

Date. 14.08.21
Rec. 14.08.21

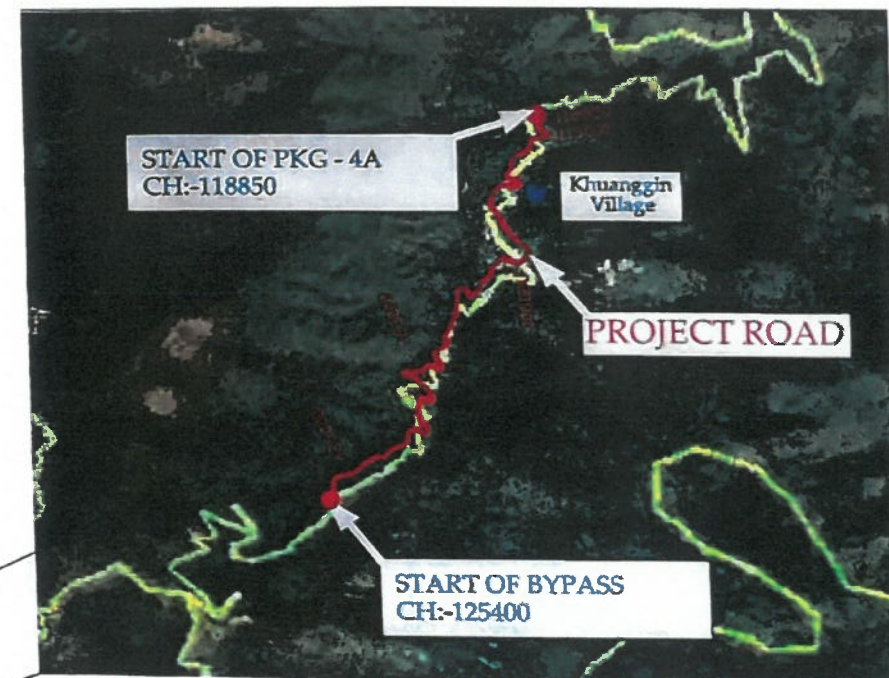
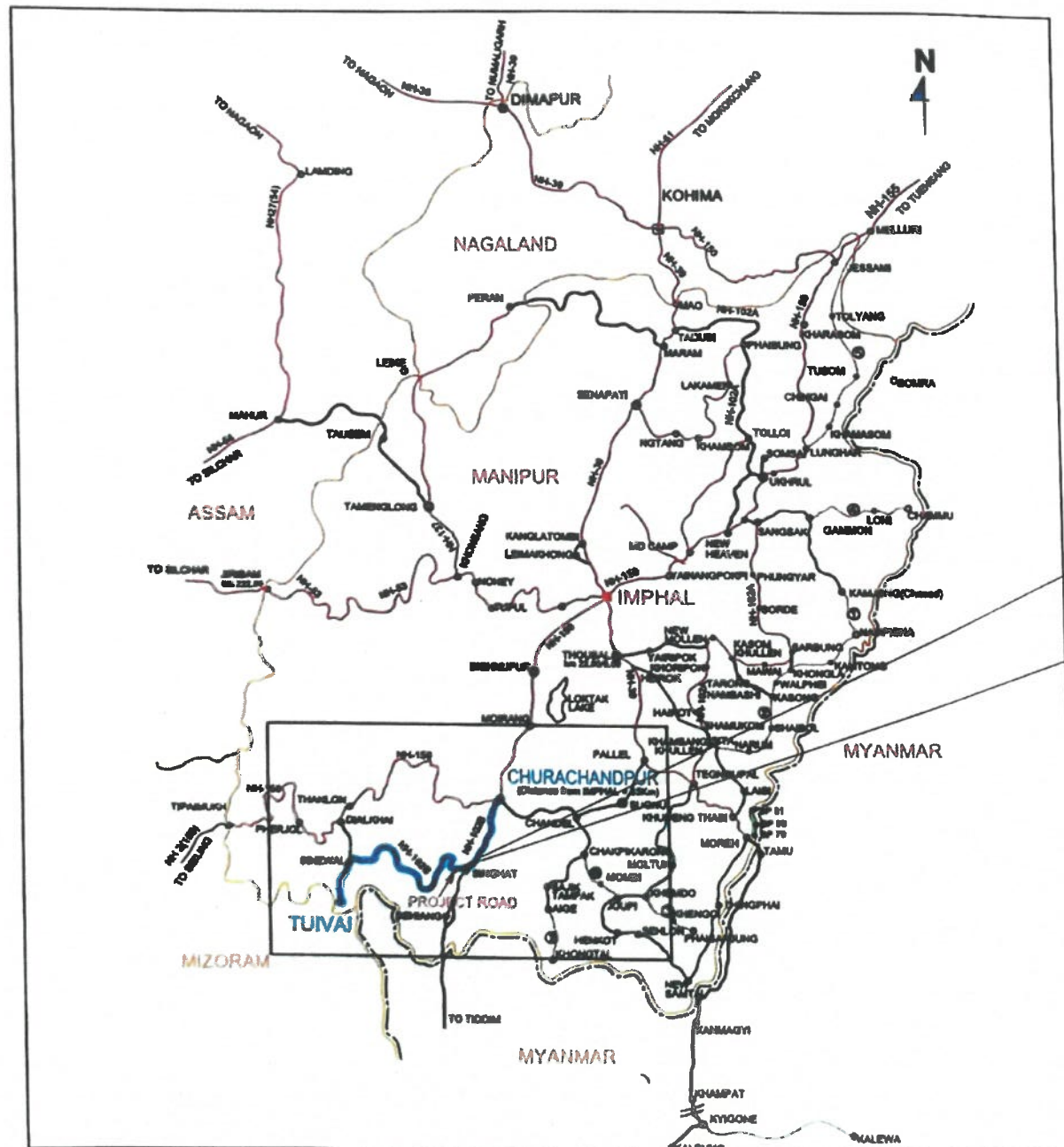
GPT/Infra/O.O. Imphal/Design/Pkg-4A/20-21/100



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

4A

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.



**SUB STRUCTURE
PACKAGE - 4A (BEFORE BY PASS)
(AT CH-120+895)**

APPROVED

AUGUST 2021



EPC CONTRACTOR:

GPT

JC - 25, Sector - III, Salt Lake,
Kolkata - 700088.

DESIGN CONSULTANT:



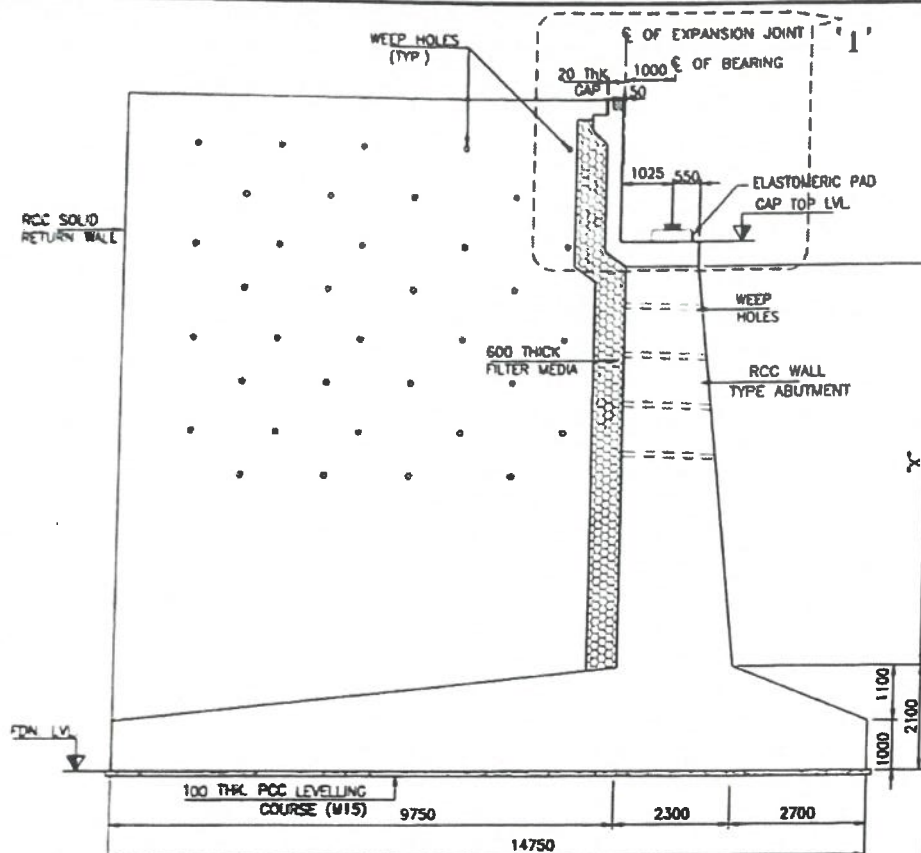
**SPS Technocrats
Pvt. Ltd.**

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

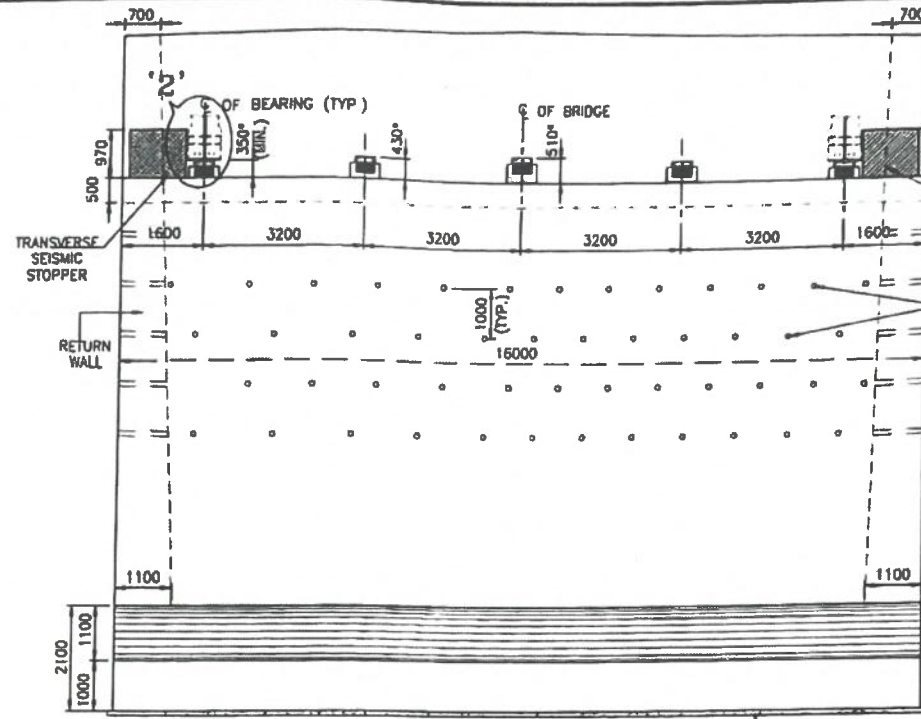
ABUTMENT

APPROVED



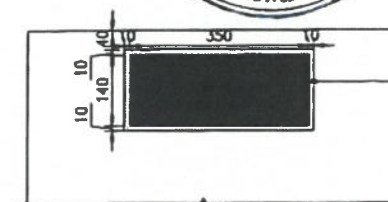


SECTION A-A
(SCALE-1:100)



SECTION B-B
(SCALE-1:100)

ABUTMENT	CAP TOP LVL	FOUNDING LVL	HEIGHT OF SHAFT "X"
ABUTMENT A1	526.092	515.500	7.992m
ABUTMENT A2	526.092	515.500	7.992m



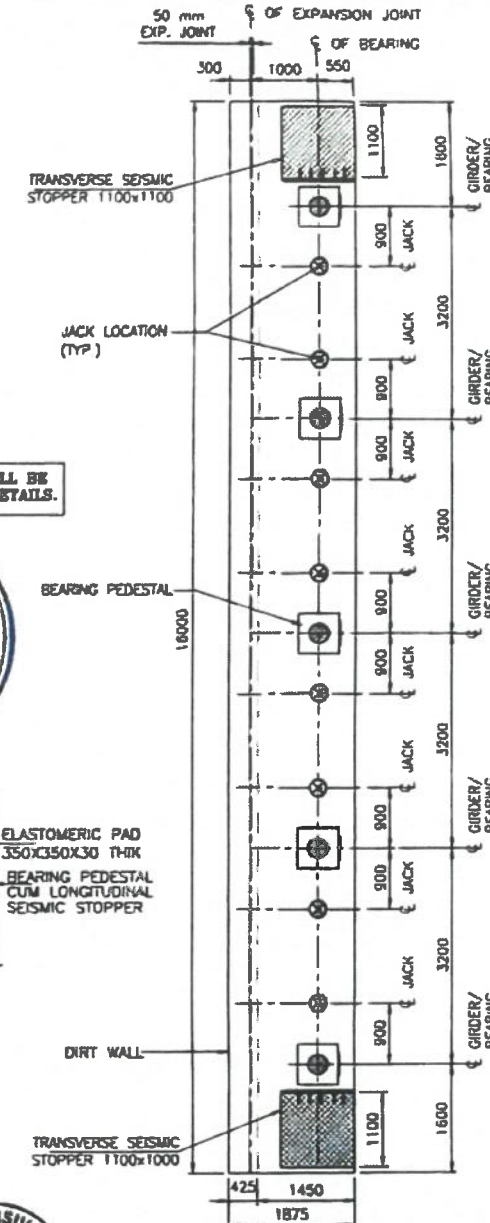
DETAIL - '3'
(SCALE-1:10)

REFERENCE DRAWINGS:-

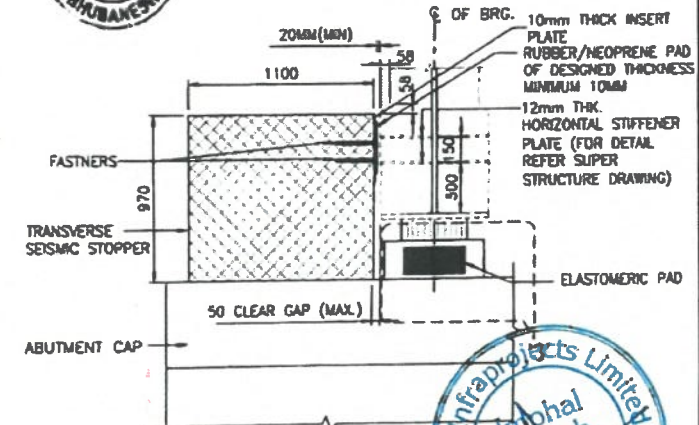
- GENERAL ARRANGEMENT DRAWING.
GPT/CCT/4A/STR/MJB/KEY/100 (SH. 1 OF 1)
GPT/CCT/4A/STR/MJB/GAD/101 (SH. 1 OF 3)
- REINF. DETAILS OF ABUTMENT FOOTING & SHAFT.
GPT/CCT/4A/STR/MJB/ABT/202 (SH-01 OF 01)
- REINF. DETAILS OF RETURN WALL, ABUT. CAP AND DIRT WALL (ABT).
GPT/CCT/4A/STR/MJB/ABT/203 (SH-01 OF 01)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

NOTES:-

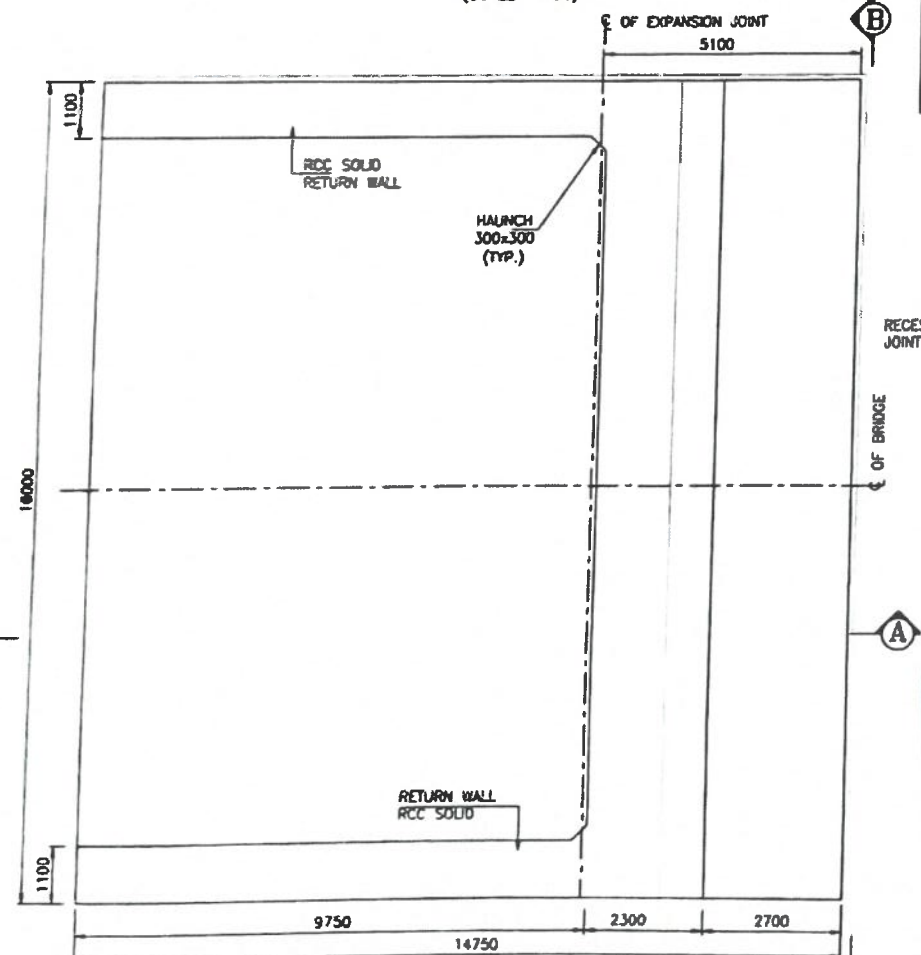
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- CONCRETE SHALL BE DESIGN MIX UNLESS OTHERWISE SPECIFIED IN DETAILED DRAWINGS, AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES FOR ALL ELEMENTS OF STRUCTURES AS INDICATED BELOW:
a) SUBSTRUCTURE M35
b) OPEN FOUNDATION M35
c) PCC LEVELLING COURSE M15
d) BEARING PEDESTAL M45
e) SEISMIC STOPPER M45
- REINFORCEMENT BAR SHALL BE CONFORMING TO IS:1786-1985 OF GRADE Fe-500.
- 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
- 100% 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.
- 600 THK FILTER MEDIA SHALL BE PROVIDED AS PER "NORTH" SPECIFICATION
- SHOWN JACK LOCATION IN PLAN AND @ SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.
- SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 60T/Sqm



PLAN OF ABUTMENT CAP
(SCALE 1:75)

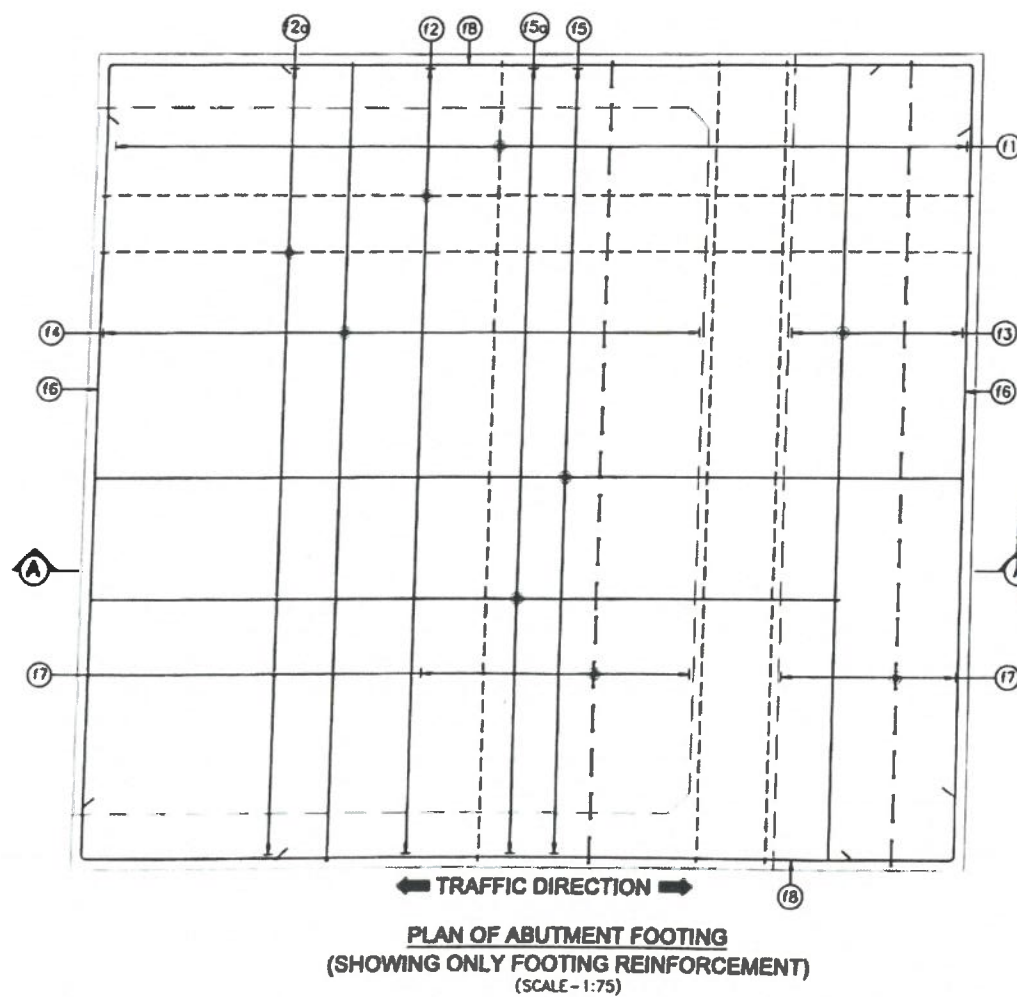
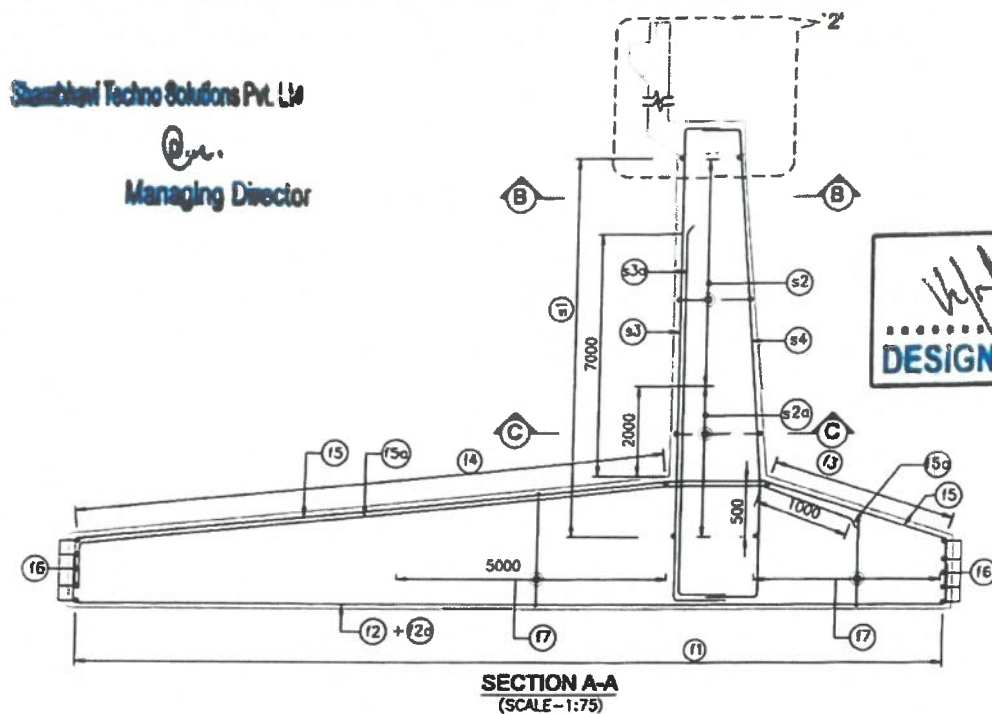


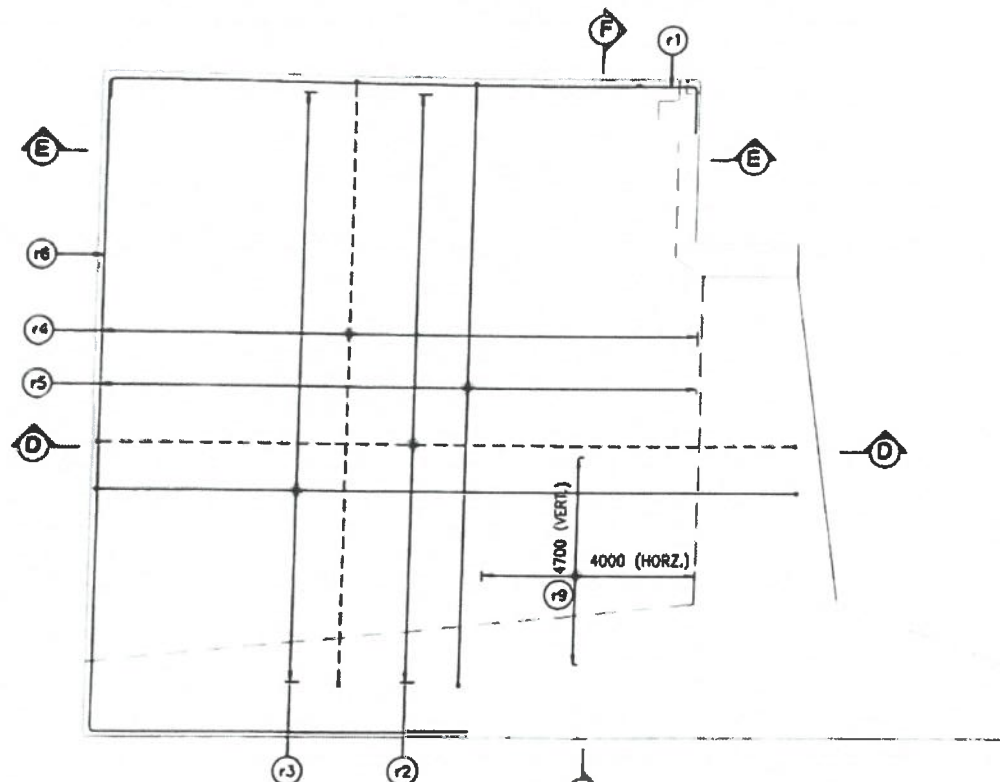
DETAIL - '2'
(SCALE-1:50)



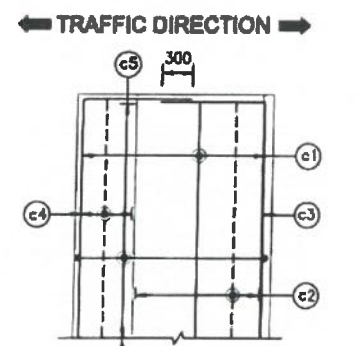
PLAN
(SCALE-1:100)

Rev. R4 R3 R2 R1 R0	Date JULY JUNE MAY MARCH	Description SPAN ARRANGEMENT REVISIONS AS PER AE COMMENTS REVISED AS PER AE COMMENTS FOR APPROVAL FOR APPROVAL	CLIENT: 	EPC CONTRACTOR: 	AUTHORITY ENGINEER: 	SAFETY CONSULTANT: 	PROOF CONSULTANT: 	DESIGN CONSULTANT: 	PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Charachandpur to Tulai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipal on Engineering, Procurement & Construction (EPC) mode.	TITLE: DIMENSION DETAILS OF ABUTMENT FOR MINOR BRIDGE AT CH-120+855 (A1&A2)	SCALE: AS SHOWN	1 OF 1	REV: R4
---	---	--	--------------------	----------------------------	--------------------------------	-------------------------------	------------------------------	-------------------------------	---	---	---------------------------	---------------	-------------------

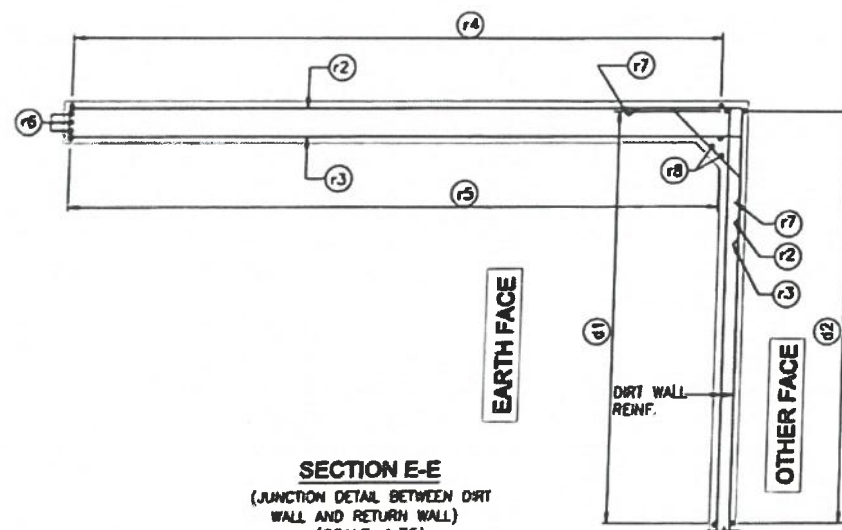




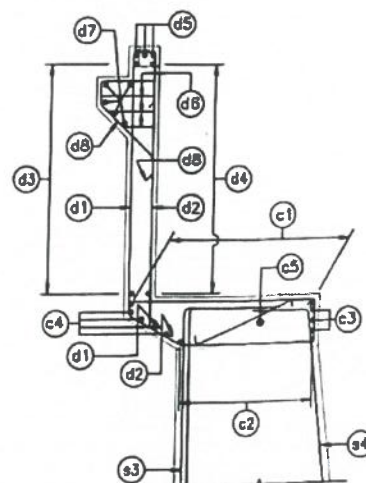
**ELEVATION SHOWING REINF.
DETAILS OF RETURN WALL**
(SCALE-1:75)



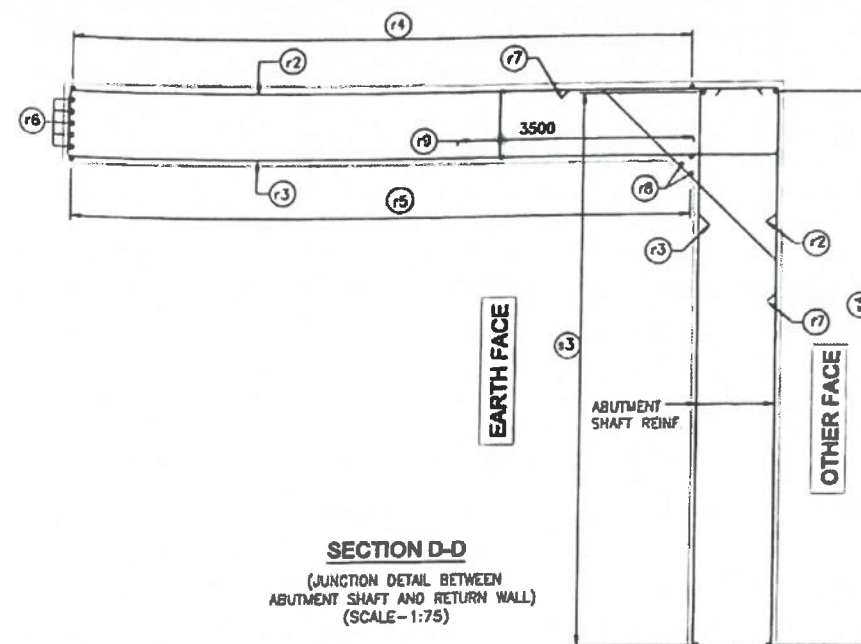
**PLAN SHOWING REINFORCEMENT
ARRANGEMENT IN ABUTMENT CAP**
(SCALE-1:50)



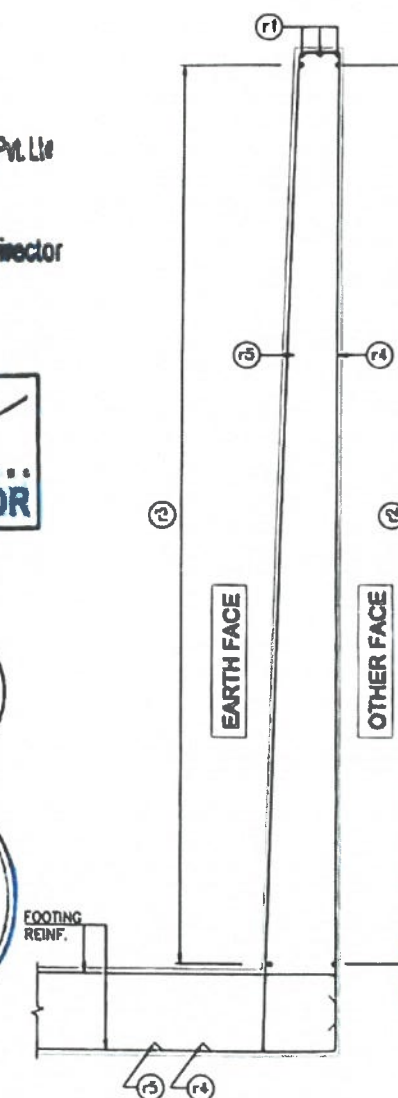
SECTION E-E
(JUNCTION DETAIL BETWEEN DIRT
WALL AND RETURN WALL)
(SCALE-1:75)



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

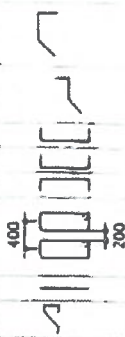


SECTION D-D
(JUNCTION DETAIL BETWEEN
ABUTMENT SHAFT AND RETURN WALL)
(SCALE-1:75)



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 Ø 400 C/C TRANS. (3 LAYERS IN VERTICALLY IN STAGGERED MANNER)		
d7	12	5 NOS.	
d8	16	100 C/C	
RETURN WALL:-			
r1	12	5 NOS.	
r2	12	80 C/C	
r3	20	80 C/C	
r4	18	80 C/C	
r5	25	80 C/C	
r6	12	5 NOS.	
r7	12	150 C/C	
r8	12	2 NOS	
r9	12	LINKS 80 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 Ø 150 C/C	

NOTES:-

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

REFERENCE DRAWINGS:-

- GENERAL ARRANGEMENT DRAWING.
CPT/CCT/4A/STR/MJB/KEY/100 (SH 1 OF 1)
CPT/CCT/4A/STR/MJB/GAD/101 (SH 1 OF 3)
- DIMENSION DETAILS OF ABUTMENT.
CPT/CCT/4A/STR/MJB/ABT/201 (SH-01 OF 01)
- REINF. DETAILS OF ABUTMENT FOOTING & SHAFT.
CPT/CCT/4A/STR/MJB/ABT/202 (SH-01 OF 01)
- REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
CPT/CCT/4A/STR/MJB/ABT/204 (SH-01 OF 01)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

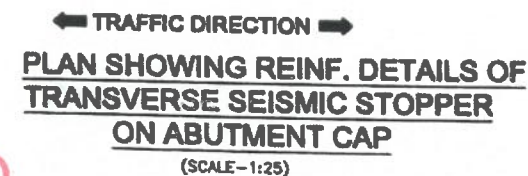
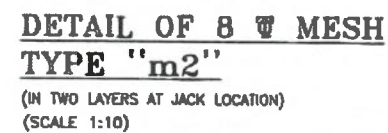
CHAITANYA PROJECTS CONSULTANCY PVT. LTD.
Regd. No. 11/2004-05
SHUBHAMSHAH

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

GPT InfraProjects Pvt. Ltd.
Imphal Branch
7/10/2021

APPROVED

Rev.	Date	Description	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROSG CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN:	HP:	TITLE: REINFORCEMENT DETAILS OF RETURN WALL, ABUTMENT CAP & DIRT WALL, DRAWING OF MINOR BRIDGE AT CH-120+000 (AT & AT)			
R4	JULY	SPARK SUBSISTENT							Warning to 2 (Two) Lane with Hard shoulder of Chaurachandpur to Tuva section of NH 102B from Km 118.550 to Km 130.000 (Package-4A) in the State of Manipal on Engineering, Procurement & Construction (EPC) mode.	DESIGNED: S.S.	CHECKED: AS.K	DATE: JULY - 2021	SCALE: AS SHOWN	1 OF 1	REV: R4
R3	JUNE	REVISED AS PER AL COMMENTS													
R2	MAY	REVISED AS PER AL COMMENTS													
R1	MAY	FOR APPROVAL													
R0	MAY	FOR APPROVAL													



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

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



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 TWO BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1785
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

