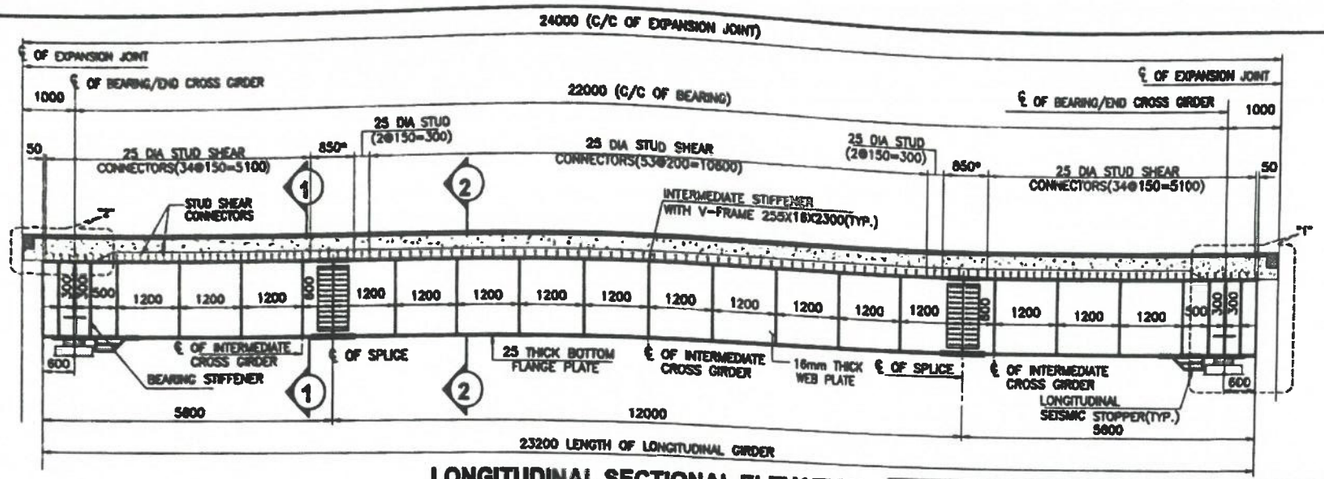
DRAWN	HP
DESIGNED	S.S
CHECKED	A.S.K
DATE: JUNE - 2021	

TITLE: GENERAL NOTES FOR SUPERSTRUCTURE

SCALE: AS SHOWN (01 OF 01)

DRG.NO: GPT/OCT/4B/STR/MJR/SUP/301

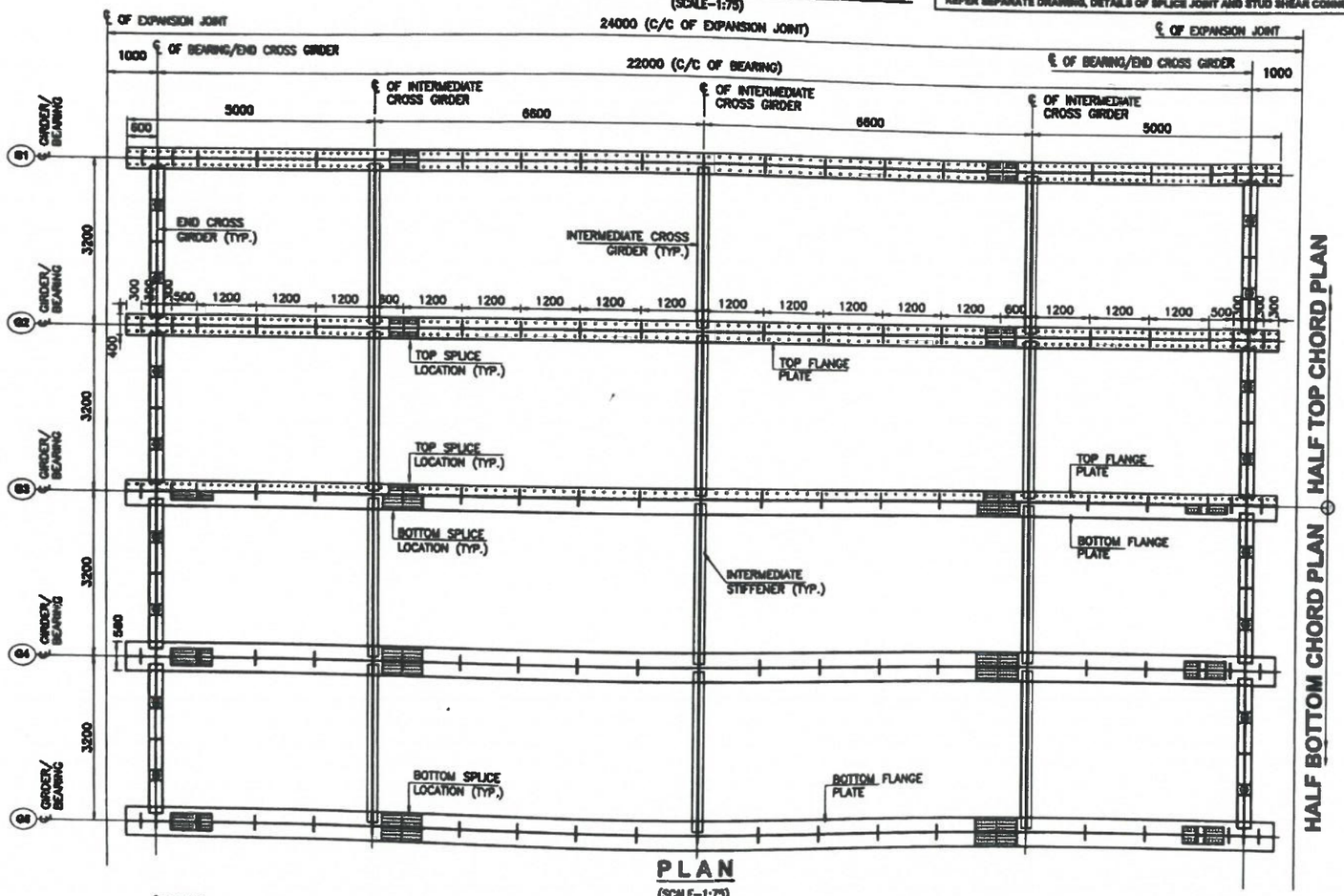
REV: R0



LONGITUDINAL SECTIONAL ELEVATION

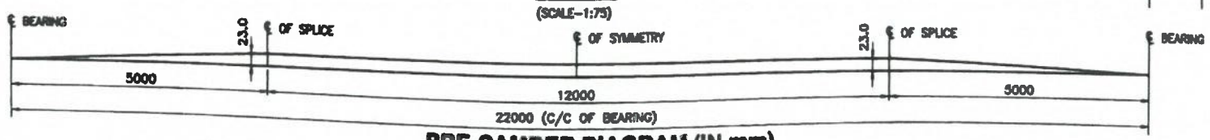
(SCALE-1:75)

* SPACING OF STUD SHEAR CONNECTORS ABOVE TOP FLANGE SPLICE PLATE PLEASE REFER SEPARATE DRAWING, DETAILS OF SPLICE JOINT AND STUD SHEAR CONNECTOR.



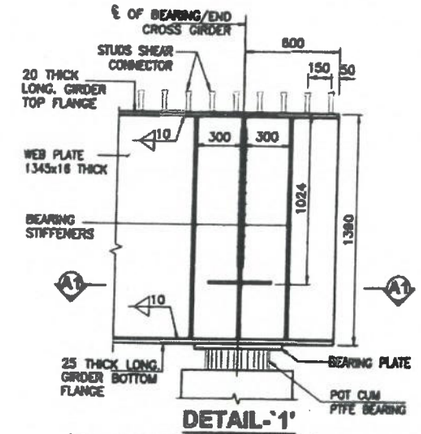
PLAN

(SCALE-1:75)



PRE-CAMBER DIAGRAM (IN mm)

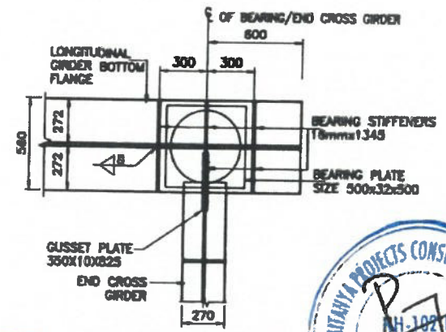
(N.T.S.)



DETAIL-'1'

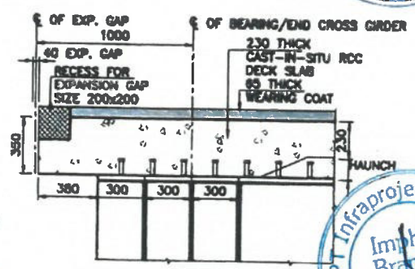
(STUD ON END CROSS GIRDER NOT SHOWN FOR CLARITY)

(SCALE-1:25)



SECTION A1-A1

(SCALE:-1:25)



DETAIL-"2"

(STUD ON END CROSS GIRDER NOT SHOWN FOR CLARITY)

(SCALE 1:25)

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MISPARK FUTURISTICS & ASSOCIATES

GPT Infraprojects Limited Imphal Branch 795001 Imphal

APPROVED

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.
3. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. GPT/CCT/4B/STR/MNB/SUP/301

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NAIDCL

EPC CONTRACTOR: GPT, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MISPARK FUTURISTICS AND ASSOCIATES, CA,2ND FLOOR, KJK TOWER, SECTOR-4,VAIBHAV, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS, PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., E-82, Rajesh Kumar Path, B.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd., # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivel section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

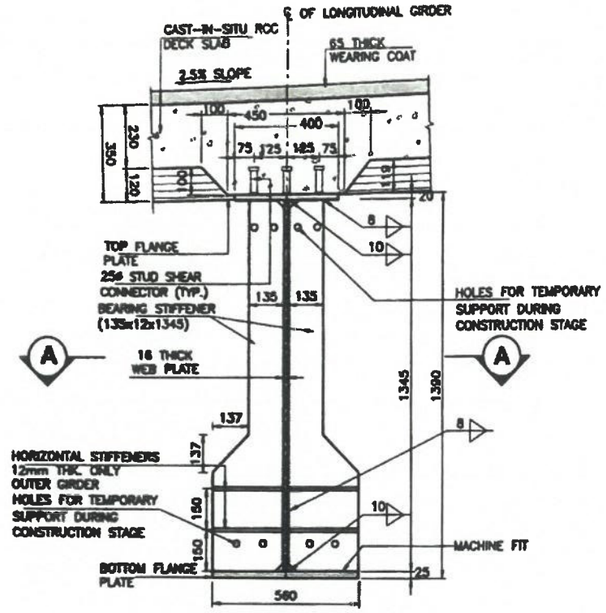
DRAWN	MP
DESIGNED	S.B
CHECKED	A.B.K
DATE: JUNE - 2021	

TITLE: DETAILS OF LONGITUDINAL GIRDER SPAN 1X24 EJ TO EJ

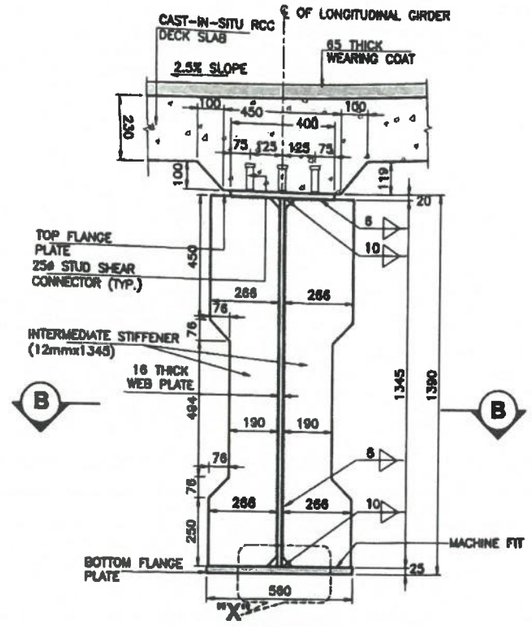
SCALE: AS SHOWN (01 OF 02)

REV: R0

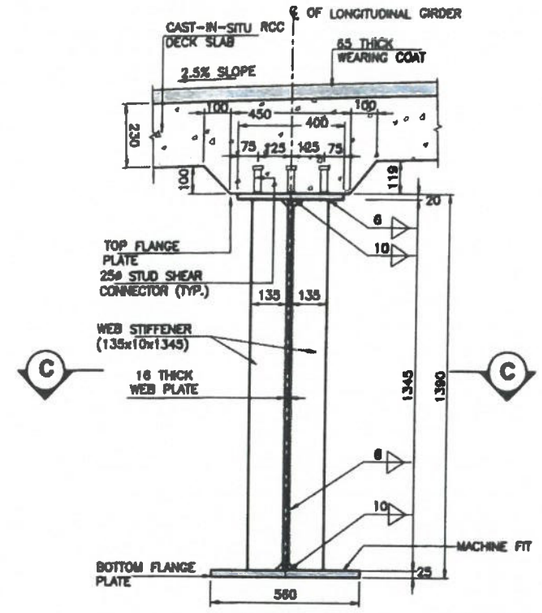
DRG.NO: GPT/CCT/4B/STR/MNB/SUP/302



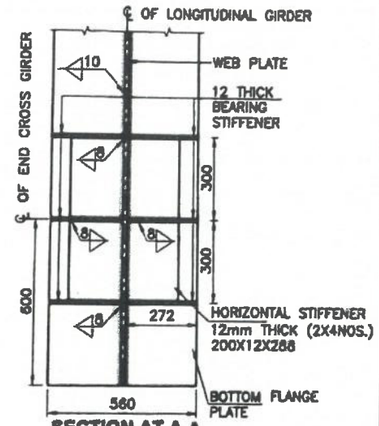
TYPICAL SECTION OF GIRDER AT BEARING STIFFENER LOCATION
(SCALE 1:15)



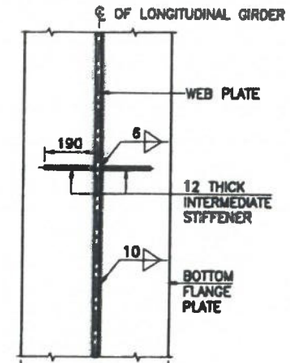
SECTION 1-1
(TYPICAL SECTION OF GIRDER AT INTERMEDIATE STIFFENER LOCATION)
(SCALE 1:15)



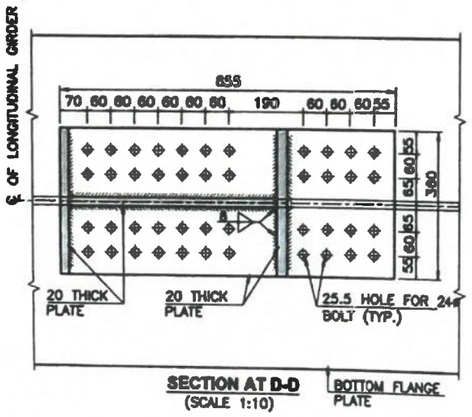
SECTION 2-2
(TYPICAL SECTION OF GIRDER AT OTHER LOCATION)
(SCALE 1:15)



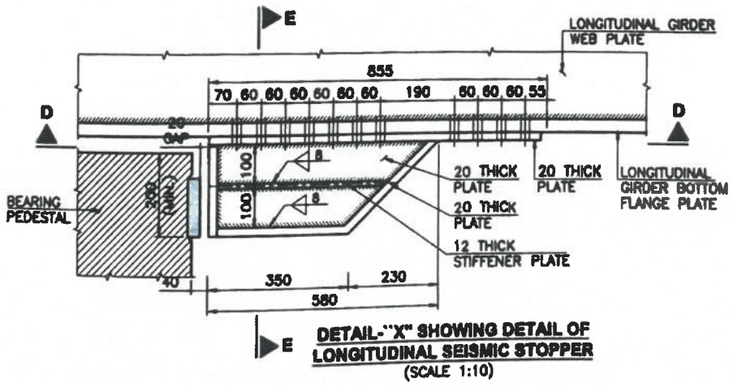
SECTION AT A-A
(SCALE 1:15)



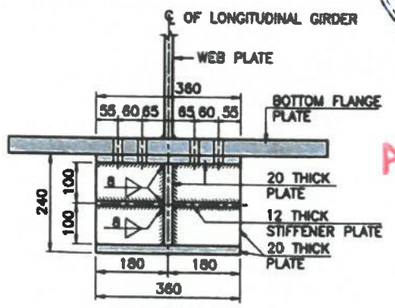
SECTION AT B-B
(SCALE 1:15)



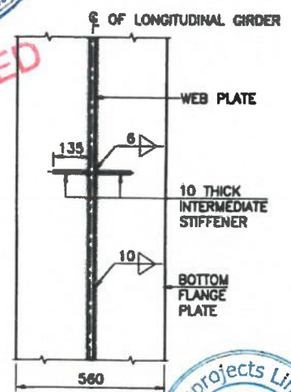
SECTION AT D-D
(SCALE 1:10)



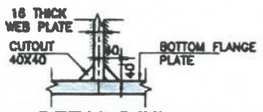
DETAIL-"X" SHOWING DETAIL OF LONGITUDINAL SEISMIC STOPPER
(SCALE 1:10)



SECTION AT E-E
(SCALE 1:10)



SECTION AT C-C
(SCALE 1:15)



DETAILS 'X'
(SCALE 1:10)

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES

GPT Infraprojects Limited Imphal Branch 795001 Imphal

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS Regd. No- 117/2004-05 BHUBANESWAR

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT Infra, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-2,3RD FLOOR, RJK TOWER, SECTOR-4,VAISHALI GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS, PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., S-42, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd., # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

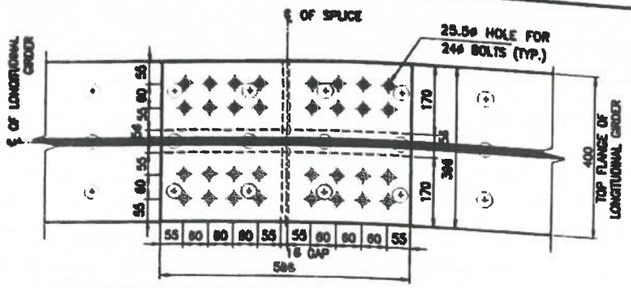
DRAWN	HP
DESIGNED	S.B
CHECKED	AS.K
DATE: JUNE - 2021	

TITLE: DETAILS OF LONGITUDINAL GIRDER FOR SPAN 1X34 EJ TO EJ

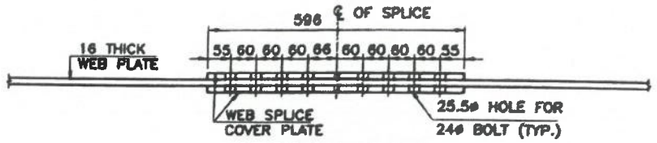
SCALE: AS SHOWN (62 OF 63)

REV: R0

DRG.NO: GPT/CCT/4B/STR/B/MUN/062



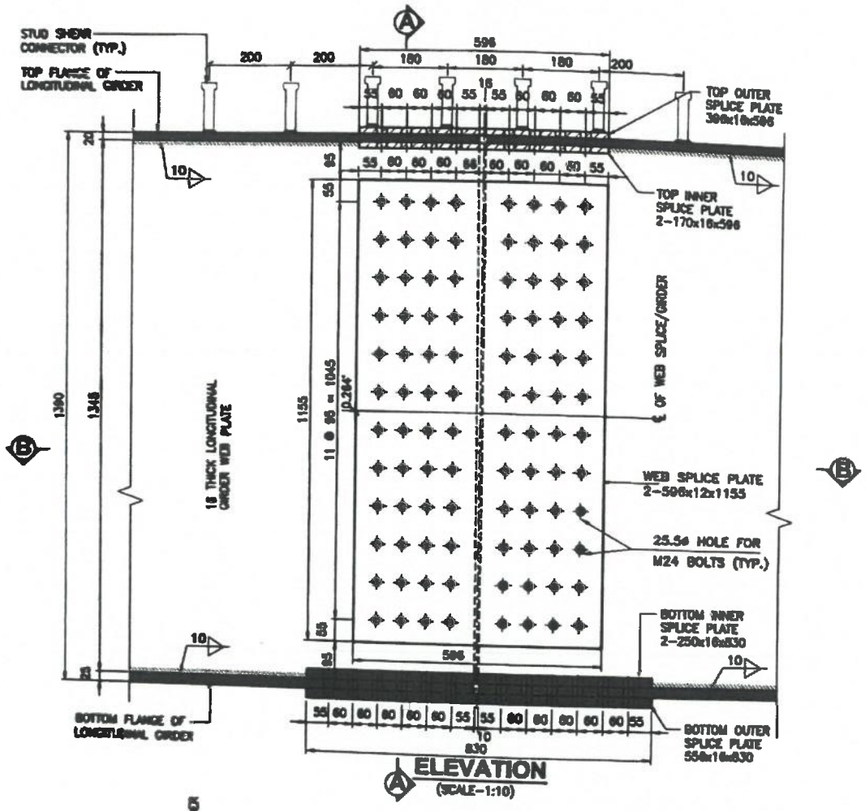
SPLICE DETAIL OF TOP FLANGE OF MAIN GIRDER
(SCALE-1:10)



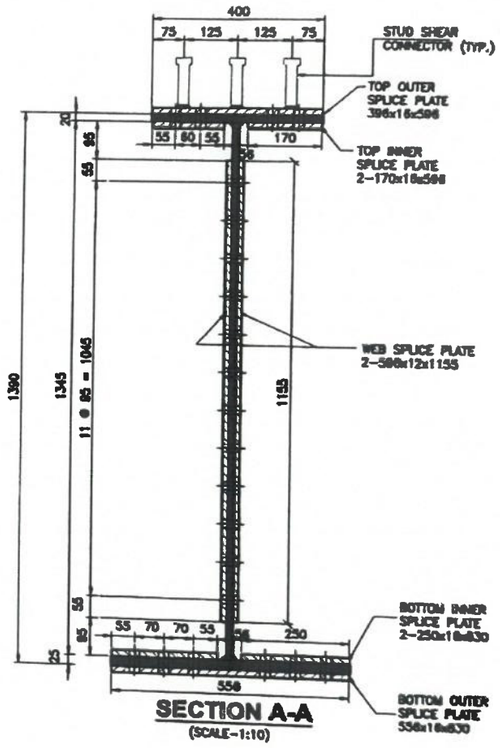
SECTION AT B-B
(SCALE 1:10)

NOTES:-

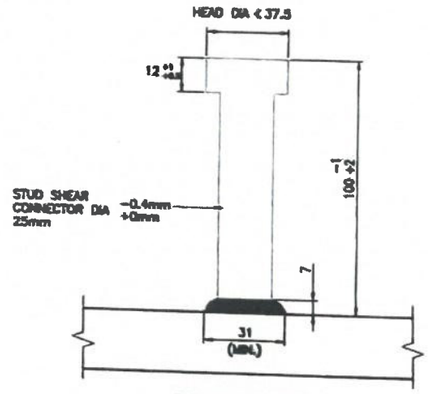
1. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE MENTIONED.
2. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
3. BOLTS USED IS M-24 (GRADE 10.9HSGF).
4. ALL STRUCTURAL STEEL SHALL CONFORM TO HIGH STRENGTH STEEL E-410(Fe-540) AS PER IS: 2062-2011.
5. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. GPT/CCT/48/STR/MNB/SUP/301



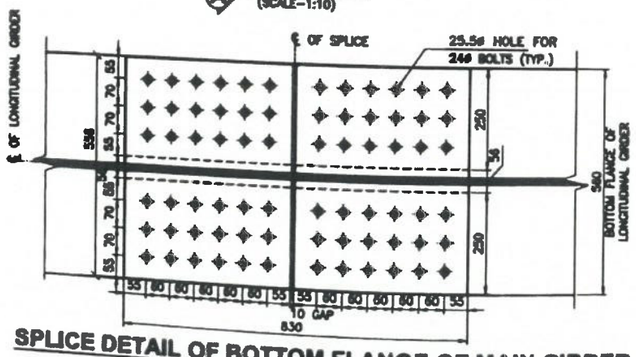
ELEVATION
(SCALE-1:10)



SECTION A-A
(SCALE-1:10)



DETAIL OF STUD SHEAR CONNECTOR
(SCALE 1:2)



SPLICE DETAIL OF BOTTOM FLANGE OF MAIN GIRDER
(SCALE-1:10)

1. THE WELDING OF STUD SHEAR CONNECTORS SHALL BE DONE BY "DRAWN ARC STUD WELDING WITH CERAMIC FERRULE" TECHNIQUE.
2. THE STUD SHEAR CONNECTOR AND CERAMIC FERRULES SHALL CONFORM TO TYPE SD3/UF AS PER BS EN ISO 13918-2008.
3. MECHANICAL PROPERTIES OF STUD SHEAR CONNECTORS SHALL BE AS PER ISO 6892/BS EN ISO 13918-2008.
4. SHAPE OF TIP OF STUD SHEAR CONNECTORS MAY BE CHOSEN BY MANUFACTURER. THE STUD TIP SHALL BE SUPPLIED WITH FLUX IN THE FORM OF PRESS-FITTED ALUMINUM BALL OR ALUMINUM SPRAY COATING.
5. THE DIAMETER OF CERAMIC FERRULE 07 AS PER FIGURE 13/TABLE 18 OF BS EN ISO 13918 SHALL BE 26 +0.5 -0.

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

GPT Infraprojects Limited Imphal Branch 795001 Imphal

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS & ASSOCIATES

APPROVED

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

Client: NHIDCL

EPC Contractor: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

Authority Engineer: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD IN ASSOCIATION WITH M/SPARK FUTURISTICS AND ASSOCIATES — C-3,2ND FLOOR, R.K TOWER, SECTOR-4,VASHALI, GHAZIABAD-201010

Safety Consultant: SUVADRA CONSULTANTS — PP-97, Tankaperi Road, BBSR-15, Odisha

Proof Consultant: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-12, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

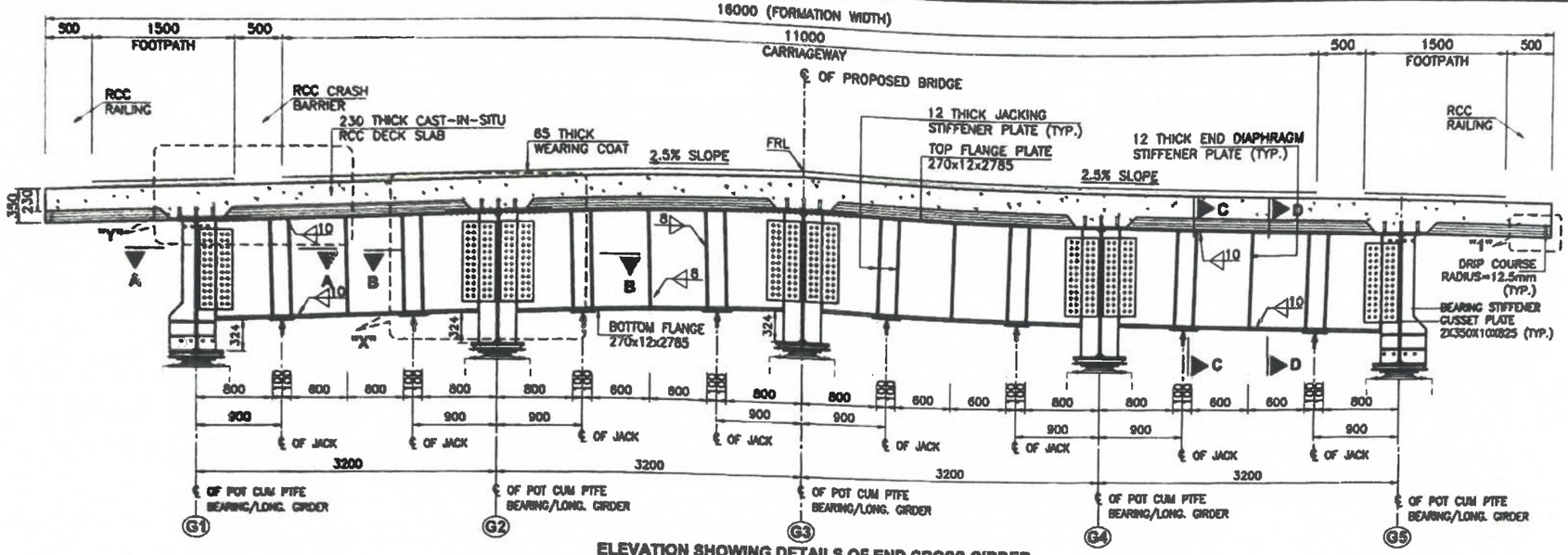
Design Consultant: SPS Technocrats Pvt. Ltd. — S 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

Project: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-48) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

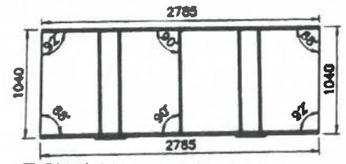
Drawn: HP
Designed: S.B
Checked: AB.K
Date: JUNE - 2021

Title: DETAILS OF SPLICE JOINT AND STUD SHEAR CONNECTOR AT SPLICED FOR SPAN 12M SJ TO SJ
Scale: AS SHOWN
1 OF 2
Drg. No: GPT/CCT/48/STR/MJB/SUP/303
Rev: R0

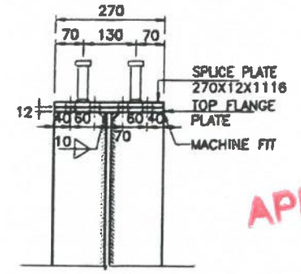
Y:\01_SPS PROJECT\9_MANIPUR\PACKAGE-48\01_Drawings\01_Major Bridge\Dwg 12M AS SUPER STRUCTURE\03 Aug 24-Jun-21



ELEVATION SHOWING DETAILS OF END CROSS GIRDER
(SCALE 1:40)