1 GENERAL ARRANGEMENT DRAWING
GPT/CCT/4A/STR/MJB/KAD/100 (SH. 1 OF 1)
GPT/CCT/4A/STR/MJB/KAD/101 (SH. 1 OF 3)

2 DIMENSION DETAILS OF ABUTMENT.
GPT/CCT/4A/STR/MJB/ABT/201(SH-01 OF 01)

3 REINF. DETAILS OF ABUTMENT FOOTING & SHAFT.
GPT/CCT/4A/STR/MJB/ABT/202(SH-01 OF 01)

4. REINF. DETAILS OF RETURN WALL, ABUT CAP AND DIRT WALL (ABT)
GPT/CCT/4A/STR/MJB/ABT/203(SH-01 OF 01)

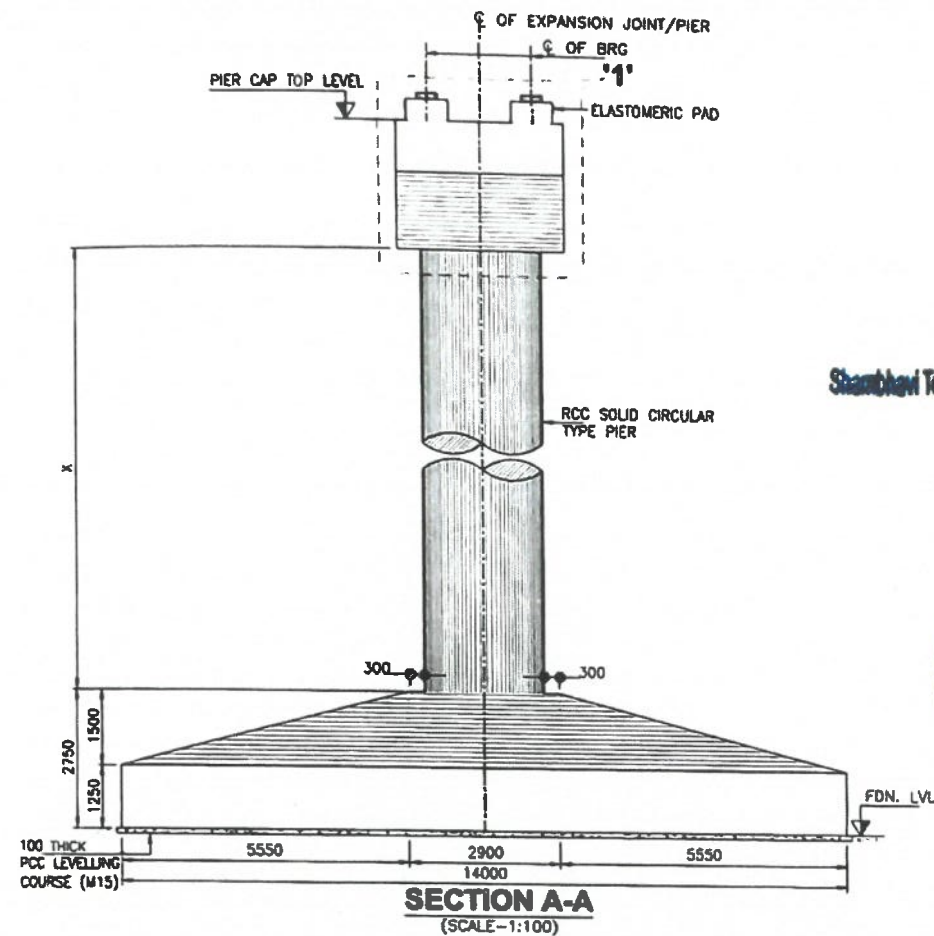
Rev.	Date	Description							PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Chaurachandpur to Tutul section of NH 102B from Km 114.650 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction	GRABN	HP	TITLE: DOLA RENT. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL FOR MINOR BRIDGE AT CH-132/093 (A1 & A2)	REV: R4
04	JULY	SPAN ADJUNCTION BY SEWER								DESIGNED	S.S		
03	JUNE	REVISED AS PER AE COMMENTS								CHECKED	AS.C		
02	MAY	REVISED AS PER AE COMMENTS								DATE: JULY - 2021	DRA. NO: 07/CTC/44/STR/132/093/AST/2004		
01	MAY	FOR APPROVAL											
00	MARCH	FOR APPROVAL											

Y:\01_SPS PROJECT\08_MANIPUR\PACKAGE-4A\01_Drawing\01_Major Bridge\SUB STRUCTURE\ABUTMENT\CT-4A-STR-4A.8-SUB.dwg 8-11-2011

PIER

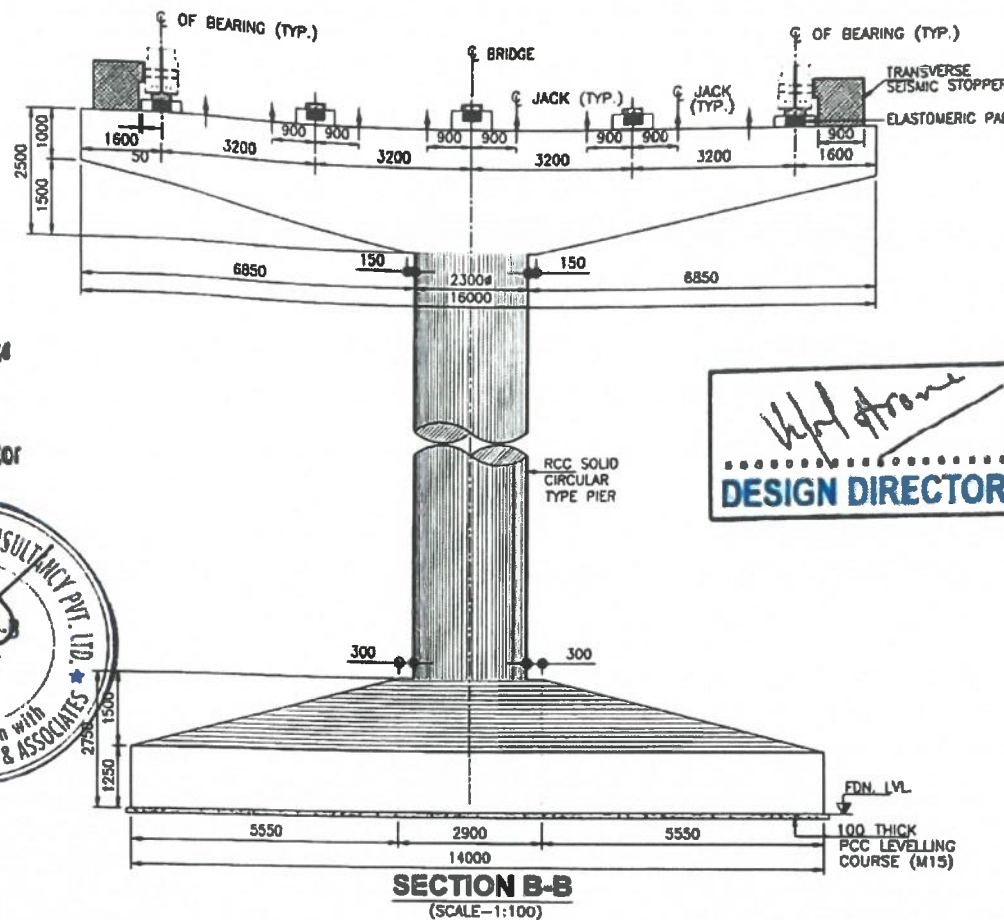


APPROVED

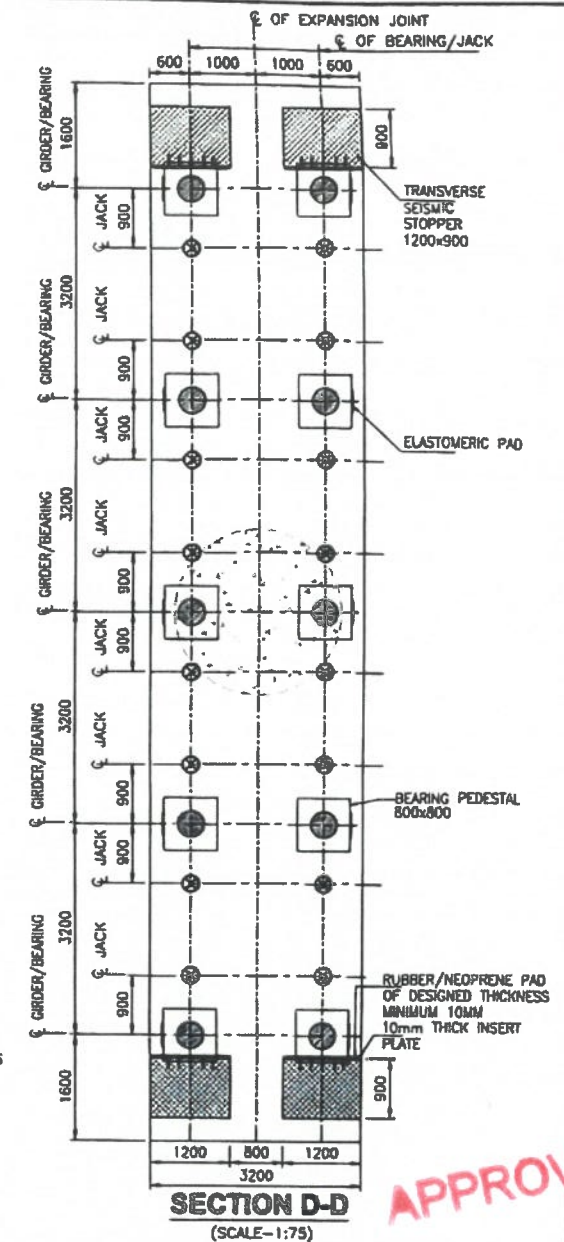


Shambhavi Techno Solutions Pvt. Ltd.

Managing Director



DESIGN DIRECTOR



APPROVED

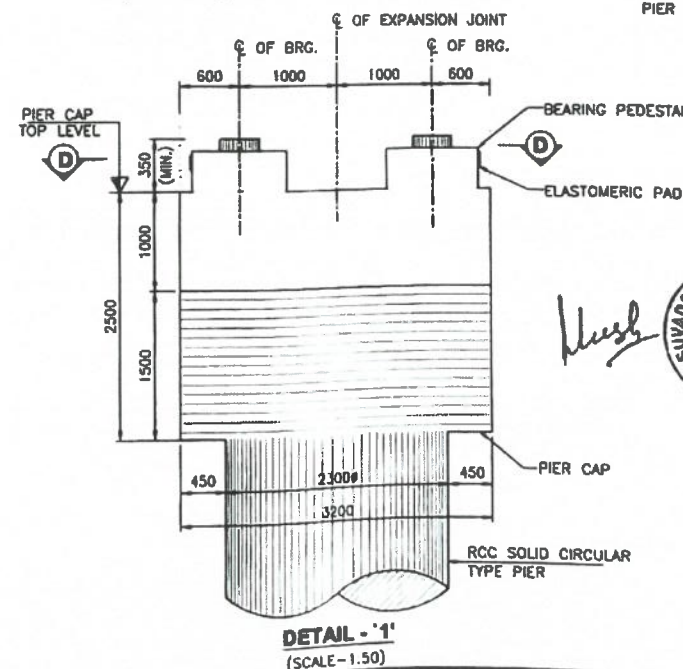
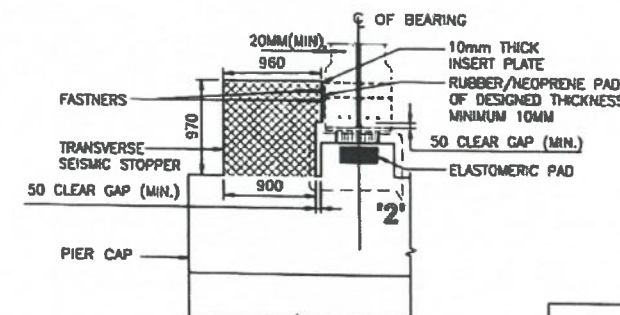
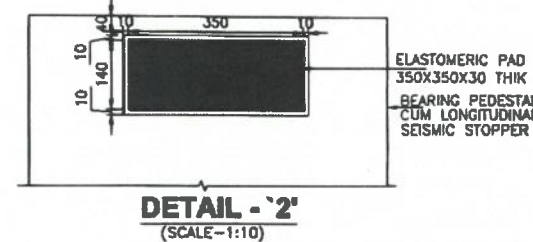
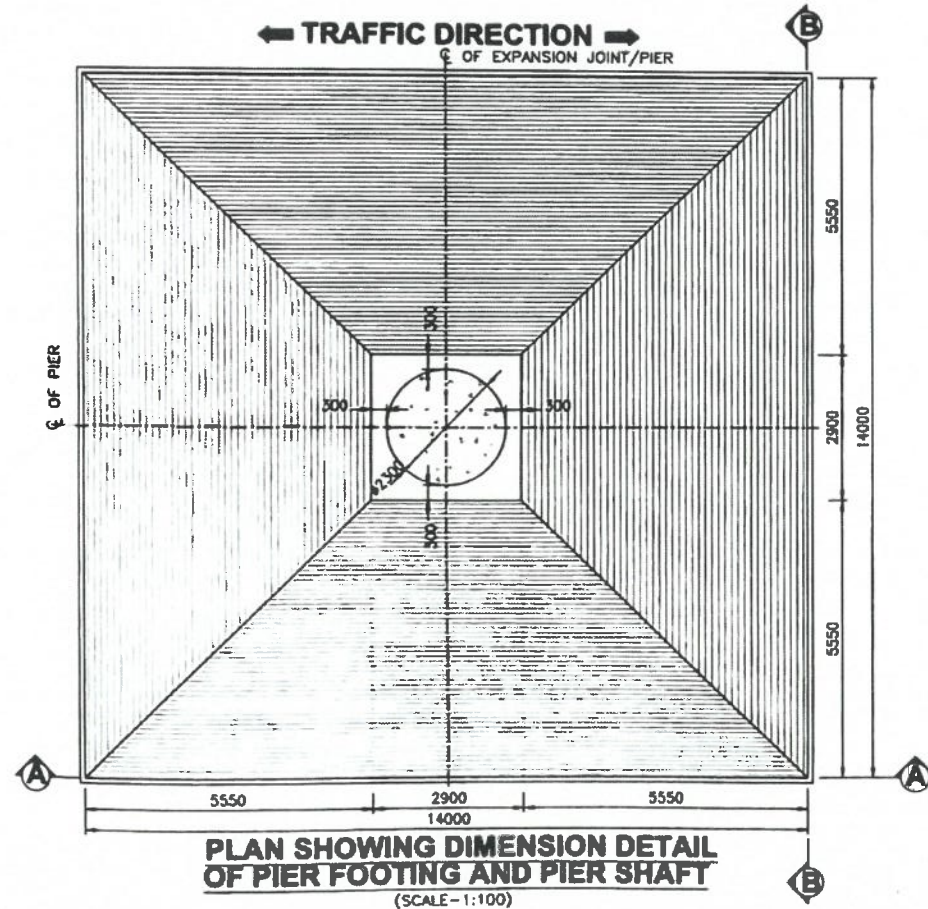
PIER P1	CAP TOP LVL.	FOUNDING LVL.	HEIGHT OF SHAFT "X"
	526.092	501.000	19.842m

NOTES:-

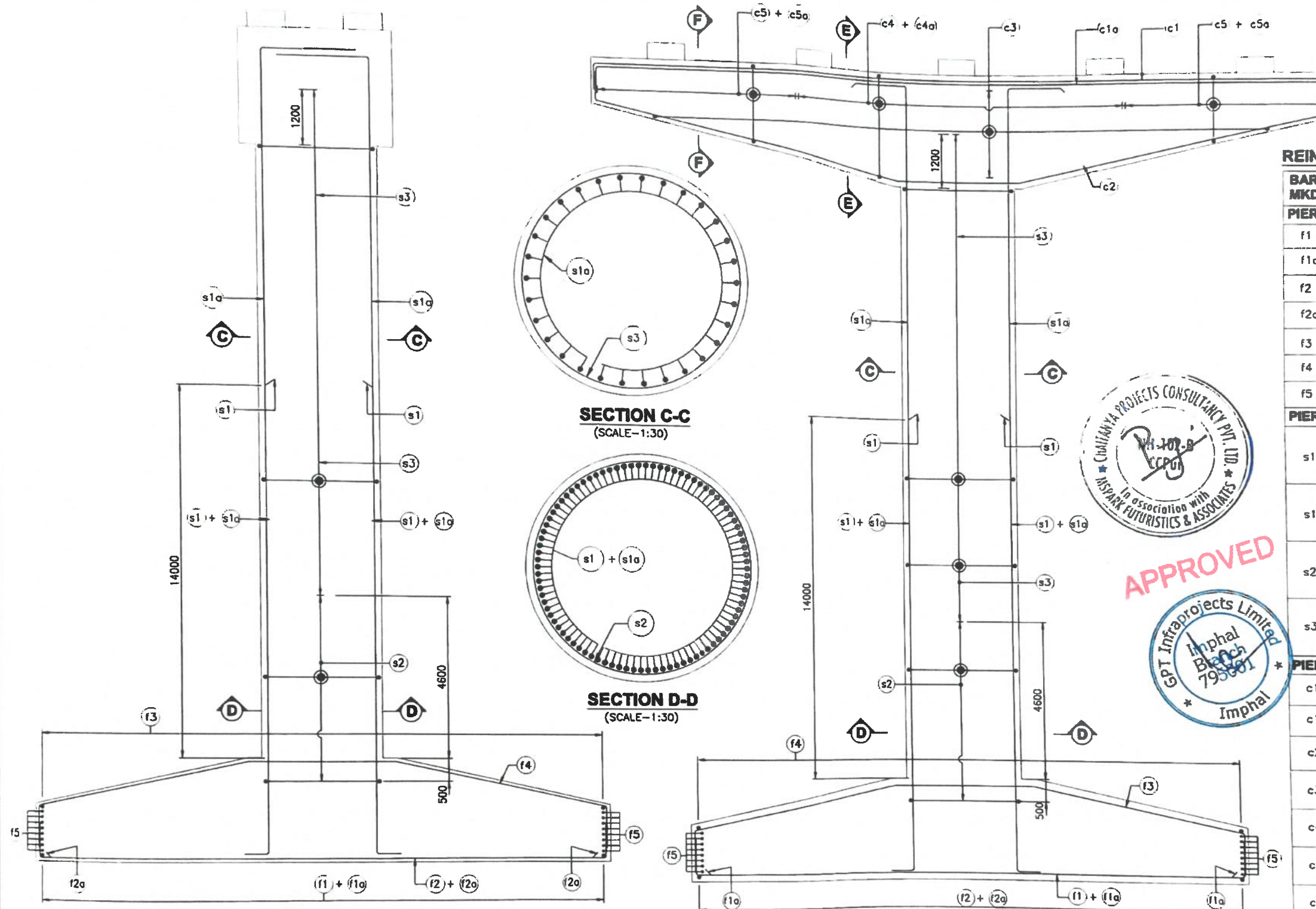
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
- CONCRETE SHALL BE DESIGN MIX UNLESS OTHERWISE SPECIFIED IN DETAILED DRAWINGS, AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES FOR ALL ELEMENTS OF STRUCTURES AS INDICATED BELOW:
 - a) PCC LEVELLING COURSEM15
 - b) FOUNDATIONM35
 - c) SUBSTRUCTUREM35
 - d) BEARING PEDESTALM45
 - e) SEISMIC STOPPERM45
- REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe500D) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
- MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
 - a) FOUNDATION75mm
 - b) PIER CAP & SEISMIC STOPPER50mm
 - c) SUB STRUCTURE-50mm
- SHOWN JACK LOCATION IN PLAN AND SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.
- 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:-

- GENERAL ARRANGEMENT DRAWING.
GPT/CCT/4A/STR/MJB/KEY/100 (SH. 1 OF 1)
GPT/CCT/4A/STR/MJB/GAD/101 (SH. 1 OF 3)
- REINFORCEMENT DETAILS OF PIER P1
GPT/CCT/4A/STR/MJB/SUB/251
GPT/CCT/4A/STR/MJB/SUB/252
GPT/CCT/4A/STR/MJB/SUB/253



Rev.	Date	Description	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN:	MP:	TITLE:	SCALE:	1 OF 1	REV:
R4	JULY	SPARK EXAMINATION							Widening to 2 (Two) Lane with Hard shoulder of Churuchandpur to Tuvai section of NH 102B from Km 118.250 to Km 130.000 (Package-4A) in the State of Manipal on Engineering, Procurement & Construction (EPC) mode.	DESIGNED	S.S.	DIMENSION DETAILS OF PIER FOR MAJOR BRIDGE AT CH-120+833.	AS SHOWN	1 OF 1	R4
R3	JUNE	REVISED AS PER AE COMMENTS								CHECKED	AB.K				
R2	MAY	REVISED AS PER AE COMMENTS													
R1	MAY	FOR APPROVAL													
R0	MARCH	FOR APPROVAL													



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	16	80 C/C	800 800
f4	16	80 C/C	800 800
f5	16	4x8 NOS.	300 300
PIER SHAFT:-			
s1	32	46 NOS.(ALTERNATE WITH s1a)	500
s1a	32	90 NOS.	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
c2	20	28 NOS.	500 500
c3	20	100 C/C	1750 1750
c4	16	2 LEGGED STIRRUP @ 100 C/C	
c4a	16	8 LEGGED STIRRUPS @ 100 C/C	
c5	16	2 LEGGED STIRRUP @ 100 C/C	
c5a	12	8 LEGGED STIRRUPS @ 100 C/C	

NOTES:-

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

SECTION B-B

(SCALE-1:60)

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING
GPT/CCT/4A/STR/MJB/KEY/100 (SH. 1 OF 1)
2. DIMENSIONS DETAILS OF PIER
GPT/CCT/4A/STR/MJB/GAD/101 (SH. 1 OF 3)
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)

Shambhavi Techno Solutions Pvt. Ltd.

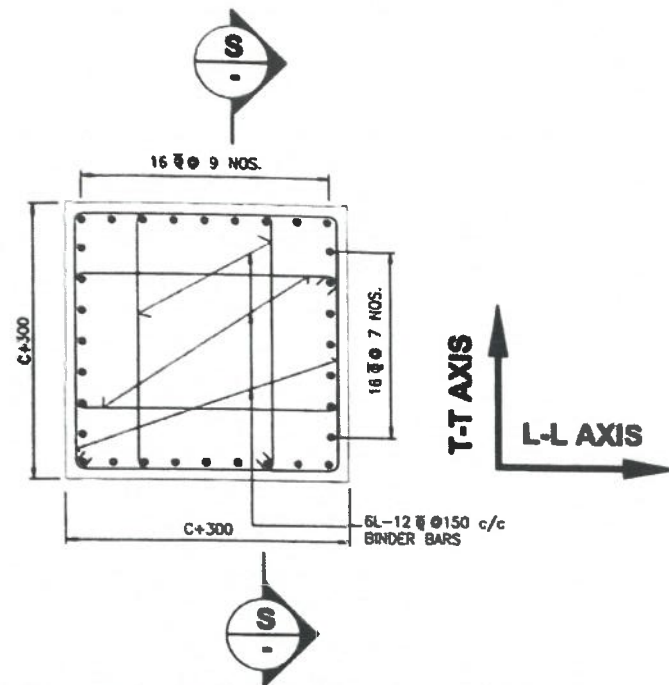
Managing Director

LEGEND:-

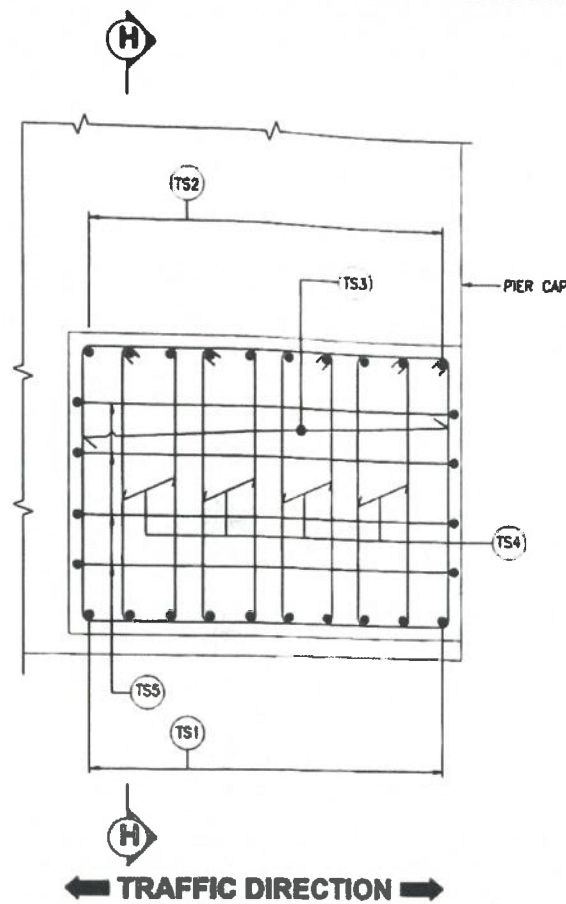
REINFORCEMENT AT TOP FACE	
REINFORCEMENT AT BOTTOM FACE	

Rev.	Date	Description	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN:	MP:	TITLE:
01	JULY	SPAN ARRANGEMENT	MAIDEL	GPT	M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD.	SUVADRA	SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.	SPS Technocrats Pvt. Ltd.	Widening to 2 (Two) Lane with Hard shoulder of Churuchandpur to Tolud section of NH 102B from Km 116.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DESIGNED:	S.S	REINFORCEMENT DETAILS OF PIER
02	JUNE	REVISED AS PER AE COMMENTS								CHECKED:	A.B.K	MAJOR BRIDGE AT CH-120+825
03	MAY	REVISED AS PER AE COMMENTS								DATE:	JULY - 2021	SCALE: AS SHOWN
04	MAY	FOR APPROVAL								DRG.NO:	GPT/CCT/4A/STR/MJB/SUB/251	1 OF 3
05	MAY	FOR APPROVAL								Rev:		B4

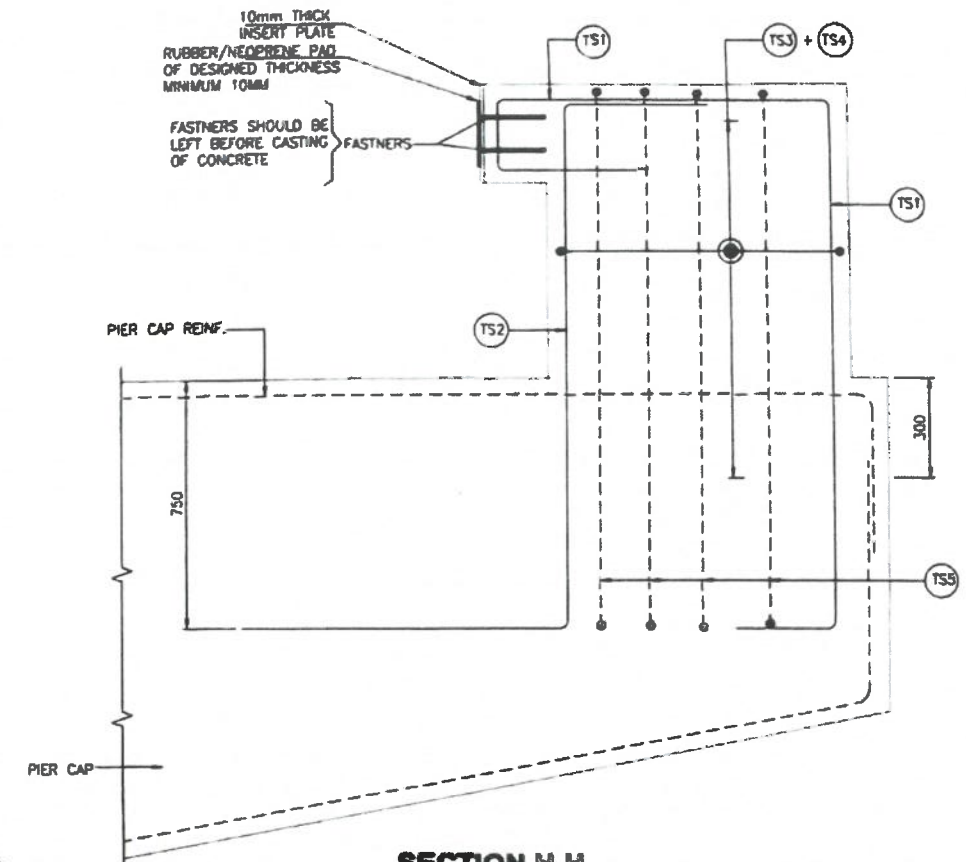
T:\01_SPS PROJECTS\MAIPUR\PACKAGE-4A\01_Drawing\01_Major Bridge\SUB STRUCTURE\EPCCCT-4A-STR-MJB-SUB-120+825.dwg 5-Jul-21



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



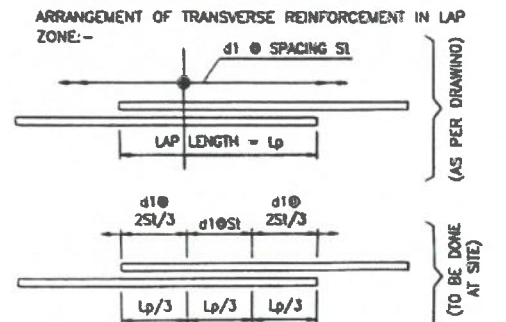
PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER
(SCALE 1:15)



SECTION H-H
(SCALE 1:15)

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 72Ø.

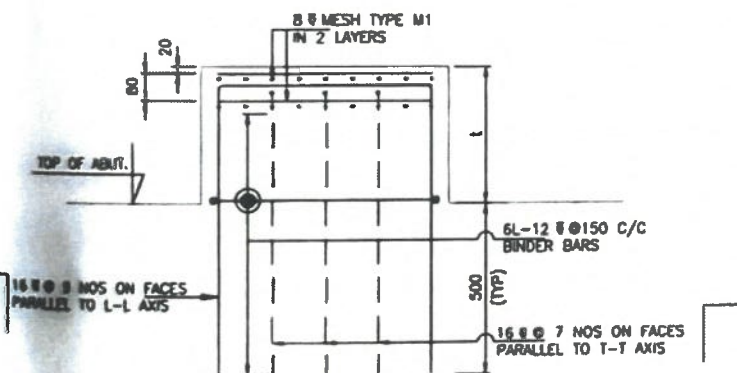


WHERE,
d1 = DIA OF TRANSVERSE REINFORCEMENT.
S1 = SPACING OF TRANSVERSE REINFORCEMENT.

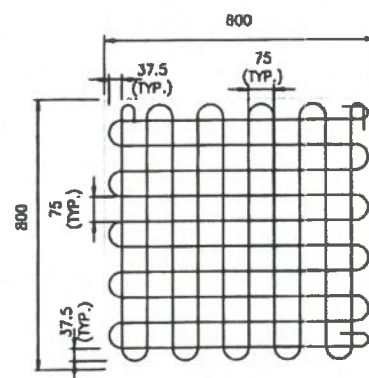
5. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
6. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT.

REFERENCE DRAWINGS:-

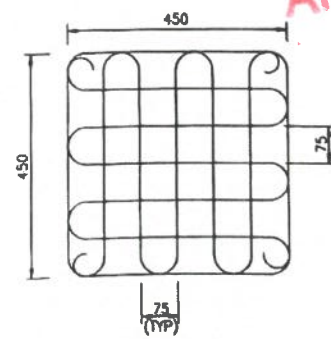
1. GENERAL ARRANGEMENT DRAWING.
GPT/CCT/4A/STR/MJB/KEY/100 (SH 1 OF 1)
GPT/CCT/4A/STR/MJB/GAD/101 (SH 1 OF 3)
2. DIMENSIONS DETAILS OF PEIR.
GPT/CCT/4A/STR/MJB/SUB/250 (SH 1 OF 1)
3. REINFORCEMENT DETAILS OF PIER P1
GPT/CCT/4A/STR/MJB/SUB/251 (SH 1 OF 1)
GPT/CCT/4A/STR/MJB/SUB/252 (SH 1 OF 1)



SECTION S-S
(SCALE 1:15)



8 Ø MESH M1
(AT EACH PEDESTAL LOCATION)
(SCALE 1:15)



8 Ø MESH M2
(AT EACH JACK LOCATION AND TEMPORARY SUPPORT)
(SCALE 1:10)



TRANSVERSE SEISMIC STOPPER

TS1	16	10 NOS	200
TS2	20	10 NOS	1500
TS3	2 LEGGED 12 Ø STIRRUPS TIED TO VERTICALLY BARS Ø 150 C/C VERTICALLY		
TS4	8 LEGGED NO. 12 Ø STIRRUPS Ø 150 C/C VERTICALLY		
TS5	2 LEGGED 12 Ø Ø 150 C/C		

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

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

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

Sl. No.	Date	Description							PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Chursandpur to Tulai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DESIGNED	MP	TITLE: REINFORCEMENT DETAILS OF PIER MAJOR BRIDGE AT CH-120+895.			
A4	JULY	SPRINT APPROVED								DESIGNED	S.S.		SCALE: AS SHOWN	3 OF 3	REV: R4
A3	JUNE	REVISED AS PER AE COMMENTS								CHECKED	A.B.K.				
A2	MAY	REVISED AS PER AE COMMENTS								DATE: JULY - 2021	ORG. NO: GPT/CCT/4A/STR/MJB/SUB/253				
A1	MAY	FOR APPROVAL													
A0	MARCH	FOR APPROVAL													

Date. 14.08.21
Rec. 14.08.21

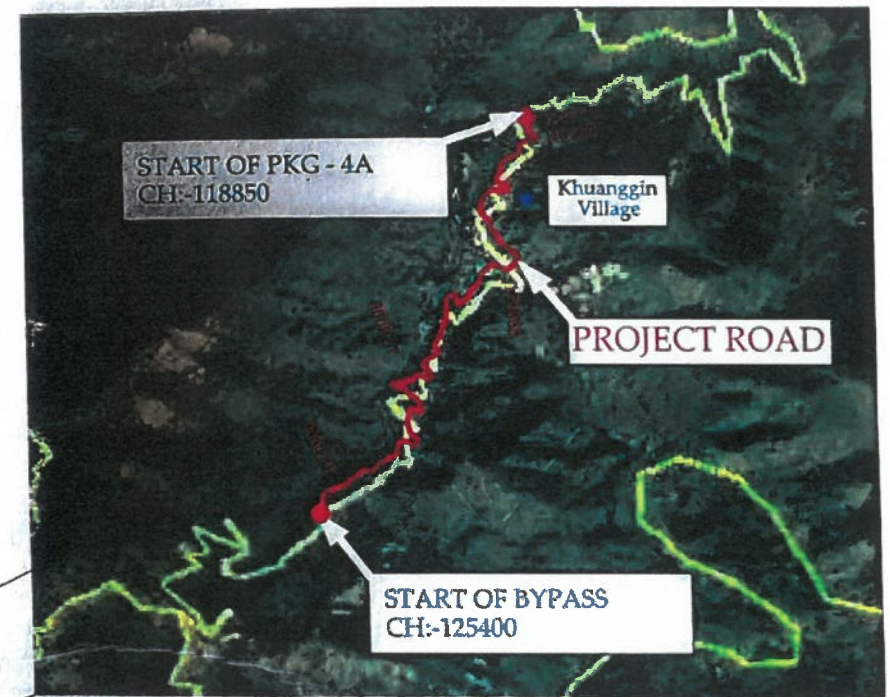
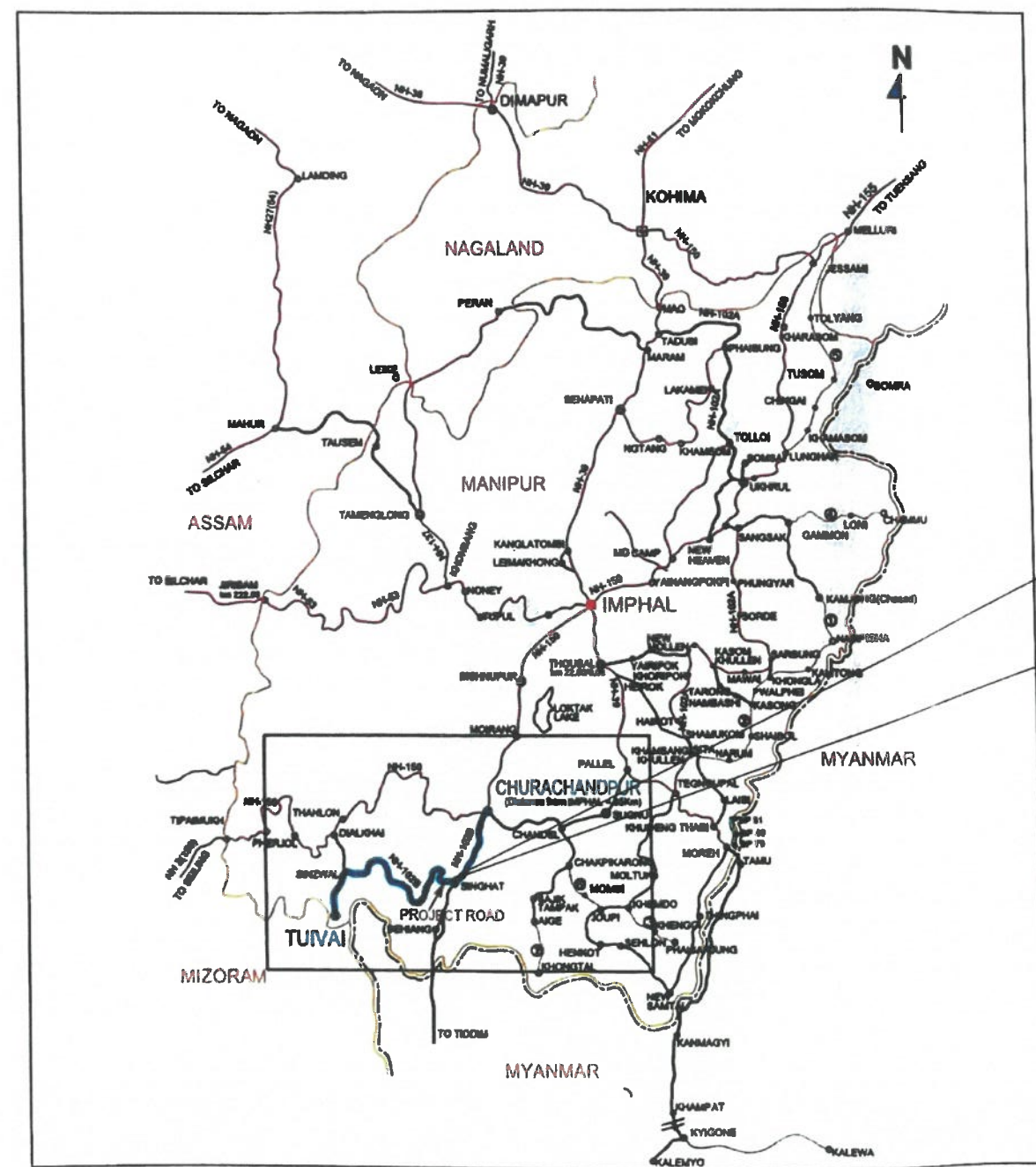
GPT - Infra/ R.O - Imphal/ Design/ Pkg - 4A/ 20-21/ 100.



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

4A

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.