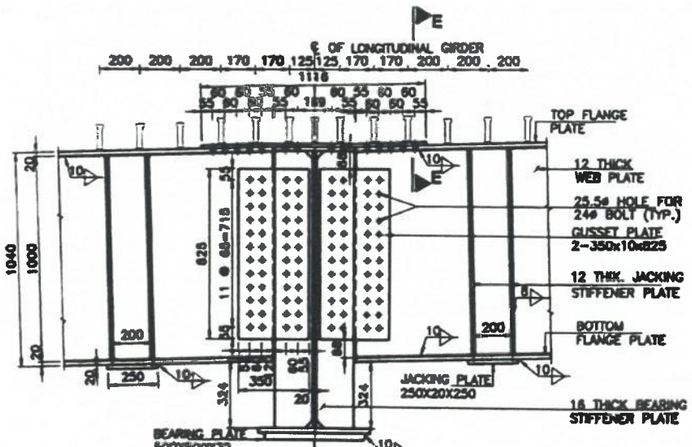


TYPICAL DETAILS OF END CROSS GIRDER
(SCALE 1:40)

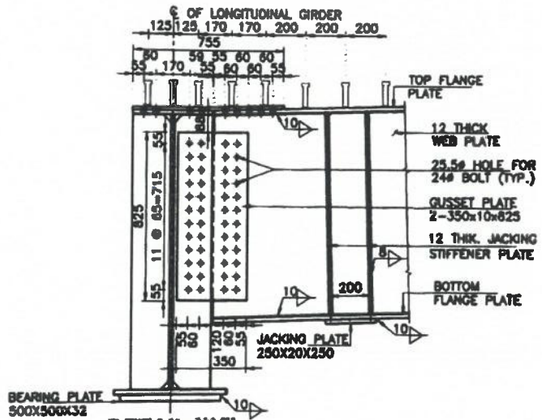


SECTION AT E-E
(SCALE 1:10)

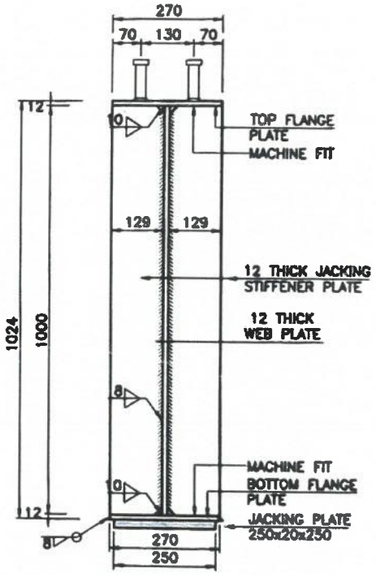
APPROVED



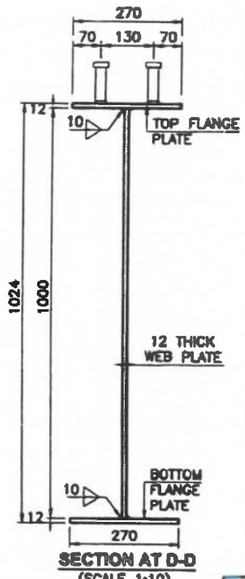
DETAIL-"X"
(SCALE 1:20)



DETAIL-"Y"
(SCALE 1:20)



SECTION AT C-C
(SCALE 1:10)



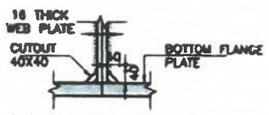
SECTION AT D-D
(SCALE 1:10)

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with INSPARK FUTURISTICS & ASSOCIATES

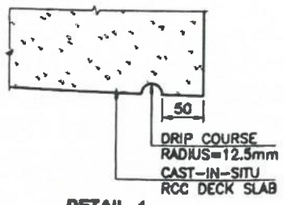
SUVADRA CONSULTANTS Regd. No. 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

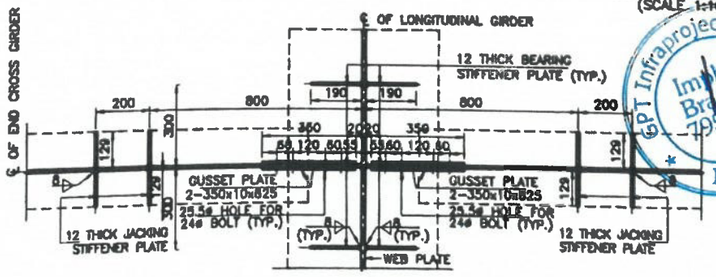
DESIGN DIRECTOR



TYP. OPENING DETAILS
(SCALE 1:10)

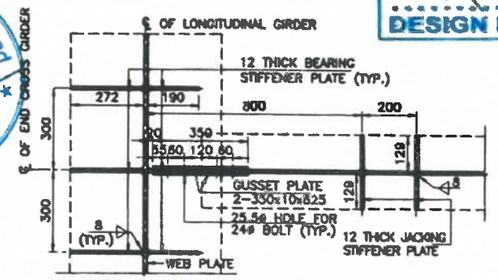


DETAIL -1
DRIP COURSE
(SCALE 1:5)



SECTION AT B-B
(SCALE 1:15)

GPT Infraprojects Limited Imphal Branch 795001 Imphal



SECTION AT A-A
(SCALE 1:15)

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.
3. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. GPT/CCT/48/STR/MNB/SUP/301

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

Client: NHIDCL

EPC Contractor: GPT, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

Authority Engineer: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH M/S PARK FUTURISTICS AND ASSOCIATES, C-3,2ND FLOOR, JUK TOWER, SECTOR-4, VAISHALI, GHAZIABAD-201010

Safety Consultant: SUVADRA CONSULTANTS, PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., E-82, Rajesh Kumar Path, S.A. Puri, Boring Road, Patna-800001

Design Consultant: SPS Technocrats Pvt. Ltd., 6 B10 & B11, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

Project: Widening to 2 (Two) Lane with Hard shoulder of Churachanpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

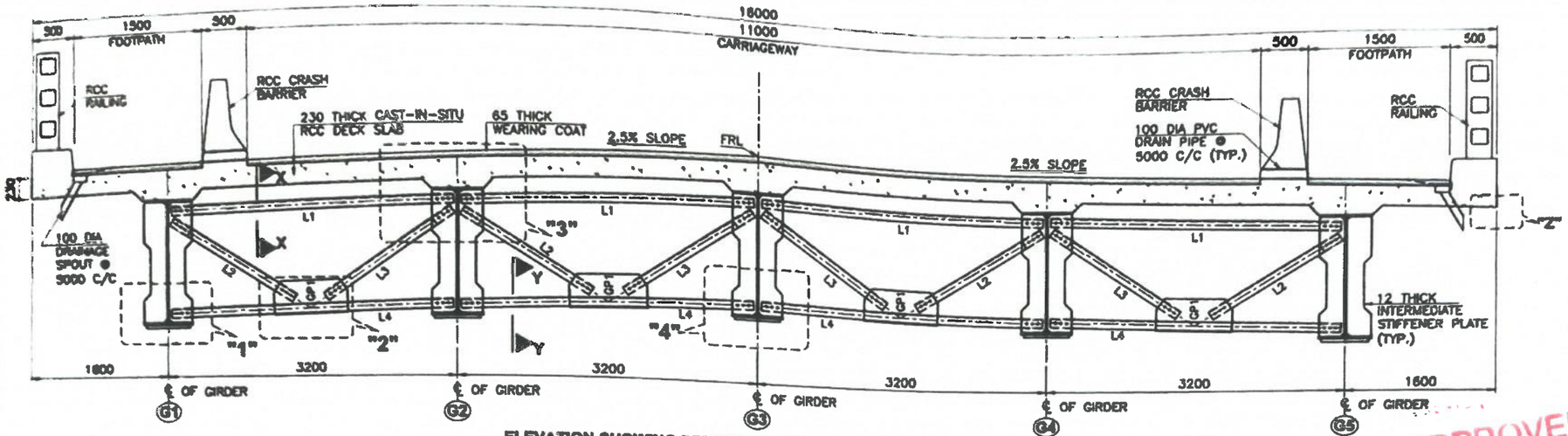
Drawn	MP
Designed	S.B
Checked	A.B.K
Date: JUNE - 2021	

Title: DETAILS OF END CROSS GIRDER FOR SPAN 1X24 EJ TO EJ

Scale: AS SHOWN (01 OF 01)

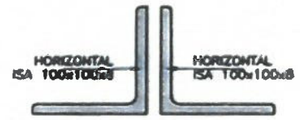
Drg. No: GPT/CCT/48/STR/MJB/SUP/304

Rev: R0



ELEVATION SHOWING DETAILS OF INTERMEDIATE CROSS GIRDER
(SCALE 1:40)

SECTION AT X-X
(SCALE 1:5)

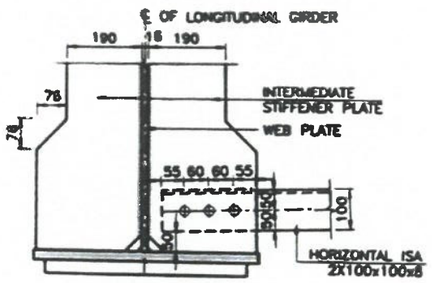


SECTION AT Y-Y
(SCALE 1:5)

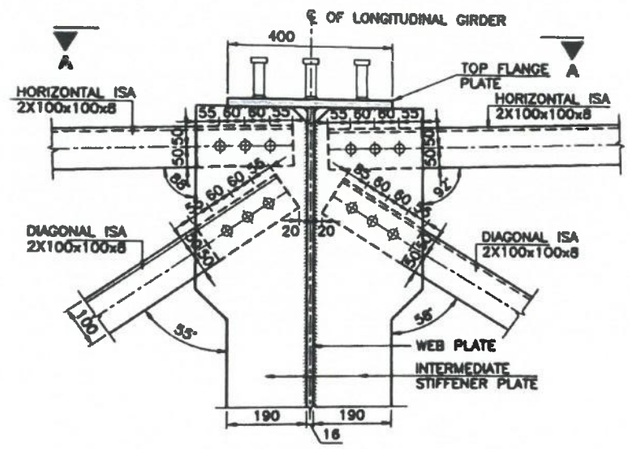
APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES

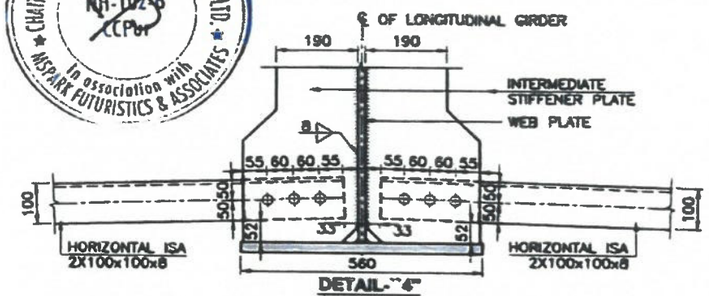
Shambhavi Techno Solutions Pvt. Ltd.
Managing Director



DETAIL-"1"
(SCALE 1:10)

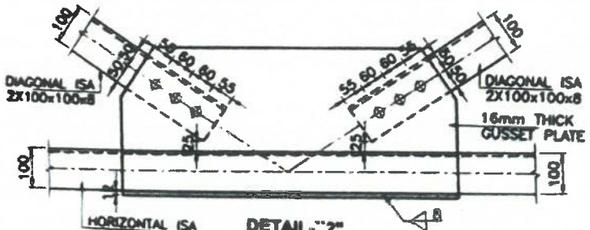


DETAIL-"3"
(SCALE 1:10)

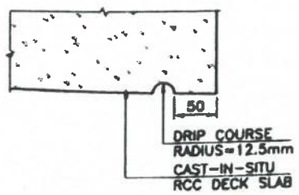


DETAIL-"4"
(SCALE 1:10)

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

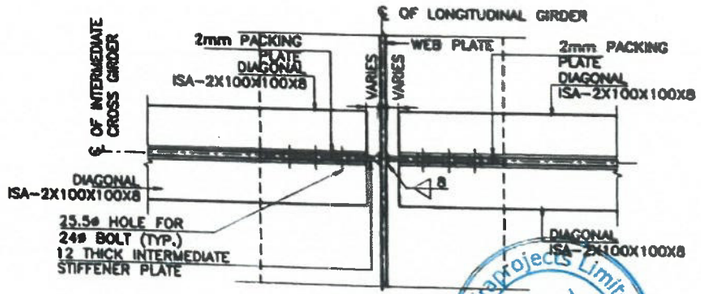


DETAIL-"2"
(SCALE 1:10)



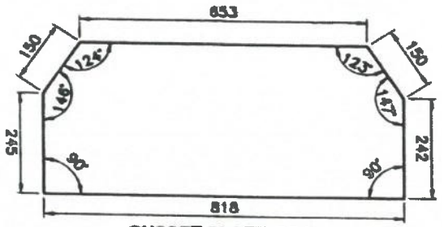
DETAIL 'Z' OF DRIP COURSE
(SCALE 1:5)

ANGLE MARKING	LENGTH (IN MM)
L1	3116
L2	1621
L3	1666
L4	3116



SECTION AT A-A
(SCALE 1:10)

GPT Infraprojects Limited Imphal Branch 795001 Imphal



GUSSET PLATE-GP1
(SCALE 1:10)

DESIGN DIRECTOR

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.
3. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. GPT/CCT/4B/STR/MNB/SUP/301

Rev.	Date	Description
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-6,3RD FLOOR, ILS TOWER, SECTOR-4, VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA, PP-37, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd., # 610 & 611, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

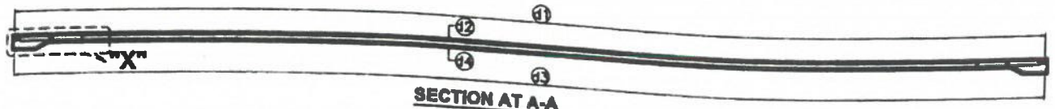
DRAWN	MP
DESIGNED	S.S
CHECKED	A.S.K
DATE: JUNE - 2021	

TITLE: DETAILS OF INTERMEDIATE CROSS GIRDER FOR SPAN 1X24 EJ TO EJ

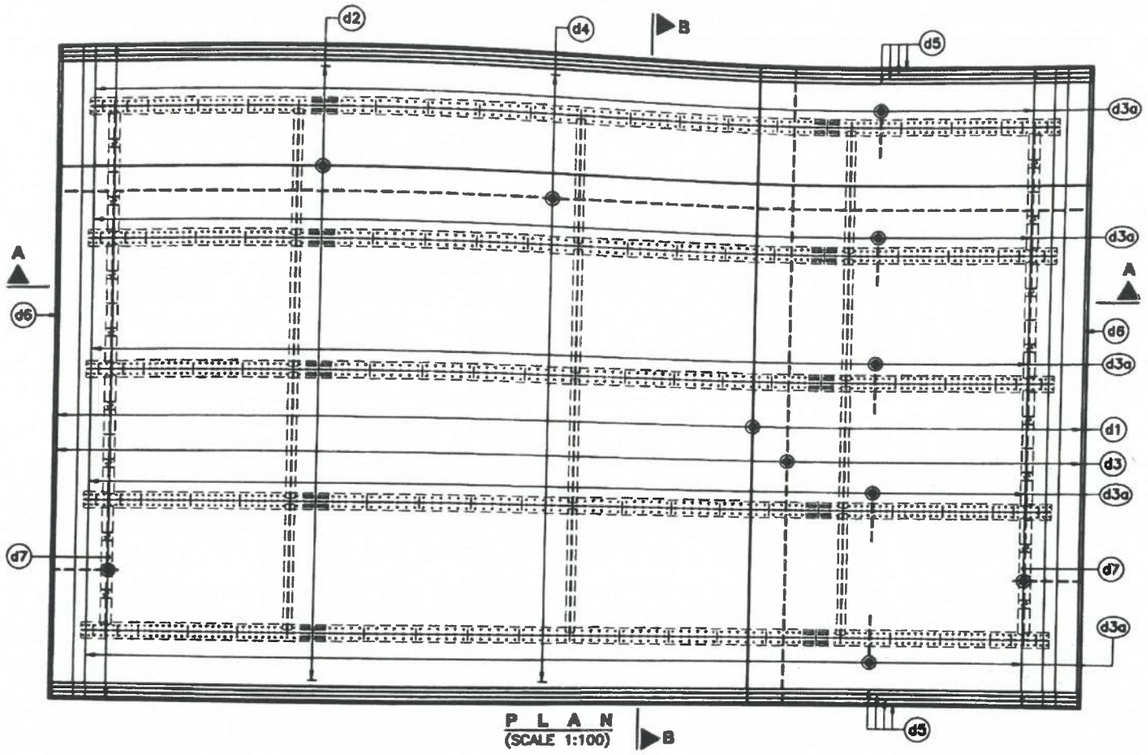
SCALE: AS SHOWN (61 OF 61)

DRG. NO: GPT/CCT/4B/STR/MJB/SUP/305

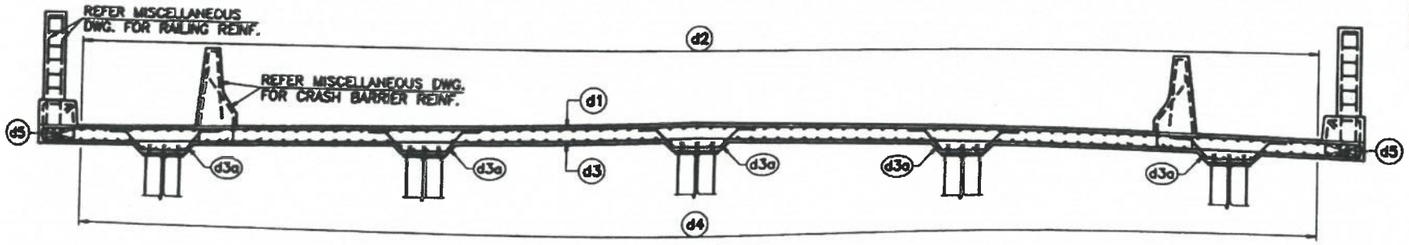
REV: R0



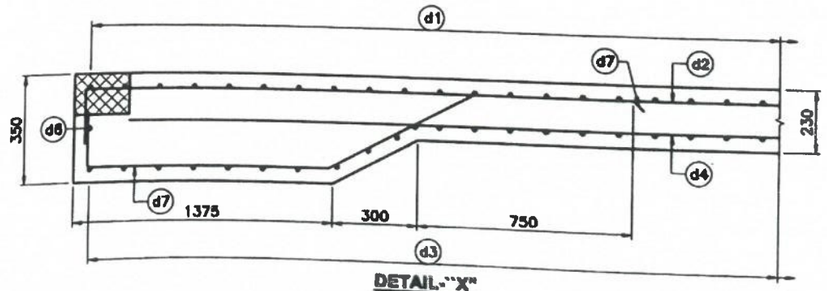
SECTION AT A-A
(SCALE 1:100)



P L A N
(SCALE 1:100)



SECTION AT B-B
(SCALE 1:50)



DETAIL-"X"
(SCALE 1:15)

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES NH-102-B' CEPur

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR

SCHEDULE OF REINFORCEMENT		
BAR MKD.	BAR DIA & SPACING/NOS.	BAR SHAPE
d1	16 ⌀ @ 100 C/C	150 150
d2	10 ⌀ @ 200 C/C	200 200
d3	16 ⌀ @ 100 C/C	150 150
d3a	12 ⌀ @ 100 C/C	200 200
d4	10 ⌀ @ 200 C/C	
d5	12 ⌀ 2x2x4 NOS.	100 100
d6	12 ⌀ 2x1 NOS.	
d7	10 ⌀ @ 100 C/C	200

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THE REINFORCEMENT SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS: 1786.
3. GRADE OF CONCRETE SHALL BE AS BELOW:-
   RCC DECK SLAB M35
4. CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:-
   RCC DECK SLAB 40mm
5. SPLICING OF REINFORCEMENT SHALL BE DONE EITHER BY OVERLAPPING OR BY USING MECHANICAL COUPLER.
6. LAPPING SHALL BE STAGGERED, BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH SHALL BE PROVIDED AS "X*D" MENTIONED IN THE TABLE BELOW, WHERE 'D' IS THE DIA OF THE SMALLER BAR UNLESS OTHERWISE SPECIFIED.

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M35	X	36	41	50	54

UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M35	X	53	61	74	80

FAVOURABLE ZONE:-
a. RAFT/SLAB BOTTOM MAIN BAR.
UNFAVOURABLE ZONE:-
a. RAFT/SLAB TOP MAIN BAR.
b. WALL/COLUMN MAIN BAR.

7. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.

GPT Infraprojects Limited Imphal Branch 795001 Imphal

LEGEND:-

TOP BAR	————
BOTTOM BAR OTHERWISE MENTIONED	- - - - - - - - - -

Rev.	Date	Description
00	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-4,2ND FLOOR, RX TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — # 518 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

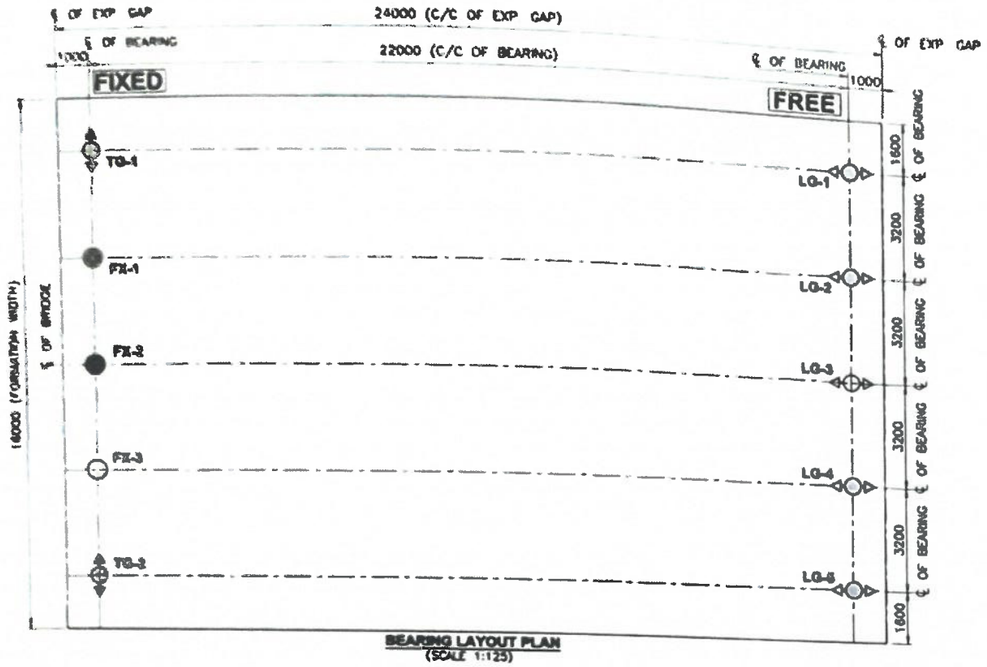
DRAWN	HP
DESIGNED	S.S
CHECKED	A.S.K
DATE: JUNE - 2021	

TITLE: REINFORCEMENT DETAILS OF DECK SLAB FOR SPAN 1X24 EJ TO EJ

SCALE: AS SHOWN (01 OF 01)

DRG.NO: GPT/CCT/4B/STR/BJB/SUP/306

REV: R0



BEARING LAYOUT PLAN
(SCALE 1:125)

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS BHUBANESWAR Regd. No- 117/2004-05

DESIGN DIRECTOR

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with ASPARK FUTURISTICS & ASSOCIATES NH-TDR-B CCPvt

GPT Infraprojects Limited Imphal Branch 795001 Imphal

NOTES:-

1. MATERIAL MODIFICATIONS IN THE STRUCTURE DETAIL e.g. PEDESTAL ETC. FOR COMPATIBILITY WITH THE BEARING DETAIL AS PER MANUFACTURER'S REQUIREMENT SHALL BE PERMITTED SUBJECTED TO APPROVAL OF THE ENGINEER.
2. SPECIFICATION FOR BEARINGS SHALL BE AS PER LATEST TECHNICAL SPECIFICATIONS AND IRC: 83 PART–III.
3. THE TESTING OF RAW MATERIALS, METALLIC COMPONENTS, ELASTOMER, PTFE AND ACCEPTANCE TEST ON BEARING SHALL CONFORM TO MORTH SPECIFICATIONS
4. MANUFACTURER SHALL SUBMIT THE CERTIFICATE FOR LOAD TESTING AND DIMENSIONS OF BEARINGS.
5. THE GROUT BEDDING MORTAR SHALL BE OF HIGH STRENGTH FREE FLOWING NON SHRINK TYPE.
6. BEARING PLANES SHALL BE MADE TRULY HORIZONTAL ALONG WITH PEDESTAL BY PROPER MECHANISM TO TAKE CARE OF GRADIENT EFFECT.
7. GRADE OF CONCRETE –
   a BEARING PEDESTAL M45
8. STRUCTURE IS LOCATED IN SEISMIC ZONE–V.
9. PRECAUTIONS TO BE TAKEN BY THE SITE ENGINEER DURING CONSTRUCTION OF STRUCTURES TILL THE GIRDER ARE BRACED BY DIAPHRAGMS/SLAB.
10. COMPREHENSIVE DATA IN TABLE, COMPRISING OF MAXIMUM/MINIMUM AND CORRESPONDING COEXISTING LOADS, FORCES, MOVEMENT AND ROTATION SHALL BE PROVIDED FOR EACH LOAD CONDITION AND CASE
11. LEGEND :-
    MOVEMENT + EXPANSION
    – CONTRACTION

LEGEND

SYMBOL	DESCRIPTION
	FIXED BEARING (FX)
	TRANS GUIDED (TG)
	LONG GUIDED (LG)
	FREE BEARING (FB)
TYPE OF BEARING : POT PTFE BEARING	

A.1 Typical Load Data Format

1.	Bearing Identification mark						
	Type of Bearing				Fixed Bearing	Long Guided	Trans Guided
2.	Number Off				3	5	2
3.	Bearing Material and Character Strength		Upper Surface		Structural steel	Structural steel	Structural steel
			Lower Surface		Concrete	Concrete	Concrete
4.	Allowable contact Pressure (kN/mm²)		Upper Surface	Serviceability	334	334	334
				Ultimate	410	410	410
			Lower Surface	Serviceability	20.1	20.1	20.1
				Ultimate	45	45	45
5.	Design Load (kN)	Serviceability Limit State (SLS)	Vertical (EXCL. SV loading)	Max	1408	1408	1408
				Permanent	803	803	803
				Min	318	318	318
			Horizontal (EXCL. SV loading)	Longitudinal	88	0	88
				Transverse	0	0	0
			Vertical (SV loading)	Max	1522	1522	1522
				Permanent	803	803	803
				Min	326	326	326
			Horizontal (SV loading)	Longitudinal	0	0	0
				Transverse	0	0	0
		Ultimate Limit State (ULS)	Vertical (EXCL. SV loading)	Max	2168	2168	2168
				Permanent	825	825	825
				Min	98	98	98
			Horizontal (EXCL. SV loading)	Longitudinal	722	0	722
				Transverse	661	661	0
			Vertical (SV loading)	Max	1882	1882	1882
				Permanent	825	825	825
				Min	498	498	498
			Horizontal (SV loading)	Longitudinal	0	0	0
				Transverse	0	0	0
6.	Displacement (mm)	Serviceability Limit State (SLS)	Irreversible	Longitudinal	-	8.9	-
				Transverse	-	-	2.9
			Reversible	Longitudinal	-	7.8	-
				Transverse	-	-	2.8
		Ultimate Limit State (ULS)	Irreversible	Longitudinal	-	9.3	-
				Transverse	-	-	3.4
			Reversible	Longitudinal	-	10.5	-
				Transverse	-	-	3.8
7.	Rotation (Radians)	Serviceability Limit State (SLS)	Irreversible	Longitudinal	0.0105	0.0105	0.0105
				Transverse	0.0000	0.0000	0.0000
			Reversible	Longitudinal	0.0020	0.0020	0.0020
				Transverse	0.0000	0.0000	0.0000
8.	Maximum Bearing Dimensions (mm), if restricted	Upper Surface		Longitudinal	580	580	580
				Transverse	580	580	580
		Lower Surface		Longitudinal	700	700	700
				Transverse	700	700	700
		Overall Height (Bearing + Pedestal) (mm)			350	350	350
9.	Maximum acceptable reaction to rotation under Serviceability Limit State (kN x m), if restricted			Longitudinal	NA	NA	NA
				Transverse	NA	NA	NA
10.	Type of Fixing Required			Upper Surface	BEARING PLATE	BEARING PLATE	BEARING PLATE
				Lower Surface	DOWEL/STUD	DOWEL/STUD	DOWEL/STUD

Sr.	Date	Description
R1	JULY-21	BY LEADING INCLUDED
R0	JUNE-21	FOR APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT, JC - 25 Sector - III Salt Lake, Kolkata - 700098

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT. LTD. IN ASSOCIATION WITH M/S ASPARK FUTURISTICS AND ASSOCIATES, C-LIG FLOUR RA TOWER, SECTOR-4 VASHALI GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA, PP-87 Tankapani Road, BBSR, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT LTD., E-92, Rajesh Kumar Path, S.J.P.Ext, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd., 6 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachanpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-48) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN: HP
DESIGNED: S.S
CHECKED: AS K
DATE: JUNE - 2021

TITLE: DETAIL OF POT CUM PTFE BEARING LAYOUT FOR SPAN 1X24 EJ TO EJ

SCALE: AS SHOWN (01 OF 01)