**GENERAL ARRANGEMENT DRAWING
PACKAGE - 4A (BEFORE BY PASS)
(AT CH-120+895)**

AUGUST 2021



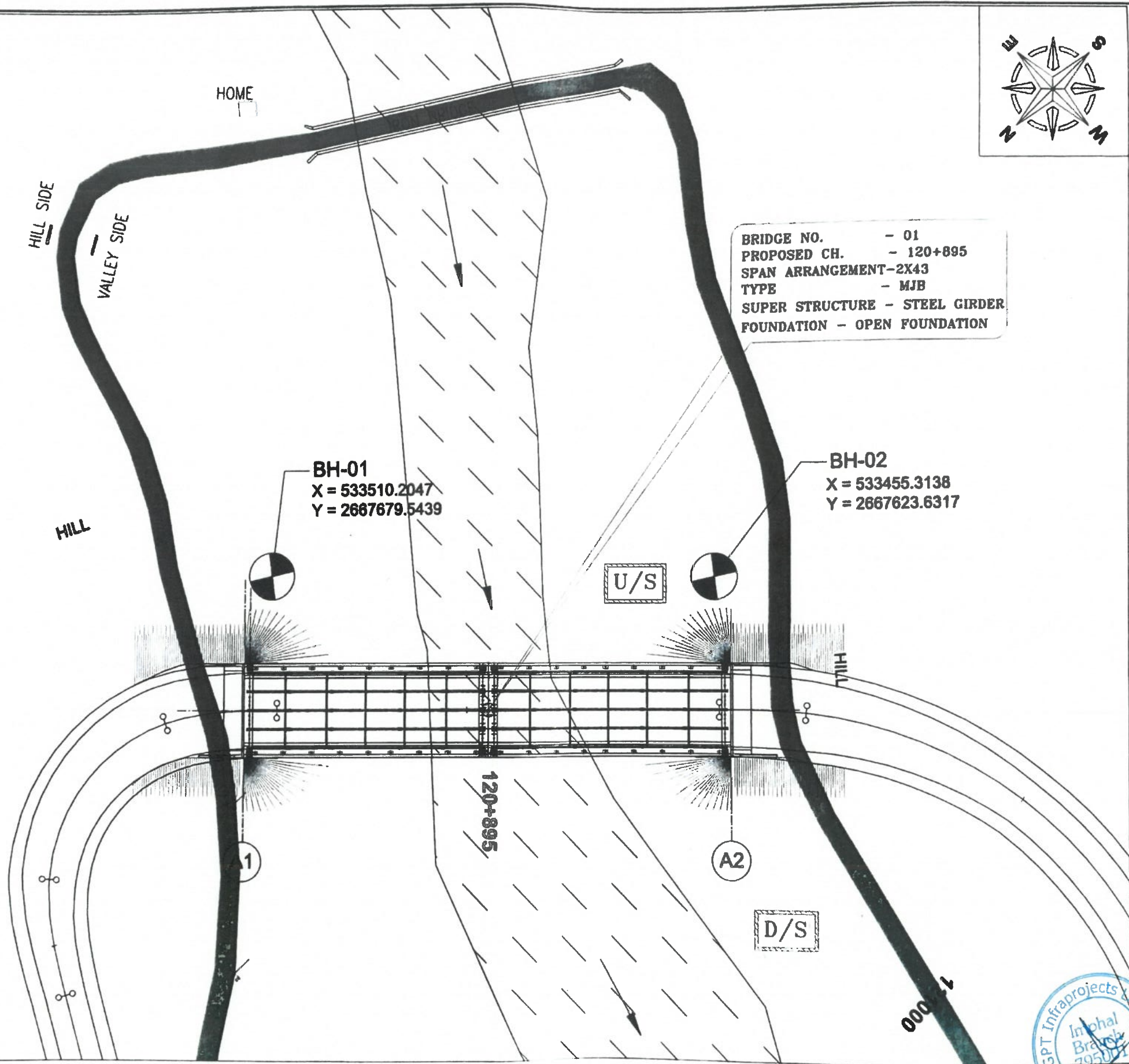
APPROVED

EPC CONTRACTOR:

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

DESIGN CONSULTANT:

SPS Technocrats Pvt. Ltd.
510 & 511, JMD Megapolls, Sector 48,
Gurgaon, Haryana - 122016.



BRIDGE NO. - 01
 PROPOSED CH. - 120+895
 SPAN ARRANGEMENT-2X43
 TYPE - MJB
 SUPER STRUCTURE - STEEL GIRDER
 FOUNDATION - OPEN FOUNDATION

- LEGEND :**
- EXISTING PLAN :**
- EXIST. ROAD
 - K-1/R : KACHA RESIDENTIAL
 - K-1/C : KACHA COMMERCIAL
 - SP-1/R : SEMI PUGGA RESI.
 - SP-1/C : SEMI PUGGA COMM.
 - P-1/R : PUGGA RESIDENTIAL
 - P-1/C : PUGGA COMMERCIAL
 - CONTOUR

- PROPOSED PLAN :**
- TOE LINE
 - ES EDGE
 - HS EDGE
 - C/W EDGE
 - GEN. LINE
 - C/W EDGE
 - HS EDGE
 - ES EDGE
 - TOE LINE
 - HQR. TANGENT POINT
 - PROW - PROPOSED ROW
 - CULVERT
 - BRIDGE

Shambhavi Techno Solutions Pvt. Ltd.
 Managing Director

DESIGN DIRECTOR

APPROVED



KEY PLAN
 (SCALE - 2:1)

Rev. R4 R3 R2 R1 R0	Date JULY JUNE MAY MAY MARCH	Description SPAN ARRANGEMENT REVISIONS AS PER AE COMMENTS FOR APPROVAL FOR APPROVAL	CLIENT: 	EPC CONTRACTOR: JC - 25, Sector - III, Salt Lake, Kolkata - 700098.	AUTHORITY ENGINEER: M/S CHAITANYA PROJECTS CONSULTANCY PVT. LTD. IN ASSOCIATION WITH MSPARC FUTURESTICS AND ASSOCIATES GROUND FLOOR, 8/A TOWER, SECTOR-4 VARDHANA, CHANDANBAO-700016.	SAFETY CONSULTANT: SUVADRA CONSULTANCY PP-47, Tantiapuri Road, BSR-1A, Odisha	PROJECT CONSULTANT: SHAMHAVI TECHNO SOLUTIONS PVT. LTD. B-42, Rajesh Kumar Path, S.S. Park, Boring Road, Patna-800001	DESIGN CONSULTANT: SPS Technocrats Pvt. Ltd. B-510 & 511, 2ND Mega Plaza, Sector 48, Gurgaon, Haryana - 122018.	PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuakul section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DRAWN MP DESIGNED S.S CHECKED AS K DATE: JULY - 2021	TITLE: KEY PLAN FOR MINOR BRIDGE AT CH-120+895. SCALE: AS SHOWN 1 OF 1 REV R4
---	--	---	--------------------	--	--	--	---	---	---	---	---

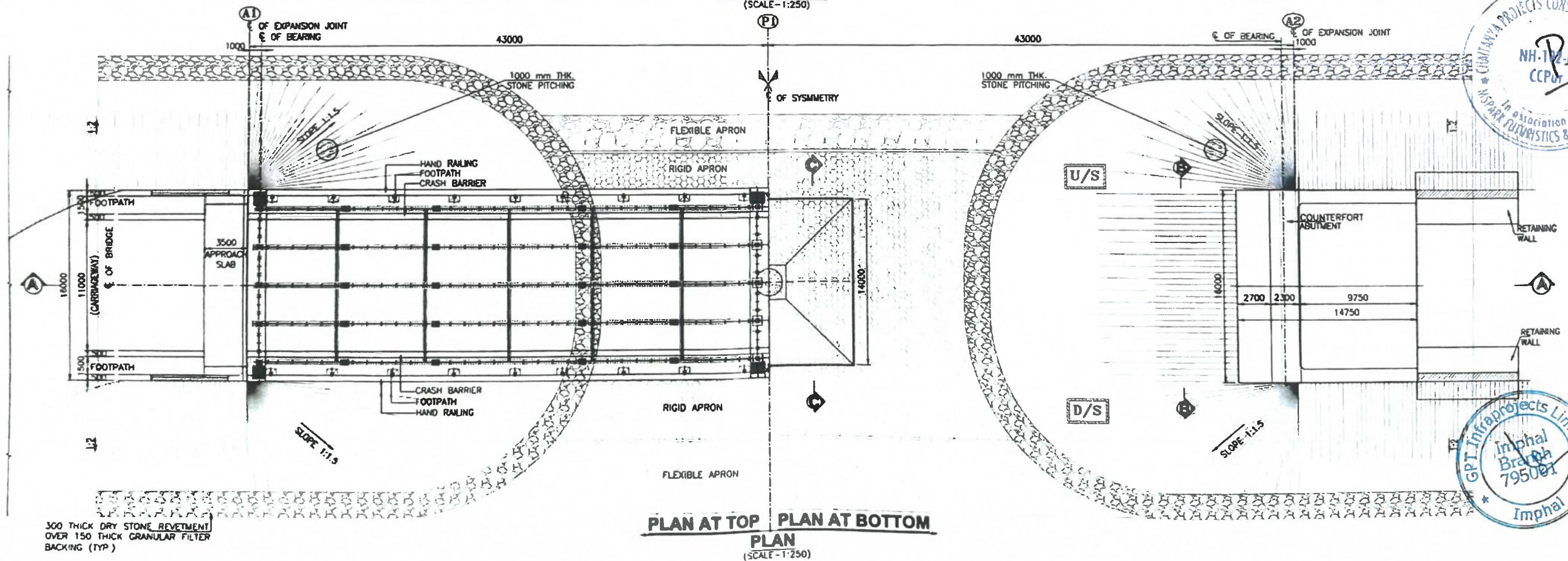


SECTION A-A
(SCALE-1:250)

Hush

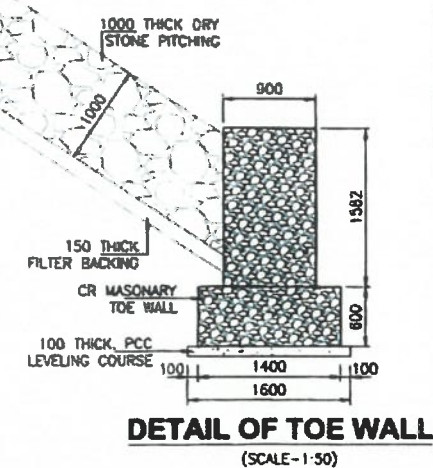
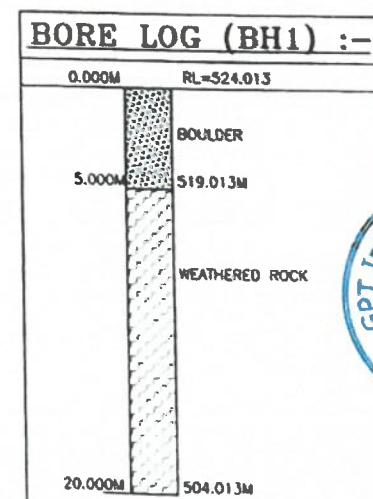
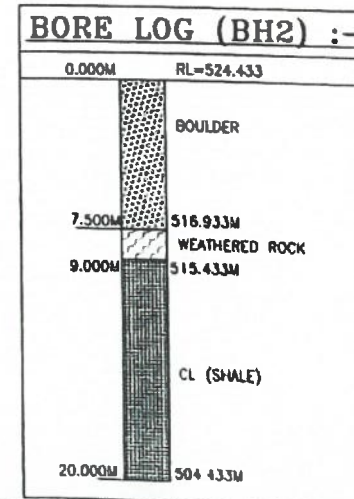
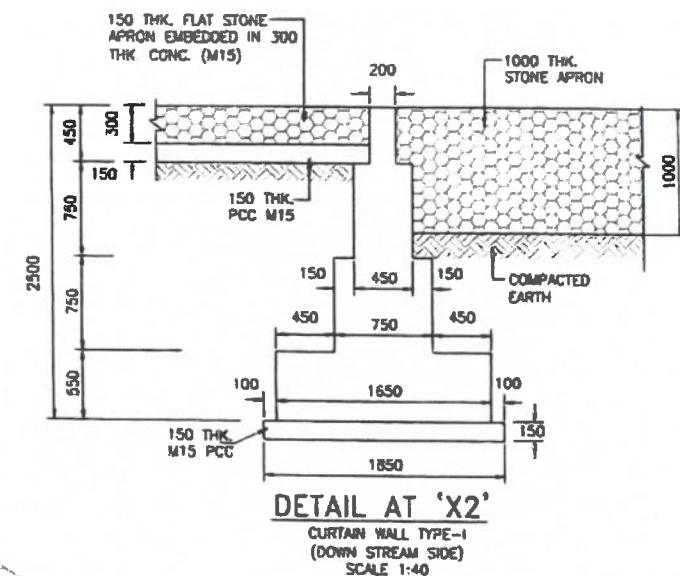
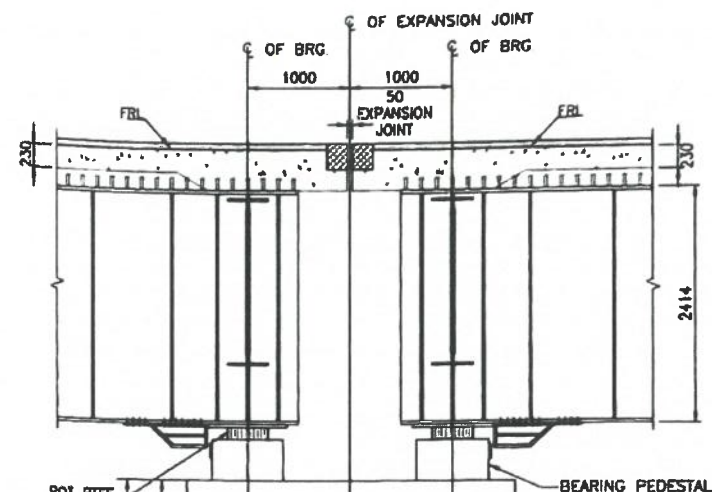
SUYADRA CONSULTANTS
Regd. No: 1172004-05
BHUBANESWAR

APPROVED


DESIGN DIRECTOR

300 THICK DRY STONE REVETMENT
OVER 150 THICK GRANULAR FILTER
BACKING (TYP)

Rev.	Date	Description		CLIENT: 	EPC CONTRACTOR: 	AUTHORITY ENGINEER: 	SAFETY CONSULTANT: 	PROOF CONSULTANT: 	DESIGN CONSULTANT: 	PROJECT: 	DESIGN: 	TITLE: 	SCALE: 	REV:
S4	JULY	SPAN ARRANGEMENT REVISED AS PER AE COMMENTS												
R3	JUNE	REVISED AS PER AE COMMENTS												
R5	MAY	REVISED AS PER AE COMMENTS												
R1	MAY	FOR APPROVAL												
R0	PLANNED	FOR APPROVAL												



DESIGN DIRECTOR

Hush

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

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

Rev.	Date	Description
04	JULY	SPAN ARRANGEMENT
03	JUNE	REVISED AS PER AE
02	MAY	COMMENTS
01	MAY	REVISED AS PER AE
00	MARCH	COMMENTS
		FOR APPROVAL
		FOR APPROVAL

CLIENT:

**EPC CONTRACTOR:**

JC - 25, Sector - III, Salt Lake,
Kolkata - 700062.

AUTHORITY ENGINEER:



M/S CHAITANYA PROJECTS
CONSULTANCY PVT.LTD.
IN ASSOCIATION WITH MSPARK
FUTURISTICS AND ASSOCIATES
C-42ND FLOOR, R.K TOWER,
SECTOR-4, VAISHALI, CHANDIGARH-201010

SAFETY CONSULTANT:

PP-67, Tashkumari Road,
DUS-18, Odisha

PROOF CONSULTANT:

**SHAMSHAVI TECHNO
SOLUTIONS PVT.LTD.**
E-82, Rajesh Kumar Park,
S.I.Pat, Barling Road,
Pune-400061

DESIGN CONSULTANT:



SPS Technocrats Pvt. Ltd.
#510 & 511, MD Nagar, Sector 48,
Gurgaon, Haryana - 122016

PROJECT:

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuwai section of NH 102B from Km 118.650 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.

Page	MR
------	----

DESIGN	MP
DESIGNED	S.S
CHECKED	AB-C

TITLE: GENERAL ARRANGEMENT DRAWING FOR
MAJOR BRIDGE AT CN. 128+886 (2X43m) SPAN

SCALE: **AS SHOWN** 02 OF 03 REV:

Doc. No. 57552144-2014-03-00101

REV:

246

Date. 14.08.21
Rec. 14.08.21

GPT. Infra/10.0 Imphal/Design/Pkg-4A/20-21/100

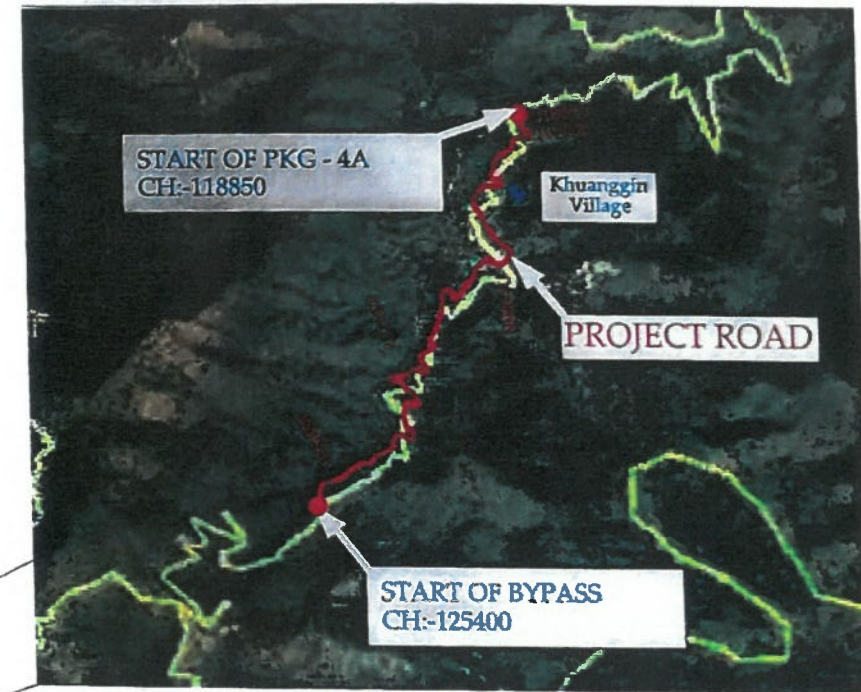
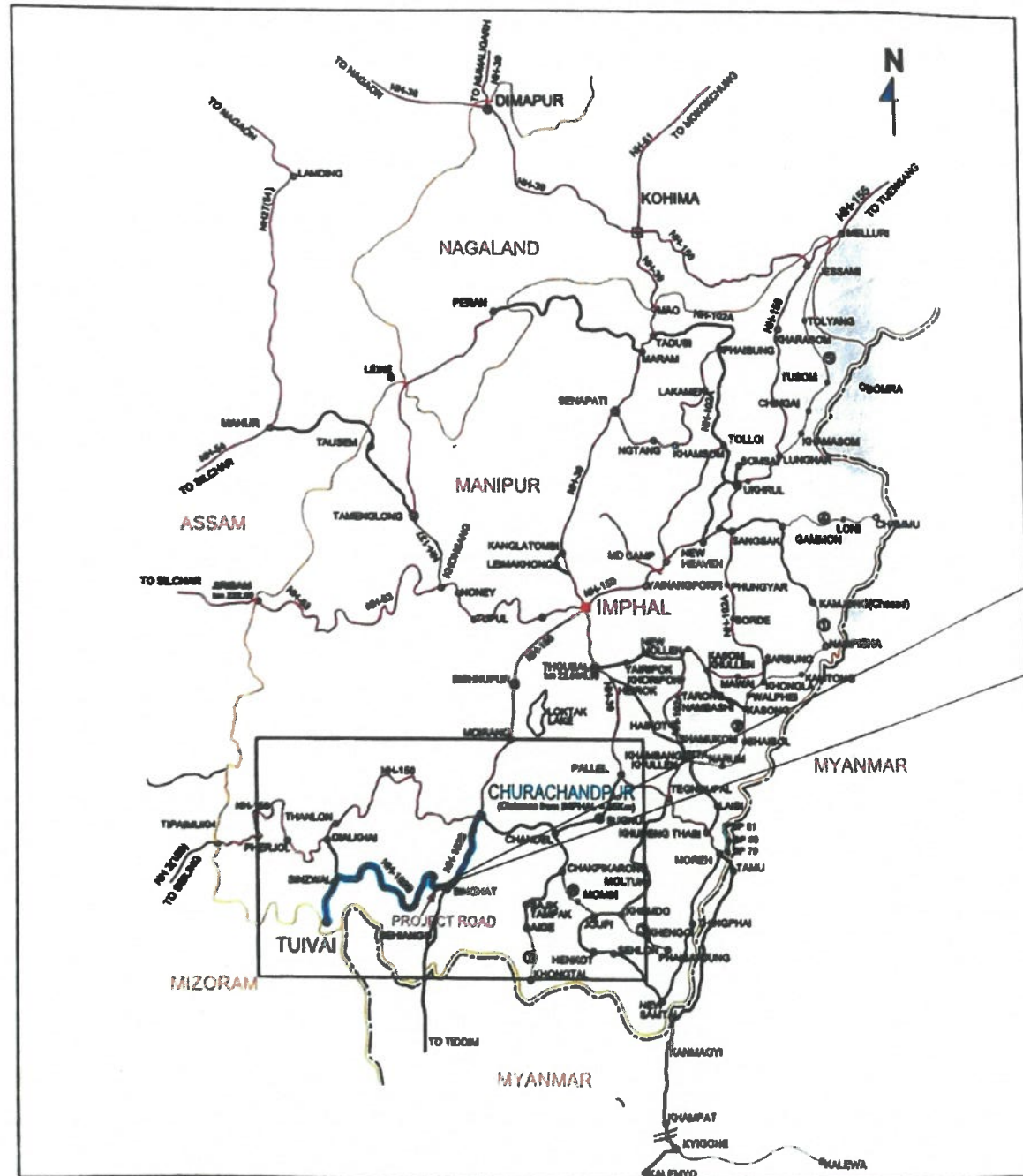
07.14.08.2021
Rec. 14.08.21



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

4A

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.



**SUPER STRUCTURE
PACKAGE - 4A (BEFORE BY PASS)
(AT CH-120+895)**



EPC CONTRACTOR:

GPT

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

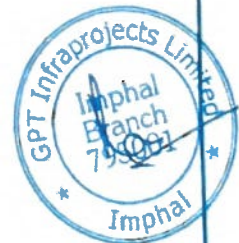
APPROVED

DESIGN CONSULTANT:



**SPS Technocrats
Pvt. Ltd.**

510 & 511, JMD Megapolis, Sector 48,
Gurgaon, 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 & 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 = 495MPa
CHARACTERISTIC YIELD STRENGTH = 385MPa
MINIMUM ELONGATION = 15%

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: 4006:1992 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 1908 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 5400-8).
2. BEND TEST:- TEST REQUIRED THE HEAD OF A STUD TO BE DISPLACED LATEALLY BY APPROXIMATE 25% OF ITS HEIGHT USING 8 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 5400-8).

(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 FORM 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 28mm +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.

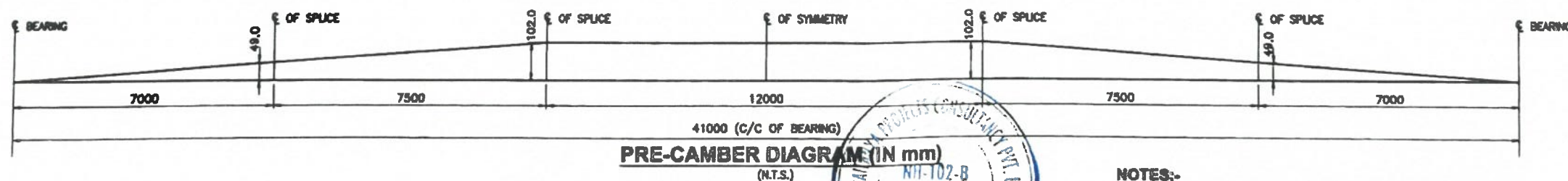
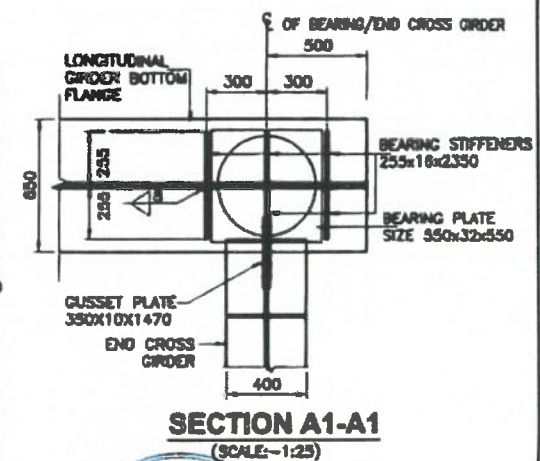
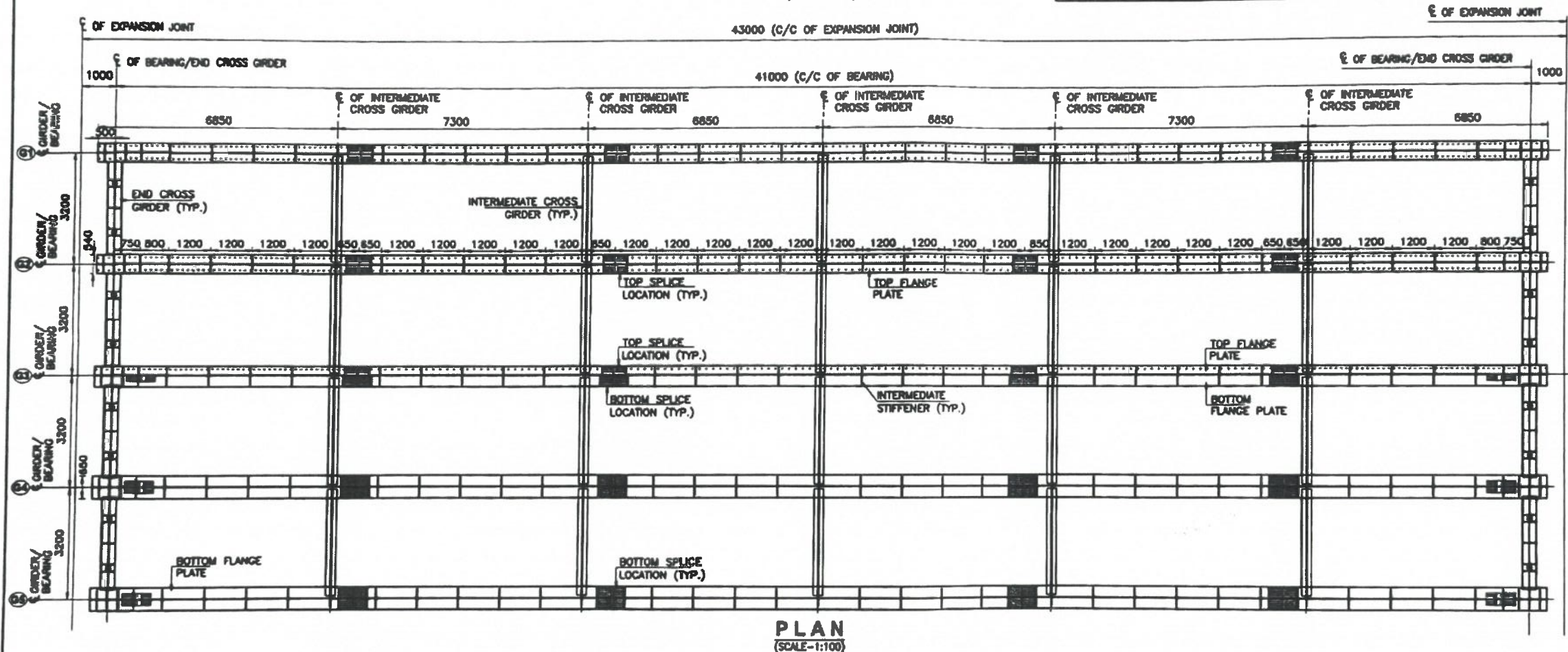
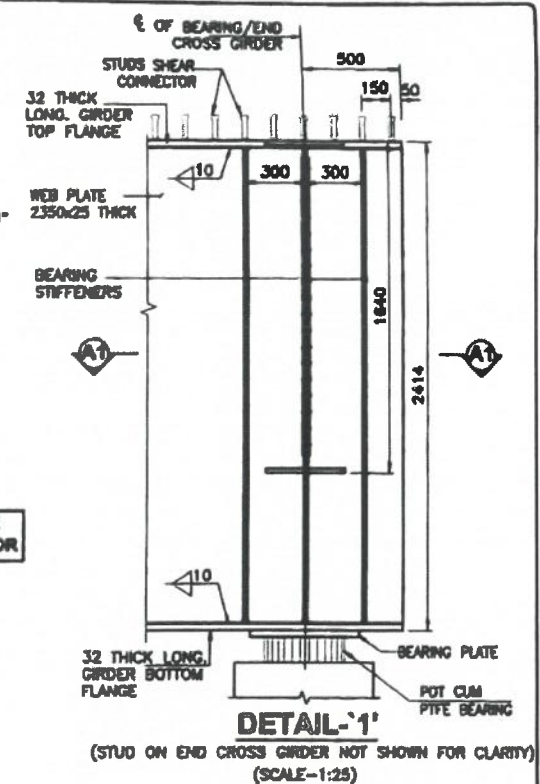
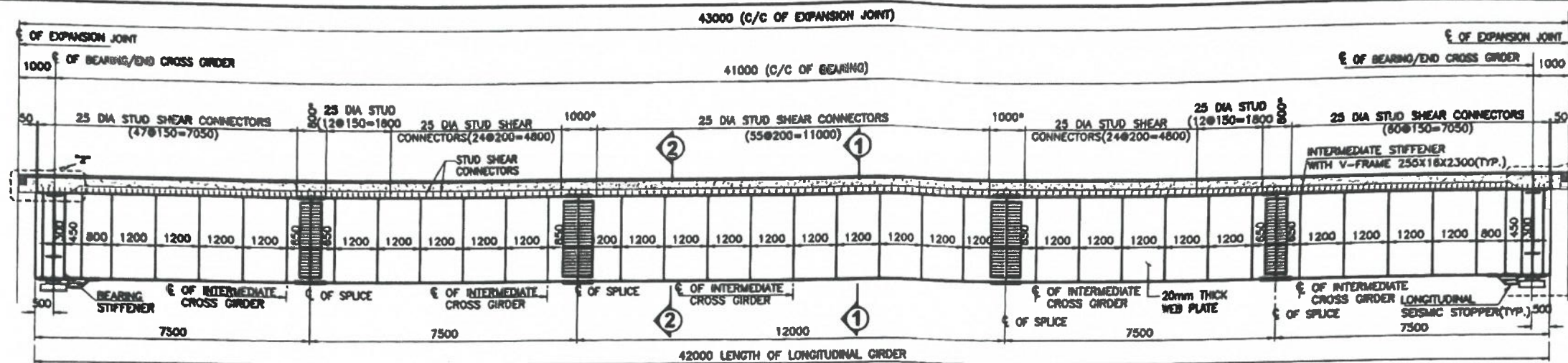


APPROVED

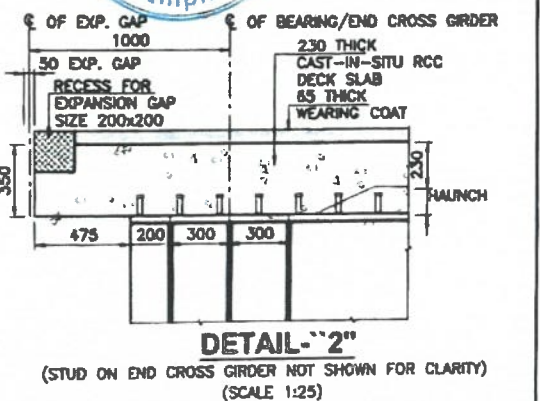


Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

Rev.	Date	Description	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN	MP	TITLE:		
R2	AUG	REVISED AS PER AE COMMENTS							Widening to 2 (Two) Lane with Hard shoulder of Churehandpur to Tulai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DESIGNED	S.S	GENERAL NOTES FOR SUPERSTRUCTURE		
R1	MAY	REVISED AS PER AE COMMENTS								CHECKED	AS.K		SCALE: AS SHOWN (51 OF 61)	REV:
RD	MAY	FOR APPROVAL								DATE: MAY - 2021	DRG NO: GPT/CCTHA/STR/MS/SUP/301		R2	



- 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/WJ8/SUP/301

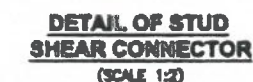


Rev.	Date	Description	 MIDCL INDIAN MARINE DEVELOPMENT CORPORATION	EPC CONTRACTOR:  GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.	AUTHORITY ENGINEER:  MS CHATYAYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURESTICS AND ASSOCIATES C-33rd FLOOR, RIL TOWER, SECTOR 17, MIDC, CHANDRASEKHARPURAM, CHENNAI - 600 088.	SAFETY CONSULTANT:  SUVADRA CONSULTANTS P-87, Tankampud Road, P.B.P.O. - 18, Odisha.	PROOF CONSULTANT:  SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-42, Rajesh Kumar Path, S.S.Pur, Boring Road, Patna-800001	DESIGN CONSULTANT:  SPS Technocrats Pvt. Ltd. 5/19 & 5/11, 2ND Mangalpur, Sector 48, Chaurang, Mayapora - 122018.	PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churuchandpur to Tivral section of NH 102B from Km 118.860 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DRAWN HP	TITLE: DETAILS OF LONGITUDINAL GIRDER SPAN 1X43 EJ TO EJ	SCALE: A3 SHOWN (01 OF 02)	REV: R1
R1	MAY	REVISED AS PER AC COMMENTS											
R0	MAY	FOR APPROVAL											
DATE: MAY - 2021			ORG.NO: OPTCTG44A/STW/MSB/SUP/352										

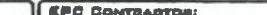


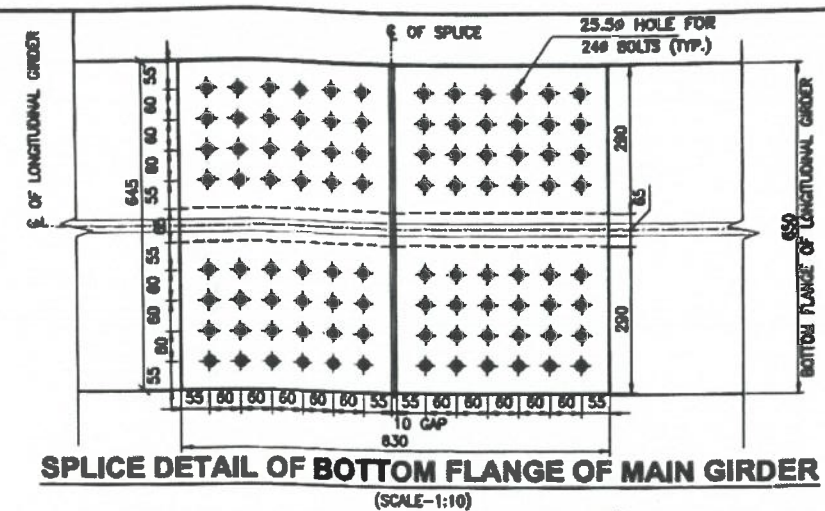
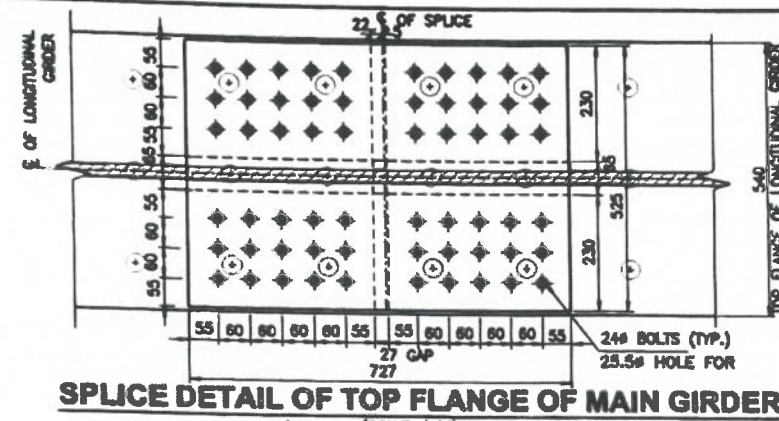
DESIGN DIRECTOR

SECTION AT B-B
(SCALE 1:10)

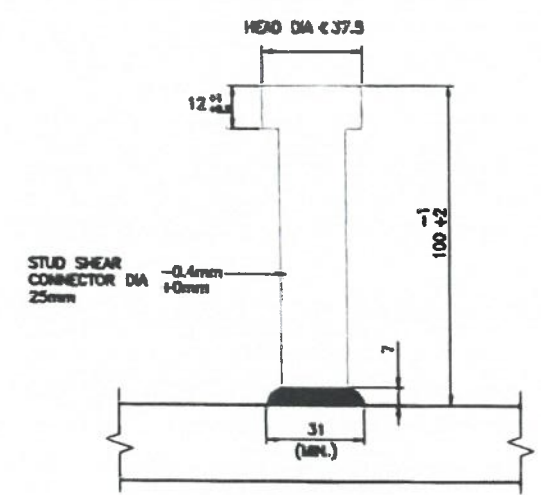
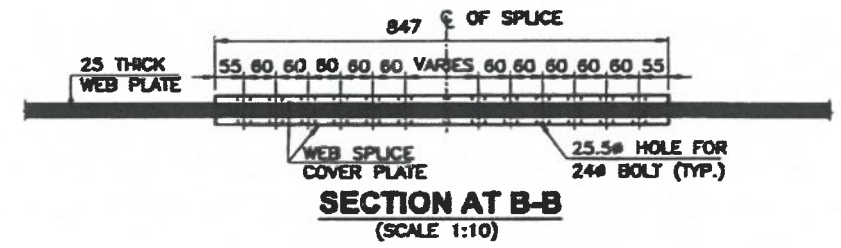
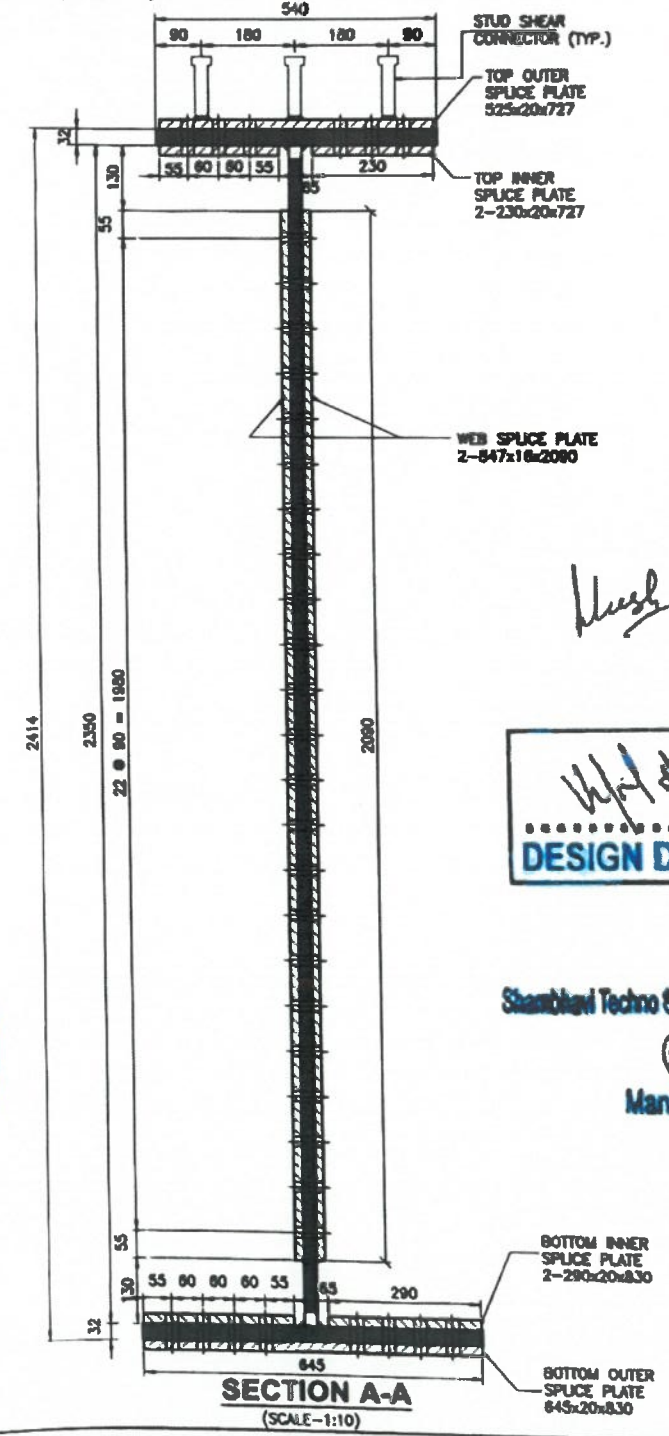
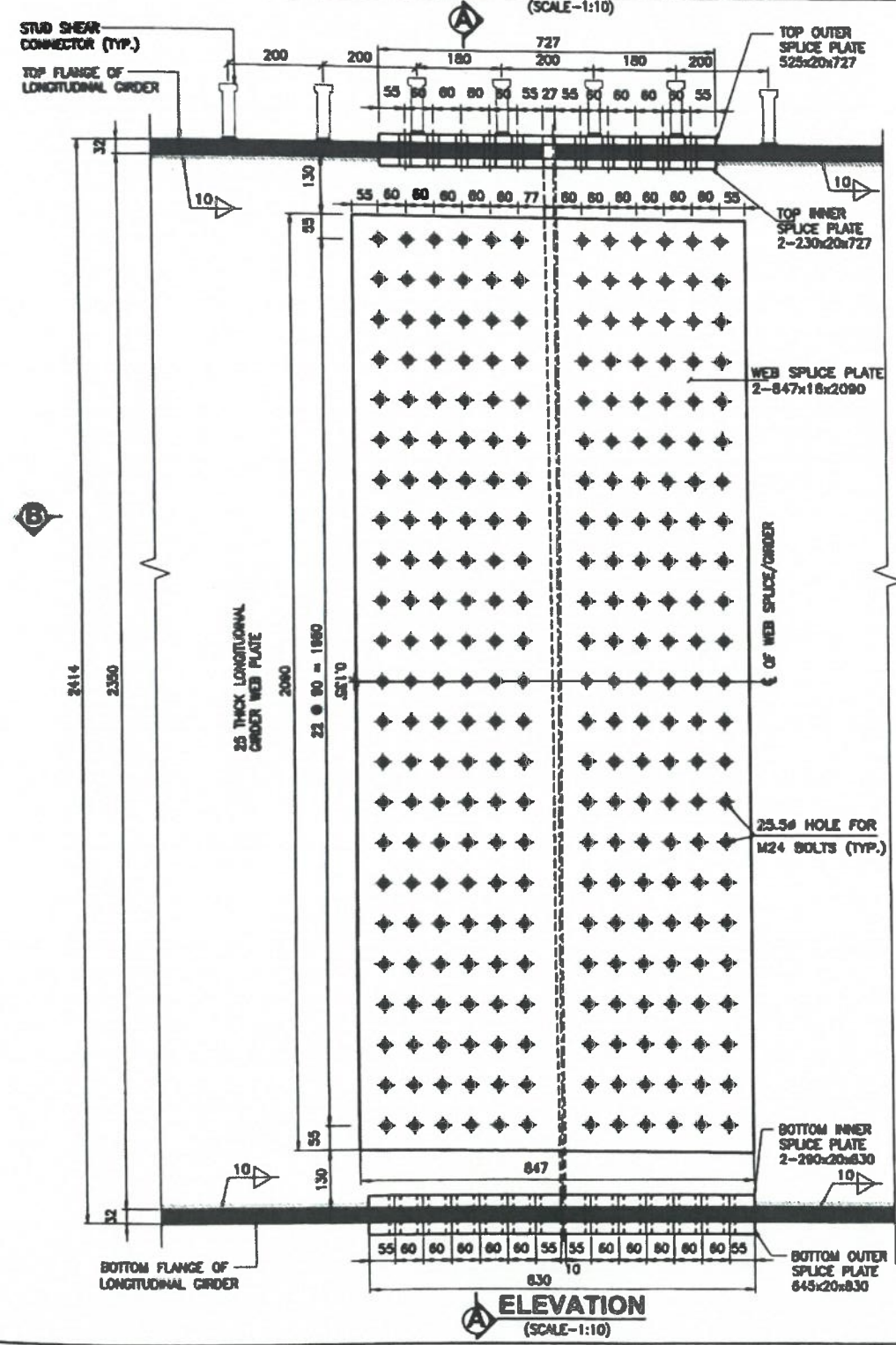


1. THE WELDING OF STUD SHEAR CONNECTORS SHALL BE DONE BY "DRAWN ARC STUD WELDING WITH CERAMIC FERRULE" TECHNIQUE.
2. THE STUD SHEAR CONNECTOR AND CERAMIC FERRULES SHALL CONFORM TO TYPE S03/U/F AS PER BS EN ISO 13918-2008.
3. MECHANICAL PROPERTIES OF STUD SHEAR CONNECTORS SHALL BE AS PER ISO 6892/BS EN 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.

Rev.	Date	Description	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN	MR	TITLE:			
R2	AUG	REVISED AS PER AE COMMENTS		 GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.	 M/S CHANTANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH M/S PANKAJ FUTURESTICS AND ASSOCIATES G-3RD FLOOR, 4 & 5 TOWER, SECTOR-4, VASHPALLI, GHANABAD-701018	 SUVADRA ENGINEERING & TECHNOLOGY PP-67, Tankampuri Road, BESVA, 18, Coimbatore	 SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-42, Rajesh Kumar Path, S.I.P, Puri, Boring Road, Patna-800081	 SPS Technocrats Pvt. Ltd. 8/510 & 511, JMD Nagarapada, Sector 46, Gurgaon, Haryana - 122016.	PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Turali section of NH 102B from Km 116.850 to Km 130.000 (Package-4A) in the State of Manipal on Engineering, Procurement & Construction (EPC) mode	DRAWN	MR	DETAILS OF SPJCE JOINT AND STIFF BEAM CONNECTION AT OUTER SPJCE FOR SPAN 114.3 RJ TO RJ			
R1	MAY	REVISED AS PER AE COMMENTS								DRAWN	SS		SCALE: AS SHOWN	1 OF 2	REV: R2
R0	MAY	FOR APPROVAL								DRAWN	AS K				
										DATE: MAY - 2021	DES. NO: GPT/ECT/4A/STIFF BEAM SUP/303				



- NOTES:-**
1. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE MENTIONED.
 2. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
 3. BOLTS USED IS M-24 (GRADE 10.9MSGF).
 4. ALL STRUCTURAL STEEL SHALL CONFORM TO HIGH STRENGTH STEEL E-410 (Fe-340) AS PER IS: 2082-2011.
 5. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. GPT/CCT/4A/STR/MAJ/SUP/301



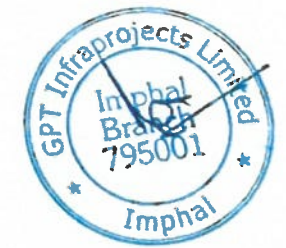
1. THE WELDING OF STUD SHEAR CONNECTORS SHALL BE DONE BY "DRAWN ARC STUD WELDING WITH CERAMIC FERRULE" TECHNIQUE.
2. THE STUD SHEAR CONNECTOR AND CERAMIC FERRULES SHALL CONFORM TO TYPE S03/UF AS PER BS EN ISO 13918-2008.
3. MECHANICAL PROPERTIES OF STUD SHEAR CONNECTORS SHALL BE AS PER BS EN ISO 13918-2008.
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 ALUMINIUM BALL OR ALUMINIUM 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.

APPROVED

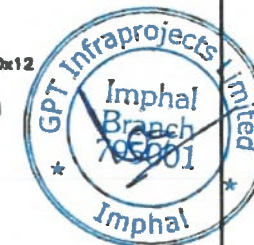
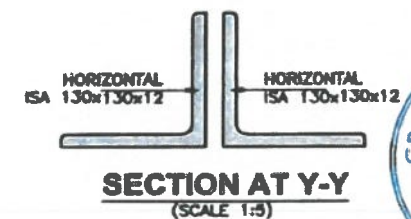
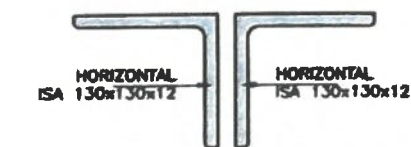
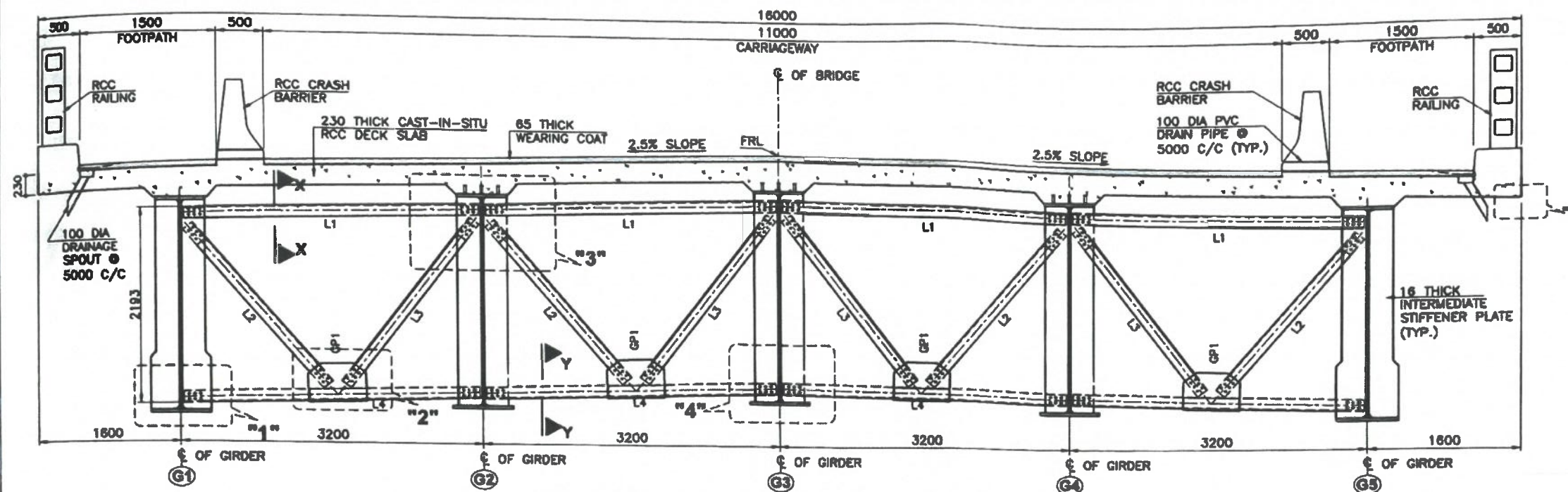


DESIGN DIRECTOR

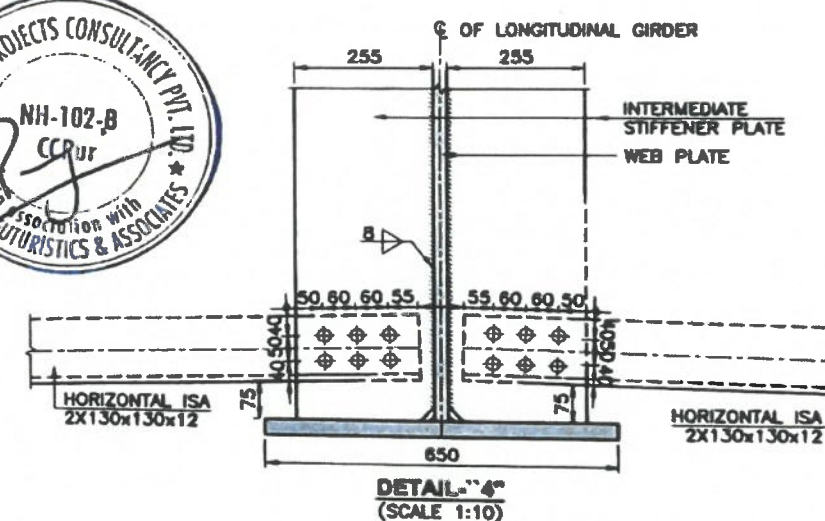
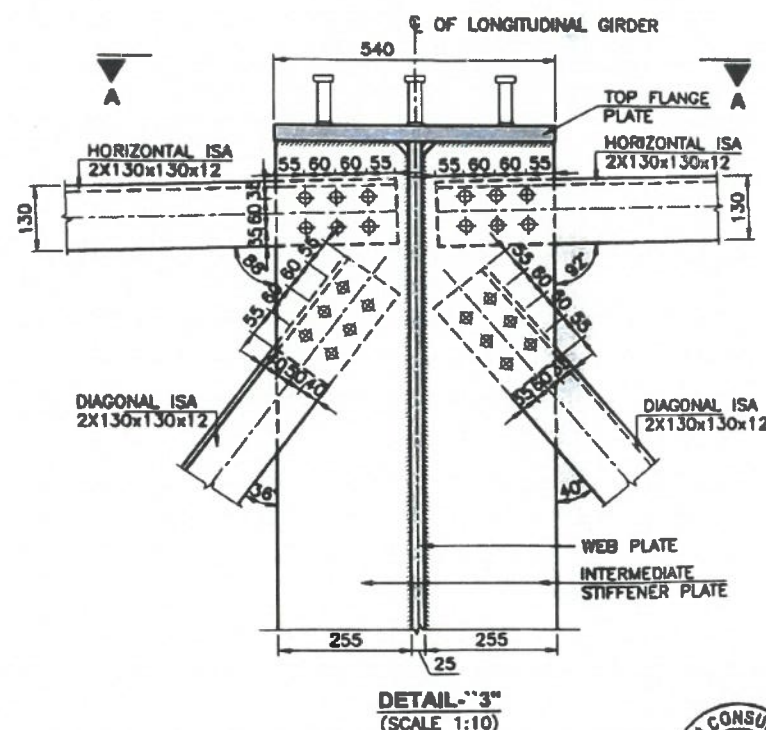
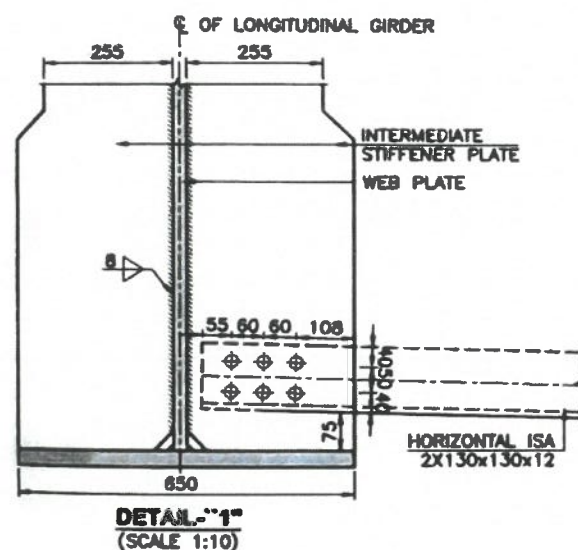
Shambhavi Techno Solutions Pvt. Ltd.
Managing Director



Rev.	Date	Description	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DATE:	DRG. NO.	Rev:
B2	AUG	REVISED AS PER AE COMMENTS		 JC - 25, Sector - III, Salt Lake, Kolkata - 700096.	 M/S CHAITANYA PROJECTS CONSULTANCY PVT. LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-2ND FLOOR, RA TOWER, SECTOR-4, WARDHA, CHHISANAGAR-751018.	 PP-47, Tenkapani Road, BBSR-18, Odisha.	 SHAMBHAVI TECHNO SOLUTIONS PVT. LTD. E-42, Rajesh Kumar Path, S.K.Pur, Boring Road, Patna-800081.	 SPS Technocrats Pvt. Ltd. 6/5/5 & 5/11, And Megapada, Sector 43, Gurgaon, Haryana - 122015.	Widening to 2 (Two) Lane with Hard shoulder of Churuchandpur to Tuvai section of NH 102B from Km 118.868 to Km 130.000 (Package-4A) in the State of Manipal on Engineering, Procurement & Construction (EPC) mode.	MAY - 2021	GPT/CCT/4A/STR/MAJ/SUP/303	R2
B1	MAY	REVISED AS PER AE COMMENTS										
R0	MAY	FOR APPROVAL										

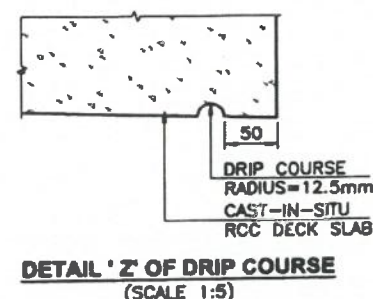
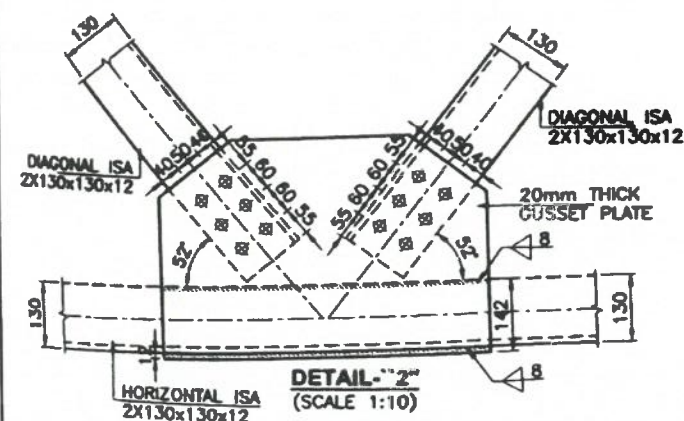


APPROVED

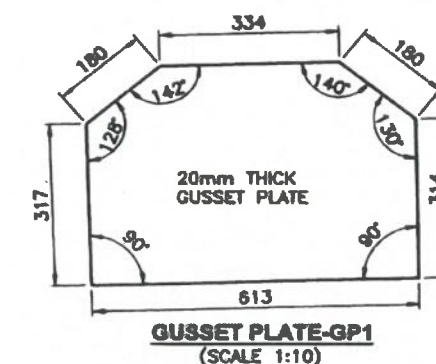
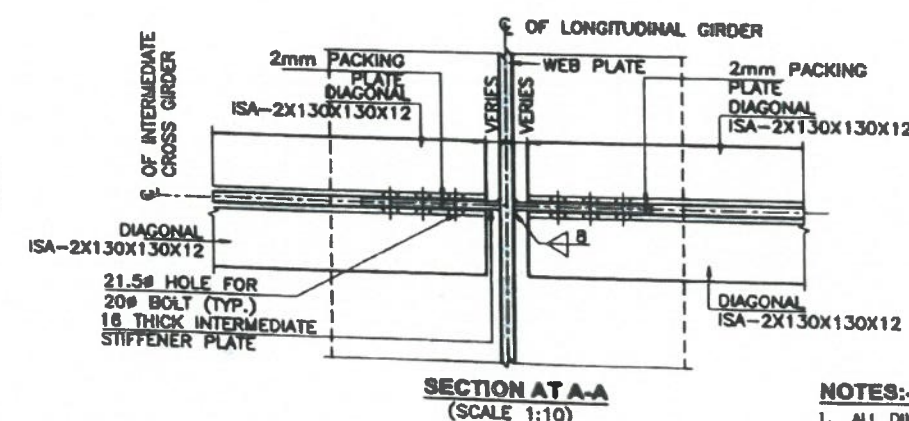


Shambhu Techno Solutions Pvt. Ltd

Managing Director



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



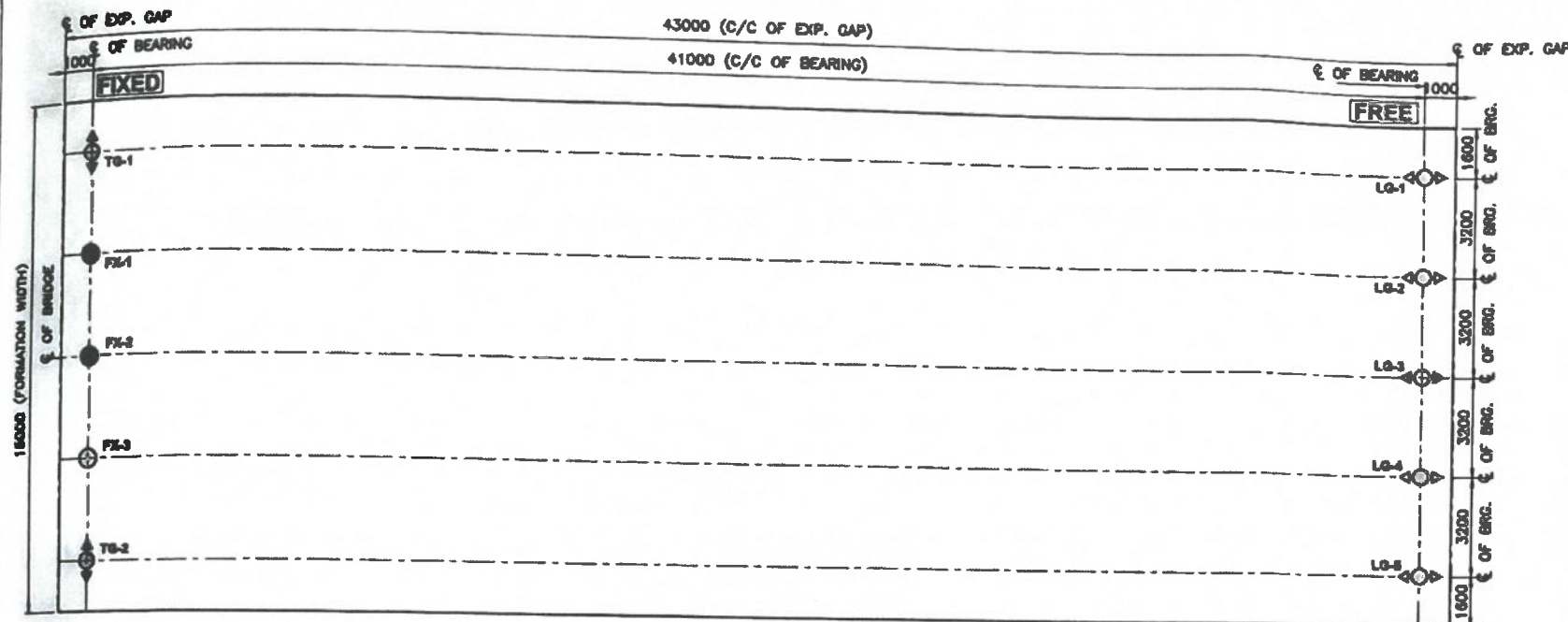
NOTES:-

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/MA/8/SUP/301

Rev.			Date	Description	CLIENT:  ENGINEERING PROJECTS CONSULTANTS ENGINEERS THE INDIA	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-2ND FLOOR, 8X TOWER, SECTOR-1, VAINALLA CHANDRABABU ROAD-201616	SAFETY CONSULTANT:  SUVADRA CONSULTANCY PVT. LTD. PP-37, Tanjapuri Road, BSR-15, Odisha	PROOF CONSULTANT:  SHAMBAVI TECHNO SOLUTIONS PVT.LTD. E-32, Rajesh Kumar Path, S.J.Puri, Boring Road, Patna-800001	DESIGN CONSULTANT:  SPS Technocrats Pvt. Ltd. 6/19 & 5/11, MID Margopada, Sector 48, Gurgaon, Haryana - 122018.	PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Churnchandpur to Tural section of NH 1022B from Km 118.850 to Km 130.000 (Package-A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DRAWN MP DESIGNED S.S. CHECKED A.K. DATE MAY - 2021	TITLE: DETAILS OF INTERMEDIATE CROSS GIRDER FOR SPAN 1X43 EJ TO EJ SCALE: AS SHOWN (1:1 OF 01) REV: 1
R5	AUG	REVISED AS PER AE COMMENTS											
R1	MAY	REVISED AS PER AE COMMENTS											
R0	MAY	FOR APPROVAL											

Shantini Techno Solutions Pvt. Ltd
D. N.
Managing Director

<table><tr><th>Sl. No.</th><th>Date</th><th>Description</th></tr><tr><td>RS</td><td>2-8-20</td><td>REVISED AS PER AE COMMENTS</td></tr><tr><td>SI</td><td>10-08</td><td>REVISED AS PER AE COMMENTS</td></tr><tr><td>SC</td><td>10-08</td><td>FOR APPROVAL</td></tr></table>			Sl. No.	Date	Description	RS	2-8-20	REVISED AS PER AE COMMENTS	SI	10-08	REVISED AS PER AE COMMENTS	SC	10-08	FOR APPROVAL	CLIENT:  NADCL NATIONAL DANGEROUS GOODS CARRIER	EPC CONTRACTOR:  GPT JC - 25, Sector - 13, Salt Lake, Kolkata - 700098.	AUTHORITY ENGINEER:  M/S CHATANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-9 1st FLOOR, RA TOWER, SECTOR-4 VASINDA, GUJARAT-382116	SAFETY CONSULTANT:  SUVADRA CONSULTANTS P-57, Tambapore Road, BSNL-18, Odessa	PROOF CONSULTANT:  SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Park, S.P.Park, Baring Road, Patna-800001	DESIGN CONSULTANT:  SPA Technocrats Pvt. Ltd. 9710 & 9711, S.D. Highways, Sector 48, Gurgaon, Haryana - 122014.	PROJECT: Widening to 2 (Two) Lane with Hard shoulder of Charhatnagar to Tumkur section of NH 102B from Km 116.650 to Km 130.000 (Package-4A) in the State of Manipal in Engineering, Procurement & Construction (EPC) mode.	ONLY WRITTEN DATA SHALL BE FOLLOWED. <table><tr><td>DESIGNED</td><td>HP</td><td rowspan="3">TITLE: REINFORCEMENT DETAILS OF DECK SLAB FOR SPAN 1X43 EJ TO EJ</td><td rowspan="3">SCALE: AS SHOWN (01 OF 01)</td><td rowspan="3">REV: R2</td></tr><tr><td>DRAWN</td><td>S.S</td></tr><tr><td>CHECKED</td><td>A.S.K</td></tr><tr><td colspan="2">DATE: MAY - 2021</td><td colspan="3">DRG.NO. 09TTCGTH4/STERLING/SP/1308</td></tr></table>			DESIGNED	HP	TITLE: REINFORCEMENT DETAILS OF DECK SLAB FOR SPAN 1X43 EJ TO EJ	SCALE: AS SHOWN (01 OF 01)	REV: R2	DRAWN	S.S	CHECKED	A.S.K	DATE: MAY - 2021		DRG.NO. 09TTCGTH4/STERLING/SP/1308		
Sl. No.	Date	Description																																				
RS	2-8-20	REVISED AS PER AE COMMENTS																																				
SI	10-08	REVISED AS PER AE COMMENTS																																				
SC	10-08	FOR APPROVAL																																				
DESIGNED	HP	TITLE: REINFORCEMENT DETAILS OF DECK SLAB FOR SPAN 1X43 EJ TO EJ	SCALE: AS SHOWN (01 OF 01)	REV: R2																																		
DRAWN	S.S																																					
CHECKED	A.S.K																																					
DATE: MAY - 2021		DRG.NO. 09TTCGTH4/STERLING/SP/1308																																				



BEARING LAYOUT PLAN
(SCALE 1:150)

LEGEND

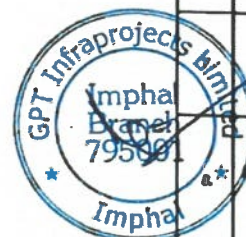
SYMBOL	DESCRIPTION
○	FIXED BEARING (FX)
○	TRANS GUIDED (TG)
○	LONG GUIDED (LG)
○	FREE BEARING (FB)

TYPE OF BEARING - POT PTFE BEARING

NOTES:-

- MATERIAL MODIFICATIONS IN THE STRUCTURE DETAIL e.g. PEDESTAL ETC. FOR COMPATIBILITY WITH THE BEARING DETAIL AS PER MANUFACTURER'S REQUIREMENT SHALL BE PERMITTED SUBJECT TO APPROVAL OF THE ENGINEER.
- SPECIFICATION FOR BEARINGS SHALL BE AS PER LATEST TECHNICAL SPECIFICATIONS AND IRC: 83 PART-III.
- THE TESTING OF RAW MATERIALS, METALLIC COMPONENTS, ELASTOMER, PTFE AND ACCEPTANCE TEST ON BEARING SHALL CONFORM TO MORTH SPECIFICATIONS.
- MANUFACTURER SHALL SUBMIT THE CERTIFICATE FOR LOAD TESTING AND DIMENSIONS OF BEARINGS.
- THE GROUT BEDDING MORTAR SHALL BE OF HIGH STRENGTH FREE FLOWING NON SHRINK TYPE.
- BEARING PLANES SHALL BE MADE TRULY HORIZONTAL ALONG WITH PEDESTAL BY PROPER MECHANISM TO TAKE CARE OF GRADIENT EFFECT.
- GRADE OF CONCRETE :-
a. BEARING PEDESTAL M45
- STRUCTURE IS LOCATED IN SEISMIC ZONE-V.
- PRECAUTIONS TO BE TAKEN BY THE SITE ENGINEER DURING CONSTRUCTION OF STRUCTURES TILL THE GIRDER ARE BRACED BY DIAPHRAGMS/SLAB.
- 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.
- LEGEND :-
MOVEMENT + EXPANSION
- CONTRACTION

A.1 Typical Load Data Format									
Bearing Identification mark		Type of Bearing		Fixed Bearing		Long Guided		Trans Guided	
1.		2.		3.		4.		5.	
Seating Material and Character Strength		Upper Surface		Structural steel		Concrete		Concrete	
Allowable contact Pressure (N/mm ²)		Lower Surface		Concrete		Concrete		Concrete	
Upper Surface		Serviceability		324		324		324	
Ultimate		410		410		410		410	
Lower Surface		Serviceability		20.1		20.1		20.1	
Ultimate		45		45		45		45	
Vertical (EXCL. SV loading)		Max		2031		2031		2031	
Permanent		1118		1118		1118		1118	
Min		748		748		748		748	
Horizontal (EXCL. SV loading)		Longitudinal		108		0		108	
Transverse		0		0		0		0	
Vertical (SV loading)		Max		2380		2380		2380	
Permanent		1118		1118		1118		1118	
Min		770		770		770		770	
Horizontal (SV loading)		Longitudinal		0		0		0	
Transverse		0		0		0		0	
Vertical (EXCL. SV loading)		Max		3087		3087		3087	
Permanent		1528		1528		1528		1528	
Min		81		81		81		81	
Horizontal (EXCL. SV loading)		Longitudinal		1438		0		1438	
Transverse		1311		1311		0		1311	
Vertical (SV loading)		Max		2980		2980		2980	
Permanent		1528		1528		1528		1528	
Min		1081		1081		1081		1081	
Horizontal (SV loading)		Longitudinal		0		0		0	
Transverse		0		0		0		0	
Irreversible		Longitudinal		-		12.8		-	
Reversible		Longitudinal		-		14.5		-	
Irreversible		Longitudinal		-		17.3		-	
Reversible		Longitudinal		-		19.5		-	
Irreversible		Longitudinal		0.0088		0.0088		0.0088	
Reversible		Longitudinal		0.0001		0.0001		0.0001	
Irreversible		Longitudinal		0.0025		0.0025		0.0025	
Reversible		Longitudinal		0.0000		0.0000		0.0000	
Upper Surface		Longitudinal		850		850		850	
Lower Surface		Longitudinal		750		750		750	
Overall Height (Bearing + Pedestal) (mm)		Longitudinal		350		350		350	
Maximum acceptable rotation to rotation under Serviceability Limit State (rad x m), if restricted		Longitudinal		NA		NA		NA	
Transverse		Longitudinal		NA		NA		NA	
Upper Surface		BEARING PLATE		BEARING PLATE		BEARING PLATE		BEARING PLATE	
Lower Surface		DOWN/STUD		DOWN/STUD		DOWN/STUD		DOWN/STUD	



APPROVED

Rev.	Date	Description	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROJECT CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DESIGN:	TITLE:
R2	JULY	SV LOADING INCLUDED	M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD.	GPT	M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD.	SUVADRA CONSULTANTS	SHAMHAVI TECHNO SOLUTIONS PVT.LTD.	SPS Technocrats Pvt. Ltd.	Widening to 2 (Two) Lane with Hard shoulder of Churendapur to Tulai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DESIGNED: S.S.	DETAIL OF POT CUM PTFE BEARING LAYOUT FOR SPAN 1X43 EJ TO EJ
R1	MAY	REVISED AS PER AE COMMENTS								CHECKED: A.S.K.	SCALE: AS SHOWN (01 OF 01)
R0	MAY	FOR APPROVAL								DATE: MAY - 2021	DRG. NO: GPT/CCT/4A/STWS/BJ/SUP/387

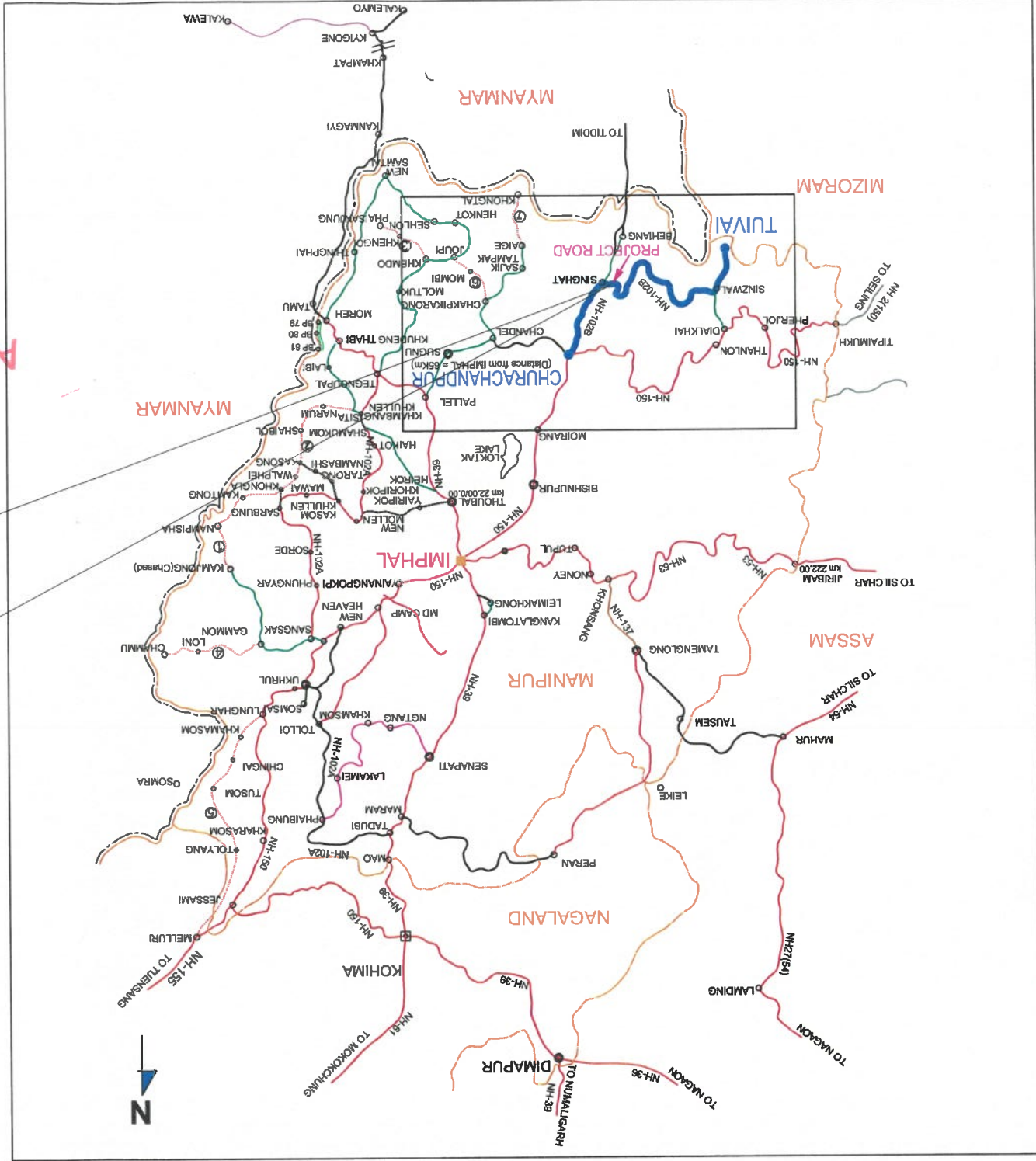
Rec. dt. 29.9.21

No. 21/GP T-Infra/B.O. ImpRd/Design/Pkg 4(A)/2020-21/115

राष्ट्रीय राजमार्ग एवं अवसरचना विकास निगम लिमिटेड
National Highways & Infrastructure Development Corporation Limited



Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 118.850 to Km 130.000(Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.