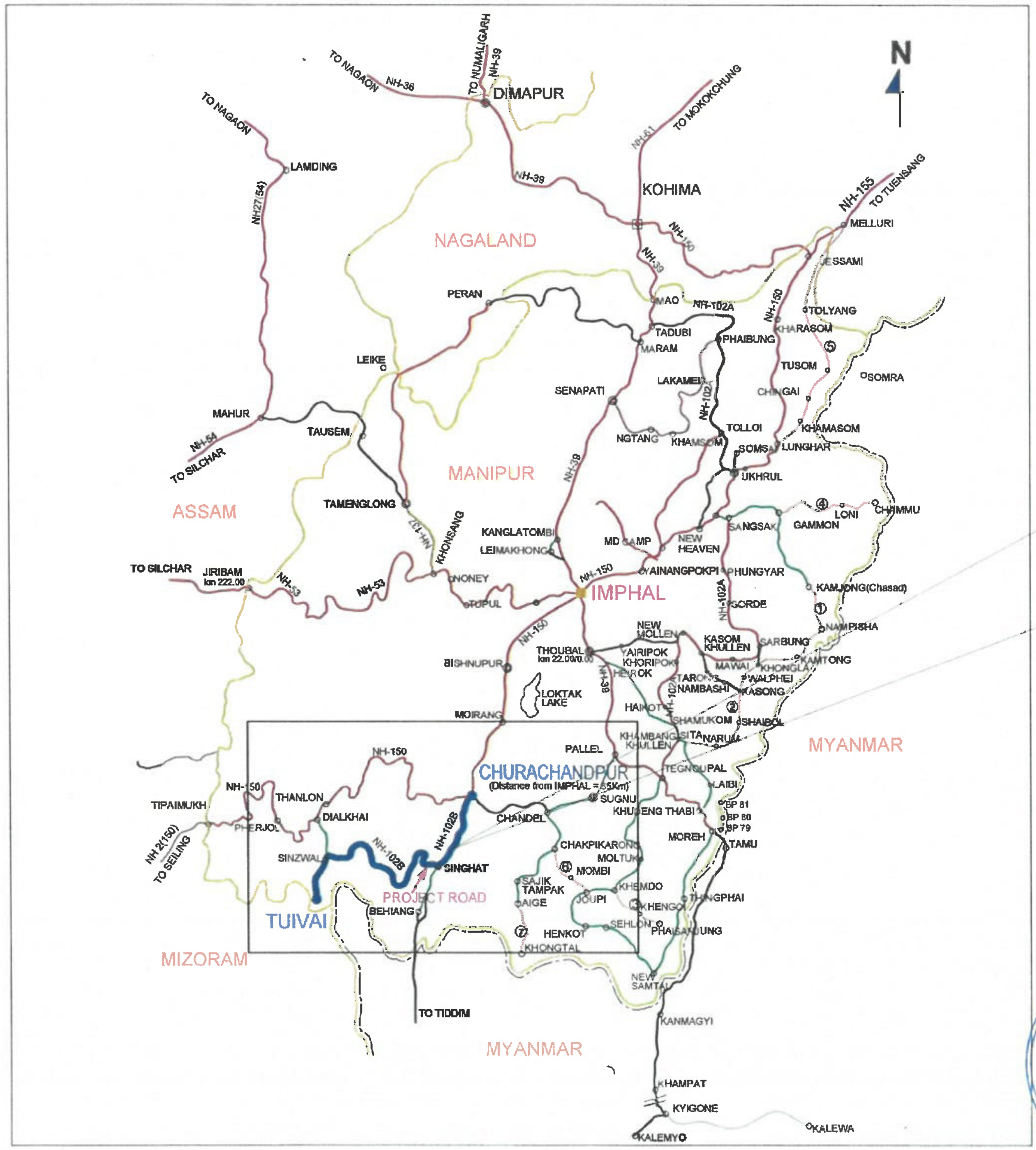
DRG. NO: GPT/CCT/HB/STR/SJN/SUP/387

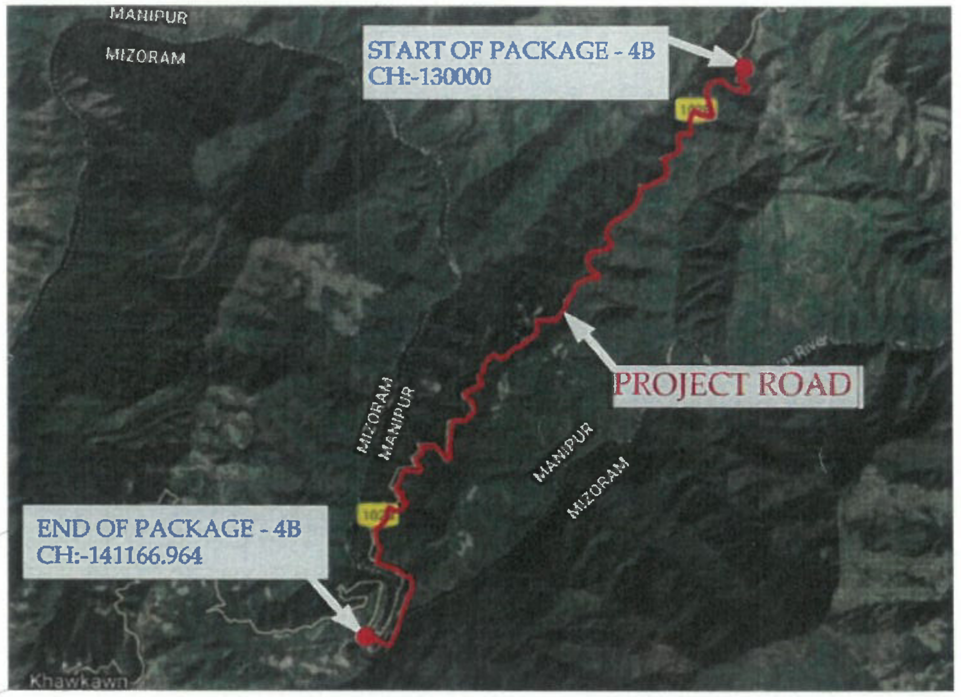
REV: R1

NHIDCL
BUILDING INFRASTRUCTURE - BUILDING THE NATION

National Highways & Infrastructure Development
राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction mode.





TYPICAL MISCELLANEOUS DRAWINGS

PACKAGE - 4B

(Km. 130+000 to Km. 141+166.964)

JANUARY - 2021

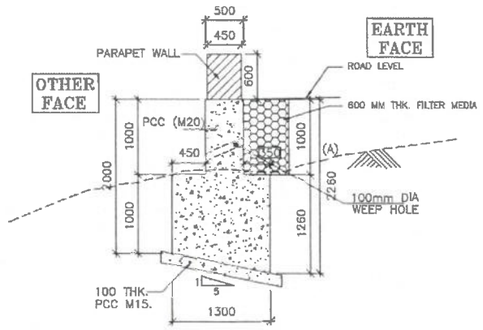
APPROVED

EPC CONTRACTOR:

GPT group
JC - 25, Sector - III, Salt Lake,
Kolkata - 700098.

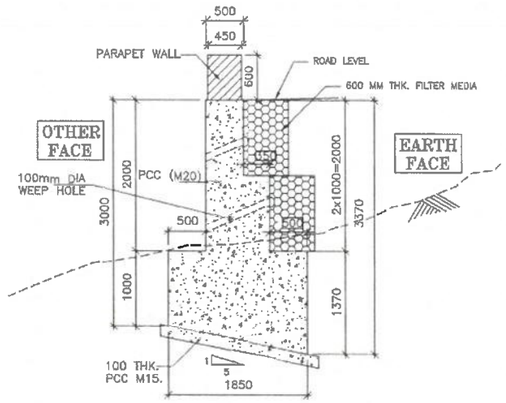
DESIGN CONSULTANT:

SPS Technocrats
Pvt. Ltd.
510 & 511, JMD Megapolis, Sector 48,
Gurugram, Haryana - 122018.



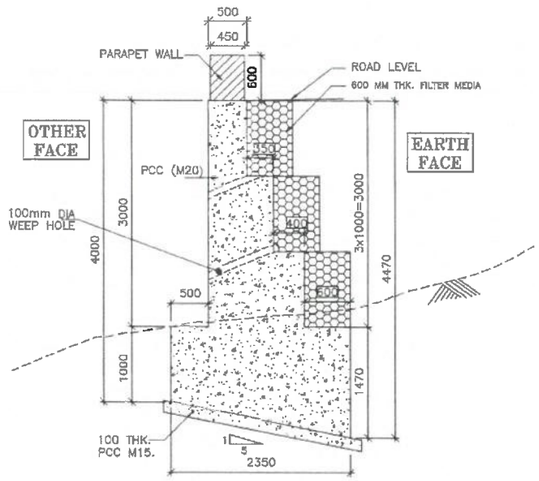
RETAINING WALL (2.0m)

SCALE 1:50



RETAINING WALL (3.0m)

SCALE 1:50

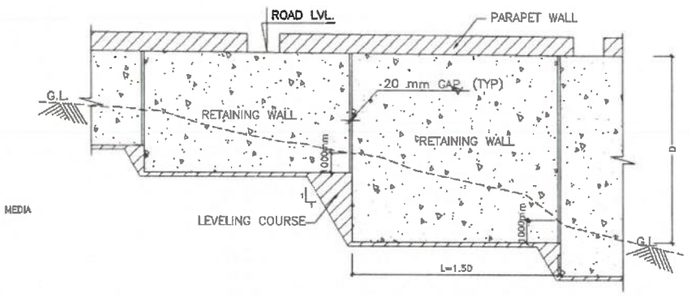


RETAINING WALL (4.0m)

SCALE 1:50

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 100MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/LWL.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78-2014.
5. BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 -2014 HAVING PROPERTIES ø =35°, C=0
6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
7. GRADE OF CONCRETE IN WALL IS M20.
8. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
9. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

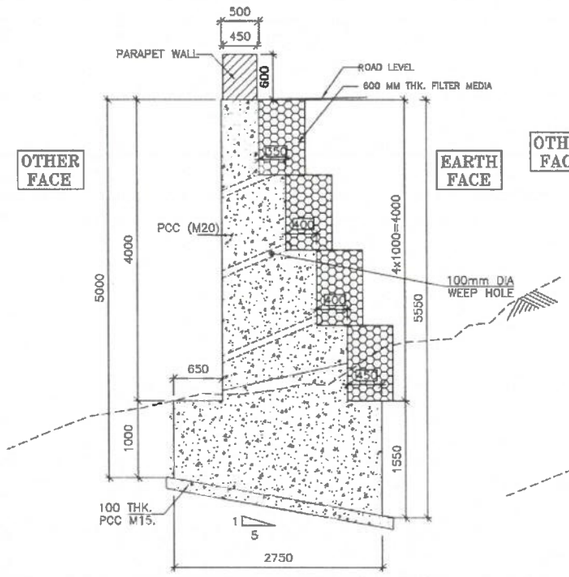


TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

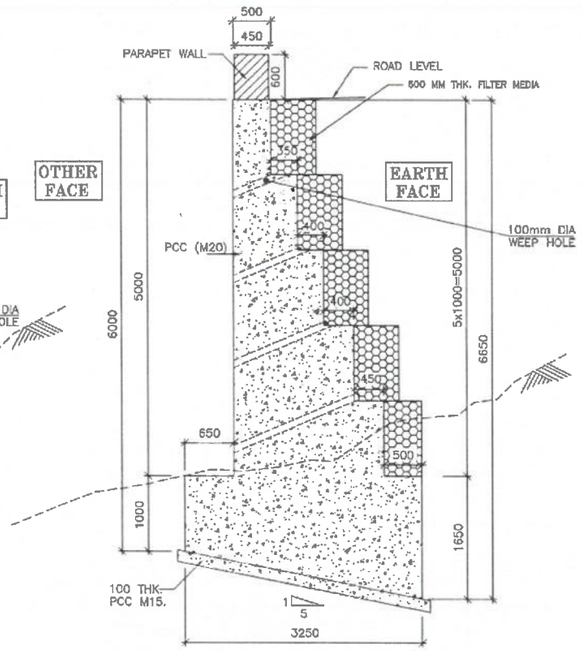
REQUIRED BEARING CAPACITY :

H MAX. (m)	2.0	3.0	4.0	5.0	6.0
REQUIRED BEARING CAPACITY (T/sqm)	10	13	18	21	25



RETAINING WALL (5.0m)

SCALE 1:50



RETAINING WALL (6.0m)

SCALE 1:50

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

APPROVED

Rev.	Date	Description

CLIENT: NHIDCL

EPC CONTRACTOR: GPT Infraprojects — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

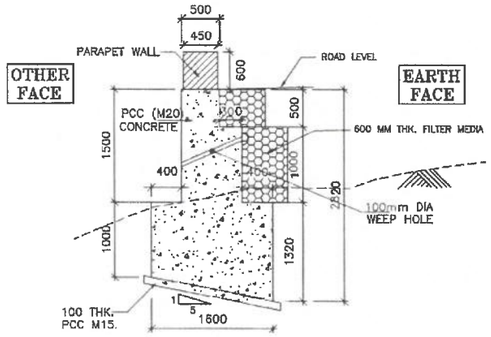
SAFETY CONSULTANT: SUVADRA Consultants — PP-97, Tankaparni Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

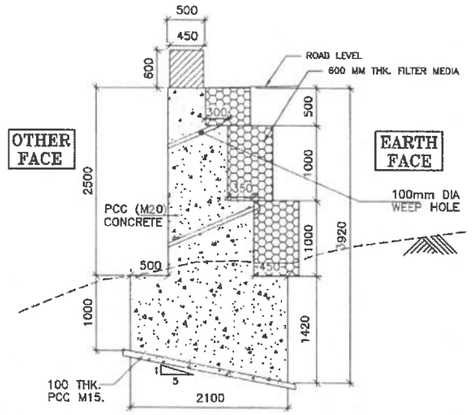
PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	S.R	TITLE: RETAINING WALL (PCC)	
DESIGNED	SHIVAM	SCALE: AS SHOWN 01 OF 02	REV: R0
CHECKED	A.B.K		
DATE: JAN - 2021		DRG.NO: GPT/CCT/4B/STR/MISC/RW/01	



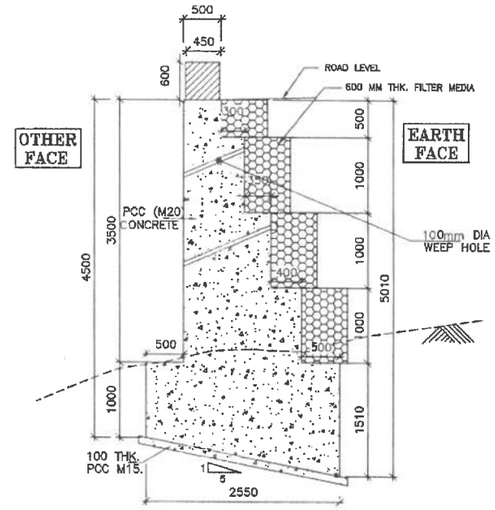
RETAINING WALL (2.5m)

SCALE 1:50



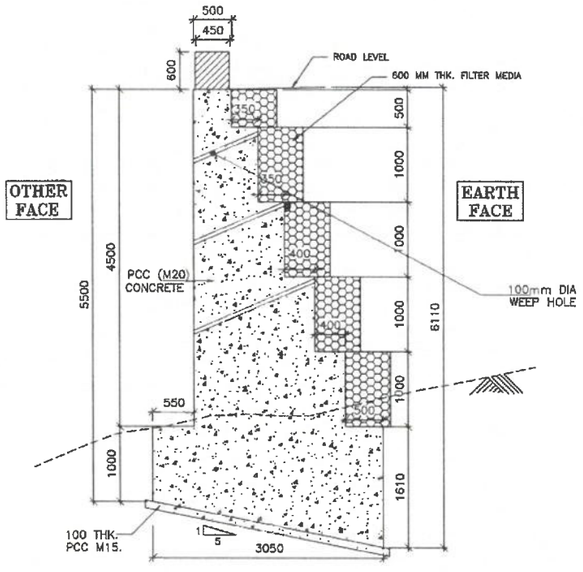
RETAINING WALL (3.5m)

SCALE 1:50



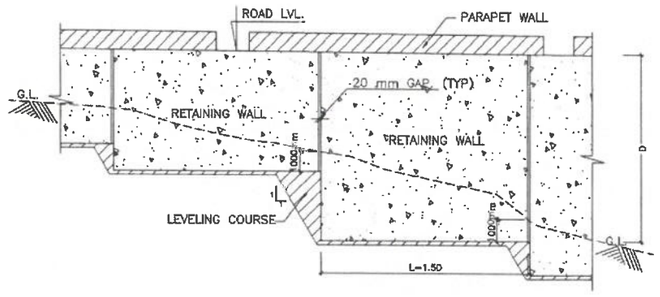
RETAINING WALL (4.5m)

SCALE 1:50



RETAINING WALL (5.5m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

GENERAL NOTES:–

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 100MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/LWL.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78–2014.
5. BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 –2014 HAVING PROPERTIES ø =35°, C=0
6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
7. GRADE OF CONCRETE IN WALL IS M20.
8. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
9. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER–IN–CHARGE BEFORE ANY EXECUTION.

REQUIRED BEARING CAPACITY :

H MAX. (m)	2.5	3.5	4.5	5.5
REQUIRED BEARING CAPACITY (T/sqm)	12	16	20	24

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

APPROVED

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. & MSPARK FUTURISTICS & ASSOCIATES

Rev.	Date	Description

CLIENT: NAIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, O-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana – 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

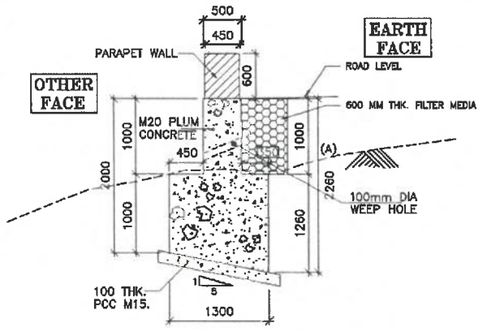
DRAWN	S.R
DESIGNED	SHIVAM
CHECKED	AB.K
DATE:	JAN - 2021

TITLE: RETAINING WALL PCC

SCALE: AS SHOWN — 02 OF 02

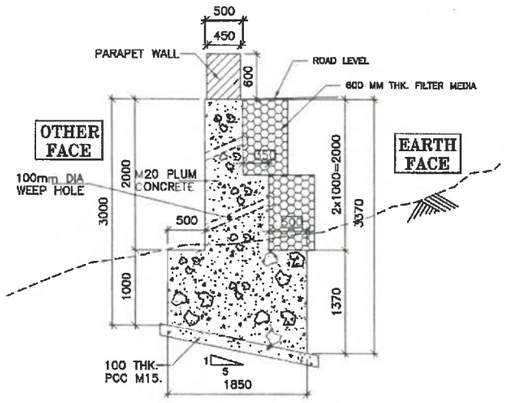
REV: R0

DRG.NO: GPT/CCT/4B/STR/MISC/RW/02



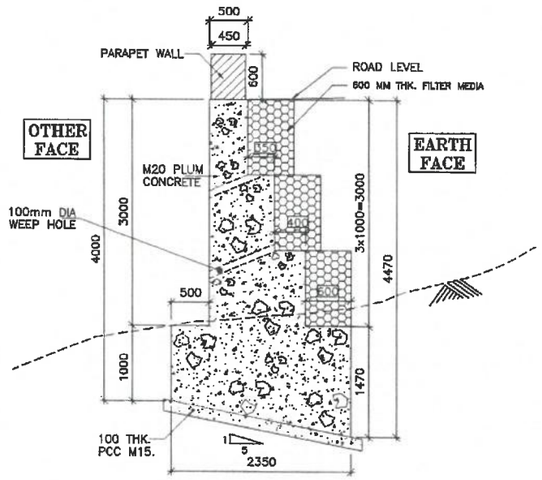
RETAINING WALL (2.0m)

SCALE 1:50



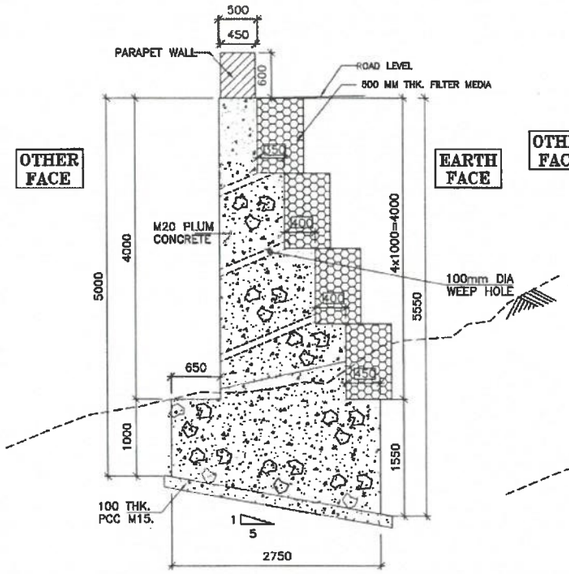
RETAINING WALL (3.0m)

SCALE 1:50



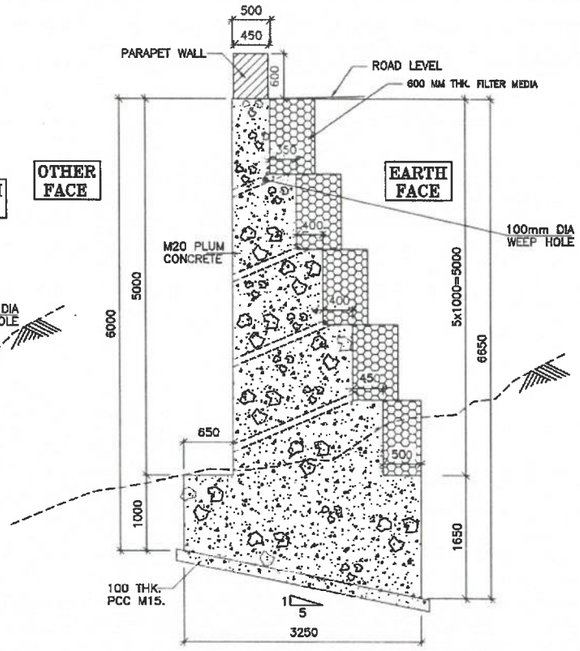
RETAINING WALL (4.0m)

SCALE 1:50



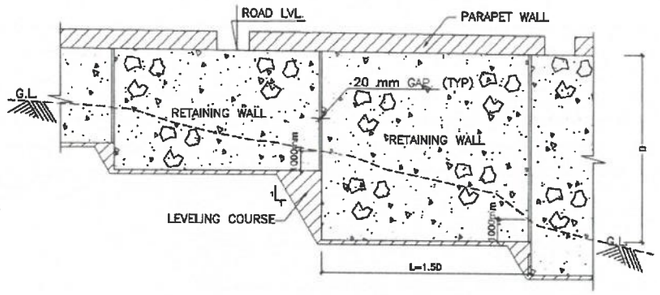
RETAINING WALL (5.0m)

SCALE 1:50



RETAINING WALL (6.0m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

Shambhavi Techno Solutions Pvt. Ltd

Managing Director

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. Reg-102 CEPI In association with MSPARK FUTURISTICS

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 100MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/LWL.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78-2014.
5. BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 -2014 HAVING PROPERTIES ø =35°, C=0
6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
7. GRADE OF CONCRETE IN WALL IS M20 WITH PLUMS.
8. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
9. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

REQUIRED BEARING CAPACITY :

H MAX. (m)	2.0	3.0	4.0	5.0	6.0
REQUIRED BEARING CAPACITY (T/sqm)	10	13	18	21	25

PLUM CONCRETE SPECIFICATIONS:-

1. **SIZE :** THE SIZE OF STONE PLUMS MAY BE FROM 150-300 MM. THE MAXIMUM DIMENSION OF THESE STONES OR PLUMS SHALL NOT EXCEED 1/3 RD THE LEAST DIMENSION OF THE MEMBERS.
2. **MATERIAL :** ALL PLUMS SHALL BE HARD, DURABLE, CLEAN AND FREE FROM SOFT MATERIALS OR LOOSEPIECES OR DELETERIOUS SUBSTANCE IN THEM & SHALL NOT HAVE SHARP CORNERS.
3. **CONSTRUCTION OPERATIONS :** DURING CONCRETING THE FIRST LAYER OF CONCRETE OF THE SPECIFIED MIX SHALL BE LAID TO A THICKNESS OF THE MAXIMUM SIZE OF THE PLUMS TO BE USED. THE PLUMS SHALL THEN BE LAID WHILE THE TOP PORTION OF THIS CONCRETE IS STILL GREEN BUT SUFFICIENTLY STIFF TO PREVENT COMPLETE SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PLUMS SHALL BE ABOUT HALF EMBEDDED IN THE CONCRETE & THE REMAINING PART EXPOSED SO AS TO FORM A KEY WITH THE NEXT LAYER OF THE CONCRETE. NO PLUM SHALL BE USED FOR CONCRETE LAID UNDER WATER.
4. WHILE PLACING THE PLUMS, CARE SHALL BE TAKEN TO SEE THAT THE CLEAR DISTANCE BETWEEN ANY TWO PLUMS IS NOT LESS THAN EITHER THE WIDTH OR THICKNESS OF EITHER OF THE PLUMS. THE DISTANCE FROM THE PLUMS TO THE OUTER SURFACE FROM ANY STEEL REINFORCEMENT SHALL BE EQUAL TO GREATEST WIDTH OF PLUMS. IF PLUMS OF STRATIFIED STONE ARE USED THEY SHALL BE LAID ON THEIR NATURAL BED. STONES WITH CONCAVE FACES SHALL BE LAID WITH THE CONCAVE UPWARD. THE THICKNESS OF THE NEXT AND SUCCESSIVE LAYERS OF CONCRETE SHALL BE AT LEAST TWICE THAT OF THE LARGEST PLUM.
5. **QUANTITY OF PLUM :** THE TOTAL VOLUME OF PLUMS SHALL NOT EXCEED 20% BY THE VOLUME OF CONCRETE AS PER CLAUSE 5.3.3, PARA 1&2 OF IS- 456-2000.

Rev.	Date	Description

CLIENT: NHIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-5,2ND FLOOR, RJK TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

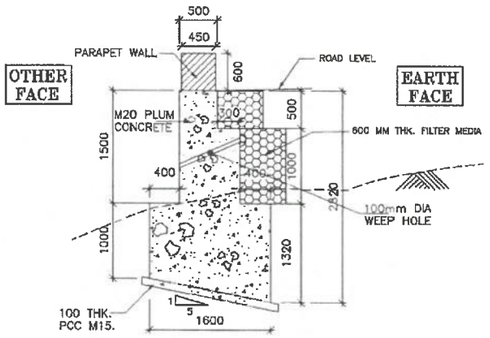
SAFETY CONSULTANT: SUVADRA — PP-97, Tankaperi Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

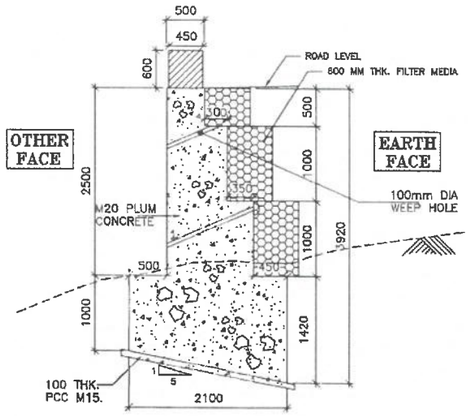
PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	S.R	TITLE: RETAINING WALL (PLUM CONCRETE)	
DESIGNED	SHIVAM	SCALE: AS SHOWN	REV:
CHECKED	AB.K	01 OF 02	R0
DATE: JAN - 2021		DRG. NO: GPT/CCT/4B/STR/MISC/RW/03	



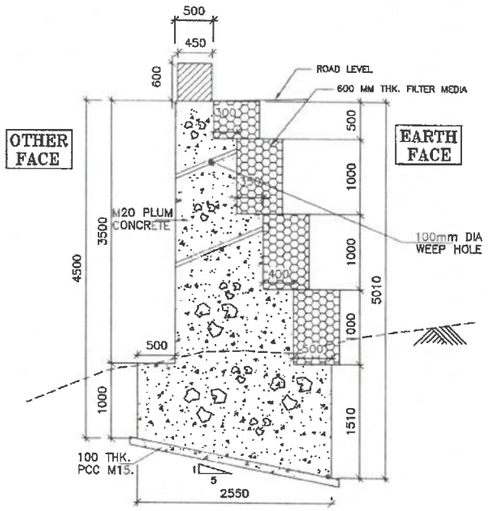
RETAINING WALL (2.5m)

SCALE 1:50



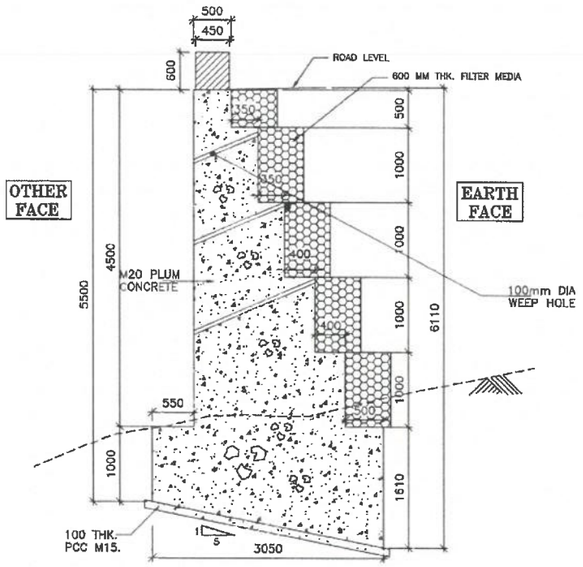
RETAINING WALL (3.5m)

SCALE 1:50



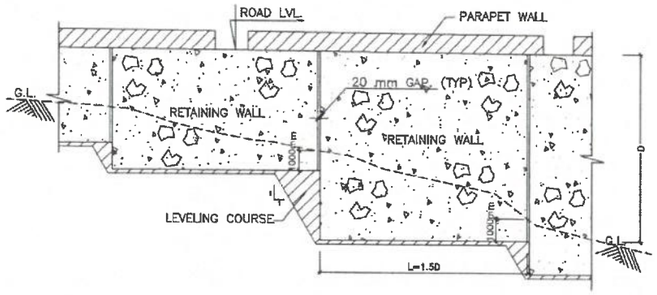
RETAINING WALL (4.5m)

SCALE 1:50



RETAINING WALL (5.5m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 100MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/LWL.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78-2014.
5. BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 -2014 HAVING PROPERTIES ø =35°, C=0
6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
7. GRADE OF CONCRETE IN WALL IS M20 WITH PLUMS.
8. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
9. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

REQUIRED BEARING CAPACITY :

H MAX. (m)	2.5	3.5	4.5	5.5
REQUIRED BEARING CAPACITY (T/sqm)	12	16	20	24

PLUM CONCRETE SPECIFICATIONS:-

1. **SIZE :** THE SIZE OF STONE PLUMS MAY BE FROM 150-300 MM. THE MAXIMUM DIMENSION OF THESE STONES OR PLUMS SHALL NOT EXCEED 1/3 RD THE LEAST DIMENSION OF THE MEMBERS.
2. **MATERIAL :** ALL PLUMS SHALL BE HARD, DURABLE, CLEAN AND FREE FROM SOFT MATERIALS OR LOOSEPIECES OR DELETERIOUS SUBSTANCE IN THEM & SHALL NOT HAVE SHARP CORNERS.
3. **CONSTRUCTION OPERATIONS :** DURING CONCRETING THE FIRST LAYER OF CONCRETE OF THE SPECIFIED MIX SHALL BE LAID TO A THICKNESS OF THE MAXIMUM SIZE OF THE PLUMS TO BE USED. THE PLUMS SHALL THEN BE LAID WHILE THE TOP PORTION OF THIS CONCRETE IS STILL GREEN BUT SUFFICIENTLY STIFF TO PREVENT COMPLETE SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PLUMS SHALL BE ABOUT HALF EMBEDDED IN THE CONCRETE & THE REMAINING PART EXPOSED SO AS TO FORM A KEY WITH THE NEXT LAYER OF THE CONCRETE. NO PLUM SHALL BE USED FOR CONCRETE LAID UNDER WATER.
4. WHILE PLACING THE PLUMS, CARE SHALL BE TAKEN TO SEE THAT THE CLEAR DISTANCE BETWEEN ANY TWO PLUMS IS NOT LESS THAN EITHER THE WIDTH OR THICKNESS OF EITHER OF THE PLUMS. THE DISTANCE FROM THE PLUMS TO THE OUTER SURFACE FROM ANY STEEL REINFORCEMENT SHALL BE EQUAL TO GREATEST WIDTH OF PLUMS. IF PLUMS OF STRATIFIED STONE ARE USED THEY SHALL BE LAID ON THEIR NATURAL BED. STONES WITH CONCAVE FACES SHALL BE LAID WITH THE CONCAVE UPWARD. THE THICKNESS OF THE NEXT AND SUCCESSIVE LAYERS OF CONCRETE SHALL BE AT LEAST TWICE THAT OF THE LARGEST PLUM.
5. **QUANTITY OF PLUM :** THE TOTAL VOLUME OF PLUMS SHALL NOT EXCEED 20% BY THE VOLUME OF CONCRETE AS PER CLAUSE 5.3.3, PARA 1&2 OF IS- 456-2000.

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

APPROVED

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102B Kohima Pur MSPARK FUTURISTICS In association with

Rev.	Date	Description

CLIENT: NHIDCL

EPC CONTRACTOR: GPT

JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES
C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
#510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

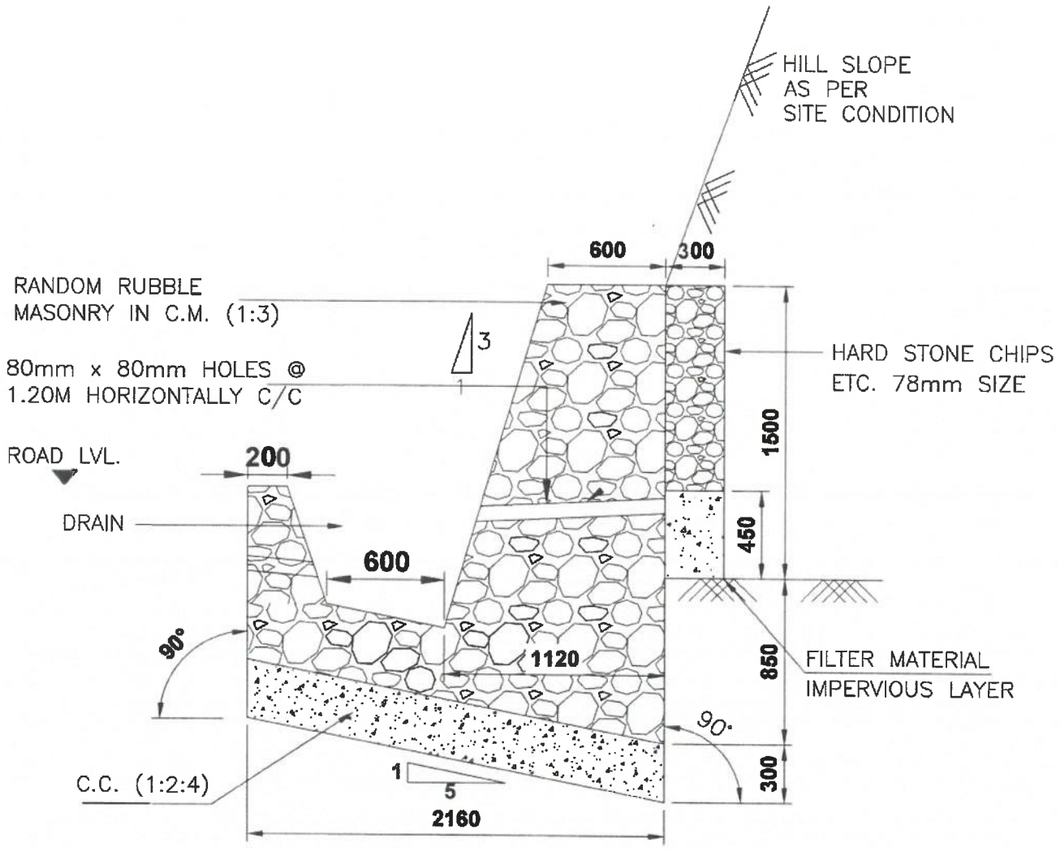
DRAWN	S.R
DESIGNED	SHIVAM
CHECKED	AB.K
DATE: JAN - 2021	

TITLE: RETAINING WALL (PLUM CONCRETE)

SCALE: AS SHOWN 02 OF 02

DRG. NO: GPT/CCT/4B/STR/MISC/RW/04

REV: R0



TYPICAL CROSS SECTION OF BREAST WALL OF 1.50 m HEIGHT

(SCALE 1:25)

GENERAL NOTES:–

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 80x80 mm WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1200mm C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE BREAST WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/L.W.L.
4. STONE MASONRY IN CEMENT MORTAR (1: 3)
5. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE 7 Ton/sqm . IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
6. BREAST WALLS ARE PROVIDED TO PROTECT THE SLOPE OF CUTTING IN NATURAL GROUND FROM ACTION OF WEATHERING & CUT SLOPE FAILURE. IT IS NOT PROVIDED FOR STABILIZING AN UNSTABLE SLOPE.
7. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER–IN–CHARGE BEFORE ANY EXECUTION.

STONE MASONRY SPECIFICATIONS:–

1. THE STONE TO BE USED FOR STONE MASONRY SHOULD BE HARD, TOUGH AND DURABLE.
2. THE PROPERLY WETTED STONE SHOULD BE USED TO AVOID MORTAR MOISTURE BEING SUCKED.
3. BEFORE LAYING THE STONE IN THE WALL, SHAPE AND DRESS IT SO THAT IT WILL NOT LOOSEN AFTER IT IS PLACED.
4. NO DRESSING OR HAMMERING WHICH WILL LOOSEN THE STONE, WILL BE PERMITTED AFTER IT IS PLACED.
5. CLEAN EACH STONE AND SATURATE IT WITH WATER BEFORE SETTING IT. CLEAN AND MOISTEN THE BED THAT WILL RECEIVE IT.
6. ENSURE THAT THE JOINTS AND BEDS HAVE AN AVERAGE THICKNESS OF NOT MORE THAN 1 INCH (25 mm).
7. ENSURE THAT THE VERTICAL JOINTS IN EACH COURSE BREAK WITH THE ADJOINING COURSES AT LEAST 6 IN.(150mm)
8. KEEP THE WALL WET WHILE POINTING. IN HOT OR DRY WEATHER, PROTECT THE POINTED MASONRY FROM THE SUN AND KEEP IT WET FOR AT LEAST THREE DAYS AFTER THE POINTING IS FINISHED.

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. * NH-102 * In association with FUTURISTICS & ASSOCIATES *

SUVADRA CONSULTANTS * BHUBANESWAR * Regd. No- 11/2004-05

Rev.	Date	Description

CLIENT: NIDCL

EPC CONTRACTOR: GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-6,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. #510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

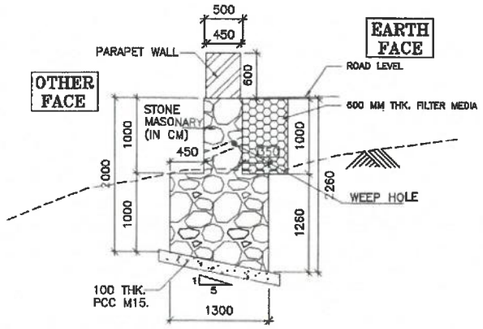
DRAWN	S.N
DESIGNED	SHIVAM
CHECKED	A.S.K
DATE: JAN - 2021	

TITLE: BREAST WALL DETAIL

SCALE: AS SHOWN 1 OF 1

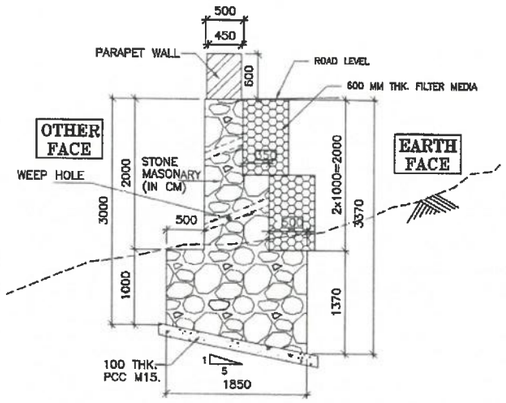
REV: R0

DRG. NO: GPT/CCT/4B/STR/MISC/BW/05



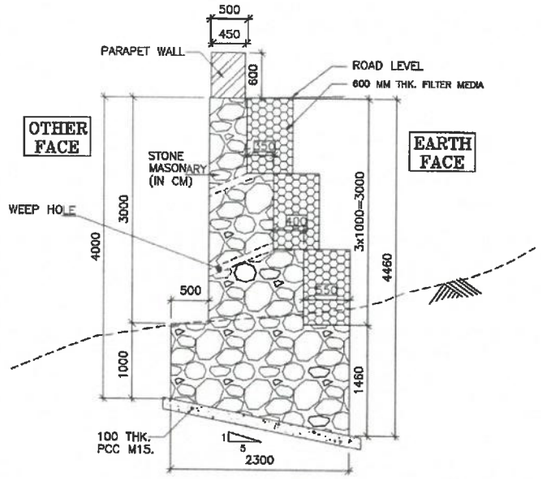
RETAINING WALL (2.0m)

SCALE 1:50



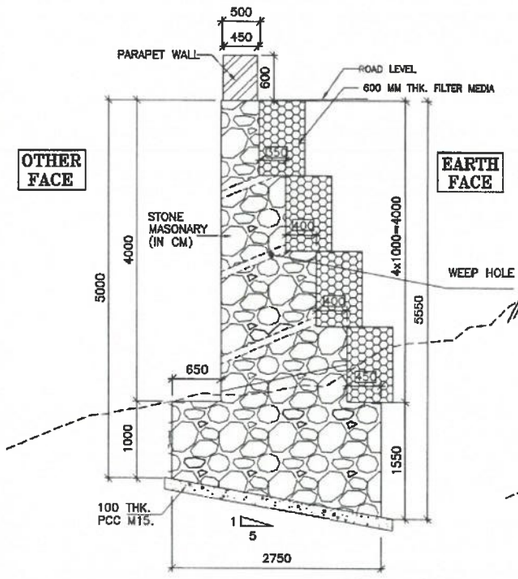
RETAINING WALL (3.0m)

SCALE 1:50



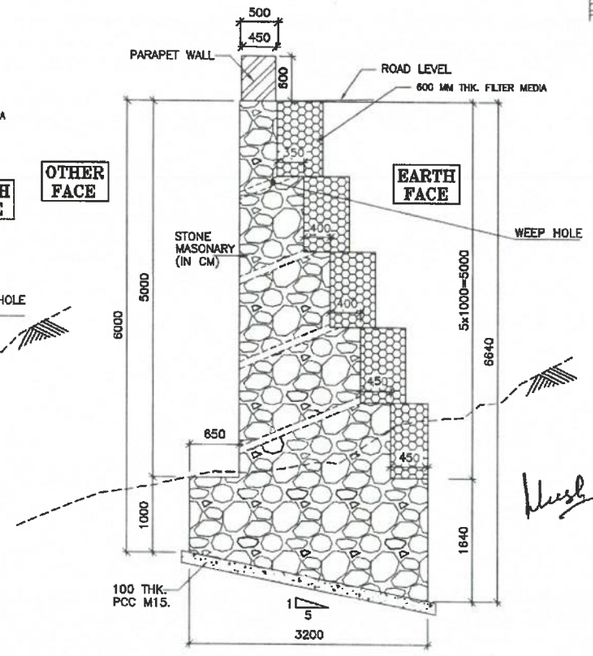
RETAINING WALL (4.0m)

SCALE 1:50



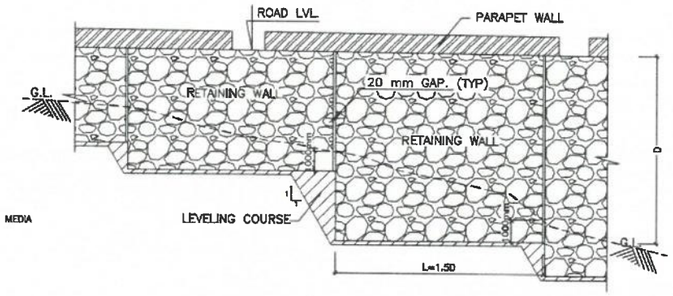
RETAINING WALL (5.0m)

SCALE 1:50



RETAINING WALL (6.0m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

Shambhavi Techno Solutions Pvt. Ltd

Managing Director

DESIGN DIRECTOR

SUVADRA CONSULTANTS BHUBANESWAR Regd. No- 11/2004-05

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102B CCPur In association with MISPARK FUTURISTICS & ASSOCIATES

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 80x150 mm or 150MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78–2014
5. BACK FILLING BEHIND THE RETAINING WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 –2014 HAVING PROPERTIES ø =35°, C=0
6. RUBBLE STONE MASONARY IN CEMENT MORTAR (1:3).
7. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
8. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER–IN–CHARGE BEFORE ANY EXECUTION.

REQUIRED BEARING CAPACITY :

H MAX. (m)	2.0	3.0	4.0	5.0	6.0
REQUIRED BEARING CAPACITY (T/sqm)	10	14	18	21	26

STONE MASONRY SPECIFICATIONS:-

1. THE STONE TO BE USED FOR STONE MASONRY SHOULD BE HARD, TOUGH AND DURABLE.
2. THE PROPERLY WETTED STONE SHOULD BE USED TO AVOID MORTAR MOISTURE BEING SUCKED.
3. BEFORE LAYING THE STONE IN THE WALL, SHAPE AND DRESS IT SO THAT IT WILL NOT LOOSEN AFTER IT IS PLACED.
4. NO DRESSING OR HAMMERING WHICH WILL LOOSEN THE STONE, WILL BE PERMITTED AFTER IT IS PLACED.
5. CLEAN EACH STONE AND SATURATE IT WITH WATER BEFORE SETTING IT. CLEAN AND MOISTEN THE BED THAT WILL RECEIVE IT.
6. ENSURE THAT THE JOINTS AND BEDS HAVE AN AVERAGE THICKNESS OF NOT MORE THAN 1 INCH (25 mm).
7. ENSURE THAT THE VERTICAL JOINTS IN EACH COURSE BREAK WITH THE ADJOINING COURSES AT LEAST 6 IN.(150mm)
8. KEEP THE WALL WET WHILE POINTING. IN HOT OR DRY WEATHER, PROTECT THE POINTED MASONRY FROM THE SUN AND KEEP IT WET FOR AT LEAST THREE DAYS AFTER THE POINTING IS FINISHED.

Rev.	Date	Description

CLIENT: NAIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MISPARK FUTURISTICS AND ASSOCIATES, C-&2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

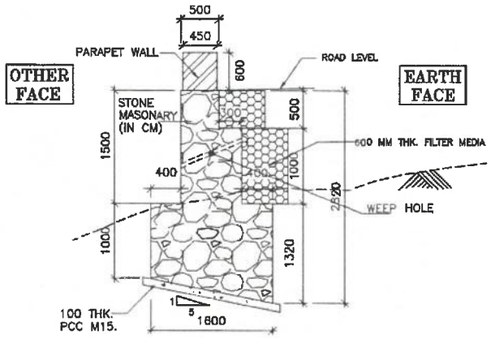
SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

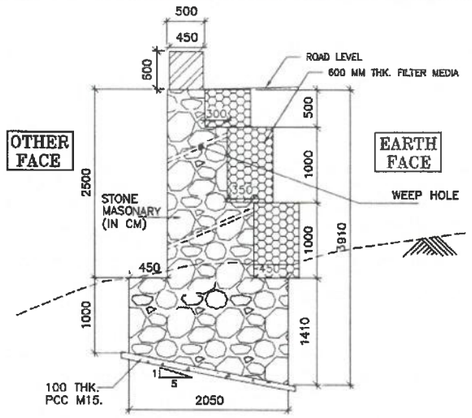
PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	
DESIGNED	SHIVAM
CHECKED	AB.K
DATE:	JAN - 2021
TITLE:	RETAINING WALL (RRM)
SCALE:	AS SHOWN
	01 OF 02
DRG. NO:	GPT/CCT/4B/STR/MISC/RW/06
REV:	R0



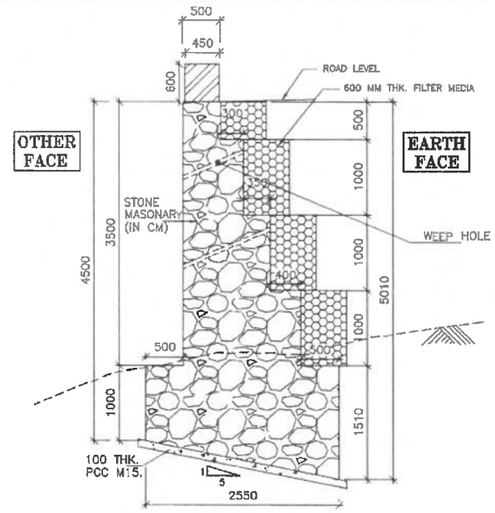
RETAINING WALL (2.5m)

SCALE 1:50



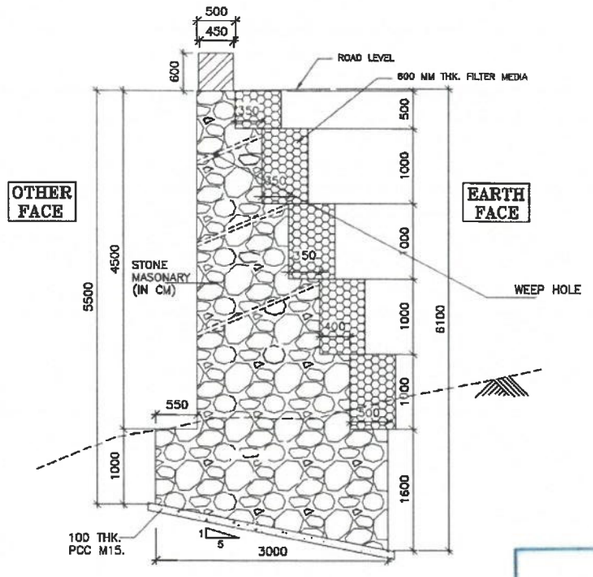
RETAINING WALL (3.5m)

SCALE 1:50



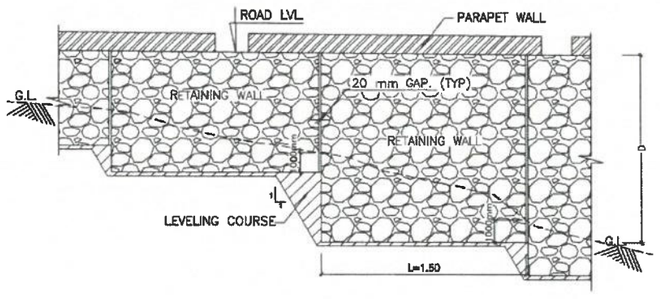
RETAINING WALL (4.5m)

SCALE 1:50



RETAINING WALL (5.5m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

DESIGN DIRECTOR

APPROVED

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. in association with MSPARK FUTURISTICS & ASSOCIATES

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 80x150 mm or 150MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78–2014
5. BACK FILLING BEHIND THE RETAINING WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 –2014 HAVING PROPERTIES ø =35°, C=0
6. RUBBLE STONE MASONARY IN CEMENT MORTAR (1:3).
7. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
8. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER–IN–CHARGE BEFORE ANY EXECUTION.

REQUIRED BEARING CAPACITY :

H MAX. (m)	2.5	3.5	4.5	5.5
REQUIRED BEARING CAPACITY (T/sqm)	12	16	20	25

STONE MASONRY SPECIFICATIONS:-

1. THE STONE TO BE USED FOR STONE MASONRY SHOULD BE HARD, TOUGH AND DURABLE.
2. THE PROPERLY WETTED STONE SHOULD BE USED TO AVOID MORTAR MOISTURE BEING SUCKED.
3. BEFORE LAYING THE STONE IN THE WALL, SHAPE AND DRESS IT SO THAT IT WILL NOT LOOSEN AFTER IT IS PLACED.
4. NO DRESSING OR HAMMERING WHICH WILL LOOSEN THE STONE, WILL BE PERMITTED AFTER IT IS PLACED.
5. CLEAN EACH STONE AND SATURATE IT WITH WATER BEFORE SETTING IT. CLEAN AND MOISTEN THE BED THAT WILL RECEIVE IT.
6. ENSURE THAT THE JOINTS AND BEDS HAVE AN AVERAGE THICKNESS OF NOT MORE THAN 1 INCH (25 mm).
7. ENSURE THAT THE VERTICAL JOINTS IN EACH COURSE BREAK WITH THE ADJOINING COURSES AT LEAST 6 IN.(150mm)
8. KEEP THE WALL WET WHILE POINTING. IN HOT OR DRY WEATHER, PROTECT THE POINTED MASONRY FROM THE SUN AND KEEP IT WET FOR AT LEAST THREE DAYS AFTER THE POINTING IS FINISHED.

Rev.	Date	Description

CLIENT: NHIDCL

EPC CONTRACTOR: GPT JV — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BSSR-18 Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	S.R
DESIGNED	SHIVAM
CHECKED	AB.K
DATE: JAN - 2021	

TITLE: RETAINING WALL RRM

SCALE: AS SHOWN — 02 OF 02

DRG.NO: GPT/CCT/4B/STR/MISC/RW/07

REV: R0

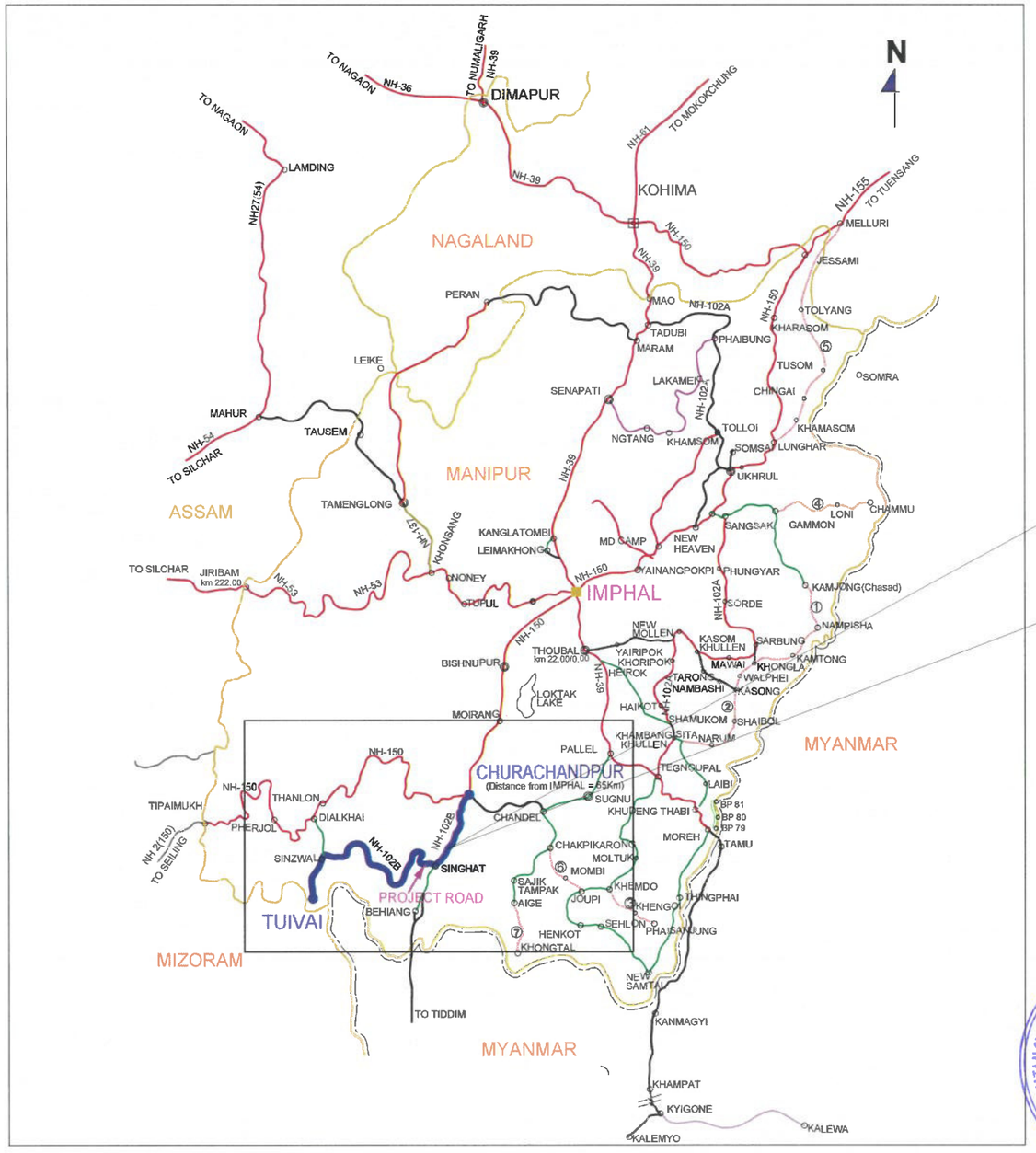
NHIDCL

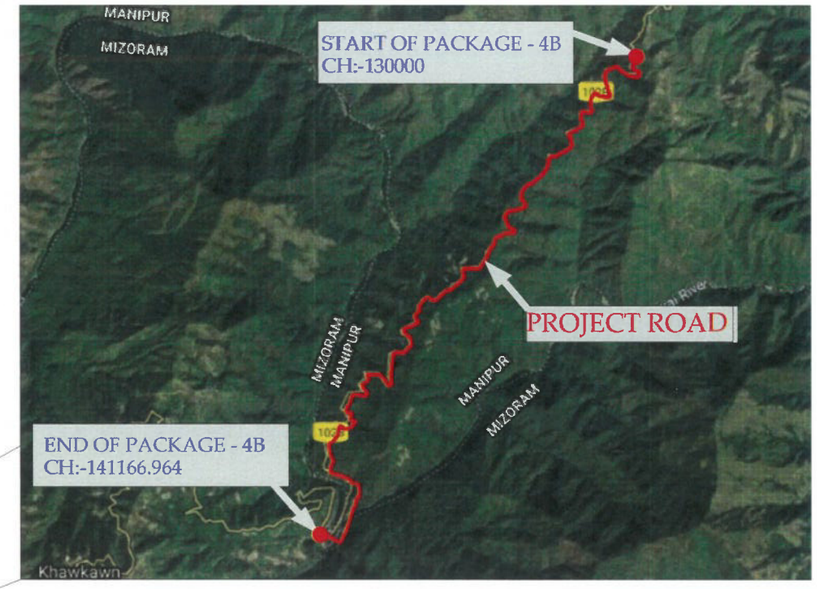
BUILDING INFRASTRUCTURE - BUILDING THE NATION

National Highways & Infrastructure Development

राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction mode.





TYPICAL MISCELLANEOUS DRAWINGS

PACKAGE - 4B

(Km. 130+000 to Km. 141+166.964)

JANUARY - 2021

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. * Construction with Quality * MSPIRK FUTURISTICS & ASSOCIATES

EPC CONTRACTOR:

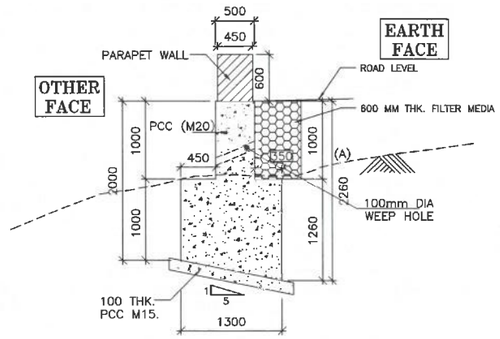
GPT group

JC - 25, Sector - III, Salt Lake,
Kolkata - 700098.