APPROVED

TYPICAL GAD OF BOX CULVERTS

PACKAGE -4A

(Km. 118+850 to Km. 130+000)

SEPTEMBER 2021



DESIGN CONSULTANT:

SPS Technocrats

Pvt. Ltd.

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



EPC CONTRACTOR:



Bharat Vardya Eastern Pvt Ltd
114, Chittaranjan Avenue,
Kolkata-700073, West Bengal

Rev.	Date	Description

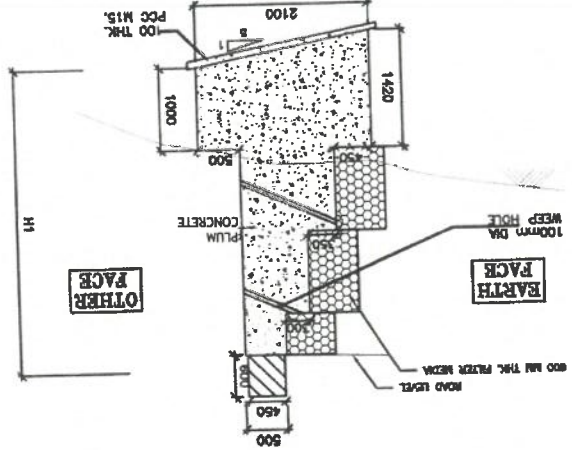
CLIENT:	MIDEL
EPC CONTRACTOR:	GPT
DESIGNER:	CHAITANYA PROJECTS IN ASSOCIATION WITH NSR&F FUTURESTICS & ASSOCIATES
SAFETY CONSULTANT:	SUVADRA
PROOF CONSULTANT:	SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
DESIGN CONSULTANT:	SPS Technocrats Pvt. Ltd.
PROJECT:	UPGRADING 2 (Two) Lane with Hand shoulder of Churachandpur to Tivai section (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.
DATE: SEP-2021	
DWG. NO.: E/PT/CT/HA/ST/11/SC/TYPICAL BAS	
SCALE: AS SHOWN	
REV:	
TITLE: TYPICAL ARRANGEMENT DRAWING OF BOX CULVERT (EXHIBIT WITH GUMPHONGA M TO 3M)	

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS, UNLESS OTHERWISE MENTIONED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE PLAN & PROFILE AND OTHER RELEVANT DRAWINGS.
3. THE BEARING CAPACITY CONSIDERED 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.
6. GRADE OF CONCRETE.
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.
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.

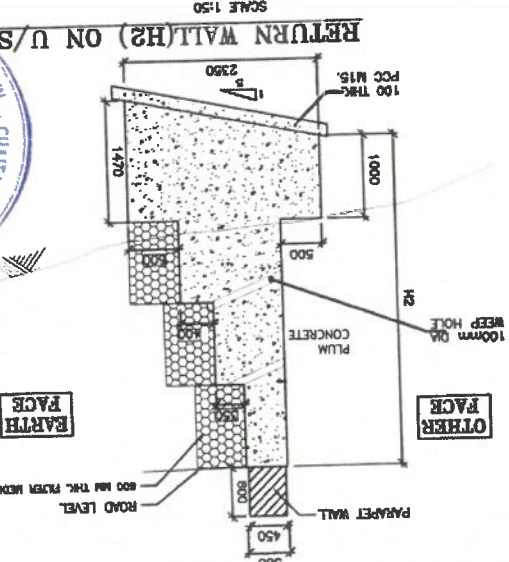


NOTES:

RETURN WALL(H1) ON D/S



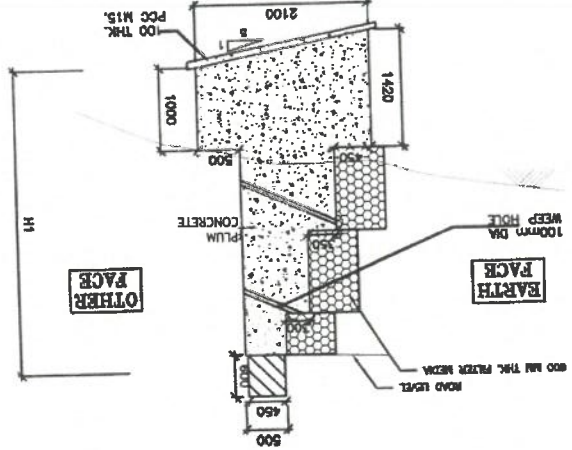
RETURN WALL(H2) ON U/S



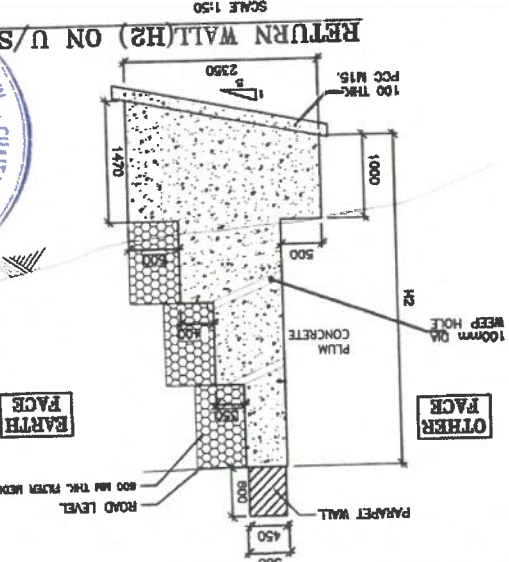
SECTION B-B (SCALE 1:50)



RETURN WALL(H1) ON D/S



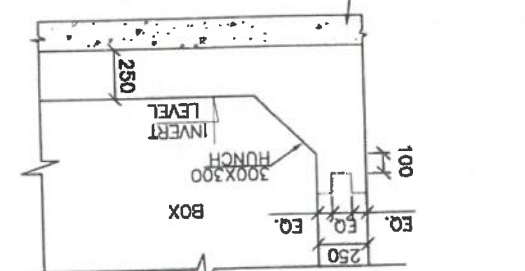
RETURN WALL(H2) ON U/S



SECTION B-B (SCALE 1:50)



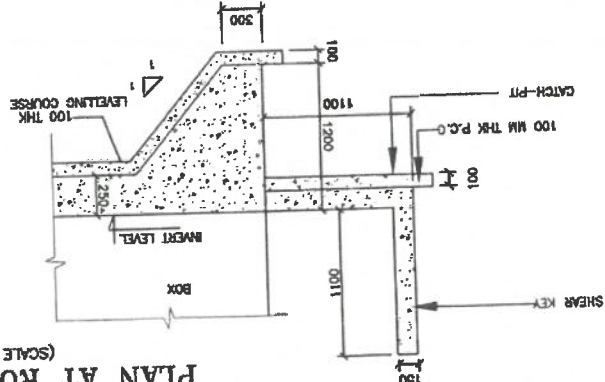
DETAIL-3 (SCALE 1:30)



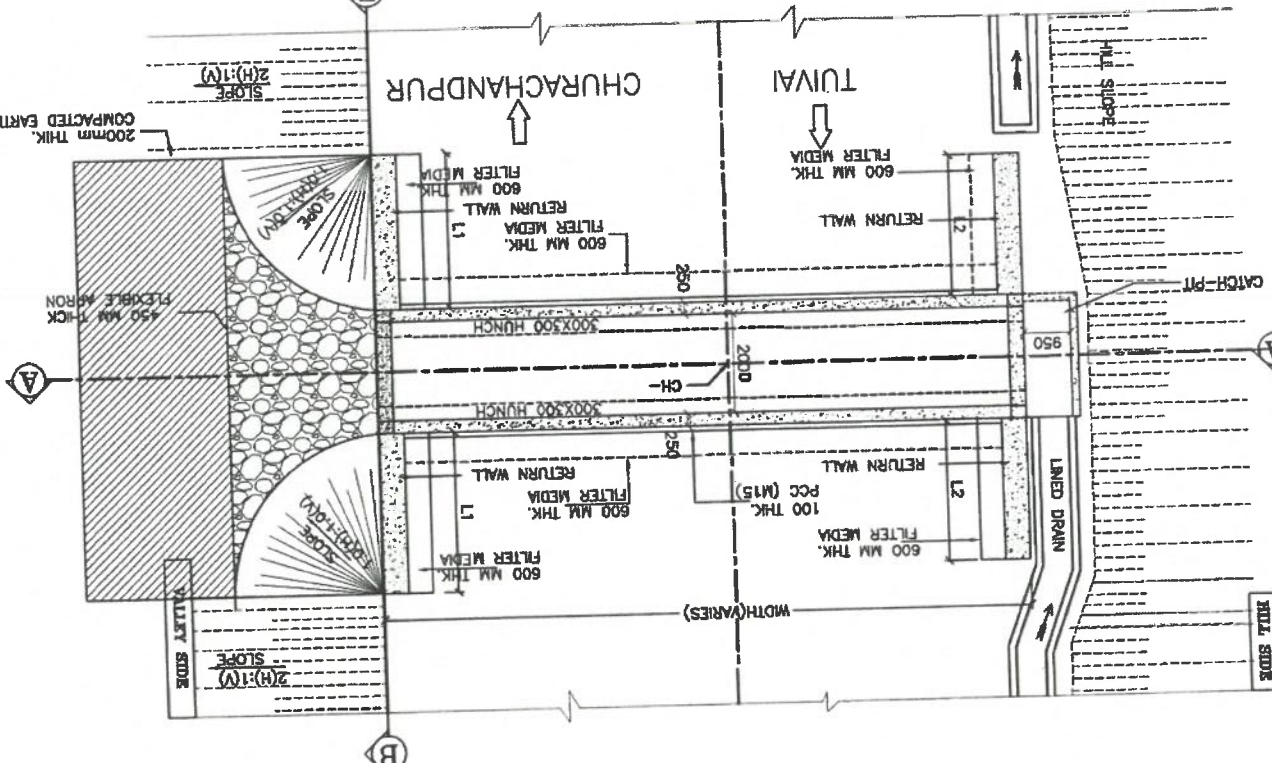
DETAIL-2 (SCALE 1:30)



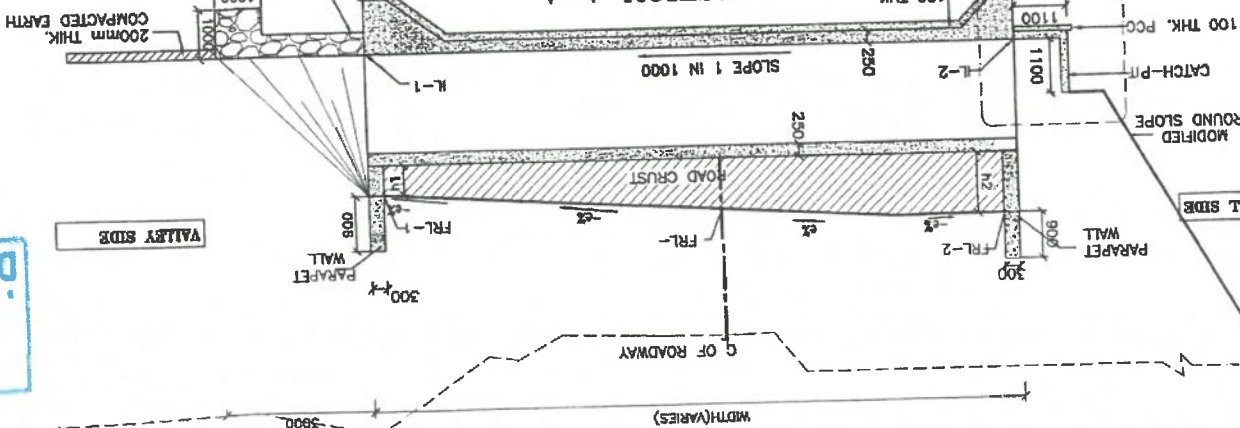
DETAIL-1 (SCALE 1:50)



PLAN AT ROAD LEVEL (SCALE 1:100)



SECTION A-A (SCALE 1:100)

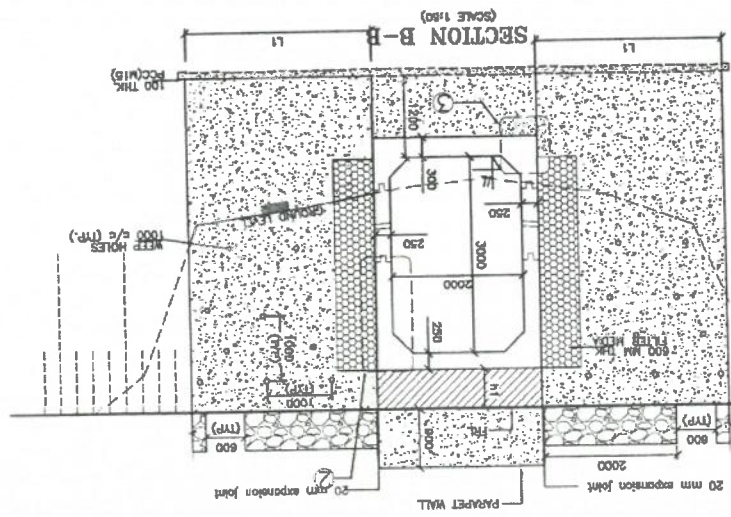
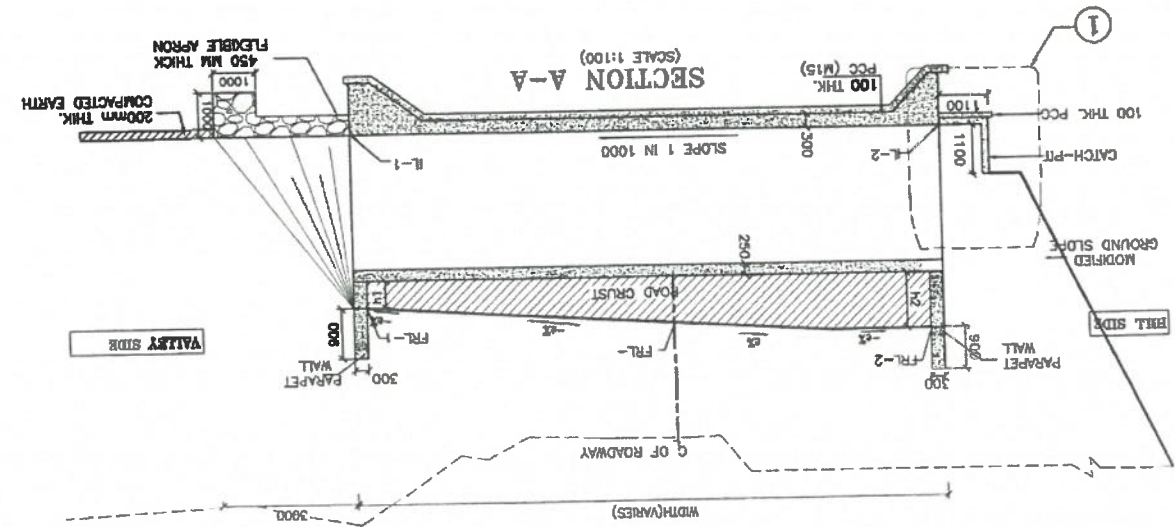
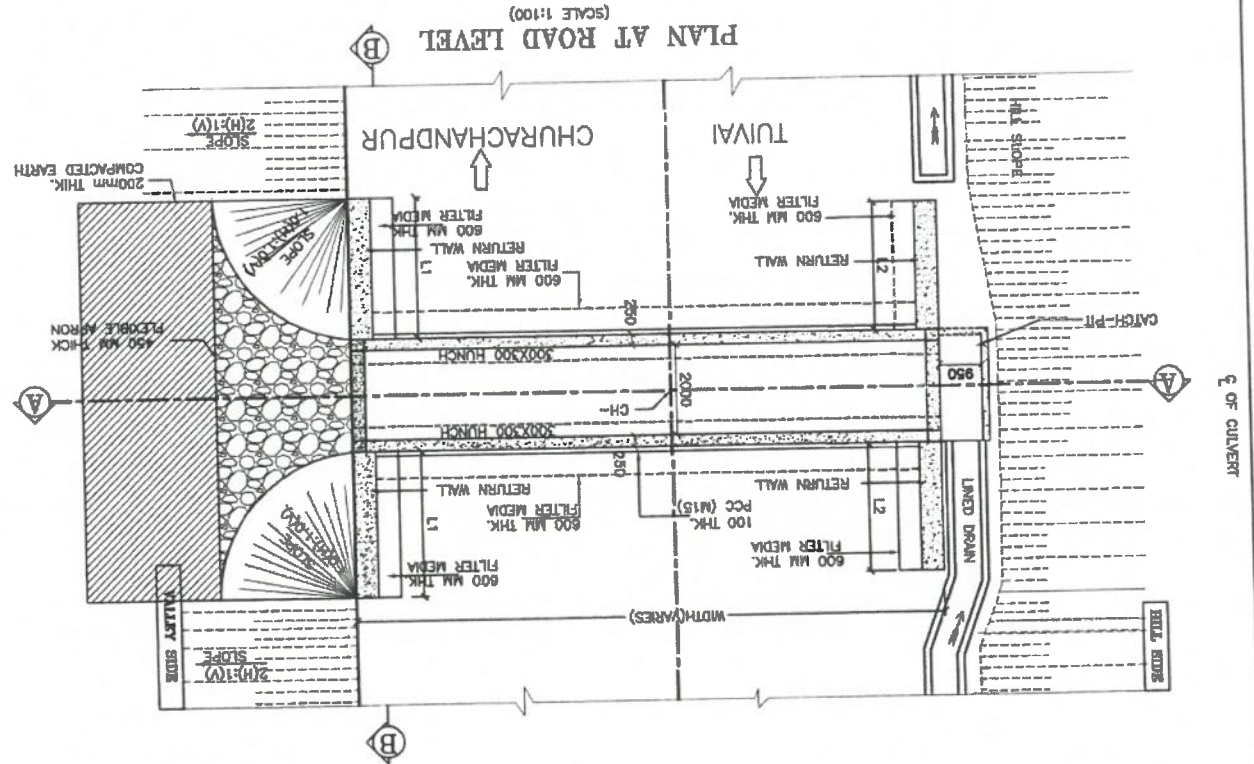
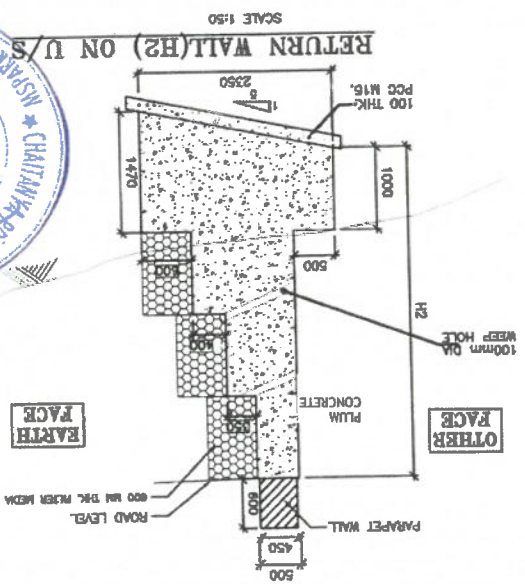
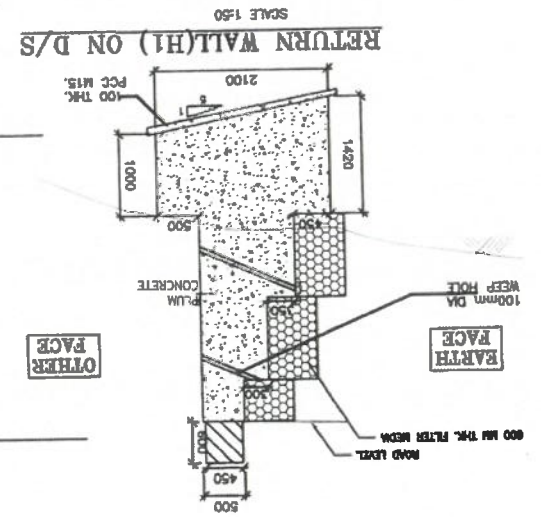
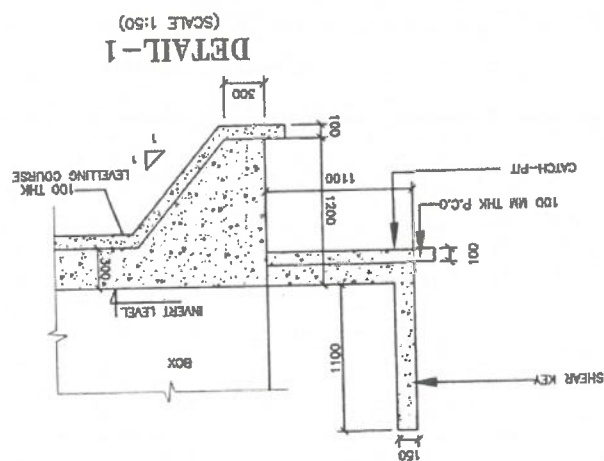
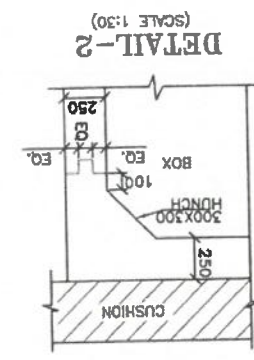
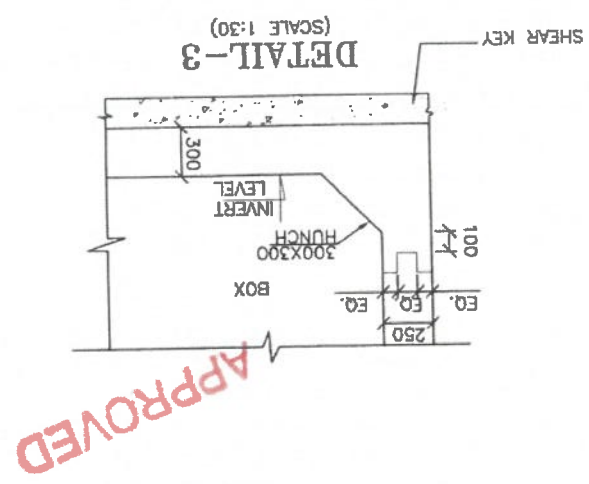


DESIGN DIRECTOR

Managing Director

Shambhavi Techno Solutions Pvt. Ltd.

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS, UNLESS OTHERWISE MENTIONED.
 2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE PLAN & PROFILE AND OTHER RELEVANT DRAWINGS.
 3. THE BEARING CAPACITY CONSIDERED 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.
 6. GRADE OF CONCRETE
 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.
 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.



Managing Director
Shamshad Techno Solutions Pvt. Ltd.

DESIGN DIRECTOR
M. H. Sharma



Managing Director
Shambhavi Techno Solutions Pvt. Ltd.

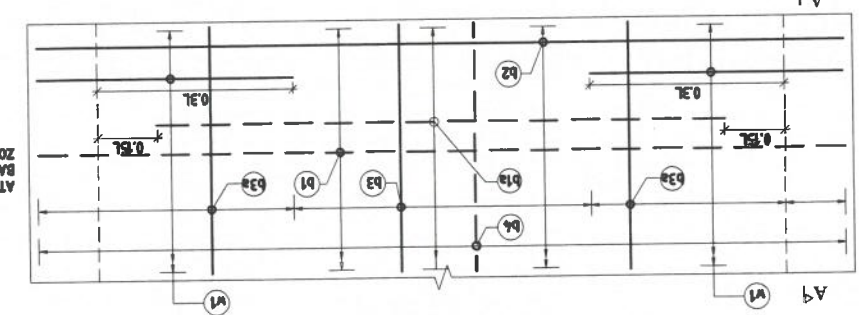
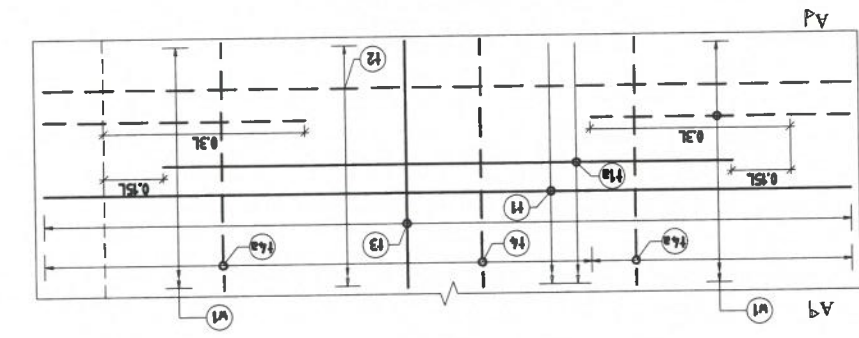
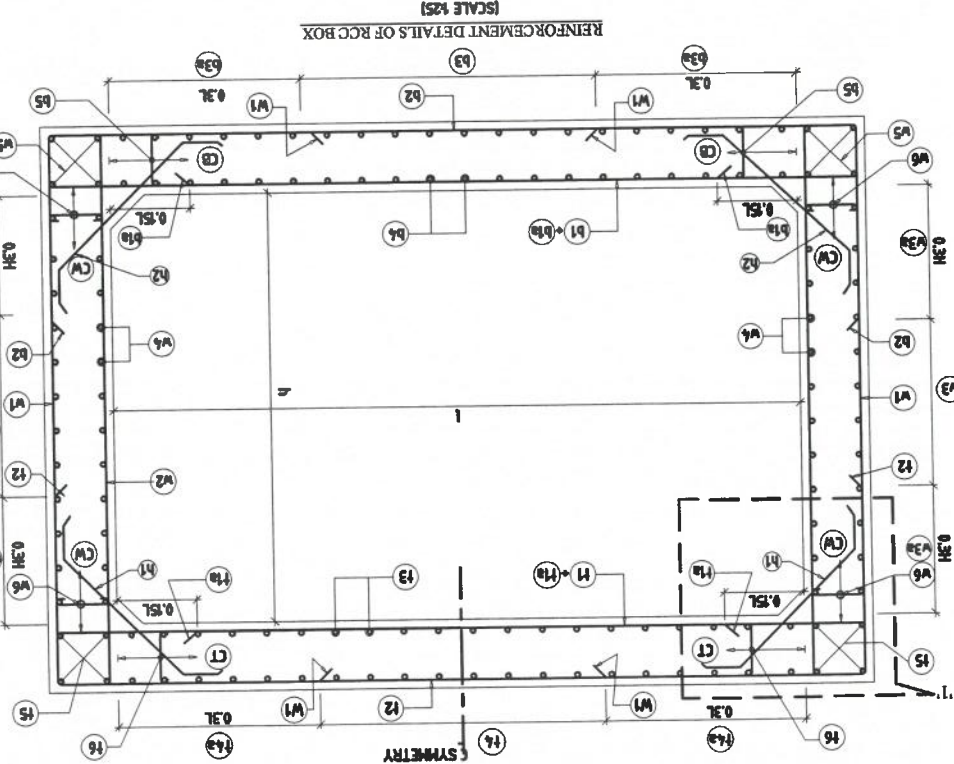
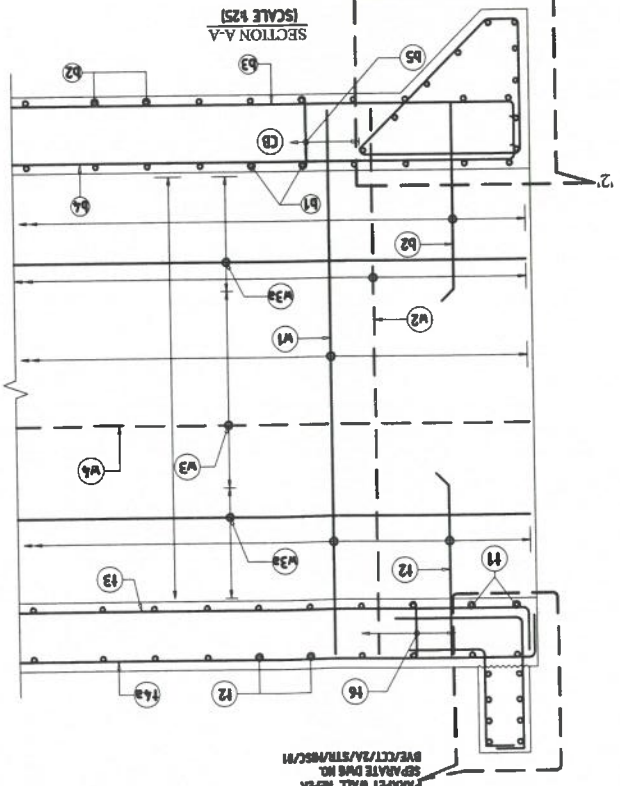
DESIGN DIRECTOR
M/S Chaitanya Projects Consultancy Pvt. Ltd.

SCHEDULE OF REINFORCEMENT									
DESIGN OF RCC BOX									
Sr.No.	Bar Mark	Shape of Bar	Bar Dia. in mm	Spacing in mm	Bar Dia. in mm	Spacing in mm	Bar Dia. in mm	Spacing in mm	Bar Dia. in mm
1	11	12	200	12	200	12	200	12	200
2	11b	-	-	-	-	-	-	-	-
3	12	10	200	10	200	10	200	10	200
4	13	8	200	8	200	8	200	8	200
5	14	8	300	8	300	8	300	8	300
6	14a	10	200	10	200	10	200	10	200
7	15	12	200	12	200	12	200	12	200
8	16	12	200	12	200	12	200	12	200
9	17a	-	-	-	-	-	-	-	-
10	18	10	200	10	200	10	200	10	200
11	19	8	300	8	300	8	300	8	300
12	19a	10	200	10	200	10	200	10	200
13	20	8	200	8	200	8	200	8	200
14	21	12	200	12	200	12	200	12	200
15	22	12	200	12	200	12	200	12	200
16	23	10	200	10	200	10	200	10	200
17	24	12	200	12	200	12	200	12	200
18	25	10	200	10	200	10	200	10	200
19	26	12	200	12	200	12	200	12	200

BOX/ SIZE	1/2X3/3	1/2X3/2	1/2X3/3	1/2X3/3
CV	000mm	000mm	000mm	400mm
CT	000mm	000mm	000mm	000mm
CB	000mm	000mm	000mm	000mm
No./ab/EC	1/2X3/3	1/2X3/2	1/2X3/3	1/2X3/3

LEGEND:
- LINE FOR TOP BAR \ NON EARTH FACE BAR
- LINE FOR BOTTOM BAR \ EARTH FACE BAR

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS & LEVELS ARE IN METERS
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
3. GRADE OF CONCRETE-
4. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% BAR.
5. SHALL BE LAPPED AT ANY LOCATION.
6. 56 x DIA OF BAR FOR FAVORABLE CONDITION.
7. 81 x DIA OF BAR FOR UNFAVORABLE CONDITION.
8. ANCHORAGE LENGTH SHALL BE PROVIDED AS PER CL NO.
9. 56 x DIA OF BAR FOR FAVORABLE CONDITION.
10. 81 x DIA OF BAR FOR UNFAVORABLE CONDITION.
11. ANCHORAGE LENGTH FOR BUNDLED BARS SHALL BE PROVIDED AS PER CL NO. 5.2.4 OF IRC 112-2011.
12. AS PER CL NO. 5.2.4 OF IRC 112-2011
13. LAP LENGTH-LS
14. 40S 40S/3 40S 40S/3 40S
15. 40S 40S/3 40S 40S/3 40S
16. 40S 40S/3 40S 40S/3 40S
17. 40S 40S/3 40S 40S/3 40S
18. 40S 40S/3 40S 40S/3 40S
19. 40S 40S/3 40S 40S/3 40S
20. 40S 40S/3 40S 40S/3 40S
21. 40S 40S/3 40S 40S/3 40S
22. 40S 40S/3 40S 40S/3 40S
23. 40S 40S/3 40S 40S/3 40S
24. 40S 40S/3 40S 40S/3 40S
25. 40S 40S/3 40S 40S/3 40S
26. 40S 40S/3 40S 40S/3 40S
27. 40S 40S/3 40S 40S/3 40S
28. 40S 40S/3 40S 40S/3 40S
29. 40S 40S/3 40S 40S/3 40S
30. 40S 40S/3 40S 40S/3 40S
31. 40S 40S/3 40S 40S/3 40S
32. 40S 40S/3 40S 40S/3 40S
33. 40S 40S/3 40S 40S/3 40S
34. 40S 40S/3 40S 40S/3 40S
35. 40S 40S/3 40S 40S/3 40S
36. 40S 40S/3 40S 40S/3 40S
37. 40S 40S/3 40S 40S/3 40S
38. 40S 40S/3 40S 40S/3 40S
39. 40S 40S/3 40S 40S/3 40S
40. 40S 40S/3 40S 40S/3 40S
41. 40S 40S/3 40S 40S/3 40S
42. 40S 40S/3 40S 40S/3 40S
43. 40S 40S/3 40S 40S/3 40S
44. 40S 40S/3 40S 40S/3 40S
45. 40S 40S/3 40S 40S/3 40S
46. 40S 40S/3 40S 40S/3 40S
47. 40S 40S/3 40S 40S/3 40S
48. 40S 40S/3 40S 40S/3 40S
49. 40S 40S/3 40S 40S/3 40S
50. 40S 40S/3 40S 40S/3 40S
51. 40S 40S/3 40S 40S/3 40S
52. 40S 40S/3 40S 40S/3 40S
53. 40S 40S/3 40S 40S/3 40S
54. 40S 40S/3 40S 40S/3 40S
55. 40S 40S/3 40S 40S/3 40S
56. 40S 40S/3 40S 40S/3 40S
57. 40S 40S/3 40S 40S/3 40S
58. 40S 40S/3 40S 40S/3 40S
59. 40S 40S/3 40S 40S/3 40S
60. 40S 40S/3 40S 40S/3 40S
61. 40S 40S/3 40S 40S/3 40S
62. 40S 40S/3 40S 40S/3 40S
63. 40S 40S/3 40S 40S/3 40S
64. 40S 40S/3 40S 40S/3 40S
65. 40S 40S/3 40S 40S/3 40S
66. 40S 40S/3 40S 40S/3 40S
67. 40S 40S/3 40S 40S/3 40S
68. 40S 40S/3 40S 40S/3 40S
69. 40S 40S/3 40S 40S/3 40S
70. 40S 40S/3 40S 40S/3 40S
71. 40S 40S/3 40S 40S/3 40S
72. 40S 40S/3 40S 40S/3 40S
73. 40S 40S/3 40S 40S/3 40S
74. 40S 40S/3 40S 40S/3 40S
75. 40S 40S/3 40S 40S/3 40S
76. 40S 40S/3 40S 40S/3 40S
77. 40S 40S/3 40S 40S/3 40S
78. 40S 40S/3 40S 40S/3 40S
79. 40S 40S/3 40S 40S/3 40S
80. 40S 40S/3 40S 40S/3 40S
81. 40S 40S/3 40S 40S/3 40S
82. 40S 40S/3 40S 40S/3 40S
83. 40S 40S/3 40S 40S/3 40S
84. 40S 40S/3 40S 40S/3 40S
85. 40S 40S/3 40S 40S/3 40S
86. 40S 40S/3 40S 40S/3 40S
87. 40S 40S/3 40S 40S/3 40S
88. 40S 40S/3 40S 40S/3 40S
89. 40S 40S/3 40S 40S/3 40S
90. 40S 40S/3 40S 40S/3 40S
91. 40S 40S/3 40S 40S/3 40S
92. 40S 40S/3 40S 40S/3 40S
93. 40S 40S/3 40S 40S/3 40S
94. 40S 40S/3 40S 40S/3 40S
95. 40S 40S/3 40S 40S/3 40S
96. 40S 40S/3 40S 40S/3 40S
97. 40S 40S/3 40S 40S/3 40S
98. 40S 40S/3 40S 40S/3 40S
99. 40S 40S/3 40S 40S/3 40S
100. 40S 40S/3 40S 40S/3 40S



Rev.	Date	Description



CLIENT:



EPD CONTRACTOR:
JC-35, SECTOR-111, SALT LAKE
KOLKATA-700048



AUTHORITY ENGINEER:
M/S CHATTANVA PROJECTS
CONSULTANCY PVT. LTD.
IN ASSOCIATION WITH MSPARK
FUTURISTICS & ASSOCIATES
C-5, 2ND FLOOR, BLK TOWER,
SECTOR-4, VAISHALI, GHANABAND-201010.



SAFETY CONSULTANT:
SUVADRA
PP-97, Tankapuri Road,
BBSR-19, Odisha



PROOF CONSULTANT:
SHAMBHAVI TECHNO
SOLUTIONS PVT. LTD.
E-82, Rajesh Kumar Path,
S.K. Puri, Boring Road,
Panna-400001



DESIGN CONSULTANT:
SPS Technocrats Pvt. Ltd.
639 - 041, MID Magapada, Sector 48,
Gununggam, Mangana - 122016.

PROJECT:
Widening to 2 (Two) Lane with Hard
Shoulder of Churachandpur to Tuliail section
of NH 102B from Km 118.850 to Km 130.000
(Package-4A) in the State of Manipur on
Engineering, Procurement & Construction
(EPC) mode.

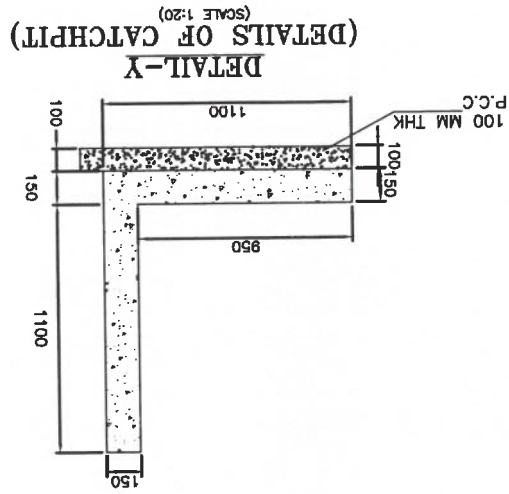
DRAWN: S.R.
DESIGNED: S.S.
CHECKED: A.B.K.
DATE: SEP - 2021

DWG. NO.: GPT/CCT/MA/STR/TYP/ CATCHPIT

SCALE: AS SHOWN

TITLE: TYPICAL DETAILS OF CATCHPIT

REV: R0



Shambhavi Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR



APPROVED

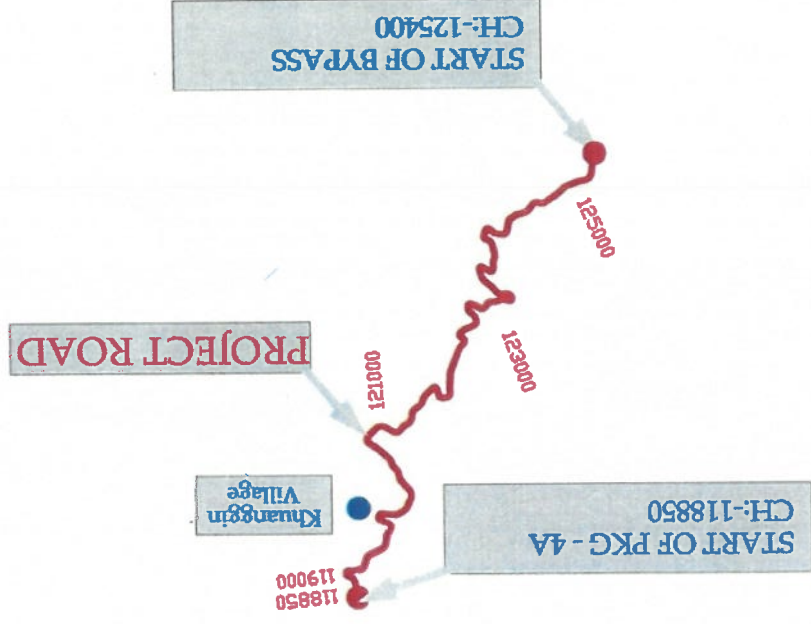


National Highways & Infrastructure Development Corporation Limited

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 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.