DESIGN CONSULTANT:

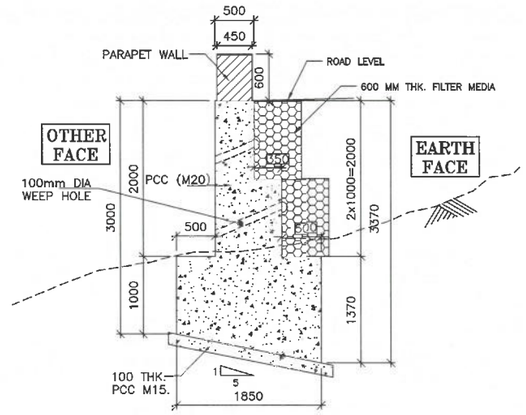
SPS Technocrats Pvt. Ltd.

510 & 511, JMD Megapolis, Sector 48,
Gurugram, Haryana - 122018.



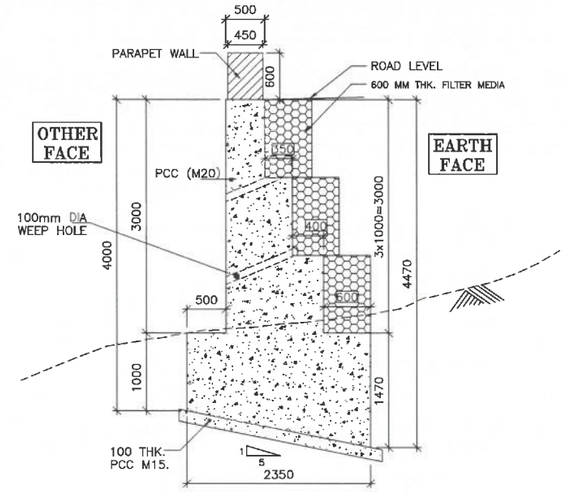
RETAINING WALL (2.0m)

SCALE 1:50



RETAINING WALL (3.0m)

SCALE 1:50

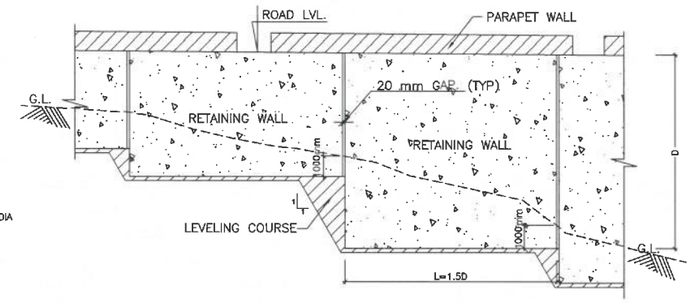


RETAINING WALL (4.0m)

SCALE 1:50

GENERAL NOTES:–

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 100MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/LWL.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78–2014.
5. BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 –2014 HAVING PROPERTIES ø =35°, C=0
6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
7. GRADE OF CONCRETE IN WALL IS M20.
8. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
9. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER–IN–CHARGE BEFORE ANY EXECUTION.

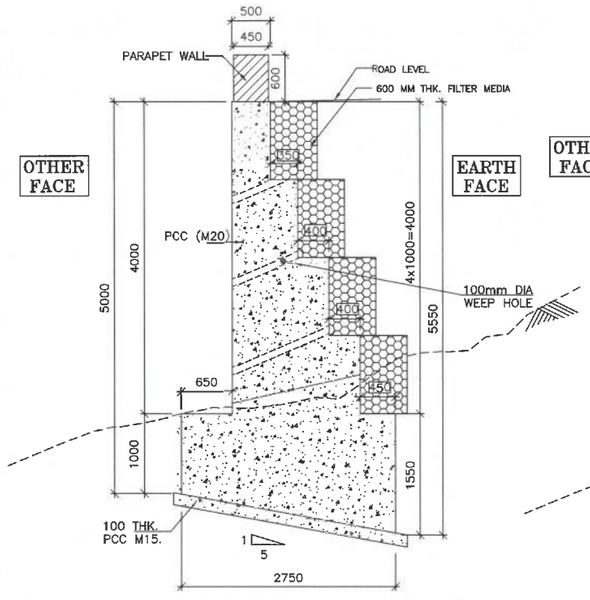


TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

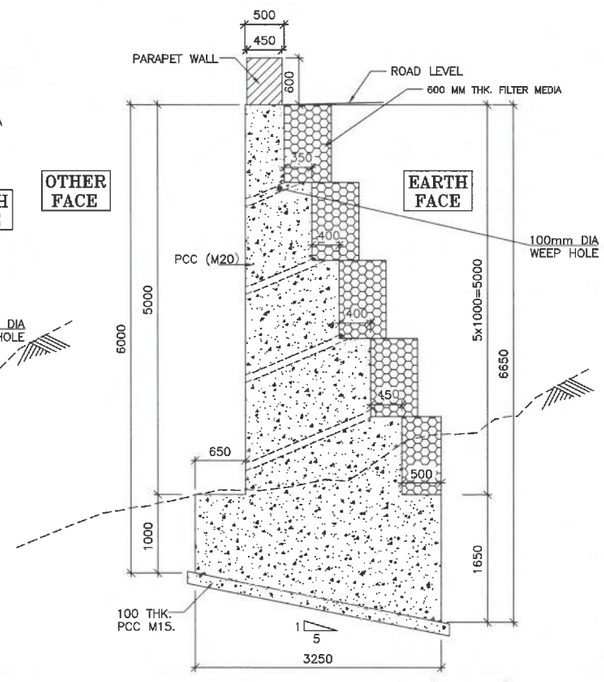
REQUIRED BEARING CAPACITY :

H MAX. (m)	2.0	3.0	4.0	5.0	6.0
REQUIRED BEARING CAPACITY (T/sqm)	10	13	18	21	25



RETAINING WALL (5.0m)

SCALE 1:50



RETAINING WALL (6.0m)

SCALE 1:50

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

APPROVED

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102-B

Rev.	Date	Description

CLIENT: NHIDCL – BUILDING INFRASTRUCTURE . BUILDING THE NATION

EPC CONTRACTOR: GPT Infraprojects
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES
C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

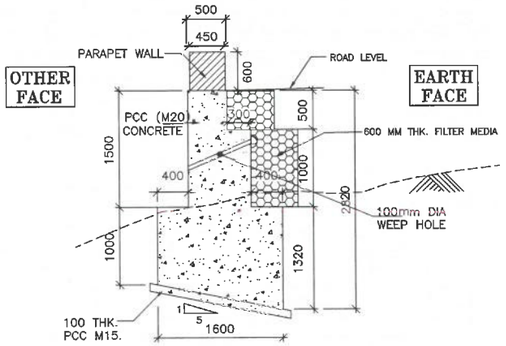
DRAWN	S.R
DESIGNED	SHIVAM
CHECKED	AB.K
DATE: JAN - 2021	

TITLE: RETAINING WALL (PCC)

SCALE: AS SHOWN — 01 OF 02

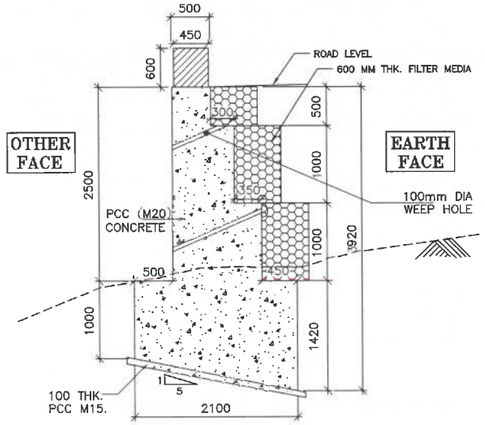
DRG. NO: GPT/CCT/4B/STR/MISC/RW/01

REV: R0



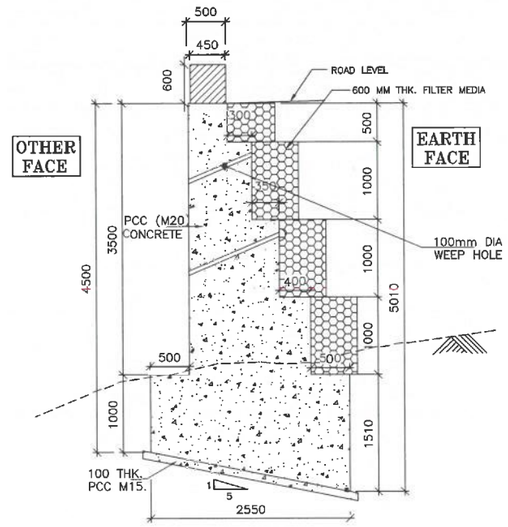
RETAINING WALL (2.5m)

SCALE 1:50



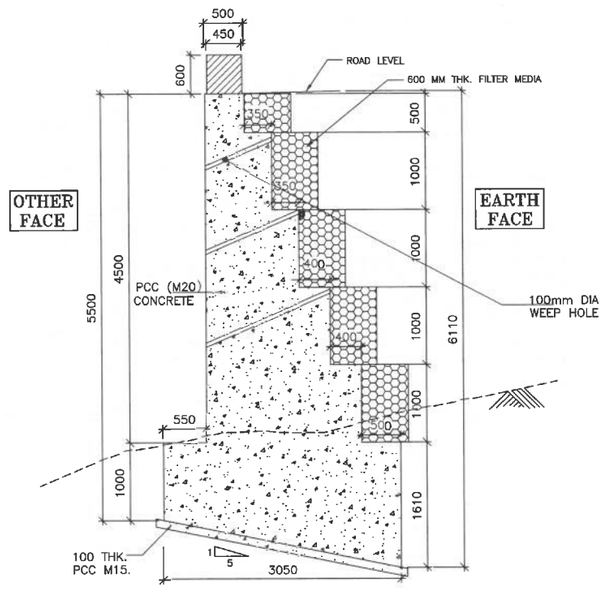
RETAINING WALL (3.5m)

SCALE 1:50



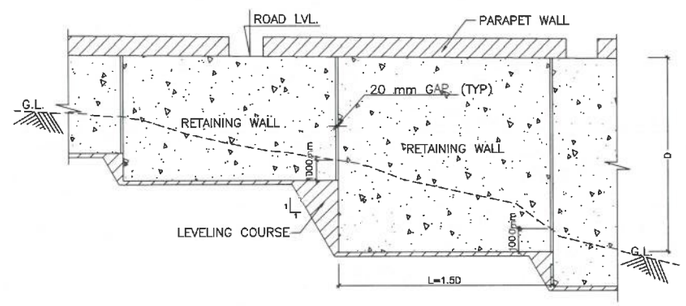
RETAINING WALL (4.5m)

SCALE 1:50



RETAINING WALL (5.5m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 100MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/LWL.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78–2014.
5. BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 –2014 HAVING PROPERTIES ø =35°, C=0
6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
7. GRADE OF CONCRETE IN WALL IS M20.
8. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
9. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER–IN–CHARGE BEFORE ANY EXECUTION.

REQUIRED BEARING CAPACITY :

H MAX. (m)	2.5	3.5	4.5	5.5
REQUIRED BEARING CAPACITY (T/sqm)	12	16	20	24

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

APPROVED

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. & ASSOCIATES MSPARK FUTURISTICS

Rev.	Date	Description

CLIENT: NHIDCL BUILDING INFRASTRUCTURE BUILDING THE NATION

EPC CONTRACTOR: GPT GROUP
JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES
C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

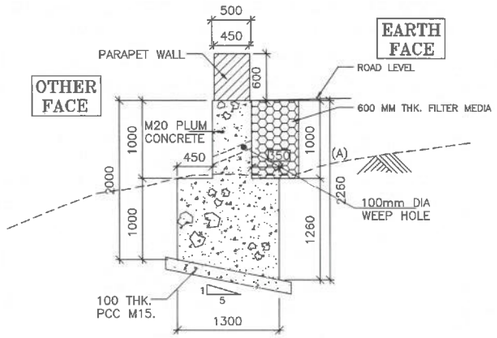
SAFETY CONSULTANT: SUVADRA CONSULTANTS
PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd.
510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

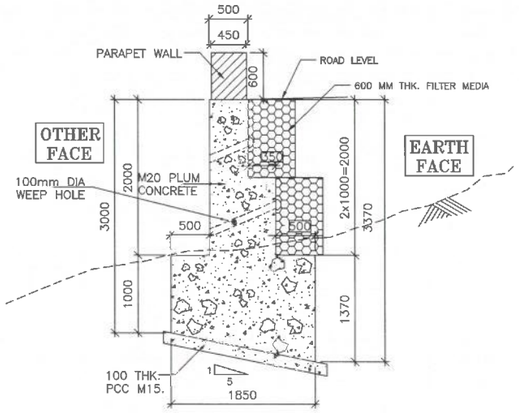
PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	S.R	TITLE:	RETAINING WALL PCC
DESIGNED	SHIVAM	SCALE:	AS SHOWN 02 OF 02
CHECKED	AB.K	REV:	R0
DATE:	JAN - 2021	DRG. NO:	GPT/CCT/4B/STR/MISC/RW/02



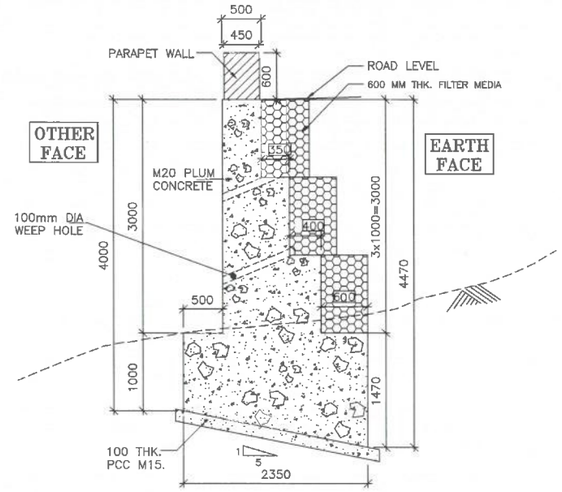
RETAINING WALL (2.0m)

SCALE 1:50



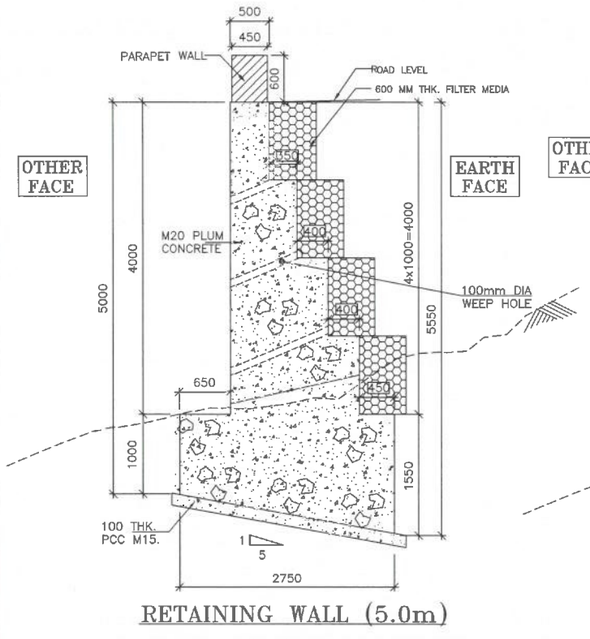
RETAINING WALL (3.0m)

SCALE 1:50



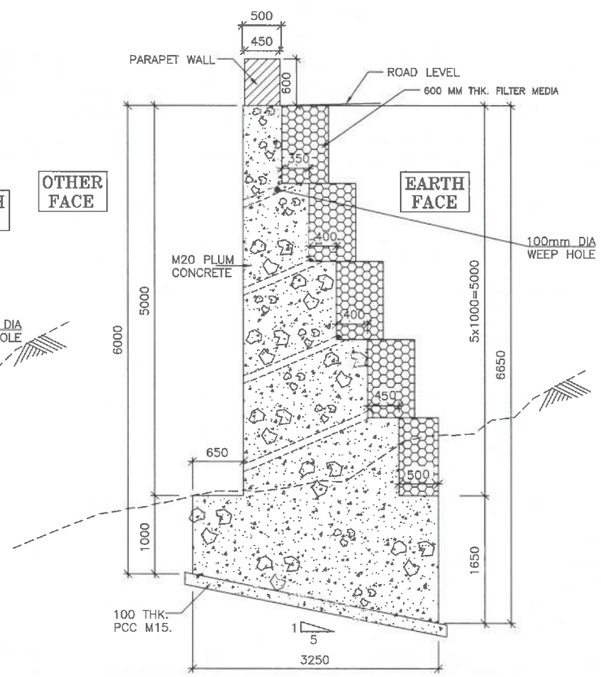
RETAINING WALL (4.0m)

SCALE 1:50



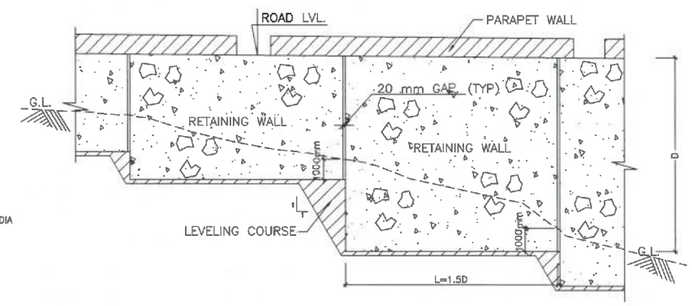
RETAINING WALL (5.0m)

SCALE 1:50



RETAINING WALL (6.0m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

Shambhavi Techno Solutions Pvt. Ltd

Managing Director

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 100MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/LWL.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78-2014.
5. BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 -2014 HAVING PROPERTIES ϕ =35°, C=0
6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
7. GRADE OF CONCRETE IN WALL IS M20 WITH PLUMS.
8. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
9. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

REQUIRED BEARING CAPACITY :

H MAX. (m)	2.0	3.0	4.0	5.0	6.0
REQUIRED BEARING CAPACITY (T/sqm)	10	13	18	21	25

PLUM CONCRETE SPECIFICATIONS:-

1. **SIZE :** THE SIZE OF STONE PLUMS MAY BE FROM 150-300 MM. THE MAXIMUM DIMENSION OF THESE STONES OR PLUMS SHALL NOT EXCEED 1/3 RD THE LEAST DIMENSION OF THE MEMBERS.
2. **MATERIAL :** ALL PLUMS SHALL BE HARD, DURABLE, CLEAN AND FREE FROM SOFT MATERIALS OR LOOSEPIECES OR DELETERIOUS SUBSTANCE IN THEM & SHALL NOT HAVE SHARP CORNERS.
3. **CONSTRUCTION OPERATIONS :** DURING CONCRETING THE FIRST LAYER OF CONCRETE OF THE SPECIFIED MIX SHALL BE LAID TO A THICKNESS OF THE MAXIMUM SIZE OF THE PLUMS TO BE USED. THE PLUMS SHALL THEN BE LAID WHILE THE TOP PORTION OF THIS CONCRETE IS STILL GREEN BUT SUFFICIENTLY STIFF TO PREVENT COMPLETE SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PLUMS SHALL BE ABOUT HALF EMBEDDED IN THE CONCRETE & THE REMAINING PART EXPOSED SO AS TO FORM A KEY WITH THE NEXT LAYER OF THE CONCRETE. NO PLUM SHALL BE USED FOR CONCRETE LAID UNDER WATER.
4. WHILE PLACING THE PLUMS, CARE SHALL BE TAKEN TO SEE THAT THE CLEAR DISTANCE BETWEEN ANY TWO PLUMS IS NOT LESS THAN EITHER THE WIDTH OR THICKNESS OF EITHER OF THE PLUMS. THE DISTANCE FROM THE PLUMS TO THE OUTER SURFACE FROM ANY STEEL REINFORCEMENT SHALL BE EQUAL TO GREATEST WIDTH OF PLUMS. IF PLUMS OF STRATIFIED STONE ARE USED THEY SHALL BE LAID ON THEIR NATURAL BED. STONES WITH CONCAVE FACES SHALL BE LAID WITH THE CONCAVE UPWARD. THE THICKNESS OF THE NEXT AND SUCCESSIVE LAYERS OF CONCRETE SHALL BE AT LEAST TWICE THAT OF THE LARGEST PLUM.
5. **QUANTITY OF PLUM :** THE TOTAL VOLUME OF PLUMS SHALL NOT EXCEED 20% BY THE VOLUME OF CONCRETE AS PER CLAUSE 5.3.3, PARA 1&2 OF IS- 456-2000.

Rev.	Date	Description

CLIENT: NHIDCL

EPC CONTRACTOR: GPT Group, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

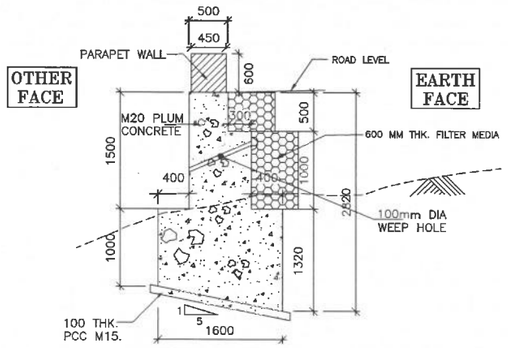
SAFETY CONSULTANT: SUVADRA CONSULTANTS, PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

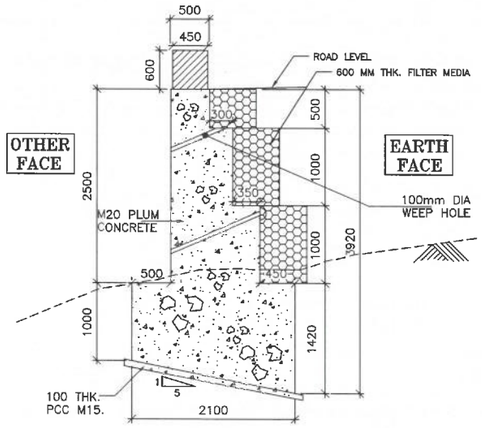
PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	S.R	TITLE: RETAINING WALL (PLUM CONCRETE)	
DESIGNED	SHIVAM		
CHECKED	A.B.K	SCALE: AS SHOWN 01 OF 02	REV: R0
DATE: JAN - 2021		DRG.NO: GPT/CCT/4B/STR/MISC/RW/03	



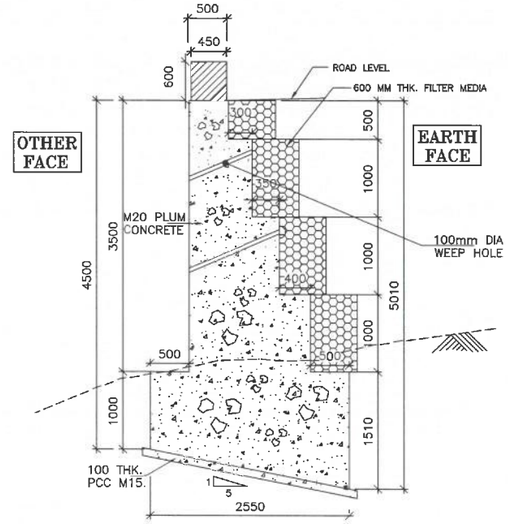
RETAINING WALL (2.5m)

SCALE 1:50



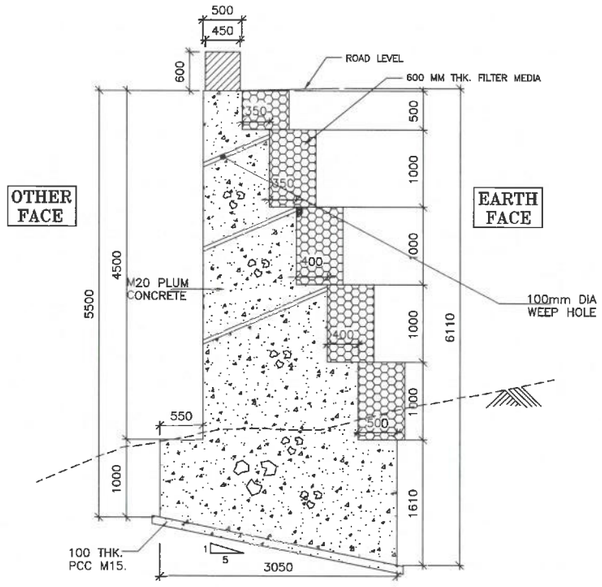
RETAINING WALL (3.5m)

SCALE 1:50



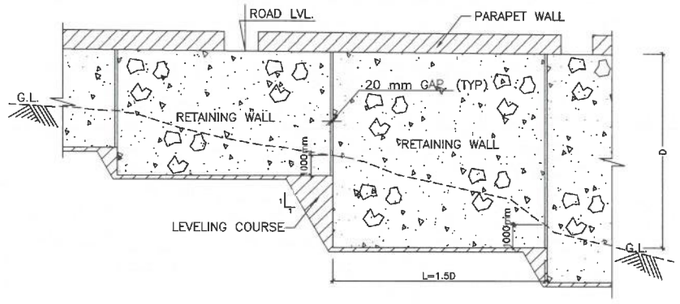
RETAINING WALL (4.5m)

SCALE 1:50



RETAINING WALL (5.5m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 100MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/LWL.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78-2014.
5. BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 -2014 HAVING PROPERTIES ø =35°, C=0
6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
7. GRADE OF CONCRETE IN WALL IS M20 WITH PLUMS.
8. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
9. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

REQUIRED BEARING CAPACITY :

H MAX. (m)	2.5	3.5	4.5	5.5
REQUIRED BEARING CAPACITY (T/sqm)	12	16	20	24

PLUM CONCRETE SPECIFICATIONS:-

1. **SIZE :** THE SIZE OF STONE PLUMS MAY BE FROM 150-300 MM. THE MAXIMUM DIMENSION OF THESE STONES OR PLUMS SHALL NOT EXCEED 1/3 RD THE LEAST DIMENSION OF THE MEMBERS.
2. **MATERIAL :** ALL PLUMS SHALL BE HARD, DURABLE, CLEAN AND FREE FROM SOFT MATERIALS OR LOOSEPIECES OR DELETERIOUS SUBSTANCE IN THEM & SHALL NOT HAVE SHARP CORNERS.
3. **CONSTRUCTION OPERATIONS :** DURING CONCRETING THE FIRST LAYER OF CONCRETE OF THE SPECIFIED MIX SHALL BE LAID TO A THICKNESS OF THE MAXIMUM SIZE OF THE PLUMS TO BE USED. THE PLUMS SHALL THEN BE LAID WHILE THE TOP PORTION OF THIS CONCRETE IS STILL GREEN BUT SUFFICIENTLY STIFF TO PREVENT COMPLETE SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PLUMS SHALL BE ABOUT HALF EMBEDDED IN THE CONCRETE & THE REMAINING PART EXPOSED SO AS TO FORM A KEY WITH THE NEXT LAYER OF THE CONCRETE. NO PLUM SHALL BE USED FOR CONCRETE LAID UNDER WATER.
4. WHILE PLACING THE PLUMS, CARE SHALL BE TAKEN TO SEE THAT THE CLEAR DISTANCE BETWEEN ANY TWO PLUMS IS NOT LESS THAN EITHER THE WIDTH OR THICKNESS OF EITHER OF THE PLUMS. THE DISTANCE FROM THE PLUMS TO THE OUTER SURFACE FROM ANY STEEL REINFORCEMENT SHALL BE EQUAL TO GREATEST WIDTH OF PLUMS. IF PLUMS OF STRATIFIED STONE ARE USED THEY SHALL BE LAID ON THEIR NATURAL BED. STONES WITH CONCAVE FACES SHALL BE LAID WITH THE CONCAVE UPWARD. THE THICKNESS OF THE NEXT AND SUCCESSIVE LAYERS OF CONCRETE SHALL BE AT LEAST TWICE THAT OF THE LARGEST PLUM.
5. **QUANTITY OF PLUM :** THE TOTAL VOLUME OF PLUMS SHALL NOT EXCEED 20% BY THE VOLUME OF CONCRETE AS PER CLAUSE 5.3.3, PARA 1&2 OF IS- 456-2000.