TYPICAL MISCELLANEOUS DRAWINGS

PACKAGE - 4A

(Km. 118+850 to Km. 130+126)

JANUARY 2021

APPROVED



EPC CONTRACTOR:

GPT Group

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



SPS Technocrats
Pvt. Ltd.

DESIGN CONSULTANT:

510 & 511, JMD Megapolls, Sector 48,
Gurgaon, Haryana - 122018.



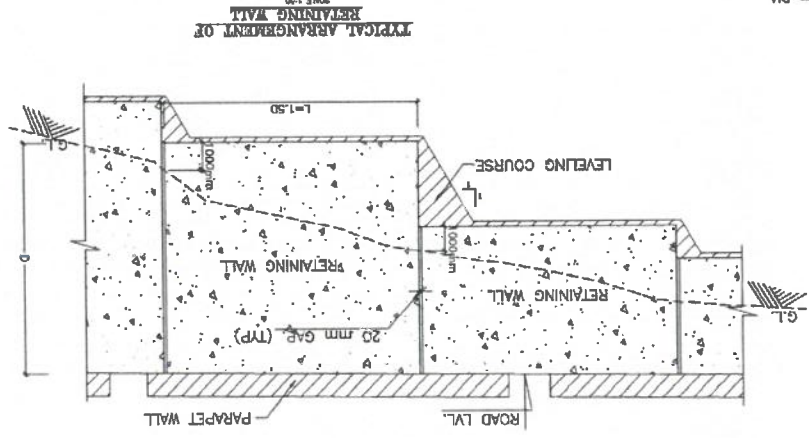
APPROVED
Managing Director
Shamshavi Techno Solutions Pvt. Ltd.



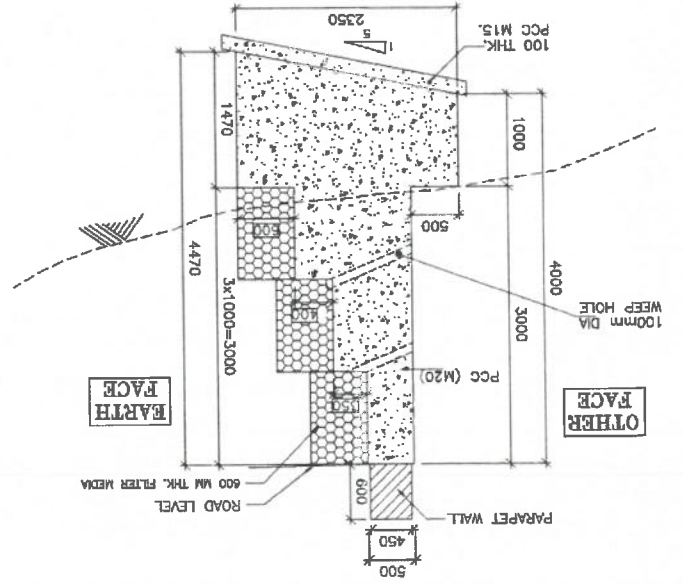
DESIGN DIRECTOR

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

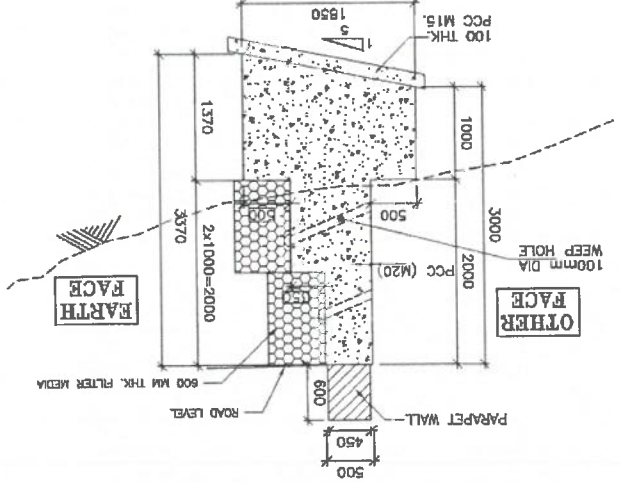
REQUIRED BEARING CAPACITY:



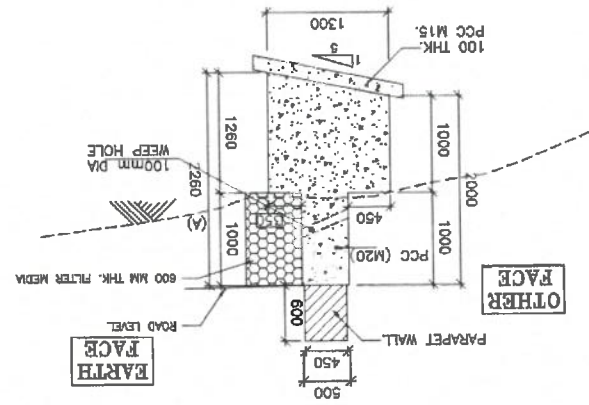
RETAINING WALL (4.0m)



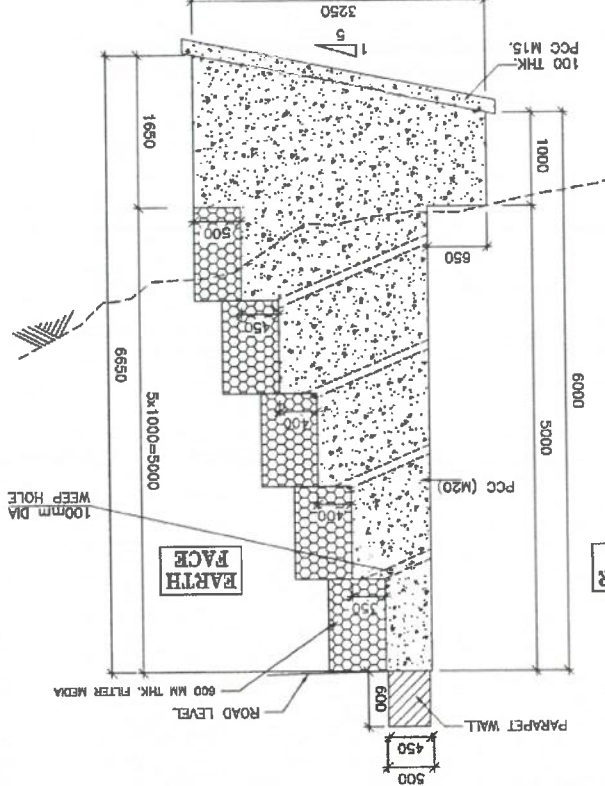
RETAINING WALL (3.0m)



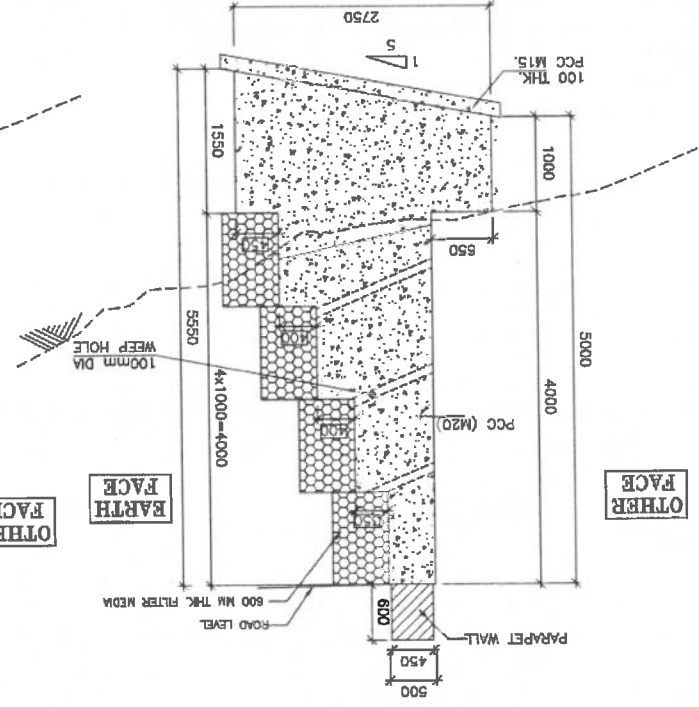
RETAINING WALL (2.0m)

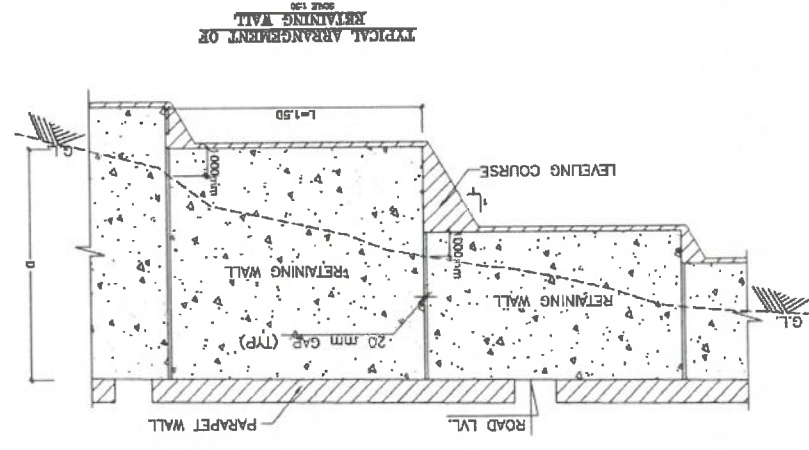
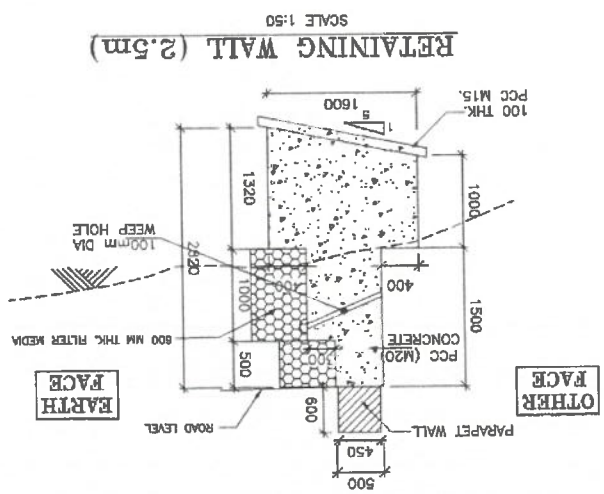
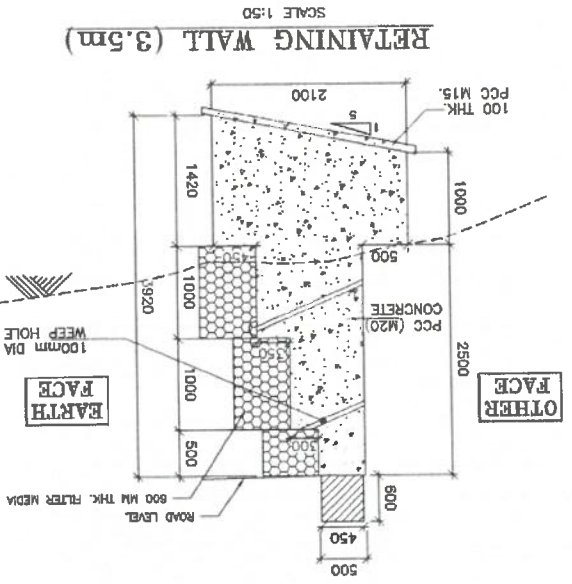
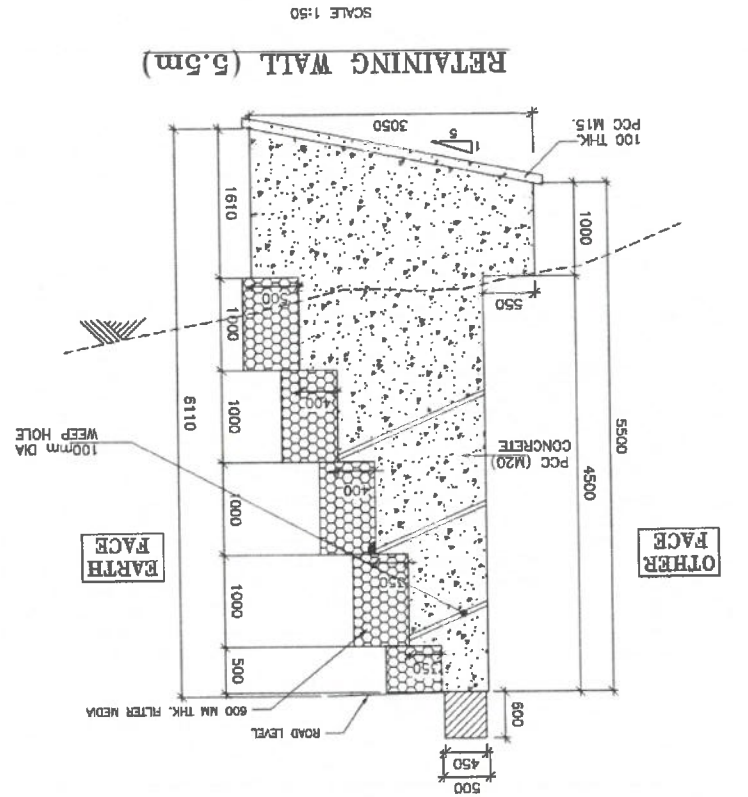


RETAINING WALL (6.0m)



RETAINING WALL (5.0m)





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

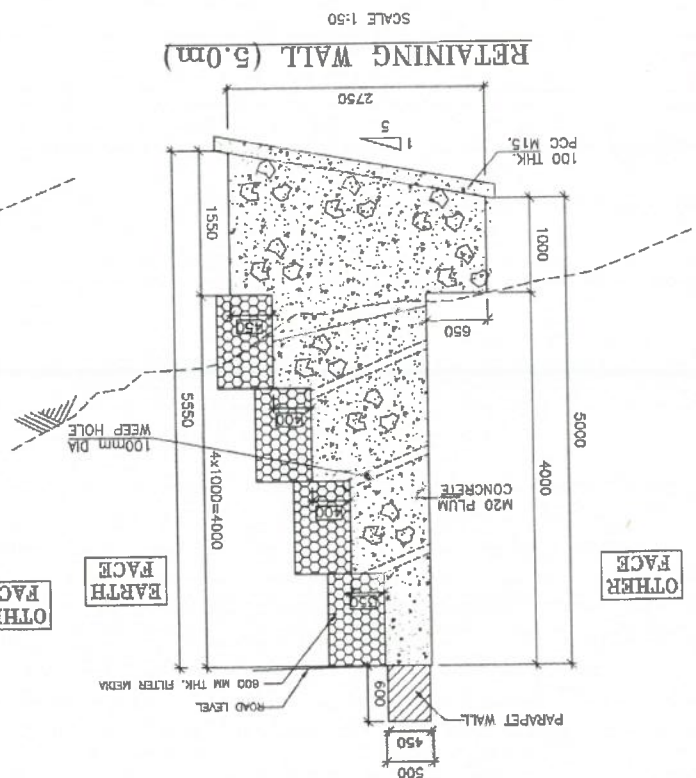
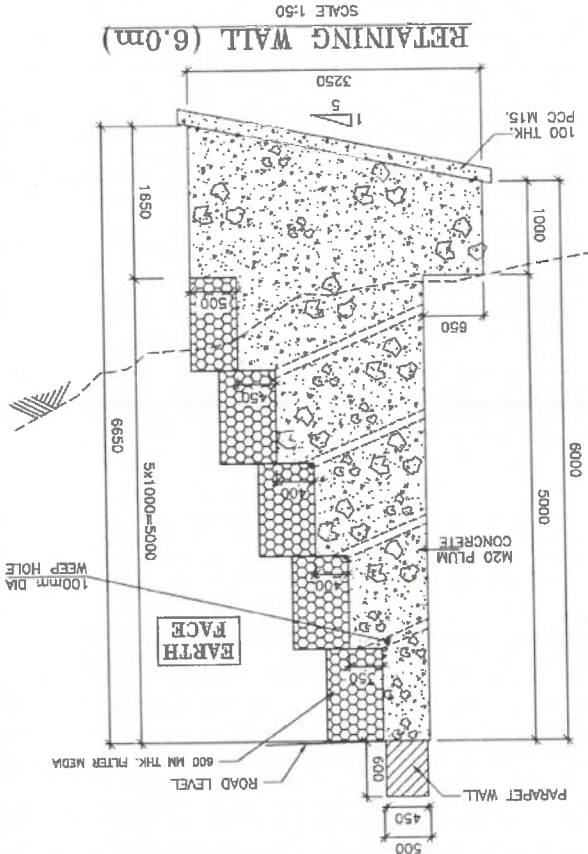
- GENERAL NOTES:-
1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWINGS.
 3. 100MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE G.L./W.L.
 4. FILTER MEDIA OF 600MM THICKNESS CONFORMING 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 $\phi = 35^\circ$, $C=0$
 6. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SON 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 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.

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 PUMPS TO BE USED. THE PUMPS SHALL THEN BE LAID WHILE THE TOP PORTION OF THIS CONCRETE IS STILL GREEN BUT SUPERFICIAL STIFF TO PREVENT COMPLETE SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PUMPS 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.

~~PLUM CONCRETE SPECIFICATIONS:-~~

REQUIRED BEARING CAPACITY:

GENERAL NOTES:-



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 SURFACE 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

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.

Shardul Techno Solutions Pvt. Ltd
Managing Director
APPROVED

DESIGN DIRECTOR

RETAINING WALL (5.5m)

SCALE 1:50

100 TRK-
PCC M15

1000

1610

3050

5

1

30°

8. **CONSTRUCTION OPERATIONS** : DURING CONCRETING PLUMS 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 SURGERANCE OF THE PLUM UNDER THEIR OWN WEIGHT.

9. **TYPICAL ARRANGEMENT OF RETAINING WALL**

10. **LEVELLING COURSE**

11. **MATERIAL** : ALL PLUMS SHALL BE HARD, DURABLE, CLEAN AND FREE FROM SOFT MATERIALS OR LOOSEPIECES OR DELICIOUS SUBSTANCE IN THEM & SHALL NOT HAVE SHARP CORNERS.

12. **WEEP HOLE** : 100mm DIA

13. **CONCRETE** : M20 PLUM CONCRETE

14. **RETAINING WALL** : 5500

15. **LEVELLING COURSE** : 1000

16. **WEEP HOLE** : 100mm DIA

17. **CONCRETE** : M20 PLUM CONCRETE

18. **RETAINING WALL** : 5500

19. **LEVELLING COURSE** : 1000

20. **WEEP HOLE** : 100mm DIA

21. **CONCRETE** : M20 PLUM CONCRETE

22. **RETAINING WALL** : 5500

23. **LEVELLING COURSE** : 1000

24. **WEEP HOLE** : 100mm DIA

25. **CONCRETE** : M20 PLUM CONCRETE

26. **RETAINING WALL** : 5500

27. **LEVELLING COURSE** : 1000

28. **WEEP HOLE** : 100mm DIA

29. **CONCRETE** : M20 PLUM CONCRETE

30. **RETAINING WALL** : 5500

31. **LEVELLING COURSE** : 1000

32. **WEEP HOLE** : 100mm DIA

33. **CONCRETE** : M20 PLUM CONCRETE

34. **RETAINING WALL** : 5500

35. **LEVELLING COURSE** : 1000

36. **WEEP HOLE** : 100mm DIA

37. **CONCRETE** : M20 PLUM CONCRETE

38. **RETAINING WALL** : 5500

39. **LEVELLING COURSE** : 1000

40. **WEEP HOLE** : 100mm DIA

41. **CONCRETE** : M20 PLUM CONCRETE

42. **RETAINING WALL** : 5500

43. **LEVELLING COURSE** : 1000

44. **WEEP HOLE** : 100mm DIA

45. **CONCRETE** : M20 PLUM CONCRETE

46. **RETAINING WALL** : 5500

47. **LEVELLING COURSE** : 1000

48. **WEEP HOLE** : 100mm DIA

49. **CONCRETE** : M20 PLUM CONCRETE

50. **RETAINING WALL** : 5500

51. **LEVELLING COURSE** : 1000

52. **WEEP HOLE** : 100mm DIA

53. **CONCRETE** : M20 PLUM CONCRETE

54. **RETAINING WALL** : 5500

55. **LEVELLING COURSE** : 1000

56. **WEEP HOLE** : 100mm DIA

57. **CONCRETE** : M20 PLUM CONCRETE

58. **RETAINING WALL** : 5500

59. **LEVELLING COURSE** : 1000

60. **WEEP HOLE** : 100mm DIA

61. **CONCRETE** : M20 PLUM CONCRETE

62. **RETAINING WALL** : 5500

63. **LEVELLING COURSE** : 1000

64. **WEEP HOLE** : 100mm DIA

65. **CONCRETE** : M20 PLUM CONCRETE

66. **RETAINING WALL** : 5500

67. **LEVELLING COURSE** : 1000

68. **WEEP HOLE** : 100mm DIA

69. **CONCRETE** : M20 PLUM CONCRETE

70. **RETAINING WALL** : 5500

71. **LEVELLING COURSE** : 1000

72. **WEEP HOLE** : 100mm DIA

73. **CONCRETE** : M20 PLUM CONCRETE

74. **RETAINING WALL** : 5500

75. **LEVELLING COURSE** : 1000

76. **WEEP HOLE** : 100mm DIA

77. **CONCRETE** : M20 PLUM CONCRETE

78. **RETAINING WALL** : 5500

79. **LEVELLING COURSE** : 1000

80. **WEEP HOLE** : 100mm DIA

81. **CONCRETE** : M20 PLUM CONCRETE

82. **RETAINING WALL** : 5500

83. **LEVELLING COURSE** : 1000

84. **WEEP HOLE** : 100mm DIA

85. **CONCRETE** : M20 PLUM CONCRETE

86. **RETAINING WALL** : 5500

87. **LEVELLING COURSE** : 1000

88. **WEEP HOLE** : 100mm DIA

89. **CONCRETE** : M20 PLUM CONCRETE

90. **RETAINING WALL** : 5500

91. **LEVELLING COURSE** : 1000

92. **WEEP HOLE** : 100mm DIA

93. **CONCRETE** : M20 PLUM CONCRETE

94. **RETAINING WALL** : 5500

95. **LEVELLING COURSE** : 1000

96. **WEEP HOLE** : 100mm DIA

97. **CONCRETE** : M20 PLUM CONCRETE

98. **RETAINING WALL** : 5500

99. **LEVELLING COURSE** : 1000

100. **WEEP HOLE** : 100mm DIA

101. **CONCRETE** : M20 PLUM CONCRETE

102. **RETAINING WALL** : 5500

103. **LEVELLING COURSE** : 1000

104. **WEEP HOLE** : 100mm DIA

105. **CONCRETE** : M20 PLUM CONCRETE

106. **RETAINING WALL** : 5500

107. **LEVELLING COURSE** : 1000

108. **WEEP HOLE** : 100mm DIA

109. **CONCRETE** : M20 PLUM CONCRETE

110. **RETAINING WALL** : 5500

111. **LEVELLING COURSE** : 1000

112. **WEEP HOLE** : 100mm DIA

113. **CONCRETE** : M20 PLUM CONCRETE

114. **RETAINING WALL** : 5500

115. **LEVELLING COURSE** : 1000

116. **WEEP HOLE** : 100mm DIA

117. **CONCRETE** : M20 PLUM CONCRETE

118. **RETAINING WALL** : 5500

119. **LEVELLING COURSE** : 1000

120. **WEEP HOLE** : 100mm DIA

121. **CONCRETE** : M20 PLUM CONCRETE

122. **RETAINING WALL** : 5500

123. **LEVELLING COURSE** : 1000

124. **WEEP HOLE** : 100mm DIA

125. **CONCRETE** : M20 PLUM CONCRETE

126. **RETAINING WALL** : 5500

127. **LEVELLING COURSE** : 1000

128. **WEEP HOLE** : 100mm DIA

129. **CONCRETE** : M20 PLUM CONCRETE

130. **RETAINING WALL** : 5500

131. **LEVELLING COURSE** : 1000

132. **WEEP HOLE** : 100mm DIA

133. **CONCRETE** : M20 PLUM CONCRETE

134. **RETAINING WALL** : 5500

135. **LEVELLING COURSE** : 1000

136. **WEEP HOLE** : 100mm DIA

137. **CONCRETE** : M20 PLUM CONCRETE

138. **RETAINING WALL** : 5500

139. **LEVELLING COURSE** : 1000

140. **WEEP HOLE** : 100mm DIA

141. **CONCRETE** : M20 PLUM CONCRETE

142. **RETAINING WALL** : 5500

143. **LEVELLING COURSE** : 1000

144. **WEEP HOLE** : 100mm DIA

145. **CONCRETE** : M20 PLUM CONCRETE

146. **RETAINING WALL** : 5500

147. **LEVELLING COURSE** : 1000

148. **WEEP HOLE** : 100mm DIA

149. **CONCRETE** : M20 PLUM CONCRETE

150. **RETAINING WALL** : 5500

151. **LEVELLING COURSE** : 1000

152. **WEEP HOLE** : 100mm DIA

153. **CONCRETE** : M20 PLUM CONCRETE

154. **RETAINING WALL** : 5500

155. **LEVELLING COURSE** : 1000

156. **WEEP HOLE** : 100mm DIA

157. **CONCRETE** : M20 PLUM CONCRETE

158. **RETAINING WALL** : 5500

159. **LEVELLING COURSE** : 1000

160. **WEEP HOLE** : 100mm DIA

161. **CONCRETE** : M20 PLUM CONCRETE

162. **RETAINING WALL** : 5500

163. **LEVELLING COURSE** : 1000

164. **WEEP HOLE** : 100mm DIA

165. **CONCRETE** : M20 PLUM CONCRETE

166. **RETAINING WALL** : 5500

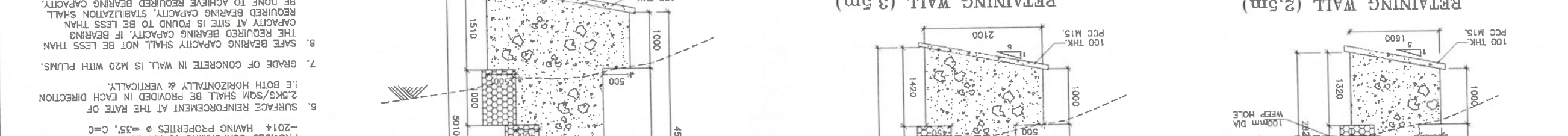
<

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.

PLUM CONCRETE SPECIFICATIONS:-

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

9. FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE
BE DONE TO MONITOR NECESSARY DESIGN OR
ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

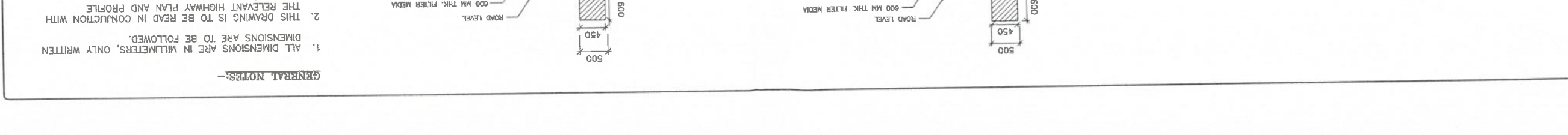


3. 100MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L/W.L.

4. FILTER MEDIA OF 600MM THICKNESS CONFORMING TO APPENDIX 6 OF IRC: 78-2014.

5. BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC: 78

DRAWINGS.

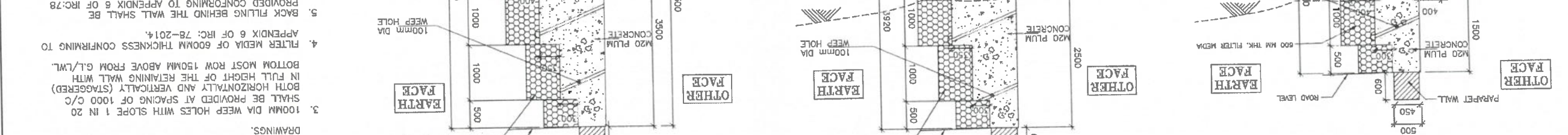


1. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN REQUIRED BEARING CAPACITY, IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN REQUIRED BEARING CAPACITY, STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.

2. GRADE OF CONCRETE IN WALL IS M20 WITH PLUMS.

3. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SGM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.

4. HAVING PROPERTIES $\phi = 35$, $C = 0$



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 OF THE CONCRETE SHALL BE ABOUT HALF WEIGHT. THESE PLUMS SHALL BE ABOUT HALF SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PLUMS SHALL BE ABOUT HALF NEXT LAYER OF THE CONCRETE. NO PLUM SHALL BE USED FOR CONCRETE LAID UNDER WATER.

Shardlow Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR

SCALE 1:50

RETAINING WALL (5.5m)



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

PLUM CONCRETE SPECIFICATIONS:-

- 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 MAXIMUM DIMENSION OF THE MEMBERS

The diagram illustrates a cross-section of a retaining wall. It features two main sections: a left section labeled 'RETAINING WALL' and a right section labeled 'RETAINING WALL'. The left section includes a 'PARAPET WALL' on top. The right section shows a sloped face labeled 'EARTH FACE'. The ground level is marked as 'G.L.'. Dimensions include a total height of 6000mm and a width of 2000mm. A note indicates '20 mm G.C. (TYP)' for the concrete thickness.

RETAINING WALL (2.5m)

SCALE 1:50

RETAINING WALL (3.5m)

SCALE 1:50

RETAINING WALL (4.5m)

SCALE 1:50

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; STABILIZATION SHALL BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY.

ROAD LEVEL

500

450

8

PCC M/S.

100 THK.

2550

1

1. BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78 -2014 HAVING PROPERTIES $\phi = 35^\circ$, $C=0$

2. SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.

3. GRADE OF CONCRETE IN WALL IS M20 WITH PLUMS.

4. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THE REQUIRED BEARING CAPACITY, IF BEARING CAPACITY AT SITE IS FOUND TO BE LESS THAN CAPACITY OF STANDARD SHALE.

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

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH

GENERAL NOTES:-

ROAD LEVEL

ROAD LEVEL

AUTHORITY ENGINEER:
 M/S CHATANYA PROJECTS
 CONSULTANCY PVT.LTD.
 IN ASSOCIATION WITH MSP&K
 FUTURISTICS AND ASSOCIATES
 C-2ND FLOOR, P&T TOWER,
 SECTOR-4,VASHALI, GHATYAAD-201010.

SUYADRA
CORPORATE
SAFETY CONSULTANT

15
15

PO-87, Tankapatti Road,
BBSR-18, Odisha

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

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

PROJECT:
Whodging to 2 (Two) Lane with Hard
outside of Churchard to Tulley section
NH-102B from Km 118.850 to Km 130.000
(Package-4A) in the State of Manipal on
Engineering, Procurement & Construction
(EPC) mode.

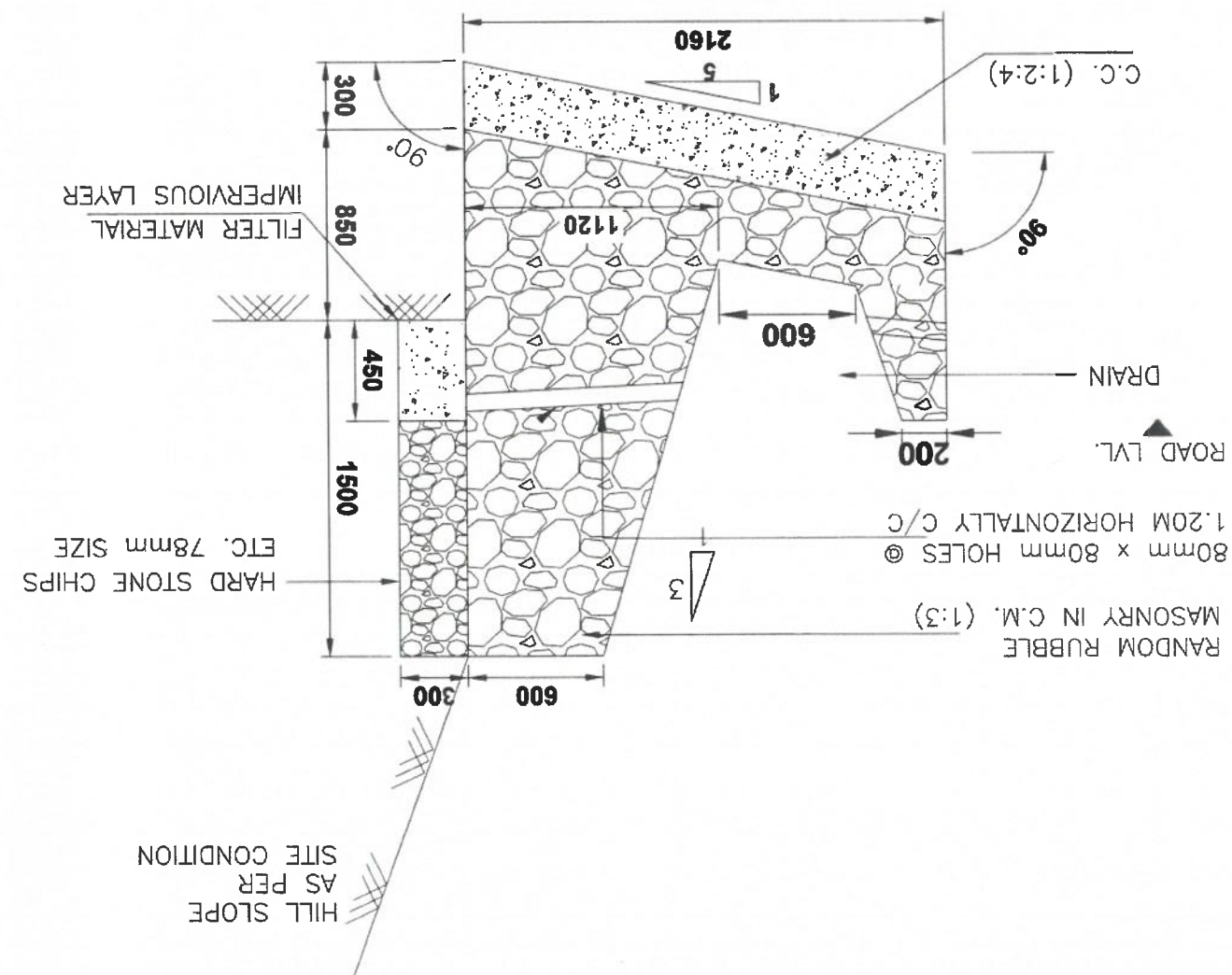
DATE: JAN - 2021			DRG. NO: GP
CHECKED	AB.K		SCALE: A
DESIGNED	A.B		TITLE:
DRAWN	B.R		

BREST WALL DETAIL	
SS SHOWN	1 OF 1
1/CT/AA/STR/MISC/BW/05	
REV:	RD

DESIGN DIRECTOR

Strathtech Techno Solutions Pvt. Ltd.
Managing Director
APPROVED

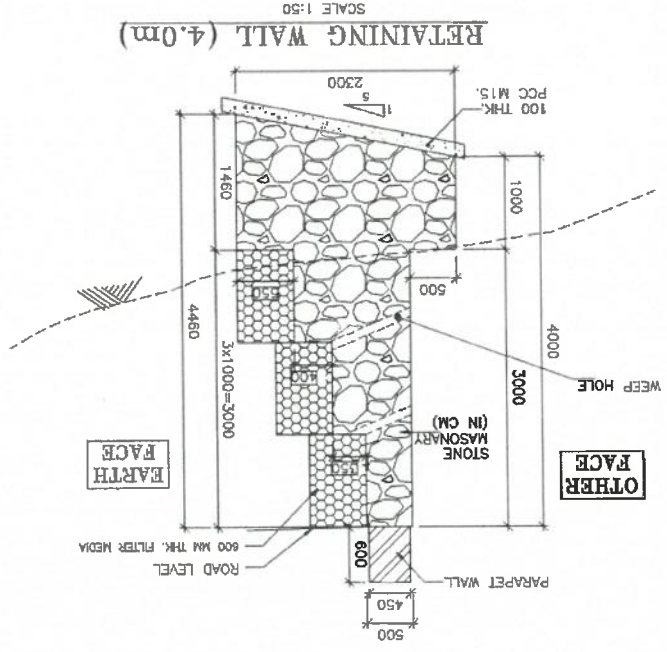
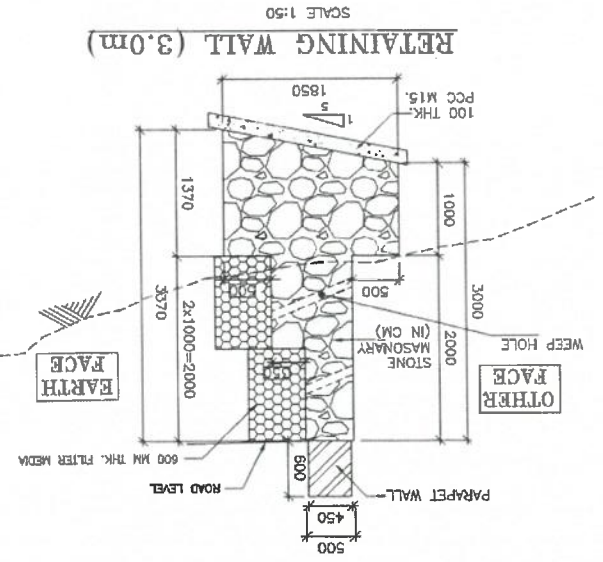
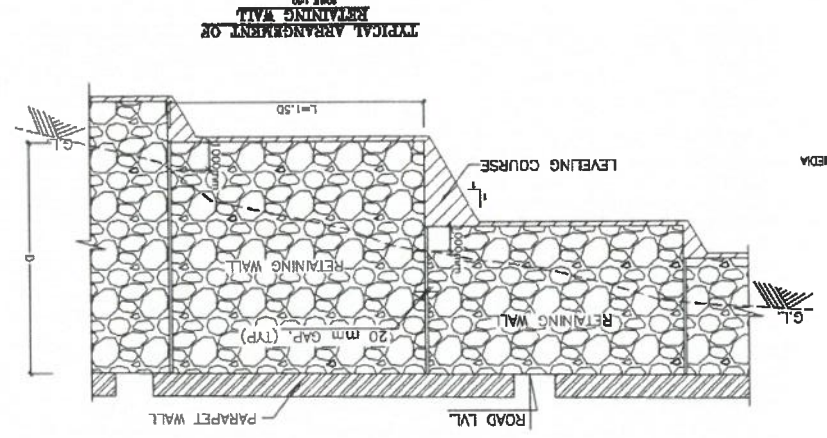
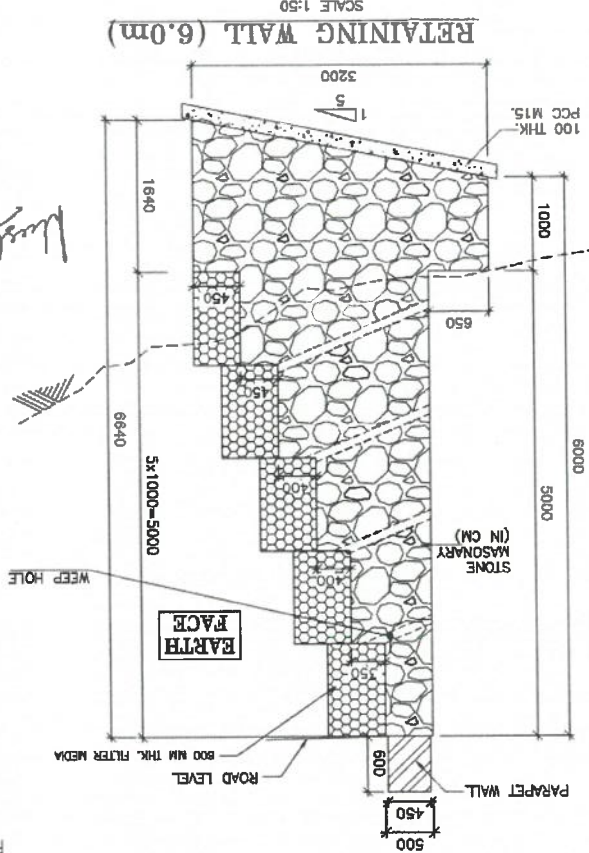
(SCALE 1:25)



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 DEEP 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/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 FINISHING.



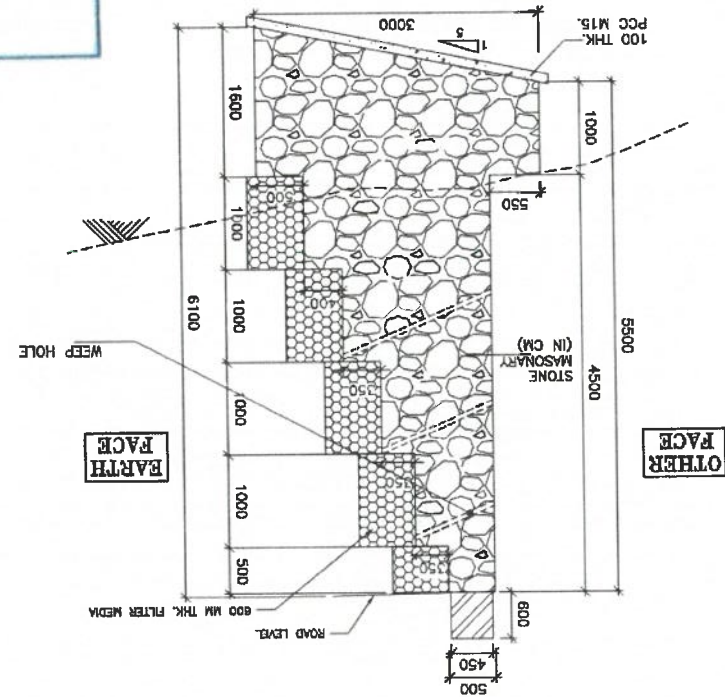
1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY WALL WITH BOTTOM MOST ROW 150MM 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 $\phi = 35^{\circ}$, $C=0$
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. BEING IT TO IMMEDIATE NOTICE OF ANY AMBIGUITY FOUND IN DRAWING OR AT SITE ENGINEER-IN-CHARGE OF ANY EXECUTION.

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

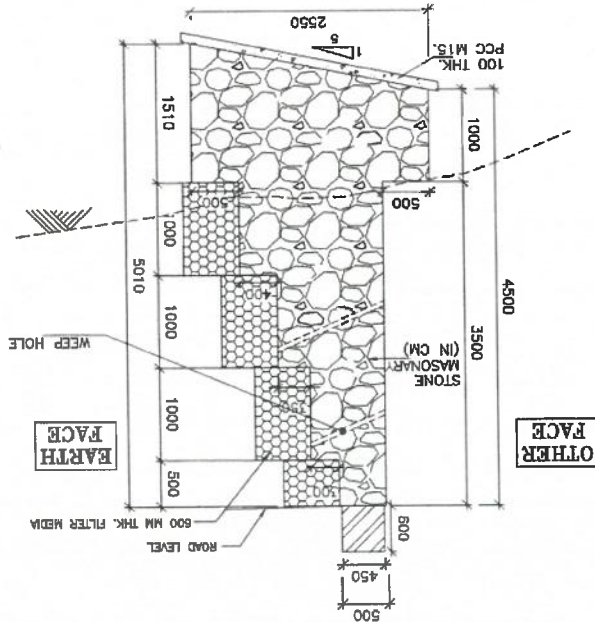
Smartway Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

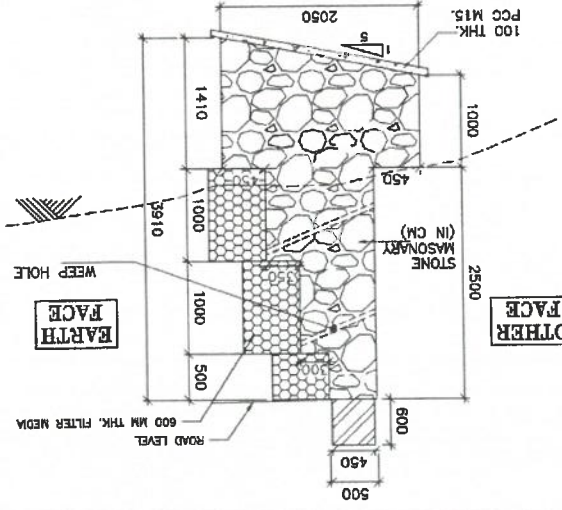
RETAINING WALL (5.5m)



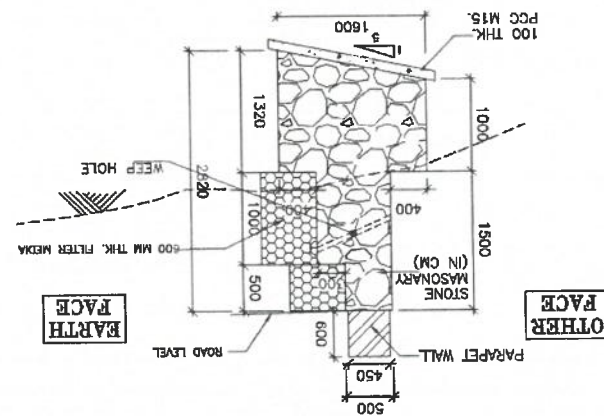
RETAINING WALL (4.5m)



RETAINING WALL (3.5m)



RETAINING WALL (2.5m)



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.

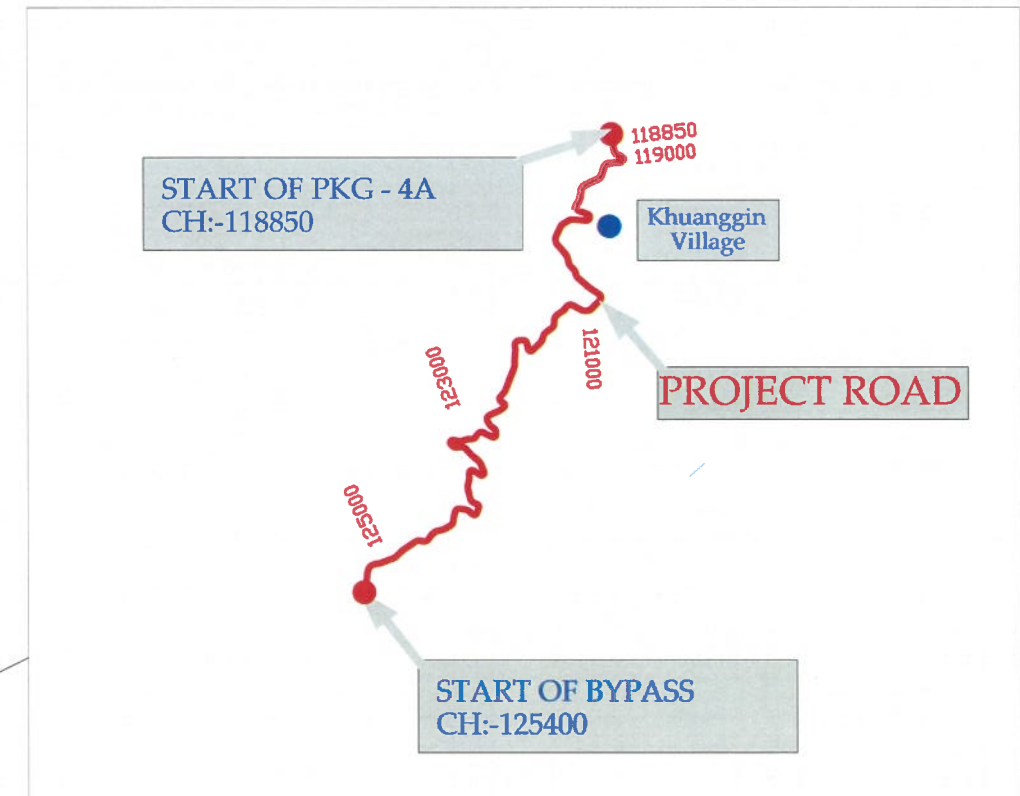
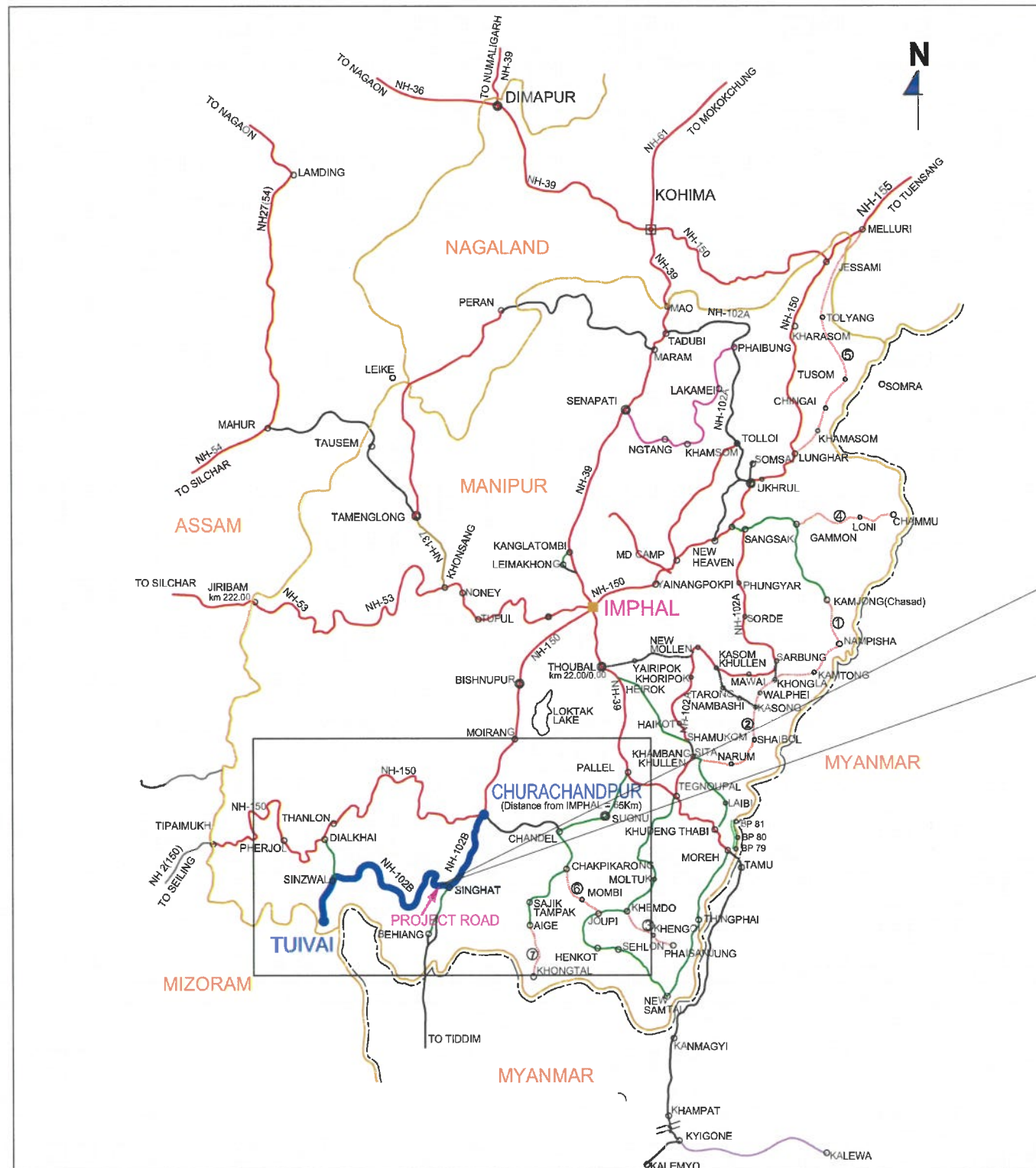
H MAX. (m)	2.5	3.5	4.5	5.5
REQUIRED BEARING CAPACITY (T/sqm)	12	16	20	25

REQUIRED BEARING CAPACITY:

- ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN
DIMENSIONS ARE TO BE FOLLOWED.
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
THE RELEVANT HIGHWAY PLAN AND PROFILE
DRAWINGS.
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.
FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO
APPENDIX 6 OF IRC- 78-2014
BACK FILLING BEHIND THE RETAINING WALL SHALL
BE PROVIDED CONFORMING TO APPENDIX 6 OF
IRC-78 -2014 HAVING PROPERTIES $\phi = 35$, C=0
RUBBLE STONE MASONARY IN CEMENT MORTAR
(1:3).
SAFE BEARING CAPACITY SHALL NOT BE LESS THAN
THE REQUIRED BEARING CAPACITY, IF BEARING
CAPACITY AT SITE IS FOUND TO BE LESS THAN
BE DONE TO ACHIEVE REQUIRED BEARING CAPACITY,
FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE
BRING IT TO IMMEDIATE NOTICE OF
ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

GENERAL NOTES:-

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.



**TYPICAL MISCELLANEOUS DRAWINGS
PACKAGE - 4A**

(Km. 118+850 to Km. 130+126)

JANUARY 2021

APPROVED



EPC CONTRACTOR:



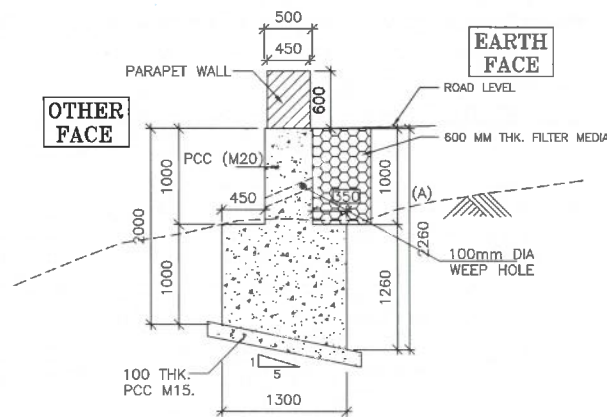
JC - 25, Sector - III, Salt Lake,
Kolkata - 700098.

DESIGN CONSULTANT:



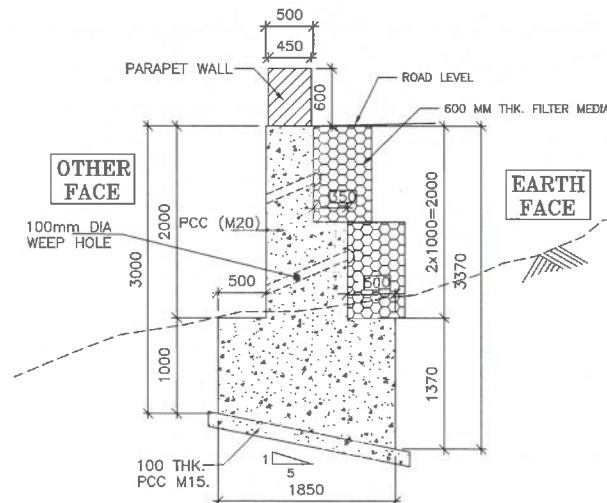
**SPS Technocrats
Pvt. Ltd.**

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



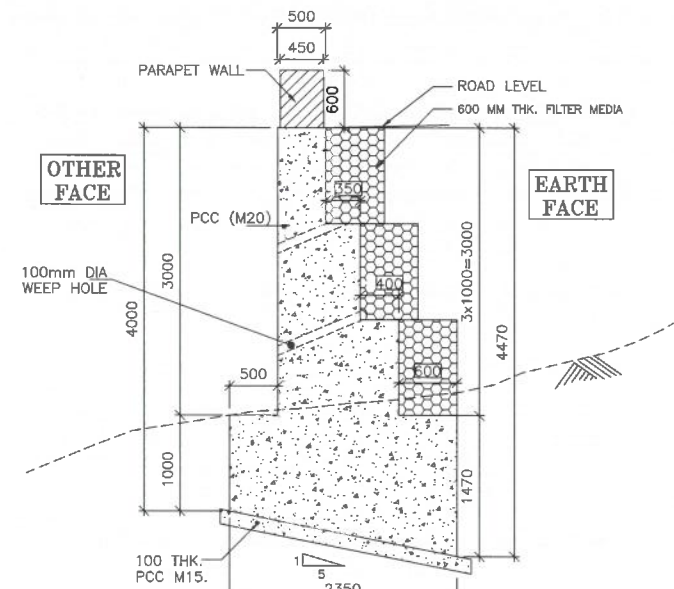
RETAINING WALL (2.0m)

SCALE 1:50



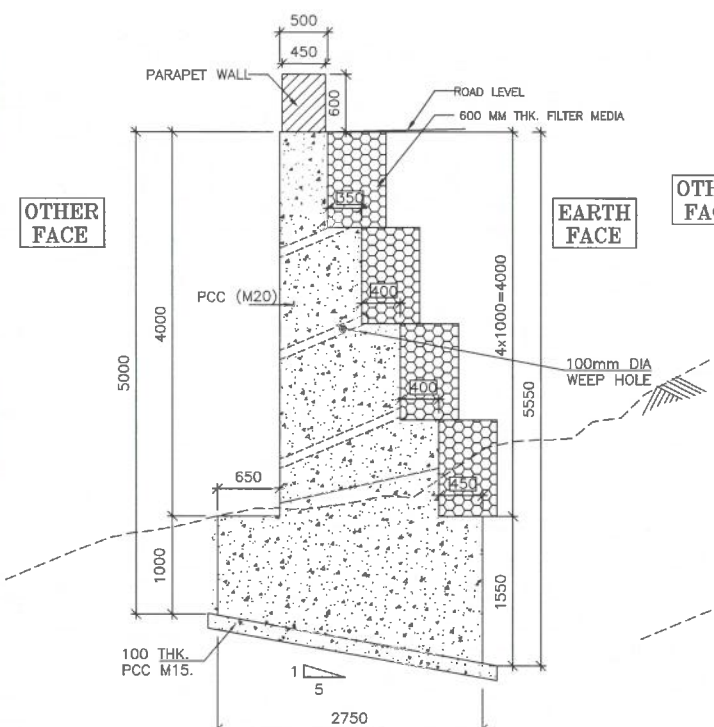
RETAINING WALL (3.0m)

SCALE 1:50



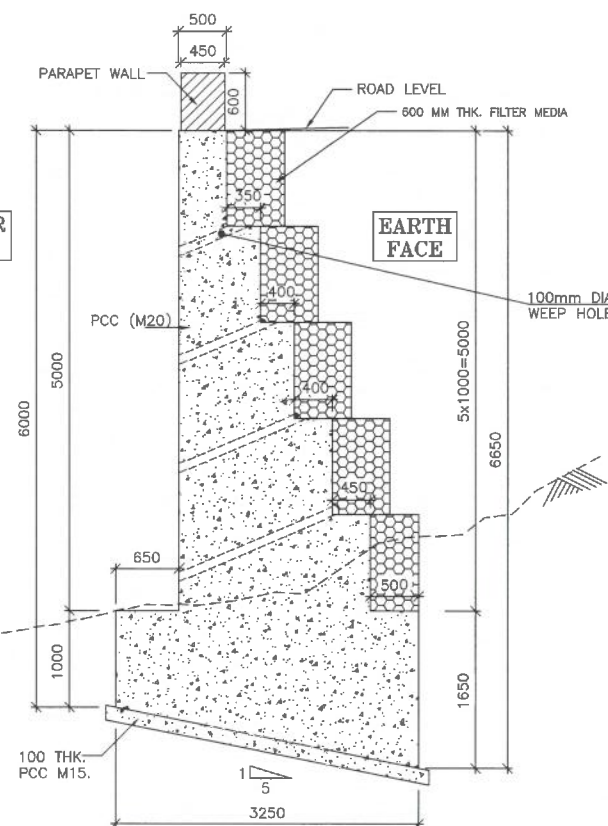
RETAINING WALL (4.0m)

SCALE 1:50



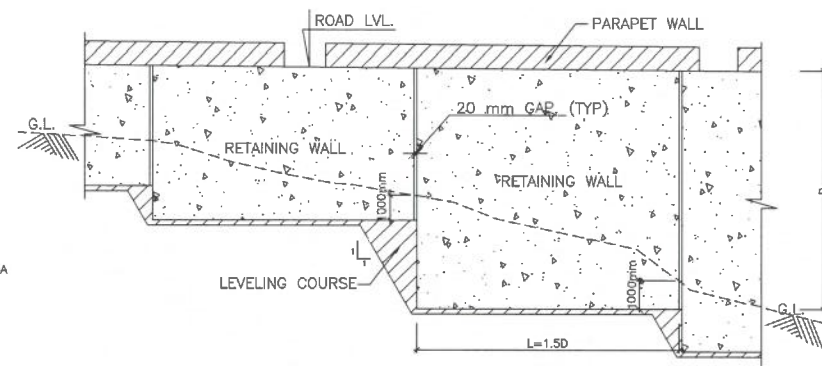
RETAINING WALL (5.0m)

SCALE 1:50



RETAINING WALL (6.0m)

SCALE 1:50



TYPICAL ARRANGEMENT OF RETAINING WALL

SCALE 1:50

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 CONJUNCTION 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 $\phi = 35^\circ$, $C=0$
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)	2.0	3.0	4.0	5.0	6.0
REQUIRED BEARING CAPACITY (T/sqm)	10	13	18	21	25

Shambhavi Techno Solutions Pvt. Ltd

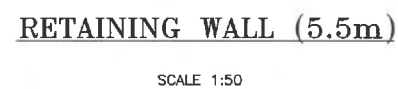
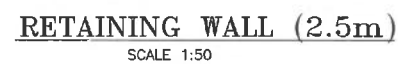
[Signature]

Managing Director

APPROVED



Rev.	Date	Description	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN:	S.R.	TITLE:	SCALE:	01 OF 02	REV:
			M/S CHAITANYA PROJECTS CONSULTANCY PVT. LTD. IN ASSOCIATION WITH MSPARK FUTURESTICS AND ASSOCIATES	GPT	M/S CHAITANYA PROJECTS CONSULTANCY PVT. LTD. IN ASSOCIATION WITH MSPARK FUTURESTICS AND ASSOCIATES	SUVADRA CONSULTANTS	SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.	SPS Technocrats Pvt. Ltd.	Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DESIGNED	A.S	RETAINING WALL (PCC)	AS SHOWN		R0
			JC - 25, Sector - III, Salt Lake, Kolkata - 700098.		C-5/2ND FLOOR, R.K TOWER, SECTOR-4(VAISHALI), GHANABAD-201010.	PP-97, Tankapuri Road, BBSR-18, Odisha	E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001	Gungam, Haryana - 122018.		CHECKED	AB.K				
										DATE: JAN - 2021			DRG.NO:GPT/CCT/4A/STR/MISC/RW/01		

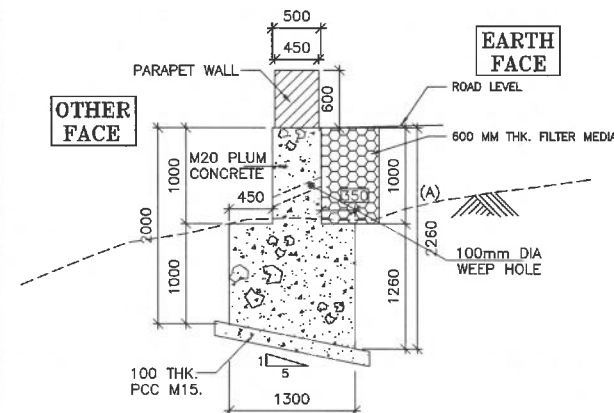



Managing Director

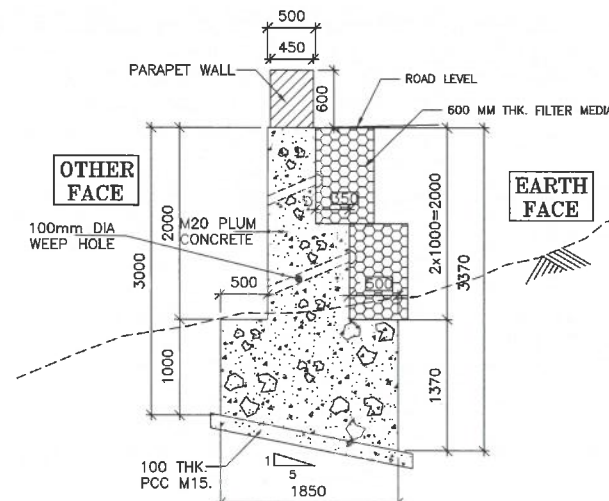
APPROVED

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

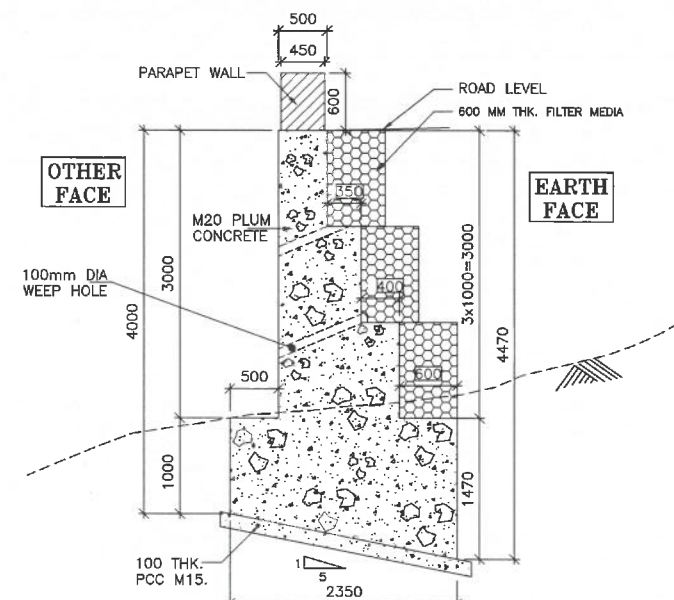
Rev.	Date	Description	CLIENT: 	EPC CONTRACTOR:  JC - 25, Sector - III, Salt Lake, Kolkata - 700098.	AUTHORITY ENGINEER:  MS CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-2ND FLOOR, PLK TOWER, SECTOR-VAISHALI, GHAZIABAD-201010.	SAFETY CONSULTANT:  PP-87, Tankapuri Road, BSR-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:  Working on 2(Two) Lane with Hard shoulder of Churachandpur to Tuvaiv section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DRAWN: S.R DESIGNED: A.S CHECKED: AB.K	TITLE: RETAINING WALL (PCC) SCALE: AS SHOWN DATE: JAN - 2021 DRG.NO: GPT/CCT/4A/STR/MISC/RW/02	REV: 02 OF 02 RO
------	------	-------------	--	--	--	--	---	--	--	--	---	-----------------------------------



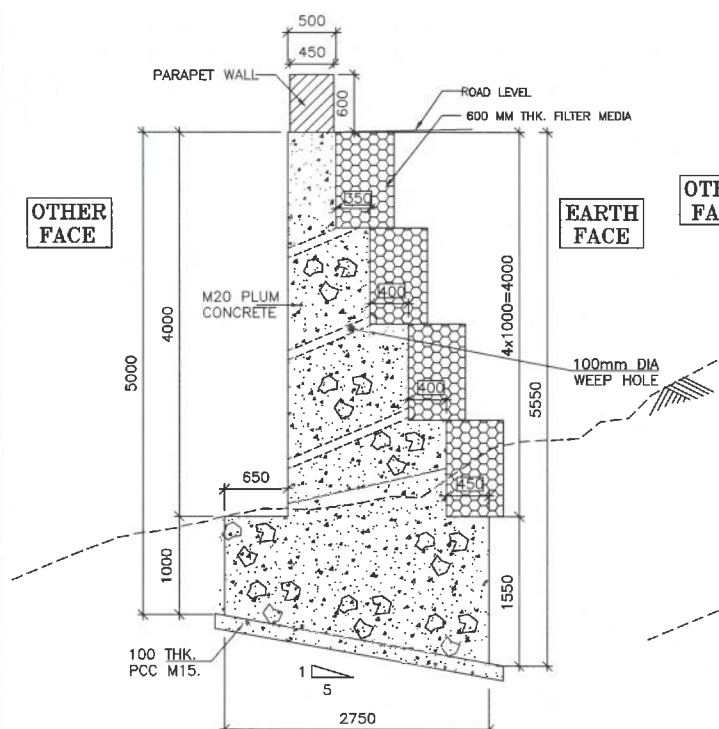
RETAINING WALL (2.0m)
SCALE 1:50



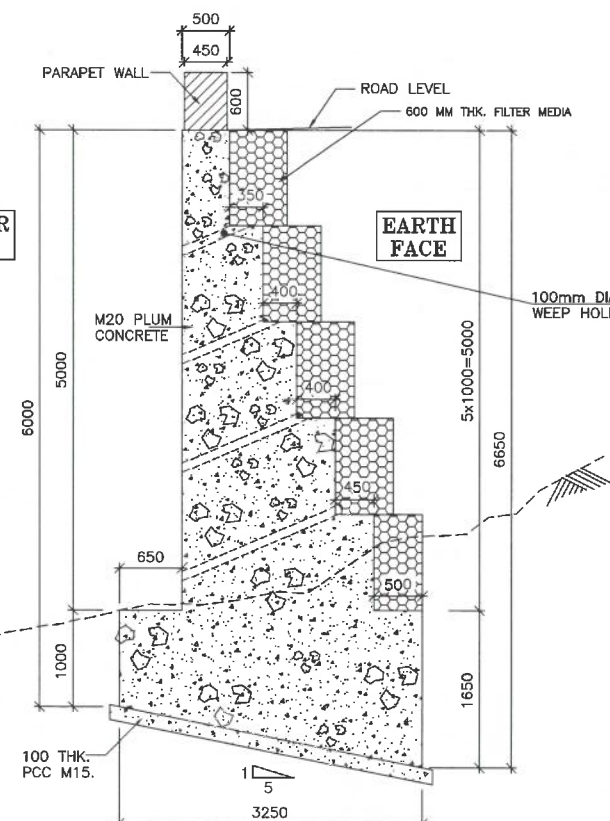
RETAINING WALL (3.0m)
SCALE 1:50



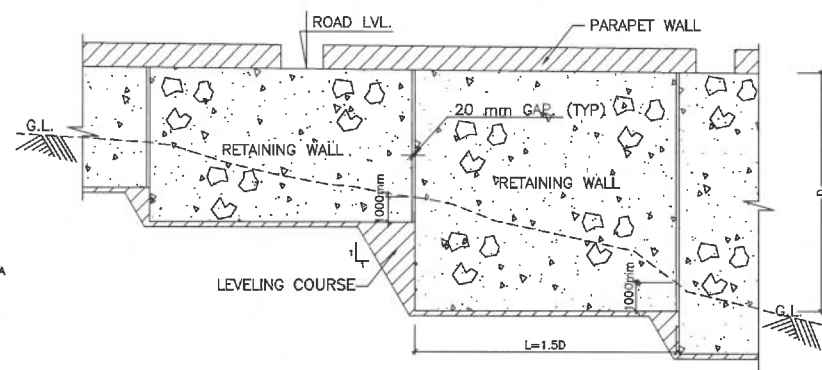
RETAINING WALL (4.0m)
SCALE 1:50



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:-

- ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
- 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.
- FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78-2014.
- BACK FILLING BEHIND THE WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC: 78-2014 HAVING PROPERTIES $\phi = 35^\circ$, $C=0$
- SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
- GRADE OF CONCRETE IN WALL IS M20 WITH PLUMS.
- 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.
- FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

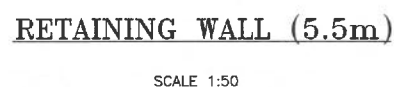
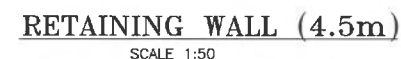
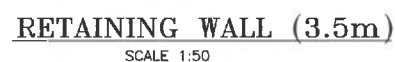
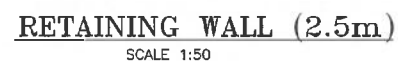
REQUIRED BEARING CAPACITY :

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:-

- 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.
- 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.
- 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.
- 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.
- 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:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROJECT CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN:	CHECKED:	DATE:	TITLE:	SCALE:	REV:
			MAIDCL	GPT	M/S CHAITANYA PROJECTS CONSULTANCY PVT. LTD.	SUVADRA	SHAMBHAVI TECHNO SOLUTIONS PVT. LTD.	SPS Technocrats Pvt. Ltd.	Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuwai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	A.S	AB.K	JAN - 2021	RETAINING WALL (PLUM CONCRETE)	AS SHOWN	01 OF 02
				JC - 25, Sector - III, Salt Lake, Kolkata - 700098.	C-5, 2ND FLOOR, R.K. TOWER, SECTOR-4, VAISHALI, GHATAKOT-201010.	PP-97, Tankapuri Road, BBSR-18, Odisha	E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001	# 510 & 511, JMD Megapole, Sector 48, Gurgaon, Haryana - 122018.					DRG. NO: GPT/CCT/4A/STR/MISC/RW/03		R0




Managing Director

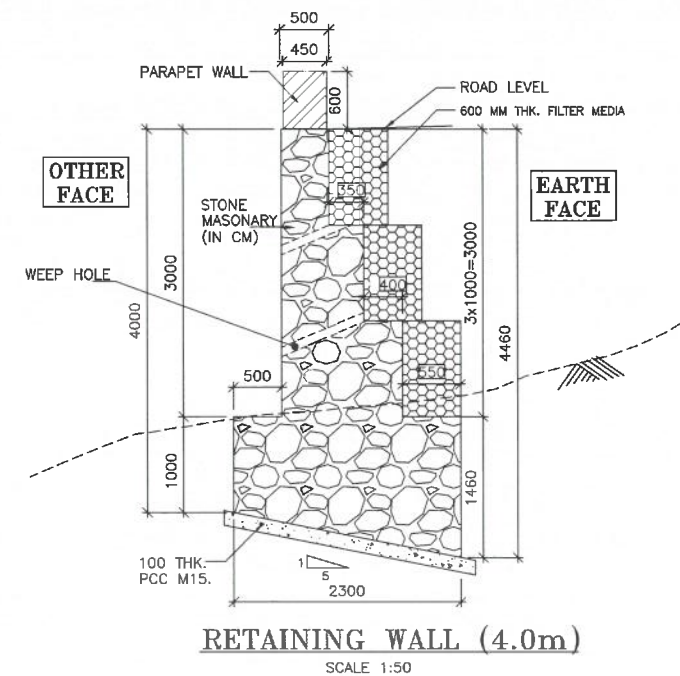
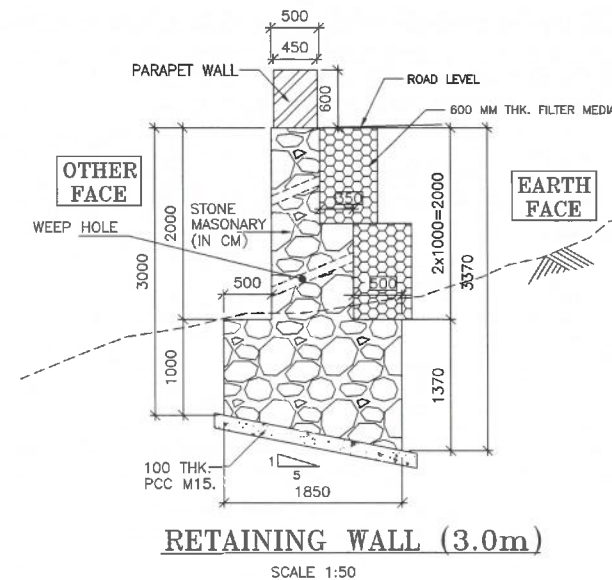
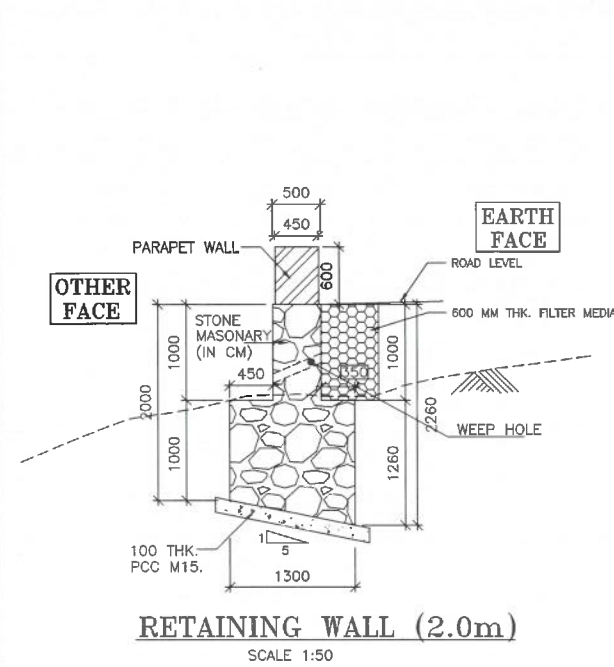
APPROVED

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. 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 $\phi = 35^\circ$, $C=0$
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.