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director
APPROVED

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. MSPARK FUTURISTICS AND ASSOCIATES In association with NH 102B SCPur

Rev.	Date	Description

CLIENT: NHIDCL BUILDING INFRASTRUCTURE BUILDING THE NATION

EPC CONTRACTOR: GPT Group, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-5,2ND FLOOR, R.K TOWER, SECTOR-4 VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS, PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

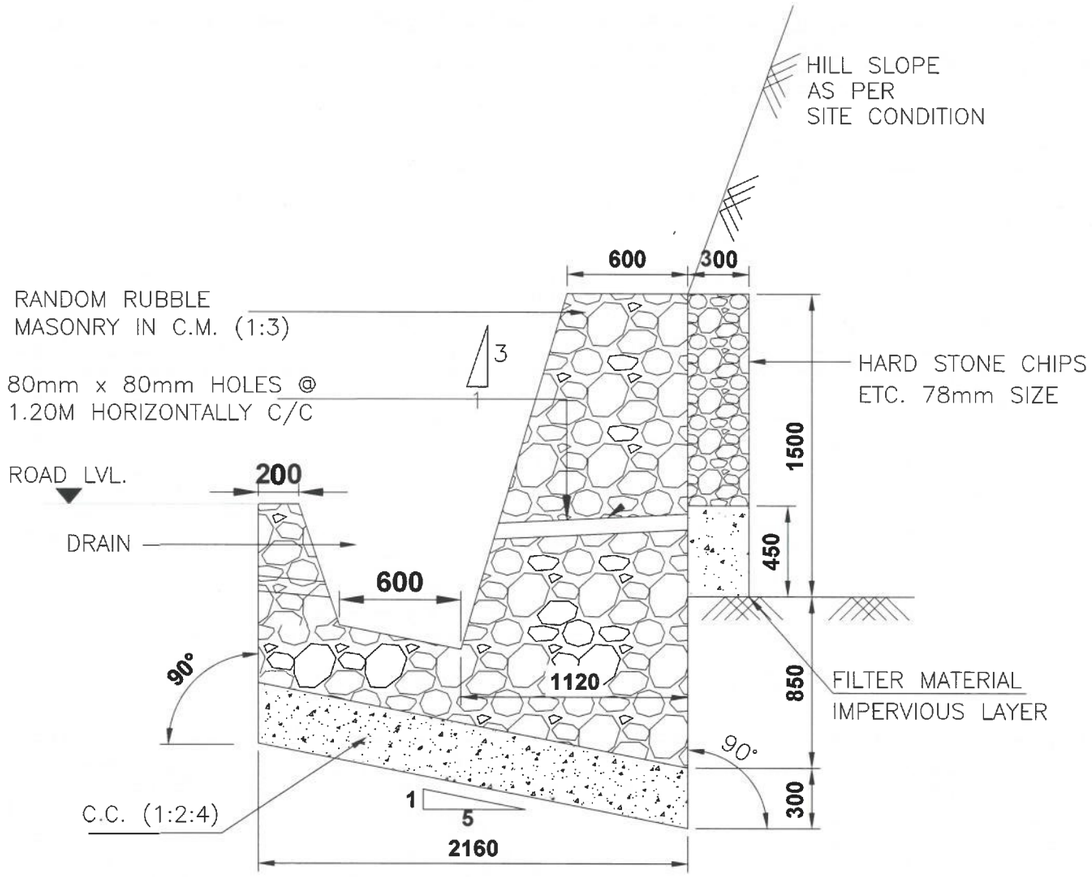
DRAWN	S.R
DESIGNED	SHIVAM
CHECKED	A.B.K
DATE: JAN - 2021	

TITLE: **RETAINING WALL (PLUM CONCRETE)**

SCALE: **AS SHOWN** 02 OF 02

DRG. NO: **GPT/CCT/4B/STR/MISC/RW/04**

REV: **R0**



TYPICAL CROSS SECTION OF BREAST WALL OF 1.50 m HEIGHT

(SCALE 1:25)

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 80x80 mm WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1200mm C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE BREAST WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/L.W.L.
4. STONE MASONRY IN CEMENT MORTAR (1: 3)
5. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE 7 Ton/sqm . IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
6. BREAST WALLS ARE PROVIDED TO PROTECT THE SLOPE OF CUTTING IN NATURAL GROUND FROM ACTION OF WEATHERING & CUT SLOPE FAILURE. IT IS NOT PROVIDED FOR STABILIZING AN UNSTABLE SLOPE.
7. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

STONE MASONRY SPECIFICATIONS:-

1. THE STONE TO BE USED FOR STONE MASONRY SHOULD BE HARD, TOUGH AND DURABLE.
2. THE PROPERLY WETTED STONE SHOULD BE USED TO AVOID MORTAR MOISTURE BEING SUCKED.
3. BEFORE LAYING THE STONE IN THE WALL, SHAPE AND DRESS IT SO THAT IT WILL NOT LOOSEN AFTER IT IS PLACED.
4. NO DRESSING OR HAMMERING WHICH WILL LOOSEN THE STONE, WILL BE PERMITTED AFTER IT IS PLACED.
5. CLEAN EACH STONE AND SATURATE IT WITH WATER BEFORE SETTING IT. CLEAN AND MOISTEN THE BED THAT WILL RECEIVE IT.
6. ENSURE THAT THE JOINTS AND BEDS HAVE AN AVERAGE THICKNESS OF NOT MORE THAN 1 INCH (25 mm).
7. ENSURE THAT THE VERTICAL JOINTS IN EACH COURSE BREAK WITH THE ADJOINING COURSES AT LEAST 6 IN.(150mm)
8. KEEP THE WALL WET WHILE POINTING. IN HOT OR DRY WEATHER, PROTECT THE POINTED MASONRY FROM THE SUN AND KEEP IT WET FOR AT LEAST THREE DAYS AFTER THE POINTING IS FINISHED.

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. * MSPARK FUTURISTICS & ASSOCIATES * NH-102 Imphal In association with

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Rev.	Date	Description

Client: NHIDCL BUILDING INFRASTRUCTURE · BUILDING THE NATION

EPC Contractor: GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

Authority Engineer: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

Safety Consultant: SUVADRA CONSULTANTS PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant: SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

Project: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

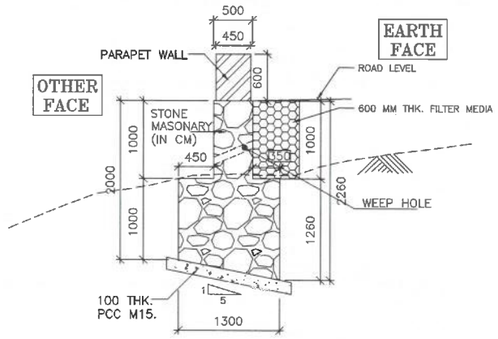
Drawn	S.R
Designed	SHIVAM
Checked	AB.K
Date:	JAN - 2021

Title: **BREAST WALL DETAIL**

Scale: **AS SHOWN** — **1 OF 1**

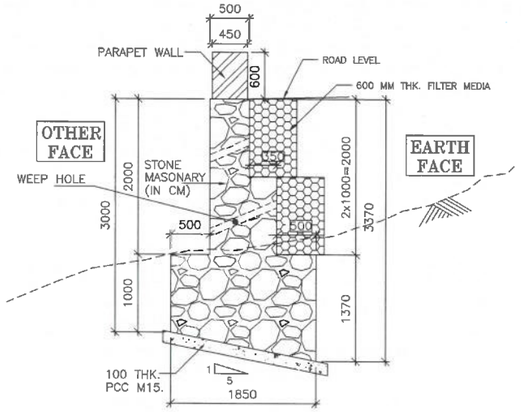
Rev: **R0**

Drg. No: **GPT/CCT/4B/STR/MISC/BW/05**



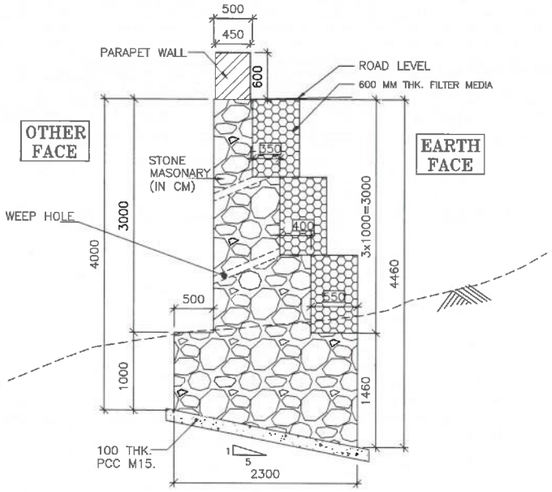
RETAINING WALL (2.0m)

SCALE 1:50



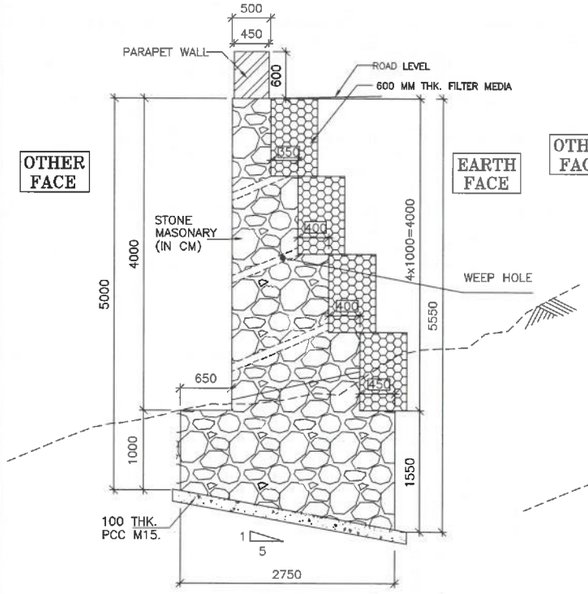
RETAINING WALL (3.0m)

SCALE 1:50



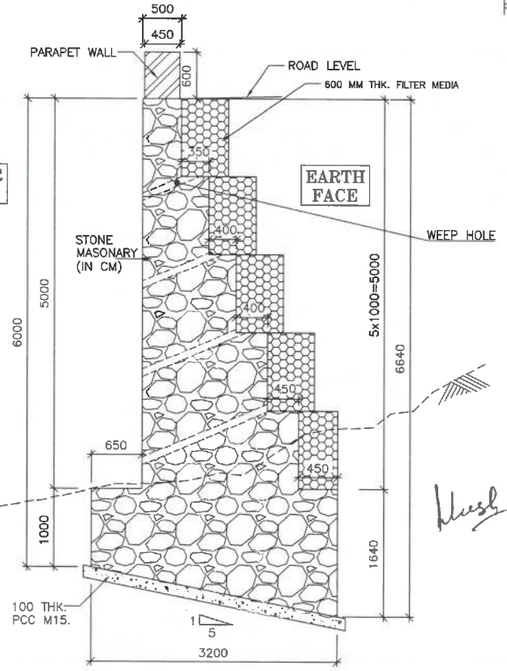
RETAINING WALL (4.0m)

SCALE 1:50



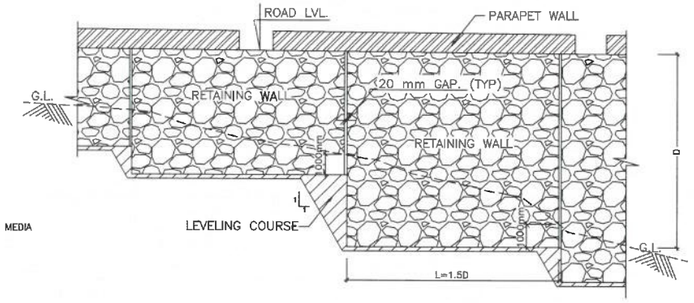
RETAINING WALL (5.0m)

SCALE 1:50



RETAINING WALL (6.0m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 80x150 mm or 150MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78-2014
5. BACK FILLING BEHIND THE RETAINING WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 -2014 HAVING PROPERTIES ø =35°, C=0
6. RUBBLE STONE MASONARY IN CEMENT MORTAR (1:3).
7. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
8. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

REQUIRED BEARING CAPACITY :

H MAX. (m)	2.0	3.0	4.0	5.0	6.0
REQUIRED BEARING CAPACITY (T/sqm)	10	14	18	21	26

STONE MASONRY SPECIFICATIONS:-

1. THE STONE TO BE USED FOR STONE MASONRY SHOULD BE HARD, TOUGH AND DURABLE.
2. THE PROPERLY WETTED STONE SHOULD BE USED TO AVOID MORTAR MOISTURE BEING SUCKED.
3. BEFORE LAYING THE STONE IN THE WALL, SHAPE AND DRESS IT SO THAT IT WILL NOT LOOSEN AFTER IT IS PLACED.
4. NO DRESSING OR HAMMERING WHICH WILL LOOSEN THE STONE, WILL BE PERMITTED AFTER IT IS PLACED.
5. CLEAN EACH STONE AND SATURATE IT WITH WATER BEFORE SETTING IT. CLEAN AND MOISTEN THE BED THAT WILL RECEIVE IT.
6. ENSURE THAT THE JOINTS AND BEDS HAVE AN AVERAGE THICKNESS OF NOT MORE THAN 1 INCH (25 mm).
7. ENSURE THAT THE VERTICAL JOINTS IN EACH COURSE BREAK WITH THE ADJOINING COURSES AT LEAST 6 IN.(150mm)
8. KEEP THE WALL WET WHILE POINTING. IN HOT OR DRY WEATHER, PROTECT THE POINTED MASONRY FROM THE SUN AND KEEP IT WET FOR AT LEAST THREE DAYS AFTER THE POINTING IS FINISHED.

APPROVED

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102B CCPur MSPARK FUTURISTICS & ASSOCIATES In association with

Rev.	Date	Description

CLIENT: NAIDCL — BUILDING INFRASTRUCTURE, BUILDING THE NATION

EPC CONTRACTOR: GPT Group — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-S,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

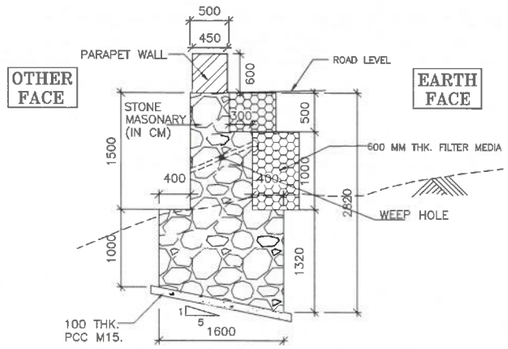
DRAWN	
DESIGNED	SHIVAM
CHECKED	AB.K
DATE: JAN - 2021	

TITLE: **RETAINING WALL (RRM)**

SCALE: **AS SHOWN** — 01 OF 02

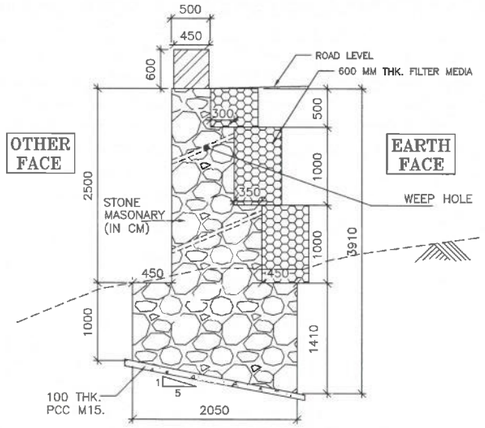
DRG.NO: **GPT/CCT/4B/STR/MISC/RW/06**

REV: **R0**



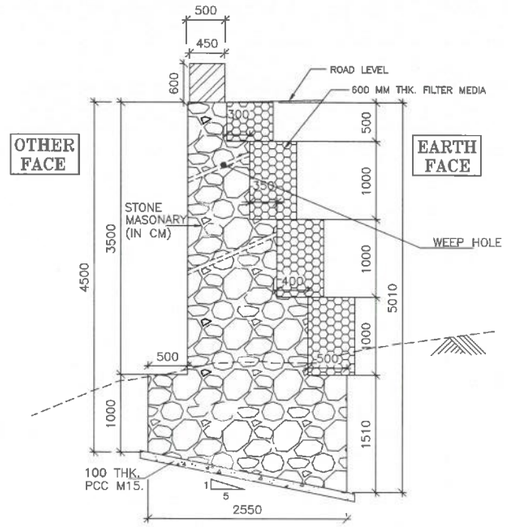
RETAINING WALL (2.5m)

SCALE 1:50



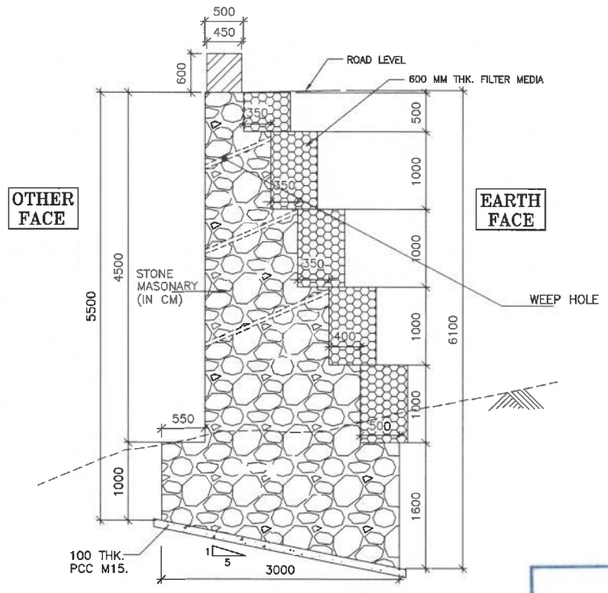
RETAINING WALL (3.5m)

SCALE 1:50



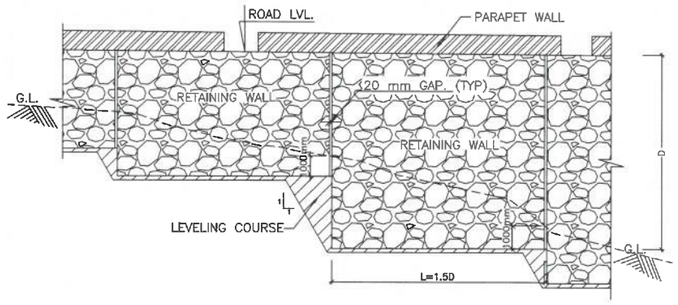
RETAINING WALL (4.5m)

SCALE 1:50



RETAINING WALL (5.5m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 80x150 mm or 150MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78-2014
5. BACK FILLING BEHIND THE RETAINING WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 -2014 HAVING PROPERTIES ø =35°, C=0
6. RUBBLE STONE MASONARY IN CEMENT MORTAR (1:3).
7. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY. IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.
8. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

REQUIRED BEARING CAPACITY :

H MAX. (m)	2.5	3.5	4.5	5.5
REQUIRED BEARING CAPACITY (T/sqm)	12	16	20	25

STONE MASONRY SPECIFICATIONS:-

1. THE STONE TO BE USED FOR STONE MASONRY SHOULD BE HARD, TOUGH AND DURABLE.
2. THE PROPERLY WETTED STONE SHOULD BE USED TO AVOID MORTAR MOISTURE BEING SUCKED.
3. BEFORE LAYING THE STONE IN THE WALL, SHAPE AND DRESS IT SO THAT IT WILL NOT LOOSEN AFTER IT IS PLACED.
4. NO DRESSING OR HAMMERING WHICH WILL LOOSEN THE STONE, WILL BE PERMITTED AFTER IT IS PLACED.
5. CLEAN EACH STONE AND SATURATE IT WITH WATER BEFORE SETTING IT. CLEAN AND MOISTEN THE BED THAT WILL RECEIVE IT.
6. ENSURE THAT THE JOINTS AND BEDS HAVE AN AVERAGE THICKNESS OF NOT MORE THAN 1 INCH (25 mm).
7. ENSURE THAT THE VERTICAL JOINTS IN EACH COURSE BREAK WITH THE ADJOINING COURSES AT LEAST 6 IN.(150mm)
8. KEEP THE WALL WET WHILE POINTING. IN HOT OR DRY WEATHER, PROTECT THE POINTED MASONRY FROM THE SUN AND KEEP IT WET FOR AT LEAST THREE DAYS AFTER THE POINTING IS FINISHED.

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Rev.	Date	Description

CLIENT: NHIDCL

EPC CONTRACTOR: GPT Group — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	S.R
DESIGNED	SHIVAM
CHECKED	A.B.K
DATE: JAN - 2021	

TITLE: RETAINING WALL RRM

SCALE: AS SHOWN — 02 OF 02

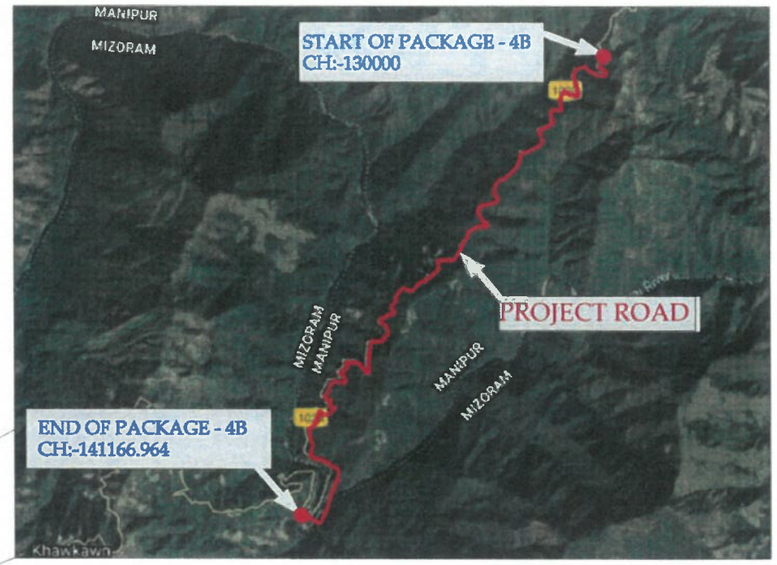
DRG.NO: GPT/CCT/4B/STR/MISC/RW/07

REV: R0

National Highways & Infrastructure Development
राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड

BUILDING INFRASTRUCTURE - BUILDING THE NATION

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction mode.



DRAWING OF TOE WALL

PACKAGE - 4B

MARCH 2022

APPROVED

EPC CONTRACTOR:

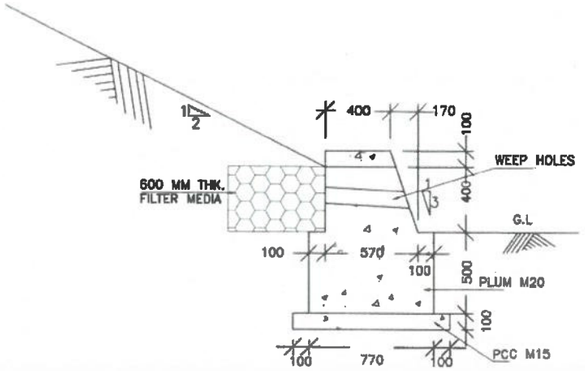
GPT Group

JC - 25, Sector - III, Salt Lake,
Kolkata - 700098.

DESIGN CONSULTANT:

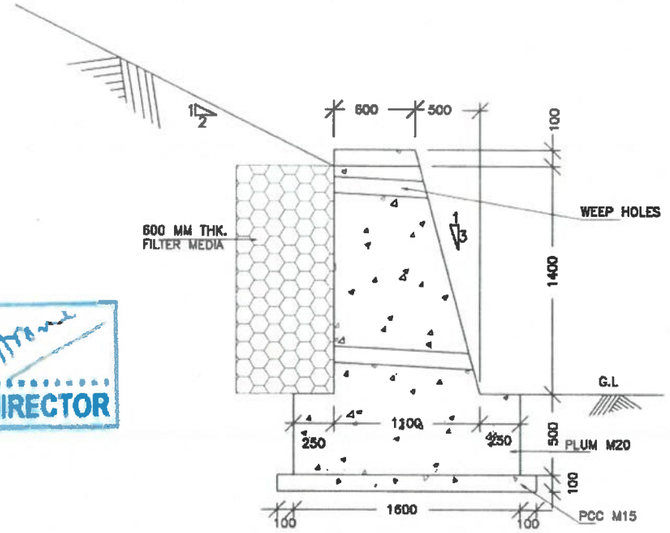
SPS Technocrats Pvt. Ltd.

510 & 511, JMD Megapolis, Sector 48,
Gurugram, Haryana - 122018.



TOE WALL (1.0m)

SCALE 1:25



TOE WALL (2.0m)

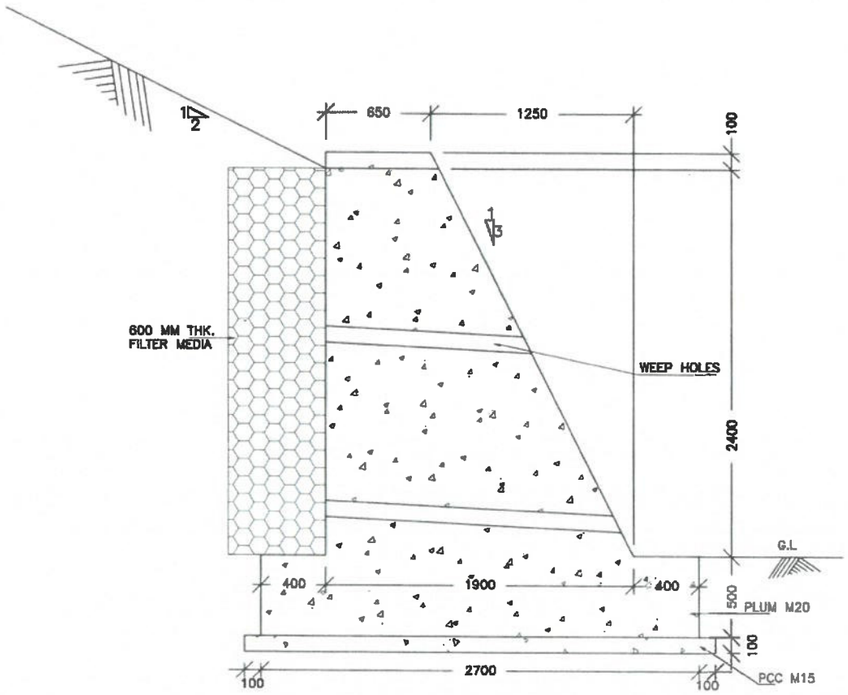
SCALE 1:25

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 117/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd

Managing Director



TOE WALL (3.0m)

SCALE 1:25

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. MH-LKO-6 CCPur In association with MSPARK FUTURISTICS & ASSOCIATES

APPROVED

GPT Infraprojects Limited Imphal Branch 795001 Imphal

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 MM C/C BOTH HORIZONTALLY & VERTICALLY IN THE BREAST WALL UPTO 150 MM ABOVE GL/LWL. IT SHALL BE
   a) 100 MM ø IN PCC/PLUM CONCRETE.
   b) 150 MM ø OR 80 X 150 MM IN RR MASONRY.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78–2014.
5. BACK FILLING BEHIND THE PCC WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 –2014 HAVING PROPERTIES ϕ =30°, C=0, γ= 20kN/m^3
6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
7. GRADE OF CONCRETE PCC M20.
8. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER–IN–CHARGE BEFORE ANY EXECUTION.