H MAX. (m)	2.5	3.5	4.5	5.
REQUIRED BEARING CAPACITY (T/sqm)	12	16	20	24

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.

TITLE: RETAINING WALL (PLUM CONCRETE		REV:
SCALE: AS SHOWN	02 OF 02	R0
DRG. NO: GPT/CCT/4A/STR/MISC/RW/04		



GENERAL NOTES:-

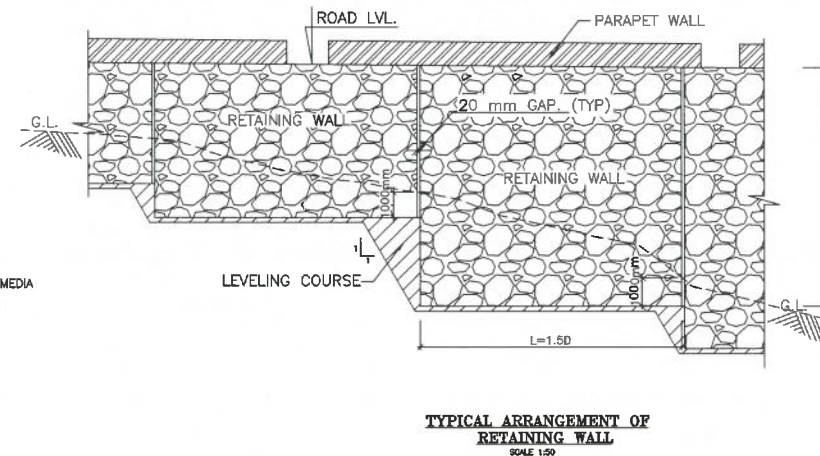
1. ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
3. 80x150 mm or 150MM DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALLY AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE FROM G.L.
4. FILTER MEDIA OF 600MM THICKNESS CONFORMING 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 $\phi = 35^\circ$, $C=0$
6. RUBBLE STONE MASONRY 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:-

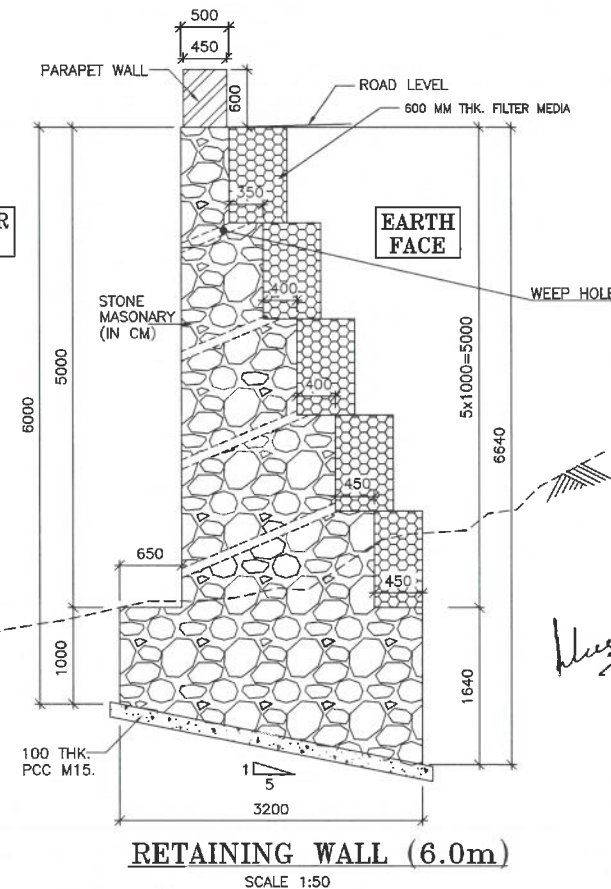
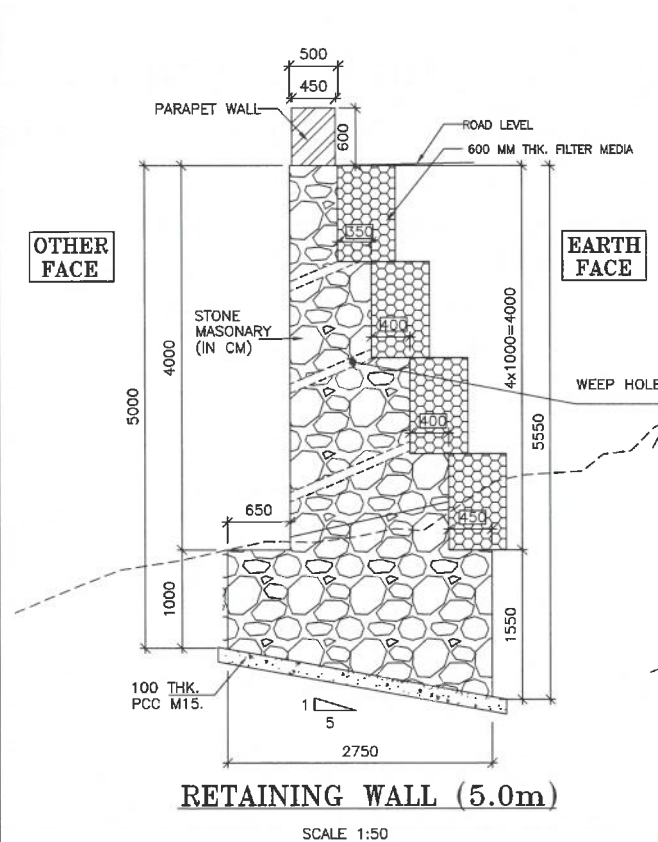
1. THE STONE TO BE USED FOR STONE MASONRY SHOULD BE HARD, TOUGH AND DURABLE.
2. THE PROPERLY WETTED STONE SHOULD BE USED TO AVOID MORTAR MOISTURE BEING SUCKED.
3. BEFORE LAYING THE STONE IN THE WALL, SHAPE AND DRESS IT SO THAT IT WILL NOT LOOSEN AFTER IT IS PLACED.
4. NO DRESSING OR HAMMERING WHICH WILL 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.



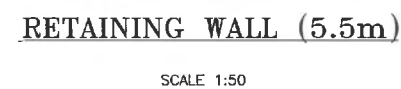
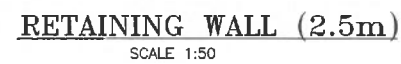
Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

APPROVED



Rev.	Date	Description	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN:	S.R.	TITLE:	SCALE:	REV:
			MAIDEL	GPT	M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-5, 2ND FLOOR, R.K. TOWER, SECTOR-4, VASAHALI, GHANABAD-201610.	SUVADRA	SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-62, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001	SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapolis, Sector 48, Gurgaon, Haryana - 122018.	Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DESIGNED: A.S.		RETAINING WALL (RRM)	AS SHOWN	01 OF 02
				JC - 25, Sector - III, Salt Lake, Kolkata - 700098.		PP-97, Tankapani Road, BBSR-18, Odisha				CHECKED: AB.K				RD
										DATE: JAN - 2021			DRG. No: GPT/CCT/4A/STR/MISC/RW/06	



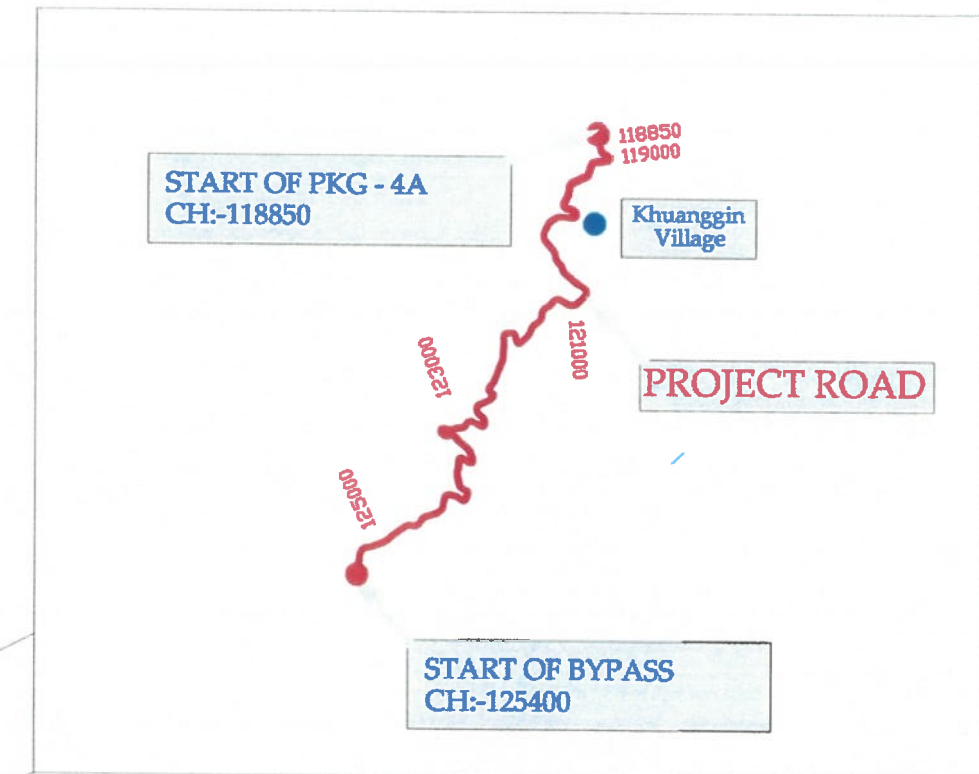
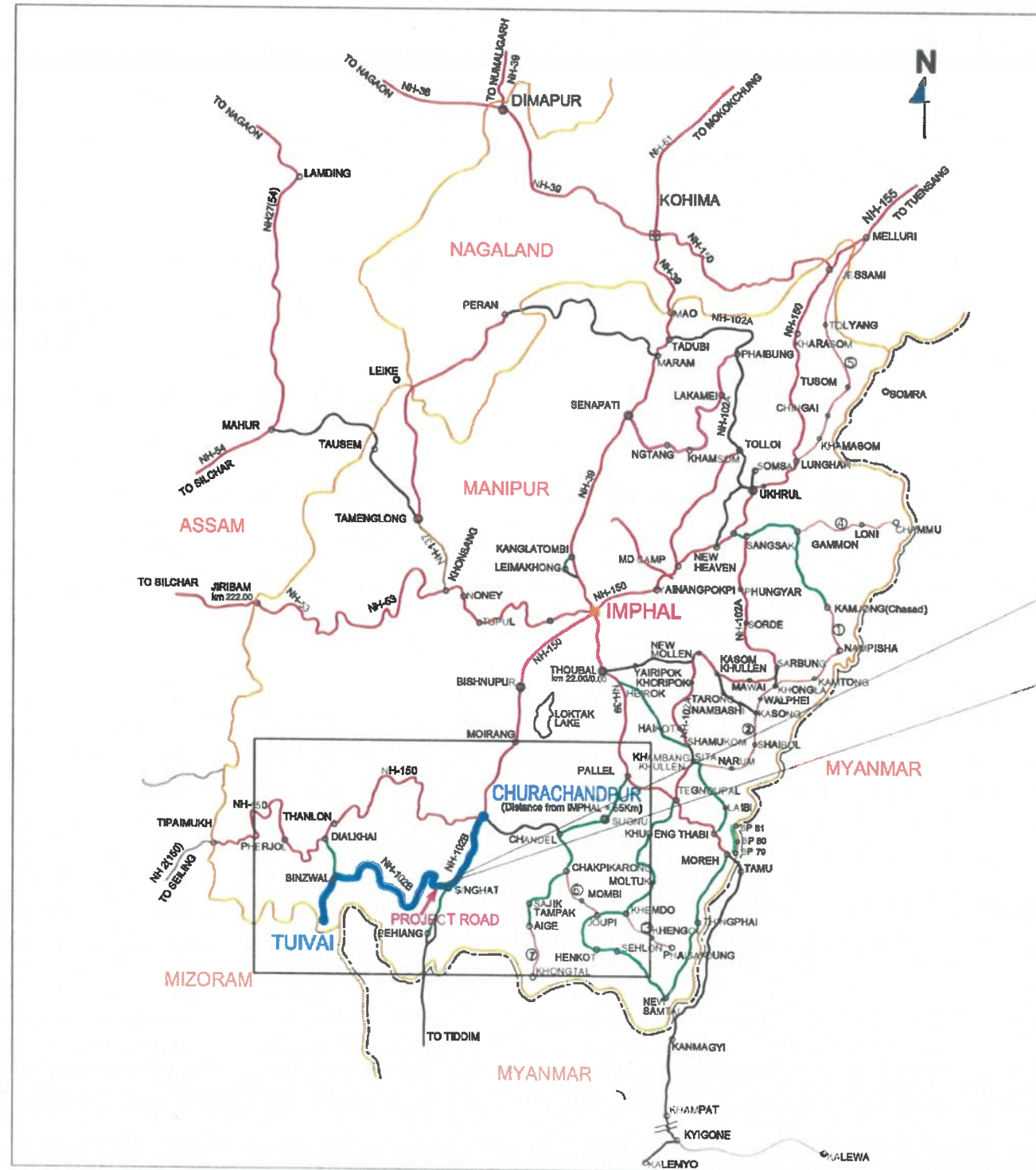
1. THE STONE TO BE USED FOR STONE MASONRY SHOULD BE HARD, TOUGH AND DURABLE.
2. THE PROPERLY WETTED STONE SHOULD BE USED TO AVOID MORTAR MOISTURE BEING SUCKED.
3. BEFORE LAYING THE STONE IN THE WALL, SHAPE AND DRESS IT SO THAT IT WILL NOT LOOSEN AFTER IT IS PLACED.
4. NO DRESSING OR HAMMERING WHICH WILL 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:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN	S.R	TITLE: RETAINING WALL RRM	REV: RO	
				 JC - 25, Sector - III, Salt Lake, Kolkata - 700098.	 M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-2ND FLOOR, R.K TOWER, SECTOR-4,VASAKHALI, GHAZIABAD-201010.	 PP-87, Tankapani Road, Rupnagar-18, Odisha	 SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, P-3 Puri, Boring Road, Patna-800001	 SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapole, Sector 48, Gurgaon, Haryana - 122018.	Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuvali section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DESIGNED A.S	SCALE: AS SHOWN	02 OF 02		
										CHECKED A.B.K				
										DATE: JAN - 2021		DRG.NO: GPT/CCT/4A/STR/MISC/RW/07		



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

Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.



**DRAWING OF TOE WALL
PACKAGE - 4A
MARCH 2022**



EPC CONTRACTOR:

DESIGN CONSULTANT:

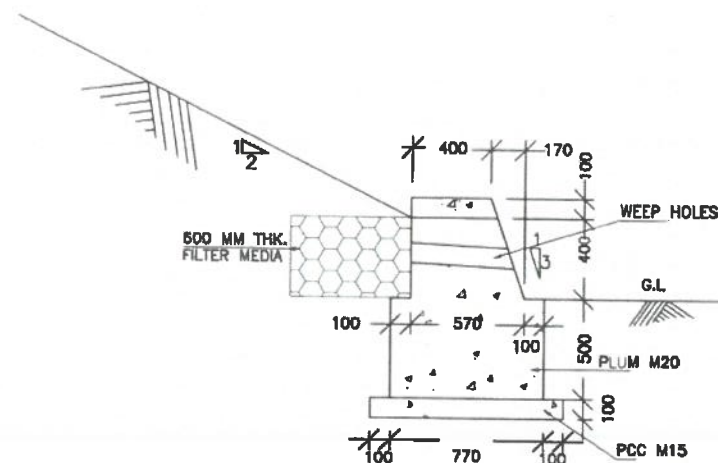
D:\TUSHANT\Manipur package-4A\GPT.jpg

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



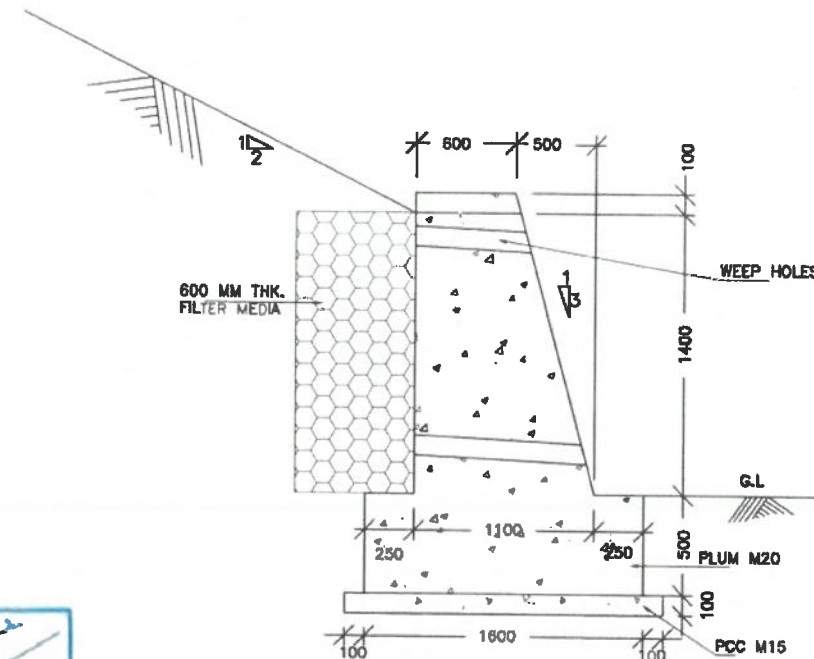
**SPS Technocrats
Pvt. Ltd.**

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



TOE WALL (1.0m)
SCALE 1:25

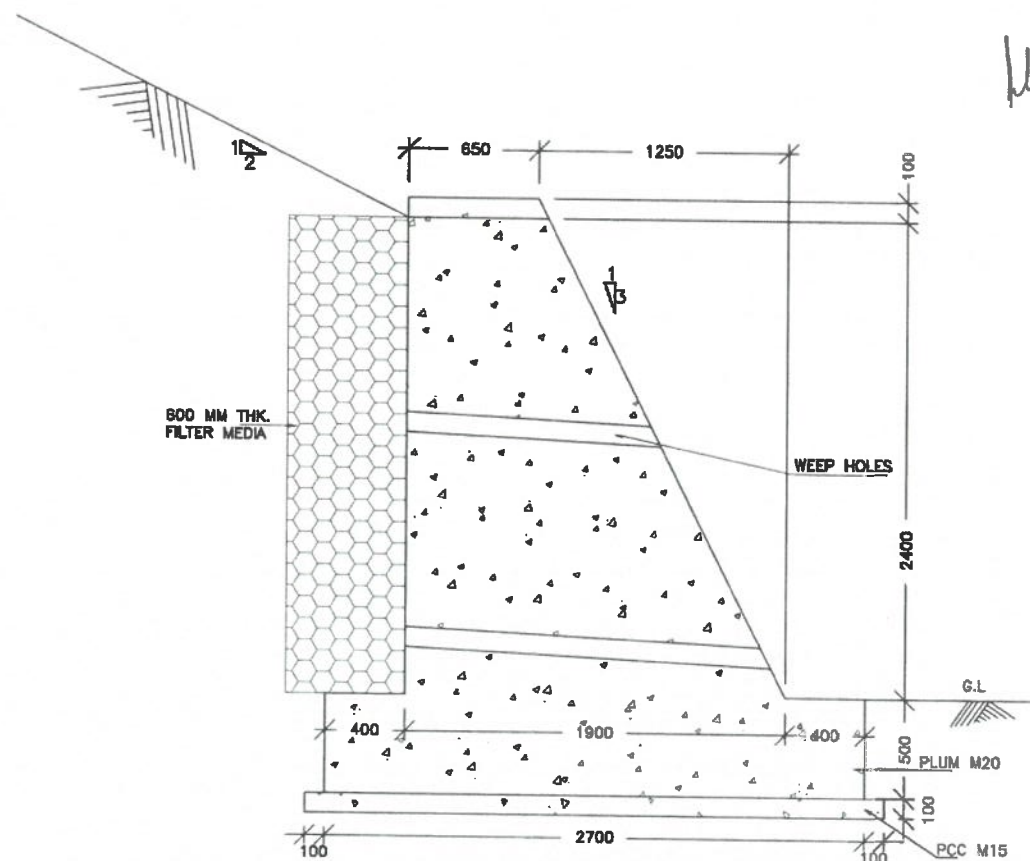
Handwritten signature
DESIGN DIRECTOR



TOE WALL (2.0m)
SCALE 1:25

Shambhavi Techno Solutions Pvt. Ltd.

Handwritten signature
Managing Director



TOE WALL (3.0m)
SCALE 1:25

Handwritten signature
SUVADRA CONSULTANTS
Regd. No. 11/2004-05
CHUBANESWAR

GENERAL NOTES:-

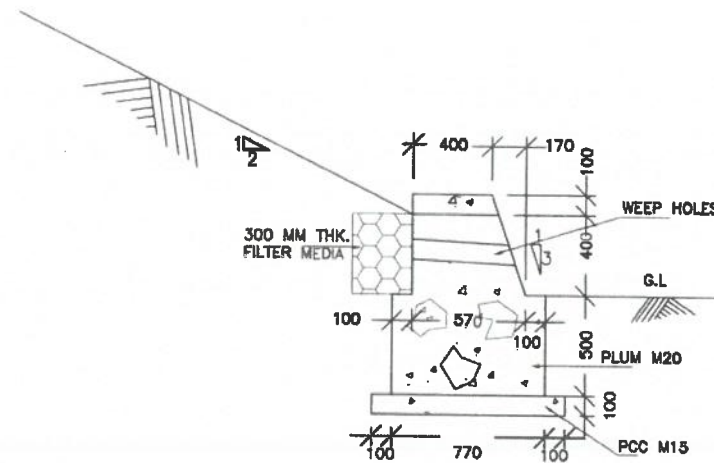
- ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
- WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 MM C/C BOTH HORIZONTALLY & VERTICALLY IN THE BREAST WALL UPTO 150 MM ABOVE GL/LWL. IT SHALL BE
 - 100 MM ϕ IN PCC/PLUM CONCRETE.
 - 150 MM ϕ OR 80 X 150 MM IN RR MASONRY.
- FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 6 OF IRC: 78-2014.
- BACK FILLING BEHIND THE PCC WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78-2014 HAVING PROPERTIES $\phi = 30^\circ$, $C=0$, $\gamma = 20\text{kN/m}^3$
- SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
- GRADE OF CONCRETE PCC M20.
- FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.



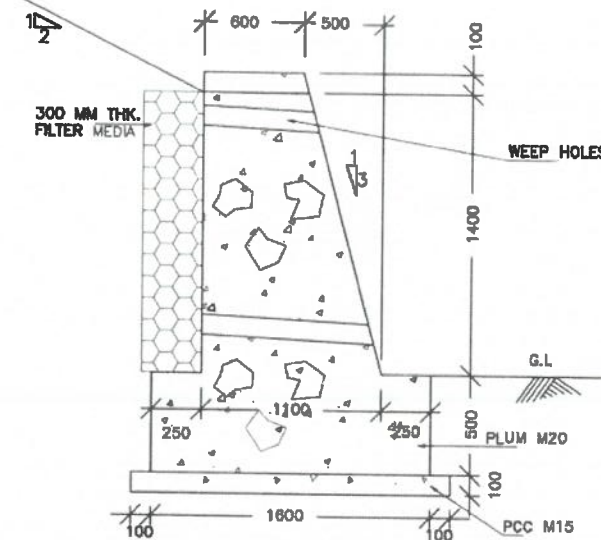
DESIGN BEARING CAPACITY :

H MAX. (m)	1.0	2.0	3.0
DESIGN BEARING CAPACITY (T/sqm)	5.0	6.0	7.0

Rev.	Date	Description	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN	N.B.R.	TITLE:	SCALE:	DATE:	REV:
R0	MAR-2022	FOR REVIEW & APPROVAL	M/S CHAITANYA PROJECTS CONSULTANCY PVT. LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES	GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.	M/S CHAITANYA PROJECTS CONSULTANCY PVT. LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-62ND FLOOR, RK TOWER, 25/1/14/4, VIKAS NAGAR, 700098.	SUVADRA CONSULTANTS PP-97, Tankapuri Road, BBSR-16, Odisha	SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001	SPS Technocrats Pvt. Ltd. # 510 & 511, JMD Megapolis, Sector 48, Gurugram, Haryana - 122018.	Widening to 2 (Two) Lane with Hard shoulder of Churehandpur to Tuivai section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	Imphal Branch 795001	Imphal	TOE WALL (PCC)	AS SHOWN	MARCH- 2022	R0
DRG. NO: GPT/G74A/STR/TW01															



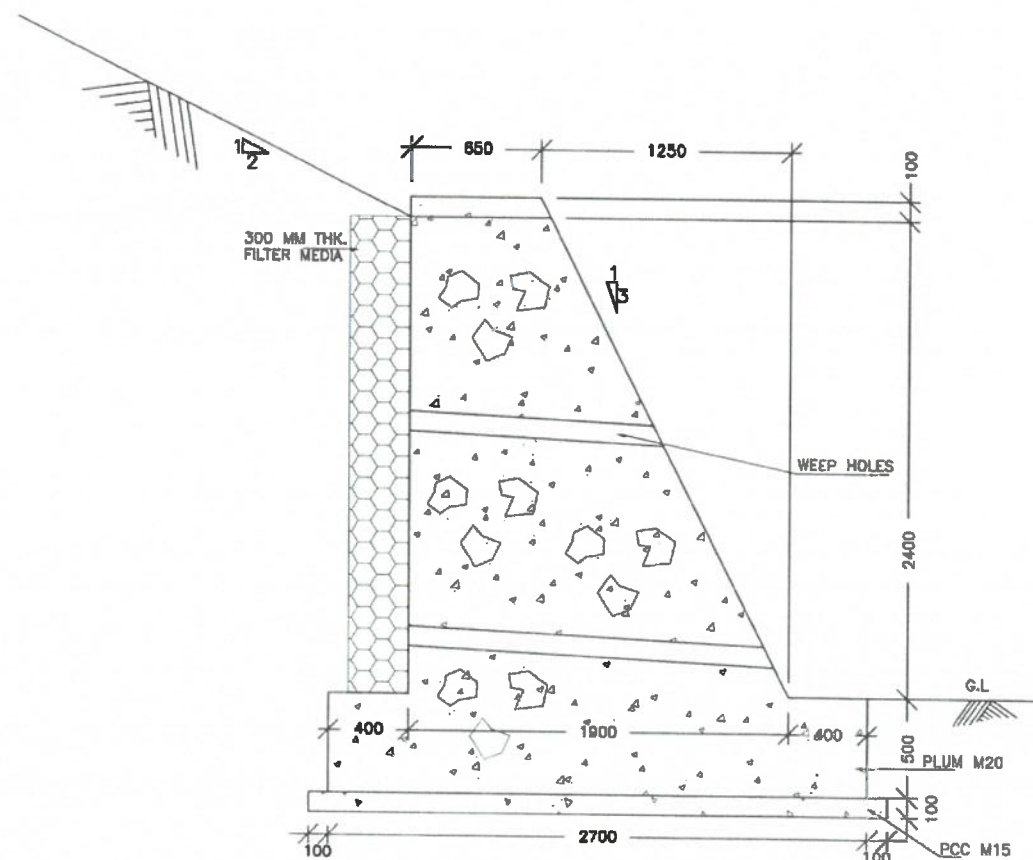
TOE WALL (1.0m)
SCALE 1:25



TOE WALL (2.0m)
SCALE 1:25



Shambhavi Techno Solutions Pvt. Ltd.
Managing Director



TOE WALL (3.0m)
SCALE 1:25



GENERAL NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
- 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 G.L./L.W.L. IT SHALL BE
 - 100 MM ϕ IN PCC/PLUM CONCRETE.
 - 150 MM ϕ OR 80 X 150 MM IN RR MASONRY.
- FILTER MEDIA OF 300MM THICKNESS CONFIRMING TO MORTH & H FILTER MEDIA SPECIFICATIONS.
- BACK FILLING BEHIND THE PCC WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 6 OF IRC:78-2014 HAVING PROPERTIES $\phi = 30^\circ$, C=0
- SURFACE REINFORCEMENT AT THE RATE OF 2.5KG/SQM SHALL BE PROVIDED IN EACH DIRECTION I.E BOTH HORIZONTALLY & VERTICALLY.
- PLUMS CONCRETE IN M20 GRADE.
- FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

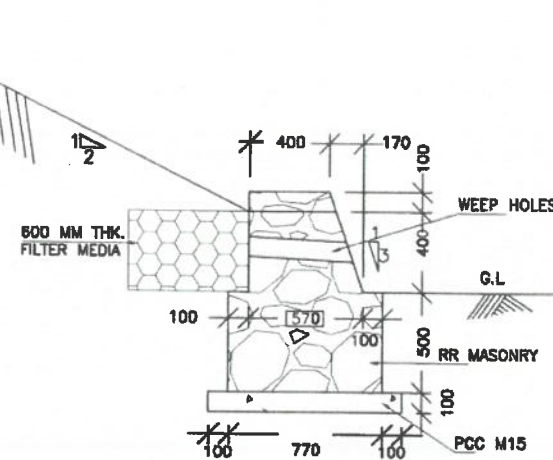
DESIGN BEARING CAPACITY :

H MAX. (m)	1.0	2.0	3.0
DESIGN BEARING CAPACITY (T/sqm)	5.0	6.0	7.0

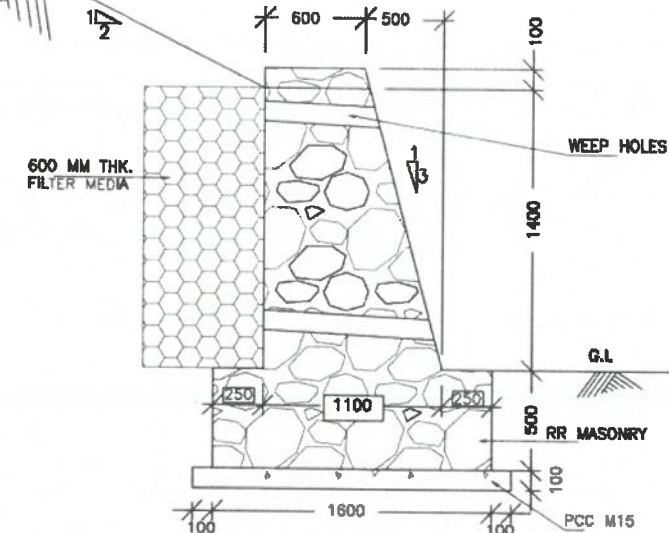
PLUM CONCRETE SPECIFICATIONS:-

- 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.
- 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.
- 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.
- 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.
- 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:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN:	N.S.R.	TITLE: TOE WALL (PLUM CONCRETE)	REV:
R0	MAR-2022	FOR REVIEW & APPROVAL		 JC - 25, Sector - III, Salt Lake, Kolkata - 700098.	 IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES 2ND FLOOR, RAJ TOWER SEA TOWER, VARDHANA, BHUBANESWAR-751015	 PP-97, Tankapal Road, BBSR-18, Odisha	 E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800031	 8 610 & 611, JMD Nagar, Sector 48, Gurgaon, Haryana - 122018.	Widening to 2 (Two) Lane with Hard shoulder of Churechandpur to Tulvel section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) In the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DESIGNED A.S	CHECKED A.V	SCALE: AS SHOWN	R0
DATE: MARCH-2022										DRG. NO: GPT/CT/4A/STR/TW/02			



TOE WALL (1.0m)
SCALE 1:25



TOE WALL (2.0m)
SCALE 1:25

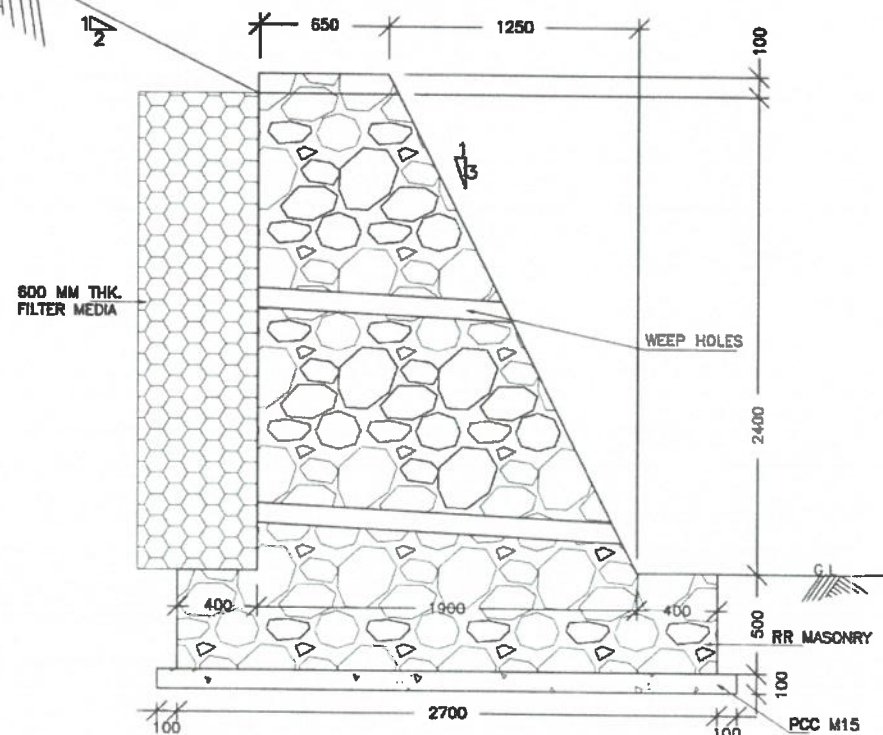


Shambhavi Techno Solutions Pvt. Ltd.

Managing Director



APPROVED



TOE WALL (3.0m)
SCALE 1:25

GENERAL NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
- WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 MM C/C BOTH HORIZONTALLY & VERTICALLY IN THE BREAST WALL UP TO 150 MM ABOVE G.L./L.W.L. IT SHALL BE
 - 100 MM ϕ IN PCC/PLUM CONCRETE.
 - 150 MM ϕ OR 80 X 150 MM IN RR MASONRY.
- FILTER MEDIA OF 600MM THICKNESS CONFIRMING TO APPENDIX 8 OF IRC: 78-2014.
- BACK FILLING BEHIND THE PCC WALL SHALL BE PROVIDED CONFORMING TO APPENDIX 8 OF IRC: 78-2014 HAVING PROPERTIES $\phi = 30^\circ$, $C=0$, $I = 20kN/m^2$
- RR MASONRY IN CEMENT MORTAR (1:3)
- FOR ANY AMBIGUITY FOUND IN DRAWING OR AT SITE BRING IT TO IMMEDIATE NOTICE OF ENGINEER-IN-CHARGE BEFORE ANY EXECUTION.

STONE MASONRY SPECIFICATIONS:-

- THE STONES TO BE USED FOR STONE MASONRY SHOULD BE HARD, TOUGH AND DURABLE.
- THE PROPERLY WETTED STONES SHOULD BE USED TO AVOID MORTAR MOISTURE BEING SUCKED.
- BEFORE LAYING THE STONE IN THE WALL, SHAPE AND DRESS IT SO THAT IT WILL NOT LOOSEN AFTER IT IS PLACED.
- NO DRESSING OR HAMMERING WHICH WILL LOOSEN THE STONE WILL BE PERMITTED AFTER IT IS PLACED.
- CLEAN EACH STONE AND SATURATE IT WITH WATER BEFORE SETTING IT. CLEAN AND MOISTEN THE BED THAT WILL RECEIVE IT.
- ENSURE THAT THE JOINTS AND BEDS HAVE AN AVERAGE THICKNESS OF NOT MORE THAN 1 INCH. (25 MM).
- ENSURE THAT THE VERTICAL JOINTS IN EACH COURSE BREAK WITH THE ADJOINING COURSES AT LEAST 6 IN. (150 MM).
- 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	CLIENT:	EPC CONTRACTOR:	AUTHORITY ENGINEER:	SAFETY CONSULTANT:	PROOF CONSULTANT:	DESIGN CONSULTANT:	PROJECT:	DRAWN	N.B.R.	TITLE:	SCALE:	DATE:	DRG. NO:	REV:
R0	MAR-2022	FOR REVIEW & APPROVAL	MAIDCL	GPT JC - 25, Sector - III, Salt Lake, Kolkata - 700098.	M/S CHAITANYA PROJECTS CONSULTANCY PVT.LTD. IN ASSOCIATION WITH MSPARK FUTURISTICS AND ASSOCIATES C-6, 2ND FLOOR, R K TOWER, SECTOR 4 Vidyut, Bhubaneswar-751010.	SUVADRA CONSULTANTS PP-47, Tankapani Road, BBSR-76, Odisha	SHAMBHAVI TECHNO SOLUTIONS PVT.LTD. E-62, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001	SPS Technocrats Pvt. Ltd. 8 510 & 511, MID Megapole, Sector 48, Gurgaon, Haryana - 122015.	Widening to 2 (Two) Lane with Hard shoulder of Chauschandpur to Tuhel section of NH 102B from Km 118.850 to Km 130.000 (Package-4A) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode.	DESIGNED	A.B	TOE WALL (RR MASONRY)	AS SHOWN	MARCH- 2022	GPT/CT/4A/STR/TW/83	R0