DESIGN BEARING CAPACITY :

H MAX. (m)	1.0	2.0	3.0
DESIGN BEARING CAPACITY (T/sqm)	5.0	6.0	7.0

Rev.	Date	Description
R0	MAR-2022	FOR REVIEW & APPROVAL

CLIENT: NEIDCL — NORTH EAST INDIA DEVELOPMENT CORPORATION — BUILDING INFRASTRUCTURE · BUILDING THE NORTH EAST

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-4,2ND FLOOR, R.K TOWER, SECTOR-4 [illegible] LUCKNOW-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-48) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

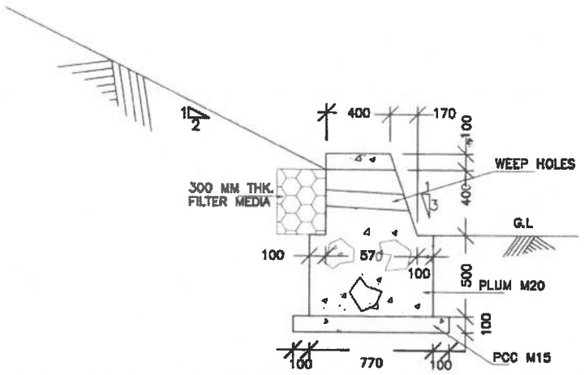
DRAWN	N.S.R
DESIGNED	A.S
CHECKED	A.V
DATE: MARCH- 2022	

TITLE: TOE WALL (PCC)

SCALE: AS SHOWN

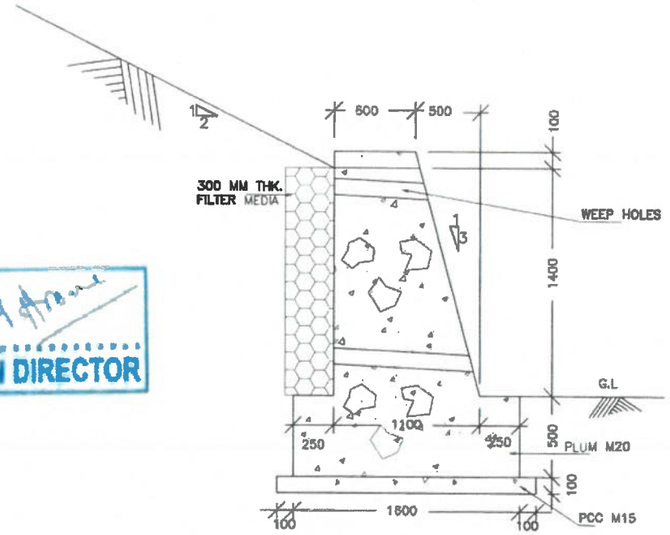
REV: R0

DRG. NO: GPT/CCT/48/STR/ TW/01



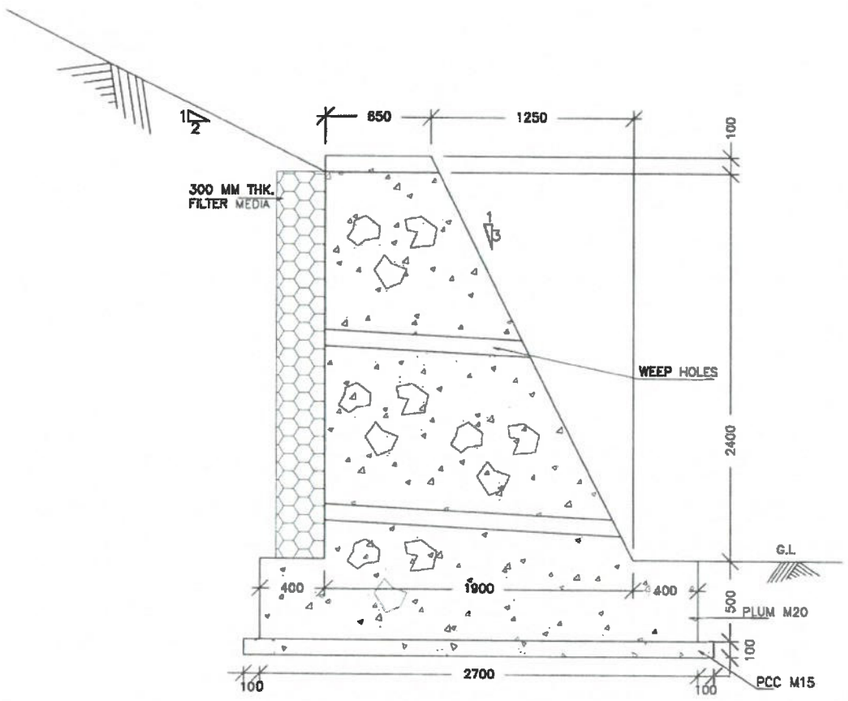
TOE WALL (1.0m)

SCALE 1:25



TOE WALL (2.0m)

SCALE 1:25



TOE WALL (3.0m)

SCALE 1:25

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. MH-1102-B CCPur In association with MSPARK FUTURISTICS & ASSOCIATES

APPROVED

GPT Infraprojects Limited Imphal Branch 795001 Imphal

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 MM C/C BOTH HORIZONTALLY & VERTICALLY IN THE BREAST WALL UPTO 150 MM ABOVE GL/LWL. IT SHALL BE
   a) 100 MM ø IN PCC/PLUM CONCRETE.
   b) 150 MM ø OR 80 X 150 MM IN RR MASONRY.
4. FILTER MEDIA OF 300MM THICKNESS CONFIRMING TO MORT&H FILTER MEDIA SPECIFICATIONS.
5. BACK FILLING BEHIND THE PCC WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 -2014 HAVING PROPERTIES ø =30°, C=0
6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
7. PLUMS CONCRETE IN M20 GRADE.
8. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

DESIGN BEARING CAPACITY :

H MAX. (m)	1.0	2.0	3.0
DESIGN BEARING CAPACITY (T/sqm)	5.0	6.0	7.0

PLUM CONCRETE SPECIFICATIONS:-

1. **SIZE :** THE SIZE OF STONE PLUMS MAY BE FROM 150-300 MM. THE MAXIMUM DIMENSION OF THESE STONES OR PLUMS SHALL NOT EXCEED 1/3 RD THE LEAST DIMENSION OF THE MEMBERS.
2. **MATERIAL :** ALL PLUMS SHALL BE HARD, DURABLE, CLEAN AND FREE FROM SOFT MATERIALS OR LOOSEPIECES OR DELETERIOUS SUBSTANCE IN THEM & SHALL NOT HAVE SHARP CORNERS.
3. **CONSTRUCTION OPERATIONS :** DURING CONCRETING THE FIRST LAYER OF CONCRETE OF THE SPECIFIED MIX SHALL BE LAID TO A THICKNESS OF THE MAXIMUM SIZE OF THE PLUMS TO BE USED. THE PLUMS SHALL THEN BE LAID WHILE THE TOP PORTION OF THIS CONCRETE IS STILL GREEN BUT SUFFICIENTLY STIFF TO PREVENT COMPLETE SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PLUMS SHALL BE ABOUT HALF EMBEDDED IN THE CONCRETE & THE REMAINING PART EXPOSED SO AS TO FORM A KEY WITH THE NEXT LAYER OF THE CONCRETE. NO PLUM SHALL BE USED FOR CONCRETE LAID UNDER WATER.
4. WHILE PLACING THE PLUMS, CARE SHALL BE TAKEN TO SEE THAT THE CLEAR DISTANCE BETWEEN ANY TWO PLUMS IS NOT LESS THAN EITHER THE WIDTH OR THICKNESS OF EITHER OF THE PLUMS. THE DISTANCE FROM THE PLUMS TO THE OUTER SURFACE FROM ANY STEEL REINFORCEMENT SHALL BE EQUAL TO GREATEST WIDTH OF PLUMS. IF PLUMS OF STRATIFIED STONE ARE USED THEY SHALL BE LAID ON THEIR NATURAL BED. STONES WITH CONCAVE FACES SHALL BE LAID WITH THE CONCAVE UPWARD. THE THICKNESS OF THE NEXT AND SUCCESSIVE LAYERS OF CONCRETE SHALL BE AT LEAST TWICE THAT OF THE LARGEST PLUM.
5. **QUANTITY OF PLUM :** THE TOTAL VOLUME OF PLUMS SHALL NOT EXCEED 20% BY THE VOLUME OF CONCRETE AS PER CLAUSE 5.3.3, PARA 1&2 OF IS-456-2000.

Rev.	Date	Description
R0	MAR-2022	FOR REVIEW & APPROVAL

CLIENT: NAIDCL

EPC CONTRACTOR: GPT — JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — D-6,2ND FLOOR, ELK TOWER, SECTOR 4, VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

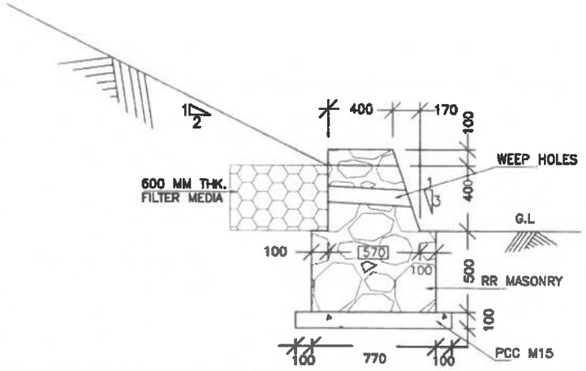
DRAWN	N.S.R
DESIGNED	A.S
CHECKED	A.V
DATE: MARCH- 2022	

TITLE: TOE WALL (PLUM CONCRETE)

SCALE: AS SHOWN

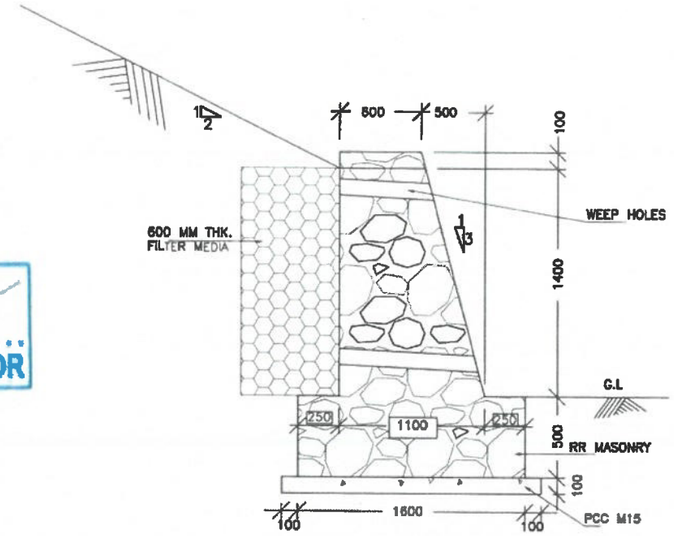
REV: R0

DRG. NO: GPT/CCT/48/STR/ TW/02



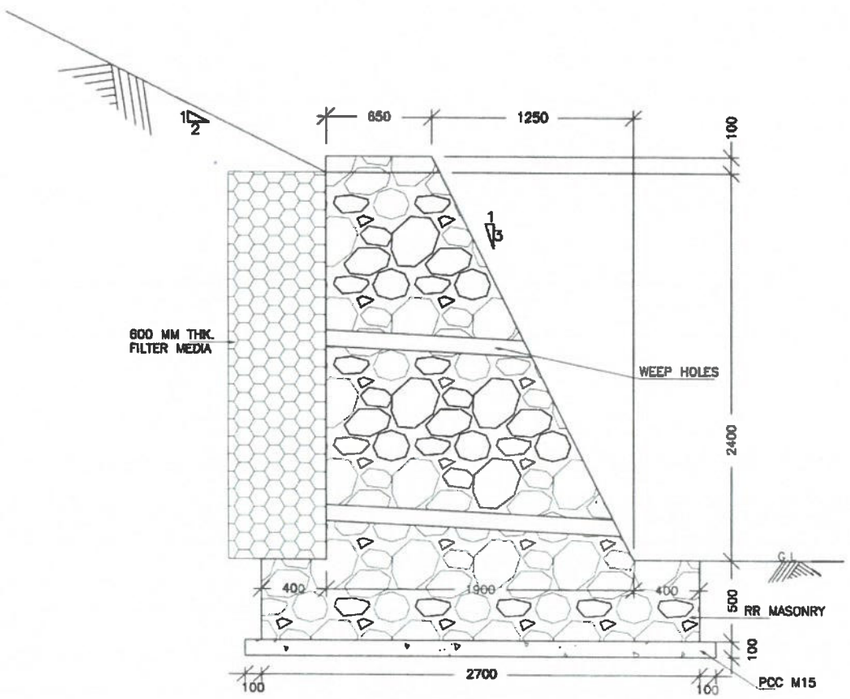
TOE WALL (1.0m)

SCALE 1:25



TOE WALL (2.0m)

SCALE 1:25



TOE WALL (3.0m)

SCALE 1:25

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102-B CCPur in association with ASPARK FUTURISTICS & ASSOCIATES

APPROVED

GPT Infraprojects Limited Imphal Branch 795001 Imphal

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 MM C/C BOTH HORIZONTALLY & VERTICALLY IN THE BREAST WALL UPTO 150 MM ABOVE GL/LWL. IT SHALL BE
   a) 100 MM ϕ IN PCC/PLUM CONCRETE.
   b) 150 MM ϕ OR 80 X 150 MM IN RR MASONRY.
4. FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 5 OF IRC: 78-2014.
5. BACK FILLING BEHIND THE PCC WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 -2014 HAVING PROPERTIES $\phi = 30°$, C=0, $\gamma = 20 kN/m^3$
6. RR MASONARY IN CEMENT MORTAR.(1:3)
7. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

STONE MASONRY SPECIFICATIONS:-

1. THE STONES TO BE USED FOR STONE MASONRY SHOULD BE HARD, TOUGH AND DURABLE.
2. THE PROPERLY WETTED STONES SHOULD BE USED TO AVOID MORTAR MOISTURE BEING SUCKED.
3. BEFORE LAYING THE STONE IN THE WALL, SHAPE AND DRESS IT SO THAT IT WILL NOT LOOSEN AFTER IT IS PLACED.
4. NO DRESSING OR HAMMERING WHICH WILL LOOSEN THE STONE WILL BE PERMITTED AFTER IT IS PLACED.
5. CLEAN EACH STONE AND SATURATE IT WITH WATER BEFORE SETTING IT. CLEAN AND MOISTEN THE BED THAT WILL RECEIVE IT.
6. ENSURE THAT THE JOINTS AND BEDS HAVE AN AVERAGE THICKNESS OF NOT MORE THAN 1 INCH. (25 MM).
7. ENSURE THAT THE VERTICAL JOINTS IN EACH COURSE BREAK WITH THE ADJOINING COURSES AT LEAST 6 IN. (150 MM).
8. KEEP THE WALL WET WHILE POINTING. IN HOT OR DRY WEATHER, PROTECT THE POINTED MASONRY FROM THE SUN AND KEEP IT WET FOR AT LEAST THREE DAYS AFTER THE POINTING IS FINISHED.

DESIGN BEARING CAPACITY :

H MAX. (m)	1.0	2.0	3.0
DESIGN BEARING CAPACITY (T/sqm)	5.0	6.0	7.0

Rev.	Date	Description
R0	MAR-2022	FOR REVIEW & APPROVAL

CLIENT: NHIDCL

EPC CONTRACTOR: GPT, JC - 25, Sector - III, Salt Lake, Kolkata - 700098.

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-62ND FLOOR, R.K TOWER, SECTOR-4 VAISHALI (GHAZIABAD-201010).

SAFETY CONSULTANT: SUVADRA CONSULTANTS, PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., E-52, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd., # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	N.B.R
DESIGNED	A.S
CHECKED	A.V
DATE: MARCH- 2022	

TITLE: TOE WALL (RR MASONRY)

SCALE: AS SHOWN

REV: R0

DRG. NO: GPT/CC7/4B/STR/ TW/03

Rec Dt. 29.9.21.

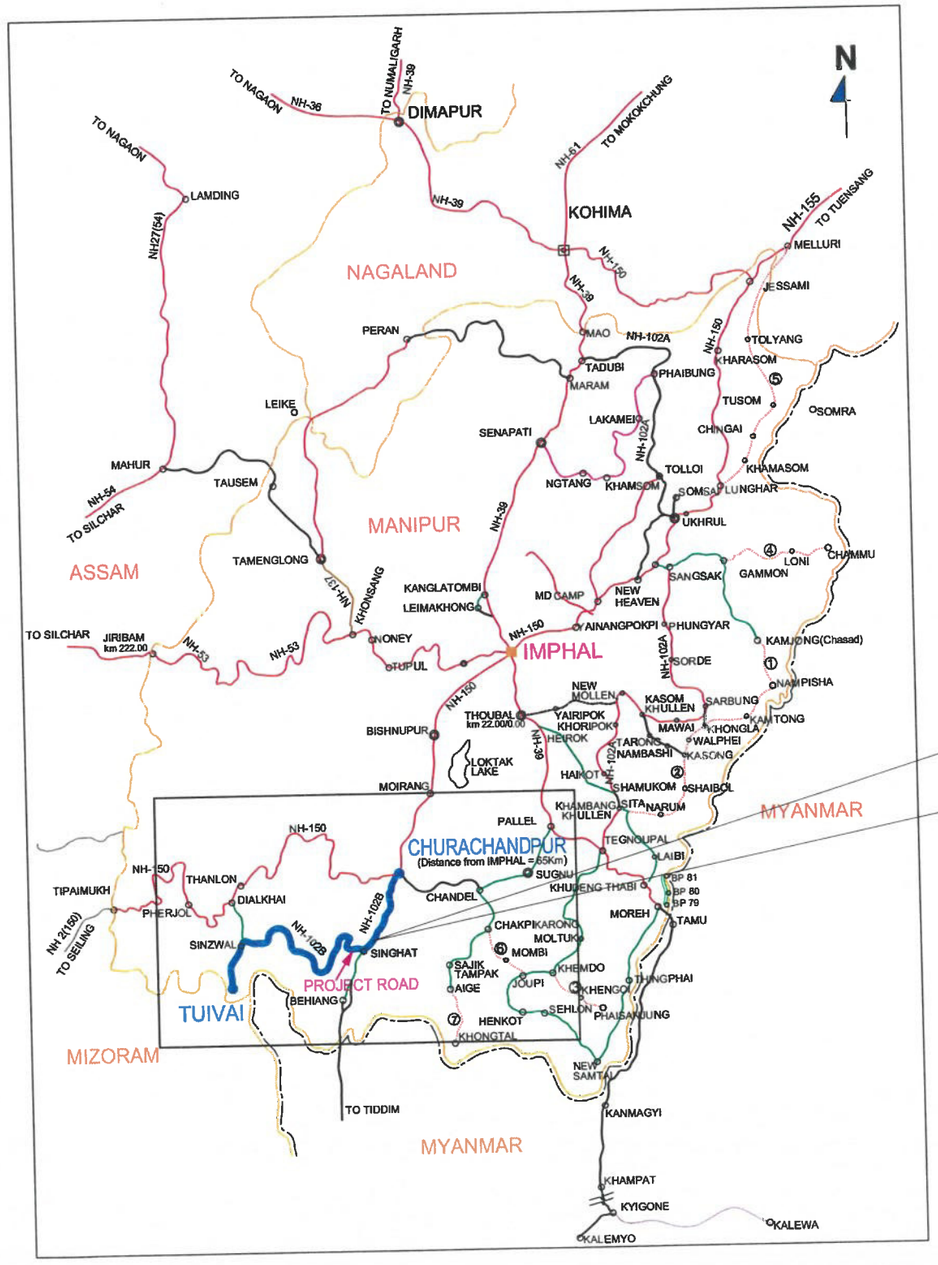
No. 21/GPT-Infra/B.O-Imphal/Design/Pkg 4(B)/2020-21/72

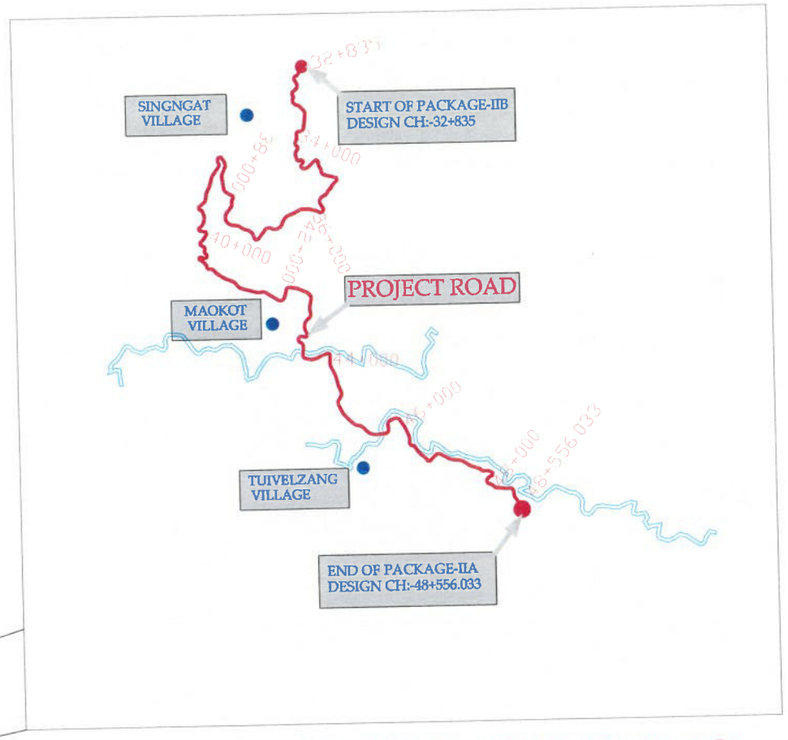
राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड

National Highways & Infrastructure Development Corporation Limited

BUILDING INFRASTRUCTURE - BUILDING THE NATION

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.





GFC OF BOX CULVERTS

PACKAGE - 4B

CHURACHANDPUR VILLAGE TO TUIVAI VILLAGE

(Km. 130+000 to Km. 141+029)

SEPTEMBER 2021

APPROVED

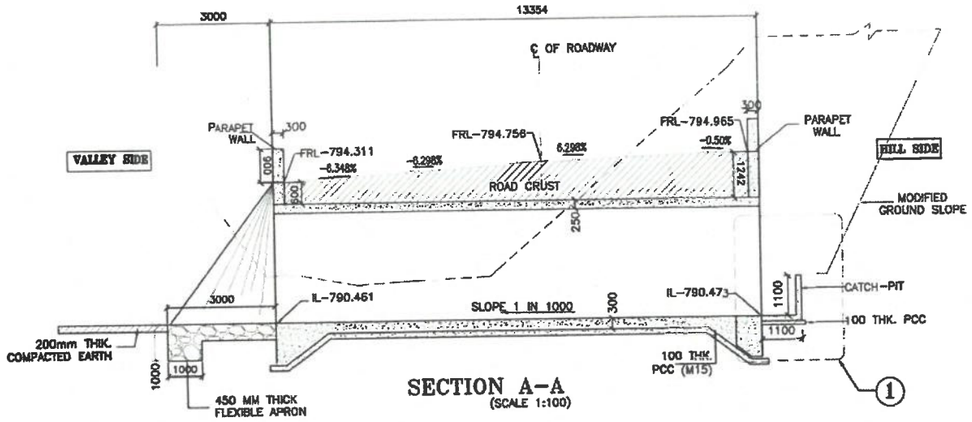
GPT Infraprojects Limited Imphal Branch 795001 Imphal

EPC CONTRACTOR:

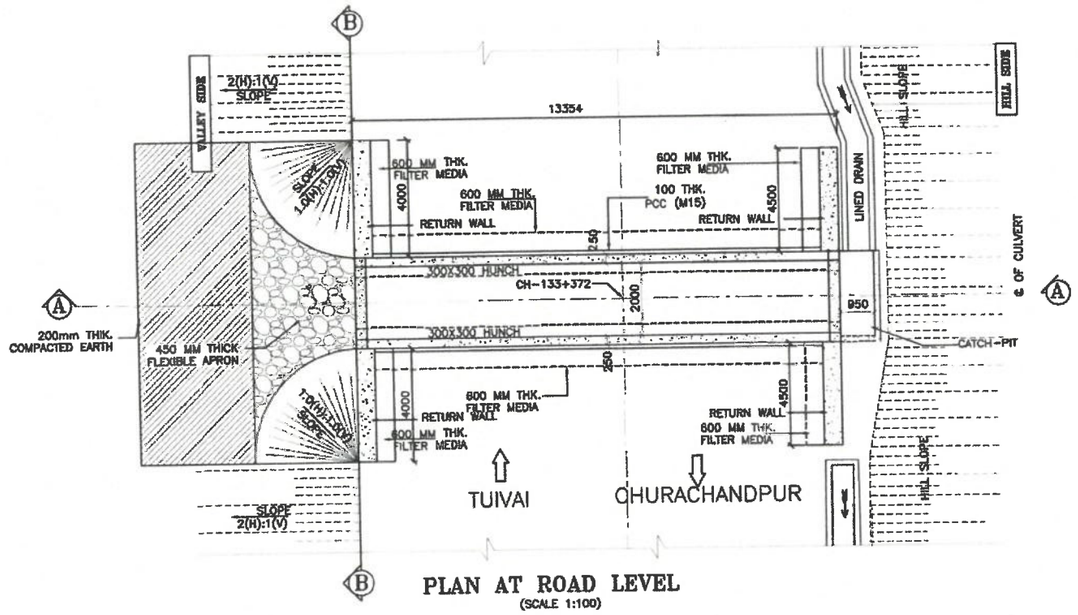
Bharat Vanijya Eastern Pvt Ltd
114, Chittaranjan Avenue,
Kolkata-700073, West Bengal

DESIGN CONSULTANT:

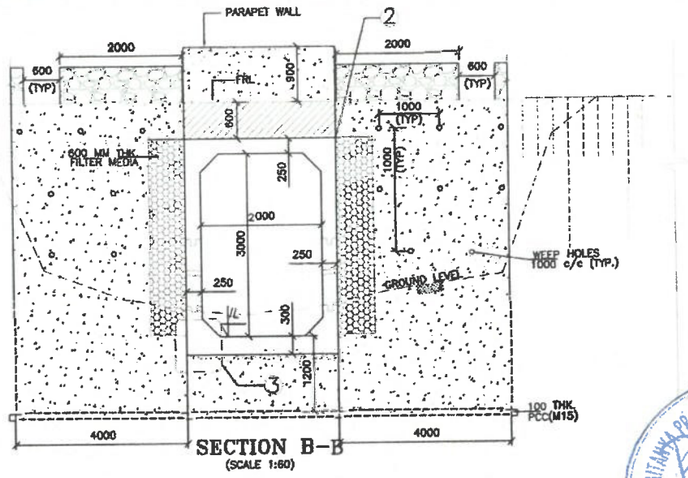
SPS Technocrats Pvt. Ltd.
510 & 511, JMD Megapolis, Sector 48,
Gurugram, Haryana - 122018.



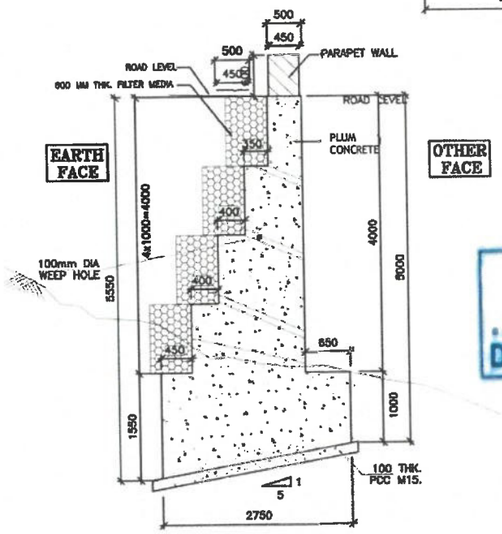
SECTION A-A
(SCALE 1:100)



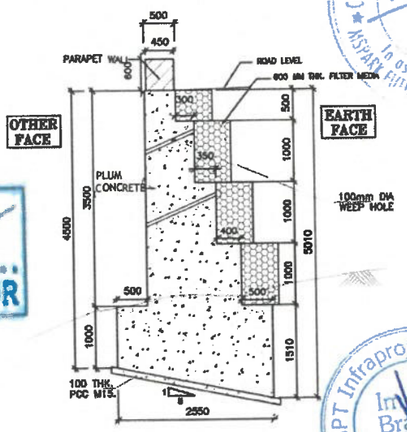
PLAN AT ROAD LEVEL
(SCALE 1:100)



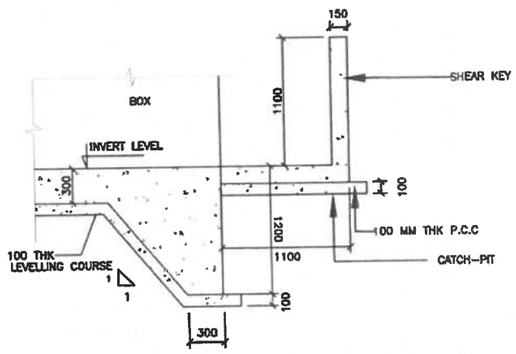
SECTION B-B
(SCALE 1:60)



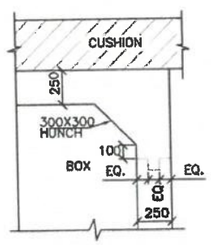
RETURN WALL (5.0m)ON U/S
SCALE 1:50



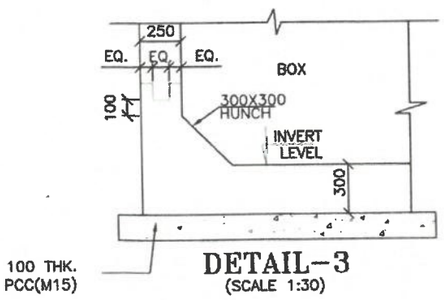
RETURN WALL (4.5m)ON D/S
SCALE 1:50



DETAIL-1
(SCALE 1:50)



DETAIL-2
(SCALE 1:30)



DETAIL-3
(SCALE 1:30)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DRAWING SHALL BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE PLAN & PROFILE AND OTHER RELEVANT DRAWINGS.
3. THE BEARING CAPACITY CONSIDERD IN DESIGN AT FOUNDING LEVEL OF CULVERT IS 12.00T/m²
4. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300MM
5. FRL – FINISHED ROAD LEVEL
   IL – INVERT LEVEL
   FL – FOUNDING LEVEL
6. GRADE OF CONCRETE
   a) M30–FOR RCC BOX CELL STRUCTURE.
   b) M15–FOR PCC
   c) M-30–PARAPET.
   d) M-20–CATCHPIT
7. GRADE OF STEEL –FE 500D.
8. 100MM DIA PVC PIPE AT SPACING 1000MM C/C IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN WALL.
9. 600MM THICK. FILTER MATERIAL BEHIND WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78–2014.
10. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
11. ANY AMBIGUITY IN DRAWING OR SITE BRING IT TO NOTICE OF ENGINEER–IN–CHARGE BEFORE EXECUTION.

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES NH-102-B CCPur

GPT Infraprojects Limited Imphal Branch 795001 Imphal

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Rev.	Date	Description

CLIENT: NHIDCL

EPC CONTRACTOR: GPT — JC-25,SECTOR-111,SALT LAKE KOLKATA-700098

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 638 - 641, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-48) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

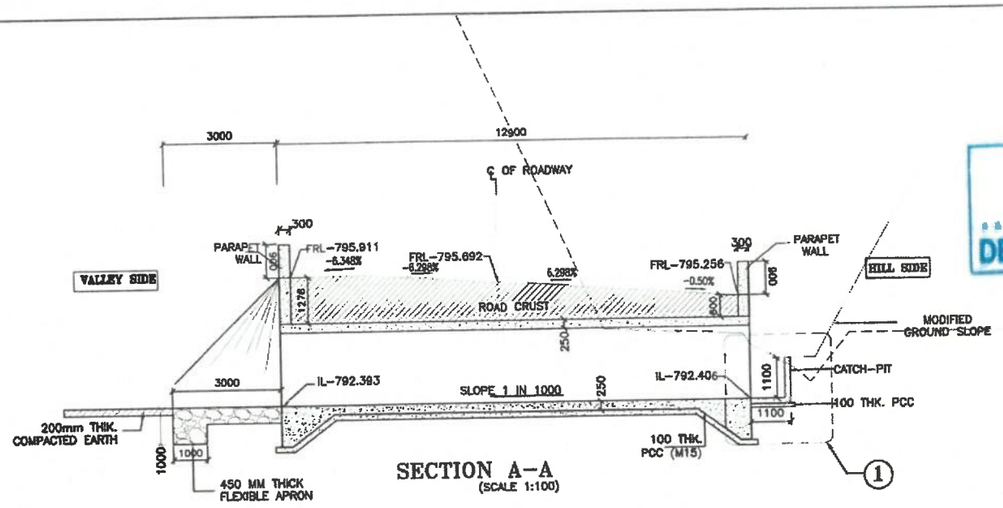
DRAWN	S.R
DESIGNED	S.S
CHECKED	AS.K
DATE: SEP - 2021	

TITLE: GENERAL ARRANGEMENT DRAWING OF BOX CULVERT AT CH-133+372(1X3m)(3m WITH CUSHION)

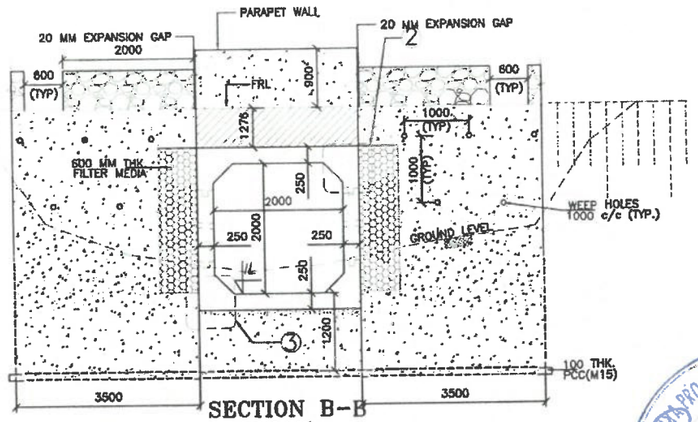
SCALE: AS SHOWN

REV: R0

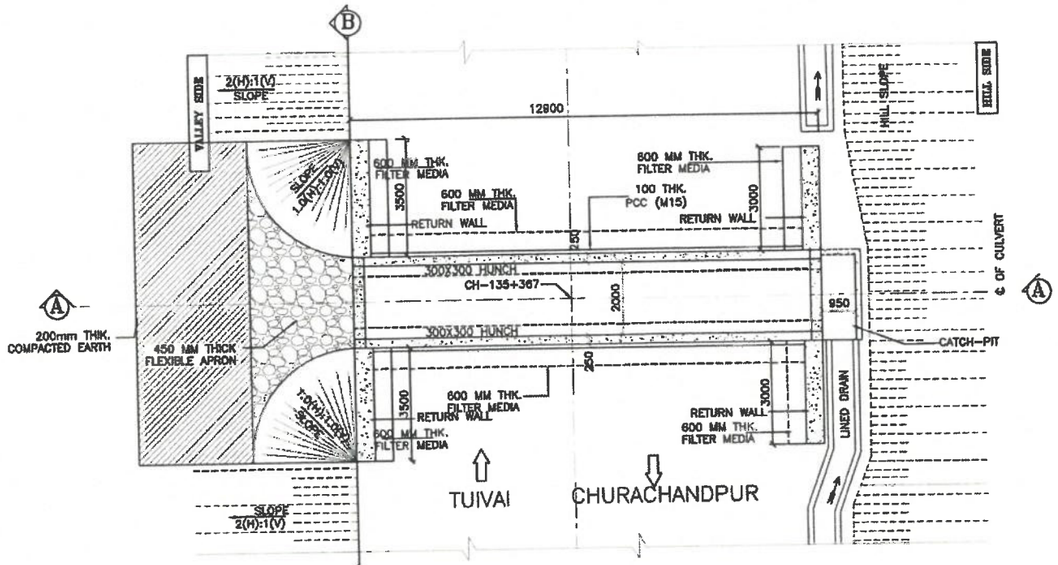
DRG.NO: GPT/CCT/48/STR/BC/CH-133+372/01



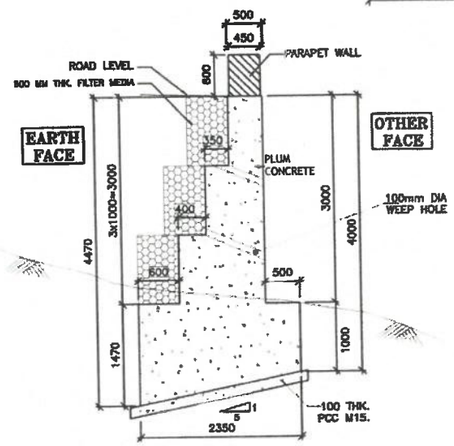
SECTION A-A
(SCALE 1:100)



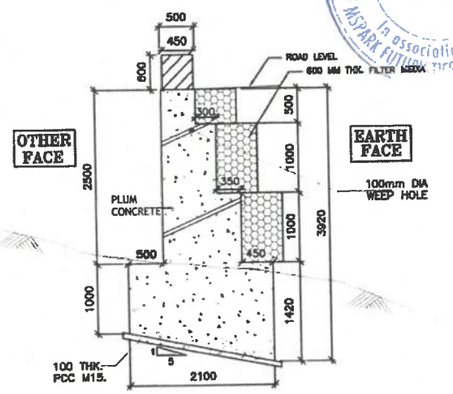
SECTION B-B
(SCALE 1:60)



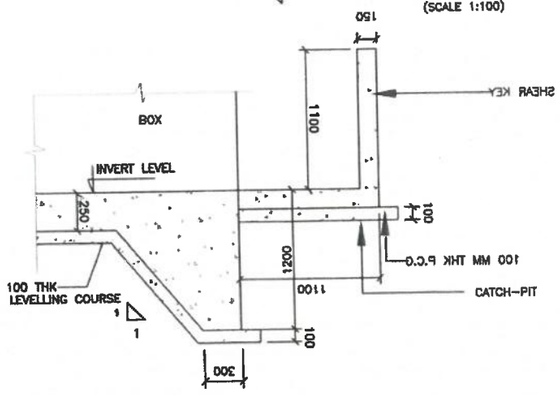
PLAN AT ROAD LEVEL
(SCALE 1:100)



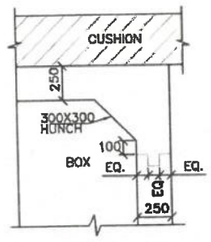
RETURN WALL (4.0m)ON U/S
SCALE 1:50



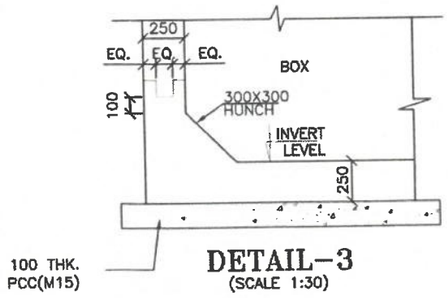
RETURN WALL (3.5m)ON D/S
SCALE 1:50



DETAIL-1



DETAIL-2
(SCALE 1:30)



DETAIL-3
(SCALE 1:30)

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES
NH-102-B CCPur

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DRAWING SHALL BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE PLAN & PROFILE AND OTHER RELEVANT DRAWINGS.
3. THE BEARING CAPACITY CONSIDERD IN DESIGN AT FOUNDING LEVEL OF CULVERT IS 11.00T/m²
4. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300MM
5. FRL – FINISHED ROAD LEVEL
   IL – INVERT LEVEL
   FL – FOUNDING LEVEL
6. GRADE OF CONCRETE
   a) M30–FOR RCC BOX CELL STRUCTURE.
   b) M15–FOR PCC
   c) M–30–PARAPET.
   d) M–20–CATCHPIT
7. GRADE OF STEEL –FE 500D.
8. 100MM DIA PVC PIPE AT SPACING 1000MM C/C IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN WALL.
9. 600MM THICK. FILTER MATERIAL BEHIND WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78–2014.
10. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
11. ANY AMBIGUITY IN DRAWING OR SITE BRING IT TO NOTICE OF ENGINEER–IN–CHARGE BEFORE EXECUTION.

GPT Infraprojects Limited Imphal Branch 795001 Imphal

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Rev.	Date	Description

CLIENT: NAIDCL — BUILDING INFRASTRUCTURE - BUILDING THE NATION

EPC CONTRACTOR: GPT — JC-25,SECTOR-111,SALT LAKE KOLKATA-700098

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-5,2ND FLOOR, R.K TOWER, SECTOR-4 VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 638 - 641, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

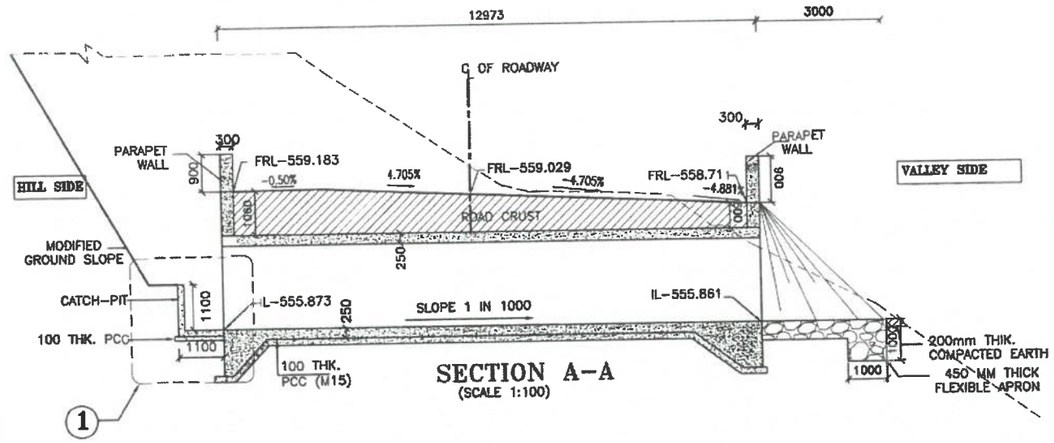
DRAWN	S.R
DESIGNED	S.S
CHECKED	AB.K
DATE: SEP - 2021	

TITLE: GENERAL ARRANGEMENT DRAWING OF BOX CULVERT AT CH-135+367(1X2m)X2m WITH CUSHION)

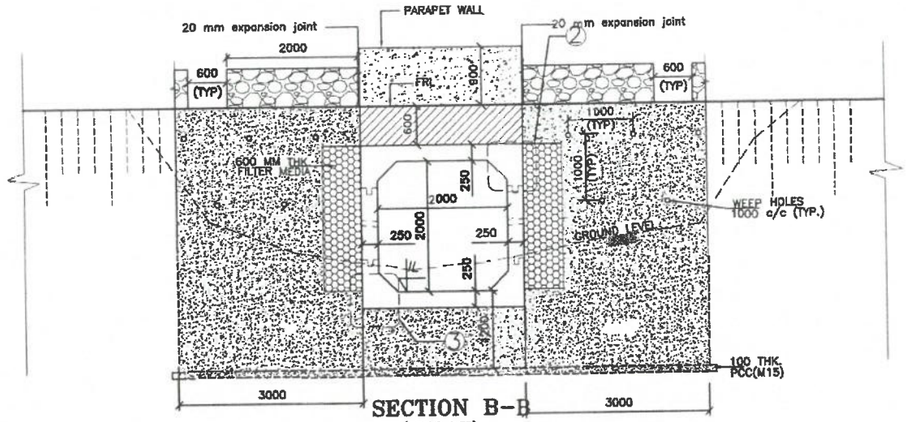
SCALE: AS SHOWN

REV: R0

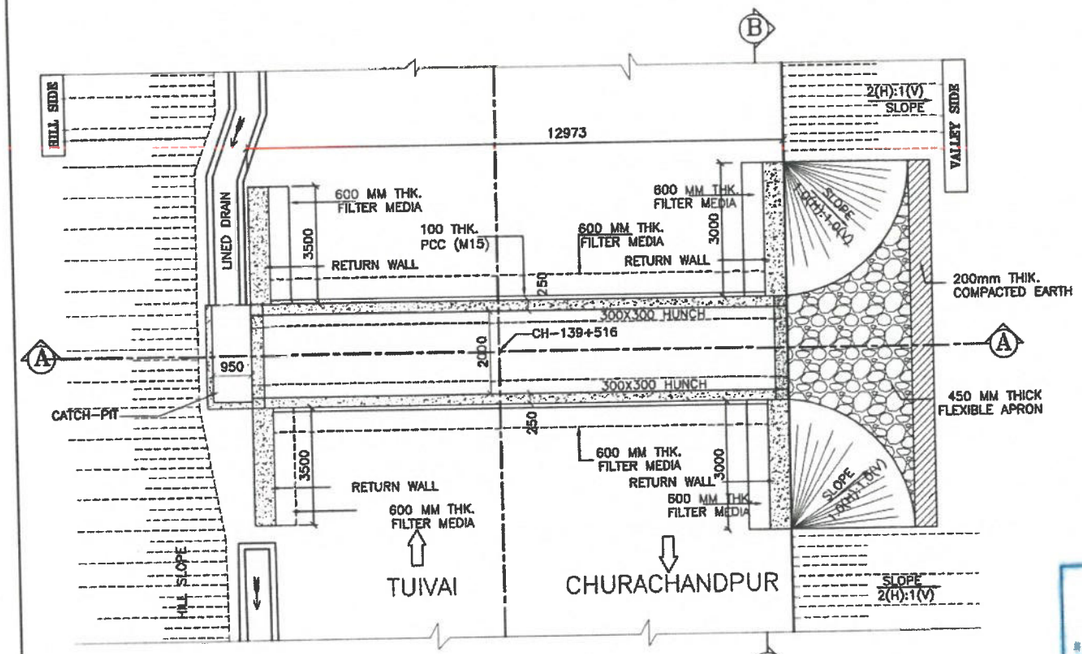
DRG.NO: GPT/CCT/4B/STR/BC/CH-135+367/01



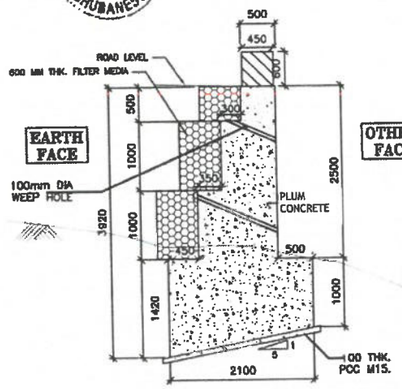
SECTION A-A
(SCALE 1:100)



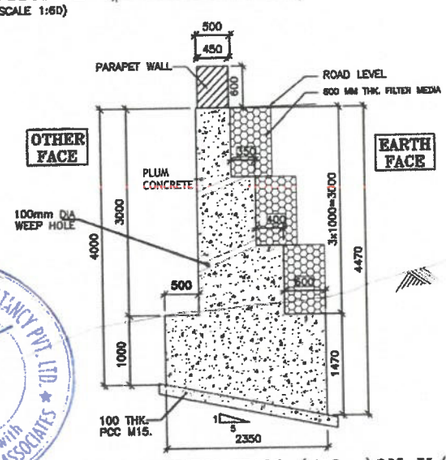
SECTION B-B
(SCALE 1:60)



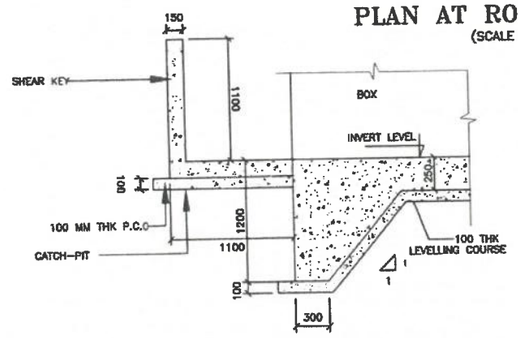
PLAN AT ROAD LEVEL
(SCALE 1:100)



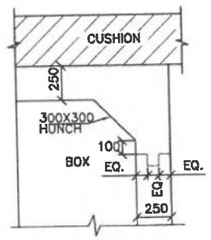
RETURN WALL (3.5m)ON D/S
SCALE 1:50



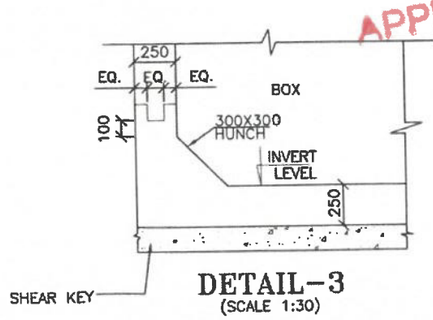
RETURN WALL (4.0m)ON U/S
SCALE 1:50



DETAIL-1
(SCALE 1:50)



DETAIL-2
(SCALE 1:30)



DETAIL-3
(SCALE 1:30)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DRAWING SHALL BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE PLAN & PROFILE AND OTHER RELEVANT DRAWINGS.
3. THE BEARING CAPACITY CONSIDERD IN DESIGN AT FOUNDING LEVEL OF CULVERT IS 11.00T/m²
4. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300MM
5. FRL – FINISHED ROAD LEVEL
   IL – INVERT LEVEL
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6. GRADE OF CONCRETE
   a) M30–FOR RCC BOX CELL STRUCTURE.
   b) M15–FOR PCC
   c) M–30–PARAPET.
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7. GRADE OF STEEL –FE 500D.
8. 100MM DIA PVC PIPE AT SPACING 1000MM C/C IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN WALL.
9. 600MM THICK. FILTER MATERIAL BEHIND WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78–2014.
10. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
11. ANY AMBIGUITY IN DRAWING OR SITE BRING IT TO NOTICE OF ENGINEER–IN–CHARGE BEFORE EXECUTION.

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

DESIGN DIRECTOR

APPROVED

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES NH-102-B CCPur

GPT Infraprojects Limited Imphal Branch 795001 Imphal

Rev.	Date	Description

Client: NHIDCL

EPC Contractor: GPT — JC-25,SECTOR-111,SALT LAKE KOLKATA-700098

Authority Engineer: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-5,2ND FLOOR, RJ-TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

Safety Consultant: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant: SPS Technocrats Pvt. Ltd. — #635 - 641, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

Project: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

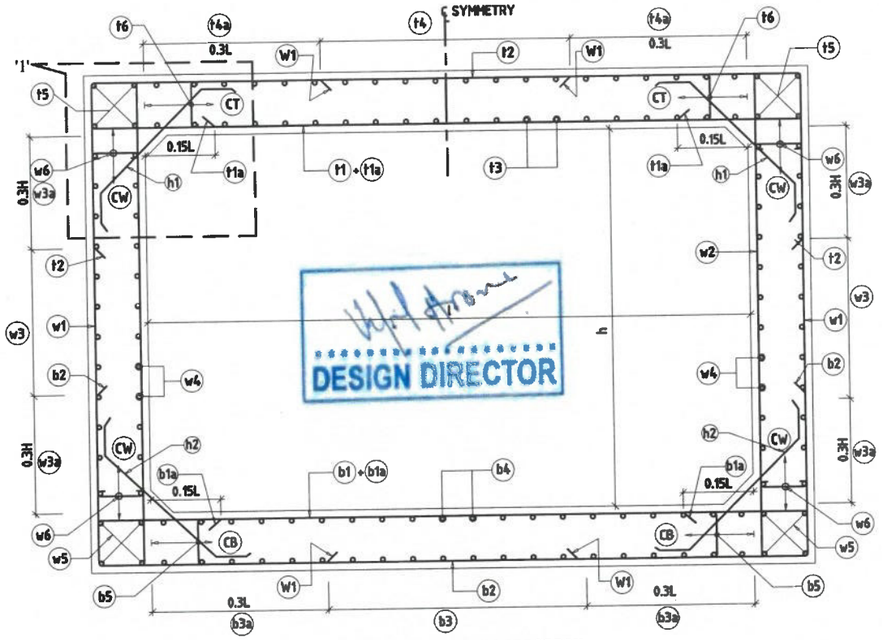
Drawn	S.R
Designed	S.S
Checked	A.B.K
Date: SEP - 2021	

Title: GENERAL ARRANGEMENT DRAWING OF BOX CULVERT AT CH-139+516(1X2mX2m WITH CUSHION)

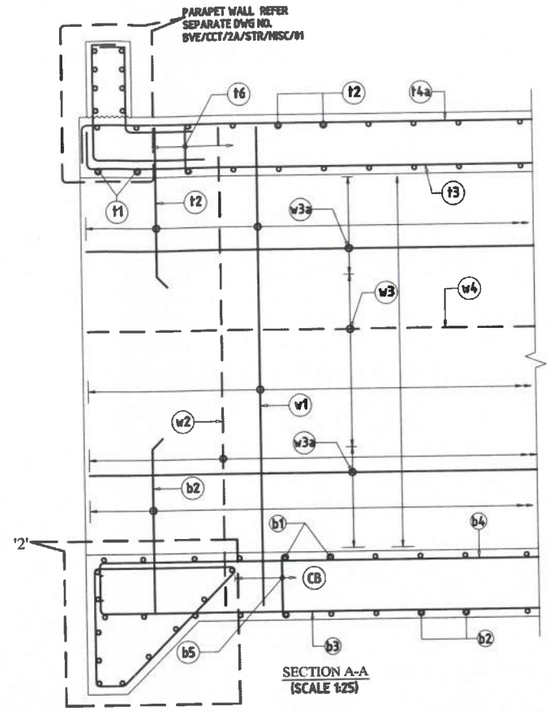
Scale: AS SHOWN

Rev: R0

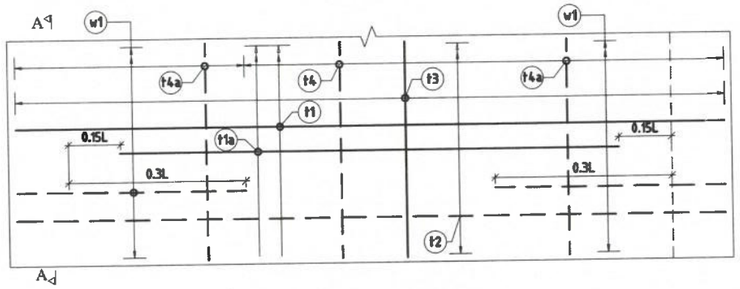
Drg. No: GPT/CCT/4B/STR/BC/CH-139+516/01



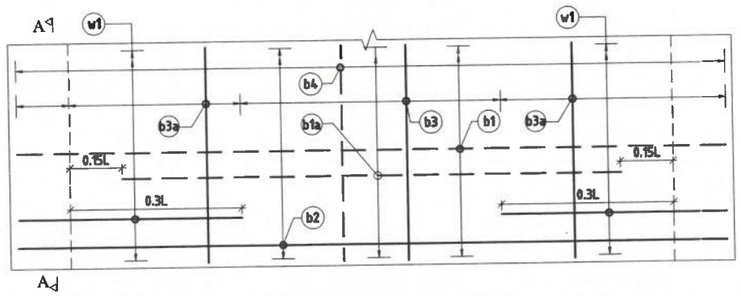
REINFORCEMENT DETAILS OF RCC BOX
(SCALE 1:25)



SECTION A-A
(SCALE 1:25)



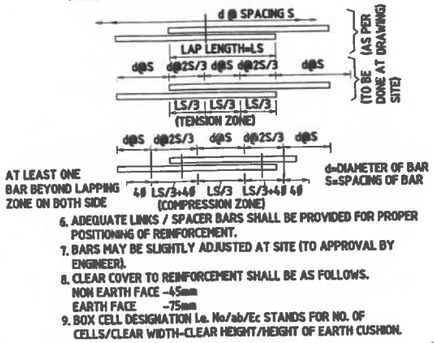
REINFORCEMENT DETAILS OF TOP SLAB
(t5 & t6 NOT SHOWN FOR CLEARITY)
(SCALE 1:25)



REINFORCEMENT DETAILS OF BOTTOM SLAB
(b5&w5 NOT SHOWN FOR CLEARITY)
(SCALE 1:25)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS & LEVELS ARE IN METERS UNLESS OTHERWISE NOTED.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
3. GRADE OF CONCRETE:-
   FOR RCC BOX M30
4. GRADE OF STEEL SHALL BE Fe-500 D CONFIRMING TO IS:1786.
5. LAPS SHALL BE STAGGERED AND NOTE MORE THAN 50% BAR. SHALL BE LAPPED AT ANY LOCATION.
   × 56 x DIA OF BAR FOR FAVORABLE CONDITION.
   × 81 x DIA OF BAR FOR UNFAVORABLE CONDITION.
   ANCHORAGE LENGTH SHALL BE PROVIDED AS PER CL NO. 15.2.4 OF IRC 112-2011
   × 40 x DIA OF BAR FOR FAVORABLE CONDITION.
   × 56 x DIA OF BAR UNFAVORABLE CONDITION.
   ANCHORAGE LENGTH FOR BUNDLED BARS SHALL BE PROVIDED AS PER CL NO. 15.2.4 OF IRC 112-2011



6. ADEQUATE LINKS / SPACER BARS SHALL BE PROVIDED FOR PROPER POSITIONING OF REINFORCEMENT.
7. BARS MAY BE SLIGHTLY ADJUSTED AT SITE (TO APPROVAL BY ENGINEER).
8. CLEAR COVER TO REINFORCEMENT SHALL BE AS FOLLOWS.
   NON EARTH FACE -45mm
   EARTH FACE -75mm
9. BOX CELL DESIGNATION i.e. No/ab/Ec STANDS FOR NO. OF CELLS/CLEAR WIDTH-CLEAR HEIGHT/HEIGHT OF EARTH CUSHION.

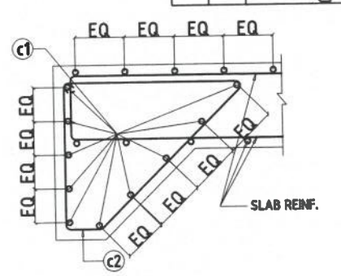
LEGEND:

- - - - - - - - - LINE FOR TOP BAR \ NON EARTH FACE BAR
———————— LINE FOR BOTTOM BAR \ EARTH FACE BAR

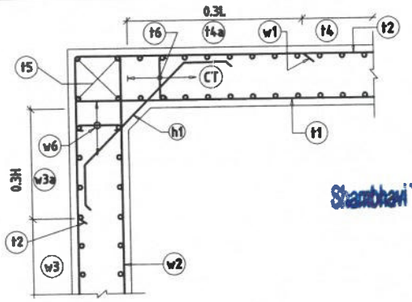
SCHEDULE OF REINFORCEMENT

DESIGN OF RCC BOX

BOX/ SIZE No./ab/Ec			1/2X2/3		1/2X3/2		1/2X3/3	
Sr.No.	Bar Mark	Shape of Bars (Not to Scale)	Bar Dia. in mm '#'	Spacing in mm	Bar Dia. in mm '#'	Spacing in mm	Bar Dia. in mm '#'	Spacing in mm
1	t1		12	200	12	200	12	200
2	t1a		-	-	-	-	-	-
3	t2		10	200	10	200	10	200
4	t3		8	200	8	200	8	200
5	t4		8	300	8	300	8	300
6	t4a		10	200	10	200	10	200
7	t5		12	2 LOCATION 4-NOS	12	2 LOCATION 4-NOS	12	2 LOCATION 4-NOS
8	b1		12	200	12	200	12	200
9	b1a		-	-	-	-	-	-
10	b2		10	200	12	200	12	200
11	b3		8	300	8	300	8	300
12	b3a		10	200	10	200	10	200
13	b4		8	200	8	200	8	200
14	w1		12	200	12	200	12	200
15	w2		12	200	12	200	12	200
16	w3		8	300	8	300	8	300
17	w3a		8	200	8	200	8	200
18	w4		8	200	8	200	8	200
19	w5		12	2 LOCATION 4-NOS	12	2 LOCATION 4-NOS	12	2 LOCATION 4-NOS
20	t6		-	-	-	-	-	-
21	b5		-	-	-	-	-	-
22	W6		-	-	-	-	10	200 (Long.) 200 (Trans.)
23	c1		10	2 LOCATION 10-NOS	10	2 LOCATION 10-NOS	10	2 LOCATION 10-NOS
24	c2		12	200	12	200	12	200
25	h1		10	200	10	200	10	200
26	h2		10	200	10	200	10	200



DETAIL - 2
(SCALE 1:20)



DETAIL AT-1
(SCALE 1:25)

BOX/ SIZE No./ab/Ec	1/2X2/3	1/2X3/2	1/2X3/3
CB	000mm	000mm	000mm
CT	000mm	000mm	000mm
CW	000mm	000mm	400mm

APPROVED

DESIGN DIRECTOR

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. NH-102-B CCPur In association with MSPARK FUTURISTICS & ASSOCIATES

GPT Infraprojects Limited Imphal Branch 795001 Imphal

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Rev.	Date	Description

CLIENT: NAIDCL BUILDING INFRASTRUCTURE - BUILDING THE NATION

EPC CONTRACTOR: GPT — JC-25,SECTOR-111,SALT LAKE KOLKATA-7000498

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES — C-5,2ND FLOOR, R.K TOWER, SECTOR-4 VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS — PP-97, Tankapani Road, BBSR-18, Odisha

PROOF CONSULTANT: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. — E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. — # 638 - 641, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 130.000 to Km 141.029 (Package-4B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

DRAWN	S.R
DESIGNED	S.S
CHECKED	AB.K
DATE: AUG - 2021	

TITLE: TYPICAL REINFORCEMENT DETAILS OF RCC BOX CULVERT

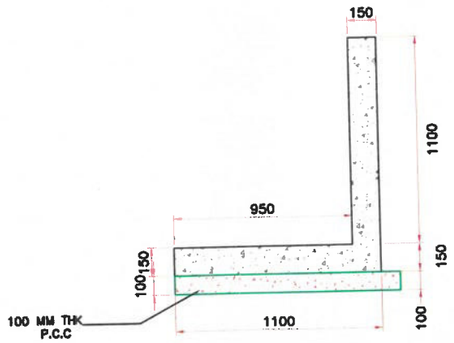
SCALE: AS SHOWN

REV: R0

DRG.NO: GPT/CCT/4B/STR/ STR/BC/RF/102

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

DESIGN DIRECTOR



DETAIL–Y
(DETAILS OF CATCHPIT)
(SCALE 1:20)

CHAITANYA PROJECTS CONSULTANCY PVT. LTD. In association with MSPARK FUTURISTICS & ASSOCIATES NH-102-B CCPur

GPT Infraprojects Limited Imphal Branch 795003 Imphal

APPROVED

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

Rev.	Date	Description

CLIENT: NAIDCL BUILDING INFRASTRUCTURE - BUILDING THE NATION

EPC CONTRACTOR: GPT — JC-25,SECTOR-111,SALT LAKE KOLKATA-700498

AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES, C-5,2ND FLOOR, R.K TOWER, SECTOR-4,VAISHALI, GHAZIABAD-201010.

SAFETY CONSULTANT: SUVADRA CONSULTANTS, PP-97, Tankapani Road, BBSR-18, Odisha

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DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. # 638 - 641, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.

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DRAWN	S.R
DESIGNED	S.S
CHECKED	AB.K
DATE: SEP - 2021	

TITLE: DETAILS OF CATCHPIT
SCALE: AS SHOWN
REV: R0
DRG.NO: GPT/CCT/4B/STR/ CATCHPIT